MOOLARBENCOAL

Annual Environmental Management Report 2011-2012

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Name of mine	Moolarben Coal Mines
Titles/Mining Leases	EL 6288, 7073, 7074 ML 1605, 1606, 1628
MOP Commencement Date	November 2009
MOP Completion Date	December 2012
AEMR Commencement Date	01/09/2011
AEMR Completion Date	31/08/2012
Name of Leaseholder	Moolarben Coal Mines Pty Limited
Name of Operator (if different)	Moolarben Coal Operations Pty Ltd
Reporting Officer	Frank Fulham
Title	General Manager
Date:	31st October 2012

Signature:

DISTRIBUTION

NSW Department of Planning and Infrastructure
NSW Department of Resources and Energy
NSW Environment Protection Authority
NSW Office of Water
Department of Sustainability, Environment, Water, Population and Communities
Mid-Western Regional Council
Moolarben Coal Operations Community Consultative Committee Members
Moolarben Coal Operations Environment and Community Relations Manager
Moolarben Coal Operations Environment and Community Relations Superintendent
Moolarben Coal Operations Environment and Community Relations Coordinators
Moolarben Coal Operations General Manager
Moolarben Coal Operations Website
Yancoal Australia

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ACRONYMS

AEMR	Annual Environmental Management Report
CCC	Community Consultative Committee
DP&I	Department of Planning and Infrastructure
DRE	Department of Resources and Energy
EPA	Environment Protection Authority
EPBC	Environment Protection and Biodiversity Conservation Act
MWRC	Mid-Western Regional Council
NOW	NSW Office of Water
SEWPAC	Sustainability, Environment, Water, Population and Communities

1.0 INTRODUCTION

The Moolarben Coal Project (MCP) is located in the Western Coalfields of New South Wales, east of Ulan and approximately 40 km northeast of Mudgee, in the Mid-Western Regional local government area, and is adjacent to the Ulan and Wilpinjong coal mines. The MCP is operated by Moolarben Coal Operations Pty Ltd (MCO).

1.1 STRUCTURE OF THIS REPORT

The structure of this report is based on the document "Guidelines and Format for Preparation of Annual Environmental Management Report", Department of Mineral Resources, Document No. EDG03 MREMP Guide V3 dated January 2006 and incorporates the reporting requirements stipulated in the Moolarben Project Approval, specifically Schedule 5, Condition 5. This report also incorporates the reporting requirements in the "Draft DWE Water Reporting Requirements for Mines" and the reporting requirements in Condition 4 of MCO's Environment Protection and Biodiversity Conservation Act (EPBC) approval.

This Annual Environmental Management Report (AEMR) provides a summary of activities, environmental management and performance at MCO from 1st September 2011 to 31st August 2012 (herein referred to as the 'reporting period'). This reporting period was selected to meet Condition 5, Schedule 5 of the Project Approval which requires this AEMR to be submitted within 12 months of the date of approval.

In accordance with Condition 5, Schedule 5 of the Project Approval, copies of this AEMR will be made available to:

- Department of Planning and Infrastructure (DP&I);
- Department of Resources and Energy (DRE);
- Environment Protection Authority (EPA);
- Department of Primary Industries – NSW Office of Water (NOW);
- Mid-Western Regional Council (MWRC); and
- MCO Community Consultative Committee (CCC).

In accordance with condition 4 of the EPBC approval a copy of the report will be supplied to Department of Sustainability, Environment, Water, Population and Communities (SEWPAC).

1.2 APPROVALS, LEASES AND LICENCES

Project approval 05_0117 was granted by DP&I in September 2007 for the operation of Moolarben Coal Mine. This approval covers Stage 1 of the project. Stage 1 includes the construction and operation of three separate open cut mines (OC1, OC2 and OC3), an underground mine (UG4), the coal handling and preparation plant (CHPP) and infrastructure area.

Stage 1 has approval to extract up to 8 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal from the open cut mines and up to 4 Mtpa ROM coal from the underground mine. It can produce up to 10 Mtpa of product coal, which can only be transported from the site by rail. Stage 1 is approved to operate until 20th December 2028.

Since gaining approval for Stage 1, MCO has made eight separate applications under S75W of the EP&A Act to modify the Minister's approval for the project. These are detailed below:

- In August 2008, an application was made to DP&I to make administrative changes and to rearrange specific items of approved infrastructure so as to improve operational efficiency

and provide improved conservation outcomes. The application (05_0117 MOD 1) was approved on 26 November 2008;

- In December 2008, an application was made to the DP&I to allow preliminary construction activities to commence prior to completion of required mine access road works. The application (05_0117 MOD 2) was approved on 18 December 2008;
- In February 2009, an application was made to the DP&I to allow Stage 1 to receive and process run-of-mine (ROM) coal from the proposed Stage 2 project; increase throughput of processing, handling and rail loading to 17 Mtpa ROM coal and 13 Mtpa product coals; increase off-site transport of product coal to 13 Mtpa; and extend the approved operating life of Stage 1 infrastructure so that Stages 1 and 2 of the MCP will be fully integrated. The application (05_0117 MOD 3) is currently being assessed by the DP&I;
- In April 2009, an application was made to the DP&I to change the configuration of the rail loop from a figure-8 to a balloon loop layout. The application (05_0117 MOD 4) was approved on 30 June 2009;
- In June 2009, an application was made to the DP&I to relocate the ROM coal facility and develop a water sharing pipeline from the Ulan coal mine. The application (05_0117 MOD 5) was approved on 5 October 2009;
- In December 2009, an application was made to the DP&I to make a minor adjustment to the location of the rejects bin and to increase its throughput. The application (05_0117 MOD 6) was approved on 11 January 2010;
- In March 2010, an application was made to the DP&I to enable the development and operation of a dewatering and water supply borefield. The application also made amendments to the Stage 1 Vegetation Offset Strategy. The application (05_0117 MOD 7) was approved on 3 February 2011; and
- In April 2010 an application was made to the DP&I to allow for a 100,000 tonne ROM stockpile at the approved ROM coal facility. The application (05_0117 MOD 8) was approved on 27 May 2010.

During the reporting period there were no variations to MCO's DP&I approval.

During the reporting period there were no variations to MCO's Environmental Protection Licence (EPL12932). An application was made to increase the allowable daily discharge from the site. Further detail on this application can be found in **Section 2.9**.

In August 2011 an application was made by MCO to DRE to allow for 36 exploration holes across twenty locations in EL7073 to provide further geological information in order to identify coal distribution, depth and type. A Review of Environmental Factors accompanied this application. This application was approved on 14 September 2011 by DRE.

During March and April 2012 an application was made by MCO to DRE to allow for 8 exploration holes in EL6288 to provide further geological information in the northern portion of EL6288. Two Surface Disturbance Notices (SDN) accompanied these applications. The applications were approved by DTIRIS on 20 March 2012 and 4 April 2012 respectively.

12 new water licences were obtained by MCO during the reporting period. These water licences were for exploration activities in EL6288 and EL7073.

Table 1 presents a summary of the approvals, leases and licences currently held by MCO.

Table 1: Leases, Licences and Approvals

Type	Approval	Number	Approval Authority	General Description	Date Granted	Expiry/Renewal Date
Exploration Licences						
EL	Exploration Licence (Mining Act 1992)	6288	NSW Department Resources and Energy	Covers Stage 1 OC and Underground 4 areas	02/12/2009	22/08/2012. Renewal lodged in August 2012. Remains undetermined
EL	Exploration Licence (Mining Act 1992)	7074	NSW Department Resources and Energy	35ha in 2 parcels of land	12/02/2008	12/02/2010 Renewal lodged in 2010. Remains undetermined.
EL	Exploration Licence (Mining Act 1992)	7073	NSW Department Resources and Energy	1,110ha to the south of OC3 adjacent to the southern boundary of EL6288	12/02/2008	12/02/2010 Renewal lodged in 2010. Remains undetermined.
Mining Leases						
ML	Mining Lease (Mining Act 1992)	1605	NSW Department Resources and Energy	Underground 4 and CHPP infrastructure area	20/12/2007	20/12/2028
ML	Mining Lease (Mining Act 1992)	1606	NSW Department Resources and Energy	OC1 and associated infrastructure area	20/12/2007	20/12/2028

Type	Approval	Number	Approval Authority	General Description	Date Granted	Expiry/Renewal Date
ML	Mining Lease (Mining Act 1992)	1628	NSW Department Resources and Energy	260.5ha	24/02/2009	24/02/2030
MOP						
MOP	Moolarben Coal Mines MOP	09/1501	NSW Department Resources and Energy	Addresses mining within Open Cut 1 and construction activities planned for the site.	Nov-09	Dec-12
Project Approvals						
DC	Project Approval (Section 75J)	05_0117	NSW Department of Planning and Infrastructure	Construction and operation of an open-cut and underground coal mining operation and associated infrastructure. Development of Stage 1 - OC 1-3 and UG 4 and associated infrastructure.	06/09/2007	20/12/2028
DC	Project Approval (Section 75W)	05-0117 (M1)	NSW Department of Planning and Infrastructure	This proposal involves amending the layout of the main infrastructure area and modifying Condition 12 of Schedule 2 and Conditions 42(b) and 56 of Schedule 3 of the project approval.	26/11/2008	20/12/2028
DC	Project Approval (Section 75W)	05-0117 (M2)	NSW Department of Planning and Infrastructure	The application seeks to modify Condition 51(a) of Schedule 3 of the project approval to allow minor preliminary construction activities to commence on site.	18/12/2008	20/12/2028
DC	Project Approval (Section 75W)	05-0117 (M4)	NSW Department of Planning and Infrastructure	Balloon Loop Modification to Stage 1 of the Moolarben Coal Project	30/06/2009	20/12/2028

Type	Approval	Number	Approval Authority	General Description	Date Granted	Expiry/Renewal Date
DC	Project Approval (Section 75W)	05-0117 (M5)	NSW Department of Planning and Infrastructure	Constructing and operating a pipeline to facilitate water sharing with the Ulan Coal Mine; - relocating the run-of-mine coal dump hopper and associated facilities; - increasing construction hours to 24 hours a day; - regularising mining lease boundary fence line clearing and other minor site and administrative adjustments.	05/10/2009	20/12/2028
DC	Project Approval (Section 75W)	05-0117 (M6)	NSW Department of Planning and Infrastructure	Relocating the rejects bin to a preferred location about 250m northwest of its approved location.	11/01/2010	20/12/2028
DC	Project Approval (Section 75W)	05-0117 (M7)	NSW Department of Planning and Infrastructure	Development and operation of a dewatering and water supply borefield and amendments to the Stage 1 Vegetation Offset Strategy.	03/02/2011	20/12/2028
DC	Project Approval (Section 75W)	05-0117 (M8)	NSW Department of Planning and Infrastructure	Establishing a 100,000 tonne ROM coal stockpile adjacent to the ROM coal dump hopper, at the ROM coal facility.	27/05/2010	20/12/2028
EPBC	EPBC Act Approval	2007/ 3297	Department of Sustainability, Environment, Water, Populations and Communities	Establishment of a coal mine and associated infrastructure as per the EPBC Referral dated 16/02/2007	24/10/2007	31/12/2027
Licences						

Type	Approval	Number	Approval Authority	General Description	Date Granted	Expiry/Renewal Date
LIC	Environmental Protection Licence	12932	NSW Environment Protection Authority	Licence authorising the carrying out of coal mining scheduled activity	18/08/2008	Not applicable
LIC	Apparatus Licence	1906954	Australian Communications and Media Authority	This Fixed licence authorises the operation of one point to multipoint station	13/10/2011	12/10/2012
LIC	Apparatus Licence	1920464	Australian Communications and Media Authority	This Fixed licence authorises the operation of one point to multipoint station	18/09/2011	17/09/2012
LIC	Apparatus Licence	1920482	Australian Communications and Media Authority	This Land Mobile Licence authorises the operation of 1 land mobile	18/09/2012	17/09/2013
LIC	Apparatus Licence	1914519	Australian Communications and Media Authority	This Land Mobile Licence authorises the operation of 1 land mobile system-GPS	30/06/2012	29/06/2013
LIC	Apparatus Licence	1913125	Australian Communications and Media Authority	This Land Mobile Licence authorises the operation of 1 land mobile	18/09/2011	17/09/2012
LIC	Apparatus Licence	1913126	Australian Communications and Media Authority	This Land Mobile Licence authorises the operation of 1 land mobile	18/09/2011	17/09/2012
LIC	Apparatus Licence	1913127	Australian Communications and Media Authority	This Land Mobile Licence authorises the operation of 1 land mobile	18/09/2011	17/09/2012

Type	Approval	Number	Approval Authority	General Description	Date Granted	Expiry/Renewal Date
LIC	Apparatus Licence	1913128	Australian Communications and Media Authority	This Land Mobile Licence authorises the operation of 1 land mobile	18/09/2011	17/09/2012
LIC	Radiation Licence	RL41761	NSW Environment Protection Authority	Licence for the operation of a radiation device on site	31/01/2010	31/01/2013
LIC	Dangerous Goods Licence	35/038029	Workcover NSW	Licence for the storage of Dangerous Goods on site	08/01/2010	08/01/2013
Agreements						
AGR	Voluntary Planning Agreement		Mid-Western Regional Council	Planning Agreement under Section 93F of the Environmental Planning & Assessment Act 1979. Details Development Contributions payable to MWRC.	23/04/2009	Ongoing
AGR	Ancillary Deed		Native Title Party	Agreement between MCO and the Native Title Party to enable mining over Crown Land.	07/07/2008	Upon surrender of all MLs
Dams Safety Committee						
DSC	Mining within the Moolarben Creek Dam Notification Area	10.123.107	NSW Dams Safety Committee	Sets out conditions related to mining within the Moolarben Creek Dam Notification Area	08/04/2009	31/12/2013
Occupancy Licences						
CL	Occupancy Licence (Crown Lands Act 1989)	404558	NSW Department of Lands	Grazing	22/11/2007	Discretion of the Minister
CL	Occupancy Licence (Crown Lands Act 1989)	403442	NSW Department of Lands	Grazing and Groundwater monitoring	24/12/2007	Discretion of the Minister
CL	Occupancy Licence (Crown Lands Act 1989)	409273	NSW Department of Lands	Northern Borefield	04/03/2009	Discretion of the Minister
Water Licences						

Type	Approval	Number	Approval Authority	General Description	Date Granted	Expiry/Renewal Date
WL	Bore Licence Certificate (Water Act 1912)	20BL168749	Department of Primary Industries	Irrigation	08/05/2008	07/05/13
WL	Bore Licence Certificate (Water Act 1912)	20BL169899	Department of Primary Industries	Monitoring	08/11/2005	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171922	Department of Primary Industries	Test Bore	14/07/2008	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171923	Department of Primary Industries	Monitoring	14/07/2008	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171924	Department of Primary Industries	Monitoring	14/07/2008	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171925	Department of Primary Industries	Monitoring	14/07/2008	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171926	Department of Primary Industries	Monitoring	14/07/2008	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171927	Department of Primary Industries	Monitoring	14/07/2008	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171928	Department of Primary Industries	Monitoring	14/07/2008	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171959	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171960	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171961	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity

Type	Approval	Number	Approval Authority	General Description	Date Granted	Expiry/Renewal Date
WL	Bore Licence Certificate (Water Act 1912)	20BL171962	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171963	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171964	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171965	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171966	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171967	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171968	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171969	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171970	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171971	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171972	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171973	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity

Type	Approval	Number	Approval Authority	General Description	Date Granted	Expiry/Renewal Date
WL	Bore Licence Certificate (Water Act 1912)	20BL171974	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171975	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171976	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171977	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171978	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171979	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171980	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171981	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171982	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171983	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171984	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171985	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity

Type	Approval	Number	Approval Authority	General Description	Date Granted	Expiry/Renewal Date
WL	Bore Licence Certificate (Water Act 1912)	20BL171986	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171987	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171988	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171989	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171990	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171991	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171992	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171993	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171994	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL171998	Department of Primary Industries	Mining – 150ML/year extraction	27/01/2009	26/01/2014
WL	Bore Licence Certificate (Water Act 1912)	20BL171999	Department of Primary Industries	Mining – 1,200ML/year extraction	27/11/2009	26/11/2014
WL	Bore Licence Certificate (Water Act 1912)	20BL172000	Department of Primary Industries	Mining – 150ML/year extraction	27/01/2009	26/01/2014

Type	Approval	Number	Approval Authority	General Description	Date Granted	Expiry/Renewal Date
WL	Bore Licence Certificate (Water Act 1912)	20BL172001	Department of Primary Industries	Mining – 450ML/year extraction	20/04/2009	19/04/2014
WL	Bore Licence Certificate (Water Act 1912)	20BL172002	Department of Primary Industries	Mining – 750ML/year extraction	27/11/2009	26/11/2014
WL	Bore Licence Certificate (Water Act 1912)	20BL172003	Department of Primary Industries	OC1 Excavation	06/05/2009	05/05/2014
WL	Bore Licence Certificate (Water Act 1912)	20BL172106	Department of Primary Industries	Monitoring	20/03/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172167	Department of Primary Industries	Monitoring	20/04/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172168	Department of Primary Industries	Monitoring	20/04/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172169	Department of Primary Industries	Monitoring	20/04/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172189	Department of Primary Industries	Test Bore	05/05/2009	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172300	Department of Primary Industries	Dewatering (Groundwater) – 150ML/year extraction	16/02/2010	15/02/2015
WL	Bore Licence Certificate (Water Act 1912)	20BL172743	Department of Primary Industries	Monitoring	22/03/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172744	Department of Primary Industries	Monitoring	22/03/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172837	Department of Primary Industries	Monitoring	06/06/2011	Perpetuity

Type	Approval	Number	Approval Authority	General Description	Date Granted	Expiry/Renewal Date
WL	Bore Licence Certificate (Water Act 1912)	20BL172838	Department of Primary Industries	Monitoring	06/06/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172839	Department of Primary Industries	Monitoring	06/06/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172840	Department of Primary Industries	Monitoring	06/06/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172842	Department of Primary Industries	Monitoring	06/06/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172843	Department of Primary Industries	Monitoring	06/06/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172893	Department of Primary Industries	Monitoring	14/07/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172894	Department of Primary Industries	Monitoring	14/07/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172895	Department of Primary Industries	Monitoring	14/07/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172896	Department of Primary Industries	Monitoring	14/07/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172897	Department of Primary Industries	Monitoring	14/07/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172898	Department of Primary Industries	Monitoring	14/07/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172899	Department of Primary Industries	Monitoring	14/07/2011	Perpetuity

Type	Approval	Number	Approval Authority	General Description	Date Granted	Expiry/Renewal Date
WL	Bore Licence Certificate (Water Act 1912)	20BL172900	Department of Primary Industries	Monitoring	14/07/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172901	Department of Primary Industries	Monitoring	14/07/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172953	Department of Primary Industries	Monitoring	15/08/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172954	Department of Primary Industries	Monitoring	15/08/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172955	Department of Primary Industries	Monitoring	15/08/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL172956	Department of Primary Industries	Monitoring	15/08/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL173006	Department of Primary Industries	Monitoring	24/10/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL173039	Department of Primary Industries	Monitoring	15/11/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL173041	Department of Primary Industries	Monitoring	15/11/2011	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL173167	Department of Primary Industries	Monitoring	30/04/2012	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL173168	Department of Primary Industries	Monitoring	30/04/2012	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL173169	Department of Primary Industries	Monitoring	30/04/2012	Perpetuity

Type	Approval	Number	Approval Authority	General Description	Date Granted	Expiry/Renewal Date
WL	Bore Licence Certificate (Water Act 1912)	20BL173170	Department of Primary Industries	Monitoring	30/04/2012	Perpetuity
WL	Bore Licence Certificate (Water Act 1912)	20BL173171	Department of Primary Industries	Monitoring	30/04/2012	Perpetuity
Works Licences-Water						
WL	Surface Water Licence (Water Act 1912)	20SL060286	Department of Primary Industries	Splitters Hollow dam works licence.	04/09/2007	03/09/2012
Development Consents-MWRC						
DC	Development Consent	0363/2009	Mid-Western Regional Council	Utility Installation, Ulan Pipeline-Lot 43 DP 1098748 Crown Land Ulan Rd Ulan NSW	17/07/2009	17/07/2014
DC	Development Consent	0178/2010	Mid-Western Regional Council	Demolition of Dwelling and Associated Outbuildings - Lot 5 Sec 4 DP 759017 - 2-4 John St Ulan	11/01/2010	11/01/2015
DC	Development Consent	0179/2010	Mid-Western Regional Council	Demolition of Weatherboard Dwelling and Outbuilding - Lot 4 Sec 4 DP 759017 - 6-8 John St Ulan	11/01/2010	11/01/2015
DC	Development Consent	0180/2010	Mid-Western Regional Council	Demolition of Dwelling and Associated Outbuilding - Lot 3 Sec 1 DP 759017 - 38-40 Main St Ulan	11/01/2010	11/01/2015

1.3 MINE CONTACTS

Table 2: Mine Contacts for Environmental Matters

Area of Responsibility	Name	Contact Number(s)
General Manager	Frank Fulham	02 6376 1520 0417 719 392
Environment and Community Relations Manager	Luke Bowden	02 6376 1568 0429 223 688
Environment and Community Relations Superintendent	Julie Thomas	02 6376 1511 0427 228 412
Environment and Community Relations Coordinator	Klay Marchant	02 6376 1507 0400 239 291
Environment and Community Relations Coordinator	Trent Cini	02 6376 1436 0408 312 269
Environmental Contact Line	**1800 556 484**	
Address	Locked Bag 2003, Mudgee, NSW, 2850	

1.4 ACTIONS REQUIRED FROM PREVIOUS AEMR REVIEW

On 13th December 2011 representatives from DRE and EPA visited the site for a meeting regarding the 2010-2011 AEMR and to conduct their annual inspection of MCO's operations. DP&I, NOW and MWRC were invited to attend this meeting, however, were unable to attend due to other commitments. This visit and inspection was positive with neither DRE nor EPA providing formal comments on the 2010-2011 AEMR.

2.0 ACTIVITIES DURING THE REPORTING PERIOD

2.1 EXPLORATION

From 1 September 2011 to 12 April 2012 sixteen partially cored boreholes were drilled in the proposed Open Cut 4 area inside EL6288. The partially cored holes ranged in depth from 12m to 96.84m. The core obtained was used for full washability coal quality analysis of the Ulan and Moolarben Seams (where present), geotechnical testing and desorpable gas testing. All of these boreholes were drilled in pasture land requiring minimal disturbance of vegetation. An operational area of approximately 50m by 50m was cleared at each site. The majority of access was via existing farm tracks, which were upgraded where necessary. Where existing tracks were not present a 3m wide track was slashed to the site. All drill pads have been rehabilitated and seeded, and all boreholes have been fully cemented.

Between March 2012 and June 2012, eighteen rotary and twenty partially cored boreholes were drilled on EL7073. The rotary boreholes ranged in depth from 27.2m to 111.13m and the partially cored boreholes ranged in depth from 11.0m to 176.54m. The boreholes were drilled on a total of twenty sites. All boreholes were drilled in pasture land requiring minimal disturbance of vegetation. Ecologists were engaged to undertake due diligence surveys of the area to ensure that any sensitive trees at this specific site were not cleared. An operational area of approximately 50m by 50m was cleared at the majority of sites. On three sites, operational pad size was reduced to 30m by 30m. The majority of access was via existing farm tracks, which were upgraded where necessary. Where existing tracks were not present a 3-4m wide track was slashed to the site. All drill pads have been rehabilitated and seeded, and all boreholes have been fully cemented.

During July 2012, ten fully cored HQ sized boreholes were drilled within the Open Cut 1 footprint. The primary purpose of these holes was to gain information concerning the extent of weathering of the coal seams in upcoming mining areas. Depths of boreholes ranged from 18.0m to 38.9m. All but three of these boreholes were drilled in areas already cleared for mining. The borehole sites that required clearing were accessed via existing tracks, and were drilled in areas that had previously been surveyed by ecologists. Approximately 0.1Ha of vegetation was cleared for these sites. Rehabilitation of these sites is ongoing at the end of the reporting period. None of the holes were grouted as no aquifers were intercepted. The boreholes were filled with stemming material awaiting the commencement of overburden removal.

In August 2012, two partially cored boreholes were drilled in EL6288 North. These boreholes ranged in depth from 272.64m to 273.0m. The core obtained was used for full washability coal quality analysis of the Ulan and Moolarben Seams (where cored), and geotechnical testing. Both of these boreholes were drilled in pasture land requiring minimal disturbance of vegetation. An operational area of approximately 30m by 30m was cleared at each site. The majority of access was via existing farm tracks, which were upgraded where necessary. Where existing tracks were not present a 6m wide track was slashed to the site. At the end of the reporting period, the boreholes are waiting geophysical logging. On completion of logging, the drill pads will be rehabilitated and seeded, and all boreholes will be fully cemented.

All exploration activities are conducted in consultation with members of MCO's Environment and Community Department. The Ground Disturbance Permit Process (see **Section 2.2** for more information) is followed for each exploration program.

2.2 LAND PREPARATION

An additional 41.0ha of land was disturbed this reporting period for Open Cut mining operations. 49.0ha of disturbed land was rehabilitated during the reporting period. The areas disturbed this reporting period are shown in **Figure 1**.

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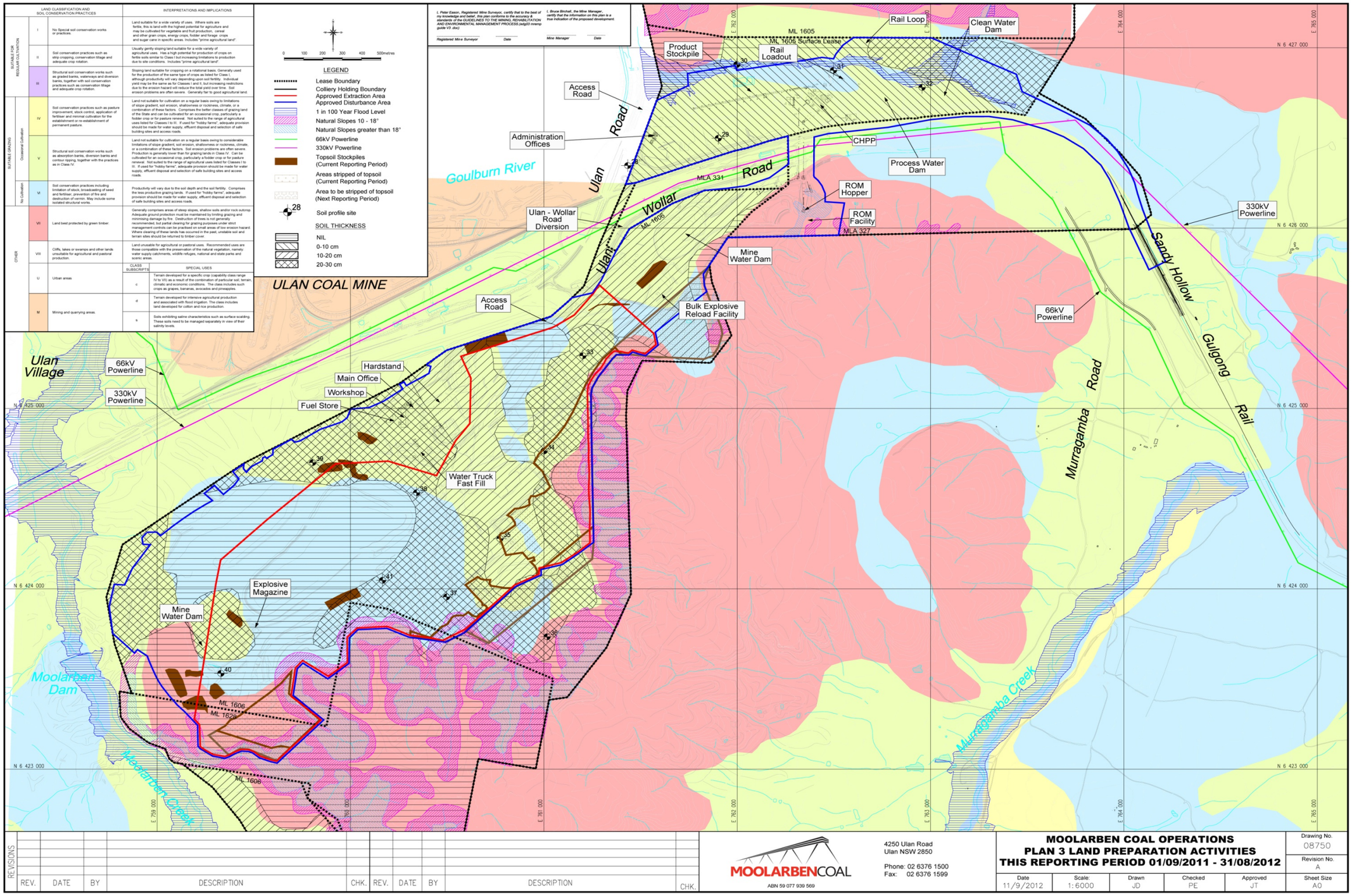


Figure 1: Land Preparation Activities This Reporting Period

2.2.1 Ground Disturbance Permit

Before any land is disturbed at MCO a Ground Disturbance Permit (GDP) needs to be authorised by a member of the Environment and Community Department. A plan of the area to be disturbed along with supporting documentation is provided to the Environment and Community Department and identifies the following:

- location of the disturbance works;
- land ownership;
- approval boundaries;
- location of proposed erosion and sediment control structures;
- management of topsoil;
- management of cleared vegetation;
- management of salvageable hollow bearing trees;
- location of known Aboriginal and/or European heritage sites; and
- information on members of the public that may need additional consideration (e.g. private landowner for exploration works).

The proposed disturbance area is pegged and clearly marked prior to any work commencing. If required, an inspection of the site is undertaken by a member of the Environment and Community Department to identify any additional environmental issues that may need further management. Where required, a qualified ecologist will conduct a pre-clearance flora and fauna survey of the area to identify threatened flora and fauna species, and potential habitat features that may need additional management. Where required, due diligence works will be undertaken to manage Aboriginal heritage matters.

2.2.2 Vegetation Clearing

All potential habitat trees are clearly marked during the pre-clearance flora and fauna survey. The first step in the clearing process is to remove the trees that haven't been marked as potential habitat trees. The potential habitat trees are left standing in open ground for at least 24 hours to encourage native fauna to relocate from the trees. Habitat trees are then gently felled under the supervision of a member of the Environment and Community Department. The trees are inspected to identify if any fauna are present in the trees and to identify if there are any salvageable hollows for reuse in rehabilitation programs. If injured fauna are identified they are captured and given to a wildlife rehabilitation expert or to the local vet for treatment.

After a habitat tree has been felled it is left in place for at least 24 hours to allow fauna still in the tree time to relocate. If fauna hasn't relocated after this time assistance may be required to help them relocate. Habitat trees with salvageable hollows are relocated to final rehabilitation areas or stockpiled for future use in rehabilitation programs.

MCO utilise two methods for the management of trees that don't have salvageable hollows. Trees are either snipped into short lengths for placement on rehabilitation or mulched and mixed in with topsoil for use on rehabilitation areas.

2.2.3 Topsoil Management

The extent of the topsoil boundary was identified during the Environmental Assessment process for MCO's operations. This boundary is used when identifying the extent of salvageable topsoil during clearing processes. Topsoil is salvaged during the clearing process, along with the mulch that is generated during the vegetation clearing process, and is used directly on rehabilitation areas or stockpiled for future use.

2.3 CONSTRUCTION

No specific construction works were undertaken during the reporting period.

2.4 MINING

All mining activities this reporting period have occurred in Open Cut 1 with operations occurring 24 hours a day, seven days a week. The status of the mining activities at the end of the reporting period is shown in **Figure 2**.

Mining operations at MCO are undertaken in accordance with the Mining Operations Plan and the relevant planning approvals. The stratigraphy of the coal seam mined at MCO is shown in **Plate 1**. Mining at MCO occurs in the Ulan Seam.

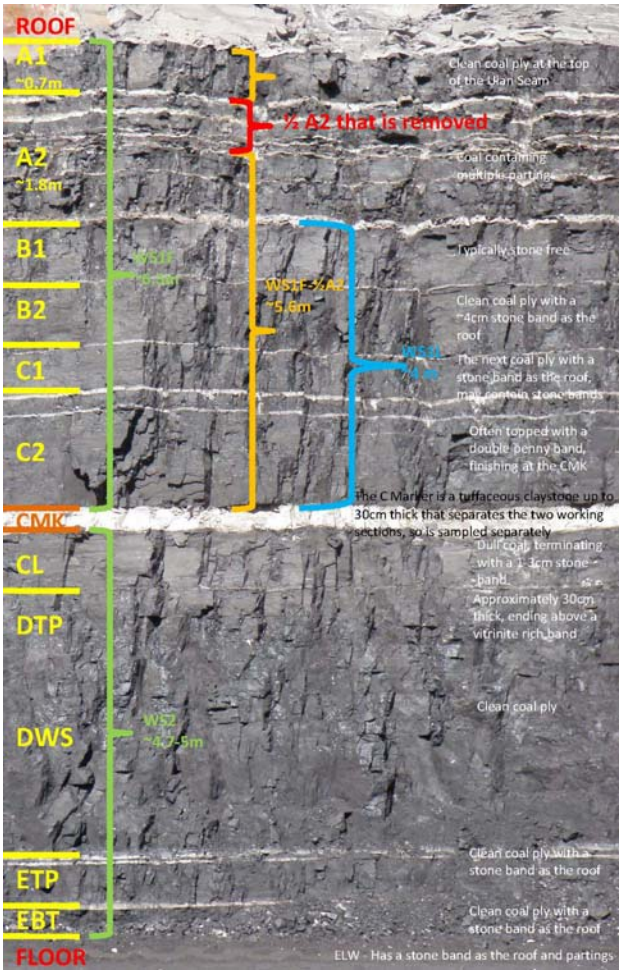


Plate 1: Coal Stratigraphy

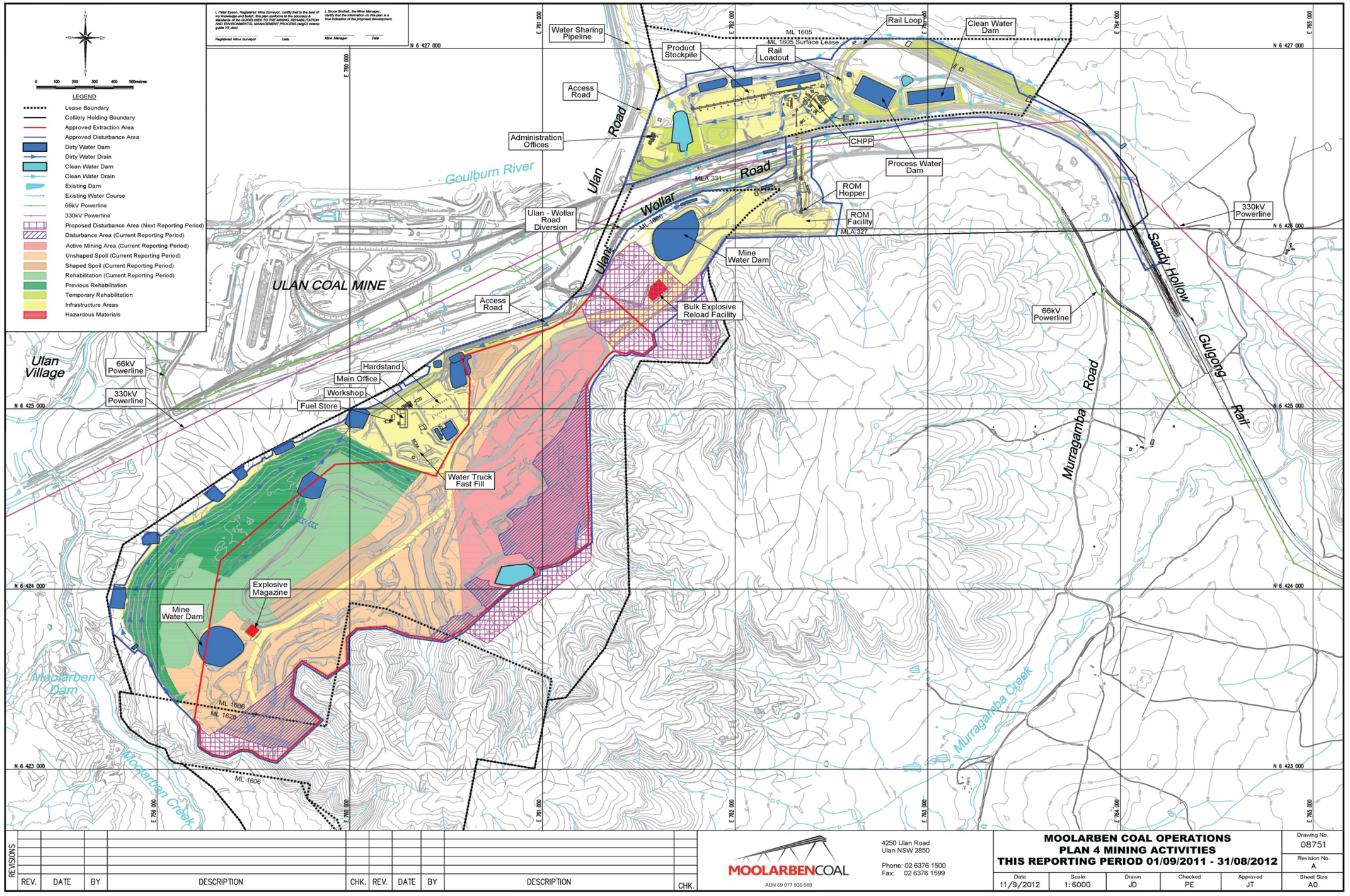


Figure 2: Mining Activities This Reporting Period

Mining is carried out by excavators and haul trucks supported by ancillary equipment including water carts, dozers, graders, fuel and service carts, loaders and drills. The mining equipment used at MCO includes:

- 2 x 996 excavators;
- 1 x 9350 excavator;
- 1 x PC450 support excavator;
- 1 x 6050 shovel;
- 1 x 1200 front end loader;
- 2 x drills;
- 5 x 475 dozers;
- 3 x 375 dozers;
- 1 x WA900 dozer;
- 2 x 825 graders;
- 1 x 24M grader;
- 3 x 785 water trucks;
- 15 x 830E rear dump trucks; and
- 2 x WA200 (wheel loaders).

Rejects generated from the processing of coal at the CHPP are transported back to the open cut operations for final disposal. Rejects are placed in selective areas of the open cut and are managed so that there will be at least a 5m cover over the rejects in the final landform.

2.5 EMPLOYMENT

During the reporting period the number of employees working at MCO slightly increased.

Table 3: Employment Statistics

Month	Employees
September 2011	194
October 2011	195
November 2011	205
December 2011	206
January 2012	210
February 2012	210
March 2012	221
April 2012	242
May 2012	242
June 2012	244
July 2012	247
August 2012	250

2.6 COAL TRANSPORT

5,282,039 tonnes of coal were transported by rail during the reporting period. The amount of coal transported from the site and timing of train movements was conducted in accordance with the conditions of approval from DP&I.

2.7 WASTE MANAGEMENT

During the reporting period MCO continued to maintain a Total Integrated Waste Management Service to manage all waste streams generated on site. This includes general waste, cardboard and paper recycling, co-mingled recycling, waste oil, and steel. The volumes of total waste and recycled material removed from site are shown in **Table 4** and **Figure 3**. The Waste Management Plan sets a recycling target of 70% for MCO. During the reporting period 78.14% of all waste removed from site was recycled. This is an improvement from last reporting period and is reflective of the work MCO are doing in consultation with the waste management contractor to identify opportunities to improve the recycling rates at MCO.

Table 4: Waste Removal Volumes

Month	Total Waste Removed (kg)	Waste Recycled (kg)	Percentage Waste Recycled
Sep-2011	56,322	40,454	71.83%
Oct-2011	53,498	41,020	76.68%
Nov-2011	27,410	18,430	67.24%
Dec-2011	88,369	64,723	73.24%
Jan-2012	33,686	26,000	77.18%
Feb-2012	103,864	88,854	85.55%
Mar-2012	101,346	81,224	80.15%
Apr-2012	101,450	87,454	86.20%
May-2012	45,158	21,710	48.08%
Jun-2012	88,034	67,616	76.81%
Jul-2012	68,498	54,574	79.67%
Aug-2012	132,280	114,140	86.29%
Yearly Total	**899,915**	**706,199**	**78.47%**

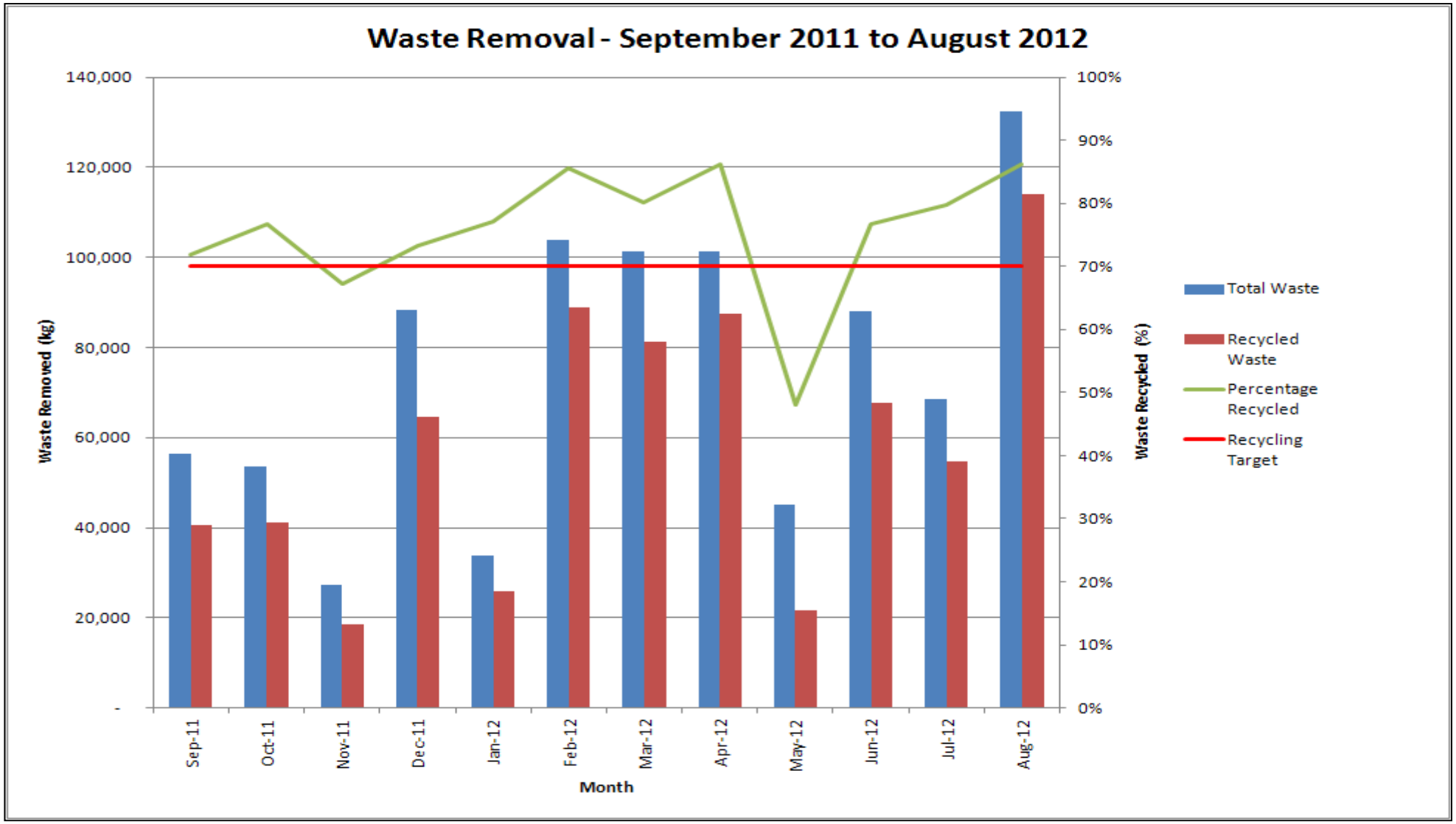


Figure 3: Waste Removed from Site

2.8 HAZARDOUS MATERIALS MANAGEMENT

MCO have a Dangerous Goods licence from Workcover NSW to store fuels and chemicals on site.

In addition to the licence, MCO have a Hazardous Substances Management Procedure that outlines the requirements for bringing hazardous and dangerous goods onto site, how to store hazardous and dangerous goods and how to dispose of the hazardous and dangerous goods. Before any hazardous and dangerous goods are brought onto site they need to be approved by the Health and Safety Manager.

2.9 WATER MANAGEMENT

Water management activities this reporting period related to managing clean and dirty water around the operations and securing water sources for future mining operations.

MCO has applied to the EPA for a 10ML/day discharge increase to MCO's EPL 12932. After assessing the information the EPA has requested MCO supply additional information to support the application. MCO has submitted draft designs for water structure upgrades to the EPA and is in the process of submitting final design drawing and a schedule of works for the delivery of the upgrades.

Key surface water structure upgrades and management include:

- The removal of "unsuitable stockpiles" from the CHPP area;
- To increase the size of the majority of dams within the CHPP area to Q50 design criteria;
- The construction of a levee bank and diversion drain to improve the clean water diversion around the CHPP;
- To relocate the current discharge points to better manage off site discharge;
- The installation of real time monitoring equipment within the water management system;
- The development of water management operating procedures; and
- To increase the size of Dam 6 in the Open Cut area to Q50 design criteria.

2.9.1 Site Water Balance

The site water balance for the reporting period can be seen in **Table 5** and shows that there was an additional 378.7ML of water stored on site at the end of the reporting period. The site water balance in the Water Management Plan predicted that 704ML of water would be received from surface water runoff this reporting period. Due to above average rainfall 1,552ML of surface water runoff was captured on site. Due to this larger than expected capture rate the reliance on water from the Northern and Southern Borefield's and from Ulan Coal Mines Limited was reduced and the water extracted from these sources was below licence and agreement allowances.

The priority for water usage at MCO is:

1. Surface Water Runoff;
2. Groundwater Inflow;
3. Water from Ulan Coal; and
4. Groundwater Extraction.

Table 5: Site Water Balance

Water Sources (ML)	
Ulan Coal East Pit	83.1
Northern Borefield	0.0
Southern Borefield	0.1
Rainfall/runoff	1,552.0
Open Cut Seepage	0.0
Potable Supply	5.6
ROM feed	285.3
Total	**1,926.2**
Water Loss (ML)	
Evaporation	140.3
Seepage	0.0
Construction & dust suppression	369.4
Discharges	0.0
Tailings/Coarse Reject	886.4
Product	150.8
Effluent	0.6
Total	**1,547.4**
Water Balance	**378.7**
Water Usage (ML)	
CHPP	1,037.2
Construction & dust suppression	369.4
Underground	0.0
Total	**1,406.6**

Note: Some of these figures are estimates only.

The actual volumes extracted from MCO's groundwater sources against licence allocation can be seen in **Table 6**.

Table 6: Groundwater Extraction

Licence Number	Site	Volume Extracted (ML)	Licence Allocation (ML)
20BL172001	TB179	0.10	150
20BL172000	TB052a	0.00	150
20BL172300	TB190	0.04	150
20BL172002	Northern Borefield	0.00	750
20BL171999	Northern Borefield	0.00	1,200
20BL169455	IB002	0.00	11
20BL172001	Northern Borefield	0.00	450
20BL172003	Open Cut 1	0.00	0
20BL168749	IB001	0.00	30

2.10 PRODUCTION AND WASTE SUMMARY

The amount of production and associated waste generated by MCO is detailed in **Table 7**.

Table 7: Production and Waste Summary

	CUMULATIVE PRODUCTION		
	Start of this Reporting Period	**At end of this Reporting Period**	**Estimate, end of next Reporting Period**
Topsoil Stripped (m^3)	370,870	447,412	518,142
Topsoil used/spread (m^3)	106,255	196,482	257,642
Topsoil stockpiled (m^3)	69,615	250,930	260,500
Waste Rock (BCM)	17,813,552	36,724,632	53,899,607
Open Cut ROM Coal (t)	9,794,737	16,927,061	24,580,218
Underground ROM Coal (t)	0	0	0
Total Coal (t)	9,794,737	16,927,061	24,580,218
Processing Waste (t)	2,970,160	5,075,122	7,563,806
Open Cut Product Coal (t)	6,824,577	11,851,939	17,016,412
Underground Product Coal (t)	0	0	0
Total Product Coal (t)	6,824,577	11,851,939	17,016,412

3.0 ENVIRONMENTAL MONITORING AND PERFORMANCE

3.1 ENVIRONMENTAL MANAGEMENT

Work continued during the reporting period on developing, implementing and improving MCO's Environmental Management System (EMS). This included the development and update of procedures, forms and training packages.

In order to measure compliance with the management plans, the project approval and various licences, MCO undertake a comprehensive monitoring program in the vicinity of the MCO mining areas. The locations of the sites monitored during the reporting period are shown on **Figure 4** to **Figure 5**. More details on the individual monitoring programs are provided below.

3.2 METEOROLOGICAL

At the end of the previous reporting period MCO installed a new meteorological monitoring station. This weather station is located on a property on Ulan Road and is referred to as WS03. WS03 is linked into the real-time monitoring system and is the main weather station for reporting purposes with WS01 and WS02 used to supplement weather data as required. For future reports data from WS03 will be the only data reported, however, to demonstrate that the results from WS01 and WS03 are similar both sets of data have been reported for this reporting period.

Data capture at WS01 and WS03 was 98.9% and 97.9% respectively for the reporting period.

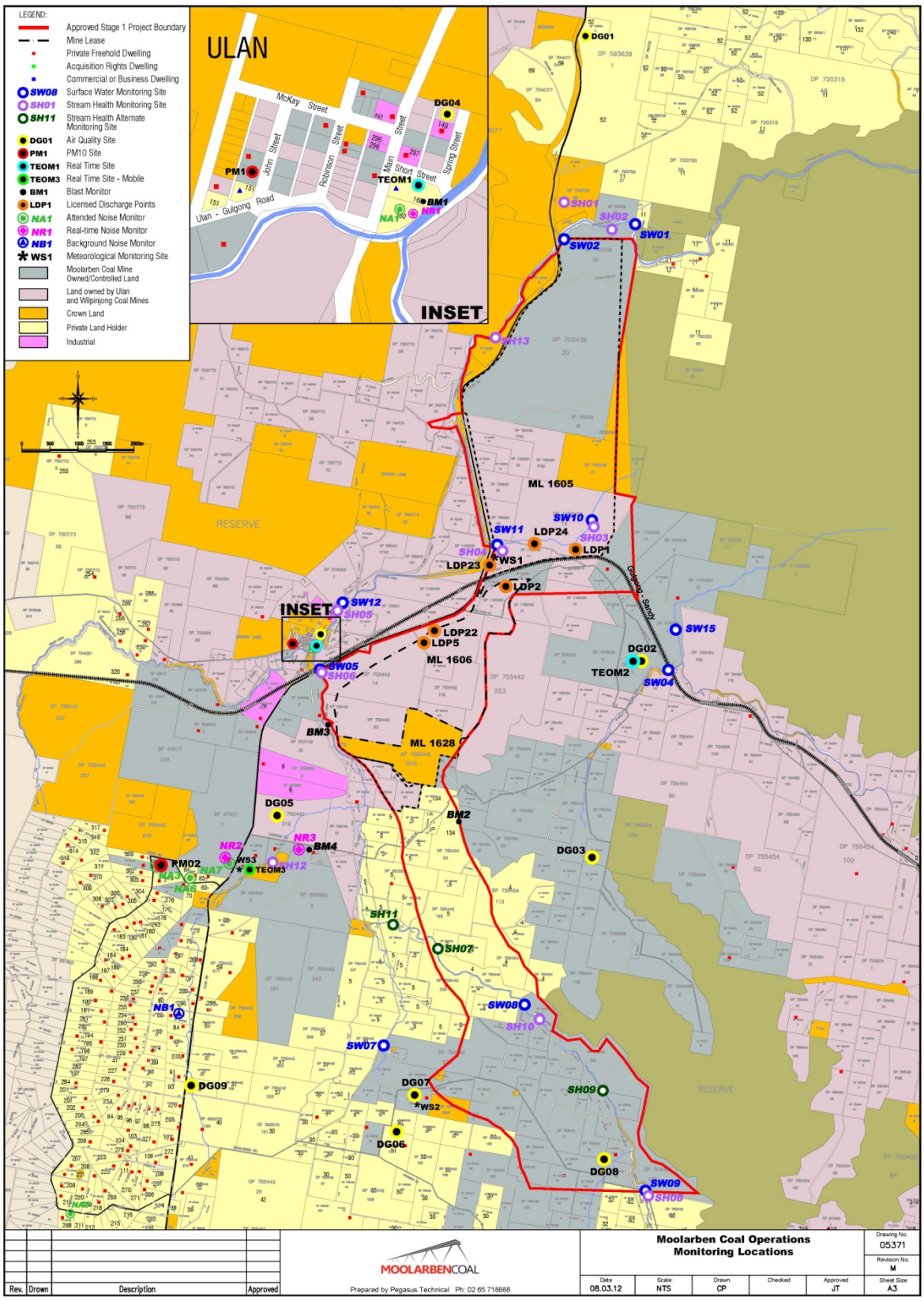


Figure 4: Environmental Monitoring Locations (excl. Groundwater)

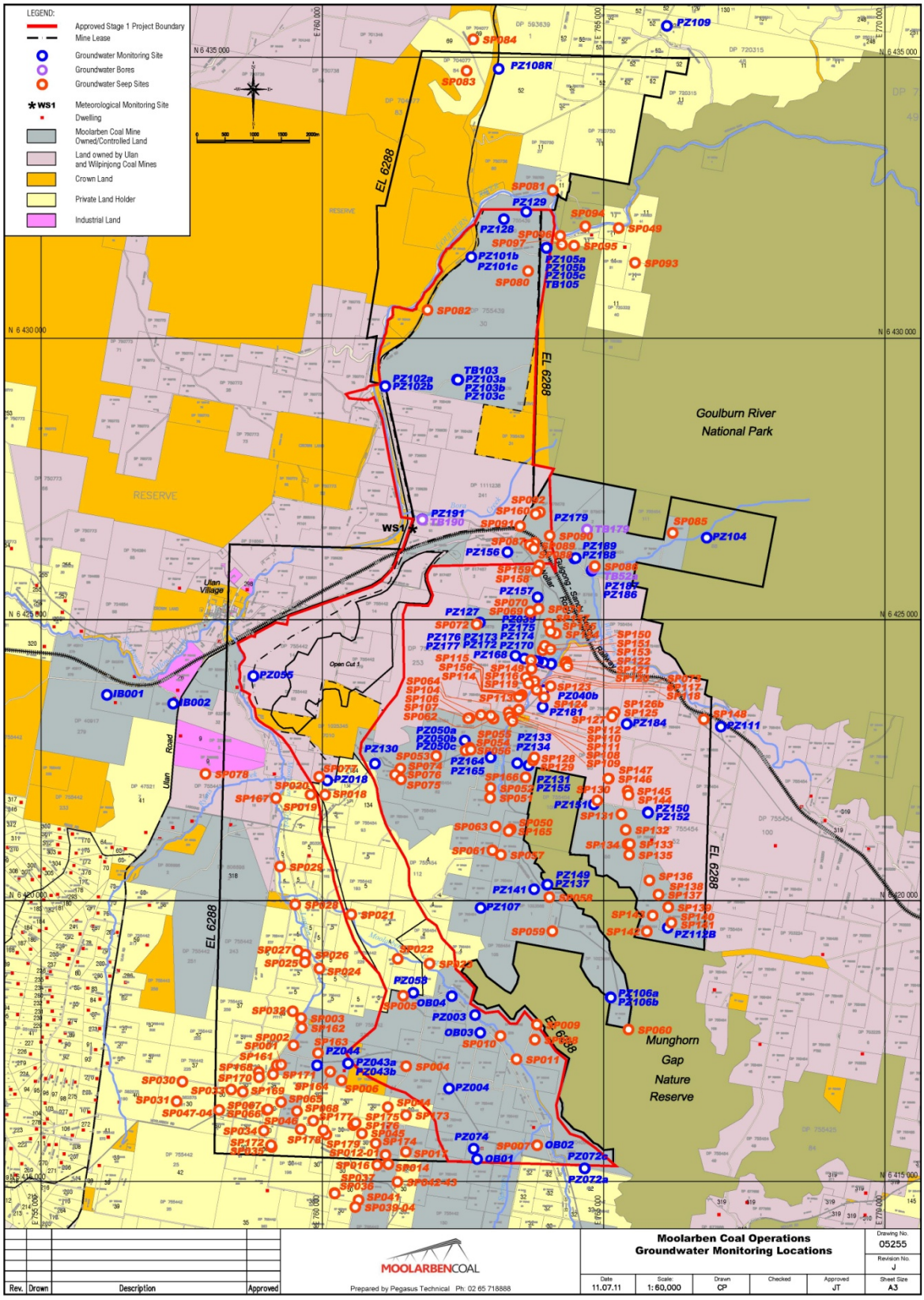


Figure 5: Groundwater Monitoring Locations

3.2.1 Rainfall

Table 8 summarises the rainfall over the reporting period at weather stations WS01 and WS03 and compares the data to the long term median rainfall from Gulgong Post Office while **Figure 6** presents the data graphically.

Rainfall recorded at WS01 and WS03 during the reporting period was 881.4mm and 864.2mm respectively. This is similar to the rainfall received during the previous reporting period (883.4mm) and was above the long-term average rainfall recorded at the Gulgong Post Office which is reported to be 653.9mm (Bureau of Meteorology website). **Figure 6** shows that the monthly rainfall between September 2011 and March 2012 was higher than the monthly average. However, between April 2012 and August 2012 rainfall was below the monthly average.

Table 8: Rainfall Data

Month	Rainfall (mm) Admin (WS01)	Rainfall (mm) Woodhead (WS03)	Long Term Average Rainfall* (mm)
September 2011	91.2	94.0	46.8
October 2011	49.0	52.2	56.6
November 2011	124.2	135.0	60.0
December 2011	66.8	63.4	67.4
January 2012	128.2	118.0	70.2
February 2012	122.6	113.0	62.5
March 2012	135.6	135.6	54.8
April 2012	7.6	13.0	44.2
May 2012	39.6	45.8	45.4
June 2012	36.0	22.6	50.5
July 2012	63.8	62.6	49.3
August 2012	16.8	9.0	46.5
Total	**881.4**	**864.2**	**653.9**

*Long Term Average Data from Bureau of Meteorology, for Gulgong Post Office.

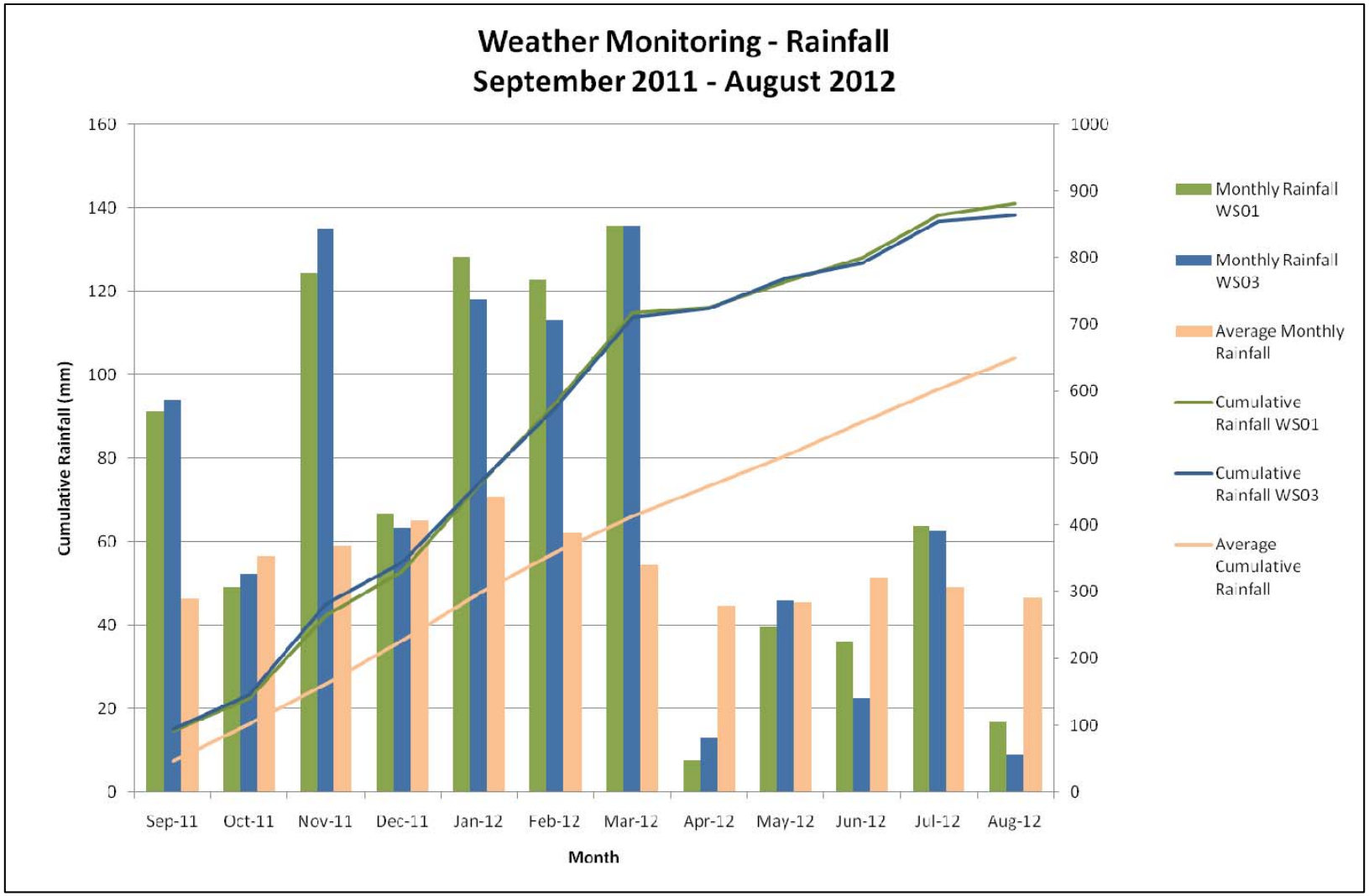


Figure 6: Rainfall Data

3.2.2 Temperature

Temperatures recorded during the reporting period are presented in **Table 9** and in **Figure 7**. During the reporting period, the coldest temperature recorded was -4.5°C in August 2012 at WS03 and the hottest temperature recorded was 35°C in November 2012 at WS01.

Table 9: Temperature Data

Month	Min. Temperature °C Admin (WS01)	Max. Temperature °C Admin (WS01)	Min. Temperature °C Woodhead (WS03)	Max. Temperature °C Woodhead (WS03)
September 2011	-1.2	28.9	-2.1	28.1
October 2011	1.5	28.6	1.4	28.7
November 2011	8.3	35	7.9	34.0
December 2011	7.3	29.6	5.7	29.2
January 2012	6.6	34.4	5.3	34.5
February 2012	11.6	31.2	10	31.5
March 2012	5.5	29.8	4.5	29.6
April 2012	1.6	29.0	1.0	29.5
May 2012	-2.5	25.4	-2.7	25.4
June 2012	-2.6	20.4	-3.4	20.9
July 2012	-3.0	17.8	-4.2	17.8
August 2012	-3.2	22.2	-4.5	22.0

3.2.3 Wind Speed and Direction

The monthly wind roses from both weather stations for the reporting period are presented in **Appendix 1**. Prevailing wind conditions for the reporting period were generally variable but were dominated by south-west winds during the winter months and north-east during the summer months. Summer winds tended to reach a maximum speed of 7.0m/s. Winds during winter were stronger reaching speeds of 10.0m/s. These results are consistent with previous reporting periods.

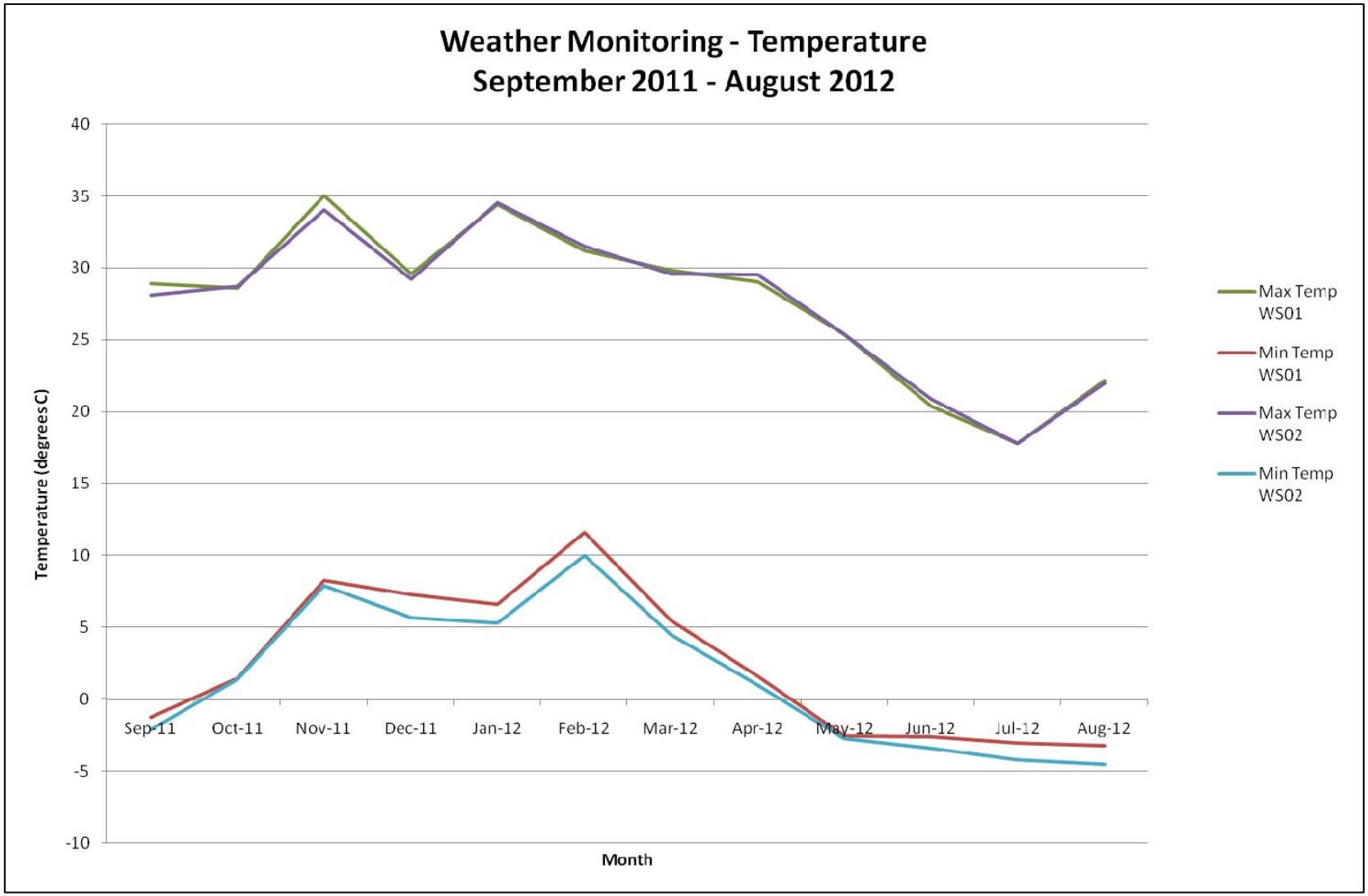


Figure 7: Temperature Data

3.3 AIR QUALITY

3.3.1 Activities This Reporting Period

Operational processes for MCO to reduce dust emissions include:

- Understanding the geology of the mining area;
- Disturb only the minimum area necessary for mining. Only one strip ahead of the active mining operations will be disturbed;
- Adoption of progressive rehabilitation of mining operations, to minimise exposed soils;
- Ensure coal handling facilities employ appropriate dust suppression methods;
- Use water carts on all trafficked areas to minimise dust generation as necessary and practicable;
- Use of chemical dust suppressants if necessary;
- Use of constructed roads only, minimisation of access roads and removal of obsolete access roads;
- Keeping disturbed active mining areas to a minimum as far as practicable;
- Maintain coal-handling areas and stockpiles in a moist condition using water carts and/or water sprays;
- Relocate, modify and/or stop mining operations in adverse meteorological conditions to minimise the short term air quality impacts;
- Dust suppression systems will be fitted to stationary and mobile plant (such as the dump hopper, transfer stations, drill rigs) to reduce dust levels and to minimise fugitive dust;
- Use of 240t haul trucks rather than 170t on the internal haul road in Open Cut 1 to reduce vehicle traffic;
- Access tracks used by topsoil stripping equipment during their loading and unloading cycle will be watered;
- Long term topsoil stockpiles, not used for over 6 months will be revegetated;
- Dust aprons will be lowered during drilling;
- All drills will be equipped with water injection systems;
- Partial enclosure of raw coal transfer and rejects conveyors where possible;
- Water injection will be used when high levels of dust are being generated by drilling activities; and
- All blasting will be undertaken in accordance with the Blast Management Plan with consideration given to prevailing wind conditions and residential receivers.

Air quality monitoring continued to be undertaken throughout the reporting period.

The AQMP includes a process for the review of data on a monthly basis against relevant criteria. This review process continued throughout the reporting period. The AQMP outlines response triggers for the real-time PM_{10} monitoring stations. When the trigger has been reached a SMS alarm is sent to operational personnel and members of the Environment and Community Department. The real-time response triggers that have been established and the management/control actions are shown in **Table 10**. These triggers were reviewed and validated during the reporting period with no changes being made.

Table 10: Air Quality Real-Time Response Triggers

No	Trigger	Management/Control Actions	Responsibility
1	Winds from NE-SE and 24 hour average >38µg/m^3 at monitoring locations to the NW-SW of the operations	• Review weather data and trends • Review weather predictions • Review current dust generating activities • Review current dust control • Ensure standard mitigation measures are in place • Monitor changes in PM10	Area Supervisor (assistance can be sought from the environmental department)
2	Winds from NE-SE and 24 hour average >45µg/m^3 at monitoring locations to the NW-SW of the operations	• Actions as per Trigger 1. • Make operational changes as appropriate. For example: dumping in protected locations, shutting down equipment	Area Supervisor (assistance can be sought from the environmental department)
3	Winds from NE-SE and two consecutive 15 minute periods >50µg/m^3 at monitoring locations to the NW-SW of the operations	• Actions as per Trigger 1. • Make operational changes as appropriate. For example: dumping in protected locations, shutting down equipment	Area Supervisor (assistance can be sought from the environmental department)

During the reporting period MCO undertook a Particulate Matter Control Best Practice Pollution Reduction Program. This report was submitted to the EPA and a copy of the report is available on MCO's website (www.moolarbencoal.com.au). The study identified the dust generating activities at MCO that rank the highest in terms of particulate generation, when both emissions and impacts were evaluated. These activities were:

- Hauling on unsealed roads;
- Material transfer of coal;
- Trucks unloading coal / overburden;
- Bulldozers on coal; and
- Wind erosion of stockpiles.

The potential Best Practice control measures for the above activities were identified, and their practicability evaluated. When the annual impacts at receptors were considered, it was identified that there is only any potential value in introducing additional best practice control measures for:

- Haulage; and
- Material transfer of coal.

As far as is practical, best practice controls are already being applied to material transfer of coal.

Investigations as part of this study indicated that the current level of water suppression at MCO (~6L/m2/hour) applied to roads may be considered to be both competitive with the use of other dust suppressants, and in itself the optimal Best Practice option for this activity.

Through the preparation of this report, it was identified that there are no feasible additional best practice measures for air quality management that can be applied to the current operation at MCO.

3.3.2 Air Quality Monitoring

The air quality criteria for MCO are shown in **Table 11**.

Table 11: Air Quality Criteria

Pollutant	Averaging Period	Criteria
Total Suspended Particulate	Annual	90µg/m^3
Particulate Matter (<10µg/m^3)	Daily	50µg/m^3
Particulate Matter (<10µg/m^3)	Annual	30µg/m^3
Deposited Dust – maximum total	Annual	4g/m^2/month
Deposited Dust – incremental increase	Annual	2g/m^2/month above background average

3.3.2.1 Total Suspended Particulates (TSP)

Total suspended particulates (TSP) are the component of the dust that is less than 50µg and is broken down into the following particle size range:

- $PM_{2.5}$ – 5% of TSP;
- $PM_{2.5-10}$ – 35% of TSP; and
- PM_{10-50} – 60% of TSP.

TSP isn't directly measured at MCO but based on the above breakdown a calculation can be made from the PM_{10} monitoring results to show that MCO is complying with the TSP criteria. The calculated TSP results can be seen in **Table 12**. These calculations show that MCO were below the TSP criteria at the monitoring locations.

Table 12: Calculated Total Suspended Solids Results

Site	Average PM_{10} Result (µg/m^3)	Calculated Average TSP Result (µg/m^3)
TEOM01 (Ulan School)	10.8µg/m^3	27.0µg/m^3
TEOM02 (Murragamba)	9.7µg/m^3	24.2µg/m^3
TEOM03 (Toole Road)	10.3µg/m^3	25.8µg/m^3
PM01 (Ulan Village)	11.4µg/m^3	28.5µg/m^3
PM02 (Ridge Road)	9.7µg/m^3	24.2µg/m^3

3.3.2.2 Particulate Matter <10µg (PM_{10})

The location of the PM_{10} monitoring stations are presented on **Figure 4**. There are two types of PM_{10} monitoring undertaken at MCO. Continuous real-time monitoring is undertaken at three locations using Tapered Element Oscillating Membrane (TEOM) units. Two permanent locations are at a property at Murragamba and at Ulan School. During the entire reporting period a mobile unit was located at a property on Ulan Road. Two HVAS units are sampled every six (6) days. Both of these units are fixed units with one located in Ulan Village and the other one located on Ridge Road. All monitoring is conducted in accordance with EPA guidelines and relevant Australian Standards.

Figure 8, **Figure 9** and **Figure 10** summarise the real-time PM_{10} results for the reporting period including the rolling average compared to the criteria. **Figure 11** summarises the HVAS PM_{10} results for the reporting period including a comparison of the rolling average against the criteria. The full data set for the real-time PM_{10} and HVAS PM_{10} is shown in **Appendix 2**.

The average PM_{10} monitoring results remained below the Project Approval criteria of 30µg/m^3 at all sites during the reporting period. The average at the end of the reporting period and the maximum rolling average throughout the reporting period are shown in **Table 13**. Data capture rates for the reporting period are also included in **Table 13**. Data was lost at TEOM01 and TEOM03 due to a pump malfunction and power outage.

Table 13: PM_{10} Averages and Data Capture Rate

Location	Reporting Period Final Average	Reporting Period Maximum Average	Data Capture Rate
TEOM01 (Ulan School)	10.8µg/m^3	10.8µg/m^3	99.5%
TEOM02 (Murragamba)	9.7µg/m^3	9.7µg/m^3	100%
TEOM03 (Ulan Road)	10.3µg/m^3	10.3µg/m^3	97.5%
PM01 (Ulan Village)	11.4µg/m^3	12.6µg/m^3	100%
PM02 (Ridge Road)	9.7µg/m^3	10.6µg/m^3	100%

There were no results recorded above the 24 hour average goal of 50µg/m^3 that required further analysis.

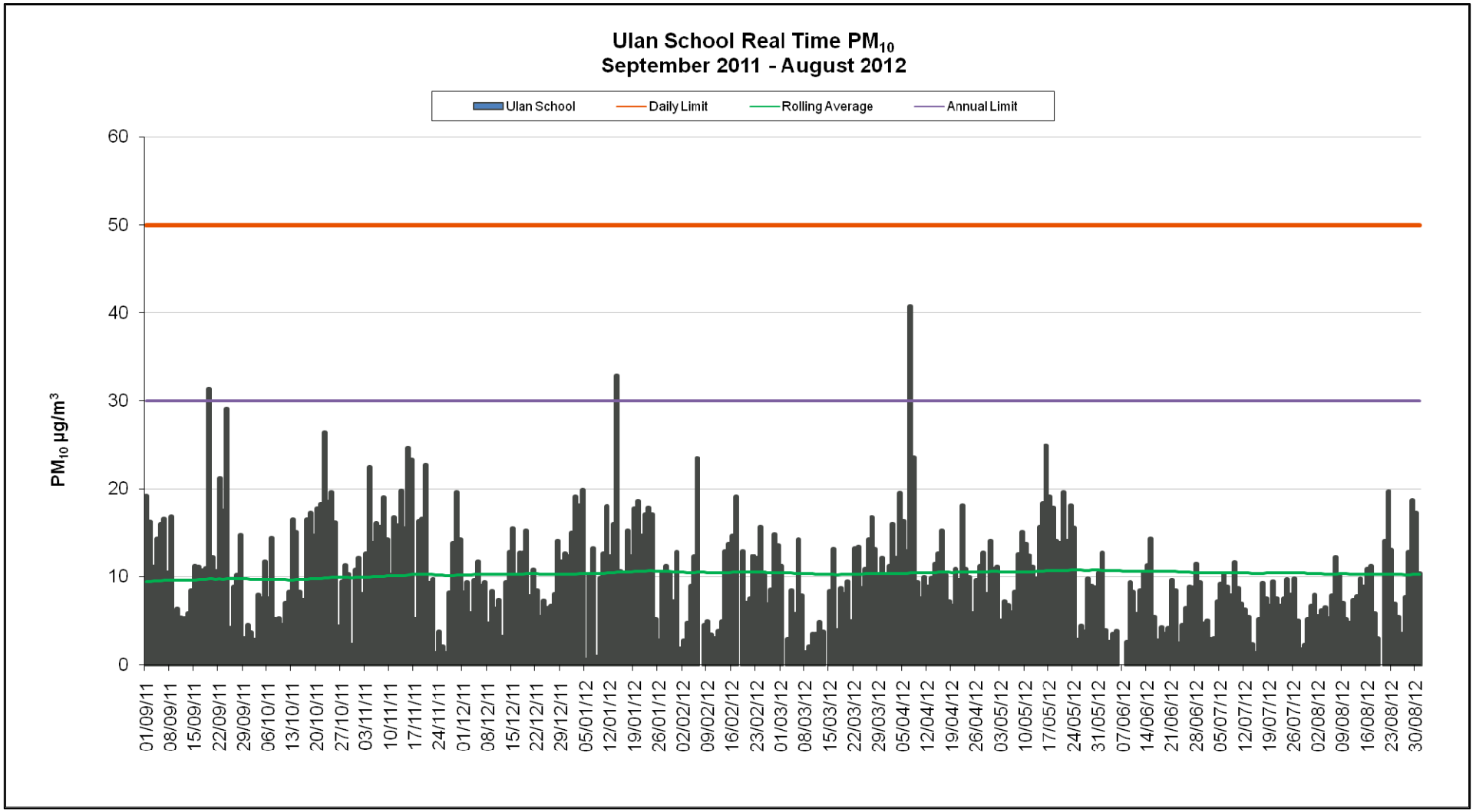


Figure 8: Real-Time PM10 Results – Ulan School

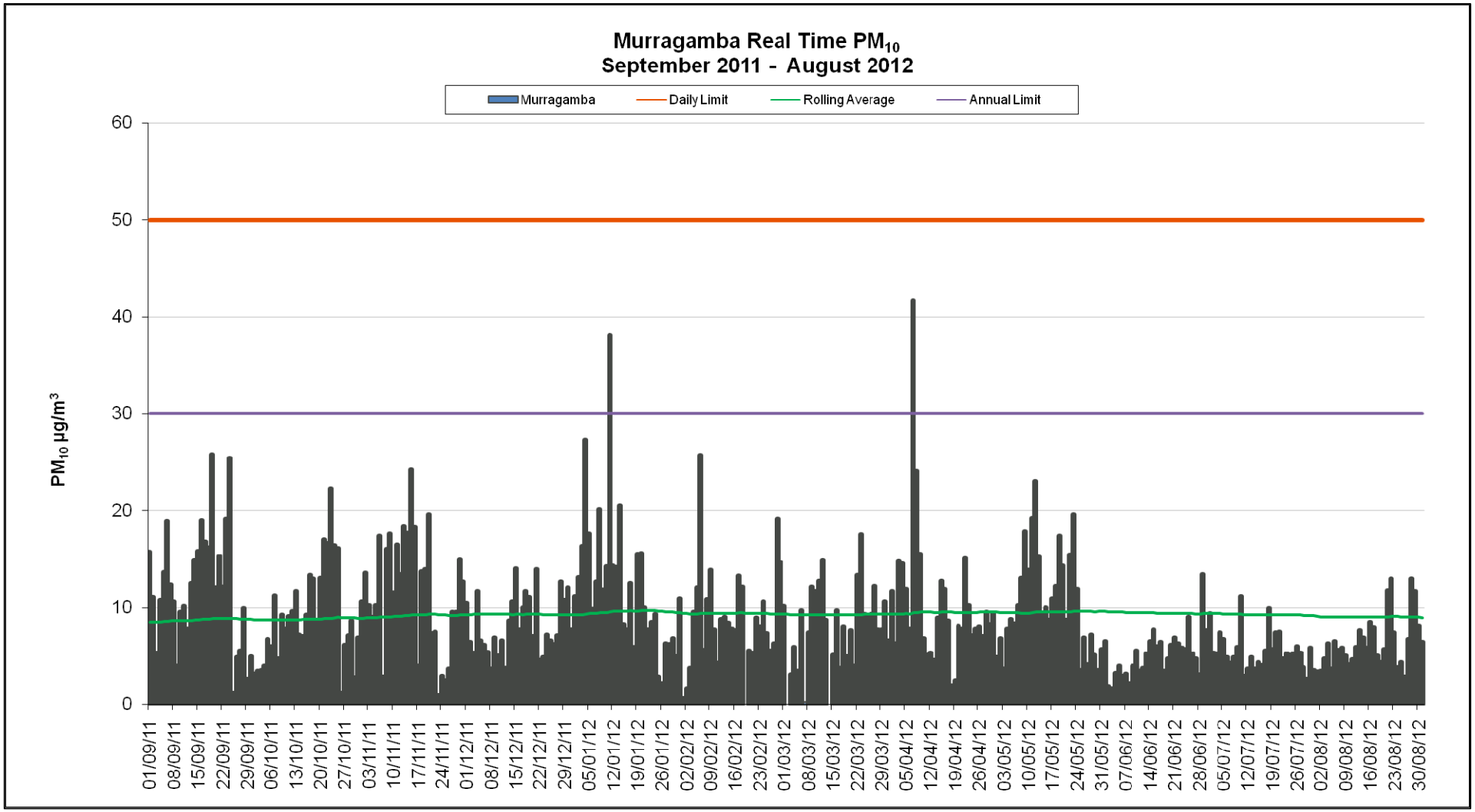


Figure 9: Real-Time PM10 Results – Murragamba

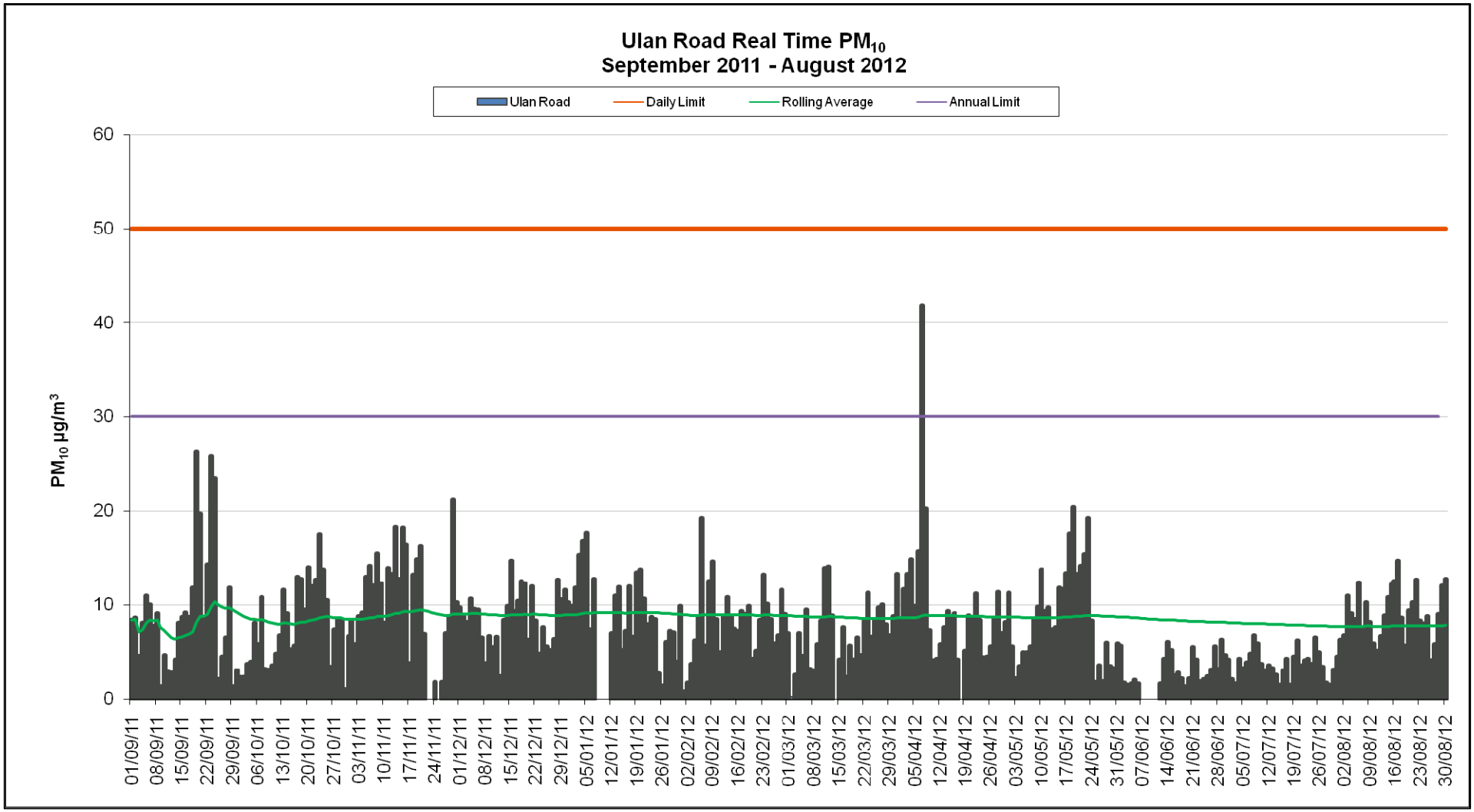


Figure 10: Real-Time PM10 Results – Ulan Road

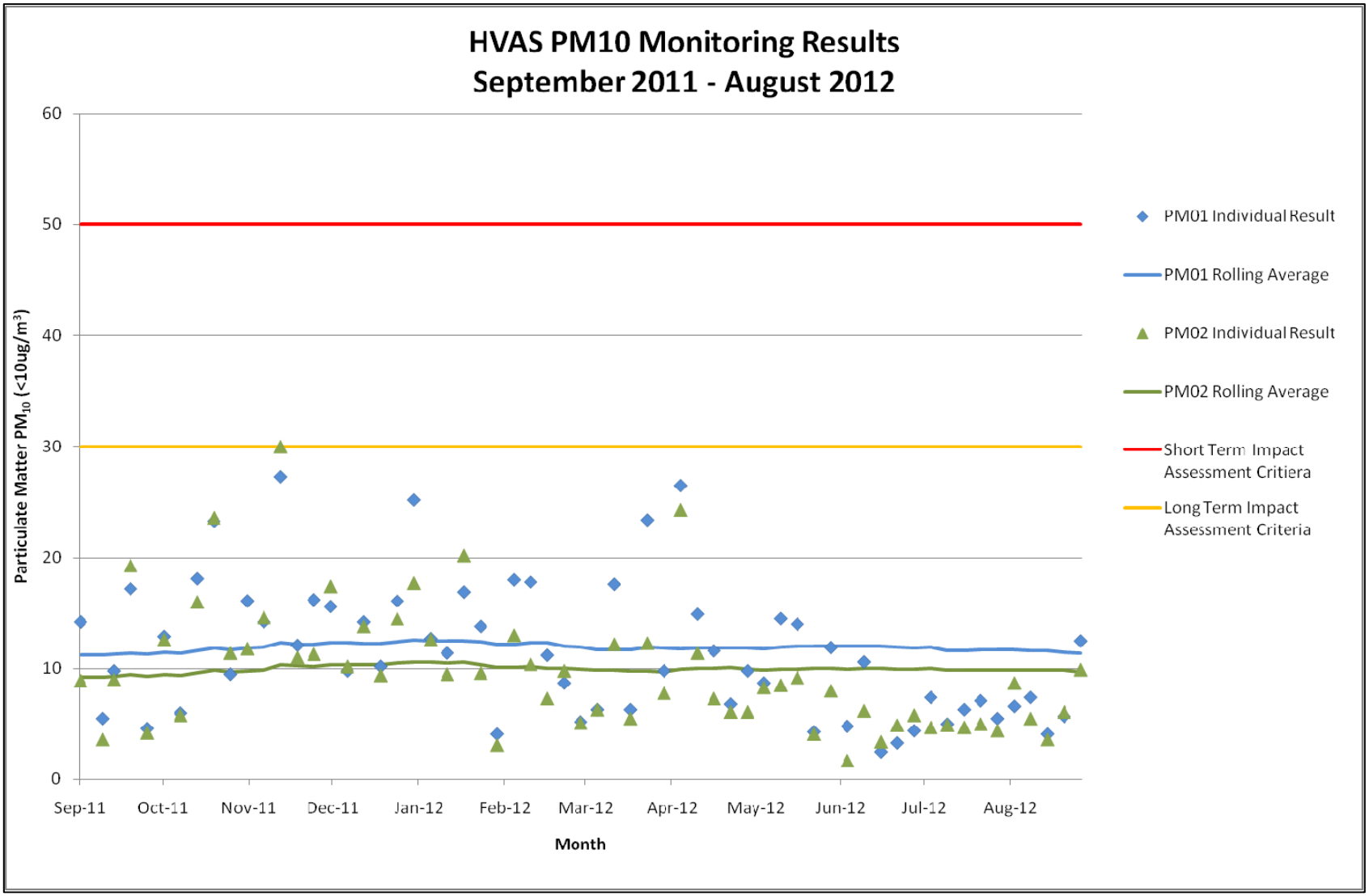


Figure 11: HVAS PM_{10} Results – Ulan School and Ridge Road

3.3.2.3 Dust Deposition

Depositional dust is monitored at nine locations (**Figure 4**) around the operations in accordance with EPA guidelines and relevant Australian Standards.

Samples are generally collected every 30 days with a tolerance of ± 2 days. In September 2011 the exposure time was 33 days as a result of contractor collection date error. Results from dust deposition gauges are expressed as insoluble solids and ash residue. Dust gauge results can become excessively contaminated from bird droppings, vegetation (such as plant matter, algae, pollen, seeds), and insects (classed as combustible matter). Over the reporting period less than 5% of records were contaminated with organic matter such as bird droppings compared to 5% last reporting period and 25% for the reporting period before that. Bird deterrent rings have been installed on all dust gauges to minimise contamination by bird droppings.

Dust deposition results are presented in **Table 14** with contaminated results being excluded from the annual average. The annual averages are presented graphically in **Figure 12**. All uncontaminated results were below the annual average dust limit of 4 g/m^2/month. The annual average dust deposition results for uncontaminated insoluble solids ranged from 0.3g/m^2/month at site DG01 to 1.6g/m^2/month at DG02.

Figure 13 shows the 2011-2012 average compared to the background average. This figure shows that at no site has the average increased by more than 2g/m^2/month and therefore the incremental increase criteria has not been exceeded. In fact there has been a drop in the depositional dust average at every location. There has been insufficient data collected from DG09 to calculate a background average.

Table 14: Depositional Dust Gauge Results

Month	Insoluble Solids (g/m^2/month)	Ash Residue (g/m^2/month)	Insoluble Solids (g/m^2/month)	Ash Residue (g/m^2/month)	Insoluble Solids (g/m^2/month)	Ash Residue (g/m^2/month)
	DG01 – Bobadeen		**DG02 – Hillview**		**DG03 – Oakey Park**	
Sep-11	0.4	0.1	0.8	0.4	Contaminated	
Oct-11	0.3	0.2	0.7	0.5	0.6	0.4
Nov-11	0.9	0.6	2.5	1.1	1.1	0.6
Dec-11	0.2	0.1	1.6	0.7	0.6	0.3
Jan-12	0.5	0.3	1.2	0.7	1.6	1.0
Feb-12	0.4	0.1	1.8	0.7	Contaminated	
Mar-12	0.2	0.1	1.0	0.5	0.6	0.2
Apr-12	0.2	0.2	Contaminated		0.7	0.4
May-12	0.3	0.1	1.7	0.6	0.4	0.2
Jun-12	0.1	0.1	3.3	1.0	0.3	0.1
Jul-12	0.1	0.1	Contaminated		0.3	0.2
Aug-12	0.3	0.2	1.3	0.7	0.5	0.3
Annual Average	**0.3**	**0.2**	**1.6**	**0.7**	**0.7**	**0.4**

Month	Insoluble Solids (g/m^2/month)	Ash Residue (g/m^2/month)	Insoluble Solids (g/m^2/month)	Ash Residue (g/m^2/month)	Insoluble Solids (g/m^2/month)	Ash Residue (g/m^2/month)
	DG04 – Ulan Village		**DG05 – Glenmoor**		**DG06 – Barcoo**	
Sep-11	0.8	0.4	0.7	0.4	0.8	0.4
Oct-11	1.2	0.8	0.2	0.2	0.3	0.2
Nov-11	1.2	0.7	0.8	0.4	1.0	0.5
Dec-11	0.8	0.4	1.0	0.8	0.3	0.2
Jan-12	2.1	1.0	1.1	0.6	0.6	0.3
Feb-12	0.8	0.5	0.3	0.2	0.2	0.1
Mar-12	0.4	0.3	0.1	0.1	0.1	0.1
Apr-12	3.0	2.5	0.8	0.5	0.5	0.3
May-12	0.8	0.6	0.3	0.2	0.3	0.2
Jun-12	0.5	0.4	0.2	0.1	<0.1	<0.1
Jul-12	3.1	2.2	2.5	1.0	0.2	0.2
Aug-12	0.6	0.5	1.2	0.7	0.4	0.2
Annual Average	**1.3**	**0.9**	**0.8**	**0.4**	**0.4**	**0.2**
	DG07 – Hillside		**DG08 – Croydon**		**DG09 – Wilga**	
Sep-11	0.6	0.3	0.6	0.3	0.5	0.3
Oct-11	0.5	0.3	0.3	0.2	0.2	0.2
Nov-11	1.8	0.8	0.5	0.2	0.9	0.5
Dec-11	0.6	0.4	0.4	0.2	0.3	0.2
Jan-12	0.8	0.2	0.8	0.3	0.6	0.3
Feb-12	0.4	0.3	0.3	0.2	0.4	0.2
Mar-12	0.2	0.2	2.2	0.2	0.3	0.2
Apr-12	2.3	0.9	0.4	0.3	0.4	0.3
May-12	1.4	0.6	0.2	0.2	0.3	0.2
Jun-12	0.1	0.1	6.2	1.5	0.1	0.1
Jul-12	0.4	0.2	1.2	0.6	0.1	0.1
Aug-12	0.3	0.2	0.6	0.4	0.2	0.2
Annual Average	**0.8**	**0.4**	**1.1**	**0.4**	**0.4**	**0.2**

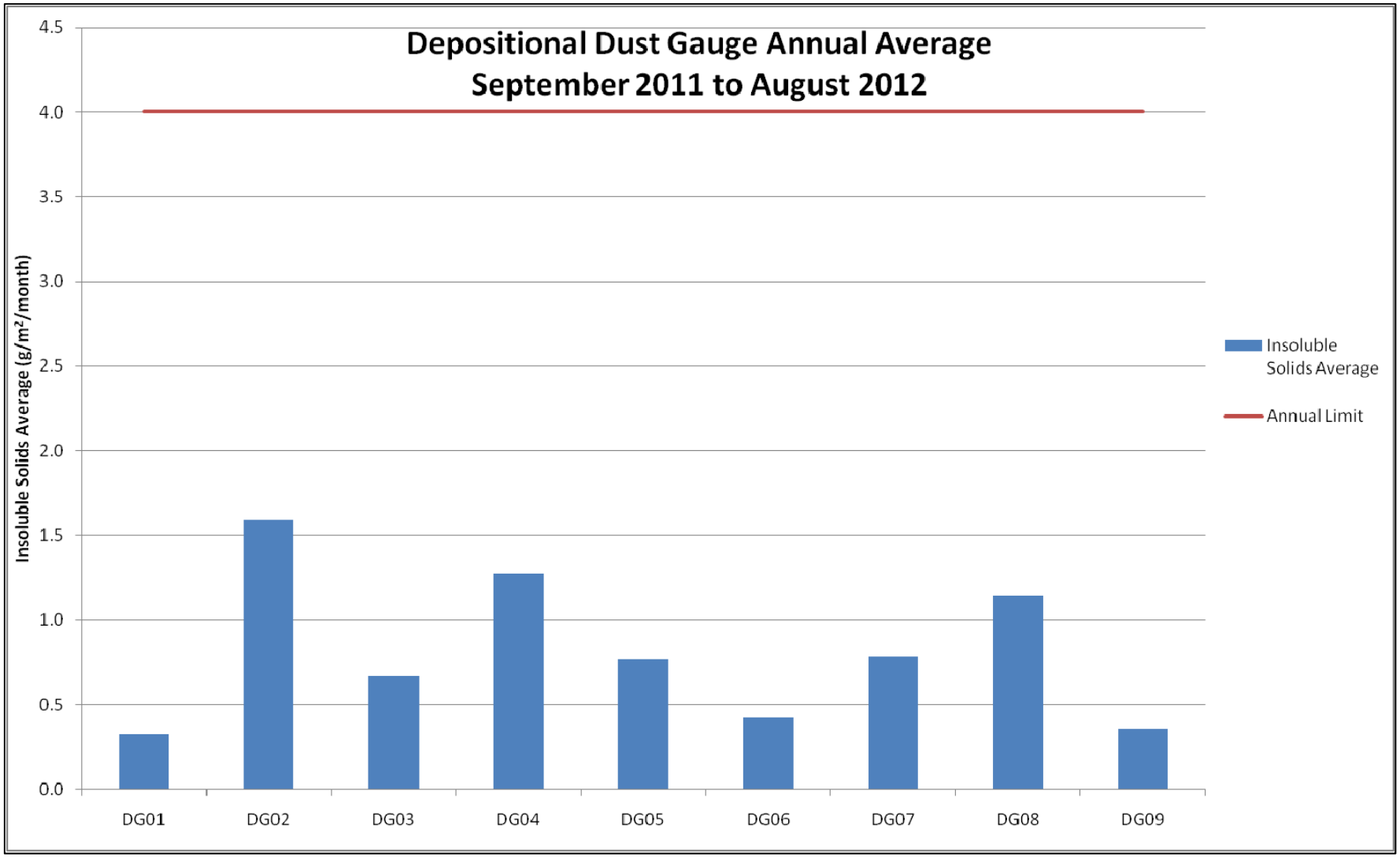


Figure 12: Depositional Dust Annual Average

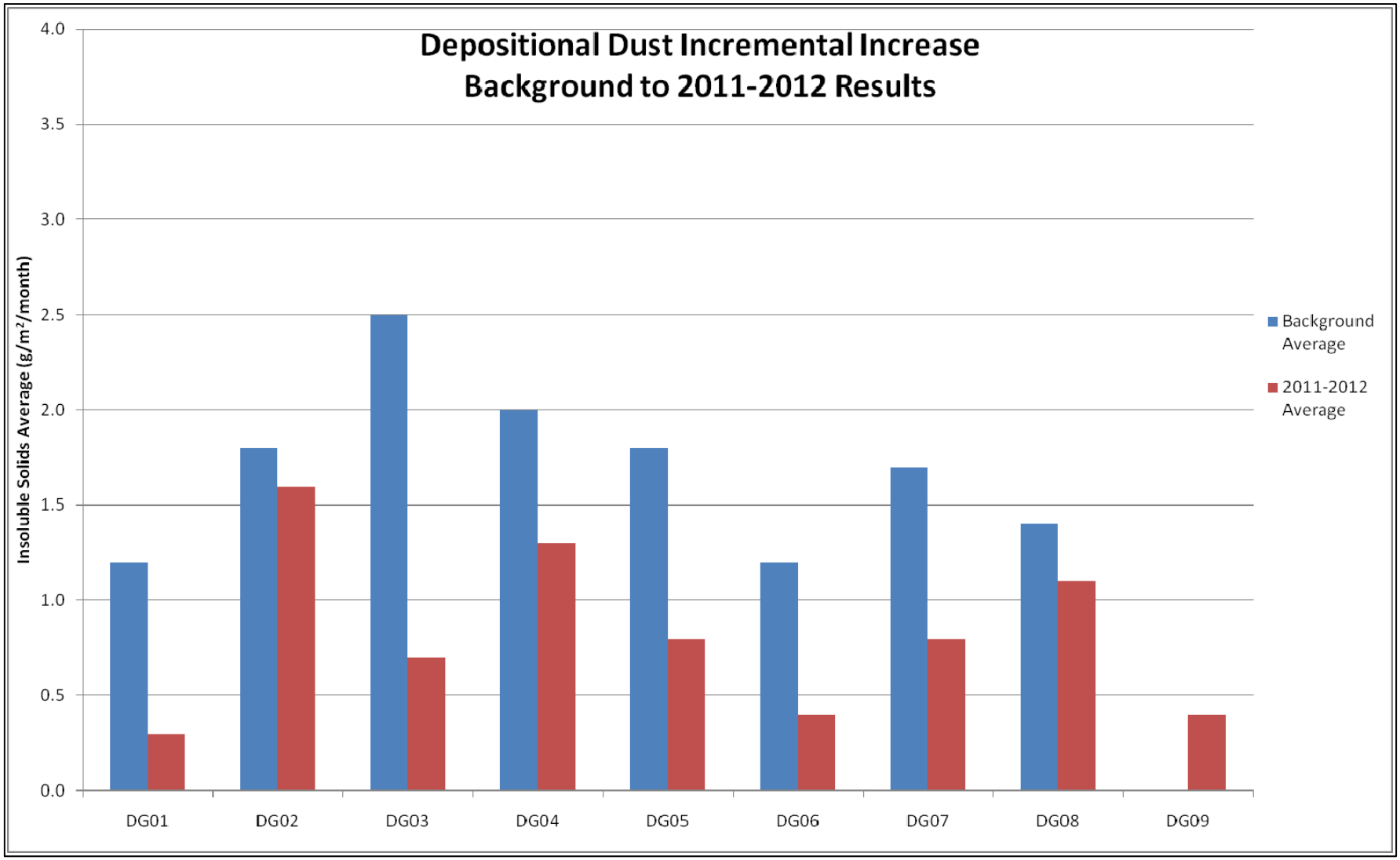


Figure 13: Depositional Dust Incremental Increase

3.3.3 Comparison to Previous Air Quality Monitoring and Predicted Levels

Table 15 to **Table 17** compares the air quality data from this reporting period to background levels and previous monitoring results. Contaminated depositional dust results have been removed from the results. The predicted values in these tables relate to the predicted air quality results at Year 2 of the operation. Year 2 has been chosen as it is the most reflective of the current mining operations at MCO.

Table 15: Comparison of Real-Time PM_{10} Results to Background and Predicted PM_{10}

Site	Background Range (µg/m^3)	Predicted Range (µg/m^3)	Previous Results Range (µg/m^3)	2011-2012 Data Range (µg/m^3)	Comment on 2011-2012 Data
Ulan Road	Not applicable as this is the first year at this site	NA	Not applicable as this is the first year at this site	0.0 – 41.9	As this is the first year of monitoring at this location a comparison cannot be made to previous data
Murragamba Road	0.0 – 102.3	NA	0.0 – 227.4	0.0 – 41.6	Consistent with previous monitoring
Ulan School	2.2 – 114.1	NA	0.0 – 119.4	0.0 – 40.7	Consistent with previous monitoring
Site	**Background Average (µg/m^3)**	**Predicted Average (µg/m^3)**	**Previous Average Range (µg/m^3)**	**2011-2012 Data Average (µg/m^3)**	**Comment on 2011-2012 Data**
Ulan Road	Not applicable as this is the first year at this site	18.9	Not applicable as this is the first year at this site	10.3	The average result at this site is lower than predicted levels.
Murragamba Road	11.8	19.8	8.5 – 12.3	9.7	The average result at this site is lower than background results, previous results and predicted levels.
Ulan School	15.1	26.4	9.5 – 13.4	10.8	The average result at this site is lower than background results, previous results and predicted levels.

All of the real-time PM_{10} averages were within the predicted levels for Year 2 of the operation.

Table 16: Comparison of HVAS Results to Background and Predicted HVAS

Site	Background Range (µg/m^3)	Predicted Range (µg/m^3)	Previous Results Range (µg/m^3)	2011-2012 Data Range (µg/m^3)	Comment on 2011-2012 Data
Ulan Village	1.2 – 44.5	NA	1.6 – 53.9	2.5 – 27.3	Consistent with previous monitoring

Site	Background Range (µg/m^3)	Predicted Range (µg/m^3)	Previous Results Range (µg/m^3)	2011-2012 Data Range (µg/m^3)	Comment on 2011-2012 Data
Ridge Road	This site was installed in May 2009 so there is no background data available	NA	1.7 – 44.3	1.7 – 30.0	Consistent with previous monitoring
Site	**Background Average (µg/m^3)**	**Predicted Average (µg/m^3)**	**Previous Average Range (µg/m^3)**	**2011-2012 Data Average (µg/m^3)**	**Comment on 2011-2012 Data**
Ulan Village	17.9	26.3	11.1 – 13.6	11.4	The average result at this site is lower than background results, previous results and predicted levels.
Ridge Road	This site was installed in May 2009 so there is no background data available	Assumed to be less than 20 as this site wasn't modelled	6.6 – 11.7	9.7	The average result at this site is lower than previous results and predicted levels.

All of the HVAS PM_{10} averages were within the predicted levels for Year 2 of the operation.

Table 17: Comparison of Insoluble Solids Results to Background and Predicted Insoluble Solids Results

Site	Background Range (Insoluble Matter) (g/m^2/month)	Predicted Range (Insoluble Matter) (g/m^2/month)	Previous Results Range (Insoluble Matter) (g/m^2/month)	2011-2012 Data Range (Insoluble Matter) (g/m^2/month)	Comment on 2011-2012 Data
DG01 – Bobadeen	0.2 – 3.1	NA	0.1 – 4.5	0.1 – 0.9	Consistent with previous monitoring
DG02 – Hillview	0.2 – 3.3	NA	0.5 – 3.3	0.7 – 3.3	Consistent with previous monitoring
DG03 – Oakey Park	1.2 – 3.8	NA	0.3 – 4.7	0.3 – 1.6	Consistent with previous monitoring
DG04 – Ulan Village	0.3 – 3.9	NA	0.5 – 4.8	0.4 – 3.1	Consistent with previous monitoring
DG05 – Glenmoor	0.5 – 3.6	NA	0.3 – 3.9	0.1 – 2.5	Consistent with previous monitoring
DG06 – Barcoo	0.2 – 3.2	NA	0.2 – 3.7	0.1 – 1.0	Consistent with previous monitoring
DG07 – Hillside	0.2 – 3.7	NA	0.1 – 3.4	0.1 – 2.3	Consistent with previous monitoring
DG08 – Croydon	0.3 – 3.6	NA	0.2 – 3.5	0.2 – 6.2	One monthly result was higher than previous results. All other results were consistent with previous results

Site	Background Range (Insoluble Matter) (g/m^2/month)	Predicted Range (Insoluble Matter) (g/m^2/month)	Previous Results Range (Insoluble Matter) (g/m^2/month)	2011-2012 Data Range (Insoluble Matter) (g/m^2/month)	Comment on 2011-2012 Data
DG09 – Wilga	0.7 – 1.6	NA	0.1 – 4.5	0.1 – 0.9	Consistent with previous monitoring
Site	**Background Average (Insoluble Matter) (g/m^2/month)**	**Predicted Average (Insoluble Matter) (g/m^2/month)**	**Previous Results Average Range (Insoluble Matter) (g/m^2/month)**	**2011-2012 Data Average (Insoluble Matter) (g/m^2/month)**	**Comment on 2011-2012 Data**
DG01 – Bobadeen	1.2	1.4	1.2 – 1.7	0.3	Consistent with previous monitoring and predicted levels
DG02 – Hillview	1.8	1.5	1.0 – 2.1	1.6	Consistent with previous monitoring and slightly higher than predicted levels
DG03 – Oakey Park	2.5	1.5	1.2 – 2.2	0.7	Consistent with previous monitoring and predicted levels
DG04 – Ulan Village	2.0	2.1	1.8 – 2.4	1.3	Consistent with previous monitoring and predicted levels
DG05 – Glenmoor	1.8	1.9	0.2 – 2.7	0.8	Consistent with previous monitoring and predicted levels
DG06 – Barcoo	1.2	1.4	0.6 – 1.4	0.4	Consistent with previous monitoring and predicted levels
DG07 – Hillside	1.7	1.4	0.5 – 2.1	0.8	Consistent with previous monitoring and predicted levels
DG08 – Croydon	1.4	1.4	0.4 – 2.2	1.1	Consistent with previous monitoring and predicted levels
DG09 – Wilga	Insufficient Data	No modelled predictions	0.4 – 1.2	0.4	As there is no background data or predicted data it is not possible to compare the results

Generally, all of the depositional dust averages were within the predicted levels for Year 2 of the operation.

3.3.4 Activities Next Reporting Period

Dust monitoring will continue to be undertaken with the results to be provided in the next AEMR.

3.4 GREENHOUSE

The *National Greenhouse and Energy Reporting Act 2007* establishes a national framework for corporations to report greenhouse gas emissions and energy consumption and production.

The Act makes registration and reporting mandatory for corporations whose energy production, energy use or greenhouse gas emissions exceed specified thresholds. MCO submits National Greenhouse Energy Reporting (NGER) returns through its parent company, Yancoal Australia Ltd.

The most recent report on Greenhouse Gas Emissions for MCO stated total emissions to be 409,156t CO2-e for the period 1st July 2011 to the 30th June 2012. This is a slight decrease in total emissions compared to the previous reporting period.

MCO have developed an Energy Savings Action Plan that outlines actions to be taken to reduce energy usage at MCO. **Table 18** gives an update on the status of outstanding actions from the end of the last reporting period.

Table 18: Energy Management Actions and Opportunities

Action	Current Status
Investigate corporate policies with respect to energy savings.	Corporate policies have been developed in accordance with EEO reporting.
Target efficiency.	Efficiency targets are still to be established. This will be done in accordance with EEO reporting.
Comply with EEO and NGER legislation	MCO will comply with NGER legislation and report for the period 1st July 2011 to the 30th June 2012 by 31st October 2012. First EEO reporting will be in May 2013.
Investigate corporate policy for energy management.	Corporate policies have been developed in accordance with EEO reporting.
Develop appropriate policy and processes for energy management.	Corporate policies have been developed in accordance with EEO reporting.
Include energy efficiency awareness in induction procedures, and ongoing training. E.g. Toolbox talks, radar.	Energy efficiency awareness is included in the induction. Ongoing training is captured in the Environmental Training Needs Analysis.
Continue awareness of legislative requirements.	MCO have subscribed to Environmental Essentials and receive regular email updates on legislative changes.
Develop an Energy Management System	Development of the Energy Management System is due for completion in 2013.
Include regulatory requirements in Energy Management System.	Regulatory requirements will be included in the Energy Management System.

3.5 EROSION AND SEDIMENT

3.5.1 Activities This Reporting Period

All active mining and rehabilitation areas are designed to incorporate water management structures such as drains and sedimentation dams to retain runoff water to allow for the settlement of sediments. All structures were independently designed in accordance with the MCO Water Management Plan and industry guidelines such as Managing Urban Stormwater.

The key erosion control activity this reporting period has been the focus on rehabilitation in the Open Cut area. Inspections following rainfall have indicated that there has been no significant erosion on the rehabilitation areas. The mulch that's incorporated into the topsoil has assisted in holding the soil surface together.

Regular inspections of the erosion and sediment control structures were undertaken prior to predicted rainfall events and following rainfall events. Sediment dams have been desilted as required to maintain capacity.

3.5.2 Activities Next Reporting Period

MCO will begin the design and construction of a significant surface water management upgrade across the site. As discussed in **Section 2.9** the majority of the work will focus on the upgrade of dams to meet Q50 design criteria.

The adequacy of the erosion and sediment control structures will continue to be monitored during the next reporting period. Where new land is to be disturbed erosion and sediment control structures will be installed prior to disturbance.

3.6 SURFACE WATER QUALITY

3.6.1 Activities This Reporting Period

Active surface water quality management strategies adopted at MCO during the reporting period include:

- Continued installation of clean and dirty water diversion drains;
- Continued building containment dams throughout the site; and
- Ongoing monitoring of surface water surrounding the site.

The Water Management Plan (WMP) includes a process for the review of data on a monthly basis against trigger levels. This review was ongoing throughout the reporting period and did not trigger the need for any specialised review of the results.

The WMP includes management response actions if it is found that MCO are impacting on surface water quality or quantity. MCO were not required to implement any of these actions during the reporting period. These actions include:

- Investigations into the cause of the impact, involving surface water experts where required;
- Reporting the impact to regulators and affected users;
- Investigating the adequacy of existing water management infrastructure and controls; and
- Implementing any mitigation where required and where possible.

Stabilisation works in the drainage channel downstream of discharge point LDP002 was undertaken during the reporting period. Monitoring of these works is discussed further in **Section 3.6.8**.

3.6.2 Surface Water Monitoring

MCO do not have any surface water quality criteria except those that relate to water discharges from the site. These discharge criteria are presented below in **Table 19**. The WMP identifies trigger values that have been developed to act as triggers for investigations into surface water quality. Where insufficient site data was available to calculate these triggers the default ANZECC criteria have been used. These triggers can be seen in **Table 20**. The 80th percentile figure is used for internal investigation purposes only. If an investigation into results outside the maximum range finds that MCO is responsible for this result, it will be treated as a non-compliance and reported to regulators and affected landowners. If the investigation finds that MCO is not responsible no further action will be taken expect for ongoing monitoring of the site.

Table 19: Discharge Water Criteria

Analyte	Concentration	Unit
EC	900	µS/cm
Iron	5	mg/L
Oil and Grease	10	mg/L
pH	6.5 – 8.5	-
Zinc	5	mg/L
Total Suspended Solids	50	mg/L

Table 20: Surface Water Quality Trigger Levels

Site No.	pH		Electrical Conductivity (µS/cm)		Total Suspended Solids (mg/L)	
	80th Percentile Trigger Value	Maximum Range Reported	80th Percentile Trigger Value	Maximum Range Reported	80th Percentile Trigger Value	Maximum Range Reported
SW01	6.5-8.0	5.4-8.1	922	1,500	50	310
SW02	6.5-8.0	4.4-7.9	1,162	1,560	50	71
SW12	6.5-8.0	N/A	350	N/A	50	N/A
SW10	6.5-8.0	N/A	350	N/A	50	N/A
SW11	6.5-8.0	N/A	350	N/A	50	N/A
SW05	6.5-8.0	5.3-7.7	1,168	1,590	50	2,600
SW08	6.5-8.0	4.5-7.6	5,020	5,910	69	510
SW09	6.5-8.0	5.2-7.9	5,076	5,750	50	140
SW04	6.5-8.0	5.1-7.8	1,480	2,260	97	440
SW07	6.5-8.0	5.3-8.0	5,180	6,540	50	64

Note: Shaded cells indicate ANZECC (2000) criteria; Unshaded cells indicate site developed criteria

The surface water monitoring locations are shown in **Figure 4** and described in **Table 21**.

Table 21: Surface Water Monitoring Site

Monitoring Station	Stream	Location
SW01	Goulburn River	Downstream of the Drip
SW02	Goulburn River	The Drip Picnic Area
SW03	Murragamba Creek	Murragamba Road crossing
SW04	Murragamba Creek	Off the Ulan-Wollar Road
SW05	Moolarben Creek	Below the Ulan - Cassilis Road near the Ulan Village
SW06	Ryan's Creek	Ulan - Cassilis Road
SW07	Lagoon Creek	Rayner Property
SW08	Moolarben Creek	Rayner Property
SW09	Moolarben Creek	Moolarben Road
SW10	Bora Creek	Upstream of operations
SW11	Bora Creek	Downstream of operations
SW12	Goulburn River	Crossing behind Ulan School

Table 22 to **Table 25** present the range of results for pH, EC, TDS and TSS for the reporting period with **Figure 14** to **Figure 17** presenting the pH, EC, TDS and TSS results graphically. The full data set for the surface water quality in the reporting period is shown in **Appendix 3**.

Table 22: pH Results

pH	SW01	SW02	SW04	SW05	SW07	SW08	SW09	SW10	SW11	SW12
Min	7.6	7.0	7.0	6.6	7.8	6.5	6.6	6.2	6.1	6.5
Med	8.0	7.7	7.4	7.5	8.0	7.5	7.4	6.2	6.5	7.3
Max	8.4	8.5	7.8	8.0	8.8	8.0	8.6	6.6	7.1	7.8

Table 23: Electrical Conductivity (µS/cm) Results

EC	SW01	SW02	SW04	SW05	SW07	SW08	SW09	SW10	SW11	SW12
Min	545	530	390	725	1,730	2,020	1,460	80	105	505
Med	715	720	813	930	2,335	2,620	2,595	88	130	680
Max	920	990	2,050	1,210	3,290	3,150	3,010	120	280	925

Table 24: Total Dissolved Solids (mg/L) Results

TDS	SW01	SW02	SW04	SW05	SW07	SW08	SW09	SW10	SW11	SW12
Min	302	308	320	414	990	734	742	61	116	248
Med	434	436	526	553	1,430	1,500	1,460	65	232	467
Max	508	524	1,080	752	2,080	1,890	1,750	82	414	628

Table 25: Total Suspended Solids (mg/L) Results

TSS	SW01	SW02	SW04	SW05	SW07	SW08	SW09	SW10	SW11	SW12
Min	<2	<2	2	<2	<2	<2	<2	<2	<2	<2
Med	9	9	10	8	7	4	13	9	12	9
Max	10	47	29	33	49	9	322	33	86	26

Note: a result of <2 relates to the result being below the detection limit

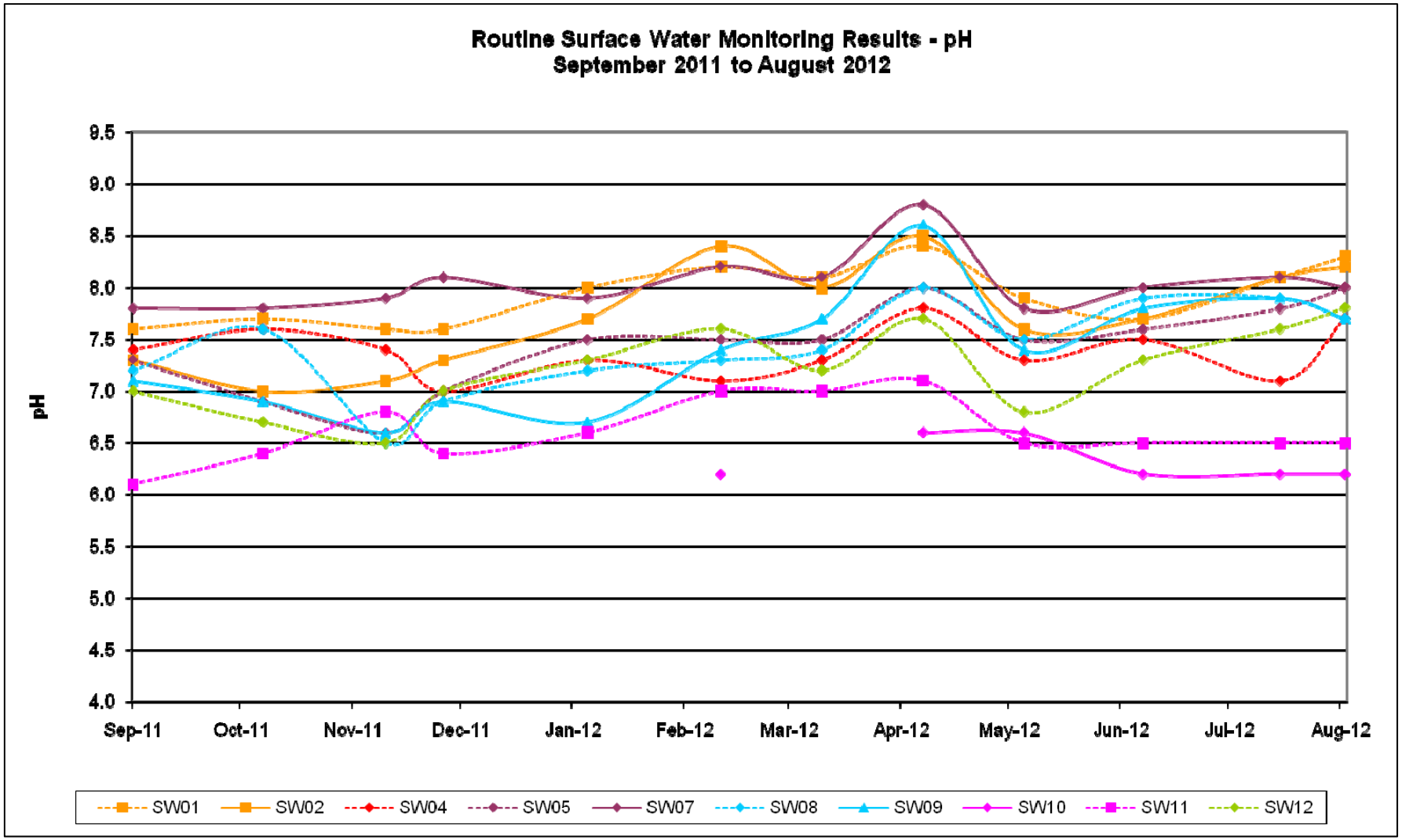


Figure 14: Surface Water pH Results

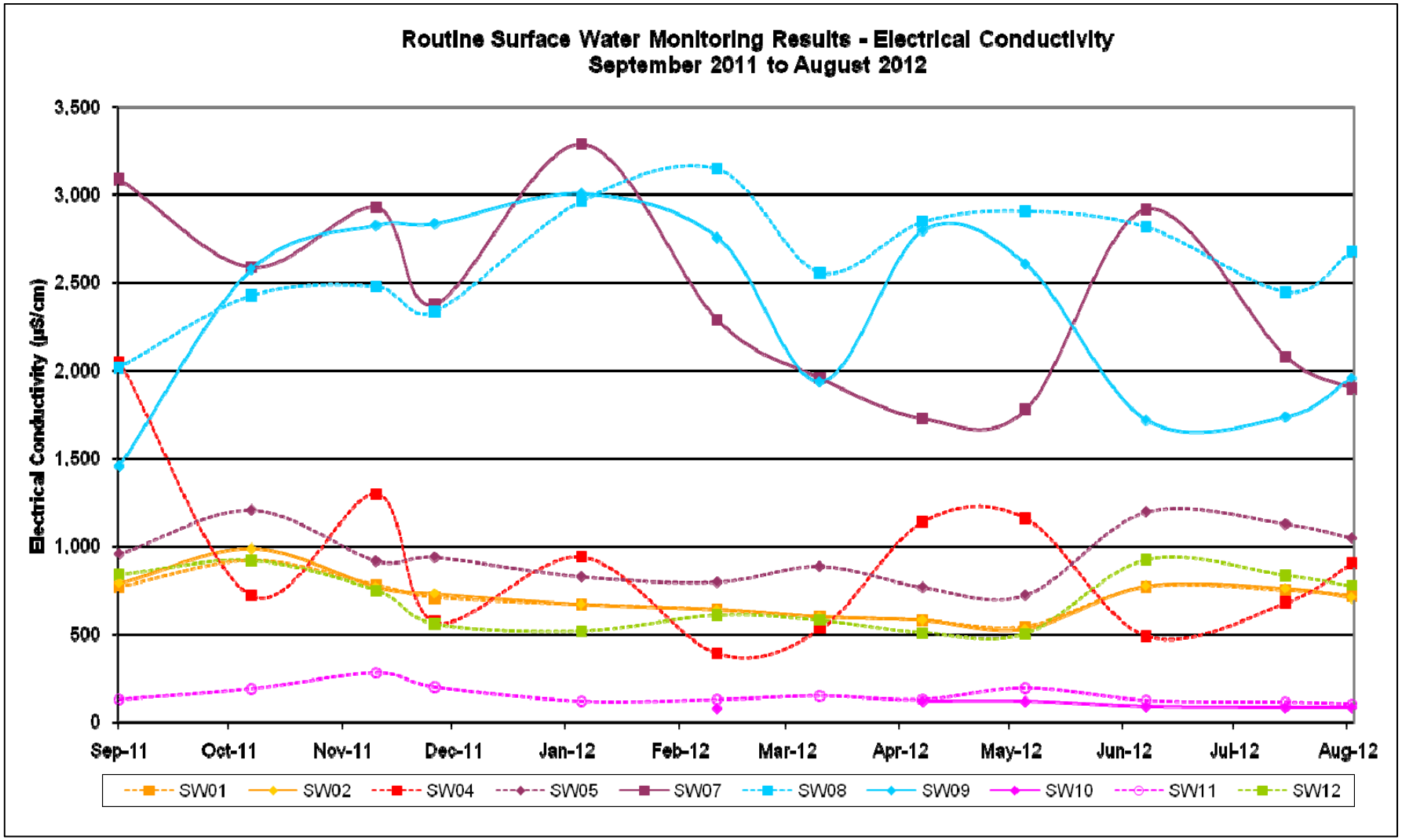


Figure 15: Surface Water Electrical Conductivity Results

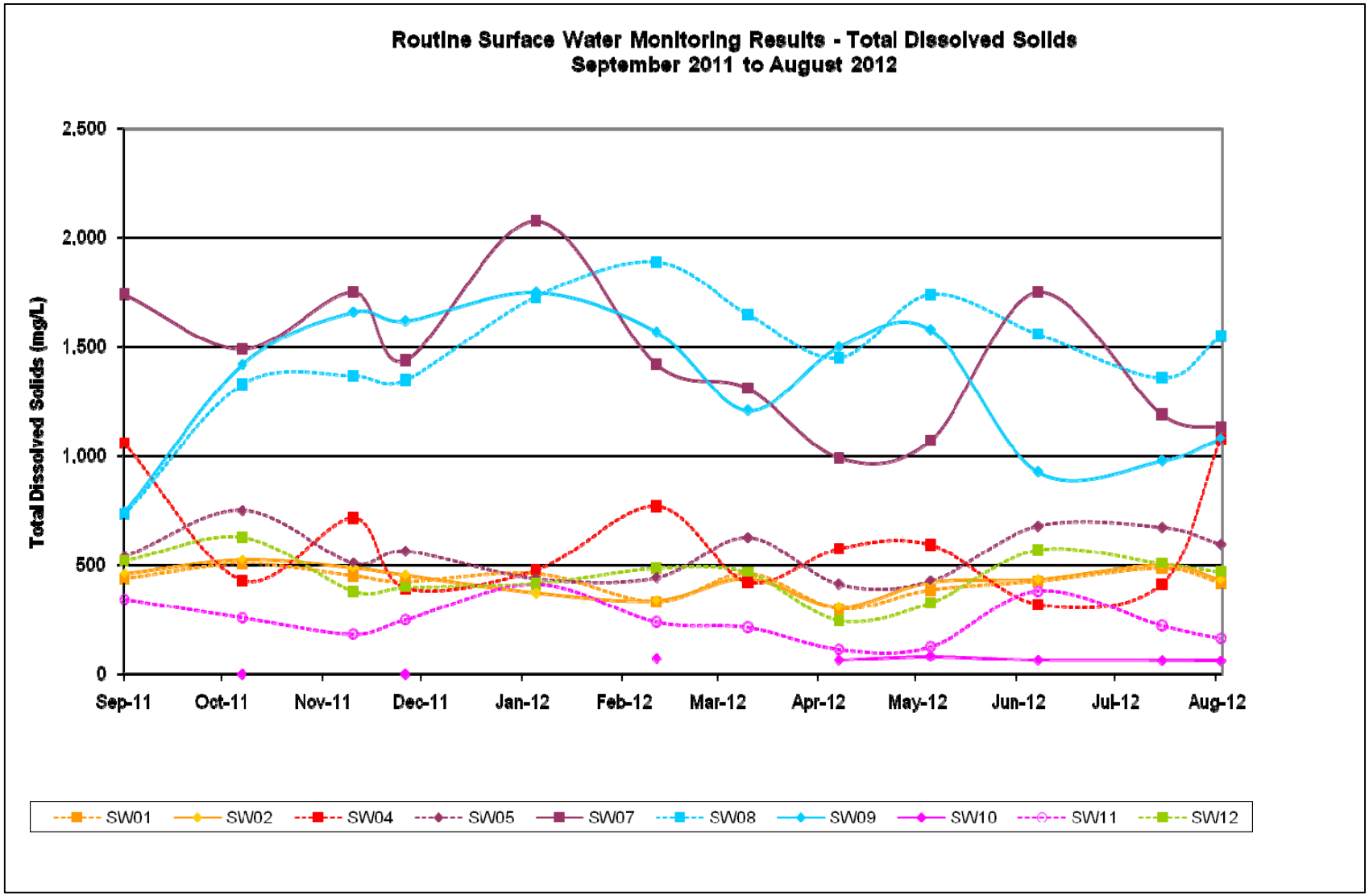


Figure 16: Surface Water Total Dissolved Solids Results

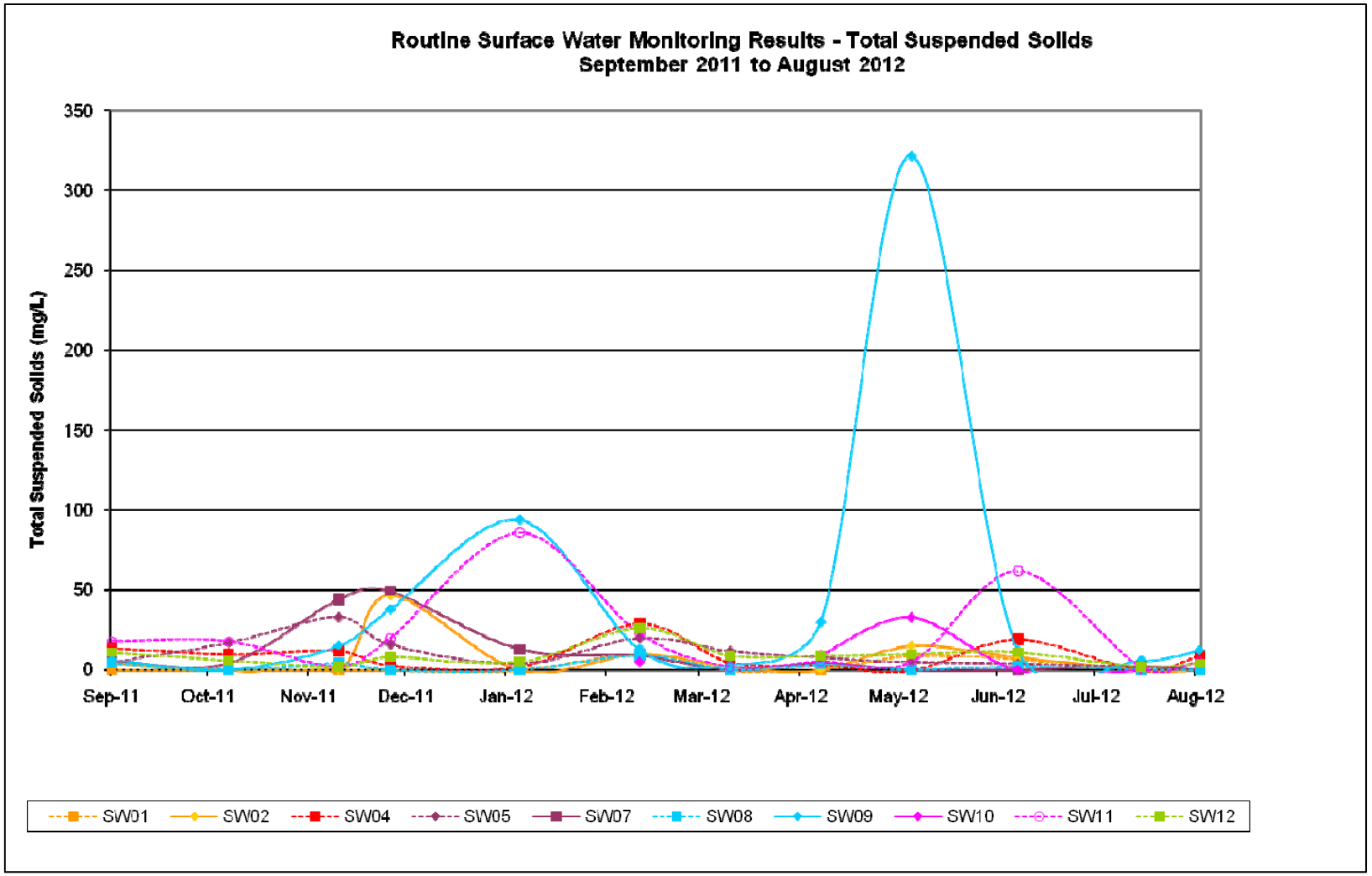


Figure 17: Surface Water Total Suspended Solids Results

3.6.3 Comparison to Previous Surface Water Quality Monitoring and Predicted Levels

Table 26 to **Table 29** compares water quality data from this reporting period to the background levels and previous monitoring results. There was no modelling conducted in the Environmental Assessment on predicted water quality surrounding the mining operations so a comparison isn't able to be made to predicted water quality.

Table 26: Comparison of Surface Water pH to Background pH

Site	Background Range	Previous Data Range	2011-2012 Data Range	Comment on 2011-2012 Data
SW01	5.4 – 8.1	6.0 – 8.3	7.6 – 8.4	Generally consistent with previous monitoring
SW02	4.4 – 7.9	5.9 – 8.1	7.0 – 8.5	As MCO weren't discharging any water around the time of the elevated pH results, this variation is attributable to factors other than MCO's operations
SW04	5.1 – 7.8	4.8 – 8.4	7.0 – 7.8	Consistent with previous monitoring
SW05	5.3 – 7.7	5.8 – 7.4	6.6 – 8.0	As MCO weren't discharging any water around the time of the elevated pH results, this variation is attributable to factors other than MCO's operations
SW07	5.3 – 8.0	6.2 – 7.9	7.8 – 8.8	As this site is located upstream of mining operations at MCO, this result is most likely due to natural variation
SW08	4.5 – 7.6	5.2 – 7.8	6.5 – 8.0	As this site is located upstream of mining operations at MCO, this result is most likely due to natural variation
SW09	5.2 – 7.9	5.9 – 7.7	6.6 – 8.6	As this site is located upstream of mining operations at MCO, this result is most likely due to natural variation
SW10	Dry	6.1 – 7.2	6.2 – 6.6	Consistent with previous monitoring
SW11	5.5 – 7.2	4.7 – 7.5	6.1 – 7.1	Consistent with previous monitoring
SW12	6.0 – 7.0	5.4 – 7.5	6.5 – 7.8	As MCO weren't discharging any water around the time of the elevated pH results, this variation is attributable to factors other than MCO's operations

Table 27: Comparison of Surface Water EC to Background EC

Site	Background Range (µS/cm)	Previous Data Range (µS/cm)	2011-2012 Data Range (µS/cm)	Comment on 2011-2012 Data
SW01	300 – 1,500	415 – 1,220	545 – 920	Consistent with previous monitoring
SW02	200 – 1,560	310 – 1,280	530 – 990	Consistent with previous monitoring
SW04	60 – 2,260	290 – 2,190	390 – 2,050	Consistent with previous monitoring

Site	Background Range (µS/cm)	Previous Data Range (µS/cm)	2011-2012 Data Range (µS/cm)	Comment on 2011-2012 Data
SW05	290 – 1,590	310 – 1,340	725 – 1,210	Consistent with previous monitoring
SW07	750 – 6,540	410 – 6,950	1,730 – 3,290	Consistent with previous monitoring
SW08	2,060 – 6,990	340 – 4,580	2,020 – 3,150	Consistent with previous monitoring
SW09	490 – 5,750	655 – 5,600	1,460 – 3,010	Consistent with previous monitoring
SW10	Dry	65 – 125	80 – 120	Consistent with previous monitoring
SW11	40 – 150	85 – 1,060	105 – 280	Consistent with previous monitoring
SW12	50 – 670	115 – 1,080	505 – 925	Consistent with previous monitoring

Table 28: Comparison of Surface Water TDS to Background TDS

Site	Background Range (mg/L)	Previous Data Range (mg/L)	2011-2012 Data Range (mg/L)	Comment on 2011-2012 Data
SW01	194 – 700	246 – 562	302 – 508	Consistent with previous monitoring
SW02	199 – 790	310 – 564	308 – 524	Consistent with previous monitoring
SW04	157 – 1,100	200 – 1,280	320 – 1,080	Consistent with previous monitoring
SW05	288 – 848	196 – 756	414 – 752	Consistent with previous monitoring
SW07	502 – 4,100	286 – 4,458	990 – 2,080	Consistent with previous monitoring
SW08	1,100 – 6,400	246 – 2,900	734 – 1,890	Consistent with previous monitoring
SW09	346 – 4,000	416 – 3,990	742 – 1,750	Consistent with previous monitoring
SW10	Dry	26 – 134	61 – 82	Consistent with previous monitoring
SW11	70 – 314	152 – 8,285	116 – 414	Consistent with previous monitoring
SW12	232 – 392	142 – 576	248 – 628	Generally consistent with previous monitoring

Table 29: Comparison of Surface Water TSS to Background TSS

Site	Background Range (mg/L)	Previous Data Range (mg/L)	2011-2012 Data Range (mg/L)	Comment on 2011-2012 Data
SW01	<2 – 310	<2 – 13	<2 – 10	Consistent with previous monitoring
SW02	<2 – 844	<2 – 10	<2 – 47	Consistent with previous monitoring
SW04	4 – 440	3 – 186	<2 – 29	Consistent with previous monitoring
SW05	<2 – 2,600	<2 – 82	<2 – 33	Consistent with previous monitoring
SW07	<2 – 64	<2 – 29	<2 – 49	Consistent with previous monitoring
SW08	<2 – 510	<2 – 53	<2 – 9	Consistent with previous monitoring

Site	Background Range (mg/L)	Previous Data Range (mg/L)	2011-2012 Data Range (mg/L)	Comment on 2011-2012 Data
SW09	2 – 140	<2 – 104	<2 – 322	The high sample was collected amongst reeds when the water level in the creek was low and the result was influenced by particulate matter from the reeds. This was an isolated result.
SW10	Dry	<2 – 77	<2 – 33	Consistent with previous monitoring
SW11	13 – 66	10 – 223	<2 – 86	Consistent with previous monitoring
SW12	<2 – 564	<2 – 166	<2 – 26	Consistent with previous monitoring

The surface water quality results recorded this reporting period are generally consistent with the background results (up to March 2009), with any exceptions commented on in the tables above. There were no high results that are attributable to MCO's operations.

3.6.4 Rainfall Event Sampling

During the reporting period there were eight occasions where rainfall events triggered the requirement to collect additional water samples. In February 2012, MCO expanded its rainfall event sampling regime to include all surface water sites to gain a better understanding of the impacts of rainfall on water courses upstream of MCO. A summary of the results is shown in **Table 30** with the full set of results shown in **Appendix 3**.

Table 30: Rainfall Event Results

Location	Date	pH	Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)
SW01 – Goulburn River	09-Sep-11	7.9	750	6
SW02 – Goulburn River	09-Sep-11	7.3	780	2
SW05 – Moolarben Creek	09-Sep-11	6.8	790	10
SW10 – Bora Creek	09-Sep-11	6.1	10	3
SW11 – Bora Creek	09-Sep-11	5.8	80	19
SW12 – Goulburn River	09-Sep-11	6.8	730	16
SW01 – Goulburn River	29-Sep-11	6.7	370	272
SW02 – Goulburn River	29-Sep-11	6.4	380	290
SW05 – Moolarben Creek	29-Sep-11	6.6	810	142
SW10 – Bora Creek	29-Sep-11	5.8	100	<2
SW11 – Bora Creek	29-Sep-11	6.2	70	64
SW12 – Goulburn River	29-Sep-11	6.6	200	408
SW01 – Goulburn River	23-Nov-11	7.1	660	49

Location	Date	pH	Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)
SW02 – Goulburn River	23-Nov-11	6.8	660	46
SW05 – Moolarben Creek	23-Nov-11	7.0	670	5
SW10 – Bora Creek	23-Nov-11	6.3	10	4
SW11 – Bora Creek	23-Nov-11	6.3	60	66
SW12 – Goulburn River	23-Nov-11	7.4	500	87
SW01 – Goulburn River	26-Nov-11	6.6	170	245
SW02 – Goulburn River	26-Nov-11	6.5	380	136
SW05 – Moolarben Creek	26-Nov-11	6.8	820	52
SW10 – Bora Creek	26-Nov-11	6.0	50	<2
SW11 – Bora Creek	26-Nov-11	5.9	30	30
SW12 – Goulburn River	26-Nov-11	7.4	60	270
SW01 – Goulburn River	12-Dec-11	7.8	620	24
SW02 – Goulburn River	12-Dec-11	7.7	610	<2
SW05 – Moolarben Creek	12-Dec-11	6.7	140	48
SW10 – Bora Creek	12-Dec-11	No Flow		
SW11 – Bora Creek	12-Dec-11	7.0	110	89
SW12 – Goulburn River	12-Dec-11	6.5	160	80
SW01 – Goulburn River	3-Feb-12	7.5	430	56
SW02 – Goulburn River	3-Feb-12	7.3	455	22
SW04 – Murragamba Creek	3-Feb-12	6.8	285	74
SW05 – Moolarben Creek	3-Feb-12	7.1	830	9
SW07- Lagoons Creek	3-Feb-12	7.6	1,420	3
SW08 – Moolarben Creek	3-Feb-12	7.4	3,040	<2
SW09 – Moolarben Creek	3-Feb-12	7.0	1,420	9
SW10 – Bora Creek	3-Feb-12	No Flow		
SW11 – Bora Creek	3-Feb-12	6.8	55	68
SW12 – Goulburn River	3-Feb-12	6.3	100	559
SW01 – Goulburn River	25-May-12	7.8	580	15

Location	Date	pH	Electrical Conductivity (µS/cm)	Total Suspended Solids (mg/L)
SW02 – Goulburn River	25-May-12	7.8	590	3
SW04 – Murragamba Creek	25-May-12	7.2	510	13
SW05 – Moolarben Creek	25-May-12	7.5	750	6
SW07- Lagoons Creek	25-May-12	8.4	3690	<2
SW08 – Moolarben Creek	25-May-12	7.8	3160	<2
SW09 – Moolarben Creek	25-May-12	7.8	1580	<2
SW10 – Bora Creek	25-May-12	8.1	80	9
SW11 – Bora Creek	25-May-12	7.5	130	24
SW12 – Goulburn River	25-May-12	6.9	200	115
SW01 – Goulburn River	11-Jul-12	7.8	630	28
SW02 – Goulburn River	11-Jul-12	8.0	645	14
SW04 – Murragamba Creek	11-Jul-12	7.4	210	59
SW05 – Moolarben Creek	11-Jul-12	7.6	885	40
SW07- Lagoons Creek	11-Jul-12	7.9	2,630	<2
SW08 – Moolarben Creek	11-Jul-12	7.8	2,010	2
SW09 – Moolarben Creek	11-Jul-12	7.7	825	12
SW10 – Bora Creek	11-Jul-12	5.9	90	<2
SW11 – Bora Creek	11-Jul-12	6.7	85	38
SW12 – Goulburn River	11-Jul-12	6.8	550	85

3.6.5 Discharges

MCO did not have any licensed discharges during the reporting period.

3.6.6 Flow Monitoring

Flow monitors were established on Bora Creek, Wilpinjong Creek and Moolarben Creek during February 2010. During the high flow events in November/December 2010 the flow monitoring systems on Bora Creek and Wilpinjong Creek were damaged and no data has been collected since this time. A fault with the flow monitoring system at Moolarben Creek in March 2011 has resulted in all data since this time being lost. To substitute for the lost data in Moolarben Creek, data has been obtained from the flow monitoring conducted by UCML at Moolarben Dam. This data is shown graphically in **Figure 18**. MCO will re-establish the flow monitoring systems in Bora Creek and Wilpinjong Creek during the next reporting period.

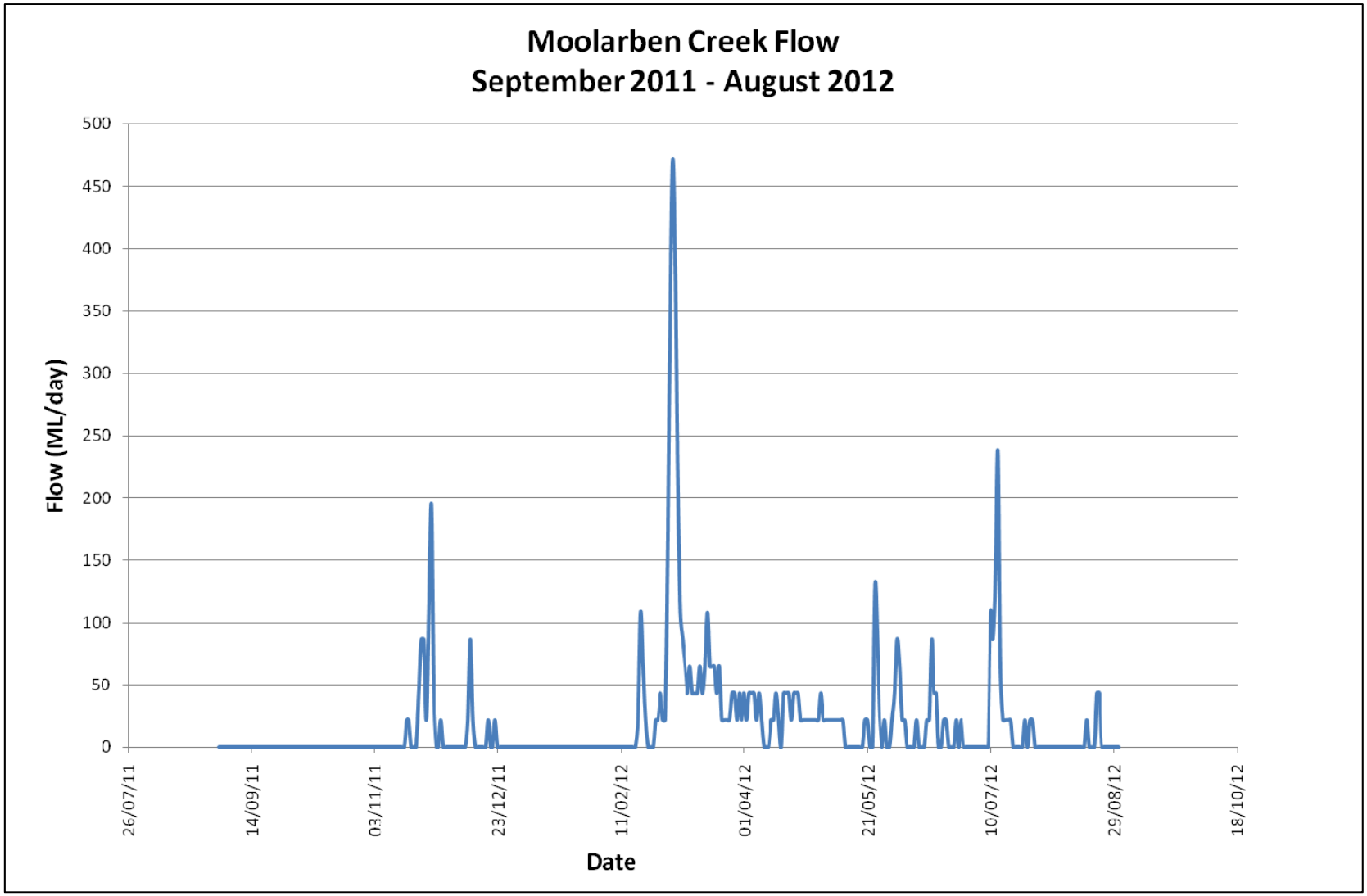


Figure 18: Flow Monitoring – Moolarben Creek

3.6.7 Effluent Monitoring

MCO's Environmental Protection Licence (EPL) has a requirement for water samples to be collected from the effluent systems on a quarterly basis. The results from the sampling of the effluent systems at the Administration, CHPP and Open Cut offices are shown in **Table 31**.

Table 31: Effluent System Monitoring

Sample Location	Sample Date	Biological Oxygen Demand (mg/L)	Total Nitrogen (mg/L)	Oil & Grease (mg/L)	Total Phosphorus (mg/L)	pH	Total Suspended Solids (mg/L)
Administration	17/10/11	14	97.7	<2	27	6.3	1,210
CHPP	17/10/11	82	94.1	7	11.2	7.5	268
Open Cut	12/09/11	24	30.7	<2	31.5	6.2	12
Administration	22/12/11	38	59.2	<2	18.6	4.9	39
CHPP	22/12/11	86	202	<2	27.4	7.8	115
Open Cut	22/12/11	24	30.7	<2	31.5	6.2	12
Administration	14/03/12	26	44.0	<2	16.2	5.1	150
CHPP	14/03/12	35	34.6	<2	9.36	7.8	90
Open Cut	14/03/12	98	31.6	6	16.3	7.1	65
Administration	14/06/12	4	76.7	<2	17.2	4.5	7
CHPP	14/06/12	73	4.4	4	0.33	6.7	28
Open Cut	14/06/12	25	57.7	<2	33.1	7.2	43

3.6.8 Channel Stability Monitoring

Channel stability monitoring along Bora Creek and Moolarben Creek was undertaken in February 2012 and May 2012. The monitoring in February 2012 was the routine monitoring for 2012, while the monitoring in May 2012 was undertaken in the Bora Creek Tributary to assess channel stability resulting from stabilisation works undertaken in March 2012. These new sites have been added to the ongoing monitoring program. The monitoring involved visual and written observational surveys and photographic records of each stream reach that included:

- Monitoring the reach of Bora Creek from the western culvert of the MCO rail loop and its confluence with Goulburn River;
- Monitoring the reach of Moolarben Creek between Moolarben Dam and its confluence with Ryan Creek; and
- Monitoring at the confluence of Moolarben Creek, Sportsman Hollow Creek and the Goulburn River.

The channel stability monitoring locations can be seen on **Figure 19** and **Figure 20**. The methodology used for this monitoring program was the *CSIRO Ephemeral Stream Assessment.* The classifications used in this methodology are shown in **Table 32** and the results from the monitoring are shown in **Table 33**.

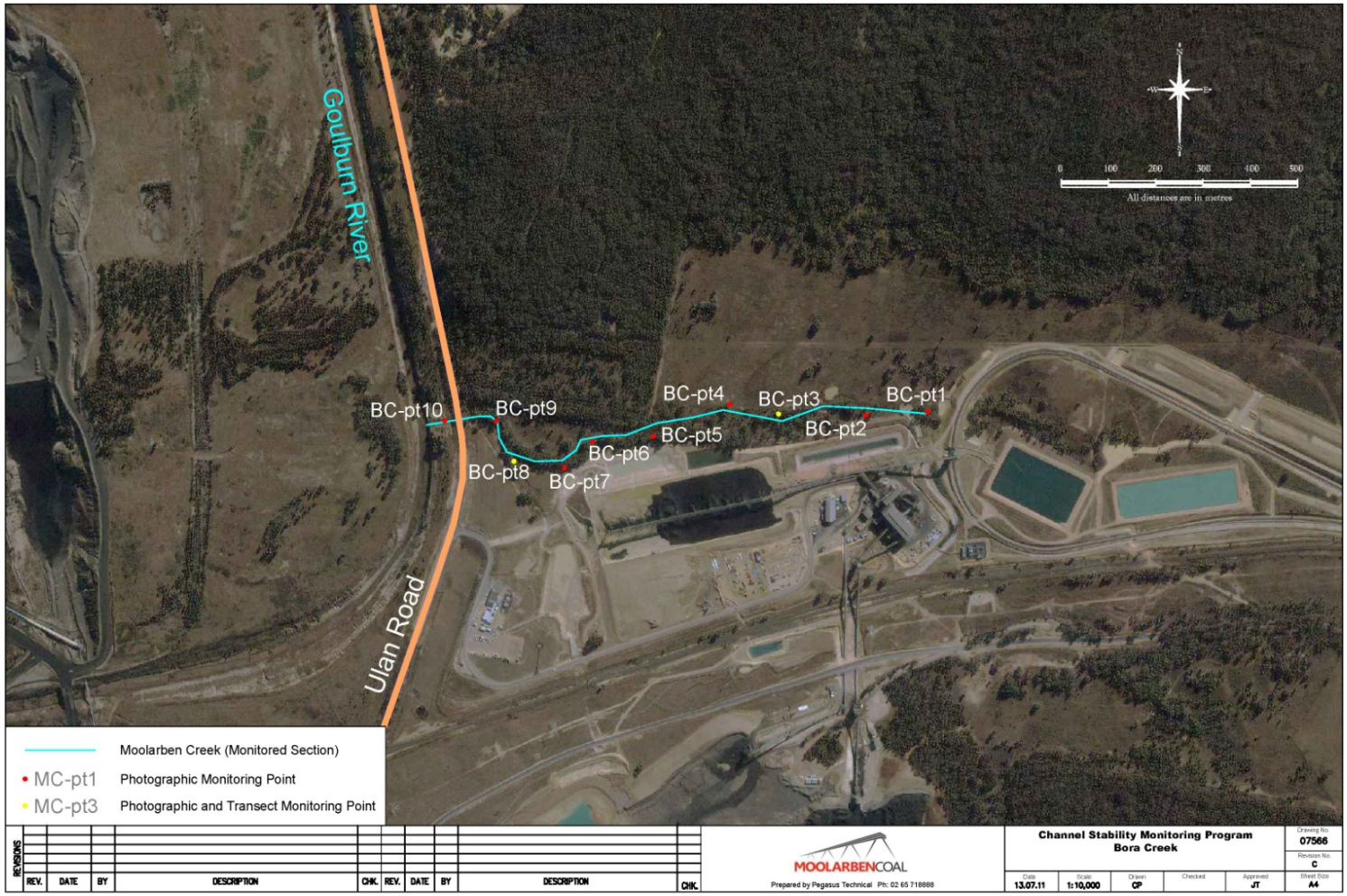


Figure 19: Channel Stability Monitoring – Bora Creek

Figure 20: Channel Stability Monitoring – Moolarben Creek

Table 32: Classification of Different Drainage Line States (CSIRO)

Activity Rating (%)	Classification	Discussion of Classification
80 +	Very Stable	Drainage line is very stable and likely to be in original form. It is able to withstand all flow velocities that have previously occurred in this area and only minimal monitoring is required, predominantly after high flow events, to ensure condition does not deteriorate
70-80	Stable	Drainage line is stable. It is important to assess this zone in relation to the other classifications and define whether this zone is moving from potentially stabilising to a more stable form or if it is deteriorating from a very stable form. The nature of this relationship will identify the type of monitoring required
60-69	Potentially Stabilising	Drainage line is potentially stabilising. Ongoing monitoring is required while rehabilitation works are not needed in the immediate future
50-59	Active	Drainage line is actively eroding and remedial actions are required. It is important to classify if erosion is caused primarily by upstream flows, lateral flows or unstable wall materials so that appropriate rehabilitation can be carried out.
< 50	Very Active	Drainage line is very actively eroding and immediate remedial actions are required. It is important to classify if erosion is caused primarily by upstream flows, lateral flows or unstable wall materials so that appropriate rehabilitation can be carried out.

Table 33: Classification of Channel Stability Monitoring Sites

Site Number	Classification 2009 – Background	Classification 2010	Classification 2011	Classification 2012	Comments
Bora Creek					
BC-pt1	Very Stable	Very Stable	Very Stable	Very Stable	No changes in stability
BC-pt2 (upstream)	Potentially Stabilising	Potentially Stabilising	Potentially Stabilising	Potentially Stabilising	No changes in stability
BC-pt2 (downstream)	Stable	Stable	Stable	Stable	No changes in stability
BC-pt3	Active/Potentially Stabilising	Potentially Stabilising	Potentially Stabilising	Potentially Stabilising	Slight improvement in stability over time
BC-pt4 (upstream)	Stable	Stable	Stable	Stable	No changes in stability
BC-pt4 (downstream)	Active	Potentially Stabilising	Potentially Stabilising	Stable	Slight improvement in stability over time
BC-pt5	Active	Active/Potentially Stabilising	Very Active	Active	Slight improvement in stability over time
BC-pt6	Active	Active/Potentially Stabilising	Active	Active	No changes in stability
BC-pt7	Active/Potentially Stabilising	Potentially Stabilising	Potentially Stabilising	Potentially Stabilising	Slight improvement in stability over time but the area is still eroding and unstable
BC-pt8	Active to Very Active	Active to Very Active	Active to Very Active	Active	No changes in stability
BC-pt9	Very Active	Active	Active	Active	Slight improvement in stability over time but the area is still eroding and unstable
BC-pt10	Active	Potentially Stabilising	Potentially Stabilising	Active	Slight improvement in stability over time
BCT-pt1	Not included in the monitoring program	Not included in the monitoring program	Not included in the monitoring program	Stable	Rock protection and earthworks installed at this location
BCT-pt2 (upstream)	Not included in the monitoring program	Not included in the monitoring program	Not included in the monitoring program	Potentially Stabilising	Regraded bank appears stable

Site Number	Classification 2009 – Background	Classification 2010	Classification 2011	Classification 2012	Comments
BCT-pt2 (downstream)	Not included in the monitoring program	Not included in the monitoring program	Not included in the monitoring program	Potentially Stabilising	Narrow vertical bank exposed dispersive soils however tree roots are holding bank in place.
BCT-pt3	Not included in the monitoring program	Not included in the monitoring program	Not included in the monitoring program	Active	Channel is susceptible to erosion to due to narrow drainage line and exposed dispersive soils
Moolarben Creek					
MC-pt1	As this site is a dam the CSIRO assessment could not be applied				No change
MC-pt2	As this site is a dam the CSIRO assessment could not be applied				No change
MC-pt3	As this site is a dam the CSIRO assessment could not be applied				No change
MC-pt4	As this site is a dam the CSIRO assessment could not be applied				No change
MC-pt5	As this site is a dam the CSIRO assessment could not be applied				No change
MC-pt6	Active	Potentially Stabilising	Potentially Stabilising	Active	Western bank remains active however eastern side has greater vegetation cover
MC-pt7	Active	Active	Active	Active	No changes in stability
MC-pt8	Active	Potentially Stabilising	Potentially Stabilising	Potentially Stabilising	Slight improvement in stability over time
Goulburn River					
GR-pt1	Very Stable	Very Stable	Very Stable	Very Stable	No changes in stability

The 2012 channel stability monitoring program for Bora Creek, Moolarben Creek and the Goulburn River displayed a large variability in terms of channel stability, vegetation composition and erosion potential along each section of the watercourses. Bora Creek and Moolarben Creek display similar characteristics associated through previous land practices.

The survey identified that some sections of Bora Creek and Moolarben Creek are still degraded and actively eroding due to natural influences, exacerbated by past land clearing and agricultural practices. The erosion in these sections of the creek has been less evident over the last 12 months. However, the survey alternately recognised some sections of each creek displaying very stable environments, with respect to their low erosion potential. The survey highlighted that the continuation of vegetation growth is crucial for the sections of the creek facing potential active erosion to become stabilised.

The slightly above average rainfall received over the previous 12 months was reflected by an increase in vegetation within and surrounding the creek lines. There has been no notable invasion of weed species along the creek lines since the baseline survey. Some active areas of erosion along the creek banks identified in the baseline survey were showing signs of stability with increased vegetation coverage. The vegetation may be seasonal and short lived which would result in the condition of the creeks returning to similar levels of stability to that observed during the 2009 baseline survey.

Following remedial works in March 2012, the Bora Creek Tributary was assessed in May 2012. The tributary showed variability in stability along its reach. The upstream section of the channel is rated stable where remedial earthworks and rock protection have been installed. The channel is generally wider in this location and remediation works were undertaken over a more extensive area since no trees impeded access. Downstream is less stable toward the confluence with Bora Creek as the channel narrows with various pinch points and cut banks resulting in a rating of potentially stabilising. Should the remediation works be successful, the stability of this channel will improve. Observations suggest that the historic erosion has been caused by upstream flow rates, rather than from lateral inflows.

Rehabilitation works including battering back steep batters, re-vegetation and rock protection on the cut banks is anticipated to slow velocities in high flow events and limit the exposure of dispersive material on steep batters which should assist in stabilising the Tributary. Further stabilisation via the planting of trees along the tops of the banks of the Tributary will increase the likelihood of creating a stable drainage line in the long term.

The channel stability monitoring program will continue on an annual basis or following significant flow events to monitor any changes in the channel stability of surrounding creeks.

3.6.9 Activities in the Next Reporting Period

Surface water monitoring will continue to be undertaken with the results to be provided in the next AEMR. Installation of the new flow monitoring system will be undertaken during the next reporting period.

3.7 GROUND WATER MANAGEMENT

3.7.1 Activities This Reporting Period

During the reporting period MCO continued to operate in accordance with its Water Management Plan (WMP). The WMP includes a process for the review of data on a monthly basis against trigger levels. This review was ongoing throughout the reporting period.

Active groundwater management strategies were not required during the reporting period as there were no mining activities during the reporting period that impacted on groundwater.

Groundwater licences were received during the reporting period for exploration activities.

3.7.2 Groundwater Monitoring

Piezometers have been installed to monitor water level and water quality associated with lithological units. These include:

- Quaternary Alluvium;
- Tertiary paleochannel deposits;
- Upper Triassic (and overlying Jurassic where present);
- Lower Triassic;
- Upper Permian coal measures;
- Middle Permian coal measures;
- Ulan Seam coal measures;
- Shoalhaven Group (Marrangaroo Formation and Nile SubGroup); and
- Basement (consisting mostly of granites and metavolcanics).

During the reporting period MCO monitored an extensive network of monitoring bores with depths ranging from less than 10m to over 150m. The locations of these piezometers are shown in **Figure 5**. Groundwater monitoring locations are sampled monthly for standing water level and chemical analysis is conducted in accordance with the WMP.

MCO do not have any groundwater quality criteria. Trigger values have been developed to act as triggers for further investigations into groundwater quality and depth. These triggers can be seen in **Table 34** and **Table 35**. The 80th percentile figure is used for internal investigation purposes only. If an investigation into results outside the maximum range finds that MCO is responsible for this result, it will be treated as a non-compliance and reported to regulators and affected landowners. If the investigation finds that MCO is not responsible no further action will be taken.

Table 34: Trigger Levels for Key Groundwater Monitoring Parameters

Site No.	pH		Electrical Conductivity (µS/cm)		Water Level (mAHD)		Justification for Monitoring Site
	80th Percentile Trigger Value	Maximum Range Reported	80th Percentile Trigger Value	Maximum Reported	80th Percentile Trigger Value	Minimum Reported	
PZ003	6.5-8.0	5.7-7.2	2,200	3,210	470.545	470.428	Located near OC3
PZ004	6.5-8.0	6.0-8.0	4,300	4,400	490.998	489.088	Located near OC3
PZ018	6.5-8.0	4.8-6.9	2,200	2,200	451.855	451.463	Background for Stage 2
PZ039	6.5-8.0	5.5-7.3	2,200	2,200	417.482	417.225	Background for Stage 2
PZ040b	6.5-8.0	5.5-7.1	2,200	2,200	419.740	419.444	Background for Stage 2

Site No.	pH		Electrical Conductivity (µS/cm)		Water Level (mAHD)		Justification for Monitoring Site
	80th Percentile Trigger Value	Maximum Range Reported	80th Percentile Trigger Value	Maximum Reported	80th Percentile Trigger Value	Minimum Reported	
PZ041b	6.5-8.0	5.2-7.1	6,200	6,300	415.313	412.103	Background for Stage 2
PZ043a	6.5-8.0	5.8-7.2	2,552	2,600	489.574	489.318	Located near OC3
PZ043b	6.5-8.0	3.5-4.9	4,700	4,700	493.957	493.895	Located near OC3
PZ044	6.5-8.0	5.6-7.5	3,000	3,000	479.321	478.695	Located near OC3
PZ050b	6.5-8.0	5.5-7.5	2,200	2,200	432.031	431.711	Background for Stage 2
PZ050c	6.5-8.0	5.5-12.5	2,200	2,500	439.508	439.372	Background for Stage 2
PZ055	6.5-8.0	5.2-7.1	2,200	2,200	See Table 35		Located near OC1
PZ058	6.5-8.0	2.5-4.9	11,880	16,000	467.628	467.543	Located near OC3
PZ072a	6.5-8.0	6.2-7.9	2,200	2,200	496.112	494.852	Located near OC3
PZ072c	6.5-8.0	6.2-7.9	3,500	3,500	503.998	503.268	Located near OC3
PZ074	6.5-8.0	5.7-7.6	4,980	5,170	501.422	501.371	Located near OC3
PZ101b	6.5-8.0	6.0-8.0	2,200	2,200	363.858	363.484	Located above UG4
PZ101c	6.5-8.0	5.9-11.9	2,200	3,600	see Table 36		Located above UG4
PZ102a	6.5-8.0	6.1-8.3	2,432	2,550	357.997	355.627	Located above UG4
PZ102b	6.5-8.0	5.9-7.9	2,500	2,540	355.354	354.769	Located above UG4
PZ103a	6.5-8.0	5.4-8.1	2,200	2,200	357.927	355.985	Located above UG4
PZ103b	6.5-8.0	5.1-9.5	2,200	2,200	391.162	366.970	Located above UG4
PZ103c	6.5-8.0	5.1-13.1	2,200	13,000	see Table 36		Located above UG4
PZ104	6.5-8.0	5.9-13.1	8,360	8,900	380.681	380.166	Located near Southern Borefield
PZ105a	6.5-8.0	5.3-7.8	2,200	2,200	360.224	359.214	Located above UG4
PZ105b	6.5-8.0	6.2-7.9	2,200	2,200	376.660	375.052	Located above UG4
PZ105c	6.5-8.0	5.1-6.8	2,200	2,200	see Table 36		Located above UG4
PZ106a	6.5-8.0	5.8-12.3	2,200	3,800	427.943	424.817	Background for Stage 2
PZ106b	6.5-8.0	4.9-8.2	2,200	2,200	502.261	502.032	Background for Stage 2
PZ107	6.5-8.0	4.7-7.1	2,200	2,200	432.583	432.511	Background for Stage 2
PZ108R	6.5-8.0	5.6-8.0	2,200	2,200	333.953	332.843	Located near UG4
PZ109	6.5-8.0	6.1-12.3	2,200	2,200	383.045	382.990	Located near UG4
PZ111	6.5-8.0	5.8-7.0	2,200	2,200	379.794	379.703	Background for Stage 2
PZ112b	6.5-8.0	4.3-6.7	7,300	8,100	479.334	479.164	Background for Stage 2
PZ125	6.5-8.0	5.0-6.7	7,300	8,100	412.648	412.588	Located near OC1
PZ127	Not applicable due to vibrating wire piezometer being installed						Background for Stage 2
PZ128	Not applicable due to vibrating wire piezometer being installed						Located above UG4
PZ129	Not applicable due to vibrating wire piezometer being installed						Located near UG4
PZ130	Not applicable due to vibrating wire piezometer being installed						Background for Stage 2
PZ131	6.5-8.0	5.6-7.2	6,438	6,590	433.468	433.388	Background for Stage 2
PZ134	6.5-8.0	5.1-6.1	4,800	4,800	431.459	431.059	Background for Stage 2
PZ137	6.5-8.0	5.1-6.7	2,200	2,200	461.020	460.922	Background for Stage 2
PZ141	6.5-8.0	4.2-5.4	5,200	5,300	461.723	461.623	Background for Stage 2
PZ149	6.5-8.0	5.1-6.7	5,100	5,700	467.739	467.196	Background for Stage 2
PZ150	6.5-8.0	5.1-6.4	5,190	6,700	377.191	377.085	Background for Stage 2
PZ151	6.5-8.0	5.7-7.0	2,200	2,200	374.567	374.510	Background for Stage 2
PZ152	6.5-8.0	5.1-6.4	6,800	6,800	442.200	442.000	Background for Stage 2
PZ155	6.5-8.0	5.8-6.6	7,980	8,000	438.042	437.979	Background for Stage 2
PZ156	6.5-8.0	4.3-7.1	2,200	2,200	372.591	372.278	Background for Stage 2
PZ157	6.5-8.0	5.9-7.6	2,200	2,200	373.723	373.153	Background for Stage 2
PZ164	6.5-8.0	3.4-5.1	9,200	10,000	See Table 35		Background for Stage 2
PZ165	6.5-8.0	5.9-6.2	2,200	2,200	See Table 35		Background for Stage 2

Site No.	pH		Electrical Conductivity (µS/cm)		Water Level (mAHD)		Justification for Monitoring Site
	80th Percentile Trigger Value	Maximum Range Reported	80th Percentile Trigger Value	Maximum Reported	80th Percentile Trigger Value	Minimum Reported	
PZ168	6.5-8.0	5.8-7.0	2,200	2,200	427.836	427.800	Background for Stage 2
PZ170	6.5-8.0	5.4-6.7	4,412	4,700	420.984	420.926	Background for Stage 2
PZ172	6.5-8.0	5.7-6.4	7,264	7,400	See Table 35		Background for Stage 2
PZ173	6.5-8.0	6.3-7.2	14,000	14,000	See Table 35		Background for Stage 2
PZ174	6.5-8.0	5.4-6.5	8,860	11,900	418.109	418.068	Background for Stage 2
PZ175	6.5-8.0	5.3-7.0	16,472	18,000	419.965	419.323	Background for Stage 2
PZ176	6.5-8.0	5.0-7.8	2,200	2,200	See Table 35		Background for Stage 2
PZ177	6.5-8.0	5.8-6.7	8,260	8,500	See Table 35		Background for Stage 2
PZ179	Not applicable due to vibrating wire piezometer being installed				See Table 35		Located near production bore TB179
PZ181	6.5-8.0	5.3-5.9	2,200	2,200	See Table 35		Background for Stage 2
PZ184	6.5-8.0	3.9-5.6	4,360	4,460	412.456	412.299	Background for Stage 2
PZ186	6.5-8.0	6.5-8.0	2,200	2,200	New site – insufficient data	New site – insufficient data	Between production bore TB52a and Wilpinjong Creek
PZ187	6.5-8.0	6.5-8.0	2,200	2,200	New site – insufficient data	New site – insufficient data	Between production bore TB52a and Wilpinjong Creek
PZ188	6.5-8.0	6.5-8.0	2,200	2,200	New site – insufficient data	New site – insufficient data	Between production bore TB179 and Wilpinjong Creek
PZ189	6.5-8.0	6.5-8.0	2,200	2,200	New site – insufficient data	New site – insufficient data	Between production bore TB179 and Wilpinjong Creek
PZ191	6.5-8.0	6.5-8.0	2,200	2,200	New site – insufficient data	New site – insufficient data	Between production bore TB190 and Bora Creek
TB103	6.5-8.0	5.7-7.3	2,200	2,200	369.665	367.730	Potential production bore location
TB105	6.5-8.0	6.8-7.8	2,200	2,200	359.924	359.190	Potential production bore location
OB001	6.5-8.0	4.7-7.6	2,200	2,200	Not applicable as site is a spring		
OB002	6.5-8.0	5.5-7.9	2,200	2,200	495.056	6.5-8.0	
OB003	6.5-8.0	5.7-7.7	2,200	2,900	471.662	6.5-8.0	
OB004	6.5-8.0	3.1-4.8	2,200	2,200	Not applicable as site is a spring		

Note: Shaded cells indicate ANZECC (2000) criteria

Unshaded cells indicate site developed criteria

There are nine sites within 5km of Open Cut 1 that are predicted to show drawdown from mining operations. As it is predicted that there will be impact on these sites their trigger levels have been calculated differently and can be seen in **Table 35**. These trigger levels are set on an exceedance of 5% of the predicted drawdown following two years of mining and water extraction from the approved bores.

Table 35: Water Level Triggers for Selected Sites

Site No.	Minimum Observed/Predicted Groundwater Level (mAHD)	Trigger Level (mAHD)
PZ055	421.83	421.50
PZ164	431.49	431.46
PZ165	435.36	435.16
PZ172	421.08	421.05
PZ173	421.82	421.47

Site No.	Minimum Observed/Predicted Groundwater Level (mAHD)	Trigger Level (mAHD)
PZ176	416.36	416.34
PZ177	415.81	415.77
PZ179 (28m)	418.77	418.68
PZ179 (33m)	413.15	412.35
PZ179 (82m)	349.40	344.90
PZ179 (145m)	351.15	347.95
PZ181	419.71	419.67

The cease-to-pump criteria for the licensed monitoring bores surrounding the production bores are provided in **Table 36** and have been determined based on deviation from the seasonal/climatic trends established in the baseline monitoring.

Table 36: Extraction Restriction Criteria

Monitoring Bore	Expected Drawdown Level (mAHD)	Cease-to-Pump Trigger Levels (mAHD)
PZ187	416.80	415.87
PZ188	415.41	414.79
PZ101c	NA	380.1
PZ103c	NA	397.7
PZ105c	NA	376.4
PZ129(35m)	NA	387.0

Summaries of the depth monitoring results from all piezometers (including vibrating wire piezometers) are presented in **Figure 21** to **Figure 33**. A summary of pH from all piezometers is presented in **Figure 34** to **Figure 40**. **Figure 41** to **Figure 47** present the groundwater electrical conductivity from all piezometers. The full data set for the groundwater monitoring is shown in **Appendix 4**.

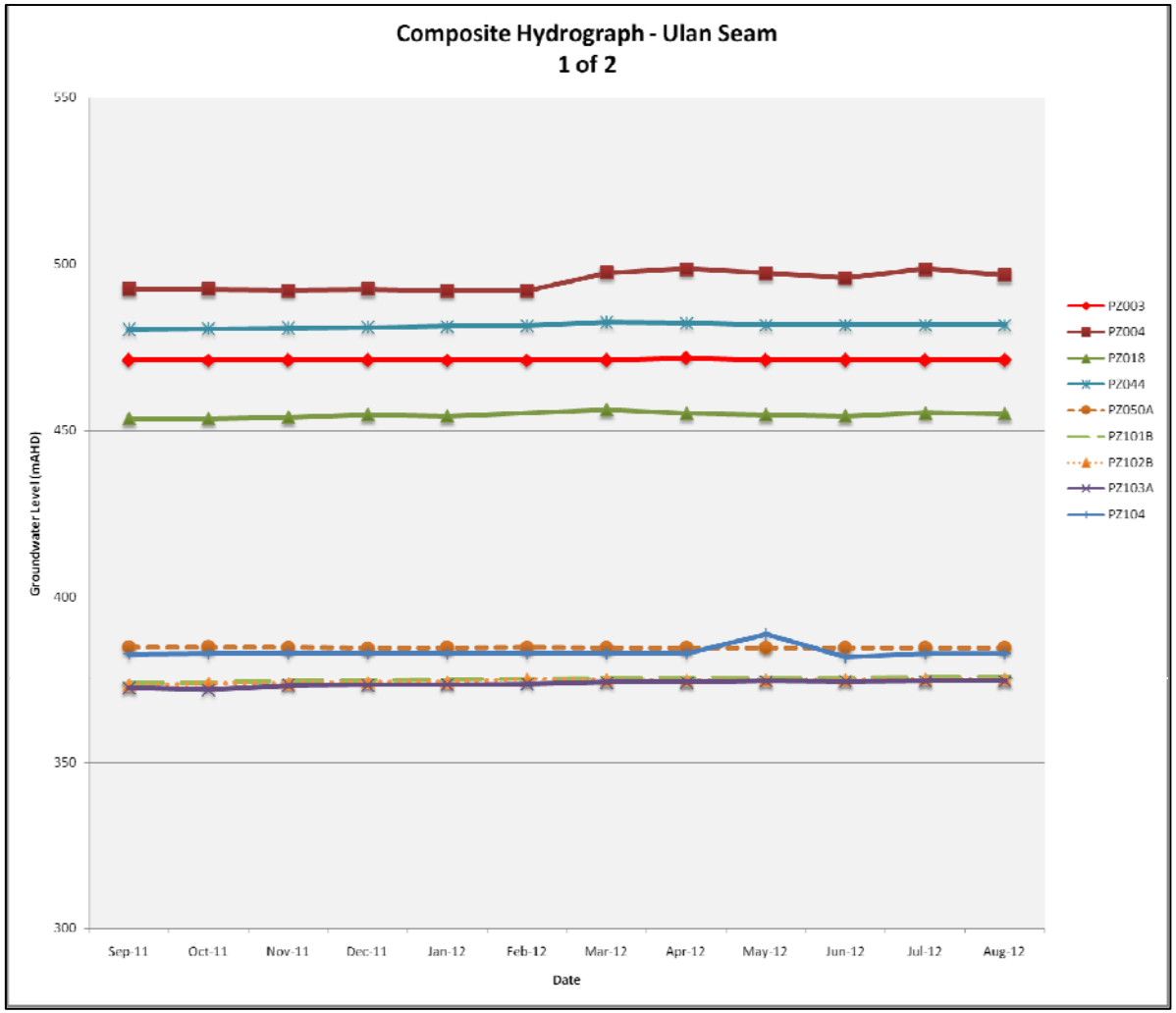


Figure 21: Composite Hydrograph 1

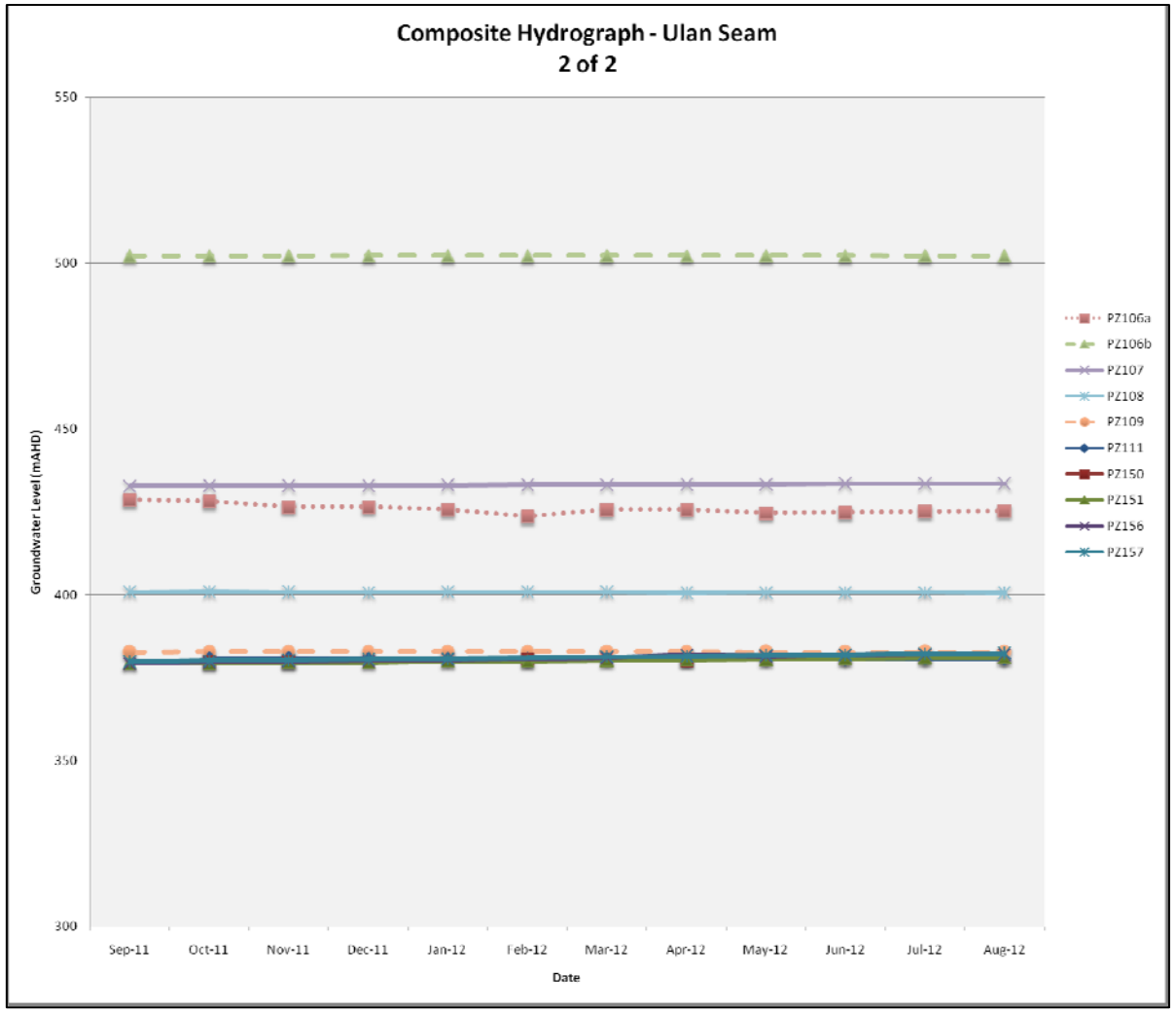


Figure 22: Composite Hydrograph 2

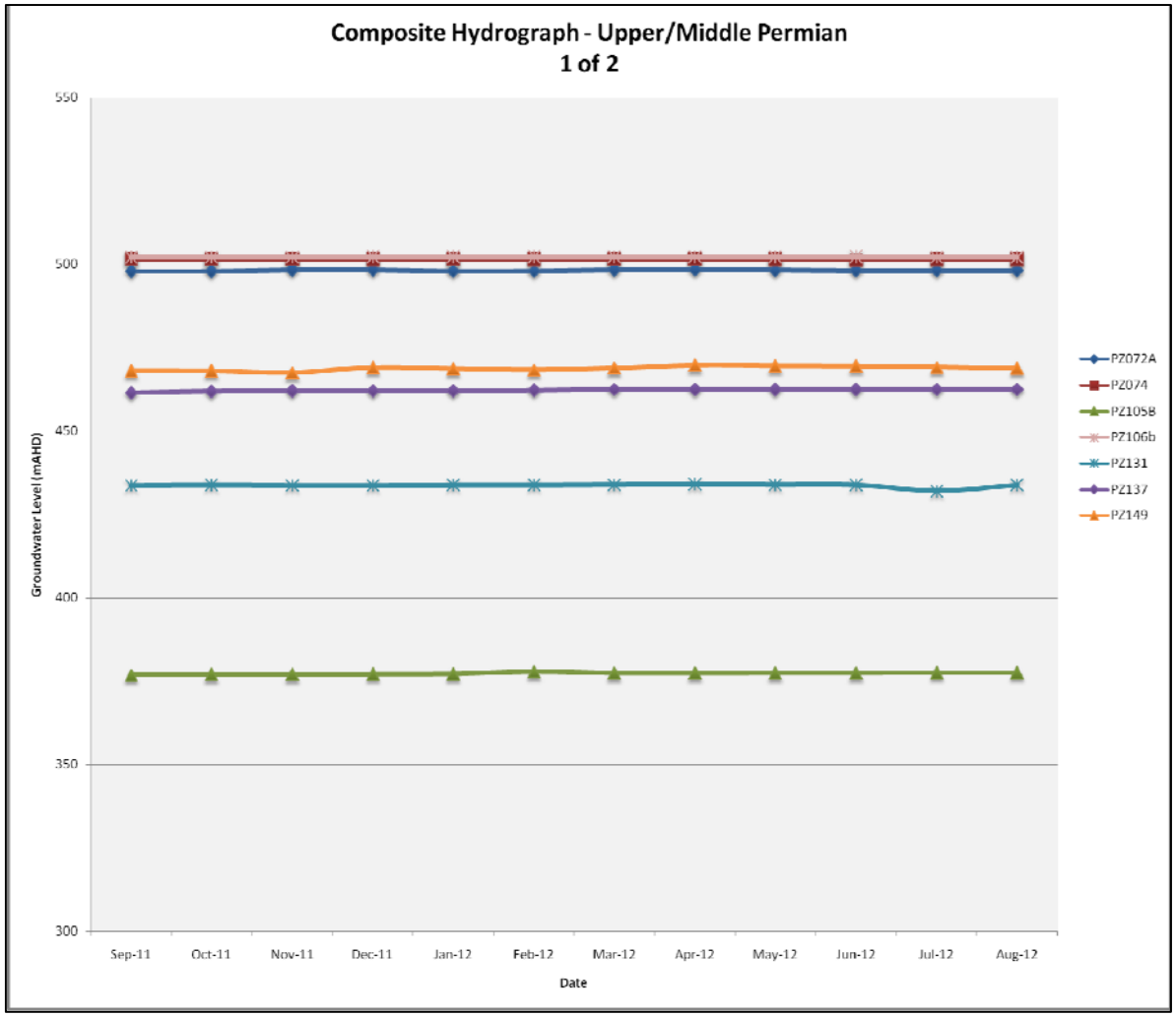


Figure 23: Composite Hydrograph 3

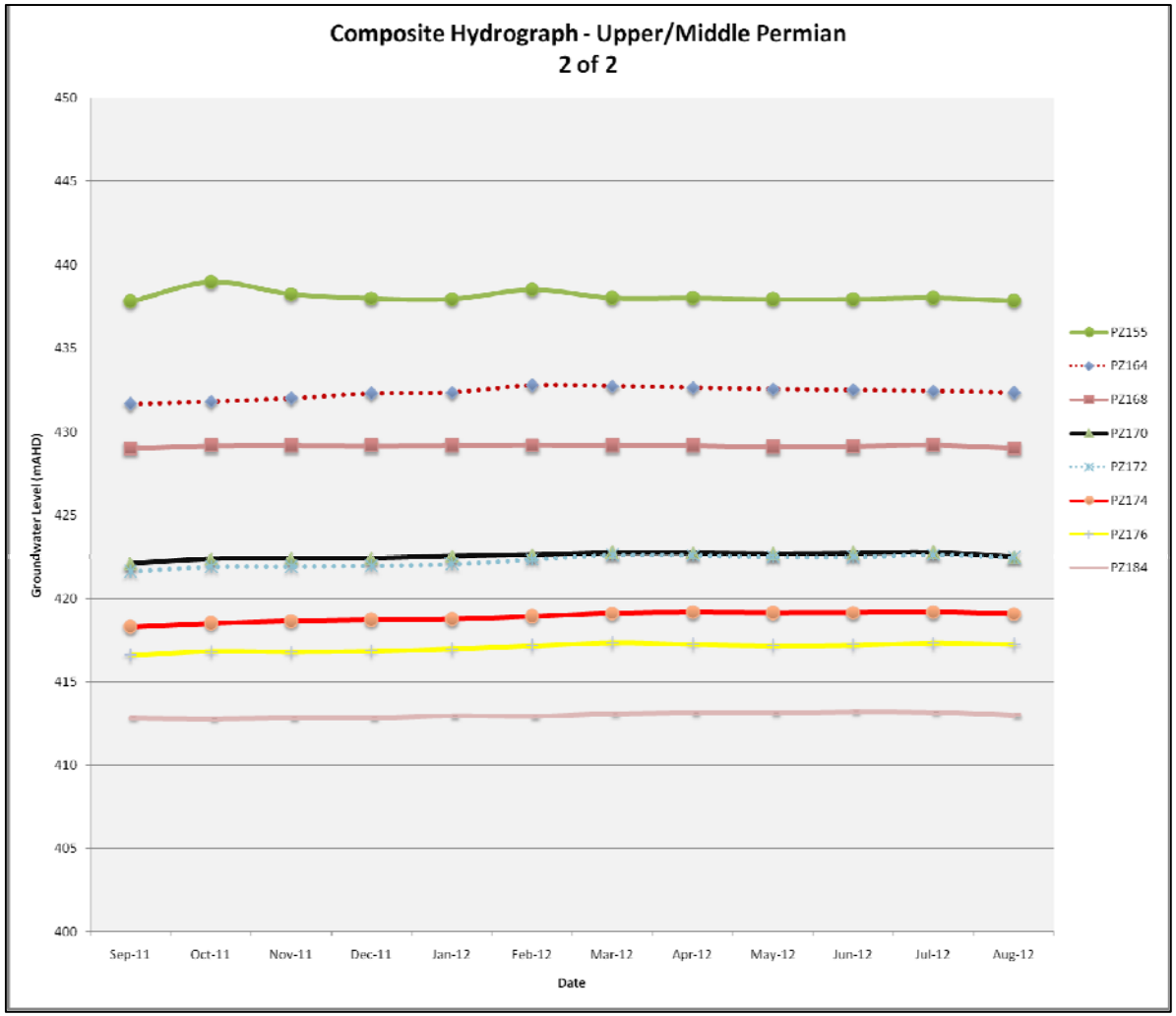


Figure 24: Composite Hydrograph 4

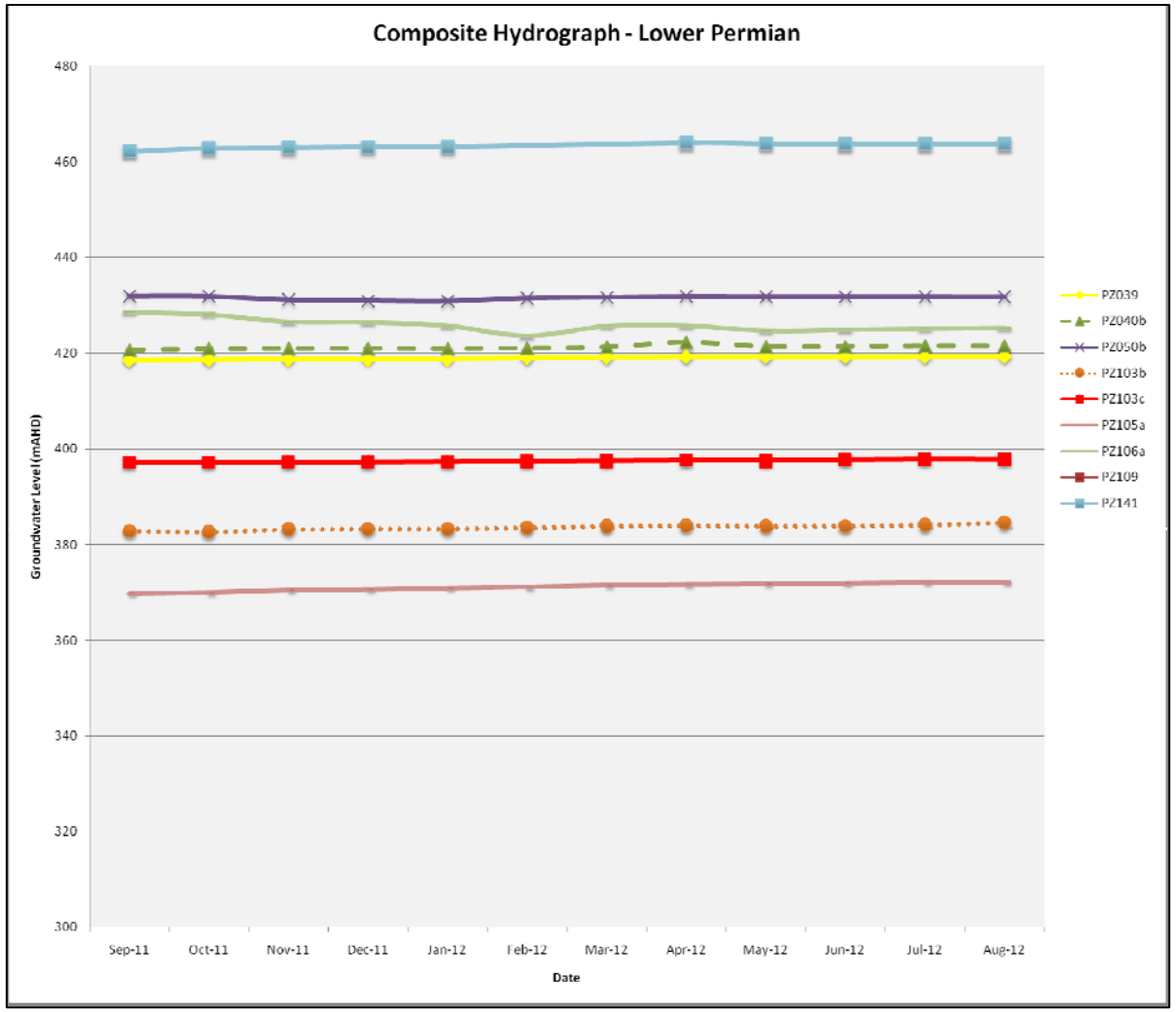


Figure 25: Composite Hydrograph 5

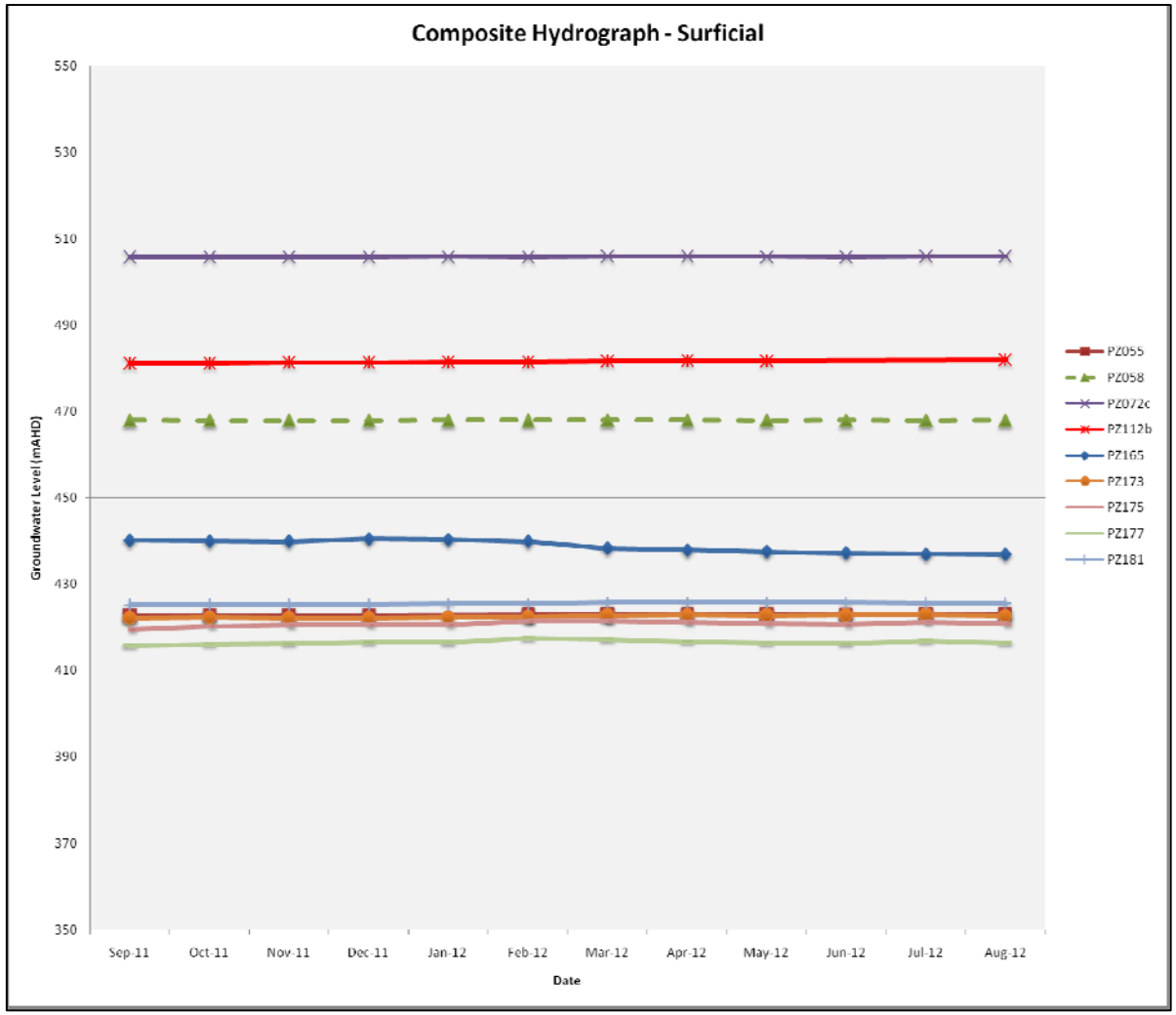


Figure 26: Composite Hydrograph 6

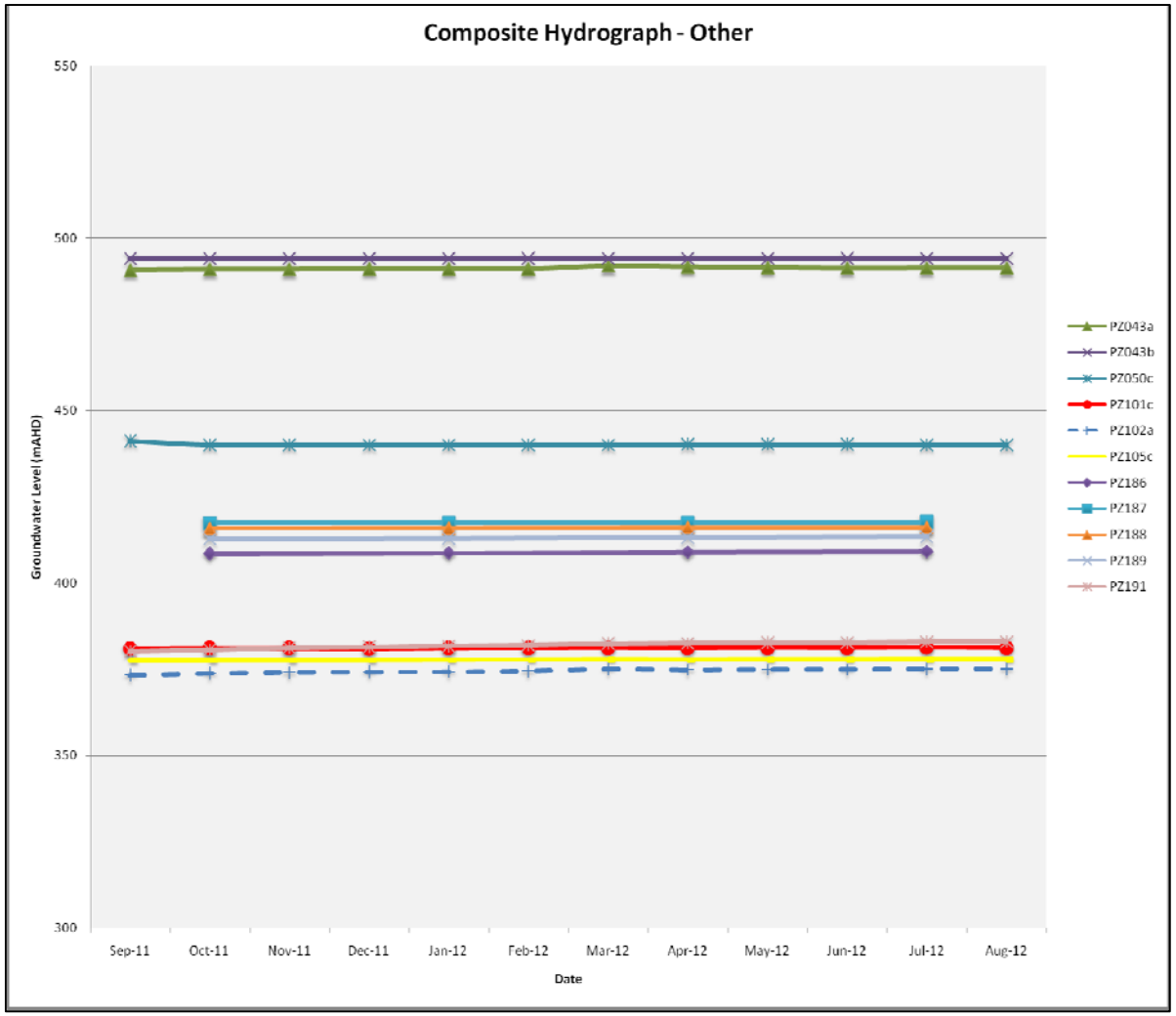


Figure 27: Composite Hydrograph 7

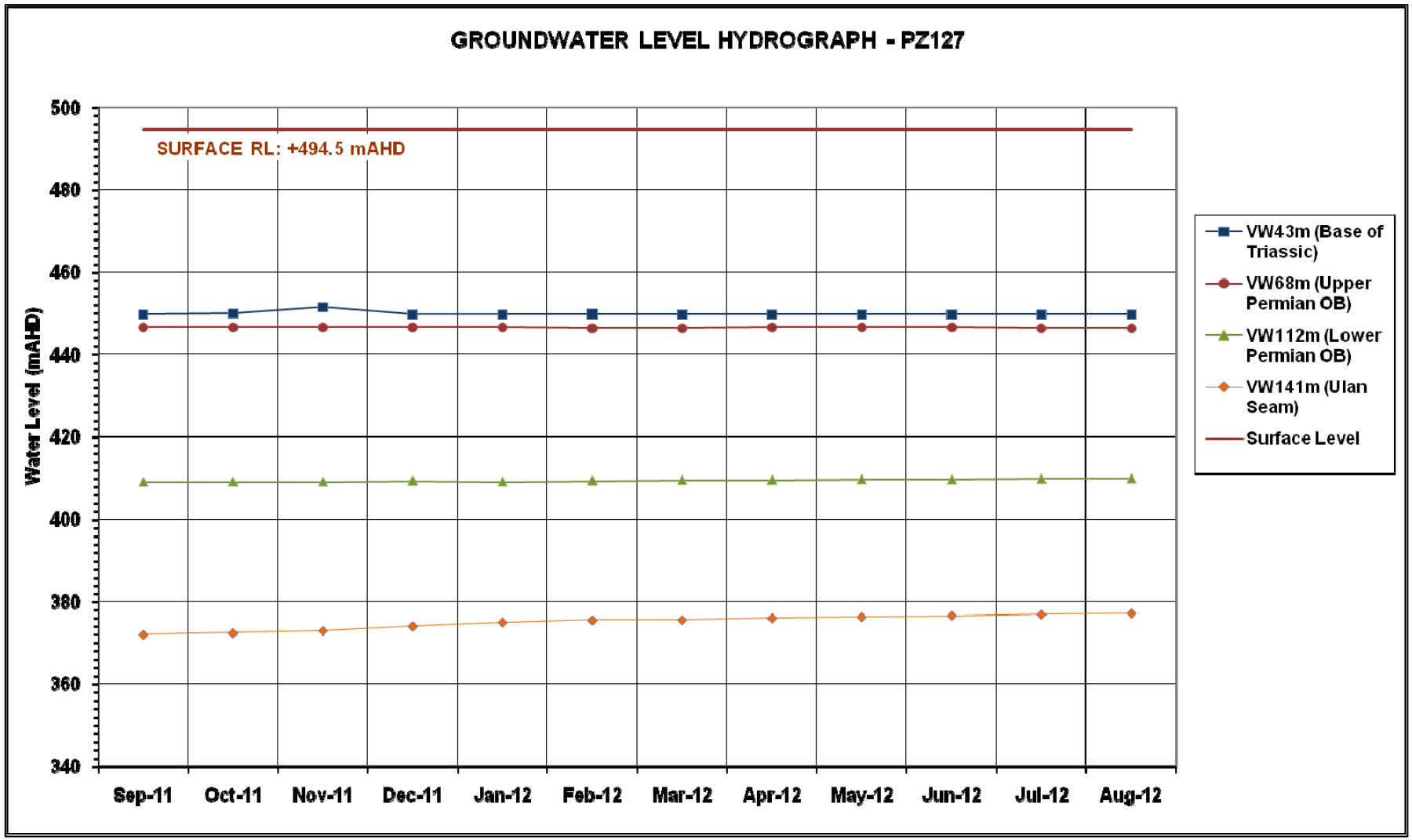


Figure 28: Hydrograph PZ127

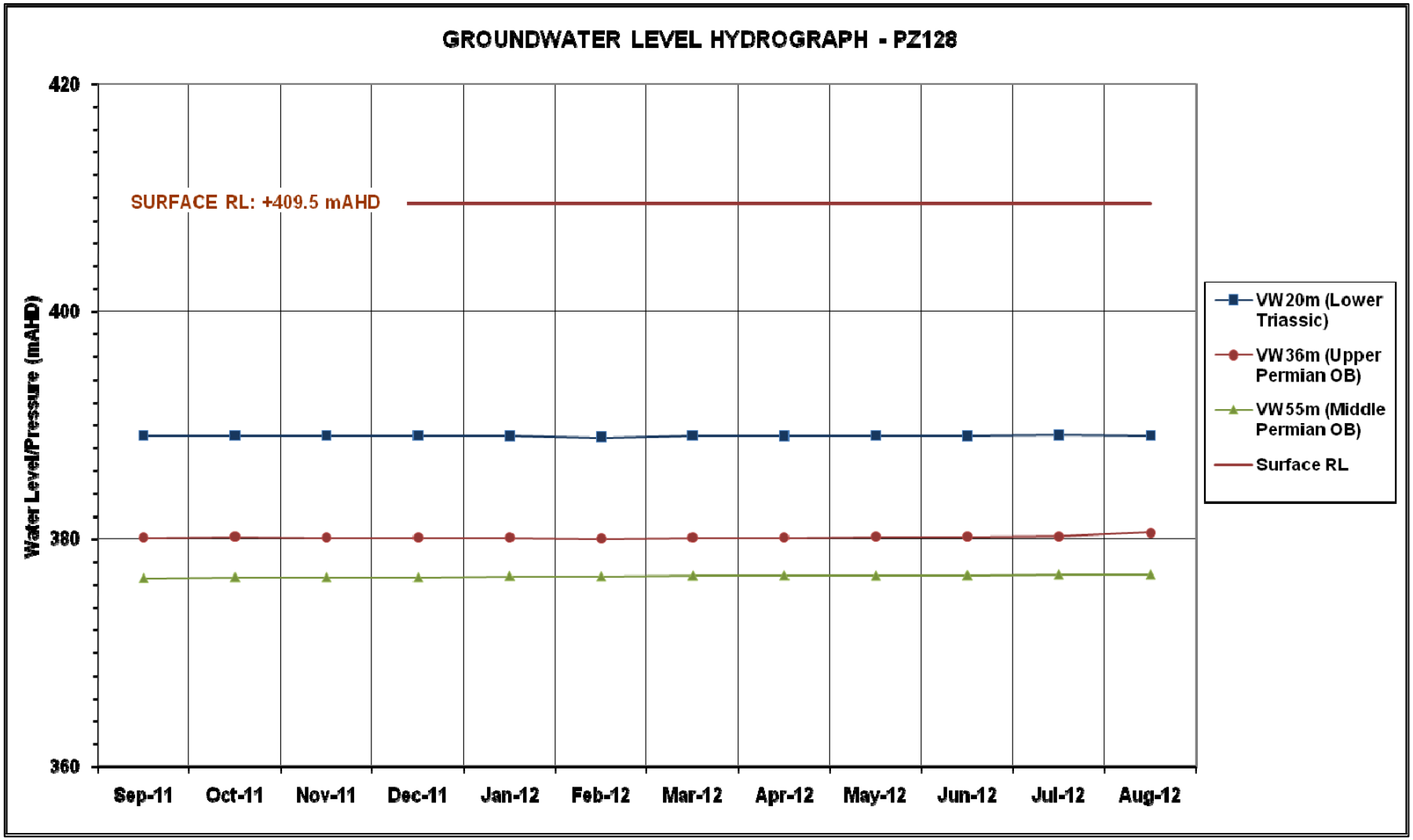


Figure 29: Hydrograph PZ128

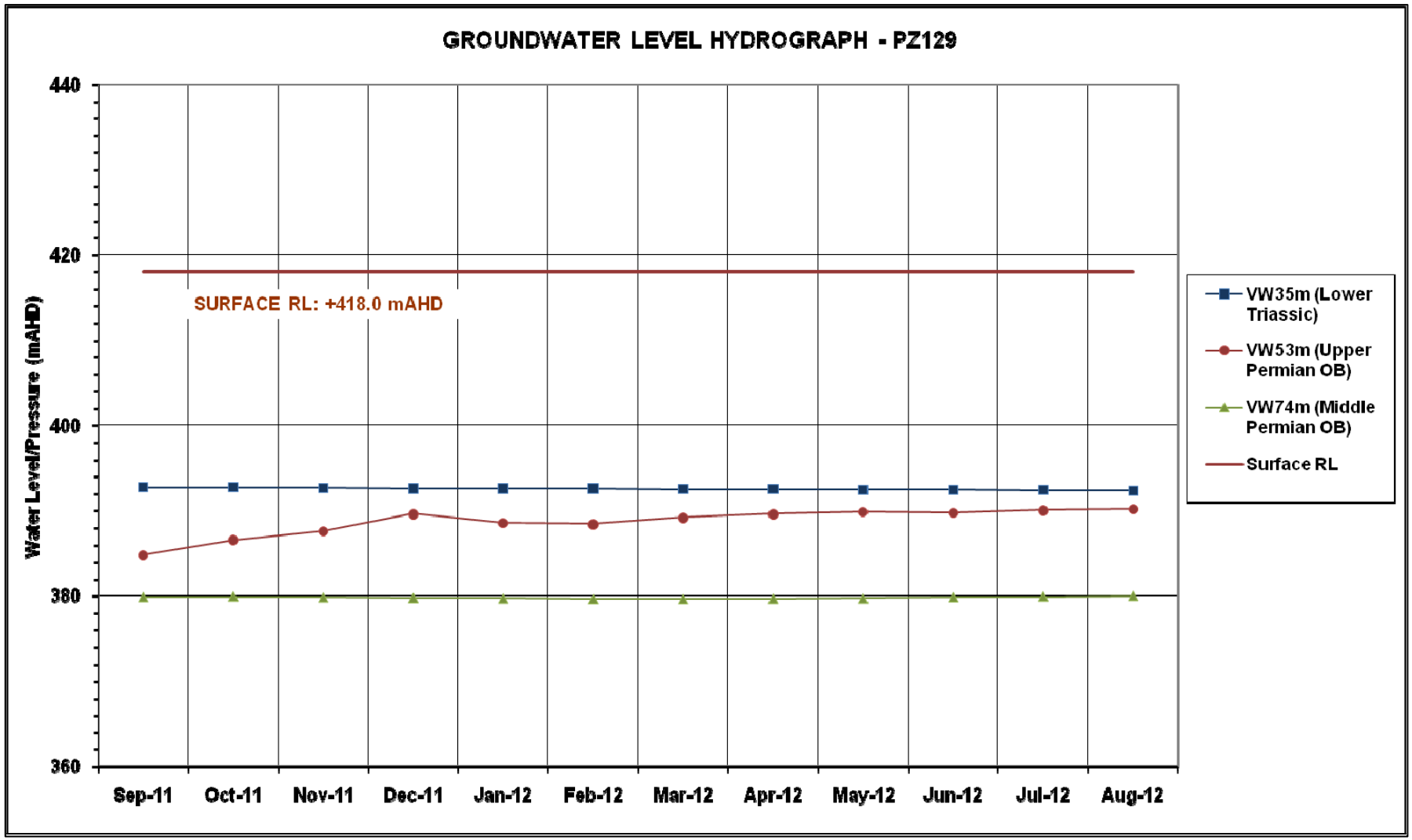


Figure 30: Hydrograph PZ129

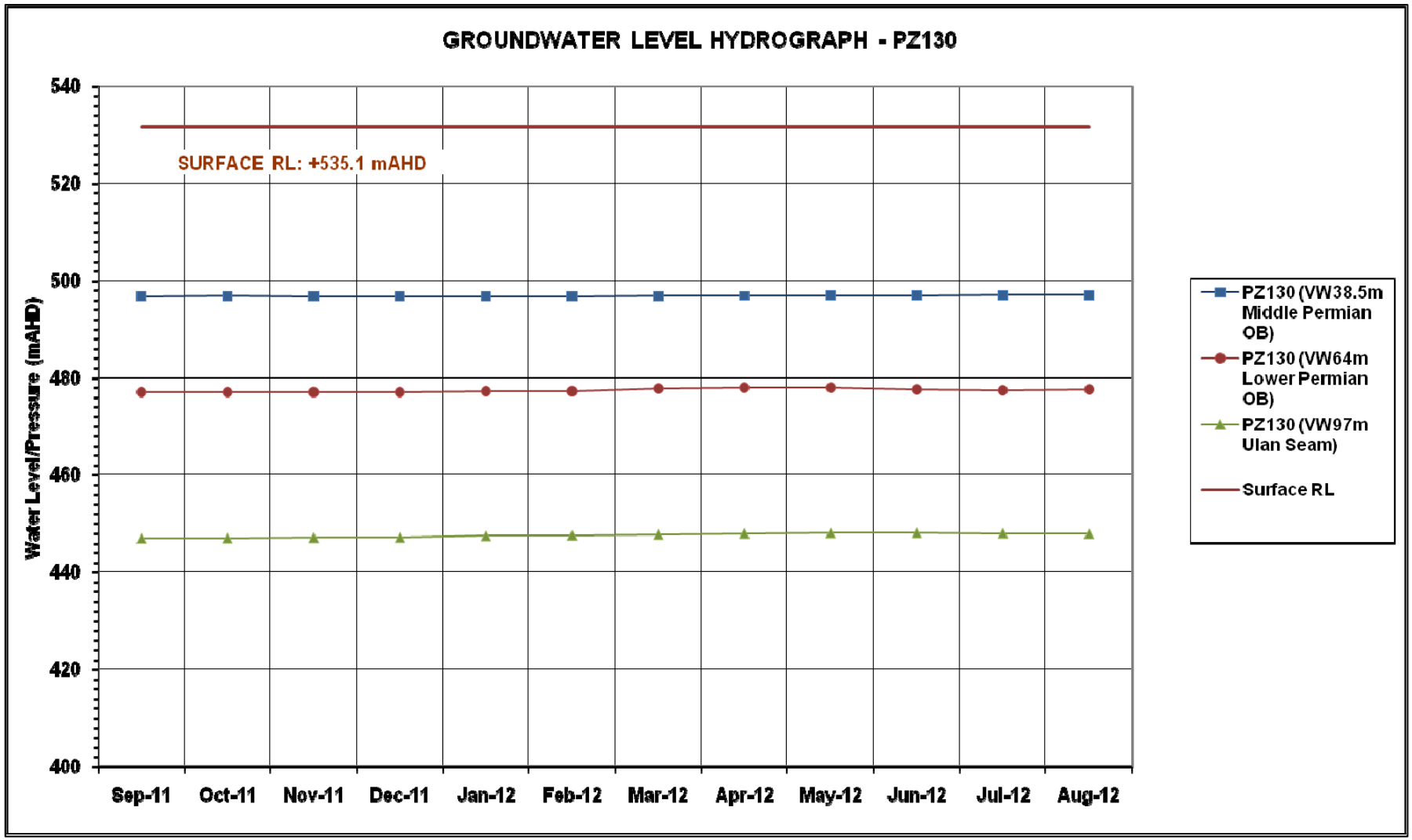


Figure 31: Hydrograph PZ130

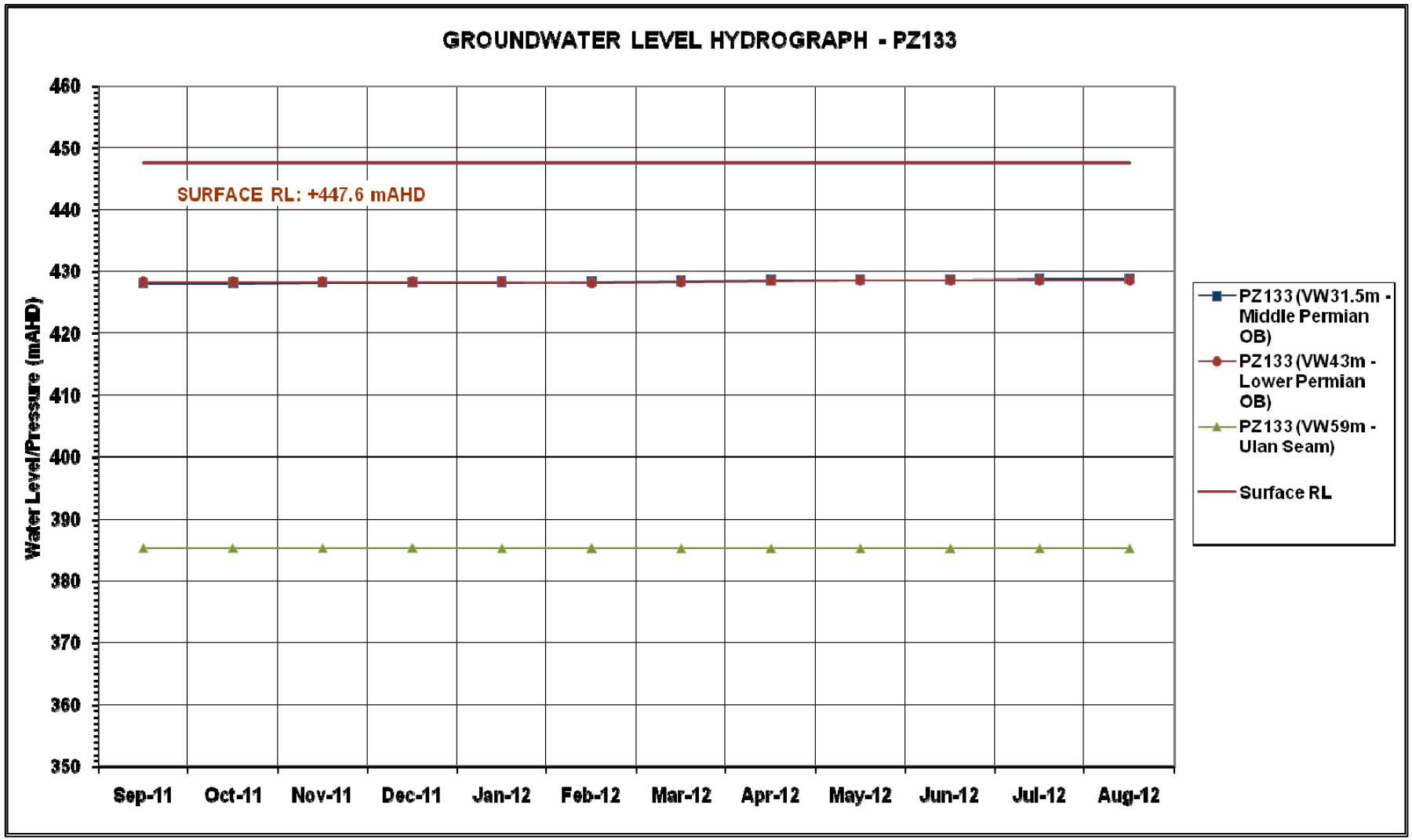


Figure 32: Hydrograph PZ133

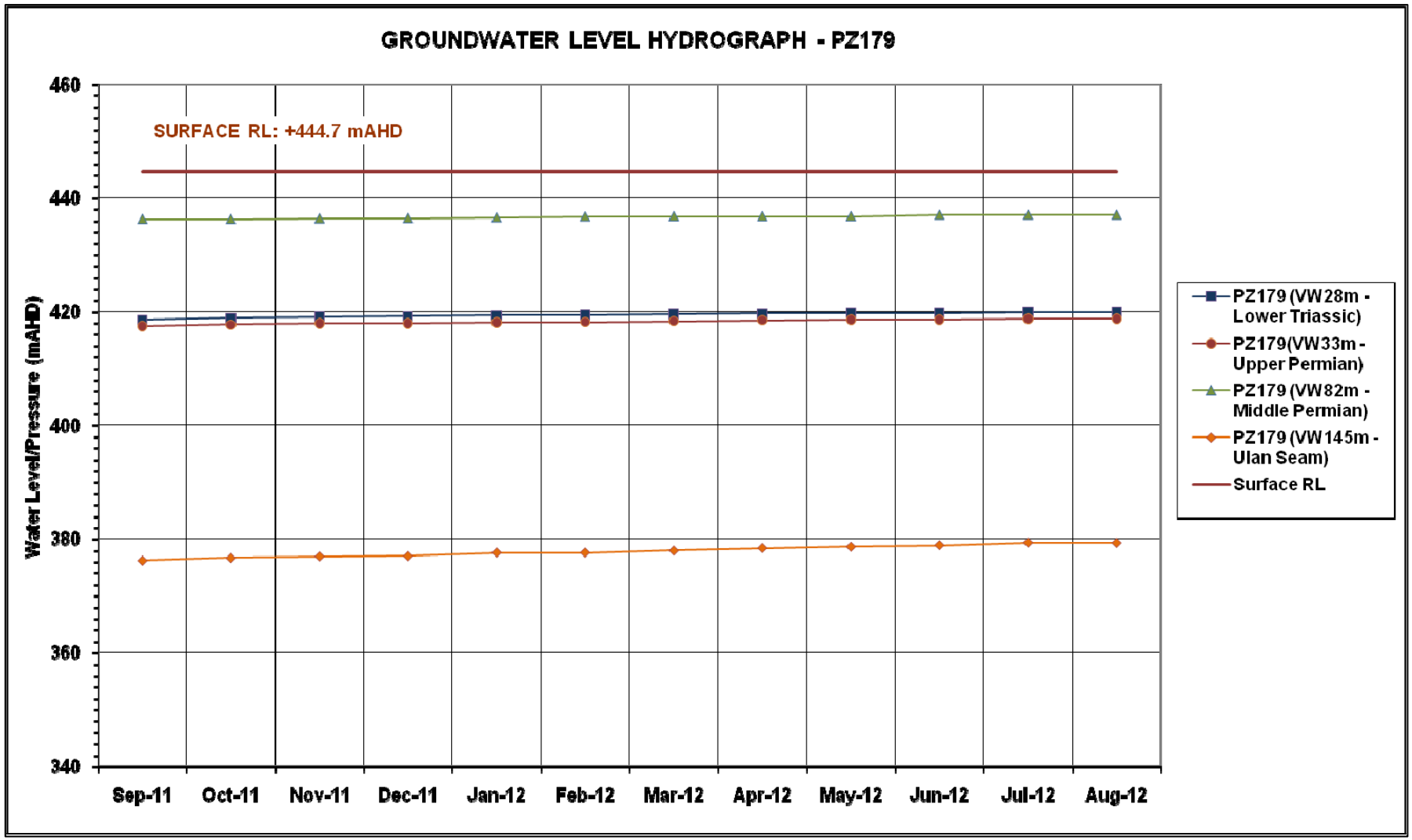


Figure 33: Hydrograph PZ179

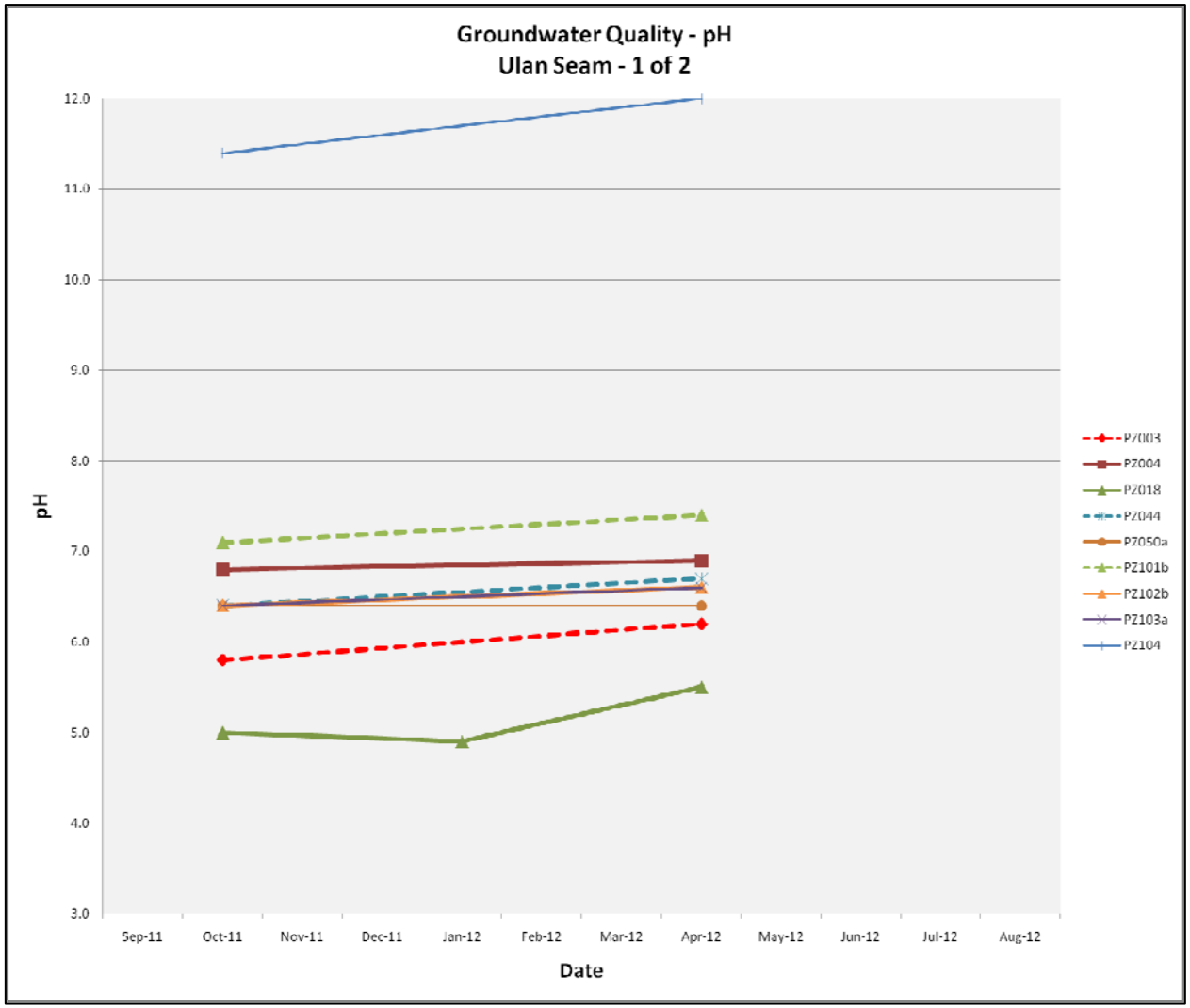


Figure 34: Groundwater pH 1

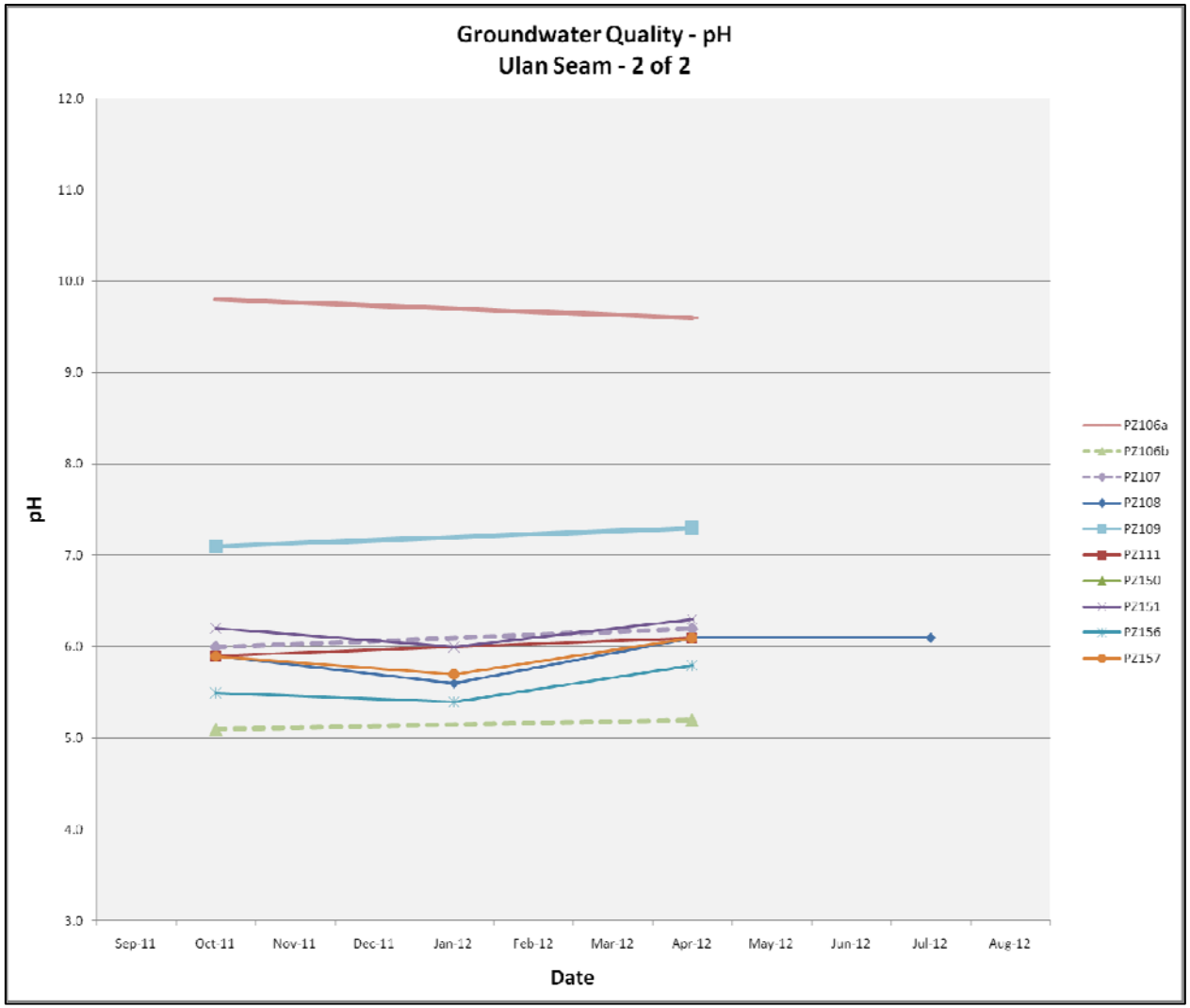


Figure 35: Groundwater pH 2

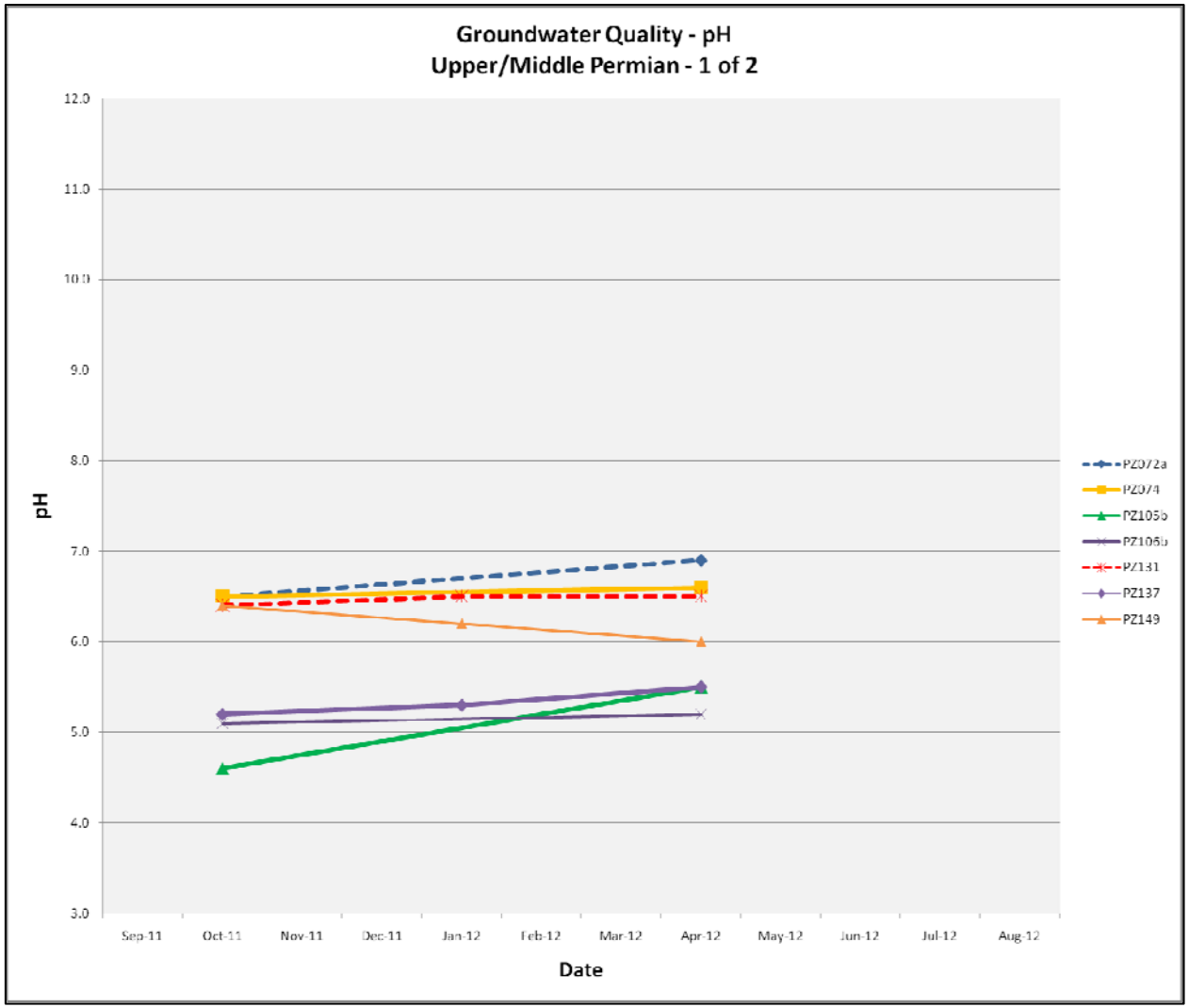


Figure 36: Groundwater pH 3

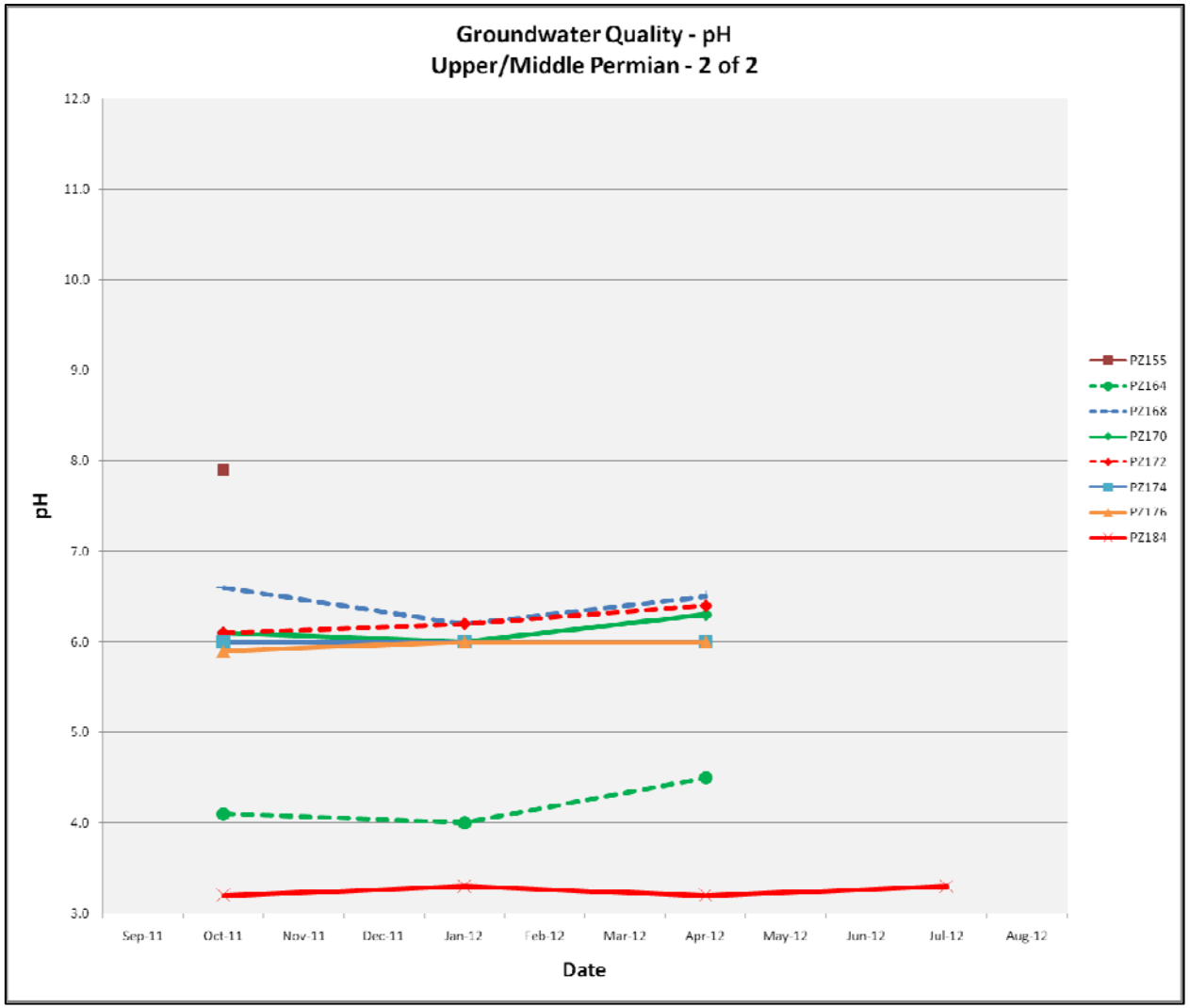


Figure 37: Groundwater pH 4

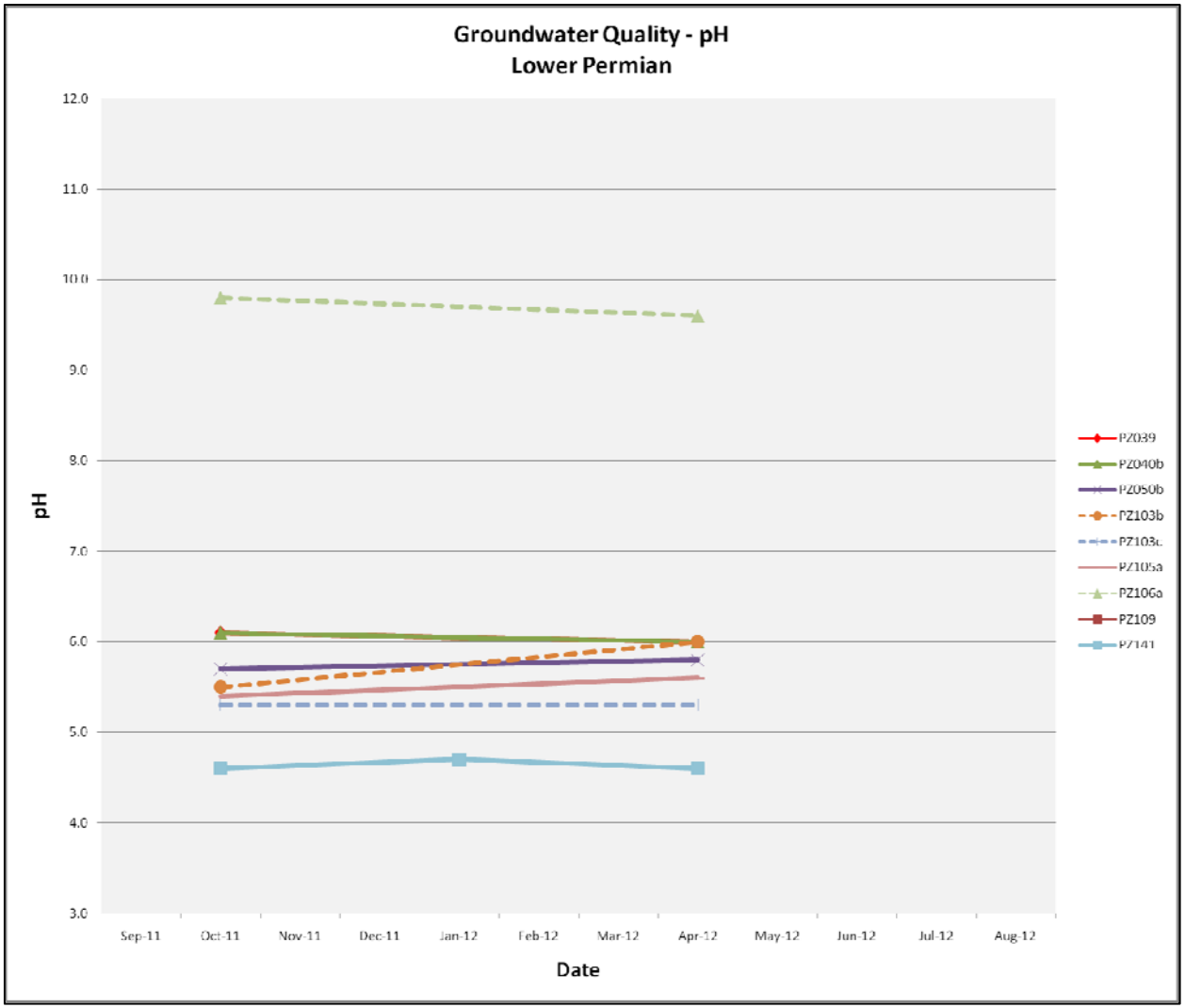


Figure 38: Groundwater pH 5

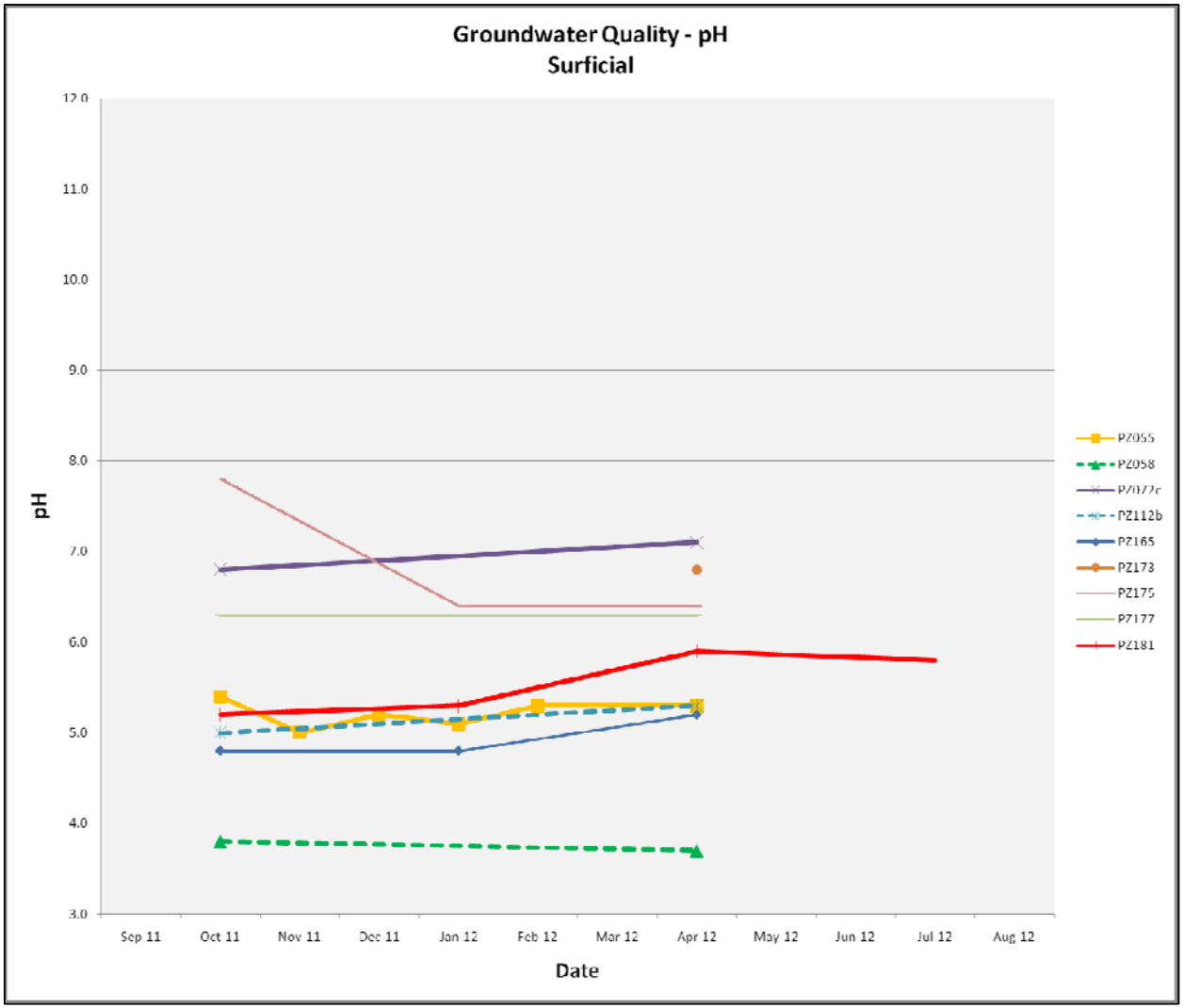


Figure 39: Groundwater pH 6

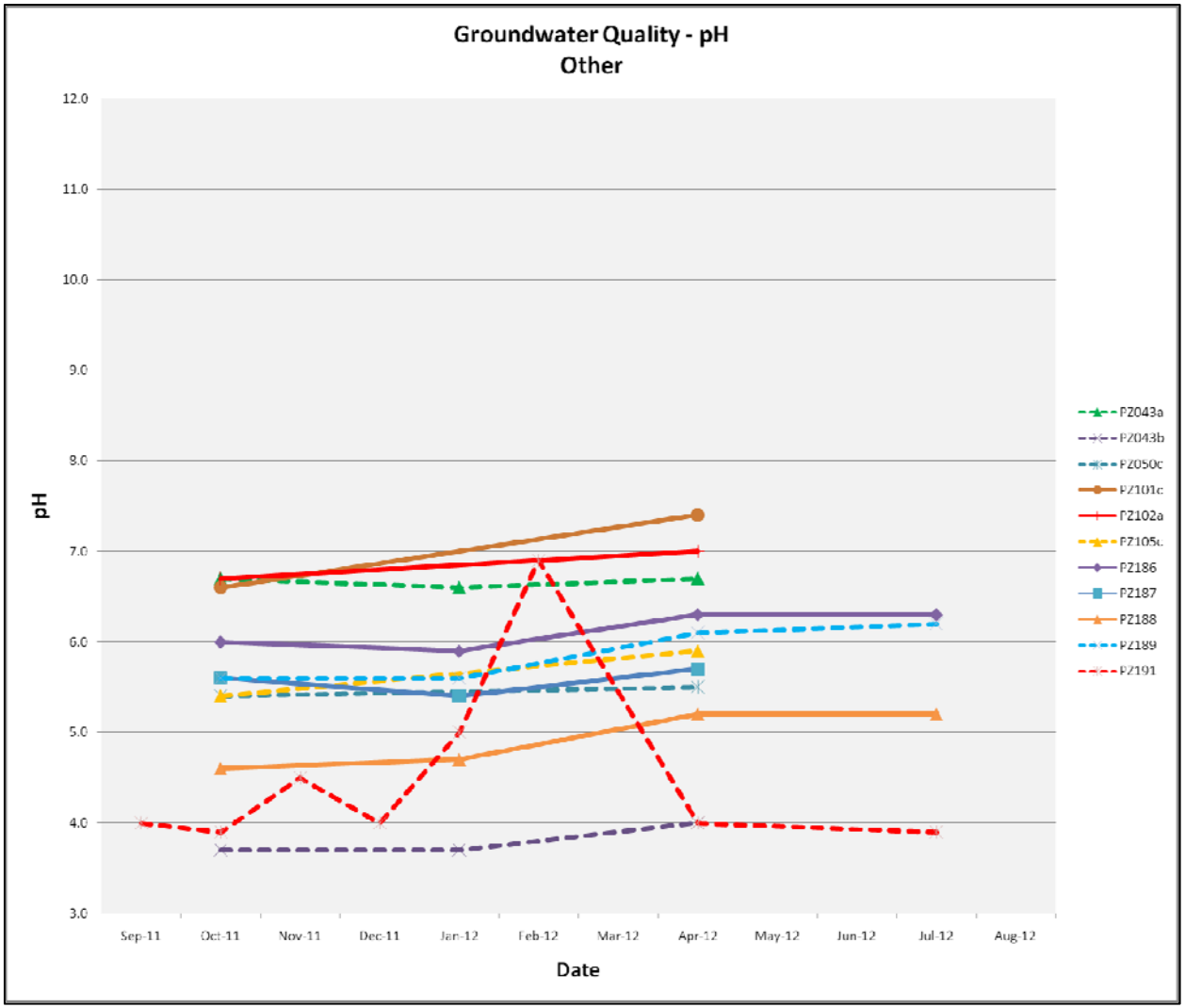


Figure 40: Groundwater pH 7

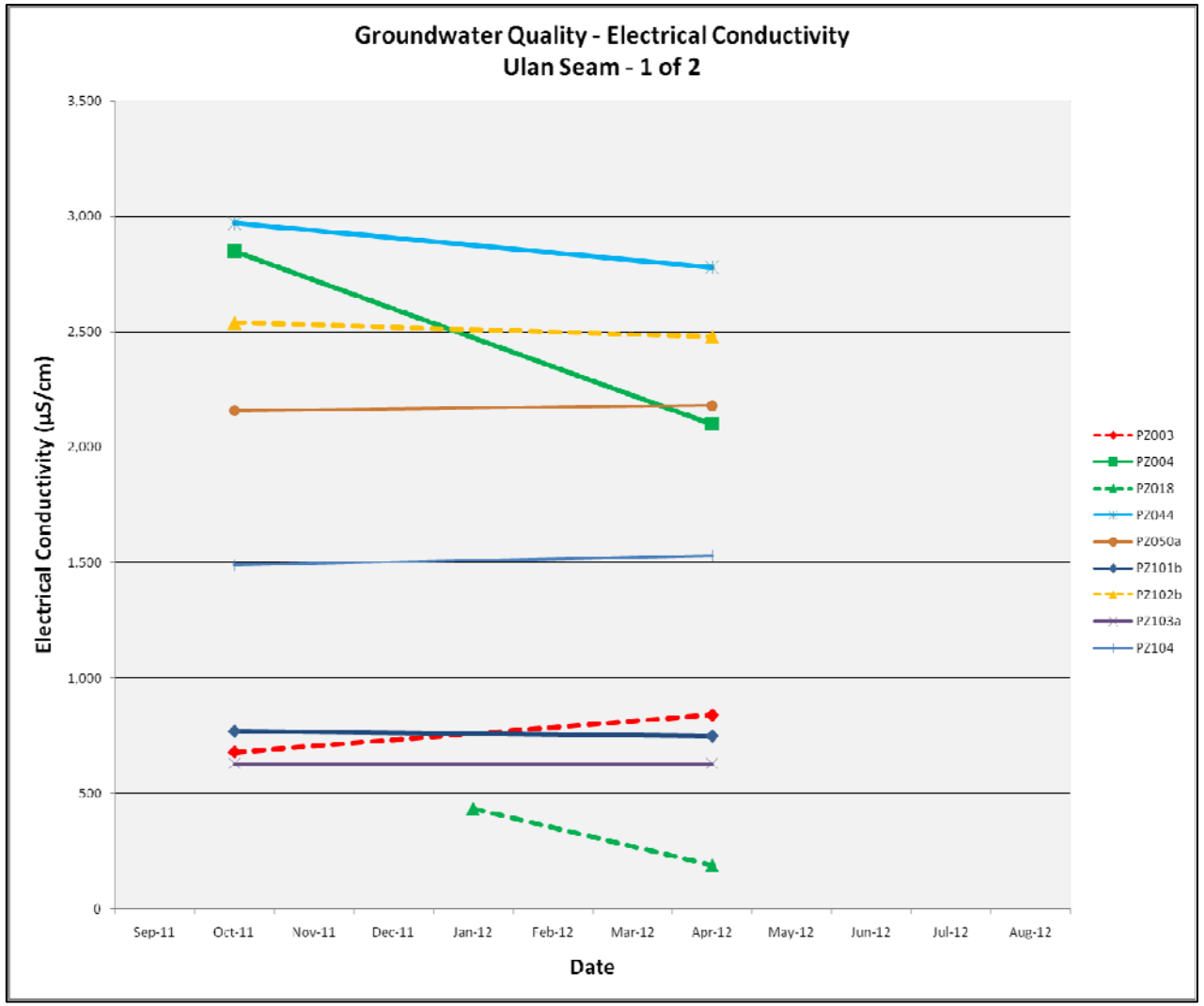


Figure 41: Groundwater Electrical Conductivity 1

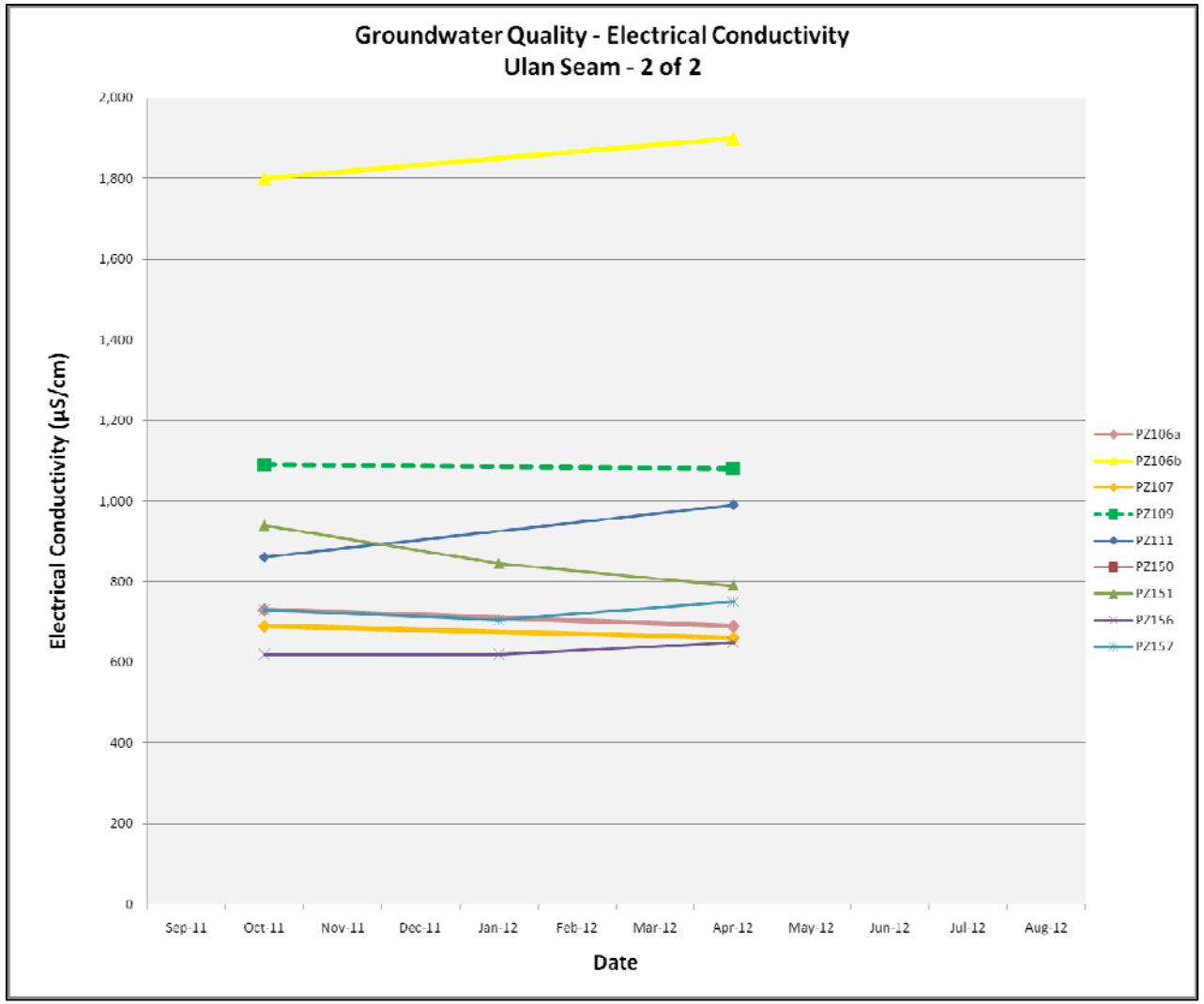


Figure 42: Groundwater Electrical Conductivity 2

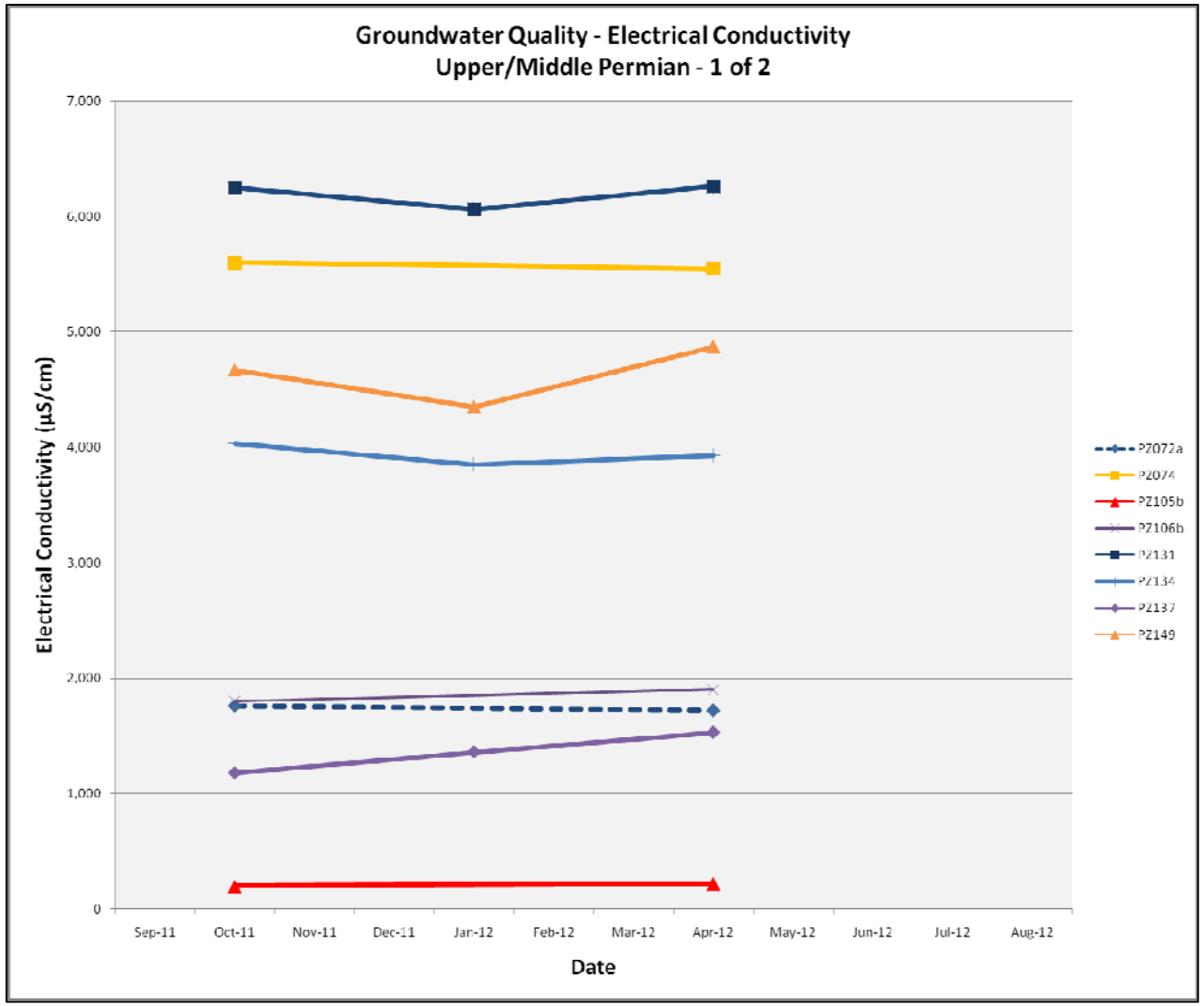


Figure 43: Groundwater Electrical Conductivity 3

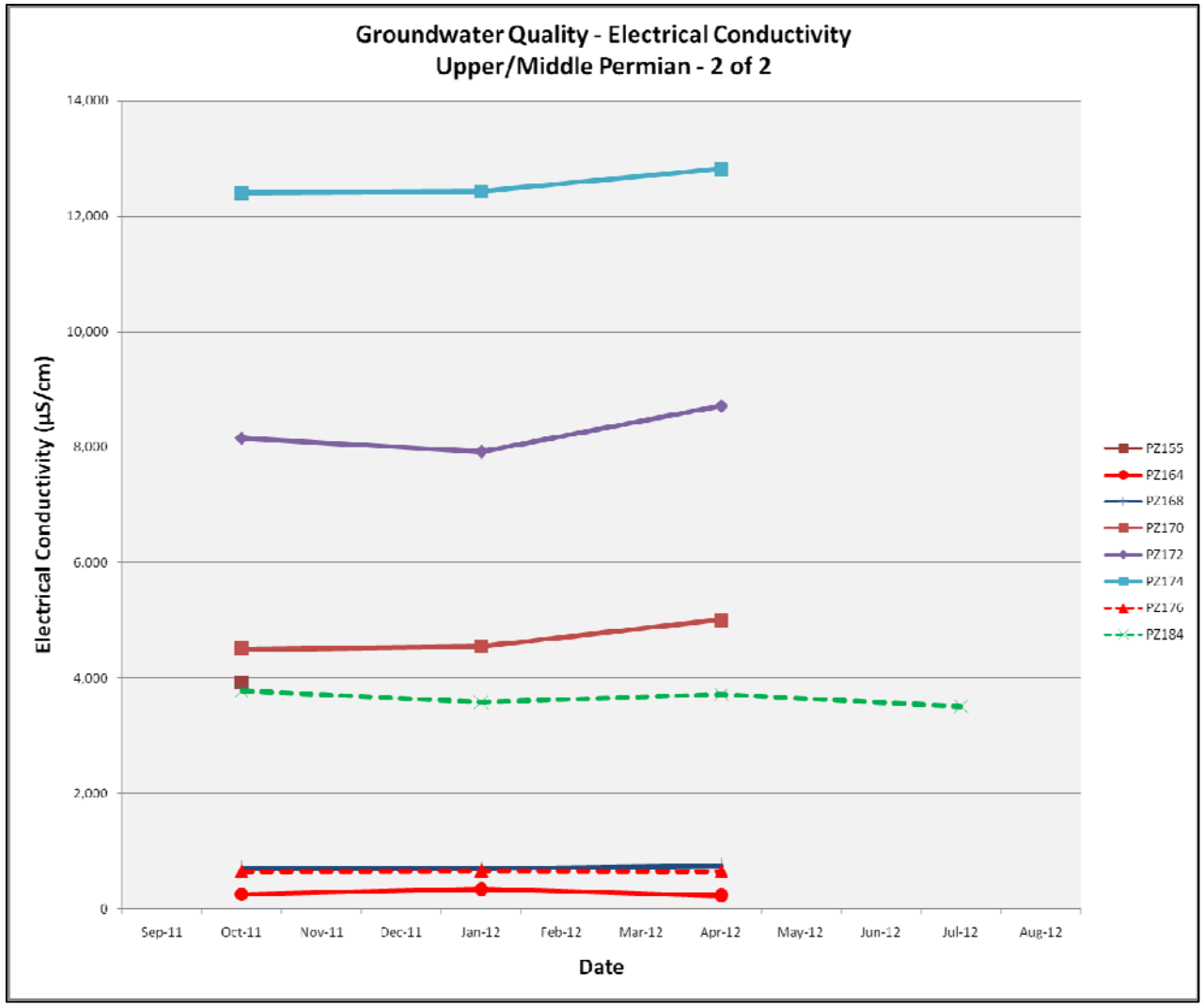


Figure 44: Groundwater Electrical Conductivity 4

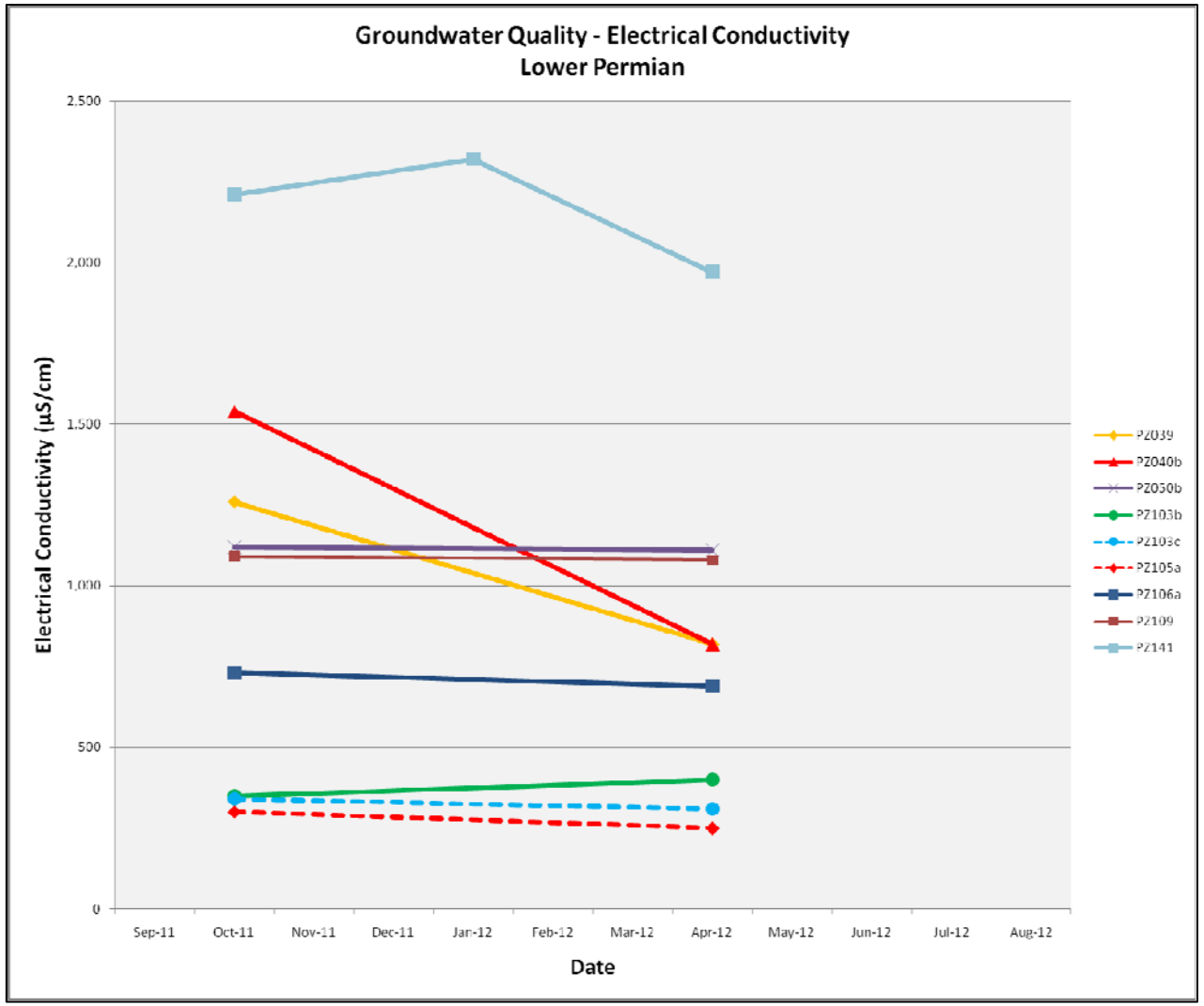


Figure 45: Groundwater Electrical Conductivity 5

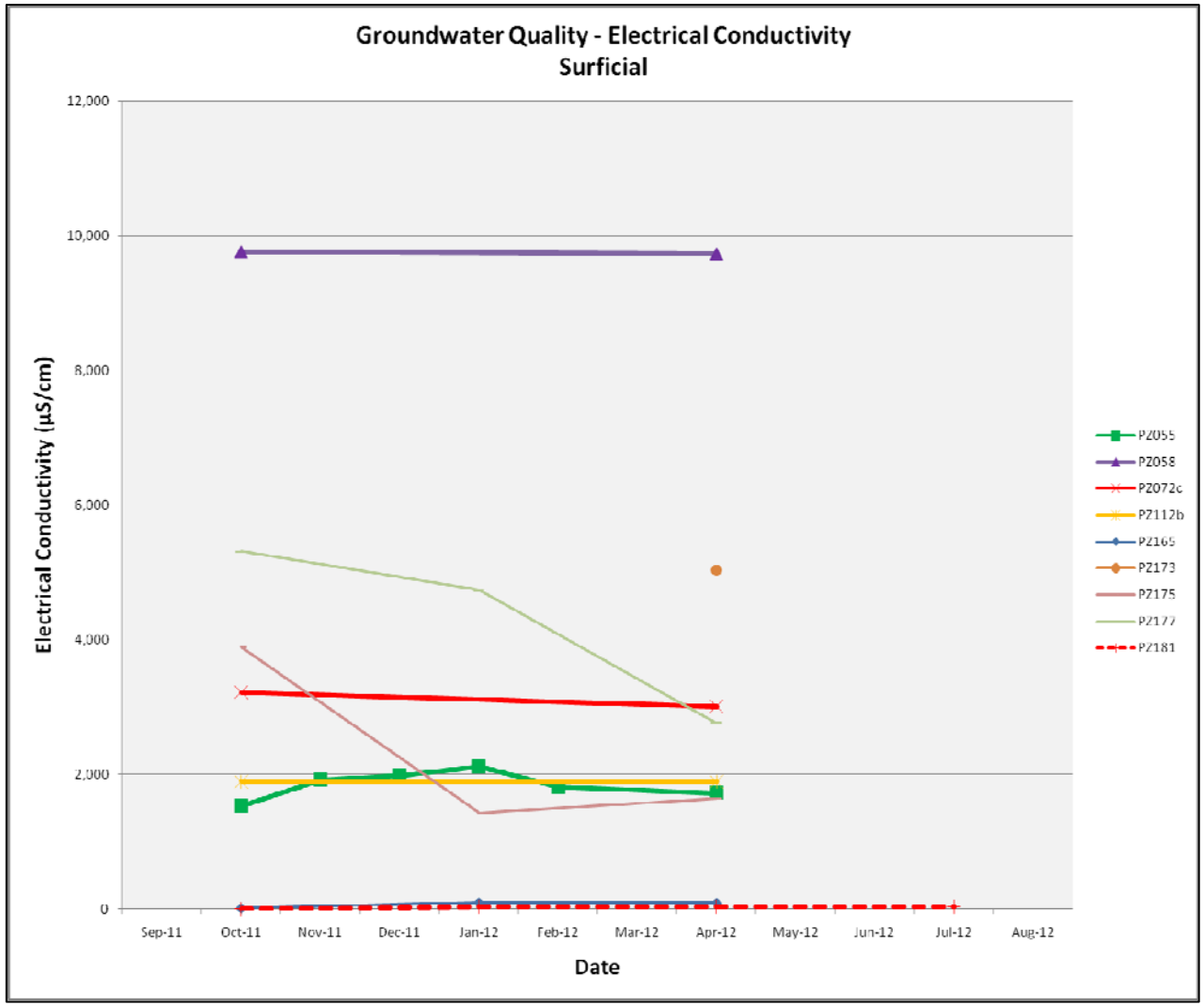


Figure 46: Groundwater Electrical Conductivity 6

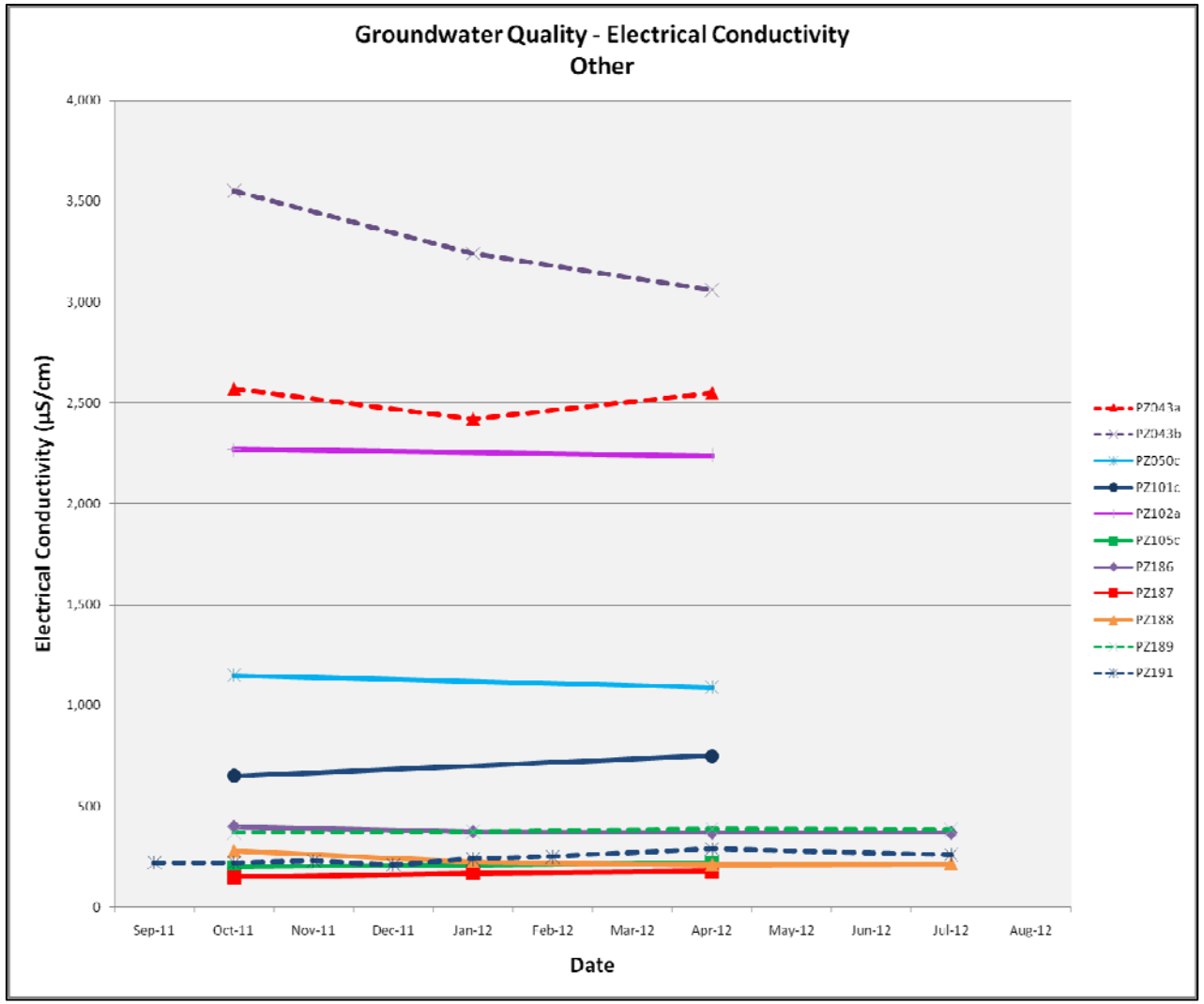


Figure 47: Groundwater Electrical Conductivity 7

3.7.3 Comparison to Previous Ground Water Monitoring and Predicted Levels

Table 37 compares the groundwater level data from this reporting period to background levels and previous monitoring results. **Table 38** and **Table 39** compares the pH and electrical conductivity water quality from this reporting period to background levels and previous monitoring results. The monitoring network was assessed for adequacy during the reporting period with no changes being made to the monitoring network.

There was no modelling conducted in the Environmental Assessment on predicted water quality surrounding the mining operations so a comparison can't be made to predicted water quality.

Based on the monitoring bore hydrographs, groundwater extraction to date would not have impacted the creeks. No bores, springs, groundwater-fed dams or soaks have been identified directly within or close to the Open Cut 1 area, and no impact on any existing user is assessed to have occurred.

Several soaks, springs and dams have been identified in the area south, east and west of pumping bores TB179 and TB052A. Based on there being no impact on groundwater levels in the monitoring bores in the alluvium it is concluded that none of these water sources have been impacted.

Eight registered groundwater bores are located within a 2km radius from the Open Cut 1. No impact from groundwater extraction is assessed to have occurred on existing groundwater users, based on the following:

- Most of the bores are located to the west of the Open Cut 1 in an area that has been previously affected by mining at Ulan open cut; and
- Monitoring bores located closer to Open Cut 1 mine indicate that there are currently no impacts from dewatering on the groundwater levels in either alluvium, Permian or Marrangaroo Formation.

Table 37: Comparison of Groundwater Levels to Background Levels

Site	Background Minimum Level (mAHD)	Previous Results Minimum Level Range (mAHD)	2011-2012 Minimum Level (mAHD)	Comment on 2011-2012 Data
OB001	N/A as the site is flowing	N/A as the site is flowing	N/A as the site is flowing	Consistent with previous monitoring
OB002	495.06	N/A as the site is flowing	N/A as the site is flowing	Consistent with previous monitoring
OB003	471.57	471.74 – 472.40	472.47	Consistent with previous monitoring
OB004	N/A as the site is flowing	N/A as the site is flowing	N/A as the site is flowing	Consistent with previous monitoring
PZ003	470.43	470.12 – 470.96	471.06	Consistent with previous monitoring
PZ004	489.09	488.10 – 492.38	491.96	Consistent with previous monitoring
PZ018	451.46	452.79 – 453.35	453.55	Generally consistent with previous monitoring
PZ039	417.23	417.41 – 418.34	418.54	Generally consistent with previous monitoring
PZ040B	419.44	419.23 – 420.51	420.73	Consistent with previous monitoring

Site	Background Minimum Level (mAHD)	Previous Results Minimum Level Range (mAHD)	2011-2012 Minimum Level (mAHD)	Comment on 2011-2012 Data
PZ043A	489.32	489.68 – 490.05	490.79	Consistent with previous monitoring
PZ043B	493.90	493.97 – 494.00	494.10	Consistent with previous monitoring
PZ044	478.70	479.38 – 480.45	480.29	Consistent with previous monitoring
PZ050A	383.55	384.42 – 384.80	384.55	Consistent with previous monitoring
PZ050B	431.71	431.70 – 432.32	430.89	As this site is located in the Murragamba Valley and mining hasn't commenced in Murragamba Valley this result is most likely not attributable to MCO and is most likely due to natural variation
PZ050C	439.37	439.68 – 439.97	440.07	Consistent with previous monitoring
PZ055	421.83	421.88 – 422.39	422.76	Consistent with previous monitoring
PZ058	467.54	467.49 – 467.64	467.86	Consistent with previous monitoring
PZ072A	494.85	496.88 – 497.57	497.97	Consistent with previous monitoring
PZ072C	503.27	503.70 – 504.19	505.79	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ074	501.37	501.38 – 501.42	501.39	Consistent with previous monitoring
PZ101B	363.48	367.84 – 371.17	373.75	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ101C	380.75	380.83 – 380.88	381.07	Consistent with previous monitoring
PZ102A	355.63	369.37 – 370.64	373.19	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ102B	354.77	369.41 – 370.66	373.22	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
TB103	367.72	375.18 – 377.39	378.35	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ103A	355.99	368.65 – 369.92	371.90	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ103B	366.97	383.27 – 390.85	382.72	Consistent with previous monitoring

Site	Background Minimum Level (mAHD)	Previous Results Minimum Level Range (mAHD)	2011-2012 Minimum Level (mAHD)	Comment on 2011-2012 Data
PZ103C	398.03	397.24 – 398.25	397.27	Consistent with previous monitoring
PZ104	381.89	380.17 – 382.55	381.96	Consistent with previous monitoring
TB105	359.19	365.01 – 367.28	369.69	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ105A	359.21	364.98 – 367.29	369.83	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ105B	375.05	376.29 – 376.65	376.87	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ105C	377.26	377.23 – 377.52	377.51	Consistent with previous monitoring
PZ106A	424.82	429.91 – 435.90	423.61	As this site is located in the Murragamba Valley and mining hasn't commenced in Murragamba Valley this result is most likely not attributable to MCO and is most likely due to natural variation
PZ106B	502.04	501.61 – 501.87	502.14	Consistent with previous monitoring
PZ107	432.51	432.40 – 432.52	432.80	Consistent with previous monitoring
PZ108	332.84	400.89 – 401.34	400.65	Consistent with previous monitoring
PZ109	383.02	382.88 – 382.98	382.75	Consistent with previous monitoring
PZ111	379.90	380.18 – 380.74	380.65	Consistent with previous monitoring
PZ112B	479.16	479.23 – 479.99	481.18	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ127 – 43m	450.28	449.82 – 450.11	449.76	Consistent with previous monitoring
PZ127 – 68m	446.62	446.21 – 446.27	446.38	Consistent with previous monitoring
PZ127 – 112m	393.23	406.33 – 407.73	409.05	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ127 – 141m	362.30	369.54 – 372.83	371.94	Consistent with previous monitoring
PZ128 – 20m	388.41	388.86 – 389.03	388.94	Consistent with previous monitoring
PZ128 – 36m	380.45	380.10 – 380.40	380.00	Consistent with previous monitoring

Site	Background Minimum Level (mAHD)	Previous Results Minimum Level Range (mAHD)	2011-2012 Minimum Level (mAHD)	Comment on 2011-2012 Data
PZ128 – 55m	375.90	376.16 – 376.33	376.53	Consistent with previous monitoring
PZ129 – 35m	382.72	388.68 – 392.60	392.33	Consistent with previous monitoring
PZ129 – 53m	376.77	380.68 – 385.80	384.82	Consistent with previous monitoring
PZ129 – 74m	379.66	379.40 – 379.62	379.60	Consistent with previous monitoring
PZ130 – 38.5m	494.82	494.65 – 494.84	496.71	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ130 – 64m	470.78	476.51 – 476.98	476.98	Consistent with previous monitoring
PZ130 – 97m	448.51	447.00 – 448.73	446.91	Generally consistent with previous monitoring
PZ131	433.39	433.53 – 433.61	432.00	As this site is located in the Murragamba Valley and mining hasn't commenced in Murragamba Valley this result is most likely not attributable to MCO and is most likely due to natural variation
PZ133 – 31.5m	419.96	427.42 – 427.89	428.06	Consistent with previous monitoring
PZ133 – 43m	419.75	427.54 – 428.03	428.12	Consistent with previous monitoring
PZ133 – 59m	387.98	385.29 – 387.10	385.16	As this site is located in the Murragamba Valley and mining hasn't commenced in Murragamba Valley this result is most likely not attributable to MCO and is most likely due to natural variation
PZ134	431.06	430.95 – 431.51	432.27	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ137	460.92	460.81 – 461.39	461.46	Consistent with previous monitoring
PZ141	461.62	461.46 – 462.27	462.20	Consistent with previous monitoring
PZ149	467.20	466.84 – 467.48	467.53	Consistent with previous monitoring
PZ150	377.09	377.43 – 379.16	379.94	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ151	374.51	375.44 – 377.79	379.48	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ152	441.22	442.00 – 442.31	442.33	Consistent with previous monitoring

Site	Background Minimum Level (mAHD)	Previous Results Minimum Level Range (mAHD)	2011-2012 Minimum Level (mAHD)	Comment on 2011-2012 Data
PZ155	437.98	437.81 – 437.92	437.82	Consistent with previous monitoring
PZ156	372.28	375.81 – 377.56	379.40	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ157	373.15	376.51 – 378.13	379.83	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ164	431.49	431.51 – 431.70	431.68	Consistent with previous monitoring
PZ165	436.58	436.52 – 436.83	436.83	Consistent with previous monitoring
PZ168	427.80	428.04 – 428.66	429.02	Generally consistent with previous monitoring
PZ170	420.93	421.09 – 421.27	422.11	Generally consistent with previous monitoring
PZ172	421.23	420.72 – 421.08	421.64	Generally consistent with previous monitoring
PZ173	421.62	421.09 – 421.60	422.18	Generally consistent with previous monitoring
PZ174	418.07	417.38 – 418.28	418.31	Consistent with previous monitoring
PZ175	419.76	418.73 – 419.70	419.48	Consistent with previous monitoring
PZ176	416.47	416.08 – 416.62	416.61	Consistent with previous monitoring
PZ177	415.87	415.66 – 415.91	415.80	Consistent with previous monitoring
PZ179 – 28m	418.77	416.72 – 418.12	418.52	Consistent with previous monitoring
PZ179 – 33m	417.67	412.48 – 413.15	417.45	Consistent with previous monitoring
PZ179 – 82m	415.63	435.42 – 436.62	436.28	Consistent with previous monitoring
PZ179 – 145m	373.38	373.81 – 374.25	376.17	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ181	424.76	410.16 – 424.66	425.15	Generally consistent with previous monitoring
PZ184	412.38	412.05 – 412.30	412.79	Generally consistent with previous monitoring
PZ186	No background data	401.75 – 404.60	408.46	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain
PZ187	No background data	416.45 – 416.85	417.40	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain

Site	Background Minimum Level (mAHD)	Previous Results Minimum Level Range (mAHD)	2011-2012 Minimum Level (mAHD)	Comment on 2011-2012 Data
PZ188	No background data	415.22 – 415.56	415.81	Generally consistent with previous monitoring
PZ189	No background data	409.27 – 411.29	412.85	Generally consistent with previous monitoring
PZ191	No background data	376.43 – 377.18	380.28	The water level has remained recharged following the rainfall event in late 2010 and subsequent follow up rain

Table 38: Comparison of Groundwater pH to Background pH

Site	Background Range	Previous Results Data Range	2011-2012 Data Range	Comment on 2011-2012 Data
OB001	4.7 – 7.6	3.7 – 5.3	4.8 – 5.3	Consistent with previous monitoring
OB002	5.5 – 7.9	6.1 – 7.2	6.6 – 7.6	Consistent with previous monitoring
OB003	5.7 – 7.7	6.0 – 6.6	6.5 – 6.7	Consistent with previous monitoring
OB004	3.1 – 4.8	3.4 – 5.8	3.7 – 3.9	Consistent with previous monitoring
PZ003	5.7 – 7.2	5.8 – 6.7	5.8 – 6.2	Consistent with previous monitoring
PZ004	6.0 – 8.0	6.5 – 7.2	6.8 – 6.9	Consistent with previous monitoring
PZ018	3.9 – 6.9	4.1 – 5.8	4.9 – 5.5	Consistent with previous monitoring
PZ039	5.5 – 7.3	5.4 – 7.0	6.0 – 6.1	Consistent with previous monitoring
PZ040B	5.5 – 7.1	3.8 – 6.3	6.0 – 6.1	Consistent with previous monitoring
PZ043A	5.8 – 7.2	6.2 – 6.9	6.6 – 6.7	Consistent with previous monitoring
PZ043B	3.4 – 5.4	3.4 – 3.9	3.7 – 4.0	Consistent with previous monitoring
PZ044	5.6 – 7.5	6.0 – 6.8	6.4 – 6.7	Consistent with previous monitoring
PZ050A	This site has had depth only readings between April 2007 and April 2010	6.5 – 6.6	6.4 – 6.4	Consistent with previous monitoring
PZ050B	5.5 – 7.5	5.2 – 6.1	5.7 – 5.8	Consistent with previous monitoring
PZ050C	5.5 – 12.5	5.3 – 6.5	5.4 – 5.5	Consistent with previous monitoring
PZ055	5.2 – 7.1	4.8 – 5.6	5.0 – 5.4	Consistent with previous monitoring

Site	Background Range	Previous Results Data Range	2011-2012 Data Range	Comment on 2011-2012 Data
PZ058	2.5 – 4.9	3.2 – 3.7	3.7 – 3.8	Consistent with previous monitoring
PZ072A	6.2 – 7.9	6.2 – 7.0	6.5 – 6.9	Consistent with previous monitoring
PZ072C	6.2 – 7.9	6.5 – 7.2	6.8 – 7.1	Consistent with previous monitoring
PZ074	5.7 – 7.6	6.2 – 6.8	6.5 – 6.6	Consistent with previous monitoring
PZ101B	6.0 – 8.0	6.5 – 7.3	7.1 – 7.4	Consistent with previous monitoring
PZ101C	5.9 – 11.9	6.2 – 7.0	6.6 – 7.4	Consistent with previous monitoring
PZ102A	6.1 – 8.3	5.8 – 6.9	6.7 – 7.0	Consistent with previous monitoring
PZ102B	5.9 – 7.9	6.0 – 6.9	6.4 – 6.6	Consistent with previous monitoring
TB103	5.7 – 7.3	6.0 – 6.7	6.5 – 6.7	Consistent with previous monitoring
PZ103A	5.4 – 8.1	6.1 – 6.7	6.4 – 6.6	Consistent with previous monitoring
PZ103B	5.1 – 9.5	5.1 – 6.3	5.5 – 6.0	Consistent with previous monitoring
PZ103C	5.1 – 13.1	5.3 – 6.2	5.3 – 5.3	Consistent with previous monitoring
PZ104	5.9 – 13.1	11.4 – 11.8	11.4 – 12.0	Consistent with previous monitoring
TB105	6.8 – 7.8	6.4 – 7.3	7.2 – 7.3	Consistent with previous monitoring
PZ105A	5.3 – 7.8	6.4 – 7.0	5.4 – 5.6	Consistent with previous monitoring
PZ105B	5.3 – 7.9	4.9 – 5.5	4.6 – 5.5	The results this year are slightly lower than previous data. This site is located near Underground 4 and as mining hasn't commenced in Underground 4 this result is most likely not attributable to MCO and is most likely due to natural variation
PZ105C	5.1 – 6.8	5.3 – 6.0	5.4 – 5.9	Consistent with previous monitoring
PZ106A	5.8 – 12.3	9.6 – 10.8	9.6 – 9.8	Consistent with previous monitoring
PZ106B	4.9 – 8.2	4.3 – 6.4	5.1 – 5.2	Consistent with previous monitoring
PZ107	4.7 – 7.1	6.0 – 6.5	6.0 – 6.2	Consistent with previous monitoring
PZ108R	5.6 – 8.0	5.5 – 6.1	5.6 – 6.1	Consistent with previous monitoring
PZ109	6.1 – 12.3	6.6 – 7.6	7.1 – 7.3	Consistent with previous monitoring
PZ111	5.8 – 7.0	6.0 – 6.6	5.9 – 6.1	Consistent with previous monitoring
PZ112B	4.3 – 6.7	4.6 – 5.3	5.0 – 5.3	Consistent with previous monitoring
PZ127	Due to the presence of the vibrating wire piezometer, water quality monitoring cannot be undertaken on this piezometer			

Site	Background Range	Previous Results Data Range	2011-2012 Data Range	Comment on 2011-2012 Data
PZ128	Due to the presence of the vibrating wire piezometer, water quality monitoring cannot be undertaken on this piezometer			
PZ129	Due to the presence of the vibrating wire piezometer, water quality monitoring cannot be undertaken on this piezometer			
PZ130	Due to the presence of the vibrating wire piezometer, water quality monitoring cannot be undertaken on this piezometer			
PZ131	5.6 – 7.2	6.0 – 6.7	6.4 – 6.5	Consistent with previous monitoring
PZ133	Due to the presence of the vibrating wire piezometer, water quality monitoring cannot be undertaken on this piezometer			
PZ134	5.1 – 6.1	5.3 – 6.5	6.0 – 6.1	As this site is located in the Murragamba Valley and mining hasn't commenced in Murragamba Valley this result is most likely not attributable to MCO and is most likely due to natural variation
PZ137	5.1 – 6.7	4.9 – 6.0	5.2 – 5.5	Consistent with previous monitoring
PZ141	4.2 – 5.4	3.8 – 5.5	4.6 – 4.7	Consistent with previous monitoring
PZ149	5.1 – 6.7	6.1 – 6.6	6.0 – 6.4	Consistent with previous monitoring
PZ150	5.1 – 6.4	5.0 – 6.0	No samples were collected due to collapsed casing	
PZ151	5.7 – 7.0	6.0 – 6.7	6.0 – 6.3	Consistent with previous monitoring
PZ152	5.1 – 6.4	4.9 – 5.9	5.4 – 5.8	Consistent with previous monitoring
PZ155	This site has been dry since March 2008		7.9	A comparison cannot be made as there is no previous data
PZ156	4.3 – 7.1	4.7 – 5.8	5.4 – 5.8	Consistent with previous monitoring
PZ157	5.9 – 7.6	5.8 – 6.8	5.7 – 6.1	Consistent with previous monitoring
PZ164	3.4 – 5.1	3.6 – 4.2	4.0 – 4.5	Consistent with previous monitoring
PZ165	5.9 – 6.2	4.8 – 5.3	4.8 – 5.2	Consistent with previous monitoring
PZ168	5.8 – 7.0	5.9 – 6.4	6.2 – 6.6	Consistent with previous monitoring
PZ170	5.4 – 6.7	5.6 – 6.4	6.0 – 6.3	Consistent with previous monitoring
PZ172	5.7 – 6.4	5.9 – 6.4	6.1 – 6.4	Consistent with previous monitoring
PZ173	6.3 – 7.2	6.4 – 6.8	6.8	Consistent with previous monitoring
PZ174	5.4 – 6.5	5.8 – 6.4	6.0 – 6.0	Consistent with previous monitoring

Site	Background Range	Previous Results Data Range	2011-2012 Data Range	Comment on 2011-2012 Data
PZ175	5.3 – 7.0	6.0 – 6.8	6.4 – 7.8	The results this year are higher than previous data. As this site is located in the Murragamba Valley and mining hasn't commenced in Murragamba Valley this result is most likely not attributable to MCO and is most likely due to natural variation
PZ176	5.0 – 7.8	5.6 – 6.0	5.9 – 6.0	Consistent with previous monitoring
PZ177	5.8 – 6.7	6.0 – 6.7	6.3 – 6.3	Consistent with previous monitoring
PZ179	Due to the presence of the vibrating wire piezometer, water quality monitoring cannot be undertaken on this piezometer			
PZ181	5.3 – 5.9	4.6 – 5.9	5.2 – 5.9	Consistent with previous monitoring
PZ184	3.9 – 5.6	3.4 – 3.9	3.2 – 3.3	This site is located in the Murragamba Valley and as mining hasn't commenced in Murragamba Valley this result is most likely not attributable to MCO and is most likely due to natural variation
PZ186	No background data	5.8 – 6.4	5.9 – 6.3	Consistent with previous monitoring
PZ187	No background data	5.3 – 6.6	5.4 – 6.2	Consistent with previous monitoring
PZ188	No background data	5.0 – 5.5	4.6 – 5.2	A review of this data and the pumping rates from nearby boreholes indicates that this result is most likely due to natural variation
PZ189	No background data	5.7 – 6.2	5.6 – 6.2	Consistent with previous monitoring
PZ191	No background data	5.0 – 5.9	3.9 – 6.9	While there is no background data to compare to, the results vary compared to previous data. This variation has been investigated and the reasons for this variation are unknown. Monitoring will continue to be undertaken to gain a better understanding of the water quality at this site.

Table 39: Comparison of Groundwater Electrical Conductivity to Background Electrical Conductivity

Site	Background Range (µS/cm)	Previous Results Data Range (µS/cm)	2011-2012 Data Range (µS/cm)	Comment on 2011-2012 Data
OB001	90 – 110	90 – 120	80 – 110	Consistent with previous monitoring
OB002	1,800 – 2,000	1,710 – 1,990	1,420 – 2,080	Consistent with previous monitoring
OB003	1,730 – 2,900	1,730 – 2,085	1,580 – 1,900	Consistent with previous monitoring
OB004	400 – 490	335 – 780	340 – 380	Consistent with previous monitoring
PZ003	620 – 3,210	705 – 5,290	680 – 840	Consistent with previous monitoring
PZ004	2,300 – 4,400	2,380 – 3,420	2,100 – 2,850	Consistent with previous monitoring
PZ018	390 – 960	140 – 575	190 – 435	Consistent with previous monitoring
PZ039	510 – 2,100	880 – 2,600	820 – 1,260	Consistent with previous monitoring
PZ040B	500 – 1,430	1,450 – 1,800	820 – 1,540	Consistent with previous monitoring
PZ043A	2,480 – 2,600	2,350 – 2,640	2,420 – 2,570	Consistent with previous monitoring
PZ043B	4,000 – 5,100	3,840 – 4,500	3,060 – 3,550	This site is located near Open Cut 3 and as mining hasn't commenced in Open Cut 3 this result is not attributable to MCO and is most likely due to natural variation
PZ044	2,800 – 3,000	2,770 – 2,980	2,780 – 2,970	Consistent with previous monitoring
PZ050A	This site has had depth only readings between April 2007 and April 2010	1,770 – 2,040	2,160 – 2,180	This site is located in the Murragamba Valley and as mining hasn't commenced in Murragamba Valley this result is not attributable to MCO and is most likely due to natural variation
PZ050B	1,300 – 2,200	1,110 – 1,600	1,110 – 1,120	Consistent with previous monitoring
PZ050C	340 – 2,500	325 – 490	1,090 – 1,150	Consistent with previous monitoring
PZ055	190 – 440	245 – 1,480	1,530 – 2,120	The results this year are higher than previous year's data but are still lower than the approved trigger levels. Monitoring will continue to be undertaken at this location
PZ058	7,600 – 16,000	10,020 – 13,430	9,730 – 9,760	Consistent with previous monitoring
PZ072A	1,500 – 1,700	1,635 – 1,780	1,720 – 1,760	Consistent with previous monitoring
PZ072C	3,200 – 3,500	3,060 – 3,310	3,010 – 3,220	Consistent with previous monitoring

Site	Background Range (µS/cm)	Previous Results Data Range (µS/cm)	2011-2012 Data Range (µS/cm)	Comment on 2011-2012 Data
PZ074	4,700 – 5,170	4,910 – 5,470	5,550 – 5,600	This site is located near Open Cut 3 and as mining hasn't commenced in Open Cut 3 this result is not attributable to MCO and is most likely due to natural variation
PZ101B	620 – 1,000	740 – 780	750 – 770	Consistent with previous monitoring
PZ101C	620 – 3,600	610 – 700	650 – 750	Consistent with previous monitoring
PZ102A	550 – 2,550	2,190 – 3,800	2,240 – 2,270	Consistent with previous monitoring
PZ102B	1,100 – 2,540	2,180 – 2,370	2,480 – 2,540	Consistent with previous monitoring
TB103R	520 – 610	535 – 600	630 – 640	Consistent with previous monitoring
PZ103A	370 – 645	570 – 610	630 – 630	Consistent with previous monitoring
PZ103B	340 – 630	370 – 500	350 – 400	Consistent with previous monitoring
PZ103C	340 – 13,000	320 – 395	310 – 340	Consistent with previous monitoring
PZ104	590 – 8,900	1,060 – 2,440	1,490 – 1,530	Consistent with previous monitoring
TB105	500 – 755	370 – 740	730 – 740	Consistent with previous monitoring
PZ105A	250 – 545	560 – 700	250 – 300	Consistent with previous monitoring
PZ105B	210 – 560	205 – 250	200 – 220	Consistent with previous monitoring
PZ105C	275 – 545	220 – 275	200 – 220	Consistent with previous monitoring
PZ106A	660 – 3,800	780 – 850	690 – 730	Consistent with previous monitoring
PZ106B	750 – 1,600	1,590 – 4,303	1,800 – 1,900	Consistent with previous monitoring
PZ107	610 – 2,000	645 – 680	660 – 690	Consistent with previous monitoring
PZ108R	240 – 350	385 – 410	390 – 420	Consistent with previous monitoring
PZ109	650 – 1,500	1,040 – 1,070	1,080 – 1,090	Consistent with previous monitoring
PZ111	720 – 1,200	725 – 930	860 – 990	Consistent with previous monitoring
PZ112B	2,500 – 8,100	1,310 – 4,380	1,890 – 1,890	Consistent with previous monitoring
PZ127	Due to the presence of the vibrating wire piezometer, water quality monitoring cannot be undertaken on this piezometer			
PZ128	Due to the presence of the vibrating wire piezometer, water quality monitoring cannot be undertaken on this piezometer			
PZ129	Due to the presence of the vibrating wire piezometer, water quality monitoring cannot be undertaken on this piezometer			
PZ130	Due to the presence of the vibrating wire piezometer, water quality monitoring cannot be undertaken on this piezometer			
PZ131	5,800 – 6,590	5,810 – 6,560	6,060 – 6,260	Consistent with previous monitoring

Site	Background Range (µS/cm)	Previous Results Data Range (µS/cm)	2011-2012 Data Range (µS/cm)	Comment on 2011-2012 Data
PZ133	Due to the presence of the vibrating wire piezometer, water quality monitoring cannot be undertaken on this piezometer			
PZ134	4,350 – 4,800	4,260 – 4,560	3,850 – 4,030	Generally consistent with previous monitoring
PZ137	420 – 1,010	1,000 – 1,350	1,180 – 1,530	This site is located in the Murragamba Valley and as mining hasn't commenced in Murragamba Valley this result is most likely not attributable to MCO and is most likely due to natural variation
PZ141	4,490 – 5,300	2,430 – 7,940	1,970 – 2,320	This site is located in the Murragamba Valley and as mining hasn't commenced in Murragamba Valley this result is most likely not attributable to MCO and is most likely due to natural variation
PZ149	3,370 – 5,700	4,360 – 4,650	4,350 – 4,870	Consistent with previous monitoring
PZ150	2,700 – 6,700	5,660 – 6,500	No sample collected due to collapsed casing	
PZ151	420 – 1,050	820 – 1,270	790 – 940	Consistent with previous monitoring
PZ152	5,680 – 6,800	6,080 – 6,520	5,690 – 6,300	Consistent with previous monitoring
PZ155	7,900 – 8,000	This site has been dry since May 2008	3,930	This site is located in the Murragamba Valley and as mining hasn't commenced in Murragamba Valley this result is most likely not attributable to MCO and is most likely due to natural variation
PZ156	440 – 520	415 – 560	620 – 650	As this site is located in the Murragamba Valley and mining hasn't commenced in Murragamba Valley this result is most likely not attributable to MCO and is most likely due to natural variation
PZ157	445 – 500	460 – 605	705 – 750	This site is located in the Murragamba Valley and as mining hasn't commenced in Murragamba Valley this result is most likely not attributable to MCO and is most likely due to natural variation
PZ164	4,560 – 10,000	4,610 – 8,810	240 – 345	This site is located in the Murragamba Valley and is in the alluvium close to Murragamba Creek. A review of the data, weather conditions and site observations indicate that this result has been influenced by surface flow in Murragamba Creek

Site	Background Range (µS/cm)	Previous Results Data Range (µS/cm)	2011-2012 Data Range (µS/cm)	Comment on 2011-2012 Data
PZ165	75 – 210	115 – 180	10 – 95	This site is located in the Murragamba Valley and is in the alluvium close to Murragamba Creek. A review of the data, weather conditions and site observations indicate that this result has been influenced by surface flow in Murragamba Creek
PZ168	640 – 720	615 – 715	705 – 750	Consistent with previous monitoring
PZ170	2,500 – 4,700	5,030 – 5,150	4,500 – 5,010	Consistent with previous monitoring
PZ172	7,000 – 7,400	7,490 – 8,140	7,920 – 8,710	This site is located in the Murragamba Valley and as mining hasn't commenced in Murragamba Valley this result is most likely not attributable to MCO and is most likely due to natural variation
PZ173	9,400 – 14,000	425 – 14,190	5,030	Consistent with previous monitoring
PZ174	2,400 – 11,900	7,440 – 14,660	12,400 – 12,820	Consistent with previous monitoring
PZ175	13,000 – 18,000	11,900 – 16,360	1,430 – 3,890	This site is located in the Murragamba Valley and is in the alluvium close to Murragamba Creek. A review of the data, weather conditions and site observations indicate that this result has been influenced by surface flow in Murragamba Creek
PZ176	710 – 840	665 – 840	650 – 665	Consistent with previous monitoring
PZ177	1,235 – 8,500	350 – 7,740	2,760 – 5,310	Consistent with previous monitoring
PZ179	Due to the presence of the vibrating wire piezometer, water quality monitoring cannot be undertaken on this piezometer			
PZ181	190 – 220	40 – 255	30 – 35	Consistent with previous monitoring
PZ184	3,900 – 4,460	3,590 – 8,020	3,510 – 3,780	Consistent with previous monitoring
PZ186	No background data	370 – 510	370 – 400	Consistent with previous monitoring
PZ187	No background data	190 – 760	150 – 180	Consistent with previous monitoring
PZ188	No background data	200 – 935	210 – 280	Consistent with previous monitoring
PZ189	No background data	265 – 475	370 – 390	Consistent with previous monitoring

Site	Background Range (µS/cm)	Previous Results Data Range (µS/cm)	2011-2012 Data Range (µS/cm)	Comment on 2011-2012 Data
PZ191	No background data	215 – 370	210 – 290	Consistent with previous monitoring

3.7.4 Groundwater Logger Data

Groundwater licences 20BL171998 and 20BL172000 require MCO to install hard rock and alluvial monitoring piezometers associated with water extraction from bores TB052a and TB179. Each of the monitoring bores has been fitted with an automatic data logger set to record water levels at hourly frequencies.

Piezometers PZ186 and PZ187 were installed for monitoring of water levels in the hard rock and alluvial between TB052A and Wilpinjong Creek. PZ188 and PZ189 were installed for monitoring of water levels in the alluvium and hard rock between TB179 and Wilpinjong Creek.

Pumping from bores TB052A and TB179 commenced in mid August 2009. As part of the Water Management Plan, MCO have developed “cease to pump” trigger levels for the alluvial aquifers (PZ187 and PZ188). The hydrographs shown in **Figure 48** and **Figure 49** indicate these trigger levels has not been exceeded.

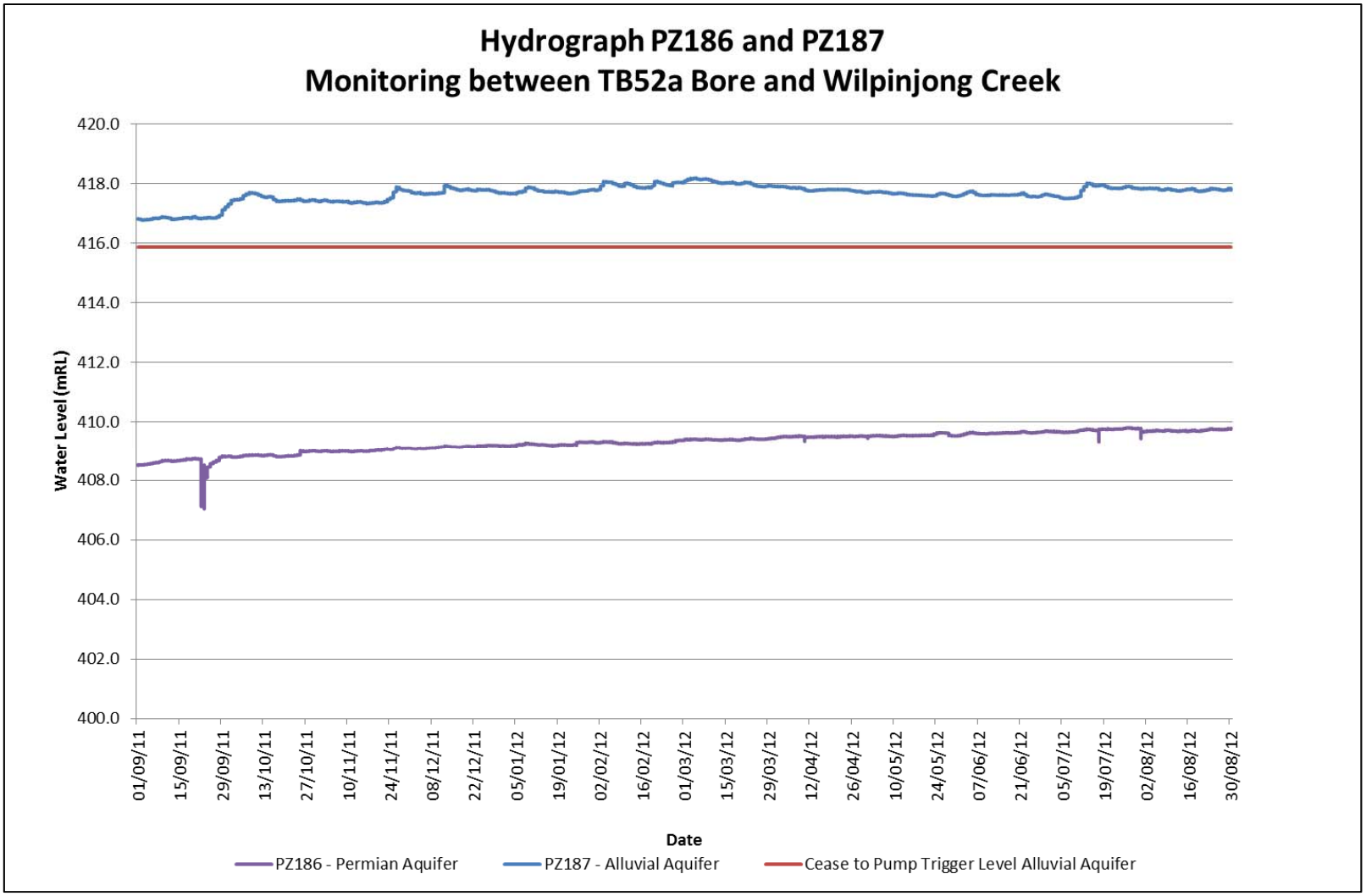


Figure 48: Monitoring Hydrograph for TB52a

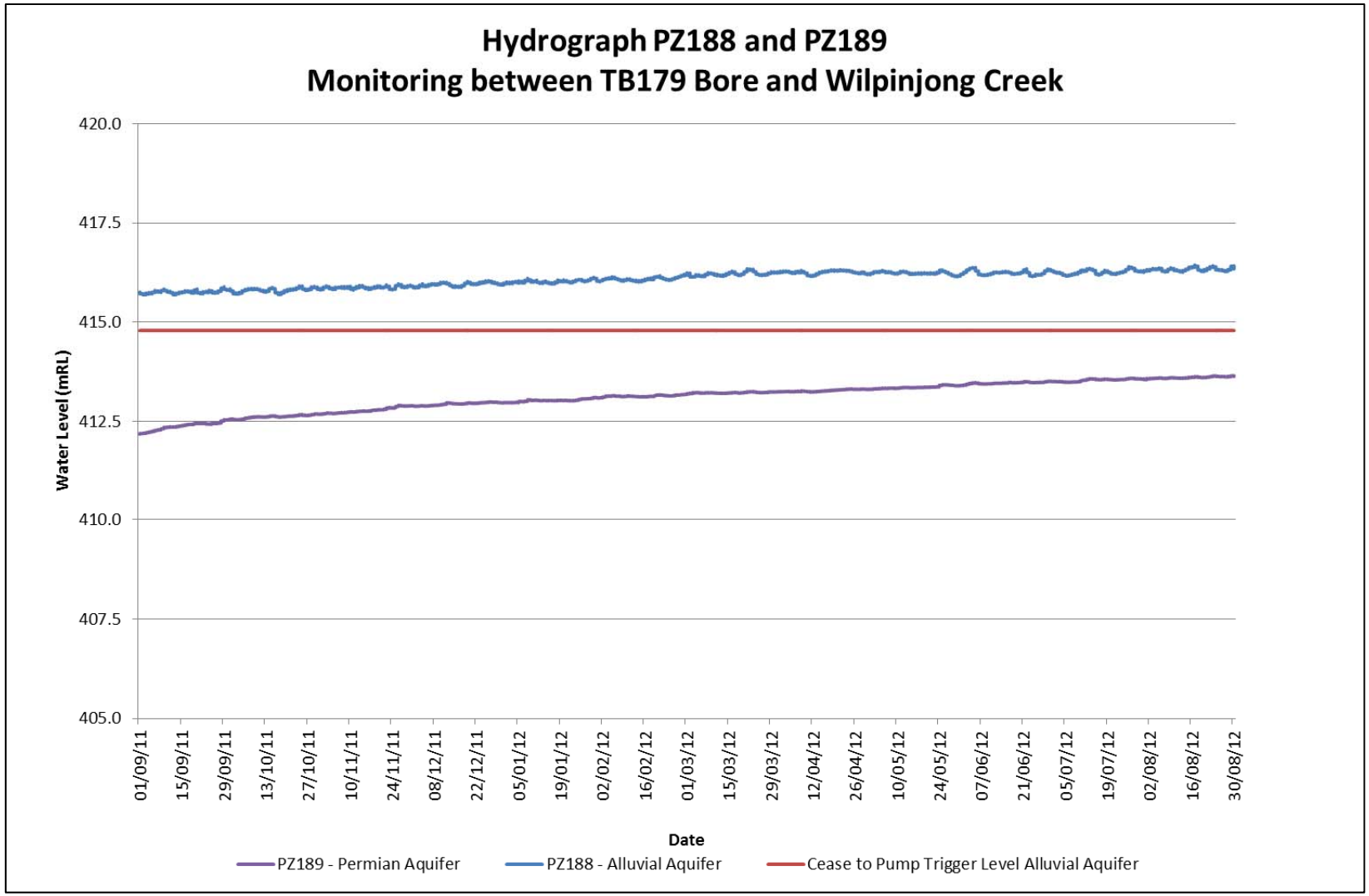


Figure 49: Monitoring Hydrograph for TB179

3.7.5 Groundwater Model Calibration

MCO are in the process of obtaining approval for additional mining areas. As part of the Environmental Assessments for these additional mining areas the groundwater model for Stage 1 was reviewed and calibrated.

3.7.6 Groundwater Census

Groundwater census surveys were undertaken in 2005 and 2007 to support the preparation of the groundwater assessments for the Moolarben Coal Project – Environmental Assessment. Surveys were conducted in 2009 and 2011 to supplement the existing baseline dataset for each site and were also extended to include any new groundwater-fed sites identified by landholders.

The groundwater census was not due to be completed during this reporting period.

3.7.7 Activities in the Next Reporting Period

Groundwater monitoring will continue to be undertaken with the results to be provided in the next AEMR. A review of the adequacy of the groundwater monitoring network will be undertaken with the outcomes from this investigation being reported in the next AEMR.

3.8 CONTAMINATED AND POLLUTED LAND

There was no action taken this reporting period to manage contaminated or polluted land within lands owned or managed by MCO.

3.9 FLORA AND FAUNA

3.9.1 Activities This Reporting Period

During the reporting period MCO continued to clear vegetation for the advancement of mining operations in Open Cut 1. The process outlined in **Section 2.2** was followed for these clearing activities. No additional management measures were required to manage threatened flora and fauna during these clearing activities.

On ground revegetation works continued in the Vegetation Offset Areas during the reporting period. More information on these works is discussed in **Section 5.3**. Protection of 1,282ha of existing native vegetation and 6ha of White Box Yellow Box Blakely's Red Gum Grassy Woodland endangered ecological community continued during the reporting period by limiting access through locked gates and fencing.

Flora and fauna monitoring in the Vegetation Offset Areas continued during the reporting period. Results of this monitoring are shown in **Section 3.9.2**.

3.9.2 Flora and Fauna Monitoring Results

Flora and fauna monitoring was undertaken during Spring 2011, Autumn 2012 and Winter 2012 and was conducted for flora (floristic and Landscape Function Analysis), fauna (amphibians, diurnal birds, nocturnal birds, mammals, microbats and reptiles), geochemical characteristics and associated analogue sites for the flora and geochemical components of the monitoring program. The following areas (**Figure 50** to **Figure 53**) were targeted during the monitoring:

- Offset Area 1 (Red Hills) – located off Ulan-Wollar Rd, comprising an area of approximately 441 ha.
- Offset Area 2 – located off Ulan Rd, to the north of current mining operations and incorporates an area of approximately 725 ha. The area includes the approved Underground (UG) 4.
- Offset Area 3 – this offset area is located off Lagoons Rd, to the southwest of the current mining operations and incorporates an area of approximately 473 ha.
- Bora Creek – Riparian vegetation along Bora Creek located off Ulan Rd.

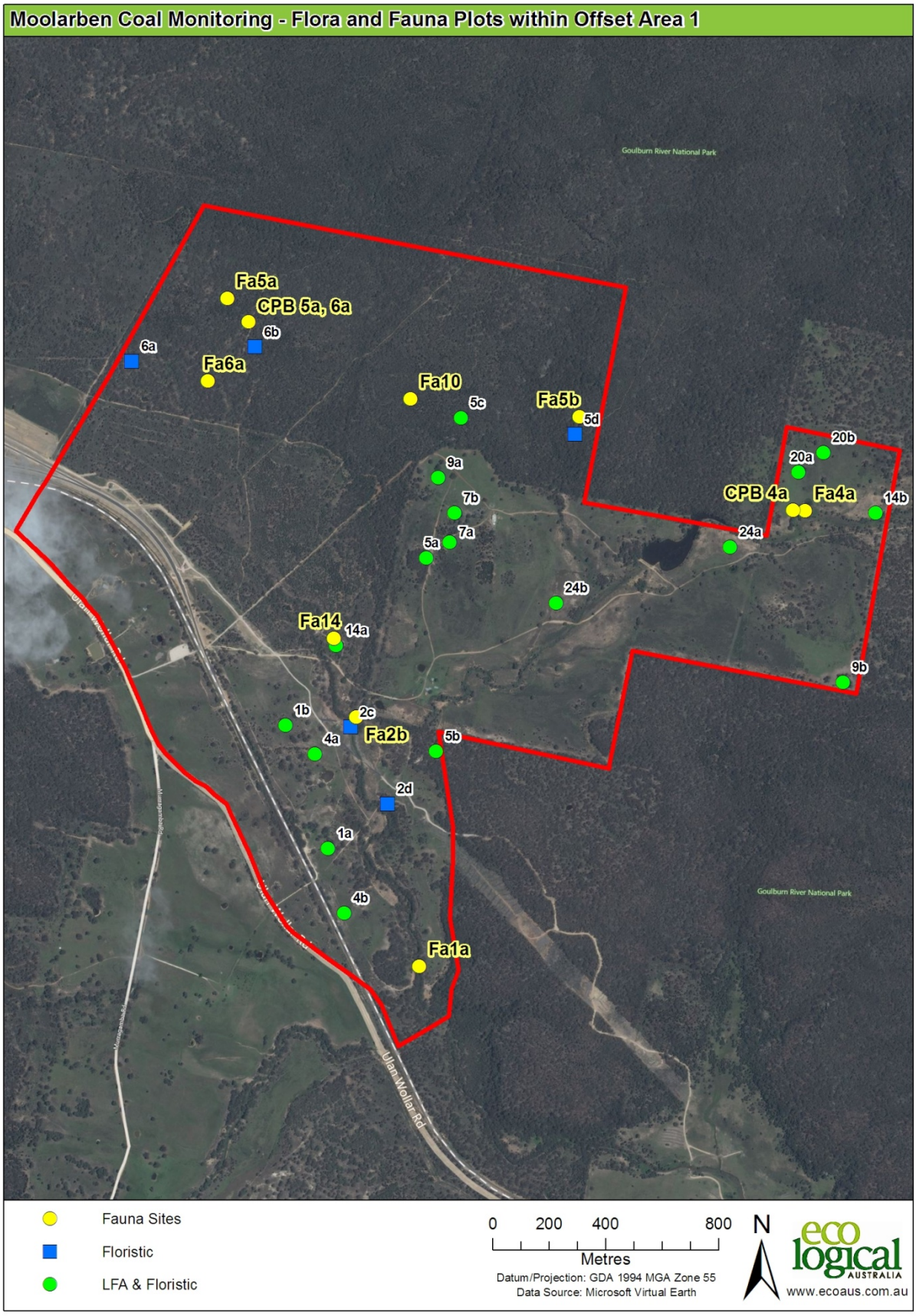


Figure 50: Offset Area 1 Flora and Fauna Monitoring Sites

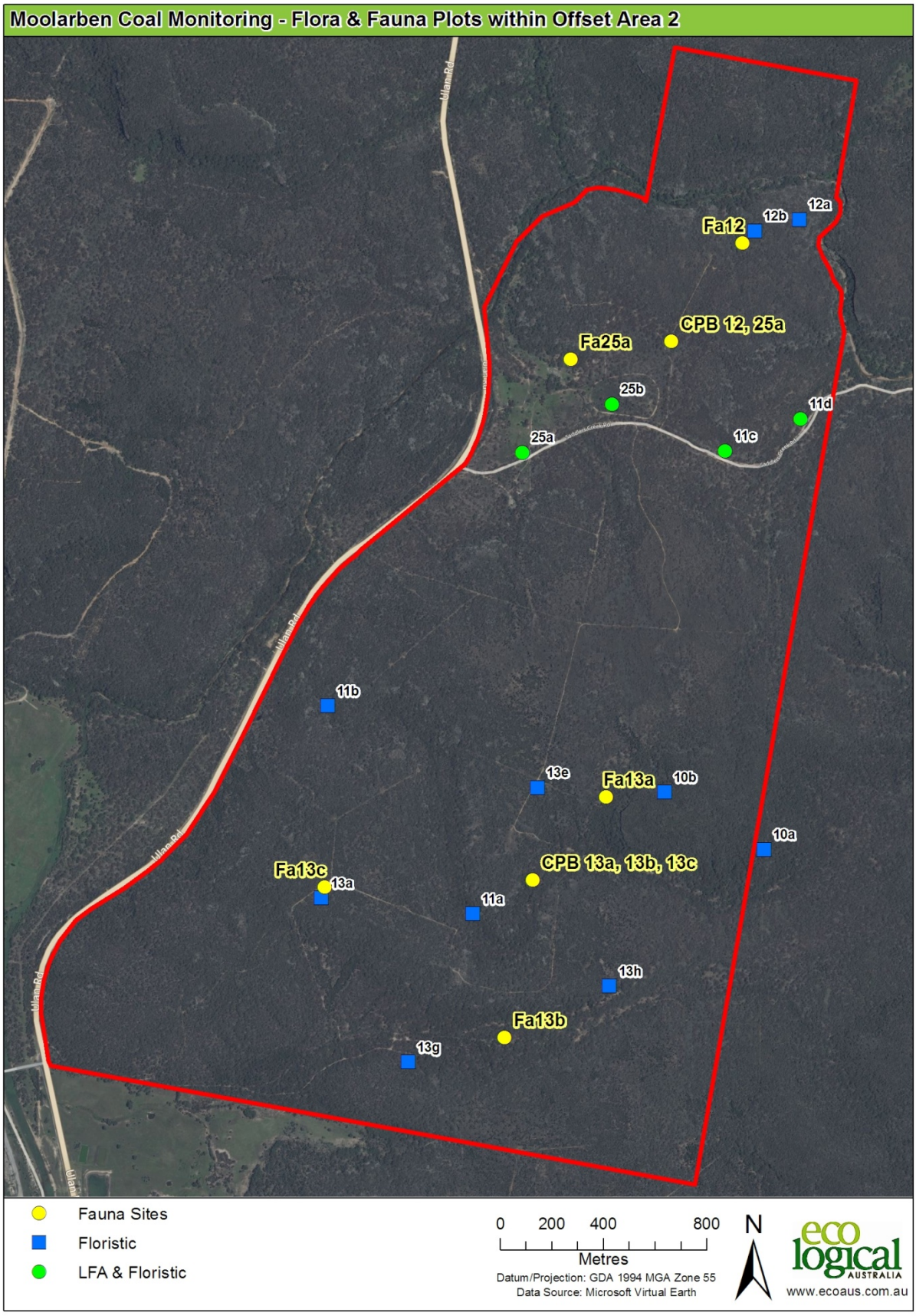


Figure 51: Offset Area 2 Flora and Fauna Monitoring Sites

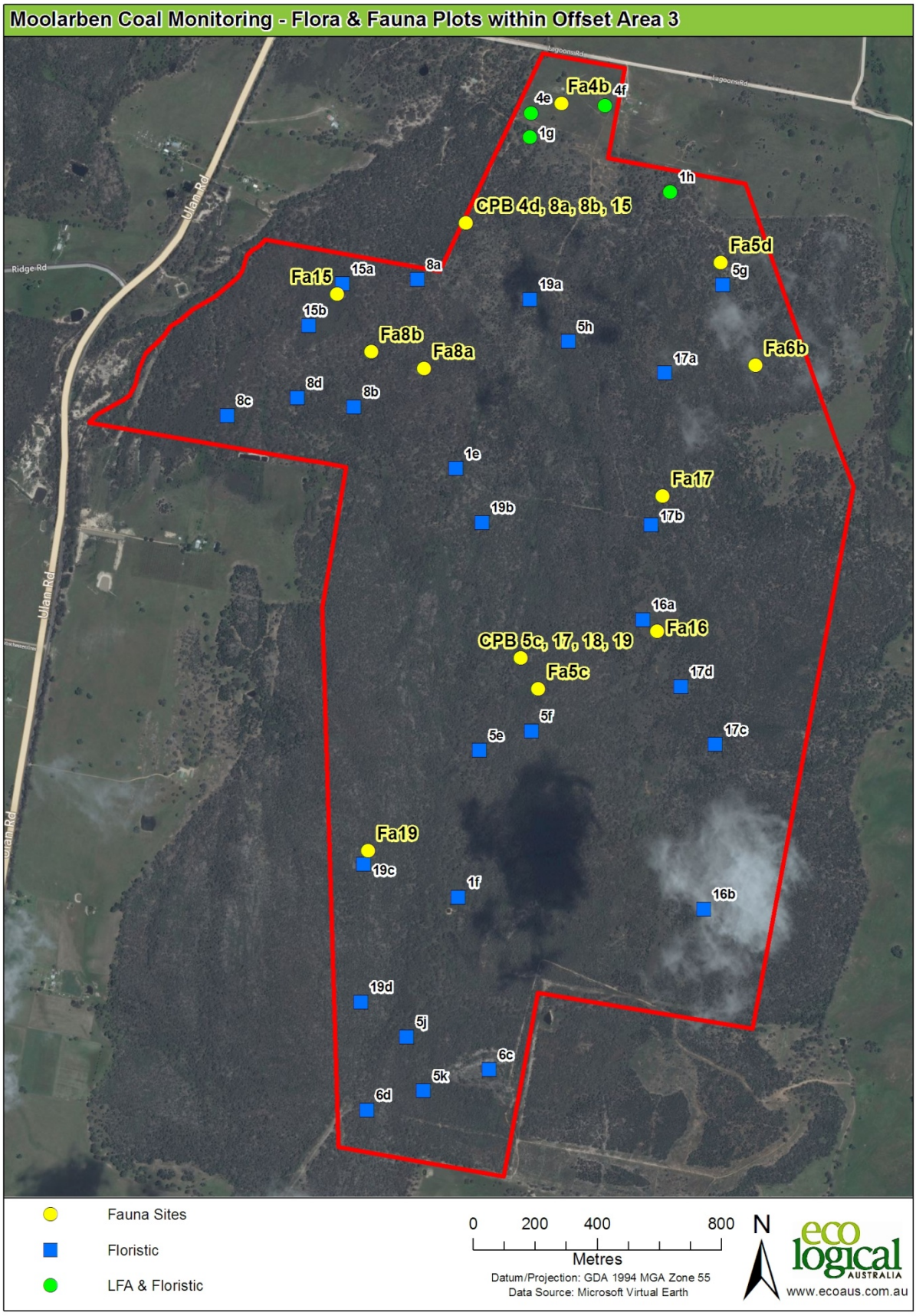


Figure 52: Offset Area 3 Flora and Fauna Monitoring Sites

Figure 53: Bora Creek Flora and Fauna Monitoring Sites

All monitoring during the reporting period was undertaken in accordance with the methods and survey techniques prescribed in the LMP and recommendations from each subsequent monitoring period. Section 3.25 of the MCO LMP initially prescribed the methods to be used for flora, fauna and geochemical monitoring during Spring 2010. However, the subsequent monitoring reports for each survey period have modified these methods based upon the results and objectives of the LMP. **Table 40** below summarises the methods utilised for each component of the monitoring program.

Table 40: Flora and Fauna Monitoring Methodology

	Spring 2011	Autumn 2012	Winter 2012	Methodology
Flora				
Landscape Function Analysis (LFA)	✓			At each site, a 20 m by 50 m nested quadrat (20 m x 20 m floristic plot and 50 m transect incorporated into 0.1 ha quadrat) was established. Within each nested quadrat LFA attributes were recorded on field data sheets in accordance with four main components of the method, as follows: • Geographic setting of the site; • Landscape organisation; • Soil surface assessment; • Vegetation dynamics.
Floristic Survey	✓	✓		Full floristic survey plots were completed in each 20 m x 20 m plot of the nested 0.1 ha quadrat to collect floristic data. All visible vascular species were recorded, with each species being assigned to one of six foliage cover classes (Walker & Hopkins 1984). Vegetation structure was recorded for each plot, specifically the height and total foliage cover of each stratum. All vascular plant species observed in the plots were identified to species level (where suitable material was available for identification), recorded and compiled into the species list.
Fauna				
Amphibians	✓			Amphibian monitoring targeted water bodies including dams and ephemeral creeks. Amphibian monitoring included active searches during the day and night for a total period of 1 h person hours per site.
Diurnal Birds	✓		✓	Diurnal bird monitoring involved conducting a census of birds along a randomly selected transect between two fixed points. Birds were recorded while walking along the random transect for a total period of 1 hour (0.5 hour in the morning and 0.5 hour in the afternoon), with all birds recorded either through direct observation, calls or other evidence (such as feathers and scats).
Nocturnal Birds	✓			Nocturnal bird monitoring involved using call playback and spotlighting survey techniques. Call playback was undertaken at each site for a period of 0.75 hours over one night, targeting the Powerful Owl, Masked Owl and Barking Owl at each site. The call playback involved 5 minutes playback, followed by 5 five minutes listening, then 5 minutes spotlighting within the immediate area where the call playback was undertaken. This was completed for each targeted species.

	Spring 2011	Autumn 2012	Winter 2012	Methodology
Mammals	✓		✓	Mammal monitoring was targeted at ground dwelling mammals. The spring 2011 monitoring included the use of Elliott traps (using 'A' and 'B' sized traps), an infra-red camera with a closed baited cage trap, hair tubes (mixture of small (Entrance Diameter 50mm) and large (Entrance Diameter 110 x 70mm)) and spotlighting. The winter 2012 monitoring excluded Elliot trapping, however incorporated the use of an infra-red camera with a closed baited trap. A trap line was set up at each of the monitoring sites and contained a combination of trap types and survey techniques.
Microbats	✓	✓		Microbat monitoring was undertaken using ultrasonic echolocation recording (Anabat detection). Two Anabat detection devices were set up at each site over two nights, targeting both terrestrial and aquatic habitat.
Reptiles	✓			Reptile monitoring included active searches during the day for 0.5 person hours per site. The search involved rock rolling, searching beneath woody debris, litter searches, and beneath other debris.
Habitat Assessment	✓	✓	✓	Habitat assessment included the identification of scats, scratches and diggings along each trapping transect line. All feral animal scratchings, warrens and scats were mark with a GPS and noted.
Geochemical				
Soil Samples	✓			Geochemical sampling was completed at new LFA/Flora sampling plots set up in spring 2012. Samples were collected in accordance with the LMP. Soil samples were taken using a 100 m diameter hand auger to a minimum depth of 300 mm (where possible), with samples taken from the 0–100 mm, 100–200 mm and 200–300 mm intervals. Samples were analysed for pH, electrical conductivity (EC), major cations, and exchangeable soil acids.

3.9.2.1 Landscape Function Analysis

Landscape Function Analysis (LFA) is a tool that assists in measuring the recovery of biological processes at the soil surface. MCO have established sites in offset sites and analogue sites (examples of offset sites in good condition) to measure trends, landscape organisation (key features observed included the distribution, width and length of patches of grass, litter, logs, cryptogams and bare ground), soil stability, nutrient cycling, water infiltration and plant density. Understandably the data shows that there is a difference between offset sites and analogue site.

While there are some differences in the data collected between offset sites and analogue sites, the key to interpreting the data will come after successive years of monitoring. LFA is not necessarily a tool by which to compare between sites, but rather to monitor trends within a site. Analogue sites provide a basis by which to compare the rate of change in the attributes measures at offset sites.

In the early stages of the monitoring program, there is insufficient data to observe trends within each site, hence, general observations from each community sampled, and between sites is provided below.

Blakely's Red Gum Grassy Woodland (Offset Sites 1a, 1b, 1g & 1h, Analogue Sites A1a & A1b)

Landscape organisation
Generally, this stratification unit exhibited high landscape organisation indices, with patches occupying between 90% and 100% of the transects. The exception being site 1g, which contained a relatively large proportion of bare soil and leaf litter. At a coarse level, this indicates that the transects contain a greater proportion of stable and resource trapping features than erodible soil surface features.

Soil Surface assessment
Generally, soil stability appeared comparable between offset and analogue sites, infiltration was higher in the analogue sites and nutrients cycling scores were also marginally higher in the analogues sites.

Vegetation dynamics
Offset sites were generally considered to be comparable to the analogue sites, with the exception of site 1h which was significantly higher in stem counts accounted for in the regenerating shrub layer.

Rough-Barked Apple Alluvial Woodland (Offset Sites 2a & 2b, Analogue Sites A2a & A2b)

Landscape organisation
The landscape organisation was comparable between offset to analogue sites for this vegetation community. There were relatively low proportions of bare ground, with indices between 0.89 and 1 implying that the sites are generally stable.

Soil Surface assessment
Generally, soil surface assessment scores appeared higher for the analogue sites, particularly for A2b.

Vegetation dynamics
Shrub counts in the offset examples were high relative to the analogue sites.

Blakely's Red Gum Grassy Woodland Derived Grassland (Offset Sites 4a, 4b, 4e & 4f, Analogue sites A1a & A1b)

Landscape organisation
The DNG examples of the Blakely's Red Gum Grassy Woodland had a relatively high proportion of bare soil, while exhibiting a reasonable level of stability, with landscape organisation indices ranging from 0.46 to 0.95. As expected, analogue sites had much higher measures and greater stability.

Soil Surface assessment
Analogue sites exhibited greater scores for all soil surface indicators, although the ground cover patch type within DNG examples did show comparable scores to the analogue sites.

Vegetation dynamics
A1b contained a lesser amount of stems to one of the DNG transects (4f), which was explained by the natural regeneration of shrubs in this sample of the DNG. A1a had the greatest number of stem counts, explained by the intact canopy, understorey and shrub layer.

Ironbark – Cyprus – Stringybark Forest (Offset Sites 5a, 5b & 5c, Analogue Sites A5a & A5b)

Landscape organisation
Despite some differences in patch diversity for this vegetation community, particularly for A5a, offset and analogues sites for this community were comparable, with indices all between 0.96 and 0.99.

Soil Surface assessment
Generally, soil surface assessment scores were similar between offset and analogue sites.

Vegetation dynamics
The stem counts between offset and analogue examples of this vegetation type are generally comparable, which is attributed to the generally homogenous young age, and therefore similar regeneration rates, of this community across the locality and region.

Ironbark – Cyprus – Stringybark Forest DNG (Offset Sites 7a & 7b, Analogue Sites A5a & A5b)

Landscape organisation
Based on the landscape organisation results, both DNG sites show relatively high proportions of grass/ground cover, with indices between 0.92 and 0.97, suggesting good stability. This is comparable to the analogue examples, which had indices of 0.96 to 0.99.

Soil Surface assessment
The DNG examples of Ironbark – Cypress - Stringybark Forest were similar to the analogues sites. However, one key difference is the high cover of grasses in sites 7a and 7b, which may be attributed to increased light availability, possibly even some level of pasture improvement, following clearing and providing favourable conditions for grass growth within the DNG.

Vegetation dynamics
These results indicate that the DNG variant of this community offers relatively high resilience and therefore recovery potential. It should be noted that the majority of stems occurred in the shrub layer component which indicates an early successional stage of regeneration.

Grey Box – Blakely's Red Gum Open Forest DNG (Offset Sites 9a & 9b, Analogue Sites A8a & A8b)

Landscape organisation
The landscape organisation of the Grey Box – Blakely's Red Gum Open Forest DNG community offset and analogue sites indicates that bare soil made up 20-30% of the DNG sites, whist the analogue equivalents did not contain bare soil.

Soil Surface assessment
All soil surface assessment scores appeared higher for the analogue sites.

Vegetation dynamics
Stem counts were much lower in the DNG sites when compared to the analogues sites, as would be expected.

Yellow Box Grassy Woodland DNG (Offset Sites 21a & 21b, Analogue Sites A20a & A20b)

Landscape organisation
Landscape organisation for the Yellow Box Grassy Woodland DNG community offset and analogue sites indicates that the DNG variant of this community was similar to analogue sites, with all recording indices of 1, which is the maximum proportion of patches and suggesting a stable soil surface.

Soil Surface assessment
Generally, soil surface assessment scores were similar with analogue sites, although analogue sites were clearly more diverse in terms of patch and interpatch types.

Vegetation dynamics
The low stem counts for this vegetation type provides opportunity for improvement potentially through direct seeding or broad-acre planting.

Rough-barked Apple Woodland on valley flats DNG (Offset Sites 24a & 24b, Analogue Sites A14a & A14b)

Landscape organisation
The results of the landscape organisation for the Rough-barked Apple Woodland on valley flats DNG community at offset and analogue sites indicates that less bare ground occurs in the analogue sites compared to the offset sites. In general, both DNG and analogue sites were considered to be in a stable condition, with DNG variants recording indices between 0.89 and 0.93.

Soil Surface assessment
Whilst the bare ground interpatches in DNG and analogue sites were similar, the patch types within the analogue samples scored higher for all three indicators.

Vegetation dynamics
The low stem counts for this vegetation community indicates opportunity for improvement potentially through direct seeding or broad-acre planting.

Blakely's Red Gum – Rough-barked Apple Woodland DNG (Offset Sites 25a & 25b, Analogue Sites A2a & A2b)

Landscape organisation
Site 25a was found to be comparable to the analogue equivalents, with proportionally higher grass/ground cover compared to bare soil. Although 25b had a higher proportion of bare ground, the presence of cryptogams at both 25a and 25b suggests that the soil surface is relatively stable.

Soil Surface assessment
The soil surface assessment reiterates that both 25a and 25b are generally stable.

Vegetation dynamics
The high number of stem counts in the DNG examples illustrates the density of the naturally regenerating shrub layer.

3.9.2.2 Floristic Surveys

A total of 448 species (380 native, 68 exotic species) were recorded across all floristic sites in spring 2011 with a reduction in species observed in Autumn 2012 with 416 species (370 native

species and 46 exotic species) recorded. A reduction in species richness from autumn to spring is to be expected with many annuals and cryptic spring flowering species more likely to be recorded in spring surveys than surveys conducted in autumn.

For those vegetation communities in which monitoring commenced in Spring 2011, and for which data only exists for one annual cycle (i.e. spring and autumn periods), no detailed comparisons can be made on changes in species richness during the monitoring period. Generally native species richness at these sites has remained relatively consistent, or undergone minor changes, from Spring 2011 to Autumn 2012 which can be attributed to seasonal fluctuations, climatic conditions and the accuracy of the survey methodology. Exotic species richness has generally declined from Spring 2011 to Autumn 2012. Based on the limited surveys conducted at these sites, it is unclear if this decline is part of a seasonal pattern or indicative of recovery from grazing pressures and other disturbances.

For those vegetation communities and sites which have been monitored since Spring 2010, it can be seen that native species richness has generally been in decline since monitoring commenced in Spring 2010 (**Figure 54**), although declines have not occurred in every season at each site. This trend has occurred at both offset sites and analogue sites and as such is likely the result of natural fluctuations in response to climatic conditions. Exceptions to this trend appear to be related to site-specific factors with no individuals trends observed in relation to vegetation communities. A general trend towards declining species richness also occurred for exotic species (**Figure 55**), although declines were not observed in all seasons at each site. Within the overall trend of decreased exotic species richness a seasonal pattern can be seen for many sites whereby exotic species richness is greater in spring surveys than in autumn surveys.

In general, the fluctuations in species observed across all sites and seasons were more frequently associated with the understorey vegetation, with canopy and shrub layer species numbers remaining relatively consistent across the entire study period. The greater variability within the understorey compared to mid and canopy layers can be attributed to the more common occurrence of annual/seasonal species, cryptic species, shorter-lived species and species with shallower root zones which may therefore be more susceptible to changes in climatic conditions.

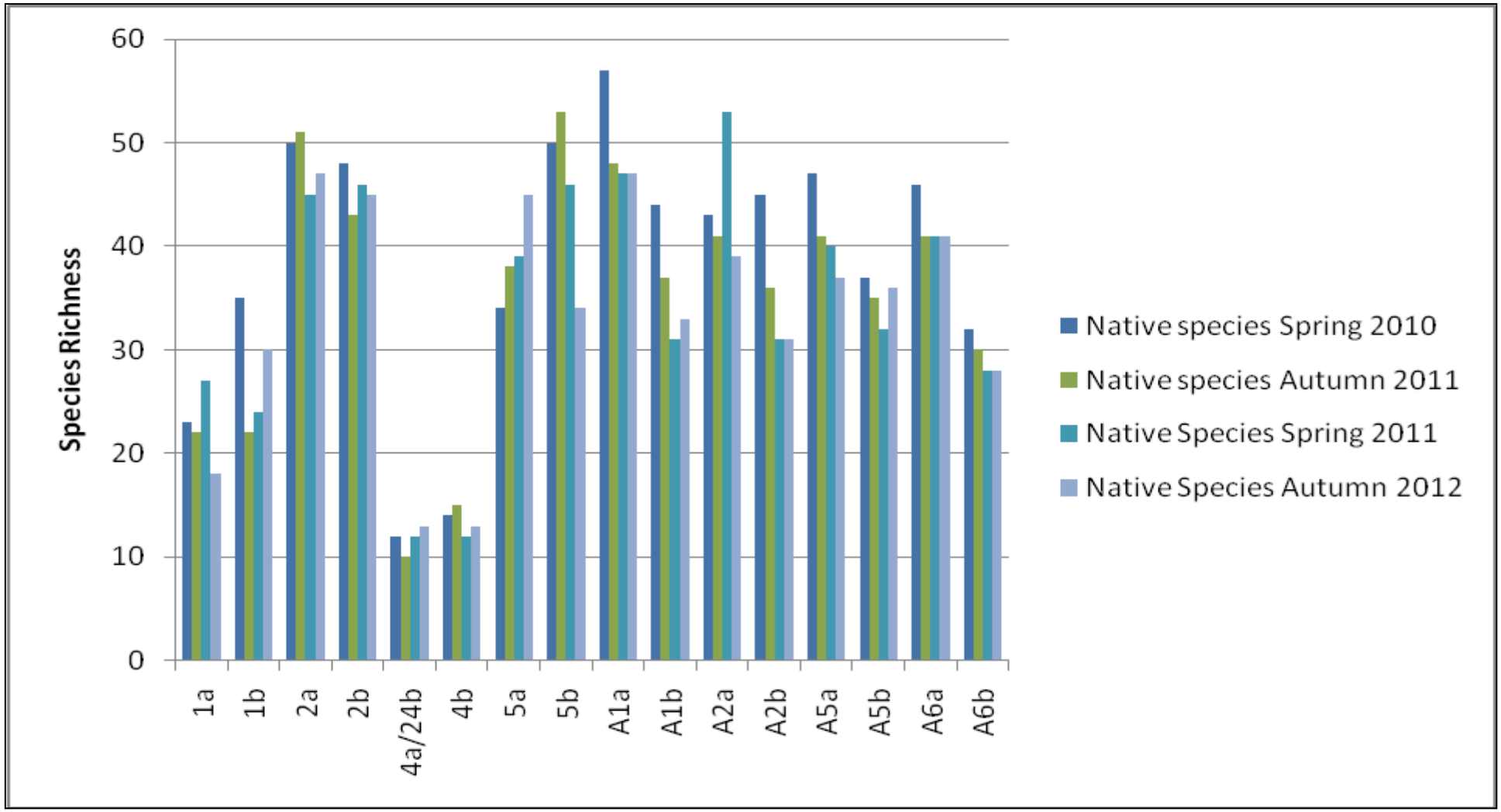


Figure 54: Native Species Richness within Existing Monitoring Sites (established Spring 2010)

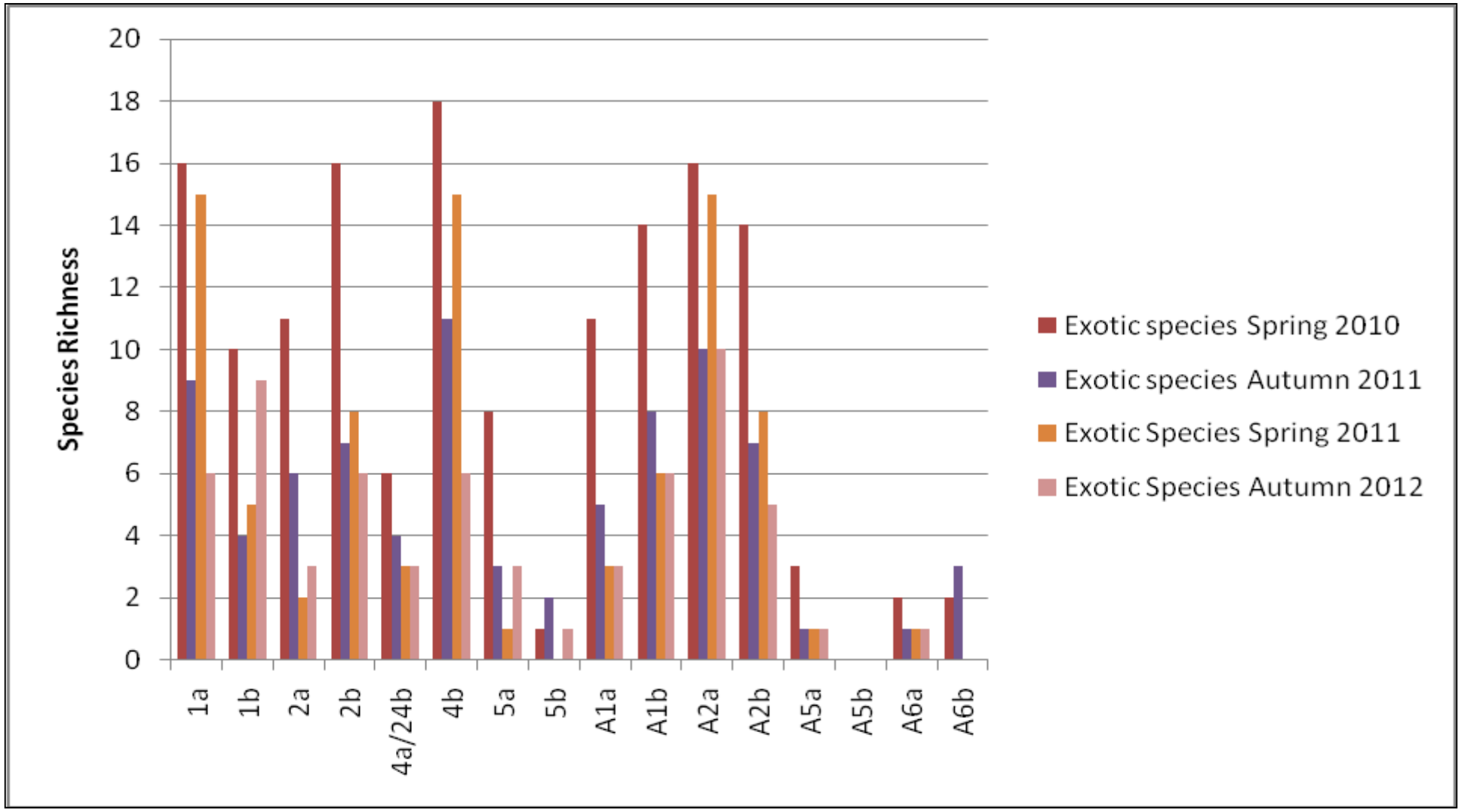


Figure 55: Exotic Species Richness within Existing Monitoring Sites (established Spring 2010)

Fauna

Fauna data collected during the three monitoring periods is summarised below in **Table 41**.

Table 41: Fauna Monitoring Results Summary

Monitoring Site	Amphibian	Birds		Mammal		Microbats		Reptile
	Spring 2011	Spring 2011	Winter 2012	Spring 2011	Winter 2012	Spring 2011	Autumn 2012	Spring 2011
Offset Area 1								
Fa1a	2	27	23	8	2	8	7	1
Fa2b	3	28	19	5	2	11	5	2
Fa4a	6	35	17	10	0	13	9	1
Fa5a	0	21	18	8	3	7	3	0
Fa6a	4	27	19	3	1	9	5	1
Fa10	1	15	14	2	0	7	8	2
Fa11a	1	22	21	1	2	11	0	2
Fa14	0	16	18	2	2	12	8	5
Offset Area 2								
Fa12	0	23	19	0	1	10	2	4
Fa13a	0	24	13	5	1	6	4	0
Fa13b	0	27	11	3	1	7	0	0
Fa13c	0	15	9	4	1	4	4	0
Fa25a	4	34	16	4	0	11	5	0
Offset Area 3								
Fa1b	0	14	32	2	3	12	5	1
Fa4b	0	20	23	6	1	9	3	0
Fa5c	1	17	24	2	5	9	7	1
Fa5d	1	31	20	5	2	10	0	4
Fa6b	0	26	26	2	1	11	8	1
Fa8a	1	15	33	4	2	7	4	0
Fa8b	0	7	23	3	1	7	0	0
Fa15	5	3	15	4	2	11	5	0
Fa17	4	12	21	1	0	6	5	0
Fa19	0	19	20	3	0	8	7	0
Bora Creek								
Fa2a	4	18	16	6	4	8	5	1

Within Offset Area 1, seven bird and six micro chiropteran bat species listed as vulnerable under the NSW Threatened Species Conservation Act 1995 (TSC Act) were observed (**Table 42**), including *Calyptorhynchus lathami* (Glossy Black-cockatoo), *Climacteris picumnus victoriae* (Brown Treecreeper (eastern subspecies)), *Daphoenositta chrysoptera* (Varied Sittella), *Glossopsitta pusilla* (Little Lorikeet), *Melanodryas cucullata* (Hooded Robin), *Petroica boodang* (Scarlet Robin), *Pyrrholaemus sagittatus* (Speckled Warbler), *Stagonopleura guttata* (Diamond Firetail), *Chalinolobus dwyeri* (Large-eared Pied Bat), *Chalinolobus picatus* (Little Pied Bat), *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), *Miniopterus australis* (Little Bentwing Bat), *Miniopterus schreibersii oceanensis* (Eastern Bentwing Bat) and *Scoteanax rueppellii*

(Greater Broad-nosed Bat). The Large-eared Pied Bat is also listed as vulnerable under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). One migratory bird species listed under the EPBC Act was recorded, namely *Merops ornatus* (Rainbow Bee-eater).

Table 42: Threatened Fauna Recorded in Offset Area 1

Common Name	TSC Act	EPBC Act	Fa1a	Fa2b	Fa4a	Fa5a	Fa6a	Fa10	Fa11a	Fa14
Glossy Black-Cockatoo	V	-				✓			✓	
Brown Treecreeper (eastern subspecies)	V	-	✓	✓	✓		✓		✓	
Varied Sittella	V	-			✓					
Little Lorikeet	V	-			✓				✓	
Hooded Robin	V	-		✓	✓					
Scarlet Robin	V								✓	
Rainbow Bee-eater	-	M		✓						
Speckled Warbler	V	-				✓			✓	
Diamond Firetail	V	-	✓	✓	✓					
Large-eared Pied Bat	V	V			✓				✓	✓
Little Pied Bat	V	-					✓			
Eastern False Pipistrelle	V	-		✓	✓					✓
Little Bentwing Bat	V	-	✓							
Eastern Bentwing Bat	V	-	✓	✓	✓	✓	✓	✓	✓	✓
Greater Broad-nosed Bat	V	-			✓				✓	

Within Offset Area 2, three bird, two micro chiropteran and one mega chiropteran bat species listed as vulnerable under the TSC Act (**Table 43**) were recorded. These included the Glossy Black-cockatoo, *Ninox strenua* (Powerful Owl), *Pomatostomus temporalis temporalis* (Grey-crowned Babbler), Large-eared Pied Bat, Eastern Bentwing Bat and *Pteropus poliocephalus* (Grey-headed Flying-fox) were recorded within Offset Area 2. Large-eared Pied Bat and Grey-headed Flying-fox are also listed as vulnerable under the Commonwealth EPBC Act. One migratory bird species listed under the EPBC Act was recorded; namely *Rhipidura rufifrons* (Rufous Fantail).

Table 43: Threatened Fauna Recorded at Offset Area 2

Common Name	TSC Act	EPBC Act	Fa12	Fa13a	Fa13b	Fa13c	Fa25a
Glossy Black-Cockatoo	V	-	✓				
Powerful Owl	V	-			✓		
Grey-crowned Babbler (eastern subspecies)	V	-		✓			
Scarlet Robin	V	-				✓	✓
Rufous Fantail	-	M			✓		
Large-eared Pied Bat	V	V					✓
Eastern Bentwing Bat	V	-	✓	✓	✓		✓
Grey-headed Flying-fox	V	V					

Within Offset Area 3, five bird and five micro chiropteran species listed as vulnerable under the TSC Act (**Table 44**), including Glossy Black-cockatoo, Brown Treecreeper, *Ninox connivens* (Barking Owl), Powerful Owl, Speckled Warbler, Little Pied Bat, Eastern False Pipistrelle, Eastern Bentwing Bat, *Myotis macropus* (Southern Myotis) and *Vespadelus troughtoni* (Eastern Cave Bat) were recorded within Offset Area 3. One migratory bird species listed under the EPBC Act was recorded, namely *Hirundapus caudacutus* (White-throated Needletail).

Table 44: Threatened Fauna Recorded at Offset Area 3

Common Name	TSC Act	EPBC Act	Fa 1b	Fa 4b	Fa 5c	Fa 5d	Fa 6b	Fa 8a	Fa 8b	Fa 15	Fa 17	Fa 19
Glossy Black-Cockatoo	V	-			✓		✓					✓
Brown Treecreeper (eastern subspecies)	V	-								✓		
Barking Owl	V	-										
Powerful Owl	V	-					✓				✓	
Speckled Warbler	V	-			✓						✓	
Varied Sittella	V	-	✓									
Little Pied Bat	V	-		✓								
Eastern False Pipistrelle	V	-		✓								
White-throated Needletail	-	M					✓					
Eastern Bentwing Bat	V	-		✓	✓	✓	✓	✓	✓	✓	✓	✓
Southern Myotis	V	-			✓						✓	
Eastern Cave Bat	V	-					✓			✓		

Three introduced mammals were observed within all areas during the monitoring periods, including *Oryctolagus cuniculus* (Rabbit), *Sus scrofa* (Feral Pig) and *Vulpes vulpes* (Fox).

3.9.2.3 Geochemical

Geochemical monitoring was undertaken at each new LFA/Flora sampling plot.

pH
All samples analysed were acidic, with pH ranging from 5 to 6.5 for all vegetation types.

Electrical Conductivity
All samples, apart from those recorded in Yellow Box Grassy Woodland and DNG sites, also recorded low electrical conductivity (EC), with all being less than 150µS/cm, which is in the range of productive soils. The EC of the Yellow Box Grassy Woodland and DNG sites ranged from 151 to 199µS/cm, compared to analogue sites, which ranged from 51 to 78µS/cm. The EC results for the Yellow Box Grassy Woodland and DNG sites exceeded the 150µS/cm threshold for productive soils. The analogue sites, however, were well below this threshold, with all sites exhibiting very low electrical conductivity. From this it can be assumed that the impact of salinity on the soil is negligible within the analogue sites.

Soluble Major Cations
The measure of soluble major cations, including Calcium (Ca) and Magnesium (Mg) within the Blakely's Red Gum Grassy Woodland and DNG sites were below the limit reading of 10mg/kg. Results for Sodium (Na) exceeded the limit reading in sites 1g and 1h. Potassium (K) was exceeded the limit reading in all sites.

The measure of soluble major cations within the Ironbark – Cypress – Stringybark Forest and DNG sites were below the limit reading of 10mg/kg, with the exception of K at all sites sampled within this vegetation community, and Na and Ca at Site 10a.

The measure of soluble major cations within the Grey Box – Blakely's Red Gum Open Forest and DNG sites were highly variable across all sites sampled. Major cations were found in lesser concentrations within sites 6a and 9b. The analogue sites showed levels higher than the other sites sampled, with Potassium being the cation found in more significant concentrations than others.

The measure of soluble major cations within the Blakely's Red Gum – Rough-barked Apple Alluvial Woodland DNG sites was generally below the limit reading of 10 mg/kg. The only exceptions to this were Site 4c which recorded levels of 20 mg/kg of Sodium and 30 mg/kg of Potassium.

The measure of soluble major cations within the Rough-barked Apple Alluvial Woodland on Valley Flats and DNG sites was generally below the limit reading of 10mg/kg. The only exceptions to this were Site 24b and Site 14b which recorded levels of 30 and 20mg/kg of Potassium respectively.

The measure of soluble major cations within the Yellow Box Grassy Woodland and DNG sites were generally above the limit reading of 10mg/kg, with the exception of Sodium across all sites sampled within this vegetation community. No distinct change could be seen in the results between the sites, and the analogue sites as all results were comparable. A high reading of Calcium was taken from Site 21a, and Potassium was elevated in analogue site A20a.

Exchangeable Soil Acids

The exchangeable soil acidity test is a measure of the total amount of the cation exchange capacity (CEC) of the soil that is due to hydrogen (H+) ions. Soil acidity comprises active and exchangeable acidity with pH providing a measure of the active acidity component.

The cation exchange capacity is the capacity of the soil to hold and exchange cations and controls soil stability and the ability of the soil to retain nutrients. The lower the cation exchange of a soil, the lower the resistance to changes in soil chemistry.

Exchangeable acidity ranged from 0.7 to 45.9meg/100g across all sites. Values below 6 meg/100g are considered low, and the soils might be susceptible to a decline in soil structure and are of low fertility.

Exchangeable acidity was significantly higher at site 1h compared to other sites sampled in Blakely's Red Gum Grassy Woodland and DNG sites. All sites located within Rough-barked Apple Alluvial Woodland on Valley Flats, which ranged from 17.5 to 45.9meq/100g.

3.9.3 Activities in the Next Reporting Period

Revegetation works in the Vegetation Offset Areas will continue during the next reporting period. The flora and fauna monitoring program will continue to be implemented and will be expanded to include rehabilitation.

3.10 STREAM HEALTH MONITORING

3.10.1 Activities This Reporting Period

Stream Health Monitoring was undertaken during Spring 2011 and Autumn 2012. The monitoring locations are illustrated in **Figure 4**.

3.10.2 Monitoring Results and Comparison to Previous Stream Health Monitoring

The monitoring for Spring 2011 was performed in November 2011. The results from this monitoring and comparison to previous results can be seen in **Table 45**. There was no modelling conducted in the Environmental Assessment on predicted stream health surrounding the mining operations so a comparison can't be made to predicted stream health.

Table 45: Spring 2011 Stream Health Monitoring Results

Index	Site	SH01	SH02	SH03	SH04	SH05	SH06	SH08	SH10	SH12	SH13
RCE	Mean	77.90	84.81	ND	59.22	51.54	51.16	50.21	54.19	62.98	74.04
RCE	SD	5.77	4.23	ND	9.94	3.44	3.74	7.63	0.88	3.30	6.56
RCE	Spring 2011	76.92	80.77	ND	76.92	57.69	57.69	63.46	55.77	67.31	80.77
RCE	**Compare to baseline**	**IR**	**IR**	**-**	**High**	**High**	**High**	**IR**	**High**	**High**	**High**
Diversity	Mean	26.67	30.20	ND	17.25	21.60	20.20	18.60	19.20	25.00	27.50
Diversity	SD	4.68	8.76	ND	3.27	4.43	3.37	4.79	1.47	8.41	5.73
Diversity	Spring 2011	18	14	ND	12	14	14	12	20	11	23
Diversity	**Compare to baseline**	**Low**	**Low**	**-**	**Low**	**IR**	**Low**	**IR**	**IR**	**Low**	**IR**
SIGNAL	Mean	3.95	3.89	ND	3.40	3.53	3.48	3.04	3.42	4.19	4.05
SIGNAL	SD	0.41	0.55	ND	0.79	0.46	0.20	0.27	0.64	0.60	0.56
SIGNAL	Spring 2011	3.94	3.93	ND	4.33	3.43	3.29	2.67	4.05	4.73	4.55
SIGNAL	**Compare to baseline**	**IR**	**IR**	**-**	**High**	**IR**	**IR**	**Low**	**IR**	**IR**	**IR**

ND represents no data. Comparison to baseline compares present seasonal score to long term mean ± standard deviation. IR means In Range.

Aquatic Habitat Condition (RCE Index)
RCE Scores in Spring 2011 were higher than Autumn 2011 for all sites. Except for at SH01 and SH02, all sites scored higher than previously. The RCE scores were above the comparable range for all sites with the exception of SH01, SH02, and SH08 which were within the range. The improvement of RCE scores across all sites since Autumn 2011 may have been due the impacts of flooding on some of the 13 characters assessed. Specifically, flooding is likely to have removed silt and accumulated debris, removed loose sediment, scoured large sections of macrophytes and algae, increased the depth to width ratio, and deposited structures such as logs and large woody debris.

Aquatic Macro Invertebrate Diversity
Fewer taxa were collected during Spring 2011 than in any previous survey for all sites. The most probable explanation for this is that there were 5 large flows between June and November 2011 that would have washed many invertebrates downstream. The largest of these occurred in June 2011, where river levels reached a 4,153ML/day peak on 16 June 2011 at the NOW

Coggan gauging station. Prior to the flood, flow was 73ML/day at the Coggan gauging station. The two exceptions to this are SH10, where more taxa were collected in Spring 2011 than at all previous dates except Autumn 2011, and SH13, where taxa diversity in spring 2011 exceeded diversity for the baseline survey in Spring 2008. Diversity was below the comparable range at five sites, and within the comparable range at four sites, those being SH05, SH08, SH10 and SH13.

Pollution Tolerance Site SIGNAL Scores

SIGNAL scores in Spring 2011 were similar to most previous post-baseline surveys at most sites, although all sites scored lower than the Spring 2008 baseline survey. For SH04, SH10, SH12, and SH13, SIGNAL scores display an overall trend increasing over time since Spring 2009. SH01 and SH02 SIGNAL scores appear to vary around 3.95 ± 0.41 and 3.89 ± 0.55. The remaining sites also appear relatively stable. The SIGNAL scores were within the comparable range for all of the sites, with the exception of SH04 where it was above the range and SH08 where it was below the range.

Despite the decrease in diversity, SIGNAL2 scores indicated an increase in ecological condition since Autumn 2011 at SH04, SH10, SH12, and SH13. The improvement in SIGNAL scores at these sites may have been a result of the flushing flows that occurred in July and October 2011, which likely removed accumulated debris and silt from the sites and created a more suitable environment for invertebrates. The only site where there was a decline in SIGNAL2 score was at the reference site on Moolarben Creek (SH08). Here, the average score fell below the range calculated from previous surveys. Two sites (SH04 and SH10) improved in SIGNAL2 score sufficiently to be re-classified from 'Severely Impaired' to 'Moderately Impaired'. Sites SH12 and SH13 are also in the 'Moderately Impaired' category and continue to improve since autumn 2011 towards their spring 2008 classification of 'Mildly Impaired'.

The monitoring for Autumn 2012 was performed in March 2012. The results from this monitoring and comparison to previous results can be seen in **Table 46**. There was no modelling conducted in the Environmental Assessment on predicted stream health surrounding the mining operations so a comparison can't be made to predicted stream health.

Table 46: Autumn 2012 Stream Health Monitoring Results

Index	Site	SH01	SH02	SH03	SH04	SH05	SH06	SH08	SH10	SH12	SH13
RCE	Mean	76.8	84.78	ND	61.85	52.24	51.29	50.82	54.14	66.92	73.46
RCE	SD	5.85	3.78	ND	10.98	3.53	3.36	6.98	0.80	9.27	5.82
RCE	Autumn 2012	71.15	84.62	ND	75.00	55.77	51.92	53.85	53.85	82.69	71.15
RCE	**Compare to baseline**	**IR**	**IR**	**ND**	**High**	**IR**	**IR**	**IR**	**IR**	**High**	**IR**
Diversity	Mean	25.00	28.00	ND	17.33	22.43	19.00	18.57	19.43	23.83	25.00
Diversity	SD	6.14	10.66	ND	3.14	4.20	4.36	4.65	2.07	7.88	5.33
Diversity	Autumn 2012	15	12	ND	15	25	12	15	23	19	22
Diversity	**Compare to baseline**	**Low**	**Low**	**-**	**IR**	**IR**	**Low**	**IR**	**High**	**IR**	**IR**
SIGNAL	Mean	3.96	4.41	ND	3.66	3.65	3.66	3.24	3.62	4.50	4.29
SIGNAL	SD	0.37	0.51	ND	0.70	0.43	0.38	0.41	0.59	0.58	0.50
SIGNAL	Autumn 2012	4.00	4.33	ND	3.73	3.44	4.42	4.00	3.48	4.95	4.45
SIGNAL	**Compare to baseline**	**IR**	**IR**	**-**	**High**	**IR**	**High**	**High**	**IR**	**IR**	**IR**

ND represents no data. Comparison to baseline compares present seasonal score to long term mean ± standard deviation. IR means In Range.

Aquatic Habitat Condition (RCE index)
RCE scores (presented as percentages) in Autumn 2012 were within the comparable range for all sites except SH04 and SH12, which were above the range. RCE scores ranged between 51.92% and 84.62% in Autumn 2012. The Goulburn River site downstream of Bobadeen Creek (SH02) and Ryans Creek reference site (SH12) received RCE scores of 84.62 and 82.69% respectively. The lowest scoring site was in Moolarben Creek, under the road bridge (SH06).

Aquatic Macro Invertebrate Diversity
Fourteen orders of macro invertebrates comprising of 46 taxa, were collected from the nine sites surveyed at MCO. Most of the invertebrates collected were insects (36 Families), with Chironomidae midges, Leptoceridae, Baetidae and Corixidae being the most abundant. Ten non-insect taxa were present, including mites, worms, bivalves, snails and shrimp. Of these, the bivavlve family Spheridae was most common. The most frequently encountered taxa were Chironomide, Baetidae, and Oligochaeta worms which occurred at all sites. The Goulburn River monitoring site downstream of Moolarben Creek and Sandy Hollow Creek (SH05) had the highest macro invertebrate diversity with 25 taxa collected. Moolarben Creek site adjacent to Open Cut 2 (SH10) had 23 invertebrate taxa collected, while the Goulburn River monitoring site (SH13) had 22 invertebrate taxa.

Pollution Tolerance Site SIGNAL Scores
SIGNAL scores in Autumn 2012 were similar to most previous surveys, although all sites except for SH06 and SH08 scored lower than the Spring 2008 baseline survey. SIGNAL scores at SH04, SH10, SH12, and SH13 generally increased from Spring 2009 to Spring 2011, but this trend was maintained only by SH12 until Autumn 2012. Despite this, SIGNAL2 scores at all of these sites remained above previous minimal scores (excluding 2008 baseline data). Comparing only autumn data across all years, all sites, with the exception of SH05, display an upward trend. All sites were within the comparable range, with the exception of SH04, SH06 and SH08, which were above.

3.10.3 Activities Next Reporting Period

Stream health monitoring will continue to be undertaken with the results to be provided in the next AEMR.

3.11 WEEDS AND FERAL ANIMALS

3.11.1 Activities This Reporting Period

MCO undertook a weed survey during December 2011 targeting noxious weeds. Noxious weeds identified during this survey included:

- Bathurst Burr;
- Blackberry;
- Blue Heliotrope;
- Cineraria;
- Spiny Burr Grass;
- St John's Wort; and
- Tree-of-Heaven.

Treatment for Blackberry was undertaken during the reporting period.

MCO were involved in regional feral animal treatment programs that targeted dogs and pigs. These involved aerial shooting, aerial baiting and on-ground baiting.

3.11.2 Activities Next Reporting Period

Weed and feral animal surveys will be continue to conducted during the next reporting period with control programs being developed based on the findings of these surveys.

3.12 BLASTING

3.12.1 Activities This Reporting Period

Blast monitoring continued to be undertaken throughout the reporting period. A review of the adequacy of the blast monitoring network was undertaken this reporting period and was found to be adequate. As a result no changes have been made to the monitoring network.

The Pre-Blast Environmental Assessment was updated during the reporting period based on feedback from the original assessment and changes in the location of the mining operations within Open Cut 1.

Blasting within 500m of public roads continued during this reporting period. These blasts require the roads to be closed to maintain public safety. This procedure outlines the process for notifications prior to the blast, what process to follow if emergency services need to get through the road closure and what inspections are taken of the public road before and after blasting. All road closures have been successful with members of the public being appreciative of the notification they receive.

3.12.2 Blast Monitoring

Blasting criteria for MCO are shown in **Table 47**.

Table 47: Blasting Assessment Criteria

Receiver	**Air Blast Overpressure Level dB (linear Peak)**	**Allowable Exceedance**
Residence on privately owned land	>115	5% of the total number of blasts over a period of 12 months
	>120	Nil
Receiver	**Peak Particle Velocity (mm/s)**	**Allowable Exceedance**
Residence on privately owned land	5	5% of the total number of blasts over a period of 12 months
	10	0%
330kV transmission line	50	0%
Aboriginal rock shelters	40	0%
Railway culverts/bridges	100	0%
Moolarben Creek Dam	10	0%

The blast monitoring locations can be seen in **Figure 4** and the results from the blasting can be seen in **Table 48**, **Figure 56** and **Figure 57**. Blasting within 2km of the Aboriginal rock shelters continued during the reporting period, triggering the requirement to monitor at these shelters. The results from these blasts can be seen in **Table 48**. Blasting within 500m of Transgrid's power lines continued during the reporting period. Results from this blasting can be seen in **Table 49**. Only those towers within 500m of the blast were monitored.

As shown in the blasting results, blasting activities were only carried out between 9am and 5pm Monday to Saturday inclusive. Blasting activities were also limited to:

- 2 blasts a day;
- 9 blasts a week, averaged over any 12 month period, including;
- a maximum of 4 blasts a week, averaged over any 12 month period, with a maximum instantaneous charge (MIC) of greater than 650kg.

There were no occasions where vibration or overpressure results exceeded the criteria set in the Project Approval and Environment Protection Licence.

There were two occasions when results weren't obtained from the blast monitors. The explanations for the missing results are:

- 24/03/12 – Moolarben Dam Wall and Lagoons Road. Data was not recorded as the monitors were uploading data to the server during the blast. Changes were made to the blast units to delay their uploading process following this missed data. All results have been captured since.
- 27/03/12 – Ulan School. Data was not recorded as the monitor failed for no apparent reason during the blast. The unit was operational prior to the blast. All results have been captured since.

Table 48: Blast Monitoring Results

Date	Time	Blast Location	Type	BM1 Ulan School		BM2 Rock Shelters		BM3 Moolarben Dam Wall		BM4 Lagoons Rd	
				Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)
01/09/11	13:56	S05B25-28	OB	0.08	103.5	Blast centroid > 2km from rock shelters. No monitoring is required to be undertaken.		1.37	not required	0.08	103.5
01/09/11	14:01	S02B18	Coal	0.51	103.5			1.37	not required	0.51	103.5
07/09/11	12:02	S04B28	Coal	0.70	95.9	1.55	not required	0.99	not required	0.28	97.5
09/09/11	10:56	S04B30	Coal	0.29	102.8	0.25	not required	0.64	not required	0.11	101.0
14/09/11	10:57	S04B30	Coal	0.63	102.8	1.79	not required	1.39	not required	0.34	95.9
16/09/11	11:54	S04B31	Coal	0.22	104.2	0.21	not required	0.86	not required	0.10	98.8
20/09/11	11:53	S04B32	Coal	0.96	100.0	1.35	not required	1.29	not required	0.22	106.0
23/09/11	13:01	S04B33	Coal	0.23	100.0	0.23	not required	0.86	not required	0.12	102.8
23/09/11	13:19	S04B34	Coal	0.09	94.0	0.24	not required	0.61	not required	0.08	91.5
26/09/11	14:00	S04B34	OB	0.60	107.0	0.84	not required	0.73	not required	0.15	104.2
28/09/11	10:56	S03B16	OB	0.48	88.0	0.91	not required	1.31	not required	0.26	95.9
04/10/11	13:06	S03B16	Coal	0.31	81.9	0.21	not required	0.19	not required	0.09	101.0
05/10/11	13:03	S02B14	Coal	0.35	98.8	0.16	not required	0.16	not required	0.11	91.5
12/10/11	10:56	S01B14	Coal	0.32	108.0	Blast centroid > 2km from rock shelters. No monitoring is required to be undertaken.		1.01	not required	0.15	98.8
14/10/11	14:59	S03B26	OB	1.08	111.5	2.54	not required	1.11	not required	0.45	98.8
21/10/11	12:58	S06B25	OB	0.65	101.9	1.45	not required	0.95	not required	0.26	91.5
26/10/11	13:07	S06B26	Coal	0.38	110.6	0.19	not required	0.27	not required	0.11	103.5
28/10/11	13:50	S01B11	Coal	0.35	98.8	Blast centroid > 2km from		0.24	not required	0.10	91.5

Date	Time	Blast Location	Type	BM1 Ulan School		BM2 Rock Shelters		BM3 Moolarben Dam Wall		BM4 Lagoons Rd	
				Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)
02/11/11	12:54	S01B11	Coal	0.19	97.5	rock shelters. No monitoring is required to be undertaken.		0.17	not required	0.10	102.8
07/11/11	12:54	S01B10	Coal	0.40	95.9			0.25	not required	0.10	94.0
09/11/11	14:00	S01B12	Coal	0.28	98.8	Blast did not trigger unit		1.15	not required	0.11	100.0
17/11/11	12:56	S03B37	OB	0.94	98.9	Blast centroid > 2km from rock shelters. No monitoring is required to be undertaken.		1.25	not required	0.20	100.0
03/12/11	13:12	S05B24	OB	0.72	113.3			1.18	not required	0.19	108.8
15/12/11	11:00	S05B22	OB	0.23	101.0			1.65	not required	0.23	101.0
04/01/12	14:00	S05B22-23	Coal	0.35	103.5	0.12	not required	0.86	not required	Blast did not trigger unit	
06/01/12	13:54	S03B36	Coal	0.20	100.0	0.09	not required	0.74	not required	Blast did not trigger unit	
11/01/12	13:03	S03B36	OB	0.73	91.5	Blast centroid > 2km from rock shelters. No monitoring is required to be undertaken.		0.57	not required	0.11	108.8
19/01/12	09:35	S04B20	OB	1.05	101.9			1.32	not required	0.18	94.0
25/01/12	09:35	S04B20-19	OB	0.98	107.0			0.81	not required	0.14	95.9
02/02/12	13:06	S04B19-20	Coal	0.19	109.9	0.18	not required	0.31	not required	0.10	98.8
07/02/12	12:58	S05B26	Coal	0.30	102.8	0.3	not required	0.56	not required	0.12	97.0
09/02/12	12:59	S05B26	Coal	0.41	102.8	0.39	not required	0.54	not required	0.39	94.0
11/02/12	10:00	S05/06B24-28	Coal	0.23	106	0.34	not required	0.45	not required	0.10	98.8
17/02/12	13:00	S05B26	Coal	1.49	91.5	1.11	not required	1.65	not required	Blast did not trigger unit	
22/02/12	14:14	S04B35	OB	0.90	106.5	0.744	not required	2.30	not required	Blast did not trigger unit	
24/02/12	16:00	S06B20	OB	0.32	102.8	0.45	not required	0.51	not required	0.12	100.0
24/02/12	16:02	S05B35	OB	0.47	98.8	0.32	not required	0.39	not required	0.10	97.5
01/03/12	16:07	S04B35	OB	0.86	101.0	0.83	not required	2.24	not required	0.26	113.8
09/03/12	16:06	S04B20	OB	0.79	109.9	0.29	not required	0.09	not required	0.1	91.5
09/03/12	16:00	S0525	Coal	0.30	101.9	0.26	not required	0.09	not required	0.10	98.8

Date	Time	Blast Location	Type	BM1 Ulan School		BM2 Rock Shelters		BM3 Moolarben Dam Wall		BM4 Lagoons Rd	
				Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)
13/03/12	13:55	S05 B35	OB	0.78	101.9	0.81	not required	1.70	not required	0.23	103.5
16/03/12	12:57	S05 B24	Coal	0.57	97.5	Blast centroid > 2km from rock shelters. No monitoring is required to be undertaken.		0.35	not required	0.10	91.5
21/03/12	12:59	S05 B24	Coal	0.29	97.5	0.1	not required	0.33	not required	0.10	94.0
24/03/12	10:01	S04B20	OB	0.56	97.5	Blast centroid > 2km from rock shelters. No monitoring is required to be undertaken.		No result - unit calling home during blast		No result - unit calling home during blast	
27/03/12	13:00	S05B25	Coal	Unit failed to record blast				0.47	not required	0.12	94.0
30/03/12	13:07	S02B10	OB	1.02	110.9			0.89	not required	0.30	101.0
05/04/12	13:08	S02B10	OB	1.51	107.0			1.02	not required	0.28	95.9
05/04/12	13:09	S05B35	Coal	0.31	98.8			0.36	not required	0.28	95.9
13/04/12	13:00	S04B36	OB	0.23	104.2	0.48	not required	0.36	not required	0.12	97.5
17/04/12	13:02	S02B10	OB	0.68	103.5	Blast centroid > 2km from rock shelters. No monitoring is required to be undertaken.		0.50	not required	0.13	94.0
19/04/12	9:26	S04B19	OB	0.64	104.9			0.65	not required	0.13	95.9
20/04/12	12:59	S06B26	OB	0.45	98.8			0.66	not required	0.12	94.0
27/04/12	12:56	S02B11	OB	1.13	101.0			1.13	not required	0.25	94.0
03/05/12	13:00	S02B10-12	OB	1.41	94.0			1.04	not required	0.27	91.5
08/05/12	12:08	S02B16-18	Coal	0.32	98.8			0.25	not required	0.09	88.0
10/05/12	13:02	S02B16-18	Coal	0.21	98.8			0.21	not required	0.09	94.0
16/05/12	12:57	S05B35	OB	1.17	104.2	1.47	not required	2.84	not required	0.54	104.2
18/05/12	11:53	S05B36	OB	1.03	101.9	1.43	not required	1.73	not required	0.45	104.9
23/05/12	12:59	S05B37	OB	1.05	98.8	1.17	not required	2.10	not required	0.39	104.9
25/05/12	12:55	S04B35	Coal	0.31	101.9	0.43	not required	1.21	not required	0.23	104.9
30/05/12	11:00	S04B36	Coal	0.39	104.2	0.23	not required	0.99	not required	0.17	101.9

Date	Time	Blast Location	Type	BM1 Ulan School		BM2 Rock Shelters		BM3 Moolarben Dam Wall		BM4 Lagoons Rd	
				Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)
01/06/12	13:15	S04B15	OB	1.54	102.8	Blast centroid > 2km from rock shelters. No monitoring is required to be undertaken.		0.96	not required	0.21	91.5
06/06/12	13:04	S05B23	Coal	0.31	105.5			0.31	not required	0.10	97.5
08/06/12	13:00	S05B22	Coal	0.21	101.9			0.38	not required	0.09	95.9
15/06/12	12:03	S03B14/16	OB	0.92	101.0			0.93	not required	0.22	94.0
19/06/12	11:52	S04B36	Coal	0.32	107.5			0.80	not required	0.15	101.9
25/06/12	15:00	S03B15-16	OB	0.70	95.9			0.66	not required	0.16	95.9
28/06/12	11:59	S03B17-18	OB	0.68	105.5			0.36	not required	0.12	98.8
05/07/12	13:00	S03B20	Coal	0.27	95.9			0.50	not required	0.10	94.0
05/07/12	13:03	S04B22	OB	0.76	101.9			0.50	not required	0.13	88.0
11/07/12	12:59	S04B16	OB	0.66	91.5			0.65	not required	0.17	88.0
17/07/12	12:00	S02B14	Coal	0.44	100.0			0.22	not required	0.10	97.5
19/07/12	13:00	S03 B14	OB	0.65	94.0			0.65	not required	0.17	91.5
25/07/12	12:00	S03B13	OB	0.75	107.0			0.59	not required	0.18	97.5
30/07/12	13:00	S03B13	OB	1.07	98.8			1.10	not required	0.20	94.0
03/08/12	12:00	S05B19	OB	0.70	97.5			0.84	not required	0.17	94.0
07/08/12	13:00	S04B14	OB	0.13	100.0			0.12	not required	0.10	91.5
09/08/12	13:02	S04B14	OB	0.10	95.9			0.10	not required	0.10	106.0
15/08/12	13:00	S02B11	Coal	0.41	95.9			0.26	not required	0.12	110.9
22/08/12	13:09	S02B10	Coal	0.35	104.2			0.25	not required	0.13	95.9
24/08/12	12:01	S05B16	OB	0.78	91.5			0.63	not required	0.21	102.8
29/08/12	12:01	S05B15	OB	0.13	94.0			0.29	not required	0.11	102.8

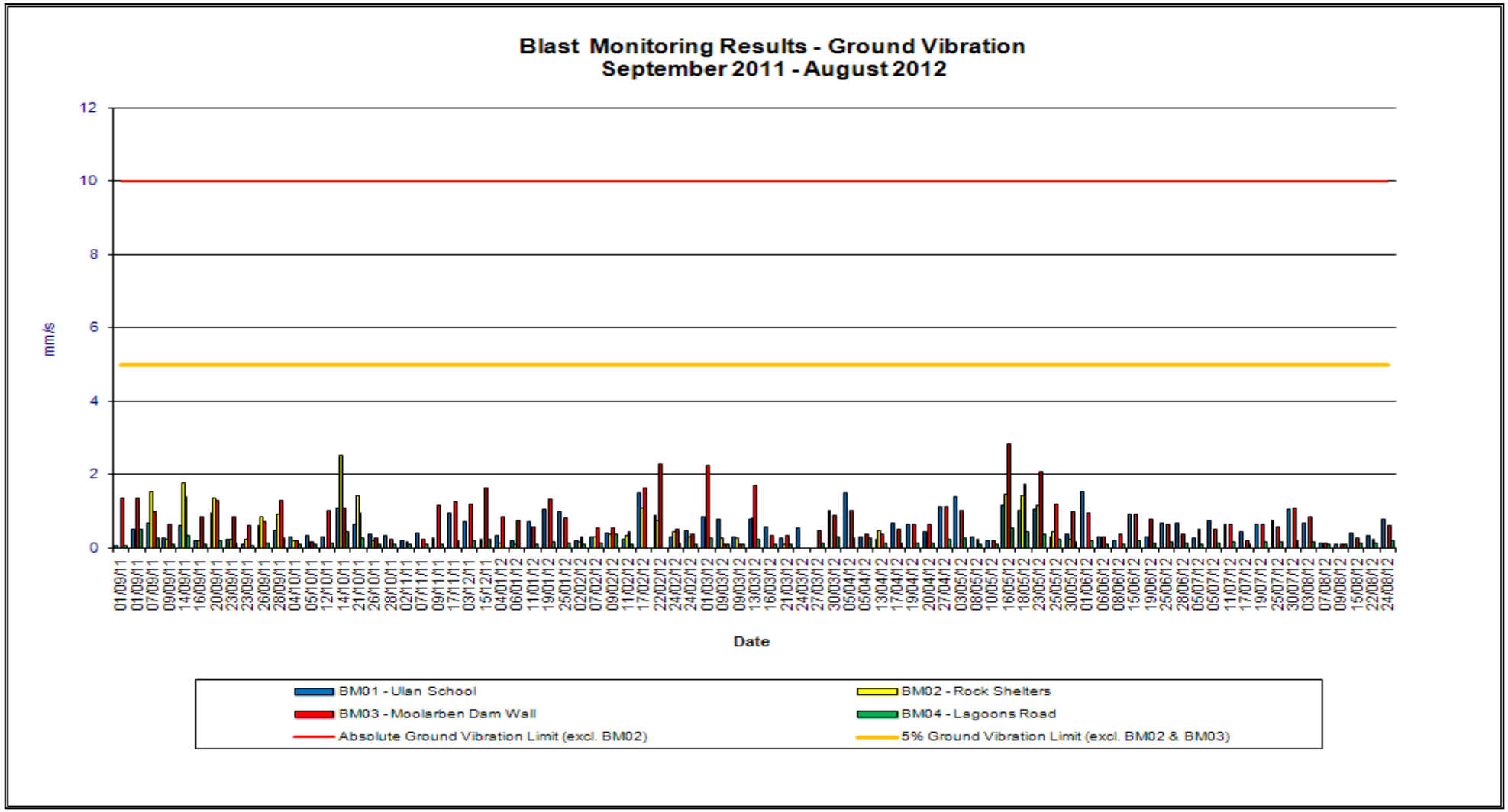


Figure 56: Vibration Results

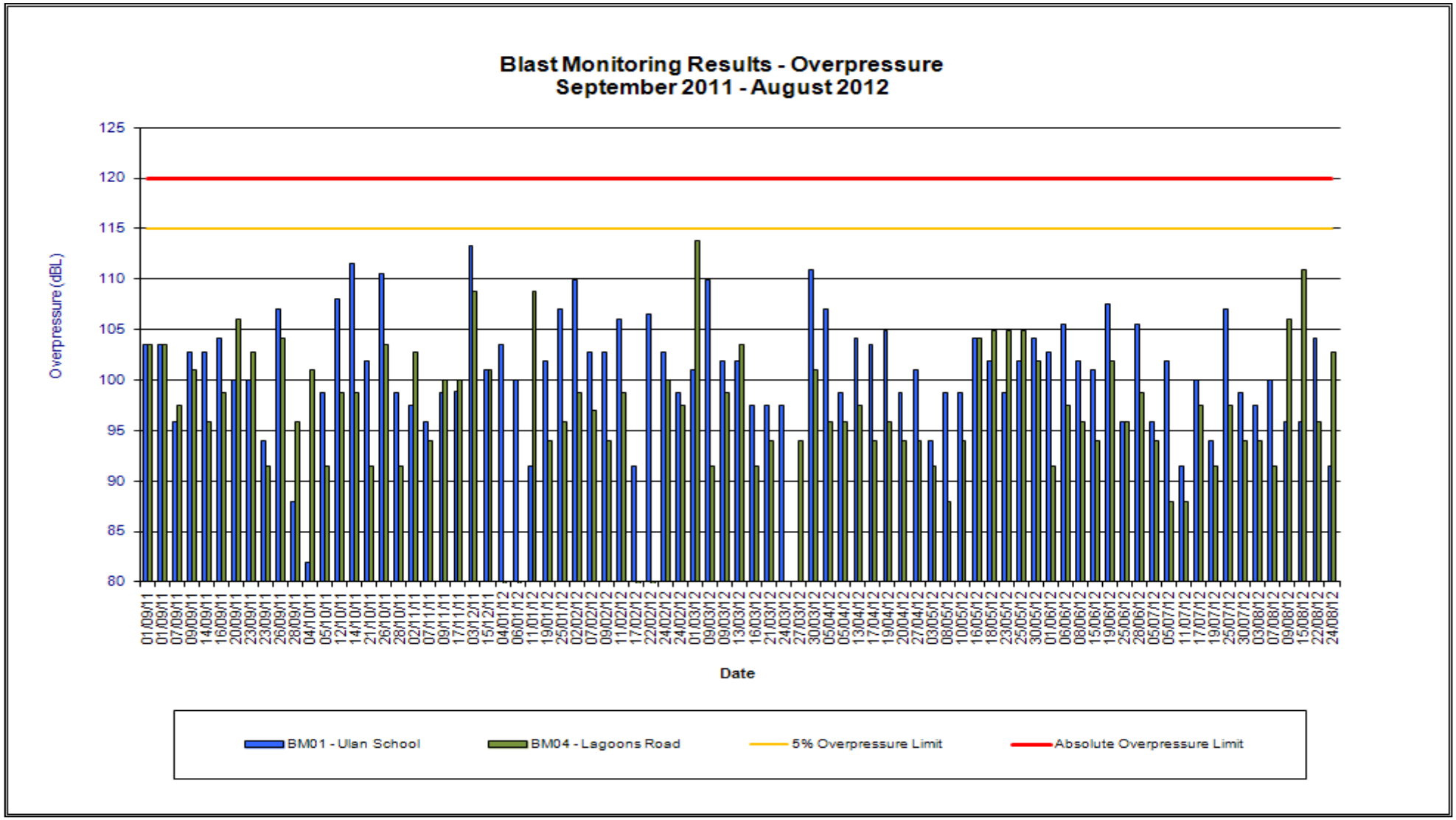


Figure 57: Overpressure Results

Table 49: Blasting Results at Transgrid's Power Lines

Date	Location (all results in mm/s)				
	Transgrid 330kV – Tower 74	Transgrid 330kV – Tower 75	Transgrid 330kV – Tower 76	Transgrid 330kV – Tower 77	Timber power Poles
04/10/11	2.54	4.09	5.65	6.78	-
05/10/11	1.03	3.27	2.71	-	-
26/10/11	3.63	4.99	1.8	-	-
28/10/11	5.41	4.54	-	-	14.5
02/11/11	7.94	5.24	-	-	15.5
07/11/11	4.69	14.8	-	-	13.4

3.12.3 Comparison to Previous Blast Monitoring and Predicted Levels

A comparison of this year's blasting results to previous year's results and predictions in the Environmental Assessment is shown in **Table 50**.

Table 50: Comparison of Blasting Results to Previous Results

Site	Vibration Predictions in Environmental Assessment (mm/s)	Previous Year's Vibration Range (mm/s)	2011-2012 Vibration Range (mm/s)	Comments on 2011-2012 Results
Ulan School	2.3	0.10 – 2.46	0.08 – 1.54	Consistent with previous results and below predicted levels
Lagoons Road	2.6	0.09 – 0.89	0.08 – 0.54	Consistent with previous results and below predicted levels
Moolarben Dam Wall	6.2	0.10 – 4.15	0.09 – 2.54	Consistent with previous results and below predicted levels
Site	**Overpressure Predictions in Environmental Assessment (dB(L))**	**Previous Year's Overpressure Range (dB(L))**	**2011-2012 Overpressure Range (dB(L))**	**Comments on 2011-2012 Results**
Ulan School	114	91.5 – 120.6	81.9 – 113.3	Consistent with previous results and below predicted levels
Lagoons Road	114	81.9 – 115.0	88.0 – 113.8	Consistent with previous results and below predicted levels

3.12.4 Activities During the Next Reporting Period

Blast monitoring will continue to be undertaken with the results to be provided in the next AEMR.

3.13 NOISE MANAGEMENT

3.13.1 Activities This Reporting Period

Operational processes for MCO to reduce noise emissions include:

- Separate day and night dumping areas when deemed necessary;
- Use of shielded areas in adverse weather conditions;
- Use of real-time noise monitoring data to assist operational personnel in proactive management of noise impacts;
- Use of production assistants to assess real-time noise monitoring levels on night shift;
- Regular maintenance of equipment, including sound attenuation components; and
- Sound power testing of mobile and stationary equipment.

Noise monitoring continued on a quarterly basis throughout the reporting period.

Noise attenuation on MCO's equipment continued during the reporting period. The status of the noise attenuation program on the current fleet of equipment at the end of the reporting period is:

- The two 996 excavators have had the full noise attenuation kits fitted;
- The 9350 excavator has had the full noise attenuation kit fitted;
- The CAT 6050 excavator has had the full noise attenuation kit fitted;
- 3 of the 830E trucks have had the full noise attenuation kit fitted;
- 6 of the 830E trucks have had Stage 1 of the noise attenuation kit fitted. Stage 2 will be fitted during the next reporting period; and
- 6 of the 830E trucks are due to have Stage 1 and Stage 2 of the noise attenuation kit fitted during the next reporting period.

All future excavator and trucks purchased by MCO will have the factory noise attenuation kits assembled prior to the machine being commissioned on site.

During the reporting period MCO trialled a DuraTray body, which is constructed of rubber on the floor and the lower levels of the tray sides. The noise tests have indicated an 8 decibel noise reduction while being loaded. MCO are investigating the purchase of additional bodies for installation on MCO's trucks.

The NMP outlines response triggers for the real-time noise monitoring stations. When the trigger has been reached a SMS alarm is sent to operational personnel and members of the Environment and Community Department. The real-time response triggers that have been established and the management/control actions are shown in **Table 51**. These triggers were reviewed and validated during the reporting period with no changes being made.

Table 51: Noise Real-Time Response Triggers

Time Period	Trigger	Management/Control Actions	Responsibility
Day	• Wind direction – 22.5^0-225^0 • Wind speed <5m/s • No rainfall • Low frequency L_{Aeq} 34dBA	• Review the audio to determine if MCO noise is audible. If so, - Review current noise generating activities - Review current noise control - Make operational changes as appropriate. For example: dumping in protected locations, shutting down equipment • Ensure standard mitigation measures are in place • Monitor changes in noise levels	Area Supervisor (assistance can be sought from the environmental department)
Evening	• Wind direction – 22.5^0-225^0 • Wind speed <5m/s • No rainfall • Low frequency L_{Aeq} 34dBA	• Review the audio to determine if MCO noise is audible. If so, - Review current noise generating activities - Review current noise control - Make operational changes as appropriate. For example: dumping in protected locations, shutting down equipment • Ensure standard mitigation measures are in place • Monitor changes in noise levels	Area Supervisor (assistance can be sought from the environmental department)
Night	• Wind direction – 22.5^0-225^0 • Wind speed <5m/s • No rainfall • Low frequency L_{Aeq} 34dBA	• Review the audio to determine if MCO noise is audible. If so, - Review current noise generating activities - Review current noise control - Make operational changes as appropriate. For example: dumping in protected locations, shutting down equipment • Ensure standard mitigation measures are in place • Monitor changes in noise levels	Area Supervisor (assistance can be sought from the environmental department)

In response to several landowners concerns over noise impacts at their properties, several independent noise studies were conducted during the reporting period. The studies were undertaken over various periods throughout the year. The results of this studies found that MCO were complying with the noise criteria at the landowner's residences.

3.13.2 Noise Monitoring

Impact Assessment Criteria

Noise Impact Assessment Criteria are set for day, evening and night time periods to protect the amenity of neighbouring residents. Impact Assessment Criteria are expressed as LA_{10} (15min). The noise impact assessment criteria for MCO are provided in **Table 52**.

Table 52: Project Specific Noise Impact Assessment Criteria for Mining

Land Number	Day	Evening	Night	
	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{A1(1min)}$
171	38	38	37	45
All other privately owned land (outside the village of Ulan)	35	35	35	45
Ulan Primary School[1]	43 (external) when in use and under all weather conditions *35 (internal) when in use and under all weather conditions*			-
Ulan Anglican Church, Ulan Catholic Church	35 (internal) when in use and under all weather conditions			-
Goulburn River National Park, Munghorn Gap Nature Reserve	50			-

Note: Properties 22, 23, 41a, 49, 64, 169, 170, 172 and 173 have been purchased by MCO since granting of Project Approval 05_0117 and have been removed from Table 52. Property 26 is now zoned industrial land and has been removed from Table 52. Property 63 has entered into a Compensation Option Agreement with MCO since granting of the Project Approval 05_0117 and has been removed from Table 49.

Note: An independent noise study conducted at Ulan Primary School found that the difference between external and internal measurements was 8 dB(A) with windows normally open. The noise criterion as measured outside the school classrooms is therefore 43 dB(A).

Land Acquisition Criteria

The properties listed in **Table 53** must be acquired by MCO upon receiving written request from the landowner.

Table 53: Land Subject to Acquisition Upon Request

4 – M. Swords	5 – M & P Swords
134 – M.J. & H. Swords	

Note: Properties 6, 15, 20, 25, 29, 29a, 29b, 33, 36, 50, 163, 164, and 165 have been purchased by MCO since granting of Project Approval 05_0117 and have been removed from Table 53 .

If the noise generated by MCO exceeds the criteria in **Table 54** at any residence on privately owned land or on more than 25% of any privately owned land, MCO will upon receiving a written request from the landowner, acquire the land.

Table 54: Project Specific Land Acquisition Criteria

Day/Evening/Night LAeq(15min)	Land Number
43 / 43 / 42	171
40 / 40 / 40	All other private land owners not listed in Table 53

Note: Properties 22, 23, 41a, 64, 49, 169, 170, 172 and 173 have been purchased by MCO since granting of Project Approval 05_0117 and have been removed from Table 54. Property 26 is now zoned industrial land and has been removed from Table 54. Property 63 has entered into a Compensation Option Agreement with MCO since granting of the Project Approval 05_0117 and has been removed from Table 51.

Traffic Noise Impact Assessment Criteria

MCO will take all reasonable and feasible measures to ensure that the traffic noise generated by the project combined with the traffic noise generated by other mines does not exceed the traffic noise impact assessment criteria in **Table 55.**

Table 55: Traffic Noise Impact Assessment Criteria

Road	Day/Evening $L_{Aeq(1\ hour)}$	Night $L_{Aeq(1\ hour)}$
Ulan Road	60	55

Note: Traffic noise generated by the project is to be measured in accordance with the relevant procedures in the OEH's Environmental Criteria for Road Traffic Noise.

Cumulative Noise Criteria

In order to protect the amenity of local residents, both amenity and land acquisition criteria have been set for cumulative noise generated by all mining operations audible at monitoring locations. MCO will take all reasonable and feasible measures to ensure that the noise generated by the operation, combined with the noise generated by other mines does not exceed the amenity criteria in **Table 56** on any privately owned land; excluding those lands listed in **Table 53**.

Table 56: Cumulative Noise Impact Criteria

Measurement	Amenity Criteria dB(A)	Acquisition Criteria dB(A)
LAeq(11 hour)-Day	50	53
LAeq(4 hour)-Evening	45	48
LAeq(9 hour)-Night	40	43

Results – Mining

The attended noise monitoring results during the reporting period can be seen in **Table 57** to **Table 64**. The monitoring period for each of these results is 15 minutes. Wind speed and/or estimated temperature inversion conditions resulted in development consent criteria not always being applicable. When properties 64, 170 and 172 were purchased the requirement to monitor in these locations was removed.

MCO complied with the project specific criteria at all monitoring sites during the reporting period.

Table 57: Attended Noise Monitoring Results – Quarter 4 2011

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA1	06/12/2011 11:34	52	4.0	-1.8	43	N	40	NA	---	---	---	---
NA1	06/12/2011 11:56	50	3.9	-1.6	43	N	40	NA	---	---	---	---
NA1	07/12/2011 11:03	45	3.0	-1.0	43	N	NM	NA	---	---	---	---
NA1	07/12/2011 11:21	46	3.2	-1.6	43	N	NM	NA	---	---	---	---
NA3	06/12/2011 15:59	49	3.8	-1.8	38	N	IA	NA	---	---	---	---
NA3	06/12/2011 16:16	42	3.7	-1.0	38	N	IA	NA	---	---	---	---
NA3	06/12/2011 18:58	40	4.3	-1.0	38	N	IA	NA	---	---	---	---
NA3	06/12/2011 19:14	41	3.9	-1.0	38	N	IA	NA	---	---	---	---
NA3	07/12/2011 00:22	37	1.9	-1.0	37	Y	<25	Nil	45	Y	25	Nil
NA3	07/12/2011 00:38	36	2.3	-1.0	37	Y	<25	Nil	45	Y	25	Nil
NA3	07/12/2011 13:41	39	3.8	-1.0	38	N	IA	NA	---	---	---	---
NA3	07/12/2011 13:57	39	3.3	-1.8	38	N	IA	NA	---	---	---	---

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA3	14/12/2011 21:14	39	3.8	-1.0	38	N	<25	NA	---	---	---	---
NA3	14/12/2011 21:31	39	3.6	-1.0	38	N	<25	NA	---	---	---	---
NA3	14/12/2011 22:00	39	3.7	-1.0	37	N	26	NA	45	N	30	NA
NA3	14/12/2011 22:16	38	3.3	-1.0	37	N	27	NA	45	N	29	NA
NA6	06/12/2011 15:18	46	3.7	-1.9	38	N	IA	NA	---	---	---	---
NA6	06/12/2011 15:34	45	3.3	-1.8	38	N	IA	NA	---	---	---	---
NA6	06/12/2011 19:36	50	3.5	-1.0	38	N	IA	NA	---	---	---	---
NA6	06/12/2011 19:52	43	3.2	-1.0	38	N	IA	NA	---	---	---	---
NA6	06/12/2011 23:35	32	1.9	-1.0	37	Y	28	Nil	45	Y	32	Nil
NA6	06/12/2011 23:53	33	2.0	-1.0	37	Y	29	Nil	45	Y	30	Nil
NA6	07/12/2011 14:20	44	3.5	-1.6	38	N	IA	NA	---	---	---	---
NA6	07/12/2011 14:36	41	3.5	-1.0	38	N	IA	NA	---	---	---	---
NA6	14/12/2011 20:33	44	4.3	-1.0	38	N	<25	NA	---	---	---	---

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA6	14/12/2011 20:50	42	3.8	-1.0	38	N	<25	NA	---	---	---	---
NA6	14/12/2011 22:41	39	3.0	-1.0	37	N	27	NA	45	N	29	NA
NA6	14/12/2011 23:02	40	2.9	-1.0	37	Y	28	Nil	45	Y	30	Nil
NA8	06/12/2011 16:52	44	3.5	-1.6	38	N	IA	NA	---	---	---	---
NA8	06/12/2011 17:08	43	4.5	-1.6	38	N	IA	NA	---	---	---	---
NA8	06/12/2011 21:09	33	2.7	-1.0	38	Y	IA	Nil	---	---	---	---
NA8	06/12/2011 21:26	37	2.9	-1.0	38	Y	IA	Nil	---	---	---	---
NA8	06/12/2011 22:00	36	3.3	-1.0	37	N	IA	NA	45	N	IA	NA
NA8	06/12/2011 22:16	36	2.7	-1.0	37	Y	IA	Nil	45	Y	IA	Nil
NA8	07/12/2011 13:00	45	3.6	-1.6	38	N	IA	NA	---	---	---	---
NA8	07/12/2011 13:16	48	3.8	-1.6	38	N	IA	NA	---	---	---	---
NA8	14/12/2011 19:05	39	3.2	-1.0	38	N	IA	NA	---	---	---	---
NA8	14/12/2011 19:21	40	2.8	-1.0	38	Y	IA	Nil	---	---	---	---

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA8	15/12/2011 00:14	44	2.9	-1.0	37	Y	IA	Nil	45	Y	IA	Nil
NA8	15/12/2011 00:31	43	2.4	-1.0	37	Y	IA	Nil	45	Y	IA	Nil

1. *Wind speed in metres per second;*
2. *VTG - Vertical temperature gradient in degrees Celsius per 100 metres altitude. Estimated from wind speed and sigma theta data;*
3. *The noise emission limits apply under meteorological conditions of:*
   - *Wind speeds of up to 3 m/s at 10 metres above ground level; or*
   - *Temperature inversion conditions of up to 3ºC/100m, and wind speeds of up to 2 m/s at 10 metres above ground level;*
4. *Estimated or measured L_{Aeq} dB attributed to MCO;*
5. *NM denotes MCO audible but not measurable, IA denotes inaudible;*
6. *NA in exceedance column means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable;*
7. *Bolded results in red indicate exceedance of criteria;*
8. *Atmospheric data is sourced from the MCO meteorological station;*
9. *Criteria apply under all weather conditions at this location (when in use).*

Table 58: Mining Operations – Quarter 4 2011

Day			Evening			Night		
Equipment Type	Quantity[1]	Location	Equipment Type	Quantity[1]	Location	Equipment Type	Quantity[1]	Location
Liebherr 996 excavator	1	S05B27 & S06B20	WA1200 loader	1	ROM	WA1200 loader	1	ROM
Liebherr 996 excavator	1	S04B20	EX PC450	1	MCOL (everywhere)	PC450	1	MCOL (everywhere)
WA1200 loader	1	ROM	WA200	2	MCOL (everywhere)	WA200	2	MCOL (everywhere)
PC450 excavator	1	MCOL (everywhere)	DML drill	1	S05B22	DML drill	1	S05B22
WA200	2	MCOL (everywhere)	D475 dozer	2	Dump	D475 dozer	2	Dump
DML drill	1	S05B22	D475 dozer	1	CHPP/ROM	D475 dozer	1	CHPP / ROM

Day			Evening			Night		
Equipment Type	**Quantity[1]**	**Location**	**Equipment Type**	**Quantity[1]**	**Location**	**Equipment Type**	**Quantity[1]**	**Location**
D475 dozer	2	Dump	D375 dozer	1	EX111 (coal)	D375 dozer	1	EX111 - Coal
D475 dozer	1	Rehab	D375 dozer	1	Pit support (everywhere)	D375 dozer	1	Pit support (everywhere)
D475 dozer	1	Workshop	WD900 dozer	1	MCOL (everywhere)	WD900 dozer	1	MCOL (everywhere)
D375 dozer	2	EX111 (coal)	825 grader	2	MCOL (everywhere)	825 grader	2	MCOL (everywhere)
D375 dozer	1	Dump	785 water truck	1	MCOL (everywhere)	785 water truck	1	MCOL (everywhere)
D375 dozer	1	Dump @450 / 455RL	Komatsu 830E RDT	4	EX101 to dump at 480RL	Komatsu 830E RDT	4	EX101 to dump at 480RL
WD900 dozer	1	MCOL (everywhere)	Komatsu 830E RDT	5	EX102 to dump	Komatsu 830E RDT	5	EX102 to dump
825 grader	2	MCOL (everywhere)	Komatsu 830E RDT	1	Rejects	Komatsu 830E RDT	1	Rejects
785 water truck	1	MCOL (everywhere)						
Komatsu 830E RDT	4	EX101 to dump at 480RL						
Komatsu 830E RDT	5	EX102 to dump						
Komatsu 830E RDT	1	Rejects						
Other Activities			**Other Activities**			**Other Activities**		
Pumping	-	Pit and fill points	Train loading	-	Active	CHPP Operations	-	Active
Train loading	-	Active	CHPP Operations	-	Active	Pumping	-	Pit and fill points
CHPP Operations	-	Active	Pumping	-	Pit and fill points			

Table 59: Attended Noise Monitoring Results – Quarter 1 2012

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA1	06/03/2012 12:45	47	3.6	-1.9	43	N	IA	NA	---	---	---	---
NA1	06/03/2012 13:00	47	3.8	-1.9	43	N	<30	NA	---	---	---	---
NA1	07/03/2012 12:51	44	2.3	-1.9	43	Y	38	Nil	---	---	---	---
NA1	07/03/2012 13:07	44	2.3	-1.9	43	Y	38	Nil	---	---	---	---
NA3	06/03/2012 13:48	41	3.5	-1.8	38	N	IA	NA	---	---	---	---
NA3	06/03/2012 14:04	38	3.8	-1.9	38	N	IA	NA	---	---	---	---
NA3	06/03/2012 20:16	38	2.7	0.5	38	N	<20	NA	---	---	---	---
NA3	06/03/2012 20:32	36	2.3	3.0	38	N	23	NA	---	---	---	---
NA3	06/03/2012 22:35	34	1.5	3.0	37	N	23	NA	45	N	26	NA
NA3	06/03/2012 22:52	33	1.6	0.5	37	Y	25	Nil	45	Y	28	Nil
NA3	07/03/2012 11:30	40	3.0	-1.9	38	N	IA	NA	---	---	---	---
NA3	07/03/2012 11:46	45	4.0	-1.6	38	N	IA	NA	---	---	---	---

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA3	07/03/2012 20:06	33	0.8	-1.0	38	Y	IA	Nil	---	---	---	---
NA3	07/03/2012 20:22	31	0.9	0.5	38	Y	<20	Nil	---	---	---	---
NA3	07/03/2012 22:34	37	2.3	3.0	37	N	<20	NA	45	N	<20	NA
NA3	07/03/2012 22:49	33	1.6	3.0	37	N	<20	NA	45	N	<20	NA
NA6	06/03/2012 14:25	43	2.3	-1.9	38	Y	IA	Nil	---	---	---	---
NA6	06/03/2012 14:41	42	1.9	-1.9	38	Y	IA	Nil	---	---	---	---
NA6	06/03/2012 19:36	52	2.8	-1.0	38	Y	<20	Nil	---	---	---	---
NA6	06/03/2012 19:54	49	2.7	-1.0	38	Y	<20	Nil	---	---	---	---
NA6	06/03/2012 22:00	43	1.8	3.0	37	N	<20	NA	45	N	23	NA
NA6	06/03/2012 22:15	44	2.1	3.0	37	N	23	NA	45	N	25	NA
NA6	07/03/2012 12:06	38	3.7	-1.8	38	N	IA	NA	---	---	---	---
NA6	07/03/2012 12:23	40	2.1	-1.9	38	Y	IA	Nil	---	---	---	---
NA6	07/03/2012 19:27	47	1.1	3.0	38	N	25	NA	---	---	---	---

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA6	07/03/2012 19:43	50	1.1	0.5	38	Y	<20	Nil	---	---	---	---
NA6	07/03/2012 22:00	38	2.0	0.5	37	N	<20	NA	45	N	<20	NA
NA6	07/03/2012 22:15	38	2.0	0.5	37	N	<20	NA	45	N	22	NA
NA8	06/03/2012 15:15	36	2.4	-1.9	38	Y	IA	Nil	---	---	---	---
NA8	06/03/2012 15:30	45	2.4	-1.9	38	Y	IA	Nil	---	---	---	---
NA8	06/03/2012 20:57	44	2.5	0.5	38	N	IA	NA	---	---	---	---
NA8	06/03/2012 21:14	43	2.2	3.0	38	N	IA	NA	---	---	---	---
NA8	06/03/2012 23:16	38	1.3	0.5	37	Y	IA	Nil	45	Y	IA	Nil
NA8	06/03/2012 23:31	37	1.3	0.5	37	Y	IA	Nil	45	Y	IA	Nil
NA8	07/03/2012 10:49	37	3.7	-1.8	38	N	IA	NA	---	---	---	---
NA8	07/03/2012 11:05	36	3.5	-1.9	38	N	IA	NA	---	---	---	---
NA8	07/03/2012 20:49	40	1.5	0.5	38	Y	IA	Nil	---	---	---	---
NA8	07/03/2012 21:05	38	1.4	0.5	38	Y	IA	Nil	---	---	---	---

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA8	07/03/2012 23:14	33	1.1	3.0	37	N	IA	NA	45	N	IA	NA
NA8	07/03/2012 23:29	33	0.4	3.0	37	N	IA	NA	45	N	IA	NA

1. *Wind speed in metres per second;*
2. *VTG - Vertical temperature gradient in degrees Celsius per 100 metres altitude. Estimated from wind speed and sigma theta data;*
3. *The noise emission limits apply under meteorological conditions of:*
   - *Wind speeds of up to 3 m/s at 10 metres above ground level; or*
   - *Temperature inversion conditions of up to 3ºC/100m, and wind speeds of up to 2 m/s at 10 metres above ground level;*
4. *Estimated or measured L_{Aeq} dB attributed to MCO;*
5. *NM denotes MCO audible but not measurable, IA denotes inaudible;*
6. *NA in exceedance column means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable;*
7. *Bolded results in red indicate exceedance of criteria;*
8. *Atmospheric data is sourced from the MCO meteorological station;*
9. *Criteria apply under all weather conditions at this location (when in use).*

Table 60: Mining Operations – Quarter 1 2012

Day			Evening			Night		
Equipment Type	Quantity[1]	Location	Equipment Type	Quantity[1]	Location	Equipment Type	Quantity[1]	Location
Liebherr 996 excavator	1	S02B20	Liebherr 996 excavator	1	S02B20	Liebherr 996 excavator	1	S02B20
Liebherr 996 excavator	1	S02 (ROM Road)	Liebherr 996 excavator	1	S02 (ROM Road)	Liebherr 996 excavator	1	S02 (ROM Road)
Liebherr 9350 excavator	1	S05B27/28	Liebherr 9350 excavator	1	S05B27/28	Liebherr 9350 excavator	1	S05B27/28
WA200	1	ROM	WA200	Roads and Drill Prep	Roads & Drill Prep	WA200	Roads and Drill Prep	Roads & Drill Prep
WA1200	1	Roads	WA1200	1	ROM Support	WA1200	1	ROM Support
DML drill	2	S05 Overburden S06 Overburden	DML Drill	1	S04 Coal	DML Drill	1	S04 Coal S05 Overburden

Day			Evening			Night		
Equipment Type	**Quantity[1]**	**Location**	**Equipment Type**	**Quantity[1]**	**Location**	**Equipment Type**	**Quantity[1]**	**Location**
D475 dozer	1	S03 Drill Prep	D475 dozer	4	Drill Prep Ex101 Floor EX102 Support	D375 dozer	1	EX111 Support
D475 dozer	2	S01 (102 Dump) S05B27 Coal	D375 dozer	3	EX111 Floor Projects	D375 dozer	3	EX111 Floor Projects
D375 dozer	2	S05 (9350 assist) S05B27 Coal	825 grader	2	Roads	825 grader	1	Roads
825 grader	2	Roads	Komatsu 830E RDT	4	EX102 Support	Komatsu 830E RDT	4	EX102 Support
785 water truck	2	Roads	Komatsu 830E RDT	3	EX111 Support	Komatsu 830E RDT	3	EX111 Support
Komatsu 830E RDT	4	EX102 support	Komatsu 830E RDT	1	Reject	Komatsu 830E RDT	1	Reject
Komatsu 830E RDT	3	Reject/121 Support	785 water truck	1	Roads	785 water truck	1	Roads
Other Activities			**Other Activities**			**Other Activities**		
Train loading	-	Active (Day 2)	Train loading	-	Active (Evening 2)	Train loading	-	Active (Night 2)
CHPP Operations	-	Active	CHPP Operations	-	Active	CHPP Operations	-	Active

Table 61: Attended Noise Monitoring Results – Quarter 2 2012

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA1	17/05/2012 12:17	37	0.6	-1.9	43	Y	IA	Nil	---	---	---	---

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA1	17/05/2012 12:33	38	0.3	-1.9	43	Y	NM	Nil	---	---	---	---
NA1	18/05/2012 10:59	37	0.3	-1.9	43	Y	<30	Nil	---	---	---	---
NA1	18/05/2012 11:15	37	0.8	-1.9	43	Y	<30	Nil	---	---	---	---
NA6	16/05/2012 20:22	26	0.0	3.0	38	N	25	NA	---	---	---	---
NA6	16/05/2012 20:40	43	0.1	-1.0	38	Y	28	Nil	---	---	---	---
NA6	16/05/2012 22:47	30	0.0	4.1	38	N	30	NA	45	N	37	NA
NA6	16/05/2012 23:07	31	0.2	3.0	38	N	31	NA	45	N	36	NA
NA6	17/05/2012 11:31	35	0.6	-1.9	37	Y	IA	Nil	---	---	---	---
NA6	17/05/2012 11:47	32	0.6	-1.9	37	Y	IA	Nil	---	---	---	---
NA6	17/05/2012 20:07	40	0.4	0.5	38	Y	<25	Nil	---	---	---	---
NA6	17/05/2012 20:25	42	0.0	0.5	38	Y	<25	Nil	---	---	---	---
NA6	17/05/2012 22:50	36	0.4	0.5	38	Y	23	Nil	45	Y	29	Nil
NA6	17/05/2012 23:11	34	0.5	-1.0	38	Y	26	Nil	45	Y	31	Nil

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA6	18/05/2012 08:42	39	0.4	-1.9	37	Y	35	Nil	---	---	---	---
NA6	18/05/2012 09:01	35	0.4	-1.9	37	Y	33	Nil	---	---	---	---
NA8	16/05/2012 21:15	27	0.0	3.0	38	N	IA	NA	---	---	---	---
NA8	16/05/2012 21:33	29	0.0	3.0	38	N	NM	NA	---	---	---	---
NA8	16/05/2012 22:00	28	0.3	3.0	38	N	IA	NA	45	N	IA	NA
NA8	16/05/2012 22:16	26	0.2	3.0	38	N	IA	NA	45	N	IA	NA
NA8	17/05/2012 10:45	44	0.5	-1.9	37	Y	IA	Nil	---	---	---	---
NA8	17/05/2012 11:03	45	0.2	-1.9	37	Y	IA	Nil	---	---	---	---
NA8	17/05/2012 20:57	22	0.0	3.0	38	N	<20	NA	---	---	---	---
NA8	17/05/2012 21:15	23	0.0	0.5	38	Y	IA	Nil	---	---	---	---
NA8	17/05/2012 22:03	25	0.0	3.0	38	N	IA	NA	45	N	IA	NA
NA8	17/05/2012 22:20	24	0.3	3.0	38	N	IA	NA	45	N	IA	NA
NA8	18/05/2012 09:32	30	0.3	-1.9	37	Y	IA	Nil	---	---	---	---

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA8	18/05/2012 09:49	33	0.4	-1.9	37	Y	IA	Nil	---	---	---	---

1. *Wind speed in metres per second;*
2. *VTG - Vertical temperature gradient in degrees Celsius per 100 metres altitude. Estimated from wind speed and sigma theta data;*
3. *The noise emission limits apply under meteorological conditions of:*
   - *Wind speeds of up to 3 m/s at 10 metres above ground level; or*
   - *Temperature inversion conditions of up to 3ºC/100m, and wind speeds of up to 2 m/s at 10 metres above ground level;*
4. *Estimated or measured L_{Aeq} dB attributed to MCO;*
5. *NM denotes MCO audible but not measurable, IA denotes inaudible;*
6. *NA in exceedance column means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable;*
7. *Bolded results in red indicate exceedance of criteria;*
8. *Atmospheric data is sourced from the MCO meteorological station;*
9. *Criteria apply under all weather conditions at this location (when in use).*

Table 62: Mining Operations – Quarter 2 2012

Day			Evening			Night		
Equipment Type	Quantity[1]	Location	Equipment Type	Quantity[1]	Location	Equipment Type	Quantity[1]	Location
Liebherr 996 excavator	1	S02B10	Liebherr 996 excavator	1	S2B10	Liebherr 996 excavator	1	S2B10
Liebherr 996 excavator	1	S02B13	Liebherr 9350 excavator	1	S03B14	Liebherr 9350 excavator	1	S03B14
Liebherr 9350 excavator	1	S02B14	WA1200 loader	1	ROM	WA1200 loader	1	ROM
WA200 loader	1	S03 Overburden	DML Drill	1	S03 Overburden	DML Drill	1	S03 Overburden
WA1200 loader	1	ROM	D475 dozer	1	S04B36	D475 dozer	1	S04B36
PC450 excavator	1	Pit maintenance	D475 dozer	1	RL460/Rehab	D475 dozer	1	RL460/Rehab
DML drill	1	S02 North	D475 dozer	2	EX102 Support	D475 dozer	2	EX102 Support
D475 dozer	1	EX111 Support RL460 Rehab	D375 dozer	1	EX111 Support	D375 dozer	1	EX111 Support
D475 dozer	2	EX102 Support	D375 dozer	1	S02 Floor set up	D375 dozer	1	S02 Floor set up

Day			Evening			Night		
Equipment Type	**Quantity[1]**	**Location**	**Equipment Type**	**Quantity[1]**	**Location**	**Equipment Type**	**Quantity[1]**	**Location**
D375 dozer	1	EX101 Support	WD900 dozer	1	EX111 Support	WD900 dozer	1	EX111 Support
D375 dozer	1	EX102 Support	825 grader	3	Roads	825 grader	3	Roads
WD900 dozer	1	EX111 Support	785 water truck	1	Roads	785 water truck	1	Roads
825 grader	2	Pit maintenance / Roads	Komatsu 830E RDT	4/3	EX111 coal to ROM	Komatsu 830E RDT	4/3	EX111 coal to ROM
785 water truck	2	Roads	Komatsu 830E RDT	4/2	EX102 to RL455	Komatsu 830E RDT	4/2	EX102 to RL455
Komatsu 830E RDT	4	EX102 to RL455	Komatsu 830E RDT	1	Reject			
Komatsu 830E RDT	3	EX111 to ROM						
Other Activities			**Other Activities**			**Other Activities**		
Pumping	-	Various	Pumping	-	-	Pumping	-	-
Train loading	-	Active	CHPP Operations	-	Active	CHPP Operations	-	Active
CHPP Operations	-	Active						

Table 63: Attended Noise Monitoring Results – Quarter 3 2012

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA1	20/08/2012 13:16	42	0.8	-1.9	43	Y	IA	Nil	---	---	---	---
NA1	20/08/2012 13:31	44	1.2	-1.9	43	Y	IA	Nil	---	---	---	---
NA1	21/08/2012 11:39	42	1.4	-1.9	43	Y	IA	Nil	---	---	---	---

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA1	21/08/2012 11:54	44	1.7	-1.9	43	Y	IA	Nil	---	---	---	---
NA6	20/08/2012 13:56	35	0.8	-1.9	38	Y	IA	Nil	---	---	---	---
NA6	20/08/2012 14:11	38	1.1	-1.9	38	Y	IA	Nil	---	---	---	---
NA6	20/08/2012 21:11	37	0.2	3.0	38	N	<25	NA	---	---	---	---
NA6	20/08/2012 21:26	39	0.0	3.0	38	N	26	NA	---	---	---	---
NA6	20/08/2012 22:41	38	0.0	3.0	37	N	<20	NA	45	N	<20	NA
NA6	20/08/2012 22:56	30	0.0	-1.0	37	Y	IA	Nil	45	Y	IA	Nil
NA6	21/08/2012 12:19	36	1.8	-1.9	38	Y	IA	Nil	---	---	---	---
NA6	21/08/2012 12:34	45	1.3	-1.9	38	Y	IA	Nil	---	---	---	---
NA6	21/08/2012 21:12	39	0.6	-1.0	38	Y	30	Nil	---	---	---	---
NA6	21/08/2012 21:28	45	0.2	0.5	38	Y	30	Nil	---	---	---	---
NA6	21/08/2012 22:44	42	0.0	0.5	37	Y	31	Nil	45	Y	32	Nil
NA6	21/08/2012 23:01	40	0.0	3.0	37	N	30	NA	45	N	32	NA

Location	Start Date/Time	Total L_{Aeq} dB	Wind Speed [1,8]	VTG [2,8]	$L_{Aeq(15min)}$ Criterion dB	Criterion Applies? [2]	MCO L_{Aeq} dB [4,5]	Exceedance [6]	$L_{A1(1min)}$ Criterion dB	Criterion Applies? [2]	MCO $L_{A1(1\ min)}$ dB [4,5]	Exceedance [6]
NA8	20/08/2012 14:37	38	0.8	-1.9	38	Y	IA	Nil	---	---	---	---
NA8	20/08/2012 14:53	40	0.7	-1.9	38	Y	IA	Nil	---	---	---	---
NA8	20/08/2012 20:29	26	0.2	0.5	38	Y	<25	Nil	---	---	---	---
NA8	20/08/2012 20:44	24	0.5	3.0	38	N	<25	NA	---	---	---	---
NA8	20/08/2012 22:00	25	0.0	3.0	37	N	<20	NA	45	N	<20	NA
NA8	20/08/2012 22:16	28	0.0	3.0	37	N	<20	NA	45	N	<20	NA
NA8	21/08/2012 13:01	40	2.3	-1.9	38	Y	IA	Nil	---	---	---	---
NA8	21/08/2012 13:17	51	2.4	-1.9	38	Y	IA	Nil	---	---	---	---
NA8	21/08/2012 20:25	38	0.1	3.0	38	N	IA	NA	---	---	---	---
NA8	21/08/2012 20:41	35	0.3	-1.0	38	Y	IA	Nil	---	---	---	---
NA8	21/08/2012 22:00	31	0.1	3.0	37	N	IA	NA	45	N	IA	NA
NA8	21/08/2012 22:16	30	0.0	3.0	37	N	IA	NA	45	N	IA	NA

1. *Wind speed in metres per second;*
2. *VTG - Vertical temperature gradient in degrees Celsius per 100 metres altitude. Estimated from wind speed and sigma theta data;*
3. *The noise emission limits apply under meteorological conditions of:*
   - Wind speeds of up to 3 m/s at 10 metres above ground level; or

- Temperature inversion conditions of up to 3ºC/100m, and wind speeds of up to 2 m/s at 10 metres above ground level;

4. *Estimated or measured L_{Aeq} dB attributed to MCO;*
5. *NM denotes MCO audible but not measurable, IA denotes inaudible;*
6. *NA in exceedance column means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable;*
7. *Bolded results in red indicate exceedance of criteria;*
8. *Atmospheric data is sourced from the MCO meteorological station;*
9. *Criteria apply under all weather conditions at this location (when in use).*

Table 64: Mining Operations – Quarter 3 2012

Day			Evening			Night		
Equipment Type	**Quantity[1]**	**Location**	**Equipment Type**	**Quantity[1]**	**Location**	**Equipment Type**	**Quantity[1]**	**Location**
Liebherr 996 excavator	1	S03B16	Liebherr 996 excavator	1	S03B16	Liebherr 996 excavator	1	S03B21
Liebherr 996 excavator	1	S05B36	Liebherr 996 excavator	1	S05B36	Liebherr 996 excavator	1	S05B36
Liebherr 9350 excavator	1	S02B14/15	Liebherr 9350 excavator	1	S02B14/15	Liebherr 9350 excavator	1	S02B15
FEL WA200	1	S03B13	FEL WA200	1	S03B13	FEL WA200	1	S03B13
FEL WA1200	1	S02B01	FEL WA1200	1	S06B17	FEL WA1200	1	S06B17
D475 dozer	1	EX102 Support	D475 dozer	1	EX102 Support	D475 dozer	1	EX102 Support
D475 dozer	1	EX111 Support	D475 dozer	1	EX111 Support	D475 dozer	1	EX111 Support
D475 dozer	1	LDR 121 Support	D475 dozer	1	LDR 121 Support	D475 dozer	1	LDR 121 Support
D475 dozer	1	S06B19 Drill Prep	D475 dozer	1	S06B19 Drill Prep	D475 dozer	1	S06B19 Drill Prep
D375 dozer	1	EX111 Support	D375 dozer	1	EX111 Support	D375 dozer	1	EX111 Support
D375 dozer	1	EX102 Support	D375 dozer	1	EX102 Support	D375 dozer	1	EX102 Support
Grader 825	2	Roads	Grader 825	2	Roads	Grader 825	2	Roads
Water Truck 785	1	Roads	Water Truck 785	1	Roads	Water Truck 785	1	Roads
Komatsu 830E RDT	3	EX102	Komatsu 830E RDT	3	EX102	Komatsu 830E RDT	3	EX102
Komatsu 830E RDT	3	EX111	Komatsu 830E RDT	3	EX111	Komatsu 830E RDT	3	EX111

Day			Evening			Night		
Equipment Type	**Quantity[1]**	**Location**	**Equipment Type**	**Quantity[1]**	**Location**	**Equipment Type**	**Quantity[1]**	**Location**
Komatsu 830E RDT	2	Rejects	Komatsu 830E RDT	2	Rejects	Komatsu 830E RDT	2	Rejects
Other Activities			**Other Activities**			**Other Activities**		
Pumping	-	Various	Pumping	-	-	Pumping	-	-
Train loading	-	Active	CHPP Operations	-	Active	CHPP Operations	-	Active
CHPP Operations	-	Active						

Results – Road Traffic

Road traffic noise assessments were undertaken on 14th December 2011 and 6th June 2012 with the results being shown in **Table 65**. The monitoring period for each of these events is 1 hour. MCO complied with the project specific criteria during this monitoring period.

Table 65: Road Traffic Noise Monitoring

Location	Start Date/Time	Criteria[2]	Measured $L_{Aeq(1\ hour)}$ dB[1]	Exceedance	Northbound Traffic Count	Southbound Traffic Count
RT1	14/12/11 06:30	55/60	51	Nil	201	35
RT1	06/06/12 06:30	55/60	53	Nil	NA	NA

1. *Measured LAeq(1 hour) may include contributions from road traffic not associated with MCO*
2. *Criteria presented are for night/day respectively*
3. *NA denotes not available.*

The measured $L_{Aeq\ (1\ hour)}$ conservatively includes contributions from all noise sources received at the monitoring location during the monitoring period. As the monitoring period straddles the shoulder period between night and day; measured levels have been assessed against both day and night criteria.

3.13.3 Comparison to Predicted Levels

Results – Mining

The noise predictions for Year 2 of the mining operations in the Environmental Assessment can be seen in **Table 66**. Year 2 has been chosen as it is the most reflective of the current mining operations at MCO. A comparison of the mining attended noise monitoring results to predictions made in the Environmental Assessment for Year 2 of mining operations can be seen in **Table 67** to **Table 70**.

Table 66: EA Predictions Under Various Weather Conditions

Location	Lapse	ENE	SW	Inversion
NA1 Ulan School[1]	35	39	35	44
NA3 Upper Ridge Rd[2]	<25	25	<25	30
NA6 Lower Ridge Rd[3]	<25	32	<25	37
NA8 South Ridge Rd[4]	<25	32	<25	37

Source: MCO EA (August 2006);
1. *Predicted levels for property 157 – Ulan Village;*
2. *Predicted levels for property 170 – Ridge Road;*
3. *Predicted levels for property 41A – Ulan Road;*
4. *Predicted levels for "all other receivers"*

Measured operational levels have been compared to the predicted levels in the EA for the relevant meteorological conditions. In the tables below, a positive difference is where the measured level is greater than the predicted level and a negative difference is where the measured levels are less than the predicted level. **Table 67** provides the difference between measured and predicted levels under lapse conditions, **Table 68** provides the difference between measured and predicted levels under ENE wind conditions, **Table 69** provides the difference between measured and predicted levels under SW wind conditions and **Table 70** provides the difference between measured and predicted levels under inversion conditions.

Table 67: Comparison to EA Predictions Under Lapse Conditions

Location	Quarter 4 2011[1,3]	Quarter 1 2012[1,3]	Quarter 2 2012[1,3]	Quarter 3 2012[1,3]
Day				
NA1 Ulan School	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR
NA3 Upper Ridge Rd	NR/NR/NR/NR	NR/NR/NR/NR	NA	NA
NA6 Lower Ridge Rd	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR
NA8 South Ridge Rd	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR

1. *NR denotes met conditions not relevant, NA is not applicable, IA denotes conditions relevant but MCO not audible during monitoring, NM denotes conditions relevant but MCO not measureable during monitoring*
2. *Daytime lapse assumes calm conditions with –1ºC/100m VTG during monitoring; and*
3. *Day 1, Measurement 1/ Day 1, Measurement 2/ Day 2 Measurement 1/Day 2, Measurement 2.*

Table 68: Comparison to EA Predictions Under ENE Wind Conditions

Location	Quarter 4 2011[1,3,4]	Quarter 1 2012[1,3,4]	Quarter 2 2012[1,3,4]	Quarter 3 2012[1,3,4]
Day				
NA1 Ulan School	+1/+1/NM/NM	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR

Location	Quarter 4 2011[1,3,4]	Quarter 1 2012[1,3,4]	Quarter 2 2012[1,3,4]	Quarter 3 2012[1,3,4]
NA3 Upper Ridge Rd	IA/NR/IA/IA	IA/NR/NR/IA	NA	NA
NA6 Lower Ridge Rd	IA/NR/IA/NR	IA/NR/IA/NR	NR/NR/NR/NR	NR/NR/NR/NR
NA8 South Ridge Rd	IA/IA/IA/IA	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR
Evening				
NA1 Ulan School	NA	NA	NA	NA
NA3 Upper Ridge Rd	IA/IA/>0/>0	>-5/-2/NR/NR	NA	NA
NA6 Lower Ridge Rd	IA/IA/NR/NR	>-12/>-12/NR/NR	-7/-4/>-7/>-7	NR/NR/-2/-2
NA8 South Ridge Rd	IA/IA/IA/IA	IA/IA/NR/NR	NR/NR/NR/NR	NR/NR/IA/IA
Night				
NA1 Ulan School	NA	NA	NA	NA
NA3 Upper Ridge Rd	>0/>0/+1/+2	-2/0/NR/NR	NA	NA
NA6 Lower Ridge Rd	NR/-3/-5/-4	NR/NR/NR/NR	NR/-1/NR/-6	NR/NR/-1/-2
NA8 South Ridge Rd	NR/IA/IA/IA	IA/IA/NR/NR	IA/NR/NR/NR	NR/NR/IA/IA

1. *NR denotes met conditions not relevant, NA denotes not applicable, IA denotes conditions relevant but MCO inaudible during monitoring, and NM denotes conditions relevant but MCO not measureable during monitoring.*
2. *ENE wind conditions assumes winds at speeds between 0.1 and 3.0 m/s from a wind direction of 45 to 90 degrees during monitoring;*
3. *Conditions relevant, however, wind speeds greater than 3 metres per second during monitoring;*
4. *Day 1, Measurement 1 / Day 1, Measurement 2 / Day 2, Measurement 1 / Day 2, Measurement 2.*

Table 69: Comparison to EA Predictions Under SW Wind Conditions

Location	Quarter 4 2011[1,3,4]	Quarter 1 2012[1,3,4]	Quarter 2 2012[1,3,4]	Quarter 3 2012[1,3,4]
Day				
NA1 Ulan School	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR
NA3 Upper Ridge Rd	NR/NR/NR/NR	NR/NR/NR/NR	NA	NA
NA6 Lower Ridge Rd	NR/NR/NR/NR	NR/NR/NR/NR	IA/NR/NR/NR	IA/NR/NR/NR
NA8 South Ridge Rd	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR	NR/IA/NR/NR
Evening				
NA1 Ulan School	NA	NA	NA	NA
NA3 Upper Ridge Rd	NR/NR/NR/NR	NR/NR/NR/NR	NA	NA
NA6 Lower Ridge Rd	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR
NA8 South Ridge Rd	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR
Night				
NA1 Ulan School	NA	NA	NA	NA

Location	Quarter 4 2011[1,3,4]	Quarter 1 2012[1,3,4]	Quarter 2 2012[1,3,4]	Quarter 3 2012[1,3,4]
Day				
NA3 Upper Ridge Rd	NR/NR/NR/NR	NR/NR/NR/NR	NA	NA
NA6 Lower Ridge Rd	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR
NA8 South Ridge Rd	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR	NR/NR/NR/NR

1. *NR denotes met conditions not relevant, NA is not applicable, IA denotes conditions relevant but MCO inaudible, NM denotes conditions relevant but MCO not measureable;*
2. *SW wind conditions assumes winds at speeds between 0.1 and 3.0 m/s from a wind direction of 202.5 to 247.5 degrees during monitoring;*
3. *Conditions relevant, however, wind speeds greater than 3 metres per second during monitoring;*
4. *Day 1, Measurement 1 / Day 1, Measurement 2 / Day 2, Measurement 1 / Day 2, Measurement 2.*

Table 70: Comparison to EA Predictions Under Inversion Conditions

Location	Quarter 4 2011[1,3]	Quarter 1 2012[1,3]	Quarter 2 2012[1,3]	Quarter 3 2012[1,3]
Evening				
NA1 Ulan School	NA	NA	NA	NA
NA3 Upper Ridge Rd	NR/NR/NR/NR	NR/-7/NR/NR	NA	NA
NA6 Lower Ridge Rd	NR/NR/NR/NR	NR/NR/-12/NR	-12/NR/NR/NR	>-12/-11/NR/NR
NA8 South Ridge Rd	NR/NR/NR/NR	NR/IA/NR/NR	IA/NM/>-15/NR	NR/>-10/IA/NR
Night				
NA1 Ulan School	NA	NA	NA	NA
NA3 Upper Ridge Rd	NR/NR/NR/NR	-7/NR/>-10/>-10	NA	NA
NA6 Lower Ridge Rd	NR/NR/NR/NR	>-17/-17/NR/NR	-7/-6/NR/NR	>-17/NR/NR/-7
NA8 South Ridge Rd	NR/NR/NR/NR	NR/NR/IA/IA	IA/IA/IA/IA	>-10/>-10/IA/IA

1. *NR denotes met conditions not relevant, NA is not applicable, IA denotes conditions relevant but MCO inaudible during monitoring, and NM denotes conditions relevant but MCO not measureable during monitoring.*
2. *Inversion conditions assumes a 3ºC/100m VTG during monitoring; and*
3. *Night 1, Measurement 1 / Night 1, Measurement 2 / Night 2, Measurement 1 / Night 2, Measurement 2.*

As shown above, a comparison of predicted and measured levels from MCO operation varies greatly. This comparison does not take into account operational activities at the time of monitoring compared to predicted scenarios.

3.13.4 Activities Next Reporting Period

Noise monitoring will continue to be undertaken with the results to be provided in the next AEMR.

Independent noise studies and acquisitions of properties will be considered on a case by case basis during the next reporting period.

3.14 VISUAL, STRAY LIGHT

Potential lighting impacts from MCO are largely limited to a night-time glow for the open cut and CHPP operations areas. To minimise impacts on neighbours lighting plants are positioned such that light is directed towards work areas and not towards private residents.

3.15 ABORIGINAL HERITAGE

3.15.1 Activities This Reporting Period

During the reporting period MCO engaged a Native Title Cultural Heritage Officer (NTCHO) as an outcome of the negotiated Ancillary Deed Agreement with the Native Title Party (North East Wiradjuri). The role of the NTCHO is to co-ordinate the implementation of the Ancillary Deed. This includes planning, co-ordinating and implementing various activities required by the Implementation Committee, co-ordinating liaison with the Aboriginal Stakeholder Groups, and undertaking other cultural heritage activities at MCO.

Meetings are held on a quarterly basis between MCO and the Implementation Committee and the Cultural Heritage Liaison Sub Committee. Progress on implementing the Ancillary Deed is discussed at these meetings.

MCO hold regular meetings with the registered Aboriginal Stakeholder Groups regarding Aboriginal heritage matters at MCO.

Training of the workforce on Aboriginal heritage continued throughout the reporting period. Posters displaying examples of Cultural Material were produced and are displayed in prominent locations around the site. Specialised presentations on Cultural Heritage have been presented at tool box talks and induction sessions for mine personnel and contractors to the mine.

A Care and Control Agreement between MCO and OEH for all artefacts salvaged from Stage 1 was finalised during the reporting period. To house these artefacts a Keeping Place has been established with the approval of all Stakeholder Groups who visited the site and approved the location.

The NTCHO provided training to the contractors involved in the revegetation of the offset areas to allow planting activities to continue in culturally sensitive areas.

3.15.2 Activities Next Reporting Period

Registered Aboriginal groups will continue to be involved in due diligence works associated with construction, exploration and mining activities.

Meetings of the Cultural Heritage Consultation Committee will continue.

3.16 EUROPEAN HERITAGE

3.16.1 Activities This Reporting Period

Site 20 is a memorial garden that MCO are required to maintain. MCO maintained the inspection program of this garden to identify any maintenance required to maintain this garden. No active management activities to this site have been required during the reporting period.

No other European Heritage management activities were undertaken during the reporting period.

3.16.2 Activities Next Reporting Period

During the next reporting period MCO will continue to maintain Site 20 (Memorial Garden).

3.17 SPONTANEOUS COMBUSTION

There have been no spontaneous combustion incidences at MCO during the reporting year.

3.18 BUSHFIRE

There were no major outbreaks of fire at MCO during the reporting period.

During the reporting period MCO finalised its Bushfire Management Plan for the site. Implementation of the plan commenced during the reporting period.

3.19 MINE SUBSIDENCE

There was no underground mining during the reporting period. Consequently, there was no subsidence associated with MCO.

3.20 HYDROCARBON CONTAMINATION

Large scale hydrocarbon storage facilities have been constructed as part of the workshop, stores and blasting facilities. These storage facilities comply with the requirements of *AS1940 – The storage and handling of flammable and combustible liquids*. Activities undertaken on site to reduce the risk of hydrocarbon contamination include:

- The main fuel tanks are self bunded meaning that if the main layer is broken a second layer is in place to stop leakage from the tanks.
- Anti-siphon pipes have been installed on the fuel tanks to stop the tanks draining in the event of a leakage.
- Installation of an oil/water separator. Pipes at the refuel area and in the workshop are plumbed to flow through the oil/water separator. The water from the vehicle wash-down bay also flows through the oil/water separator.
- Spill kits are maintained in the workshop and in service vehicles to assist in the clean up any hydrocarbon spills.
- Dry-break couplings have been installed on the hydrocarbon hoses so that they are non-drip.
- Automatic fuel shut off systems have been installed so that tanks can't be overfilled.
- A dedicated waste oil tank has been installed so that the waste oil can be removed off site and disposed off correctly.
- Refuelling procedures have been developed for guidance on how to correctly refuel equipment.

Appropriate disposal of hydrocarbons to reduce the risk of hydrocarbon contamination is managed through the integrated Waste Management Service.

3.21 METHANE DRAINAGE/VENTILATION

As there was no underground mining at MCO during the reporting period, there was no methane drainage or ventilation required.

3.22 PUBLIC SAFETY

To maintain the safety of visitors, neighbours and the general public the following measures are implemented at MCO:

- Fencing of mining lease;
- Locking gates on access roads and entries into land owned by MCO;
- Placement of signage on gates and fences; and
- Installation of boom gates at main entrances into the operations.

3.23 COMPLIANCE SUMMARY

3.23.1 Reportable Incidents This Reporting Period

Discharge Incident – September 2011

During the period 27 September 2011 to 30 September 2011 MCO received 46.6mm of rainfall. Dirty water relating to MCO's operations was managed in accordance with legislative requirements applicable to the operations whereby dirty water runoff was retained to sedimentation basins and clean water was diverted around the premises. In order to maintain freeboard in the sedimentation dams this dirty water was pumped to one of the site's main dams. During these pumping activities it was noted that some of the water was being pumped into a clean water drain leading to a clean water dam. The pump was turned off immediately following the discovery of this water flow.

It was determined during the inspection by MCO that this dam was subject to minimal overflow and that offsite impact would be nil to negligible from the incident. Following investigation and confirmation of details relating to the incident, the water was pumped from this clean water dam into one of the site's main dams in order to prevent water pumped from the sediment dam flowing offsite.

This incident was reported to the EPA with no further correspondence received.

Noise Penalty Infringement Notice (PIN) – November 2011

On 30 November 2011 MCO received a PIN from the EPA for failure to react to noise alarms and take action to reduce noise between the hours of 11:00pm on 08/11/12 and 4:00am on 09/11/12. Correspondence was sent to the EPA on 21 December 2011 showing that MCO did take action to reduce noise levels. The shift report for the applicable period details that operations, which included diggers, all trucks and dozers were shut-down by MCO during the hours 12:30am to 1:15am on 9 November 2011. Notwithstanding this, noise alarms continued to be received with noise levels above 34dB(A). Audio files recorded at the Lagoons Road monitoring station during this period clearly record audible mining activity notwithstanding that MCO's operations were shut down.

Despite this evidence and subsequent meetings with the EPA over this matter, the EPA still enforced the PIN, which MCO have paid.

Water Discharge – February 2012

On 19 February 2012 at 11:00pm approximately 30mm of rain was received over a one hour period. It was noticed that Sediment Dam 14 at the CHPP had reached full capacity and that a potential uncontrolled discharge had occurred. Further investigations conducted during daylight on 20 February 2012 indicate that an uncontrolled discharge did not occur.

This incident was reported to the EPA with no further correspondence received.

Water Discharge – March 2012

During the period 1 March 2012 to 3 March 2012 MCO received approximately 113mm of rain. On 3 March 2012 Sediment Dam 6 in Open Cut 1 reached full capacity and began to spill. MCO had pumps installed on this dam and were attempting to keep water levels below capacity, however, due to the prolonged heavy rainfall the pumps were not able to maintain the water levels in this dam. In addition, the volume and speed of water crossing the access road to Sediment Dam 6 posed a serious safety issue to pump crew personnel, which limited their access to these pumps.

The incident was reported to the EPA with no further corresponded received.

3.23.2 Update on Reportable Incidents from Previous Reporting Periods

Unlicensed Discharge – June 2009

During June 2009 there was a discharge of sediment laden water into Bora Creek during a rainfall event. This incident was caused by primary erosion and sediment control structures failing during the rainfall event. Secondary control structures in the form of silt fencing were subsequently breached by sediment laden water. A large clean water catchment was being managed on a temporary basis through the site's erosion and sediment control structures.

The prosecution for this event was finalised in March 2012 with MCO being fined $105,000 for this incident.

Discharge Incident – December 2009

During late December 2009 MCO experienced a significant rainfall event with follow up rains experienced in early January 2010. Despite the prior deployment and continual operation of a 110L/s; 6 inch pump, the volume of water being contained within a blocked section of Bora Creek on 27th December 2010 was assessed and deemed to be posing a significant risk to the integrity of the rail loop formation and site infrastructure. In the interests of preventing a greater environmental impact and minimising damage to vital infrastructure, an informed decision was made by MCO to remove a section of the blockage of Bora Creek allowing sediment laden water to be released into Bora Creek.

The prosecution for this event was finalised in April 2012 with MCO being fined $112,500 for this incident.

4.0 COMMUNITY RELATIONS

4.1 ENVIRONMENTAL COMPLAINTS

MCO has developed a Community Complaints Procedure which details how to receive, respond to, and record and action any community complaints. MCO will record specific details relating to any community complaint including;

- The location of the complaint;
- The nature of the complaint;
- The method of the complaint, e.g. telephone;
- Monitoring results, including meteorological conditions at the time of the complaint;
- Site investigation outcomes;
- Site activity and activity changes; and
- Any necessary actions assigned.

MCO maintains a 24 hour Community Hotline (1800 556 484) to respond to any complaints from neighbouring residents or interested stakeholders. The Community Hotline is advertised in the local media and is also available on the MCO website and in the community newsletters.

During the reporting period, MCO received 359 direct complaints. Whilst MCO is aware that EPA has received complaints relating to MCO's operations these complaints they have not been included in this report. A summary of the complaints and the investigation is provided in **Appendix 5**.

4.1.1 Comparison to Previous Complaints

The number and type of complaints received this reporting is compared to previous complaints in **Table 71** and **Figure 58**. The complaints during this reporting period came from 35 residents. Over 60% of the noise complaints came from only three residents. MCO have conducted additional noise monitoring at each of these locations, with all results showing that MCO are complying with relevant noise criteria. Consultation is ongoing with these complainants to address their noise concerns.

It was noted during the reporting period that above ground mining operations ramped up at a nearby mining operation and it is understood that a lot of complaints received by MCO also relate to this neighbouring mining operation.

Table 71: Comparison of Community Complaints

Reporting Period	Noise	Blasting	Dust	Lighting	Water	Other	Total
2007-2008	0	0	0	0	0	2	**2**
2008-2009	4	0	1	0	2	0	**7**
2009-2010	35	8	10	0	2	1	**56**
2010-2011	110	3	0	0	0	0	**113**
2011-2012	334	17	2	0	3	3	**359**

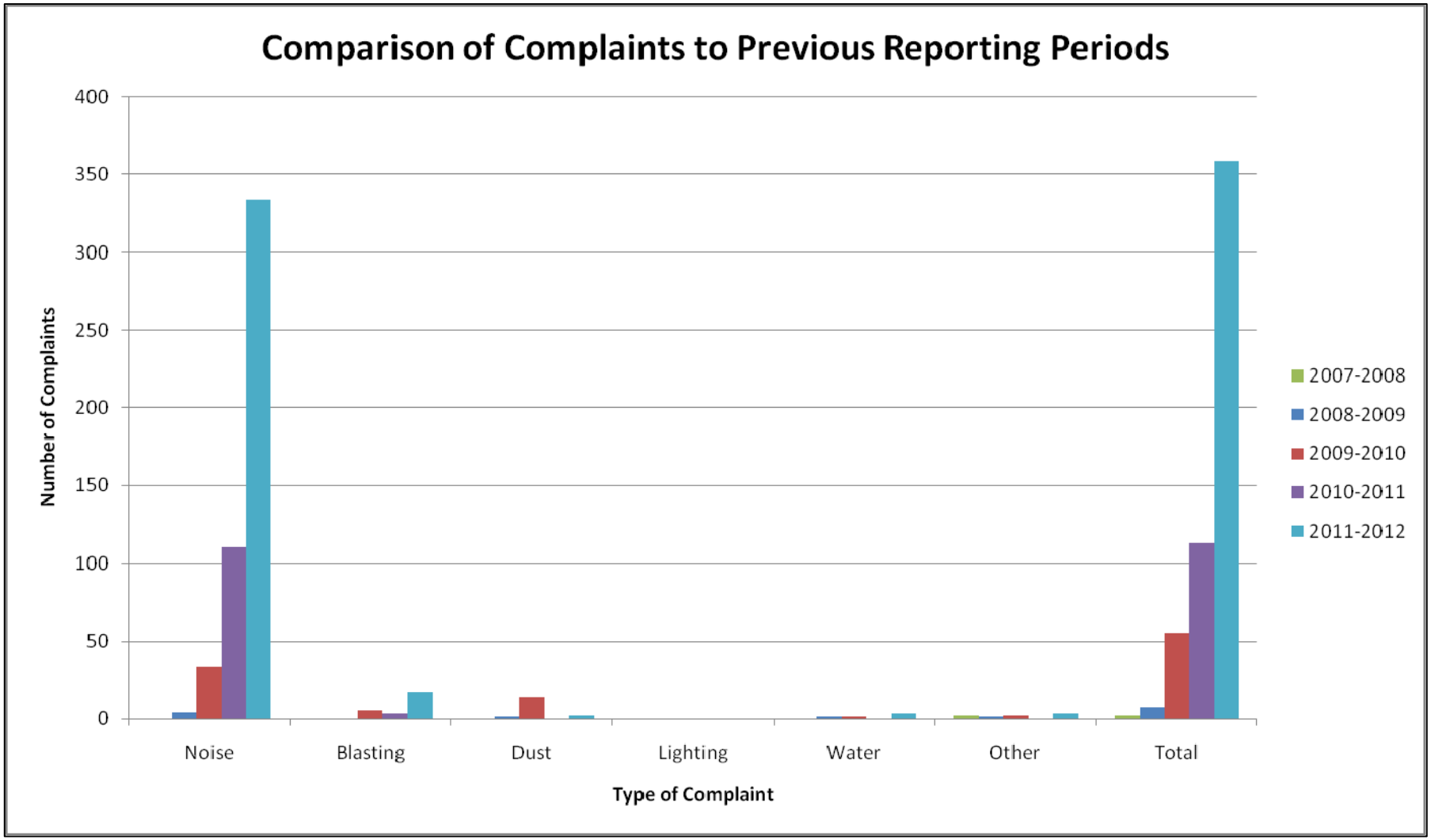


Figure 58: Comparison of Community Complaints

4.1.2 Activities Next Reporting Period

During the next reporting period MCO will continue to undertake the following actions to manage complaints:

- Continued noise attenuation of the equipment;
- Ongoing consultation with neighbouring landowners including acquisition as required;
- Ongoing training with the workforce on issues being raised through community complaints;
- Continued recording of complaints to identify trends in location of complaints, weather conditions at time of complaints and operational activities at the time of complaints; and
- Modifying operations as required (including shutting down the operations).

4.2 COMMUNITY LIAISON, SPONSORSHIPS AND DONATIONS

Community/stakeholder related activities undertaken during the reporting period include:

- Tours of the site by CCC members;
- Conducting information sessions about mining activities for parents of children at Ulan School;
- Careers talks with local school students;
- School Partnership Meeting with Department of Education and Training;
- Tours by individual local schools;
- Participation in a local job expo to promote careers in the mining industry;
- Visit by 1st year Mining Engineering students from UNSW;
- Apprenticeships career information sessions;
- Emergency Response Team members are volunteers in the Rural Fire Service;
- Provide use of MCO's training facilities to the Rural Fire Service;
- Emergency Response Team respond to offsite emergencies; and
- Mentoring students through the Max Potential Program.

Approximately $77,500 of community donations and sponsorships were provided to local groups during the reporting period. The following groups were supported:

- Cooks Gap RFS – new pagers;
- Mudgee Gymnastics – support for club;
- Cudgegong Cruisers – Mudgee Motor Fest;
- Mudgee North West Legacy – support for organisation;
- Mudgee Valley Writers – support for writing competition;
- PCYC Charity Golf Day – support for charity day;
- Rotary Club of Mudgee – Christmas Carols;
- Rylstone/Kandos Street Machine Club – yearly event;
- Cassilis Pony Club – club shirts;
- Gulgong Show Society – annual event;
- Mudgee Pony Club – jumps for cross country course;
- Newborn and Infant Emergency Transport Service – support for fundraising calendar;
- Life Skills Plus – new computers;
- Kandos High School – presentation night;

- St Matthew's School – presentation night;
- Movember – Men's Health Awareness;
- Merriwa Relay for Life – Cancer Council;
- Rotary Club of Dubbo – Science Challenge;
- Cudgegong Cruisers – Can Assist fundraiser;
- Can Assist – supporting fundraising Music Festival;
- Mudgee Health Council – Health Professionals Welcoming Function;
- Mudgee Police – sponsorship of entry in NSW Police Country Cup;
- Gulgong Skate Park Committee – support for upgrades to park including new table and shelter;
- Gulgong High School – school magazine;
- Gulgong Heritage Festival Committee – support for street parade;
- Variety Car Bash – support for entrant;
- Cudgegong Valley Antique Machinery Club – support for annual rally;
- Frontline Community Services – support for Youth Camp;
- Kidney Kar Rally – Support for two entrants;
- Prostate Cancer Foundation – fundraising event;
- Relay for Life – Cancer Council;
- Mudgee District Netball – support for club;
- Riding for Disabled – support for club;
- Mudgee Pony Club – 60th Anniversary celebrations;
- District Renta Scooter – purchase of new scooter;
- Coolah RSL – ANZAC Day luncheon;
- Gulgong Turf Club – support for race meeting;
- Rotary Club – support for Clock Awards;
- Mudgee Veteran's Golf – support for Veterans Week of Golf;
- Wings, Wheels and Wines – scholarship for aero club;
- Grassroots Rugby Festival – support for event;
- Mudgee Readers Festival – support for event;
- Kandos Rylstone Junior Rugby League Club – support for club;
- Mid-Western Regional Council – senior's garden;
- NSW Police Legacy – Child Safety Handbook; and
- Cassilis Campdraft – support for event.

In addition to the above donations, MCO also paid Mid-Western Regional Council $470,500 in accordance with the Voluntary Planning Agreement.

4.3 COMMUNITY CONSULTATIVE COMMITTEE

During the reporting period, six Community Consultative Committee (CCC) meetings were held. The CCC contains members of the local community, representatives from Mid-Western Regional Council, and representatives of MCO. These meetings are chaired by an independent chairperson and all meetings are minuted with the minutes being available publicly on the MCO website (www.moolarbencoal.com.au). A summary of the items discussed in the meetings is shown in **Table 72.**

Table 72: CCC Meetings

Meeting Date	Items Addressed
18 October 2011	Introduction of acting Environment and Community Relations Manager Ulan Road upgrade strategy Update of mining approvals (Stage 2 and exploration activities) General update on operations
13 December 2011	Presentation of 2010-2011 AEMR A Christmas dinner was provided by Moolarben Coal
14 February 2012	Tour of the Open Cut 1 area Introduction of new Environment and Community Relations Manager Air Quality Pollution Reduction Program General update on operations
17 April 2012	Update on exploration activities Discussion on the future of The Drip Update on Ulan Road strategy General update on operations
12 June 2012	Exploration drilling update Discussion on water discharges General update on operations
14 August 2012	Update on mining approvals (Stage 2 and Mining Operations Plan) General update on operations

5.0 REHABILITATION

5.1 BUILDINGS

No buildings were demolished during the reporting period.

5.2 REHABILITATION OF DISTURBED LAND – OPEN CUT

5.2.1 Activities This Reporting Period

During the reporting period MCO continued bulk reshaping of the environmental bund and dump areas for final rehabilitation with 49ha of land being rehabilitated this reporting period. This rehabilitation is consistent with the commitments in the Mining Operations Plan. Rehabilitation activities consist of bulk reshaping of overburden, installing water control systems consisting of drop structures, drainage lines, contours and sediment dams, spreading a mixture of topsoil and mulch at an approximate thickness of 100mm, deep ripping to a depth of 300mm and then spreading seed and fertiliser. The rehabilitation activities and locations of the water control systems can be seen in **Figure 59**.

All of the rehabilitation conducted to date has been on overburden spoil with the final landform proposed to be native vegetation. Depending on the location of the rehabilitation area two vegetation communities are used in the seeding mix. Box Gum Woodland is used on lower slopes and Ironbark Open Forest is used on upper slopes and elevated flat areas. This is consistent with the naturally occurring vegetation in the area. For the drainage lines, a drainage line mix is used. **Table 73** to **Table 75** show the seed mixes used on the rehabilitation program.

Table 73: Seed Mix for Box Gum Woodland

Genus	Species
Acacia	decora
	hakeoides
	polybotrya
	verniciflua
	implexa
	spectabilis
Angophora	floribunda
Dodonaea	spatulata
Eucalyptus	albens
	blakelyi
	crebra
	moluccana
Kunzea	ambigua
Leptospermum	polygalifolium
Melaleuca	thymifolia
Ghania	aspera
Austrodanthonia	sp
Aristida	sp
Cynodon	dactylon
Chloris	truncata
Millet	Millet
Fertiliser	Granulock 12
Ameliorants	As required

Table 74: Seed Mix for Ironbark Open Forest

Genus	Species
Acacia	buxifolia
	gladiformis
	uncinata
	verniciflua
	spectabilis
	ulicifolia
	penninervous
Allocasuarina	gymnanthera
	diminuta
	verticilliata
Dodonaea	viscosa
	triangularis
Eucalyptus	crebra
	dweryii
	fibrosa
	macroryncha
	parramattensis
	punctata
	rossii
	sparsifolia
	agglomerata
Hakea	dactyloides
Ghania	aspera
Callitris	endlicherii
Microlaeana	stipoides
Austrodanthonia	sp
Aristida	sp
Cynodon	dactylon
Millet	Millet
Fertiliser	Granulock 12
Ameliorants	As required

Table 75: Seed Mix for Drainage Lines

Genus	Species
Callistemon	rigidus
Leptospermum	arachnoides
	continentale
	polygalifolium
Melaleuca	thymifolia
Themeda	triandra
Microlaeana	stipoides
Cynodon	dactylon
Chloris	truncata
Millet	Millet
Fertiliser	Granulock 12
Ameliorants	As required

As rehabilitation at MCO is still in the early phases of establishment, rehabilitation monitoring hasn't commenced to establish germination success and to confirm rehabilitation objectives are being met. This monitoring will commence in the next reporting period.

5.2.2 Activities Next Reporting Period

During the next reporting period MCO plan to rehabilitate approximately 55ha of land. This rehabilitation will take place on overburden with the final land use proposed to be native vegetation. The proposed areas to be disturbed and the proposed areas to be rehabilitated are shown in **Figure 59**. This figure shows disturbance activities occurring outside of the currently approved Mining Operations Plan (MOP). MCO will update the MOP and have it approved prior to this disturbance occurring.

The rehabilitation monitoring program will be established during the next reporting period with the initial results reported in next year's AEMR.

5.3 REVEGETATION OF DISTURBED LAND – OFFSET AREAS

5.3.1 Activities This Reporting Period

During the reporting period on ground revegetation works continued in the Offset Areas. These works focused in the "Red Hills" area off Ulan-Wollar Road. The revegetation works required in the "Dexter Mountain" area off Lagoons Road were completed during the previous reporting period. A third area above "UG4" consists mostly of native vegetation with no revegetation works undertaken during the reporting period. The project approval requirements for these areas are:

- Condition 42 (b) conserve and enhance at least 2.6 hectares of regenerating White Box Yellow Box Blakely's Red Gum Grassy Woodland endangered ecological community on Property 6 ("Dexter Mountain");
- Condition 42 (c) revegetate disturbed land with at least 48 hectares of White Box Yellow Box Blakely's Red Gum endangered ecological community on Properties 6, 10, 12, 13, 14 and 15 ("Red Hills", "UG4", and "Dexter Mountain"); and
- Condition 42 (d) revegetate at least 153 hectares of cleared land on the Properties 12, 13, 14 and 15 ("Red Hills").

At the end of the reporting period the following percentages of these requirements had been met:

- Condition 42 (b) = 112%
- Condition 42 (c) = 84.8% (inclusive of natural regeneration)
- Condition 42 (d) = 62.0% (inclusive of natural regeneration)

Physical on ground works continued during the reporting period with approximately 28ha being prepared for planting. This work involved:

- Setting out areas with respect to contour lines and other site constraints;
- Slashing 2m wide strips throughout the planting area;
- Ripping up-to a depth of 600mm throughout the planting area; and
- Mounding over rip lines for planting.

All planting spots had a dish constructed on the prepared mound, a Hiko or forestry size seedling was planted with a 20 gram slow release fertiliser tablet, marked with a bamboo cane

and watered in thoroughly. Propagation of seedlings was undertaken by a local nursery using provenance seed drawn from MCO's native plant seed bank.

Table 76 lists the species and quantities planted to date. The species totals shows weighting toward the use of *Eucalyptus albens*, *Eucalyptus melliodora*, *Eucalyptus blakelyi*, *Eucalyptus crebra* and *Angophora floribunda*, as these are the dominant species found in the White Box Yellow Box Blakely's Red Gum Grassy Woodland endangered ecological community. All other species have been chosen to blend with and complement the existing native vegetation occurring within or adjacent to the planting area.

Table 76: Species Used in the Biodiversity Revegetation Program

Genus	Species	Number Planted
Acacia	*decora*	6
	implexa	390
Allocasuarina	*diminuta*	240
	luehmanii	434
Angophora	*floribunda*	796
Callistemon	*pinifolious*	905
Dodonaea	*cuneata*	155
Eucalyptus	*albens*	200
	agglomerata	217
	blakelyi	1023
	bridgesiana	744
	crebra	460
	dealbata	34
	fibrosa	524
	melliodora	735
	molucanna	1060
	punctata	115
Hakea	*dactyloides*	34
Leptospermum	*continentale*	567
	polygalifolium	733
Lomandra	*longifolia*	58
Melaleuca	*erubescens*	318
	thymifolia	638
Kunzea	*ambigua*	497

Protection of 1,282ha of existing native vegetation and 6ha of White Box Yellow Box Blakely's Red Gum Grassy Woodland endangered ecological community continued during the reporting period by limiting access through locked gates and fencing.

5.3.2 Activities Next Reporting Period

Physical protection and revegetation of the offset areas will continue during the next reporting period. Arrangements for the long-term protection and management of the offset areas will continue.

5.4 OTHER INFRASTRUCTURE

No infrastructure was required to be rehabilitated during the reporting period.

5.5 REHABILITATION TRIALS OR RESEARCH

No rehabilitation trials have been established at MCO. The outcomes of any trials that are established in the future will be reported in the relevant AEMR.

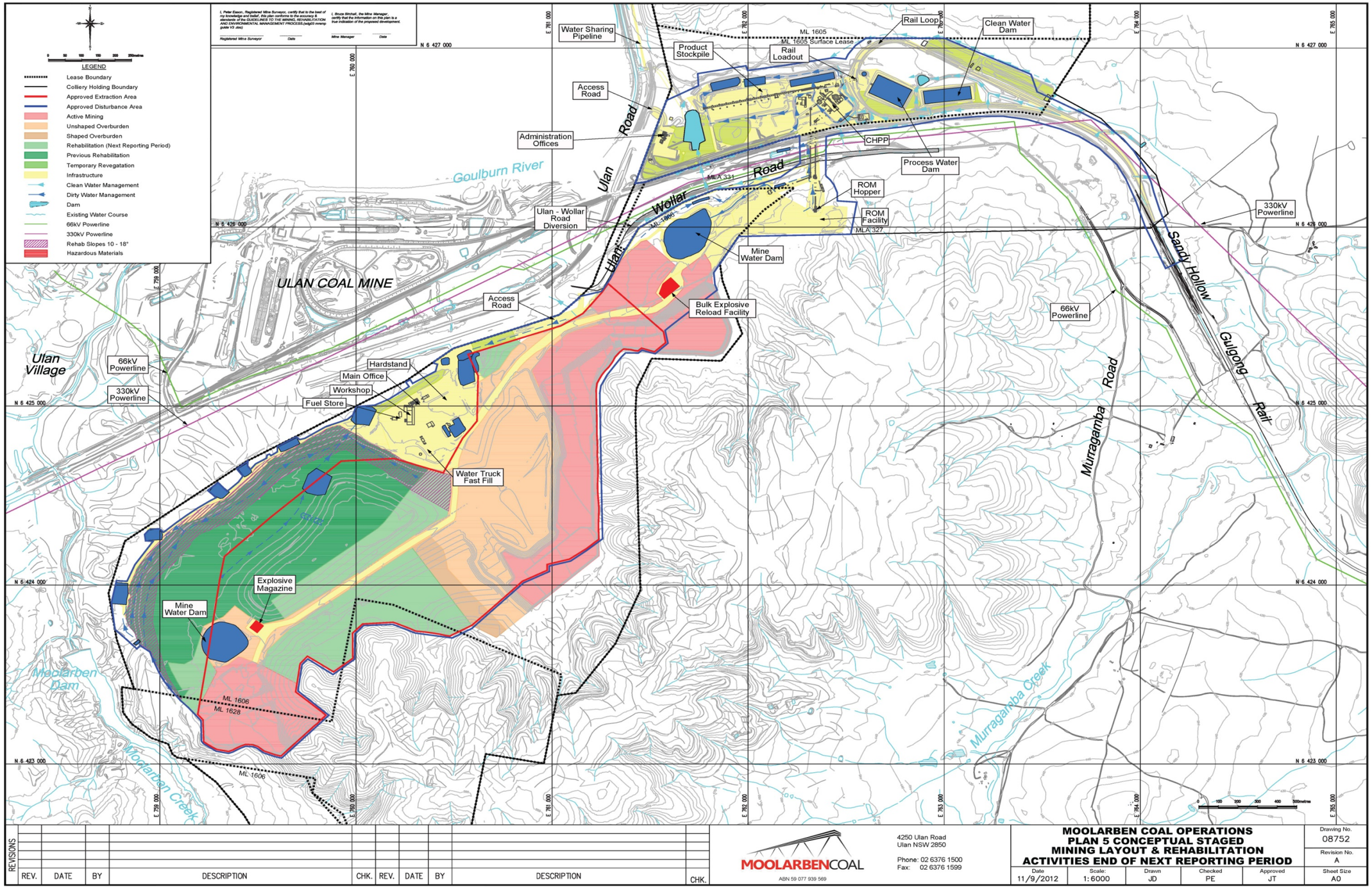


Figure 59: Proposed Disturbance Areas

5.6 REHABILITATION SUMMARY

Table 77: Rehabilitation Summary 2011-2012

	Area Affected / Rehabilitated (hectares)		
	To Date	**Last Report**	**Next Report (estimated)**
A: MINE LEASE AREA			
Mine Lease 1605	1,099.6		
Mine Lease 1606	495.4		
Total	**1,595.0**		
B: DISTURBED AREAS			
B1 Infrastructure area	124.0	135.0	118.0
B2 Active Mining Area (Excluding B3 – B5)	73.0	71.0	91.0
B3 Waste Emplacement (Active / unshaped)	94.0	101.0	70.0
B4 Tailings emplacements (active / uncapped)	0.0	0.0	0.0
B5 Shaped waste emplacement (awaits final vegetation)	12.0	0.0	7.0
ALL DISTURBED AREAS	**303.0**	**307.0**	**286.0**
C. REHABILITATION PROGRESS			
C1 Total Rehabilitated Area (except for maintenance)	94.0	45.0	149.0
D. REHABILITATION ON SLOPES			
D1 10 to 18 degrees	27.0	27.0	29.0
D2 Greater than 18 degrees	0.0	0.0	0.0
E. SURFACE OF REHABILITATED LAND			
E1 Pasture and grasses	0.0	0.0	0.0
E2 Native forest / ecosystems	94.0	45.0	149.0
E3 Plantations and crops	0.0	0.0	0.0
E4 Other (includes nonvegetative outcomes)	0.0	0.0	0.0

Note: the total disturbed areas and the surface of rehabilitated land were incorrectly reported in the last AEMR. The correct values are shown in the table above.

Table 78: Maintenance Activities on Rehabilitated Land

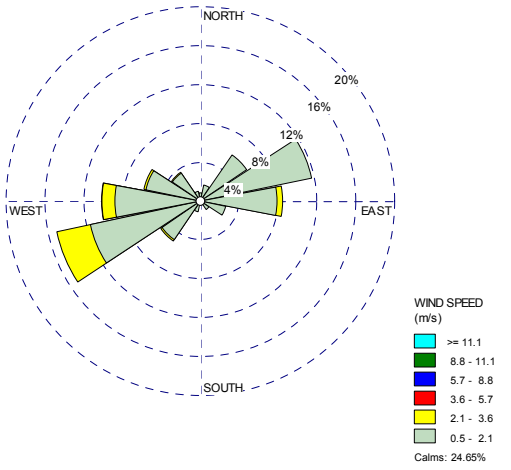
NATURE OF TREATMENT	Area Treated (ha)		Comment / control strategies / treatment detail
	Report Period	Next Period	
Additional erosion control works (drains re-contouring, rock protection)	1.0	0.0	Unknown – Erosion control works will depend on monitoring of rehabilitation areas throughout the reporting period.
Re-covering (detail – further topsoil, subsoil sealing, etc)	0.0	0.0	Unknown – Re-covering works will depend on monitoring of rehabilitation areas throughout the reporting period.
Soil treatment (detail – fertiliser, lime, gypsum, etc)	0.0	0.0	Unknown – Soil treatment works will depend on monitoring of rehabilitation areas throughout the reporting period.
Treatment / Management (detail – grazing, cropping, slashing, etc)	0.0	0.0	Not applicable - Lands rehabilitated to date do not include grazing or cropping lands.
Re-seeding / Replanting (detail – species density, season, etc)	0.0	0.0	Unknown – Re-seeding works will depend on monitoring of rehabilitation areas throughout the reporting period.
Adversely Affected by Weeds (detail – type and treatment)	0.0	0.0	Unknown – Weed control works will depend on monitoring of rehabilitation areas throughout the reporting period.
Feral animal control (detail – additional fencing, trapping, baiting, etc)	0.0	0.0	Unknown – Erosion control works will depend on monitoring of rehabilitation areas throughout the reporting period.

6.0 ACTIVITIES PROPOSED IN THE NEXT AEMR PERIOD

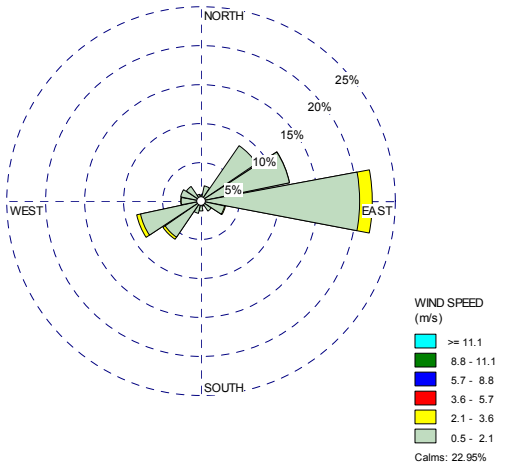
Various activities are proposed to be undertaken during the next reporting period and are anticipated to include:

- Exploration Activities;
  - OC2
  - Underground 1 and 2
  - OC4
  - EL6288 North
  - EL7073
  - OC1
  - UG3
- Commence implementation of updated water management strategy;
- On-ground revegetation works for the Biodiversity Offset Areas will continue;
- Continue installing noise attenuation on equipment; and
- Continuous improvement of the environmental management system.

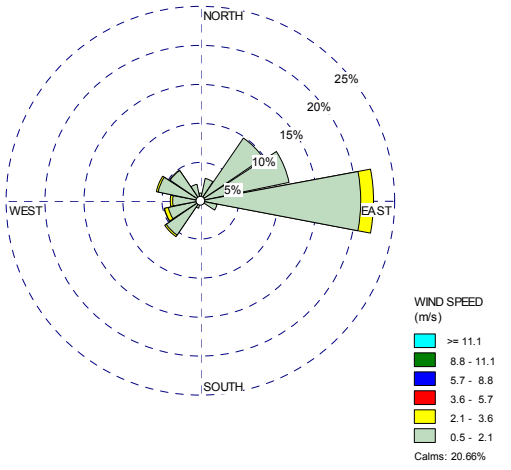
Appendix 1: Wind Rose Data



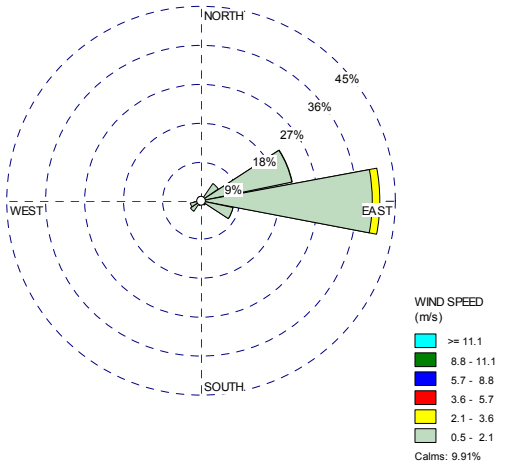
WS01 – Sep 11



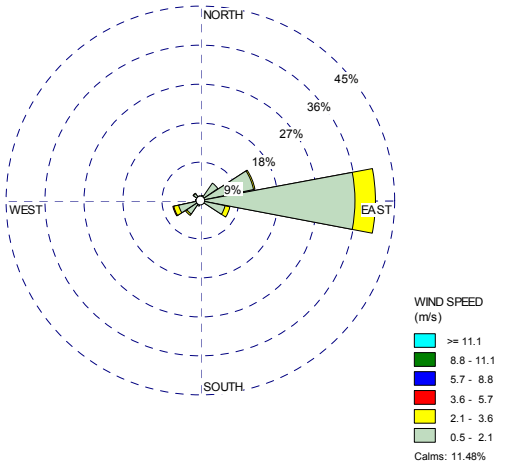
WS01 – Oct 11



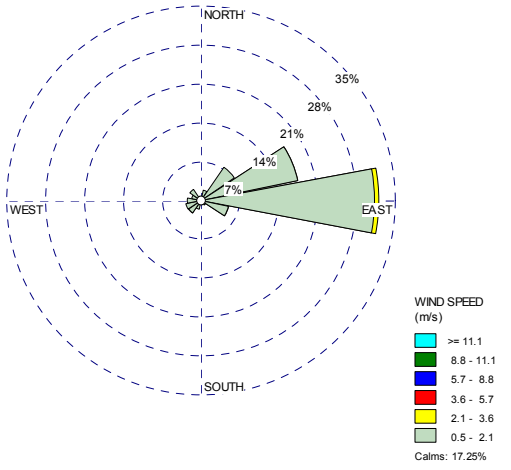
WS01 – Nov 11



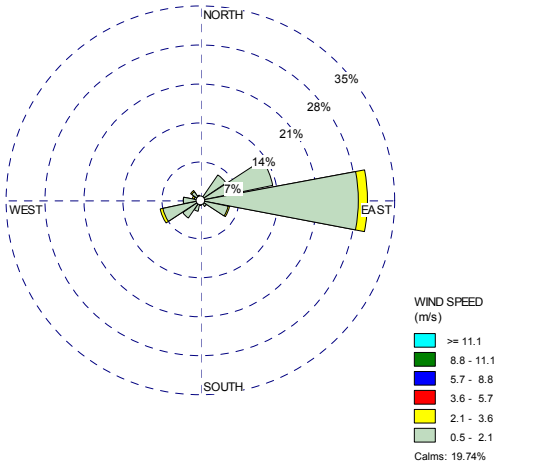
WS01 – Dec 11



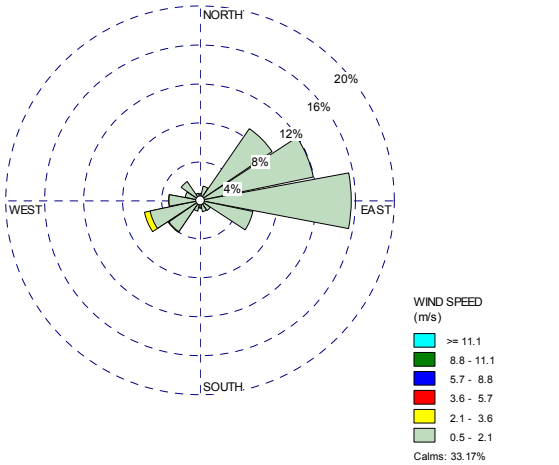
WS01 – Jan 12



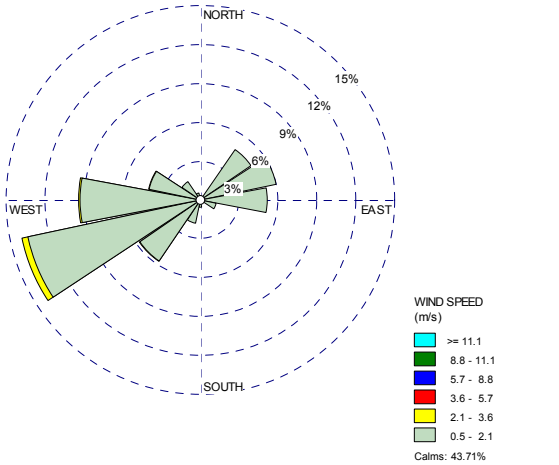
WS01 – Feb 12



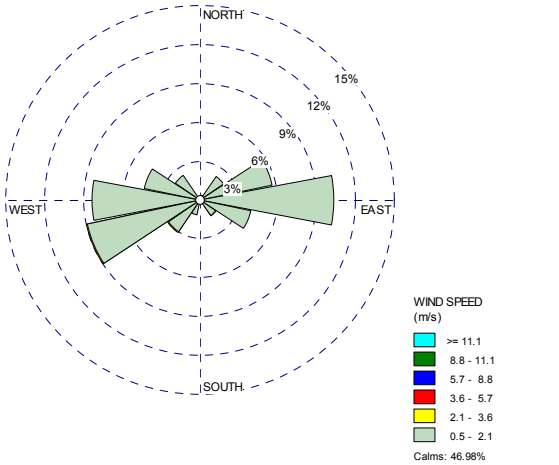
WS01 – Mar 12



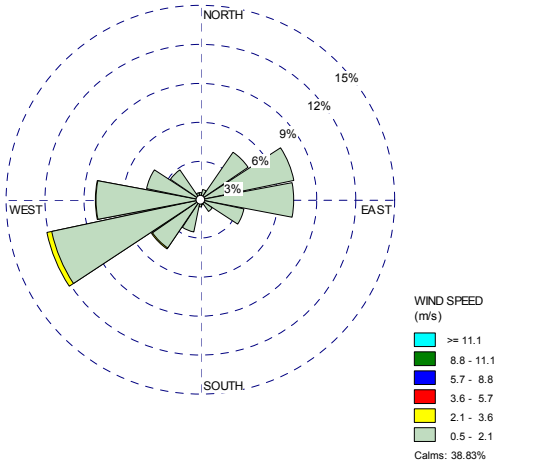
WS01 – Apr 12



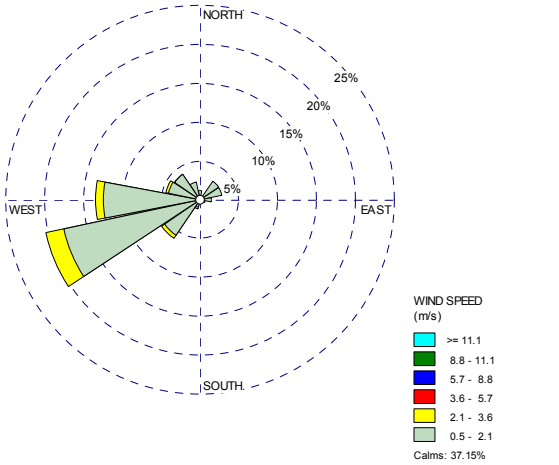
WS01 – May 12



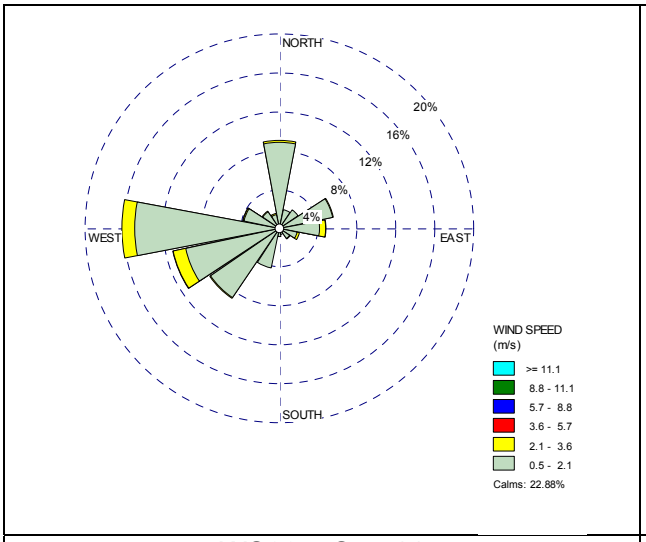
WS01 – Jun 12



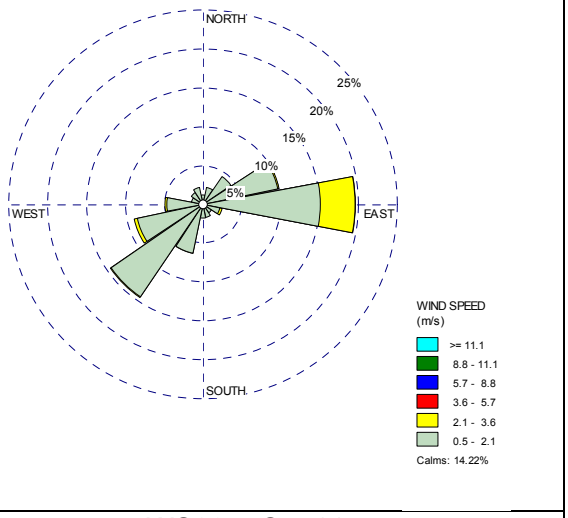
WS01 – Jul 12



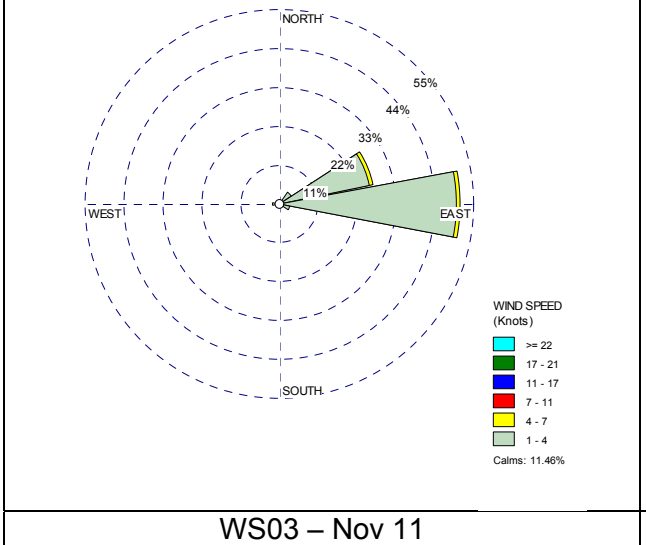
WS01 – Aug 12



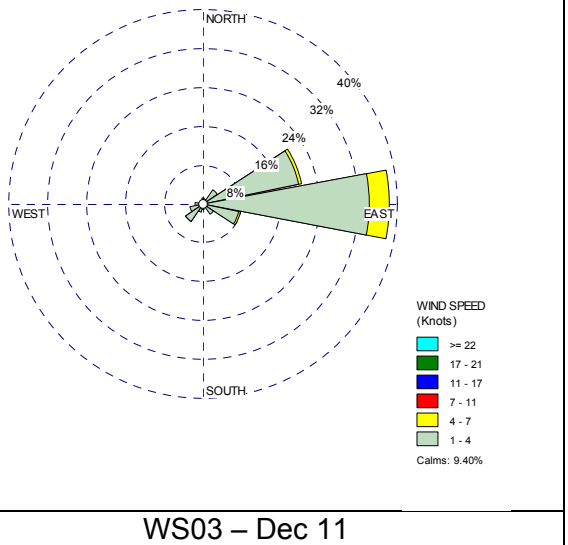
WS03 – Sep 11



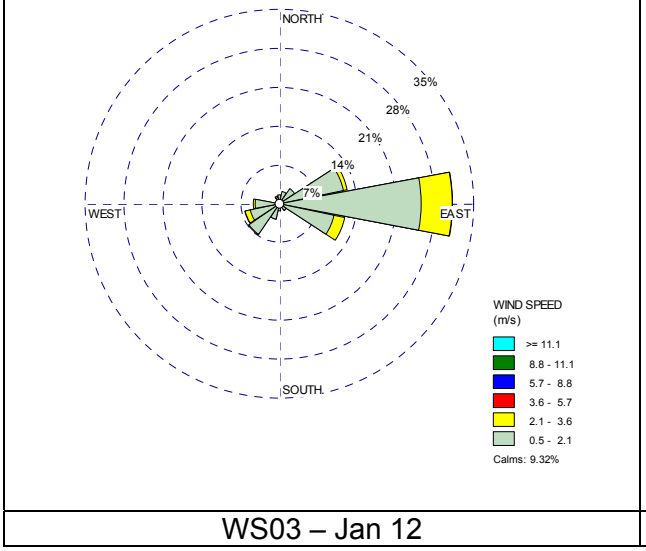
WS03 – Oct 11



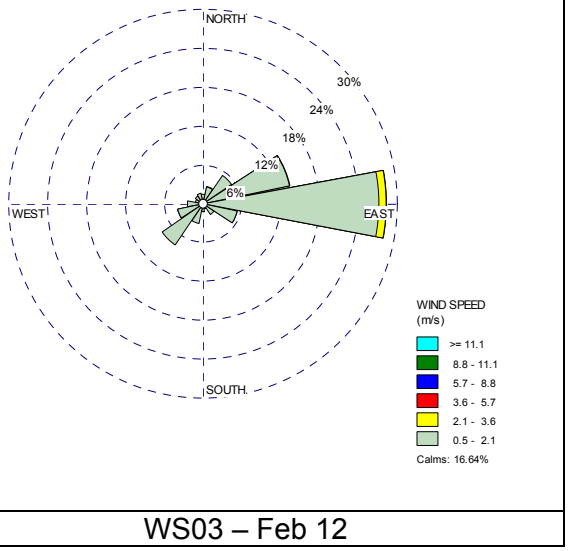
WS03 – Nov 11



WS03 – Dec 11



WS03 – Jan 12



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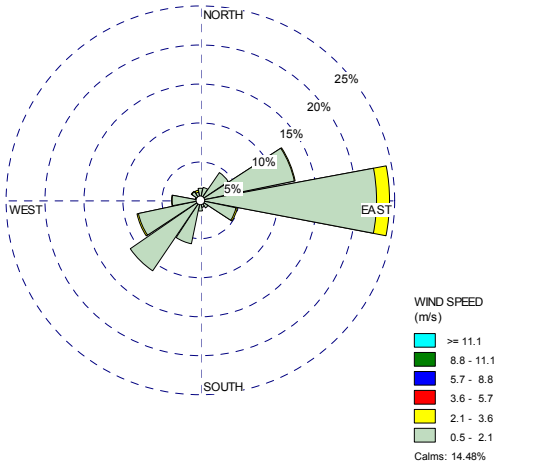
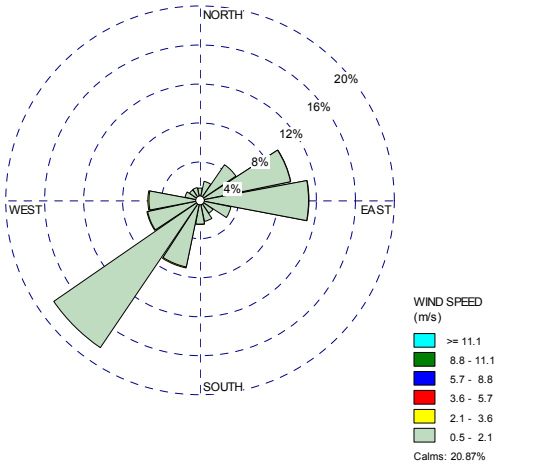
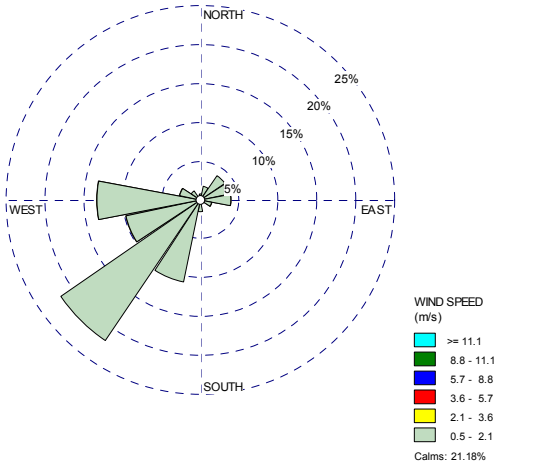


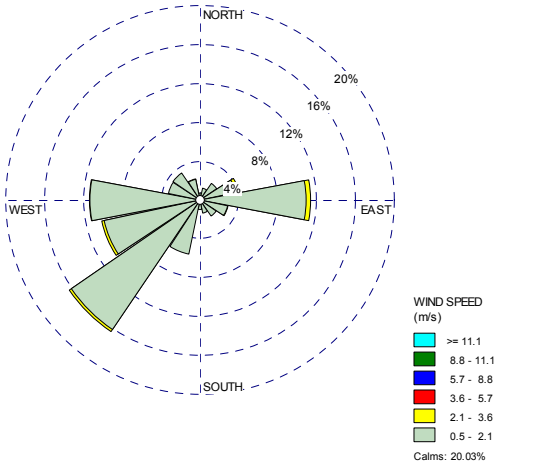
WS03 – Mar 12



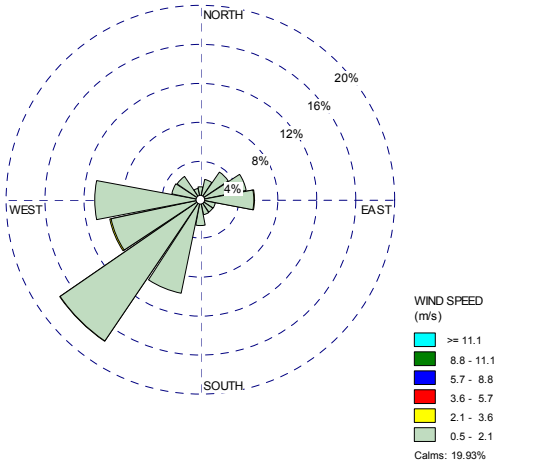
WS03 – Apr 12



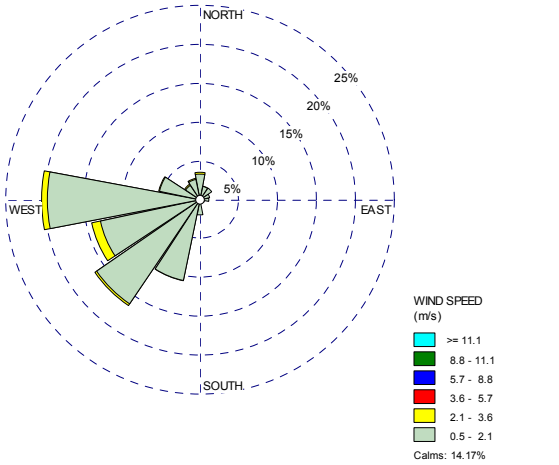
WS03 – May 12



WS03 – Jun 12



WS03 – Jul 12



WS03 – Aug 12

Appendix 2: Air Quality Monitoring Data

Real-Time PM_{10} Data

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
01/09/11	8.4	15.7	19.2	50		8.4	8.5	9.4	30
02/09/11	8.6	11.0	16.3	50		8.5	8.5	9.5	30
03/09/11	4.6	5.3	11.1	50		7.2	8.5	9.5	30
04/09/11	8.1	10.7	14.4	50		7.4	8.5	9.5	30
05/09/11	11.0	13.6	16.0	50		8.1	8.6	9.5	30
06/09/11	10.0	18.9	16.6	50		8.5	8.6	9.6	30
07/09/11	7.8	12.3	10.5	50		8.4	8.6	9.6	30
08/09/11	9.1	10.6	16.9	50		8.5	8.7	9.6	30
09/09/11	1.3	3.9	4.1	50		7.7	8.6	9.6	30
10/09/11	4.7	9.5	6.4	50		7.4	8.7	9.6	30
11/09/11	2.9	10.1	5.4	50		7.0	8.7	9.6	30
12/09/11	2.8	7.8	5.3	50		6.6	8.7	9.6	30
13/09/11	4.2	12.5	5.9	50		6.4	8.7	9.6	30
14/09/11	8.1	14.8	8.5	50		6.5	8.7	9.6	30
15/09/11	8.7	15.8	11.2	50		6.7	8.7	9.6	30
16/09/11	9.2	19.0	11.1	50		6.8	8.8	9.7	30
17/09/11	8.7	16.8	10.7	50		7.0	8.8	9.7	30
18/09/11	11.8	16.2	11.0	50		7.2	8.8	9.7	30
19/09/11	26.3	25.8	31.3	50		8.2	8.9	9.8	30
20/09/11	19.7	12.0	12.2	50		8.8	8.9	9.7	30
21/09/11	8.5	15.3	10.6	50		8.8	8.9	9.7	30
22/09/11	14.3	12.1	21.2	50		9.0	8.9	9.7	30
23/09/11	25.8	19.1	17.5	50		9.8	8.9	9.7	30
24/09/11	23.5	25.4	29.1	50		10.3	8.9	9.8	30

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
25/09/11	2.1	1.1	4.2	50		10.0	8.9	9.8	30
26/09/11	4.5	4.8	8.9	50		9.8	8.9	9.8	30
27/09/11	6.5	5.5	10.2	50		9.7	8.8	9.8	30
28/09/11	11.8	9.9	14.8	50		9.8	8.8	9.8	30
29/09/11	1.3	2.6	3.1	50		9.5	8.8	9.8	30
30/09/11	3.0	4.9	4.6	50		9.2	8.8	9.7	30
01/10/11	2.3	3.1	3.7	50		9.0	8.8	9.7	30
02/10/11	2.3	3.4	2.9	50		8.8	8.7	9.7	30
03/10/11	3.7	3.5	8.0	50		8.7	8.7	9.7	30
04/10/11	4.0	3.9	7.6	50		8.5	8.7	9.7	30
05/10/11	8.1	6.7	11.7	50		8.5	8.8	9.7	30
06/10/11	5.8	6.0	7.6	50		8.4	8.8	9.7	30
07/10/11	10.8	11.2	14.5	50		8.5	8.8	9.7	30
08/10/11	3.2	4.7	5.2	50		8.4	8.8	9.7	30
09/10/11	3.1	9.2	5.3	50		8.2	8.8	9.7	30
10/10/11	3.6	7.8	4.6	50		8.1	8.7	9.7	30
11/10/11	4.8	9.1	7.1	50		8.0	8.7	9.7	30
12/10/11	6.8	9.6	8.3	50		8.0	8.8	9.6	30
13/10/11	11.6	11.6	16.5	50		8.1	8.8	9.6	30
14/10/11	9.1	7.2	15.1	50		8.1	8.8	9.7	30
15/10/11	5.3	7.0	8.3	50		8.0	8.8	9.7	30
16/10/11	5.7	9.2	7.4	50		8.0	8.8	9.7	30
17/10/11	13.0	13.3	16.5	50		8.1	8.8	9.7	30
18/10/11	12.8	12.9	17.3	50		8.2	8.8	9.7	30
19/10/11	9.5	8.4	14.7	50		8.2	8.8	9.8	30
20/10/11	14.0	13.0	17.8	50		8.3	8.8	9.8	30
21/10/11	12.0	17.0	18.3	50		8.4	8.9	9.8	30
22/10/11	12.7	16.6	26.4	50		8.5	8.9	9.9	30

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
23/10/11	17.5	22.2	18.5	50		8.7	8.9	9.9	30
24/10/11	13.8	16.4	19.6	50		8.8	9.0	9.9	30
25/10/11	10.5	16.1	16.2	50		8.8	9.0	10.0	30
26/10/11	3.4	1.1	4.4	50		8.7	9.0	10.0	30
27/10/11	7.4	6.1	9.5	50		8.7	9.0	10.0	30
28/10/11	8.5	7.1	11.3	50		8.7	9.0	9.9	30
29/10/11	8.4	8.6	10.3	50		8.7	9.0	9.9	30
30/10/11	1.0	2.7	2.3	50		8.5	8.9	9.9	30
31/10/11	6.7	6.9	10.8	50		8.5	8.9	9.9	30
01/11/11	8.3	10.6	12.1	50		8.5	8.9	9.9	30
02/11/11	5.8	13.5	8.1	50		8.5	9.0	9.9	30
03/11/11	8.8	10.2	12.7	50		8.5	9.0	10.0	30
04/11/11	9.2	9.0	22.4	50		8.5	9.0	10.0	30
05/11/11	13.0	10.2	13.9	50		8.5	9.0	10.0	30
06/11/11	14.2	17.4	16.1	50		8.6	9.0	10.0	30
07/11/11	12.1	2.8	15.7	50		8.7	9.0	10.0	30
08/11/11	15.5	16.0	19.0	50		8.8	9.0	10.1	30
09/11/11	12.3	17.6	14.3	50		8.8	9.1	10.1	30
10/11/11	8.1	11.5	10.2	50		8.8	9.1	10.1	30
11/11/11	13.9	16.5	16.8	50		8.9	9.1	10.1	30
12/11/11	13.3	13.4	15.9	50		8.9	9.1	10.1	30
13/11/11	18.3	18.4	19.8	50		9.1	9.2	10.2	30
14/11/11	12.8	17.7	15.5	50		9.1	9.2	10.2	30
15/11/11	18.2	24.2	24.7	50		9.2	9.2	10.2	30
16/11/11	16.4	18.3	23.3	50		9.3	9.3	10.3	30

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
17/11/11	3.8	3.9	5.2	50		9.3	9.3	10.3	30
18/11/11	13.2	13.7	16.4	50		9.3	9.3	10.3	30
19/11/11	14.9	13.9	16.6	50		9.4	9.3	10.3	30
20/11/11	16.3	19.6	22.7	50		9.5	9.3	10.3	30
21/11/11	6.9	7.3	9.3	50		9.4	9.3	10.3	30
22/11/11	0.0	7.5	9.7	50		9.3	9.3	10.3	30
23/11/11	-0.1	0.9	1.4	50		9.2	9.3	10.3	30
24/11/11	1.8	2.9	3.8	50		9.1	9.3	10.2	30
25/11/11	0.0	2.4	2.2	50		9.0	9.2	10.2	30
26/11/11	1.8	3.6	1.4	50		8.9	9.2	10.1	30
27/11/11	7.0	9.5	8.2	50		8.9	9.2	10.1	30
28/11/11	8.7	9.5	13.9	50		8.9	9.2	10.1	30
29/11/11	21.2	14.9	19.6	50		9.0	9.2	10.2	30
30/11/11	10.3	12.6	14.3	50		9.1	9.3	10.2	30
01/12/11	9.7	10.4	8.2	50		9.1	9.3	10.2	30
02/12/11	8.8	6.4	9.4	50		9.1	9.3	10.2	30
03/12/11	8.2	5.3	5.9	50		9.1	9.3	10.2	30
04/12/11	10.7	11.6	9.6	50		9.1	9.3	10.3	30
05/12/11	9.6	6.6	11.7	50		9.1	9.3	10.3	30
06/12/11	9.5	6.1	9.0	50		9.1	9.3	10.3	30
07/12/11	6.5	5.4	9.4	50		9.1	9.3	10.3	30
08/12/11	3.8	3.6	4.7	50		9.0	9.3	10.3	30
09/12/11	6.7	6.9	8.4	50		9.0	9.3	10.3	30
10/12/11	5.5	5.0	6.4	50		8.9	9.3	10.3	30
11/12/11	6.6	6.6	7.4	50		8.9	9.3	10.3	30
12/12/11	2.4	3.7	3.2	50		8.9	9.3	10.3	30

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
13/12/11	8.4	8.6	9.4	50		8.9	9.3	10.3	30
14/12/11	9.9	10.6	12.9	50		8.9	9.3	10.3	30
15/12/11	14.7	14.0	15.5	50		8.9	9.3	10.3	30
16/12/11	9.3	7.7	10.0	50		8.9	9.3	10.3	30
17/12/11	10.4	10.0	12.8	50		8.9	9.3	10.3	30
18/12/11	12.5	11.6	12.8	50		9.0	9.3	10.3	30
19/12/11	12.3	11.0	15.3	50		9.0	9.3	10.4	30
20/12/11	6.3	7.0	7.8	50		9.0	9.3	10.4	30
21/12/11	12.0	13.9	10.8	50		9.0	9.3	10.4	30
22/12/11	8.3	4.5	8.5	50		9.0	9.3	10.4	30
23/12/11	4.8	4.8	5.5	50		9.0	9.3	10.3	30
24/12/11	7.6	7.2	7.3	50		8.9	9.3	10.3	30
25/12/11	5.6	6.6	6.5	50		8.9	9.2	10.3	30
26/12/11	5.2	6.2	6.7	50		8.9	9.3	10.3	30
27/12/11	6.4	7.1	8.1	50		8.9	9.3	10.3	30
28/12/11	12.7	12.6	14.1	50		8.9	9.3	10.3	30
29/12/11	10.6	10.7	11.7	50		8.9	9.3	10.3	30
30/12/11	11.6	12.0	12.7	50		8.9	9.3	10.3	30
31/12/11	10.3	7.7	12.3	50		8.9	9.3	10.3	30
01/01/12	9.9	11.1	15.0	50		9.0	9.2	10.3	30
02/01/12	11.8	13.1	19.1	50		9.0	9.3	10.3	30
03/01/12	15.3	16.3	18.1	50		9.0	9.3	10.4	30
04/01/12	16.8	27.3	19.9	50		9.1	9.4	10.4	30
05/01/12	17.7	17.6	0.6	50		9.2	9.4	10.4	30
06/01/12	7.4	9.8	10.2	50		9.1	9.4	10.4	30
07/01/12	12.8	12.6	13.3	50		9.2	9.4	10.4	30
08/01/12	No data	20.1	0.9	50	Power interruption to Ulan Road unit resulting in lost	9.2	9.4	10.4	30
09/01/12	No data	11.8	9.9	50		9.2	9.5	10.4	30

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
10/01/12	No data	14.2	12.7	50	data	9.2	9.5	10.4	30
11/01/12	No data	38.1	18.0	50		9.2	9.6	10.5	30
12/01/12	7.0	14.3	12.4	50		9.2	9.6	10.5	30
13/01/12	11.0	14.1	16.0	50		9.2	9.6	10.5	30
14/01/12	11.9	20.5	32.8	50		9.2	9.7	10.6	30
15/01/12	5.2	8.2	10.6	50		9.2	9.7	10.6	30
16/01/12	7.2	7.7	10.2	50		9.1	9.7	10.6	30
17/01/12	12.0	12.5	15.3	50		9.2	9.7	10.6	30
18/01/12	6.6	5.9	12.3	50		9.1	9.7	10.6	30
19/01/12	13.5	15.5	17.8	50		9.2	9.7	10.6	30
20/01/12	13.8	15.6	18.6	50		9.2	9.7	10.6	30
21/01/12	10.7	10.0	14.7	50		9.2	9.7	10.7	30
22/01/12	7.9	7.7	17.1	50		9.2	9.7	10.7	30
23/01/12	8.7	8.5	17.9	50		9.2	9.7	10.7	30
24/01/12	8.5	9.3	17.1	50		9.2	9.7	10.7	30
25/01/12	2.7	2.8	5.2	50		9.2	9.7	10.7	30
26/01/12	1.4	2.1	2.8	50		9.1	9.6	10.7	30
27/01/12	6.1	6.3	10.5	50		9.1	9.6	10.7	30
28/01/12	7.2	6.2	11.2	50		9.1	9.6	10.6	30
29/01/12	7.1	6.8	10.5	50		9.1	9.5	10.6	30
30/01/12	4.0	4.9	7.2	50		9.0	9.5	10.6	30
31/01/12	9.9	10.9	12.9	50		9.0	9.5	10.6	30
01/02/12	0.8	0.6	1.9	50		9.0	9.4	10.6	30
02/02/12	1.7	1.6	2.8	50		8.9	9.4	10.5	30
03/02/12	3.7	3.7	4.8	50		8.9	9.4	10.5	30
04/02/12	6.2	9.5	9.0	50		8.9	9.4	10.5	30
05/02/12	8.7	12.0	12.3	50		8.9	9.4	10.5	30
06/02/12	19.2	25.7	23.5	50		8.9	9.4	10.6	30

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
07/02/12	5.7	5.6	0.0	50		8.9	9.4	10.5	30
08/02/12	12.5	10.8	4.6	50		8.9	9.4	10.5	30
09/02/12	14.6	13.8	5.0	50		9.0	9.4	10.5	30
10/02/12	8.5	7.7	3.5	50		9.0	9.4	10.5	30
11/02/12	5.0	4.2	3.1	50		9.0	9.4	10.5	30
12/02/12	8.7	8.8	3.9	50		9.0	9.4	10.4	30
13/02/12	10.8	9.0	5.0	50		9.0	9.4	10.5	30
14/02/12	8.8	8.4	13.0	50		9.0	9.4	10.5	30
15/02/12	7.5	7.8	13.8	50		9.0	9.4	10.5	30
16/02/12	7.2	7.6	14.7	50		8.9	9.4	10.5	30
17/02/12	9.3	13.2	19.1	50		8.9	9.4	10.6	30
18/02/12	9.0	12.1	0.0	50		8.9	9.5	10.5	30
19/02/12	9.9	0.0	13.0	50		8.9	9.4	10.5	30
20/02/12	4.3	5.5	7.1	50		8.9	9.4	10.5	30
21/02/12	5.1	5.3	7.6	50		8.9	9.4	10.5	30
22/02/12	8.4	8.9	12.4	50		8.9	9.4	10.5	30
23/02/12	13.2	8.0	12.1	50		8.9	9.4	10.5	30
24/02/12	10.1	10.6	15.7	50		8.9	9.4	10.5	30
25/02/12	8.5	7.3	10.5	50		8.9	9.4	10.5	30
26/02/12	5.9	5.5	6.9	50		8.9	9.4	10.5	30
27/02/12	6.8	6.3	8.6	50		8.9	9.3	10.5	30
28/02/12	11.6	19.1	14.9	50		8.9	9.4	10.5	30
29/02/12	9.0	14.6	13.6	50		8.9	9.4	10.5	30
01/03/12	7.0	10.1	11.2	50		8.9	9.4	10.5	30
02/03/12	0.1	-0.7	-0.1	50		8.9	9.3	10.5	30
03/03/12	2.6	3.0	3.0	50		8.8	9.3	10.5	30
04/03/12	7.0	5.9	8.5	50		8.8	9.3	10.4	30
05/03/12	4.6	3.4	5.8	50		8.8	9.3	10.4	30

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
06/03/12	9.5	9.7	14.3	50		8.8	9.3	10.4	30
07/03/12	3.2	0.1	7.9	50		8.8	9.3	10.4	30
08/03/12	3.0	7.4	1.5	50		8.7	9.3	10.4	30
09/03/12	5.8	12.1	2.2	50		8.7	9.3	10.4	30
10/03/12	8.3	11.6	3.6	50		8.7	9.3	10.3	30
11/03/12	13.9	12.7	3.6	50		8.7	9.3	10.3	30
12/03/12	14.1	14.8	4.9	50		8.8	9.3	10.3	30
13/03/12	8.9	8.7	3.8	50		8.8	9.3	10.3	30
14/03/12	0.0	0.0	0.0	50		8.7	9.3	10.3	30
15/03/12	4.2	5.1	8.4	50		8.7	9.3	10.3	30
16/03/12	7.6	9.7	13.2	50		8.7	9.3	10.3	30
17/03/12	2.3	3.7	4.0	50		8.7	9.3	10.3	30
18/03/12	5.7	8.0	8.7	50		8.6	9.3	10.3	30
19/03/12	4.2	4.9	8.1	50		8.6	9.3	10.3	30
20/03/12	6.5	7.6	9.5	50		8.6	9.3	10.3	30
21/03/12	4.7	3.9	5.0	50		8.6	9.3	10.3	30
22/03/12	8.3	13.3	13.3	50		8.6	9.3	10.3	30
23/03/12	11.3	17.5	13.5	50		8.6	9.3	10.3	30
24/03/12	6.6	9.3	8.7	50		8.6	9.3	10.3	30
25/03/12	8.5	9.2	10.9	50		8.6	9.3	10.3	30
26/03/12	9.7	9.3	14.3	50		8.6	9.3	10.4	30
27/03/12	10.0	12.2	16.8	50		8.6	9.3	10.4	30
28/03/12	7.9	7.7	13.2	50		8.6	9.4	10.4	30
29/03/12	6.8	7.7	10.3	50		8.6	9.4	10.4	30
30/03/12	8.8	10.6	12.1	50		8.6	9.3	10.4	30
31/03/12	13.3	6.6	10.1	50		8.6	9.3	10.4	30
01/04/12	8.3	11.6	11.2	50		8.6	9.4	10.4	30
02/04/12	11.7	6.3	16.0	50		8.6	9.3	10.4	30

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
03/04/12	13.3	14.7	12.1	50		8.7	9.3	10.4	30
04/04/12	14.9	14.5	19.5	50		8.7	9.4	10.4	30
05/04/12	9.9	11.9	16.4	50		8.7	9.4	10.4	30
06/04/12	15.7	7.8	13.0	50		8.7	9.4	10.4	30
07/04/12	41.9	41.6	40.7	50		8.9	9.5	10.4	30
08/04/12	20.2	24.0	23.6	50		8.9	9.5	10.5	30
09/04/12	7.3	15.5	9.4	50		8.9	9.5	10.5	30
10/04/12	4.1	6.8	7.6	50		8.9	9.5	10.5	30
11/04/12	4.3	5.1	10.0	50		8.9	9.5	10.5	30
12/04/12	5.8	5.3	8.9	50		8.9	9.5	10.5	30
13/04/12	7.6	4.5	9.9	50		8.9	9.5	10.5	30
14/04/12	9.3	8.9	11.5	50		8.9	9.5	10.5	30
15/04/12	8.7	12.7	12.7	50		8.9	9.5	10.5	30
16/04/12	9.1	11.9	15.3	50		8.9	9.6	10.6	30
17/04/12	4.2	8.6	10.2	50		8.8	9.6	10.5	30
18/04/12	0.0	1.9	7.2	50		8.8	9.5	10.5	30
19/04/12	5.1	2.4	6.7	50		8.8	9.5	10.5	30
20/04/12	8.9	8.1	10.9	50		8.8	9.5	10.5	30
21/04/12	8.6	7.8	9.6	50		8.8	9.5	10.5	30
22/04/12	11.2	15.0	18.1	50		8.8	9.5	10.6	30
23/04/12	8.4	10.2	10.9	50		8.8	9.5	10.6	30
24/04/12	4.4	7.1	10.0	50		8.8	9.5	10.6	30
25/04/12	4.5	7.8	5.9	50		8.8	9.5	10.6	30
26/04/12	5.6	8.0	9.6	50		8.7	9.5	10.6	30
27/04/12	8.6	7.0	11.2	50		8.7	9.5	10.6	30
28/04/12	11.4	9.5	12.8	50		8.8	9.5	10.6	30
29/04/12	7.0	8.2	8.1	50		8.7	9.6	10.6	30
30/04/12	8.2	9.4	14.1	50		8.7	9.6	10.6	30

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
01/05/12	11.3	4.8	10.9	50		8.8	9.5	10.6	30
02/05/12	5.6	6.8	11.1	50		8.7	9.5	10.6	30
03/05/12	2.2	3.6	5.1	50		8.7	9.5	10.6	30
04/05/12	3.5	7.8	7.2	50		8.7	9.5	10.6	30
05/05/12	5.0	8.8	6.8	50		8.7	9.5	10.6	30
06/05/12	5.0	8.3	6.0	50		8.7	9.5	10.6	30
07/05/12	5.6	10.2	8.3	50		8.6	9.4	10.5	30
08/05/12	8.5	13.0	12.6	50		8.6	9.4	10.5	30
09/05/12	9.8	17.8	15.1	50		8.7	9.4	10.6	30
10/05/12	13.8	13.8	13.8	50		8.7	9.4	10.6	30
11/05/12	9.3	19.2	12.5	50		8.7	9.5	10.6	30
12/05/12	9.7	23.0	11.1	50		8.7	9.5	10.6	30
13/05/12	7.4	15.2	9.8	50		8.7	9.6	10.6	30
14/05/12	7.6	9.3	15.7	50		8.7	9.6	10.6	30
15/05/12	11.8	10.0	18.4	50		8.7	9.6	10.7	30
16/05/12	11.7	8.7	24.9	50		8.7	9.5	10.7	30
17/05/12	13.4	10.9	19.1	50		8.7	9.5	10.7	30
18/05/12	17.6	12.2	17.9	50		8.7	9.5	10.7	30
19/05/12	20.4	17.4	14.1	50		8.8	9.5	10.7	30
20/05/12	13.3	14.3	13.9	50		8.8	9.5	10.7	30
21/05/12	14.2	8.7	19.6	50		8.8	9.5	10.7	30
22/05/12	15.4	15.4	14.1	50		8.9	9.6	10.8	30
23/05/12	19.2	19.6	18.1	50		8.9	9.6	10.8	30
24/05/12	8.3	11.9	15.6	50		8.9	9.6	10.8	30
25/05/12	1.8	3.5	2.9	50		8.9	9.6	10.8	30
26/05/12	3.6	6.9	4.5	50		8.8	9.6	10.8	30
27/05/12	1.9	4.1	3.8	50		8.8	9.6	10.8	30
28/05/12	6.0	7.2	9.8	50		8.8	9.6	10.8	30

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
29/05/12	3.5	5.1	9.0	50		8.8	9.6	10.8	30
30/05/12	3.3	3.5	8.8	50		8.8	9.6	10.8	30
31/05/12	5.9	5.7	10.5	50		8.8	9.6	10.8	30
01/06/12	5.7	6.5	12.8	50		8.7	9.6	10.8	30
02/06/12	1.7	1.8	4.0	50		8.7	9.6	10.7	30
03/06/12	1.5	1.6	2.7	50		8.7	9.6	10.7	30
04/06/12	1.6	3.2	3.6	50		8.7	9.6	10.7	30
05/06/12	2.0	3.9	3.9	50		8.6	9.5	10.7	30
06/06/12	1.6	2.9	No data	50	Pump on unit at School failed during maintenance. School pump was replaced by Ulan Road unit pump until repairs were complete.	8.6	9.5	10.7	30
07/06/12	No data	3.1	No data	50		8.6	9.5	10.7	30
08/06/12	No data	2.1	2.7	50		8.6	9.5	10.7	30
09/06/12	No data	3.9	9.4	50		8.5	9.5	10.6	30
10/06/12	No data	5.5	8.3	50		8.5	9.5	10.6	30
11/06/12	No data	3.4	5.8	50		8.5	9.5	10.6	30
12/06/12	1.6	3.7	8.5	50		8.4	9.5	10.6	30
13/06/12	4.3	5.2	10.5	50		8.4	9.5	10.6	30
14/06/12	6.1	6.5	11.3	50		8.4	9.5	10.7	30
15/06/12	5.2	7.7	14.4	50		8.4	9.5	10.7	30
16/06/12	2.5	6.0	5.5	50		8.4	9.4	10.7	30
17/06/12	2.8	6.4	2.8	50		8.4	9.4	10.6	30
18/06/12	2.2	3.4	4.3	50		8.3	9.4	10.6	30
19/06/12	1.3	4.7	3.6	50		8.3	9.4	10.6	30
20/06/12	2.2	6.1	4.2	50		8.3	9.4	10.6	30
21/06/12	5.5	6.9	9.6	50		8.3	9.4	10.6	30
22/06/12	4.2	6.3	8.5	50		8.3	9.4	10.6	30
23/06/12	1.9	5.8	2.5	50		8.3	9.4	10.6	30
24/06/12	2.1	5.7	4.6	50		8.2	9.4	10.6	30
25/06/12	2.4	9.0	6.5	50		8.2	9.4	10.6	30

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
26/06/12	3.1	5.2	8.9	50		8.2	9.4	10.5	30
27/06/12	5.6	4.7	8.8	50		8.2	9.4	10.5	30
28/06/12	3.2	3.0	11.5	50		8.2	9.4	10.5	30
29/06/12	6.3	13.4	9.4	50		8.2	9.4	10.5	30
30/06/12	4.7	7.6	4.7	50		8.2	9.4	10.5	30
01/07/12	4.2	9.4	5.1	50		8.1	9.4	10.5	30
02/07/12	2.1	5.3	3.0	50		8.1	9.4	10.5	30
03/07/12	1.6	5.2	3.1	50		8.1	9.4	10.4	30
04/07/12	4.3	7.4	7.2	50		8.1	9.4	10.4	30
05/07/12	3.3	6.7	9.2	50		8.1	9.4	10.4	30
06/07/12	3.9	4.8	10.3	50		8.1	9.4	10.5	30
07/07/12	4.8	4.2	8.9	50		8.0	9.3	10.5	30
08/07/12	6.8	4.8	7.9	50		8.0	9.3	10.5	30
09/07/12	5.9	5.9	11.6	50		8.0	9.3	10.5	30
10/07/12	3.7	11.1	8.7	50		8.0	9.3	10.5	30
11/07/12	3.0	2.9	7.0	50		8.0	9.3	10.5	30
12/07/12	3.6	3.6	6.3	50		8.0	9.3	10.5	30
13/07/12	3.3	4.8	5.5	50		8.0	9.2	10.4	30
14/07/12	2.6	3.6	2.4	50		8.0	9.2	10.4	30
15/07/12	1.5	4.3	1.4	50		7.9	9.2	10.4	30
16/07/12	3.0	4.0	5.2	50		7.9	9.2	10.4	30
17/07/12	4.3	5.5	9.3	50		7.9	9.2	10.4	30
18/07/12	1.5	9.9	7.6	50		7.9	9.3	10.4	30
19/07/12	4.5	5.7	6.7	50		7.9	9.3	10.4	30
20/07/12	6.2	7.4	9.5	50		7.9	9.3	10.5	30
21/07/12	3.6	7.5	7.6	50		7.9	9.3	10.5	30
22/07/12	4.1	4.7	6.7	50		7.9	9.3	10.5	30
23/07/12	4.3	5.2	7.6	50		7.8	9.3	10.5	30

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
24/07/12	3.7	5.1	9.7	50		7.8	9.3	10.5	30
25/07/12	6.5	5.2	8.0	50		7.8	9.3	10.5	30
26/07/12	5.0	6.0	9.8	50		7.8	9.2	10.5	30
27/07/12	3.4	5.3	5.1	50		7.8	9.2	10.5	30
28/07/12	1.7	3.8	1.8	50		7.8	9.2	10.5	30
29/07/12	1.5	2.6	2.3	50		7.8	9.2	10.4	30
30/07/12	3.1	5.8	5.2	50		7.7	9.2	10.4	30
31/07/12	4.5	3.5	6.7	50		7.7	9.2	10.4	30
01/08/12	6.3	3.3	8.0	50		7.7	9.1	10.4	30
02/08/12	6.8	3.4	5.6	50		7.7	9.1	10.4	30
03/08/12	11.0	4.7	6.2	50		7.7	9.0	10.4	30
04/08/12	9.1	6.3	6.6	50		7.7	9.0	10.3	30
05/08/12	8.5	3.6	5.3	50		7.7	9.0	10.3	30
06/08/12	12.4	6.5	7.9	50		7.8	9.0	10.3	30
07/08/12	7.6	5.6	12.2	50		7.8	9.0	10.3	30
08/08/12	10.3	5.8	10.1	50		7.8	9.0	10.4	30
09/08/12	8.2	5.0	7.1	50		7.8	9.0	10.3	30
10/08/12	5.9	4.1	5.2	50		7.8	9.0	10.3	30
11/08/12	5.1	4.6	4.8	50		7.8	9.0	10.3	30
12/08/12	6.7	5.9	7.4	50		7.8	9.0	10.3	30
13/08/12	8.9	7.6	7.8	50		7.8	9.0	10.3	30
14/08/12	10.8	6.9	9.8	50		7.8	9.0	10.3	30
15/08/12	12.2	5.8	8.9	50		7.8	9.0	10.3	30
16/08/12	12.5	8.5	10.9	50		7.8	9.0	10.3	30
17/08/12	14.7	7.9	11.2	50		7.8	9.0	10.3	30
18/08/12	8.6	5.0	5.9	50		7.8	9.0	10.3	30
19/08/12	5.7	4.3	3.1	50		7.8	9.0	10.3	30
20/08/12	9.4	5.7	0.0	50		7.8	9.0	10.3	30

TEOM Data Summary									
Date	Ulan Road	Murragamba	School	24hr Average Limit (µg/m^3)	Comment	Ulan Road	Murragamba	School	Annual Average Limit (µg/m^3)
	Daily Result					Average			
21/08/12	10.3	11.7	14.1	50		7.8	9.1	10.3	30
22/08/12	12.7	12.9	19.7	50		7.8	9.1	10.3	30
23/08/12	8.3	7.4	13.1	50		7.8	9.1	10.3	30
24/08/12	8.0	3.8	7.0	50		7.8	9.1	10.3	30
25/08/12	8.8	4.3	5.5	50		7.8	9.1	10.3	30
26/08/12	4.1	2.8	3.6	50		7.8	9.0	10.3	30
27/08/12	5.8	6.7	7.7	50		7.8	9.0	10.2	30
28/08/12	9.0	12.9	12.9	50		7.8	9.0	10.2	30
29/08/12	12.1	11.6	18.7	50		7.8	9.0	10.3	30
30/08/12	12.8	8.1	17.3	50		7.9	9.0	10.3	30
31/08/12	10.1	6.4	10.4	50		7.9	9.0	10.3	30

HVAS PM_{10} Data

Sample Date	Sample Location	Particulate Matter 10 ($\mu g/m^3$)	Annual Rolling Average ($\mu g/m^3$)	Sample Location	Particulate Matter 10 ($\mu g/m^3$)	Annual Rolling Average ($\mu g/m^3$)
05-Sep-11	PM01	14.2	11.2	PM02	8.9	9.2
13-Sep-11	PM01	5.5	11.2	PM02	3.6	9.2
17-Sep-11	PM01	9.8	11.3	PM02	9.0	9.3
23-Sep-11	PM01	17.2	11.4	PM02	19.3	9.4
29-Sep-11	PM01	4.6	11.3	PM02	4.2	9.3
05-Oct-11	PM01	12.9	11.5	PM02	12.6	9.5
11-Oct-11	PM01	6.0	11.4	PM02	5.8	9.4
17-Oct-11	PM01	18.1	11.6	PM02	16.0	9.6
23-Oct-11	PM01	23.3	11.9	PM02	23.6	9.8
29-Oct-11	PM01	9.5	11.7	PM02	11.4	9.7
04-Nov-11	PM01	16.1	11.9	PM02	11.8	9.7
10-Nov-11	PM01	14.2	11.9	PM02	14.6	9.8
16-Nov-11	PM01	27.3	12.3	PM02	30.0	10.3
22-Nov-11	PM01	12.1	12.2	PM02	11.0	10.3
28-Nov-11	PM01	16.2	12.2	PM02	11.3	10.1
04-Dec-11	PM01	15.6	12.3	PM02	17.4	10.3
10-Dec-11	PM01	9.8	12.3	PM02	10.2	10.4
16-Dec-11	PM01	14.2	12.3	PM02	13.8	10.3
22-Dec-11	PM01	10.2	12.3	PM02	9.4	10.3
28-Dec-11	PM01	16.1	12.4	PM02	14.5	10.5
03-Jan-12	PM01	25.2	12.6	PM02	17.7	10.5
09-Jan-12	PM01	12.7	12.5	PM02	12.6	10.5
15-Jan-12	PM01	11.4	12.5	PM02	9.5	10.5
21-Jan-12	PM01	16.9	12.5	PM02	20.2	10.6
27-Jan-12	PM01	13.8	12.4	PM02	9.6	10.4
02-Feb-12	PM01	4.1	12.2	PM02	3.1	10.1
08-Feb-12	PM01	18.0	12.2	PM02	13.0	10.1
14-Feb-12	PM01	17.8	12.3	PM02	10.4	10.1
20-Feb-12	PM01	11.2	12.3	PM02	7.3	10.0
26-Feb-12	PM01	8.7	12.0	PM02	9.8	10.0
03-Mar-12	PM01	5.2	11.9	PM02	5.1	9.9
09-Mar-12	PM01	6.3	11.7	PM02	6.3	9.8
15-Mar-12	PM01	17.6	11.7	PM02	12.2	9.8
21-Mar-12	PM01	6.3	11.7	PM02	5.5	9.8
27-Mar-12	PM01	23.4	12.0	PM02	12.3	9.8
02-Apr-12	PM01	9.8	11.9	PM02	7.8	9.6
08-Apr-12	PM01	26.5	11.7	PM02	24.3	10.0

Sample Date	Sample Location	Particulate Matter 10 (µg/m^3)	Annual Rolling Average (µg/m^3)	Sample Location	Particulate Matter 10 (µg/m^3)	Annual Rolling Average (µg/m^3)
14-Apr-12	PM01	14.9	11.9	PM02	11.4	10.0
20-Apr-12	PM01	11.6	11.9	PM02	7.3	10.0
26-Apr-12	PM01	6.8	11.9	PM02	6.1	10.0
02-May-12	PM01	9.8	11.8	PM02	6.1	9.9
08-May-12	PM01	8.7	11.8	PM02	8.3	9.9
14-May-12	PM01	14.5	11.9	PM02	8.5	9.9
20-May-12	PM01	14.0	12.0	PM02	9.2	9.9
26-May-12	PM01	4.3	12.0	PM02	4.1	10.0
01-Jun-12	PM01	11.9	12.0	PM02	8.0	10.0
07-Jun-12	PM01	4.8	12.0	PM02	1.7	9.9
13-Jun-12	PM01	10.6	12.0	PM02	6.2	10.0
19-Jun-12	PM01	2.5	12.0	PM02	3.4	10.0
25-Jun-12	PM01	3.3	11.9	PM02	4.9	9.9
01-Jul-12	PM01	4.4	11.9	PM02	5.8	9.9
07-Jul-12	PM01	7.4	11.9	PM02	4.7	10.0
13-Jul-12	PM01	5.0	11.6	PM02	4.9	9.8
19-Jul-12	PM01	6.3	11.6	PM02	4.7	9.9
25-Jul-12	PM01	7.1	11.7	PM02	5.0	9.9
31-Jul-12	PM01	5.5	11.7	PM02	4.4	9.8
06-Aug-12	PM01	6.6	11.7	PM02	8.7	9.8
12-Aug-12	PM01	7.4	11.6	PM02	5.5	9.8
18-Aug-12	PM01	4.1	11.6	PM02	3.6	9.8
24-Aug-12	PM01	5.7	11.5	PM02	6.1	9.8
30-Aug-12	PM01	12.5	11.4	PM02	9.9	9.7

Appendix 3: Surface Water Monitoring Data

Surface Water Quality Data – Routine

Sample Location	Sample Date	Arsenic mg/L	Barium mg/L	Cadmium mg/L	Chromium mg/L	Copper mg/L	Dissolved Oxygen mg/L	Electrical Conductivity @ 25°C µS/cm	Iron mg/L	Lead mg/L	Lithium mg/L	Manganese mg/L	Nickel mg/L	Oil & Grease mg/L	pH	Selenium mg/L	Strontium mg/L	Temperature	Time	Total Dissolved Solids @ 180°C mg/L	Total Nitrogen as N mg/L	Total Phosphorus as P mg/L	Total Suspended Solids mg/L	Turbidity NTU	Zinc mg/L
SW01	12-Sep-11	<0.001	0.033	<0.0001	<0.001	<0.001	10.9	770	0.56	<0.001	0.045	0.069	0.004		7.6	<0.01	0.196	13.8	1349	440	0.3	0.01	<2	6.8	<0.005
SW01	18-Oct-11							920							7.7			20.0	1305	508			<2		
SW01	21-Nov-11							780							7.6			20.5	1308	454			<2		
SW01	7-Dec-11							710							7.6			18.1	1530	426			<2		
SW01	16-Jan-12							670							8.0			24.4	1548	464			<2		
SW01	22-Feb-12							640							8.2			21.0	1300	334			10		
SW01	21-Mar-12							600							8.1			23.4	1520	464			<2		
SW01	18-Apr-12	<0.001	0.021	<0.0001	0.001	<0.001	9.3	580	1.1	<0.001	0.059	0.056	0.005		8.4	<0.01	0.161	18.4	1515	302	0.2	<0.01	<2	8.6	<0.005
SW01	16-May-12							545							7.9			11.0	1140	388			9		
SW01	18-Jun-12							770							7.7			10.9	914	428			7		
SW01	26-Jul-12							750							8.1			7.9	1023	488			<2		
SW01	13-Aug-12							720							8.3			10.3	1359	422			<2		
	min							545							7.6					302			<2		
	median							715							8.0					434			9		
	max							920							8.4					508			10		
SW02	12-Sep-11	<0.001	0.034	<0.0001	<0.001	<0.001	11	790	0.6	<0.001	0.046	0.061	0.004		7.3	<0.01	0.204	15.0	1319	460	<0.1	0.02	4	5.9	<0.005
SW02	18-Oct-11							990							7.0			19.0	1236	524			<2		
SW02	21-Nov-11							770							7.1			20.5	1246	488			<2		
SW02	7-Dec-11							730							7.3			18.6	1507	454			47		
SW02	16-Jan-12							670							7.7			24.1	1520	374			<2		
SW02	22-Feb-12							640							8.4			21.4	1420	338			10		
SW02	21-Mar-12							600							8.0			23.5	1451	438			2		
SW02	18-Apr-12	<0.001	0.017	<0.0001	<0.001	<0.001	9.8	580	1.19	<0.001	0.063	0.058	0.005		8.5	<0.01	0.159	18.6	1455	308	0.2	<0.01	<2	9.2	<0.005
SW02	16-May-12							530							7.6			8.4	1052	422			15		
SW02	18-Jun-12							775							7.7			9.7	839	434			8		
SW02	26-Jul-12							760							8.1			7.7	958	500			<2		
SW02	13-Aug-12							710							8.2			10.5	1329	432			<2		
	min							530							7.0					308			<2		
	median							720							7.7					436			9		
	max							990							8.5					524			47		
SW04	12-Sep-11	<0.001	0.037	<0.0001	<0.001	<0.001	9.9	2,050	1.69	<0.001	0.003	0.298	0.003		7.4	<0.01	0.259	14.9	1209	1,060	0.4	0.02	14	30.7	0.01
SW04	18-Oct-11							720							7.6			22.4	1339	430			10		
SW04	21-Nov-11							1,300							7.4			21.8	1354	716			12		
SW04	7-Dec-11							570							7.0			19.4	1643	394			3		
SW04	16-Jan-12							940							7.3			22.8	1201	476			2		
SW04	22-Feb-12							390							7.1			22.3	1338	770			29		
SW04	21-Mar-12							530							7.3			23.3	1631	422			5		
SW04	18-Apr-12	<0.001	0.034	<0.0001	<0.001	<0.001	7.2	1,140	0.92	<0.001	0.003	0.157	0.002		7.8	<0.01	0.222	18.8	1536	576	0.3	<0.01	3	6.7	<0.005
SW04	16-May-12							1,160							7.3			14.3	1354	594			<2		
SW04	18-Jun-12							490							7.5			13.5	1112	320			19		
SW04	26-Jul-12							680							7.1			9.1	1240	414			<2		
SW04	13-Aug-12							905							7.7			11.3	1118	1,080			9		
	min							390							7.0					320			<2		
	median							813							7.4					526			10		
	max							2,050							7.8					1,080			29		

Sample Location	Sample Date	Arsenic mg/L	Barium mg/L	Cadmium mg/L	Chromium mg/L	Copper mg/L	Dissolved Oxygen mg/L	Electrical Conductivity @ 25°C µS/cm	Iron mg/L	Lead mg/L	Lithium mg/L	Manganese mg/L	Nickel mg/L	Oil & Grease mg/L	pH	Selenium mg/L	Strontium mg/L	Temperature	Time	Total Dissolved Solids @ 180°C mg/L	Total Nitrogen as N mg/L	Total Phosphorus as P mg/L	Total Suspended Solids mg/L	Turbidity NTU	Zinc mg/L
SW05	12-Sep-11	<0.001	0.037	<0.0001	<0.001	<0.001	10	960	1.12	0.001	0.004	0.163	0.001		7.3	<0.01	0.288	15.2	1452	540	1.1	0.02	5	18.2	0.02
SW05	18-Oct-11							1,210							6.9			16.8	1137	752			17		
SW05	21-Nov-11							920							6.6			20.1	1148	510			33		
SW05	7-Dec-11							940							7.0			18.3	1656	566			16		
SW05	16-Jan-12							830							7.5			23.9	1622	440			4		
SW05	22-Feb-12							800							7.5			21.5	1134	444			20		
SW05	21-Mar-12							890							7.5			23.4	1645	628			12		
SW05	18-Apr-12	0.001	0.02	<0.0001	0.001	<0.001	8.5	770	0.98	<0.001	0.004	0.124	0.002		8.0	<0.01	0.239	17.8	1348	414	0.7	0.01	8	8.5	<0.005
SW05	16-May-12							725							7.5			15.5	1433	428			5		
SW05	18-Jun-12							1,200							7.6			13.6	1156	680			4		
SW05	26-Jul-12							1,130							7.8			8.0	925	674			2		
SW05	13-Aug-12							1,050							8.0			10.9	1507	598			<2		
	min							725							6.6					414			<2		
	median							930							7.5					553			8		
	max							1,210							8.0					752			33		
SW07	12-Sep-11	<0.001	0.043	<0.0001	<0.001	<0.001	9.7	3,090	0.06	<0.001	0.002	0.498	0.002		7.8	<0.01	1.14	14.3	1532	1,740	1.0	0.03	5	1.4	0.008
SW07	18-Oct-11							2,590							7.8			20.7	1419	1,490			4		
SW07	21-Nov-11							2,930							7.9			20.3	1426	1,750			44		
SW07	7-Dec-11							2,380							8.1			18.9	1729	1,440			49		
SW07	16-Jan-12							3,290							7.9			26.7	1720	2,080			13		
SW07	22-Feb-12							2,290							8.2			23.7	1413	1,420			9		
SW07	21-Mar-12							1,960							8.1			21.0	1129	1,310			<2		
SW07	18-Apr-12	<0.001	0.024	<0.0001	<0.001	<0.001	11.0	1,730	0.24	<0.001	0.002	0.517	0.002		8.8	<0.01	0.67	17.9	1204	990	0.6	0.01	4	0.7	<0.005
SW07	16-May-12							1,780							7.8			14.1	1605	1,070			<2		
SW07	18-Jun-12							2,920							8.0			6.8	744	1,750			<2		
SW07	26-Jul-12							2,080							8.1			10.2	1506	1,190			2		
SW07	13-Aug-12							1,900							8.0			5.9	936	1,130			<2		
	min							1,730							7.8					990			<2		
	median							2,335							8.0					1,430			7		
	max							3,290							8.8					2,080			49		
SW08	12-Sep-11	<0.001	0.031	<0.0001	<0.001	<0.001	10.3	2,020	0.2	<0.001	0.002	0.061	0.002		7.2	<0.01	0.46	13.5	1552	734	0.5	0.01	4	0.4	<0.005
SW08	18-Oct-11							2,430							7.6			16.3	1446	1,330			<2		
SW08	21-Nov-11							2,480							6.5			18.4	1500	1,370			4		
SW08	7-Dec-11							2,340							6.9			15.4	1759	1,350			<2		
SW08	16-Jan-12							2,970							7.2			21.8	1743	1,730			<2		
SW08	22-Feb-12							3,150							7.3			20.1	1439	1,890			9		
SW08	21-Mar-12							2,560							7.4			19.8	1107	1,650			<2		
SW08	18-Apr-12	<0.001	0.056	<0.0001	<0.001	<0.001	8.9	2,850	0.76	<0.001	0.003	0.125	0.003		8.0	<0.01	0.719	16.6	1228	1,450	0.5	<0.01	3	2.5	<0.005
SW08	16-May-12							2,910							7.5			11.8	1637	1,740			<2		
SW08	18-Jun-12							2,820							7.9			14.1	1420	1,560			2		
SW08	26-Jul-12							2,450							7.9			8.8	1526	1,360			<2		
SW08	13-Aug-12							2,680							7.7			4.6	1011	1,550			<2		
	min							2,020							6.5					734			<2		
	median							2,620							7.5					1,500			4		
	max							3,150							8.0					1,890			9		

Sample Location	Sample Date	Arsenic mg/L	Barium mg/L	Cadmium mg/L	Chromium mg/L	Copper mg/L	Dissolved Oxygen mg/L	Electrical Conductivity @ 25°C µS/cm	Iron mg/L	Lead mg/L	Lithium mg/L	Manganese mg/L	Nickel mg/L	Oil & Grease mg/L	pH	Selenium mg/L	Strontium mg/L	Temperature	Time	Total Dissolved Solids @ 180°C mg/L	Total Nitrogen as N mg/L	Total Phosphorus as P mg/L	Total Suspended Solids mg/L	Turbidity NTU	Zinc mg/L
SW09	12-Sep-11	<0.001	0.054	<0.0001	<0.001	<0.001	7.8	1,460	0.41	<0.001	<0.001	0.081	0.002		7.1	<0.01	0.337	15.4	1613	742	0.6	0.05	6	0.4	<0.005
SW09	18-Oct-11							2,580							6.9			18.5	1506	1,420			<2		
SW09	21-Nov-11							2,830							6.6			17.9	1448	1,660			15		
SW09	7-Dec-11							2,840							6.9			17.0	1747	1,620			38		
SW09	16-Jan-12							3,010							6.7			20.8	1802	1,750			94		
SW09	22-Feb-12							2,760							7.4			20.3	1459	1,570			13		
SW09	21-Mar-12							1,940							7.7			19.1	1050	1,210			3		
SW09	18-Apr-12	<0.001	0.091	<0.0001	0.001	<0.001	7.8	2,800	3.42	<0.001	0.001	4.44	0.008		8.6	<0.01	0.718	16.9	1254	1,500	1.0	0.02	30	0.8	0.007
SW09	16-May-12							2,610							7.4			13.0	1658	1,580			322		
SW09	18-Jun-12							1,720							7.8			15.7	1345	928			12		
SW09	26-Jul-12							1,740							7.9			11.3	1547	978			6		
SW09	13-Aug-12							1,960							7.7			6.0	1047	1,080			12		
	min							1,460							6.6					742			<2		
	median							2,595							7.4					1,460			13		
	max							3,010							8.6					1,750			322		
SW10	12-Sep-11	No sample was collected as the site was dry																	1238						
SW10	18-Oct-11	No sample was collected as the site was dry																	1202						
SW10	21-Nov-11	No sample was collected as the site was dry																	1625						
SW10	7-Dec-11	No sample was collected as the site was dry																	1625						
SW10	16-Jan-12	No sample was collected as the site was dry																	1404						
SW10	22-Feb-12							80						<2	6.2			21.6	1200	72			5		
SW10	21-Mar-12	No sample was collected as the site was dry																	1610						
SW10	18-Apr-12	<0.001	0.023	<0.0001	0.002	<0.001	9.5	120	2.36	<0.001	<0.001	0.276	<0.001	<2	6.6	<0.01	0.015	22.4	1413	65	0.8	0.03	9	2	<0.005
SW10	16-May-12							120						<2	6.6			19.4	1253	82			33		
SW10	18-Jun-12							90						<2	6.2			11.6	1018	65			<2		
SW10	26-Jul-12							85						<5	6.2			9.7	1126	63			<2		
SW10	13-Aug-12							85						<5	6.2			16.3	1258	61			<2		
	min							80							6.2			9.7		61			<2		
	median							88							6.2			17.9		65			9		
	max							120							6.6			22.4		82			33		
SW11	12-Sep-11	<0.001	0.017	<0.0001	0.008	0.004	5	130	3.27	0.002	0.003	0.024	0.015	<2	6.1	<0.01	0.016	16.6	1300	345	0.4	0.04	18	212	0.029
SW11	18-Oct-11							190						<2	6.4			19.4	1222	260			18		
SW11	21-Nov-11							280						<2	6.8			21.1	1226	185			2		
SW11	7-Dec-11							200						<2	6.4			20.0	1607	250			20		
SW11	16-Jan-12							120						<2	6.6			27.4	1422	414			86		
SW11	22-Feb-12							130						<2	7.0			21.3	1222	240			23		
SW11	21-Mar-12							150						<2	7.0			25.4	1548	216			2		
SW11	18-Apr-12	0.001	0.012	<0.0001	0.005	0.001	6.9	130	2.83	<0.001	0.002	0.034	0.01	<2	7.1	<0.01	0.019	20.1	1441	116	0.4	0.03	5	47.5	0.01
SW11	16-May-12							195						<2	6.5			13.5	1159	127			5		
SW11	18-Jun-12							125						<2	6.5			11.3	945	383			62		
SW11	26-Jul-12							115						<5	6.5			7.3	1052	224			2		
SW11	13-Aug-12							105						<5	6.5			8.4	1432	165			5		
	min							105							6.1					116			2		
	median							130							6.5					232			12		
	max							280							7.1					414			86		

Sample Location	Sample Date	Arsenic mg/L	Barium mg/L	Cadmium mg/L	Chromium mg/L	Copper mg/L	Dissolved Oxygen mg/L	Electrical Conductivity @ 25°C µS/cm	Iron mg/L	Lead mg/L	Lithium mg/L	Manganese mg/L	Nickel mg/L	Oil & Grease mg/L	pH	Selenium mg/L	Strontium mg/L	Temperature	Time	Total Dissolved Solids @ 180°C mg/L	Total Nitrogen as N mg/L	Total Phosphorus as P mg/L	Total Suspended Solids mg/L	Turbidity NTU	Zinc mg/L
SW12	12-Sep-11	<0.001	0.038	<0.0001	0.001	<0.001	9.6	840	1.98	0.002	0.004	0.136	0.002		7.0	<0.01	0.264	14.9	1502	520	0.8	0.01	11	38.2	<0.005
SW12	18-Oct-11							920							6.7			17.4	1128	628			6		
SW12	21-Nov-11							750							6.5			19.9	1142	382			2		
SW12	7-Dec-11							560							7.0			17.8	1705	398			8		
SW12	16-Jan-12							520							7.3			22.6	1638	416			5		
SW12	22-Feb-12							610							7.6			21.7	1121	486			26		
SW12	21-Mar-12							580							7.2			23.8	1652	466			9		
SW12	18-Apr-12	0.001	0.018	<0.0001	0.002	<0.001	8.4	510	1.73	0.001	0.003	0.116	0.002		7.7	<0.01	0.147	18.7	1340	248	0.6	0.02	9	21.2	<0.005
SW12	16-May-12							505							6.8			14.3	1446	328			10		
SW12	18-Jun-12							925							7.3			13.5	1209	570			11		
SW12	26-Jul-12							835							7.6			8.2	933	506			2		
SW12	13-Aug-12							775							7.8			9.9	1237	468			4		
	min							505							6.5					248			2		
	median							680							7.3					467			9		
	max							925							7.8					628			26		

The results highlighted in red indicate the results are above the maximum results reported for background surface water results or are above the ANZECC guidelines for this area and require further investigation into the cause of the result. The results in yellow are between the 80th percentile value and the maximum results or ANZECC guidelines and act as an early warning system that further investigations may be required. The outcomes of any investigations are discussed further in **Section 3.6.3**. The blue shading indicates that this analysis was not due required for this sample.

Surface Water Quality Data – Rainfall Event

Sample Location	Sample Date	Arsenic_ mg/L	Barium_ mg/L	Cadmium_ mg/L	Chromium_ mg/L	Copper_ mg/L	Dissolved Oxygen mg/L	Electrical Conductivity µS/cm	Iron_ mg/L	Lead_ mg/L	Lithium_ mg/L	Manganese_ mg/L	Nickel_ mg/L	pH	Selenium_ mg/L	Strontium_ mg/L	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Total Phosphorus as P mg/L	Total Suspended Solids @ 105°C mg/L	Turbidity_ NTU	Zinc_ mg/L
SW01	09-Sep-11	0.002	0.041	<0.0001	<0.001	<0.001	10.8	750	0.52	<0.001	0.071	0.093	0.003	7.9	<0.01	0.219	400	0.7	<0.01	6	8.4	<0.005
SW01	29-Sep-11	0.004	0.084	0.0001	0.016	0.008	9.3	370	10.3	0.007	0.018	1.79	0.04	6.7	<0.01	0.093	470	1.1	0.1	272	566	0.072
SW01	23-Nov-11	0.001	0.039	<0.0001	0.004	0.002	8.6	660	2.93	0.002	0.033	0.39	0.032	7.1	<0.01	0.184	462	0.7	0.1	49	90.7	0.05
SW01	26-Nov-11	0.002	0.090	<0.0001	0.013	0.008	8.9	170	7.84	0.004	0.009	0.301	0.02	6.6	<0.01	0.07	180	1.8	0.3	245	122	0.023
SW01	12-Dec-11	<0.001	0.036	<0.0001	0.004	0.003	6.6	620	2.35	<0.001	0.044	0.118	0.01	7.8	<0.01	0.176	400	0.2	0.0	24	38	0.016
SW01	03-Feb-12	<0.001	0.037	<0.0001	0.004	0.002	8.8	430	3.45	0.002	0.024	0.214	0.011	7.5	<0.01	0.128	376	0.6	0.1	56	111	0.02
SW01	25-May-12	<0.001	0.034	<0.0001	<0.001	0.001	11.4	580	1.82	<0.001	0.042	0.158	0.007	7.8	<0.01	0.159	320	no result	<0.01	15	19.6	0.009
SW01	11-Jun-12	<0.001	0.035	<0.0001	0.002	0.001	10.6	630	1.77	<0.001	0.045	0.094	0.007	7.8	<0.01	0.178	342	0.3	0.0	28	34.1	0.007
	min							170						6.6						6		
	median							600						7.7						39		
	max							750						7.9						272		
SW02	09-Sep-11	0.002	0.043	<0.0001	0.002	0.006	11.1	780	0.4	<0.001	0.078	0.088	0.01	7.3	<0.01	0.22	446	0.7	<0.01	2	4.1	0.018
SW02	29-Sep-11	0.003	0.079	0.0001	0.014	0.007	8.9	380	8.49	0.006	0.018	1.58	0.034	6.4	<0.01	0.098	430	0.9	0.1	290	540	0.063
SW02	23-Nov-11	<0.001	0.033	<0.0001	0.002	0.002	8.6	660	2.38	0.002	0.031	0.249	0.034	6.8	<0.01	0.188	454	0.4	0.1	46	84.2	0.048
SW02	26-Nov-11	0.003	0.042	<0.0001	0.007	0.003	8.8	380	5.46	0.005	0.018	0.559	0.025	6.5	<0.01	0.109	358	1.3	0.1	136	129	0.043
SW02	12-Dec-11	<0.001	0.026	<0.0001	<0.001	<0.001	6.6	610	0.69	<0.001	0.051	0.092	0.008	7.7	<0.01	0.194	390	0.1	0.1	<2	9.4	0.021
SW02	03-Feb-12	0.001	0.026	<0.0001	0.004	0.002	9	455	2.74	0.001	0.03	0.109	0.011	7.3	<0.01	0.127	358	0.7	0.1	22	68.1	0.015
SW02	25-May-12	<0.001	0.029	<0.0001	<0.001	<0.001	11.4	590	1.34	<0.001	0.044	0.081	0.007	7.8	<0.01	0.158	332	no result	<0.01	3	18.1	0.013
SW02	11-Jun-12	<0.001	0.030	<0.0001	0.001	<0.001	10.8	645	1.36	<0.001	0.048	0.075	0.007	8.0	<0.01	0.183	346	0.5	0.0	14	23.4	<0.005
	min							380						6.4						<2		
	median							600						7.3						22		
	max							780						8.0						290		
SW04	09-Sep-11																					
SW04	29-Sep-11																					
SW04	23-Nov-11																					
SW04	26-Nov-11																					
SW04	12-Dec-11																					
SW04	03-Feb-12	0.001	0.037	<0.0001	0.007	0.004	7.9	285	4.7	0.003	0.002	0.159	0.007	6.8	<0.01	0.063	330	1.4	0.2	74	110	0.018
SW04	25-May-12	<0.001	0.043	<0.0001	0.004	0.003	9.8	510	3.3	0.002	0.002	0.169	0.006	7.2	<0.01	0.106	328	no result	<0.01	13	60.7	0.012
SW04	11-Jun-12	0.001	0.028	<0.0001	0.006	0.004	9.6	210	4.27	0.003	0.001	0.152	0.006	7.4	<0.01	0.045	238	0.4	0.0	59	142	0.012
	min							210						6.8						13		
	median							285						7.2						59		
	max							510						7.4						74		
SW05	09-Sep-11	0.002	0.036	<0.0001	0.007	0.002	9.1	790	0.87	<0.001	0.004	0.225	0.007	6.8	<0.01	0.249	440	1.3	0.0	10	17.6	0.006
SW05	29-Sep-11	0.002	0.045	<0.0001	0.006	0.003	8.8	810	3.84	0.005	0.006	0.193	0.004	6.6	<0.01	0.215	612	1.9	<0.01	142	165	0.014
SW05	23-Nov-11	0.001	0.022	<0.0001	<0.001	<0.001	6.9	670	0.98	<0.001	0.003	0.095	0.002	7.0	<0.01	0.178	414	1.2	0.0	5	14.4	<0.005
SW05	26-Nov-11	0.003	0.033	<0.0001	0.002	<0.001	8.6	820	2.52	0.003	0.005	0.126	0.003	6.8	<0.01	0.296	516	2.8	0.0	52	31.3	0.02
SW05	12-Dec-11	<0.001	0.022	<0.0001	0.009	0.004	6	140	1.49	0.002	0.002	0.021	0.006	6.7	<0.01	0.034	252	1.2	0.1	48	180	0.022
SW05	03-Feb-12	0.001	0.034	<0.0001	0.002	0.003	7.7	830	1.85	0.001	0.003	0.146	0.005	7.1	<0.01	0.351	574	1.1	0.0	9	19.7	0.015
SW05	25-May-12	<0.001	0.021	<0.0001	<0.001	<0.001	9.3	750	0.78	<0.001	0.003	0.072	0.001	7.5	<0.01	0.235	424	no result	<0.01	6	8.3	0.006
SW05	11-Jun-12	0.001	0.030	<0.0001	0.002	<0.001	10.2	885	1.8	0.002	0.003	0.077	0.002	7.6	<0.01	0.274	474	1.6	0.0	40	38.6	<0.005
	min							140						6.6						5		
	median							800						6.9						25		
	max							885						7.6						142		

Sample Location	Sample Date	Arsenic_ mg/L	Barium_ mg/L	Cadmium_ mg/L	Chromium_ mg/L	Copper_ mg/L	Dissolved Oxygen mg/L	Electrical Conductivity µS/cm	Iron_ mg/L	Lead_ mg/L	Lithium_ mg/L	Manganese_ mg/L	Nickel_ mg/L	pH	Selenium_ mg/L	Strontium_ mg/L	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Total Phosphorus as P mg/L	Total Suspended Solids @ 105°C mg/L	Turbidity_ NTU	Zinc_ mg/L
SW07	09-Sep-11																					
SW07	29-Sep-11																					
SW07	23-Nov-11																					
SW07	26-Nov-11																					
SW07	12-Dec-11																					
SW07	03-Feb-12	0.001	0.026	<0.0001	<0.001	0.001	7.8	1420	0.52	<0.001	0.002	0.438	0.005	7.6	<0.01	0.731	922	1.3	0.1	3	9.1	0.006
SW07	25-May-12	0.001	0.094	<0.0001	<0.001	0.001	8.3	3690	<0.05	<0.001	0.002	0.012	0.003	8.4	<0.01	1.71	2300	no result	<0.01	<2	0.9	<0.005
SW07	11-Jun-12	<0.001	0.045	<0.0001	<0.001	<0.001	9.2	2630	0.3	<0.001	0.002	0.122	0.004	7.9	<0.01	1.02	1600	0.6	0.0	<2	2.7	<0.005
	min							1,420						7.6						<2		
	median							2,630						7.9						<2		
	max							3,690						8.4						3		
SW08	09-Sep-11																					
SW08	29-Sep-11																					
SW08	23-Nov-11																					
SW08	26-Nov-11																					
SW08	12-Dec-11																					
SW08	03-Feb-12	<0.001	0.065	<0.0001	<0.001	<0.001	7.8	3040	0.9	<0.001	0.002	0.164	0.004	7.4	<0.01	1.06	1810	0.6	0.0	<2	5.9	<0.005
SW08	25-May-12	<0.001	0.061	<0.0001	<0.001	<0.001	8.3	3160	0.46	<0.001	0.004	0.061	0.002	7.8	<0.01	0.949	1740	no result	1.5	<2	3.1	<0.005
SW08	11-Jun-12	<0.001	0.037	<0.0001	<0.001	<0.001	9.2	2010	0.68	<0.001	0.002	0.052	0.002	7.8	<0.01	0.56	1060	1.3	0.0	2	9	<0.005
	min							2,010						7.4						<2		
	median							3,040						7.8						<2		
	max							3,160						7.8						2		
SW09	09-Sep-11																					
SW09	29-Sep-11																					
SW09	23-Nov-11																					
SW09	26-Nov-11																					
SW09	12-Dec-11																					
SW09	03-Feb-12	<0.001	0.044	<0.0001	<0.001	<0.001	7	1420	3.4	<0.001	<0.001	0.52	0.008	7.0	<0.01	0.379	880	1.1	0.1	9	15.1	0.006
SW09	25-May-12	<0.001	0.043	<0.0001	<0.001	<0.001	9.4	1580	1.46	<0.001	<0.001	0.197	0.003	7.8	<0.01	0.324	790	no result	<0.01	<2	7.2	<0.005
SW09	11-Jun-12	<0.001	0.031	<0.0001	<0.001	<0.001	9	825	2.62	<0.001	<0.001	0.205	0.004	7.7	<0.01	0.186	444	1	0.1	12	26.4	<0.005
	min							825						7.0						<2		
	median							1,420						7.7						7		
	max							1,580						7.8						12		
SW10	09-Sep-11	0.002	0.018	0.0001	<0.001	<0.001	9.3	10	0.3	<0.001	<0.001	0.068	<0.001	6.1	<0.01	0.004	<5	1.2	0.1	3	4.1	<0.005
SW10	29-Sep-11	<0.001	0.029	<0.0001	<0.001	0.001	8.5	100	0.41	<0.001	<0.001	0.098	<0.001	5.8	<0.01	0.009	126	0.7	0.1	<2	5.8	<0.005
SW10	23-Nov-11	<0.001	0.017	<0.0001	<0.001	<0.001	8.3	10	0.3	<0.001	<0.001	0.037	<0.001	6.3	<0.01	0.004	48	1	0.0	4	5	<0.005
SW10	26-Nov-11	0.002	0.016	<0.0001	0.001	0.001	8.6	50	0.32	<0.001	<0.001	0.035	<0.001	6.0	<0.01	0.008	70	1	0.1	<2	4.5	<0.005
SW10	12-Dec-11	No Sample - Dry																				
SW10	03-Feb-12	No Sample - Dry																				
SW10	25-May-12	<0.001	0.016	<0.0001	<0.001	<0.001	10	80	3.9	<0.001	<0.001	0.072	<0.001	8.1	<0.01	0.005	56	no result	<0.01	9	3.1	<0.005
SW10	11-Jun-12	<0.001	0.020	<0.0001	<0.001	<0.001	9.6	90	0.55	<0.001	<0.001	0.068	<0.001	5.9	<0.01	0.015	40	0.9	0.1	<2	2.7	<0.005
	min							10						5.8						<2		
	median							65						6.1						4		
	max							100						8.1						9		

Sample Location	Sample Date	Arsenic_ mg/L	Barium_ mg/L	Cadmium_ mg/L	Chromium_ mg/L	Copper_ mg/L	Dissolved Oxygen mg/L	Electrical Conductivity µS/cm	Iron_ mg/L	Lead_ mg/L	Lithium_ mg/L	Manganese_ mg/L	Nickel_ mg/L	pH	Selenium_ mg/L	Strontium_ mg/L	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Total Phosphorus as P mg/L	Total Suspended Solids @ 105°C mg/L	Turbidity_ NTU	Zinc_ mg/L
SW11	09-Sep-11	0.003	0.020	0.0002	0.003	0.005	9.1	80	1.99	0.002	0.002	0.058	0.019	5.8	<0.01	0.017	229	0.9	<0.01	19	138	0.036
SW11	29-Sep-11	0.001	0.024	<0.0001	0.013	0.004	9.4	70	5.43	0.003	0.004	0.03	0.007	6.2	<0.01	0.016	389	0.8	0.1	64	325	0.024
SW11	23-Nov-11	<0.001	0.023	<0.0001	0.016	0.005	8.4	60	5.88	0.004	0.004	0.028	0.008	6.3	<0.01	0.016	347	0.7	0.1	66	373	0.027
SW11	26-Nov-11	<0.001	0.011	<0.0001	0.005	0.002	9.2	30	1.61	0.001	0.001	0.012	0.004	5.9	<0.01	0.011	112	1.4	<0.01	30	103	0.014
SW11	12-Dec-11	<0.001	0.025	<0.0001	0.011	0.004	6.1	110	4.42	0.003	0.002	0.026	0.006	7.0	<0.01	0.021	323	0.7	0.1	89	383	0.038
SW11	03-Feb-12	<0.001	0.015	<0.0001	0.009	0.003	8.9	55	3.37	0.002	0.002	0.017	0.005	6.8	<0.01	0.011	154	1	0.1	68	157	0.018
SW11	25-May-12	<0.001	0.020	<0.0001	0.01	0.003	10.5	130	3.29	0.002	0.002	0.04	0.004	7.5	<0.01	0.02	181	no result	<0.01	24	147	0.018
SW11	11-Jun-12	<0.001	0.015	<0.0001	0.007	0.002	9.6	85	2.59	0.002	0.002	0.021	0.004	6.7	<0.01	0.015	138	0.6	0.0	38	159	0.014
	min							30						5.8						19		
	median							75						6.5						51		
	max							130						7.5						89		
SW12	09-Sep-11	0.003	0.032	0.0001	0.038	0.007	8.8	730	1.63	0.001	0.004	0.232	0.029	6.8	<0.01	0.196	426	1.2	0.0	16	20.3	0.018
SW12	29-Sep-11	0.002	0.050	<0.0001	0.008	0.005	8.9	200	9.23	0.014	0.009	0.203	0.004	6.6	<0.01	0.051	400	1	0.1	408	535	0.021
SW12	23-Nov-11	0.001	0.033	<0.0001	0.005	0.002	7.1	500	5.62	0.007	0.006	0.124	0.003	7.4	<0.01	0.13	516	1	0.1	87	202	0.01
SW12	26-Nov-11	0.002	0.044	<0.0001	0.01	0.005	7.7	60	9.96	0.017	0.01	0.158	0.005	7.4	<0.01	0.028	470	1.5	0.1	370	244	0.021
SW12	12-Dec-11	<0.001	0.030	<0.0001	0.004	0.002	5.5	160	3.84	0.007	0.003	0.072	0.002	6.5	<0.01	0.041	270	0.6	0.1	80	163	0.015
SW12	03-Feb-12	0.002	0.054	<0.0001	0.013	0.006	7.7	100	13.8	0.019	0.012	0.146	0.005	6.3	<0.01	0.036	348	1.6	0.2	559	511	0.017
SW12	25-May-12	0.002	0.037	<0.0001	0.008	0.004	9	200	8.42	0.008	0.008	0.079	0.004	6.9	<0.01	0.044	277	no result	<0.01	115	154	0.018
SW12	11-Jun-12	0.001	0.030	<0.0001	0.004	0.002	9.5	550	4.17	0.006	0.004	0.081	0.002	6.8	<0.01	0.157	350	1	0.1	85	103	0.005
	min							60						6.3						16		
	median							200						6.8						101		
	max							730						7.4						559		

The blue shading indicates that the sample was not due for collection.

Appendix 4: Groundwater Monitoring Data

Groundwater Levels (mAHD)

BORE	OB-1	OB-2	OB-3	OB-4	PZ003	PZ004	PZ018	PZ039	PZ040B	PZ043A	PZ043B	PZ044	PZ050A	PZ050B	PZ050C	PZ055	PZ058	PZ072A	PZ072C	PZ074	PZ101B	PZ101C	PZ102A	PZ102B	TB103
Sep-11	N/A	flowing	472.52	N/A	471.07	492.36	453.55	418.54	420.73	490.79	494.11	480.29	384.88	431.92	441.18	422.79	467.93	497.97	505.86	501.52	373.75	381.07	373.19	373.22	378.35
Oct-11	N/A	flowing	472.47	N/A	471.06	492.45	453.63	418.64	420.90	490.95	494.13	480.55	384.83	431.87	440.13	422.76	467.90	498.00	505.82	501.50	374.00	381.13	373.80	373.81	378.65
Nov-11	N/A	flowing	472.51	N/A	471.09	492.14	453.99	418.78	420.98	490.99	494.17	480.71	384.74	431.16	440.13	422.82	467.90	498.28	505.88	501.49	374.58	381.12	374.11	373.82	379.23
Dec-11	N/A	flowing	472.51	N/A	471.10	492.39	454.75	418.85	421.00	491.09	494.14	480.96	384.55	430.98	440.10	422.81	467.86	498.28	505.85	501.43	374.76	381.07	374.19	374.19	379.47
Jan-12	N/A	flowing	472.53	N/A	471.06	492.04	454.34	418.89	420.93	491.12	494.20	481.32	384.61	430.89	440.12		467.92	498.03	505.89	501.49	374.99	381.20	374.27	374.27	379.70
Feb-12	N/A	flowing	472.52	N/A	471.06	491.96		419.07	421.10	491.12	494.10	481.42	384.73	431.53	440.08	422.93	467.96	498.06	505.79	501.42	375.15	381.23	374.47	375.15	379.83
Mar-12	N/A	flowing	472.60	N/A	471.13	497.41	456.23	419.24	421.30	491.90	494.16	482.49	384.68	431.71	440.12	423.02	467.95	498.31	505.98	501.51	375.50	381.25	375.08	375.04	380.22
Apr-12	N/A	flowing	472.62	N/A	471.79	498.53	455.19	419.29	422.31	491.67	494.12	482.33	384.65	431.86	440.19	422.94	467.92	498.44	505.98	501.46	375.67	381.21	374.84	374.72	380.29
May-12	N/A	flowing	472.62	N/A	471.16	497.28	454.75	419.28	421.43	491.48	494.14	481.67	384.71	431.84	440.20	423.02	467.91	498.27	505.88	501.42	375.67	381.28	374.97	374.97	380.15
Jun-12	N/A	flowing	472.57	N/A	471.17	495.85	454.43	419.28	421.45	491.30	494.10	481.60	384.64	431.85	440.16	423.07	467.94	498.13	505.87	501.39	375.69	381.27	374.97	374.99	380.30
Jul-12	N/A	flowing	472.56	N/A	471.13	498.59	455.31	419.33	421.55	491.37	494.11	481.59	384.64	431.83	440.13	423.05	467.87	498.14	505.96	501.41	375.81	381.34	375.18	375.19	380.55
Aug-12	N/A	flowing	472.61	N/A	471.15	496.66	454.99	419.36	421.54	491.39	494.18	481.74	384.69	431.78	440.07	422.98	467.93	498.13	505.98	501.43	375.88	381.26	375.13	375.18	380.59
min			*472.47*		*471.06*	*491.96*	*453.55*	*418.54*	*420.73*	*490.79*	*494.10*	*480.29*	*384.55*	*430.89*	*440.07*	*422.76*	*467.86*	*497.97*	*505.79*	*501.39*	*373.75*	*381.07*	*373.19*	*373.22*	*378.35*
max			*472.62*		*471.79*	*498.59*	*456.23*	*419.36*	*422.31*	*491.90*	*494.20*	*482.49*	*384.88*	*431.92*	*441.18*	*423.07*	*467.96*	*498.44*	*505.98*	*501.52*	*375.88*	*381.34*	*375.18*	*375.19*	*380.59*

Gaps in data indicate that no result is available

BORE	PZ103A	PZ103B	PZ103C	PZ104	TB105	PZ105A	PZ105B	PZ105C	PZ106A	PZ106B	PZ107	PZ108	PZ109	PZ111	PZ112B	PZ127	PZ128	PZ129	PZ130	PZ131	PZ133	PZ134	PZ137	PZ141	PZ149
Sep-11	372.42	382.94	397.27	382.86	369.69	369.83	376.87	377.51	428.61	502.14	432.80	400.85	382.77		481.18	VW	VW	VW	VW	433.73	VW	432.27	461.46	462.20	468.11
Oct-11	371.90	382.72	397.28	382.91	370.08	370.09	377.02	377.60	428.13	502.21	432.91	400.96	382.85	380.95	481.22	VW	VW	VW	VW	433.85	VW	432.45	461.91	462.83	468.04
Nov-11	373.19	383.26	397.30	382.95	370.54	370.57	377.05	377.60	426.60	502.19	432.94	400.84	382.83	380.88	481.35	VW	VW	VW	VW	433.75	VW	432.50	461.98	462.92	467.53
Dec-11	373.29	383.38	397.30	382.96	370.70	370.74	377.13	377.65	426.50	502.24	432.98	400.79	382.83	380.85	481.33	VW	VW	VW	VW	433.74	VW	432.66	462.08	463.10	469.06
Jan-12	373.41	383.38	397.39	382.97	371.00	371.01	377.23	377.76	425.75	502.26	433.15	400.85	382.81	380.79	481.48	VW	VW	VW	VW	433.81	VW	432.78	462.07	463.12	468.73
Feb-12	373.62	383.56	397.51	383.09	371.24	371.26	377.88	377.86	423.61	502.26	433.22	400.86	382.83	380.77	481.44	VW	VW	VW	VW	433.81	VW	432.86	462.23		468.36
Mar-12	374.08	383.91	397.62	383.04	371.56	371.58	377.45	377.96	425.69	502.28	433.26	400.83	382.83	380.85	481.70	VW	VW	VW	VW	433.96	VW	433.17	462.56		468.89
Apr-12	374.06	384.02	397.70	383.02	371.74	371.76	377.42	377.90	425.76	502.29	433.32	400.72	382.81	380.85	481.83	VW	VW	VW	VW	434.06	VW	433.13	462.54	463.94	469.72
May-12	374.55	383.88	397.69	388.71	371.86	371.87	377.46	377.96	424.70	502.28	433.40	400.77	382.75	380.74	481.72	VW	VW	VW	VW	433.96	VW	433.03	462.41	463.75	469.59
Jun-12	374.42	383.95	397.85	381.96	371.98	372.02	377.47	377.97	424.90	502.24	433.50	400.75	382.77	380.65		VW	VW	VW	VW	433.86	VW	432.91	462.40	463.61	469.49
Jul-12	374.50	384.16	397.94	382.99	372.46	372.18	377.56	378.05	425.14	502.20	433.55	400.78	382.76	380.68		VW	VW	VW	VW	432.00	VW	433.04	462.49	463.68	469.23
Aug-12	374.51	384.58	397.89	382.98	372.15	372.26	377.54	378.01	425.33	502.16	433.53	400.65	382.79	380.72	481.94	VW	VW	VW	VW	433.84	VW	433.00	462.51	463.63	468.84
min	*371.90*	*382.72*	*397.27*	*381.96*	*369.69*	*369.83*	*376.87*	*377.51*	*423.61*	*502.14*	*432.80*	*400.65*	*382.75*	*380.65*	*481.18*	*VW*	*VW*	*VW*	*VW*	*432.00*	*VW*	*432.27*	*461.46*	*462.20*	*467.53*
max	*374.55*	*384.58*	*397.94*	*388.71*	*372.46*	*372.26*	*377.88*	*378.05*	*428.61*	*502.29*	*433.55*	*400.96*	*382.85*	*380.95*	*481.94*	*VW*	*VW*	*VW*	*VW*	*434.06*	*VW*	*433.17*	*462.56*	*463.94*	*469.72*

Gaps in data indicate that no result is available
VW = vibrating wire has been installed

BORE	PZ150	PZ151	PZ152	PZ155	PZ156	PZ157	PZ164	PZ165	PZ168	PZ170	PZ172	PZ173	PZ174	PZ175	PZ176	PZ177	TB179	PZ181	PZ184	PZ186	PZ187	PZ188	PZ189	PZ191
Sep-11		379.48	442.39	437.82	379.40	379.83	431.68	440.11	429.02	422.11	421.64	422.18	418.31	419.48	416.61	415.80	N/A	425.15	412.83					380.28
Oct-11	379.94	379.55	442.33	438.98	379.80	380.23	431.83	439.98	429.18	422.40	421.92	422.28	418.52	420.20	416.85	416.16	N/A	425.20	412.79	408.46	417.40	415.81	412.85	380.74
Nov-11	380.03	379.77	442.40	438.26	380.05	380.43	432.02	439.92	429.20	422.45	421.93	422.18	418.66	420.51	416.81	416.20	N/A	425.30	412.85					381.26
Dec-11		379.79	442.37	438.01	380.19	380.56	432.31	440.47	429.18	422.45	421.98	422.21	418.73	420.53	416.86	416.56	N/A	425.33	412.85					381.43
Jan-12		380.07	442.49	437.97	380.48	380.86	432.37	440.31	429.20	422.57	422.08	422.36	418.78	420.53	416.99	416.50	N/A	425.40	412.97	408.72	417.63	415.98	412.93	381.72
Feb-12	380.62	380.15	442.41	438.52			432.79	439.87	429.21	422.66	422.36	422.51	418.94	421.43	417.19	417.50	N/A	425.45	412.94					381.96
Mar-12		380.39	442.53	438.03	381.01	381.34	432.74	438.32	429.20	422.79	422.63	422.85	419.12	421.37	417.35	417.24	N/A	425.72	413.08					382.43
Apr-12	380.42	380.53	442.57	438.03	381.73	381.52	432.65	437.86	429.20	422.78	422.61	422.90	419.18	421.05	417.27	416.74	N/A	425.72	413.15	409.01	417.64	416.13	413.19	382.53
May-12		380.64	442.44	437.95	381.48	381.76	432.57	437.52	429.11	422.72	422.52	422.84	419.15	420.78	417.20	416.38	N/A	425.65	413.14					382.63
Jun-12		380.89	442.57	437.96	381.73	381.99	432.51	437.19	429.16	422.76	422.51	422.87	419.17	420.67	417.23	416.28	N/A	425.66	413.21					382.73
Jul-12		381.08	442.46	438.03	381.94	382.25	432.45	436.93	429.22	422.81	422.65	422.93	419.20	421.17	417.34	416.86	N/A	425.62	413.18	409.16	417.71	416.15	413.41	382.90
Aug-12		381.15	442.48	437.86	382.01	382.32	432.35	436.83	429.05	422.53	422.47	422.75	419.08	420.74	417.27	416.46	N/A	425.47	413.00					382.95
min	*379.94*	*379.48*	*442.33*	*437.82*	*379.40*	*379.83*	*431.68*	*436.83*	*429.02*	*422.11*	*421.64*	*422.18*	*418.31*	*419.48*	*416.61*	*415.80*	*N/A*	*425.15*	*412.79*	*408.46*	*417.40*	*415.81*	*412.85*	*380.28*
max	*380.62*	*381.15*	*442.57*	*438.98*	*382.01*	*382.32*	*432.79*	*440.47*	*429.22*	*422.81*	*422.65*	*422.93*	*419.20*	*421.43*	*417.35*	*417.50*	*N/A*	*425.72*	*413.21*	*409.16*	*417.71*	*416.15*	*413.41*	*382.95*

The results highlighted in red indicate the results are below the minimum results reported for background groundwater levels and require further investigation into the cause of the result. The results in yellow are between the 80th percentile value and the minimum results and act as an early warning system that further investigations may be required. The outcomes of any investigations are discussed further in **Section 3.7.2**.

Groundwater Quality Data

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
OB001	Sep-11																																		
OB001	Oct-11																80								4.8							19	100		
OB001	Nov-11																																		
OB001	Dec-11																																		
OB001	Jan-12																																		
OB001	Feb-12																																		
OB001	Mar-12																																		
OB001	Apr-12	6	<2	<2	6	0.71	<0.001	<0.05	<0.0001	1	0.81	21	<0.001	0.0030	0.0650	<0.004	110	<0.1	<0.05	0.002	5	0.01	0.006	0.12	5.3	<0.01	1.2	<0.01	<0.001	13	<2	18	67	0.20	0.071
OB001	May-12																																		
OB001	Jun-12																																		
OB001	Jul-12																																		
OB001	Aug-12																																		
	min																80								4.8										
	median																95								5.1										
	max																110								5.3										
OB002	Sep-11																																		
OB002	Oct-11																2,080								6.6							18	1,210		
OB002	Nov-11																																		
OB002	Dec-11																																		
OB002	Jan-12																																		
OB002	Feb-12																																		
OB002	Mar-12																																		
OB002	Apr-12	230	<2	<2	230	13.80	<0.001	<0.05	<0.0001	81	13.30	248	<0.001	<0.001	0.0040	<0.004	1,420	0.6	<0.05	<0.001	52	<0.001	<0.001	0.34	7.6	<0.01	15.0	<0.01	<0.001	106	104	14	842	0.50	0.024
OB002	May-12																																		
OB002	Jun-12																																		
OB002	Jul-12																																		
OB002	Aug-12																																		
	min																1,420								6.6										
	median																1,750								7.1										
	max																2,080								7.6										
OB003	Sep-11																																		
OB003	Oct-11																1,580								6.7							18	826		
OB003	Nov-11																																		
OB003	Dec-11																																		
OB003	Jan-12																																		
OB003	Feb 12																																		
OB003	Mar-12																																		
OB003	Apr-12	310	<2	<2	310	18.50	<0.001	<0.05	<0.0001	60	17.10	344	<0.001	<0.001	<0.001	<0.004	1,900	0.5	9.58	<0.001	63	0.25	0.002	0.15	6.5	0.18	19.0	<0.01	<0.001	194	126	19	1,070	0.80	0.016
OB003	May-12																																		
OB003	Jun-12																																		
OB003	Jul-12																																		
OB003	Aug-12																																		
	min																1,580								6.5										
	median																1,740								6.6										
	max																1,900								6.7										
OB004	Sep-11																																		
OB004	Oct-11																340								3.7							16	412		
OB004	Nov-11																																		
OB004	Dec-11																																		
OB004	Jan-12																																		
OB004	Feb-12																																		
OB004	Mar-12																																		
OB004	Apr-12	<2	<2	<2	<2	2.12	<0.001	0.06	<0.0001	0	2.03	39	0.001	0.0160	0.0030	<0.004	380	0.1	0.51	0.007	4	0.06	0.020	3.99	3.9	0.03	7.6	<0.01	<0.001	34	49	19	372	6.60	0.035
OB004	May-12																																		
OB004	Jun-12																																		
OB004	Jul-12																																		
OB004	Aug-12																																		
	min																340								3.7										
	median																360								3.8										
	max																380								3.9										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ003	Sep-11																																		
PZ003	Oct-11																680							5.8							19	3,220		
PZ003	Nov-11																																		
PZ003	Dec-11																																		
PZ003	Jan-12																																		
PZ003	Feb-12																																		
PZ003	Mar-12																																		
PZ003	Apr-12	93	<2	<2	93	8.03	<0.001	<0.05	<0.0001	17	7.79	181	<0.001	<0.001	<0.001	<0.004	840	0.2	<0.05	<0.001	27	0.00	<0.001	0.25	6.2	<0.01	7.8	<0.01	<0.001	104	51	19	440	0.40	<0.005
PZ003	May-12																																		
PZ003	Jun-12																																		
PZ003	Jul-12																																		
PZ003	Aug-12																																		
	min																680							5.8											
	median																760							6.0											
	max																840							6.2											
PZ004	Sep-11																																		
PZ004	Oct-11																2,850							6.8							20	1,740		
PZ004	Nov-11																																		
PZ004	Dec-11																																		
PZ004	Jan-12																																		
PZ004	Feb-12																																		
PZ004	Mar-12																																		
PZ004	Apr-12	550	<2	<2	550	23.20	0.001	0.06	<0.0001	43	21.80	227	<0.001	<0.001	0.0010	<0.004	2,100	1.1	<0.05	<0.001	92	0.11	0.008	1.05	6.9	0.05	34.0	<0.01	<0.001	257	278	18	1,210	2.30	0.024
PZ004	May-12																																		
PZ004	Jun-12																																		
PZ004	Jul-12																																		
PZ004	Aug-12																																		
	min																2,100							6.8											
	median																2,475							6.9											
	max																2,850							6.9											
PZ018	Sep-11																																		
PZ018	Oct-11																							5.0							15	667		
PZ018	Nov-11																																		
PZ018	Dec-11																																		
PZ018	Jan-12	11	<2	<2	11	4.44	<0.001	0.07	<0.0001	1	4.04	120	<0.001	<0.001	0.0010	<0.004	435	<0.1	0.08	<0.001	16	0.01	0.002	0.44	4.9	0.05	3.5	<0.01	<0.001	60	40	21	344	1.10	0.072
PZ018	Feb 12																																		
PZ018	Mar-12																																		
PZ018	Apr-12	16	<2	<2	16	2.08	<0.001	<0.05	0.00040	10	2.01	46	<0.001	<0.001	0.0020	<0.004	190	<0.1	0.09	<0.001	1	0.00	0.002	2.57	5.5	0.13	3.6	<0.01	<0.001	32	22	18	256	4.10	<0.005
PZ018	May-12																																		
PZ018	Jun-12																																		
PZ018	Jul-12																																		
PZ018	Aug-12																																		
	min																190							4.9											
	median																313							5.0											
	max																435							5.5											
PZ039	Sep-11																																		
PZ039	Oct-11																1,260							6.1							20	654		
PZ039	Nov-11																																		
PZ039	Dec-11																																		
PZ039	Jan-12																																		
PZ039	Feb-12																																		
PZ039	Mar-12																																		
PZ039	Apr-12	64	<2	<2	64	7.15	<0.001	<0.05	<0.0001	22	6.92	191	<0.001	<0.001	0.0010	<0.004	820	0.2	<0.05	<0.001	24	0.03	0.002	0.22	6.0	0.04	9.3	<0.01	<0.001	83	23	18	1023	0.40	0.017
PZ039	May-12																																		
PZ039	Jun-12																																		
PZ039	Jul-12																																		
PZ039	Aug-12																																		
	min																820							6.0											
	median																1,040							6.1											
	max																1,260							6.1											

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ040B	Sep-11																																		
PZ040B	Oct-11																1,540								6.1							20	654		
PZ040B	Nov-11																																		
PZ040B	Dec-11																																		
PZ040B	Jan-12																																		
PZ040B	Feb-12																																		
PZ040B	Mar-12																																		
PZ040B	Apr-12	64	<2	<2	64	7.15	<0.001	<0.05	<0.0001	22	6.92	191	<0.001	<0.001	0.0010	<0.004	820	0.2	<0.05	<0.001	24	0.03	0.002	0.22	6.0	0.04	9.3	<0.01	<0.001	83	23	18	424	0.40	0.017
PZ040B	May-12																																		
PZ040B	Jun-12																																		
PZ040B	Jul-12																																		
PZ040B	Aug-12																																		
	min																820								6.0										
	median																1,180								6.1										
	max																1,540								6.1										
PZ043A	Sep-11																																		
PZ043A	Oct-11																2,570								6.7							20	1,680		
PZ043A	Nov-11																																		
PZ043A	Dec-11																																		
PZ043A	Jan-12	620	<2	<2	620	30.00	0.003	<0.05	<0.0001	143	28.40	397	0.001	0.0010	<0.001	<0.004	2,420	0.9	1.67	<0.001	191	0.14	0.005	0.19	6.6	<0.01	35.0	<0.01	<0.001	106	309	21	1455	0.60	0.014
PZ043A	Feb-12																																		
PZ043A	Mar-12																																		
PZ043A	Apr-12	660	<2	<2	660	29.80	0.004	<0.05	<0.0001	159	27.10	354	<0.001	<0.001	<0.001	<0.004	2,550	0.9	3.25	<0.001	171	0.14	<0.001	0.05	6.7	<0.01	36.0	<0.01	<0.001	95	318	20	1031	0.40	<0.005
PZ043A	May-12																																		
PZ043A	Jun-12																																		
PZ043A	Jul-12																																		
PZ043A	Aug-12																																		
	min																2,420								6.6										
	median																2,550								6.7										
	max																2,570								6.7										
PZ043B	Sep-11																																		
PZ043B	Oct-11																3,550								3.7							19	2,360		
PZ043B	Nov-11																																		
PZ043B	Dec-11																																		
PZ043B	Jan-12	<2	<2	<2	<2	33.20	0.015	0.06	0.00100	2	30.20	631	0.001	0.2480	0.0170	<0.004	3,240	0.7	0.36	0.00500	87	0.14	0.307	1.58	3.7	0.01	50.0	<0.01	<0.001	499	739	21	2,060	3.20	2.050
PZ043B	Feb-12																																		
PZ043B	Mar-12																																		
PZ043B	Apr-12	<2	<2	<2	<2	28.00	0.017	<0.05	0.00100	17	26.70	525	0.002	0.2300	0.0260	<0.004	3,060	0.4	2.48	0.01000	74	0.17	0.333	1.45	4.0										
PZ043B	May-12																																		
PZ043B	Jun-12																																		
PZ043B	Jul-12																																		
PZ043B	Aug-12																																		
	min																3,060								3.7										
	median																3,240								3.7										
	max																3,550								4.0										
PZ044	Sep-11																																		
PZ044	Oct-11																2,970								6.4							18	2,420		
PZ044	Nov-11																																		
PZ044	Dec-11																																		
PZ044	Jan-12																																		
PZ044	Feb-12																																		
PZ044	Mar-12																																		
PZ044	Apr-12	410	<2	<2	410	34.10	0.001	<0.05	<0.0001	462	34.10	227	<0.001	<0.001	<0.001	<0.004	2,780	0.3	2.34	<0.001	74	0.40	0.001	0.04	6.7	<0.01	42.0	<0.01	<0.001	89	939	17	2,120	0.40	<0.005
PZ044	May-12																																		
PZ044	Jun-12																																		
PZ044	Jul-12																																		
PZ044	Aug-12																																		
	min																2,780								6.4										
	median																2,875								6.6										
	max																2,970								6.7										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ050A	Sep-11																																		
PZ050A	Oct-11																2,160								6.4							18	1,270		
PZ050A	Nov-11																																		
PZ050A	Dec-11																																		
PZ050A	Jan-12																																		
PZ050A	Feb-12																																		
PZ050A	Mar-12																																		
PZ050A	Apr-12	380	<2	<2	380	21.30	<0.001	<0.05	<0.0001	72	21.00	454	<0.001	<0.001	<0.001	<0.004	2,180	1.1	0.76	<0.001	113	0.09	0.004	0.01	6.4	0.36	14.0	<0.01	<0.001	178	44	21	1,090	0.20	<0.005
PZ050A	May-12																																		
PZ050A	Jun-12																																		
PZ050A	Jul-12																																		
PZ050A	Aug-12																																		
	min																2,160								6.4										
	median																2,170								6.4										
	max																2,180								6.4										
PZ050B	Sep-11																																		
PZ050B	Oct-11																1,120								5.7							17	682		
PZ050B	Nov-11																																		
PZ050B	Dec-11																																		
PZ050B	Jan-12																																		
PZ050B	Feb-12																																		
PZ050B	Mar-12																																		
PZ050B	Apr-12	21	<2	<2	21	10.00	0.001	<0.05	0.00020	24	9.71	284	<0.001	0.0100	0.0020	<0.004	1,110	<0.1	6.78	<0.001	36	0.18	0.012	0.05	5.8	0.22	13.0	<0.01	<0.001	120	76	20	672	0.40	0.059
PZ050B	May-12																																		
PZ050B	Jun-12																																		
PZ050B	Jul-12																																		
PZ050B	Aug-12																																		
	min																1,110								5.7										
	median																1,115								5.8										
	max																1,120								5.8										
PZ050C	Sep-11																																		
PZ050C	Oct-11																1,150								5.4							19	684		
PZ050C	Nov-11																																		
PZ050C	Dec-11																																		
PZ050C	Jan-12																																		
PZ050C	Feb-12																																		
PZ050C	Mar-12																																		
PZ050C	Apr-12	13	<2	<2	13	9.25	<0.001	<0.05	0.00070	24	9.19	284	<0.001	0.0170	0.0030	<0.004	1,090	0.4	<0.05	<0.001	39	0.18	0.032	0.25	5.5	<0.01	12.0	<0.01	<0.001	103	47	19	584	0.80	0.115
PZ050C	May-12																																		
PZ050C	Jun-12																																		
PZ050C	Jul-12																																		
PZ050C	Aug-12																																		
	min																1,090								5.4										
	median																1,120								5.5										
	max																1,150								5.5										
PZ055	Sep-11																																		
PZ055	Oct-11	14	<2	<2	14	14.20	<0.001	<0.05	0.00020	4	13.10	294	<0.001	0.0230	0.0020	0.016	1,530	0.2	<0.05	<0.001	64	0.52	0.042	0.04	5.4	0.12	13.0	<0.01	<0.001	168	272	15	966	0.20	0.105
PZ055	Nov-11	22	<2	<2	22	18.90	<0.001	<0.05	0.00010	31	17.90	408	<0.001	0.0230	0.0020	<0.004	1,920	0.1	0.27	<0.001	90	0.34	0.044	<0.01	5.0	0.02	15.0	<0.01	<0.001	196	333	17	1,190	0.50	0.085
PZ055	Dec-11	22	<2	<2	22	18	<0.001	<0.05	<0.0001	26	17.4	376	<0.001	0.025	0.002	<0.004	1,980	<0.1	0.35	<0.001	86	0.375	0.046	0.05	5.2	0.02	17	<0.01	<0.001	198	334	18	1150	<0.1	0.107
PZ055	Jan-12	22	<2	<2	22	19.50	<0.001	<0.05	0.00010	36	20.20	432	<0.001	0.0280	0.0020	<0.004	2,120	<0.1	0.36	0.00100	98	0.43	0.049	0.03	5.1	0.02	19.0	<0.01	<0.001	226	330	18	1,210	0.10	0.115
PZ055	Feb-12	23	<2	<2	23	15.10	<0.001	<0.05	<0.0001	27	15.80	347	<0.001	0.0300	0.0020	<0.004	1,810	0.2	0.39	<0.001	78	0.40	0.044	0.01	5.3	0.02	28.0	<0.01	<0.001	169	233	18	1,030	1.60	0.081
PZ055	Mar-12																																		
PZ055	Apr-12	23	<2	<2	23	16.20	<0.001	<0.05	<0.0001	26	15.10	340	<0.001	0.0360	0.0010	<0.004	1,720	0.1	0.46	<0.001	72	0.55	0.038	0.01	5.3	0.02	16.0	<0.01	<0.001	172	296	20	1,150	0.10	0.076
PZ055	May-12																																		
PZ055	Jun-12																																		
PZ055	Jul-12																																		
PZ055	Aug-12																																		
	min																1,530								5.0										
	median																1,865								5.3										
	max																2,120								5.4										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ058	Sep-11																																		
PZ058	Oct-11																9,760								3.8							18	7,880		
PZ058	Nov-11																																		
PZ058	Dec-11																																		
PZ058	Jan-12																																		
PZ058	Feb-12																																		
PZ058	Mar-12																																		
PZ058	Apr-12	<2	<2	<2	<2	116.00	0.015	<0.05	0.00170	70	131.00	2,090	0.023	0.7240	<0.001	<0.004	9,730	2.6	12.10	0.04400	371	0.72	0.882	<0.01	3.7	0.02	12.0	0.080	<0.001	1,500	2,750	19	7,540	0.60	1.700
PZ058	May-12																																		
PZ058	Jun-12																																		
PZ058	Jul-12																																		
PZ058	Aug-12																																		
	min																9,730								3.7										
	median																9,745								3.8										
	max																9,760								3.8										
PZ072A	Sep-11																																		
PZ072A	Oct-11																1,760								6.5							19	960		
PZ072A	Nov-11																																		
PZ072A	Dec-11																																		
PZ072A	Jan-12																																		
PZ072A	Feb-12																																		
PZ072A	Mar-12																																		
PZ072A	Apr-12	410	<2	<2	410	17.30	<0.001	<0.05	<0.0001	95	16.80	262	<0.001	<0.001	<0.001	<0.004	1,720	1.4	<0.05	<0.001	62	0.06	0.002	0.07	6.9	0.15	19.0	<0.01	<0.001	150	82	18	1,020	0.20	<0.005
PZ072A	May-12																																		
PZ072A	Jun-12																																		
PZ072A	Jul-12																																		
PZ072A	Aug-12																																		
	min																1,720								6.5										
	median																1,740								6.7										
	max																1,760								6.9										
PZ072C	Sep-11																																		
PZ072C	Oct-11																3,220								6.8							17	1830		
PZ072C	Nov-11																																		
PZ072C	Dec-11																																		
PZ072C	Jan-12																																		
PZ072C	Feb-12																																		
PZ072C	Mar-12																																		
PZ072C	Apr-12	605	<2	<2	605	28.90	<0.001	<0.05	<0.0001	69	31.60	574	<0.001	<0.001	<0.001	<0.004	3,010	1.4	<0.05	<0.001	132	0.01	0.002	1.07	7.1	<0.01	12.0	<0.01	<0.001	391	222	19	1,730	1.50	<0.005
PZ072C	May-12																																		
PZ072C	Jun-12																																		
PZ072C	Jul-12																																		
PZ072C	Aug-12																																		
	min																3,010								6.8										
	median																3,115								7.0										
	max																3,220								7.1										
PZ074	Sep-11																																		
PZ074	Oct-11																5,600								6.5							18	4,010		
PZ074	Nov-11																																		
PZ074	Dec-11																																		
PZ074	Jan-12																																		
PZ074	Feb-12																																		
PZ074	Mar-12																																		
PZ074	Apr-12	760	<2	<2	760	64.50	<0.001	<0.05	<0.0001	431	67.40	1,130	<0.001	<0.001	<0.001	<0.004	5,550	0.4	1.64	0.02600	251	0.14	<0.001	0.02	6.6	0.03	65.0	<0.01	<0.001	543	839	19	4,050	0.40	<0.005
PZ074	May-12																																		
PZ074	Jun-12																																		
PZ074	Jul-12																																		
PZ074	Aug-12																																		
	min																5,550								6.5										
	median																5,575								6.6										
	max																5,600								6.6										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ101B	Sep-11																																		
PZ101B	Oct-11																770							7.1							20	400		
PZ101B	Nov-11																																		
PZ101B	Dec-11																																		
PZ101B	Jan-12																																		
PZ101B	Feb-12																																		
PZ101B	Mar-12																																		
PZ101B	Apr-12	324	<2	<2	324	8.17	0.010	<0.05	<0.0001	55	7.72	60	<0.001	<0.001	<0.001	<0.004	750	1.5	2.48	<0.001	20	0.32	0.001	0.03	7.4	0.22	18.0	<0.01	<0.001	66	<2	18	396	0.50	<0.005
PZ101B	May-12																																		
PZ101B	Jun-12																																		
PZ101B	Jul-12																																		
PZ101B	Aug-12																																		
	min																750							7.1										
	median																760							7.3										
	max																770							7.4										
PZ101C	Sep-11																																		
PZ101C	Oct-11																650							6.6							21	400		
PZ101C	Nov-11																																		
PZ101C	Dec-11																																		
PZ101C	Jan-12																																		
PZ101C	Feb-12																																		
PZ101C	Mar-12																																		
PZ101C	Apr-12	324	<2	<2	324	8.17	0.010	<0.05	<0.0001	55	7.72	60	<0.001	<0.001	<0.001	<0.004	750	1.5	2.48	<0.001	20	0.32	0.001	0.03	7.4	0.22	18.0	<0.01	<0.001	66	<2	18	396	0.50	<0.005
PZ101C	May-12																																		
PZ101C	Jun-12																																		
PZ101C	Jul-12																																		
PZ101C	Aug-12																																		
	min																650							6.6										
	median																700							7.0										
	max																750							7.4										
PZ102A	Sep-11																																		
PZ102A	Oct-11																2,270							6.7							20	1,500		
PZ102A	Nov-11																																		
PZ102A	Dec-11																																		
PZ102A	Jan-12																																		
PZ102A	Feb-12																																		
PZ102A	Mar-12																																		
PZ102A	Apr-12	350	<2	<2	350	22.90	<0.001	0.06	0.00040	167	24.50	209	<0.001	0.0030	<0.001	<0.004	2,240	1.8	5.15	<0.001	52	0.25	0.006	0.01	7.0	0.05	37.0	<0.01	<0.001	251	479	18	1,420	1.20	0.008
PZ102A	May-12																																		
PZ102A	Jun-12																																		
PZ102A	Jul-12																																		
PZ102A	Aug-12																																		
	min																2,240							6.7										
	median																2,255							6.9										
	max																2,270							7.0										
PZ102B	Sep-11																																		
PZ102B	Oct-11																2,540							6.4							19	1,850		
PZ102B	Nov-11																																		
PZ102B	Dec-11																																		
PZ102B	Jan-12																																		
PZ102B	Feb-12																																		
PZ102B	Mar-12																																		
PZ102B	Apr-12	215	<2	<2	215	29.60	<0.001	<0.05	<0.0001	215	28.40	138	<0.001	<0.001	<0.001	<0.004	2,480	1.5	9.58	<0.001	86	1.24	0.003	<0.01	6.6	0.01	36.0	<0.01	<0.001	222	1,030	19	1,820	0.70	<0.005
PZ102B	May-12																																		
PZ102B	Jun-12																																		
PZ102B	Jul-12																																		
PZ102B	Aug-12																																		
	min																2,480							6.4										
	median																2,510							6.5										
	max																2,540							6.6										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ103A	Sep-11																																		
PZ103A	Oct-11																630								6.4							20	344		
PZ103A	Nov-11																																		
PZ103A	Dec-11																																		
PZ103A	Jan-12																																		
PZ103A	Feb-12																																		
PZ103A	Mar-12																																		
PZ103A	Apr-12	196	<2	<2	196	6.51	0.005	<0.05	<0.0001	51	6.43	92	<0.001	0.0020	0.0030	<0.004	630	0.7	6.57	<0.001	23	0.13	0.006	<0.01	6.6	0.06	15.0	<0.01	<0.001	37	<2	19	318	1.70	<0.005
PZ103A	May-12																																		
PZ103A	Jun-12																																		
PZ103A	Jul-12																																		
PZ103A	Aug-12																																		
	min																630								6.4										
	median																630								6.5										
	max																630								6.6										
PZ103B	Sep-11																																		
PZ103B	Oct-11																350								5.5							19	202		
PZ103B	Nov-11																																		
PZ103B	Dec-11																																		
PZ103B	Jan-12																																		
PZ103B	Feb-12																																		
PZ103B	Mar-12																																		
PZ103B	Apr-12	76	<2	<2	76	3.87	<0.001	<0.05	0.00330	20	3.70	78	<0.001	0.0030	<0.001	<0.004	400	0.2	4.91	<0.001	15	0.22	0.019	0.08	6.0	0.01	8.2	<0.01	<0.001	29	7	18	204	0.20	0.305
PZ103B	May-12																																		
PZ103B	Jun-12																																		
PZ103B	Jul-12																																		
PZ103B	Aug-12																																		
	min																350								5.5										
	median																375								5.8										
	max																400								6.0										
PZ103C	Sep-11																																		
PZ103C	Oct-11																340								5.3							19	160		
PZ103C	Nov-11																																		
PZ103C	Dec-11																																		
PZ103C	Jan-12																																		
PZ103C	Feb-12																																		
PZ103C	Mar-12																																		
PZ103C	Apr-12	13	<2	<2	13	2.78	<0.001	<0.05	<0.0001	11	2.94	74	0.001	0.0350	<0.001	<0.004	310	<0.1	2.51	<0.001	12	0.46	0.200	<0.01	5.3	0.65	7.4	<0.01	<0.001	28	21	18	160	0.70	0.187
PZ103C	May-12																																		
PZ103C	Jun-12																																		
PZ103C	Jul-12																																		
PZ103C	Aug-12																																		
	min																310								5.3										
	median																325								5.3										
	max																340								5.3										
PZ104	Sep-11																																		
PZ104	Oct-11																1,490								11.4							21	436		
PZ104	Nov-11																																		
PZ104	Dec-11																																		
PZ104	Jan-12																																		
PZ104	Feb-12																																		
PZ104	Mar-12																																		
PZ104	Apr-12	<2	30	300	330	8.30	<0.001	0.05	<0.0001	139	7.97	14	0.025	<0.001	<0.001	<0.004	1,530	0.2	<0.05	<0.001	0	0.00	<0.001	0.04	12.0	0.04	4.2	<0.01	<0.001	21	63	20	436	<0.1	<0.005
PZ104	May-12																																		
PZ104	Jun-12																																		
PZ104	Jul-12																																		
PZ104	Aug-12																																		
	min																1,490								11.4										
	median																1,510								11.7										
	max																1,530								12.0										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ105A	Sep-11																																		
PZ105A	Oct-11																300							5.4								20	158		
PZ105A	Nov-11																																		
PZ105A	Dec-11																																		
PZ105A	Jan-12																																		
PZ105A	Feb-12																																		
PZ105A	Mar-12																																		
PZ105A	Apr-12	17	<2	<2	17	2.62	<0.001	<0.05	0.00010	12	2.28	81	<0.001	0.0150	0.0020	<0.004	250	<0.1	<0.05	<0.001	5	0.20	0.111	0.04	5.6	0.03	2.9	<0.01	<0.001	27	<2	18	151	0.10	0.151
PZ105A	May-12																																		
PZ105A	Jun-12																																		
PZ105A	Jul-12																																		
PZ105A	Aug-12																																		
	min																250							5.4											
	median																275							5.5											
	max																300							5.6											
PZ105B	Sep-11																																		
PZ105B	Oct-11																200							4.6								20	114		
PZ105B	Nov-11																																		
PZ105B	Dec-11																																		
PZ105B	Jan-12																																		
PZ105B	Feb-12																																		
PZ105B	Mar-12																																		
PZ105B	Apr-12	26	<2	<2	26	2.41	<0.001	<0.05	0.00090	12	2.07	67	<0.001	0.0150	0.0110	<0.004	220	<0.1	<0.05	<0.001	6	0.18	0.090	0.02	5.5	<0.01	2.0	<0.01	<0.001	21	<2	18	139	<0.1	0.060
PZ105B	May-12																																		
PZ105B	Jun-12																																		
PZ105B	Jul-12																																		
PZ105B	Aug-12																																		
	min																200							4.6											
	median																210							5.1											
	max																220							5.5											
PZ105C	Sep-11																																		
PZ105C	Oct-11																200							5.4								20	137		
PZ105C	Nov-11																																		
PZ105C	Dec-11																																		
PZ105C	Jan-12																																		
PZ105C	Feb-12																																		
PZ105C	Mar-12																																		
PZ105C	Apr-12	22	<2	<2	22	2.00	<0.001	<0.05	<0.0001	12	1.74	53	<0.001	0.0020	0.0010	<0.004	220	<0.1	<0.05	<0.001	4	0.44	0.046	0.04	5.9	0.02	2.4	<0.01	<0.001	17	3	18	116	0.20	0.014
PZ105C	May-12																																		
PZ105C	Jun-12																																		
PZ105C	Jul-12																																		
PZ105C	Aug-12																																		
	min																200							5.4											
	median																210							5.7											
	max																220							5.9											
PZ106A	Sep-11																																		
PZ106A	Oct-11																730							9.8								23	360		
PZ106A	Nov-11																																		
PZ106A	Dec-11																																		
PZ106A	Jan-12																																		
PZ106A	Feb-12																																		
PZ106A	Mar-12																																		
PZ106A	Apr-12	17	10	<2	27	5.69	<0.001	<0.05	<0.0001	15	5.25	170	<0.001	<0.001	<0.001	<0.004	690	0.1	<0.05	<0.001	1	0.00	<0.001	0.12	9.6	0.03	21.0	<0.01	<0.001	89	17	22	306	0.60	<0.005
PZ106A	May-12																																		
PZ106A	Jun-12																																		
PZ106A	Jul-12																																		
PZ106A	Aug-12																																		
	min																690							9.6											
	median																710							9.7											
	max																730							9.8											

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ106B	Sep-11																																		
PZ106B	Oct-11																1,800								5.1							21	988		
PZ106B	Nov-11																																		
PZ106B	Dec-11																																		
PZ106B	Jan-12																																		
PZ106B	Feb-12																																		
PZ106B	Mar-12																																		
PZ106B	Apr-12	11	<2	<2	11	16.70	<0.001	<0.05	0.00020	26	15.90	553	<0.001	0.0410	<0.001	<0.004	1,900	<0.1	0.92	<0.001	50	1.10	0.075	0.03	5.2	0.01	10.0	<0.01	<0.001	235	42	19	1,050	0.10	0.113
PZ106B	May-12																																		
PZ106B	Jun-12																																		
PZ106B	Jul-12																																		
PZ106B	Aug-12																																		
	min																1,800								5.1										
	median																1,850								5.2										
	max																1,900								5.2										
PZ107	Sep-11																																		
PZ107	Oct-11																690								6.0							22	372		
PZ107	Nov-11																																		
PZ107	Dec-11																																		
PZ107	Jan-12																																		
PZ107	Feb-12																																		
PZ107	Mar-12																																		
PZ107	Apr-12	134	<2	<2	134	6.69	<0.001	<0.05	<0.0001	27	6.12	106	<0.001	<0.001	<0.001	<0.004	660	0.1	<0.05	<0.001	20	0.10	0.005	0.02	6.2	0.02	10.0	<0.01	<0.001	66	49	22	334	<0.1	0.235
PZ107	May-12																																		
PZ107	Jun-12																																		
PZ107	Jul-12																																		
PZ107	Aug-12																																		
	min																660								6.0										
	median																675								6.1										
	max																690								6.2										
PZ108R	Sep-11																																		
PZ108R	Oct-11	94	<2	<2	94	3.57	<0.001	<0.05	<0.0001	18	3.50	57	0.001	<0.001	0.0020	<0.004	390	0.2	<0.05	<0.001	13	0.01	0.006	0.14	5.9	0.03	2.2	<0.01	<0.001	34	4	20	214	0.30	0.020
PZ108R	Nov-11																																		
PZ108R	Dec-11																																		
PZ108R	Jan-12	108	<2	<2	108	4.13	<0.001	<0.05	<0.0001	18	4.16	67	0.001	<0.001	0.0020	<0.004	415	0.2	<0.05	<0.001	21	0.01	0.005	0.21	5.6	0.03	2.2	<0.01	<0.001	34	4	19	244	0.40	0.020
PZ108R	Feb-12																																		
PZ108R	Mar-12																																		
PZ108R	Apr-12	105	<2	<2	105	4.29	<0.001	<0.05	<0.0001	18	3.99	74	0.002	<0.001	0.0020	<0.004	390	0.1	<0.05	<0.001	21	0.01	0.006	0.29	6.1	0.05	2.4	<0.01	<0.001	30	5	18	170	0.60	0.019
PZ108R	May-12																																		
PZ108R	Jun-12																																		
PZ108R	Jul-12	116	<1	<1	116	4.27	<0.001	<0.05	<0.0001	22	4.31	64	0.001	<0.001	0.0060	<0.004	420	0.1	<0.05	<0.001	18	0.02	0.007	0.26	6.1	0.10	3.0	<0.01	<0.001	38	7	18	242	1.10	0.063
PZ108R	Aug-12																																		
	min																390								5.6										
	median																403								6.0										
	max																420								6.1										
PZ109	Sep-11																																		
PZ109	Oct-11																1,090								7.1							23	650		
PZ109	Nov-11																																		
PZ109	Dec-11																																		
PZ109	Jan-12																																		
PZ109	Feb-12																																		
PZ109	Mar-12																																		
PZ109	Apr-12	555	<2	<2	555	12.40	<0.001	0.09	<0.0001	35	11.00	46	<0.001	<0.001	0.0030	<0.004	1,080	2.0	0.56	<0.001	15	0.02	0.002	0.03	7.3	0.10	32.0	<0.01	<0.001	165	<2	19	582	2.40	0.005
PZ109	May-12																																		
PZ109	Jun-12																																		
PZ109	Jul-12																																		
PZ109	Aug-12																																		
	min																1,080								7.1										
	median																1,085								7.2										
	max																1,090								7.3										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ111	Sep-11																																		
PZ111	Oct-11																860							5.9							21	508		
PZ111	Nov-11																																		
PZ111	Dec-11																																		
PZ111	Jan-12																																		
PZ111	Feb-12																																		
PZ111	Mar-12																																		
PZ111	Apr-12	70	<2	<2	70	7.79	<0.001	<0.05	<0.0001	42	7.73	220	<0.001	0.0250	<0.001	<0.004	990	0.1	20.50	0.00300	35	0.80	0.070	<0.01	6.1	0.01	14.0	<0.01	<0.001	55	9	20	526	0.30	0.028
PZ111	May-12																																		
PZ111	Jun-12																																		
PZ111	Jul-12																																		
PZ111	Aug-12																																		
	min																860							5.9										
	median																925							6.0										
	max																990							6.1										
PZ112B	Sep-11																																		
PZ112B	Oct-11																1,890							5.0							17	1,150		
PZ112B	Nov-11																																		
PZ112B	Dec-11																																		
PZ112B	Jan-12																																		
PZ112B	Feb-12																																		
PZ112B	Mar-12																																		
PZ112B	Apr-12	4	<2	<2	4	16.20	<0.001	<0.05	0.00020	2	17.70	354	<0.001	0.0140	0.0020	<0.004	1,890	0.1	<0.05	<0.001	18	0.07	0.048	2.10	5.3	0.10	8.0	<0.01	<0.001	367	297	20	1,090	3.00	0.073
PZ112B	May-12																																		
PZ112B	Jun-12																																		
PZ112B	Jul-12																																		
PZ112B	Aug-12																																		
	min																1,890							5.0										
	median																1,890							5.2										
	max																1,890							5.3										
PZ131	Sep-11																																		
PZ131	Oct-11																6,250							6.4							21	4,650		
PZ131	Nov-11																																		
PZ131	Dec-11																																		
PZ131	Jan-12	420	<2	<2	420	73.40	<0.001	<0.05	<0.0001	432	75.60	1,420	<0.001	<0.001	<0.001	<0.004	6,060	0.2	7.53	<0.001	370	0.30	<0.001	0.08	6.5	<0.01	69.0	<0.01	<0.001	503	1,200	22	4,990	0.80	0.013
PZ131	Feb 12																																		
PZ131	Mar-12																																		
PZ131	Apr-12	475	<2	<2	475	69.00	<0.001	<0.05	<0.0001	213	66.10	1,490	<0.001	<0.001	0.0010	<0.004	6,260	0.2	9.26	<0.001	377	0.34	0.001	0.06	6.5	0.16	74.0	<0.01	<0.001	518	840	19	4,720	1.50	0.020
PZ131	May-12																																		
PZ131	Jun-12																																		
PZ131	Jul-12																																		
PZ131	Aug-12																																		
	min																6,060							6.4										
	median																6,250							6.5										
	max																6,260							6.5										
PZ134	Sep-11																																		
PZ134	Oct-11																4,030							6.1							22	2,380		
PZ134	Nov-11																																		
PZ134	Dec-11																																		
PZ134	Jan-12	63	<2	<2	63	39.70	<0.001	<0.05	<0.0001	141	37.10	1,130	<0.001	0.0020	<0.001	<0.004	3,850	0.2	65.60	<0.001	111	2.29	0.005	<0.01	6.0	0.06	53.0	<0.01	<0.001	450	317	20	2,700	1.00	0.070
PZ134	Feb-12																																		
PZ134	Mar-12																																		
PZ134	Apr-12	130	<2	<2	130	40.20	<0.001	<0.05	<0.0001	139	37.00	1,130	<0.001	0.0020	<0.001	<0.004	3,930	0.2	68.70	<0.001	110	2.14	0.005	<0.01	6.1	0.08	57.0	<0.01	<0.001	449	275	19	2,420	1.40	0.020
PZ134	May-12																																		
PZ134	Jun-12																																		
PZ134	Jul-12																																		
PZ134	Aug-12																																		
	min																3,850							6.0										
	median																3,930							6.1										
	max																4,030							6.1										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ137	Sep-11																																		
PZ137	Oct-11																1,180							5.2							19	714		
PZ137	Nov-11																																		
PZ137	Dec-11																																		
PZ137	Jan-12	24	<2	<2	24	12.90	<0.001	0.08	<0.0001	47	12.00	411	0.001	0.0060	0.0090	<0.004	1,360	0.4	3.65	<0.001	46	0.92	0.016	0.09	5.3	<0.01	32.0	<0.01	<0.001	116	40	20	1,040	0.40	0.150
PZ137	Feb-12																																		
PZ137	Mar-12																																		
PZ137	Apr-12	15	<2	<2	15	13.00	<0.001	<0.05	<0.0001	45	11.80	418	<0.001	0.0050	0.0010	<0.004	1,530	<0.1	<0.05	<0.001	46	0.90	0.015	0.22	5.5	<0.01	31.0	<0.01	<0.001	115	44	18	822	0.40	0.050
PZ137	May-12																																		
PZ137	Jun-12																																		
PZ137	Jul-12																																		
PZ137	Aug-12																																		
	min																1,180								5.2										
	median																1,360								5.3										
	max																1,530								5.5										
PZ141	Sep-11																																		
PZ141	Oct-11																2,210							4.6							17	1,250		
PZ141	Nov-11																																		
PZ141	Dec-11																																		
PZ141	Jan-12	<2	<2	<2	<2	22.30	0.010	<0.05	0.00020	2	20.30	744	<0.001	0.0320	<0.001	<0.004	2,320	0.2	3.28	<0.001	42	0.30	0.076	<0.01	4.7	<0.01	21.0	<0.01	<0.001	372	62	19	1,380	0.50	0.250
PZ141	Feb-12																																		
PZ141	Mar-12																																		
PZ141	Apr-12	4	<2	<2	4	17.10	0.010	<0.05	0.00030	1	15.70	560	<0.001	0.0240	<0.001	<0.004	1,970	0.1	2.58	<0.001	30	0.23	0.056	0.02	4.6	0.03	16.0	<0.01	<0.001	294	57	18	952	0.40	0.169
PZ141	May-12																																		
PZ141	Jun-12																																		
PZ141	Jul-12																																		
PZ141	Aug-12																																		
	min																1,970								4.6										
	median																2,210								4.6										
	max																2,320								4.7										
PZ149	Sep-11																																		
PZ149	Oct-11																4,670							6.4							20	2,930		
PZ149	Nov-11																																		
PZ149	Dec-11																																		
PZ149	Jan-12	490	<2	<2	490	45.40	0.002	0.07	<0.0001	155	45.40	1,220	0.001	0.0020	0.0030	<0.004	4,350	0.2	3.02	0.00200	217	6.29	0.004	<0.01	6.2	0.08	50.0	<0.01	<0.001	427	59	21	3,340	1.60	0.041
PZ149	Feb-12																																		
PZ149	Mar-12																																		
PZ149	Apr-12	245	<2	<2	245	50.80	0.002	0.06	<0.0001	148	49.40	1,330	0.001	0.0170	<0.001	<0.004	4,870	0.2	13.20	<0.001	246	13.20	0.012	0.02	6.0	0.13	46.0	<0.01	<0.001	474	403	17	2,900	1.80	0.012
PZ149	May-12																																		
PZ149	Jun-12																																		
PZ149	Jul-12																																		
PZ149	Aug-12																																		
	min																4,350								6.0										
	median																4,670								6.2										
	max																4,870								6.4										
PZ150	Sep-11																																		
PZ150	Oct-11	No sample collected due to collapsed casing																																	
PZ150	Nov-11																																		
PZ150	Dec-11																																		
PZ150	Jan-12	No sample collected due to collapsed casing																																	
PZ150	Feb-12																																		
PZ150	Mar-12																																		
PZ150	Apr-12	No sample collected due to collapsed casing																																	
PZ150	May-12																																		
PZ150	Jun-12																																		
PZ150	Jul-12	No sample collected due to collapsed casing																																	
PZ150	Aug-12																																		
	min																NA								NA										
	median																NA								NA										
	max																NA								NA										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ151	Sep-11																																		
PZ151	Oct-11																940								6.2							22	633		
PZ151	Nov-11																																		
PZ151	Dec-11																																		
PZ151	Jan-12	147	<2	<2	147	8.40	<0.001	<0.05	<0.0001	46	7.95	156	<0.001	<0.001	<0.001	<0.004	845	0.2	2.12	<0.001	25	0.14	0.002	0.10	6.0	0.06	20.0	<0.01	<0.001	71	51	22	480	0.30	0.032
PZ151	Feb-12																																		
PZ151	Mar-12																																		
PZ151	Apr-12	132	<2	<2	132	7.00	<0.001	<0.05	<0.0001	39	6.70	124	<0.001	<0.001	<0.001	0.031	790	0.1	0.80	<0.001	18	0.14	0.002	0.12	6.3	0.12	21.0	<0.01	<0.001	64	44	21	396	0.40	0.034
PZ151	May-12																																		
PZ151	Jun-12																																		
PZ151	Jul-12																																		
PZ151	Aug-12																																		
	min																790								6.0										
	median																845								6.2										
	max																940								6.3										
PZ152	Sep-11																																		
PZ152	Oct-11																6,300								5.4							19	4,150		
PZ152	Nov-11																																		
PZ152	Dec-11																																		
PZ152	Jan-12	55	<2	<2	55	62.70	0.001	<0.05	0.00170	150	57.40	2,060	<0.001	0.3680	<0.001	<0.004	6,040	<0.1	55.10	<0.001	210	20.40	1.210	<0.01	5.5	<0.01	62.0	<0.01	<0.001	714	168	19	3,940	0.40	1.020
PZ152	Feb-12																																		
PZ152	Mar-12																																		
PZ152	Apr-12	50	<2	<2	50	58.10	0.001	<0.05	0.00240	126	56.30	1,910	<0.001	0.3760	<0.001	<0.004	5,690	<0.1	62.10	<0.001	177	19.20	1.320	<0.01	5.8	0.02	67.0	<0.01	<0.001	776	156	19	3,740	0.40	1.150
PZ152	May-12																																		
PZ152	Jun-12																																		
PZ152	Jul-12																																		
PZ152	Aug-12																																		
	min																5,690								5.4										
	median																6,040								5.5										
	max																6,300								5.8										
PZ155	Sep-11																																		
PZ155	Oct-11																3,930								7.9							20	5,140		
PZ155	Nov-11																																		
PZ155	Dec-11																																		
PZ155	Jan-12	No sample could be collected as the site was dry																																	
PZ155	Feb 12																																		
PZ155	Mar-12																																		
PZ155	Apr-12	No sample could be collected as the site was dry																																	
PZ155	May-12																																		
PZ155	Jun-12																																		
PZ155	Jul-12																																		
PZ155	Aug-12																																		
	min																3,930								7.9										
	median																3,930								7.9										
	max																3,930								7.9										
PZ156	Sep-11																																		
PZ156	Oct-11																620								5.5							22	348		
PZ156	Nov-11																																		
PZ156	Dec-11																																		
PZ156	Jan-12	44	<2	<2	44	5.82	0.003	<0.05	<0.0001	23	5.43	159	<0.001	0.0130	<0.001	<0.004	620	0.1	7.20	<0.001	21	0.33	0.060	<0.01	5.4	0.02	9.7	<0.01	<0.001	53	22	920	324	0.40	0.014
PZ156	Feb-12																																		
PZ156	Mar-12																																		
PZ156	Apr-12	53	<2	<2	53	6.04	0.003	<0.05	<0.0001	24	5.47	159	<0.001	0.0120	<0.001	<0.004	650	0.1	8.10	<0.001	21	0.32	0.061	0.01	5.8	0.09	11.0	<0.01	<0.001	52	24	1642	312	0.30	0.006
PZ156	May-12																																		
PZ156	Jun-12																																		
PZ156	Jul-12																																		
PZ156	Aug-12																																		
	min																620								5.4										
	median																620								5.5										
	max																650								5.8										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ157	Sep-11																																		
PZ157	Oct-11																730							5.9							22	430		
PZ157	Nov-11																																		
PZ157	Dec-11																																		
PZ157	Jan-12	111	<2	<2	111	7.12	<0.001	<0.05	<0.0001	40	6.81	170	0.004	0.0060	0.0010	<0.004	705	0.1	0.97	<0.001	37	0.17	0.030	0.02	5.7	0.25	8.0	<0.01	<0.001	36	5	21	474	0.70	0.108
PZ157	Feb-12																																		
PZ157	Mar-12																																		
PZ157	Apr-12	113	<2	<2	113	7.31	<0.001	<0.05	<0.0001	41	6.90	174	<0.001	0.0050	<0.001	<0.004	750	0.1	0.83	<0.001	38	0.16	0.028	0.01	6.1	0.27	8.2	<0.01	<0.001	35	7	20	384	0.30	0.028
PZ157	May-12																																		
PZ157	Jun-12																																		
PZ157	Jul-12																																		
PZ157	Aug-12																																		
	min																705								5.7										
	median																730								5.9										
	max																750								6.1										
PZ164	Sep-11																																		
PZ164	Oct-11																260							4.1							19	258		
PZ164	Nov-11																																		
PZ164	Dec-11																																		
PZ164	Jan-12	<2	<2	<2	<2	2.95	<0.001	<0.05	0.00030	1	2.54	89	0.001	0.0280	0.0080	<0.004	345	0.1	0.23	0.00300	9	0.11	0.039	0.54	4.0	<0.01	4.5	<0.01	<0.001	38	21	23	324	1.40	0.184
PZ164	Feb-12																																		
PZ164	Mar-12																																		
PZ164	Apr-12	<2	<2	<2	<2	2.66	<0.001	<0.05	0.00020	0	2.42	78	<0.001	0.0220	0.0070	<0.004	240	0.1	0.23	0.00200	8	0.14	0.028	0.26	4.5	0.06	3.6	<0.01	<0.001	38	22	18	203	1.10	0.138
PZ164	May-12																																		
PZ164	Jun-12																																		
PZ164	Jul-12																																		
PZ164	Aug-12																																		
	min																240								4.0										
	median																260								4.1										
	max																345								4.5										
PZ165	Sep-11																																		
PZ165	Oct-11																10							4.8							16	124		
PZ165	Nov-11																																		
PZ165	Dec-11																																		
PZ165	Jan-12	<2	<2	<2	<2	0.86	<0.001	0.12	<0.0001	1	0.71	18	<0.001	0.0050	0.0060	<0.004	95	<0.1	0.07	<0.001	2	0.01	0.004	1.18	4.8	0.37	6.9	<0.01	<0.001	8	17	22	200	3.80	0.058
PZ165	Feb 12																																		
PZ165	Mar-12																																		
PZ165	Apr-12	5	<2	<2	5	0.43	<0.001	<0.05	<0.0001	0	0.61	3	<0.001	0.0060	0.0040	<0.004	90	<0.1	0.06	<0.001	1	0.02	0.004	1.23	5.2	0.56	6.4	<0.01	<0.001	8	12	19	113	4.40	0.011
PZ165	May-12																																		
PZ165	Jun-12																																		
PZ165	Jul-12																																		
PZ165	Aug-12																																		
	min																10								4.8										
	median																90								4.8										
	max																95								5.2										
PZ168	Sep-11																																		
PZ168	Oct-11																710							6.6							21	370		
PZ168	Nov-11																																		
PZ168	Dec-11																																		
PZ168	Jan-12	208	<2	<2	208	7.58	<0.001	<0.05	<0.0001	46	7.34	117	<0.001	<0.001	<0.001	<0.004	705	0.1	<0.05	<0.001	37	0.00	0.002	0.14	6.2	<0.01	12.0	<0.01	<0.001	39	6	19	444	0.20	0.065
PZ168	Feb-12																																		
PZ168	Mar-12																																		
PZ168	Apr-12	200	<2	<2	200	6.61	<0.001	<0.05	<0.0001	42	6.51	89	<0.001	<0.001	0.0020	0.021	750	0.1	0.56	<0.001	33	0.05	0.003	0.13	6.5	0.03	12.0	<0.01	<0.001	32	5	19	380	0.10	0.036
PZ168	May-12																																		
PZ168	Jun-12																																		
PZ168	Jul-12																																		
PZ168	Aug-12																																		
	min																705								6.2										
	median																710								6.5										
	max																750								6.6										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ170	Sep-11																																		
PZ170	Oct-11																4,500								6.1							20	3,020		
PZ170	Nov-11																																		
PZ170	Dec-11																																		
PZ170	Jan-12	220	<2	<2	220	47.30	0.002	<0.05	0.00020	230	46.70	1,510	<0.001	0.0440	0.0010	<0.004	4,550	0.1	4.81	<0.001	220	0.56	0.148	0.08	6.0	<0.01	28.0	<0.01	<0.001	377	16	20	3,820	<0.1	0.338
PZ170	Feb-12																																		
PZ170	Mar-12																																		
PZ170	Apr-12	225	<2	<2	225	45.80	0.010	<0.05	<0.0001	275	46.60	1,450	0.001	0.0250	<0.001	<0.004	5,010	0.1	9.36	<0.001	201	0.28	0.126	0.03	6.3	0.04	32.0	<0.01	<0.001	357	17	19	3,010	1.10	0.096
PZ170	May-12																																		
PZ170	Jun-12																																		
PZ170	Jul-12																																		
PZ170	Aug-12																																		
	min																4,500								6.0										
	median																4,550								6.1										
	max																5,010								6.3										
PZ172	Sep-11																																		
PZ172	Oct-11																8,150								6.1							20	4,870		
PZ172	Nov-11																																		
PZ172	Dec-11																																		
PZ172	Jan-12	450	<2	<2	450	85.90	0.001	<0.05	0.00230	151	84.40	2,640	<0.001	0.0340	<0.001	<0.004	7,920	0.4	<0.05	<0.001	468	0.45	0.256	0.30	6.2	<0.01	3.3	<0.01	<0.001	880	115	20	6,450	3.00	0.534
PZ172	Feb-12																																		
PZ172	Mar-12																																		
PZ172	Apr-12	490	<2	<2	490	85.90	0.001	<0.05	0.00250	152	86.10	2,610	<0.001	0.0360	<0.001	0.016	8,710	0.4	<0.05	0.00100	450	0.34	0.250	0.39	6.4	0.01	3.4	<0.01	<0.001	952	119	18	4,870	0.40	0.509
PZ172	May-12																																		
PZ172	Jun-12																																		
PZ172	Jul-12																																		
PZ172	Aug-12																																		
	min																7,920								6.1										
	median																8,150								6.2										
	max																8,710								6.4										
PZ173	Sep-11																																		
PZ173	Oct-11	No sample was collected as the site was dry																																	
PZ173	Nov-11																																		
PZ173	Dec-11																																		
PZ173	Jan-12	No sample was collected as the site was dry																																	
PZ173	Feb 12																																		
PZ173	Mar-12																																		
PZ173	Apr-12	430	<2	<2	430	50.60	0.004	<0.05	<0.0001	6	47.80	1,490	<0.001	0.1380	0.0010	<0.004	5,030	1.0	26.30	<0.001	166	4.99	0.028	0.03	6.8	0.37	7.3	<0.01	<0.001	774	<2	19	3,370	1.10	0.026
PZ173	May-12																																		
PZ173	Jun-12																																		
PZ173	Jul-12																																		
PZ173	Aug-12																																		
	min																5,030								6.8										
	median																5,030								6.8										
	max																5,030								6.8										
PZ174	Sep-11																																		
PZ174	Oct-11																12,400								6.0							18	7,970		
PZ174	Nov-11																																		
PZ174	Dec-11																																		
PZ174	Jan-12	430	<2	<2	430	143.00	<0.001	<0.05	<0.0001	243	141.00	4,500	<0.001	0.1490	0.0020	<0.004	12,420	0.8	0.08	<0.001	778	1.08	0.074	<0.01	6.0	0.02	6.3	<0.01	<0.001	1,480	365	21	9,350	1.40	0.080
PZ174	Feb-12																																		
PZ174	Mar-12																																		
PZ174	Apr-12	460	<2	<2	460	141.00	<0.001	<0.05	0.00010	233	145.00	4,430	<0.001	0.1660	0.0010	<0.004	12,820	0.8	0.10	<0.001	800	1.01	0.077	<0.01	6.0	<0.01	7.3	<0.01	<0.001	1,540	352	18	7,410	0.20	0.062
PZ174	May-12																																		
PZ174	Jun-12																																		
PZ174	Jul-12																																		
PZ174	Aug-12																																		
	min																12,400								6.0										
	median																12,420								6.0										
	max																12,820								6.0										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ175	Sep-11																																		
PZ175	Oct-11																3,890								7.8							18	4,950		
PZ175	Nov-11																																		
PZ175	Dec-11																																		
PZ175	Jan-12	67	<2	<2	67	13.20	<0.001	<0.05	<0.0001	2	12.40	383	0.004	0.0030	0.0080	<0.004	1,430	0.3	0.56	<0.001	62	0.02	0.007	1.96	6.4	0.02	5.9	<0.01	<0.001	162	52	20	990	4.30	0.034
PZ175	Feb-12																																		
PZ175	Mar-12																																		
PZ175	Apr-12	128	<2	<2	128	16.20	0.002	<0.05	<0.0001	1	15.00	468	0.004	0.0200	0.0010	<0.004	1,640	0.3	2.95	<0.001	75	0.41	0.008	0.07	6.4	0.37	7.8	<0.01	<0.001	198	19	19	940	2.10	0.009
PZ175	May-12																																		
PZ175	Jun-12																																		
PZ175	Jul-12																																		
PZ175	Aug-12																																		
	min																1,430								6.4										
	median																1,640								6.4										
	max																3,890								7.8										
PZ176	Sep-11																																		
PZ176	Oct-11																650								5.9							18	374		
PZ176	Nov-11																																		
PZ176	Dec-11																																		
PZ176	Jan-12	46	<2	<2	46	6.11	<0.001	<0.05	<0.0001	20	5.56	184	<0.001	<0.001	<0.001	<0.004	665	<0.1	11.60	<0.001	25	0.21	<0.001	<0.01	6.0	0.05	4.5	<0.01	<0.001	57	<2	21	390	0.20	<0.005
PZ176	Feb-12																																		
PZ176	Mar-12																																		
PZ176	Apr-12	69	<2	<2	69	6.57	<0.001	<0.05	<0.0001	20	6.72	184	<0.001	<0.001	<0.001	<0.004	650	<0.1	10.10	<0.001	26	0.21	<0.001	0.01	6.0	0.14	4.0	<0.01	<0.001	80	<1	19	302	0.40	<0.005
PZ176	May-12																																		
PZ176	Jun-12																																		
PZ176	Jul-12																																		
PZ176	Aug-12																																		
	min																650								5.9										
	median																650								6.0										
	max																665								6.0										
PZ177	Sep-11																																		
PZ177	Oct-11																5,310								6.3							17	3,840		
PZ177	Nov-11																																		
PZ177	Dec-11																																		
PZ177	Jan-12	180	<2	<2	180	47.70	<0.001	0.06	<0.0001	23	45.60	1,450	<0.001	0.0060	<0.001	<0.004	4,740	0.7	<0.05	<0.001	115	0.01	0.009	<0.01	6.3	0.03	0.6	<0.01	<0.001	804	155	20	2,740	0.30	0.055
PZ177	Feb-12																																		
PZ177	Mar-12																																		
PZ177	Apr-12	130	<2	<2	130	26.90	<0.001	<0.05	<0.0001	1	25.20	798	<0.001	0.0030	0.0020	<0.004	2,760	0.5	<0.05	<0.001	63	0.01	0.006	0.02	6.3	0.69	0.4	<0.01	<0.001	458	84	19	1,700	0.80	0.007
PZ177	May-12																																		
PZ177	Jun-12																																		
PZ177	Jul-12																																		
PZ177	Aug-12																																		
	min																2,760								6.3										
	median																4,740								6.3										
	max																5,310								6.3										
PZ181	Sep-11																																		
PZ181	Oct-11	4	<2	<2	4	0.21	<0.001	<0.05	<0.0001	1	0.16	3	<0.001	<0.001	<0.001	<0.004	<10	<0.1	<0.05	<0.001	0	0.01	0.002	0.45	5.2	<0.01	0.3	<0.01	<0.001	2	2	20	57	0.60	0.009
PZ181	Nov-11																																		
PZ181	Dec-11																																		
PZ181	Jan-12	5	<2	<2	5	0.30	<0.001	<0.05	<0.0001	1	0.33	7	<0.001	<0.001	0.0010	<0.004	35	<0.1	<0.05	<0.001	1	0.01	0.001	0.40	5.3	<0.01	0.3	<0.01	<0.001	5	<2	20	78	0.70	0.013
PZ181	Feb-12																																		
PZ181	Mar-12																																		
PZ181	Apr-12	9	<2	<2	9	0.20	<0.001	<0.05	<0.0001	<1	0.22	<3	<0.001	<0.001	<0.001	<0.004	34	<0.1	<0.05	<0.001	<1	0.00	<0.001	0.41	5.9	0.15	<1	<0.01	<0.001	5	<2	20	46	0.50	0.009
PZ181	May-12																																		
PZ181	Jun-12																																		
PZ181	Jul-12	5	<1	<1	5	0.28	<0.001	<0.05	<0.0001	<1	0.17	5	<0.001	<0.001	<0.001	<0.04	30	<0.1	<0.05	<0.001	<1	0.01	0.001	0.40	5.8	0.02	<1	<0.01	<0.001	4	2	18	42	0.70	0.011
PZ181	Aug-12																																		
	min																<10								5.2										
	median																27								5.6										
	max																35								5.9										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ184	Sep-11																																		
PZ184	Oct-11	<2	<2	<2	<2	34.40	<0.001	<0.05	0.00050	29	31.30	1,010	0.001	0.1340	0.0080	<0.004	3,780	0.4	8.63	0.00800	60	0.74	0.220	0.04	3.2	0.15	8.2	<0.01	<0.001	569	284	18	2,070	1.00	0.317
PZ184	Nov-11																																		
PZ184	Dec-11																																		
PZ184	Jan-12	<2	<2	<2	<2	36.00	<0.001	<0.05	0.00050	25	31.50	1,060	0.002	0.1220	0.0050	<0.004	3,580	0.4	7.88	0.00800	62	0.86	0.196	<0.01	3.3	<0.01	9.2	<0.01	<0.001	572	294	18	2,030	1.20	0.310
PZ184	Feb-12																																		
PZ184	Mar-12																																		
PZ184	Apr-12	<2	<2	<2	<2	32.80	<0.001	<0.05	0.00050	22	32.30	957	0.001	0.1310	0.0050	0.013	3,720	0.4	21.00	0.00700	56	0.76	0.218	<0.01	3.2	0.03	8.0	<0.01	<0.001	607	277	20	1,940	1.20	0.267
PZ184	May-12																																		
PZ184	Jun-12																																		
PZ184	Jul-12	<1	<1	<1	<1	31.00	<0.001	<0.05	0.00050	24	32.70	890	<0.001	0.1170	0.0030	<0.004	3,510	0.2	9.14	0.007	53	0.75	0.200	<0.01	3.3	<0.01	9.0	<0.01	<0.001	619	282	19	2,010	1.50	0.235
PZ184	Aug-12																																		
	min																3,510								3.2										
	median																3,650								3.3										
	max																3,780								3.3										
PZ186	Sep-11																																		
PZ186	Oct-11	75	<2	<2	75	3.19	0.008	<0.05	<0.0001	21	3.23	60	<0.001	<0.001	<0.001	<0.004	400	0.2	8.07	<0.001	11	0.22	0.002	0.05	6.0	0.80	9.2	<0.01	<0.001	24	<2	18	210	<0.1	0.036
PZ186	Nov-11																																		
PZ186	Dec-11																																		
PZ186	Jan-12	84	<2	<2	84	3.88	0.010	<0.05	<0.0001	22	3.37	78	<0.001	<0.001	<0.001	<0.004	375	0.4	7.70	<0.001	12	0.21	0.002	<0.01	5.9	0.99	9.3	<0.01	<0.001	24	<2	19	210	0.10	0.010
PZ186	Feb-12																																		
PZ186	Mar-12																																		
PZ186	Apr-12	86	<2	<2	86	3.81	0.010	<0.05	<0.0001	21	3.47	74	<0.001	<0.001	<0.001	<0.004	370	0.2	7.50	<0.001	12	0.20	0.002	0.03	6.3	0.58	10.0	<0.01	<0.001	27	<2	18	250	0.20	0.007
PZ186	May-12																																		
PZ186	Jun-12																																		
PZ186	Jul-12	87	<1	<1	87	3.54	0.009	<0.05	<0.0001	19	3.54	64	<0.001	<0.001	<0.001	<0.004	370	0.2	8.18	<0.001	10	0.21	0.002	<0.01	6.3	0.16	12.0	<0.01	<0.001	24	<1	16	204	0.10	<0.005
PZ186	Aug-12																																		
	min																370								5.9										
	median																373								6.2										
	max																400								6.3										
PZ187	Sep-11																																		
PZ187	Oct-11	30	<2	<2	30	1.19	0.003	<0.05	<0.0001	1	1.37	21	<0.001	<0.001	0.0010	<0.004	150	<0.1	0.70	<0.001	1	0.01	0.001	0.01	5.6	0.13	0.5	<0.01	<0.001	28	<2	17	128	0.30	0.018
PZ187	Nov-11																																		
PZ187	Dec-11																																		
PZ187	Jan-12	29	<2	<2	29	1.68	0.002	<0.05	<0.0001	1	1.41	39	<0.001	<0.001	<0.001	<0.004	170	0.1	0.27	<0.001	1	0.01	0.002	<0.01	5.4	<0.01	0.5	<0.01	<0.001	29	<2	21	119	0.10	0.006
PZ187	Feb 12																																		
PZ187	Mar-12																																		
PZ187	Apr-12	29	<2	<2	29	1.68	0.006	<0.05	<0.0001	1	1.47	39	0.001	<0.001	0.0020	<0.004	180	<0.1	0.70	<0.001	1	0.01	0.003	0.04	5.7	0.09	0.7	<0.01	<0.001	30	<2	18	144	0.30	0.012
PZ187	May-12																																		
PZ187	Jun-12																																		
PZ187	Jul-12	34	<1	<1	34	1.54	0.003	<0.05	<0.0001	<1	1.42	29	<0.001	<0.001	<0.001	<0.004	190	<0.1	1.22	<0.001	<1	0.01	0.002	<0.01	6.2	0.52	<1	<0.01	<0.001	31	2	18	164	0.40	<0.005
PZ187	Aug-12																																		
	min																150								5.4										
	median																175								5.7										
	max																190								6.2										
PZ188	Sep-11																																		
PZ188	Oct-11	6	<2	<2	6	2.12	<0.001	<0.05	<0.0001	1	2.05	71	<0.001	0.0070	0.0020	<0.004	280	<0.1	<0.05	<0.001	4	0.04	0.023	0.02	4.6	<0.01	0.5	<0.01	<0.001	37	<2	17	152	<0.1	0.030
PZ188	Nov-11																																		
PZ188	Dec-11																																		
PZ188	Jan-12	8	<2	<2	8	2.36	<0.001	<0.05	<0.0001	9	2.13	78	<0.001	0.0050	<0.001	<0.004	225	<0.1	<0.05	0.00400	4	0.02	0.016	<0.01	4.7	<0.01	0.5	<0.01	<0.001	31	<2	19	130	<0.1	0.032
PZ188	Feb-12																																		
PZ188	Mar-12																																		
PZ188	Apr-12	8	<2	<2	8	2.05	<0.001	<0.05	<0.0001	10	1.73	67	<0.001	0.0040	0.0020	<0.004	210	<0.1	<0.05	<0.001	2	0.02	0.012	0.09	5.2	0.11	0.6	<0.01	<0.001	24	<2	18	127	0.30	0.019
PZ188	May-12																																		
PZ188	Jun-12																																		
PZ188	Jul-12	6	<1	<1	6	1.73	<0.001	<0.05	<0.0001	<1	1.68	57	<0.001	0.0060	<0.001	<0.004	215	<0.1	0.07	<0.001	3	0.03	0.018	0.05	5.2	0.35	<1	<0.01	<0.001	33	<1	18	153	0.40	0.016
PZ188	Aug-12																																		
	min																210								4.6										
	median																220								5.0										
	max																280								5.2										

Sample Location	Sample Date	Alkalinity - Bicarbonate mg CaCO3/L	Alkalinity - Carbonate mg CaCO3/L	Alkalinity - Hydroxide mg CaCO3/L	Alkalinity - Total as CaCO3 mg CaCO3/L	Anion Sum me/L	Arsenic - filterable_ mg/L	Boron - filterable_ mg/L	Cadmium - filterable_ mg/L	Calcium - total mg/L	Cation Sum me/L	Chloride mg/L	Chromium - filterable_ mg/L	Cobalt - filterable_ mg/L	Copper - filterable_ mg/L	Cyanide_ mg/L	Electrical Conductivity µS/cm - lab	Fluoride_ mg/L	Iron- filterable_ mg/L	Lead - filterable_ mg/L	Magnesium - total mg/L	Manganese - filterable_ mg/L	Nickel - filterable_ mg/L	Nitrates_ mg/L N	pH - lab	Phosphorus - total_ mg/L	Potassium - total mg/L	Selenium - filterable_ mg/L	Silver - filterable_ mg/L	Sodium - total mg/L	Sulfates mg/L	Temperature	Total Dissolved Solids @ 180°C_ mg/L	Total Nitrogen_ mg/L N	Zinc - filterable_ mg/L
PZ189	Sep-11																																		
PZ189	Oct-11	53	<2	<2	53	3.06	<0.001	<0.05	<0.0001	17	3.17	71	<0.001	<0.001	0.0020	<0.004	370	0.2	4.18	<0.001	11	0.13	<0.001	0.03	5.6	<0.01	6.0	<0.01	<0.001	29	<2	18	214	0.20	0.048
PZ189	Nov-11																																		
PZ189	Dec-11																																		
PZ189	Jan-12	51	<2	<2	51	3.42	<0.001	<0.05	<0.0001	17	3.08	85	<0.001	<0.001	<0.001	<0.004	375	0.2	13.80	<0.001	11	0.34	<0.001	<0.01	5.6	0.20	6.0	<0.01	<0.001	27	<2	19	200	0.20	0.006
PZ189	Feb-12																																		
PZ189	Mar-12																																		
PZ189	Apr-12	70	<2	<2	70	3.29	<0.001	<0.05	<0.0001	15	2.87	67	<0.001	<0.001	<0.001	<0.004	390	0.2	14.80	<0.001	11	0.38	0.001	<0.01	6.1	0.18	6.6	<0.01	<0.001	24	<2	18	256	0.20	0.017
PZ189	May-12																																		
PZ189	Jun-12																																		
PZ189	Jul-12	69	<1	<1	69	3.64	<0.001	<0.05	<0.0001	14	3.63	80	<0.001	<0.001	<0.001	<0.004	385	0.2	16.60	<0.001	9	0.37	<0.001	<0.01	6.2	0.13	7.0	<0.01	<0.001	26	<1	18	254	0.10	<0.005
PZ189	Aug-12																																		
	min																370								5.6										
	median																380								5.9										
	max																390								6.2										
PZ191	Sep-11	<2	<2	<2	<2	1.61	<0.001	<0.05	<0.0001	3	1.53	57	<0.001	<0.001	<0.001	<0.004	220	<0.1	<0.05	<0.001	5	0.32	0.002	0.07	4.0	0.39	3.1	<0.01	<0.001	20	<2	19	105	<0.1	0.014
PZ191	Oct-11	<2	<2	<2	<2	1.61	<0.001	<0.05	<0.0001	3	1.68	57	<0.001	<0.001	0.0010	<0.004	220	<0.1	0.09	<0.001	5	0.33	0.002	0.14	3.9	0.21	2.9	<0.01	<0.001	24	<2	18	310	0.70	0.016
PZ191	Nov-11	<2	<2	<2	<2	1.77	0.001	<0.05	<0.0001	2.2	1.42	57	<0.001	<0.001	<0.001	<0.004	230	0.1	12.7	<0.001	5	0.352	0.001	0.07	4.5	0.15	3.1	<0.01	<0.001	19	8	22	162	0.5	0.088
PZ191	Dec-11	<2	<2	<2	<2	2.29	<0.001	<0.05	<0.0001	3	1.60	81	<0.001	<0.001	0.0010	<0.004	210	0.2	<0.05	<0.001	6	0.35	0.002	<0.01	4.0	0.14	3.4	<0.01	<0.001	21	<2	21	138	0.40	0.024
PZ191	Jan-12	<2	<2	<2	<2	2.00	<0.001	<0.05	<0.0001	2	1.83	71	<0.001	<0.001	<0.001	<0.004	240	0.1	13.20	<0.001	5	0.34	0.003	<0.01	5.0	0.22	2.7	<0.01	<0.001	28	<2	20	158	0.20	0.023
PZ191	Feb-12	<2	<2	<2	<2	1.61	<0.001	0.05	<0.0001	2	1.63	57	<0.001	<0.001	0.0040	<0.004	250	<0.1	1.39	<0.001	5	0.36	0.004	0.04	6.9	0.40	3.3	<0.01	<0.001	23	<2	21	110	0.50	0.227
PZ191	Mar-12																																		
PZ191	Apr-12	<2	<2	<2	<2	1.81	<0.001	<0.05	<0.0001	10	1.72	64	<0.001	<0.001	0.0040	<0.004	290	0.1	0.13	0.00900	5	0.28	0.003	0.07	4.0	0.09	3.2	<0.01	<0.001	17	<2	19	137	<0.1	0.017
PZ191	May-12																																		
PZ191	Jun-12																																		
PZ191	Jul-12	<1	<1	<1	<1	1.78	<0.001	<0.05	<0.0001	4	1.58	63	<0.001	<0.001	0.0020	<0.004	260	<0.1	0.22	<0.001	5	0.38	0.003	0.05	3.9	0.24	4.0	<0.01	<0.001	20	<1	15	139	<0.1	0.014
PZ191	Aug-12																																		
	min																210								3.9										
	median																235								4.0										
	max																290								6.9										
TB103	Sep-11																																		
TB103	Oct-11																640								6.5							21	342		
TB103	Nov-11																																		
TB103	Dec-11																																		
TB103	Jan-12																																		
TB103	Feb-12																																		
TB103	Mar-12																																		
TB103	Apr-12	188	<2	<2	188	6.55	<0.001	<0.05	<0.0001	53	6.50	99	<0.001	<0.001	<0.001	<0.004	630	0.7	0.06	<0.001	23	0.09	0.003	0.01	6.7	<0.01	14.0	<0.01	<0.001	37	<2	19	314	0.20	<0.005
TB103	May-12																																		
TB103	Jun-12																																		
TB103	Jul-12																																		
TB103	Aug-12																																		
	min																630								6.5										
	median																635								6.6										
	max																640								6.7										
TB105	Sep-11																																		
TB105	Oct-11																740								7.2							21	416		
TB105	Nov-11																																		
TB105	Dec-11																																		
TB105	Jan-12																																		
TB105	Feb-12																																		
TB105	Mar-12																																		
TB105	Apr-12	318	<2	<2	318	8.05	<0.001	0.07	<0.0001	54	7.73	60	<0.001	<0.001	<0.001	<0.004	730	1.9	0.17	<0.001	21	0.01	<0.001	0.01	7.3	0.02	22.0	<0.01	<0.001	63	<2	18	398	0.80	<0.005
TB105	May-12																																		
TB105	Jun-12																																		
TB105	Jul-12																																		
TB105	Aug-12																																		
	min																730								7.2										
	median																735								7.3										
	max																740								7.3										

The results highlighted in red indicate the results are outside the maximum results reported for background groundwater quality or are above the ANZECC guidelines and require further investigation into the cause of the result. The results in yellow are between the 80th percentile value and the maximum results or ANZECC guidelines and act as an early warning system that further investigations may be required. The outcomes of any investigations are discussed further in **Section 3.7.2**. The blue shading indicates that the sample was not due for collection.

Appendix 5: Community Complaints

Number	Date	Location	Issue	Investigation and Follow Up
1.	1st September 2011	Ulan Road	Noise	Complainant rang the complaints hotline at 10:27pm in 01/09/11 to complain about ongoing noise. The complainant stated the noise was ongoing and had kept them awake 24 hrs a day for the past 17 months. At the time of the complaint LF noise levels were approximately 35.4dB at the Lagoons Road monitor.
2.	2nd September 2011	Ulan Road	Driving	The complainant left a message on the ECRC's phone regarding a driving incident on Ulan Road. The ECRC rang the complainant back to discuss the incident. The complainant was turning into Winchester Crescent and there was another vehicle behind them. A third vehicle was overtaking the second vehicle and nearly collided with the complainant's vehicle. The complainant was OK and wanted to let MCO know about the incident. No details of the cars involved were recorded by the complainant to identify the drivers or where they were from.
3.	2nd September 2011	Ulan Road	Noise	Complainant rang the complaints hotline at 9:20pm on 02/09/11 to complain about ongoing noise. At the time of the complaint LF noise levels were approximately 28.6dB at the Lagoons Road monitor.
4.	2nd September 2011	Ridge Road	Noise	Complainant rang the complaints hotline at 11:11pm on 02/09/11 to complain about noise from the operation. At the time of the complaint the LF noise levels were approximately 33dB. A review of the audio revealed dozer track and trucks. The ECRC rang the OCE at approximately 11:45pm on 02/09/11. The OCE stated they were changing to a lower dump location. The ECRC rang the complainant on the 03/09/2011 at approximately 9:00am and left a message.
5.	2nd September 2011	Maiala Road	Noise	Complainant rang the complaints hotline at 11:34pm on 02/09/11 to complain about noise from the operation. At the time of the complaint the LF noise levels were approximately 34dB. A review of the audio revealed dozer track and trucks. The ECRC rang the OCE at approximately 11:45pm on 02/09/11. The OCE stated they were changing to a lower dump location. The ECRC rang the complainant on the 03/09/11 at 9:00am. The complainant mentioned it had been noisy lately and was happy for MCO to measure noise levels at their property during the next monitoring period.
6.	2nd September 2011	Winchester Crescent	Noise	Complainant rang the complaints hotline at 11:00pm on the 02/09/11 and 01:00am on the 03/09/11 to complain about noise from the operation. At the time of the first complaint the LF noise levels were approximately 33dB. A review of the audio revealed dozer track and trucks. The ECRC rang the OCE at approximately 11:45pm on 02/09/11. The OCE stated they were changing to a lower dump location. At the time of the second complaint LF noise levels were approximately 34.2 dB at the Lagoons Road monitor. The ECRC rang the complainant on the 03/09/11 at 9:00am. The complainant stated the noise was getting beyond a joke and would call the EPA in the future and that MCO were above their noise

Number	Date	Location	Issue	Investigation and Follow Up
				criteria.
7.	3rd September 2011	Ulan Road	Noise	Complainant rang the complaints hotline at 7:55pm on 03/09/11 to complain about noise from the operation. At the time of the complaint the LF noise levels were approximately 39dB. Wind speed and direction at the time of the complaint were 1m/s and SW respectively.
8.	4th September 2011	Ulan Road	Noise	Complainant rang the complaints hotline at 8:53am on 04/09/11 to complain about noise. A review of noise levels throughout the night showed LF noise levels between 32dB and 37dB.
9.	5th September 2011	Drip Lane	Water	The complainant wanted to lodge a complaint regarding water loss from their dams. The complainant can at times feel vibration from blasting activities and has associated this vibration with the water loss. They mentioned that the dams started leaking in February but they have only just noticed that the dams are nearly dry. The ECRC discussed the situation with the complainant and advised that is unlikely mining operations at MCO are affecting their dams due to the distance from the operation (15km). Also, dams much closer to the mine are monitored on a regular basis and there has been no impact from mining operations noted on these dams. The complainant commented that the Soil Conservation Service was coming to inspect the dams to determine why they were leaking. The complainant was asked to call the ECRC next time they felt a vibration and the ECRC could confirm if it was as a result of MCO's blasting activities.
10.	8th September 2011	Ulan Road	Noise	The complainant rang the complaints line to complain about the noise. The ECRC rang the complainant back and they commented that the complaint was relating to noise around 3:00-3:30am every morning. They commented that the noise wakes them up and is interrupting their sleep.
11.	8th September 2011	Maiala Road	Noise	Complainant rang to complain about the noise levels at 2:00am on 08/09/11. Low frequency noise levels were between 35-37.8dB at Lagoons Road and 35.3-39.0dB at Libertis property at the time of the complaint. It was confirmed with the complainant that attended noise monitoring will be undertaken at their property during September.
12.	12th September 2011	Maiala Road	Noise	Complainant rang to complain about the noise levels between 4am and 5am on 12/09/11. The complainant stated a loud banging noise woke them. The ECRC spoke with the OCE at approx 10:00am on the 12/09/11 and the OCE mentioned that at that time the only piece of equipment operating was a dozer. All 3 diggers had not been operating. LF noise levels at Lagoons Rd monitor were between 30dB and 32.7dB at the time of the complaint. Noise levels at the Ulan Rd monitor were between 29dB and 40dB with the increase attributable to early morning road traffic. The ECRC spoke with the complainant's partner at approx 2:00pm on the 12/09/11. The ECRC stated that none of the diggers had been operating at this time and only a dozer had been working. The ECRC mentioned that an increase in noise levels at that time may be the result of increased traffic flow.

Number	Date	Location	Issue	Investigation and Follow Up
13.	16th September 2011	Ulan Road	Noise	Complainant rang the complaints line at 3:30am on 16/09/11 to complain about machinery noise. The complainant stated it had woken them. At the time of the complainant LF noise levels were approximately 36.5db at the Lagoons Rd monitor. Wind speed was 0.1m/s and direction was SSW. The ECRC called the complainant on the 16/09/11 at approximately 8:30am and left a message.
14.	16th September 2011	Ulan Road	Noise	Complainant rang the complaints line at 3:56pm on 16/09/11 to complain about noise. At the time of the complainant LF noise levels were approximately 42.0db at the Lagoons Rd monitor. Wind speed was 4.2m/s and from the W. The ECRC spoke with the OCE at the time of the complaint and the OCE stated they had assessed the complaint and current weather conditions (strong westerly winds) and decided to halt operations until the end of shift. The ECRC rang the complainant at approximately 5:00pm and left a message.
15.	18th September 2011	Ulan Road	Noise	Complainant rang the complaints line at 2:06am on 18/09/11 to complain about noise. The complainant stated there was very loud machinery noise coming from the operation since 9:00pm the previous evening. At the time of the complaint LF noise levels were approximately 34.5db at the Lagoons Rd monitor. Wind direction and speed at the time of the complaint were WSW and 1.3m/s respectively.
16.	18th September 2011	Ulan Road	Noise	Complainant rang the complaints line at 6:39pm on 18/09/11 to complain about noise from the night before. The complainant stated machinery noise woke them at 2:05am. At the time of the complaint LF noise levels were approximately 34.5db at the Lagoons Rd monitor. Wind direction and speed at the time of the complaint were WSW and 1.3m/s respectively.
17.	20th September 2011	Ulan Road	Noise	Complainant rang the complaints line to complain about noise due to loud machines at 9:55pm on 19/09/11 and 2:20am on 20/09/11.The ECRC reviewed the data. From 9:00pm to 2:30am LF levels were between 30.9dB and 40.1dB. A review of the audio indicated distant truck noise at 9:30pm and 2:00am. Wind direction throughout the evening was from the SW and wind speed was between 0.2m/s and 1.7m/s. Production summary indicates that EX02 was shut down at 8:45pm, and EX11 was shut down between 10:00-11:15pm, and from 12:30am. Attempts have been made to contact complainant. Issues from this night were discussed on the phone 22/09/11 as follow up from complaints on that morning.
18.	20th September 2011	Ridge Road	Noise	Complainant rang the complaints line to complain about noise from the night before at approximately 10:00pm (19/09/11). The ECRC reviewed the data. From 09:30pm to 11:30pm LF levels were between 34.6dB and 41.0dB. A review of the audio indicated distant truck noise. Wind direction throughout the evening was from the SW and wind speed was between 0m/s and 0.5m/s. Production summary indicates that EX02 was shut down at 8:45pm, and EX11 was shut down between 10:00pm-11:15pm, and from 12:30am. The complainant said that they could hear the dump ('boom boom' noise) and dozer tracks, but commented that they didn't hear these same noises later on in the night.

Number	Date	Location	Issue	Investigation and Follow Up
19.	20th September 2011	Ulan Road	Noise	Complainant rang the complaints line to complain about noise at approximately 8:00pm on 20/09/11. The ECRC reviewed the data. From 9:30pm to 11:30pm LF levels were between 34.6dB and 41.0dB. A review of the audio indicated distant truck noise. Wind direction throughout the period was from the SW and wind speed was between 0m/s and 0.5m/s. Production summary indicates that EX02 was shut down at 8:45pm, and EX11 was shut down between 10:00-11:15pm, and from 12:30am onwards. Attempts have been made to contact complainant.
20.	20th September 2011	Ulan Road	Noise	Complainant rang the complaints line to complain about road noise between 05:00-06:15am on 20/09/11. The ECRC reviewed the data from the period. From 05:00 to 06:30 LF levels were between 37.8dB and 48.5dB. Wind direction during the period was from the N and wind speed was between 3m/s and 4.1m/s. Attempts have been made to contact complainant.
21.	20th September 2011	Lagoons Road	Noise	Complainant rang the Senior OCE to complain about noise levels at approximately 7:00pm on 20/09/11.The ECRC reviewed the data. From 6:00pm to 8:00pm LF levels were between 32dB and 41.4dB. A review of the audio indicated wind noise on microphone and distant truck noise. Wind direction throughout the evening was from the N and wind speed was approximately 1.5m/s. Production summary indicates that dozers were operating in first gear from 8:15pm and trucks were in slow mode from 8:20pm. Complainant rang back and stated that there was a lot of noise at approximately 7:00pm.
22.	21st September 2011	Ridge Road	Noise	Complainant rang the ECRC at 07:00am on 21/09/11 to complain about noise heard at 11:00pm on 19/09/11 and throughout the night. The ECRC reviewed the data from the period. From 9:30pm to 11:30pm LF levels were between 34.6dB and 41.0dB. A review of the audio indicated distant truck noise. Wind direction throughout the evening was from the SW and wind speed was between 0.0m/s and 0.5m/s. Production summary indicates that EX02 was shut down at 8:45pm, and EX11 was shut down between 10:00-11:15pm, and from 12:30am on 20/09/11.Complainant stated that they could hear a droning noise and feel vibration.
23.	22nd September 2011	Ulan Road	Noise	Complainant rang the complaints line at 2:45am and 4:50am on 22/09/11 to complain about noise throughout the night. The ECRC reviewed the data. From 2:15am to 5:00am LF levels were between 26.7dB and 39.2dB. A review of the audio indicated distant truck noise at 2:30am and road noise at 4:30am. Wind direction was from the NW at 2:15am and SE from 4:00am onwards, and wind speed was between 0m/s and 0.5m/s. Complainant indicated to the ECRC that they could hear dozers throughout the night, with the loudest noise at 4:45am. The complainant's noise complaints on 20/09/11 were also discussed.
24.	22nd September 2011	Maiala Road	Noise	Complainant rang the complaints line to complain about noise at approximately 4:30am on 22/09/11. The ECRC reviewed the data for the period. From 4:00am to 5:00am LF levels were between 26.7dB and 39.2dB. A review of the audio indicated road traffic noise. Wind direction in the period was from the

Number	Date	Location	Issue	Investigation and Follow Up
				SE and wind speed was between 0m/s and 0.3m/s. Complainant indicated that a drone could be heard from 4:00am, and that it "shouldn't be there" Complainant indicated that they are considering complaining to the EPA as they believe there is no way that MCO is in compliance with noise criteria.
25.	22nd September 2011	Ridge Road	Noise	Complainant rang the complaints line to complain about noise at approximately 4:30am on 22/09/11. The ECRC reviewed the data for the period. From 4:00am to 5:00am LF levels were between 26.7dB and 39.2dB. A review of the audio indicated road traffic noise. Wind direction during the period was from the SE and wind speed was between 0m/s and 0.3m/s. Complainant commented that they were woken by 'one big bang' at about 4:30am, and could hear a constant droning for the rest of the morning. In particular, they could hear dozer tracks and other machines through the bedroom window, and could hear tracks when outside. Noise was compared to high flow traffic noise at a distance. Complainant also commented that while noise at this time was high, noise levels over the previous 3-4 weeks have been the quietest since MCO started operating.
26.	23rd September 2011	Ulan Road	Noise	Complainant rang the complaints line at 2:37am to complain about loud machinery noise. The ECRC reviewed the data from the night. From 2:00am to 3:00am LF levels were between 34.4dB and 39dB. A review of audio indicated distant vehicle noise. Wind direction was from the SW and wind speed was between 0.4m/s and 0.8m/s. Complainant said that the same issues that they complained about on 22/09/11 were still present (general vehicle noise), and indicated that noise at 1:30am "wasn't so bad", however the noise picked up at 2:30am.
27.	26th September 2011	Ridge Road	Noise	Complainant rang at 10:35pm on 26/09/11 to complain about noise levels since 9:30pm. LF noise levels at Libertis property at this time were between 37.5 and 44.5dB and at Lagoons Road they were between 36.1 and 37.8dB. Wind speed was 2.4-3.6m/s and wind direction was from the east at Ulan Road weather station. In response to the complaint digger EX111 was shut down. Noise levels noticeably dropped at Lagoons Road with no noticeable change at Libertis property. A message was left on the complainant's phone advising them of the action taken.
28.	26th September 2011	Maiala Road	Noise	Complainant rang at 10:36pm on 26/09/11 to complain about noise levels. LF noise levels at Libertis property at this time were between 37.5 and 44.5dB and at Lagoons Road they were between 36.1 and 37.8dB.Wind speed was 2.4-3.6m/s and wind direction was from the east at Ulan Road weather station. In response to the complaint digger EX111 was shut down. Noise levels noticeably dropped at Lagoons Road with no noticeable change at Libertis property. The complaint was discussed with the complainant the next morning. The complainant was asked if they noticed any change in the noise levels after EX111 was shut down. They commented that it was too cold to continue to stand outside listening for noise so they had gone back inside and didn't notice the change in the noise levels. The complainant also commented on dangerous driving along Ulan Road and was advised of what actions MCO are

Number	Date	Location	Issue	Investigation and Follow Up
				taking with respect to dangerous driving.
29.	27th September 2011	Ulan Road	Noise	The complainant rang at 12:39am on 27/09/11 to complain about noise from the operation. LF noise levels at the Libertis property were between 32.8 and 40.1dB and were between 32.6 and 35.7dB at Lagoons Road at the time of the complaint. Wind speed was between 1.5 and 2.9m/s and the wind direction was between the east and the south. The complainant was contacted the next morning to discuss their complaint. They commented that the noise was going all night and had been audible since 7.30pm. They were advised of the action taken to shut down EX111 earlier in the night.
30.	27th September 2011	Ridge Road	Noise	The complainant left a message on the ECRC's office phone at 4:27pm on 27/09/11 complaining about noise at 7am this morning and that it was still loud now. LF noise levels around 7:00am were between 33.4-38.6dB at Lagoons Road and between 39.7-42.7dB at Libertis property. Wind speed was 2.1-3.0m/s from the ENE.LF noise levels around 4:30pm were between 32.8-35.7dB at Lagoons Road and between 39.6-43.3dB at Libertis property. Wind speed was 2.7-3.0m/s from the E.
31.	27th September 2011	Ulan Road	Noise	Complainant rang at 6:55pm on 27/09/11 to complain about noise. The ECRC rang the OCE to discuss the current operations. As this was around shift change the operating equipment would change shortly. The complainant was contacted at 7:14pm on 27/09/11 and advised that due to the shift change the operating equipment would change shortly. The complainant asked if the mine would operate all night and was told that it was planned to operate all night. A follow up complaint was received at 7:55pm.LF noise levels were between 29.6-34.4dB at Lagoons Road and between 37.7-43.7dB at Libertis property. Wind speed was 0.0-1.3m/s from the east.
32.	27th September 2011	Maiala Road	Noise	Complainant rang at 8:58pm on 27/09/11 to complain about noise from the operation. LF noise levels at the time of the complaint were between 35.0-36.9dB at Lagoons Road and 39.0-40.9dB at Libertis property. Wind speed was 0.0-0.2m/s from the east. The complainant was contacted the next day to discuss their concerns. They commented that they went back outside half an hour after the complaint and it was still loud. They are clearly annoyed that they can hear noise and commented that we shouldn't be allowed to operate in the area as we are destroying people's peace and quiet. It was discussed that mining operations do create noise and we are allowed a certain level of noise, however, they don't care about compliance and will continue to complain while ever they can hear mine noise.
33.	27th September 2011	Ulan Road	Noise	The complainant rang at 10:35pm on 27/09/11 to complain about noise. LF noise levels were between 35.5-36.9dB at Lagoons Road and between 36.3-40.8dB at Libertis property. Wind speed was 0.2-0.4m/s from the SW.
34.	27th September 2011	Ridge Road	Noise	Complainant rang at 10:58pm on 27/09/11 to complain about the noise. The complainant's partner rang the ECRC's office phone at 11:19pm on 27/09/11 to complain about the noise as well. LF noise levels at Lagoons Road were between 34.9-36.6dB and between 36.1-37.2dB at Libertis property. Wind speed

Number	Date	Location	Issue	Investigation and Follow Up
				was 0.1-0.4m/s from the SW. EX111 was shut down around the time of the complaint.
35.	28th September 2011	Ulan Road	Noise	Complainant rang to complain about noise at 6:04am on 28/09/11. There were two follow up calls at 9:34am and 9:41am about noise the night before and during the morning. The complainant's partner claimed the noise was so loud they had to go to Mudgee to escape. LF noise levels were between 38.7-40.1dB and 36.5-37.7dB respectively at Lagoons Road. LF noise levels were between 42.1-43.5dB and 35.6-42.4dB respectively at Libertis property. Wind speed was 0.3-1.2m/s from the NE and 1.6-2.5m/s from the E. In response to the first complaint the decision was made not to start up EX102 in the south but to continue with EX101 in the north. When the complainant was contacted to discuss the complaint they commented it was the worst night's noise they'd had.
36.	28th September 2011	Ridge Road	Noise	The complainant rang the ECRC directly at 7:22am on 28/09/11 to complain about noise. The ECRC responded by going out to do noise monitoring at the complainant's residence. Due to other influences it was hard to determine the exact contribution from the mine but it was around 38dB. EX101 circuit was shut down so any noise change could be observed. EX111 circuit continued to run. There was no major change in overall noise levels. LF noise levels were between 41.5-45.4dB at Lagoons Road and between 39.2-41.3dB at Libertis property. Wind speed was 0.1-0.9m/s from the east. The ECRC spoke with the complainant at their residence and they are clearly concerned about the impact the noise is having on their personal life and the impact the mine is having on their business. It was agreed to have a meeting on the 29/09/11 to discuss their concerns further.
37.	28th September 2011	Ridge Road	Noise	The complainant rang at 9:35am on 28/09/11 to complain about the noise during the night before and into the morning. The complainant commented about a rumbling noise and banging noises from the mine that is disturbing their ability to enjoy the outdoors. LF noise levels at the time of the complaint were between 36.5-37.7dB at Lagoons Road. LF noise levels were between 35.6-42.4dB at Libertis property. Wind speed was 1.6-2.5m/s from the E. The complainant also expressed concerns over vibration effects causing two boulders to roll down the hill behind their property. They were asked to call back next time they feel a vibration and we will confirm if it was from MCO.
38.	28th September 2011	Ulan Road	Noise	The complainant rang at 10:30am on 28/09/11 to complain about noise at the following times 26/09/11 12:10pm, 27/09/11 11:00pm, and 28/09/11 10:15am. The complainant commented they have been away for 8-9 months and now they are back they can notice a major increase in the noise levels. They commented it was affecting their sleep. It was discussed with the complainant that other mining operations have come on line while they were away but they were adamant that it couldn't be anyone else and was definitely MCO.
39.	28th September	Ulan Road	Noise	Complainant rang to complain about noise at 6:34pm on 28/09/11. The OCE commented that heavy rain was present at the time of the complaint, so noise results aren't valid.

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40.	28th September 2011	Ulan Road	Noise	Complainant rang to complain about noise at 6:50pm on 28/09/11. OCE's comments were that heavy rain was present at the time of the complaint, so noise results aren't valid.
41.	1st October 2011	Maiala Road	Noise	The complainant rang at 8:50pm on 01/10/11 to complain about the noise during the night. The ECRC rang the complainant the following day at 3:45pm and left a message. LF noise levels at the time of the complaint were between 31.4dB at Lagoons Road. LF noise levels were between 38.7dB at Ulan Road monitor. Wind speed was 0.4m/s from the E.
42.	14th October 2011	Ulan Road	Noise	Complainant rang the complaints line at 2:58am on 14/10/11 to complain about loud machinery noise. The ECRC reviewed the data from the period. From 2:30am to 3:30am LF levels were between 28.6dB and 31.8dB. A review of audio indicated distant vehicle and dozer track noise. Wind direction was from the E and wind speed was between 1.3m/s and 3.4m/s. Complainant indicated that they could clearly hear excavators and rocks being dumped in trucks.
43.	14th October 2011	Ridge Road	Noise	Complainant emailed the ECRC at 12:20am on the 14/10/11 to complain about noise. Complainant indicated in the email that they cannot get to sleep due to the droning, crashing and revving coming from the direction of MCO. The ECRC reviewed the data. From 12:00am to 1:00am LF levels were between 32.2dB and 44.6dB. A review of audio indicated distant vehicle and grinding noise. Wind direction was from the E and wind speed was between 1.0m/s and 2.8m/s. Complainant commented that they could hear a constant droning, and periodic crashing most nights, and indicated that they had not heard these sounds in the area for the last 16 years until MCO started night time operations.
44.	14th October 2011	Ulan Road	Noise	Complainant rang on 17/10/11 to complain about noise on 14/10/11 at 10:15am. LF noise levels were between 34.6-39.6dB. Wind speed was 2.2-2.7m/s from the east. Several attempts have been made to contact the complainant without success.
45.	14th October 2011	Ridge Road	Blasting	Complainant rang complaints line 3:11pm on 14/10/11 due to large rumbles, and the vibration of their whole house. An overburden blast was undertaken at 3:00 pm on the 14/10/11 in Strip 6 Block 25 of Open Cut 1. A blast was also undertaken by Ulan West at 3:15 pm on the 14/10/11. Results of blast monitoring were within allowable criteria. Complainant indicated that it felt like there were two distinct blasts a few minutes past 3:00 pm, and that the windows rattled, and there was rumbling and vibration through the house. They also heard the rumble of a weaker blast at approximately 3:15 pm, however there was no vibration associated with it. Complainant also stated that they had discussed this issue previously with the ECRM and wanted us to know that they can still regularly hear blasts. MCO Technical Services department indicated that a faster timing was used which may have produced an increase in overpressure and noise generation.

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46.	14th October 2011	Ridge Road	Blasting	Complainant rang the complaints line at 3:24pm on the 14/10/11 to complain about blasting operations. An overburden blast was undertaken at 3:00 pm on the 14/10/11 in Strip 6 Block 25 of Open Cut 1. A blast was also undertaken by Ulan West at 3:15 pm on the 14/10/11. Results of blast monitoring were within allowable criteria. Complainant indicated that they could hear every blast undertaken by MCO, and the blasting upsets their dogs. Complainant also stated that cracks have appeared in their house that was not present when purchased it 5 years ago. Complainant wants to be added to the blast notification register. Complainant said that they was also bothered by the blast undertaken by Ulan at 3:15 pm on the 14/10/11 and would contact them about it. MCO Technical Services department indicated that a faster timing was used which may have produced an increase in overpressure and noise generation.
47.	14th October 2011	Ridge Road	Noise	Complainant rang the complaints line at 3:24pm on the 14/10/11 to complain about noise throughout the last couple of nights. Complainant stated in their initial complaint that they had been hearing rumblings the last couple of nights that sound like rubbish is being loaded, and can hear banging noises. Complainant stated in the follow up call that they are regularly are outside with their dogs from 9:00 pm to 9:30 pm, and can clearly hear dump trucks, and periodic dozer tracks.
48.	14th October 2011	Ridge Road	Blasting	Complainant rang the complaints line at 5:02pm on the 14/10/11. Complainant indicated that they are concerned about boulders on their property rolling down the nearby hill and damaging their home. Complainant reported that the recent blast caused two boulders to roll, and that more are 'ready to go'. Complainant requested that somebody from the mine have a look at the property to see what they are talking about, and requested to be added to the blast notification register. Complainant was informed that MCO will visit the property and discuss any concerns.
49.	14th October 2011	Maiala Road	Noise	Complainant rang the complaints line at 9:41pm 14/10/11 to complain about noise from the mine. The ECRC reviewed the data from the period. From 9:00pm to 10:00pm LF levels were between 29.3dB and 42.8dB. A review of audio indicated distant machinery noise. Wind direction was from the E and wind speed was between 1.8m/s and 2.4m/s. Complainant indicated that they could hear machinery from the mine, and can usually hear a droning of machinery. Complainant indicated that this was the first time in a few weeks that the noise could be heard.
50.	14th October 2011	Winchester Cr	Noise	Complainant rang the complaints line on the 14/10/11 to complain about loud droning and banging noises. The ECRC reviewed the data from the period. From 10:00pm to 11:00pm LF levels were between 31.2dB and 35.0dB. A review of audio indicated distant machinery noise, dumping noises and wind. Wind direction was from the east and wind speed was between 2.0m/s and 2.5m/s. Complainant indicated that they could hear a constant loud droning and humming noise, and distinctly hear rocks being loaded into trucks. Complainant indicated that this is an ongoing issue since the mine started

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				operating and seemed to be getting worse. Complainant stated that as soon as there are easterly winds that they can hear the noise. Complainant stated that they will contact the EPA whenever noise from the mine can be heard.
51.	14th October 2011	Ridge Road	Noise	Complainant rang the complaints line at 11:54pm on the 14/10/11 to complain about machinery noise and noise from the dumping of rocks. The ECRC reviewed the data from the period. From 10:30pm to 11:30pm LF levels were between 31.5dB and 40.0dB. A review of audio indicated distant machinery noise. Wind direction was from the E and wind speed was between 2.0m/s and 2.7m/s. Complainant indicated that they could hear rocks being dumped into trucks every few minutes. Complainant stated that they could not hear any noise from the mine since 05/10/11 until 13/10/11, and that noise levels seemed to be worse immediately prior to rain.
52.	15th October 2011	Ulan Road	Noise	Complainant rang the complaints line at 3:14am and 6:21am on the 15/10/11 to complain about noise from the mine. The ECRC reviewed the data from the period. From 2:45am to 3:45am LF levels were between 26.5dB and 35.8dB. A review of audio indicated distant machinery noise. Wind direction was from the E to NE and wind speed was between 0.7m/s and 1.5m/s. From 6:00am to 7:00am LF levels were between 27.1dB and 29.5dB. A review of audio indicated faint distant machinery noise. Wind direction was from the E to SE and wind speed was between 0.6m/s and 1.6m/s. Complainant indicated that they could hear dumping of rocks and dozers, which happens at the same time every night. Complainant stated that while noise levels have been lower the previous week and a half, noise from 13/10/11 to 15/10/11 was worse again. Complainant was woken by dumping of rocks. Complainant also indicated that they can see the glow of lights from the mine at their property.
53.	16th October 2011	Ulan Road	Noise	Complainant rang to complain about noise at 11:20pm on 16/10/11. LF noise levels were between 19.6-31.2dB at Lagoons Road. Wind speed was 0.4-1.5m/s from the south. Several attempts have been made to contact the complainant without success.
54.	17th October 2011	Ulan Road	Noise	Complainant rang the complaints line at 4:04am 17/10/11 to complain that noise that woke them. The ECRC reviewed the data from the period. From 3:30am to 4:30am LF levels were between 21.1dB and 27.2dB. A review of audio indicated faint distant machinery noise. Wind direction was from the NE to SE and wind speed was between 0.1m/s and 0.9m/s. Complainant could not be contacted.
55.	17th October 2011	Ulan Road	Noise	Complainant rang to complain about noise at 4:10am on 17/10/11. LF noise levels were between 21.5-27.1dB at Lagoons Road. Wind speed was 0.2-0.6m/s from the north-east. Several attempts have been made to contact the complainant without success.
56.	17th October 2011	Ulan Road	Traffic	Complainant rang on 17/10/11 to complain about traffic noise in general. Several attempts have been made to contact the complainant without success.

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57.	17th October 2011	Spring Creek Road	Blasting	Complainant rang with concerns over impacts of sulphur fumes on the health of children. The concerns related to a blast on 14/10/11 at 3:00pm where it was reported to them that fume and dust blew towards Ulan School and the children were warned to cover their eyes and nose. The complainant is concerned about the mining impacts on Ulan School and the health of their child. They are considering withdrawing their child from the school. As the complainant is interested in finding out more about the mining process, what actions MCO take to minimise impacts on the school and what monitoring takes place a meeting was arranged for 26/10/11 to discuss their concerns further. A meeting was held on 26/10/11 where the current and future mine plans were discussed. The management activities undertaken to minimise impacts on the school were also discussed. The complainant was appreciative of the mine taking the time to meet with them personally.
58.	18th October 2011	Ulan Road	Noise	Complainant rang on 18/10/11 at 2:30am to complain about excessive machinery noise coming from MCO. LF noise levels at the time of the complaint were 33.8-36.1dB at Lagoons Road. Wind speed was 2.0-2.5m/s from the ENE.
59.	18th October 2011	Ulan Road	Noise	Complainant rang complaints line at 2:56pm on 18/10/11 to complain about noise at 3:30am that morning. LF noise levels were between 34.7-36.1dB at Lagoons Road. Wind speed was 2.0-2.5m/s from the ENE. A message was left for the complainant to call back.
60.	18th October 2011	Ulan Road	Traffic	Complainant rang to complain about traffic noise in general. The complainant was called within 5 minutes of making the complaint however they didn't answer and a message was left.
61.	18th October 2011	Maiala Road	Noise	Complainant rang to complain about noise on 18/10/11 at 10:00pm. LF noise levels were between 35.1-41.1dB at Ulan Road and 31.2-38.7dB at Lagoons Road. Wind speed was 0.5-0.9m/s from the east. The complainant was contacted the next day. Despite commenting that they don't want to be bought out, they would like to know why we aren't talking to them about acquisition when we are purchasing people in Winchester Crescent. The noise modelling completed for the Stage 2 PPR and the acquisition strategy was explained to them and they were informed that no one along Maiala Road is on our current list to discuss acquisition with. The complainant commented that they are going to continue to complain until something is done about the noise.
62.	18th October 2011	Winchester Cr	Noise	Complainant rang to complain about noise at 11:36pm on 18/10/11. LF noise levels at Lagoons Road were between 32.9-35.8dB at the time of the complaint. Wind speed was 0.5-0.9m/s from the NNE. The complainant was contacted the next day. They commented they can hear loud humming, banging and droning noise. The noise was also loud the night before and the Friday before as well. It was explained that MCO shut down the open cut operations for 1/2 hour that night and that it didn't make a difference to the noise levels and mining operations were still audible. The complainant commented that they are sheltered by a large ridge from Ulan West and they were adamant that all the noise is

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				MCO. The location of the Ulan CHPP was discussed with the complainant. They commented they are going to continue to complain to us and the EPA.
63.	19th October 2011	Ulan Road	Noise	Complainant rang to complain about noise at 2:17am on the 19/10/11. LF noise levels at Lagoons Road were between 35.4-36.8dB at the time of the complaint. Wind speed was 0.0-0.8m/s from the north. The recent complaints were discussed with the complainant on 19/10/11. They commented that the noise goes all week, starts at 9:00pm and goes through to 5:00am.
64.	19th October 2011	Ulan Road	Noise	The complainant rang at 19/10/11 at 6:35am to complain about noise in general. The complainant was contacted straight away and their recent complaints were discussed. They commented that the noise was too loud on the morning of the 14/10/11 to operate their tractor and to work on their property. The monitoring we do closer to the mine was discussed; however, the complainant believes the noise environment at their property is different to the noise environment elsewhere with a tunnelling affect increasing the noise levels at their residence. They were advised that our attended monitoring in the area disputes this. They don't agree with our traffic monitoring results and again believe that they have a unique environment. It was explained that the monitoring is done in a worst case location at shift change. The complainant commented that they have ordered their own noise unit. It was explained to the complainant that in order for the results to be reliable the unit needs to be calibrated and the results need to be interpreted by a noise expert. As we have been having trouble contacting the complainant an alternate phone number was requested. They commented that their mobile doesn't work on the property so have requested we continue to leave messages on their home phone.
65.	19th October 2011	Maiala Road	Noise	Complainant rang at 9:12pm on the 19/10/11 to complain about noise from the operation. LF noise levels on Ulan Road were between 32.1-44.7dB and between 30.4-32.6dB at Lagoons Road. Wind speed was 0.9-1.2m/s from the east. Messages have been left for the complainant to call back but there has been no response.
66.	20th October 2011	Ulan Road	Noise	Complainant rang at 1:40am on the 20/10/11 to complain about noise. LF noise levels at Lagoons Road were between 29.6-34.1dB at the time of the complaint. Wind speed was between 0.6-1.1m/s from the NE.
67.	21st October 2011	Ulan Road	Noise	Complainant rang to complain about noise at 10:56pm on 21/10/11. LF noise levels were between 29.4-34.5dB. Wind speed was 0.2-1.0m/s from the NE.
68.	22nd October 2011	Winchester Cr	Noise	Complainant rang to complain about noise at 11:49pm on the 22/10/11. They are also concerned about black staining on their water tanks. LF noise levels at the time of the complaint were between 29.0-31.8dB. Wind speed was 0.3-0.6m/s from the NE. The complainant was contacted on 23/10/11 to discuss their concerns. The noises they can hear are a droning noise and dozer tracks. They are concerned over dirt in their water tank and dirty stains appearing on their tank. It was discussed with

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				them that the dust levels in the area are low and that is was unlikely that there is dust in their tank from MCO's operations. However, it was agreed to collect a water sample from their tank. A water sample was collected on 4/11/11. Results showed no dust was present in the water. These results were communicated to the complainant on 17/11/11 with no further action required.
69.	23rd October 2011	Ulan Road	Noise	Complainant rang to complain about noise at 12:11am on 23/10/11. LF noise levels at the time of the complaint were between 31.6-34.9dB. Wind speed was 0.3-1.2m/s from ENE. Complainant was contacted on 23/10/11 who advised they could hear banging noises. The noise levels were discussed with them but they don't agree with our noise results.
70.	23rd October 2011	Ridge Road	Noise	Complainant rang to complain about noise at 12:30am on 23/10/11. LF noise levels were between 29.0-31.8dB. Wind speed was 0.3-0.9m/s from NE. Complainant was contacted on 23/10/11. They commented that the noise wasn't very loud but they could hear a grinding noise, dozer tracks and dumping noise while they were sitting outside. They haven't heard MCO for the last couple of weeks.
71.	24th October 2011	Ulan Road	Noise	Complainant rang at 12:28am and 12:29am on 24/10/11 to complain about noise from the mine and road traffic. LF noise levels at Lagoons Road were 34 dB at the time of the complaint. Wind speed was 0.4m/s from the W. The ECRC attempted to contact the complainant on the 25/10/11 but was unsuccessful.
72.	24th October 2011	Ridge Road	Noise	Complainant rang the complaints line at 9:48pm on 24/10/11 to complain about noise. The complainant stated they could hear loud grinding noise and dumping. LF noise levels at the time of the complaint were 36.2 dB at the Lagoon's Road monitor. Wind speed was 0.4 m/s and wind direction was from the west. A review of the audio revealed a constant mine related hum and occasional dumping noise.
73.	24th October 2011	Winchester Cr	Noise	Complainant rang the complaints line at 10:08pm on 24/10/11 to complain about noise. The complainant stated they could hear loud humming, droning and banging noises. LF noise levels at the time of the complaint were 35.6 dB at the Lagoon's Road monitor. Wind speed was 0.9 m/s and wind direction was from the west. A review of the audio revealed a constant mine related hum and occasional dumping noise.
74.	25th October 2011	Ulan Road	Noise	Complainant rang at 1:59am on 25/10/11 to complain about noise from the mine. LF noise levels at Lagoons Road were 34.9 dB at the time of the complaint. Wind speed was between 0.0-0.1m/s from the NNE. The ECRC attempted to contact the complainant on the 25/10/11 but was unsuccessful.
75.	25th October 2011	Ulan Road	Noise	Complainant rang at 2:12am on 25/10/11 to complain about noise from the mine. LF noise levels at Lagoons Road were 33.6 dB at the time of the complaint. Wind speed was 0.4m/s from the SSE.
76.	28th October 2011	Ulan Road	Noise	Complainant rang at 12:31am and 4:57am on 28/10/11 to complain about noise from the mine. LF noise levels at Lagoons Road monitor were 33.0db and 32.7db at the time of the complaints. A review of the audio revealed low mine related noise during the time of the complaints. Wind speed was

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				between 0.1 and 0.9m/s from the east. The ECRC rang the complainant at 9:52am on 28/10/11 and left a message.
77.	28th October 2011	Ulan Road	Noise	Complainant rang at 3:25am on 28/10/11 to complain about noise from the mine. LF noise levels at Lagoons Road monitor were 35.3db at the time of the complaint. A review of the audio revealed low mine related noise during the time of the complaints. Wind speed was between 0.0-0.1m/s from the east. The ECRC rang the complainant at 10:35am on 28/10/11 and left a message.
78.	28th October 2011	Winchester Cr	Noise	Complainant rang at 10:31pm on the 28/10/11 to complain about noise from the mine. LF noise levels at Lagoons Road monitor were 42.2db at the time of the complaint. A review of the noise graph from Lagoons Road showed high LF noise levels. Continuous truck/vehicle noise was audible in audio from 28/10/11 10:15pm, and 29/10/11 1:00am. Audio at 6:00 am appeared to be predominantly traffic noise, with some distant mine noise audible. Wind speed was between 0.4-1.0m/s from the ESE. The ECRC rang the complainant at approximately 9:00am on 29/10/11 and left a message.
79.	28th October 2011	Ulan Road	Noise	Complainant rang at 10:34pm on 28/10/11 to complain about noise from the mine. LF noise levels at Lagoons Road monitor were 42.2db at the time of the complaint. A review of the noise graph from Lagoons Road showed high LF noise levels. Continuous truck/vehicle noise was audible in audio from 28/10/11 10:15pm, and 29/10/11 1:00am. Audio at 6:00am appeared to be predominantly traffic noise, with some distant mine noise audible. Wind speed was between 0.4-1.0m/s from the ESE. The ECRC rang the complainant at approximately 9:15am on 29/10/11 and left a message.
80.	29th October 2011	Ulan Road	Noise	Complainant rang at 8:18am on 29/10/11 to complain about noise and traffic from the mine. Audio at 6:00 am appeared to be predominantly traffic noise, with some distant mine noise audible. Wind speed was between 0.4-1.0m/s from the ESE. The ECRC rang the complainant at approximately 9:00 am on 29/10/11 and left a message.
81.	3rd November 2011	Ulan Road	Noise	Complainant rang to complain about loud mine noise at 1:14am on the 03/11/11. LF noise levels for the period 1:00-1:30am 03/11/11 were between 28.3dB and 33.7dB. Wind speed was 0.0-0.7m/s from the north. Review of audio from Lagoons Road indicated distant machinery and truck noise, and road traffic noise. No trains were loaded during the period. Complainant indicated that they were woken by banging noises and vibration before 1:00am 03/11/11, and were not able to sleep for an hour due to the noise. Complainant stated that noise included a chugging roar, and banging of buckets, and asked if there was any train loading during the night. Complainant stated that noise has not been as loud for the past few weeks, and that noise was clearly audible during still wind conditions. Complainant also made a complaint to UCML, and said that while noise seemed to come from the direction of MCO that it may have been from UCML.

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82.	3rd November 2011	Maiala Road	Noise	Complainant rang to complain about noise at 2:30 am on the 03/11/11. LF noise levels for the period of 2:15-2:45am 03/11/11 were between 25.2dB and 41.6dB at Ulan Road, and between 25.0dB and 31.0dB at Lagoons Road. Wind speed was 0.9-1.6m/s from the NE. Review of audio from the period indicated vehicle traffic noise, with distant machinery noise audible. Complainant indicated that they were woken at 2:30am by constant heavy machinery noise. Complainant stated that the noise level was high until it stopped at 3:30am.
83.	4th November 2011	Maiala Road	Noise	Complainant rang at 11:27pm on the 04/11/11 to complain about machinery noise. LF noise levels for the period 11:15-11:45pm were between 35.8dB and 37.4dB. Wind speed was 1.5-2.1m/s from ENE. Review of audio indicated distant truck and machinery noise. Complainant indicated that they could hear a constant droning of machinery moving, with no banging sounds. Complainant stated that the noise seemed to be coming from a different area located further south than usual.
84.	5th November 2011	Winchester Cr	Noise	Complainant rang at 11:37pm on the 04/11/11 to complain about a roaring noise. LF noise levels for the period 11:15-11:45am were between 35.8dB and 37.4dB. Wind speed was 1.5-2.1m/s from ENE. Review of audio indicated a distinct roar of truck and machinery noise. Complainant indicated that there was a very loud and continuous howling noise, including revving of motors, machinery roaring sounds and dozer tracks. Complainant said that noise on previous night was loud also, and that the noise starts low in the evening but continually gets louder to the point that they could not sleep, and that it is common in the wind conditions. Complainant also indicated that noise on morning of 05/11/11 was very loud.
85.	5th November 2011	Winchester Cr	Noise	Complainant called the complaints line at 12:16am on 05/11/11 to complain about truck noise. LF noise levels for the period 12:00-12:30am were between 35.5dB and 39.4dB. Wind speed was 1.8-2.2m/s from ENE. Review of audio indicated a distinct roar of machinery noise. Complainant indicated that they had not heard noise from the mine of this volume before, despite being told about it by neighbours. Complainant stated that the noise was a constant roar with some banging sounds, and other sounds like a truck going down a hill. Complainant stated that this noise started from approximately 11:30pm on the 04/11/11.
86.	5th November 2011	Ulan Road	Noise	Complainant rang complaints line at 2:18am and 3:45am on the 05/11/11 to complain about machinery noise. LF noise levels for the period 2:00am to 2:30am were between 32.5dB and 38.4dB. Wind speed was 0.5-1.0m/s from NE to N. Review of audio indicated distinct constant machinery noise that becomes progressively louder. LF noise levels for the period 3:30am to 4:00am were between 34.8dB and 36.6db. Wind speed was 1-1.4m/s from the NE. Review of audio indicated distinct constant machinery noise. Complainant indicated that they could hear a loud banging, digger exhaust and various constant machinery noise that had woken them twice. Noise level 'wasn't that bad' when they

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				went to bed at 9:00pm. Complainant commented that they had not heard the mine very much for the last week.
87.	5th November 2011	Ulan Road	Noise	Complainant rang complaints line at 3:17am on the 05/11/11 to complain that machinery noise had woken them up. LF noise levels for the period 3:00 am-3:30 am were between 36.3dB and 37.2dB. Wind speed was 1.0-1.5m/s from the NE. Review of audio indicated constant distinct machinery noise, with audible dozer tracks. Complainant could not be contacted.
88.	5th November 2011	Ridge Road	Noise	Complainant rang complaints line at 9:24pm on the 05/11/11 to complain that dumping into trucks noise is slowly building up over the previous hour and a half, and is getting louder. Complainant also stated to complaints line that they would be calling the EPA. LF noise levels for the period 9:15pm - 9:45pm were between 35.1dB and 44 dB. Wind speed was 0-0.1m/s from the N. Review of audio indicated distinct machinery noise and truck exhaust. Complainant could not be contacted for further information.
89.	6th November 2011	Ulan Road	Noise	Complainant rang complaints line at 1:09am on the 06/11/11 to complain about being woken by machinery and mine noise. LF noise levels for the period 12:45 am-1:15 am were between 33.0dB and 39.2dB. Wind speed was 0.4-0.5m/s from E to NE. Review of audio indicated constant distinct machinery noise, with some audible dozer tracks and truck exhaust. Complainant could not be contacted for further information.
90.	6th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 2:20am on the 06/11/11 to complain about being woken by excessively loud machinery noise coming from the mine. An additional complaint was also made at 7:26am on the 06/11/11. LF noise levels for the period 2:00am-02:30am were between 32.8dB and 35.4dB. Wind speed was 0.4-0.5m/s from the NE. Review of audio indicated constant distinct machinery noise. LF noise levels for the period 7:15am- 7:45am were between 33.3dB and 36.9dB. Wind speed was 0.0-0.3m/s from N to NE. Review of audio indicated distinct machinery noise, and some traffic noise. Complainant could not be contacted for further information.
91.	6th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 8:29pm on the 06/11/11 to complain about loud machinery noise from the mines starting at 7:30pm and getting progressively louder. LF noise levels for the period 8:15 to 8:45pm were between 34.5dB and 38.1 dB. Wind speed was 0.0-0.7m/s from the NE. Review of audio indicated distinct constant machinery noise, with some banging and dozer tracks audible. Complainant could not be contacted for further information.
92.	6th November 2011	Lagoons Road	Noise	Complainant rang complaints line at 9:44pm on the 06/11/11 to complain about very loud machinery noise from the mine. LF noise levels for the period 9:30pm-10:00pm were between 32.8dB and 37.8dB. Wind speed was 0.2-0.4m/s from the NW to NE. Review of audio indicated distinct machinery noise, with dozer tracks audible. Complainant stated that they were able to hear dozers and digger over their TV, and that noise was very loud. Complainant could also see lights from their property, and suggested

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				that too much of the hill (southern tip of the pit) had been mined.
93.	6th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 8:19pm on the 06/11/11 to complain about extreme machinery noise. LF noise levels for the period 8:00 pm-8:30 pm were between 33.7dB and 38.1dB. Wind speed was 0.0-0.7m/s from N to ENE. Review of audio indicated distinct constant machinery noise, with some banging and dozer tracks audible. Complainant could not be contacted for further information.
94.	7th November 2011	Ridge Road	Noise	Complainant talked to the ECRC directly at 9:15am on the 07/11/11 to complain about noise in the afternoon and evening of 06/11/11. LF noise levels for the period 4:00pm-9:00pm were between 25.0dB and 42.6dB. Wind speed was 0.0-1.9m/s from the N to NW. Review of audio indicated distinct constant machinery noise. Complainant indicated that they could hear a constant loud humming sound from 4pm onwards, which was still going when they went to bed. Complainant stated that they had never heard the noise this loud.
95.	8th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 1:53am and 9:05am on the 08/11/11 to complain about extreme machinery noise. LF noise levels for the period 1:30am and 2:00am were between 37.0dB and 38.0dB at the Lagoons Rd monitor. Wind speed was between 0.0 and 0.4m/s from SE. The ECRC rang the complainant the following morning to discuss the complaint.
96.	9th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 12:35am on 08/11/11 to complain about extreme machinery noise. LF noise levels for the period 12:00am-12:35am were between 34.1dB and 32.8dB at the Lagoons Rd monitor. Wind speed was 0.4-0.9m/s from SE. Complainant could not be contacted for further information.
97.	9th November 2011	Winchester Cr	Noise	Complainant rang the complaints line at 12:16am on 09/11/11 to complain about noise. LF noise levels for the period 12:00-1:00am were between 29.6dB and 31.4dB at the Winchester Cr monitor which is located on the complainant's property. Wind speed was 0.0-0.4m/s from NE. Complainant was contacted the following day and mentioned that the noise was ongoing. The ECRC mentioned the results from the portable noise monitor will be made available after review.
98.	9th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 2:52am on 09/11/11 to complain about excessive machinery noise. LF noise levels for the period 2:30am and 3:00am were between 38.7dB and 39.0dB at the Lagoons Rd monitor. Wind speed was 0.4-0.9m/s from SE. Both diggers, all trucks and dozers were down between 12:30am and 1:15am and LF noise levels remained the same. Complainant could not be contacted for further information.
99.	9th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 2:51am on 09/11/11 to complain about excessive machinery noise. LF noise levels for the period 2:30am and 3:00am were between 38.7dB and 39.0dB at the Lagoons Rd monitor. Wind speed was 0.4-0.9m/s from SE.

Number	Date	Location	Issue	Investigation and Follow Up
100.	10th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 10:19pm on 09/11/11 and 3:48am on the 10/11/11 to complain about noise from the mine. LF noise levels for the period between 10:00pm and 10:30pm were 34.2dB and 33.8dB at the Lagoons Rd monitor. Wind speed was 0.0-0.4m/s from SSE. LF noise levels for the period between 3:30am and 4:00am were 34.2dB and 34.6dB. Wind speed was 0.0-0.1m/s from SSE. A review of the audio at times of the complaints indicated mine related hum. The complainant was contacted on the 10/11/11 and was left a message.
101.	12th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 2:06am, 4:21am and 6:28am on the 12/11/11 to complain about mine noise. LF noise levels at the Lagoons Rd monitor for the time of each complaint were 33.6dB, 34.8dB and 32.6dB respectively. Wind speed was between 0.0 and 0.9 m/s from ENE. LF noise levels at the Winchester Cr monitor for the time of each complaint were 32.2dB, 32.3dB and 35.1dB respectively. Wind speed was between 0.0 and 0.9 m/s from ENE. The ECRC visited Winchester Cr between 9:30 pm and 10:15 pm on 12/11/2011. Mine noise was audible from the East in the direction of another mining operation. No mine noise could be heard from MCO. The ECRC contacted the complainant the following day and again on the 14/11/11 to discuss the complaint but could not reach them.
102.	12th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 2:52am, 4:29am and 6:12am on the 12/11/11 to complain about mine noise. LF noise levels at the Lagoons Rd monitor for the time of each complaint were 35.5dB, 34.4dB and 32.6dB respectively. Wind speed was between 0.0 and 0.4 m/s from SE - ENE. LF noise levels at the Winchester Cr monitor for the time of each complaint were 33.8dB, 35.7dB and 36.1dB respectively. Wind speed was between 0.0 and 0.9 m/s from ENE - E. The ECRC visited Winchester Cr between 9:30pm and 10:15pm on 12/11/11. Mine noise was audible from the East in the direction of another mining operation. No mine noise could be heard from MCO. The ECRC contacted the complainant the following day and left a message.
103.	12th November 2011	Ridge Road	Noise	Complainant rang the complaints line at 6:05am on the 12/11/11 to complain about mine noise. LF noise levels at the Lagoons Rd monitor for the time of the complaint were 32.6dB and there was no wind present. LF noise levels at the Winchester Cr monitor for the time of the complaint were 36.1dB there was no wind present.
104.	13th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 1:35am and 3:37am on the 13/11/11 to complain about mine noise. LF noise levels at the Lagoons Rd monitor for each complaint were 33.7dB and 29.8dB respectively and wind speed and direction were 0.4m/s from SE. LF noise levels at the Winchester Cr monitor for the time of the complaints were 22.9dB and 29.5dB and there was no wind present.
105.	13th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 4:47am on the 13/11/11 to complain about mine noise. LF noise levels at the Lagoons Rd monitor at the time of the complaint were 31.7dB. Wind speed and

Number	Date	Location	Issue	Investigation and Follow Up
				direction were 0.4 m/s from SE. LF noise levels at the Winchester Cr monitor at the time of the complaint were 36.7 dB. Wind speed and direction were 0.4m/s from SE. A review of the audio revealed very low mine noise and road traffic.
106.	13th November 2011	Maiala Road	Noise	Complainant rang the complaints line at 11:28am on the 13/11/11 to complain about mine noise. LF noise levels at the Lagoons Rd monitor were 43.7dB. Wind speed and direction at the time of the complaint were 4.5m/s from the ENE. A review of the audio revealed wind noise on the microphone.
107.	13th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 1:35am and 3:37am on the 13/11/11 to complain about mine noise. LF noise levels at the Lagoons Rd monitor for each complaint were 33.7dB and 29.8dB respectively and wind speed and direction were 0.4m/s from SE. LF noise levels at the Winchester Cr monitor for the time of the complaints were 22.9dB and 29.5dB and there was no wind present.
108.	14th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 10:22pm on the 13/11/11 and 12:26am, 01:39am and 4:45am on the 14/11/11 to complain about mine noise. LF noise levels at the Lagoons Rd monitor for each complaint were 33.2dB, 31.2dB, 32.9dB and 36.5dB respectively. LF noise levels at the Winchester Cr monitor for each complaint were 33.9dB, 29.3dB, 26.3dB and 35.7dB respectively. Wind speed and direction were 0.0-1.3 m/s from ENE-ESE. The ECRC called the complainant at 9:30am on the 14/11/11 to discuss the complaints and left a message.
109.	14th November 2011	Ulan Road	Noise	Complainant rang the complaints line at 3:03am and 4:18am on the 14/11/11 to complain about mine noise. LF noise levels at the Lagoons Rd monitor for each complaint were 33.5dB and 35.3dB respectively. LF noise levels at the Winchester Cr monitor for each complaint were 30.6dB and 30.1dB respectively. Wind speed and direction were 0.0-1.3m/s from ENE-ESE.
110.	16th November 2011	Maiala Road	Noise	The complainant left a message on the ECRC's phone at 06:37am on 16/11/11 complaining about noise the night before. The complainant was contacted at 7:35am to discuss their concerns. They commented that the noise started around 10:00pm on 15/11/11 and they could hear clanging noises. The complainant was advised that the noise levels last night were OK, but they were not interested in compliance. Noise levels at Lagoons Road were between 31.7dB and 37.4dB between 10:00pm and 4:00am. Noise levels at Ulan Road were between 29.3dB and 36.4dB between 10:00pm and 4:00am.
111.	18th November 2011	Ridge Road	Noise	Complainant rang to complain about noise at 9:18pm, 10:12pm and 10:56pm on 18/11/11. Noise levels at Ulan Road/Ridge Road corner were between 31.2-40.1dB. Wind was 0.6-1.4m/s from the east. Complainant was contacted on 21/11/11 to discuss their complaints. Compliance with criteria was discussed with them, however, they are clearly upset with the level of noise being generated and feel that it is not acceptable
112.	18th November 2011	Ridge Road	Noise	Complainant rang to complain about noise at 11:35pm on 18/11/11. LF noise levels at Ulan Road/Ridge Road were between 32.4-35.3dB. Wind speed was 0.4-1.2m/s from ENE. A message was

Number	Date	Location	Issue	Investigation and Follow Up
				left for the complainant on 19/11/11.
113.	28th November 2011	Ridge Road	Noise	Complainant rang the complaints line at 4:45am on the 28/11/11 to complain about noise from the mine. LF noise levels for the period 4:30am to 5:00am were between 30.9dB and 36.5dB at the Lagoons Road monitor, and between 32.9dB and 41.5dB at the Ulan Road monitor. Wind speed was 0.0m/s to 1.0m/s from the south. A review of the audio at the time of complaint indicated machinery noise and dozer tracks. Complainant indicated that they could distinctly hear dozer tracks, dumping into trucks and general excavator/machinery noise between 4:30am and 4:45am. Complainant believed that noise vibration had travelled through the bed and woke them up. Complainant indicated that no noise could be heard after 5:15am and that it has been a while since noise was like this. Complainant indicated that they have also made an EPA complaint.
114.	28th November 2011	Maiala Road	Noise	Complainant rang the complaints line at 4:45am on the 28/11/11 to complain about noise in the early hours of the morning. LF noise levels for the period 1:00am to 5:00am were between 29.5dB and 38.0dB at the Lagoons Road monitor, and between 30.0dB and 41.5dB at the Ulan Road monitor. Wind speed was 0.0m/s to 1.7m/s from the south. A review of the audio at the time of complaint indicated machinery noise and dozer tracks. Complainant could not be contacted.
115.	28th November 2011	Ulan Road	Traffic	An email was received from the complainant on 28/11/11 regarding a vehicle overtaking them above the speed limit on the gravel section of the current road works on Ulan Road and covering them with dirt and gravel. The complainant followed the vehicle into the MCO Main Administration car park. The driver of the car has been identified and the issue has been addressed with them.
116.	28th November 2011	Maiala Road	Noise	Complainant rang complaints line at 9:11pm on 28/11/11 to complain about noise. Noise levels at Lagoons Road were between 31.0-35.0dB and between 33.2-37.8dB at Ulan Road. Wind speed was between 0.2-0.9m/s from NW. The complainant was contacted on 29/11/11 to discuss their complaint. They clearly weren't interested in the noise levels being in compliance, however, would like more monitoring to be conducted at their residence.
117.	29th November 2011	Winchester Cr	Noise	Complainant rang to complain about noise at 7:16am on 29/11/11. The ECRC visited the area at approximately 7:45am. Mine noise from MCO was audible at the time of the visit. Attempts were made to measure the noise, however, bird and insect activity prevented an accurate reading being obtained. Also audible were road traffic noise and road work construction noise. The complainant's house is in an elevated position and they have a clear view of the RL480 dump. The ECRC spoke with the complainant who has concerns about the future activities of the mine and how they will impact on them. A commitment was made that someone would get back to them with more information on what the future mining activities are and what the predictions are at their residence.

Number	Date	Location	Issue	Investigation and Follow Up
118.	29th November 2011	Ridge Road	Noise	The complainant rang to complain about noise at 8:11pm on 29/11/11. LF noise levels at the time of the complaint were between 37.1-38.0dB at Ulan Road and between 35.8-39.3dB at Lagoons Road. Wind speed was 0.0-1.0m/s from the SW. Around the time of the complaint dozers were operating on the rehabilitation. These were moved at approximately. 8:15 pm. The ECRC visited the area to observe the noise environment around 9:30pm. Mining noise was audible on Ridge Road with insects and frogs being dominant. Attempts were made to measure the noise but due to the noise from the insects and frogs a valid result wasn't able to be obtained. Noise levels at Ulan Road and Lagoons Road were around 35.5dB at this time with wind from the SW at 1.0m/s. The complainant called the hotline again at approximately 10:15 pm. The ECRC had a lengthy conversation with the complainant about noise impacts at their property. They are clearly not happy that we have been allowed to move into the area and create noise. The complainant was appreciative that the ECRC had taken the time to observe the noise levels for themselves.
119.	1st December 2011	Maiala Road	Noise	Complainant rang at 6:54am on 01/12/11 to complain about noise at 4:00am that morning. Noise levels at Lagoons Road were between 24.2-28.9db and between 29.7-32.0dB at Ulan Road at 4:00 am. Wind speed was 1.7-2.6m/s from SW. The complainant was contacted at 2:15pm on 01/12/11 to discuss the complaint. They commented that there was a rhythmical low level noise early in the night they could hear while sitting outside.
120.	7th December 2011	Maiala Road	Noise	Complainant rang the complaints line at approximately 7:10am on 07/12/11 to complain about noise. The complainant spoke to the ECRC and commented that the bathroom cupboards were vibrating and that it has been noisy during the night. The complainant was abrupt on the phone and clearly annoyed. The ECRC told the complainant a member of the E&C Department would visit the area immediately. The ECRC visited the area and could hear low mine noise including reverse beeper alarms at the resident's house. The complainant saw the ECRC as they left the house but didn't stop to discuss the complaint. The ECRC also visited Ridge Road but MCO noise was not clearly audible.
121.	13th December 2011	Maiala Road	Noise	Complainant rang to complain about noise at 9:39pm on 13/12/11. LF noise levels were between 28.6-29.7dB at Lagoons Road and between 33.6-36.6dB at Ulan Road. Wind speed was 1.2-2.7m/s from NE. Attempts to contact the complainant have been unsuccessful.
122.	15th December 2011	Ridge Road	Noise	Complainant rang to complain about noise at 7:23am on 15/12/11. Complainant was contacted and the complaint related to noise the previous night with no specific times being provided.
123.	16th December 2011	Ridge Road	Noise	Complainant rang to complain about noise at 4:44am on 16/12/11. LF noise levels at Lagoons Road were between 28.3-34.8dB and between 34.4-38.0dB at Ulan Road. Wind speed was 1.0-1.5m/s from NE. Complainant was contacted on 22/12/11. They commented that noise was loud on Saturday morning (17/12/11). They also commented that there has been mine noise this week but not enough to

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				cause concern. Once informed that MCO had been shut down this week their comments were they haven't been able to hear anything at all.
124.	16th December 2011	Ridge Road	Noise	Complainant rang to complain about noise at 11:49pm on 16/12/11. LF noise levels at Lagoons Road were between 32.1-35.5dB and between 35.2-38.2dB at Ulan Road. Wind speed was between 2.7-3.2m/s from NE. Attempts to contact the complainant have been unsuccessful.
125.	18th December 2011	Ulan Road	Noise	Complainant rang to complain about noise at 11:19pm on 18/12/11. LF noise levels at Lagoons Road were between 32.0-33.4dB. Wind speed was 0.0-0.9m/s from NW-NE. The complainant was contacted on 22/12/11 to discuss the complaint. They had no further comment.
126.	18th December 2011	Winchester Cr	Noise	Complainant rang to complain about noise at 11:38pm on 18/12/11. LF noise levels at Lagoons Road were between 32.0-33.4dB. Wind speed was 0.0-0.5m/s from the west. The complainant was contacted on 22/12/11.They commented that the noise was a roaring type of sound at the time of the complaint. They commented that the noise lately has generally been better than it was a couple of months ago.
127.	24th December 2011	Ulan Road	Noise	The complainant rang the complaints line at 3:58am on 24/12/11 to complain about noise. The complainant was contacted on 24/12/11 at 8:56am to discuss the complaint. The complainant was aware that MCO was planning to be shut down; however, as they could clearly hear excavators and trucks they thought the plans had changed. When they were informed the plans hadn't changed they commented that the noise was coming from another mine to the east.
128.	1st January 2012	Ridge Road	Noise	Complainant rang to complain about noise at 10:58pm on 01/01/12. Operations at the time of the complaint were an excavator on coal in the northern part of OC1. LF noise levels were between 24.4-29.1dB at Lagoons Road and between 31.7-36.6dB at Ulan Road. There was no wind present. The complainant was contacted at 9:24am on 02/01/12 to discuss the complaint. They commented that they had started to hear mine noise from approximately 7:15am on 01/01/12.
129.	3rd January 2012	Ridge Road	Noise	Complainant contacted complaints line at 8:33am on 03/01/12 to complain about noise at 3:00am and that it had been getting louder during the morning. LF noise levels at the time of the complaint were between 29.9-32.0dB at Lagoons Road and between 28.6-29.4dB at Ulan Road. Wind speed was 0.1-0.8m/s from NE. The ECRC visited the area at 8:45am. Total noise levels on the hand held noise unit were between 35dB and 37dB however mine noise was generally low. Road traffic and birds were the dominant noise sources. An attempt to contact the complainant was made 9:23am on 03/01/12 but was unsuccessful.
130.	3rd January 2012	Maiala Road	Noise	Complainant contacted complaints line at 12:23pm on 03/01/12 to complain about noise at 3:00am on 03/01/12. LF noise levels at the time of the complaint were between 29.9-32.0dB at Lagoons Road and between 28.6-29.4dB at Ulan Road. Wind speed was 0.1-0.8m/s from NE. The complainant was contacted at 1:54pm on 03/01/12 and they commented that the noise had woken them at 3:00am and

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				had continued for a while after that. It was discussed that the overall noise levels were low much closer to the mine.
131.	4th January 2012	Ridge Road	Noise	Complainant contacted complaints line at 10:38pm and 10:53pm on 04/01/12 to complain about noise from the mine. The second complaint stated that the EPA would be contacted in relation to ongoing noise. The complainant stated noise had been continuing from 9:15pm and that MCO had been winding the noise up and down during the evening. LF noise levels at the time of the complaint were between 29.0dB-39.0dB at Lagoons Road and between 38.0-39.0dB at Ulan Road. Wind speed was 0.4-0.7m/s from SSE. A review of the audio revealed occasional dozer track and general mine hum. The complainant was contacted at 9:30am on 05/01/12 and was left a message.
132.	6th January 2012	Ulan Road	Noise	Complainant contacted complaints line at 3:15am 06/01/12 to complain about noise from the mine. LF noise levels at the time of the complaint were between 29.6-39.2dB at Lagoons Road, and between 28.1-37.3dB at Ulan Road. Wind speed was 0.6m/s from the WSW. A review of the audio revealed a general mining hum. The complainant was contacted at 11:15am 06/01/12 and was left a message.
133.	6th January 2012	Ridge Road	Noise	Complainant contacted complaints line at 04:37am 06/01/12 to complain about increased noise from the mine. LF noise levels at the time of the complaint were between 34.4-37.2dB at Lagoons Road, and between 31.8-40.0dB at Ulan Road. Wind speed was 0.3m/s from the SW. A review of the audio revealed general mine hum and intermittent dozer tracks. Complainant indicated that they were woken at 4:05am by noises of dumping into trucks, and dozers, with the noise remaining constant until 5:00am when the complainant was able to return to sleep. Complainant stated that prior to rains the previous evening mining noise could be heard in the distance.
134.	7th January 2012	Ulan Road	Noise	Complainant rang complaints line at 1:46am 07/01/12 to submit a noise complaint. LF noise levels at the time of the complaint were between 29.7-34.0dB at Lagoons Road, and between 29.9-34.8dB at Ulan Road. Wind speed was between 1.6-2.5m/s from the NE-E. A review of audio revealed general mining hum and dozer tracks. The complainant could not be contacted; however a message was left on the complainant's answering machine.
135.	7th January 2012	Ridge Road	Noise	Complainant rang the complaints line at 7:54am 07/01/12 to complain about machinery noise from the mine, and excavator dumping noise. LF noise levels at the time of the complaint were between 33.9-35.6dB at Lagoons Road, and between 34.4-38.6dB at Ulan Road. Wind speed was between 2.1-4.1m/s from the NE-ESE. Some general mine noise could be heard on the audio, however it was difficult to distinguish from wind and traffic noise. Complainant indicated that they could hear machinery noise from the mine when they woke up in the morning. Complainant also stated that they are maintaining a record of times that they have heard noise from the mine.

Number	Date	Location	Issue	Investigation and Follow Up
136.	7th January 2012	Ridge Road	Noise	Complainant rang the complaints line at 8:09pm 07/01/12 to complain about machinery noise from the mine, and excavator dumping noise. LF noise levels at the time of the complaint were between 29.2-36.5dB at Lagoons Road, and between 28.4-43.8dB at Ulan Road. Wind speed was between 0.1-0.8m/s from the east initially, then SW. A review of audio revealed distant machinery noise. Multiple attempts to contact the complainant were unsuccessful.
137.	8th January 2012	Ulan Road	Noise	Complainant rang the complaints line at 12:31am 08/01/12 to submit a noise complaint. LF noise levels at the time of the complaint were between 29.7-34.0dB at Lagoons Road, and between 29.9-34.8dB at Ulan Road. Wind speed was between 1.6-2.5m/s from the NE-E. A review of audio revealed a general mine hum and dozer tracks. The complainant could not be contacted; however a message was left on the complainant's answering machine.
138.	15th January 2012	Maiala Road	Noise	Complainant rang to complain about noise at 6:37pm on 15/01/12. The complainant was contacted at 6:43pm and they confirmed that the noise was loud right now. The OCE was contacted to find out what equipment was operating. One overburden digger was operating in S05-06B26-28 with the dumping location being in a protected area. The OCE checked the audio on the real-time noise unit and commented they could only hear birds and road traffic. LF noise levels at Lagoons Road were between 26.4-33.6dB and between 36.9-38.6dB at Ulan Road (audio indicates road traffic noise). Wind speed was 1.8-2.4m/s from the east. Maiala Road was visited by the ECRC between 7:25-7:40pm. Upon arrival the dominant noise sources were planes, insects, birds and road traffic. When all else was quiet a faint mine hum could be heard. Individual noises identified were dozer tracks and possibly mechanical drive trucks. The OCE was contacted at 7:39pm who confirmed that MCO's mining operations hadn't changed since the complaint was made. Upper Ridge Road was visited at 7:50pm with a very, very faint mining noise being audible when all else was quiet. Lower Ridge Road was visited at 7:55pm where no mining noise was audible. The complainant was contacted at 9:18am on 16/01/12 to discuss these observations with no further comment being made by the complainant.
139.	17th January 2012	Ridge Road	Noise	Complainant rang to complain about noise at 4:41am on 17/01/12. LF noise levels at Lagoons Road were between 30.6-32dB and between 38.8-39.3dB at Ulan Road. Wind speed and direction was between 0.0-0.4m/s from ESE. Review of the audio from Lagoons Road revealed mine noise including the occasional horn and loading or dumping. Audio from Ulan Road revealed only road traffic. Diggers 1 and 2 were operating in S05B27 and S02B16 respectively with material reporting to 460 dump and S01 dump. The complainant was contacted at 2:50pm on the 17/01/12 to discuss the complaint and was appreciative of the phone call.
140.	17th January 2012	Ulan Road	Noise	Complainant rang to complain about noise at 3:47am on 17/01/12. LF noise levels at Lagoons Road were between 30.1-33.1dB and between 34.2-35dB at Ulan Road. Wind speed and direction was

Number	Date	Location	Issue	Investigation and Follow Up
				between 0.0-0.4m/s from ESE. Review of the audio from Lagoons Road revealed low dozer track noise and faint mine hum. Diggers 1 and 2 were operating in S05B27 and S02B16 respectively with material reporting to 460 dump and S01 dump. The complainant was contacted at 11:20am on the 17/01/12. They stated that the noise had woken them up and that traffic noise was ridiculous. The complainant said that the traffic noise was from MCO only. The ECRC explained that other operations also contribute to mine traffic and that MCO had complied with its project approval in recent traffic noise monitoring.
141.	18th January 2012	Ridge Road	Noise	Complainant rang to complain about noise at 3:16am on 18/01/12. LF noise levels at the portable noise unit on Ridge Road located across the road from the complainant were between 35.2dB and 37.6dB. Lagoons Road was between 31.6dB and 34.7dB. Wind speed and direction was between 0.0-0.4m/s from ESE. Review of the audio from Ridge Road and Lagoons Road revealed mine noise including the occasional horn and loading or dumping. Audio from Ulan Road revealed only road traffic.
142.	18th January 2012	Ulan Road	Noise	Complainant rang to complain about noise at 4:47am on 18/01/12. LF noise levels at Lagoons Road were between 27.1dB and 27.9dB and between 40.5dB and 41.4dB at Ulan Road. Wind speed and direction was between 0.0-0.4m/s from ESE. Review of the audio from Lagoons Road revealed birds and low distant mine noise with occasional dumping of material related noise. Review of audio from Ulan Road revealed traffic noise. Attempts were made to contact the complainant on the 18/01/12 but were unsuccessful.
143.	20th January 2012	Maiala Road	Noise	Complainant rang to complain about noise at 9:13pm, 9:26pm, and 10:39pm on 20/01/12. Shift records show EX101, EX102 and EX111 were operating in S05, S02 and S04 respectively. LF noise levels at Ridge Road were between 27.2dB and 30.7dB. Review of the audio from Ridge Road revealed birds, insects and low mine noise and traffic noise.
144.	21st January 2012	Ridge Road	Noise	Complainant rang to complain about noise at 9:00pm and 10:38pm on 21/01/12. Shift records show EX101, EX102 and EX111 were operating in S05, S02 and S04 respectively. EX101 trucks were relocated to a lower dump following alarms and complaints. LF noise levels at Ridge Road were between 25.9dB at 9:00pm and 39.6dB at 10:38pm. Review of the audio from Ridge Road at 9:00pm revealed road traffic and insects. Review of the audio at 10:38pm revealed planes, road traffic, wind on the microphone and some minor mine related hum. Wind speed and wind direction were between 0.9m/s and 1.3m/s from the east.
145.	22nd January 2012	Ulan Road	Noise	Complainant rang to complain about noise at 2:08am on the 22/01/12. Shift records show EX101, EX102 and EX111 were operating in S05, S02 and S04 respectively. LF noise levels at Lagoons Road were 35.2dB. Review of the audio from Lagoons Road revealed birds, insects, strong winds on the microphone and occasional truck retard. Wind speed and wind direction was 1.8m/s and from the east.

Number	Date	Location	Issue	Investigation and Follow Up
				Attempts were made to contact the complainant the following day but were unsuccessful.
146.	23rd January 2012	Ulan Road	Noise	Complainant rang to complain about noise at 11:57pm on 23/01/12, and again at 02:18am on 24/01/12. Records from the shift were reviewed: Digger 101 was removing overburden from S05B27 with dumping at RL480. Digger 102 was removing overburden from S02B15 with dumping at the new ROM road. Digger 111 was removing coal from S04B36 to the ROM. Rejects were being dumped in S01 in a protected area. Between 11:30pm-12:30am LF noise levels at Lagoons Road were between 35.8-45.0dB. Noise was between 33.2-43.0dB at Ulan Road and between 33.3-37.1dB at Ridge Road. Wind speed was between 2.9-3.5m/s from the east. Between 12:45am and 1:45am noise levels at Lagoons Road were between 39.5-41.7dB. Noise was between 31.9-35.3dB at Ulan Road and 34.7-39.1dB at Ridge Road. Wind speed was between 2.7-3.9m/s from the E. Review of audio at Lagoons Road and Ulan Road revealed a general mining hum and intermittent dozer tracks that can be overheard above significant wind noise. Review of audio at 918 Ridge Road revealed faint mining noise that was difficult to hear over wind noise. A message was left on the complainant's phone at 2:52pm 24/01/12.
147.	24th January 2012	Maiala Road	Noise	Complainant rang at 6:40am 24/01/12 to complain about noise from 4:30am until the time of the complaint. Prior to 5:00am Digger 101 was removing overburden from S05B27 with dumping at RL480. Digger 102 was removing overburden from S02B15 with dumping at the new ROM road. Digger 111 was removing coal from S04B36 to the ROM. Rejects were being dumped in S01 in a protected area. Between 5:00am and 7:00am the diggers were not operating. Between 4:30am and 6:45am LF noise levels at Lagoons Road were between 35.2-40.6dB. Noise was between 35.1-44.2dB at Ulan Road and between 33.0-40.3dB at Ridge Road. Wind speed was between 2.9-3.5m/s from the east. Review of audio revealed traffic noise and significant wind noise, with mining noise difficult to identify. The ECRC attended Maiala Road and Upper Ridge Road at 6:55am. Very faint mining noise could be heard at Maiala Road over traffic and wind. No mining noise could be heard at Upper Ridge Road over traffic, wind and animal noises. Complainant indicated that they had been woken by mine noise at 4:30am, and that the noise had continued at a high level until the time of the complaint. The complainant stated that while wind noise could be heard at their property, it was clearly distinguishable from mine noise.
148.	24th January 2012	Maiala Road	Noise	Complainant rang to complain about noise at 9:01pm on 24/01/12. Digger 101 was removing overburden from S05B27 and dumping at RL480. Digger 102 was removing overburden from S02B15 to the new ROM road. Digger 111 was removing coal from S04B36 to the ROM. Between 8:30pm and 9:30pm LF noise levels were between 34.9-41.9dB at Lagoons Road. Noise was between 34.5-38.1dB at Ulan Road and 29.8-34.5dB at Ridge Road. Wind speed was between 2.1-3.1m/s from ENE-E. Review of audio revealed machinery noise, including truck retard and dozer tracks, with some high wind noise. Messages were left on the complainant's home phone at 3:57pm 25/01/12, and mobile phone at

Number	Date	Location	Issue	Investigation and Follow Up
				3:59pm with no response.
149.	24th January 2012	Ulan Road	Noise	Complainant rang to complain about noise at 9:29pm on 24/01/12, and 1:38am and 3:48am on 25/01/12. Digger 101 was removing overburden from S05B27 and dumping at RL480. Digger 102 was removing overburden from S02B15 to the new ROM road. Digger 111 was removing coal from S04B36 to the ROM. Between 9:00pm and 10:00pm LF noise levels at Lagoons Road were between 33.1-36.8dB. Noise was between 34.5-38.1dB at Ulan Road and between 29.6-33.1dB at Ridge Road. Wind speed was between 2.1-2.4m/s from the east. Between 1:00am and 2:00am LF noise levels at Lagoons Road were between 32.1-38.6dB. Noise was between 30.6-32.6dB at Ulan Road and between 27.1-31.0dB at Ridge Road. Wind speed was between 1.7-2.4m/s from the east. Between 3:15am and 4:15am LF noise levels at Lagoons Road were between 32.8-34.0dB. Noise was between 32.4-35.1dB at Ulan Road and between 26.8-32.8dB at Ridge Road. Wind speed was between 0.6-1.7m/s from the east. Review of audio revealed machinery noise, including truck retard and dozer tracks, with some high wind noise. A message was left on the complainants home phone at 3:55pm 25/01/12 with no response.
150.	26th January 2012	Ridge Road	Noise	Complainant rang to complain about noise at 2:33am on 26/01/12. Digger 101 was removing overburden from S06B26 to 460RL dump. Digger 102 was removing overburden from S02B15 to the new ROM road. Digger 111 was removing coal from S04B36 to the ROM. Rejects were being dumped from 460RL. All overburden trucks were operated in slow mode. Between 2:00am and 3:00am LF noise levels at Lagoons Road were between 46.6-47.5dB. Noise was between 35.5-38.1dB at Ulan Road and between 34.4-37.2dB at Ridge Road. Wind speed was between 2.3-3.1m/s from ESE with constant rain. Review of audio revealed machinery noise including truck retard, and significant wind noises. Complainant indicated that they could hear banging and whirring which went on all night, and throughout most of the day. Complainant noticed that a newly cleared area is visible, and believed that noise was coming straight up the valley from this area. Complainant indicated that they can always hear MCO noise, however the noise levels depend on the weather, with noise worst a day or two prior to rains. Complainant indicated that noise levels have been higher in the last few weeks.
151.	27th January 2012	Ridge Road	Water	Complainant rang the complaints line to comment that a water sample from their tank had a pH of 5.9, and that the complainant has had terrible rashes for the last 12 months. The complainant has had rashes that start on the hands and head since last February, and has had a referral from a doctor to see a specialist in Dubbo. The doctor has not suggested that the skin condition is mine related. The complainant has swapped everything in their house including detergents, and has not isolated the cause of the rashes to date, but believes that it is due to their rainwater. The rainwater is the sole potable water at the property, with no bore water being used. Complainant believes the low pH is due

Number	Date	Location	Issue	Investigation and Follow Up
				to influence from mine dust from MCO. The ECRM spoke to the complainant who advised that they were suffering from a serious skin rash and claimed that it was from fugitive mine dust from MCO. The ECRM went onto explain some issues with acidity in the mining industry and how MCO did not suffer from these issues, e.g.- ARD. ECRM advised complainant that all our dust monitoring results were available to them if they required them to help with their prognosis. ECRM advised that if there was a problem related to mine activities we would work closely with the complainant and the practitioner to rectify the issue. Complainant also complained about traffic and Ulan Rd conditions. ECRM advised her that all reckless driving can be reported and that we would pass the report onto the road safety committee.
152.	27th January 2012	Ridge Road	Blasting	EPA rang to inform the ECRM that complainant rang and complained about the lack of attention they are receiving regarding their concerns of MCO blasting. ECRM then rang the complainant and discussed their concerns. Complainant was concerned that MCO blasting is responsible for the movement of large boulders on their property. Complainant suggested that the boulders, if dislodged, would be a serious safety concern. Complainant also complained about traffic, noise and dust being a problem that contributes to the decrease of land valuation. ECRM advised complainant that MCO would take a portable blast monitor to the area of concern to gather data to ensure the pre-blast modelling was accurate. Complainant was satisfied with the action and appreciated the quick response to the call.
153.	27th January 2012	Ulan Road	Noise	Complainant rang to complain about noise throughout the night at 10:30pm 27/01/12, and from 4:00am on 28/01/12. Digger 101 was removing overburden from S05B27 and dumping at RL480. Digger 102 was removing overburden from S02B15 to the new ROM road. Digger 111 was removing coal from S04B36 to the ROM. Diggers did not operate during swing shift (5:00am -7:00am). LF noise levels at Lagoons Road for the night were between 32.1-39.6dB. Noise was between 30.6-37.1dB at Ulan Road and between 26.8-32.8dB at Ridge Road. Wind speed was between 1.1-3.3m/s from NNE-E. Review of audio revealed machinery noise, including truck retard and dozer tracks, with some high wind noise. A message was left on the complainants home phone at 3:56pm 25/01/12 with no response.
154.	27th January 2012	Ulan Road	Noise	Complainant rang to complain about noise at 03:12am on 27/01/12. Digger 101 was removing overburden from S06B26 to 460RL dump. Digger 102 was removing overburden from S02B15 to the new ROM road. Digger 111 was removing coal from S04B36 to the ROM. Rejects were being dumped from 460RL. All overburden trucks were operated in slow mode. OCE noted that only wind and rain could be heard on audio when checked. Between 2:30am and 3:30am LF noise levels at Lagoons Road were between 39.3-47.5dB. Noise was between 33.0-37.2dB at Ulan Road and between 32.8-35.5dB at Ridge Road. Wind speed was between 1.4-2.6m/s from ESE, with constant rain. Review of audio

Number	Date	Location	Issue	Investigation and Follow Up
				revealed machinery noise including truck retard, and significant wind noises. A message was left on the complainants home phone 5:00pm 27/01/12 with no response.
155.	28th January 2012	Ulan Road	Noise	Complainant rang at 03:07am 28/01/12 to complain about noise. Digger 101 was removing overburden from S04 to 480RL dump. Digger 102 was removing overburden from S02 to S01 dump, and was broken down periodically from 01:00 to 03:40. Between 2:30am and 3:30am LF noise levels at Lagoons Road were between 26.6-48.6dB. Noise was between 35.8-38.4dB at Ulan Road and between 29.9-38.8dB at Ridge Road. Wind speed was between 2.3-3.3m/s from E. Review of audio found a general machinery hum, dozer tracks and general traffic noise which was difficult to distinguish from strong wind noise. Complainant could not be contacted for further information.
156.	29th January 2012	Ulan Road	Noise	Complainant complained about noise on 29/01/12 at 02:07am, 03:44am, 05:30am and 09:09am. Digger 101 was removing overburden from S01 to 480RL. Digger 1 did not operate during swing shift (5:00am-7:00am). Digger 102 was removing overburden from S02 to S01 dump. Digger 102 was not operating from 4:40am to 5:40am. Loader 121 was removing overburden from S05 to 460RL, and was shut down at 3:46am in response to complaint. Between 1:30am and 2:30am LF noise levels at Lagoons Road were between 30.1-34.6dB. Noise was between 30.8-33.1dB at Ulan Road and between 22.8-28.8dB at Ridge Road. Wind speed was between 0.8-1.7m/s from E. Between 3:15am and 4:15am LF noise levels at Lagoons Road were between 34.1-38.4dB. Noise was between 26.9-33.5dB at Ulan Road and between 25.5-28.9dB at Ridge Road. Wind speed was between 0.9-1.4m/s from NE. Between 5:00am and 6:00am LF noise levels at Lagoons Road were between 26.0-32.3dB. Noise was between 26.3-38.9dB at Ulan Road and between 27.4-37.2dB at Ridge Road. Wind speed was between 0.9-2.4m/s from ENE-E. Between 8:30am and 9:30am LF noise levels at Lagoons Road were between 33.2-42.4dB. Noise was between 33.0-41.9dB at Ulan Road and between 30.0-36.4dB at Ridge Road. Wind speed was between 0.9-2.4m/s from ENE-E. Wind speed was between 1.2-3.7m/s from NE-ENE. Review of audio at Lagoons Road and Ulan Road during the night found a general machinery hum, dozer tracks and truck retard in addition to strong wind noise. Review of audio at 918 Ridge Road during the night found distant mine noise which was difficult to distinguish from strong wind noise. Review of audio from 5:30am onwards found traffic, animal and high wind noise which was difficult to distinguish from mine noise. A message was left with the complainant at 1:10pm 29/01/12 with no response.
157.	29th January 2012	Maiala Road	Noise	Complainant rang at 2:36am 29/01/12 to complain about noise. Digger 101 was removing overburden from S01 to 480RL. Digger 102 was removing overburden from S02 to S01 dump. Between 2:00am and 3:00am LF noise levels at Lagoons Road were between 30.1-34.6dB. Noise was between 30.8-33.1dB at Ulan Road and between 26.3-29.3dB at Ridge Road. Wind speed was between 0.1-1.7m/s

Number	Date	Location	Issue	Investigation and Follow Up
				from E. Review of audio at Lagoons Road and Ulan Road found a general machinery hum, dozer tracks and truck retard in addition to strong wind noise. Review of audio at 918 Ridge Road found distant mine noise which was difficult to distinguish from strong wind noise. Complainant stated that they were woken by very loud mining noise at around 2:00-2:30am, including a mechanical drone, bangs and clangs, and a continuous groan. Complainant stated that they had to have some tablets to get back to sleep, and the noise appeared to be coming from further south than usual. Complainant has been away for a few days, so could not comment on noise from earlier in the week. Complainant stated that mining noise could only be heard at the front of the house where the bedrooms are, and suggested that if MCO build them a new house with bedrooms at the rear that they would not hear the mine. Complainant stated that something had to be done about the noise, as it is constantly there.
158.	29th January 2012	Ulan Road	Noise	Complainant rang at 7:22pm on 29/01/12 and 2:43am on 30/01/12 to complain about noise. Digger 101 was removing overburden from S04 to 460RL dump. Digger 102 was removing overburden from S04 to the S01 dump. LDR121 was removing topsoil from S03 to 480RL. Sunday night at approximately 9.30 pm the Production Superintendent received a phone call from the OCE explaining that he had received noise related complaints from members in the community. Since the start of his night shift, the OCE had concerns and shutdown EX101 working in strip 6 top of coal pass with trucks hauling waste back into S01 coal road dump and LDR121 loading topsoil in S04 south with 2 trucks hauling topsoil outside the pit crest at the southern end of the pit. EX102 was broken down and EX111 was in the workshop having sound attenuation fitted. At this particular time the Lagoons Road and the Ulan Road monitor were approximately 40.0dB. MCO operations were completely shut down for approximately 4.5 hours. The Production Superintendent noted at Lagoons Road that there was other mining equipment from neighbouring operations contributing to the noise levels. Between 7:00pm and 8:00pm LF noise levels at Lagoons Road were between 38.7-42.1dB. Noise was between 37.7-42.5dB at Ulan Road and between 29.4-38.2dB at Ridge Road. Wind speed was between 2.0-2.9m/s from ENE. Between 2:15am and 3:15am LF noise levels at Lagoons Road were between 35.5-41.7dB. Noise was between 32.7-33.2dB at Ulan Road and between 27.2-37.1dB at Ridge Road. Wind speed was between 2.0-2.2m/s from the east. Review of audio identified general mining noise and truck retard which was difficult to distinguish at times from strong wind noise at times. A message was left with the complainant at 2:00pm 30/01/12 with no response.
159.	29th January 2012	Winchester Crescent	Noise	Complainant rang at 7:24pm on 29/01/12 to complain about noise. Digger 101 was removing overburden from S04 to 460RL dump. Digger 102 was removing overburden from S04 to the S01 dump. LDR121 was removing topsoil from S03 to 480RL. Sunday night at approximately 9.30 pm the Production Superintendent received a phone call from the OCE explaining that he had received noise

Number	Date	Location	Issue	Investigation and Follow Up
				related complaints from members in the community. Since the start of his night shift ,the OCE had concerns and shutdown EX101 working in strip 6 top of coal pass with trucks hauling waste back into S01 coal road dump and LDR121 loading topsoil in S04 south with 2 trucks hauling topsoil outside the pit crest at the southern end of the pit. EX102 was broken down and EX111 was in the workshop having sound attenuation fitted. At this particular time the Lagoons Road and the Ulan Road monitor were approximately 40.0dB. MCO operations were completely shut down for approximately 4.5 hours. The Production Superintendent noted at Lagoons Road that there was other mining equipment from neighbouring operations contributing to the noise levels. Between 7:00pm and 8:00pm LF noise levels at Lagoons Road were between 38.7-42.1dB. Noise was between 37.7-42.5dB at Ulan Road and between 29.4-38.2dB at Ridge Road. Wind speed was between 2.0-2.9m/s from ENE. Review of audio identified general mining noise and truck retard which was difficult to distinguish at times from strong wind noise at times. The complainant indicated that they could hear a grumbling sound, similar to the bass portion of traffic noise, but never ending. This noise can be heard in certain rooms of the house. Complainant was asleep following the complaint, so could not comment on whether noise levels decreased following shutdown of MCO equipment. Complainant stated that noise levels were also high from 4:30am the previous morning. Complainant stated that they want to extend their house, but were worried that future noise levels from the expansion of mines in the area may impact them too greatly over time, and were concerned that they would have to leave and that the house extension would be wasted. They were provided them with information on future Stage 1 activities and proposed Stage 2 activities.
160.	29th January 2012	Maiala Road	Noise	Complainant rang at 7:49pm and 10:30pm on 29/01/12 to complain about noise. Digger 101 was removing overburden from S04 to 460RL dump. Digger 102 was removing overburden from S04 to the S01 dump. LDR121 was removing topsoil from S03 to 480RL. Sunday night at approximately 9.30 pm the Production Superintendent received a phone call from the OCE explaining that he had received noise related complaints from members in the community. Since the start of his night shift ,the OCE had concerns and shutdown EX101 working in S06 top of coal pass with trucks hauling waste back into S01 coal road dump and LDR121 loading topsoil in S04 south with 2 trucks hauling topsoil outside the pit crest at the southern end of the pit. EX102 was broken down and EX111 was in the workshop having sound attenuation fitted. At this particular time the Lagoons Road and the Ulan Road monitor were approximately 40.0dB. MCO operations were completely shut down for approximately 4.5 hours. The Production Superintendent noted at Lagoons Road that there was other mining equipment from neighbouring operations contributing to the noise levels. Between 7:15pm and 8:15pm LF noise levels at Lagoons Road were between 38.7-42.1dB. Noise was between 37.7-42.5dB at Ulan Road and

Number	Date	Location	Issue	Investigation and Follow Up
				between 29.4-38.2dB at Ridge Road. Wind speed was between 2.0-2.9m/s from ENE. Between 10:00pm and 11:00pm LF noise levels at Lagoons Road were between 38.2-42.9dB. Noise was between 30.8-39.8dB at Ulan Road and between 27.7-35.2dB at Ridge Road. Wind speed was between 2.0-2.2m/s from E. Review of audio identified general mining noise and truck retard which was difficult to distinguish at times from strong wind noise. Complainant stated that they could hear clanking noises and constant noise of machinery moving around throughout the night and in the morning. Complainant noted that MCO shut down operations for a length of time and that noise still persisted, however it was not as loud as when the complaint was made.
161.	29th January 2012	Ulan Road	Noise	Complainant rang at 8:36pm on 29/01/12 to complain about noise. Digger 101 was removing overburden from S04 to 460RL dump. Digger 102 was removing overburden from S04 to the S01 dump. LDR121 was removing topsoil from S03 to 480RL. Sunday night at approximately 9.30 pm the Production Superintendent received a phone call from the OCE explaining that he had received noise related complaints from members in the community. Since the start of his night shift ,the OCE had concerns and shutdown EX101 working in S06 top of coal pass with trucks hauling waste back into S01 coal road dump and LDR121 loading topsoil in S04 south with 2 trucks hauling topsoil outside the pit crest at the southern end of the pit. EX102 was broken down and EX111 was in the workshop having sound attenuation fitted. At this particular time the Lagoons Road and the Ulan Road monitor were approximately 40.0dB. MCO operations were completely shut down for approximately 4.5 hours. The Production Superintendent noted at Lagoons Road that there was other mining equipment from neighbouring operations contributing to the noise levels. Between 8:00pm and 9:00pm LF noise levels at Lagoons Road were between 38.1-40.0dB. Noise was between 37.7-39.5dB at Ulan Road and between 29.4-39.4dB at Ridge Road. Wind speed was between 2.0-2.9m/s from E. Review of audio identified general mining noise and truck retard which was difficult to distinguish at times from strong wind noise at times. A message was left with the complainant at 1:58pm 30/01/12 with no response.
162.	30th January 2012	Winchester Crescent	Noise	Complainant called to complain about noise at 8:56pm 30/01/12. Review of shift records and discussion with the Production Superintendent confirmed that no machinery was operating in Open Cut 1 both prior to, and at the time of the complaint. Between 8:30pm and 9:30pm LF noise levels at Lagoons Road were between 28.3-44.0dB. Noise was between 28.8-41.9dB at Ulan Road and between 28.8-41.2dB at Ridge Road. Wind speed was between 0.0-0.6m/s from SW. Review of audio from Ulan Road identified a constant rumble/grinding and truck retard. Similar noise could be heard at Lagoons Road, with additional intermittent dozer track sounds. Complainant stated that loud rumbling noise could be heard at the time of the complaint, and the previous two nights. Complainant was informed that no machinery was operating in Open Cut 1 at the time of the complaint, and stated that

Number	Date	Location	Issue	Investigation and Follow Up
				they have not complained to any other mines in the area. Complainant contacted the hotline again on 31/01/12 in relation to the previous complaint. The ECRC advised that during the time of complaint on 30/01/12 MCO were not operating. The ECRC explained that often there are other mine sources in the area that can contribute to mine related noise.
163.	1st February 2012	Ridge Road	Noise	Complainant called to complain about noise at 10:35pm on 01/02/12. Review of shift records and discussion with the Production Superintendent confirmed that excavators and dozers had been shut down in the south of the pit at 10:25pm in response to noise alarms and review of noise levels. Following further alarms the Production Superintendent shut down the pit at 11:30pm for approximately 10 minutes and live audio revealed loading noise from another operation. LF noise levels at time of complaint at Lagoons Road were 43.8dB, at Ulan Road were 32.5dB and Ridge Road were 41.1dB. Wind speed was 3.1m/s from ESE. Review of audio from Lagoons Road and Ridge Road identified strong wind on the microphone with mine noise difficult to distinguish. The complainant was contacted the following day to discuss the complaint. They mentioned they could hear droning noises but noticed a drop in noise levels after 11:00pm.
164.	2nd February 2012	Maiala Road	Noise	Complainant called to complain about noise at 9:43pm on 02/02/12. Review of shift records confirmed that following the complaint all gear was shut down temporarily for 10 mins. No changes in noise levels were noticed. The OCE reviewed the live audio during this time and identified minimal background noise and gear driven trucks. Between 9:30pm and 9:45pm LF noise levels at Lagoons Road were between 35.9-38.0dB. At Ulan Road noise levels were between 37.8-38.8dB and between 38.0-38.1dB at Ridge Road. Wind speed was 1.8-2.2m/s from the east. Review of audio from Lagoons Road and Ridge Road identified strong wind on the microphone, traffic noise, and low intermittent truck noise. The complainant was contacted on 03/02/12 at 1:15pm. They stated the noise they heard was different from usual and came from the south. They could not distinguish any particular equipment. The ECRC advised them that the OCE had taken actions following the complaint.
165.	3rd February 2012	Maiala Road	Noise	Complainant called to complain about noise at 9:33pm on 03/02/12. Review of shift records confirmed that EX101 and EX102 were operating in S05B26 and S05B22 respectively. EX111 was operating in S04B32 and S05B36. Following the complaint the OCE reviewed the noise levels and audio. Between 9:30pm and 9:45pm LF noise levels at Lagoons Road were between 35.2-35.4dB. At Ulan Road noise levels were between 37.6-39.1dB and between 36.2-38.6dB at Ridge Road. Wind speed was 0.4m/s from the SE. Review of audio from the closest monitor at Ridge Road identified a constant rumbling which could not be clearly attributed to mining. Road traffic was also noticeable. The complainant was contacted on the 04/02/12 at 10:00am to discuss the complaint.

Number	Date	Location	Issue	Investigation and Follow Up
166.	3rd February 2012	Ridge Road	Noise	Complainant called to complain about noise at 11:41pm on 03/02/12. Review of shift records confirmed that EX101 and EX102 were operating in S05B26 and S05B22 respectively. EX111 was operating in S04B32 and S05B36. Following the complaint the OCE reviewed the noise levels and audio. Dozer track noise was noticeable. Noise alarms and levels were monitored throughout the rest of the shift. Between 11:30pm and 11:45pm LF noise levels at Lagoons Road were 37.2dB. At Ulan Road noise levels were between 33.7-35.6dB and between 39.2-40.2dB at Ridge Road. Wind speed was 0.4m/s from the SE. Review of audio from Lagoons Road identified general low mine noise, insects and occasional road traffic. The complainant was contacted the following day.
167.	4th February 2012	Ulan Road	Noise	Complainant called to complain about noise at 10:09pm on 04/02/12. Review of shift records confirmed that EX101 and EX102 were operating in S05B26 and S05B22 respectively. EX111 was operating in S05B35 and LDR121 in S05B25 on topsoil. Following the complaint the OCE reviewed the noise levels and audio. Between 10:00pm and 10:15pm LF noise levels at Lagoons Road were between 36.3-36.5dB. At Ulan Road noise levels were between 34.4-36.6dB and between 28.0-28.7dB at Ridge Road. Wind speed was 0.9m/s from the ESE. Review of audio from Lagoons Road monitor identified general mine noise including trucks. The complainant was contacted the following day and was left a message.
168.	8th February 2012	Ulan Road	Noise	Complainant rang to complain about noise at 4:00am on 08/02/12. Mining operations were overburden removal from S05 to S01 dump and coal mining from S03. LF noise levels were between 29.5-32.7dB at Lagoons Road at the time of the complaint. Wind speed was 1.3-3.4m/s from the ENE. A message was left for the complainant at 9:22am on 08/02/12 with the monitoring results and a phone number if more information was required.
169.	8th February 2012	Ridge Road	Noise	Complainant rang to complain about noise at 10:28pm on 08/02/12. LF noise levels at Lagoons Road were between 40.2-40.3dB and between 35.8-40.5dB at Ulan Road. These results were affected by wind with speeds between 2.3-3.2m/s from the east. Following the complaint LDR121 and two trucks were relocated from their operations in southern S05. A review of the audio indicated that truck retard was audible prior to the complaint. The audio after the time of the complaint was dominated by wind with the occasional dozer track being audible. The complainant's partner was contacted at 11:22am on 09/02/12 to discuss their complaint. There was a general discussion about noise, dust, blasting, clearing and rehabilitation activities at MCO.
170.	9th February 2012	Maiala Road	Noise	Complainant rang the complaints line to complain about noise at 10:03pm on 09/02/12. EX101 was operating in S05B25 with dumping in S01 north. EX111 was operating in S04B32 hauling to the ROM. LF noise levels at Lagoons Road were between 40.2-45.1dB and between 34.2-40.5dB at Ulan Road. These results were affected by the wind with speeds between 1.4-3.0m/s from the east. The audio was

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				dominated by wind. When the wind gusts dropped truck retard was audible. The complainant was contacted at 10:27am on 10/02/12 to discuss the complaint. They commented that the noise they can hear is a whining noise that gets into their head.
171.	10th February 2012	Ulan Road	Noise	Complainant rang complaints line to complain about noise at 3:06am on 10/02/12. There was a follow up complaint at 5:22am. For the initial complaint EX101 was operating in S05B25 with dumping in S01 north. EX111 was operating in S04B32 hauling to the ROM. LF noise levels at Lagoons Road were between 34.0-37.2dB and between 33.3-36.7dB at Ulan Road. Wind speed was between 1.1-1.6m/s from NE. A review of the audio indicated that truck movements were the dominant noise source. The occasional loud banging noise associated with loading activities could be heard. For the second complaint EX101 was shut down. EX111 was operating in S04B32 hauling to the ROM. LF noise levels at Lagoons Road were between 35.5-42.3dB and between 39.4-41.9dB at Ulan Road. Wind speed was between 0.6-1.0m/s from NE. There was also some rain present at the time of the complaint. A review of the audio indicated rain falling on the microphone. Truck movements and excavator fans were also audible with a couple of planes being audible at times. A message was left for the complainant to call back at 11:33am 10/02/12.
172.	10th February 2012	Ridge Road	Noise	Complainant rang the complaints line to complain about noise at 4:37am on 10/02/12. EX101 was operating in S05B25 with dumping in S01 north. EX111 was operating in S04B32 hauling to the ROM. LF noise levels were between 34.0-35.3dB at Lagoons Road and between 34.6-36.6dB at Ulan Road. Wind speed was between 0.8-1.1m/s from NE. A review of the audio indicated the noise environment was dominated by excavator fans and truck movements.
173.	10th February 2012	Maiala Road	Noise	Complainant rang to complain about noise at 8:10pm on 10/02/12. There was a follow up complaint at 10:38pm. EX101 was working in S05B25 hauling to the new ROM road. EX102 was working in S05B23 hauling to the new ROM road. EX111 was working in S04B36 hauling to the ROM. For the initial complaint LF noise at Lagoons Road was between 31.5-36.6dB and between 37.2-38.3dB at Ulan Road. Wind speed was between 0.8-1.2m/s from SE. A review of the audio was dominated by birds and insects. Low level mining hum and truck retard could also be heard. For the second complaint LF noise at Lagoons Road was between 34.4-35.6dB and between 35.2-37.3dB at Ulan Road. Wind speed was between 0.2-1.0m/s from NE-SE. A review of the audio indicated a general hum from the excavators. Truck retard and loading activities could also be heard. The shift report indicates that the mining operations were shut down at 9:15pm with loading and mechanical drive truck being audible. EX101 and EX102 were shut down between 12:00am and 1:00am, and EX111 was shut down between 11:30pm and 2:30am. The complainant was contacted at 4:10pm on 11/02/12 to discuss the complaints with no additional comments being made.

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174.	10th February 2012	Ridge Road	Noise	Complainant rang to complain about noise at 8:56pm on 10/02/12. EX101 was working in S05B25 hauling to the new ROM road. EX102 was working in S05B23 hauling to the new ROM road. EX111 was working in S04B36 hauling to the ROM. LF noise at Lagoons Road was between 34.9-37.4dB and between 38.2-39.2dB at Ulan Road. Wind speed was between 0.6-1.2m/s from SE. A review of the audio indicates that traffic noise and mining noise dominated the noise environment. Distinguishing the sources of the mining noise was very hard with the occasional retard and dozer noise being audible. The shift report indicates that the mining operations were shut down at 9:15pm with loading and mechanical drive truck being audible. EX101 and EX102 were shut down between 12:00am and 1:00am, and EX111 was shut down between 11:30pm and 2:30am. A message was left for the complainant at 4:12pm on 11/02/12 to call back if they wished to discuss the complaint further.
175.	10th February 2012	Ulan Road	Noise	Complainant rang to complain about noise at 10:43pm on 10/02/12. EX101 was working in S05B25 hauling to the new ROM road. EX102 was working in S05B23 hauling to the new ROM road. EX111 was working in S04B36 hauling to the ROM. LF noise at Lagoons Road was between 33.8-36.3dB and between 35.2-37.6dB at Ulan Road. Wind speed was between 0.2-1.0m/s from NE. A review of the audio indicated a mining related hum and truck retard were audible along with insects and planes. The shift report indicates that the mining operations were shut down at 9:15pm with loading and mechanical drive truck being audible. EX101 and EX102 were shut down between midnight and 1am, and EX111 was shut down between 11:30pm and 2:30am. A message was left for the complainant at 4:13pm on 11/02/12 to call back to discuss the complaint further. As this complainant hasn't been returning calls, it was stressed that unless they call back we are unable to help them.
176.	10th February 2012	Ridge Road	Noise	Complainant rang to complain about noise at 11:19pm on 10/02/12. EX101 was working in S05B25 hauling to the new ROM road. EX102 was working in S05B23 hauling to the new ROM road. EX111 was working in S04B36 hauling to the ROM. LF noise at Lagoons Road was between 33.8-36.3dB and between 35.2-38.1dB at Ulan Road. Wind speed was between 0.4-1.0m/s from NE. A review of the audio indicated trucks (mechanical drive) were dominant along with loading activities, horns, and dozers. The shift report indicates that the mining operations were shut down at 9:15pm with loading and mechanical drive truck being audible. EX101 and EX102 were shut down between 12:00am and 1:00am, and EX111 was shut down between 11:30pm and 2:30am. The complainant was contacted at 4:14pm on 11/02/12 to discuss the complaint further. They commented that it was quieter this morning
177.	11th February 2012	Maiala Road	Noise	Complainant rang to complain about noise at 11:49pm on 11/02/12. There were follow up complaints at 12:47am and 1:03am on 12/02/12. EX101 was operating in S05B25 with trucks hauling to new ROM road. EX102 was operating in S05B22 with trucks hauling to new ROM road. EX111 was operating in S05B26 side casting A2 partings. For the first complaint LF noise at Lagoons Road was between 29.5-

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				33.7dB and between 34.3-37.3dB at Ulan Road. Wind speed was between 0.1-0.5m/s from East. A review of the audio indicated road traffic noise and a general mine hum were audible. For the second complaint LF noise at Lagoons Road was between 27.4-31.5dB and between 31.7-34.5dB at Ulan Road. Wind speed was between 0.1-0.5m/s from SE. A review of the audio indicated a general mine hum with some truck retard was audible. For the third complaint LF noise at Lagoons Road was between 27.4-35.8dB and between 31.7-34.5dB at Ulan Road. Wind speed was between 0.1-0.3m/s from SW. A review of the audio indicated road traffic noise and a mine hum. The mine hum was quieter than at 11:49pm. The shift report indicates that all equipment was shut down between 1:10am and 1:25am with mining noise still being audible. The operations were shut down again between 2:45am and 2:55am with dozer tracks and loading activities being audible.
178.	12th February 2012	Ulan Road	Noise	Complainant rang to complain about noise at 4:10am on 12/02/12. EX101 was operating in S05B25 with trucks hauling to new ROM road. EX102 was operating in S05B22 with trucks hauling to new ROM road. EX111 was operating in S05B26 side casting A2 partings. LF noise at Lagoons Road was between 33.5-37.9dB and between 34.6-36.7dB at Ulan Road. Wind speed was between 0.2-1.3m/s from SW. A review of the audio indicated that mine related noise was dominant. Noise sources included excavator fans, dozers and truck retard. The shift report indicates that all equipment was shut down between 1:10am and 1:25am with mining noise still being audible. The operations were shut down again between 2:45am and 2:55am with dozer tracks and loading activities being audible.
179.	12th February 2012	Ulan Road	Noise	Complainant rang to complain about noise at 8:44am on 12/02/12. EX101 was operating in S06B25 with trucks hauling to 460RL dump. EX102 was operating in S05B22 with trucks hauling to 460RL dump. LF noise levels at the Lagoons Road were between 27.9-40.7dB and between 32.8-40.8dB at Ulan Road. Wind speed was between 0.6-0.9m/s from NE. A review of the audio indicated birds and mining related noise were the dominant noise sources with traffic noise also being audible. The complainant was contacted at 9:25am on 12/02/12 to discuss this complaint and their recent complaints. During the discussion the complainant commented that as we don't monitor near their residence we can't understand the noise environment at their residence. An offer was made to conduct some attended noise monitoring at their residence, which was refused. The resident has been conducting their own monitoring.
180.	12th February 2012	Maiala Road	Noise	Complainant rang to complain about noise at 10:49pm on 12/02/12. EX102 was operating in S05B22 with trucks hauling to new ROM road. EX111 was operating in S05B28 with trucks hauling to ROM bin. LF noise levels at Lagoons Road were between 22.0-31.9dB and between 30.3-34.5dB at Ulan Road. Wind speed was between 0.1-0.4m/s from SE. A review of the audio indicated insect noise and a low level mine hum were the dominant noise sources. Occasional truck retard could also be heard. A

Number	Date	Location	Issue	Investigation and Follow Up
				message was left for the complainant at 3:05pm on 13/02/12 asking them to call back if they wished to discuss this further.
181.	13th February 2012	Maiala Road	Noise	Complainant rang the complaints line to complain about noise at 9:49pm on 13/02/12. EX101 was operating in S05B25 overburden with dumping in S01 north. EX111 was operating in S05B28 hauling to the ROM. EX102 was not in operation. LF noise levels were between 32.6-33.8dB at Lagoons Road and between 35.7-36.9 dB at Ulan Road. Wind speed was 0.4m/s from the east. The OCE reviewed the audio at the time of the complaint and noted some occasional truck retard noise and some background mining noise. Alarms were reviewed throughout the shift and drills were shutdown from 11:45pm-4:00am. EX 111 was shut down at 12:25pm. The complainant was contacted on the 14/02/12 at 3:55pm and was left a detailed message.
182.	14th February 2012	Ulan Road	Dust	Complainant rang the front office to complain about dust at 9:45am on 14/02/12. The complainant commented they could see a dusty haze towards MCO and that their partner had been sneezing a lot lately. The ECRC commented that drilling was occurring in the south of the pit during the morning which may have contributed to dust due to its location and elevation. The ECRC drove out to Ulan Road shortly after the complaint but could not identify any particular dust sources.
183.	15th February 2012	Ridge Road	Noise	Complainant rang the complaints line to complain about noise at 10:43pm on 15/02/12. EX102 was operating in S05 overburden with dumping in S01 north. EX111 was operating in S01 and S04 hauling to the ROM. EX101 was not in operation. LF noise levels were between 33.2-38.6dB at Lagoons Road and between 39.7-39.9dB at Ulan Road. Wind speed was between 0.0-0.4m/s from ESE. Review of the audio from Lagoons Road monitor revealed a low mine hum with intermittent truck noise. Audio from Ulan Road monitor revealed constant mine related hum, traffic, planes and insects. The complainant was contacted on the 16/02/12 at 4:17pm and was left a detailed message.
184.	15th February 2012	Ridge Road	Noise	Complainant rang the complaints line to complain about noise at 9:21pm on 15/02/12. EX102 was operating in S05 overburden with dumping in S01 north. EX111 was operating in S01 topsoil and S04 hauling to the ROM. EX101 was not in operation. LF noise levels were between 33.4-33.7dB at Lagoons Road and between 34.1-32.9dB at Ulan Road. Wind speed was between 0.0-0.4m/s from ESE. Review of the audio from Lagoons Road monitor revealed mine noise including trucks and general mine hum. Audio from Ulan Road monitor revealed constant mine related hum including some trucks, traffic, planes and insects. The complainant was contacted on the 16/02/12 at 4:10pm to discuss the complaint.
185.	17th February 2012	Winchester Cres	Noise	Complainant rang the complaints line to complain about noise at 10:52pm on 17/02/12. EX102 was operating in S05 overburden with dumping in S01 north. EX111 was operating in S01 and to the ROM. EX101 was not in operation. LF noise levels were 26.3dB at Lagoons Road and between 33.1-40.9dB

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				at Ulan Road. Wind speed was between 0.0-0.4m/s from SSE. Review of the shift summary indicated that following the complaint the OCE reviewed real time audio and noise levels. Noise levels and real time audio revealed little audible noise from mining. Review of the audio from Lagoons Road monitor revealed a low mine hum with intermittent truck noise. Audio from Ulan Road monitor revealed constant mine related hum, traffic, planes and insects.
186.	18th February 2012	Ulan Road	Noise	Complainant rang the complaints line to complain about noise at 2:38am on 18/02/12. EX102 was operating in S05 overburden with dumping in S01 north. EX111 was operating in S01 and to the ROM. EX101 was not in operation. LF noise levels were 27.4dB at Lagoons Road and 30.1dB at Ulan Road. Wind speed was between 0.0-0.4m/s from WNW. Review of the shift summary indicated that following the complaint the OCE reviewed real time audio and noise levels. Noise levels and real time audio revealed little audible noise from mining. Review of the audio from Lagoons Road monitor revealed a low mine hum with intermittent truck noise. Audio from Ulan Road monitor revealed constant mine related hum, traffic, planes and insects.
187.	18th February 2012	Maiala Road	Noise	Complainant rang the complaints line to complain about noise at 8:17pm on 18/02/12. EX102 was operating in S05 overburden with dumping in S01 north. EX111 was operating in S01 and to the ROM. EX101 was not in operation. LF noise levels were 38.2dB at Lagoons Road and 37.1dB at Ulan Road. Wind speed was between 0.0-0.9m/s from WNW. Following the complaint the OCE reviewed real time audio and noise levels. Noise levels and real time audio revealed minimal audible noise from mining. Review of the audio from Lagoons Road monitor revealed a low mine hum with intermittent truck noise. Audio from Ulan Road monitor revealed constant mine related hum, traffic, planes and insects.
188.	19th February 2012	Maiala Road	Noise	Complainant rang the complaints line to complain about noise at 9:33pm on 19/02/12. EX102 was operating in S05 overburden with dumping in S01 north. EX111 was operating in S01 and to the ROM. EX101 was not in operation. LF noise levels were 34.6dB at Lagoons Road and 36.3dB at Ulan Road. Wind speed was between 0.0-0.4m/s from NW.
189.	20th February 2012	Maiala Road	Noise	Complainant rang to complain about noise at 9:47pm on 20/02/12. EX101 was working in S05B30 and EX102 was working in S05B27, with both hauling to the new ROM road. LF noise at Lagoons Road was between 30.8-35.3dB and between 29.7-36.4dB at Ulan Road. Wind speed was between 0.1-1.0m/s from N-NE. A review of audio indicated a mining related hum and truck retard, along with traffic and insect noise. There was no response when ECRM attempted to contact the complainant.
190.	21st February 2012	Ulan Road	Noise	Complainant rang to complain about noise at 12:01am on 21/02/12. The shift report indicates that the mining operations were shut down at 11:10pm for 2.5 hours. Prior to shutdown EX101 was working in S05B30 and EX102 was working in S05B27, with both hauling to the new ROM road. LF noise at Lagoons Road was between 26.1-32.5dB and between 31.8-33.5dB at Ulan Road. Wind speed was

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				between 0.2-1.0m/s ranging from N-S. A review of audio indicated a general mining hum with audible dozer tracks, insects and traffic. A message was left with the complainant to call back and discuss the complaint further.
191.	22nd February 2012	Ridge Road	Noise	Complainant rang to complain about noise at 10:35pm on 22/02/12. EX101 was working in S05B24 hauling to the new ROM road. EX102 was working in S05B225 hauling to 460RL. EX111 was working in S05B27 undertaking cleaning and drainage works. LF noise at Lagoons Road was between 32.5-35.8dB, and between 33.9-37.2dB at Ulan Road. Wind speed was between 1.8-2.6m/s from ENE-E. A review of audio indicated a mining related hum and truck retard, along with intermittent dozer tracks, traffic noise and insects. In response to noise alarms at 9:30pm and 10:15pm, trucks to S04B35 were stopped, and the 460 dump was moved further to the north. Complainant indicated that they could hear loud whirring and clacking sounds that seemed to quieten down around 11:00pm-12:00am. Complainant stated that there has been a steady increase in noise in the past two years, and that noise is especially bad when wind is coming from the east, and that they are unable to get a decent night's sleep.
192.	23rd February 2012	Maiala Road	Noise	Complainant rang to complain about noise at 9:27pm on 23/02/12. EX101 was operating in S05B25 and EX102 was operating in S06B25, with trucks for both hauling to the new ROM road. Drill 192 was operating in S05B22. LF noise at Lagoons Road was between 30.3-37.1dB with noise at Ulan Road between 34.5-42.1dB. Wind speed was between 0.9-1.5m/s from WSW-SW. Review of audio indicated general mining hum, periodic dumping, truck retard, traffic noise and insects. All operations during the shift were located north of block 26, with dumps in blocks 9/10. Complainant indicated that they could hear a continual whine that appeared to start at 9:30pm, and some banging and clanging sounds.
193.	23rd February 2012	Ridge Road	Noise	Complainant rang to complain about noise at 9:49pm on 23/02/12, and at 3:52am and 4:46am on 24/02/12. EX101 was operating in S05B25 and EX102 was operating in S06B25, with trucks for both hauling to the new ROM road. Drill 192 was operating in S05B22. LF noise at Lagoons Road from 9:15pm to 10:15pm 24/02/12 was between 30.3-37.1dB with noise at Ulan Road between 35.4-42.1dB. Wind speed was between 0.9-1.5m/s from WSW-SW. Review of audio indicated general mining hum, truck retard, traffic noise, insects and a plane. LF noise at Lagoons Road from 3:15am to 4:15am 24/02/12 was between 31.7-35.6dB with noise at Ulan Road between 31.1-35.1dB. Wind speed was between 1.3-1.7m/s from SW. Review of audio indicated general mining hum, road traffic, occasional dumping sounds and insects. LF noise at Lagoons Road from 4:15am to 5:15am was between 31.6-36.2dB with noise at Ulan Road between 33.1-43.5dB. Wind speed was between 0.5-1.5m/s from SW. Review of audio indicated general mining hum, road traffic, occasional dumping sounds and insects. All operations during the shift were located north of block 26, with dumps in blocks 9/10. Complainant

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				indicated that they could hear dumping into the back of haul trucks as well as operation of the excavator, relating the noise to a dodgy fridge. Complainant stated that they were woken with a bang and a crash, and rang the EPA at 4:50am. Complainant could only hear traffic noises during swing shift.
194.	23rd February 2012	Ridge Road	Noise	Complainant rang to complain about noise at 10:38pm on 23/02/12. EX101 was operating in S05B25 and EX102 was operating in S06B25, with trucks for both hauling to the new ROM road. Drill 192 was operating in S05B22. LF noise at Lagoons Road was between 31.8-33.5dB with noise at Ulan Road between 34.5-42.1dB. Wind speed was between 0.9-1.3m/s from WSW-SW. Review of audio indicated a general mining hum, truck retard, dozer tracks and periodic dumping noises, along with insects and intermittent traffic. All operations during the shift were located north of block 26, with dumps in blocks 9/10. Complainant indicated that they could hear rocks clashing into trucks, and booming sounds. Complainant was not interested in discussing noise data.
195.	23rd February 2012	Ridge Road	Noise	Complainant called to complain about noise at 11:45pm on 23/02/12. EX101 was operating in S05B25 and EX102 was operating in S06B25, with trucks for both hauling to the new ROM road. Drill 192 was operating in S05B22. LF noise levels at Lagoons Road were between 32.8-35.8db and between 34.3-41.0dB at Ulan Road. Wind speed was between 0.9-1.7m/s from the WSW-SW. Review of audio indicated general mining hum, truck retard, occasional dumping, road traffic, wind noise and insects. All operations during the shift were located north of block 26, with dumps in blocks 9/10. Complainant indicated that they could hear the excavator, dropping of rocks into trucks, and whirring of tyres. Complainant noted that noise levels dropped a bit after their complaint was made.
196.	24th February 2012	Ridge Road	Dust	Complainant rang the ECRS at approximately 9:00am 24/02/12. The complainant commented that they could consistently see a dusty haze in the vicinity of Ulan Road and Winchester Crescent, and that Ulan School was very dusty at approximately 8:30am. The instantaneous PM10 at Ulan School at 8:30am was 42.3µg/m^3. The rolling 24 hour average PM10 at Ulan School was 13.0µg/m^3 at 8:30am. Complainant was informed that the ECRC was at Ulan School at approximately 7:45am, and in Open Cut 1 with the OCE immediately afterwards, with no dust issues observed. Complainant indicated that they were not interested in monitoring data, and stated that dust in the area has been particularly bad since MCO started operations. Complainant noted that the complaint is due to aesthetic issues with dust, stating that they had not had any difficulties breathing or could identify any dust smells.
197.	25th February 2012	Ridge Road	Noise	Complainant rang to complain about noise at 8:06am and 8:47am on 25/02/12. Generally both EX101 and EX102 were operating in S05B22 with trucks hauling overburden to the S01B9/10. EX101 was down on power and was operating very slowly from 8:20am to 8:45am. LF noise at Lagoons Road was between 30.3-40.0dB with noise at Ulan Road between 32.8-39.1dB. Wind speed was between 1.4-

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				2.8m/s from NE-E. Review of audio indicated mine rumbling that was difficult to distinguish over wind noise, road traffic and birds. The complainant was called at 2:56pm on 25/02/12, but could not be reached.
198.	25th February 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 8:32am on 25/02/12. Generally both EX101 and EX102 were operating in S05B22 with trucks hauling overburden to the S01B9/10 dump. EX101 was down on power and was operating very slowly from 8:20am to 8:45am. LF noise at Lagoons Road was between 30.3-38.9dB with noise at Ulan Road between 32.8-37.8dB. Wind speed was between 2.2-2.8m/s from NE-E. Review of audio indicated mine rumbling that was difficult to distinguish over wind noise, road traffic and birds. A message was left with the complainant at 2:55pm on 25/02/12.
199.	25th February 2012	Ulan Road	Noise	Complainant rang to complain about noise at 8:50pm on 25/02/12, and 1:42am on 26/02/12. EX101 and EX102 were operating in S05B22/23 with dumping in S01B9/10 dumps. Initially one truck was dumping into 460RL south. This was changed to S01 dumps following a noise alarm at 8:16pm. LF noise at Lagoons Road at 8:50pm 25/02/12 was between 33.2-37.3dB with noise at Ulan Road between 33.3-34.7dB. Wind speed was between 0.1-1.0m/s from E-SE. Review of audio indicated insects, road traffic noise, general mining hum, and occasional dumping sounds. LF noise at Lagoons Road at 1:42am 26/02/12 was between 31.0-33.2dB with noise at Ulan Road between 33.0-36.5dB. Wind speed was between 1.5-2.3m/s from the east. Review of audio indicated occasional dumping, general mining hum and low frequency machinery noise which was difficult to distinguish from wind noise, truck retard, road traffic and insects. A message was left with the complainant at 11:03am 26/02/12 with no response.
200.	26th February 2012	Ulan Road	Noise	Complainant rang to complain about noise at 7:17am on 26/02/12. No machinery was operating in Open Cut 1 at the time of the complaint, and no machinery was operating during swing shift. LF noise at Lagoons Road was between 29.4-36.7dB with noise at Ulan Road between 34.6-37.5dB. Wind speed was between 0.4-1.0m/s from NNE-NE. Review of audio indicated a distant mining hum, road traffic, and birds/insects. A message was left with the complainant at 11:01am with no response.
201.	26th February 2012	Maiala Road	Noise	Complainant rang to complain about noise at 8:50pm and 9:50pm on 26/02/12. EX101 was operating in S05 with trucks hauling overburden to the S01 dump and 460RL dump. EX102 was operating in S05 with trucks hauling coal to the ROM. LDR121 was operating on the ROM. LF noise at Lagoons Road was between 30.4-40.2dB with noise at Ulan Road between 33.9-40.9dB. Wind speed was between 0.5-1.2m/s from NE-E. Review of audio indicated distant mining hum and distinct low frequency machinery noise, truck retard, road traffic, insects, and occasional barking of dogs. The complainant indicated that they could hear whirring and truck sounds. The complainant believed that the noise was louder than that of previous nights.

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202.	26th February 2012	Ridge Road	Noise	Complainant rang to complain about noise at 10:20pm on 26/02/12. EX101 was operating in S05 with trucks hauling overburden to the S01 dump and 460RL dump. EX102 was operating in S05 with trucks hauling coal to the ROM. LDR121 was operating on the ROM. LF noise at Lagoons Road was between 32.6-43.6dB with noise at Ulan Road between 35.0-42.2dB. Wind speed was between 0.1-1.2m/s from the east. Review of audio indicated a general mining hum, truck retard, road traffic noise, and insects. A message was left with the complainant at 4:00pm 27/02/12 with no response.
203.	27th February 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 8:25pm on 27/02/12. The complainant commented that they could hear noise from MCO's rocks. EX101 was operating in S05B22 with trucks hauling overburden to the RL460 dump. EX102 was operating in S05B28 with trucks hauling coal to the ROM. LF noise levels at Lagoons Road were between 26.8-35.5dB and between 33.2-39.3dB at Ulan Road. There was no wind present. A review of the audio indicated insects was the dominant noise source with a faint mining hum being present. Other occasional noise sources included a dozer, truck retard, traffic and planes. No banging noises were audible. The complainant was contacted at 8:56am on 28/02/12. A detailed message was left on what the noise results were and what the review of the audio indicated.
204.	27th February 2012	Maiala Road	Noise	Complainant rang to complain about noise at 9:06pm on 27/02/12. The complainant commented that the noise was excessive. EX101 was operating in S05B22 with trucks hauling overburden to the RL460 dump. EX102 was operating in S05B28 with trucks hauling coal to the ROM. LF noise levels at Lagoons Road were between 32.4-35.5dB and between 34.2-39.3dB at Ulan Road. Wind speed was between 0.1-0.8m/s from the SW. A review of the audio indicated that insects and a faint mine hum were the dominant noise sources. Truck retard and planes could be heard occasionally. The complainant was contacted at 11:13am on 28/02/12. They commented that the noise they could hear was a low level hum and they can hear truck movements (revving up and dying down).
205.	27th February 2012	Ulan Road	Noise	Complainant rang to complain about noise at 12:10am and 4:45am on 27/02/12. Generally EX101 was operating in S05 with trucks hauling overburden to the S01 and 460RL dumps. EX102 was operating in S05 with trucks hauling coal to the ROM. LDR121 was operating on the ROM. LF noise at Lagoons Road at 12:10am was between 33.0-36.6dB with noise at Ulan Road between 32.7-36.3dB. Wind speed was between 0.0-0.9m/s from the SE-S. Review of audio indicated a general mining hum with occasional dumping, truck retard, road traffic and insects. LF noise at Lagoons Road at 4:45am was between 32.8-34.9dB with noise at Ulan Road between 34.1-39.1dB. No wind was recorded. Review of audio indicated a general mining hum, road traffic and insects. EX101 was shut down from12:20am to 2:00am. A corresponding drop in noise levels was observed. A message was left with the complainant at 4:02pm 27/02/12 with no response.

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206.	27th February 2012	Ulan Road	Noise	Complainant rang to complain about noise at 4:53am on 27/02/12. EX101 was operating in S05 with trucks hauling overburden to the S01 and 460RL dumps. EX102 was operating in S05 with trucks hauling coal to the ROM. LDR121 was operating on the ROM. LF noise at Lagoons Road was between 32.8-34.9dB with noise at Ulan Road between 34.1-39.1dB. No wind was recorded. Review of audio indicated a general mining hum, road traffic and insects. A message was left with the complainant at 04:05pm 27/02/12 with no response.
207.	28th February 2012	Lagoons Road	Noise	Complainant rang to complain about noise at 12:28am on 28/02/12. The complainant commented that the mine was fairly noisy. Generally EX101 was operating in S05B22 with trucks hauling overburden to the RL460 dump. EX102 was operating in S05B28 with trucks hauling coal to the ROM. All equipment was shut down between 12:00am and 1:00am. LF noise levels at Lagoons Road were between 33.1-35.4dB and between 33.3-36.4dB at Ulan Road. Wind speed was between 0.0-1.0m/s from the SW. The audio was dominated by insects. Very faint mine hum, planes and traffic were also audible.
208.	28th February 2012	Ridge Road	Noise	Complainant rang to complain about noise at 4:02am on 28/02/12. The complainant commented that they could hear dumping noises for the last hour or so. EX101 was operating in S05B22 with trucks hauling overburden to the RL460 dump. EX102 was operating in S05B28 with trucks hauling coal to the ROM. LF noise levels at Lagoons Road were between 36.1-37.6dB and between 32.1-35.9dB at Ulan Road. Wind speed was between 0.3-0.9m/s from the SW. The audio was dominated by truck movements and insects. Some road traffic and dozers were also audible. The complainant was contacted at 1:33pm on 28/02/12 to discuss the complaint further. They commented that banging noises woke them around 3:00am.
209.	29th February 2012	Maiala Road	Noise	Complainant rang to complain about noise at 10:53pm on 29/02/12. The complainant also commented that they wanted their Drip back. EX101 was operating in S05B22 with trucks hauling overburden to RL460. EX111 was operating in S05B27-28 with trucks hauling coal to the ROM. LF noise levels at Lagoons Road were between 30.2-35.7dB and between 32.0-39.7dB at Ulan Road. Wind speed was between 2.0-2.2m/s from NE. A review of the audio indicated wind and road traffic were the dominant noise sources. Low level mine hum could be heard as well as insects, planes and rain. The complainant was contacted at 12:35pm on 01/03/12. They commented that despite noise levels they could hear mine noise and that is not acceptable. They also commented that they think it is wrong that a foreign owned company is allowed to buy a part of our National Park. The mine plans and protection of the Drip were discussed with them but they still don't believe it is right.
210.	4th March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 9:29am on 04/03/12. They commented that the noise had been loud from 3:00am that morning. Night shift - EX101 was operating on the old ROM road with trucks hauling to RL460. Day shift - EX101 was operating on the old ROM road with trucks hauling to

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				RL460. Loader 121 was operating at the ROM. At 3:30am LF noise at Lagoons Road was between 35.1-36.6dB and between 32.0-34.0dB at Ulan Road. Wind speed was between 1.7-2.7m/s from NE. A review of the audio indicated that insects and frogs were the dominant noise sources. Mine hum was the dominant low frequency noise source. At 9:29am LF noise at Lagoons Road was between 35.8-38.9dB and between 35.6-38.8dB at Ulan Road. Wind speed was between 1.5-1.9m/s from east. Birds, insects and mine hum were the dominant noise sources around this time. Road traffic was also audible. A message was left on the complainant's phone at 9:37am on 04/03/12 asking them to call back if they wished to discuss the complaint further.
211.	4th March 2012	Maiala Road	Noise	The complainant left a message on the ECRS' phone at 8:22pm complaining about noise. Follow up calls were made to the hotline at 8:44pm and 9:32pm. EX101 was operating on the old coal road with trucks hauling to RL460. EX111 was operating in S04 hauling coal to the ROM. Dozers were operating on drill prep in the southern area of the pit and had been shut down prior to the complaint at 9:32pm. For the initial complaint, LF noise levels at Lagoons Road were between 33.6-38.9dB and between 35.0-37.6dB at Ulan Road. Wind speed was between 0.3-0.8m/s from south. A review of the audio indicated that insects and frogs were the dominant noise sources with mine hum being the dominant low frequency noise source. For the second complaint LF noise levels at Lagoons Road were between 35.7-38.9dB and between 31.0-37.6dB at Ulan Road. Wind speed was between 0.4-0.8m/s from SW. A review of the audio indicated that insects and frogs were the dominant noise sources with general mine hum and truck retard being the dominant low frequency noise sources. For the third complaint LF noise levels at Lagoons Road were between 34.3-39.6dB and between 33.7-39.7dB at Ulan Road. Wind speed was between 1.0-1.4m/s from SW. A review of the audio indicated that insects and frogs were the dominant noise source. There was minimal mining related noise audible. Road traffic was audible especially at Ulan Road where a vehicle close to the monitor revved its engine for a couple of minutes. A detailed message was left on the complainant's phone at 1:25pm on 05/03/12. They were asked to call back if they wanted any further information.
212.	4th March 2012	Lagoons Road	Noise	The complainant rang the complaints line at 8:48pm on 04/03/12 to complain about noise. They also rang the Production Superintendent at approx. 9pm to complain about noise. The Production Superintendent visited the complainant to discuss the noise complaint. Following this visit dozers in the southern end of the pit were shut down. EX101 was operating on the old coal road with trucks hauling to RL460. EX111 was operating in S04 hauling coal to the ROM. LF noise at Lagoons Road was between 33.6-38.9dB and between 31.0-37.6dB at Ulan Road. Wind speed was between 0.4-0.7m/s from the SW. A review of the audio indicated that frogs and insects were the dominant noise sources. Mine hum and planes could also be heard. The ECRS left a message for the complainant at 12:33pm

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				on 05/03/12 acknowledging receipt of the complaint and that they had spoken with the Production Superintendent. The complainant was asked to call back if they would like more details.
213.	4th March 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 11:32pm on 04/03/12. EX101 was operating on the old coal road with trucks hauling to RL460. EX111 was operating in S04 hauling coal to the ROM. LF noise levels at Lagoons Road were between 32.9-33.5dB and between 37.7-31.2dB at Ulan Road. Wind speed was between 0.4-1.0m/s from SW. A review of the audio indicated that insects and frogs were the dominant noises with very faint mine hum being audible at times. The complainant was contacted at 1:52pm on 05/03/12 to discuss the complaint. They commented they could hear diggers dumping into empty trucks and that it was impossible to sleep at their house. The noise levels and audio were discussed with the complainant who disputed the results. The complainant asked how their complaint can be taken to a higher level as they feel MCO aren't taking action to reduce noise at their property. An offer was made to conduct some monitoring at their house, which was accepted. It was explained to the complainant that results will determine if MCO need to take any further action to reduce noise levels at their property. The monitoring is scheduled to occur in the week beginning 05/03/12.
214.	7th March 2012	Ridge Road	Noise	Complainant rang to complain about noise at 1:30am on 07/03/12. EX101 was operating on the old coal road with trucks hauling to RL460. EX111 was operating in S04 hauling coal to the ROM. LF noise levels at Lagoons Road were between 28.7-30.1dB and 30.6dB at Ulan Road. Wind speed was 0.4m/s from ENE. A review of the audio indicated that insects and frogs were the dominant noises with very faint mine hum being audible at times. The complainant could not be contacted the following day.
215.	10th March 2012	Ridge Road	Noise	Complainant rang to complain about noise at 9:07pm on 10/03/12. EX101 was operating in S02B10 with material reporting to RL460. EX102 was operating in S02B20 with material reporting to S02 Mid Dump. EX111 was operating in S0 B28. LF noise levels at Lagoons Road were between 27.6-25.6dB and 34.2dB at Ulan Road. Wind speed was between 0.0-0.4m/s from SE. Review of the shift report indicated the OCE reviewed the LF noise levels at time of the complaint. Levels were below criteria and audio revealed no mining noise. No gear was in operation in the south of the pit during the shift. A review of the audio indicated that insects and frogs were the dominant noises along with road traffic. Mine noise was not audible. The complainant was contacted on the 12/03/12 at 2:30pm. They said the noise had been better lately however they could hear it clearly on Sunday morning.
216.	12th March 2012	Ridge Road	Noise	Complainant rang to complain about noise at 8:56pm on 12/03/12. They commented that they have heard mine noise for the last 2 hours, that machinery can be heard and that they feel that it is far too noisy. EX101 was operating in S04B35 with overburden dumped to build a ramp in the area. EX102 was operating in S02B22 with trucks hauling to the S01 dump. EX111 was operating in S05B28 with trucks hauling coal to the ROM. LF noise levels at Ulan Road between 7:00pm and 9:30pm were

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				between 33.1-41.9dB. Due to loss of wind sock on microphone, Lagoons Road noise data was not valid. Wind speed was between 1.2-2.4m/s from the east. Audio was dominated by wind noise and insects, with audible road traffic, general mining hum and retard. Audio at 7:15pm and 7:45pm was dominated by wind noise, road traffic and insects, with a general mining hum audible. Complainant stated that they could hear constant machinery noises with occasional dumping noises until approximately 9:30pm. Complainant also indicated that they could hear similar noises at 5:30am 13/03/12 until it was drowned out by morning traffic noise.
217.	12th March 2012	Ridge Road	Noise	Complainant rang to complain about noise at 9:28pm on 12/03/12. They commented that they could hear whirring and clunking sounds. EX101 was operating in S04B35 with overburden dumped to build a ramp in the area. EX102 was operating in S02B22 with trucks hauling to the S01 dump. EX111 was operating in S05B28 with trucks hauling coal to the ROM. LF noise levels at Ulan Road were between 32.7-39.7dB. Due to loss of wind sock on microphone, Lagoons Road noise data was not valid. Wind speed was between 0.0-1.2m/s from the NE-E. Audio was dominated by wind noise and insects, with audible general mining hum and retard. Prior to complaint, OCE commented that reversing alarm could be heard in audio that could not be attributed to MCO. All diggers were progressively shut down however digger noise was still present on audio, so diggers resumed operations. Complainant indicated that the noise levels were high but preferred to discuss other issues.
218.	13th March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 1:40am and 4:47am on 13/03/12. They commented that noise from the mine had woken them up. EX102 was operating in S02B22 with trucks hauling to the S01 dump. EX111 was operating in S05B28 with trucks hauling coal to the ROM. EX101 was previously operating in S04B35 with overburden dumped to build a ramp in the area, however this digger was shut down in response to noise levels at 11:00pm 12/03/12. EX102 and EX111 were operated during swing shift. For the first complaint LF noise levels at Ulan Road were between 31.1-34.0dB. Due to loss of wind sock on microphone, Lagoons Road noise data was not valid. Wind speed was between 1.3-2.1m/s from the E. Audio was dominated by wind noise and insects, with audible general mining hum and retard. For the second complaint LF noise levels at Ulan Road were between 37.1-42.6dB. Due to loss of wind sock on microphone, Lagoons Road noise data was not valid. Wind speed was between 1.6-1.8m/s from the ENE-E. Audio was dominated by wind noise and road traffic, with audible mining hum and engine noise. The complainant indicated that they could hear the digger from 1:30am until 8:00am and it was very irritating. Complainant was unable to elaborate on noise heard any further.
219.	13th March 2012	Maiala Road	Noise	Complainant rang to complain about noise at 9:41pm on 13/03/12. EX101 was operating in S04B35 with overburden dumped to the S04 ramp in the same area. EX111 was operating in S05B27/28

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				hauling coal to the ROM. Drilling operations were being undertaken in S05B20. LF noise levels at Ulan Road were between 34.7-36.5dB. Due to loss of wind sock on microphone, Lagoons Road noise data was not valid. Wind speed was between 0.2-1.0m/s from ENE-E. Audio was dominated by a general mining hum, machinery noise, insects and wind noise, with road traffic noise and retard audible. Complainant commented that lately noise has not been as high, however noise levels were very high on Sunday night (11/03/12) and at the time of the complaint. Complainant could hear machinery noise when outside or when the TV isn't on.
220.	13th March 2012	Ridge Road	Noise	Complainant rang to complain about noise at 11:23pm on 13/03/12. EX101 was operating in S04B35 with overburden dumped to the S04 ramp in the same area. EX102 was operating in S02B20 with overburden dumped to the S01 lower dump/ramp. EX111 was operating in S05B27/28 hauling coal to the ROM. Drilling operations were being undertaken in S05B20. LF noise levels at Ulan Road were between 35.8-41.2dB. Due to loss of wind sock on microphone, Lagoons Road noise data was not valid. Wind speed was between 0.2-2.0m/s from ENE-E. Audio was dominated by general mining hum and machinery noise which was difficult to distinguish over wind noise, with road traffic noise, insects and retard audible. Complainant stated that they could constantly hear mining noise such as dumping into trucks all night, although it appeared to be quieter at approximately 1:30am. Complainant reported that noise levels the previous night were very similar, and that noise is getting more constant over time.
221.	13th March 2012	Ridge Road	Noise	Complainant rang to complain about noise at 2:18am on 14/03/12. Complainant also commented that the mine was very loud and it was 'not good enough'. EX101 was operating in S04B35 with overburden dumped to the S04 ramp in the same area. EX102 was operating in S02B20 with overburden dumped to the S01 lower dump/ramp. EX111 was operating in S05B27/28 hauling coal to the ROM. Drilling operations were being undertaken in S05B20. LF noise levels at Ulan Road were between 35.1-38.9dB. Due to loss of wind sock on microphone, Lagoons Road noise data was not valid. Wind speed was between 0.0-0.5m/s from SSW-W. Audio was dominated by a general mining hum, machinery noise, insects and wind noise, with road traffic noise and occasional dumping audible. Complainant stated that the noise levels were very loud, and could clearly hear trucks driving back and forth, and banging sounds. Complainant indicated that the noise had been constant with their window open until approximately 2:45am when they fell asleep. Complainant also discussed their concerns regarding visual impacts of dust with the ECRC.
222.	14th March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 12:28am and 4:34am on 14/03/12. EX101 was operating in S04B35 with overburden dumped to the S04 ramp in the same area. EX102 was operating in S02B20 with overburden dumped to the S01 lower dump/ramp. EX111 was operating in S05B27/28 hauling coal to the ROM. Drilling operations were being undertaken in S05B20. For the first complaint

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				LF noise levels at Ulan Road were between 30.7-38.2dB. Due to loss of wind sock on microphone, Lagoons Road noise data was not valid. Wind speed was between 1.1-1.8m/s from E. Audio was dominated by a general mining hum, machinery noise, insects and wind noise, with road traffic noise and retard audible. For the second complaint LF noise levels at Ulan Road were between 37.8-44.7dB. Due to loss of wind sock on microphone, Lagoons Road noise data was not valid. Wind speed was between 0.1-0.7m/s from SSW. Audio was dominated by a general mining hum, wind noise and road traffic noise. A message was left with the complainant at 12:55pm on 14/03/12, with no response.
223.	14th March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 11:48pm on 14/03/12. Complainant commented that they could hear machinery and could not sleep due to low level noise. EX101 and EX102 were not operating. EX111 was operating in S05B28 hauling coal to the ROM. LDR121 was operating in S04B30. LF noise levels at Lagoons Road were between 28.0-31.8dB and between 34.0-35.5dB at Ulan Road. Wind speed was between 0.2-0.9m/s from NE-E. Review of audio was dominated by a general mining hum and insects, with occasional retard. The ECRC attempted to contact complainant at 11:11am and 3:02pm on 15/03/12 with no response.
224.	15th March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 12:52am and 5:00am on 15/03/12. Complainant commented that they could hear loud machinery noise coming from the mine. EX101 and EX102 were not operating. EX111 was operating in S05B28 hauling coal to the ROM. LDR121 was operating in S04B30. For the first complaint LF noise levels at Lagoons Road were between 26.1-30.3dB and between 29.8-34.0dB at Ulan Road. Wind speed was between 0.0-1.0m/s from NE. Review of audio indicated a distant general mining hum, insects, with occasional retard and road traffic noise. For the second complaint LF noise levels at Lagoons Road were between 32.3-35.7dB and between 37.7-45.2dB at Ulan Road. Wind speed was between 0.1-0.7m/s from NE-E. Review of audio indicated a distant mining hum and insects with occasional road traffic noise. A message was left with the complainant at 11:20am 15/03/12 informing the complainant that only 1 out of 3 diggers was operating during the night, and that noise levels were comparatively low.
225.	15th March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 11:10pm on 15/03/12 and 2:50am on 16/03/12. They commented that there was loud machinery noise coming from the mine. EX102 was operating in S02B22 hauling overburden to the S01 ramp. EX111 was operating in S05B28 hauling coal to the ROM. LDR121 was operating in S02B20 hauling overburden to the 460RL dump. For the first complaint LF noise at Lagoons Road was between 32.0-37.7dB and between 32.9-37.5dB at Ulan Road. Wind speed was between 0.3-1.6m/s from E. A review of audio indicated that insects were the dominant noise source, with a general mining hum the dominant LF noise source. Retard and occasional road traffic was also audible. For the second complaint LF noise at Lagoons Road was between 33.3-36.7dB

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				and between 34.6-37.3dB at Ulan Road. Wind speed was between 0.0-0.9m/s from SW. A review of audio indicated that insects were the dominant noise source, with a general mining hum the dominant LF noise source. Occasional road traffic was also audible. The ECRC left a message with the complainant at 2:38pm 16/03/12 with no response.
226.	16th March 2012	Lagoons Road	Noise	Complainant rang ECRC to complain about noise at 8:50am on 16/03/12. They commented that there was a constant loud rumble throughout the night, without being able to hear specific machines or noises. EX102 was operating in S02B22 hauling overburden to the S01 ramp. EX111 was operating in S05B28 hauling coal to the ROM. LDR121 was operating in S02B20 hauling overburden to the 460RL dump. LF noise throughout the night at Lagoons Road was between 28.6-39.7dB and between 32.5-45.1dB at Ulan Road. Wind speed was 0.0-2.9m/s, changing between N, E and SW. A review of audio indicated that insects were the dominant noise source, with a general mining hum the dominant LF noise source. Occasional road traffic and retard was also audible. The ECRC discussed operations with the complainant and explained that EX101 in S04B35 was shut down.
227.	19th March 2012	Maiala Road	Noise	Complainant rang the complaints line at 1:14pm on 19/03/12 to complain about noise at 12:30am on 19/03/12. They commented they could hear clanging noises that woke them up with the noises stopping around 1:00am. EX101 and EX102 were not operating at the time of the complaint. EX111 was operating in S06B28 with trucks hauling coal to ROM. LF noise at Lagoons Road was between 36.6-40.4dB. Wind speed was between 1.6-2.8m/s from the east. Due to problems with the noise unit at Ulan Road valid data has not been obtained. A review of the audio at Lagoons Road indicated that wind was the dominant noise source. Some mining hum was audible when the wind speed was low. The complainant was contacted at 2:30pm on 19/03/12 to discuss the complaint further. The complainant requested a copy of the last 8 months worth of real-time monitoring data showing when we were in non compliance and a copy of all of our shift reports showing what action we take. It was discussed with the complainant that as this information is for internal purposes only, we can't make this available to them. It was agreed to send them a copy of the latest attended noise monitoring report and the results of monitoring conducted near their residence. The complainant commented that no-one ever responds to their complaints and comes out and listens for themselves. It was pointed out that this is not the case and when we send them the noise reports we will send out details of the complaints where we have visited their property. The complainant made it quite clear that they do not believe any of the information that we are telling them and hung up the phone.
228.	19th March 2012	Maiala Road	Noise	Complainant contacted the complaints line to complain about noise at 9:41pm on 19/03/12. EX101 was operating in S05B36 with trucks hauling to a nearby ramp. EX102 was operating in S02B10-13 with trucks hauling to the ROM dump. LF noise at Lagoons Road was between 34.2-35.5dB and between

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				33.5-35.2dB at Ulan Road. Wind speed was 2.9-3.6m/s from east. The audio review identified insects and wind were the dominant noise sources. Road traffic, truck retard, excavators, dozers and planes were also audible. An email was sent to the complainant on 20/03/12 outlining the noise levels and review of audio.
229.	20th March 2012	Maiala Road	Noise	Complainant called to complain about noise at 9:46pm on 20/03/12. EX101 was operating in S05B36 with trucks hauling to a nearby ramp. EX101 was shut down at ~10.15pm. EX102 was operating in S02B10-13 with trucks hauling to ROM road dump. EX111 was operating in S05 with trucks hauling coal to the ROM. LF noise levels at Lagoons Road were between 35.5-36.9dB and between 34.7-37.3dB at Ulan Road. Wind speed was between 1.9-2.6m/s from east. A review of the audio indicated that mine noise (excavators and trucks) along with insects dominated the noise environment. Banging noise associated with loading activities, dozers and wind gusts could also be heard. An email was sent to the complainant on 22/03/12.
230.	22nd March 2012	Ulan Road	Noise	Complainant called to complain about noise at 9:35pm on 22/03/12. EX102 was working in S03B018 hauling overburden to the S01 dump. EX111 was working in S05B24-25 hauling coal to the ROM. LF noise levels at Lagoons Road were between 30.2-33.6dB and between 31.8-36.8dB at Ulan Road. Wind speed was between 1.3-1.8m/s from NE. A review of the audio indicated that insects and mining related noise (excavators and trucks) dominated the noise environment. Road traffic and a plane were occasionally audible as well. A message was left for the complainant at 11:55am on 23/03/12.
231.	22nd March 2012	Maiala Road	Noise	Complainant called to complain about noise at 10:00pm on 22/03/12. EX102 was working in S03B018 hauling overburden to the S01 dump. EX111 was working in S05B24-25 hauling coal to the ROM. LF noise levels at Lagoons Road were between 30.2-32.2dB and between 32.5-34.2dB at Ulan Road. Wind speed was between 1.6-1.8m/s from NE. A review of the audio indicated that insects and mining related noise (excavators and trucks) dominated the noise environment. Banging noises associated with loading activities, road traffic and wind were occasionally audible as well.
232.	25th March 2012	Ridge Road	Noise	Complainant rang to complain about noise at 7:48am on 25/03/12. EX101 was operating in S05B36 and EX102 was operating in S02B13. Both diggers were on overburden. LF noise levels at Lagoons Road were between 34.8-37.3dB and between 36.9-41.2dB at Ulan Road. Wind speed was between 0.0-0.8m/s from SW. A review of the audio indicated that birds and mining noise (excavators and trucks) dominated the noise environment. Planes and road traffic could also be heard. The complainant was contacted at 8:23am on 25/03/12 to discuss the complaint with no further comment being made.
233.	25th March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 8:27am on 25/03/12. EX101 was operating in S05B36 and EX102 was operating in S02B13. Both diggers were on overburden. LF noise levels at Lagoons Road were between 34.8-37.6dB and between 37.0-38.5dB at Ulan Road. Wind speed was between 0.0-

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				0.1m/s from SE. A review of the audio indicated that birds and mining noise (excavators and truck retard) dominated the noise environment. Road traffic, dozers and CHPP alarms could also be heard. The complainant was contacted at 8:29am on 25/03/12 to discuss the complaint. They commented that it was doubtful that we were in compliance with our criteria. The ECRS visited the area near the complainant's house at 9:10am on 25/03/12 to observe the noise. Road traffic noise and wind dominated the noise environment with very faint mining hum audible from MCO when all else was quiet.
234.	26th March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 2:18am on 26/03/12. EX102 was operating in S02B14 with trucks hauling overburden to S01 dump. EX111 was operating in S05B26 with trucks hauling coal to the ROM. LF noise levels at Lagoons Road were 32.0dB and between 35.0-35.5dB at Ulan Road. Wind speed was between 1.0-1.5m/s from east. A review of the audio indicated that insects and a faint mining hum dominated the noise environment. Dozers could also be heard occasionally. Attempts to contact the complainant have been unsuccessful.
235.	26th March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 7:55am on 26/03/12. EX101 was operating in S04B37 with trucks hauling overburden to the Brace Dump. EX102 was operating in S03B20 with trucks hauling overburden to the S01 dump. EX111 was operating in S05B25/28 with trucks hauling coal to the ROM. A dozer operating in the southern area of the pit was shut down in response to this complaint. LF noise levels at Lagoons Road were between 33.4-33.9dB and between 39.5-40.2dB at Ulan Road. Wind speed was between 0.3-0.8m/s from north. A review of the audio indicated that mining hum and truck retard along with birds dominated the noise environment. Road traffic and dozers were also audible at times. The ECRC visited the area near the complainant's house and observed very faint mine hum coming from the direction of MCO. Attempts to contact the complainant have been unsuccessful.
236.	26th March 2012	Ridge Road	Noise	Complainant contacted the complaints line to complain about noise at 11:10pm on 26/03/12. EX102 was operating in S02B13 with trucks hauling overburden to S01 dump. EX111 was operating in S05B7 with trucks hauling coal to the ROM. LF noise levels at Lagoons Road were between 32.9-33.8dB and between 35.6-40.8dB at Ulan Road. Wind speed was between 0.1-0.7m/s from SW. A review of the audio indicated that mining related noise (excavators, truck retard and dozers) along with insects dominated the noise environment. Road traffic noise and loading activities were occasionally audible. The complainant was contacted at 2:51pm on 27/03/12 to discuss the complaint. They had no further comment.
237.	27th March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 2:00am on 27/03/12. A follow up complaint was received at 4:52am on 27/03/12. EX102 was operating in S02B13 with trucks hauling overburden to S01 dump. EX111 was operating in S05B7 with trucks hauling coal to the ROM. For the first complaint LF noise levels at Lagoons Road were between 33.1-36.9dB and between 32.8-34.9dB at Ulan Road. Wind

Number	Date	Location	Issue	Investigation and Follow Up
				speed was between 0.4-0.8m/s from south. A review of the audio indicated mining noise (excavators and truck retard) and insects dominated the noise environment. For the second complaint LF noise levels at Lagoons Road were between 34.5-35.9dB and between 37.1-45.0dB at Ulan Road. Wind speed was between 0.0-0.4m/s from SW. A review of the audio indicated insects and truck retard dominated the noise environment. General mining hum was also audible. Attempts to contact the complainant have been unsuccessful.
238.	28th March 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 10:46pm on 28/03/12. EX102 was operating in S05B20-21. EX101 was operating in S04B35. LF noise levels at Lagoons Road were between 29-30dB and were 35.0dB at Ulan Road. Wind speed was 1.3m/s from WNW. A review of the audio indicated very little mining noise. Only low mine hum could be heard at times. A plane and insects dominated the noise environment. The ECRC spoke to the complainant at 1:30pm on the 29/03/12. The complainant mentioned that the noise was worse on the Sunday evening. Complainant asked for noise levels to be sent to him directly. The ECRC advised the complainant that such requests would need to be verified by management.
239.	29th March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 12:16am on 29/03/12. A follow up complaint was received at 3:18 am on 29/03/12. For the first complaint LF noise levels at Lagoons Road were 30.6dB and 34.4dB at Ulan Road. Wind speed was between 0.0-0.4m/s from south. For the second complaint LF noise levels at Lagoons Road were 30.7dB and 33.8dB at Ulan Road. Wind speed was between 0.0-0.4m/s from south. A review of the audio from both monitors at both complainant times revealed minor mine related noise. Attempts to contact the complainant have been unsuccessful.
240.	29th March 2012	Maiala Road	Noise	Complainant rang to complain about noise at 9:05pm on 29/03/12. EX102 was operating in S03B12 with overburden reporting to RL480. LF noise levels at Lagoons Road were 33.6 dB and 32.8dB at Ulan Road. Wind speed was between 0.0-0.4m/s from south. A review of the audio revealed mine related noise. Trucks could be heard at various times. General traffic and planes could also be heard. An email was sent to the complainant on the 30/03/12.
241.	30th March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 1:51am on 30/03/12. EX102 was operating in S03B12 with overburden reporting to RL480. LF noise levels at Lagoons Road were 33.4dB and 36.9dB at Ulan Road. Wind speed was between 0.0-0.4m/s from ESE. A review of the audio revealed minor mine related noise. Trucks were audible at times. An attempt to reach the complainant was unsuccessful.
242.	30th March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 2:57am on 29/03/12. EX102 was operating in S03B12 with overburden reporting to RL480. LF noise levels at Lagoons Road were 31.8 dB and 35.7 dB at Ulan Road. Wind speed was between 0.0-0.4m/s from ESE. A review of the audio revealed mine related noise. Trucks could be heard at various times. Attempts to contact the complainant were

Number	Date	Location	Issue	Investigation and Follow Up
				unsuccessful.
243.	30th March 2012	Ridge Road	Noise	Complainant rang to complain about noise at 11:13pm on 30/03/12. EX101 was operating in S04B35 with material reporting to RL460. EX102 was operating in S03B12 with overburden reporting to RL480. Following alarms the shift supervisor changed EX101 truck run to flat run at 9:00pm. Between 9:20pm and 9:30pm EX101 and EX102 were stopped and noise levels and audio was monitored. Mining operations could still be heard. At 9:45pm both diggers recommenced and dozer operating in S06B35 was relocated to S05B36. All trucks were put into slow mode. Following complaint at 11:13 pm EX101 and dozers were shut down in that area of the pit. LF noise levels at Lagoons Road were 35.7dB and 35.5dB at Ulan Road. Wind speed was between 0.0-0.4m/s from SW. A review of the audio revealed low mine noise. Attempts to contact the complainant were unsuccessful.
244.	31st March 2012	Ulan Road	Noise	Complainant rang to complain about noise at 11:35pm on 31/03/12. EX102 was operating in S04B18 with overburden reporting to RL480. EX111 was operating in S05B25. LF noise levels at Lagoons Road were 34.6dB and 35.5dB at Ulan Road. Wind speed was between 0.0-0.4m/s from ESE. A review of the audio revealed low mine noise. Attempts to contact the complainant were unsuccessful.
245.	2nd April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 8:55am on 2/04/12. They commented that they heard two large bangs at 8:30am, then rumbling for approximately 15 minutes following. EX101 was operating in S05B35 removing overburden to the 460 dump. EX111 was operating in S05B28 hauling coal to the ROM. Banging associated with train movements could be heard at the MCO main administration building during the morning. LF noise levels at Lagoons Road were between 29-42.7dB, with noise at Ulan Road between 31.9-43.2dB. Wind speed was 0.7-1.7m/s from NE. A loud rumbling sound could be heard on the audio at 8:25am for approximately 5 minutes, with some screeching audible. The ECRC explained to the complainant that operations had not changed that would explain the noises heard for such a specific time, and explained that it was believed that the noises were due to a train in the area. The complainant was happy with the results of the investigation.
246.	3rd April 2012	Saddlers Creek Road	Noise	Complainant emailed both MCO and UCML at 8:00am 03/04/12 to complain about noise for the previous two nights. The complainant was advised that there has been no change in mine activity over the past few days at MCO.
247.	4th April 2012	Maiala Road	Noise	Complainant rang to complain about noise at 9:17pm on 04/04/12. EX102 was operating in S04B19 hauling overburden to RL460 dump. EX111 was hauling coal to the ROM. LDR121 was operating at the ROM. LF noise levels at Lagoons Road were between 34.4-36.8dB, with noise levels at Ulan Road between 34.2-42.7dB. Wind speed was between 1.5-2.0m/s from ENE. A review of audio indicated machinery noise, dozer tracks, insects and frogs.

Number	Date	Location	Issue	Investigation and Follow Up
248.	5th April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 2:17am on 05/04/12. EX102 was operating in S04B19 hauling overburden to RL460 dump. EX111 was hauling coal to the ROM. LDR121 was operating at the ROM. LF noise levels at Lagoons Road were between 36.4-37.7dB, with noise levels at Ulan Road between 33.4-36.0dB. Wind speed was between 0.2-1.1m/s from N/NE. Review of audio indicated machinery noise, insects and intermittent road traffic noise. Complainant stated that it was very noisy, and they could hear dumping into trucks, and machine operation. Complainant indicated that noise appeared to stop at 3:00am, and that while there had been noise for the previous few nights, noise levels were not sufficient to require a complaint.
249.	5th April 2012	Ridge Road	Blasting	Complainant called the complaints line on 05/04/12 at 1:10pm to complain about blasting and vibration of their house. An overburden blast was undertaken at MCO at 1:08pm on 05/04/12 in S02B10. The ECRC rang the complainant immediately and discussed the issue. The complainant said they had felt their windows vibrate and it was more of a courtesy call to let the mine know as they aren't always home. They were appreciative of the call. All results were within compliance levels.
250.	6th April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 3:11am on 06/04/12. EX102 was operating in S04B18 OB hauling to RL460. EX111 was in S05B26 WS1 hauling to the ROM. LF noise levels at Lagoons Road were 33.9dB, with noise levels at Ulan Road 37.0dB. Wind speed was between 0.0-0.4m/s from E/SE. Review of audio indicated minor machinery noise, insects and intermittent road traffic noise. Complainant could not be contacted to discuss the complaint.
251.	7th April 2012	Maiala Road	Noise	Complainant rang to complain about noise at 9:05pm on 07/04/12. EX102 was operating in S04B18 OB hauling to RL460. LF noise levels at Lagoons Road were 32.4dB, with noise levels at Ulan Road 37.3dB. Wind speed was between 0.0-0.4m/s from E/SE. Review of audio indicated minor machinery noise, insects and intermittent road traffic noise. Complainant was emailed on the 10/04/12.
252.	8th April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 7:05am on 08/04/12. EX101 was operating in S04B35. EX102 was operating in S04B18 OB hauling to RL460. LF noise levels at Lagoons Road were 36.2 dB, with noise levels at Ulan Road 35.8dB. Wind speed was 1.8m/s from E. Review of audio indicated minor machinery noise, insects and intermittent road traffic noise. Complaint could not be contacted the following day.
253.	8th April 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 10:30am on 08/04/12. EX101 was operating in S04B35. EX102 was operating in S04B18 OB hauling to RL460. LF noise levels at Lagoons Road from 7am-10am were between 32.4 dB and 38.4 dB, with noise levels at Ulan Road 37.3 dB. Wind speed was between 0.0-0.4m/s from E/SE. Review of audio indicated some machinery noise including trucks, insects and intermittent road traffic noise. Complainant was contacted on the 10/04/12 at 10:00am. Complainant indicated the noise was generally loud from 6 am onwards and that being Easter Sunday

Number	Date	Location	Issue	Investigation and Follow Up
				felt it was unacceptable. They noticed that the noise level dropped later in the day.
254.	13th April 2012	Ridge Road	Noise	Complainant rang to complain about noise at 12:51am on 13/04/12. EX102 was in S04B19 with trucks hauling to 445RL. LDR121 was on the ROM. LF noise levels at Lagoons Road were between 33.6-36.5dB and between 33.9-38.5dB at Ulan Road. Wind speed was between 1.0-1.2m/s from SW. A review of the audio indicated that mining related noise and insects dominated the noise environment. A call back message was left on the complainant's phone.
255.	13th April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 3:07am on 13/04/12. EX102 was in S04B19 with trucks hauling to 445RL. LDR121 was on the ROM. LF noise levels at Lagoons Road were between 36.8-38.6dB and between 34.6-38.3dB at Ulan Road. Wind speed was between 0.0-0.3m/s from SW. A review of the audio indicated that mining related noise and insects dominated the noise environment. Attempts to contact the complainant have been unsuccessful.
256.	13th April 2012	Ridge Road	Noise	Complainant rang to complain about noise at 8:17am on 13/04/12. EX101 was operating in S05B36 and EX102 was operating in S05B20. LF noise at Lagoons Road was around 40.1-43.0dB and around 38.8-43.0dB at Ulan Road. Wind speed was around 0.3m/s from east. Noise levels had been higher earlier in the morning and were dropping when the complaint was lodged. They continued to drop after MCO commenced operations. The complainant was visited by the ECRS at ~8:35am on 13/04/12 to discuss the complaint and to observe the noise environment. Mine hum was audible with dozer tracks being heard on one occasion. During the discussions the complainant commented that the noise has been bad over the last 3-4 nights and they were woken this morning between 5.30am and 6.30am. Prior to them complaining this morning they had heard two loud bangs and dozer tracks. The complainant was informed that MCO didn't start up until ~8am due to a Toolbox Talk (time was later confirmed as 8:10am by the OCE). The complainant agreed that as MCO and UCML are so close together it is hard to determine where the noise is coming from and understood the reason they were being asked so many questions about their observations and the timings of when they heard things. They are aware that UCML have changed their operations in recent times. As the complainant had previously complained about banging noises the DuraTray trial was discussed with them. They were appreciative that MCO are trying to reduce noise impacts.
257.	13th April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 8:44am on 13/02/12. They commented they could hear loud machinery noise. EX101 was operating in S05B36 and EX102 was operating in S05B20. LF noise at Lagoons Road was around 33.5-34.2dB and around 32.3-37.0dB at Ulan Road. Wind speed was around 1.1-1.6m/s from the east. Noise levels had been higher earlier in the morning and were dropping when the complaint was lodged. They continued to drop after the complaint was lodged and MCO were in full operations. The ECRS visited the area at 8:50am to visit the complainant and to

Number	Date	Location	Issue	Investigation and Follow Up
				observe the noise environment. A visit to the complainant to discuss their observations wasn't possible as the gates were locked and attempts to contact the complainant by phone were unsuccessful. Traffic noise and birds dominated the noise environment. When both of these noise sources were quiet faint mine hum was audible.
258.	13th April 2012	Maiala Road	Noise	Complainant rang to complain about noise at 10:47pm on 13/04/12. EX102 was operating in S05B20 with trucks hauling to the RL460-pit floor dump. EX111 was operating in S05B26 with trucks hauling coal to the ROM. LF noise at Lagoons Road was between 30.3-37.3dB and between 34.1-35.2dB at Ulan Road. Wind speed was between 0.2-0.4m/s from the SW. A review of the audio indicated that mining related noise (excavators and trucks) along with insects dominated the noise environment. Planes were also clearly audible.
259.	14th April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 2:33am on 14/04/12. There was a follow up complaint at 4:12am on 14/04/12. EX102 was operating in S05B20 with trucks hauling to the RL460-pit floor dump. EX111 was operating in S05B26 with trucks hauling coal to the ROM. For the first complaint LF noise at Lagoons Road was between 34.9-36.3dB and between 30.2-33.1dB at Ulan Road. Wind speed was between 0.1-0.9m/s from the SW. A review of the audio indicated mining related noise (excavators and truck retard) and insects were the dominant noise sources. For the second complaint LF noise at Lagoons Road was between 32.9-34.0dB and between 35.1-37.0dB at Ulan Road. Wind speed was between 0.8-1.1m/s from the SW. A review of the audio indicated mining related noise (excavators and truck retard) and insects were the dominant noise sources.
260.	14th April 2012	Ridge Road	Noise	Complainant rang to complain about noise at 9:28pm on 14/04/12. There was a follow up complaint at 10:35pm. EX101 was operating in S05B36 with trucks hauling to the RL470 dump. EX102 was operating in S04B20 with trucks hauling to the RL450 dump. EX111 was operating in S05B27 with trucks hauling to the ROM. EX101 was shut down at 11:00pm For the first complaint LF noise at Lagoons Road was between 37.5-39.1dB and between 33.9-36.9dB at Ulan Road. Wind speed was between 0.0-0.9m/s from the SW. For the second complaint LF noise at Lagoons Road was between 39.4-43.1dB and was 35.0db at Ulan Road. Wind speed was between 0.3-1.0m/s from the SW. A review of the audio indicated that excavators, trucks and dozers were clearly audible at Lagoons Road. Mining noise wasn't as clear at Ulan Road. The complainant was contacted on 16/04/12. The complainant commented that they noticed when EX101 was shut down as it became much quieter.
261.	16th April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 1:13am on 16/04/12. There was a follow up complaint at 3:39am. EX101 was operating in S04B20. EX111 was operating in S05B27. At the time of the earlier complaint EX101 was not operating as it was shut down for crib. For the initial complaint LF noise levels at Lagoons Road were between 30.7-32.4dB and between 29.7-33.2dB at Ulan Road. Wind

Number	Date	Location	Issue	Investigation and Follow Up
				speed was between 0.7-1.0m/s from the SW. A review of the audio indicated that mining related noise (excavators and trucks) were audible along with insects and planes. For the second complaint LF noise levels at Lagoons Road were between 26.1-28.7dB and between 28.3-33.6dB at Ulan Road. Wind speed was between 0.9-1.0m/s from the SW. A review of the audio indicated that insects dominated the noise environment. Faint mine hum and a train horn were also audible. Attempts to contact the complainant have been unsuccessful.
262.	17th April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 3:48am on 17/04/12. EX101 was operating in S05B21. EX111 was operating in S05B26. LDR121 was operating at the ROM. The OCE checked the noise levels immediately and went to the south end to listen to the noise. They observed mine noise but noted it wasn't dominant. No equipment was operating south of RL455 dump. LF noise levels at Lagoons Road were 30.5dB and 33.9dB at Ulan Road. Wind speed was 0.4m/s from the ESE. A review of the audio indicated that mining related noise (excavators and truck movements) were audible along with insects and planes. Attempts to contact the complainant have been unsuccessful.
263.	17th April 2012	Maiala Road	Noise	Complainant rang to complain about noise at 6:30am on 17/04/12. ROM rehandle from 5:00 am with reject truck hauling to RL445 dump were the only equipment in operation at the time of the complaint. The OCE checked the audio and noted traffic noise was dominant. LF noise levels at Lagoons Road were 30.5dB and 33.9dB at Ulan Road. Wind speed was between 0.4m/s from the ESE. A review of the audio indicated that road noise and birds were most dominant. No audible mine noise could be heard.
264.	17th April 2012	Ulan Road	Blasting	Complainant rang and left a message regarding blast fume on the Health, Safety & Human Resources Manager's phone at approximately 2:00pm on 17/04/12 following a blast that occurred at MCO at 1:00pm. The complainant was travelling to work and had been stopped at the road closure during the blast and noticed a large red/orange fume drift across Ulan Road toward UCML. The ECRC also witnessed the blast fume from Ulan School following the blast. The complainant was called the following day. The ECRC explained the processes and steps taken to minimise dust/blast fume from blasting activities on neighbouring receptors such as the school, Ulan village and UCML. The ECRC also explained that the MCO Drill and Blast supervisor would be investigating reasons why so much fume occurred during the blast. The complainant was appreciative of the feedback.
265.	17th April 2012	Ulan Road	Driving	The complainant called the complaints line at 3:55pm on the 17/04/12. They mentioned they had observed 2 guys in a small white sedan hooning and fish tailing up the complainant's road, and ended up doing a 180 degree turn in front of their house. The complainant stopped them and noticed they were wearing MCO shirts and that they looked like apprentices. The MCO Health, Safety & Human Resources Manager was notified of the complaint the following morning and spoke to the employees

Number	Date	Location	Issue	Investigation and Follow Up
				immediately. The Health, Safety & Human Resources Manager rang the complainant on the 18/04/12 and said they had identified the employees responsible and action had been taken and that they would be apologising to them in person for their actions.
266.	17th April 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 10:37pm on 17/04/12. EX101 was operating in S04B22. EX111 was operating in S05B27-28. Loader 121 was operating at the ROM. LF noise levels at Lagoons Road between 10:00pm and 10:45pm were between 21.2-41.1dB. The highest LF noise level occurred at 10:15 pm. LF noise levels at Ulan Road between 10:00pm and 10:45pm were between 31.2-41.6dB. The highest LF noise level occurred at 10:15pm. Wind speed was between 0.4-0.9m/s from the SSE. A review of the audio at 10:15 pm indicated that a long roaring noise (either a plane or train) was most dominant noise source. Mining noise was not audible. Complainant could not be contacted.
267.	18th April 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 10:40pm on 18/04/12. Complainant stated that they could hear a loud rumble and banging. EX101 was operating in S05B20. EX111 was operating in S05B26. LDR121 was operating at the ROM. LF noise levels at Lagoons Road between 10:30pm and 10:45pm were between 38.7-41.4dB. LF noise levels at Ulan Road were between 38.4-41.9dB. Wind speed was 0.4m/s from the E. A review of the audio revealed some mining noise including trucks and planes could also be heard.
268.	18th April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 11:00pm on 18/04/12 and again at 1:13am on the 19/04/12. Complainant stated that they could hear a loud noise coming from the mine. EX101 was operating in S05B20. EX111 was operating in S05B26. LDR121 was operating at the ROM. For the first complaint LF noise levels at Lagoons Road were 31.8dB. LF noise levels at Ulan Road were 33.9dB. Wind speed was 0.9m/s from the ESE. For the second complaint LF noise levels at Lagoons Road were 27.1 dB. LF noise levels at Ulan Road were 35.3dB. Wind speed was 0.9m/s from the east. A review of the audio for both periods revealed some mine related noise including trucks however mine noise was not dominant. Attempts to reach the complainant have been unsuccessful.
269.	20th April 2012	Ridge Road	Blasting	Complainant called the complaints line on 20/04/12 at 1:03pm to complain about blasting and vibration at their house. An overburden blast was undertaken at MCO at 12:59pm on 20/04/12 in S06B26. The ECRC rang the complainant immediately and discussed the issue. The complainant said they had felt their windows vibrate and it was more of a courtesy call to let the mine know as they aren't always home. They were appreciative of the call. The results from the blast were within compliance.
270.	21st April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 12:11am, 2:22am and 4:01am on 21/04/12. EX101 was in S05B21 with trucks hauling to 445RL. EX111 was in S05B27 and LDR121 was in S02B11. LF noise levels at Lagoons Road at time of complaints were 32.9dB, 30.0dB and 31.9dB and 36.2 dB, 29.9dB

Number	Date	Location	Issue	Investigation and Follow Up
				and 31.7dB at Ulan Road. Wind speed was between 0.0-0.4m/s from the south. A review of the audio indicated little mining related noise. Attempts to contact the complainant have been unsuccessful.
271.	21st April 2012	Ridge Road	Noise	Complainant rang to complain about noise at 8:22pm on 21/04/12. EX102 was in S05B21 and EX111 was on RL480 topsoil. LF noise levels at Lagoons Road at time of complaint were 32.5dB and 36.1dB at Ulan Road. Wind speed was between 0.0-0.4m/s from the south. A review of the audio indicated little mining related noise. The ECRC spoke with the complainant on the 23/04/12.
272.	21st April 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 10:23pm on 21/04/12. EX102 was in S05B21 and EX111 was on RL480 topsoil. LF noise levels at Lagoons Road at time of complaint were 35.2 dB and 32.2 dB at Ulan Road. Wind speed was between 0.0-0.4m/s from the south. A review of the audio indicated some mining related noise including trucks and some loading. The ECRC spoke with the complainant on the 23/04/12.
273.	22nd April 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 10:12am on 22/04/12. EX102 was in S05B37 with OB reporting to RL445. EX102 was in S05B21 with OB reporting to RL470. LF noise levels at Lagoons Road at time of complaint were 31.4dB and 32.1dB at Ulan Road. Wind speed was between 0.0-0.4m/s from S. A review of the audio indicated some mine related noise including loading. The ECRC spoke with the complainant on the 23/04/12.
274.	22nd April 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 7:42pm on 22/04/12. EX102 was in S05B21 and EX111 was on RL480 topsoil. LF noise levels at Lagoons Road at time of complaint were 36.1dB and 40.1dB at Ulan Road. Wind speed was between 0.0-0.4m/s from the south. A review of the audio indicated some mining related noise including truck movements and some loading. The ECRC spoke with the complainant on the 23/04/12. The ECRC offered to place a real time noise monitor at the complainant's property for further monitoring which was accepted.
275.	22nd April 2012	Lagoons Road	Noise	Complainant rang to complain about noise at 10:06pm on 22/04/12. EX102 was in S05B21 and EX111 was on RL480 topsoil. LF noise levels at Lagoons Road at time of complaint were 36.6dB and 37.5dB at Ulan Road. Wind speed was between 0.0-0.4m/s from the south. A review of the audio indicated some mining related noise including truck movements and some loading. The ECRC rang and left a message with the complainant on the 23/04/12.
276.	27th April 2012	Ridge Road	Noise	Complainant rang to complain about noise at 4:37am on 27/04/12. EX102 was operating in S04B19 with trucks hauling overburden to the RL455 dump. EX101 and EX111 were not operating. LF noise levels at Lagoons Road were between 29.9-32.6dB and between 34.0-37.6dB at Ulan Road. Wind speed was between 1.0-1.7m/s from the SW. A review of the audio indicated that a passing train and road traffic dominated the noise environment. A message was left for the complainant at 1:56pm on 27/04/12.

Number	Date	Location	Issue	Investigation and Follow Up
277.	27th April 2012	Winchester Cres	Blasting	Complainant rang to complain about blasting at 1:05pm on 27/04/12. MCO blasted an overburden shot in S02B10 at approximately 1pm on 27/04/12. The complainant was contacted at 1:11pm on 27/04/12 to discuss the blast. They commented that this was the first time they had felt a blast from MCO. As there were no results available at the time it was agreed to call them back the following week when results were available. They were appreciative of the call. The complainant was contacted on 01/05/12 to discuss the results. The vibration at Ulan School and Moolarben Dam was 1.13mm/s and was 0.25mm/s at Lagoons Road. Overpressure was <101.0dB at all sites.
278.	28th April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 3:54am on 28/04/12. EX102 was operating in S04B19 with trucks hauling to the RL445 dump in S05B28. EX111 was operating in S04B15 with trucks hauling topsoil to the RL480 dump. LF noise levels at Lagoons Road were between 32.0-33.5dB and between 35.9-37.2dB at Ulan Road. Wind speed was 0.2-1.0m/s from the south. A review of the audio indicated that mining related noise dominated the noise environment. Noises that could be heard included excavators, truck retard, horns, dozers and loading/banging noises.
279.	28th April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 8:20am on 28/04/12. EX101 was operating in S05B37 with trucks hauling to RL470 dump. EX102 was operating in S04B19 with trucks hauling to RL455 dump. LF noise at Lagoons Road was between 38.2-42.8dB and between 37.8-38.9dB at Ulan Road. Wind speed was 0.0-0.4m/s from the south. A review of the audio indicated that excavator noise was the dominant noise source. Birds and road traffic were also audible.
280.	28th April 2012	Ridge Road	Noise	Complainant rang to complain about noise at 8:37am on 28/04/12. EX101 was operating in S05B37 with trucks hauling to RL470 dump. EX102 was operating in S04B19 with trucks hauling to RL455 dump. Following a conversation between the OCE and ECRS, EX101 was shut down at approx. 9:30am for 1 hour. LF noise at Lagoons Road was between 36.8-41.0dB and between 36.5-39.1dB at Ulan Road. Wind speed was 0.0-0.6m/s from NE. There was a noticeable drop in the noise levels after EX101 was shut down. A review of the audio indicated that mining related noise dominated the noise environment. Excavators, truck retard, loading/banging and dozers were clearly audible. Birds and road traffic could also be heard. The complainant was contacted at 8:41am on 28/04/12. They were clearly upset about the noise levels they were experiencing and commented that it is getting worse.
281.	28th April 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 10:12am on 28/04/12. EX101 was still shut down due to earlier noise concerns. EX102 was operating in S04B19 with trucks hauling to the RL445 dump. LF noise at Lagoons Road was between 30.4-39.0dB and between 30.5-39.1dB at Ulan Road. Wind speed was 0.8-1.1m/s from the east. A review of the audio indicated that low level mine hum and birds dominated the noise environment. Planes were also around the time of the complaint. The mining related noise was noticeably quieter than earlier in the morning. The complainant was contacted on

Number	Date	Location	Issue	Investigation and Follow Up
				01/05/12 to discuss the complaint. They commented that it had been loud all morning.
282.	30th April 2012	Ulan Road	Noise	Complainant rang to complain about noise at 12:16am on 30/04/12. There were follow up complaints at 2:24am and 3:17am. EX102 was operating in S04B18 with trucks hauling to the RL445 dump. EX111 was operating in S05B25 with trucks hauling to the ROM. For the first complaint LF noise levels at Lagoons Road were between 28.5-34.7dB and between 28.7-36.6dB at Ulan Road. Wind speed was 0.1-0.5m/s from the SW. A review of the audio indicated that excavator noise and truck retard dominated the noise environment. Loading/banging noises and planes were also audible. For the second complaint LF noise levels at Lagoons Road were between 32.4-33.7dB and between 32.4-34.3dB at Ulan Road. Wind speed was 0.1m/s from NW. A review of the audio indicated that mine hum and truck retard along with insects dominated the noise environment. The occasional high pitched squealing noise was also audible. For the third complaint LF noise levels at Lagoons Road were between 33.2-34.4dB and between 33.1-33.4dB at Ulan Road. Wind speed was 0.1-0.4m/s from the SW. A review of the audio indicated that mine hum and insects dominated the noise environment. Truck retard and a plane were also audible.
283.	30th April 2012	Ridge Road	Noise	Complainant rang to complain about noise at 3:30am on 30/04/12. EX102 was operating in S04B18 with trucks hauling to the RL445 dump. EX111 was operating in S05B25 with trucks hauling to the ROM. LF noise levels at Lagoons Road were between 32.7-34.4dB and between 33.1-35.9dB at Ulan Road. Wind speed was 0.0-0.4m/s from SW. A review of the audio indicated that mine hum and insects dominated the noise environment. Truck retard and a plane were also audible.
284.	1st May 2012	Ulan Road	Noise	Complainant rang to complain about noise at 3:37am and 4:07am on 01/05/12. EX102 was operating in S04B18 with trucks hauling to RL452 dump. EX111 was operating in S06B27 with trucks hauling to the ROM. LF noise at Lagoons Road was between 36.4-36.9dB and between 35.5-36dB at Ulan Road. Wind speed was 0.0-0.4m/s from the east.
285.	1st May 2012	Lagoons Road	Noise	Complainant rang to complain about noise at 10:02pm and 10:16pm on 01/05/12. EX102 was operating in S04B19 with trucks hauling to RL455 dump. EX111 was operating in S06B27 with trucks hauling to the ROM. LDR121 was on ROM support. LF noise at Lagoons Road was between 38.5-39.2 dB and 32.0-38.8dB at Ulan Road. Wind speed was 0.0-0.4m/s from the south east. The ECRC spoke with the complainant the following day.
286.	1st May 2012	Ulan Road	Noise	Complainant rang to complain about noise at 8:25pm on 01/05/12. EX102 was operating in S04B19 with trucks hauling to RL455 dump. EX111 was operating in S06B27 with trucks hauling to the ROM. LDR121 was on ROM support. LF noise at Lagoons Road was 34.6dB and 37.0dB at Ulan Road. Wind speed was 0.0-0.4m/s from the east. The complainant could not be contacted the following day.

Number	Date	Location	Issue	Investigation and Follow Up
287.	2nd May 2012	Ridge Road	Noise	Complainant rang to complain about noise at 11:19pm on 01/05/12 and 3:08am on the 02/05/12. EX102 was operating in S04B19 with trucks hauling to RL455 dump. EX111 was operating in S06B27 with trucks hauling to the ROM. LDR121 was on ROM support. For the first complaint the noise levels were 35.5dB at Lagoons Road and 37.1dB at Ulan Road. For the second complaint the noise levels were 36.1dB at Lagoons Road and 33.2dB at Ulan Road. Wind speed was 0.0-0.4m/s from the east. The complainant could not be contacted the following day.
288.	4th May 2012	Ulan Road	Noise	Complainant rang to complain about noise at 12:19am on 04/05/12. ECRS rang the complainant at 12:23am. As there was no answer a message was left advising the complainant that representatives from MCO were on their way to observe the noise environment near the complainant's house. The ECRS and Production Assistant observed the noise environment at Winchester Cr/Ulan Rd south intersection around 12:31am. When there was no road traffic noise a very faint mine hum could be heard. The occasional dozer could also be heard. It was later confirmed with the OCE that there were no dozers operating on the rehabilitation. Insects and dogs barking were also heard at this location. Attempts were made to monitor the mine noise, however, due to the insect activity this wasn't possible. Total noise was generally less than 35dB when there was no road traffic. The noise environment was observed in Ulan Village where a dozer from UCML was audible along with the rotary breaker. The noise environment on Lagoons Road was observed where truck movements from MCO were audible. EX102 was in S02B12 with trucks hauling to RL451 dump and EX111 was in S06B27 with trucks hauling to ROM. LF noise at Lagoons Road was between 28.2-34.8dB and between 26.4-33.1dB at Winchester Cr. Wind was between 0.0-0.9m/s from SW.
289.	4th May 2012	Ridge Road	Noise	Complainant rang to complain about noise at 8:01am on 04/05/12. EX101 was operating in S04B37 with trucks hauling to RL470 dump. EX101 trucks did not start operating until 8:30 am. EX102 was operating in S03B14 with trucks hauling to the RL455. EX111 was operating in S05B34 coal. LF noise at Lagoons Road between 7:00am and 8:30am was between 40.2-40.6 dB. LF noise at Winchester Crescent between 7:00am and 8:30am was between 34.1-43.2dB. Wind speed was 0.0-0.4m/s from the east. The complainant was contacted on 07/05/12.
290.	5th May 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 12:04am on 05/05/12. EX102 was operating in S02B12 with trucks hauling to RL451 dump. EX111 was operating in S06B25 with trucks hauling to the ROM. At time of complaint LF noise was 29.4dB at Lagoons Road, 28.1dB at Winchester Crescent and 38.6dB at Winchester Crescent south. Wind speed was 0.0-0.4m/s from the east. Review of the audio revealed road noise, some very low mine related noise. The complainant could not be contacted the following day.

Number	Date	Location	Issue	Investigation and Follow Up
291.	5th May 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 12:35am and 2:38am on 05/05/12. EX102 was operating in S02B12 with trucks hauling to RL451 dump. EX111 was operating in S06B25 with trucks hauling to the ROM. At the time of the complaints LF noise was between 22.0-22.4dB at Lagoons Road, 23.7-28.5dB at Winchester Crescent and 32.6-36.0dB at Winchester Crescent south. Wind speed was 0.0-0.4m/s from the east. Review of the audio revealed road noise, some very low mine related noise. The complainant could not be contacted the following day.
292.	14th May 2012	Saddlers Creek Road	Water	Complainant rang at 9:30am on 14/05/12 to enquire about if MCO knew anything about the river in front of their place being turbid. The ECRM responded by saying that we were discharging from our clean water dam. Complainant mentioned that the turbidity was high with NTU at 650. ECRM commented that the water is from a clean water dam that sits above the mining activities and was discharged via a pipeline directly to the opposite end of the mine into the clean water drainage system. ECRM advised that the water quality results were: pH~7, EC ~180µS/cm, TSS~40mg/L. Complainant said it was ashamed for this to happen. Complaint then said the mine noise was loud for the last two weeks. ECRM advised that our alarms and complaints have actually decreased in the last two weeks. ECRM advised that they would have a look at the discharge issue.
293.	15th May 2012	Ridge Road	Noise	Complainant rang to complain about noise at 4.51am on 15/05/12. EX102 was operating in S02B14 with trucks hauling overburden to the RL460 dump. EX111 was operating in S02B18 with trucks hauling to the ROM. LDR121 was also operating at the ROM. LF noise at Lagoons Road was 36.7dB, at Winchester Crescent 31.5dB and at Winchester Crescent south 33.6dB. Wind was between 0.0-0.6m/s from SSW. Complainant could not be contacted the following day.
294.	17th May 2012	Ridge Road	Noise	Complainant rang to complain about noise at 12.34am on 17/05/12. EX102 was operating in S02B10 with trucks hauling overburden to the RL455 dump. EX111 was operating in S02B13 with trucks hauling coal to the ROM. LDR121 was operating at the ROM. Dozers 301 and 306 were in S02 setting up a ramp. Dozer 302 was operating at RL460. 2 graders and a water cart were operating on the roads. LF noise at Lagoons Road was between 32.8-34.5dB and at Winchester Cres was between 30.1-33.7dB. There was no wind present. A message was left with the complainant the following day.
295.	17th May 2012	Moolarben Road	Blasting	Complainant rang to complain about a blast undertaken on 16/05/2012 at 1:00pm. The complainant advised that the blast shook their parent's house. The complainant said that the blast is usually worse when MCO blast up against the ridge. The blast was undertaken in S05B36 and the results were: Dam Wall: 2.84 mm/s 114.0 dB(L) School Yard:1.17 mm/s 104.2 dB(L) Rock Shelters: 1.47 mm/s 104.9 dB(L) Lagoons Road: 0.54mm/s 104.2 dB(L)

Number	Date	Location	Issue	Investigation and Follow Up
296.	18th May 2012	Ulan Road	Noise	Complainant phoned to complain about noise on 18/05/12 at 3.32am. EX101 was operating in S02B10 with trucks hauling overburden to the RL455 dump. EX111 was operating in S02B14 with trucks hauling coal to the ROM. LDR121 was operating at the ROM. Dozer 322 was operating on the roads. Dozer 307 was operating at RL470. 2 graders and a water cart were operating on the roads. Production Assistant drove to the corner of Ulan Road and Winchester Cres (South) at 4.03am. Faint mine hum and insects were audible. Production Assistant then drove to a location approximately 200 metres North of the complainants address on Ulan Road at 4.07am. Faint mine hum was audible. LF noise at Winchester Crescent south was 20.3dB. LF noise at Winchester Crescent was 25.3dB. LF noise at Lagoons Road was 31.9dB. Wind was 0.7m/s from SWW.
297.	21st May 2012	Ulan Road	Noise	Complainant rang to complain about noise at 2:21am on 21/05/12. EX101 was operating in S03B11 with trucks hauling overburden to the RL450 dump. EX111 was operating in S02B17 with trucks hauling coal to the ROM. LDR121 was operating at the ROM. LF noise at Lagoons Road was 33.4dB and at Winchester Crescent was 27.3dB and was 26.5dB at Winchester Crescent south. Wind was between 0.0-0.4m/s from SE. The complainant could not be contacted the following day.
298.	23rd May 2012	Lagoons Road	Noise and Blasting	Complainant rang to query why there was a loud whining sound coming from equipment on the mine site. Complainant advised that the noise sounded as if it were coming from equipment that had a bearing failure. Complainant also commented that the blast from last Wednesday (16/05/12) was extremely loud and caused the pergola to shake. After discussion with the OC operators the ECRM advised the complainant that the only machine working in the southern section of the mine was the drill rig. The drill rig had been operating in the area for 2 weeks and its activities had not changed. The ECRM advised that there was a complaint this morning about UCML's rock crusher which may have been the cause of the noise. The ECRM advised that data from last Wednesday's blast was within compliance and the information would be passed onto the blast engineer.
299.	23rd May 2012	Ridge Road	Blasting	Complainant rang the complaints line at 1:01pm to complain about the blast on 23/05/12. The blast was fired at 12:59pm. The complainant also rang MCO reception at 1:05pm. The ECRS spoke with the complainant who was clearly unhappy that they were able to hear the blast. They also had concerns that MCO are misleading them by only monitoring small blasts at their house (their perception). They commented that today's was a large blast and they were disappointed MCO didn't monitor it. It was explained to the complainant MCO did intend to monitor at their residence today, however, we needed to monitor at a statutory location and due to damage to our portable blast monitor we didn't have a spare monitor to monitor at their property. They were assured that MCO are not trying to mislead them. They calmed down and were accepting of this explanation. They asked that their complaint be recorded and their concerns passed onto MCO management. The ECRS committed to doing this.

Number	Date	Location	Issue	Investigation and Follow Up
				Preliminary results indicate the blast was in compliance with criteria.
300.	24th May 2012	Ulan Road	Noise	Complainant rang to complain about noise at 12:26am and 3:05am on 24/05/12. EX101 was operating in S02B13 with trucks hauling overburden to the RL425 dump. EX111 was operating in S02B14 with trucks hauling coal to the ROM. Drill 192 was operating S04 South on coal. Following the first complaint, Drill 192 was shut down for the rest of the shift. For the first complaint, LF noise at Lagoons Road was 39.4dB, at Winchester Crescent was 32.3dB and at Winchester Crescent south was 38.3dB. Wind was 1.1m/s from SSE. For the second complaint, LF noise at Lagoons Road was 36.7dB, at Winchester Crescent was 27.1dB and at Winchester Crescent south was 22.7dB. Wind was between 0.0-0.4m/s from NNW. The ECRC and production assistant visited the area approximately 10 minutes after the complaint. Very faint mine noise was observed. Road traffic noise was dominant. After the second complaint the ECRC and PA again visited the complainants address and observed faint mine noise from MCO. UCML wash plant noise was also observed. Attempts to contact the complainant have been unsuccessful.
301.	29th May 2012	Ulan Road	Noise	Complainant rang the complaints line at 3:56am on the 29/05/12 to complain about machinery noise from MCO. EX101 was operating in S02/3B10/11 with trucks hauling overburden to the RL450 dump. EX111 was operating in S02B15 with trucks hauling coal to the ROM. Loader 121 was on ROM support. LF noise at Lagoons Road was 29.3dB, at Winchester Crescent was 26.7dB and at Winchester Crescent south was 27.0dB. Wind was between 0.0-0.4 m/s from the east. A review of the audio revealed low mine related noise. Road traffic was the dominant noise source.
302.	30th May 2012	Ulan Road	Noise	Complainants called the complaints line on the 30/05/12 at 2:42am to complain about machinery noise. EX101 was operating in S02B10 with trucks hauling overburden to S01 B13. EX102 was operating in S05 B21 with trucks reporting to S02B21. LDR121 was on ROM support. LF noise at Lagoons Road was 29.6dB, at Winchester Cres was 29.1dB and at Winchester Crescent south was 32.5dB. Wind was between 0.0-0.4 m/s from the east. A review of the audio revealed distant low mine related noise. A message was left with the complainant.
303.	30th May 2012	Ridge Road	Blasting	A complaint was received via the hotline at 11:08am on the 30/05/12 following a coal blast in S04B36 at 11:00am. The ECRC called the complainant and discussed the blast. The caller felt it was a medium sized blast and that MCO should be conducting monitoring at their house. It was explained that when MCO has a monitor available it will monitor blasts at the house. This was accepted by the caller. Results of the blast were within compliance criteria.
304.	30th May 2012	Ridge Road	Blasting	A complaint was received via the hotline on the 30/05/2012 following a coal blast in S04B36 at 11:00am. The ECRC called the complainant and discussed the blast. Results of the blast were within compliance criteria.

Number	Date	Location	Issue	Investigation and Follow Up
305.	30th May 2012	Ridge Road	Noise	Complainant rang to complain about noise at 11:11pm on 30/05/12. EX101 was operating in S02B10-14 with trucks hauling overburden to the RL450 dump. EX111 was operating in S04B35 with trucks hauling coal to the ROM. LDR121 was operating at the ROM. LF noise at Lagoons Road was 31.5dB and was 34.4dB at Winchester Crescent south. Wind was between 0.0-0.4m/s from SE. The complainant could not be contacted the following day.
306.	31st May 2012	Ulan Road	Noise	Complainant rang to complain about noise at 2:58am on 31/05/12. EX101 was operating in S02B10-14 with trucks hauling overburden to the RL450 dump. EX111 was operating in S04B35 with trucks hauling coal to the ROM. LDR121 was operating at the ROM. LF noise at Lagoons Road was 33.4dB, at Winchester Crescent was 29.4 dB and at Winchester Crescent south was 32.5dB. Wind was between 0.0-0.4m/s from SE. The complainant could not be contacted the following day.
307.	31st May 2012	Ulan Road	Noise	Complainant rang to complain about noise at 9:27pm on 31/05/12 and 1:01am and 3:31am on the 01/06/12. EX101 was operating in S03B16 with trucks hauling overburden to the RL450 dump. EX102 was operating in S04B20 with trucks reporting to new road. EX111 was operating in S04B35 with trucks hauling coal to the ROM. LDR121 was operating at the ROM. Following the first complaint EX111 was shut down at 10:15 pm. Noise levels for the three complaints were: LF noise at Lagoons Road (SX36) was 35.4 dB, 34.7 dB and 35.6 dB LF noise at Winchester Cres (SX39) was 33.1, 30.4 dB and 29.1 dB LF noise at Winchester Cres South (SX55) was 35 dB, 29.6 dB and 24.7 dB Wind was between 0.0m/s-0.4m/s from SE. The complainant was contacted and left a message the following day.
308.	31st May 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 9:44pm on 31/05/12. EX101 was operating in S03B16 with trucks hauling overburden to the RL450 dump. EX102 was operating in S04B20 with trucks reporting to new road. EX111 was operating in S04B35 with trucks hauling coal to the ROM. LDR121 was operating at the ROM. Following the complaint EX111 was shut down at 10:15 pm. LF noise at Lagoons Road was 35.2dB, was 35.5 dB at Winchester Crescent and 40.7dB at Winchester Crescent south. Wind was between 0.0-0.4m/s from SE. The complainant was contacted the following day. They mentioned it had been noisy most of the evening but were appreciative of the steps MCO had taken to minimise impacts.
309.	1st June 2012	Ridge Road	Noise	Complainant called the complaints line at 8:30am on the 01/06/12. The ECRC immediately drove to the complainant's house and observed rumbling noise from MCO/UCML direction. No specific machinery could be identified. The ECRC called the complainant advising them of noise levels and current operations. At the time of the complaint noise levels were below MCO impact assessment criteria. EX101 was operating in S03B16 with trucks hauling overburden to the RL450 dump. EX102 was

Number	Date	Location	Issue	Investigation and Follow Up
				operating in S04B20 with trucks reporting to new road. EX111 was operating in S04B35 with trucks hauling coal to the ROM. LDR121 was operating at the ROM.
310.	7th June 2012	Ulan Road	Noise	The complainant rang to complain about noise at 3:27am on 07/06/12. EX101 was operating in S03B14 hauling to the RL450 dump. EX102 was operating in S04B18-20 hauling to the RL450 dump. EX111 was operating in S04B37 hauling to the ROM. LF noise at Lagoons Road was between 26.5-27.4dB and between 30.8-32.3dB at Winchester Crescent. A review of the audio indicated that faint mine hum was audible at Lagoons Road, with the occasional faint dozer noise and reverse quacker noise also being audible. Mining noise was not audible at all at Winchester Cr. Some wind noise was audible.
311.	7th June 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 10:21pm on 07/06/12. EX101 was operating in S03B19 with trucks hauling overburden to the RL460 Dump. EX102 was operating in S04B19 with trucks hauling overburden to the RL430 Dump. LF noise was between 28.1-28.7dB at Lagoons Road and between 28.9-33.5dB at Winchester Crescent. Wind speed was 0.0-0.2m/s from the NE. The Production Assistant drove to the complainant's house and observed that mine noise was faintly audible. The complainant was contacted by the ECRS on 08/06/12 to discuss the complaint. The complainant commented that they could hear individual truck movements and the noise is clearly louder in the front bedrooms in their house. The actions taken with shutting down equipment and the PA observing the noise environment were discussed. The complainant is clearly concerned about the noise impacts at their property and commented that they are going to pursue other avenues to get action taken. The results from recent real-time monitoring at this residence are still pending.
312.	8th June 2012	Ulan Road	Noise	Complainant rang at 2:33am on 08/06/12 to complain about noise. EX102 was operating at S04B19 hauling overburden to 460RL Dump. LF noise at Lagoons Road was 34.8-37.9dB and at Winchester Crescent was 30.4dB. There was no wind. The complainant drove to the complainant's house and mine noise was audible along with crickets. All machinery was shutdown at 3:00am at which time LF noise at Lagoons Rd was 36.4dB and at Winchester Cr was 27.7dB. Attempts to contact the complainant have been unsuccessful. Messages have been left.
313.	10th June 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 8:23am on 10/06/12. EX101 was in S03B13 with trucks hauling to RL450 dump. EX102 was in S04B19 with trucks hauling to the RL430 dump. EX111 was in S04B36 with trucks hauling to the ROM. EX111 was started up at 8am and was shut down in response to this complaint. It wasn't started up again until 10am. LF noise at Lagoons Road was between 38.2-40.1dB and between 35.4-37.9dB at Winchester Cr. There was no wind. A review of the audio indicated that road traffic noise dominated the low frequency noise environment. When the road traffic was quiet mining noise was audible. This noise was associated with truck movements, excavator fans and UCML CHPP noise. The complainant was contacted by the ECRS at 8:44am on 10/06/12 to discuss the

Number	Date	Location	Issue	Investigation and Follow Up
				complaint. They commented that loading activities were clearly audible and that it has been noisy last night and yesterday morning as well. It was later confirmed by the OCE that MCO were loading in a rocky area for the last couple of shifts. Potential noise sources at UCML were also discussed.
314.	10th June 2012	Ridge Road	Noise	Complainant rang to complain about noise at 9:41am on 10/06/12. EX101 was in S03B13 with trucks hauling to RL450 dump. EX102 was in S04B19 with trucks hauling to the RL430 dump. LF noise at Lagoons Road was between 37.0-39.9dB and between 32.9-35.1dB at Winchester Cr. There was no wind. A review of the audio indicates that UCML CHPP noise (rotary breaker, trucks, and dozers) dominated the noise environment. This is supported by observations from site personnel on site at the time of the complaint. The complainant was contacted by the ECRS at 9:56am on 10/06/12 to discuss the complaint. They commented there had been a constant roaring noise since 7:30am with dozer noise as well. The noise was loud yesterday morning and last night as well with the same noise being audible on both mornings. They commented the noise was starting to quieten down while we were talking. The potential noise impacts from UCML were discussed with the complainant. They commented it was possible the noise was coming from there but from their residence it was hard to determine the direction of the noise source.
315.	10th June 2012	Ulan Road	Noise	Complainant rang to complain about noise at 8:31pm on 10/06/12. There were follow up calls at 10:24pm and 3:45am on 11/06/12. EX101 was operating in S03B14 with trucks hauling to the RL430 dump. EX111 was operating in S05B36 with trucks hauling to the ROM. For the first complaint LF noise at Lagoons Road was between 30.8-32.8dB and between 31.7-34.9dB at Winchester Crescent. Wind speed was 0.0-0.2m/s from NE. A review of the audio indicated that general mine hum was audible. Dogs, road traffic and the occasional plane were also audible. For the second complaint LF noise at Lagoons Road was between 33.5-35.9dB and between 31.4-34.4dB at Winchester Crescent. There was no wind. A review of the audio indicated that general mine hum dominated the audio. Road traffic, planes and dogs were also audible. For the third complaint LF noise at Lagoons Road was between 35.9-36.2dB and between 23.5-25.1dB at Winchester Crescent. Wind speed was 0.0-0.3m/s from NE. A review of the audio indicated that very, very faint mine hum was audible. The occasional road traffic noise was also audible. Attempts were made at 8:32pm and 10:25pm on 10/06/12 by the ECRS to contact the complainant (both times 1 minute after a complaint was received). There was no answer on the home phone. Messages were left encouraging the complainant to call back to discuss the complaint. The complainant was reminded that unless they talk to MCO there is nothing we can do to address their concerns.
316.	10th June 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 9:20pm on 10/06/12. EX101 was operating in S03B14 with trucks hauling to the RL430 dump. EX111 was operating in S05B36 with trucks hauling to the

Number	Date	Location	Issue	Investigation and Follow Up
				ROM. LF noise at Lagoons Road was between 34.4-35.8dB and between 32.3-38.1dB at Winchester Crescent. There was no wind. A review of the audio indicated that faint mine hum was audible with the occasional truck movement and banging noise being audible. Planes were also clearly audible at times. The complainant was contacted at 2:45pm on 12/06/12 to discuss the complaint. Results from the complaints monitoring at their residence to determine the noise impacts at their property are still pending.
317.	11th June 2012	Ulan Road	Noise	Complainant rang to complain about noise at 9:58pm on 11/06/12. There were follow up complaints at 12:58am, 1:43am, 2:39am and 3:36am on 12/06/12. EX101 was operating in S03B14 with trucks hauling to RL460 dump. EX111 was operating in S04B36 with trucks hauling to ROM. At approx. 2am the dump location for EX101 was changed to RL430 dump and EX111 was shut down. For the first complaint LF noise at Lagoons Road was between 30.2-32.4dB and between 30.6-30.9dB at Winchester Crescent. There was no wind. A review of the audio indicated that faint mine hum dominated the noise environment. Road traffic could also be heard at times. For the second complaint LF noise at Lagoons Road was between 32.3-35.4dB and between 24.8-32.9dB at Winchester Crescent. Wind speed was 0.1m/s from NE. A review of the audio indicated that faint mine hum dominated the noise environment along with a dog barking. Road traffic, a horn and a dozer could be heard at times. For the third complaint LF noise at Lagoons Road was between 36.9-38.8dB and between 27.4-32.2dB at Winchester Crescent. Wind speed was 0.0-0.3m/s from NE. A review of the audio indicated that faint mine hum dominated the noise environment along with dogs barking. For the fourth complaint LF noise at Lagoons Road was between 28.2-31.9dB and between 26.8-28.4dB at Winchester Crescent. Wind speed was 0.0-0.5m/s from NE. A review of the audio indicated that faint mine hum was audible along with dogs and roosters. The mine hum was quieter than earlier in the night. For the fifth complaint LF noise at Lagoons Road was between 30.2-32.2dB and between 27.7dB at Winchester Crescent. Wind speed was 0.0-0.6m/s from NE. A review of the audio indicated that very, very faint mine hum was audible. Road traffic noise was also audible.
318.	12th June 2012	Ulan Road	Noise	The complainant rang to complain about noise at 9:24pm on 12/06/12. Follow up complaints were made at 12:48am and 2:19am on 13/06/12. EX101 was operating in S02B13 hauling overburden to Block Tip. EX102 was operating in S04B19 hauling overburden to RL430 (shut down at approximately 10:30pm). EX111 was operating in S04 B36 hauling to the ROM. For the first complaint LF noise at Lagoons Road was between 25.5-32.4dB and between 31.5-38.7dB at Winchester Crescent. Wind speed was 0.0-0.9m/s from SE. Production Assistant drove to where complaint was made and observed that plane noise and road noise dominated the noise environment. Mine noise (from east of MCO) and crickets were also audible. There was no mine noise from the north. For the second complaint LF noise at

Number	Date	Location	Issue	Investigation and Follow Up
				Lagoons Road was 24.4dB and 30.1dB at Winchester Crescent. Wind speed was 0.0-1.5m/s from SE. Production Assistant drove to where complaint was made and observed that mine noise was faintly audible, cricket noise was dominant. Mine noise was coming from the east and the north (source unidentified). There were two distinct noise sources. For the third complaint LF noise at Lagoons Road was 29.3dB and 30.7dB at Winchester Crescent. Wind speed was 0.0-0.1m/s from the SE. Production Assistant drove to where complaint was made and observed that mine noise was very, very faintly audible, cricket noise was dominant. Noise levels declined at the site of the complaint as the night went on.
319.	13th June 2012	Ulan Road	Noise	Complainant rang to complain about noise at 9:00am on 13/06/12. They commented that the noise was extremely loud. The ECRS immediately rang the complainant and left a message on their phone advising them that they were on their way to observe the noise environment. It was requested that the complainant meet the ECRS in their driveway to observe the noise environment and to discuss their complaint. The ECRS and ECRC arrived at the complainant's residence at 9:10am. The complainant hadn't come outside to meet the ECRS. There were signs of the complainant being home (the fire was burning), however as the front gate was locked the ECRS wasn't able to knock on the door to confirm the complainant was home and to discuss the complaint with them. The noise environment at the complainant's residence was observed. No mining noise was audible. The occasional plane and road traffic noise were audible. The OCE was contacted to discuss mining operations. They mentioned that the wheeled dozer had been shut down in response to the complaint, otherwise no changes had been made. They were advised by the ECRS to continue mining operations without any further changes.
320.	13th June 2012	Ulan Road	Noise	Complainant rang to complain about noise at 8:27pm on 13/06/12. Follow up complaints were made at 9:41pm and 10:32pm on 13/06/12. EX101 was operating in S02/3B13 hauling overburden to RL470 dump. EX102 was operating in S04B17 hauling overburden to RL430 dump. EX111 was operating in S04B35 hauling to the ROM. For the first complaint LF noise levels were between 33.5-34.2dB at Lagoons Rd and between 28.7-31.1dB Winchester Crescent. Wind speed was 0.1-0.9m/s from ESE. The Production Assistant drove to where the complaint was made and observed that crickets and dog barking were dominant. Mine noise was barely audible – very, very faint. When there was no road traffic present the total noise was approx. 27.7-30.2dB. It was not possible to determine LF/mine related noise due to constant cricket noise. For the second complaint LF noise levels were between 34.5-37.8dB at Lagoons Road and between 26.1-29.0dB at Winchester Crescent. Wind speed was 0.1-0.6m/s from ESE. The Production Assistant drove to where the complaint was made. Crickets and dog barking were dominant. There was occasional road traffic. Mine noise was faintly audible. Total measured noise at this location was approx. 24.4-29.7dB. It was not possible to determine LF/mine

Number	Date	Location	Issue	Investigation and Follow Up
				related noise due to constant cricket noise. For the third complaint LF noise levels were between 36.3-40.2dB at Lagoons Road and 27.4dB at Winchester Crescent. Wind was 0.2-2.0m/s from ESE. The Production Assistant drove to where the complaint was made. Crickets and dog barking were dominant. Mine noise was audible below this. Total noise at this location was approx. 27.7-32.7dB. It was not possible to determine LF/mine related noise due to constant cricket noise. The complainant was contacted by the ECRS at 11:40am on 13/06/12 to discuss their recent complaints. They commented that the noise is driving them crazy and wants something done. They claimed they aren't getting any sleep. The noise observations at their gate yesterday (12/06/12) indicating that mine noise was not audible were discussed. The complainant claims that mine noise is not audible at their gate but is very loud at their back porch. They believe the noise comes over the ridge and lands on their back porch. They commented all of their neighbours have the same problem. The ECRS advised the complainant that MCO are trying to identify what the noise problem is at this residence but that it is hard to do when the complainant won't answer calls or allow MCO onto their property. The complainant has their own noise logger arriving next week and will be using this data to assess compliance with noise criteria, including road traffic noise. The complainant was reminded again that MCO will only accept these results if they have been collected in accordance with appropriate standards by calibrated equipment and have been reviewed and endorsed by a qualified noise expert. The complainant asked what MCO are doing to reduce the road traffic noise. The ECRS advised that the latest round of road traffic noise showed that total traffic noise was in compliance with criteria and based on this MCO have no plans to address road traffic noise. The complainant was reminded that MCO are not responsible for all of the traffic on Ulan Road. The complainant commented they are going to lodge a complaint with the EPA about vehicles turning around in his driveway in the middle of the night. The complainant was advised that these vehicles are visiting the area to assess the noise environment in response to their complaints and that the EPA is aware that this is happening.
321.	14th June 2012	Ridge Road	Noise	Complainant rang to complain about noise at 1:12am on 14/06/12. EX101 was operating in S02/3B13 hauling overburden to 470RL. EX102 was operating in S04B17 hauling overburden to 430RL. EX111 was operating in S04B35 hauling WS2 to the ROM. LF noise levels were between 35.8-36.4dB at Lagoons Road and between 27.3-28.3dB at Winchester Cr. Wind was 0.0-0.1m/s from ESE. The Production Assistant observed the noise environment along Ridge Rd where general mine hum and cricket noise were audible. Noise measurements ranged between 28.2-35.2dB. It was not possible to determine LF/mine related noise due to constant cricket noise. The complainant was contacted at 1:00pm on 14/06/12 to discuss the complaint. They commented the noise was constant from 9:00pm on 13/06/12 to the time of the complaint. Machinery that stood out were dozer tracks and trucks

Number	Date	Location	Issue	Investigation and Follow Up
				changing gear. The influence from UCML was discussed with respect to the noise described but the complainant was sure the noise was coming from MCO as noise from UCML is coming from a different direction. The observations of the Production Assistant were discussed and the complainant commented that they think it is a good thing that MCO have additional resources on night shift to assist with noise management.
322.	15th June 2012	Ridge Road	Noise	Complainant rang to complain about noise at 9:12pm on 15/06/12. EX101 was operating in S02B14 with trucks hauling to RL470 dump. EX102 was operating in S04B18 with trucks hauling to RL450 dump. EX111 was operating in S04B35 with trucks hauling to the ROM. Following this complaint EX111 was shut down and the dumping location for EX101 was changed to RL450 dump. LF noise at Lagoons Road was between 36.0-37.9dB and between 29.9-32.8dB at Winchester Crescent. Wind speed was 0.6-1.0m/s from SW. A review of the audio indicated that excavator noise dominated the noise environment. Truck retard, dozer and loading noise were also audible. Planes in the area were also audible. An initial phone call to the complainant was made by the ECRS at 9:38am on 16/06/12. They commented that the noise did quieten down after they made the call. A commitment was given to call back on Monday with more details. A follow up call was made by the ECRS at 10:22am on 18/06/12 where the operations and noise levels were discussed. The complainant did comment that it was a lot less noisy in the early hours of the morning.
323.	15th June 2012	Ulan Road	Noise	Complainant rang to complain about noise at 9:36pm on 15/06/12. They commented that the noise was very loud last night and tonight and was keeping the household up. EX101 was operating in S02B14 with trucks hauling to the RL450 dump. EX102 was operating in S04B18 with trucks hauling to the RL450 dump. EX111 had been shut down at 9:30pm. LF noise at Lagoons Road was between 36.3-37.9dB and between 32.1-32.8dB at Winchester Crescent. Wind speed was 0.7-1.0m/s from SW. A review of the audio indicated that there had been a drop in mine related noise from earlier in the evening. The mining related noise was more of a general mine hum rather than individual pieces of equipment being audible. There was plane activity in the area as well. An initial phone call was made by the ECRS to the complainant at 9:40am on 16/06/12. A message was left saying that a follow up call would be made on Monday when more information was available. The ECRS phoned the complainant at 10:28am on 18/06/12 to discuss the complaint. The complainant requested that no-one from MCO contact them in the future. If they wish to speak with anyone at MCO they will call us.
324.	15th June 2012	Ulan Road	Noise	Complainant rang to complain about noise at 9:41pm on 15/06/12. They commented that the noise was loud tonight and last night and was keeping the household awake. A follow up complaint was lodged at 3:50am on 16/06/12. EX101 was operating in S02B14 with trucks hauling to the RL450 dump. EX102 was operating in S04B18 with trucks hauling to the RL450 dump. EX111 had been shut down at

Number	Date	Location	Issue	Investigation and Follow Up
				9:30pm. For the first complaint LF noise at Lagoons Road was between 36.3-36.8dB and between 30.1-32.1dB at Winchester Crescent. Wind speed was 0.7-1.0m/s from SW. A review of the audio indicated that there had been a drop in mine related noise from earlier in the evening. The mining related noise was more of a general mine hum rather than individual pieces of equipment being audible. There was plane activity in the area as well. For the second complaint LF noise at Lagoons Road was between 36.4-37.0dB and between 28.7-29.5dB at Winchester Crescent. Wind speed was 0.6-1.0m/s from SW. A review of the audio indicated the noise environment was similar to when the first complaint was lodged. The complainant was contacted by the ECRS at 9:41am on 16/06/12. They commented that the noise was getting worse and will continue to get worse as MCO moves further south.
325.	15th June 2012	Winchester Cres	Noise	Complainant rang to complain about noise at 10:41pm on 15/06/12. EX101 was operating in S02B14 with trucks hauling to the RL450 dump. EX102 was operating in S04B18 with trucks hauling to the RL450 dump. EX111 had been shut down at 9:30pm. LF noise at Lagoons Road was between 36.4-37.4dB and between 32.6-35.7dB at Winchester Cr. Wind speed was 0.7-1.0m/s from SW. A review of the audio indicated that a general mining hum was audible. No particular equipment could be identified. Road traffic noise and dogs barking were also audible. An initial phone call was made to the complainant by the ECRS at 9:55am on 16/06/12. The complaint commented the noise was a loud roaring noise that was present yesterday morning and again this morning. A commitment was given to call back on Monday with more information. Attempts to contact the complainant on Monday were unsuccessful.
326.	20th June 2012	Ulan Road	Noise	The complainant rang to complain about noise at 3:33am on 20/06/12. Complainant stated they could hear lots of noise from mine including bulldozers. EX102 was operating in S03B13 with trucks hauling to RL450 dump, EX111 was operating in S02B18 with trucks hauling to ROM. LF noise at Lagoons Road was 31.5dB and 31.0dB at Winchester Crescent. Production Assistant drove to location of complaint. The hand held monitor at the location of the complaint recorded 26.2-28.8dB. General mine rumble audible. Crickets also audible.
327.	20th June 2012	Winchester Cres	Noise	The complainant rang to complain about noise at 4:40am on 20/06/12. Complainant stated loud noise from the mine including crashing and banging woke the house up. EX102 was operating in S03B13 hauling to RL450 dump and EX111 was operating in S02B18 hauling to the ROM. LF noise at Lagoons Road was 29.1dB and 32.4dB at Winchester Crescent. Production Assistant drove to location of complaint and observed road traffic (approx. 5 cars in 5 minutes) and mine noise which was faintly audible, but not heard when road traffic present. The noise levels on the hand held monitor at the location of the complaint were between 23.4-26.2dB.

Number	Date	Location	Issue	Investigation and Follow Up
328.	20th June 2012	Winchester Cres	Noise	The complainant rang to complain about noise at 9:06pm on 20/06/12. EX102 was operating in S02B10 hauling to RL470 dump and EX111 was operating in S04B38 hauling to ROM. LF noise at Lagoons Road was 31.5dB and 31.6dB at Winchester Crescent. The noise levels on the hand held noise monitor at the location of the complaint were between 31.3-34.0dB. Wind speed was between 0.0-1.1m/s from SW. The Production Assistant drove to the complaint location. Mine noise was audible (general rumble), dog barking and occasional road traffic were audible. It was unclear whether noise was coming from UCML or MCO. On the way back to the mine the PA stopped at Cope Rd/Ulan Rd Junction. UCML was audible (general rumble), MCO was inaudible except for occasional truck retard which was quieter than UCML noise. UCML noise was the same noise heard at complaint site except much louder. The ECRC discussed the noise complaint with the complainant the following day and described the actions MCO had taken during the evening and the results of the noise monitoring.
329.	20th June 2012	Winchester Cres	Noise	The complainant rang to complain about noise at 9:15pm on 20/06/12. There was a follow up complaint at 10:55pm on 20/06/12. EX102 was operating in S02B10 hauling to RL470 dump and EX111 was operating in S04 B38 hauling to ROM. For the first complaint, LF noise at Lagoons Road was 33.4dB and at Winchester Crescent was 32.5dB. Wind speed was between 0.0-1.1m/s from SW. The Production Assistant drove to the complaint location. The noise levels from the hand held noise monitor at the complaint location was 28.2-30.6dB. Mine noise was faintly audible (general rumble), dogs barking and regular road traffic were also audible. Mine noise not audible when road traffic present. Unclear whether noise was coming from UCML or MCO. On the way back to the mine the PA stopped at Cope Rd/Ulan Rd Junction. UCML was audible (general rumble), MCO was inaudible except for occasional truck retard which was quieter than UCML noise. UCML noise was the same noise heard at complaint site except much louder. For the second complaint LF noise at Lagoons Road was 33.6dB and at Winchester Crescent was 37.6dB. Wind speed was between 0.0-0.5m/s from SW. The PA drove to the complaint location. The noise levels from the hand held noise monitor at the complaint location was 29.3-30.7dB. Mine noise was audible (general drone) along with crickets and road traffic (reasonably consistent). It was unclear whether noise was coming from UCML or MCO. The ECRC spoke with the complainant the following day. The ECRC discussed the actions MCO had taken during the evening to manage noise. The complainant had mentioned they had rung UCML but hasn't had a response from them.
330.	20th June 2012	Ulan Road	Noise	Complainant rang to complain about noise at 11:56pm on 20/06/12. EX102 was operating in S02B10 hauling to RL470 dump and EX111 was operating in S04B38 hauling to ROM. LF noise at Lagoons Road was 34.7dB and at Winchester Crescent was 30.4dB. Wind speed was 0.0-0.2m/s from SW. The Production Assistant drove to the complaint location. The hand held noise monitor at the location of the

Number	Date	Location	Issue	Investigation and Follow Up
				complaint was between 27.1-30.6dB. Road traffic was constant, mine noise inaudible when road traffic present. Mine noise audible in brief gaps in traffic. Muffled sound, could occasionally make out truck noise, and heard one thump sound, hard to distinguish. Unclear whether UCML or MCO noise.
331.	22nd June 2012	Ulan Road	Noise	The complainant rang to complain about noise at 3:25am on 22/06/12. EX102 was operating in S02B13 hauling to RL470 dump and EX111 was operating in S04B37 hauling to ROM & Block Tip. LF noise at Lagoons Road was between 33.1-33.5dB and between 28.8-31.9dB at Winchester Crescent. Wind speed was 0.0-2.7m/s from the SW.
332.	23rd June 2012	Ridge Road	Noise	The complainant rang to complain about noise on 21-23/06/12. On 21/06/12 EX102 was operating in S02B13 hauling to RL470 dump and EX111 was operating in S04B37 hauling to ROM. On 22/06/12 EX101 was operating in S02/03B13 hauling to RL450 dump, ROM road, rehabilitation and South Haul road regrade. EX102 was operating in S02/03B13 hauling O/B to RL450 dump, ROM road, rehabilitation and South Haul road regrade. EX111 was operating in S04B36 hauling to the ROM. On 23/06/12 EX101 was operating in S02B13 hauling to road regrade and EX102 was operating in S02/03B12 hauling to road regrade. An attempt to reach the complainant was unsuccessful.
333.	25th June 2012	Ulan Road	Noise	The complainant rang to complain about noise at 2:47am on 25/06/12. A follow up complaint was made at 3:08am. EX101 was operating in S02B14 hauling to regrade and RL470 dump. EX102 was operating in S02/03B12 hauling to regrade and RL470 dump. EX111 was operating in S04B37 hauling to the ROM. LF noise at Lagoons Road at the time of the complaints was 30.0-31.8dB and 30.0-30.6dB respectively. LF noise at Winchester Crescent was 34.5-38.3dB and 36.8-38.3dB respectively. There was no wind present. Complainant could not be contacted the following day.
334.	25th June 2012	Winchester Cres	Noise	The complainant rang to complain about noise at 8:02am on 25/06/12. EX101 was operating in S03B14 hauling O/B to RL450 dump. EX102 was operating in S03B14 hauling to RL470 dump. EX111 was operating in S04B37 hauling to the ROM. The ECRC drove to the area following the complaint and noted some mine noise from MCO/UCML direction. An attempt to reach the complainant was unsuccessful.
335.	25th June 2012	Ridge Road	Blasting	Complainant called at approximately 3:30pm to complain about blasting from MCO. The complainant was contacted at 4:00pm and it was confirmed that MCO had fired an overburden blast in S03B14. The complainant had asked why they hadn't been contacted prior to the blast. The ECRC instructed the complainant to visit MCO website for up-to-date information on blasting.
336.	26th June 2012	Ulan Road	Noise	The complainant rang to complain about noise at 3:26am on 26/06/12. EX101 was operating in S03B14 hauling to RL470 dump. EX111 was operating in S04B37 hauling to the ROM. LF noise at Lagoons Road was between 39.1-40.3dB and between 28.7-31.6dB at Winchester Crescent. The Production Assistant drove to the location of the complaint and observed that very faint mine noise was audible.

Number	Date	Location	Issue	Investigation and Follow Up
				The hand held noise unit was reading between 21.3-24.4dB at the location of the complaint. Complainant called again at 9:30 am. The ECRC had visited the area earlier in the morning and had noted mine noise from the Winchester Cres area however road noise dominated the acoustic environment.
337.	26th June 2012	Ulan Road	Noise	The complainant rang to complain about noise at 3:30am. LF noise at Lagoons Road was between 39.1-40.3dB and between 28.7-31.6dB at Winchester Crescent. The hand held noise monitor recorded between 21.3-24.4dB at the location of the complaint.
338.	28th June 2012	Ulan Road	Noise	The complainant rang to complain about noise at 4:39am on 28/06/12. EX101 was operating in S02B10 hauling to RL470 dump and EX111 was operating in S04B37 hauling to ROM. LF noise was 33.4dB at Lagoons Road and 33.0dB at Winchester Crescent. Wind speed was between 0.1-2.2m/s from the east. The Production Assistant drove to the location of the complaint. Regular road traffic, crickets and breeze blowing in the trees were the dominant sounds. Mine noise was not heard at all. There was a follow up complaint at 9:00am. The ECRC drove to the complainant's house immediately and noted very faint noise (barely audible) from the east (Wilpinjong). A message was left with the complainant to discuss the complaint and noise noted by the ECRC.
339.	28th June 2012	Ulan Road	Noise	The complainant rang at 9:14pm on 28/06/12. EX101 was operating in S03B10 hauling to RL460 dump and EX111 was operating in S04B37 hauling to the ROM. LF noise at Lagoons Road was 34.9dB and 32.0dB at Winchester Crescent. The Production Assistant drove to the complaint location. The hand held noise monitor read between 32.7-33.1dB at the complaint location. Crickets were the dominant sound with occasional road noise. General rumble of mine heard only when road traffic was absent.
340.	28th June 2012	Maiala Road	Noise	The complainant rang to complain about noise at 9:35pm on 28/06/12. EX101 was operating in S03B10 hauling to RL460 dump and EX111 was operating in S04B37 hauling to the ROM. LF noise at Lagoons Road was 35.9dB and was 34.3dB at Winchester Crescent. The wind speed was 0.0-1.3m/s from the east. The Production Assistant drove to the complaint location. Crickets were dominant, mine rumble with thumps audible. Both were much louder here than at all previous locations stopped at (Lagoons Road, Winchester Crescent, Ulan Road). Unable to get a reading from hand held monitor due to loud cricket noise. The PA then drove back from the complaint location to Ridge Road and stopped approximately in line with the complainant's address (between complaint location and MCO). Mine noise was heard coming distinctly from the West, road traffic on Ulan Road could be heard as a separate sound coming from the East of the mine noise. Mine noise not as loud at this location as at complainants. Based on these observations the noise source was most likely UCML.
341.	7th July 2012	Ulan Road	Noise	The complainant rang to complain about noise at 1:16am on 07/07/12. EX101 was operating in S02B10 hauling to RL480 dump and EX111 was operating in S05B24 hauling waste to RL453 dump. LF noise

Number	Date	Location	Issue	Investigation and Follow Up
				was 34.1dB at Lagoons Road and was 30.7dB at Winchester Crescent. The wind speed was between 0.0-1.3m/s from SE.
342.	8th July 2012	Ulan Road	Noise	The complainant rang to complain about noise at 1:01am on 08/07/12. There was a follow up complaint at 3:51am. EX101 was operating in S02B10 hauling to RL470/480 dump. LF noise at Lagoons Road was 30.8dB and 32.4-35.5dB for the two complaints respectively. At Winchester Crescent the LF noise levels were 27.7dB and 28.1-28.2dB respectively. Wind speed was between 0.0-0.9m/s from NE.
343.	9th July 2012	Winchester Crescent	Noise	The complainant rang to complain about noise at 8:49pm on 09/07/12. EX101 was operating in S02B10 hauling to RL480 dump and EX111 was operating in S04B35 hauling to ROM. LF noise at Lagoons Road was between 31.6-34.4dB and between 34.1-35.4dB at Winchester Crescent. The Production Assistant drove to the complaint location where road traffic noise and numerous dogs barking were the dominant sound. Mine rumble was audible only when there was no road traffic. The hand held noise monitor was reading between 28.0-30.2dB at the location of the complaint.
344.	10th July 2012	Ridge Road	Noise	The complainant rang to complain about noise at 1:15am on 10/07/12. EX101 was operating in S02B10 hauling to RL480 dump. LF noise at Lagoons Road was 30.0dB and 26.2dB at Winchester Crescent. The hand held noise monitor was reading between 29.8-33.4dB at the location of the complaint. The Production Assistant drove to the complaint location and noted that the breeze in the trees and crickets were the dominant noise. Mine noise was faintly audible and they could hear the drone and dozer track coming from UCML and general hum coming from MCO. These were two different sounds. Complainant could not be contacted the following day.
345.	11th July 2012	Ridge Road	Blasting	Caller rang to complain about blasting at 1:00pm on the 11/07/12. MCO had fired an overburden shot at 1:00pm in S04B16. The complainant mentioned they had not received any warning prior to the blast. The ECRC spoke to the complainant and discussed MCO's obligations on blast notification and reminded the resident that information regarding blasting activities is available on the MCO website.
346.	12th July 2012	Ulan Road	Noise	The complainant rang to complain about noise at 2:14am on 12/07/12. EX101 was operating in S02/03B10 hauling to RL450 dump. LF noise was 37.2dB at Lagoons Rd and 26.0dB at Winchester Crescent. The Production Assistant drove to the complaint location. Crickets were the dominant sound with general mine rumble also audible. The hand held noise monitor was reading between 34.6-35.2dB at the complaint location.
347.	16th July 2012	Ridge Road	Blasting and Noise	MCO received an email from a complainant on the 16/07/12 complaining about noise and blasting in general.
348.	17th July 2012	Ridge Road	Noise	The complainant rang to complain about noise at 2:04am on 17/07/12. EX101 was operating at S02B11 hauling to RL470 dump and EX111 was operating in S05B24 hauling to the ROM. LF noise at Lagoons Road was between 35.3-36.1dB and between 27.3-27.3dB at Winchester Crescent. There

Number	Date	Location	Issue	Investigation and Follow Up
				was no wind present. The Production Assistant drove to complaint location. General mine hum was audible with UCML dozer track audible. Occasional crashing sound from UCML was audible, and occasional truck retard from MCO audible. Cricket's were also audible and were the dominant sound heard. The ECRC left a message on the complainant's phone at 9:15 am on the 17/07/12 to call back to discuss actions taken by MCO during the shift.
349.	20th July 2012	Winchester Crescent	Noise	The complainant rang to complain about noise at 10:56pm on 20/07/12. EX101 was operating in. S02/03B10 and EX111 was operating in S05B24. LF noise at Winchester Crescent was 30.9dB. The Production Assistant drove to complaint location at 11:10pm. General mine noise hum was faintly audible. Dogs barking and ongoing road traffic was dominant sound. When there were no cars or dogs barking, the noise on the handheld noise monitor was below 30dB. The ECRC spoke with the complainant on the 24/07/12 at 11:15 am to discuss the complaints and noise monitoring programs currently being undertaken in the Winchester Crescent area.
350.	20th July 2012	Ridge Road	Noise	The complainant rang to complain about noise at 10:59pm on 20/07/12. EX101 was operating in S02/03B10 and EX111 was operating in S05B24. LF noise at Winchester Crescent at 11:00pm was 32.1dB. The Production Assistant drove to top of Ridge Road at 11:40pm. General mine noise hum was faintly audible. Crickets and occasional road traffic were the dominant sounds. Handheld noise monitor was approx 29-32dB. A message was left with the complainant on the 23/07/12.
351.	20th July 2012	Ulan Road	Noise	The complainant rang to complain about noise at 11:20pm on 20/07/12. EX101 was operating in S02/03B10 and EX111 was operating in S05B24. LF noise at Winchester Cr was 32.1dB. The Production Assistant drove to Ulan Road area at 11:20pm. General mine noise hum was faintly audible. Crickets and occasional road traffic were the dominant sound. Handheld noise monitor was approx 29-32dB. Drove to corner of Ridge Rd/Ulan Rd. Mine hum noise faintly audible. A message was left with the complainant on the 23/07/12.
352.	24th July 2012	Ridge Road	Noise	The complainant rang to complain about noise at 3:30am on 24/07/12. EX101 was operating in S03B17 hauling to the inpit ramp dump and EX111 was operating in S05B23 hauling to the ROM. LF noise at Winchester Cr was 28.4dB. The Production Assistant drove to top of Ridge Road at 3:45am. General mine rumble noise was dominant, crickets were faintly audible. Handheld noise monitor was below 30dB. Complainant could not be contacted the following day and was left a message.
353.	13th August 2012	Ulan Road	Noise	The complainant rang the MCO complaints line on 13/08/12 at 1:55am to complain about noise. There was a follow up complaint at 4:13am. EX101 was operating in S03B14 hauling to RL480 dump. EX111 was operating in S05B23 hauling to ROM. LDR121 was operating in S05B19 hauling to RL455 dump. For the first complaint LF noise at Lagoons Road was between 20.7-22.4dB and between 24.5-31.8dB at Winchester Crescent. Wind speed was between 0.3-1.4m/s from the SSW. The Production Assistant

Number	Date	Location	Issue	Investigation and Follow Up
				visited the area of the complaint and observed that mine hum was faintly audible. Occasional dogs barking and crickets were audible. The noise results on the hand held noise monitor averaged between 25-29dB. For the second complaint LF noise at Lagoons Road was between 24.5-30.6dB and between 29.1-34.5dB at Winchester Cres. Wind speed was between 0.4-1.2m/s from the SSW. The Production Assistant listened to the audio and observed that traffic noise was dominant. Attempts to contact the complainant have been unsuccessful.
354.	21st August 2012	Ulan Road	Noise	Complainant contacted the complaints line on 21/08/12 at 2:42am to complain about noise. EX101 was operating in S03 B21 hauling to 470RL dump and EX111 was operating in S02B14 hauling to the ROM. LF noise was 30.7dB at Lagoons Road and 35.2dB at Winchester Crescent. The Production Assistant visited the area of the complaint and observed that mine rumble was faintly audible with crickets being the dominant sound. The handheld noise monitor averaged 29-33dB for 15 minutes. The complainant could not be contacted the following day.
355.	21st August 2012	Ulan Road	Noise	Complainant called the complaints line on 21/08/12 at 10:52pm to complain about noise. EX101 was operating in S03B21 and EX111 was operating in S02B13. LF noise at Lagoons Road was 39.0dB and was 32.9dB at Winchester Crescent. The Production Assistant had been in the area 20 minutes prior to the complaint and observed that mining noise was not audible. Following the complaint they returned to the area and noted that dogs barking were the dominant sound with occasional road traffic. Mine hum was faintly audible. The hand held monitor average between 29-31dB. EX101 was parked up at 11:10pm with no noticeable difference to noise levels.
356.	22nd August 2012	Winchester Crescent	Noise	Complainant contacted the complaints line on 22/08/12 at 9:38pm to complain about noise. EX101 was operating in S03B21 with hauling to RL480 dump. EX111 was operating in S02B13 hauling to the ROM. LF noise at Lagoons Road was 35.1dB and was 32.8dB at Winchester Crescent. The Production Assistant drove to the area of the complaint and observed that mine hum was faintly audible and that road traffic was the dominant sound when present. Mine rumble was from the direction of MCO/UCML with UCML wash plant audible. The complainant was left a message the following day.
357.	27th August 2012	Ulan Road	Noise	The complainant rang to complain about noise at 3:59am on 27/08/12. EX101 was operating in S04B20 hauling to the RL430 dump and EX111 was operating in S02B10 hauling to the RL430 dump. LF noise at Lagoons Road was between 36.0-37.1dB and between 29.3-29.6dB at Winchester Crescent. The hand held unit at the location of the complaint was between 24.3-28.6dB. There was no wind present. The Production Assistant drove to the complaint location. Road traffic was regular. Mine noise audible only when road traffic absent, crickets also audible. Attempts to contact the complainant have been unsuccessful. A detailed message has been left for them with a request to call back.

Number	Date	Location	Issue	Investigation and Follow Up
358.	28th August 2012	Ulan Road	Noise	The complainant rang to complain about noise at 3:59am on 28/08/12. EX101 was operating in S03B20 hauling to RL425 dump and EX111 was operating in S05B21 hauling to the ROM. LF noise was between 36.3-37.5dB at Lagoons Road and between 26.8-27.6dB at Winchester Crescent. The Production Assistant drove to the location of the complaint and observed that crickets were the dominant sound. Mine rumble and a rooster crowing were also audible. The hand held unit at the location of the complaint read between 24.1-27.7dB. Between 2:30am and the time of the complaint the PA had been observing the noise environment in the community. As a result of their observations MCO had already relocated the dump trucks to a lower location and had slowed the dozers down. The PA had also observed mining noise from UCML in the form of rumbling, crashing and thumping noises. They had also observed dragline noise from UCML. Attempts to contact the complainant have been unsuccessful. A detailed message has been left.
359.	28th August 2012	Ridge Road	Noise	The complainant rang to complain about noise at 10:02pm on 28/08/12. EX101 was operating in S03B20 hauling to RL425 dump. EX101 was in the process of being shut down at the time of the complaint with the last truck coming off the dump at 10:00pm. EX111 was operating in S05B21 with hauling to the ROM. LF noise at Lagoons Road was between 39.3-40.9dB and between 31.1-34.1dB at Winchester Crescent. Wind speed was between 0.1-0.2m/s from WSW. The Production Assistant drove to the location of the complaint. Mine drone was audible with UCML dozer distinct. Crickets dominant sound with road traffic dominant when present (on and off while at this location). Attempts to contact the complainant have been unsuccessful. A message has been left asking them to call back to discuss further.