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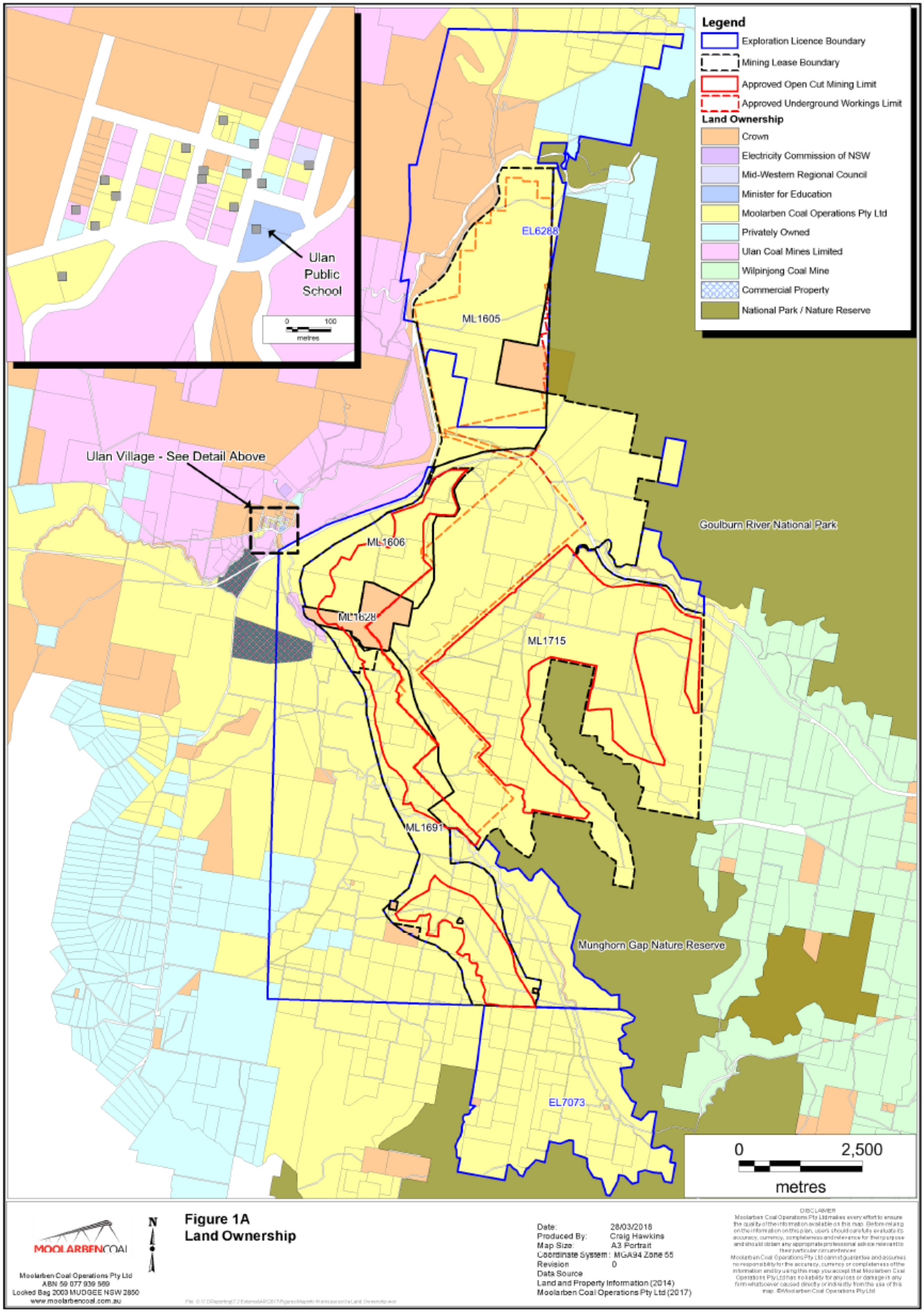


Figure 1-a Land Ownership

APPENDIX 2. MONITORING LOCATIONS

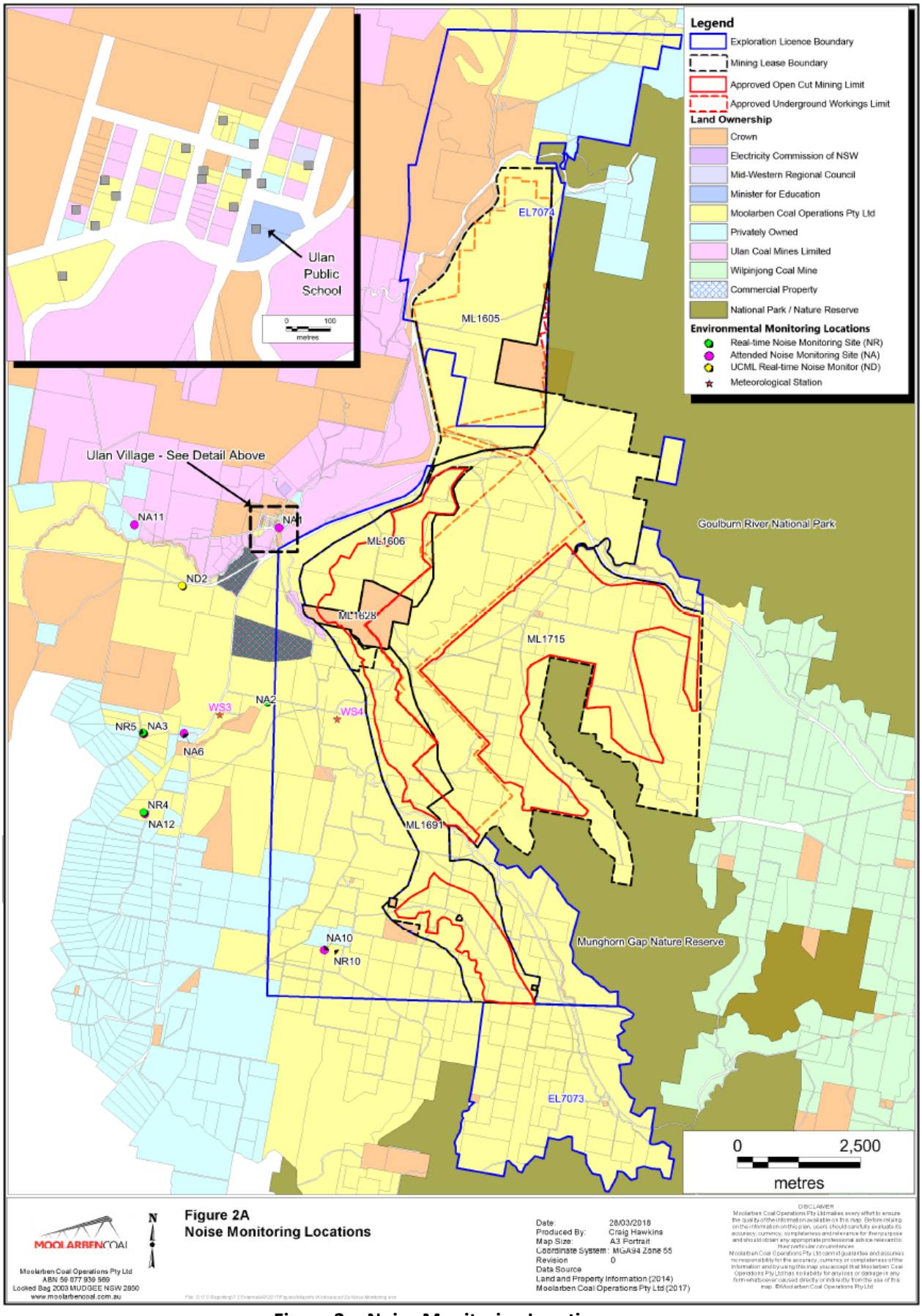


Figure 2-a Noise Monitoring Locations

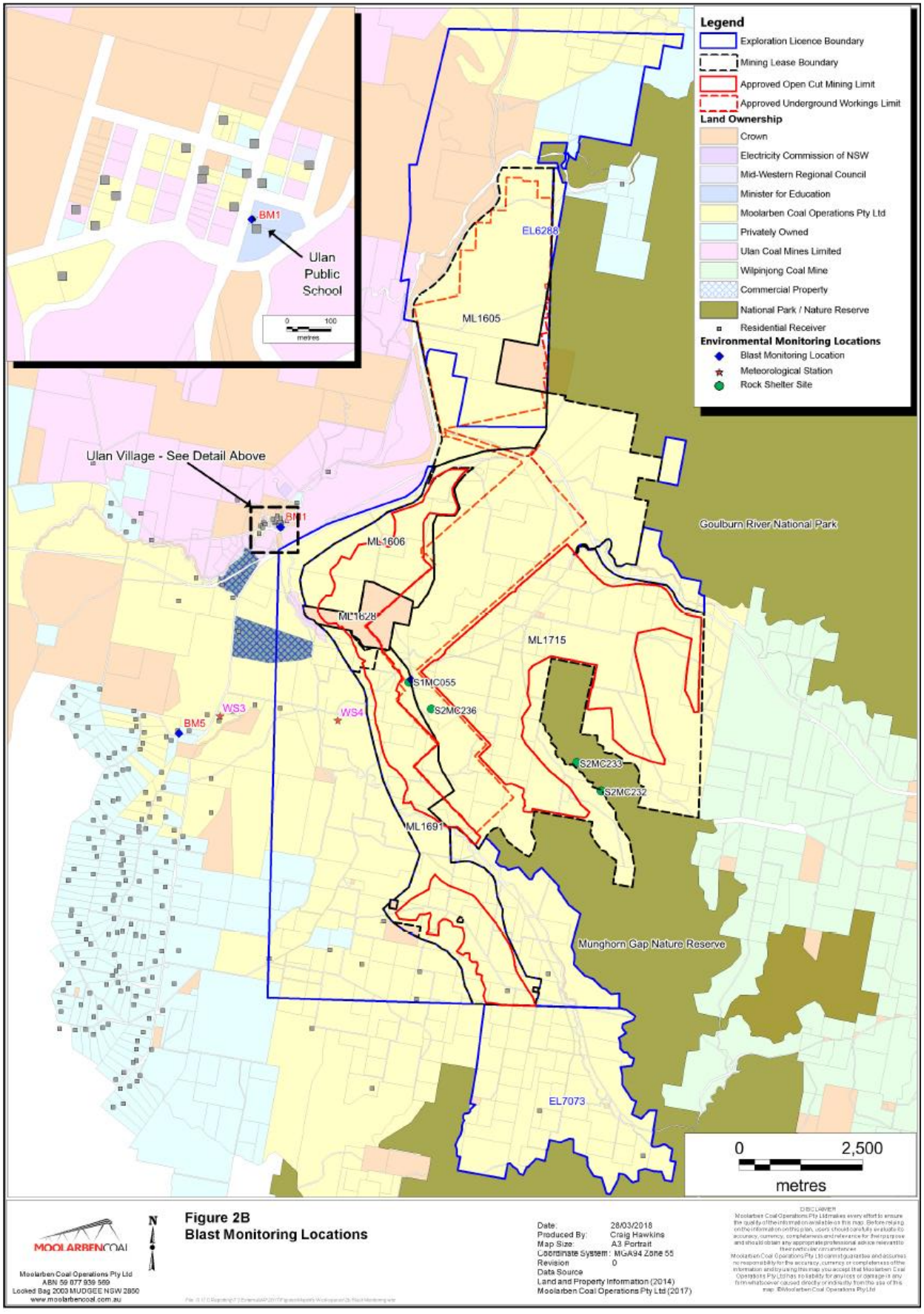
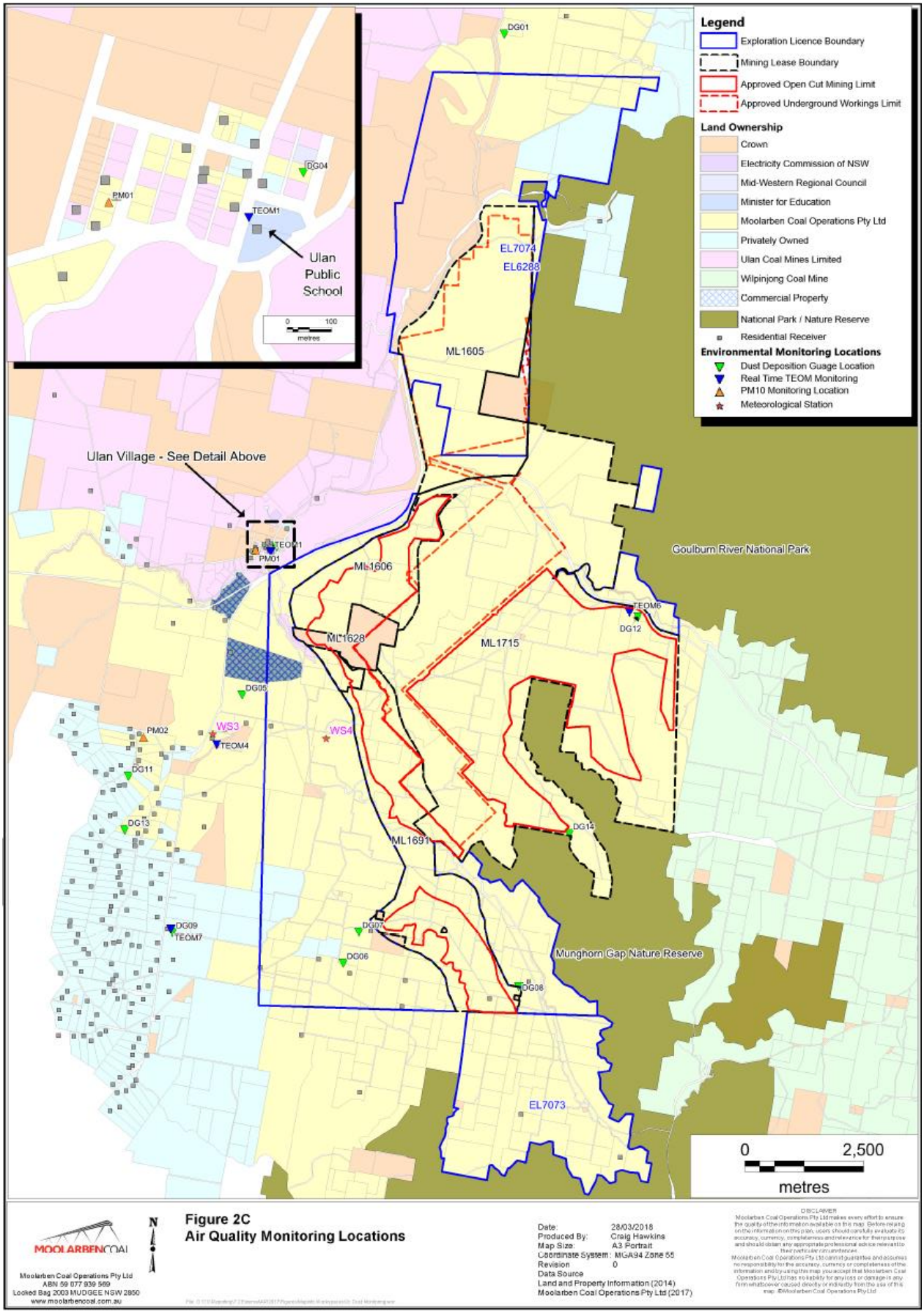


Figure 2-b Blast Monitoring Locations



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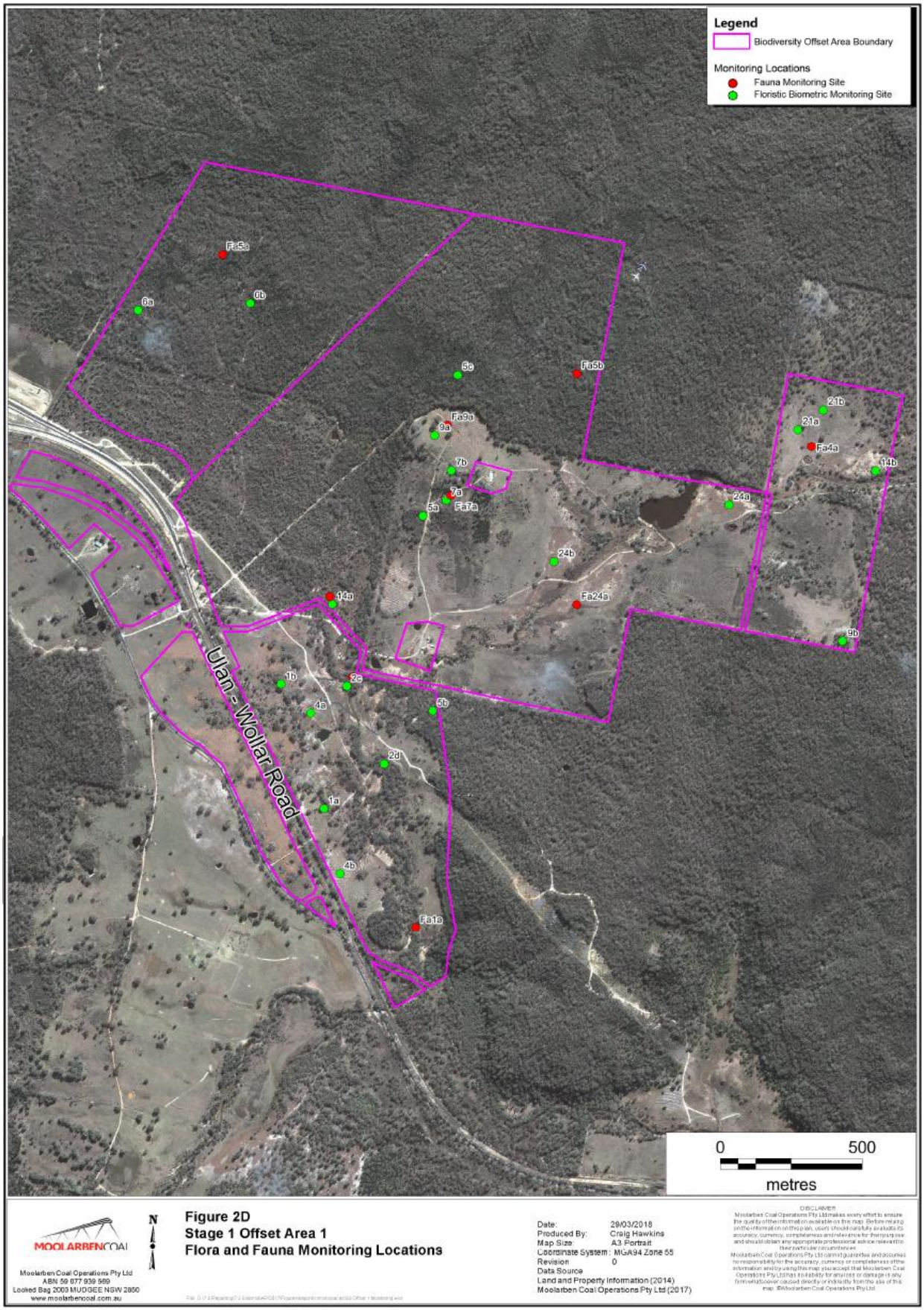


Figure 2-d MCO Stage 1 Offset Area 1 monitoring site locations

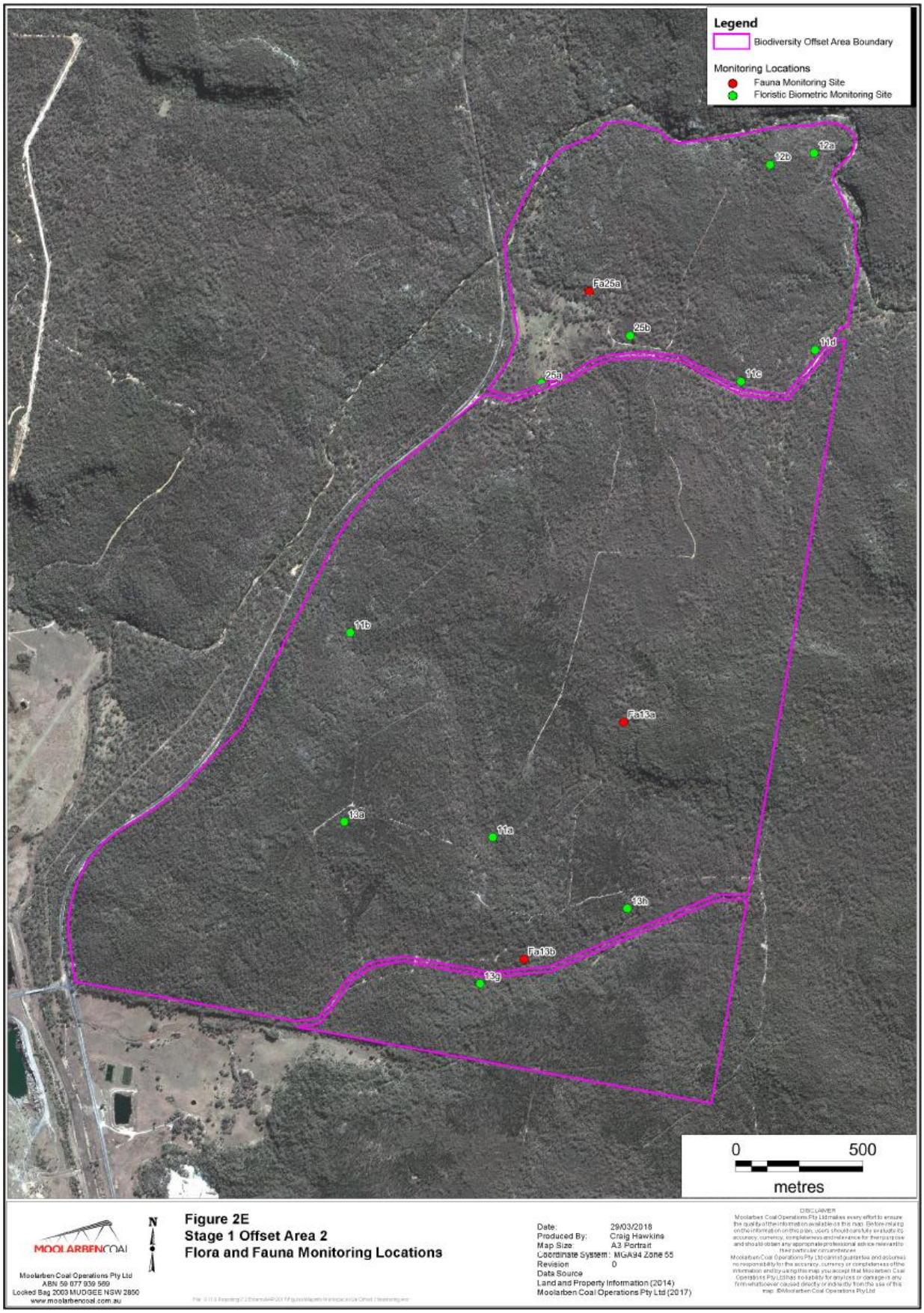


Figure 2-e MCO Stage 1 Offset Area 2 monitoring site locations

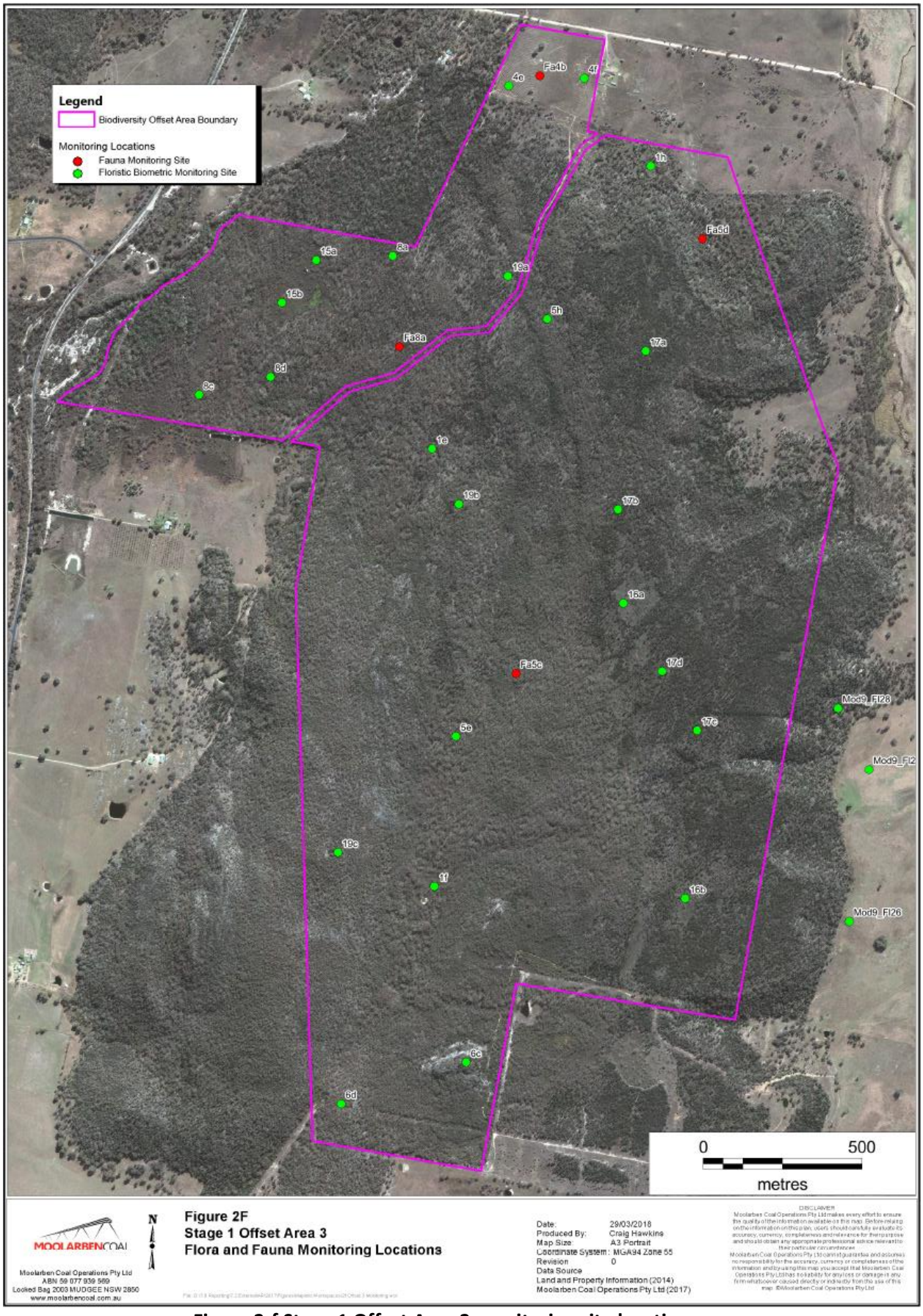


Figure 2-f Stage 1 Offset Area 3 monitoring site locations

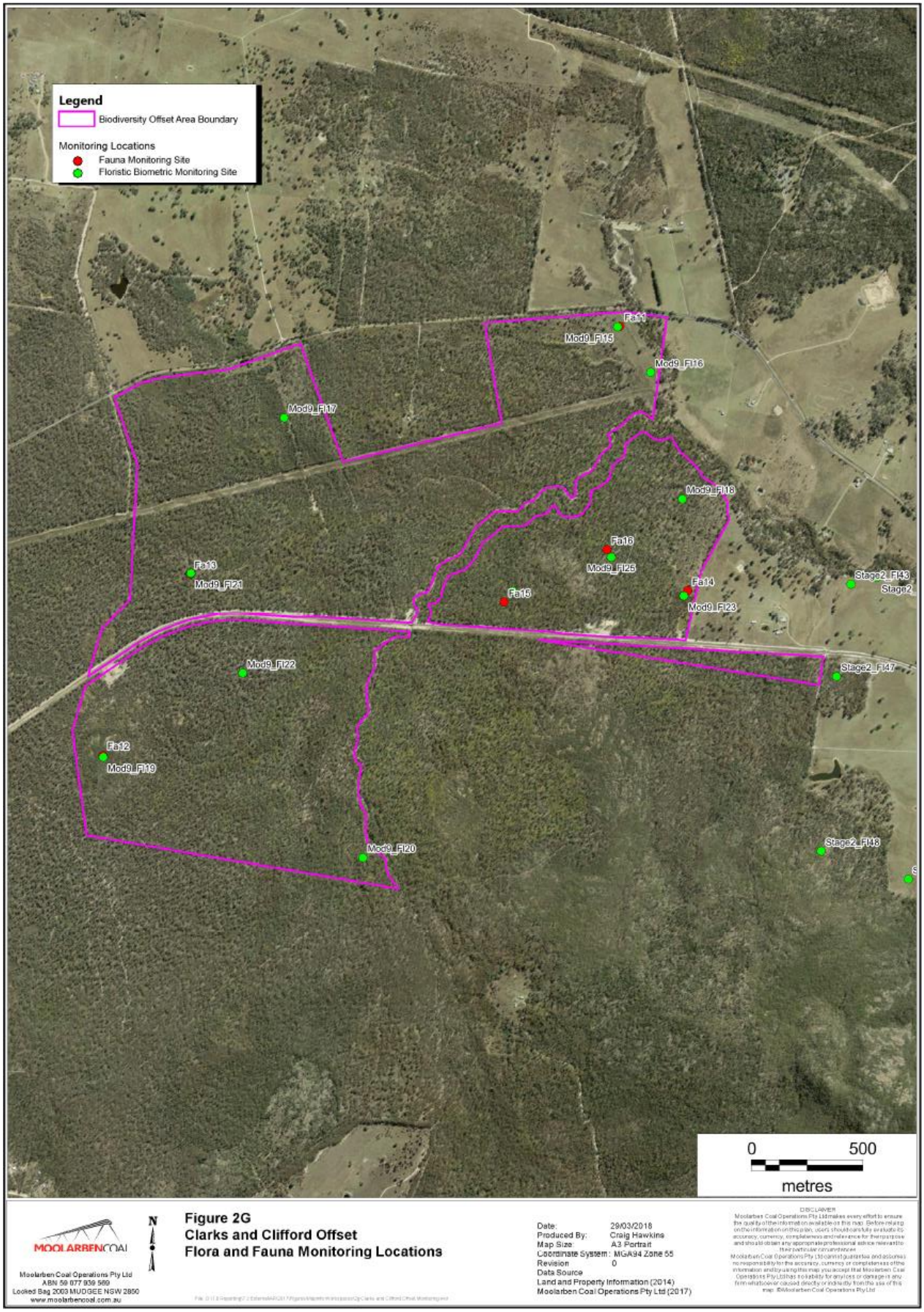


Figure 2-g Clarks and Clifford Offset monitoring site locations

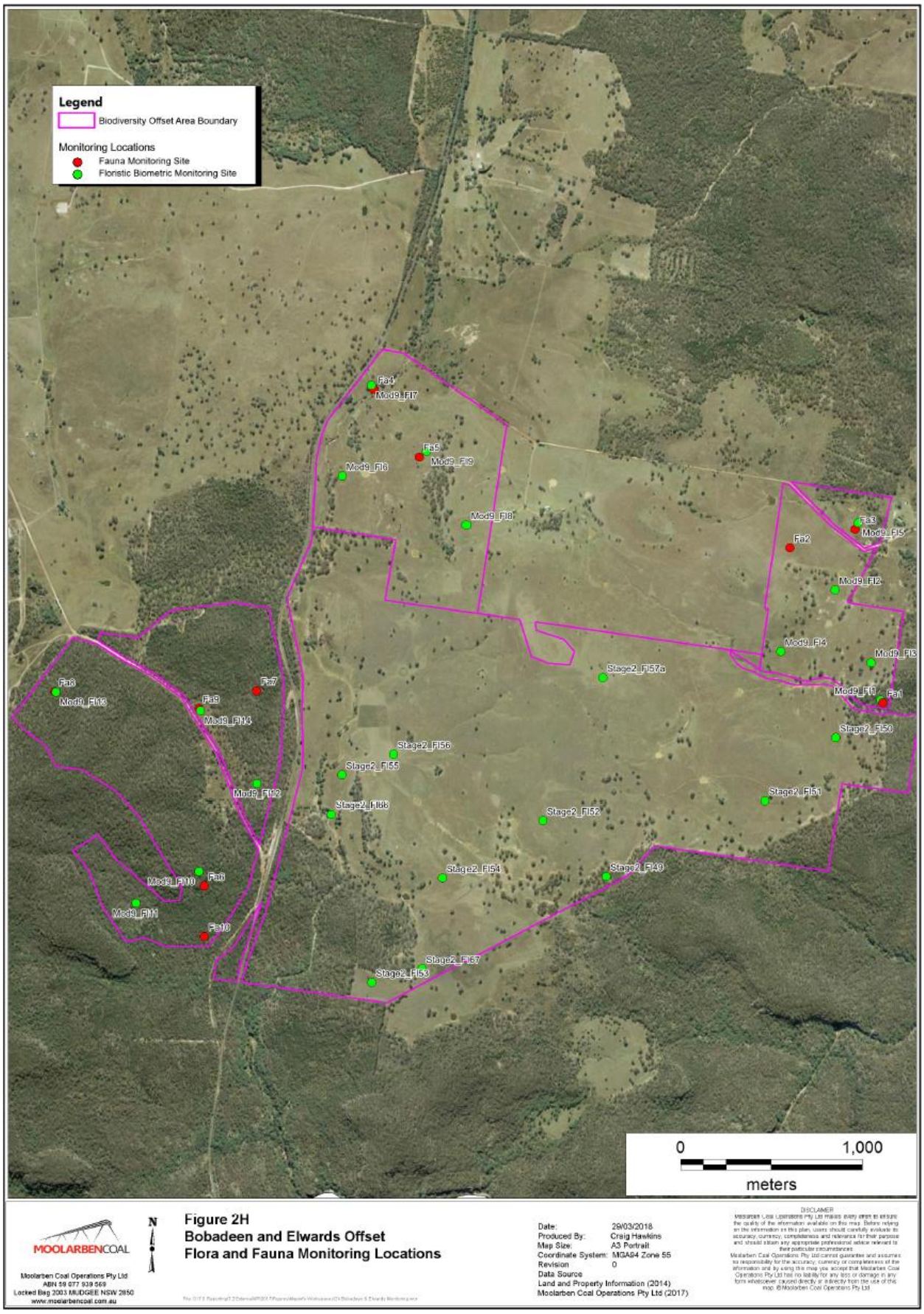


Figure 2-h Bobadeen and Elwards Offset monitoring site locations

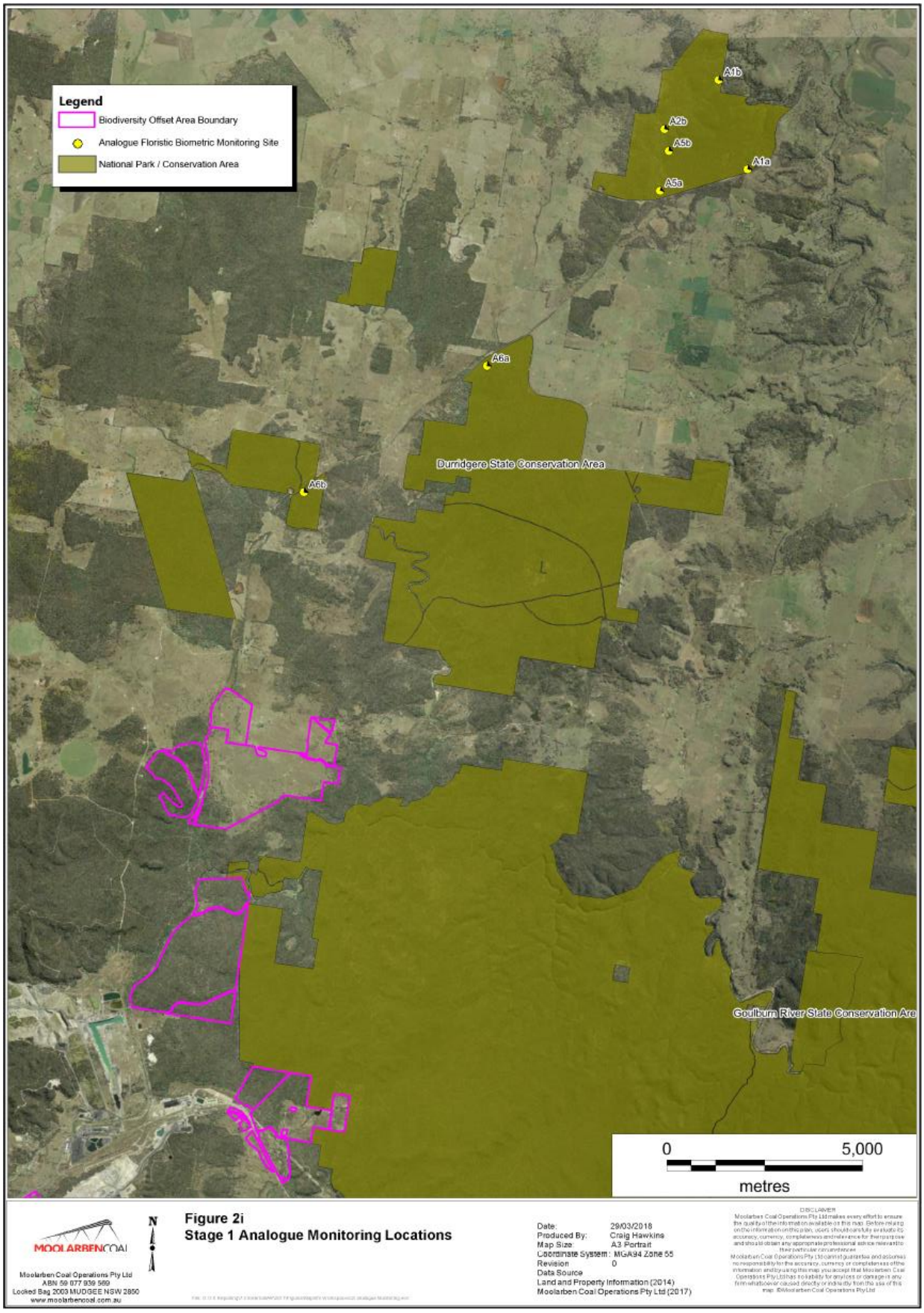


Figure 2-i MCO analogue monitoring site locations

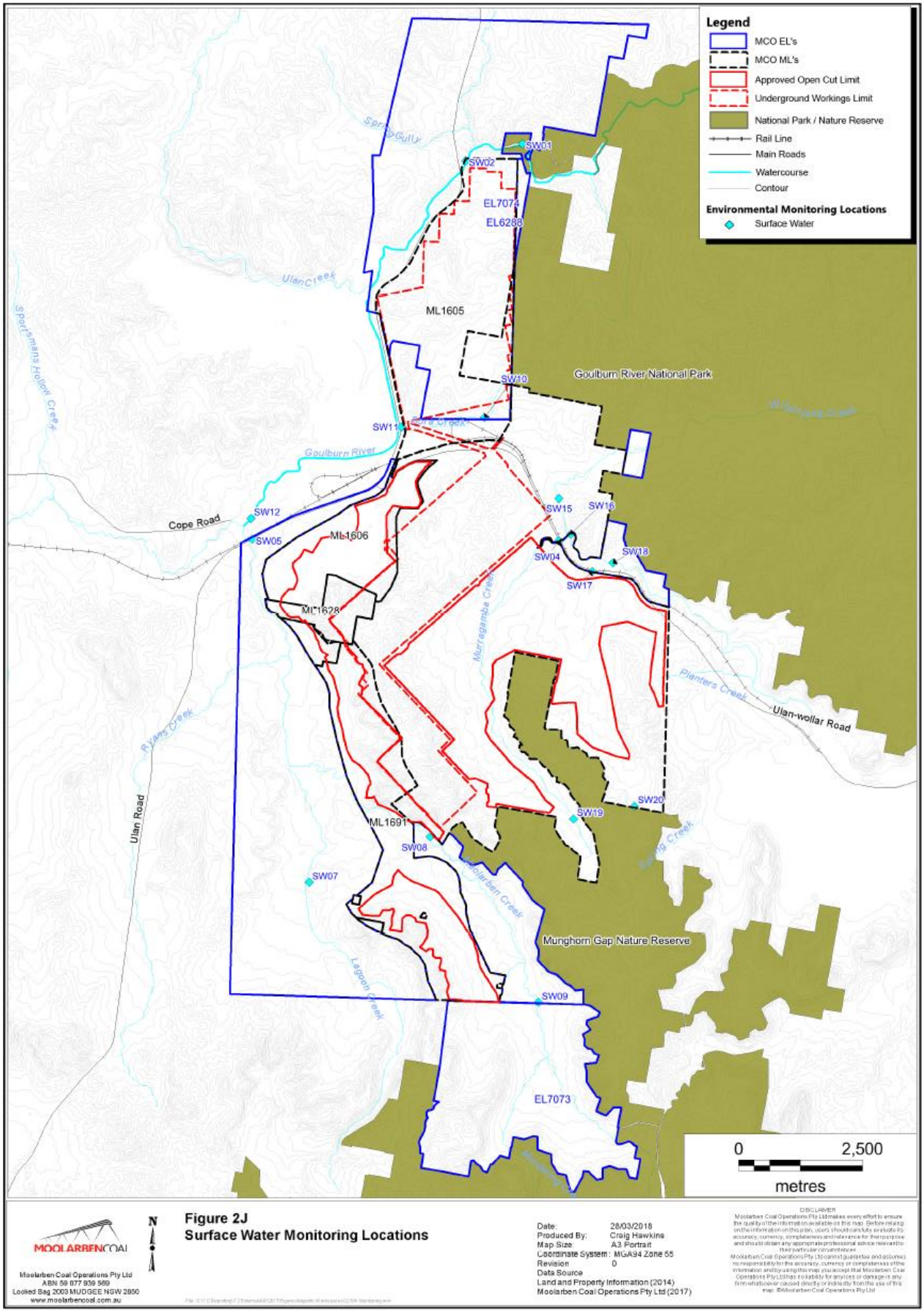


Figure 2-jSurface Water Monitoring Locations

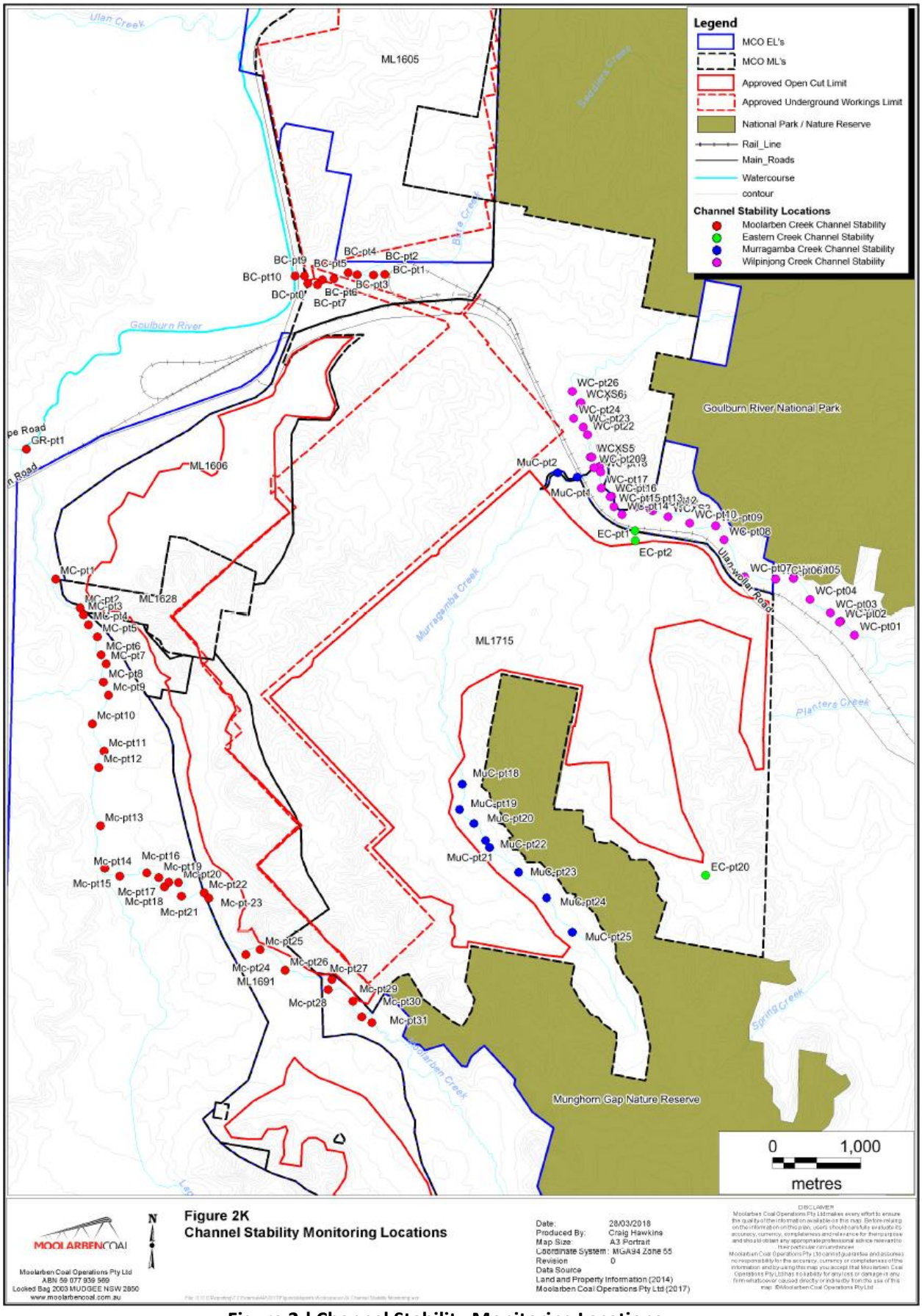


Figure 2-kChannel Stability Monitoring Locations

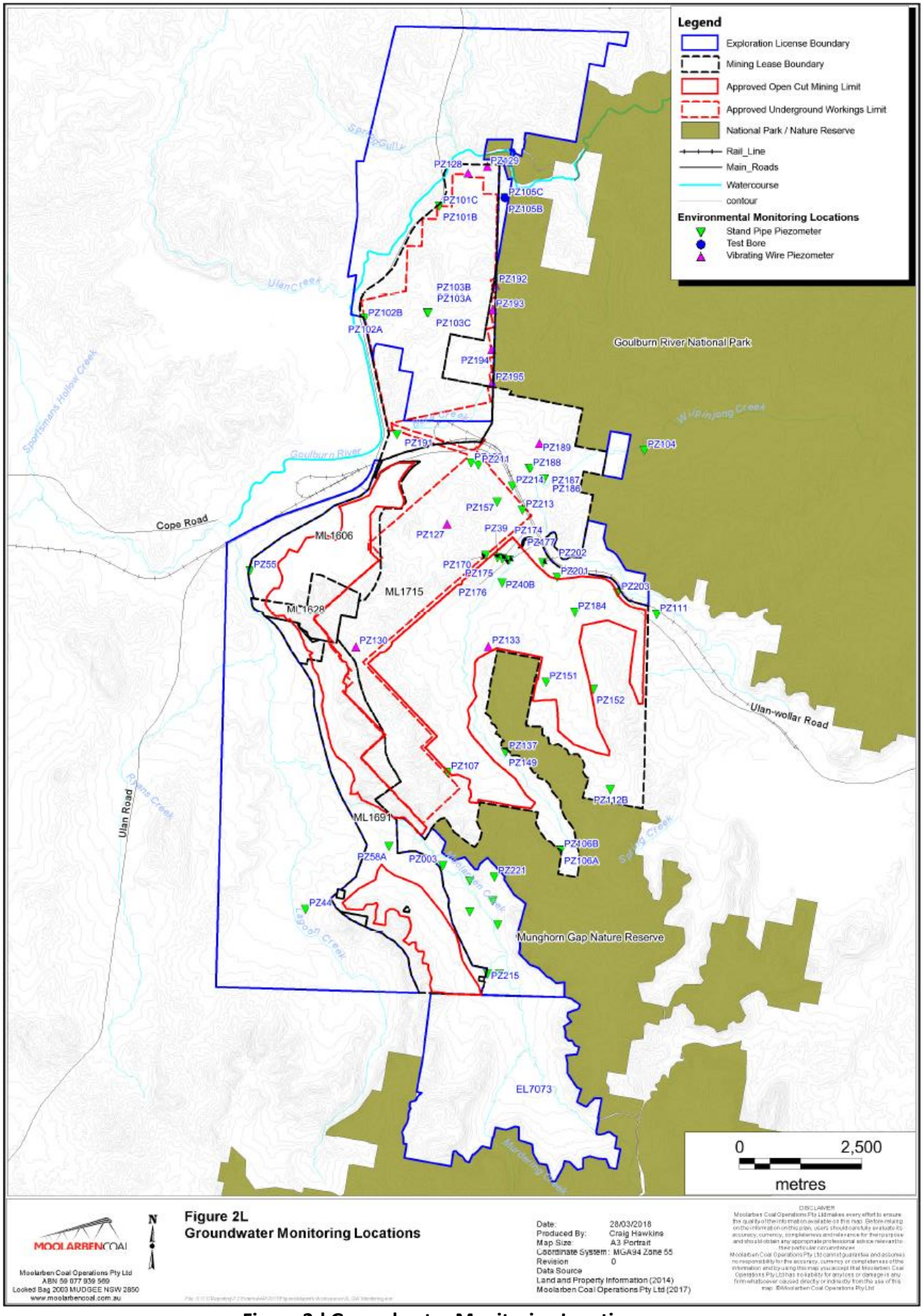


Figure 2-l Groundwater Monitoring Locations

Figure 2-m Location of floristic and Fauna monitoring sites

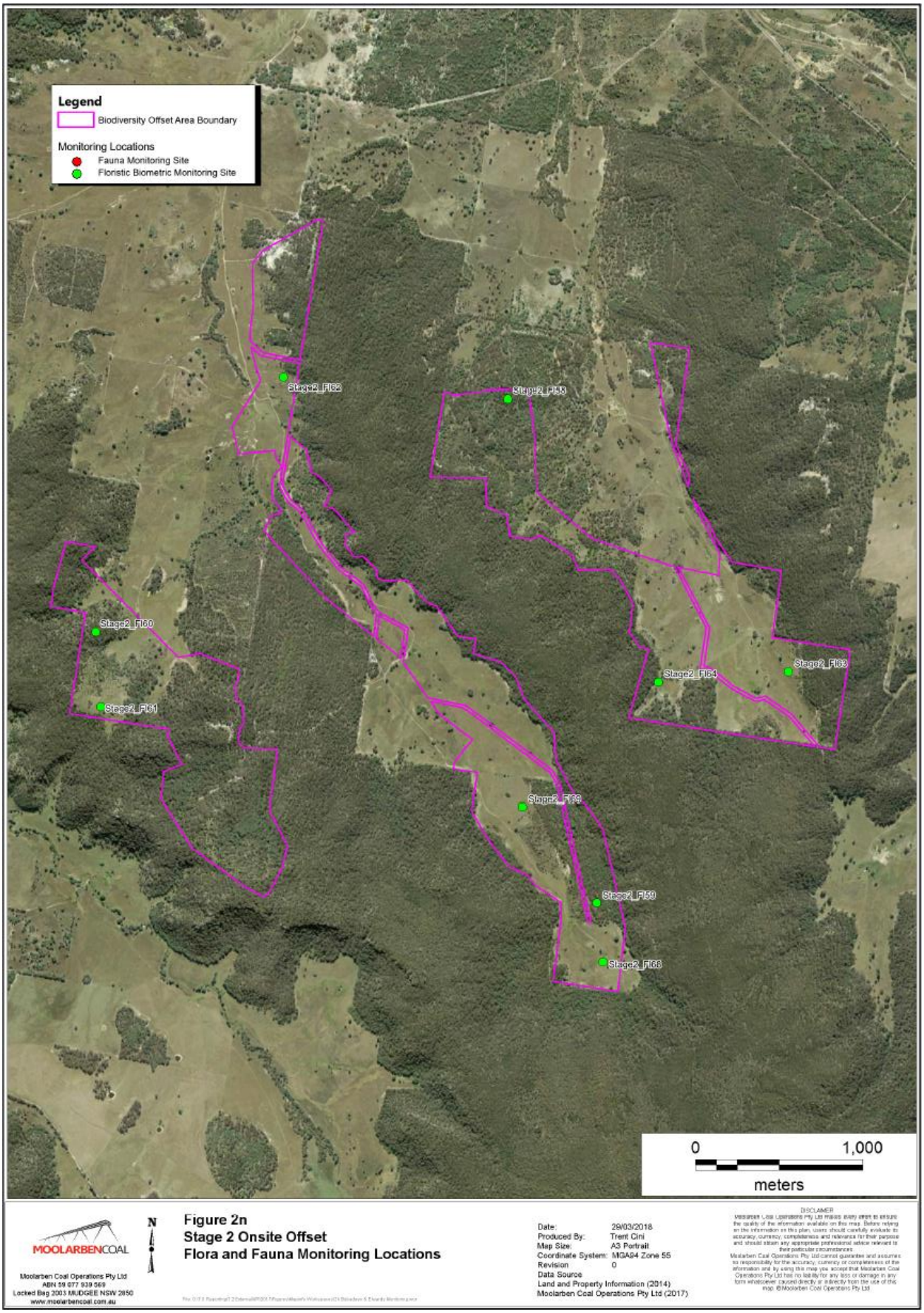


Figure 2-n Stage 2 Onsite Offset Flora and Fauna Monitoring Locations

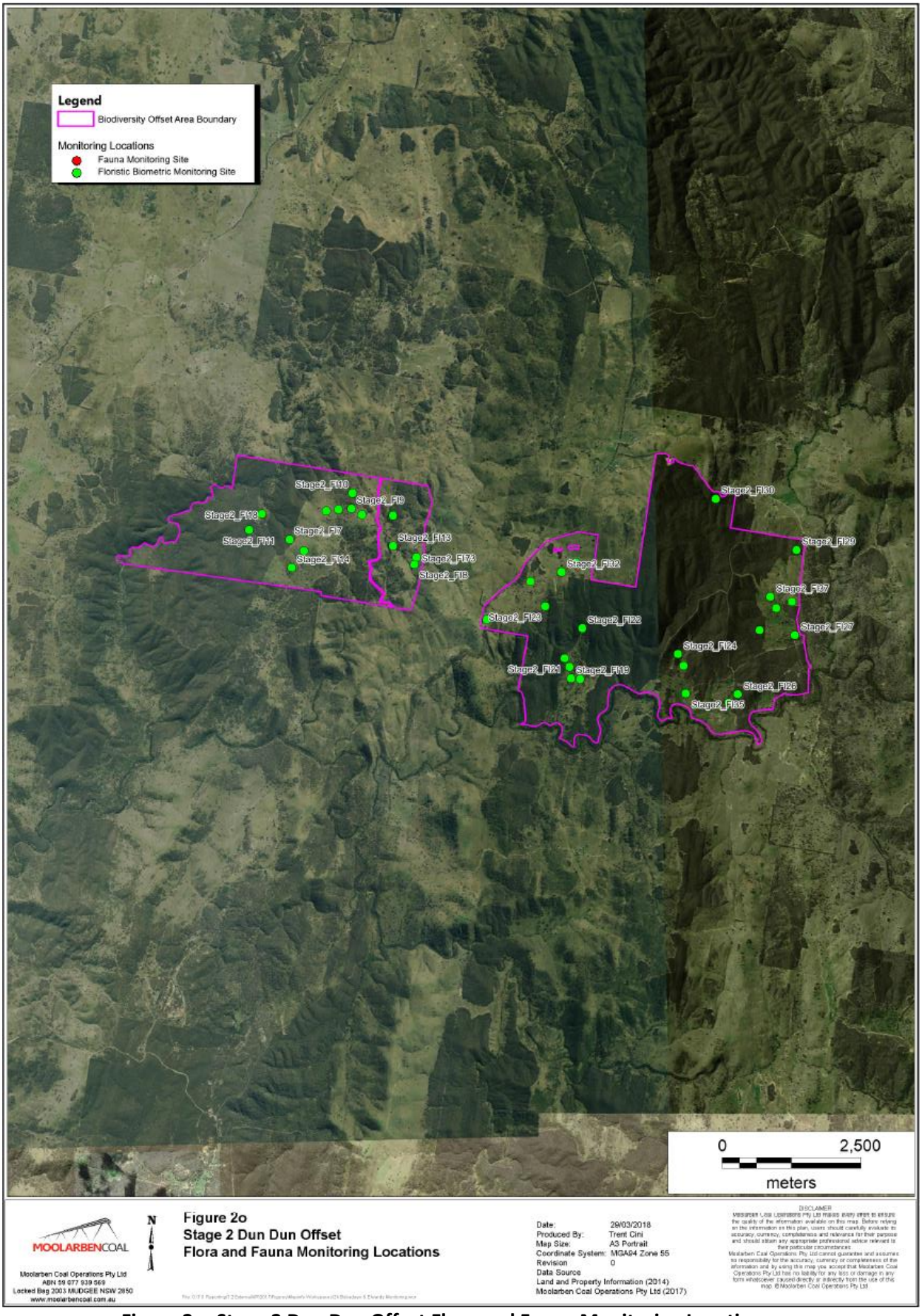


Figure 2-o Stage 2 Dun Dun Offset Flora and Fauna Monitoring Locations

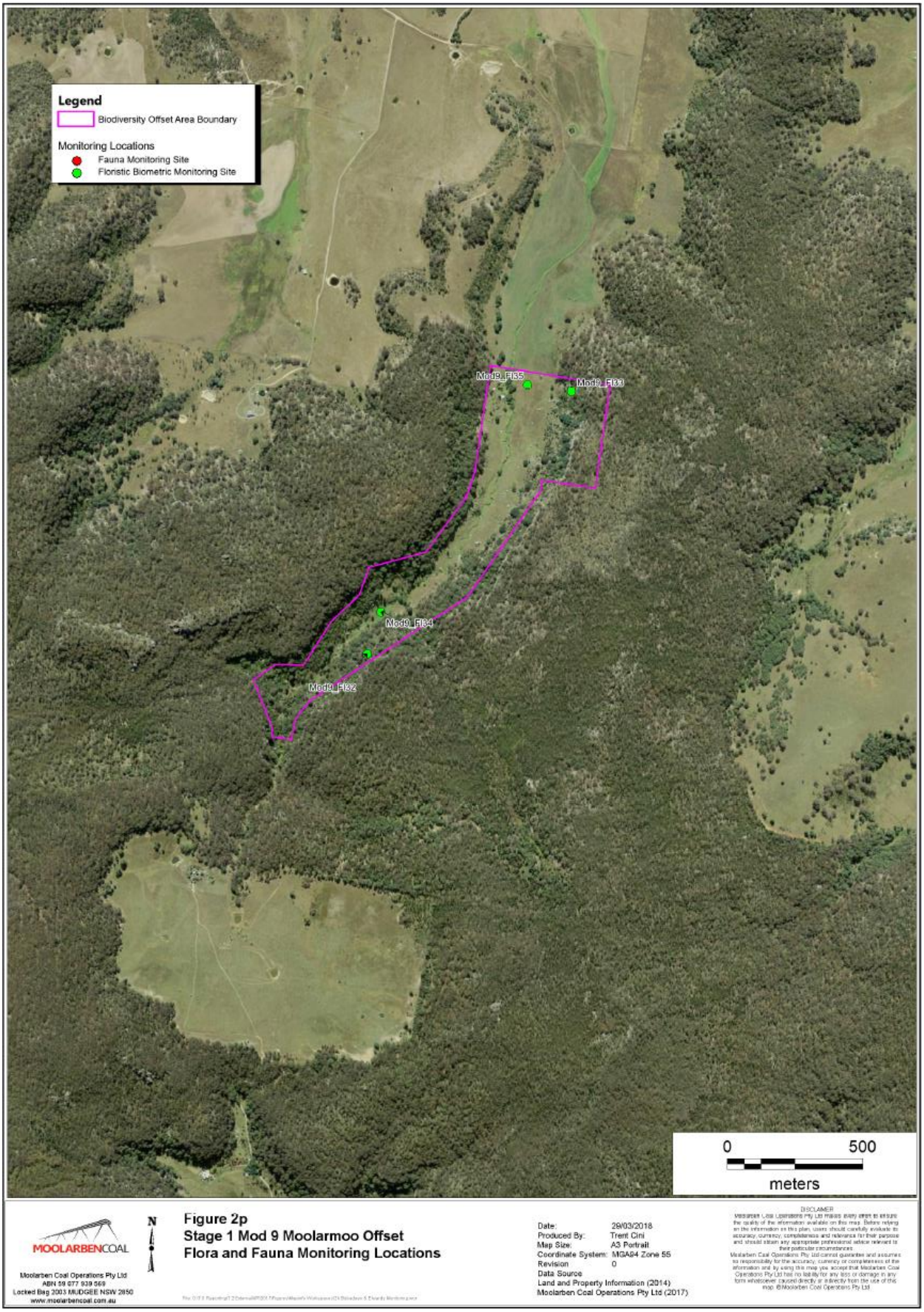


Figure 2-p Stage 1 Mod 9 Moolarmoo Offset Monitoring Locations

APPENDIX 3. MONITORING DATA

APPENDIX 3A. DAILY METEOROLOGICAL DATA (WS03)

Date	Temperature (2m) (ºC)		Temperature (10m) (ºC)		Relative Humidity	Rain
	Min	Max	Minimum	Maximum	Average	(mm)
01/01/17	19.7	27.8	20.5	27.2	77.8	0.8
02/01/17	17.2	33.2	17.7	32.4	64.5	0.6
03/01/17	15.6	27.1	16.1	26.2	60.2	0.0
04/01/17	16.6	25.7	16.8	24.8	60.9	0.0
05/01/17	17.2	30.5	17.4	29.6	60.9	0.0
06/01/17	13.5	30.5	14.4	29.6	58.8	0.0
07/01/17	15.5	31.2	16.4	30.1	56.5	0.0
08/01/17	13.6	34.4	14.5	33.9	52.9	0.0
09/01/17	17.2	38.6	18.0	36.9	39.8	0.0
10/01/17	21.7	36.6	21.8	35.4	44.4	0.2
11/01/17	21.4	35.0	22.1	34.0	50.4	0.0
12/01/17	18.7	39.9	20.3	38.9	55.2	0.0
13/01/17	19.7	41.2	19.9	40.0	46.5	0.0
14/01/17	21.6	34.2	23.2	33.6	39.9	0.0
15/01/17	15.5	27.8	17.3	26.9	62.1	0.0
16/01/17	13.6	36.7	14.6	35.7	55.0	0.0
17/01/17	20.6	39.4	21.4	38.0	45.6	0.2
18/01/17	21.6	39.5	21.7	38.1	49.6	5.6
19/01/17	18.6	29.5	18.4	28.7	67.2	0.0
20/01/17	17.4	29.2	17.5	28.2	80.0	15.8
21/01/17	14.9	30.4	15.3	29.2	67.0	0.2
22/01/17	16.3	32.9	16.5	31.3	52.5	0.0
23/01/17	16.4	36.4	17.0	34.6	56.1	0.0
24/01/17	22.2	36.8	24.7	36.0	51.5	0.0
25/01/17	18.0	24.7	17.9	24.8	51.5	9.4
26/01/17	18.7	27.6	18.7	26.8	81.7	0.4
27/01/17	19.3	31.0	19.5	30.5	65.6	0.0
28/01/17	15.1	36.0	15.8	34.6	60.8	0.0
29/01/17	18.3	37.1	19.2	35.9	65.9	6.0
30/01/17	19.3	37.5	20.0	36.5	57.1	0.0
31/01/17	22.0	39.7	23.8	38.7	42.3	0.0
01/02/17	22.1	39.4	22.1	38.8	58.9	1.2
02/02/17	21.2	32.9	21.4	32.0	65.2	0.2
03/02/17	20.5	33.5	20.7	32.2	68.1	0.0
04/02/17	21.4	38.8	22.1	38.0	69.9	5.8
05/02/17	20.3	38.6	20.8	36.8	61.3	0.0
06/02/17	16.6	39.8	18.5	38.5	42.7	0.0
07/02/17	22.3	32.6	22.4	31.6	68.5	12.4
08/02/17	20.6	29.7	20.7	29.0	68.7	0.0
09/02/17	20.0	35.9	20.3	34.9	58.5	0.0
10/02/17	16.1	41.1	17.0	40.6	45.1	0.0
11/02/17	20.3	44.0	21.7	42.7	38.3	0.0
12/02/17	21.8	42.2	22.3	41.6	31.1	0.0
13/02/17	14.4	30.6	14.8	29.8	28.1	0.0
14/02/17	18.7	30.8	18.8	29.2	52.1	0.0
15/02/17	16.7	32.2	16.8	30.4	59.0	0.0
16/02/17	14.3	35.6	15.4	33.8	52.3	0.0
17/02/17	17.4	36.0	19.0	34.3	67.2	27.8
18/02/17	16.6	35.8	17.2	34.3	61.0	0.2
19/02/17	15.1	27.8	15.4	26.5	37.5	0.0
20/02/17	8.2	24.6	11.1	23.8	40.7	0.0
21/02/17	5.8	30.4	7.0	29.8	46.1	0.0
22/02/17	13.8	33.2	15.1	32.1	54.6	0.0
23/02/17	14.2	35.5	15.3	34.6	52.3	0.0
24/02/17	16.0	35.7	17.3	34.2	53.2	0.0
25/02/17	17.4	27.7	17.8	27.0	68.0	0.0
26/02/17	17.2	25.9	17.4	25.3	62.2	0.0
27/02/17	12.8	27.6	14.2	27.1	59.4	0.0
28/02/17	14.9	27.5	16.0	26.8	69.5	5.6
01/03/17	14.2	26.7	15.0	26.3	72.4	0.0
02/03/17	14.0	30.9	15.1	29.2	72.1	0.4

Date	Temperature (2m) (°C)		Temperature (10m) (°C)		Relative Humidity	Rain (mm)
	Min	Max	Minimum	Maximum	Average	
03/03/17	14.6	28.6	15.3	28.0	72.3	0.2
04/03/17	17.7	20.3	18.0	20.4	89.6	5.0
05/03/17	16.6	25.3	16.5	25.1	86.0	4.4
06/03/17	12.8	28.1	13.7	27.7	66.4	0.0
07/03/17	9.7	24.8	10.7	24.3	62.4	0.0
08/03/17	9.5	23.1	10.3	22.6	67.9	0.0
09/03/17	10.8	24.4	11.8	23.6	64.9	0.0
10/03/17	7.7	28.1	8.4	27.9	60.2	0.0
11/03/17	10.0	29.3	10.8	29.0	60.3	0.0
12/03/17	9.8	32.7	10.8	30.7	51.7	0.0
13/03/17	14.2	27.1	15.1	26.9	62.1	3.0
14/03/17	12.9	27.3	13.7	26.7	81.9	13.6
15/03/17	16.1	26.6	16.6	26.2	75.6	0.0
16/03/17	19.7	30.3	19.7	29.7	69.0	0.0
17/03/17	15.5	26.5	16.6	25.9	67.4	0.0
18/03/17	17.2	23.8	17.3	23.7	70.9	1.4
19/03/17	20.6	30.6	20.7	29.9	72.3	1.6
20/03/17	19.3	27.3	20.1	26.8	85.3	0.8
21/03/17	19.9	29.3	20.3	28.4	85.0	1.8
22/03/17	19.7	28.7	19.9	27.5	83.1	7.0
23/03/17	18.8	23.1	18.9	22.6	85.3	0.2
24/03/17	15.9	20.8	15.7	20.6	86.2	23.4
25/03/17	15.6	27.5	15.7	26.6	86.2	15.6
26/03/17	15.9	27.6	16.2	27.2	83.7	1.0
27/03/17	14.6	30.6	15.2	29.6	80.5	0.0
28/03/17	17.0	32.2	17.8	31.6	74.1	0.0
29/03/17	19.8	33.2	20.2	32.3	72.6	0.8
30/03/17	13.8	24.4	14.4	25.0	74.5	37.8
31/03/17	13.0	21.6	13.2	21.3	64.6	0.0
01/04/17	8.0	22.2	8.5	21.9	74.4	0.0
02/04/17	9.5	20.7	10.9	20.3	68.9	0.0
03/04/17	9.1	19.9	10.8	19.5	71.3	0.0
04/04/17	6.9	19.8	7.6	19.9	73.7	0.0
05/04/17	8.3	19.0	9.0	18.7	73.6	0.0
06/04/17	8.7	20.4	9.7	19.9	74.1	0.0
07/04/17	8.0	21.5	8.7	21.2	72.9	0.0
08/04/17	7.5	22.8	8.6	22.3	72.3	0.0
09/04/17	7.8	24.6	8.6	24.0	72.4	9.8
10/04/17	5.5	14.3	5.9	13.9	66.8	0.0
11/04/17	9.0	22.6	9.5	22.3	68.2	0.0
12/04/17	7.7	21.4	8.9	20.9	81.2	0.8
13/04/17	9.8	23.3	10.9	21.9	80.3	0.0
14/04/17	6.3	22.9	7.2	22.6	76.5	0.2
15/04/17	5.2	23.1	5.8	22.9	70.7	0.0
16/04/17	6.8	23.1	7.7	22.5	72.8	0.0
17/04/17	5.7	22.7	6.5	22.6	75.2	0.0
18/04/17	8.7	23.0	9.8	22.7	76.7	0.0
19/04/17	8.4	21.5	10.0	21.4	78.1	0.2
20/04/17	7.3	21.5	8.4	21.5	78.5	0.0
21/04/17	6.8	20.2	7.8	20.2	75.2	0.0
22/04/17	8.9	21.5	9.7	20.8	79.9	0.0
23/04/17	6.9	24.2	7.7	24.2	74.8	0.0
24/04/17	7.5	23.7	8.7	23.3	75.2	0.0
25/04/17	12.6	24.7	13.2	23.7	84.7	2.8
26/04/17	7.5	18.1	7.7	17.4	86.1	9.2
27/04/17	4.1	13.8	5.0	13.3	76.6	0.4
28/04/17	2.2	18.3	2.9	18.1	72.1	0.0
29/04/17	1.6	19.4	2.3	19.1	74.8	0.0
30/04/17	4.0	19.1	4.7	19.2	83.7	0.0
01/05/17	7.5	22.5	9.0	22.2	74.9	3.4
02/05/17	5.2	21.6	5.8	21.2	71.0	0.0
03/05/17	4.0	16.8	5.0	16.7	80.0	0.0
04/05/17	10.5	17.2	11.6	16.9	74.3	0.0
05/05/17	5.9	20.5	6.5	20.6	80.1	0.0
06/05/17	4.5	22.1	5.3	21.6	77.6	0.6
07/05/17	1.3	18.5	2.3	18.0	70.0	0.2

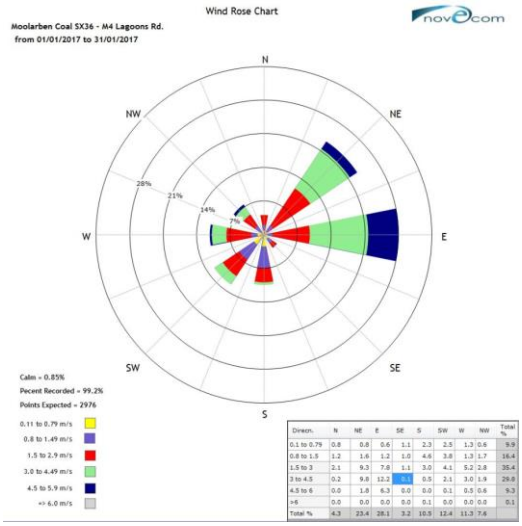
Date	Temperature (2m) (°C)		Temperature (10m) (°C)		Relative Humidity	Rain
	Min	Max	Minimum	Maximum	Average	(mm)
08/05/17	-0.1	17.9	0.6	18.2	73.7	0.0
09/05/17	1.7	18.0	2.7	17.9	79.6	0.2
10/05/17	1.3	18.9	2.1	18.9	76.2	0.0
11/05/17	1.2	20.2	1.9	20.3	77.3	0.0
12/05/17	2.5	17.1	3.6	17.0	86.0	0.2
13/05/17	6.3	19.6	7.8	19.5	83.2	0.0
14/05/17	4.7	20.1	5.4	19.3	83.9	0.0
15/05/17	5.2	17.7	6.4	17.8	80.6	0.0
16/05/17	1.8	18.3	2.6	17.9	76.7	0.0
17/05/17	1.3	19.7	2.3	19.4	74.9	0.2
18/05/17	4.1	19.4	5.5	19.4	81.5	0.2
19/05/17	11.1	14.3	11.9	14.3	94.8	9.4
20/05/17	8.6	20.0	9.6	19.4	91.8	12.4
21/05/17	6.6	20.2	6.9	19.9	87.5	0.0
22/05/17	9.6	19.5	11.3	19.4	88.6	0.0
23/05/17	8.9	20.4	9.8	19.8	87.4	0.0
24/05/17	5.9	18.3	7.0	18.0	79.9	0.0
25/05/17	2.4	18.0	3.2	17.9	79.9	0.2
26/05/17	0.6	18.2	1.6	18.0	82.0	0.0
27/05/17	1.8	19.4	2.4	19.2	87.1	0.2
28/05/17	4.2	19.9	5.3	19.5	73.0	0.2
29/05/17	-3.1	12.6	-2.4	12.4	70.9	0.0
30/05/17	-3.2	12.7	-2.5	12.4	79.7	0.0
31/05/17	-0.5	12.4	1.4	12.0	74.1	0.0
01/06/17	-3.9	14.9	-2.7	14.6	76.3	0.0
02/06/17	-2.6	15.4	-2.1	15.3	78.5	0.0
03/06/17	-1.0	16.3	-0.1	16.2	80.8	0.0
04/06/17	0.3	16.6	1.4	16.4	85.1	0.0
05/06/17	-1.1	15.1	-0.4	14.8	88.5	0.0
06/06/17	1.7	12.1	1.9	11.7	82.6	0.0
07/06/17	1.4	14.5	2.3	14.3	78.9	0.0
08/06/17	3.3	17.2	4.4	17.1	82.6	0.0
09/06/17	2.9	16.8	4.1	16.6	82.4	0.2
10/06/17	4.3	16.0	6.2	15.7	83.9	0.2
11/06/17	5.3	14.1	7.3	14.2	92.5	0.6
12/06/17	3.9	18.6	5.1	18.6	83.7	0.0
13/06/17	2.3	16.9	3.8	16.7	82.4	0.0
14/06/17	2.3	17.3	3.2	16.8	87.7	0.0
15/06/17	4.5	17.9	5.7	18.0	87.2	0.2
16/06/17	4.7	16.0	5.4	15.6	90.3	0.0
17/06/17	5.0	17.0	6.6	16.6	89.3	0.0
18/06/17	2.2	17.0	3.2	17.1	81.4	0.0
19/06/17	0.9	18.2	1.9	18.3	79.5	0.0
20/06/17	2.8	18.0	4.1	17.6	79.4	0.0
21/06/17	-1.4	17.8	-1.0	17.8	77.1	0.0
22/06/17	-0.3	17.0	0.6	16.7	84.9	0.0
23/06/17	0.4	16.4	1.3	16.3	75.6	0.0
24/06/17	0.8	16.9	2.0	16.6	66.3	0.0
25/06/17	2.5	16.4	3.4	16.3	76.7	1.0
26/06/17	-0.4	15.3	0.3	15.1	77.8	0.0
27/06/17	-2.1	12.2	-1.6	12.0	79.4	0.0
28/06/17	6.9	10.7	7.2	10.4	94.4	4.6
29/06/17	1.9	12.9	3.2	12.5	89.7	2.6
30/06/17	-1.8	13.4	-0.5	13.1	78.0	0.0
01/07/17	-7.8	12.8	-5.7	12.3	77.4	0.0
02/07/17	-7.9	15.7	-5.6	15.3	80.0	0.0
03/07/17	-4.7	15.7	-1.8	15.1	89.4	0.2
04/07/17	0.5	17.0	4.6	16.4	67.0	0.0
05/07/17	-4.1	16.0	-0.9	15.2	70.6	0.0
06/07/17	-6.3	14.1	-3.6	13.5	80.2	0.0
07/07/17	-6.6	15.7	-4.5	15.0	73.0	0.0
08/07/17	-6.8	13.9	-4.0	13.1	75.3	0.0
09/07/17	-7.2	13.8	-4.5	13.0	78.2	0.0
10/07/17	-7.1	14.8	-4.6	14.0	73.3	0.0
11/07/17	-8.0	15.3	-5.7	15.0	72.2	0.0
12/07/17	-7.6	13.5	-3.9	13.0	82.3	0.0

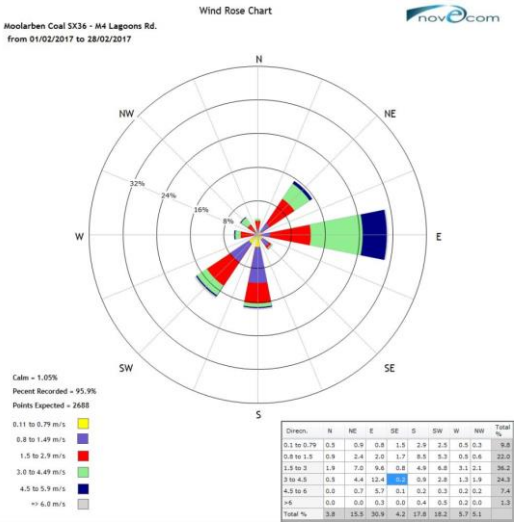
Date	Temperature (2m) (°C)		Temperature (10m) (°C)		Relative Humidity	Rain
	Min	Max	Minimum	Maximum	Average	(mm)
13/07/17	-4.7	15.8	-2.1	15.5	81.9	0.0
14/07/17	-4.0	18.6	-2.6	17.4	79.7	0.0
15/07/17	-0.6	16.0	1.6	14.7	83.0	0.2
16/07/17	-5.6	15.1	-3.7	14.6	78.1	0.0
17/07/17	-3.3	17.0	-1.4	16.3	81.3	0.0
18/07/17	-1.4	20.6	0.5	19.5	66.5	0.0
19/07/17	2.7	12.1	5.7	11.2	69.9	0.0
20/07/17	2.1	12.7	4.8	11.9	63.2	0.0
21/07/17	-5.2	15.0	-2.9	14.3	72.0	0.0
22/07/17	-8.4	15.6	-6.2	15.2	70.4	0.0
23/07/17	-8.3	17.2	-6.1	16.8	62.4	0.0
24/07/17	-4.9	16.9	-1.0	16.1	61.8	0.0
25/07/17	-6.5	17.4	-4.2	17.0	61.8	0.0
26/07/17	-1.8	18.3	1.1	17.7	58.8	0.0
27/07/17	-5.6	16.4	-3.3	16.2	72.0	0.0
28/07/17	-5.5	17.0	-3.0	16.3	64.8	0.0
29/07/17	-9.0	19.0	-5.9	18.3	60.2	0.0
30/07/17	0.1	22.7	2.5	21.7	48.2	0.0
31/07/17	4.7	14.6	6.6	14.4	78.7	4.0
01/08/17	1.6	14.9	2.5	14.7	83.6	0.4
02/08/17	-1.6	14.5	-0.9	14.6	76.1	0.2
03/08/17	0.6	14.9	3.3	14.5	91.3	20.0
04/08/17	6.7	10.6	6.7	10.2	79.5	0.6
05/08/17	2.0	14.9	2.9	14.4	70.0	0.0
06/08/17	0.6	16.8	1.8	16.2	67.1	0.0
07/08/17	3.1	13.0	4.8	12.4	56.4	0.0
08/08/17	2.0	13.4	4.5	13.2	67.0	0.0
09/08/17	1.0	16.6	1.8	16.1	71.2	0.0
10/08/17	-0.9	21.5	0.1	21.0	60.0	0.0
11/08/17	3.6	19.5	6.3	19.0	52.1	0.0
12/08/17	-0.1	16.4	0.8	16.1	69.1	0.0
13/08/17	-1.8	19.2	-0.9	18.7	68.4	0.0
14/08/17	-1.4	20.0	-0.6	19.7	64.0	0.0
15/08/17	2.9	23.6	4.1	23.1	54.5	0.0
16/08/17	1.9	17.4	2.8	18.3	53.9	0.0
17/08/17	-1.1	18.1	-0.2	17.7	57.6	0.0
18/08/17	6.8	12.3	7.0	11.7	51.7	0.0
19/08/17	3.1	11.5	3.7	10.9	55.9	0.0
20/08/17	-4.2	15.2	-3.4	15.1	61.6	0.0
21/08/17	1.5	13.6	3.4	13.1	67.7	0.0
22/08/17	-0.1	20.2	1.4	19.7	56.2	0.0
23/08/17	-0.4	21.8	0.4	21.3	60.4	0.0
24/08/17	-0.8	16.4	0.6	15.9	56.8	0.0
25/08/17	1.2	16.3	3.0	16.0	56.8	0.4
26/08/17	-1.9	17.8	-1.0	17.4	63.8	0.0
27/08/17	2.2	14.0	3.1	13.5	59.0	0.0
28/08/17	-3.4	15.0	-2.4	14.2	62.2	0.0
29/08/17	-2.6	16.7	-1.5	16.0	62.5	0.0
30/08/17	-1.9	16.1	-1.9	15.6	57.9	0.0
31/08/17	-1.8	16.8	-1.0	16.7	59.9	0.0
01/09/17	-2.8	18.0	-1.3	17.5	61.6	0.0
02/09/17	-1.9	21.1	-1.2	20.7	55.7	0.0
03/09/17	1.6	26.2	2.6	25.2	43.5	0.0
04/09/17	1.0	17.3	2.4	16.7	51.9	0.0
05/09/17	4.1	14.0	4.7	13.3	48.2	0.0
06/09/17	6.9	15.4	7.1	14.7	48.6	0.0
07/09/17	2.3	16.1	5.9	15.6	52.6	0.0
08/09/17	1.5	15.6	3.2	15.1	56.8	0.0
09/09/17	-1.7	17.4	0.0	16.8	53.6	0.0
10/09/17	-0.8	19.7	0.3	19.0	56.1	0.0
11/09/17	-1.5	21.5	-0.3	20.8	50.5	0.0
12/09/17	2.0	28.1	3.2	27.1	42.8	0.0
13/09/17	7.3	29.7	10.1	28.5	39.3	0.0
14/09/17	0.9	12.2	2.7	12.1	64.6	6.2
15/09/17	-0.1	16.4	1.1	15.9	65.2	0.0
16/09/17	0.7	19.4	1.6	18.9	59.7	0.0

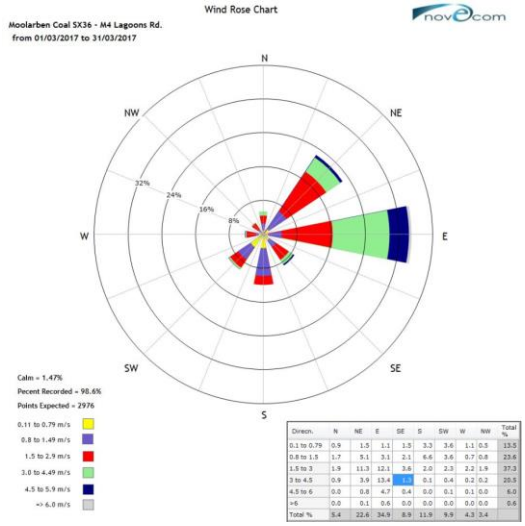
Date	Temperature (2m) (°C)		Temperature (10m) (°C)		Relative Humidity	Rain
	Min	Max	Minimum	Maximum	Average	(mm)
17/09/17	0.0	20.4	0.9	19.7	58.8	0.0
18/09/17	-0.5	24.8	0.5	23.7	55.9	0.0
19/09/17	2.3	19.3	3.5	18.4	44.3	0.0
20/09/17	-1.4	21.7	-0.6	20.6	52.2	0.0
21/09/17	0.6	26.5	1.9	25.4	42.9	0.0
22/09/17	1.8	29.5	3.2	28.5	37.5	0.0
23/09/17	6.3	33.1	7.9	32.1	31.3	0.0
24/09/17	11.7	28.5	12.8	28.1	26.4	0.0
25/09/17	8.8	22.8	10.8	22.0	37.3	0.0
26/09/17	2.5	23.7	3.4	23.0	42.3	0.0
27/09/17	8.9	29.5	9.6	28.6	52.0	0.0
28/09/17	6.8	23.5	8.4	24.0	42.4	0.0
29/09/17	3.1	22.4	4.0	21.6	46.7	0.0
30/09/17	8.2	20.0	10.7	19.2	37.0	0.0
01/10/17	0.8	22.7	1.7	21.9	41.0	0.0
02/10/17	2.9	20.7	3.7	18.7	50.9	0.0
03/10/17	10.0	23.4	11.1	22.6	74.5	0.8
04/10/17	6.9	29.1	7.7	26.9	58.8	0.2
05/10/17	13.0	29.7	14.4	28.3	56.4	0.0
06/10/17	10.2	21.3	11.8	20.7	47.3	0.0
07/10/17	11.1	20.3	11.2	19.8	60.4	0.0
08/10/17	9.2	15.9	9.8	15.3	89.1	14.4
09/10/17	13.7	27.0	14.1	26.1	79.3	0.2
10/10/17	11.4	26.8	12.4	26.0	74.4	0.0
11/10/17	14.7	31.6	14.9	30.6	62.2	0.2
12/10/17	11.3	23.0	12.7	22.2	64.2	6.0
13/10/17	5.2	25.5	5.9	24.7	53.1	0.0
14/10/17	9.0	20.5	9.8	20.0	69.7	0.0
15/10/17	13.7	23.2	13.8	22.9	63.6	0.0
16/10/17	12.9	23.8	13.1	23.2	54.8	0.0
17/10/17	12.8	25.2	12.9	24.5	57.4	0.0
18/10/17	13.5	27.4	13.8	26.8	56.6	0.0
19/10/17	10.9	30.1	12.1	29.2	54.3	0.0
20/10/17	12.4	21.5	12.2	22.0	90.4	28.4
21/10/17	8.6	20.7	8.9	19.8	65.8	0.0
22/10/17	5.9	21.8	6.3	21.0	62.8	0.0
23/10/17	8.0	21.7	8.8	21.5	66.6	0.0
24/10/17	6.6	27.2	7.7	26.1	58.3	0.0
25/10/17	11.7	28.6	13.0	27.6	58.3	0.0
26/10/17	11.9	30.2	13.4	29.1	52.1	0.6
27/10/17	9.7	25.7	10.9	24.6	64.4	0.0
28/10/17	15.2	28.1	15.4	27.2	58.9	0.0
29/10/17	10.6	29.8	11.6	28.9	56.0	0.0
30/10/17	10.6	31.1	11.5	30.0	48.0	0.0
31/10/17	6.3	20.8	6.4	19.9	41.9	0.0
01/11/17	5.2	21.7	6.1	21.0	40.9	0.0
02/11/17	5.0	25.7	6.0	24.8	48.0	0.0
03/11/17	7.9	28.7	9.2	27.8	50.2	0.0
04/11/17	13.1	19.4	13.3	19.8	80.0	4.8
05/11/17	13.0	21.3	13.0	20.7	77.0	0.0
06/11/17	9.4	24.9	11.0	24.2	68.6	6.4
07/11/17	4.3	24.4	5.2	23.3	58.2	0.0
08/11/17	11.0	20.0	11.2	19.6	59.6	0.0
09/11/17	6.4	24.0	7.7	23.3	58.4	0.0
10/11/17	6.0	24.5	7.0	23.9	56.2	0.0
11/11/17	8.2	24.7	10.1	24.2	55.4	0.0
12/11/17	11.3	25.5	11.7	25.1	51.8	0.0
13/11/17	9.5	26.1	10.9	25.2	63.8	0.2
14/11/17	12.1	26.2	12.4	25.7	54.5	0.0
15/11/17	8.8	29.0	9.6	28.2	55.3	0.0
16/11/17	15.2	20.5	15.5	19.9	79.8	8.4
17/11/17	13.3	27.8	14.1	27.1	75.9	38.2
18/11/17	14.8	17.9	14.4	17.7	91.7	22.6
19/11/17	14.6	22.1	14.6	21.8	69.1	0.0
20/11/17	9.5	24.1	10.5	23.9	63.1	0.0
21/11/17	11.5	24.9	12.0	24.6	60.7	0.0

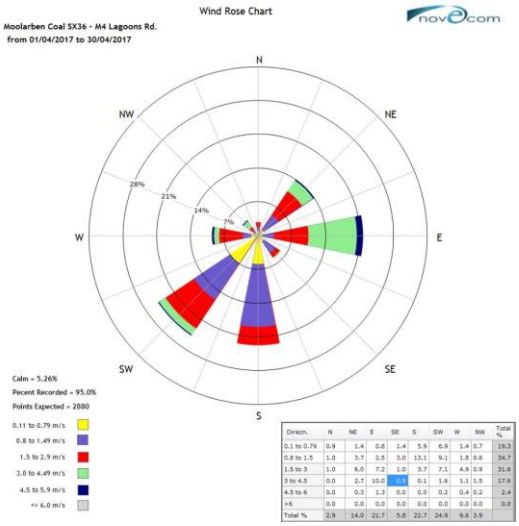
Date	Temperature (2m) (°C)		Temperature (10m) (°C)		Relative Humidity	Rain (mm)
	Min	Max	Minimum	Maximum	Average	
22/11/17	10.7	25.7	11.7	25.1	59.9	0.0
23/11/17	10.1	28.3	10.7	26.5	65.2	0.0
24/11/17	10.2	30.1	11.1	29.6	62.7	0.0
25/11/17	11.4	30.8	12.4	30.1	55.9	0.0
26/11/17	13.7	32.0	15.0	30.7	55.7	0.0
27/11/17	15.9	24.5	17.1	23.8	75.9	22.0
28/11/17	13.7	30.3	14.5	29.3	71.1	0.0
29/11/17	16.5	26.4	17.3	26.2	71.9	0.0
30/11/17	16.5	30.6	17.4	29.8	66.7	0.0
01/12/17	15.0	31.4	16.3	29.9	62.2	0.0
02/12/17	14.4	24.6	14.6	25.1	80.6	33.4
03/12/17	12.7	21.6	12.6	20.5	72.1	0.4
04/12/17	9.4	25.5	9.9	24.0	68.7	0.0
05/12/17	14.9	23.5	15.0	22.4	73.6	11.2
06/12/17	10.7	22.4	11.1	21.5	78.2	0.2
07/12/17	9.7	30.1	10.6	28.9	56.3	0.2
08/12/17	13.6	28.0	15.0	27.1	51.0	0.0
09/12/17	15.9	26.7	16.3	26.2	62.0	0.0
10/12/17	10.3	27.9	11.4	27.2	60.0	0.0
11/12/17	11.6	31.2	12.5	30.6	55.5	0.0
12/12/17	15.0	32.3	16.8	31.7	55.8	0.0
13/12/17	13.7	35.0	14.9	34.0	53.2	0.0
14/12/17	14.1	36.1	15.4	35.2	47.4	0.0
15/12/17	16.7	34.0	18.0	33.1	47.0	0.0
16/12/17	17.0	36.4	18.3	35.6	57.7	11.6
17/12/17	19.6	33.5	20.8	33.5	60.8	3.8
18/12/17	17.2	35.7	17.9	34.8	68.5	0.8
19/12/17	19.0	37.1	19.7	35.8	57.4	0.0
20/12/17	21.1	36.3	22.5	35.4	45.1	0.0
21/12/17	19.4	23.2	19.5	23.0	72.1	0.0
22/12/17	17.9	26.6	17.7	26.3	76.0	6.2
23/12/17	14.7	34.4	15.5	33.4	58.7	0.0
24/12/17	15.4	37.6	16.8	36.7	45.8	0.0
25/12/17	16.7	25.2	16.9	26.1	45.8	0.0
26/12/17	15.6	20.9	15.7	20.5	75.6	0.0
27/12/17	18.0	28.8	18.1	28.5	62.9	0.0
28/12/17	14.5	33.8	15.1	33.0	53.8	0.0
29/12/17	17.3	36.0	19.1	34.0	46.7	0.0
30/12/17	18.8	30.9	19.8	30.1	68.6	12.6
31/12/17	13.6	32.5	14.5	31.1	65.0	0.0

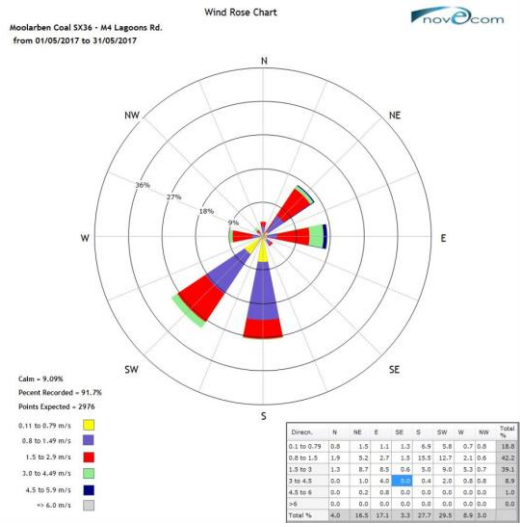
Figure 3-a Monthly Wind Rose

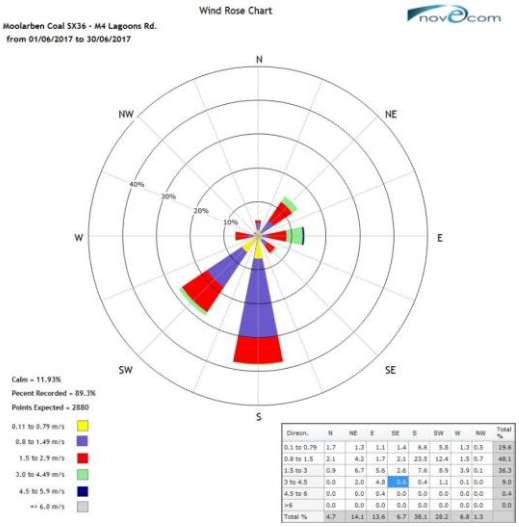






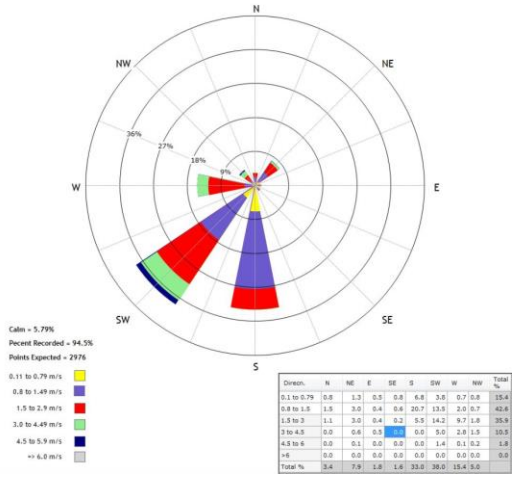






Wind Rose Chart

Moolarben Coal SX36 - M4 Lagoons Rd.
from 01/07/2017 to 31/07/2017

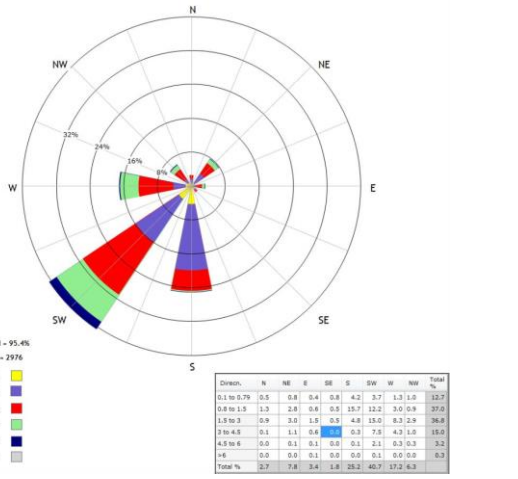


Calm = 5.79%
Pecent Recorded = 94.5%
Points Expected = 2976

Direcn.	N	NE	E	SE	S	SW	W	NW	Total %
0.1 to 0.79	0.8	1.3	0.5	0.8	6.8	3.8	0.7	0.8	15.4
0.8 to 1.5	1.5	3.0	0.4	0.6	20.7	13.5	2.0	0.7	42.6
1.5 to 3	1.1	3.0	0.4	0.2	5.5	14.2	9.7	1.8	35.9
3 to 4.5	0.0	0.6	0.5	0.3	0.0	5.0	2.8	1.5	10.5
4.5 to 6	0.0	0.1	0.0	0.0	0.0	1.4	0.1	0.2	1.8
>6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total %	3.4	7.9	1.8	1.4	33.0	38.0	15.4	5.0	

Wind Rose Chart

Moolarben Coal SX36 - M4 Lagoons Rd.
from 01/08/2017 to 31/08/2017

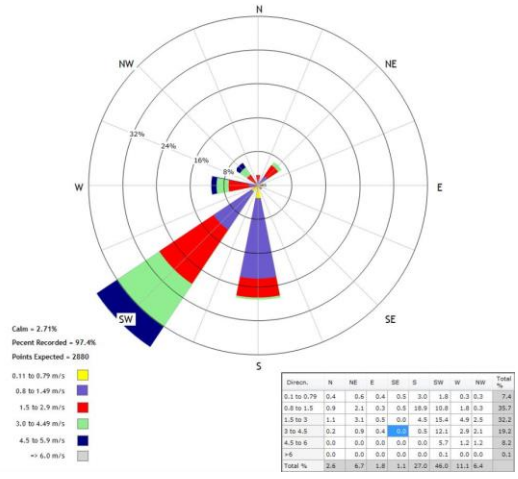


Calm = 4.79%
Pecent Recorded = 95.4%
Points Expected = 2976

Direcn.	N	NE	E	SE	S	SW	W	NW	Total %
0.1 to 0.79	0.5	0.8	0.4	0.8	4.2	3.7	1.3	1.0	12.7
0.8 to 1.5	1.3	2.8	0.6	0.5	15.7	12.2	3.0	0.9	37.0
1.5 to 3	0.9	3.0	1.5	0.5	4.8	15.0	8.3	2.9	36.8
3 to 4.5	0.1	1.1	0.6	0.0	0.3	7.5	4.3	1.0	15.0
4.5 to 6	0.0	0.1	0.1	0.0	0.1	2.1	0.3	0.3	3.2
>6	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.3
Total %	2.7	7.8	3.4	1.8	25.2	40.7	17.2	4.3	

Wind Rose Chart

Moolarben Coal SX36 - M4 Lagoons Rd.
from 01/09/2017 to 30/09/2017

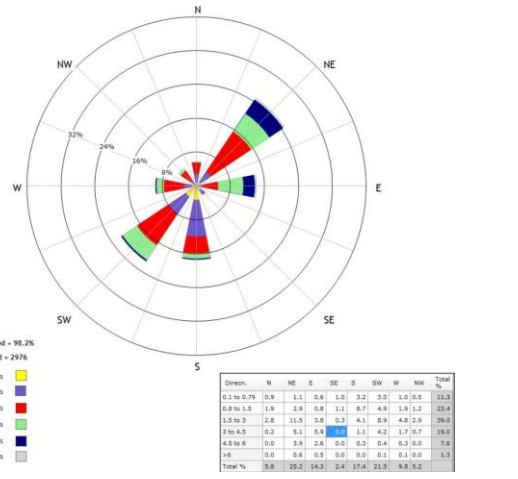


Calm = 2.71%
Pecent Recorded = 97.4%
Points Expected = 2880

Direcn.	N	NE	E	SE	S	SW	W	NW	Total %
0.1 to 0.79	0.4	0.6	0.4	0.5	3.0	1.8	0.3	0.3	7.4
0.8 to 1.5	0.9	2.1	0.3	0.5	18.9	10.8	1.8	0.3	35.7
1.5 to 3	1.1	3.1	0.5	0.0	4.5	15.4	4.9	2.5	32.2
3 to 4.5	0.2	0.9	0.4	0.0	0.5	12.1	2.9	2.1	19.2
4.5 to 6	0.0	0.0	0.0	0.0	0.0	5.7	1.2	1.2	8.2
>6	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Total %	2.6	6.7	1.8	1.1	27.0	46.0	11.1	6.4	

Wind Rose Chart

Moolarben Coal SX36 - M4 Lagoons Rd.
from 01/10/2017 to 31/10/2017

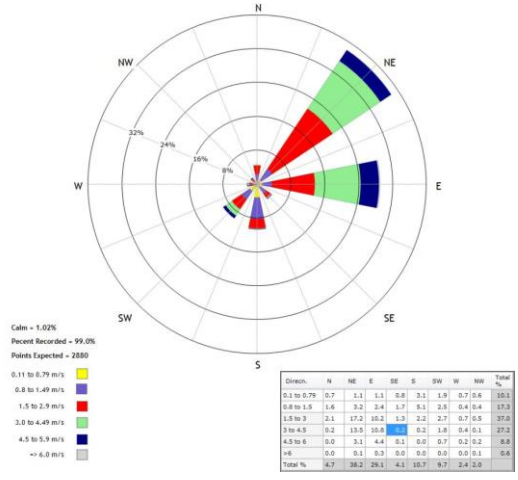


Calm = 1.64%
Pecent Recorded = 98.2%
Points Expected = 2976

Direcn.	N	NE	E	SE	S	SW	W	NW	Total %
0.1 to 0.79	0.9	1.1	0.6	1.0	3.2	3.0	1.0	0.5	11.3
0.8 to 1.5	1.9	2.9	0.8	1.1	8.7	4.9	1.9	1.2	23.4
1.5 to 3	2.8	11.5	3.8	0.3	4.1	8.9	4.8	2.9	39.0
3 to 4.5	0.2	5.1	5.9	0.0	1.1	4.2	1.7	0.7	19.0
4.5 to 6	0.0	3.9	2.6	0.0	0.3	0.4	0.3	0.0	7.6
>6	0.0	0.6	0.5	0.0	0.0	0.1	0.1	0.0	1.3
Total %	5.8	25.2	14.3	2.4	17.4	21.5	9.8	5.2	

Wind Rose Chart

Moolarben Coal SX36 - M4 Lagoons Rd.
from 01/11/2017 to 30/11/2017

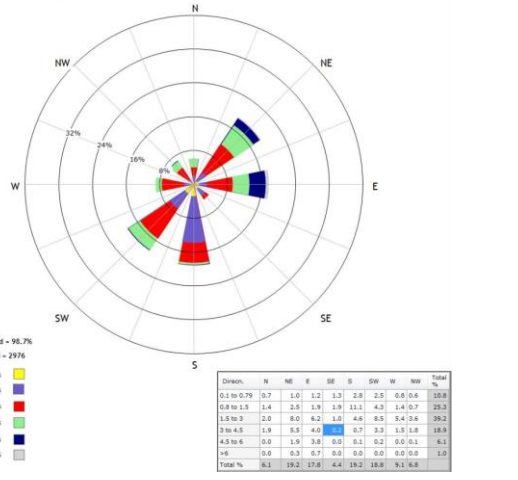


Calm = 1.02%
Pecent Recorded = 99.0%
Points Expected = 2880

Direcn.	N	NE	E	SE	S	SW	W	NW	Total %
0.1 to 0.79	0.7	1.1	1.1	0.8	3.1	1.9	0.7	0.6	10.1
0.8 to 1.5	1.6	3.2	2.4	1.7	5.1	2.5	0.4	0.4	17.3
1.5 to 3	2.1	17.2	10.2	1.3	2.2	2.7	0.7	0.5	37.0
3 to 4.5	0.2	13.5	10.8	0.1	0.2	1.8	0.4	0.1	27.2
4.5 to 6	0.0	3.1	4.4	0.1	0.0	0.7	0.2	0.2	8.8
>6	0.0	0.1	0.3	0.0	0.0	0.0	0.0	0.1	0.6
Total %	4.7	38.2	29.1	4.1	10.7	9.7	2.4	2.0	

Wind Rose Chart

Moolarben Coal SX36 - M4 Lagoons Rd.
from 01/12/2017 to 31/12/2017



Calm = 1.33%
Pecent Recorded = 98.7%
Points Expected = 2976

Direcn.	N	NE	E	SE	S	SW	W	NW	Total %
0.1 to 0.79	0.7	1.0	1.2	1.3	2.8	2.5	0.8	0.6	10.8
0.8 to 1.5	1.4	2.5	1.9	1.9	11.1	4.3	1.4	0.7	25.3
1.5 to 3	2.0	8.0	6.2	1.0	4.6	8.5	5.4	3.6	39.2
3 to 4.5	1.9	5.9	4.0	0.1	0.7	3.3	1.5	1.8	18.9
4.5 to 6	0.0	1.9	3.8	0.0	0.1	0.2	0.0	0.1	6.1
>6	0.0	0.3	0.7	0.0	0.0	0.0	0.0	0.0	1.0
Total %	6.1	19.2	17.8	4.4	19.2	18.8	9.1	6.8	

APPENDIX 3B. NOISE COMPLIANCE REPORT

Moolarben Coal Operations

Environmental Noise Monitoring

Annual Report

1 January to 31 December 2017

Prepared for

Moolarben Coal Operations Pty Ltd

Global Acoustics

Noise and Vibration Analysis and Solutions

Global Acoustics Pty Ltd
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Moolarben Coal Operations

Environmental Noise Monitoring
Annual Report – 1 January to 31 December 2017

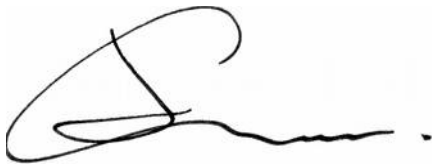
Reference: 18002_R02
Report date: 28 February 2018

Prepared for

Moolarben Coal Operations
4250 Ulan Road
Ulan NSW 2850

Prepared by

Global Acoustics Pty Ltd
PO Box 3115
Thornton NSW 2322



Prepared:	Amanda Borserio Acoustics Consultant	QA Review:	Joel Curran Acoustics Consultant

Global Acoustics Pty Ltd ~ Environmental noise modelling and impact assessment ~ Sound power testing ~ Noise control advice ~ Noise and vibration monitoring ~ OHS noise monitoring and advice ~ Expert evidence in Land and Environment and Compensation Courts ~ Architectural acoustics ~ Blasting assessments and monitoring ~ Noise management plans (NMP) ~ Sound level meter and noise logger sales and hire

EXECUTIVE SUMMARY

Global Acoustics was engaged by Moolarben Coal Operations Pty Ltd (MCO) to provide a summary of operational environmental noise surveys conducted around Moolarben Coal Mine (MCM) from 1 January to 31 December 2017.

During the 2017 reporting period, attended environmental noise monitoring described in this report was conducted monthly. Quarterly attended monitoring was conducted throughout the reporting period in accordance with Project Approvals 05_0117 and 08_0135, the MCO Noise Management Plan (NMP) and EPL 12932. More detail regarding monitoring locations and timing of monitoring during 2017 is provided in Section 1.2 of this report.

Attended noise monitoring was carried out during 2017 to quantify and describe the existing acoustic environment around MCO and compare the results with relevant limits.

January to December 2017 Compliance

MCO complied with the project specific criteria at all monitoring sites during attended noise monitoring undertaken between January and December 2017.

EIS Comparison

Results indicated that MCO levels were often well under the predicted levels where meteorological conditions were relevant and there are no systemic issues as a result of the operation.

Measured L_{Aeq} noise levels were greater than predicted in June for NA6 and NA12 under calm conditions. Measured $L_{A1,1minute}$ noise levels were greater than predicted levels in April for both NA6 and NA12 under wind conditions.

The model (Year 2016 of the OC4 South West Haul Road Modification) predicted that there would be no exceedances of the criterion for the indicative scenarios and at no point were measured levels greater than the relevant criterion for each location, where criteria applied.

Global Acoustics Pty Ltd

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Appendices

1 INTRODUCTION

1.1 Background

Global Acoustics was engaged by Moolarben Coal Operations Pty Ltd (MCO) to provide a summary of operational environmental noise surveys conducted around Moolarben Coal Mine (MCM) from 1 January to 31 December 2017.

The MCM is located on Ulan Road, approximately 40 kilometres north east of Mudgee. Stage 1 of the mine consists of 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 mining infrastructure area (MIA). Stage 2 includes the construction and operation of Open Cut 4 (OC4), Underground Mine (UG1 and UG2) and a ROM coal facility in OC4.

During this reporting period, major activities included:

- The operation of OC1, OC2 and OC4;
- The operation of the CHPP and rail load-out facilities;
- Vegetation clearing, topsoil stripping, drilling, overburden removal, coaling and rehabilitation activities in OC1, OC2 and OC4; and
- Construction and operation activities in the Underground (MIA and Boxcut) and CHPP areas.

Attended noise monitoring was carried out during 2017 in accordance with the approved "Moolarben Coal Complex Noise Management Plan" as required by EPL condition M9 to quantify and describe the existing acoustic environment around MCO and compare the results with relevant limits.

1.2 Monitoring Locations and Timing

1.2.1 January to December 2017, Monthly

There were six monthly attended monitoring locations between January and December 2017 as detailed in Table 1.1 and shown on Figure 1. Monitoring during this period was undertaken monthly. It should be noted that this figure shows the actual monitoring position, not the location of residences.

Table 1.1: ATTENDED NOISE MONITORING LOCATIONS – JANUARY TO DECEMBER 2017, MONTHLY

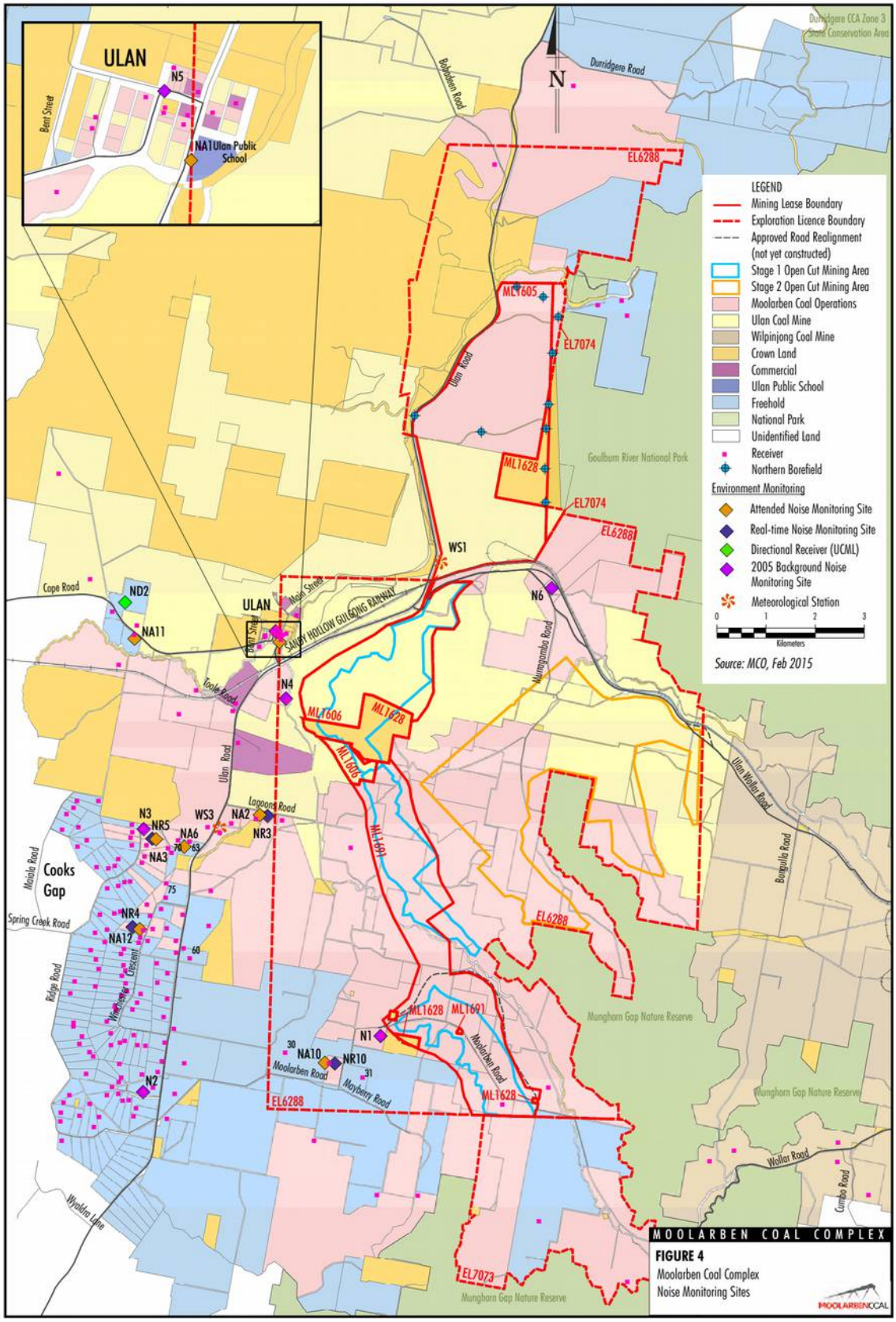
Report Descriptor	Monitoring Location	Location Purpose	Monitoring Period
NA1	Ulan Public School, Ulan Village	Compliance	Day
NA2	Lagoons Road, Ulan	Validation	Night
NA3	Upper Ridge Road, Cooks Gap	Validation	Night
NA6	Lower Ridge Road, Cooks Gap	Compliance	Night
NA10	Moolarben Road, Moolarben	Validation	Night
NA12	Winchester Crescent, Cooks Gap	Compliance/Validation	Night

1.2.2 January to December 2017, Quarterly

In addition to the monthly monitoring locations detailed in Table 1.1, quarterly surveys were completed at these additional attended monitoring locations (conducted in February, May, August and November 2017). These are detailed in Table 1.2 and shown in Figure 1 and Figure 2. It should be noted that the figures show the actual monitoring position, not the location of residences.

Table 1.2: ATTENDED NOISE MONITORING LOCATIONS – JANUARY TO DECEMBER 2017, QUARTERLY

Report Descriptor	Monitoring Location	Location Purpose	Monitoring Period
NA11	Cope Road (Receiver 258), Ulan	Management	Night
GRNP	Goulburn River National Park	Compliance	Night
MGNR	Munghorn Gap Nature Reserve	Compliance	Night



Source: Moolarben Coal Operations Pty Ltd

Figure 1: MCO Attended Noise Monitoring Sites, January to December 2017

Figure 2: MCO Quarterly Attended Monitoring Locations, January to December 2017

1.3 Terminology & Abbreviations

Some definitions of terms and abbreviations, which may be used in this report, are provided in Table 1.3.

Table 1.3: TERMINOLOGY & ABBREVIATIONS

Descriptor	Definition
L_A	The A-weighted root mean squared (RMS) noise level at any instant
L_{Amax}	The maximum A-weighted noise level over a time period or for an event
L_{A1}	The noise level which is exceeded for 1 per cent of the time
L_{A10}	The noise level which is exceeded for 10 percent of the time, which is approximately the average of the maximum noise levels
L_{A50}	The noise level which is exceeded for 50 per cent of the time
L_{A90}	The level exceeded for 90 percent of the time, which is approximately the average of the minimum noise levels. The L_{A90} level is often referred to as the "background" noise level and is commonly used to determine noise criteria for assessment purposes
L_{Amin}	The minimum A-weighted noise level over a time period or for an event
L_{Aeq}	The average noise energy during a measurement period
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to describe human response to noise
SPL	Sound pressure level (SPL), fluctuations in pressure measured as 10 times a logarithmic scale, the reference pressure being 20 micropascals
Hertz (Hz)	Cycles per second, the frequency of fluctuations in pressure, sound is usually a combination of many frequencies together
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude. Estimated from wind speed and sigma theta data
IA	Inaudible. When site only noise is noted as IA, there was no noise from the source of interest audible at the monitoring location
NM	Not Measurable. If site only noise is noted as NM, this means some noise from the source of interest was audible at low-levels, but could not be quantified
Day	This is the period 7:00am to 6:00pm
Evening	This is the period 6:00pm to 10:00pm
Night	This is the period 10:00pm to 7:00am

2 PROJECT APPROVAL AND CRITERIA

2.1 Project Approval

Current mining operations at the Moolarben Coal Complex are undertaken in accordance with the requirements of NSW Project Approval 05_0117 and 08_0135 (as modified). The relevant noise conditions from the most recent consolidated approvals can be viewed on the MCO website.

2.2 Environmental Protection Licence

MCO holds Environmental Protection Licence (EPL) No. 12932 for Moolarben mine. The licence was originally approved in August 2008. The most recent license revision was issued on 26 May 2016. Section L5 of the licence outlines noise limits and can be viewed on the MCO website.

2.3 Noise Management Plan

The Noise Management Plan (NMP) was originally approved in March 2010, and more recently in July 2015, to address noise impacts associated with the operation of the entire Moolarben Coal Complex, including Stage 1 and Stage 2 of the operation. Section 4 details criteria and Section 6 details the noise monitoring program, including monitoring locations and methodology. The NMP can be viewed on the MCO website.

2.4 Noise Impact Assessment Criteria

Impact assessment criteria for MCO between January and December 2017 are detailed in Table 2.1. The criteria are based on the NMP, which is consistent with the consolidated approval and the EPL.

Table 2.1: MCO NOISE IMPACT ASSESSMENT CRITERIA, dB

NMP Descriptor	Monitoring Location	Day $L_{Aeq,15minute}$	Evening [1] $L_{Aeq,15minute}$	Night [1] $L_{Aeq,15minute}$/ $L_{A1,1minute}$
NA1[2]	Ulan Public School – internal	35	NA	NA/NA
	Ulan Public School – external[3]	43	NA	NA/NA
NA6	Lower Ridge Road	37	37	37/45
NA12	Winchester Crescent	35	35	35/45
GRNP[4]	Goulburn River National Park	50	50	50
MGNR[4]	Munghorn Gap Nature Reserve	50	50	50

Notes:

1. *NA indicates criteria are not applicable at this location during this time period;*
2. *Criteria for Ulan Public School apply `when in use`;*
3. *A difference of 8 dB between internal and external criteria has been adopted at NA1 for consistency with previous versions of the NMP; and*
4. *Monitoring at these locations undertaken quarterly in accordance with the NMP.*

L5.3 from the EPL states:

- *The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:*
  - *wind speeds greater than 3 metres/second at 10 metres above ground level; or*
  - *Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or*
  - *Stability category G temperature inversion conditions.*

2.4.1 Noise Mitigation Criteria

As detailed in Condition 4 of Schedule 3 of the project approval, mitigation criteria for MCO are to consider noise in respect to criteria detailed in Table 2.2 at any residence on privately-owned land.

Table 2.2: MCO MITIGATION CRITERIA, dB[1]

NMP Descriptor	Monitoring Location	Day/Evening/Night $L_{Aeq,15minute}$
NA6	Lower Ridge Road	37/37/37
NA12	Winchester Crescent	37/37/37

Notes:

1. *From consolidated project approval.*

2.4.2 Land Acquisition Criteria

As detailed in Condition 2 of Schedule 3 of the project approval, acquisition criteria for MCO are to consider noise in respect to criteria detailed in Table 2.3 at any residence on privately-owned land.

Table 2.3: MCO LAND ACQUISITION CRITERIA, dB[1]

NMP Descriptor	Monitoring Location	Day/Evening/Night $L_{Aeq,15minute}$
NA6	Lower Ridge Road	40/40/40
NA12	Winchester Crescent	40/40/40

Notes:

1. *From consolidated project approval.*

2.5 Modifying Factors

Industrial Noise Policy (INP, 2000)

Noise monitoring and reporting from *January to September 2017* was carried out generally in accordance with Environment Protection Authority (EPA) Industrial Noise Policy (INP). Chapter 4 of the INP deals specifically with modifying factors that may apply to industrial noise. The most common modifying factors are addressed in detail below.

2.5.1 Tonality, Intermittent and Impulsive Noise

As defined in the Industrial Noise Policy:

> *Tonal noise contains a prominent frequency and is characterised by a definite pitch.*
>
> *Impulsive noise has high peaks of short duration or a sequence of such peaks.*
>
> *Intermittent noise is characterised by the level suddenly dropping to the background noise levels several times during a measurement, with a noticeable change in noise level of at least 5 dB. Intermittent noise applies to night-time only.*

Years of monitoring have indicated that noise levels from mining operations, particularly those levels measured at significant distances from the source are relatively continuous. Given this, noise levels from MCO at the monitoring locations are unlikely to be intermittent. In addition, there is no equipment on site that is likely to generate tonal or impulsive noise as defined in the INP.

2.5.2 Low Frequency

As defined in the Industrial Noise Policy:

> *Low frequency noise contains major components within the low frequency range (20 Hz to 250 Hz) of the frequency spectrum.*

As detailed in Chapter 4 of the INP, low frequency noise should be assessed by measuring the site only C-weighted and site only A-weighted level over the same time period. The correction/penalty of 5 dB is to be applied *if the difference between the two levels is 15 dB or more*.

Low frequency noise can also be assessed against levels specified in the paper "A Simple Method for Low Frequency Noise Emission Assessment" (Broner JLFNV Vol29-1 pp1-14 2010). If the site only C – weighted noise level at a receptor exceeds the relevant criterion, a 5 dB penalty (modifying factor) is added to measured levels.

Low frequency assessment methods are detailed in Table 2.4.

Table 2.4: LOW FREQUENCY ASSESSMENT METHODS AND MODIFICATION FACTOR TRIGGERS

Assessment Method	Calculation Method	Night Period Modifying Factor Trigger	Day Period Modifying Factor Trigger
Broner, 2010	Site only L_{Ceq}	>60	>65
INP, total	Site only L_{Ceq} minus site only L_{Aeq}	>=15	>=15

Between January and September 2017 the EPA undertook a review of the assessment of low frequency noise. While a Draft Industrial Noise Guideline (ING) was released in September 2015, low frequency noise results from MCO have been compared to the assessment methods and modifying factor triggers presented above. The applicability of these triggers have been considering when applying low frequency modifying factor corrections.

Noise Policy for Industry (NPfI, 2017)

Noise monitoring and reporting from *October to December 2017* was carried out generally in accordance with the EPA 'Noise Policy for Industry' (NPfI, 2017).

The EPA 'Noise Policy for Industry' (NPfI, 2017) was approved for use in NSW in October 2017, and supersedes the EPA's Industrial Noise Policy (INP, 2000). Assessment and reporting of modifying factors is to be carried out in accordance with Fact Sheet C of the NPfI. NPfI modifying factors, as they are applicable to mining noise, are described in more detail below.

2.5.3 Tonal and Intermittent Noise

As defined in the NPfI:

> *Tonal noise contains a prominent frequency and is characterised by a definite pitch.*
>
> *Intermittent noise is characterised by the level suddenly dropping/increasing several times during a measurement, with a noticeable change in noise level of at least 5 dB. Intermittent noise applies to night-time only and is not intended to be applied to changes in noise level due to meteorology.*

Years of monitoring have indicated that noise levels from mining operations, particularly those levels measured at significant distances from the source are relatively continuous. Given this, noise levels at the monitoring locations are unlikely to be intermittent. In addition, there is no equipment on site that is likely to generate tonal noise as defined in the NPfI.

2.5.4 Low Frequency Noise

The NPfI contains the current method of assessing low frequency noise, which is a 2 step process as detailed below:

> *Measure/assess source contribution C-weighted and A-weighted L_{eq},T levels over the same time period. The low frequency noise modifying factor correction is to be applied where the C-A level is 15 dB or more and:*

*• where any of the 1/3 octave noise levels in Table C2 are exceeded by **up to and including** 5 dB and cannot be mitigated, a 2 dBA positive adjustment to measured A weighted levels applies for the evening/night period; and*

*• where any of the 1/3 octave noise levels in Table C2 are exceeded by **more than** 5 dB and cannot be mitigated, a 5 dBA positive adjustment to measured A weighted levels applies for the evening/night period and a 2 dBA positive adjustment applies for the daytime period.*

Table C2 and associated notes from the NPfI is reproduced below:

Table C2: One-third octave low-frequency noise thresholds.

Hz/dB(Z)	One-third octave $L_{Zeq,15min}$ threshold level												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

Notes:

- dB(Z) = decibel (Z frequency weighted).
- For the assessment of low-frequency noise, care should be taken to select a wind screen that can protect the microphone from wind-induced noise characteristics at least 10 dB below the threshold values in Table C2 for wind speeds up to 5 metres per second. It is likely that high performance larger diameter wind screens (nominally 175 mm) will be required to achieve this performance (Hessler, 2008). In any case, the performance of the wind screen and wind speeds at which data will be excluded needs to be stated.
- Low-frequency noise corrections only apply under the standard and/or noise-enhancing meteorological conditions.
- Where a receiver location has had architectural acoustic treatment applied (including alternative means of mechanical ventilation satisfying the Building Code of Australia) by a proponent, as part of consent requirements or as a private negotiated agreement, alternative external low-frequency noise assessment criteria may be proposed to account for the higher transmission loss of the building façade.
- Measurements should be made between 1.2 and 1.5 metres above ground level unless otherwise approved through a planning instrument (consent/approval) or environment protection licence, and at locations nominated in the development consent or licence.

3 METHODOLOGY

3.1 Overview

All noise monitoring was conducted in accordance with the Environment Protection Authority (EPA) 'Industrial Noise Policy' (INP) guidelines (January to September), Noise Policy for Industry (NPfI) guidelines (October to December) and Australian Standard AS 1055 'Acoustics, Description and Measurement of Environmental Noise' and the MCO NMP.

MCO personnel have provided a log of operations that confirms operations were in progress during each monthly survey period in 2017.

4 RESULTS

The following sub-sections present a summary of 2017 monitoring data. Table 4.2 compares MCO levels during January 2017 against land acquisition and mitigation criteria detailed in the project approval.

4.1 January 2017

Table 4.1 compares MCO levels during January 2017 against impact assessment criteria detailed in the project approval.

Table 4.1: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – JANUARY 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	23/01/2017 13:10	56	2.4	A	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	23/01/2017 22:26	34	1.1	D	37	24	Yes	Nil	45	25	Yes	Nil
NA12	23/01/2017 22:00	33	0.4	F	35	23	Yes	Nil	45	29	Yes	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.2: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – JANUARY 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	23/01/2017 22:26	34	1.1	D	40	42	24	Yes	Nil	Nil
NA12	23/01/2017 22:00	33	0.4	F	37	40	23	Yes	Nil	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.2 February/Quarter 1 2017

Table 4.3 compares MCO levels during February 2017 against impact assessment criteria detailed in the project approval. In accordance with the NMP (approved July 2015) additional sites are required to be monitored on a quarterly basis and include GRNP and MGNP. Table 4.4 compares MCO levels during February 2017 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.3: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – FEBRUARY 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	23/02/2017 11:33	48	2.0	A	43	<30	Yes	Nil	NA	NA	NA	NA
NA6	22/02/2017 22:26	37	1.1	F	37	<30	Yes	Nil	45	32	Yes	Nil
NA12	22/02/2017 22:00	36	2.4	D	35	<30	Yes	Nil	45	32	Yes	Nil
GRNP	23/03/2017 22:00	28	4.1	D	50	IA	Yes	Nil	NA	NA	NA	NA
MGNR	23/02/2017 01:54	27	0.8	E	50	IA	Yes	Nil	NA	NA	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.4: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – FEBRUARY 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	22/02/2017 22:26	37	1.1	F	40	42	<30	Yes	Nil	Nil
NA12	22/02/2017 22:00	36	2.4	D	37	40	<30	Yes	Nil	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.3 March 2017

Table 4.5 compares MCO levels during March 2017 against impact assessment criteria detailed in the project approval. Table 4.6 compares MCO levels during March 2016 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.5: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – MARCH 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s[5]	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	24/03/2017 12:38	50	5.4	C	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	23/03/2017 23:22	38	3.9	D	37	<30	No	NA	45	31	No	NA
NA12	23/03/2017 23:45	39	3.2	D	35	30	No	NA	45	34	No	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.6: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – MARCH 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	23/03/2017 23:22	38	3.9	D	40	42	<30	No	NA	NA
NA12	23/03/2017 23:45	39	3.2	D	37	40	30	No	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.4 April 2017

Table 4.7 compares MCO levels during April 2017 against impact assessment criteria detailed in the project approval. Table 4.8 compares MCO levels during April 2017 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.7: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – APRIL 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	07/04/2017 11:05	50	4.0	A	43	30	Yes	Nil	NA	NA	NA	NA
NA6	06/04/2017 22:01	38	2.2	F	37	32	Yes	Nil	45	40	Yes	Nil
NA12	06/04/2017 22:45	43	2.6	E	35	30	Yes	Nil	45	39	Yes	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.8: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – APRIL 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	06/04/2017 22:01	38	2.2	F	40	42	32	Yes	Nil	Nil
NA12	06/04/2017 22:45	43	2.6	E	37	40	30	Yes	Nil	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.5 May/Quarter 2 2017

Table 4.9 compares MCO levels during May 2017 against impact assessment criteria detailed in the project approval. In accordance with the NMP (approved July 2015) additional sites are required to be monitored on a quarterly basis and include GRNP and MGNP. Table 4.10 compares MCO levels during May 2017 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.9: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – MAY 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	26/05/2017 11:09	43	1.7	A	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	25/05/2017 22:06	33	0.9	D	37	<25	Yes	Nil	45	<30	Yes	Nil
NA12	25/05/2017 22:30	31	0.9	D	35	<25	Yes	Nil	45	<25	Yes	Nil
GRNP	25/05/2017 23:07	36	0.6	F	50	<30	Yes	Nil	NA	NA	NA	NA
MGNR	26/05/2017 02:15	26	0.9	D	50	<25	Yes	Nil	NA	NA	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.10: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – MAY 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	25/05/2017 22:06	33	0.9	D	40	42	<25	Yes	Nil	Nil
NA12	25/05/2017 22:30	31	0.9	D	37	40	<25	Yes	Nil	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.6 June 2017

Table 4.11 compares MCO levels during June 2017 against impact assessment criteria detailed in the project approval. Table 4.12 compares MCO levels during June 2017 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.11: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – JUNE 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	21/06/2017 12:10	47	1.4	A	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	20/06/2017 22:21	36	0.0	G	37	36	No	NA	45	43	No	NA
NA6[2]	20/06/2017 23:50	33	0.6	G	37	32	No	NA	45	38	No	NA
NA12	20/06/2017 22:00	34	0.0	G	35	28	No	NA	45	31	No	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO; and*
2. *Remeasure*

Table 4.12: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – JUNE 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	20/06/2017 22:21	36	0.0	G	40	42	36	No	NA	NA
NA6[2]	20/06/2017 23:50	33	0.6	G	40	42	32	No	NA	NA
NA12	20/06/2017 22:00	34	0.0	G	37	40	28	No	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO; and*
2. *Remeasure.*

4.7 July 2017

Table 4.13 compares MCO levels during July 2017 against impact assessment criteria detailed in the project approval. Table 4.14 compares MCO levels during July 2017 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.13: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – JULY 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	21/07/2017 11:20	45	1.6	B	43	<30	Yes	Nil	NA	NA	NA	NA
NA6	20/07/2017 22:00	28	1.1	F	37	IA	Yes	Nil	45	IA	Yes	Nil
NA12	20/07/2017 22:30	36	3.0	E	35	IA	Yes	Nil	45	IA	Yes	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.14: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – JULY 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	20/07/2017 22:00	28	1.1	F	40	42	IA	Yes	Nil	Nil
NA12	20/07/2017 22:30	36	3.0	E	37	40	IA	Yes	Nil	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.8 August/Quarter 3 2017

Table 4.15 compares MCO levels during August 2017 against impact assessment criteria detailed in the project approval. In accordance with the NMP (approved July 2015) additional sites are required to be monitored on a quarterly basis and include GRNP and MGNP. Table 4.16 compares MCO levels during August 2017 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.15: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – AUGUST 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	17/08/2017 10:54	48	4.8	A	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	16/08/2017 23:21	28	0.0	G	37	<20	No	NA	45	<20	No	NA
NA12	16/08/2017 23:45	17	0.0	G	35	IA	No	NA	45	IA	No	NA
GRNP	21/09/2017 23:21	31	0.0	G	50	31	No	NA	NA	NA	NA	NA
MGNR	17/08/2017 00:47	18	0.0	G	50	IA	No	NA	NA	NA	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.16: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – AUGUST 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	16/08/2017 23:21	28	0.0	G	40	42	<20	No	NA	NA
NA12	16/08/2017 23:45	17	0.0	G	37	40	IA	No	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.9 September 2017

Table 4.17 compares MCO levels during September 2017 against impact assessment criteria detailed in the project approval. Table 4.18 compares MCO levels during September 2017 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.17: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – SEPTEMBER 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	22/09/2017 11:15	45	2.0	A	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	21/09/2017 22:38	44	0.0	G	37	<20	No	NA	45	<20	No	NA
NA12	21/09/2017 22:15	30	0.0	G	35	<20	No	NA	45	<20	No	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.18: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – SEPTEMBER 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	21/09/2017 22:38	44	0.0	G	40	42	32	No	NA	NA
NA12	21/09/2017 22:15	30	0.0	G	37	40	<30	No	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.10 October 2017

Table 4.19 compares MCO levels during October 2017 against impact assessment criteria detailed in the project approval. Table 4.20 compares MCO levels during October 2017 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.19: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – OCTOBER 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	31/10/2017 10:14	48	3.0	A	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	30/10/2017 22:30	38	5.0	D	37	IA	No	NA	45	IA	NA	NA
NA12	30/10/2017 22:00	42	6.2	D	35	IA	No	NA	45	IA	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.20: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – OCTOBER 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	30/10/2017 22:30	38	5.0	D	40	42	IA	No	NA	NA
NA12	30/10/2017 22:00	42	6.2	D	37	40	IA	No	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.11 November/Quarter 4 2017

Table 4.21 compares MCO levels during November 2017 against impact assessment criteria detailed in the project approval. In accordance with the NMP (approved July 2015) additional sites are required to be monitored on a quarterly basis and include GRNP and MGNP. Table 4.22 compares MCO levels during November 2017 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.21: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – NOVEMBER 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	15/11/2017 13:28	46	1.2	A	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	15/11/2017 23:21	34	1.9	E	37	31	Yes	Nil	45	40	Yes	Nil
NA12	15/11/2017 23:45	36	1.3	E	35	27	Yes	Nil	45	31	Yes	Nil
GRNP	15/11/2017 22:00	36	2.7	E	50	IA	Yes	Nil	NA	NA	NA	NA
MGNR	16/11/2017 01:41	33	2.0	E	50	IA	Yes	Nil	NA	NA	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.22: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – NOVEMBER 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	15/11/2017 23:21	34	1.9	E	40	42	31	Yes	Nil	Nil
NA12	15/11/2017 23:45	36	1.3	E	37	40	27	Yes	Nil	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.12 December 2017

Table 4.23 compares MCO levels during December 2017 against impact assessment criteria detailed in the project approval. Table 4.24 compares MCO levels during December 2017 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.23: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – DECEMBER 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	13/12/2017 10:42	44	3.4	E	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	12/12/2017 22:00	35	0.9	G	37	<20	No	NA	45	<20	No	NA
NA12	12/12/2017 22:30	34	1.6	F	35	26	Yes	Nil	45	27	Yes	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.24: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – DECEMBER 2017

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	12/12/2017 22:00	35	0.9	G	40	42	<20	No	NA	NA
NA12	12/12/2017 22:30	34	1.6	F	37	40	26	Yes	Nil	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.13 Summary of Operational Results

4.13.1 Day

A summary of MCO daytime operational $L_{Aeq,15minute}$ results from 2017 is presented in Table 4.25.

Table 4.25: 2017 MCO OPERATIONAL $L_{Aeq,15minute}$ SUMMARY - DAY

Location	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17
NA1 Ulan School	IA	<30	IA	IA	IA	IA	<30	IA	IA	IA	IA	IA

4.13.2 Night

A summary of MCO night operational $L_{Aeq,15minute}$ results from 2017 is presented in Table 4.26.

Table 4.26: 2017 MCO OPERATIONAL $L_{Aeq,15minute}$ SUMMARY – NIGHT

Location	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17
NA6 Lower Ridge Road	24	<30	<30	35	<25	36	IA	<20	<20	IA	31	<20
NA6 Lower Ridge Road[2]	-	-	-	-	-	32	-	-	-	-	-	-
NA12 Winchester Crescent	23	<30	30	33	<25	28	IA	IA	<20	IA	27	26
GRNP	-	IA	-	-	<30	-	-	31	-	-	IA	-
MGNR	-	IA	-	-	<25	-	-	IA	-	-	IA	-

Notes:

1. *GRNP and MGNR locations monitored quarterly; and*
2. *Remeasure.*

A summary of MCO night operational $L_{A1,1minute}$ results from 2017 is presented in Table 4.27.

Table 4.27: 2017 MCO OPERATIONAL $L_{A1,1minute}$ SUMMARY – NIGHT

Location	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17
NA6 Lower Ridge Road	25	32	31	41	<30	43	IA	<20	<20	IA	40	<20
NA6 Lower Ridge Road[1]	-	-	-	-	-	38	-	-	-	-	-	
NA12 Winchester Crescent	29	32	34	40	<25	31	IA	IA	<20	IA	31	27

Notes:

1. *Remeasure.*

4.14 Comparison with Environmental Assessment Predictions

Predicted Year 2016 operational noise levels are provided in OC4 South-West Modification Noise Assessment by SLR (April 2015). The noise assessment was prepared for Stage 1 Modification 11/Stage 2 Modification 1.

Table 9 of the South-West Modification report details different modelling parameters for different periods. Of particular relevance in this comparison exercise is the meteorological parameters (wind speed and direction and temperature gradient) for day (NA1 only) and night. Table 9 has been reproduced below. Monitoring was not undertaken during the evening period during 2017 and therefore no comparison has been made with these predictions.

Table 9 Calm (Neutral) and Noise Enhancing Meteorological Modelling Parameters

Period	Meteorological Parameter	Air Temperature	Relative Humidity	Wind Velocity	Temperature Gradient
Daytime	Calm	18°C	55%	0 m/s	0°C/100 m
	Wind only	19°C	55%	WSW and W 3 m/s	0°C/100 m
Evening	Calm	16°C	66%	0 m/s	0°C/100 m
	Wind only	16°C	65%	ENE, SSW, SW, WSW and W 3 m/s	0°C/100 m
Night-time	Calm	12°C	75%	0 m/s	0°C/100 m
	Wind only	12°C	75%	ENE, E, SSW, SW and WSW 3 m/s	0°C/100 m
	Strong Inversion	6°C	70%	0 m/s	5.2°C/100 m
	Strong Inversion plus Drainage	6°C	70%	ENE 1.0 m/s	5.2°C/100 m

Predicted Year 2016 and 2018 operational noise levels from Table 22 of the modification report are summarised in Table 4.28 for comparison with attended monitoring results, with the exception of NA1 as predicted $L_{Aeq,15minute}$ levels were not provided. However, Table 23 of the modification report details $L_{Aeq,period}$ amenity levels for NA1 (Ulan School). While it is not strictly correct to compare $L_{Aeq,15minute}$ with $L_{Aeq,period}$, results for these parameters (when predicted) are usually similar (within 2 to 3 dB), and, in the case of NA1, the predicted $L_{Aeq,period}$ is very low. Notwithstanding that it is also not possible to directly compare atmospheric condition results for NA1, it is assumed that if measured $L_{Aeq,15minute}$ values are less than 30 dB then this approximately correlates with the predicted $L_{Aeq,period}$.

Table 4.28: MCO OPERATIONAL PREDICTIONS, YEAR 2016 - dB

Location	$L_{Aeq,period}$	$L_{Aeq,15minute}$ Calm	$L_{Aeq,15minute}$ Wind or Inversion	$L_{A1,1minute}$ Wind or Inversion
NA1 Ulan School[1,2]	27	NA	NA	NA
NA6 Lower Ridge Road[3]	NA	21	37	40
NA8 South Ridge Road[4]	NA	13	21	24
NA9 Winchester Cres[5]	NA	16	32	35
NA12 Winchester Cres[6]	NA	17	34	37

Source: MCO OC4 South-West Modification Noise Assessment (SLR, April 2015).

Notes:

1. *$L_{Aeq,period}$ result for worst case atmospheric condition;*
2. *Day result only for this location corresponding to period of use;*
3. *Predicted levels for 70 – DJ & A Coventry;*
4. *Predicted levels for 171 – AD & SA McGregor;*
5. *Predicted levels for 83 – CF & CR Wall; and*
6. *Predicted levels for 238 – B Powell; and*
7. *NA is not applicable at this location.*

4.14.1 2017 Comparison

Table 4.29 to Table 4.32 in this report compare the measured operational levels to the predicted levels for Year 2016 in the modification report for the relevant meteorological conditions. The difference against predicted levels for all relevant meteorological parameters as detailed in Table 9 of the modification report (shown above) have been included.

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. Notation used in the tables to denote differences is irrespective of the integer value sign. For example, the notation >-17 means the values are more than 17 dB less than the predicted level.

Where the meteorological conditions (primarily wind direction and temperature gradient) during the attended monitoring do not correspond with those that are modelled, no further analysis is undertaken.

4.14.2 Day Comparison

Detailed analysis of meteorological conditions which were present during 2017 attended day monitoring show that the following conditions did not occur:

- Calm.

Table 4.29 provides the difference between measured and predicted levels during the day period.

Table 4.29: 2017 MCO OPERATIONAL $L_{Aeq,period}$ dB DIFFERENCE AGAINST PREDICTED WIND CONDITIONS - DAY, YEAR 2016 [1,2,3]

Location	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17
NA1 Ulan School	NR	NR	NR	NR	NR	NR	NR	NR	IA	NR	NR	NR

Notes:

1. *NR denotes met conditions not relevant, IA denotes conditions relevant but MCO inaudible during monitoring;*
2. *Wind conditions assumes winds at speeds between 0.1 and 3 m/s during monitoring; and*
3. *Assumes the following possible predicted wind directions: WSW from 236.25 to 258.75 degrees; W from 258.75 to 281.25 degrees.*

4.14.3 Night Comparison

Detailed analysis of meteorological conditions which were present during 2017 attended night monitoring show that the following conditions did not occur:

- strong inversion plus ENE drainage.

Table 4.30 provides the difference between measured and predicted levels for calm conditions during the night for $L_{Aeq,15minute}$ levels.

Table 4.30: 2017 MCO OPERATIONAL $L_{Aeq,15minute}$ dB DIFFERENCE AGAINST PREDICTED CALM CONDITIONS - NIGHT, YEAR 2016[2,4]

Location	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17
NA6 Lower Ridge Road	NR	NR	NR	NR	NR	+15[2]	NR	NM[2]	NM[2]	NR	NR	NR
NA12 Winchester Cres	NR	NR	NR	NR	NR	+11[2]	NR	IA[2]	NM[2]	NR	NR	NR

Notes:

1. *NR denotes met conditions not relevant, NA denotes not applicable, IA denotes conditions relevant but MCO inaudible during monitoring, NM denotes conditions relevant but MCO not directly measurable during monitoring; and*
2. *Calm conditions assumes winds of 0.0 m/s.*

Table 4.31 provides the difference between measured and predicted levels for ENE, E, SSW, SW or WSW winds during the night for $L_{Aeq,15minute}$ levels. As the reported model results are the highest predicted noise level (without specifying the actual meteorological condition responsible) it is not possible to determine which conditions match specifically. Differences during strong inversions of 5.2 degrees Celsius per 100 m are also indicated.

Table 4.31: 2017 MCO OPERATIONAL $L_{Aeq,15minute}$ dB DIFFERENCE AGAINST PREDICTED WIND AND INVERSION CONDITIONS - NIGHT, YEAR 2016[2,4]

Location	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17
NA6 Lower Ridge Road	-13[2]	>-7[2]	NR	-2[2]	>-12[2]	NR	NR	>-17[3]	>-17[3]	NR	-6[2]	>-17[3]
NA12 Winchester Cres	-11[2]	>-4[2]	NR	-1[2]	>-9[2]	-6[3]	NR	IA[2]	>-14[2]	NR	NR	-8[2]

Notes:

1. *NR denotes met conditions not relevant, NA denotes not applicable, IA denotes conditions relevant but MCO inaudible during monitoring, NM denotes conditions relevant but MCO not directly measurable during monitoring;*
2. *Wind conditions assumes winds at speeds between 0.1 and 3 m/s during monitoring and assumes the following possible predicted wind directions: ENE from 56.25 to 78.75 degrees, E from 78.75 to 101.25 degrees, SSW from 191.25 to 213.75 degrees, SW from 213.75 to 236.25 degrees and WSW from 236.25 to 258.75 degrees; and*
3. *Strong Inversion of 5.2 degrees Celsius per 100 m or greater.*

Table 4.32 provides the difference between measured and predicted levels for ENE, E, SSW, SW or WSW winds during the night for $L_{A1,1minute}$ levels. Differences during strong inversions of 5.2 degrees Celsius per 100 m are also indicated.

Table 4.32: 2017 MCO OPERATIONAL $L_{A1,1minute}$ dB DIFFERENCE AGAINST PREDICTED WIND AND INVERSION CONDITIONS - NIGHT, YEAR 2016[2]

Location	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17
NA6 Lower Ridge Road	-15[2]	-8[2]	NR	+1[2]	>-10[2]	NR	NR	>-20[3]	>-20[3]	NR	0[2]	>-20[2]
NA12 Winchester Cres	-8[2]	-5[2]	NR	+3[2]	>-12[2]	-6[3]	NR	IA[2]	>-17[2]	NR	-11[2]	-10[2]

Notes:

1. *NR denotes met conditions not relevant, NA denotes not applicable, IA denotes conditions relevant but MCO inaudible during monitoring, NM denotes conditions relevant but MCO not directly measurable during monitoring;*
2. *Wind conditions assumes winds at speeds between 0.1 and 3 m/s during monitoring and assumes the following wind directions: ENE from 56.25 to 78.75 degrees, E from 78.75 to 101.25 degrees, SSW from 191.25 to 213.75 degrees, SW from 213.75 to 236.25 degrees and WSW from 236.25 to 258.75 degrees;*
3. *Strong inversion.*

As shown above, a comparison of predicted and measured levels from MCO Year 2016 OC4 South-West operation varies greatly. This comparison does not take into account operational activities at the time of monitoring compared to predicted scenarios.

Results indicated that MCO levels were often well under the predicted levels where meteorological conditions were relevant and there are no systemic issues as a result of the operation.

Measured L_{Aeq} noise levels were greater than predicted in June for NA6 and NA12 under calm conditions. Measured $L_{A1,1minute}$ noise levels were greater than predicted levels in April for both NA6 and NA12 under wind conditions. The model (Year 2016 of the OC4 South West Haul Road Modification) predicts that there will be no exceedances of the criterion for the indicative scenarios and at no point were measured levels greater than the relevant criterion for each location where criteria applied.

5 SUMMARY OF COMPLIANCE

During the 2017 reporting period, attended environmental noise monitoring described in this report was conducted monthly. More detail regarding monitoring locations and timing of monitoring during 2017 is provided in Section 1.2 of this report.

Attended noise monitoring was carried out during 2017 to quantify and describe the existing acoustic environment around MCO and compare the results with relevant limits.

5.1 January to December 2017 Compliance

MCO complied with the project specific criteria at all monitoring sites during attended noise monitoring undertaken between January and December 2017.

5.2 EIS Comparison

Results indicated that MCO levels were often well under the predicted levels where meteorological conditions were relevant and there are no systemic issues as a result of the operation.

Measured L_{Aeq} noise levels were greater than predicted in June for NA6 and NA12 under calm conditions. Measured $L_{A1,1minute}$ noise levels were greater than predicted levels in April for both NA6 and NA12 under wind conditions.

The model (Year 2016 of the OC4 South West Haul Road Modification) predicted that there would be no exceedances of the criterion for the indicative scenarios and at no point were measured levels greater than the relevant criterion for each location, where criteria applied.

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APPENDIX 3C. BLAST MONITORING DATA

Date	Time	BM1 Ulan School		BM5 Ridge Road	
		Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)
3/01/17	12:00:00 PM	91.5	0.24	101	0.17
9/01/17	4:02:00 PM	94	0.25	101.9	0.21
10/01/17	2:04:00 PM	97.5	0.39	94	0.25
12/01/17	12:16:00 PM	101	0.58	98.8	0.78
13/01/17	12:07:00 PM	97.5	0.2	101.9	0.23
21/01/17	4:00:00 PM	105.5	0.18	103.5	0.3
24/01/17	12:01:00 PM	88	0.24	94	0.19
27/01/17	12:05:00 PM	104.9	0.15	107	0.25
28/01/17	12:00:00 PM	88	0.14	95.9	0.33
28/01/17	4:00:00 PM	88	0.14	97.5	0.08
31/01/17	4:04:00 PM	88	0.62	98.8	0.57
31/01/17	4:13:00 PM	91.5	0.55	95.9	0.41
4/02/17	12:00:00 PM	91.5	0.18	98.8	0.42
6/02/17	12:04:00 PM	94	1.1	94	0.11
9/02/17	12:01:00 PM	95.9	0.19	98.8	0.29
11/02/17	4:12:00 PM	95.9	0.25	94	0.25
13/02/17	4:25:00 PM	101.9	0.55	94	0.69
15/02/17	4:00:00 PM	81.9	0.33	94	0.15
17/02/17	4:45:00 PM	111.5	0.86	126.6	0.82
21/02/17	12:07:00 PM	97.5	0.42	98.8	0.54
23/02/17	4:02:00 PM	88	0.13	94	0.17
23/02/17	4:06:00 PM	81.9	0.19	94	0.22
24/02/17	12:01:00 PM	91.5	0.31	95.9	0.29
28/02/17	12:12:00 PM	88	0.69	100	0.62
28/02/17	3:59:00 PM	97.5	0.11	109.5	0.14
2/03/17	4:07:00 PM	98.8	0.23	94	0.26
2/03/17	4:12:00 PM	91.5	0.17	94	0.26
3/03/17	12:03:00 PM	91.5	0.34	91.5	0.27
6/03/17	12:36:00 PM	88	0.15	94	0.18
7/03/17	4:15:00 PM	95.9	0.15	97.5	0.14
7/03/17	4:20:00 PM	95.9	0.18	97.5	0.13
8/03/17	12:00:00 PM	94	0.11	101	0.22
10/03/17	12:23:00 PM	97.5	0.63	97.5	0.5
10/03/17	12:27:00 PM	94	0.51	91.5	0.24
14/03/17	2:04:00 PM	94	0.42	102.8	0.91
20/03/17	12:12:00 PM	98.8	0.72	101	0.9
20/03/17	3:53:00 PM	94	0.46	97.5	0.38
22/03/17	4:49:00 PM	91.5	0.09	102.8	0.28
23/03/17	12:03:00 PM	94	0.47	94	0.29
24/03/17	4:00:00 PM	91.5	0.11	109.2	0.25
25/03/17	4:07:00 PM	91.5	0.27	97.5	0.46
27/03/17	4:01:00 PM	88	0.18	91.5	0.46
30/03/17	3:59:00 PM	94	0.14	91.5	0.23
1/04/17	4:10:00 PM	91.5	0.26	94	0.49
7/04/17	12:56:00 PM	101	0.3	101	0.8
8/04/17	4:18:00 PM	94	0.13	100	0.21
10/04/17	4:14:00 PM	91.5	0.38	95.9	0.38
13/04/17	12:02:00 PM	98.8	0.14	104.2	0.33
18/04/17	12:46:00 PM	95.9	0.25	98.8	0.47
19/04/17	4:03:00 PM	101	0.48	101	0.79
21/04/17	12:01:00 PM	97.5	0.36	98.8	0.46
29/04/17	12:04:00 PM	100	0.49	97.5	0.46
1/05/17	4:35:00 PM	91.5	0.28	104.9	1.06
5/05/17	4:07:00 PM	88	0.24	100	0.5
5/05/17	4:08:00 PM	88	0.12	94	0.26
8/05/17	12:14:00 PM	104.9	0.8	100	0.47
16/05/17	12:04:00 PM	94	0.26	97.5	0.47
16/05/17	3:59:00 PM	91.5	0.2	97.5	0.48
17/05/17	12:07:00 PM	102.8	0.24	106.5	0.29
20/05/17	12:03:00 PM	88	0.2	91.5	0.26
22/05/17	4:06:00 PM	94	0.24	101	0.68

Date	Time	BM1 Ulan School		BM5 Ridge Road	
		Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)
30/05/17	12:19:00 PM	97.5	1.06	101.9	1.11
31/05/17	1:43:00 PM	91.5	0.16	95.9	0.3
1/06/17	2:00:00 PM	94	0.21	97.5	0.42
5/06/17	4:07:00 PM	91.5	0.28	100	0.88
7/06/17	11:59:00 AM	91.5	0.22	97.5	0.41
8/06/17	12:04:00 PM	88	0.09	95.9	0.09
9/06/17	11:59:00 AM	97.5	0.11	111.5	0.25
13/06/17	12:16:00 PM	98.8	0.09	100	0.24
15/06/17	12:03:00 PM	94	0.56	101.9	0.81
22/06/17	12:06:00 PM	106.5	0.46	103.5	0.27
24/06/17	12:09:00 PM	88	0.17	95.9	0.4
26/06/17	12:45:00 PM	91.5	0.27	88	0.42
28/06/17	12:01:00 PM	95.9	0.26	95.9	0.38
30/06/17	12:04:00 PM	101.9	0.14	101.9	0.09
3/07/17	12:10:00 PM	94	0.14	91.5	0.01
3/07/17	1:06:00 PM	88	0.09	94	0.09
4/07/17	4:02:00 PM	91.5	0.13	91.5	0.1
6/07/17	12:32:00 PM	94	0.36	97.5	0.53
7/07/17	4:03:00 PM	91.5	0.33	97.5	0.54
11/07/17	12:41:00 PM	94	0.18	91.5	0.2
13/07/17	12:26:00 PM	110.9	0.69	106.5	0.19
13/07/17	12:27:00 PM	110.9	0.69	106.5	0.19
14/07/17	12:57:00 PM	102.8	0.14	101	0.13
17/07/17	12:03:00 PM	88	0.32	98.8	0.66
18/07/17	12:01:00 PM	108.8	0.14	*	0.22
21/07/17	11:59:00 AM	94	0.19	97	0.16
24/07/17	12:33:00 PM	103.5	0.39	95.9	0.46
27/07/17	4:24:00 PM	91.5	0.19	95.9	0.31
28/07/17	12:04:00 PM	95.9	0.26	101.9	0.63
1/08/17	12:02:00 PM	97.5	0.18	88	0.18
3/08/17	12:08:00 PM	94	0.12	101.9	0.27
4/08/17	4:06:00 PM	95.9	0.1	91.5	0.23
8/08/17	1:16:00 PM	101	0.55	101.9	0.31
9/08/17	12:01:00 PM	91.5	0.32	95.9	0.32
11/08/17	11:56:00 AM	97.5	0.14	94	0.12
15/08/17	1:16:00 PM	94	0.26	100	0.67
18/08/17	12:14:00 PM	97.5	0.23	95.9	0.35
25/08/17	11:59:00 AM	97.5	0.3	97.5	0.42
28/08/17	12:15:00 PM	115.2	0.34	104.2	0.31
30/08/17	11:55:00 AM	94	0.16	94	0.48
31/08/17	12:14:24 PM	94	0.1	97.5	0.19
6/09/17	12:07:00 PM	105.5	0.36	102.8	0.19
8/09/17	4:11:00 PM	98.8	0.26	95.9	0.3
12/09/17	11:58:00 AM	81.9	0.16	91.5	0.16
13/09/17	4:04:00 PM	91.5	0.11	103.5	0.08
16/09/17	4:04:00 PM	108	0.24	102.8	0.39
30/09/17	3:57:00 PM	101.9	0.28	103.5	1.15
7/10/17	11:55:00 AM	96.1	0.16	98.2	0.25
12/10/17	4:45:00 PM	107.5	0.43	80.4	0.39
13/10/17	3:58:00 PM	95.2	0.25	76.3	0.59
19/10/17	12:02:00 PM	97.8	0.13	71.2	0.3
24/10/17	11:54:00 AM	89.9	0.23	85	0.19
26/10/17	12:01:00 PM	102.9	0.4	87.5	0.28
27/10/17	12:02:00 PM	86.9	0.07	88.3	0.05
28/10/17	12:04:00 PM	87.5	0.15	89	0.6
28/10/17	12:16:00 PM	96.3	0.08	99	0.14
30/10/17	11:56:00 AM	110	0.08	103.5	0.16
1/11/17	11:56:00 AM	93	0.23	83.4	0.3
2/11/17	3:59:00 PM	97.6	0.1	100.7	0.25
6/11/17	12:02:00 PM	106.3	0.14	87.6	0.49
6/11/17	12:10:00 PM	101.6	0.15	102.6	0.24
10/11/17	12:05:00 PM	88.5	0.06	102.4	0.11
13/11/17	12:04:00 PM	92.5	0.09	101.7	0.17
14/11/17	11:54:00 AM	88.6	0.08	89.6	0.15

Date	Time	BM1 Ulan School		BM5 Ridge Road	
		Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)
16/11/17	11:56:00 AM	95.3	0.2	91.2	0.23
21/11/17	12:18:00 PM	96.4	0.21	100.3	0.44
23/11/17	12:56:00 PM	97.7	0.25	102.4	0.7
24/11/17	12:22:00 PM	86.4	0.07	89.5	0.25
24/11/17	12:29:00 PM	102.8	0.42	96.8	0.21
27/11/17	1:00:00 PM	93.4	0.25	94.9	0.22
27/11/17	4:06:00 PM	92.7	0.15	102.4	0.61
1/12/17	12:00:00 PM	103.9	0.22	94.2	0.43
4/12/17	11:56:00 AM	94.5	0.19	102.1	0.35
8/12/17	12:13:00 PM	107.8	0.5	94.8	0.56
14/12/17	12:06:00 PM	88	0.2	83	0.27
18/12/17	2:31:00 PM	93.5	0.2	89.6	0.65

*Environmental influenced

APPENDIX 3D. AIR QUALITY DATA

Table A : Summary of the MCO Air Quality-Monitoring Program

Monitoring Parameter	Monitoring Location	Frequency	Justification
Dust Deposition	DG01 – Bobadeen	Every 30 days ± 2 days	Background monitoring north of the Moolarben Coal Complex.
	DG04 – Ulan Village	Every 30 days ± 2 days	Representative of nearest non-mine owned residences to the north-west of the Moolarben Coal Complex.
	DG05 – Glenmoor	Every 30 days ± 2 days	Representative of nearest non-mine owned residences to the south-west and west of the Moolarben Coal Complex.
	DG06 – Barcoo	Every 30 days ± 2 days	Representative of non-mine owned residences to the south, south-west and west of the Moolarben Coal Complex.
	DG07 – Hillside	Every 30 days ± 2 days	Representative of non-mine owned residences to the south of the Moolarben Coal Complex. Due to its close proximity to OC3, DG07 will be discontinued prior to mining OC3 and an alternative location will be investigated.
	DG08 – Croydon	Every 30 days ± 2 days	Representative of non-mine owned residences to the south of the Moolarben Coal Complex. Due to its close proximity to OC3, DG08 will be discontinued prior to mining OC3 and an alternative location will be investigated.
	DG09 – Wilga	Every 30 days ± 2 days	Representative of non-mine owned residences to the south-west and west of the Moolarben Coal Complex.
	DG11 – Ridge Road	Every 30 days ± 2 days	Representative of non-mine owned residences to the south-west and west of the Moolarben Coal Complex.
	DG12 – Ulan-Wollar Rd	Every 30 days ± 2 days	Representative of mine owned land east of the Moolarben Coal Complex.
	DG 13 – Winchester Cres	Every 30 days ± 2 days	Representative of mine owned land south of the southwest and south of the Moolarben Coal Complex
	DG 14 – Murragamba Valley	Every 30 days ± 2 days	Representative of non-mine owned residences to the south-west and west of the Moolarben Coal Complex.
HVAS – PM10	PM01 (Ulan Village)	Every 6 days	Indicative of potential impacts to nearest non-mine owned residences to the north-west of the Moolarben Coal Complex.
	PM02 (Ridge Road)	Every 6 days	Background monitoring south-west west of the Moolarben Coal Complex.
Real Time PM_{10}	TEOM 01 (Ulan School)	Real Time PM_{10}	Real time monitoring at Ulan Public School.
	TEOM 04 (Ulan Road)	Real Time PM_{10}	Real-time monitoring representative of nearest non-mine owned residences to the south-west and west of the Moolarben Coal Complex.
	TEOM 07 (Ulan Road)	Real Time PM_{10}	Real time monitoring representative of non-mine owned residences to the south-west of and west of the Moolarben Coal Complex.
	TEOM06 (Ulan-Wollar Rd)	Real Time PM_{10}	Real time monitoring representative of mine owned land to the east of Moolarben Coal Complex and indicator of background air quality. (Note there are no residences on private or mine owned land in the vicinity of the monitor).

Table B : Summary of the MCO Air Quality-Monitoring Program – Dust Deposition

Dust Gauge	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
DG1	1.2	0.7	0.6	0.6	0.3	0.4	0.3	0.2	0.8	0.5	1.1	1
DG4	1.9	1.3	C	0.7	1.3	1	0.3	0.6	1.2	1.7	1.2	0.6
DG5	1.3	0.9	2	1.3	1.1	1	0.3	2	1	4	C	C
DG6	1.1	0.8	1	0.6	0.3	0.3	0.2	0.5	0.7	0.6	C	C
DG7	0.6	0.6	0.5	0.6	0.3	0.2	0.3	0.3	0.7	0.9	2	1.4
DG8	0.8	1.4	1	0.7	0.4	0.4	1.1	0.3	0.7	0.9	1.4	1.1
DG9	1.1	0.7	C	0.7	0.5	0.3	0.4	0.4	1.3	0.5	1	2.1
DG11	1.8	1.3	1.6	1.3	0.9	0.8	0.4	0.5	0.8	1.3	0.6	2.3
DG12	1	1.5	0.9	0.7	0.9	0.9	1.3	0.7	1.8	1	1.8	2.3
DG13	0.8	1.2	0.7	0.5	0.5	0.5	0.3	0.5	1	0.5	0.8	1.2
DG14	1.3	1.4	2.5	1.4	0.5	0.9	1.5	0.4	1.2	0.9	1.5	0.8

*C – Dust gauge deemed contaminated after analysis of influencing factors. These factors include an ash residue result of <50%, the presence of bird droppings or other contaminants such as insects in the dust gauge and analysis of historical results from the dust gauge.

Figure 3-b 2012 to 2016 Dust Depositional Results

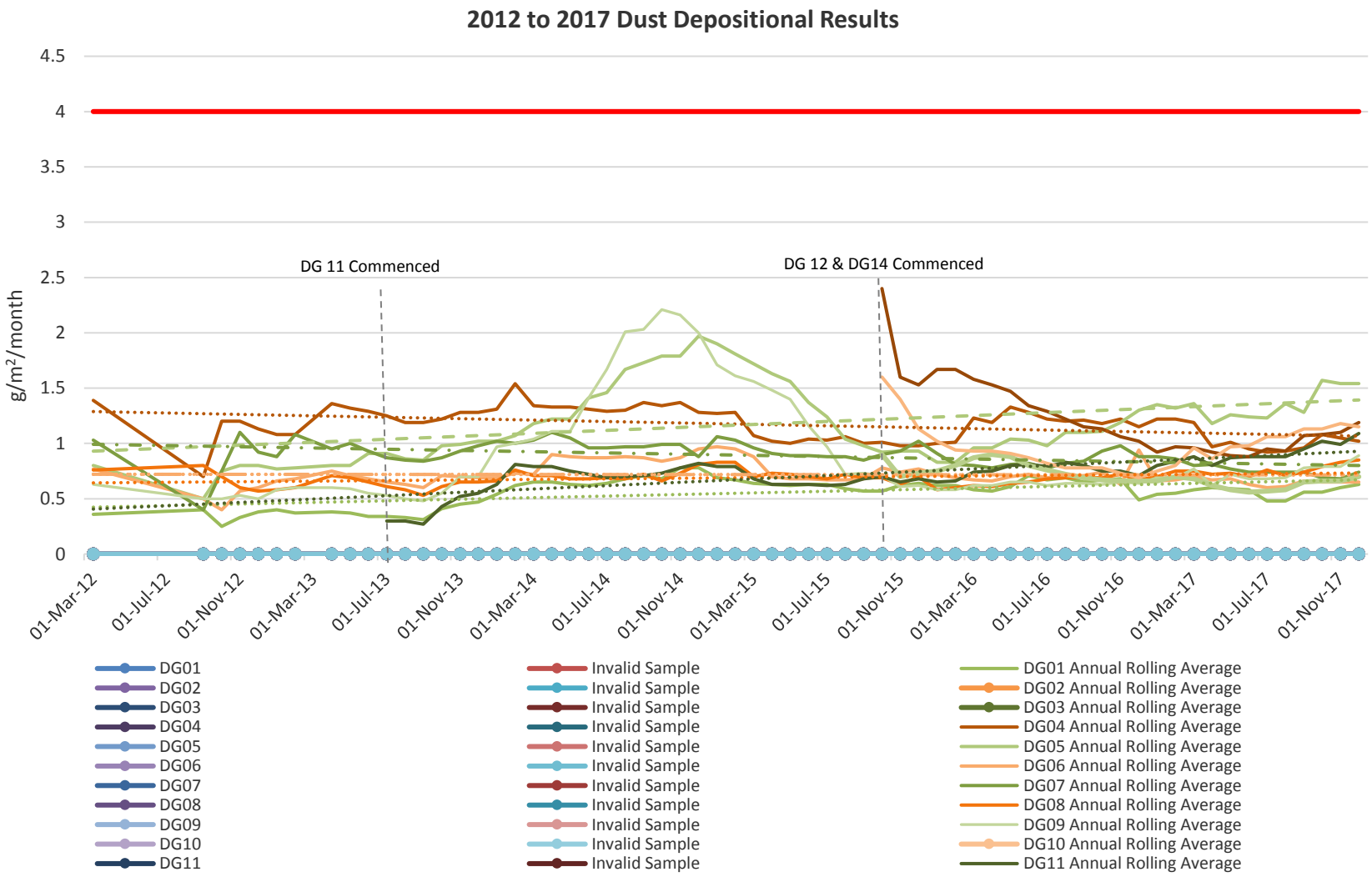


Table 3: TEOM Monitoring Data

Date	Lagoons Road TEOM04	Ulan School TEOM01 EPL 17	Ulan-Wollar Road TEOM06 EPL15	Ridge Road TEOM05 EPL27	Ulan Road TEOM07 EPL27	Comment
	Daily Result (24hr Average Limit = 50µg/m³))					
1/01/2017	14.9	12.8	10.4	8.3		
2/01/2017	11.2	8.5	8.3	8.2		
3/01/2017	15.4	23.3	6.1	3.2		
4/01/2017	16.9	11.5	5.6	-		TEOM 05 Out of Service
5/01/2017	16.6	11.8	5.7	-		"
6/01/2017	15.3	9.4	4.9	-		"
7/01/2017	14.9	9	5.8	-		"
8/01/2017	14.1	5.4	7.5	-		"
9/01/2017	20	22.1	24.9	-		"
10/01/2017	23	19.5	18.4	-		"
11/01/2017	15.3	12.4	18.1	-		"
12/01/2017	30	20.5	23.6	19.2		Interim replacement of TEOM05 with EBAM
13/01/2017	20	16	16	18.4		
14/01/2017	11.1	7.4	21.2	8.3		
15/01/2017	25	18.7	17.7	13.2		
16/01/2017	19.3	14.2	12	-		Equipment Fault
17/01/2017	18.5	16	15.2	-		Equipment Fault
18/01/2017	12.7	16.5	17.8	26.0		
19/01/2017	14	11.7	8.6	18.7		
20/01/2017	9.5	12.1	11.3	10.2		
21/01/2017	18.8	14.2	11	18.3		
22/01/2017	23.1	16.9	13	18.1		
23/01/2017	16.3	15.2	10	10.8		
24/01/2017	14.8	16.1	11.7	6.4		
25/01/2017	10.4	5.4	2.8	12.1		
26/01/2017	19	11.5	8.1	35.0		
27/01/2017	19.8	12	7.1	18.8		
28/01/2017	13.4	11.4	9.7	13.7		
29/01/2017	16.4	15.2	14.8	6.4		
30/01/2017	15.6	5.4	14.1	14.1		
31/01/2017	13.1	13.7	14.7	8.6		
1/02/2017	21.2	16.9	14.4	16.2		
2/02/2017	16.8	15.6	12.1	30.7		
3/02/2017	22.5	17.6	14.5	20.5		
4/02/2017	20	12.6	13.3	27.3		
5/02/2017	11.5	9	9.6	10.2		
6/02/2017	16.3	10.5	13.9	12.4		
7/02/2017	21	18.7	13.7	172.84		Fire on Moolarben Road
8/02/2017	11.5	9.4	4	8.2		
9/02/2017	15.2	7.3	10.1	13.8		
10/02/2017	19.5	12.1	5.2	11.6		
11/02/2017	19.7	16.9	2.4	10.2		
12/02/2017	25.6	19.8	33.9	12.9		
13/02/2017	13.2	9.4	3	7.7		
14/02/2017	32.8	20.3	18.9	55.4		Bushfire Moolarben Rd
15/02/2017	18.3	12.8	8.8	20.0		
16/02/2017	37	31.4	24.2	42.5		
17/02/2017	33.7	2.4	31.9	13.2		
18/02/2017	15.2	14	18.6	12.4		
19/02/2017	14.3	11.4	35	9.9		
20/02/2017	13.1	9.8	21.6	4.9		
21/02/2017	23.3	17.6	20.4	7.4		
22/02/2017	23.3	20.2	13.7	11.8		
23/02/2017	26.9	23.4	21.8	15.1		
24/02/2017	28.5	27	24.9	11.4		
25/02/2017	18.1	11.5	7.7	10.3		
26/02/2017	12	10.1	6.5	6.2		
27/02/2017	13.5	14.3	8.5	9.7		

Date	Lagoons Road TEOM04	Ulan School TEOM01 EPL 17	Ulan-Wollar Road TEOM06 EPL15	Ridge Road TEOM05 EPL27	Ulan Road TEOM07 EPL27	Comment
	Daily Result (24hr Average Limit = 50µg/m³))					
28/02/2017	11.1	3.4	5.8	7.9		
1/03/2017	11.1	3.4	5.8	7.9		
2/03/2017	9.6	3.3	5.9	3.5		
3/03/2017	6.1	12.3	7.7	13.7		
4/03/2017	9.7	11.4	8.5	11.1		
5/03/2017	7.6	4.4	2	1.0		
6/03/2017	6.3	4.2	3.4	2.3		
7/03/2017	12.7	8.9	4.9	8.9		
8/03/2017	14.9	12.8	8.7	11.0		
9/03/2017	11.2	14.7	6.8	13.2		
10/03/2017	18.4	19.6	12.5	15.6		
11/03/2017	20.9	18.5	12.4	16.1		
12/03/2017	23.3	19.9	13.7	15.5		
13/03/2017	23.1	30.8	21.3	5.5		
14/03/2017	13.5	1.2	8.1	3.6		
15/03/2017	9.9	7.1	4.3	5.1		
16/03/2017	6.3	4.3	5	5.1		
17/03/2017	8	9.1	6.2	5.8		
18/03/2017	8.1	11.2	7.2	8.4		
19/03/2017	13.2	8.7	5.6	3.2		
20/03/2017	14.7	9.5	7.3	11.4		
21/03/2017	13.6	9	6.3	5.7		
22/03/2017	9	7.7	6.7	5.5		
23/03/2017	11.8	7.4	5.5	13.7		
24/03/2017	8.7	4.8	3.6	6.3		
25/03/2017	18.2	12.1	10.8	9.1		
26/03/2017	20.3	13.1	11.3	14.1		
27/03/2017	19	14.4	11.3	18.6		
28/03/2017	15.4	15.9	18.2	9.5		
29/03/2017	21.3	19.2	15.6	29.3		
30/03/2017	14	11.5	11	7.6		
31/03/2017	14.7	13.2	8.7	10.2		
1/04/2017	12.5	10.2	8	10.3		
2/04/2017	10.6	12.5	7.3	11.0		
3/04/2017	7.6	9.8	5.9	4.7		
4/04/2017	7.5	9.5	5	7.1		
5/04/2017	12	8.2	4.4	6.3		
6/04/2017	14.6	10.2	4.6	5.0		
7/04/2017	12.2	9.4	4.8	4.4		
8/04/2017	14.7	11.1	5.3	5.9		
9/04/2017	19	6.7	15.7	8.4		
10/04/2017	41.3	39.5	41.1	18.8		
11/04/2017	16.9	16.5	13.3	10.3		
12/04/2017	11	11.2	6.4	3.4		
13/04/2017	12	10.9	4.5	6.0		
14/04/2017	13.6	7.2	8.2	7.4		
15/04/2017	18.9	13.5	19	11.4		
16/04/2017	27.6	17.9	22.3	16.6		
17/04/2017	30.5	21.5	20.2	14.0		
18/04/2017	22.2	19.4	14.6	14.2		
19/04/2017	15.9	12.2	8.2	10.9		
20/04/2017	13.1	13	6.4	7.3		
21/04/2017	22.4	13.1	9.9	5.8		
22/04/2017	22.9	16	13.7	5.3		
23/04/2017	19.8	16	11.1	9.2		
24/04/2017	26.9	18.6	16.1	11.5		
25/04/2017	15.4	16.4	15.2	10.1		
26/04/2017	3.8	1.5	0.9	2.6		
27/04/2017	7.1	6.1	7.7	5.3		
28/04/2017	8.1	7.9	7.6	7.6		
29/04/2017	7	5.2	9.7	8.6		
30/04/2017	13.9	12.5	8.7	7.3		

Date	Lagoons Road TEOM04	Ulan School TEOM01 EPL 17	Ulan-Wollar Road TEOM06 EPL15	Ridge Road TEOM05 EPL27	Ulan Road TEOM07 EPL27	Comment
	Daily Result (24hr Average Limit = 50µg/m³))					
1/05/2017	11.9	15.3	16.3	7.8		
2/05/2017	9.4	9.9	19	Na		
3/05/2017	16	1.8	1.5	Na		
4/05/2017	16.9	10.8	5.9	5.1		
5/05/2017	19.7	12	5.6	7.6		
6/05/2017	10.4	9.4	20.5	9.6		
7/05/2017	6.5	5.4	13.2	6.7		
8/05/2017	19.3	20.3	19.8	12.7		
9/05/2017	16.8	22.8	11.3	9.0		
10/05/2017	21.6	13.9	10.3	9.9		
11/05/2017	25.6	16.1	13.8	16.2		
12/05/2017	27.3	24	21.2	39.6		
13/05/2017	24.6	15.4	11.3	16.9		
14/05/2017	17.6	13.1	11.1	12.3		
15/05/2017	11.2	8.2	9.3	8.2		
16/05/2017	16.9	10.1	13.6	12.7		
17/05/2017	21.7	19.5	15.9	12.2		
18/05/2017	21.8	19.9	15.6	8.7		
19/05/2017	11.4	5.4	4	4.9		
20/05/2017	5	3	2.1	0.4		
21/05/2017	8.5	5.8	6.7	4.7		
22/05/2017	15.9	15.8	12.4	20.3		
23/05/2017	11.3	10.4	8.4	15.9		
24/05/2017	7.2	8.9	8.5	4.2		
25/05/2017	10.4	9.1	8.8	9.2		
26/05/2017	10.6	8.4	9.6	7.7		
27/05/2017	13.8	11.6	13.7	7.5		
28/05/2017	9.6	7.8	11.9	5.1		
29/05/2017	6.7	6.7	14.2	4.5		
30/05/2017	3.2	8.2	10	6.7		
31/05/2017	6.4	5.7	6.6	3.1		
1/06/2017	14.6	9.5	8.2	9.3		
2/06/2017	15.4	10	11.4	7.0		
3/06/2017	16.1	8.6	9.3	4.6		
4/06/2017	12	8.7	8.2	3.5		
5/06/2017	13.3	12.1	14.6	5.8		
6/06/2017	9	8.3	12.8	9.0		
7/06/2017	6	5.4	4.3	2.4		
8/06/2017	5.7	3.7	6.1	3.3		
9/06/2017	9.4	10.2	6.4	Na		
10/06/2017	8.3	9.9	4.4	4.3		
11/06/2017	9.7	6.8	1.4	6.7		
12/06/2017	9.7	7.4	4.9	3.8		
13/06/2017	9.7	12.2	8.3	4.3		
14/06/2017	10.3	10.6	7.1	4.9		
15/06/2017	14.1	10.1	7.2	9.6		
16/06/2017	15.7	17.3	13.6	9.8		
17/06/2017	19.2	16.6	12.9	12.9		
18/06/2017	10	9.5	9	6.7		
19/06/2017	16.2	18.6	11.1	12.0		
20/06/2017	18.2	15.5	12	5.3		
21/06/2017	12	11.5	10.7	4.3		
22/06/2017	22.4	15.5	9.5	10.4		
23/06/2017	13.4	15.6	18.1	6.6		
24/06/2017	12.9	15.2	13.2	6.8		
25/06/2017	10.6	9.9	14.7	6.2		
26/06/2017	10.6	8.8	11.7	7.2		
27/06/2017	16.7	16.7	11.9	4.8		
28/06/2017	12	13.9	11.1	8.1		
29/06/2017	5.4	7.4	4.7	Na		
30/06/2017	6.6	10.8	5	3.5		
1/07/2017	13.3	8.6	6.6	10.7		

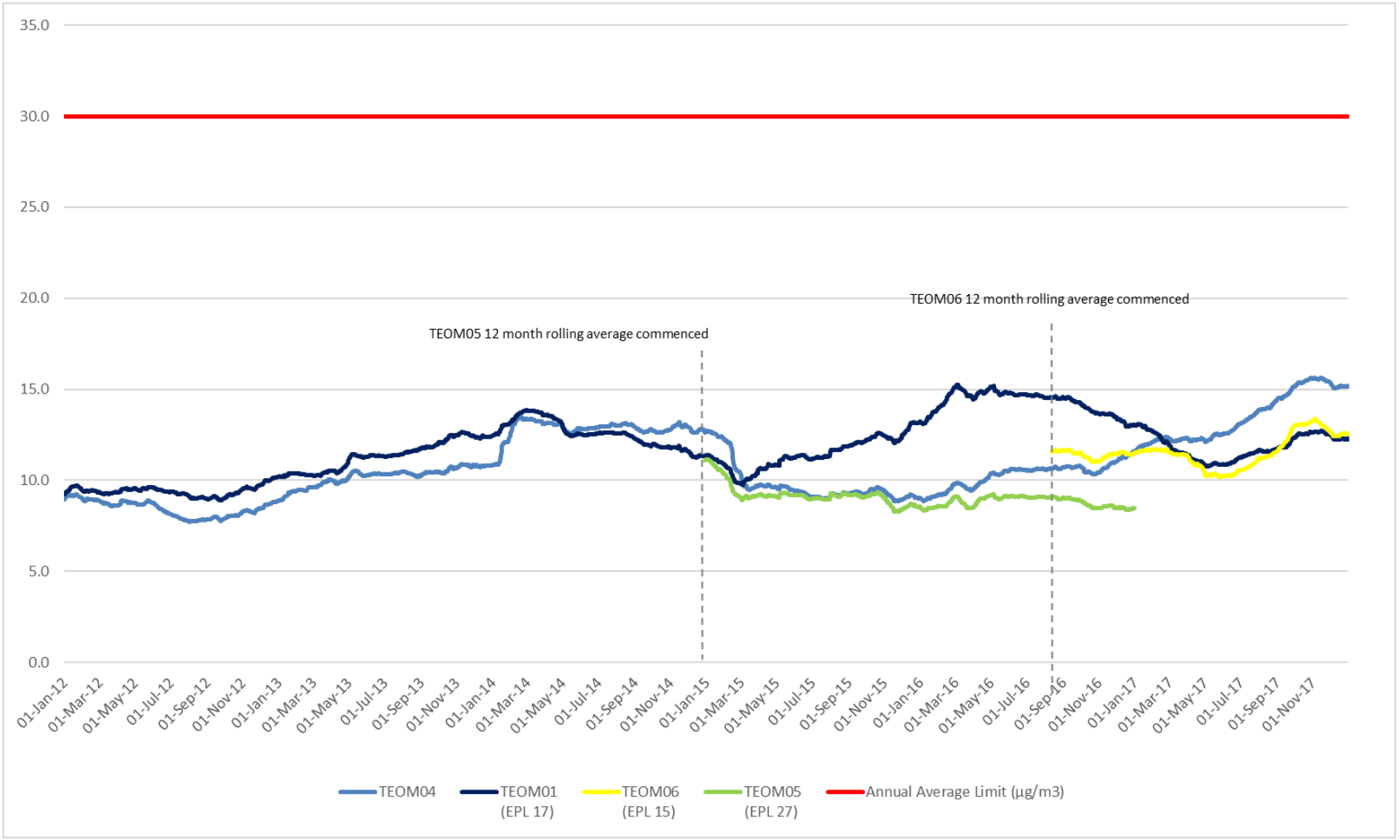
Date	Lagoons Road TEOM04	Ulan School TEOM01 EPL 17	Ulan-Wollar Road TEOM06 EPL15	Ridge Road TEOM05 EPL27	Ulan Road TEOM07 EPL27	Comment
	Daily Result (24hr Average Limit = 50µg/m³))					
2/07/2017	9.4	9.7	7.1	9.4		
3/07/2017	10.1	12.5	9.6	6.0		
4/07/2017	6.9	8.1	7.1	4.7		
5/07/2017	8.1	11.5	8.5	3.5		
6/07/2017	9	11.1	7.8	4.4		
7/07/2017	12.9	8.9	12.9	6.9		
8/07/2017	10.7	9.3	14.5	8.8		
9/07/2017	11	8.6	15.5	6.0		
10/07/2017	8.7	10.6	10.8	5.7		
11/07/2017	15.8	10	7.3	6.3		
12/07/2017	12	17.8	13.3	6.7		
13/07/2017	19.9	15.2	10.3	6.4		
14/07/2017	8.8	14.3	14.3	3.7		
15/07/2017	8.5	5.9	10.5	1.6		
16/07/2017	17	8.8	10.4	5.2		
17/07/2017	15.5	12.5	12.6	6.7		
18/07/2017	9.8	15.7	19.7	7.7		
19/07/2017	7.9	6.1	14.7	6.3		
20/07/2017	9.1	7.3	14.3	5.3		
21/07/2017	26	11	10.5	11.6		
22/07/2017	12.1	9.6	17	11.7		
23/07/2017	8.6	8.1	15.2	12.6		
24/07/2017	10.3	11.7	18.3	7.5		
25/07/2017	16.6	11.1	16.3	12.4		
26/07/2017	10.9	10.7	20.3	12.0		
27/07/2017	25.7	12.2	10.4	10.7		
28/07/2017	10.7	11	21.1	9.9		
29/07/2017	14.7	10.3	16.4	15.7		
30/07/2017	18	19.6	25.5	7.1		
31/07/2017	14.6	13.4	29.5	1.3		
1/08/2017	5.3	4.6	5.7		2.5	TEOM 07 Installed
2/08/2017	12	7.1	9		2.2	
3/08/2017	11.2	5	12		3.1	
4/08/2017	1.9	1.3	0.1		NA	
5/08/2017	4.7	3.8	3.7		1.1	
6/08/2017	4.8	4.6	5.8		1.4	
7/08/2017	6.5	4.8	7.6		5.0	
8/08/2017	6.2	6.4	5.9		6.3	
9/08/2017	7.9	7.1	8.6		1.7	
10/08/2017	7.5	8.5	10.2		9.6	
11/08/2017	13.1	11.5	14.5		14.5	
12/08/2017	10.3	7.8	9.9		12.7	
13/08/2017	14.7	9.3	14		11.5	
14/08/2017	14.5	13	15.9		14.9	
15/08/2017	12.9	15.8	14.1		11.2	
16/08/2017	12.3	10.8	13.3		12.3	
17/08/2017	11.2	10.4	13		11.8	
18/08/2017	12.1	10.4	22.5		11.8	
19/08/2017	6	3.4	8.6		3.4	
20/08/2017	15.9	4.9	5.5		8.9	
21/08/2017	21.2	18.5	17.8		16.6	
22/08/2017	31.7	22.1	17.9		15.8	
23/08/2017	23.4	24.6	22.8		19.1	
24/08/2017	11	10.7	16.7		9.3	
25/08/2017	27.2	11.1	6.7		11.4	
26/08/2017	18.3	12	15.7		16.1	
27/08/2017	8.4	6.5	12.6		7.5	
28/08/2017	9.2	6	9		5.6	
29/08/2017	27.6	14.6	12.1		13.2	
30/08/2017	12.7	12.7	19.1		11.6	
31/08/2017	19.2	15.2	12.9		11.1	
1/09/2017	22.5	16.4	14.9		15.3	

Date	Lagoons Road TEOM04	Ulan School TEOM01 EPL 17	Ulan-Wollar Road TEOM06 EPL15	Ridge Road TEOM05 EPL27	Ulan Road TEOM07 EPL27	Comment
	Daily Result (24hr Average Limit = 50µg/m³))					
2/09/2017	24.3	13.7	23.2		15.0	
3/09/2017	21.8	26.2	32.7		19.9	
4/09/2017	11.8	11	15.3		12.0	
5/09/2017	11.8	9.7	16.2		12.5	
6/09/2017	11	9.6	18.4		11.1	
7/09/2017	10.1	9.2	16.9		9.4	
8/09/2017	9.2	10.8	18.7		10.0	
9/09/2017	9.6	7.7	14		7.3	
10/09/2017	12.9	9	15.8		10.4	
11/09/2017	19.1	11.9	23		15.0	
12/09/2017	21.9	8.6	32.4		16.0	
13/09/2017	18.8	12.6	43		19.4	
14/09/2017	7.2	6	11.4		5.3	
15/09/2017	9.2	12.5	11.8		8.8	
16/09/2017	9.8	7.5	13.2		8.5	
17/09/2017	20.4	13.2	11.3		10.7	
18/09/2017	21.9	18	26		17.0	
19/09/2017	14.6	12.9	21.8		15.4	
20/09/2017	16.7	12.6	23.3		15.4	
21/09/2017	20	18.9	28.5		15.0	
22/09/2017	28	18.4	33.6		20.1	
23/09/2017	31.1	32.6	49.5		28.6	
24/09/2017	40.6	34.4	42.4		40.6	
25/09/2017	20.1	19.3	38.6		20.9	
26/09/2017	18.3	17	22.8		19.8	
27/09/2017	38.2	34	27		30.8	
28/09/2017	21.3	18	26.4		19.2	
29/09/2017	14.1	12.3	18.5		19.9	
30/09/2017	13.3	10.1	28		13.5	
1/10/2017	14	11	18		9.6	Replacement TEOM delivered (D3)
2/10/2017	25	19	21		20.1	
3/10/2017	19	17	14		13.5	
4/10/2017	19	14	10		11.6	
5/10/2017	17	13	12		12.4	
6/10/2017	16	20	6		18.6	
7/10/2017	22	22	11		14.1	
8/10/2017	20	15	12		12.9	
9/10/2017	7	7	7		4.9	
10/10/2017	19	16	13		13.5	
11/10/2017	20	16	14		14.9	
12/10/2017	5	4	7		2.9	
13/10/2017	13	12	16		11.0	
14/10/2017	15	14	14		10.7	
15/10/2017	14	9	5		5.1	
16/10/2017	19	6	9		10.1	
17/10/2017	21	18	13		13.9	
18/10/2017	21	17	10		12.0	
19/10/2017	19	14	10		14.3	
20/10/2017	7	5	8		4.0	
21/10/2017	16	12	8		9.6	
22/10/2017	12	9	11		8.8	
23/10/2017	15	10	6		8.3	
24/10/2017	11	10	9		9.1	
25/10/2017	12	12	19		9.4	
26/10/2017	19	28	28		13.4	
27/10/2017	12	10	8		7.3	
28/10/2017	20	11	20		12.6	
29/10/2017	13	8	27		11.2	
30/10/2017	13	11	22		11.5	
31/10/2017	6	5	7		4.2	
1/11/2017	12.3	9.8	19		15.7	
2/11/2017	16.8	19.6	21.1		19.2	

Date	Lagoons Road TEOM04	Ulan School TEOM01 EPL 17	Ulan-Wollar Road TEOM06 EPL15	Ridge Road TEOM05 EPL27	Ulan Road TEOM07 EPL27	Comment
	Daily Result (24hr Average Limit = 50µg/m³))					
3/11/2017	19.8	22.4	22.7		17.6	
4/11/2017	13.2	10.7	11.8		8.7	
5/11/2017	9	4	1.9		4.4	
6/11/2017	11.5	9.1	9.3		7.1	
7/11/2017	9.5	7.4	8.9		4.6	
8/11/2017	17.1	12	7.3		8.4	
9/11/2017	15.9	11.5	5.7		8.8	
10/11/2017	17.8	11	6		9.3	
11/11/2017	17.8	10.9	6.1		8.6	
12/11/2017	17.7	15.4	7.8		10.0	
13/11/2017	19.3	16.5	9.9		13.2	
14/11/2017	21.5	15	9.4		14.4	
15/11/2017	10.7	14.2	3		10.1	
16/11/2017	12.1	9	8.3		8.8	
17/11/2017	10.5	0.3	0.3		5.3	
18/11/2017	6.1	2.4	2.2		1.7	
19/11/2017	13.2	11	7.7		6.6	
20/11/2017	15.3	11.9	7.3		7.1	
21/11/2017	17.1	12	9.2		11.1	
22/11/2017	15.9	11.6	8.9		9.4	
23/11/2017	11.5	17.3	8.2		6.5	
24/11/2017	10.9	5.8	3.7		3.3	
25/11/2017	17.9	15.1	11.2		10.0	
26/11/2017	21.2	12.3	7.2		10.5	
27/11/2017	11.8	9.5	6.5		5.6	
28/11/2017	17.5	16.9	10.3		10.1	
29/11/2017	12.7	11.4	5.9		6.3	
30/11/2017	14.6	16.4	6.8		8.3	
1/12/2017	9.0	10.4	4.9		4.2	
2/12/2017	8.0	6.0	6.2		4.8	
3/12/2017	4.7	1.9	4.5		1.1	
4/12/2017	9.5	7.8	8.7		5.4	
5/12/2017	11.6	8.5	8.3		6.2	
6/12/2017	6.8	5.4	4.0		4.5	
7/12/2017	12.8	9.4	13.3		6.4	
8/12/2017	16.0	13.7	18.6		11.9	
9/12/2017	16.2	11.2	9.9		9.0	
10/12/2017	21.9	14.7	11.9		10.9	
11/12/2017	24.2	14.3	13.0		13.0	
12/12/2017	22.9	13.1	12.3		12.2	
13/12/2017	24.1	18.6	23.9		14.6	
14/12/2017	27.6	22.8	29.1		21.2	
15/12/2017	25.7	25.5	30.2		21.2	
16/12/2017	16.6	13.3	7.0		12.4	
17/12/2017	24.2	20.2	19.6		18.1	
18/12/2017	17.5	14.7	14.4		12.9	
19/12/2017	17.0	15.1	12.1		12.5	
20/12/2017	20.0	16.9	20.7		17.9	
21/12/2017	19.3	19.7	15.8		14.1	
22/12/2017	12.0	9.3	7.8		7.9	
23/12/2017	16.6	13.3	11.0		11.4	
24/12/2017	21.1	17.3	18.4		17.5	
25/12/2017	15.0	12.6	11.7		11.6	
26/12/2017	8.4	5.8	5.0		3.9	
27/12/2017	15.0	10.9	9.9		8.9	
28/12/2017	15.3	10.9	8.3		9.3	
29/12/2017	14.1	11.8	13.6		11.9	
30/12/2017	7.9	6.4	5.9		5.0	
31/12/2017	17.7	14.6	14.9		12.2	

NA = negative value - Likely humidity related

Figure 3-c 2012 to 2017 TEOM Rolling Average

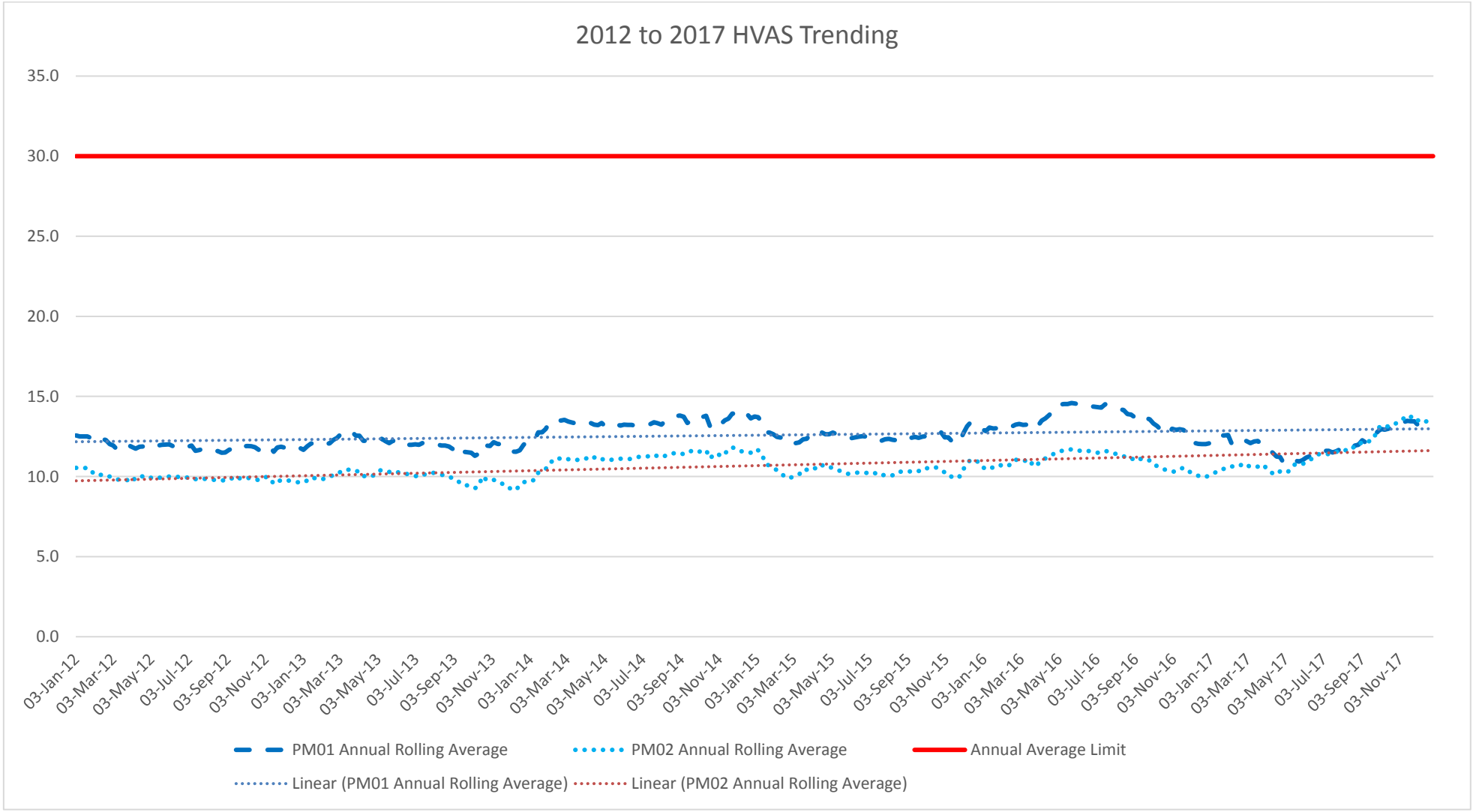


Note: TEOM07 data insufficient to develop 12 month rolling average.

Table 4: HVAS monitoring results

Sample Location	Sampling Date	Particulate Matter <10 µm µg/m³	Sample Location	Sampling Date	Particulate Matter <10 µm µg/m³
PM01	6-Jan-17	15	PM02	5-Jul-17	6
PM02	6-Jan-17	18	PM01	11-Jul-17	5
PM01	12-Jan-17	28	PM02	11-Jul-17	5
PM02	12-Jan-17	26	PM01	17-Jul-17	8
PM01	18-Jan-17	32	PM02	17-Jul-17	11
PM02	18-Jan-17	18	PM01	23-Jul-17	7
PM01	24-Jan-17	19	PM02	23-Jul-17	6
PM02	24-Jan-17	18	PM01	29-Jul-17	9
PM01	30-Jan-17	19	PM02	29-Jul-17	7
PM02	30-Jan-17	25	PM01	4-Aug-17	1
PM01	5-Feb-17	13	PM02	4-Aug-17	1
PM02	5-Feb-17	11	PM01	10-Aug-17	5
PM01	11-Feb-17	17	PM02	10-Aug-17	5
PM02	11-Feb-17	16	PM01	16-Aug-17	7
PM01	17-Feb-17	31	PM02	16-Aug-17	7
PM02	17-Feb-17	24	PM01	22-Aug-17	21
PM01	23-Feb-17	25	PM02	22-Aug-17	22
PM02	23-Feb-17	31	PM01	28-Aug-17	6
PM01	1-Mar-17	10	PM02	28-Aug-17	5
PM02	1-Mar-17	7	PM01	3-Sep-17	19
PM01	7-Mar-17	10	PM02	3-Sep-17	18
PM02	7-Mar-17	9	PM01	9-Sep-17	6
PM01	13-Mar-17	24	PM02	9-Sep-17	7
PM02	13-Mar-17	20	PM01	15-Sep-17	6
PM01	19-Mar-17	10	PM02	15-Sep-17	7
PM02	19-Mar-17	12	PM01	21-Sep-17	11
PM01	25-Mar-17	13	PM02	21-Sep-17	11
PM02	25-Mar-17	16	PM01	27-Sep-17	34
PM01	31-Mar-17	10	PM02	27-Sep-17	38
PM02	31-Mar-17	11	PM01	3-Oct-17	14
PM01	6-Apr-17	8	PM02	3-Oct-17	19
PM02	6-Apr-17	10	PM01	9-Oct-17	7
PM01	12-Apr-17	9	PM02	9-Oct-17	6
PM02	12-Apr-17	7	PM01	15-Oct-17	11
PM01	18-Apr-17	22	PM02	15-Oct-17	8
PM02	18-Apr-17	23	PM01	21-Oct-17	15
PM01	24-Apr-17	17	PM02	21-Oct-17	17
PM02	24-Apr-17	24	PM01	27-Oct-17	8
PM01	30-Apr-17	7	PM02	27-Oct-17	8
PM02	30-Apr-17	9	PM01	2-Nov-17	16
PM01	6-May-17	8	PM02	2-Nov-17	18
PM02	6-May-17	10	PM01	8-Nov-17	14
PM01	12-May-17	15	PM02	8-Nov-17	15
PM02	12-May-17	25	PM01	14-Nov-17	17
PM01	18-May-17	17	PM02	14-Nov-17	22
PM02	18-May-17	18	PM01	20-Nov-17	16
PM01	24-May-17	5	PM02	20-Nov-17	16
PM02	24-May-17	6	PM01	26-Nov-17	9
PM01	30-May-17	6	PM02	26-Nov-17	15
PM02	30-May-17	4	PM01	2-Dec-17	<1
PM01	5-Jun-17	11	PM02	2-Dec-17	<1
PM02	5-Jun-17	12	PM01	8-Dec-17	10
PM01	11-Jun-17	6	PM02	8-Dec-17	8
PM02	11-Jun-17	6	PM01	14-Dec-17	23
PM01	17-Jun-17	13	PM02	14-Dec-17	23
PM02	17-Jun-17	15	PM01	20-Dec-17	22
PM01	23-Jun-17	11	PM02	20-Dec-17	24
PM02	23-Jun-17	12	PM01	26-Dec-17	7
PM01	29-Jun-17	4	PM02	26-Dec-17	8
PM02	29-Jun-17	2			
PM01	5-Jul-17	7			

Figure 3-d 2012 to 2017 HVAS Trending



APPENDIX 3E. BIODIVERSITY MONITORING DATA

Table 5: Threatened fauna recorded during 2017

Scientific Name	Species	TSC Act	EPBC Act	Location
Birds				
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	Dun Dun (Stage2_Fa20), Onsite Offset (Stage2_Fa15), Mod9_Fa4, Mod9_Fa19
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	Fa14a, Fa25a, Fa5c, Fa5a, Fa7a, BOA1, Old Bobadeen (Stage2_Fa9)
Chthonicola sagittata	Speckled Warbler	V	-	Dun Dun (Stage2_Fa22) Libertus (Stage2_Fa1) Nori (Stage2_Fa32) Onsite Offset (Stage2_Fa17) Ulan 18 (Stage2_Fa5), Mod9_Fa7, Mod9_Fa9
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	-	Fa13b, Fa14a, Fa1a, Fa24a, Fa25a, Fa2b, Fa4a, Fa5a, Fa5b, Fa5c, Fa7a, Fa8a, Fa9a, Libertus (Stage2_Fa1) Nori (Stage2_Fa30, Stage2_Fa32, Stage2_Fa34) Ulan 18 (Stage2_Fa4), Mod9_Fa13
Daphoenositta chrysoptera	Varied Sittella	V	-	Fa13a, Fa8a, Libertus (Stage2_Fa1)
Glossopsitta pusilla	Little Lorikeet	V	-	Fa4a, Dun Dun (Stage2_Fa24) Nori (Stage2_Fa30) Old Bobadeen (Stage2_Fa34) Onsite Offset (Stage2_Fa15), Mod9_Fa14
Hieraaetus morphnoides	Little Eagle	V		Mod9_Fa10
Haliaeetus leucogaster	White-bellied Sea-eagle	V	-	BOA1
Melanodryas cucullata	Hooded Robin	V	-	Fa24a, Onsite Offset (Stage2_Fa13)
Ninox connivens	Barking Owl	V		Mod9_Fa4
Petroica boodang	Scarlet Robin	V	-	Dun Dun (Stage2_Fa20)
Petroica phoenicea	Flame Robin	V		Mod9_Fa21
Stagonopleura guttata	Diamond Firetail	V	-	Dun Dun (Stage2_Fa23)
Mammals				
Pseudomys novaehollandiae	New Holland Mouse	V	V	Fa7a
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Libertus, Ulan 18, Old Bobadeen, Onsite Offset (Stage2_Fa3, Stage2_Fa6, Stage2_Fa8, Stage2_Fa12, Stage2_Fa17)

Scientific Name	Species	TSC Act	EPBC Act	Location
Miniopterus orianae oceanensis	Eastern Bent-winged Bat	V	-	Libertus, Ulan 18, Old Bobadeen, Onsite Offset, Dun Dun, Nori (Stage2_Fa6, Stage2_Fa14, Stage2_Fa17, Stage2_Fa18, Stage2_Fa20, Stage2_Fa23, Stage2_Fa24, Stage2_Fa29, possible at all others except for Stage2_Fa9, Stage2_Fa10, Stage2_Fa11, Stage2_Fa13, Stage2_Fa16, Stage2_Fa26)
Saccolaimus flaviventris	Yellow-bellied Sheathtail Bat	V	-	Ulan 18, Old Bobadeen, Nori (Stage2_Fa5*, Stage2_Fa12, Stage2_Fa32)
Vespadelus troughtoni	Eastern Cave Bat	V	-	Ulan 18, Old Bobadeen, Onsite Offset, Dun Dun, Nori (Stage2_Fa4, Stage2_Fa12*, Stage2_Fa14*, Stage2_Fa18, Stage2_Fa24*, Stage2_Fa27*, Stage2_Fa29, Stage2_Fa32)
Pseudomys novaehollandiae	New Holland Mouse	V	V	Fa7a
Reptiles				
Hoplocephalus bungaroides	Broad-headed Snake	E	V	Moolarmoo

Figure 5 Native species richness at Stage 1 MZ2 regeneration sites from 2010-2017

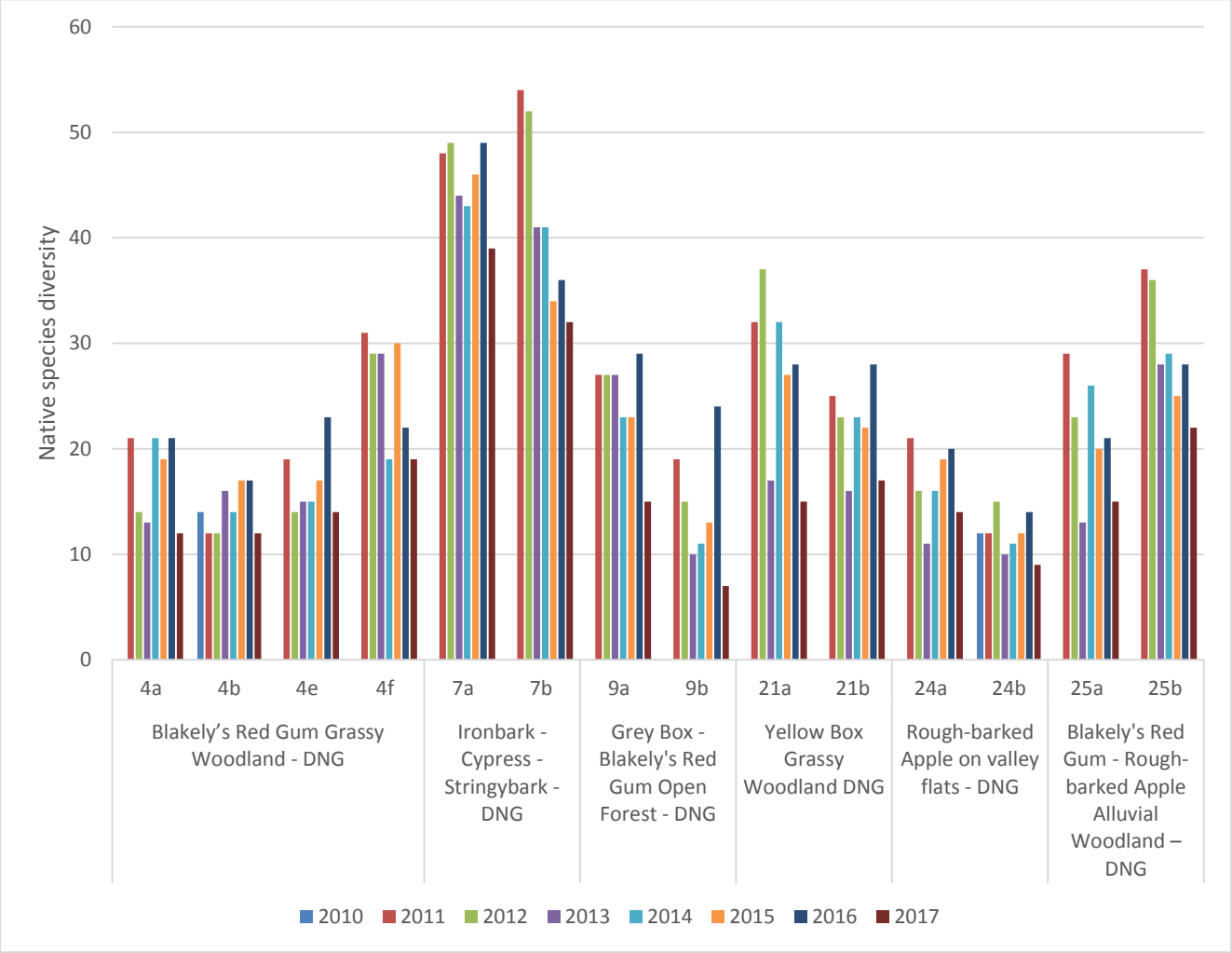
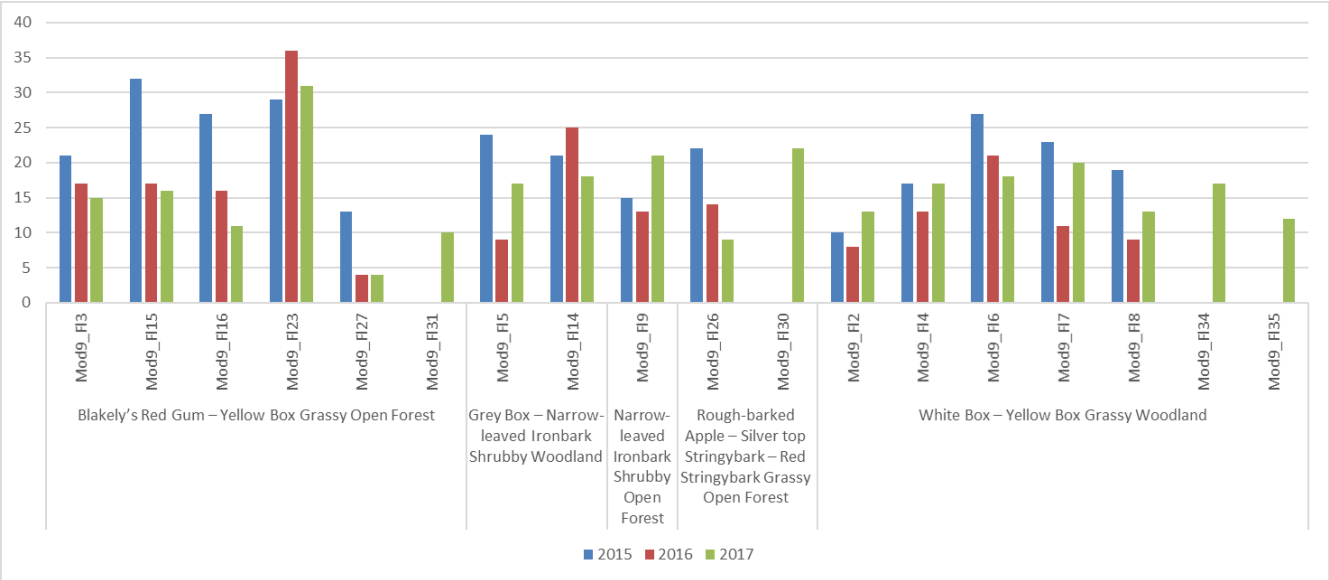


Figure 6 Native species richness at MOD 9 MZ2 sites from 2015 - 2017



Appendix 3F. SURFACE WATER MONITORING DATA

Table 6: 2017 Surface water quality data

Sample Point	Date	Arsenic - Total (mg/L)	Barium - Total (mg/L)	Cadmium - Total (mg/L)	Chromium - Total (mg/L)	Copper - Total (mg/L)	Electrical Conductivity - Lab (µS/cm)	Electrical Conductivity -Field (µS/cm)	Iron - Total (mg/L)	Lead - Total (mg/L)	Lithium Total (mg/L)	Manganese - Total (mg/L)	Nickel - Total (mg/L)	Oil & Grease (mg/L)	pH (Field) (Unit)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Strontium Total (mg/L)	Temperature (°C)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Total Suspended Solids (mg/L)	Turbidity - Field (NTU)	Zinc - Total (mg/L)
SW01	10/01/2017 13:40	<0.001	0.0	<0.0001	<0.001	<0.001	758	783		<0.001	0.1	0.0	0.0		8.1	8.0	<0.01	0.2	31.8	385	0.1	<5	1.1	<0.005
SW01	9/02/2017 15:00						659	675							8.3	8.2			32.8	432		<5	1.6	
SW01	9/03/2017 7:40						646	660							7.6	7.8			19.5	396		<5	1.2	
SW01	31/03/2017 9:50						611	564	1.0						8.0	7.5			20.2	386		6	24.2	<0.005
SW01	4/04/2017 7:25						476	463							7.7	7.6			15.9	379		<5	5	
SW01	9/05/2017 10:50						588	597							7.9	8.2			11.2	352		<5	2.1	
SW01	13/06/2017 11:55	<0.001	0.1	<0.0001	<0.001	<0.001	261	274	2.2	<0.001	0.0	0.1	<0.001		7.3	7.2	<0.01	0.1	12.5	147	<0.1	<5	3.4	<0.005
SW01	11/07/2017 12:00						674	597							8.1	8.2			6.1	382		<5	2.4	
SW01	9/08/2017 13:20						749	698							8.1	7.8			10.6	413		<5	2.3	
SW01	6/09/2017 11:00						813	813							6.9	7.9			12.5	476		<5	1.8	
SW01	10/10/2017 12:35						771	760							7.8	7.7			19.7	431		<5	2.3	
SW01	13/11/2017 10:15						268	279							7.2	7.5			24.0	143		<5	2.6	
SW01	18/11/2017 10:10						238	235	1.3						7.0	7.6			17.3	183		<5	6.2	<0.005
SW01	3/12/2017 10:30						649	653	0.3						7.6	8.1			19.4	418		<5	4.0	<0.005
SW01	11/12/2017 10:20						280	295							6.8	7.3			24.6	166		8	44.7	
SW02	10/01/2017 14:00	<0.001	0.0	<0.0001	<0.001	<0.001	748	776		<0.001	0.1	0.0	0.0		8.3	8.2	<0.01	0.2	31.0	461	0.2	<5	0.7	<0.005
SW02	9/02/2017 15:05						656	687							8.4	8.2			33.9	466		<5	1.5	
SW02	9/03/2017 7:45						650	661							7.7	7.8			19.7	401		<5	1.0	
SW02	31/03/2017 9:55						622	581	1.2						8.0	7.9			20.4	370		<5	25.9	<0.005

Sample Point	Date	Arsenic - Total (mg/L)	Barium - Total (mg/L)	Cadmium - Total (mg/L)	Chromium - Total (mg/L)	Copper - Total (mg/L)	Electrical Conductivity - Lab (µS/cm)	Electrical Conductivity -Field (µS/cm)	Iron - Total (mg/L)	Lead - Total (mg/L)	Lithium Total (mg/L)	Manganese - Total (mg/L)	Nickel - Total (mg/L)	Oil & Grease (mg/L)	pH (Field) (Unit)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Strontium Total (mg/L)	Temperature (°C)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Total Suspended Solids (mg/L)	Turbidity - Field (NTU)	Zinc - Total (mg/L)
SW02	4/04/2017 7:30						475	479							7.6	7.7			15.7	372		<5	5.8	
SW02	9/05/2017 10:55						588	595							7.4	8.1			11.9	373		<5	2.3	
SW02	13/06/2017 11:50	<0.001	0.0	<0.0001	<0.001	0.0	594	629	1.0	<0.001	0.1	0.4	0.0		6.6	7.7	<0.01	0.1	12.8	380	0.2	<5	3.5	<0.005
SW02	11/07/2017 12:05						672	629							7.4	8.2			7.2	376		30	19.1	
SW02	9/08/2017 13:30						763	707							7.6	7.7			11.8	426		<5	2.6	
SW02	6/09/2017 11:05						811	797							7.2	7.6			12.8	499		<5	1.1	
SW02	10/10/2017 12:25						786	778							7.7	7.8			20.0	500		6	3.3	
SW02	13/11/2017 10:30						771	789							7.2	7.8			23.9	474		6	1.1	
SW02	18/11/2017 10:20						711	715	0.1						6.7	7.8			17.2	499		<5	3.1	<0.005
SW02	3/12/2017 10:20						630	652	0.4						7.4	8.0			19.9	430		<5	4.6	<0.005
SW02	11/12/2017 10:30						732	749							7.2	7.9			24.1	490		<5	4.1	
SW04	10/01/2017 10:55	0.0	0.0	<0.0001	<0.001	<0.001	826	858		<0.001	<0.001	0.3	0.0		7.7	8.0	0.0	0.2	30.1	472	1.5	8	8.1	<0.005
SW04	9/02/2017 11:55						969	1015							8.5	8.2			33.3	616		28	32.9	
SW04	9/03/2017 15:40						1280	1322							8.5	7.8			26.8	728		5	20.5	
SW04	31/03/2017 12:55						143	155	2.0						6.7	7.0			27.7	224		34	159.0	0.0
SW04	4/04/2017 16:40						315	292							6.6	6.9			21.4	262		24	73.3	
SW04	9/05/2017 13:05						717	720							7.0	7.7			13.3	430		9	15.1	
SW04	13/06/2017 13:45	<0.001	0.0	<0.0001	<0.001	0.0	700	726	0.6	<0.001	0.0	0.1	0.0		7.0	7.6	0.0	0.1	11.2	450	0.6	<5	15.5	0.0
SW04	11/07/2017 9:25						758	639							6.9	7.7			1.2	440		5	10.1	
SW04	9/08/2017 8:00						627	562							6.9	7.4			5.4	388		24	77.5	
SW04	6/09/2017 8:20						748	732							7.8	7.4			8.8	408		17	16.9	

Sample Point	Date	Arsenic - Total (mg/L)	Barium - Total (mg/L)	Cadmium - Total (mg/L)	Chromium - Total (mg/L)	Copper - Total (mg/L)	Electrical Conductivity - Lab (µS/cm)	Electrical Conductivity -Field (µS/cm)	Iron - Total (mg/L)	Lead - Total (mg/L)	Lithium Total (mg/L)	Manganese - Total (mg/L)	Nickel - Total (mg/L)	Oil & Grease (mg/L)	pH (Field) (Unit)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Strontium Total (mg/L)	Temperature (°C)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Total Suspended Solids (mg/L)	Turbidity - Field (NTU)	Zinc - Total (mg/L)
SW04	10/10/2017 9:45						1040	1012							7.1	7.7			16.9	514		24	29.1	
SW04	13/11/2017 14:35						729	731							8.2	7.8			27.9	471		46	36.9	
SW04	18/11/2017 13:15						226	226	3.5						7.6	7.6			18.5	265		94	159	0.0
SW04	3/12/2017 11:45						128	126	2.0						6.7	7.2			21.7	223		29	159	0.0
SW04	11/12/2017 14:15						195	195							7.4	7.4			30.0	217		12	47.1	
SW05	10/01/2017 11:15						417	450							7.1	7.5			30.5	286		13	4.9	
SW05	9/02/2017 12:47	0.0		<0.0001	<0.001	<0.001	304	305	1.0	<0.001		0.2	<0.001		7.5	7.6	0.1		29.8	257	0.9	8	7.2	<0.005
SW05	9/03/2017 8:30						278	284							6.9	7.4			20.6	224		<5	10.6	
SW05	31/03/2017 13:10						245	278	1.7						7.1	7.4			24.4	361		<5	27.8	<0.005
SW05	4/04/2017 8:35						380	368							7.0	7.2			19.2	350		14	38.0	
SW05	9/05/2017 15:25						386	381							7.1	7.6			14.3	270		12	17.7	
SW05	13/06/2017 15:35	<0.001	0.0	<0.0001	<0.001	0.0	446	456	1.0	<0.001	0.0	0.1	<0.001		7.1	7.5	<0.01	0.1	12.3	338	0.5	5	15.6	<0.005
SW05	11/07/2017 13:30						512	464							7.8	7.7			8.3	326		5	10.9	
SW05	9/08/2017 14:30						685	608							7.4	7.6			10.6	380		<5	13.0	
SW05	6/09/2017 15:05						576	562							8.1	7.5			12.6	318		6	12.9	
SW05	10/10/2017 15:15						483	477							6.3	7.5			20.6	302		12	18.5	
SW05	13/11/2017 10:50						525	531							7.3	7.5			23.5	324		11	9.8	
SW05	18/11/2017 12:30						81	83	1.8						7.7	6.9			17.8	211		20	170	0.0
SW05	3/12/2017 12:30						479	510	1.4						6.9	7.5			21.5	330		7	39.4	<0.005
SW05	11/12/2017 9:20						688	701							7.2	7.3			25.3	478		24	8.6	
SW07	10/01/2017 12:50	0.0	0.1	<0.0001	<0.001	<0.001	2600	2670		0.0	0.0	2.1	0.0		8.0	8.0	0.2	0.8	35.9	1530	4.1	82	33.5	0.0
SW07	9/02/2017 14:20						2090	2147							8.7	8.6			38.2	1110		6	3.5	

Sample Point	Date	Arsenic - Total (mg/L)	Barium - Total (mg/L)	Cadmium - Total (mg/L)	Chromium - Total (mg/L)	Copper - Total (mg/L)	Electrical Conductivity - Lab (µS/cm)	Electrical Conductivity -Field (µS/cm)	Iron - Total (mg/L)	Lead - Total (mg/L)	Lithium Total (mg/L)	Manganese - Total (mg/L)	Nickel - Total (mg/L)	Oil & Grease (mg/L)	pH (Field) (Unit)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Strontium Total (mg/L)	Temperature (°C)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Total Suspended Solids (mg/L)	Turbidity - Field (NTU)	Zinc - Total (mg/L)
SW07	9/03/2017 10:00						2000	2174							7.7	8.0			20.6	1330		<5	1.3	
SW07	31/03/2017 14:15						2830	2680	0.1						7.9	8.0			24.3	1830		<5	0.2	<0.005
SW07	4/04/2017 10:45						2250	2324							7.9	8.0			20.8	1420		<5	0.7	
SW07	9/05/2017 15:45						2110	2109							8.1	8.0			13.3	1350		92	11.4	
SW07	13/06/2017 16:20	<0.001	0.0	<0.0001	<0.001	<0.001	1970	2034	0.3	<0.001	0.0	0.5	0.0		7.6	7.9	0.0	0.8	11.2	1180	0.8	108	11.2	<0.005
SW07	11/07/2017 15:45						1990	1814							8.0	7.9			6.8	1170		90	14.6	
SW07	9/08/2017 16:00						2330	2300							7.4	7.9			10.5	1360		270	29.8	
SW07	6/09/2017 15:35						1890	1812							7.8	7.8			12.1	954		231	19.8	
SW07	10/10/2017 15:40						2770	2750							7.9	8.2			23.9	1580		<5	3.6	
SW07	13/11/2017 16:40						3410	3340							7.5	7.9			24.7	2050		30	14.1	
SW07	18/11/2017 12:05						3480	3380	0.4						6.9	7.9			17.5	2350		8	8.8	<0.005
SW07	3/12/2017 12:50						3200	3170	0.1						7.6	8.2			24.3	1800		<5	1.7	<0.005
SW08	10/01/2017 12:15	0.0	0.1	<0.0001	0.0	<0.001	2700	2740		<0.001	0.0	1.6	0.0		6.2	6.6	0.3	0.4	26.1	1610	1.4	62	31.2	0.0
SW08	9/02/2017 13:50						3230	3330							6.7	6.8			26.3	1840		14	14.3	
SW08	9/03/2017 9:25						3360	3260							6.3	6.9			19.9	1950		21	14.9	
SW08	31/03/2017 13:55						3600	3280	6.3						6.2	7.0			22.7	1980		<5	37.6	0.0
SW08	4/04/2017 9:50						3370	3400							6.5	7.0			18.5	1980		<5	10.5	
SW08	9/05/2017 15:55						3050	3070							6.4	7.1			11.5	1750		10	17.6	
SW08	13/06/2017 16:55	<0.001	0.1	<0.0001	<0.001	<0.001	2770	2860	4.9	<0.001	0.0	0.9	0.0		6.3	6.9	0.0	0.6	10.5	1620	0.5	19	26.2	<0.005
SW08	11/07/2017 16:10						2890	2620							6.5	6.8			6.8	1740		7	14.1	
SW08	9/08/2017 16:30						3660	3510							6.8	7.0			9.8	1920		<5	10.1	
SW08	6/09/2017 16:05						3050	2970							6.8	7.0			10.5	1590		7	15.1	

Sample Point	Date	Arsenic - Total (mg/L)	Barium - Total (mg/L)	Cadmium - Total (mg/L)	Chromium - Total (mg/L)	Copper - Total (mg/L)	Electrical Conductivity - Lab (µS/cm)	Electrical Conductivity -Field (µS/cm)	Iron - Total (mg/L)	Lead - Total (mg/L)	Lithium Total (mg/L)	Manganese - Total (mg/L)	Nickel - Total (mg/L)	Oil & Grease (mg/L)	pH (Field) (Unit)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Strontium Total (mg/L)	Temperature (°C)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Total Suspended Solids (mg/L)	Turbidity - Field (NTU)	Zinc - Total (mg/L)
SW08	10/10/2017 16:10						2930	2870							6.3	7.0			18.3	1680		6	14.5	
SW08	13/11/2017 16:50						3130	3100							6.8	7.1			20.8	1620		9	7.7	
SW08	18/11/2017 11:50						2270	2250	2.0						7.2	7.5			17.4	1460		21	31.0	0.0
SW08	3/12/2017 13:00						2920	2850	2.2						7.4	7.6			19.3	1630		7	15.7	<0.005
SW08	11/12/2017 15:40						3080	3030							6.9	7.1			26.4	2020		5	9.3	
SW09	10/01/2017 11:45	<0.001	0.1	<0.0001	<0.001	<0.001	3760	3710		<0.001	0.0	3.9	0.0		6.8	7.5	0.0	1.0	28.9	2190	0.4	9	17.5	<0.005
SW09	9/02/2017 13:20						3680	3620							7.3	7.6			29.8	2250		7	11.5	
SW09	9/03/2017 9:00						3930	3740							6.6	7.3			21.0	2240		5	39.5	
SW09	31/03/2017 13:45						3060	2600	1.0						7.3	7.8			22.4	1550		<5	4.6	<0.005
SW09	4/04/2017 9:25						3570	3610							6.8	7.3			19.1	2060		<5	25.3	
SW09	9/05/2017 16:00						3550	3540							6.8	7.7			13.3	1940		12	19.9	
SW09	13/06/2017 16:40	<0.001	0.1	<0.0001	<0.001	<0.001	3410	3540	1.2	<0.001	<0.001	1.0	0.0		7.0	7.6	<0.01	0.9	11.4	2220	0.5	<5	8.4	<0.005
SW09	11/07/2017 16:30						3500	3230							7.0	7.5			8.4	2100		11	16.6	
SW09	9/08/2017 16:50						3560	3420							7.0	7.5			10.2	2030		<5	13.2	
SW09	6/09/2017 16:20						3560	3450							6.9	7.5			12.6	1990		7	14.2	
SW09	10/10/2017 16:40						3660	3600							6.6	7.3			21.8	2140		8	9.7	
SW09	13/11/2017 17:00						3580	3510							6.7	7.3			22.0	2280		<5	3.2	
SW09	18/11/2017 11:40						2710	2620	1.4						7.1	7.7			17.4	1660		41	36.3	0.0
SW09	3/12/2017 13:05						3310	3360	3.2						7.0	7.6			19.7	1710		13	20.1	<0.005
SW09	11/12/2017 15:50						3800	3810							6.8	7.1			26.5	2450		15	12.5	
SW11 (EPA03)	31/03/2017 10:40						167	180	2.3					<5	6.7	6.9			21.2	272		26	242.0	0.0

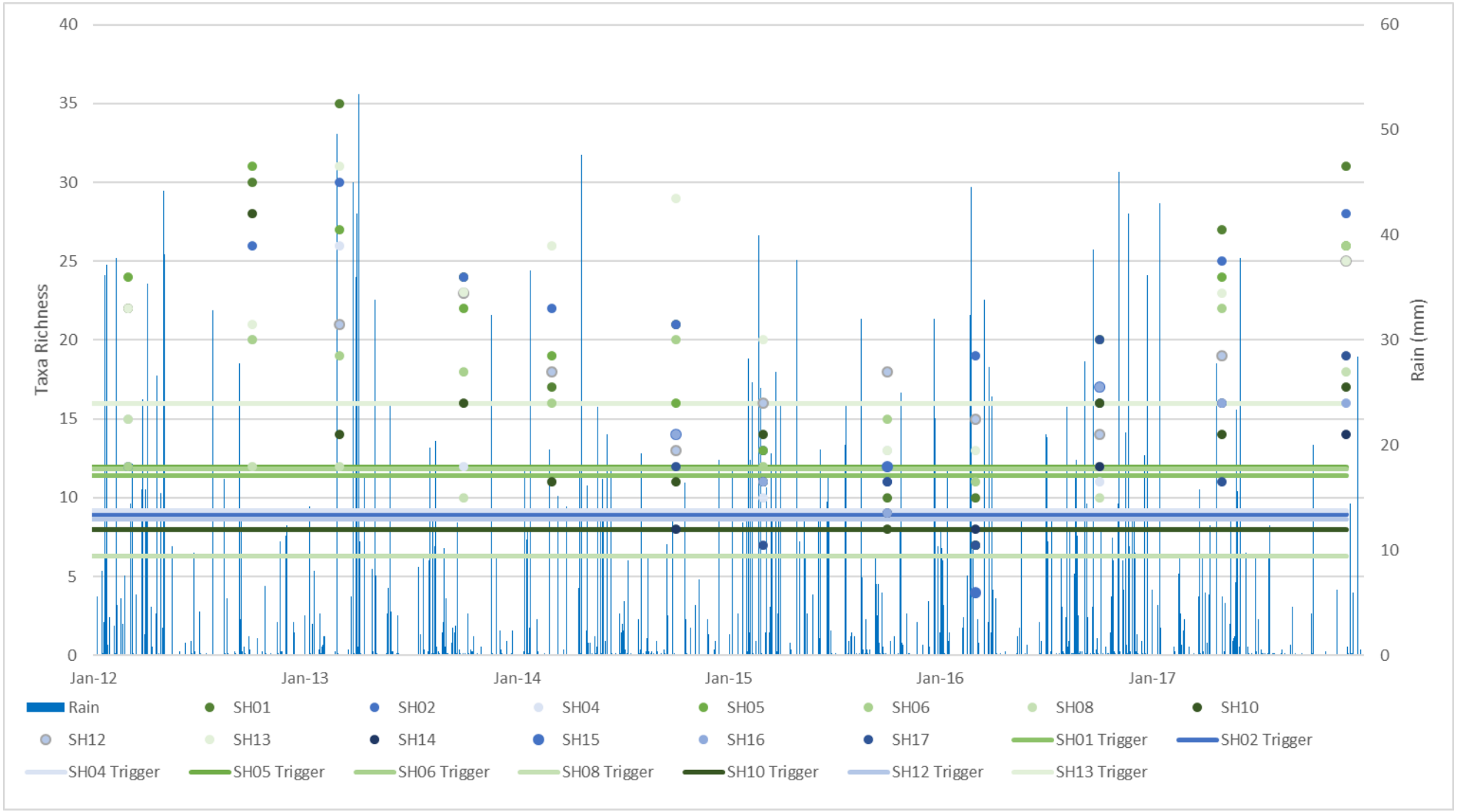
Sample Point	Date	Arsenic - Total (mg/L)	Barium - Total (mg/L)	Cadmium - Total (mg/L)	Chromium - Total (mg/L)	Copper - Total (mg/L)	Electrical Conductivity - Lab (µS/cm)	Electrical Conductivity -Field (µS/cm)	Iron - Total (mg/L)	Lead - Total (mg/L)	Lithium Total (mg/L)	Manganese - Total (mg/L)	Nickel - Total (mg/L)	Oil & Grease (mg/L)	pH (Field) (Unit)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Strontium Total (mg/L)	Temperature (°C)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Total Suspended Solids (mg/L)	Turbidity - Field (NTU)	Zinc - Total (mg/L)
SW11 (EPA03)	4/04/2017 8:05						362	359						<5	6.5	6.9			18.2	350		23	77.9	
SW11 (EPA03)	9/05/2017 11:20						396	400						<5	7.3	7.7			13.2	324		6	49.3	
SW11 (EPA03)	18/11/2017 10:40						92	88	2.7					<5	7.2	7.1			17.4	222		91	18	0.0
SW11 (EPA03)	3/12/2017 10:50						107	106	3.3					<5	7.3	6.9			19.2	276		36	320	0.0
SW11 (EPA03)	11/12/2017 11:00						218	235						<5	6.8	6.7			23.4	479		31	168	
SW12	10/01/2017 13:12	0.0	0.0	<0.0001	<0.001	<0.001	362	399		<0.001	0.0	0.4	<0.001		7.4	7.5	0.0	0.1	32.7	236	0.8	9	4.8	<0.005
SW12	9/02/2017 14:50						280	287							7.4	7.6			33.2	209		<5	6.0	
SW12	9/03/2017 11:30						221	274							7.1	7.5			22.4	226		<5	8.7	
SW12	31/03/2017 13:20						202	206	7.0						7.0	7.1			26.5	372		16	196.0	0.0
SW12	4/04/2017 8:50						336	324							7.0	7.3			19.3	330		16	51.5	
SW12	9/05/2017 15:30						364	358							7.1	7.6			13.6	258		6	14.3	
SW12	13/06/2017 15:45	<0.001	0.0	<0.0001	<0.001	<0.001	420	425	0.8	<0.001	0.0	0.0	<0.001		7.0	7.5	<0.01	0.1	11.2	289	0.3	<5	10.2	<0.005
SW12	11/07/2017 13:40						478	427							7.6	7.6			7.6	304		<5	8.1	
SW12	9/08/2017 14:40						616	552							7.4	7.6			10.6	319		<5	9.8	
SW12	6/09/2017 15:10						556	538							7.8	7.5			12.5	344		8	9.6	
SW12	10/10/2017 15:15						459	452							6.6	7.5			20.4	314		<5	8.4	
SW12	13/11/2017 10:45						471	473							7.1	7.4			22.8	316		7	7.1	
SW12	18/11/2017 12:25						97	91	8.2						7.8	6.7			17.9	396		84	328.0	0.0
SW12	3/12/2017 12:40						308	302	3.8						6.9	7.3			21.3	266		42	82.0	0.0

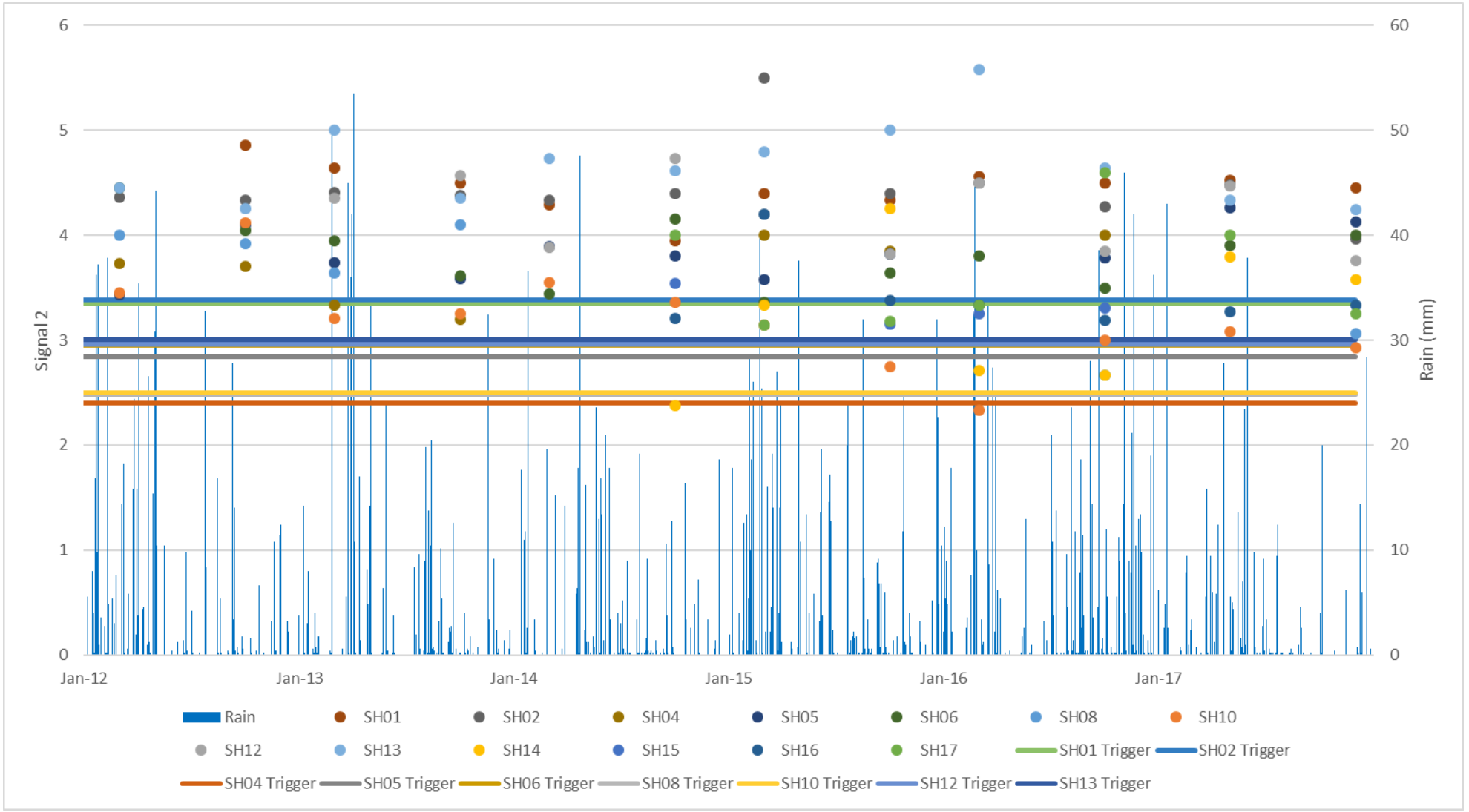
Sample Point	Date	Arsenic - Total (mg/L)	Barium - Total (mg/L)	Cadmium - Total (mg/L)	Chromium - Total (mg/L)	Copper - Total (mg/L)	Electrical Conductivity - Lab (µS/cm)	Electrical Conductivity -Field (µS/cm)	Iron - Total (mg/L)	Lead - Total (mg/L)	Lithium Total (mg/L)	Manganese - Total (mg/L)	Nickel - Total (mg/L)	Oil & Grease (mg/L)	pH (Field) (Unit)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Strontium Total (mg/L)	Temperature (°C)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Total Suspended Solids (mg/L)	Turbidity - Field (NTU)	Zinc - Total (mg/L)
SW12	11/12/2017 9:55						474	487							7.1	7.2			24.3	334		8	11.5	
SW15	10/01/2017 15:30	<0.001	0.1	<0.0001	<0.001	<0.001	335	348		<0.001	<0.001	0.7	0.0		6.6	7.0	0.1	0.1	29.1	237	1.2	50	304.0	<0.005
SW15	9/02/2017 12:10						342	348							6.9	7.1			28.4	284		65	174.0	
SW15	9/03/2017 14:55						368	384							6.7	7.0			21.9	362		24	361.0	
SW15	31/03/2017 11:15						161	178	12.0						6.2	6.6			21.5	168		15	73.9	0.0
SW15	4/04/2017 11:20						202	199							6.2	6.4			18.6	190		16	67.4	
SW15	9/05/2017 12:00						220	218							7.3	7.1			12.8	198		26	120.0	
SW16	10/01/2017 15:20	0.0	0.1	<0.0001	0.0	<0.001	440	480		0.0	<0.001	2.6	0.0		7.4	7.5	0.1	0.2	30.1	334	3.2	12	27.5	<0.005
SW16	9/02/2017 12:20						501	516							7.6	7.6			28.4	428		16	45.9	
SW16	9/03/2017 15:10						480	570							7.3	7.6			21.6	388		<5	25.9	
SW16	31/03/2017 11:30						194	222	1.6						6.4	6.8			23.0	238		27	140.0	0.0
SW16	4/04/2017 11:30						331	324							6.2	6.4			19.2	332		14	67.4	
SW16	9/05/2017 12:05						434	431							6.8	7.2			11.6	280		9	25.7	
SW16	13/06/2017 14:15	<0.001	0.0	<0.0001	<0.001	0.0	397	406	3.4	<0.001	0.0	0.3	0.0		6.9	7.2	<0.01	0.1	10.8	258	0.8	6	37.5	<0.005
SW16	11/07/2017 8:40						415	378							6.5	7.2			3.7	215		<5	24.1	
SW16	9/08/2017 15:45						368	362							7.7	7.3			9.3	210		9	32.4	
SW16	6/09/2017 16:45						397	385							7.1	7.1			9.5	238		12	21.1	
SW16	10/10/2017 8:35						437	498							7.4	7.4			15.3	282		28	30.6	
SW16	13/11/2017 13:50						512	488							7.3	7.4			19.8	342		10	35.2	
SW16	18/11/2017 12:50						546	529	6.7						7.2	7.6			17.9	410		28	49.6	0.0
SW16	3/12/2017 11:20						314	310	5.7						7.0	7.3			19.7	210		34	100.0	0.0

Sample Point	Date	Arsenic - Total (mg/L)	Barium - Total (mg/L)	Cadmium - Total (mg/L)	Chromium - Total (mg/L)	Copper - Total (mg/L)	Electrical Conductivity - Lab (µS/cm)	Electrical Conductivity -Field (µS/cm)	Iron - Total (mg/L)	Lead - Total (mg/L)	Lithium Total (mg/L)	Manganese - Total (mg/L)	Nickel - Total (mg/L)	Oil & Grease (mg/L)	pH (Field) (Unit)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Strontium Total (mg/L)	Temperature (°C)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Total Suspended Solids (mg/L)	Turbidity - Field (NTU)	Zinc - Total (mg/L)
SW16	11/12/2017 13:25						401	407							7.1	6.7			23.4	364		40	64.4	
SW17	10/01/2017 10:30	0.0	0.1	<0.0001	0.0	<0.001	858	908		0.0	0.0	2.4	0.0		6.7	7.2	0.2	0.2	26.2	639	3.1	39	17.9	0.0
SW17	9/02/2017 11:50						206	200							6.5	6.7			29.2	226		66	120.0	
SW17	9/03/2017 15:35						517	520							3.9	4.0			26.6	400		26	41.3	
SW17	31/03/2017 12:50						48	50	3.2						6.3	6.5			27.0	170		60	268.0	0.0
SW17	4/04/2017 16:35						59	60							6.3	6.7			22.5	132		29	133.0	
SW17	9/05/2017 13:00						101	96							7.0	7.1			17.1	221		65	223.0	
SW17	13/06/2017 13:25	0.0	0.0	<0.0001	0.0	0.0	80	82	9.1	0.0	0.0	0.1	0.0		7.0	6.7	0.1	0.0	13.5	172	1.5	40	127.0	0.0
SW17	11/07/2017 9:10						102	946							6.5	7.1			3.8	194		16	120.0	
SW17	9/08/2017 7:50						58	56							7.2	6.6			6.5	142		28	174.0	
SW17	6/09/2017 15:25						86	96							7.1	7.0			16.6	220		43	168.0	
SW17	18/11/2017 13:10						50	47	2.1						7.5	6.8			17.5	151		47	122.0	0.0
SW17	3/12/2017 11:35						48	44	3.7						6.9	6.5			20.5	158		54	209.0	0.0
SW17	11/12/2017 14:05						72	73							6.7	6.5			27.6	221		19	117.0	
SW19	9/02/2017 10:15						70	70							6.1	6.3			28.4	88		40	71.5	
SW19	9/08/2017 10:10						37	40							6.7	5.7			10.9	41		12	20.4	

Note: Sampling events where location was too low to sample have not been included.

Figure 3-g Stream Health Trending data and rainfall




Signal 2
Rain (mm)
0
1
2
3
4
5
6
0
10
20
30
40
50
60
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Rain
SH01
SH02
SH04
SH05
SH06
SH08
SH10
SH12
SH13
SH14
SH15
SH16
SH17
SH01 Trigger
SH02 Trigger
SH04 Trigger
SH05 Trigger
SH06 Trigger
SH08 Trigger
SH10 Trigger
SH12 Trigger
SH13 Trigger

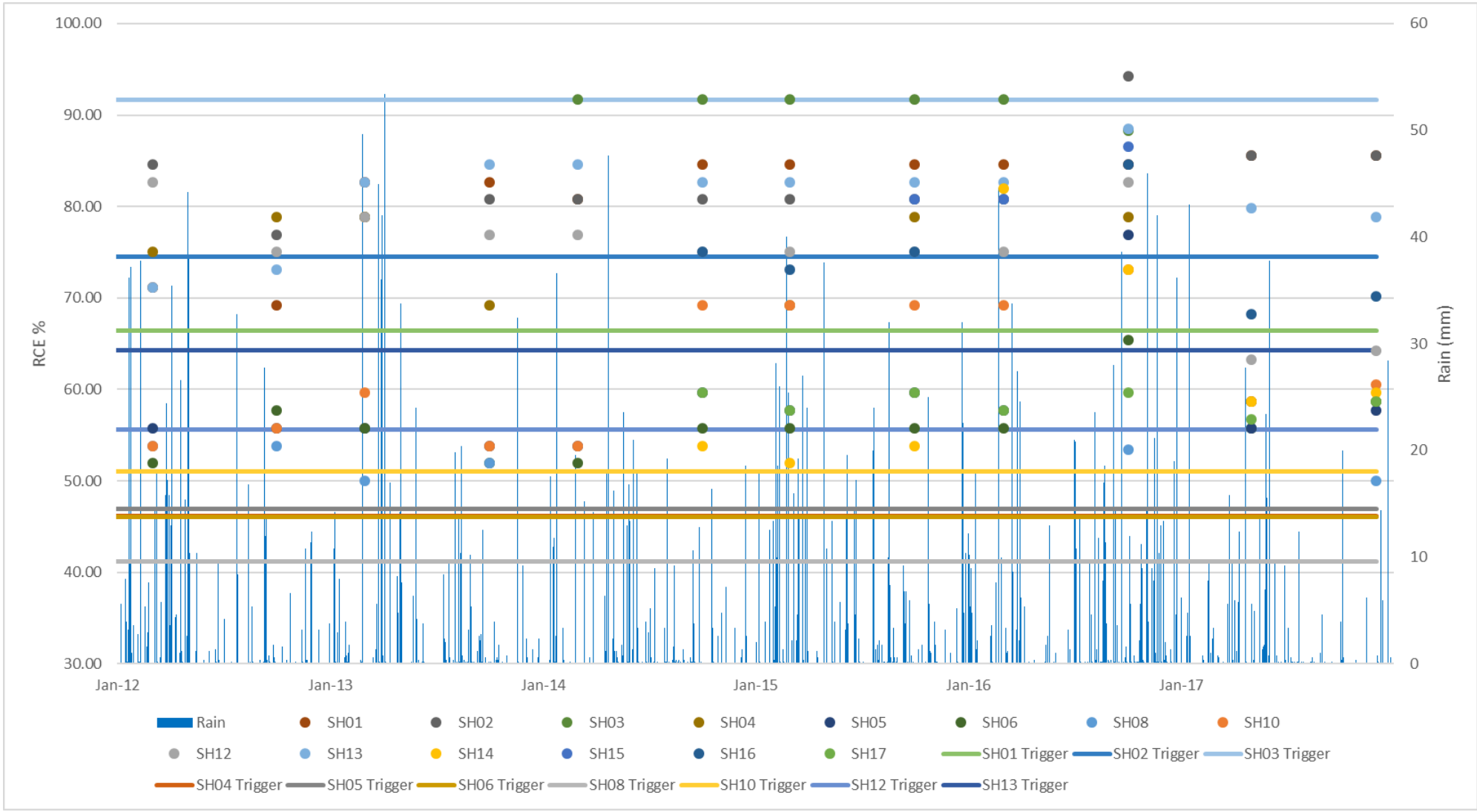
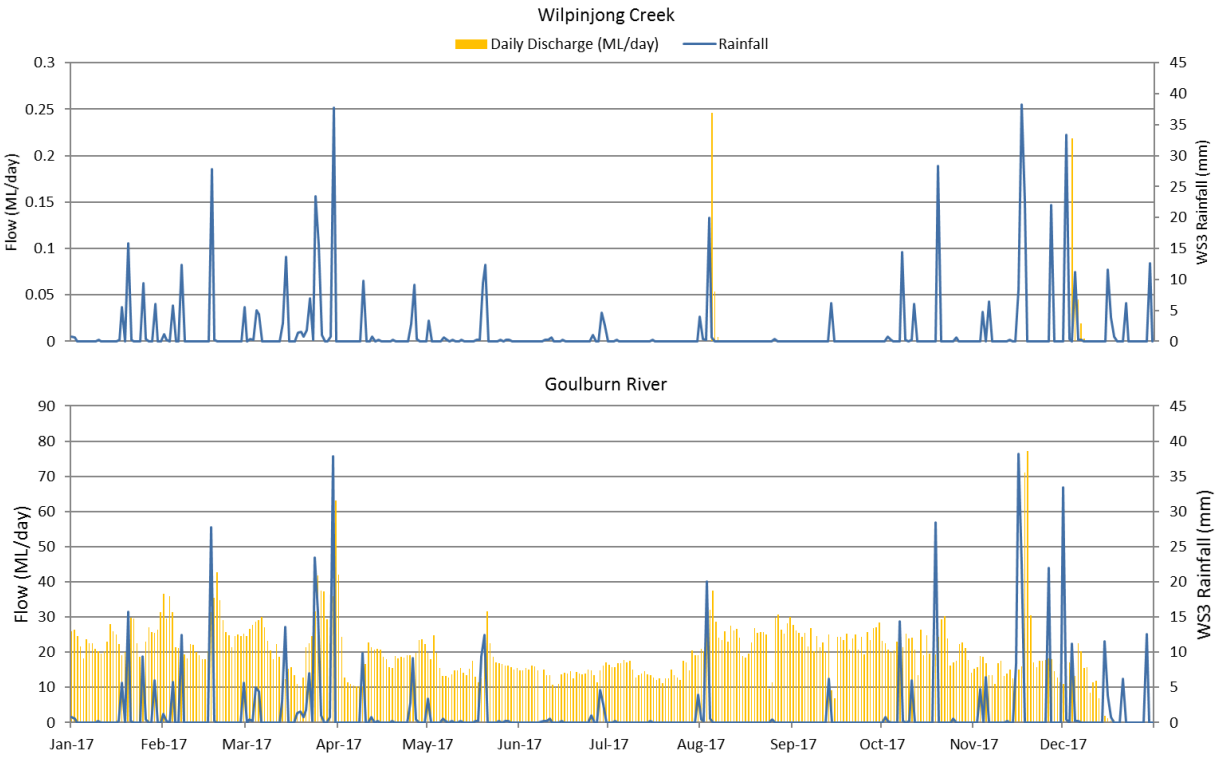

100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
RCE %
60
50
40
30
20
10
0
Rain (mm)
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Rain
SH01
SH02
SH03
SH04
SH05
SH06
SH08
SH10
SH12
SH13
SH14
SH15
SH16
SH17
SH01 Trigger
SH02 Trigger
SH03 Trigger
SH04 Trigger
SH05 Trigger
SH06 Trigger
SH08 Trigger
SH10 Trigger
SH12 Trigger
SH13 Trigger

Table 7: Effluent Discharge Quality

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)
Admin Effluent	9-Feb-17	8	64.5	<5	22.3	7.6	19
CHPP Effluent	9-Feb-17	6	3.3	7	0.25	7.5	25
OC Effluent Tank	8-Feb-17	7	10.4	<5	3.37	7.3	62
UG Effluent Tank	10-Feb-17	67	11.6	10	1.33	7.5	78
Admin Effluent	11-May-17	37	112	<5	12.2	7.8	73
CHPP Effluent	11-May-17	3	4	<5	0.25	7.4	40
OC Effluent Tank	11-May-17	39	167	<5	22.9	7.4	174
UG Effluent Tank	11-May-17	39	21	<5	3.3	7.7	31
OC Effluent Tank	9-Aug-17	32	189	<5	18.7	7.6	37
UG Effluent Tank	9-Aug-17	64	9	6	1.1	7.6	26
Admin Effluent	9-Aug-17	37	361	<5	23.4	8.2	140
CHPP Effluent	9-Aug-17	44	218	16	41.5	7.7	1390
Admin Effluent	14-Nov-17	32	230	<5	25.4	7.9	86
CHPP Effluent	14-Nov-17	6	2.3	<5	0.08	7.7	14
OC Effluent Tank	14-Nov-17	7	8	<5	3.03	7.4	17
UG Effluent Tank	14-Nov-17	31	9.5	8	3.48	7.4	24

Figure 3-h 2017 Stream Flow and rainfall



APPENDIX 3G. GROUNDWATER MONITORING DATA

Sample Point	Date	Alkalinity Bicarbonate (mg/L)	Alkalinity Carbonate (mg/L)	Alkalinity Hydroxide (mg/L)	Alkalinity Total (mg/L)	Aluminium - Dissolved (mg/L)	Ammonia as N (mg/L)	Arsenic - Dissolved (mg/L)	Boron - Dissolved (mg/L)	Cadmium - Dissolved (mg/L)	Calcium - Dissolved (mg/L)	Chloride (mg/L)	Chromium - Dissolved (mg/L)	Cobalt - Dissolved (mg/L)	Copper - Dissolved (mg/L)	Electrical Conductivity - Lab (µS/cm)	Fluoride (mg/L)	Iron - Dissolved (mg/L)	Lead - Dissolved (mg/L)	Magnesium - Dissolved (mg/L)	Manganese - Dissolved (mg/L)	Mercury - Dissolved (mg/L)	Nickel - Dissolved (mg/L)	Nitrate (mg/L)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Potassium - Dissolved (mg/L)	Reactive Phosphorus - Total (mg/L)	Selenium - Dissolved (mg/L)	Silver - Dissolved (mg/L)	Sodium - Dissolved (mg/L)	Sulphate - Turbidimetric (mg/L)	Total Dissolved Solids (mg/L)	Total Suspended Solids (mg/L)	Zinc - Dissolved (mg/L)
Piezometer PZ003	4/04/2017 10:00	100	<1	<1	100	<0.01	<0.01	<0.001	<0.05	<0.0001	7	177	<0.001	<0.001	<0.001	839	0.1	<0.05	<0.001	21	0.003	<0.0001	0.001	0.4	6.68	0.06	6	0.06	<0.01	<0.001	114	29	460	24	<0.005
Piezometer PZ003	10/10/2017 16:20	81	<1	<1	81	0.11	0.03	<0.001	<0.05	<0.0001	9	128	<0.001	0.001	<0.001	644	0.2	<0.05	<0.001	19	0.005	<0.0001	0.004	0.4	7.07	0.02	7	<0.01	<0.01	<0.001	103	40	329	22	0.017
Piezometer PZ039	3/04/2017 15:05	31	<1	<1	31	<0.01	<0.01	<0.001	<0.05	<0.0001	24	182	<0.001	<0.001	<0.001	697	<0.1	<0.05	<0.001	17	0.12	<0.0001	0.002	0.1	6.11	0.04	9	0.02	<0.01	<0.001	62	10	454	18	0.009
Piezometer PZ039	10/10/2017 11:20	24	<1	<1	24	<0.01	0.1	<0.001	<0.05	<0.0001	25	165	<0.001	0.004	<0.001	588	<0.1	1.92	<0.001	16	0.249	<0.0001	0.002	0.17	6.12	0.02	10	<0.01	<0.01	<0.001	56	11	330	15	0.019
Piezometer PZ040B	4/04/2017 11:55	76	<1	<1	76	<0.01	<0.01	0.002	<0.05	<0.0001	37	290	<0.001	<0.001	<0.001	1140	<0.1	<0.05	<0.001	29	0.002	<0.0001	<0.001	0.19	6.78	0.01	17	<0.01	<0.01	<0.001	111	21	699	43	<0.005
Piezometer PZ040B	10/10/2017 12:05	36	<1	<1	36	<0.01	<0.01	<0.001	<0.05	<0.0001	27	336	<0.001	<0.001	<0.001	1140	0.1	<0.05	<0.001	26	0.074	<0.0001	0.003	0.21	6.37	<0.01	14	<0.01	<0.01	<0.001	144	19	651	26	0.012
Piezometer PZ044	4/04/2017 10:25	413	<1	<1	413	<0.01	<0.01	<0.001	<0.05	<0.0001	411	239	<0.001	<0.001	<0.001	2870	0.2	<0.05	<0.001	74	<0.001	<0.0001	<0.001	0.3	7.29	0.05	38	<0.01	<0.01	<0.001	96	812	2320	18	0.007
Piezometer PZ044	10/10/2017 16:50	443	<1	<1	443	<0.01	<0.01	<0.001	<0.05	<0.0001	430	234	<0.001	<0.001	<0.001	2680	0.2	<0.05	<0.001	80	<0.001	<0.0001	<0.001	0.38	7.33	0.01	41	<0.01	<0.01	<0.001	106	838	2180	35	0.006
Piezometer PZ055	3/04/2017 15:50	35	<1	<1	35	0.02	0.62	<0.001	<0.05	<0.0001	23	479	<0.001	0.344	0.002	2450	<0.1	1.43	<0.001	92	5.92	<0.0001	0.07	<0.01	5.72	0.04	17	<0.01	<0.01	<0.001	276	362	1710	29	0.098
Piezometer PZ055	11/10/2017 13:15	36	<1	<1	36	0.02	0.72	<0.001	<0.05	<0.0001	31	520	<0.001	0.423	0.003	2450	<0.1	<0.05	<0.001	124	7.53	<0.0001	0.088	0.01	6.06	<0.01	20	<0.01	<0.01	<0.001	335	430	1600	22	0.1
Piezometer PZ101B	5/04/2017 10:55	336	<1	<1	336	<0.01	0.52	0.006	<0.05	<0.0001	53	50	<0.001	<0.001	<0.001	792	0.9	1.61	<0.001	20	0.263	<0.0001	0.002	<0.10	7.74	0.19	17	<0.01	<0.01	<0.001	74	2	471	66	<0.005
Piezometer PZ101B	11/10/2017 14:00	365	<1	<1	365	<0.01	0.49	0.006	0.05	<0.0001	62	43	<0.001	<0.001	<0.001	760	1.2	2.42	<0.001	23	0.289	<0.0001	0.005	<0.01	7.89	0.18	20	<0.01	<0.01	<0.001	89	4	440	51	0.008
Piezometer PZ101C	5/04/2017 11:15	220	<1	<1	220	<0.01	0.2	0.001	<0.05	<0.0001	32	56	<0.001	0.003	<0.001	630	0.5	0.24	<0.001	17	0.905	<0.0001	0.002	<0.01	7.33	0.1	9	<0.01	<0.01	<0.001	58	2	342	57	0.396
Piezometer PZ101C	11/10/2017 14:05	263	<1	<1	263	<0.01	0.07	<0.001	<0.05	<0.0001	41	52	<0.001	<0.001	<0.001	610	0.5	<0.05	<0.001	20	0.304	<0.0001	0.001	0.09	7.55	0.28	11	<0.01	<0.01	<0.001	76	3	346	481	0.134
Piezometer PZ102A	5/04/2017 14:30	356	<1	<1	356	<0.01	0.99	<0.001	0.06	<0.0001	103	199	<0.001	<0.001	<0.001	2060	1.8	2.27	<0.001	38	0.146	<0.0001	0.004	<0.01	7.46	0.04	28	<0.01	<0.01	<0.001	244	326	1320	31	0.006
Piezometer PZ102A	11/10/2017 12:40	378	<1	<1	378	0.01	1.03	<0.001	0.08	<0.0001	124	199	<0.001	0.002	<0.001	1900	2	1.78	<0.001	45	0.117	<0.0001	0.005	<0.01	7.49	<0.01	36	<0.01	<0.01	<0.001	302	376	1190	80	0.01
Piezometer PZ102B	5/04/2017 14:50	242	<1	<1	242	<0.01	0.71	<0.001	<0.05	<0.0001	192	125	<0.001	<0.001	<0.001	2630	1.2	2.93	<0.001	87	1.68	<0.0001	0.003	<0.01	7.17	0.03	30	<0.01	<0.01	<0.001	225	888	1530	28	<0.005
Piezometer PZ102B	11/10/2017 15:45	214	<1	<1	214	<0.01	0.58	<0.001	<0.05	<0.0001	179	127	<0.001	<0.001	<0.001	2340	1	5.35	<0.001	78	0.954	<0.0001	0.003	<0.01	7.22	<0.01	31	<0.01	<0.01	<0.001	230	907	1850	91	0.013
Piezometer PZ103A	5/04/2017 13:30	155	<1	<1	155	<0.01	0.04	<0.001	<0.05	<0.0001	43	66	<0.001	<0.001	<0.001	564	0.2	<0.05	<0.001	18	0.023	<0.0001	0.003	0.13	7.07	0.06	10	<0.01	<0.01	<0.001	33	4	312	28	<0.005
Piezometer PZ103A	11/10/2017 14:20	167	<1	<1	167	<0.01	0.2	<0.001	<0.05	<0.0001	40	66	<0.001	0.012	<0.001	562	0.2	3.23	<0.001	19	1.02	<0.0001	0.016	<0.01	7.1	<0.01	11	<0.01	<0.01	<0.001	36	9	292	48	0.02
Piezometer PZ103C	5/04/2017 14:10	12	<1	<1	12	0.01	0.39	<0.001	<0.05	<0.0001	4	64	<0.001	0.02	<0.001	308	<0.1	0.76	<0.001	7	0.415	<0.0001	0.129	0.06	5.45	0.99	6	<0.01	<0.01	<0.001	34	10	170	1570	0.055
Piezometer PZ103C	11/10/2017 14:30	12	<1	<1	12	0.01	0.65	<0.001	<0.05	<0.0001	5	56	<0.001	0.009	<0.001	293	<0.1	<0.05	<0.001	7	0.367	<0.0001	0.125	0.06	5.68	0.88	6	<0.01	<0.01	<0.001	35	13	195	2080	0.05
Piezometer PZ104	5/04/2017 9:40	<1	64	1860	1930	0.02	0.11	<0.001	<0.05	<0.0001	735	24	0.032	<0.001	0.001	8400	0.1	<0.05	<0.001	<1	<0.001	<0.0001	<0.001	0.02	12.4	<0.01	5	<0.01	<0.01	<0.001	33	<1	1960	56	<0.005
Piezometer PZ104	10/10/2017 8:10	<1	52	2000	2050	0.01	0.12	<0.001	<0.05	<0.0001	794	21	0.033	<0.001	<0.001	7530	6.1	<0.05	<0.001	<1	<0.001	<0.0001	0.001	0.02	12.5	<0.01	5	<0.01	<0.01	<0.001	37	3	1920	141	<0.005
Piezometer PZ105A	5/04/2017 11:50	21	<1	<1	21	<0.01	0.01	<0.001	<0.05	<0.0001	7	64	<0.001	0.014	<0.001	304	<0.1	3.3	<0.001	6	0.218	<0.0001	0.096	0.02	6.03	0.31	3	<0.01	<0.01	<0.001	35	3	157	36	0.028
Piezometer PZ105A	10/10/2017 13:00	25	<1	<1	25	<0.01	<0.01	<0.001	<0.05	<0.0001	8	56	<0.001	0.01	0.005	291	<0.1	<0.05	<0.001	6	0.187	<0.0001	0.106	0.09	6.28	<0.01	3	<0.01	<0.01	<0.001	40	20	186	17	0.064
Piezometer PZ105B	5/04/2017 12:05	8	<1	<1	8	0.01	0.03	0.004	<0.05	<0.0001	2	49	<0.001	0.01	<0.001	205	<0.1	0.41	<0.001	4	0.102	<0.0001	0.065	0.14	5.55	0.02	1	<0.01	<0.01	<0.001	26	<1	129	18	0.035
Piezometer PZ105B	10/10/2017 13:05	6	<1	<1	6	0.03	0.03	0.002	<0.05	<0.0001	1	44	<0.001	0.013	<0.001	194	<0.1	0.11	0.003	4	0.076	<0.0001	0.069	0.03	5.51	<0.01	<1	<0.01	<0.01	<0.001	30	<1	121	10	0.052

Sample Point	Date	Alkalinity Bicarbonate (mg/L)	Alkalinity Carbonate (mg/L)	Alkalinity Hydroxide (mg/L)	Alkalinity Total (mg/L)	Aluminium - Dissolved (mg/L)	Ammonia as N (mg/L)	Arsenic - Dissolved (mg/L)	Boron - Dissolved (mg/L)	Cadmium - Dissolved (mg/L)	Calcium - Dissolved (mg/L)	Chloride (mg/L)	Chromium - Dissolved (mg/L)	Cobalt - Dissolved (mg/L)	Copper - Dissolved (mg/L)	Electrical Conductivity - Lab (µS/cm)	Fluoride (mg/L)	Iron - Dissolved (mg/L)	Lead - Dissolved (mg/L)	Magnesium - Dissolved (mg/L)	Manganese - Dissolved (mg/L)	Mercury - Dissolved (mg/L)	Nickel - Dissolved (mg/L)	Nitrate (mg/L)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Potassium - Dissolved (mg/L)	Reactive Phosphorus - Total (mg/L)	Selenium - Dissolved (mg/L)	Silver - Dissolved (mg/L)	Sodium - Dissolved (mg/L)	Sulphate - Turbidimetric (mg/L)	Total Dissolved Solids (mg/L)	Total Suspended Solids (mg/L)	Zinc - Dissolved (mg/L)
Piezometer PZ105C	5/04/2017 11:40	18	<1	<1	18	<0.01	<0.01	<0.001	<0.05	<0.0001	6	43	<0.001	<0.001	<0.001	210	<0.1	<0.05	<0.001	3	0.005	<0.0001	0.004	0.17	6.59	0.01	2	<0.01	<0.01	<0.001	24	4	140	92	0.013
Piezometer PZ105C	10/10/2017 13:10	22	<1	<1	22	<0.01	0.01	<0.001	<0.05	<0.0001	7	40	<0.001	<0.001	<0.001	204	<0.1	<0.05	<0.001	3	0.057	<0.0001	0.026	0.19	6.56	<0.01	2	<0.01	<0.01	<0.001	26	5	123	42	0.048
Piezometer PZ106A	4/04/2017 13:35	33	9	<1	42	0.55	0.03	<0.001	<0.05	<0.0001	18	182	<0.001	<0.001	<0.001	720	<0.1	<0.05	<0.001	2	<0.001	<0.0001	<0.001	0.94	9.06	0.01	19	<0.01	<0.01	<0.001	98	10	388	25	<0.005
Piezometer PZ106A	10/10/2017 13:25	39	9	<1	48	0.62	<0.01	<0.001	<0.05	<0.0001	22	183	<0.001	<0.001	<0.001	693	0.2	<0.05	<0.001	2	<0.001	<0.0001	<0.001	0.87	8.93	<0.01	21	<0.01	<0.01	<0.001	110	11	458	51	<0.005
Piezometer PZ106B	4/04/2017 13:50	11	<1	<1	11	0.05	0.04	<0.001	<0.05	0.0004	24	525	<0.001	0.041	<0.001	1880	<0.1	<0.05	<0.001	43	0.957	<0.0001	0.063	<0.01	5.62	<0.01	8	<0.01	<0.01	<0.001	232	32	1140	<5	0.121
Piezometer PZ106B	10/10/2017 13:35	13	<1	<1	13	0.02	<0.01	<0.001	<0.05	0.0009	26	527	<0.001	0.006	<0.001	1790	<0.1	<0.05	<0.001	46	0.452	0.0001	0.066	0.06	6.21	<0.01	9	<0.01	<0.01	<0.001	253	42	1030	23	0.155
Piezometer PZ107	4/04/2017 13:10	147	<1	<1	147	<0.01	0.12	<0.001	<0.05	<0.0001	27	79	<0.001	<0.001	<0.001	706	0.1	<0.05	<0.001	18	0.134	<0.0001	<0.001	0.04	6.7	0.14	9	<0.01	<0.01	<0.001	77	40	388	56	<0.005
Piezometer PZ107	10/10/2017 13:00	237	<1	<1	237	<0.01	<0.01	<0.001	<0.05	<0.0001	48	227	<0.001	<0.001	<0.001	1240	0.2	<0.05	<0.001	50	0.003	<0.0001	0.001	0.09	6.98	<0.01	17	<0.01	<0.01	<0.001	143	87	704	22	0.009
Piezometer PZ109	5/04/2017 10:25	237	<1	<1	237	<0.01	0.02	<0.001	<0.05	<0.0001	43	73	<0.001	<0.001	<0.001	747	0.1	<0.05	0.006	30	0.007	<0.0001	0.004	0.12	7.04	0.04	3	<0.01	<0.01	<0.001	56	13	396	79	0.054
Piezometer PZ109	10/10/2017 11:55	256	<1	<1	256	<0.01	<0.01	<0.001	<0.05	<0.0001	40	100	<0.001	<0.001	0.002	742	0.2	<0.05	<0.001	34	0.012	<0.0001	0.004	0.15	7.27	<0.01	3	<0.01	<0.01	<0.001	78	15	434	55	0.04
Piezometer PZ111	3/04/2017 7:30	42	<1	<1	42	<0.01	0.45	<0.001	<0.05	<0.0001	39	247	<0.001	0.024	<0.001	896	<0.1	14.4	<0.001	26	0.953	<0.0001	0.062	0.2	6.07	0.02	13	<0.01	<0.01	<0.001	63	9	594	1400	0.014
Piezometer PZ112B	4/04/2017 15:10	4	<1	<1	4	0.04	0.03	<0.001	<0.05	<0.0001	<1	251	<0.001	0.008	0.001	1270	<0.1	0.05	<0.001	9	0.067	<0.0001	0.023	1.11	5.68	0.06	5	<0.01	<0.01	<0.001	187	163	896	296	0.04
Piezometer PZ112B	10/10/2017 14:20	6	<1	<1	6	0.1	<0.01	<0.001	<0.05	0.0002	2	414	<0.001	0.019	<0.001	1950	<0.1	<0.05	<0.001	22	0.068	<0.0001	0.051	1.62	5.75	0.02	8	<0.01	<0.01	<0.001	354	272	972	39	0.077
Piezometer PZ137	4/04/2017 12:35	50	<1	<1	50	<0.01	<0.01	<0.001	<0.05	<0.0001	52	363	<0.001	0.003	<0.001	1450	<0.1	<0.05	<0.001	45	0.762	<0.0001	0.006	0.09	6.28	<0.01	29	<0.01	<0.01	<0.001	112	76	888	26	0.025
Piezometer PZ137	10/10/2017 12:45	50	<1	<1	50	<0.01	<0.01	<0.001	<0.05	<0.0001	44	322	<0.001	0.002	<0.001	1210	<0.1	0.05	<0.001	37	0.623	<0.0001	0.008	0.09	6.42	<0.01	28	<0.01	<0.01	<0.001	106	51	788	13	0.03
Piezometer PZ149	4/04/2017 12:50	234	<1	<1	234	0.13	<0.01	0.001	0.07	<0.0001	134	1570	0.001	0.031	<0.001	7380	0.1	15.6	<0.001	233	16.8	<0.0001	0.021	<0.01	6.61	0.06	40	<0.01	<0.01	<0.001	578	420	3710	212	0.017
Piezometer PZ151	4/04/2017 14:25	320	<1	<1	320	<0.01	0.07	<0.001	<0.05	<0.0001	85	307	<0.001	<0.001	<0.001	1770	0.3	0.05	<0.001	46	0.063	<0.0001	0.002	0.12	7.19	0.28	22	<0.01	<0.01	<0.001	166	104	974	444	0.021
Piezometer PZ151	11/10/2017 8:55	350	<1	<1	350	<0.01	0.23	0.005	<0.05	<0.0001	100	313	<0.001	<0.001	<0.001	1680	0.4	3.7	<0.001	56	0.114	<0.0001	0.007	0.02	7.35	0.22	25	<0.01	<0.01	<0.001	191	91	952	526	0.009
Piezometer PZ152	4/04/2017 14:45	34	<1	<1	34	<0.01	0.55	<0.001	<0.05	<0.0001	127	1570	<0.001	0.152	<0.001	6560	<0.1	36.4	<0.001	164	16.7	<0.0001	0.51	<0.01	5.86	0.14	57	<0.01	<0.01	<0.001	662	148	3730	351	0.344
Piezometer PZ157	3/04/2017 13:25	104	<1	<1	104	<0.01	0.04	<0.001	<0.05	<0.0001	56	281	<0.001	0.008	<0.001	1110	<0.1	0.18	<0.001	51	0.229	<0.0001	0.044	<0.01	6.68	0.03	8	<0.01	<0.01	<0.001	52	6	710	59	0.084
Piezometer PZ157	10/10/2017 10:30	145	<1	<1	145	<0.01	<0.01	<0.001	<0.05	<0.0001	53	230	<0.001	<0.001	<0.001	947	0.1	<0.05	<0.001	46	0.012	<0.0001	0.024	0.1	6.86	<0.01	9	<0.01	<0.01	<0.001	54	8	708	130	0.156
Piezometer PZ170	3/04/2017 14:30	214	<1	<1	214	<0.01	0.22	0.003	<0.05	<0.0001	238	1180	<0.001	0.008	<0.001	4860	<0.1	8.23	<0.001	170	0.329	<0.0001	0.044	<0.01	6.69	0.02	27	0.04	<0.01	<0.001	291	6	3080	90	0.012
Piezometer PZ170	10/10/2017 11:10	216	<1	<1	216	0.02	0.3	0.002	<0.05	<0.0001	140	815	<0.001	0.006	<0.001	3160	<0.1	7.5	<0.001	144	0.362	<0.0001	0.04	0.33	6.82	0.03	22	<0.01	<0.01	<0.001	261	4	2500	101	0.009
Piezometer PZ174	3/04/2017 15:45	399	<1	<1	399	<0.01	0.18	<0.001	<0.05	<0.0001	201	4280	<0.001	0.138	<0.001	13700	0.6	<0.05	<0.001	710	0.814	<0.0001	0.071	0.02	7.24	<0.02	4	<0.01	<0.01	<0.001	1460	331	7770	10	0.056
Piezometer PZ174	10/10/2017 11:35	506	<1	<1	506	<0.01	0.09	<0.001	<0.05	<0.0001	169	4120	<0.001	0.104	<0.001	13600	0.4	0.06	<0.001	600	0.668	<0.0001	0.054	0.24	6.77	<0.01	3	<0.01	<0.01	<0.001	1230	371	9580	11	0.05
Piezometer PZ175	3/04/2017 15:55	53	<1	<1	53	0.48	0.03	<0.001	<0.05	<0.0001	7	342	0.004	0.004	0.012	1290	0.2	0.34	<0.001	50	0.006	<0.0001	0.013	0.6	6.5	0.18	9	<0.01	<0.01	<0.001	129	50	936	16	0.029
Piezometer PZ175	10/10/2017 11:45	423	<1	<1	423	0.12	0.07	<0.001	<0.05	<0.0001	58	1800	0.001	0.014	0.006	8930	0.6	0.16	<0.001	346	0.161	<0.0001	0.006	0.78	7.1	0.02	5	<0.01	<0.01	<0.001	840	269	5880	22	0.022
Piezometer PZ176	3/04/2017 15:20	45	<1	<1	45	<0.01	0.08	<0.001	<0.05	<0.0001	15	157	<0.001	<0.001	<0.001	602	<0.1	6	<0.001	19	0.208	<0.0001	0.001	<0.01	6.53	0.03	4	<0.01	<0.01	<0.001	57	<1	308	18	0.009

Sample Point	Date	Alkalinity Bicarbonate (mg/L)	Alkalinity Carbonate (mg/L)	Alkalinity Hydroxide (mg/L)	Alkalinity Total (mg/L)	Aluminium - Dissolved (mg/L)	Ammonia as N (mg/L)	Arsenic - Dissolved (mg/L)	Boron - Dissolved (mg/L)	Cadmium - Dissolved (mg/L)	Calcium - Dissolved (mg/L)	Chloride (mg/L)	Chromium - Dissolved (mg/L)	Cobalt - Dissolved (mg/L)	Copper - Dissolved (mg/L)	Electrical Conductivity - Lab (µS/cm)	Fluoride (mg/L)	Iron - Dissolved (mg/L)	Lead - Dissolved (mg/L)	Magnesium - Dissolved (mg/L)	Manganese - Dissolved (mg/L)	Mercury - Dissolved (mg/L)	Nickel - Dissolved (mg/L)	Nitrate (mg/L)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Potassium - Dissolved (mg/L)	Reactive Phosphorus - Total (mg/L)	Selenium - Dissolved (mg/L)	Silver - Dissolved (mg/L)	Sodium - Dissolved (mg/L)	Sulphate - Turbidimetric (mg/L)	Total Dissolved Solids (mg/L)	Total Suspended Solids (mg/L)	Zinc - Dissolved (mg/L)
Piezometer PZ176	10/10/2017 11:50	49	<1	<1	49	<0.01	<0.01	<0.001	<0.05	<0.0001	15	152	<0.001	<0.001	<0.001	578	<0.1	<0.05	<0.001	18	0.006	<0.0001	<0.001	0.08	7.03	<0.01	3	<0.01	<0.01	<0.001	57	<1	395	19	<0.005
Piezometer PZ177	3/04/2017 15:30	174	<1	<1	174	0.01	0.02	<0.001	<0.05	<0.0001	17	1170	<0.001	0.003	<0.001	5360	0.5	0.08	<0.001	98	0.005	<0.0001	0.004	<0.01	6.95	0.92	<1	<0.01	<0.01	<0.001	768	135	3330	2380	<0.005
Piezometer PZ177	10/10/2017 12:00	239	<1	<1	239	<0.01	<0.01	<0.001	<0.05	<0.0001	21	1400	<0.001	0.008	<0.001	5820	0.6	0.06	<0.001	122	0.012	<0.0001	0.013	<0.01	7.08	0.05	<1	<0.01	<0.01	<0.001	875	180	3710	194	0.017
Piezometer PZ184	4/04/2017 15:50	<1	<1	<1	<1	18.4	0.79	<0.001	<0.05	0.0008	27	1330	0.003	0.171	0.01	6230	0.3	3.25	0.013	104	0.852	<0.0001	0.269	0.2	3.29	0.24	6	0.02	<0.01	<0.001	856	418	3020	1330	0.373
Piezometer PZ184	11/10/2017 9:20	<1	<1	<1	<1	31.3	0.65	0.003	<0.05	0.0008	32	1670	0.004	0.224	0.013	6720	<0.1	0.48	0.015	149	1.05	0.0006	0.368	0.45	3.36	0.22	6	<0.01	0.02	<0.001	1060	585	4140	2880	0.487
Piezometer PZ186	5/04/2017 9:05	75	<1	<1	75	<0.01	0.08	0.005	<0.05	<0.0001	19	52	<0.001	<0.001	<0.001	344	0.1	7.13	<0.001	10	0.184	<0.0001	<0.001	<0.01	6.74	0.13	9	<0.01	<0.01	<0.001	25	<1	272	36	0.009
Piezometer PZ186	10/10/2017 7:35	84	<1	<1	84	<0.01	<0.01	<0.001	<0.05	0.0003	21	47	<0.001	<0.001	<0.001	328	0.2	<0.05	<0.001	11	0.012	<0.0001	0.002	0.08	7.45	1.02	10	<0.01	<0.01	<0.001	26	1	236	66	0.031
Piezometer PZ187	5/04/2017 9:15	23	<1	<1	23	0.06	0.1	0.003	<0.05	<0.0001	<1	36	<0.001	<0.001	<0.001	178	<0.1	0.42	<0.001	2	0.018	<0.0001	0.002	0.01	6.11	0.02	<1	<0.01	<0.01	<0.001	29	<1	123	64	0.008
Piezometer PZ187	10/10/2017 7:45	26	<1	<1	26	0.07	0.14	0.005	<0.05	<0.0001	<1	38	<0.001	<0.001	<0.001	190	<0.1	1.1	<0.001	2	0.015	<0.0001	0.003	0.01	6.19	0.2	<1	<0.01	<0.01	<0.001	38	2	148	26	0.019
Piezometer PZ188	5/04/2017 8:40	6	<1	<1	6	<0.01	0.03	<0.001	<0.05	<0.0001	<1	47	<0.001	0.006	<0.001	194	<0.1	<0.05	<0.001	3	0.052	<0.0001	0.011	0.18	5.66	0.05	<1	<0.01	<0.01	<0.001	29	<1	134	122	0.02
Piezometer PZ188	9/10/2017 16:35	9	<1	<1	9	<0.01	<0.01	<0.001	<0.05	<0.0001	1	42	<0.001	0.006	0.001	188	<0.1	<0.05	<0.001	3	0.042	<0.0001	0.014	0.07	5.91	<0.01	<1	<0.01	<0.01	<0.001	31	2	141	71	0.041
Piezometer PZ189	5/04/2017 8:50	39	<1	<1	39	<0.01	0.04	<0.001	<0.05	<0.0001	11	65	<0.001	<0.001	<0.001	336	0.1	16.4	<0.001	9	0.405	<0.0001	<0.001	0.01	6.29	0.23	4	<0.01	<0.01	<0.001	29	1	239	94	0.007
Piezometer PZ189	9/10/2017 16:45	43	<1	<1	43	<0.01	0.06	<0.001	<0.05	<0.0001	11	64	<0.001	<0.001	<0.001	318	0.2	20.9	<0.001	10	0.491	<0.0001	0.002	0.04	6.45	<0.01	5	<0.01	<0.01	<0.001	34	1	244	105	0.015
Piezometer PZ191	11/10/2017 11:10	<1	<1	<1	<1	0.03	0.39	<0.001	<0.05	<0.0001	5	64	<0.001	<0.001	<0.001	312	<0.1	1.45	<0.001	5	0.328	<0.0001	0.002	0.08	3.96	0.14	4	<0.01	<0.01	<0.001	30	<1	225	629	0.027
Test Bore TB105	5/04/2017 12:20	283	<1	<1	283	<0.01	0.68	<0.001	0.05	<0.0001	43	47	<0.001	<0.001	<0.001	703	1.4	<0.05	<0.001	16	0.027	<0.0001	0.006	<0.01	7.68	<0.01	17	<0.01	<0.01	<0.001	72	<1	364	38	<0.005
Test Bore TB105	10/10/2017 12:55	354	<1	<1	354	<0.01	0.73	<0.001	0.07	<0.0001	47	43	<0.001	<0.001	<0.001	715	1.7	0.23	<0.001	18	0.006	<0.0001	0.002	0.01	7.99	0.01	21	0.11	<0.01	<0.001	79	<1	412	<5	0.008
Piezometer PZ201	3/04/2017 7:50	51	<1	<1	51	<0.01	0.67	<0.001	<0.05	<0.0001	6	39	<0.001	0.012	<0.001	263	<0.1	6.16	<0.001	9	0.978	<0.0001	0.022	0.04	6.13	0.18	6	<0.01	<0.01	<0.001	24	8	148	246	0.053
Piezometer PZ201	11/10/2017 9:10	62	<1	<1	62	<0.01	0.46	0.003	<0.05	<0.0001	7	33	<0.001	0.009	<0.001	250	<0.1	10.8	<0.001	9	1.02	<0.0001	0.023	0.06	6.51	0.68	6	<0.01	<0.01	<0.001	27	8	178	409	0.042
Piezometer PZ202	11/10/2017 9:25	21	<1	<1	21	0.02	0.03	<0.001	<0.05	<0.0001	2	14	<0.001	0.004	<0.001	107	<0.1	0.47	<0.001	4	0.37	<0.0001	0.008	0.01	5.88	0.19	2	<0.01	<0.01	<0.001	13	13	140	3590	0.027
Piezometer PZ203	3/04/2017 16:05	7	<1	<1	7	0.02	<0.01	<0.001	<0.05	<0.0001	4	70	<0.001	0.039	0.003	334	<0.1	<0.05	<0.001	5	0.207	<0.0001	0.028	0.1	5.77	0.01	<1	<0.01	<0.01	<0.001	49	15	222	22	0.033
Piezometer PZ203	11/10/2017 9:30	9	<1	<1	9	0.04	<0.01	<0.001	<0.05	<0.0001	3	68	<0.001	0.047	0.001	318	<0.1	<0.05	<0.001	5	0.26	<0.0001	0.04	0.08	6.33	<0.01	<1	<0.01	<0.01	<0.001	50	16	207	32	0.037
Piezometer PZ058A	11/10/2017 16:00	<1	<1	<1	<1	316	0.46	0.048	0.05	0.0142	150	3460	0.095	1.72	0.258	14700	<0.1	0.98	0.004	633	2.31	0.0002	2.3	<0.01	3.51	0.45	21	0.08	5.37	<0.001	1980	3700	13000	1110	11.8

BORE	PZ127 - 43m	PZ127 - 68m	PZ127 - 112m	PZ127 - 141m	PZ128 - 20m	PZ128 - 36m	PZ128 - 55m	PZ129 - 35m	PZ129 - 53m	PZ129 - 74m	PZ130 - 38.5m	PZ130 - 64m
Jan-17	449.13	442.27	402.27	388.00	388.82	379.42	375.13	390.94	387.51	378.98	497.55	473.60
Feb-17	449.24	442.23	400.77	385.43	388.81	379.44	375.15	390.93	387.60	378.85	497.91	473.30
Mar-17	449.24	442.21	399.39	385.01	388.83	379.44	375.08	390.91	387.63	378.76	498.17	473.19
Apr-17	449.24	442.21	399.05	384.77	388.94	379.44	375.06	390.87	387.80	378.81	498.27	473.16
May-17	449.24	442.27	398.76	382.98	388.95	379.07	374.26	390.84	387.89	378.81	498.32	473.08
Jun-17	449.24	442.50	398.07	381.70	388.98	378.70	373.65	390.85	387.70	378.79	498.06	473.06
Jul-17	449.24	444.37	398.13	380.72	388.86	378.44	373.37	390.84	387.99	378.69	497.84	473.00
Aug-17	449.13	444.37	398.24	380.25	388.82	378.18	373.08	390.76	387.30	378.45	497.60	472.88
Sep-17	449.13	444.54	397.67	378.71	388.81	377.64	372.80	390.76	386.10	378.21	497.46	472.80
Oct-17	449.07	444.72	396.86	378.66	388.86	377.13	372.55	390.69	384.96	377.86		472.78
Nov-17	449.24	444.68	396.58	378.52	388.84	376.63	372.22	390.67	384.70	377.54	497.14	472.80
Dec-17	449.07	444.72	396.41	377.74	388.86	376.28	371.84	390.56	384.38	377.24	497.07	472.75
min	*449.07*	*442.21*	*396.41*	*377.74*	*388.81*	*376.28*	*371.84*	*390.56*	*384.38*	*377.24*	*497.07*	*472.75*
max	*449.24*	*444.72*	*402.27*	*388.00*	*388.98*	*379.44*	*375.15*	*390.94*	*387.99*	*378.98*	*498.32*	*473.60*

BORE	PZ130 - 97m	PZ133 - 31.5m	PZ133 - 43m	PZ133 - 59m	PZ179 - 28m	PZ179 - 33m	PZ179 - 82m	PZ179 - 145m	PZ192-68m	PZ192-166m	PZ192-178m	PZ193 - 80m
Jan-17	449.59	428.83	426.93	387.76	416.68	414.71	438.72	365.16	404.77	365.58	361.16	419.07
Feb-17	449.63	427.92	427.61	387.78	416.23	414.05	438.49	360.35	404.64	364.89	359.39	419.07
Mar-17	449.65	426.34	427.02	387.75	415.88	413.13	438.37	356.78	401.66	363.53	357.91	418.33
Apr-17	449.70	425.88	426.80	387.75	415.52	412.83	438.49	352.00	400.66	362.31	356.58	417.94
May-17	449.75	425.54	426.53	387.83	415.19	412.38	438.55	351.33	400.05	361.97	356.37	417.79
Jun-17	449.68	425.26	426.61	387.85	414.86	412.19	438.49	348.74	399.64	361.81	356.48	417.61
Jul-17	449.53	425.19	426.59	387.83	414.68	412.01	438.20	348.97	401.69	361.08	355.61	417.81
Aug-17	449.48	425.04	426.31	387.83	414.50	411.81	438.09	347.70	403.43	360.48	354.91	418.53
Sep-17	449.63	424.85	426.09	387.83	414.29	411.65	437.29	346.55	403.88	359.75	354.50	418.69
Oct-17	449.59	424.63	425.82	387.83	414.12	411.55	436.89	345.63	404.23	358.97	353.41	418.74
Nov-17	449.48	424.38	425.51	387.83	413.98	411.55	436.77	344.09	404.26	358.35	352.73	418.73
Dec-17	449.61	424.35	425.26	387.83	413.87	411.54	436.72	343.84	404.23	358.64	353.15	418.67
min	*449.48*	*424.35*	*425.26*	*387.75*	*413.87*	*411.54*	*436.72*	*343.84*	*399.64*	*358.35*	*352.73*	*417.61*
max	*449.75*	*428.83*	*427.61*	*387.85*	*416.68*	*414.71*	*438.72*	*365.16*	*404.77*	*365.58*	*361.16*	*419.07*

BORE	PZ193 - 162m	PZ193 - 184m	PZ194 - 78m	PZ194 - 173m	PZ194 - 196m	PZ195 - 72m	PZ195 - 162m	PZ195 - 175m
Jan-17	366.95	361.03	421.78	373.05	356.42	420.95	366.91	329.31
Feb-17	365.37	359.22	421.73	371.82	354.22	420.95	365.54	327.70
Mar-17	363.15	357.52	421.72	370.29	352.79	420.94	364.03	325.64
Apr-17	361.65	356.07	421.64	369.10	351.62	420.92	363.25	323.92
May-17	361.50	355.69	421.65	368.38	351.35	420.91	362.73	322.63
Jun-17	361.83	355.62	421.50	368.10	351.06	420.75	362.45	321.82
Jul-17	361.95	355.04	421.31	367.73	350.33	420.68	362.15	321.19
Aug-17	361.06	354.50	421.28	367.04	350.12	420.62	361.62	320.41
Sep-17	361.19	354.09	421.19	366.55	349.25	420.57	360.96	319.70
Oct-17	360.55	353.17	421.16	365.89	348.42	420.55	360.19	318.84
Nov-17	359.70	352.40	421.10	365.31	347.86	420.51	359.67	318.10
Dec-17	360.20	352.60	421.03	365.23	348.08	420.46	359.33	317.71
min	*359.70*	*352.40*	*421.03*	*365.23*	*347.86*	*420.46*	*359.33*	*317.71*
max	*366.95*	*361.03*	*421.78*	*373.05*	*356.42*	*420.95*	*366.91*	*329.31*

BORE	PZ3	PZ39	PZ40B	PZ44	PZ55	PZ58	PZ101C	PZ101B	PZ102B	PZ102A	PZ103C	PZ103B	PZ103A	PZ104	PZ105C	PZ105B	PZ105A	TB105	PZ106B	PZ106A
Jan-17	470.99	418.04	419.97	481.87	423.34			370.07	364.22	364.35	400.31	371.94	364.10	381.01	377.06	376.57	368.84	368.83	497.33	427.52

Feb-17	471.47	417.85	419.70	481.26	423.33			369.75	363.16	363.24	399.88	371.70	362.89	380.80	376.95	376.44	368.52	368.49	497.24	427.68
Mar-17	471.69	417.45	419.30	480.91	423.40			368.96	361.33	361.30	399.08	369.41	359.01	380.62	376.79	376.29	367.88	367.86	497.17	427.76
Apr-17	471.40	417.32	419.04	480.70	423.43		381.52	368.16	361.22	361.30	399.62		360.27	380.34	376.69	376.18	367.29	367.27	497.01	427.81
May-17	471.22	417.14	418.74	480.50	423.47		381.46	369.90	361.11	361.18	399.45	367.38	359.91	380.02	376.60	376.06	368.58	368.56	496.94	427.07
Jun-17	471.08	417.04	418.50	480.34	423.44	467.56	381.42	369.80	361.60	361.71	399.84		360.39	379.67	376.41	375.88	368.52	368.50	496.80	427.28
Jul-17	470.95	416.96	418.35	480.20	423.40	467.54	381.36	369.64	361.73	361.85	399.82		360.39	379.45	376.29	375.77	368.42	368.42	496.64	427.40
Aug-17	470.90	416.93	418.21	480.11	423.38	467.56	381.34	369.20	360.48	360.51	399.53	367.39	356.70	379.24	376.20	375.66	368.28	368.24	496.52	427.50
Sep-17	470.85	416.61	418.05	480.01	423.34	467.57	381.33	368.00	360.72	360.81	399.88	366.40	358.90	379.01	376.09	375.54	367.12	367.11	496.41	427.58
Oct-17	470.83	416.27	417.83	479.89	423.27	467.56	381.31	368.97	360.42	360.47	400.00		358.91	378.73	375.91	375.35	367.52	367.50	496.23	427.67
Nov-17	470.66	416.08	417.72	479.75	423.19	467.49	381.20	368.39	358.43	358.74	399.69		354.42	378.39	375.69	375.15	367.27	367.25	496.09	426.90
Dec-17	470.08	416.12	417.63	479.72	423.24	467.45	381.15	367.99	359.60	359.80	399.91		357.88	378.12	375.58	375.02	366.93	366.90	496.07	427.07
min	*470.08*	*416.08*	*417.63*	*479.72*	*423.19*	*467.45*	*381.15*	*367.99*	*358.43*	*358.74*	*399.08*	*366.40*	*354.42*	*378.12*	*375.58*	*375.02*	*366.93*	*366.90*	*496.07*	*426.90*
max	*471.69*	*418.04*	*419.97*	*481.87*	*423.47*	*467.57*	*381.52*	*370.07*	*364.22*	*364.35*	*400.31*	*371.94*	*364.10*	*381.01*	*377.06*	*376.57*	*368.84*	*368.83*	*497.33*	*427.81*

BORE	**PZ107**	**PZ109**	**PZ111**	**PZ112B**	**PZ137**	**PZ149**	**PZ151**	**PZ152**	**PZ156**	**PZ157**	**PZ170**	**PZ174**	**PZ175**	**PZ176**	**PZ177**	**PZ184**	**PZ186**	**PZ187**	**PZ188**	**PZ189**
Jan-17	434.37	382.46	374.43	480.52	461.36	469.73	377.93	441.54	360.94	364.77	420.91	417.93	419.22	416.60	416.20	411.73	414	417.05	421.28	410.34
Feb-17	434.44	382.41	374.43	480.53	461.06	469.62	377.21	441.50	346.80	359.44	420.86	417.75	418.92	416.40	415.90	411.68	415.85	416.82	421.41	410.14
Mar-17	434.51	382.40	374.35	480.59	460.83	468.55	376.57	441.54		353.99	420.85	417.41	418.70	416.30	415.77	411.63	417.1	416.64	421.45	409.82
Apr-17	434.44	382.34	374.18	480.50	460.66	469.51	375.99	441.51		351.28	420.79	417.30	418.65	416.30	415.68	411.57	417.69	416.50	421.48	410.15
May-17	434.45	382.36	373.93	480.49	460.68	469.41	375.50	441.52		348.96	420.81	417.13	418.62	416.30	415.67	411.56	418.75	416.41	421.58	410.31
Jun-17	434.41	382.32	373.67	480.36	460.62	468.89	374.95	441.43		347.80	420.77	417.01	418.45	416.20	415.53	411.47	418.75	416.27	421.60	410.20
Jul-17	434.37	382.36	373.42	480.24	460.58	468.49	374.63	441.38		346.30	420.70	416.94	418.27	416.10	415.41	411.42	418.75	416.16	421.63	410.10
Aug-17	434.39	382.39	373.09	480.18	460.59	468.19	374.52	441.32		343.51	420.69	416.89	418.12	416.00	415.38	411.36	418.75	416.11	421.70	410.05
Sep-17	434.41	382.40	372.89	480.14	460.61	467.99	374.42	441.31		341.93	420.67	416.63	418.00	416.00	415.37	411.34	418.75	416.06	421.74	408.19
Oct-17	434.39	382.40	372.46	480.09	460.62	467.64	374.40	441.27		339.63	420.64	416.31	417.76	415.93	415.29	411.24	418.75	415.91	421.77	407.84
Nov-17	434.27	382.32	371.97	479.97	460.63	467.64	373.91	441.20		338.29	420.63	416.13	417.58	415.84	415.21	411.10	418.75	415.78	421.79	408.27
Dec-17	434.28	382.34	371.60	479.97	460.66	469.87	373.99	441.18		337.73	420.58	416.16	417.65	415.80	415.25	411.09	393.33	415.79	415.24	408.15
min	*434.27*	*382.32*	*371.60*	*479.97*	*460.58*	*467.64*	*373.91*	*441.18*	*346.80*	*337.73*	*420.58*	*416.13*	*417.58*	*415.80*	*415.21*	*411.09*	*393.33*	*415.78*	*415.24*	*407.84*
max	*434.51*	*382.46*	*374.43*	*480.59*	*461.36*	*469.87*	*377.93*	*441.54*	*360.94*	*364.77*	*420.91*	*417.93*	*419.22*	*416.60*	*416.20*	*411.73*	*418.75*	*417.05*	*421.79*	*410.34*

BORE	**PZ191**	**PZ201**	**PZ202**	**PZ203**	**PZ211**	**PZ213**	**PZ214**
Jan-17	370.93	409.55	408.68	403.46			
Feb-17	369.79	409.25	408.63	403.38			
Mar-17	368.69	409.03	408.59	403.32			
Apr-17	367.94	409.12	408.60	403.31			
May-17	367.12	409.09	408.57	403.27			
Jun-17	367.04	409.08	408.45	403.20			
Jul-17	366.88	408.96	407.39	403.18			
Aug-17	366.42	408.96	408.59	403.14			
Sep-17	366.14	408.82	408.58	403.12	432.5	415.12	414.96
Oct-17	365.42	408.53	408.58	403.10	432.5	415.04	414.90
Nov-17	364.69	408.42	408.40	403.07	432.52	415.04	414.88
Dec-17	364.42	408.59	408.59	403.10	432.51	414.96	414.96
min	*364.42*	*408.42*	*407.39*	*403.07*	*432.50*	*414.96*	*414.90*
max	*370.93*	*409.55*	*408.68*	*403.46*	*432.52*	*415.12*	*414.88*

GROUNDWATER LEVEL GRAPHS

Figure 3-i: Ulan Granite Composite Hydrograph

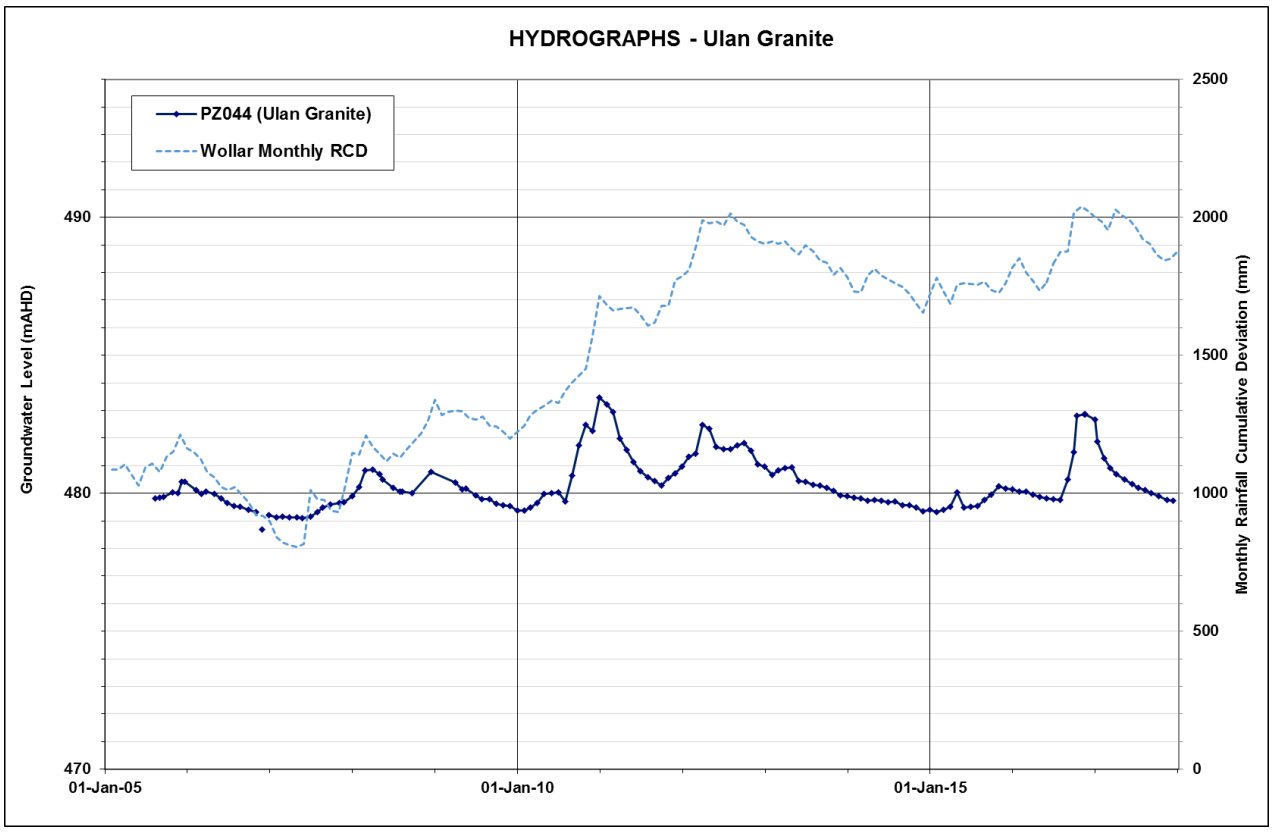


Figure 3-j: Marrangaroo and Ulan Seam Composite Hydrograph

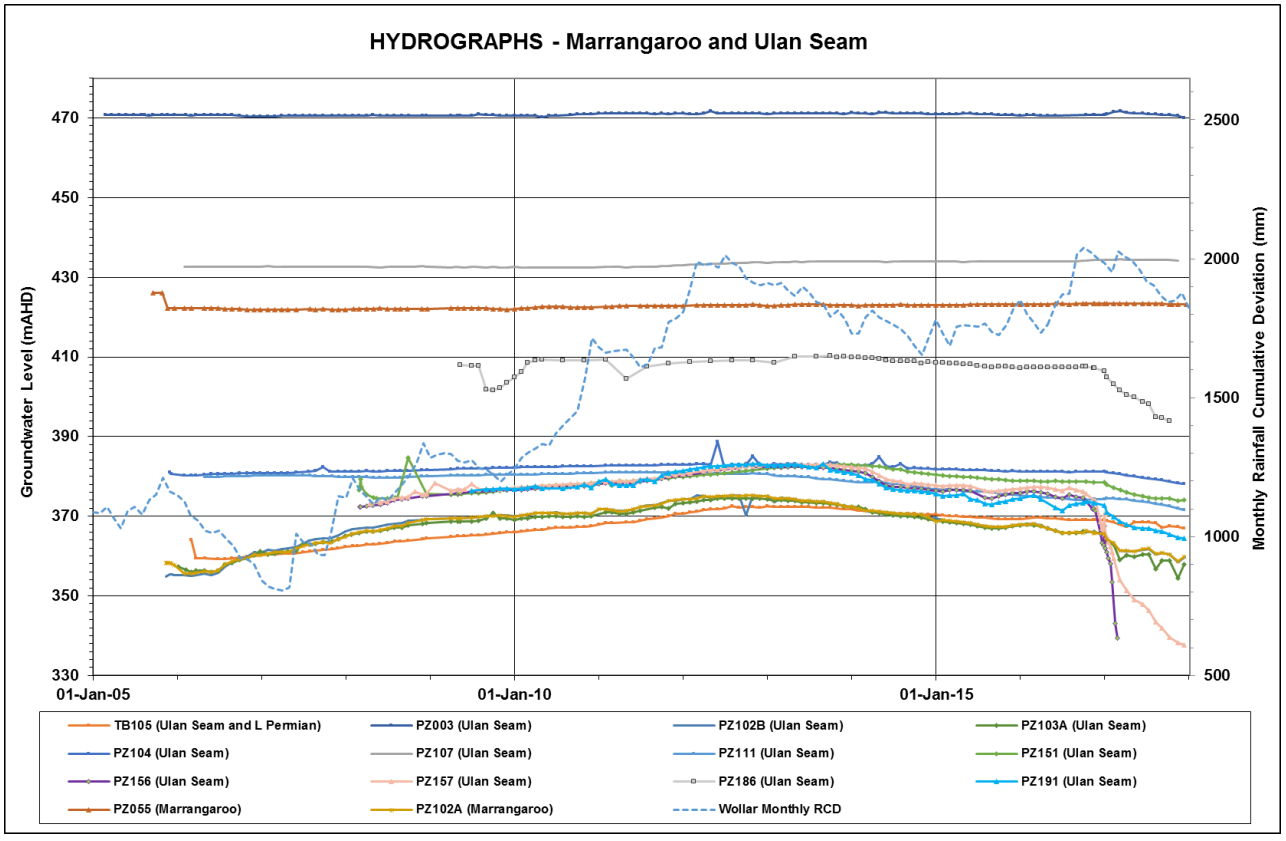


Figure 3-k: Permian Overburden Composite Hydrograph

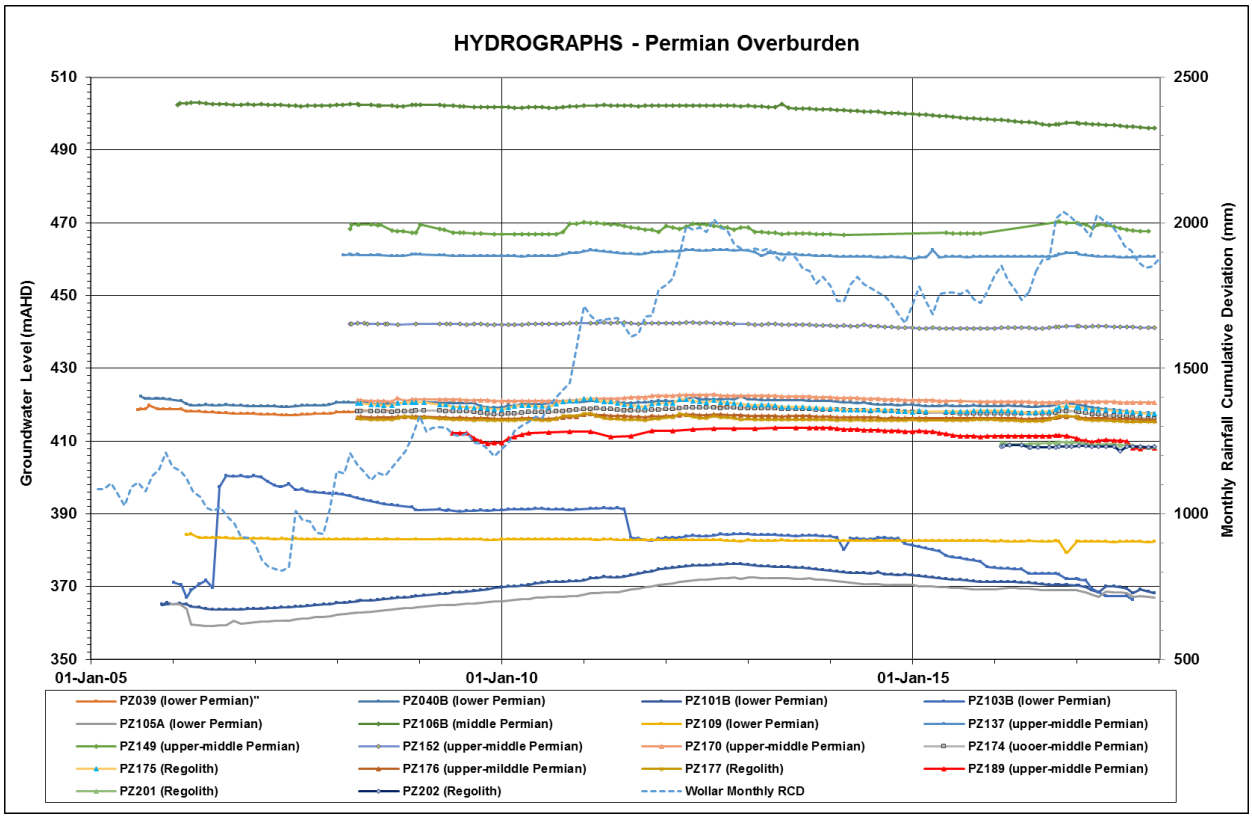


Figure 3-l: Triassic Composite Hydrograph

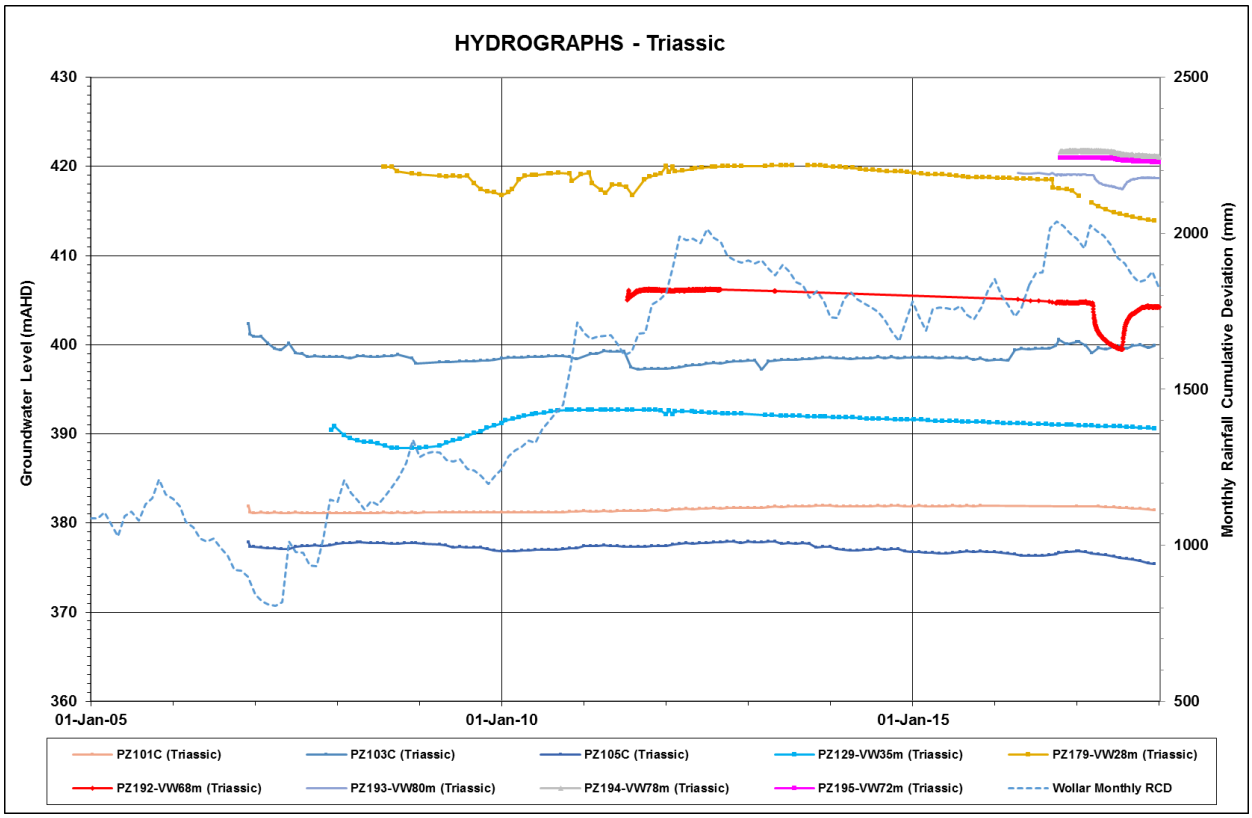
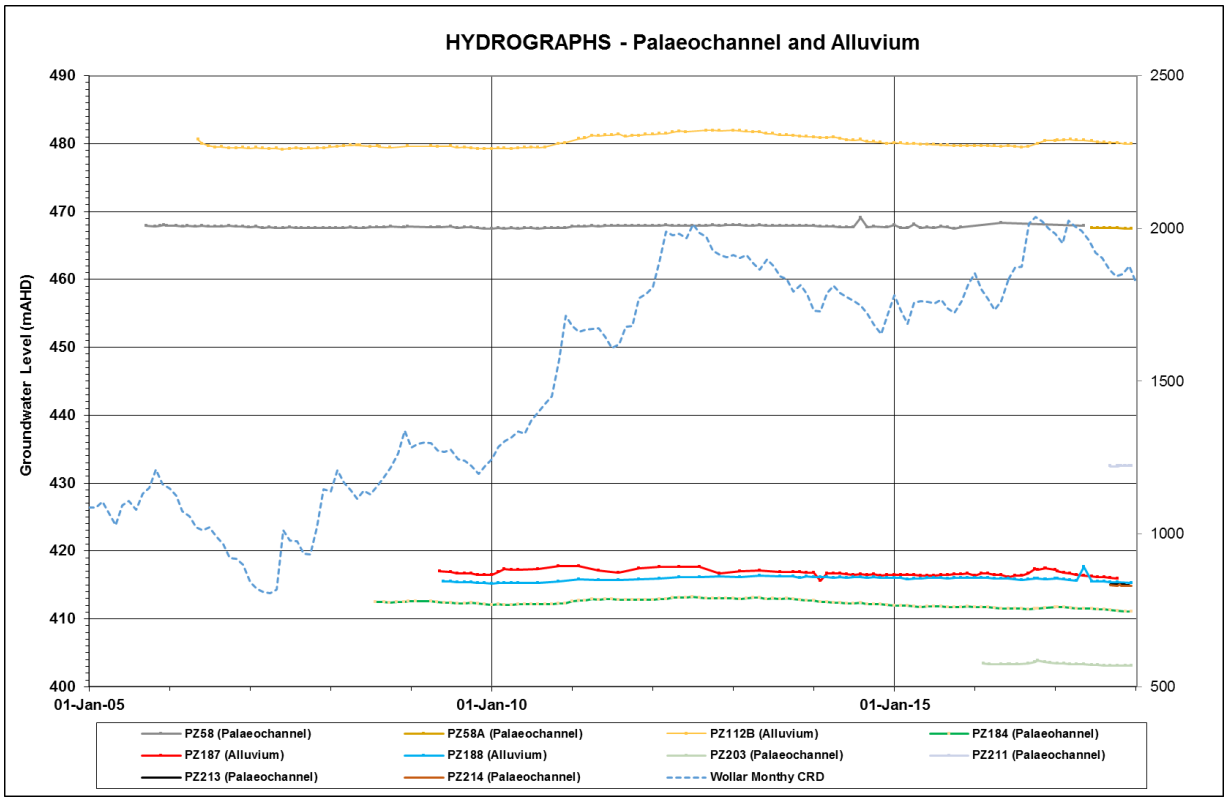


Figure 3-m Alluvium Composite Hydrograph



APPENDIX 4. EPBC COMPLIANCE TABLES (2007/3297) (2008/4444) (2013/6926)

Condition Number	Condition	Compliance[1]	Evidence/Comments
EPBC 2007/3297			
1	In order to protect the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland listed ecological community, the person taking the action shall make suitable arrangements within 12 months of this approval to: (a) Transfer at least 130 hectares of the White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland listed ecological community to the NSW Minister for Climate Change Environment and Water offset, on a "like for like" basis, the 65 hectares that would be cleared by the project at an offset ratio of 2:1; and (b) Provide the NSW Department of Environment and Climate Change (DECC) with funds (which at the discretion of DECC may include an in-kind contribution) to cover any reasonable costs associated with the transfer and ongoing management of this land.	Noted	Completed prior to period.
2	In order to protect the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland listed ecological community, the person taking the action shall in accordance with the Rehabilitation and Offset Management Plan (See Condition 3 below): (a) Revegetate at least 38 hectares of disturbed land on the "Red Hills" property with Yellow Box-White Box-Blakely's Red Gum vegetation; (b) Revegetate at least 143 hectares of cleared land on the "Red Hills" property with suitable native vegetation to improve wildlife corridor linkages; (c) Conserve and enhance at least 1262 hectares of existing native vegetation onsite; and (d) Make suitable arrangements to protect these offset areas from development in the long term, to the satisfaction of the Minister for the Environment and Water Resources (the Minister).	Compliant	Revegetation works were completed in a prior period. MCO continues to conserve Area 1, Area 2 and Area 3. Offset security mechanism has previously been endorsed by the DotEE and the NSW DPE. Offsets security terms were being reviewed by the NSW Department of Planning and Environment at the end of the period. MCO continues to progress offset security.
3	In order to protect the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland listed ecological community, the person taking action shall prepare and implement a detailed Rehabilitation and Offsets Management Plan for the project to the satisfaction of the Minister for the Environment and Water Resources. The proponent shall progressively rehabilitate the site to the satisfaction of Minister for the Environment and Water Resources and the NSW Department of Primary Industries, in general accordance with the proposed Rehabilitation and Offset Management Plan. The rehabilitation and Offset Management Plan must include: (a) The rehabilitation objectives for the site, vegetation offsets and landscaping;	Compliant	The Landscape Management Plan was approved 25 November 2013 This report, refer to Sections 6.5 and 9.

Condition Number	Condition	Compliance[1]	Evidence/Comments
	(b) A description of the short, medium and long-term measures that would be implemented to: • Rehabilitate the site • Implement the vegetation offsets; and • Landscape the environmental bunds; (c) Performance and completion criteria for the rehabilitation of the site, implementation of the vegetation offsets, and landscaping of the environmental bunds; (d) A detailed description of the measures that would be implemented over the next 3 years including the progressive rehabilitation of mining areas and progressive implementation of the vegetation offset areas referred to in Condition 2. (e) A program to monitor the effectiveness of these measures, and progress against the performance and completion criteria (see (c) above); (f) A description of the potential risks to successful rehabilitation and/or revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and (g) Details of who would be responsible for monitoring, reviewing, and implementing the plan. Coal mining operations must not commence until the plan has been approved. The approved plan must be implemented.		
4	The person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, by 31 March for the preceding calendar year. Annual reports must be published until the Minister is satisfied that the person taking the action has complied with all conditions of the approval. Documentary evidence providing proof of the date of publication mist be provided to the Department at the same time as the compliance report is published.	Compliant	This report.
5	Upon the direction of the Minister, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister'. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister	Compliant	Noted.
6	If the Minster believes that it is necessary or desirable for the better protection of the listed threatened species and ecological communities to do so, the Minister may request that the person taking the action make specified revisions to the plans, reports or management strategies approved pursuant to paragraphs 1, 2 and 3, and submit the revised plan, report or strategy for the Minster's approval. The person taking the action must comply with any such request. The revised approve plan, report or strategy must be implemented.	Compliant	Noted

Condition Number	Condition	Compliance[1]	Evidence/Comments
7	If at any time after 5 years from the date of this approval, the Minister notifies the person taking the action in writing that the Minister is not satisfied that there has been substantial commencement of coal mining operations, the action must not thereafter be commenced without the written agreement of the Minister.	Compliant	Noted
EPBC 2008/4444			
1	The approval holder must not clear more than 1, 534 hectares of native vegetation within the defined footprint at Schedule 1.	Compliant	This Report Section 4
2	To mitigate the impacts of the proposal on the Large-eared Pied Bat, Southern Long-eared Bat, Regent Honeyeater, Swift Parrot and the Spotted-tail Quoll, the approval holder must prepare and submit, prior to the proposed date of commencement of the action, a mine site Vegetation Clearance Protocol and Landscape Management plan (VCPLMP) for the Minister's written approval. The VCPLMP must; a. Delineate areas to be cleared, describe pre-clearance survey methods, specify actions to minimise fauna impacts and detail vegetation clearance procedures. b. Require collection and stockpiling of habitat features important to threatened fauna species for reinstatement in rehabilitation areas. c. Require use of native, locally sourced seed for propagation for rehabilitation activates. d. Specify a two stage clearing protocol where non-habitat trees are cleared 24 hours prior to any habitat trees are cleared, to encourage fauna to move out of an area. The approval holder must not commence until the VCPLMP is approved by the Minister. The approved VCPLMP must be implemented.	Compliant	VCPLMP was approved in a previous period. The VCPLMP continues to be implemented.
3	To compensate for the loss of 123.3 hectares of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (WBGW) ecological community and 902 hectares of habitat for EPBC listed threatened species, the approval holder must prepare and submit (within 3 months after the approval), a Biodiversity Offset Management Plan (BOMP) for the proposed EPBC Offset Areas, for the Minister's written approval. The BOMP must; a. Identify those lands described as the Offset Areas at Schedule 2 (Figures 1-7) of this notice that are necessary to achieve the outcomes required by the Environmental Offsets Policy 2012. This must include offset attributes, shapefiles, textile descriptions and maps to clearly define the location and boundaries of the offset area (s). b. Provide a survey and description of the current condition (prior to any management activities) of the offset areas identified in Condition 3a. c. Detail management actions and regeneration and revegetation strategies to be undertaken on the offset areas to improve the ecological quality of these areas, including: I. a description and timeframe of measures that would be implemented to improve the condition of the ecological communities on the site;	Compliant	A Biodiversity Offset Management Plan (BOMP) was submitted to the Department of Environment for approval in **2015**. The BOMP is being reviewed following comments from the Department of the Environment and Energy. The BOMP will be resubmitted in the next period.

Condition Number	Condition	Compliance[1]	Evidence/Comments
	II. Performance and completion criteria for evaluating the management of the offset area, and criteria for triggering remedial action; III. a program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria; IV. a description of potential risks to the successful implementation of the plan, a description of the measures that will be implemented to mitigate against these risks and a description of the contingency measures that will be implemented if defines triggers arise; and V. details of who would be responsible for monitoring, reviewing, and implementing the plan. The approved BOMP must be published on the approval holder's internet website, within 1 month of being approved and for a period of 5 years thereafter. The approved BOMP must be implemented.		
4	To compensate for the loss of 123.3 hectares of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (WBGW) ecological community and 902 hectares of habitat for EPBC listed threatened species, within 24 months of the date of this approval, the approval holder must secure the lands identified as the Offset Areas at Schedule 2 (Figures 1-7) of this notice as a biodiversity offset by a legal instrument under relevant nature conservation legislation on the title of the land. This instrument must: a. Provide for the protection of the land in perpetuity; b. Prevent any future development activities, including mining and mineral extraction; c. Ensure the active management of the land; and d. Be provided to the Department within 3 months of it being issued, as evidence of compliance with this condition.	Non-Compliant	2 of seven offsets have been secured in perpetuity. The remaining 5 of 7 offsets were not secured in perpetuity within 24 months of the approval. Offset mechanisms for the remaining 5 offsets have previously been endorsed by the DotEE and the NSW DPE. Offsets security terms were being reviewed by the NSW Department of Planning and Environment at the end of the period. MCO requested an extension of time from the DotEE. A response is pending. MCO continues to progress offset security.
5	The approval holder must undertake management and monitoring of water resources in accordance with this project approval for Application Number 08-0135 issued by the NSW Planning Assessment Commission under the Environmental Planning and Assessment Act 1979 (NSW) on 30 January 2015.	Compliant	Moolarben Complex Water Management Plan. This report Section 7
6	Upon request, the approval holder shall supply the groundwater monitoring data for the Moolarben Coal Project to the Department, NSW Government agencies, Operators of the Ulan and/or Wilpinjong mines or other adjacent mine operators. A protocol for the supply of the data will be included in the project's Water Management Plan.	Compliant	Moolarben Complex Water Management Plan
7	The approval holder must make available for the Minister on request, all plans or programs and any review of plans or programs produced pursuant to Condition 5.	Compliant	Noted
8	Within 30 days after the commencement of the action, the approval holder must advise the Department in writing of the actual date of commencement.	Compliant	Completed in a previous period.
9	The approval holder must maintain accurate records substantiating all activities associated with or relevant to these conditions of approval, including measures taken to implement the BOMP and	Compliant	Noted.

Condition Number	Condition	Compliance[1]	Evidence/Comments
	VCPLMP, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.		
10	The approval holder must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of the BOMP and VCPLMP as specified in the conditions, by 31 March for the preceding calendar year. Documentary evidence providing proof of the date of publication must be provided to the Department at the same time as the compliance report is published.	Compliant	This report.
11	Non-compliance with any of the conditions of this approval must be reported to the Department within 2 business days of becoming aware of the non-compliance.	Compliant	MCO notified the DotEE within 2 days of becoming aware of the non-compliance with offset security timing (Condition 4) above.
12	Upon the direction of the Minister, the approval holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minster. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.	Not Applicable	Noted
13	If the approval holder wishes to carry out any activity otherwise than in accordance with the Plans as specified in the conditions, the approval holder must submit to the Department for the Minister's written approval a revised version of that Plan. The approval holder must not commence the varied activity until the Minster has approved the varied Plan in writing. The Minister will not approve a varied plan unless the revised Plan would result in an equivalent or improved environmental outcome over time. If the Minister approves the revised Plan, that Plan must be implemented in place of the Plan originally approved.	Not Applicable	Noted
14	If the Minister believes that it is necessary or convenient for the better protection of listed threatened species and ecological communities to do so, the Minister may request that the approval holder make specified revisions to the Plan specified in the conditions and submit the revised Plan for the Minister's written approval. The approval holder must comply with any such request. The revise approved Plan must be implemented. Unless the Minster has approved the revised Plan then the approval holder must continue to implement the plan originally approved.	Not Applicable	Noted
15	If, at any time after 5 years from the date of this approval, the approval holder has not substantially commenced the action, then the approval holder must not substantially commence the action without the written agreement of the Minister.	Compliant	Action commenced **2 August 2014.**

Condition Number	Condition	Compliance[1]	Evidence/Comments
EPBC 2013/6926			
1	The approval holder must not clear more than 171.4 hectares of native vegetation within the defined footprint at Schedule 1, Figures 1 and 2.	Compliant	The extent of clearing to **31 December 2017** is approximately 92ha.
2	To assist in mitigating the impacts of the proposal on the Large-eared Pied Bat, Southern Long-eared Bat, Regent Honeyeater, Swift Parrot, Potted-tail Quoll and the Koala, the approval holder must prepare and submit a mine site Vegetation Clearance Protocol and Landscape Management Plan (VCPLMP) for the Minister's written approval. The VCPLMP must; a. Delineate areas to be cleared, describe pre-clearance survey methods, specify actions to minim is fauna impacts and details vegetation clearance procedures. b. Require collection and stockpiling of habitat features important to threatened fauna species for reinstatement in rehabilitation areas. c. Require use of native, locally sourced seed for propagation for rehabilitation activities. d. Specify a two stage clearing protocol where non-habitat trees are cleared 24 hours prior to any habitat trees in their proximity being cleared, to encourage fauna to move out of an area. e. Include a revegetation strategy to improve connectivity between isolated vegetation patches (including between Munghorn Gap Nature Reserve, Goulburn River National Park and Dexter Mountain).	Compliant	VCPLMP was approved in a previous period. The VCPLMP continues to be implemented.
3	The approval holder must not commence until the VCPLMP is approved by the Minister. The approved VCPLMP must be implemented.	Compliant	VCPLMP was approved in a previous period. The VCPLMP continues to be implemented.
4	To compensate for the loss of 16.5 hectares of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (WBGW) ecological community and 171.4 hectares of habitat for EPBC listed threatened species, the approval holder must prepare and submit a Biodiversity Offset Management Plan (BOMP) for the proposed EPBC offset sites, for the Minister's written approval. The BOMP must; a. Identify those lands described as the Offset Areas at Schedule 2 (Figures 1-5) of this notice that are necessary to achieve the outcomes required by the Environmental Offsets Policy 2012 (or subsequent published revisions). This must include offset attributes, shapefiles, textual descriptions and maps clearly define the location and boundaries of the offset area(s). b. Provide a survey and description of the current condition (prior to any management activities) of the offset areas identified in Condition 4a. c. Details management actions and regeneration and revegetation strategies to be undertaken on the offset areas to improve the ecological quality of these areas, including: (i) A description and timeframe of measures that would be implemented to improve the condition of the ecological communities on the site: (ii) Performance and completion criteria for evaluating the management of the offset area, and criteria	Compliant	A Biodiversity Offset Management Plan (BOMP) prepared and submitted to the Department of Environment with BOMP approval granted on **17 December 2014**. The requirements of this conditions are addressed in the below section of the BOMP: a) Section 2 and Appendix 1 b) Section 3 c) Sections 4, 5, 6 & 7.

Condition Number	Condition	Compliance[1]	Evidence/Comments
	triggering remedial action; (iii) A program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria; (iv) A description of potential risks to the successful implementation of the plan, a description of the measures that will be implemented to mitigate against these risks and a description of the contingency measures that will be implemented if defined triggers arise; and (v) Details of who would be responsible for monitoring, reviewing, and implementing the plan.		
5	The approval holder must not commence the action until the BOMP is approved by the Minister. The approval BOMP must be published on an internet web site approved by the Department, within 1 month of being approved and for a period of 5 years thereafter. The approved BOMP must be implemented.	Compliant	The BOMP was approved in a previous period and is located on MCO's website. The BOMP continues to be implemented.
6	To compensate for the loss of 16.5 hectares of the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (WBGW) ecological community and 171.4 hectares of habitat for EPBC listed threatened species, the approval holder must secure the lands identified as the Offset Areas at Schedule 2 (Figures 1-5) of this notice as a biodiversity offset by a legal instrument under relevant nature conservation legislation on the title of the land. This instrument must: a. Provide for the protection of the land in perpetuity; b. Prevent any future development activities, including mining and mineral extraction; and c. ensure the active management of the land. The approval holder must not commence the action until the Department has approved the proposed instrument in writing.	Compliant	Offset security mechanism has previously been endorsed by the DotEE and the NSW DPE. Offsets security terms were being reviewed by the NSW Department of Planning and Environment at the end of the period. MCO continues to progress offset security.
7	The approval holder must provide evidence to the Department of their compliance with Condition 6, along with offset attributes, shapefiles and textual descriptions and maps to clearly define the location and boundaries of the offset sites, prior to the commencement of the action.	Compliant	Completed in previous period.
8	Within 30 days after the commencement of the action, the approval holder must advise the Department in writing of the actual date of commencement.	Compliant	Completed in previous period.
9	The approval holder must maintain accurate records substantiating all activities associated with or relevant to these conditions of approval, including measures take to implement the BOMP and VCPLMP, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with Section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may be publicised through the general media.	Compliant	Noted

Condition Number	Condition	Compliance[1]	Evidence/Comments
10	The approval holder must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of the BOMP and VCPLMP as specified in the conditions, by 31 March for the preceeding calendar year. Documentary evidence providing proof of the date of publication must be provided to the Department at the same time as the compliance report is published.	Compliant	This report.
11	Non-compliance with any of the conditions of this approval must be reported to the Department within 2 business days of becoming aware of the non-compliance.	Not Applicable	Noted
12	Upon the direction of the Minister, the approval holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must be address the criteria to the satisfaction of the Minister.	Not Applicable	Noted
13	If the approval holder wishes to carry out any activity otherwise than in accordance with the Plan as specified in the conditions, the approval holder must submit to the Department for the Minister's written approval a revised version of the Plan. The approval holder must not commence the varied activity until the Minster has approved the varied Plan in writing. The Minister will not approve a varied Plan unless the revised Plan would result in an equivalent or improved environmental outcome over time. If the Minster approves the revised Plan, that Plan must be implemented in place of the Plan originally approved.	Not Applicable	Noted
14	If the Minster believes that it is necessary or convenient for the better protection of listed threatened species and ecological communities to do so, the Minster may request that the approval holder make specified revisions to the Plan specified in the conditions and submit the revised Plan for the Minsters written approval. The approval holder must comply with any such request. The revised approved Plan must be implemented. Unless the Minister has approved the revised Plan then the approval holder must continue to implement the Plan originally approved.	Not Applicable	Noted
15	If, at any time after 5 years from the date of this approval, the approval holder has not substantially commenced the action, then the approval holder must not substantially commence the action without the written agreement of the Minster.	Compliant	Action commenced in prior period.

APPENDIX 5. COMMUNITY COMPLAINTS SUMMARY 2017

Date	Type	Location	Complaint Description
6/01/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring Results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
6/01/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
7/01/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring Results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
7/01/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
8/01/2017	Noise	Moolarben Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring Results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
9/01/2017	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
10/01/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
10/01/2017	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring Results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
10/01/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
13/01/2017	Air	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Dust levels. No actions required. Caller advised of investigation, results and actions.
21/01/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
23/01/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
4/02/2017	Noise	Moolarben Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
5/02/2017	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
22/02/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
24/02/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
27/02/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. The Caller was unable to be contacted.

Date	Type	Location	Complaint Description
28/02/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
28/02/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
1/03/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
1/03/2017	Noise	Ridge Road	No investigation was conducted. A message was left. No further action was required.
8/03/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
8/03/2017	Blast	Winchester Crescent	No Investigation was Conducted. Caller advised of investigation, results and actions.
20/03/2017	Noise	Moolarben Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels. No actions required. Caller advised of investigation, results and actions.
22/03/2017	Noise	Moolarben Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
24/03/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. The Caller was contacted within 24Hours, a message was left. No further action was required.
26/03/2017	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
31/03/2017	Noise	Winchester Crescent	The Caller was contacted on 03/04/2017, a message was left.
5/04/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
6/04/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
7/04/2017	Noise	Moolarben Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
7/04/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
17/04/2017	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. The Caller was contacted on 18/04/17. A message was left.
18/04/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
18/04/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. The Caller was not able to be contacted.

Date	Type	Location	Complaint Description
19/04/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
21/04/2017	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
21/04/2017	Blast	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Blast levels. No actions required. Caller advised of investigation, results and actions.
24/04/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
24/04/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
27/04/2017	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
29/04/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
4/05/2017	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
4/05/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. A message was left.
4/05/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. A message was left.
4/05/2017	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
4/05/2017	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. A message was left.
7/05/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. A message was left.
7/05/2017	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. A message was left.
7/05/2017	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. A message was left.
8/05/2017	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required.
8/05/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
9/05/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.

Date	Type	Location	Complaint Description
9/05/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
14/05/2017	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
17/05/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
19/05/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller not able to be contacted.
1/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
3/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
10/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
11/06/2017	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
11/06/2017	Noise	Moolarben Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. a message was left.
14/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller not able to be contacted.
15/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. The Caller was not contacted.
17/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
17/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
17/06/2017	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
18/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
19/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
22/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
22/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.

Date	Type	Location	Complaint Description
28/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
30/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
30/06/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
1/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
1/07/2017	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions. Caller advised of investigation,
2/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions. Caller advised of investigation, results and actions.
3/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
3/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
12/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
16/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
21/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
21/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
22/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
27/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
27/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. The Caller was not contacted upon their request.
27/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
30/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller unable to be contacted.

Date	Type	Location	Complaint Description
31/07/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
2/08/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller not contacted upon their request.
3/08/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller unable to be contacted.
14/08/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
27/08/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. The Caller was not contacted upon their request.
30/08/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
31/08/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller unable to be contacted.
1/09/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
24/09/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. The Complainant was not contacted upon their request.
2/10/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. The Complainant was not able to be contacted. No further action was required.
2/10/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
5/10/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. The Complainant was not contacted upon their request.
6/10/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller not able to be contacted. A message was left.
12/11/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Complainant not able to be contacted.
20/11/2017	Water	Saddlers Creek Road	Investigation revealed no water releases. No actions required. Complainant advised of investigation.
21/11/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. The Complainant was not contacted upon their request.
22/11/2017	Other	Ulan Road	Complaint discussed with complainant.
24/11/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.

Date	Type	Location	Complaint Description
28/11/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
29/11/2017	Blast	Winchester Crescent	Investigation revealed no blast fired on day of call. A message was left for the caller.
4/12/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Complainant was unable to be contacted. A message was left for the caller.
8/12/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Complainant was unable to be contacted. A message was left for the caller.
10/12/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
11/12/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
13/12/2017	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. The Complainant was not contacted upon their request.
14/12/2017	Noise	Ulan Road	Complaint was discussed with caller.
21/12/2017	Water	Saddlers Creek Road	Investigation was conducted. Complainant advised of investigation, results and actions.

APPENDIX 6. COMMUITY CONTRIBUTIONS

Community Support Program

Beneficiary	Project/Event
Mudgee Running Festival	Mudgee Running Festival
Mudgee High School -	Try a Trade
Cudgegong Cruisers	Can Cruise 2018
PCYC	Colour Run Fundraiser
Mudgee High School -	Aquaponics
Sculptures in the Garden	Sculptures In the Garden Art Prize
Lifeskills Plus	Purchase of Softplay equipment
Max Potential	Mentoring Program - District High School
Rotary Club of Mudgee	Mathematical Minds Competition
Gulgong Polocrosse	Water Pipe System
Gulgong Mens Bowling	Annual Gulgong Bowls Tournament
Ulan Public School	Canberra Excursion
Mid-Western Dance Festival	Mid-Western Dance Festival
Hargraves Triamble Pony Club	Construction of 25m round pen
Henbury Sport & Rec Club (Kandos)	Gold Club Seating
Lake Windamere Under Canvas	Road reconstruction
Cassilis Bushmans Carnival Ass'n	Rodeo Ground Improvements
Cooyal Tennis Club	Outdoor seating
Goolma Amenities Committee	Reinforce 2 of 4 tennis courts
Gulgong Amateur Fishing Club	Restock Goulburn River
Gulgong Folk Festival	PA hire for folk festival - NYE
Gulgong Chamber of Commerce	Gulgong Gold & Mining Festival
Gulgong Little Athletics	Timer
Gulgong Netball	Post Pads
Lions Club of Mudgee	Christmas Twilight Market
Mudgee Little A	Upgrade Long Jump pit runways
NewCo	Laptop & Projector
Police Rugby	Rugby Competition fundraiser
Rotary Clubs of Mudgee	Christmas Carols
Rylstone Street Feast Inc	Rylstone St Feast
The Business Concierge	Survivor Life Skills Program for Mudgee High School
Turill Community and Sports Clubs Inc	Front Fence and Entrance Upgrade
Watershed Landcare	Green Day – District primary schools

Additional Donations

Beneficiary	Project/Event
Benevolent Society	Mudgee Running Festival – Coal Mines Cup competition
Cancer Council	Relay for Life
Celebrity Golf Day	Annual local charity fundraiser
Coolah Campdraft	Coolah Campdraft
Life Skills Plus	Fundraising Raffles
Mudgee Police	Police Rugby Competition
Mudgee Show Society	Mudgee Rodeo
Mudgee Rugby League	9's Competition
Moolarben Spirit Awards	High School awards program
Rotary Australia Benevolent Society	Bushfire Relief Appeal
Parkrun	Park Run
Westpac Rescue Helicopter	Fundraising event