Coleambally IRRIGATION

2013

Annual Compliance Report

Contents

Overview

The Murrumbidgee region had good rain leading up to the 2012/13 irrigation season with the major storages on which CICL relies full, the season's final water allocation reached 100%.

The area under cropping within CICL's area of operations totalled 64,680ha, in comparison to 68,829ha for the preceding season. The major crops were rice, wheat, corn, cotton and canola. As was the case in the preceding season, rice was the major crop, with 19,071ha and 53% of water supplied by CICL being devoted to its production.

The key water statistics for the year were:

- metered net diversions into the Area of Operations 524,792ML
- metered usage to customers 495,979ML
- net channel losses 28,812ML
- groundwater usage within Area of Operation 75,052ML

CICL notes that the losses of 28,812ML were the lowest on record. Not unexpectedly, there was a rise in groundwater levels during 2012/13. In September 2013, the water table was within 2m of ground level over an area of 3,543ha in comparison to 1,597ha in September 2012 (n.b. this was still well below the LWMP remediation trigger point of 10,000ha at which the requirement of enhanced net recharge activity is activated).

During October to December 2012, CICL conducted weekly sampling of drainage water. Although Molinate and other analytes were detected from time to time, at no stage did CICL breach the Environment Pollution Licence conditions.

CICL continues to manage Coleambally Irrigation Biodiversity Reserve Trusts (CIBRT) for environmental purposes. The Reserves cover an area of approximately 1,600ha across 10 individual blocks. The purpose of the Reserves is to protect all forms of dominant native vegetation within their boundaries, including black box depressions and cypress pine, rosewood and boree landscapes. Regular maintenance work included weed control, preservation of fire breaks and feral animal control. Additional funding of $18,000 for CIBRT management and $26,000, to fund Property Vegetation Plans, was received from the Murrumbidgee Catchment Management Authority (MCMA) during 2012/13.

At the time of writing, the general security allocation within the Murrumbidgee stood at 48%. With Burrinjuck and Blowering Dams at 65% and 89% of capacity respectively, the outlook for the 2013/14 irrigation season is challenging as CICL's members are more heavily dependent on Burrinjuck Dam.

1. Introduction

1.1 General

The Coleambally Irrigation District (CID) is located south of Griffith between the towns of Darlington Point and Jerilderie, New South Wales in the southern Murray-Darling Basin of Australia. The District comprises 495 irrigation farms containing 79,000ha of irrigated land supplied through open earthen channels and approximately 325,000ha of West Coleambally Channel District to which CICL supplies stock, tank and opportunistic irrigation water.

CICL's irrigation water is sourced from the Snowy Scheme via the Murrumbidgee River. The water is diverted into the Coleambally Main Canal upstream of Gogelderie Weir near Darlington Point. Water supplies are regulated from two major dams, Burrinjuck and Blowering.

The CID was developed over the period 1958 to 1970. CICL's delivery system is gravity fed and incorporates state of the art and solar-powered metering and flow regulation technologies which providing for fully automated water ordering and accounting.

Coleambally Irrigation Cooperative Limited's (CICL) irrigation system consists of 41km of Main Canal from the Murrumbidgee River, 477km of supply channels, and a further 734km of drainage channels.

CICL is a leading exponent of open channel irrigation management and in the last 10 years has invested over $40 million in system automation. Throughout 2012/2013, CICL extended this automation (Total Channel Control) into the West Coleambally Channel region and under a contractural arrangement into the neighbouring Kerarbury Channel Irrigation Area.[1] In addition, CICL's members have spent $95 million of their own funding since 2000 improving their land and water management practices and enhancing local biodiversity.

This is the 16th Annual Compliance Report (ACR)[2] compiled by Coleambally Irrigation Co-Operative Limited (CICL). It is written in compliance with:

- the Environment Protection Licence issued by the Department of Environment and Climate Change under the Protection of Environment Operations Act 1995 (POEO before 1995); and
- the conditions of the amended approval 40CA401473 of August 2012 issued by the NSW Office of Water's Water Access Licences (8 licences) and Nominated Works and Water Use Approvals issued under the Water Management Act 2000.

The aim of this report is to demonstrate CICL's compliance with the conditions specified under the amended approval 40CA401473 of August 2012 and its Environment Protection Licence. The format of the report closely mirrors those conditions specified under Schedule 1 reporting conditions 12.1 to 12.2 of the amended approval 40CA401473 of August 2012.

The location of Coleambally is shown in Figure 1.1.

The CICL area of operation is shown in Figure 1.2; there was no change during the reporting period.

[1] Kerarbury receives its supply via CICL and under the new contractual arrangement, control of Kerarbury's automated channel system is through CICL's TCC system.
[2] Known as Annual Environment Report (AER) prior to 2009/10

Figure 1.1 CIA Location Diagram

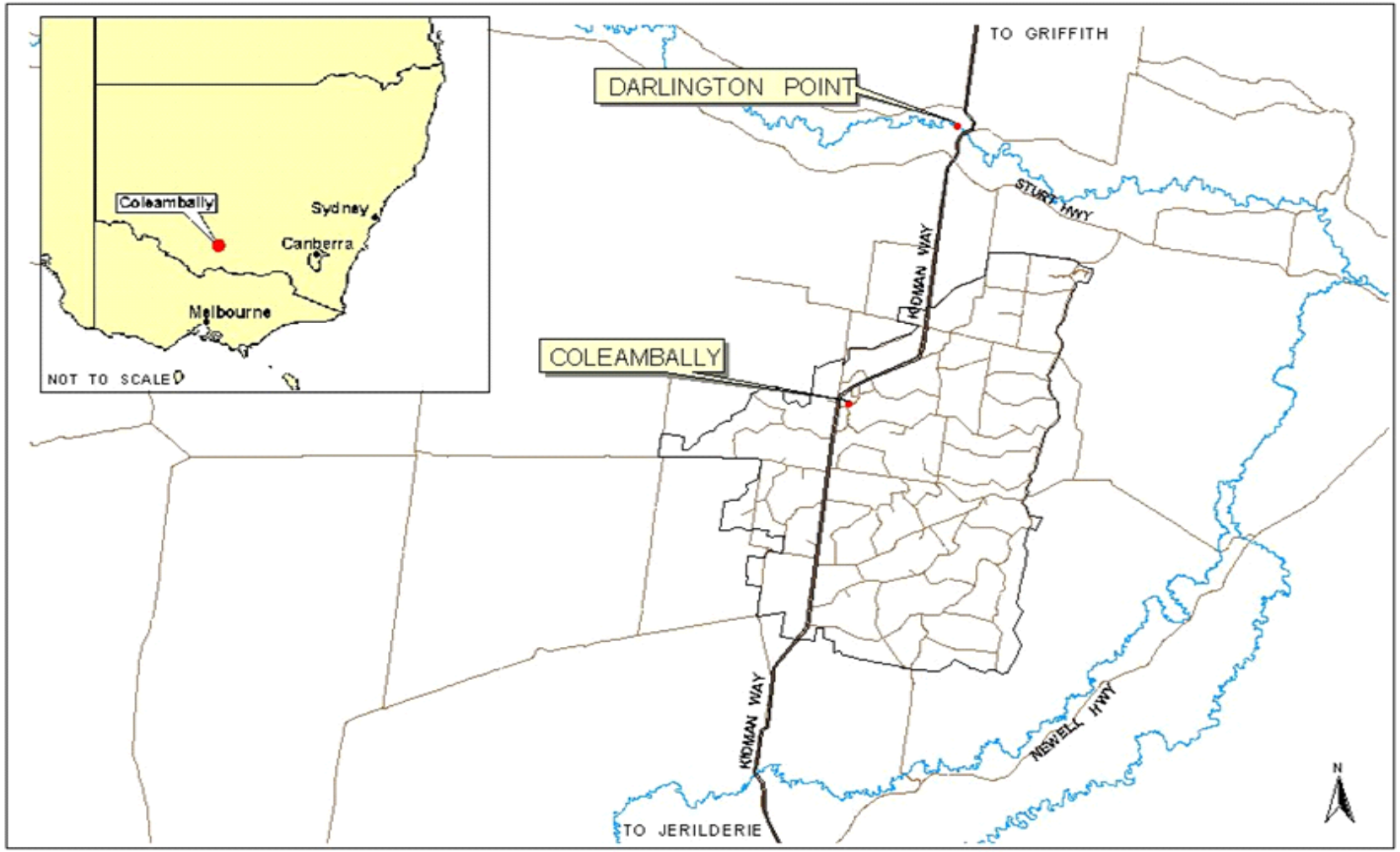
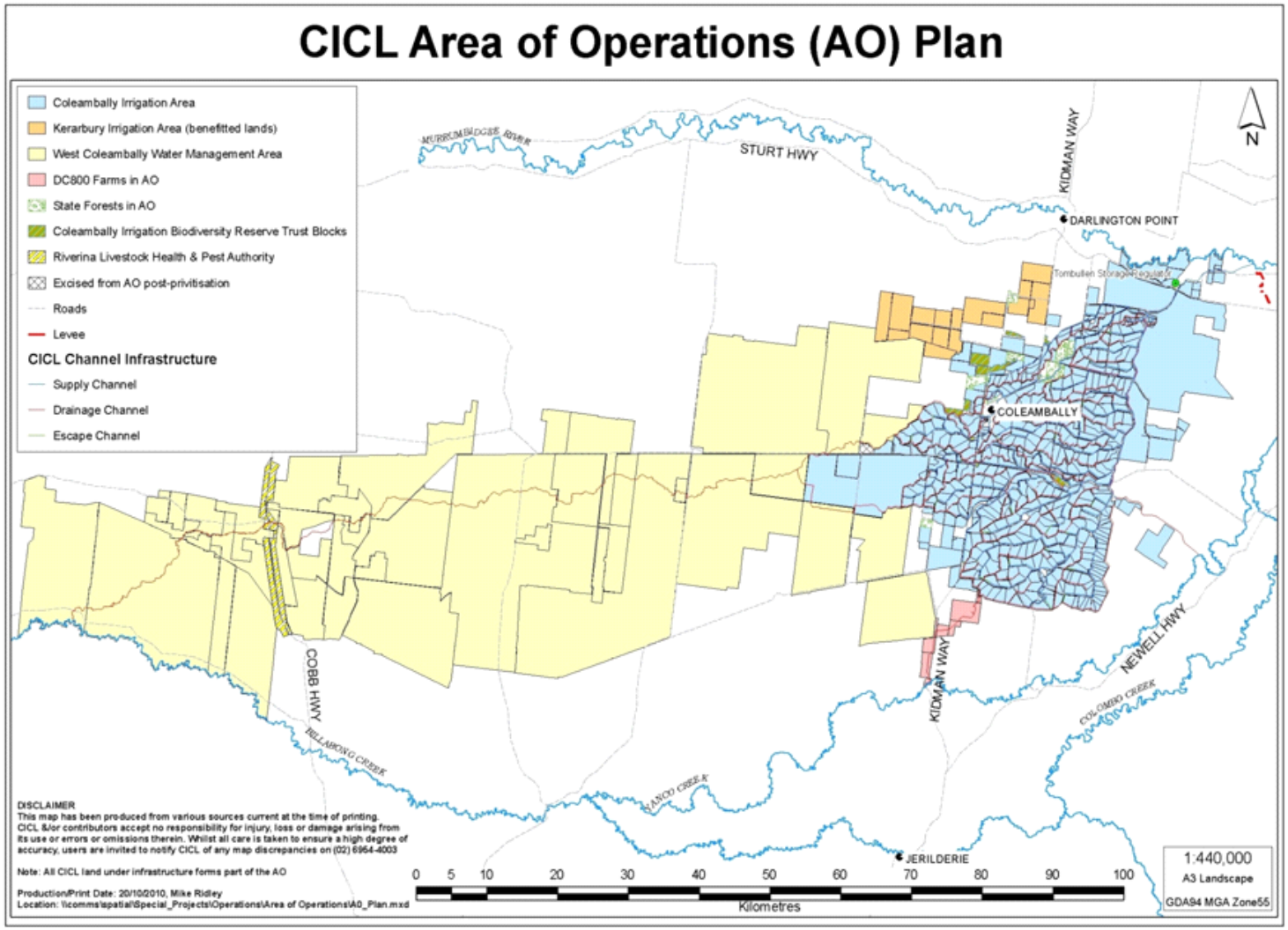


Figure 1.2 Current Area of Operation of CICL including the benefitted lands.



1.2 Plans of Works and Monitoring Sites (Piezometers)

Figure 1.3 shows the location of approved Works. The amended approval 40CA401473 of August 2012 and the groundwater work approvals 40CA403808 and 40WA404593 issued by the NSW Office of Water includes three water extraction works, namely: Coleambally Main Canal Off-take, Col Bore and Hort Bore. The amended approval 40CA401473 of August 2012 also includes three drainage discharge points: CCD on the Coleambally Catchment Drain; DC 800A on Drainage Channel 800; and CODD on the West Coleambally Channel. One additional monitoring point has also been approved: CODA, on the West Coleambally Channel. The CODA monitoring point is used for the Rice Chemical Monitoring Program in lieu of CODD due to CODA's closer proximity to Coleambally. Figure 1.3 also shows the location of the Kerarbury Channel Off-take Regulator, which supplies water to the benefitted lands of the Kerarbury District.

Further and as agreed with NSW Office of Water in 2012, an additional map in A1 Format is provided in appendix A6 to provide a higher level of detail.

A total of 737 piezometers have been approved as monitoring works to measure groundwater pressure levels in the Upper and Lower Shepparton Aquifers. Their locations are shown in Figure 1.4.

Figure 1.3 Works Plan

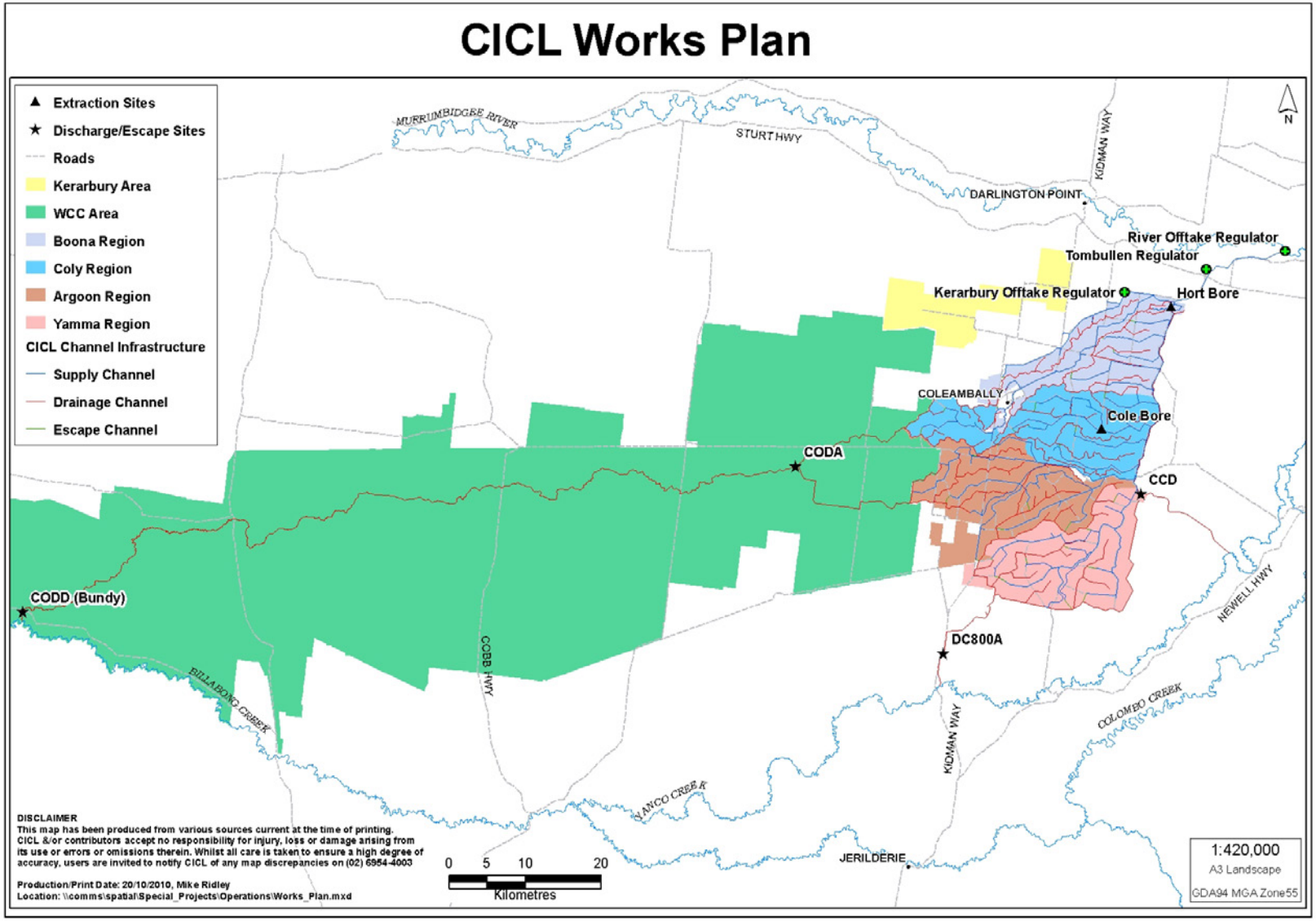
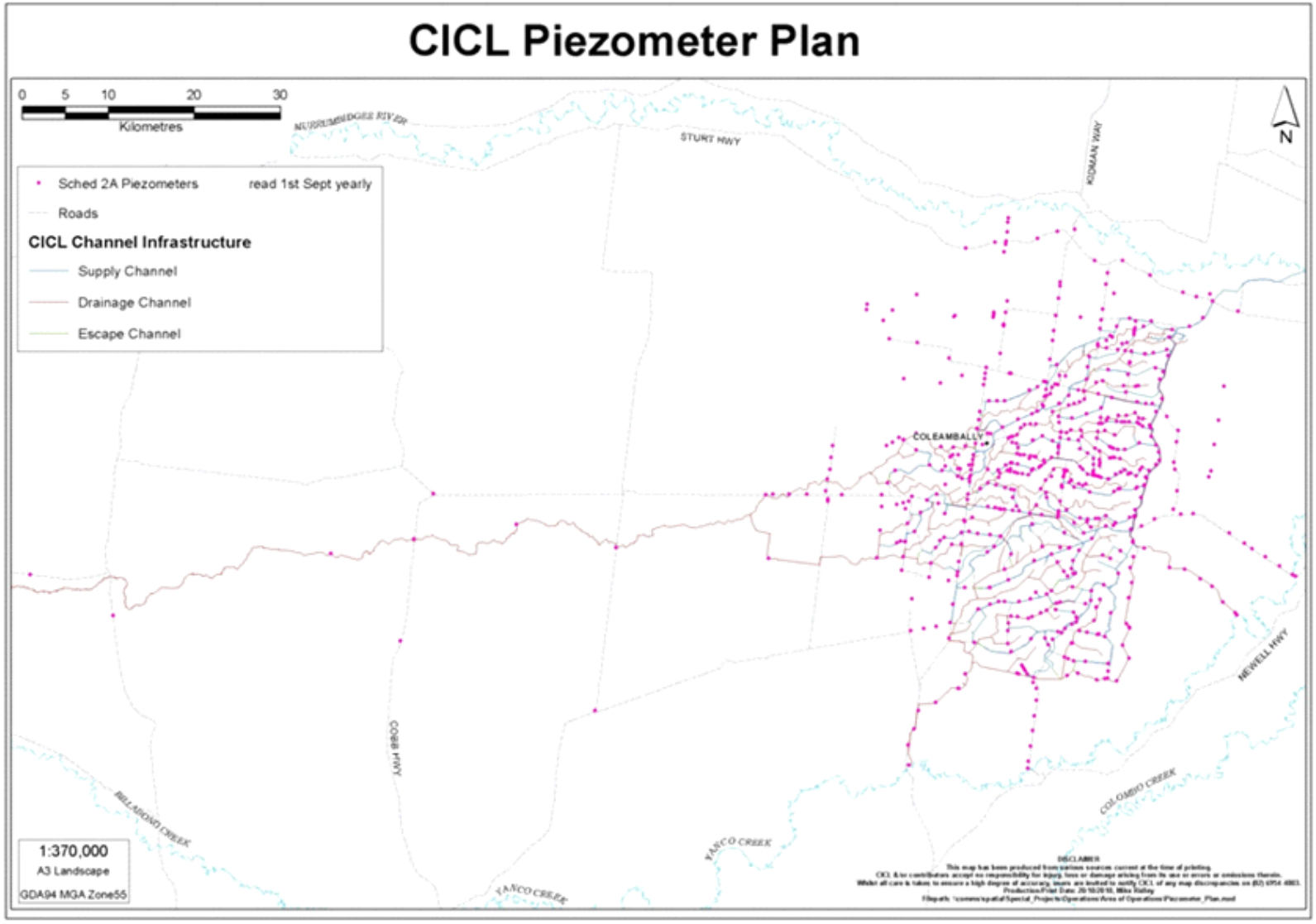


Figure 1.4 Piezometer (Monitoring Sites) Plan



2. Statement of Compliance

This is to certify that from 1st July 2012 to 30th June 2013, CICL has complied with all monitoring and reporting requirements of the Water Access licences, Water Supply Works, amended approval 40CA401473 of August 2012, groundwater work approvals 40CA403808, 40WA404593 and Environment Protection Licence (Number 4652) issued to it by the NSW Government, with the exception of those matters explained in section 3.4.

The information presented in this report is complete, true and accurate to the best of my knowledge.

John Culleton
Chief Executive Officer

3. Data and Analysis

3.1 Water Allocation

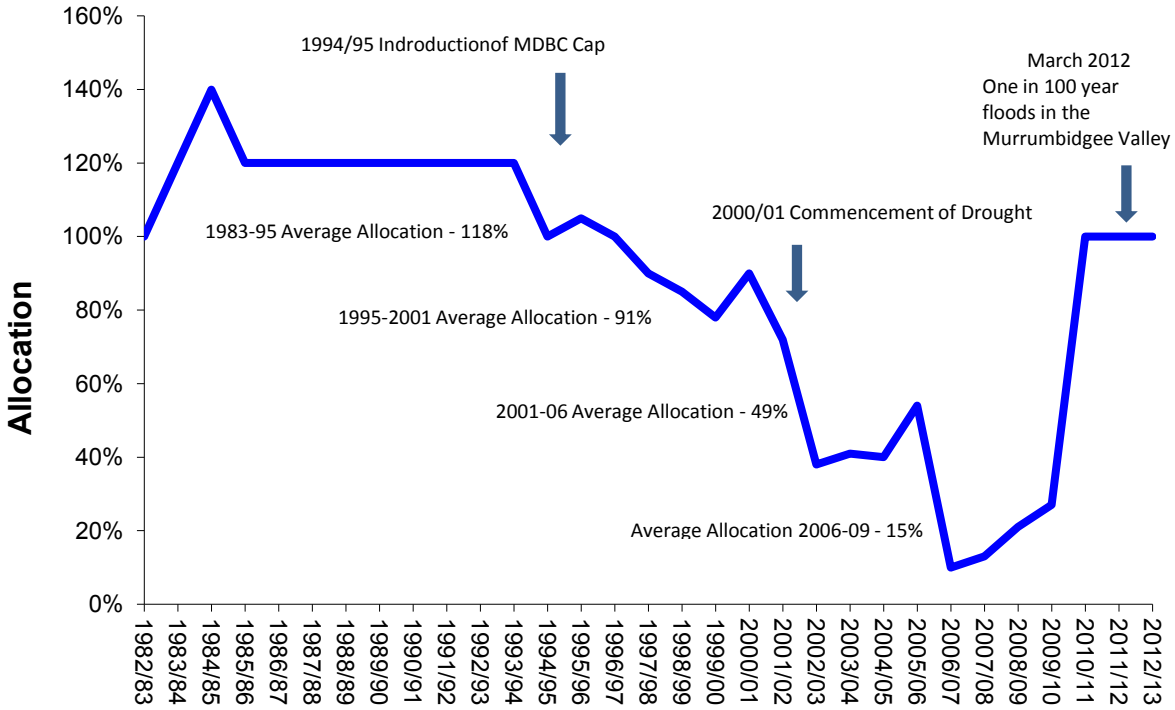
Table 3.1 shows the dates and announced general security annual allocation in the Murrumbidgee Valley during 2012/13.

Table 3.1 Announced General Security water allocations for 2012/13

Date	Announced Allocation (%)
2/07/2012	64%
3/12/2012	100%

Figure 3.1 shows announced annual allocations for general security entitlement since 1982/83 in the Murrumbidgee Valley. It also shows the impact of the introduction of the MDBA cap and the effects of drought.

Figure 3.1: Annual allocations for general security entitlement since 1982/83 in the Murrumbidgee Valley



3.2 Monitoring Data

In compliance with condition 12.17 of the amended approval 40CA401473 of August 2012, the following monitoring data is included:

1. Piezometer pressure level data, in Appendix A1
2. Surface Water Extraction and Salinity, in Appendix A2
3. Groundwater Extraction from CICL's Approved Works, Salinity and Salt Load, in Appendix A3
4. Groundwater Extraction from other Approved Works, in Appendix A3
5. Drainage Flow and Salinity data from three licensed discharge sites and one licensed monitoring site, in Appendix A3
6. Drainage Water quality data for pH, Nutrients, in Appendix A4

7. Drainage Water quality data for Chemicals, in Appendix A4
8. Crop type, crop area and water usage data, in section 3.3.4
9. Rice Chemical Monitoring Program results in Appendix A5.

3.3 Trends

3.31 Salinity

Tables 3.2 to 3.5 show monthly average salinity readings at three licensed discharge points and one licensed monitoring point. In the tables, 2012/13 data is compared with data from the previous two years and with the benchmark data. The benchmark was set up through averaging the data of the three years immediately preceding the privatization of CICL in 2000. This includes data from 1996/97, 1997/98 and 1998/1999. In the case of salinity data a blank cell indicates no flow. In the Table 3.2 the 2010/11 figures were as presented however as previous reports indicate this data was effected by backflow, and the flow and salinity data incorrect.

Table 3.2: MONTHLY SALINITY READINGS AT LICENSED DISCHARGE POINT CCD on the Coleambally Catchment Drain (µS/cm)

Month	2012/13	2011/12	2010/11	Benchmark
July				120
August				164
September				213
October	103			143
November	131	92		98
December	88	75		96
January	70	211		128
February	60	214		16
March	75	176		64
April		155		94
May				106
June				158
Average	**86**	**157**	**n/a**	**117**
Median	75	145	n/a	113

Table 3.3: MONTHLY SALINITY READINGS AT LICENSED DISCHARGE POINT DC800A on the Drainage Channel DC800 (µS/cm)

Month	2012/13	2011/12	2010/11	Benchmark
July	329	375	181	1496
August	272	321	192	1661
September	285	273	208	338
October	275	347	204	257
November	281	259	301	314
December	362	259	297	306
January	201	182	310	268
February	245	207	224	240
March	443	248	282	268
April	411	318	294	215
May	458	280	270	226
June	236	211	211	534
Average	**317**	**297**	**248**	**510**
Median	283	304	247	287

Table 3.4: MONTHLY SALINITY READINGS AT LICENSED MONITORING POINT CODA on the West Coleambally Channel (µS/cm)

Month	2012/13	2011/12	2010/11	Benchmark
July	390		187	1359
August	385	252	176	1504
September	308	287	254	886
October	150	250	241	399
November	126	235	212	524
December	133	207	272	526
January	105	210	289	457
February	236	207	258	437
March	276	233	320	367
April	555	193	268	459
May	270	221	299	487
June	212	252	226	1133
Average	**262**	**232**	**258**	**712**
Median	253	233	256	506

Table 3.5: MONTHLY SALINITY READINGS AT LICENSED DISCHARGE POINT CODD @ BUNDY on the West Coleambally Channel (µS/cm)

Month	2012/13	2011/12	2010/11	Benchmark
July	231		183	1868
August	267	225	225	1829
September	344	329	287	536
October	201	347	281	415
November	279	347	380	450
December	392	256	425	531
January	290	435	439	416
February	178	966	279	409
March	172	789	374	374
April	238	n/a	427	362
May	n/a	236	362	330
June	172	242	261	406
Average	**251**	**417**	**327**	**660**
Median	238	338	324	415

The above data shows that the monthly average salinity in the last three years, including 2012/13, at CODA and DC800A has remained relatively low in comparison to benchmark years. However the exceptionally low result at CCD was due to the fact it was used mainly to supply river water to Statewater for use in the Yanco creek system.

The lower salinity at the drainage monitoring sites is due to the lowering of groundwater (and by association, water-tables) within the CIA. Whilst groundwater levels have increased over 2012/13, there has been a reduction in water-tables below the level of the bed (base) of the drainage channels which means there is no salt intrusion from water-tables into drainage water.

Unfortunately due to localised flood events on the Yanco and Billabong Creeks where creek levels were above 3m, gauging instrumentation at the sites CCD and CODD were affected by backwater and inundation as gauging at above 3m is inaccurate. This is the third year in which flooding and backwater affected data quality. As a result the hydrometric unit of the NSW Office of Water, State Water Corporation and CICL met at the site and it was agreed that during the planned upgrade of CCD by State Water the instrumentation would be updated and moved to a more suitable site.

3.32 Flow

Tables 3.6 to 3.9 show monthly average drainage flows at three licensed discharge points and one licensed monitoring point. In the tables, 2012/13 data is compared with the previous two years' data and with the benchmark data. The benchmark was established through averaging the data of three years immediately preceding the privatization of CICL in 2000.

Table 3.6: MONTHLY FLOW READINGS AT LICENSED DISCHARGE POINT CCD on the Coleambally Catchment Drain (ML)

Month	2012/13	2011/12	2010/11	Benchmark
July	0	0	0	21
August	0	0	268	290
September	0	0	2504	887
October	1688	0	2760	1853
November	406	1175	2311	2073
December	416	5061	8453	2305
January	3725	4764	1126	3619
February	3064	2740	891	1843
March	356	10244	0	2112
April	3	2496	0	1756
May	0	0	0	1430
June	0	0	820	279
Total	**9659**	**26481**	**19132**	**18468**
Average	**805**	2207	**1594**	**1539**
Median	179	587	856	1800

Table 3.7: MONTHLY FLOW READINGS AT LICENSED DISCHARGE POINT DC800A on the Drainage Channel DC800 (ML)

Month	2012/13	2011/12	2010/11	Benchmark
July	107	25	191	432
August	36	138	127	1197
September	794	333	924	4455
October	1149	242	3586	5962
November	1106	1334	455	5119
December	617	2296	866	5162
January	2840	5353	1430	7660
February	1240	3783	6802	6795
March	962	8411	2474	7816
April	518	521	2405	3721
May	341	879	822	2961
June	986	315	1357	1675
Total	**10696**	**23629**	**21437**	**52955**
Average	**891**	**1969**	**1786**	**4413**
Median	878	700	1141	4787

Table 3.8: MONTHLY FLOW READINGS AT LICENSED MONITORING POINT CODA on the West Coleambally Channel (ML)

Month	2012/13	2011/12	2010/11	Benchmark
July	0	0	181	619
August	89	195	11	739
September	644	202	2037	4983
October	2574	1723	531	4494
November	1709	2950	839	5014
December	2206	4351	498	4041
January	2874	4262	4062	6806
February	1426	4013	8908	5540
March	2274	23935	1181	8438
April	229	1836	147	4427
May	1143	3680	1181	4209
June	1863	1185	1653	2183
Total	**17033**	**48331**	**21227**	**51493**
Average	**1419**	**4028**	**1769**	**4291**
Median	1568	2393	1010	4460

Table 3.9: MONTHLY FLOW READINGS AT LICENSED DISCHARGE POINT CODD@BUNDY on the West Coleambally Channel at Bundy (ML)

Month	2012/13	2011/12	2010/11	Benchmark
July	36	0	106	282
August	0	1	40	2150
September	1	9	17	3327
October	26	115	1	1914
November	81	148	0	3187
December	11	122	0	1536
January	246	42	11	3523
February	28	54	534	4461
March	23	237	0	3517
April	23	0	27	1814
May	0	861	476	2511
June	77	473	597	3053
Total	**553**	**2062**	**1807**	**31275**
Average	**46**	**187**	**151**	**2606**
Median	25	115	22	2782

The above data shows that the flooding that impact on the like data from 2011/12 did not occur in 2012/13

Again, the veracity of this data is open to question because of gauging that was affected by 'backwater' during periods of excessive flows down connected creeks the Billabong and the Yanco.

3.33 Extraction

Table 3.10 shows monthly average extraction at the Coleambally Main Canal Off-take. In the tables, 2012/13 data is compared with the previous two years' data and with the benchmark data. The benchmark was established through averaging the data of three years immediately preceding the privatisation of CICL in 2000.

Table 3.10: MONTHLY EXTRACTIONS (ML) AT LICENCE POINT CCS (Main Canal Off-take)

Month	2012/13	2011/12	2010/11	Benchmark
July	0	0	2000	0
August	23660	19854	37469	0
September	32947	36807	11783	42294
October	97331	66700	39158	38311
November	82664	73567	33848	57310
December	105557	83163	61471	66774
January	133102	115482	76483	95277
February	72389	67156	29869	61406
March	32426	2213	22579	105786
April	11445	22360	8513	54865
May	6625	13276	13530	33506
June	0	0	0	0
Total	**598146**	**500578**	**336703**	**555533**
Average	**59815**	**41715**	**28059**	**46294**
Median	52668	29583	26224	48580

The above data shows that CICL deliveries in 2012/13 were well above the norm.

Tables 3.11 to 3.12 show monthly average extractions from both Col Bore and Hort Bore. In the tables 2012/13 Col Bore and Hort Bore data is compared with the previous three years' data.

Table 3.11: MONTHLY EXTRACTIONS (ML) COL BORE

Month	2012/13	2011/12	2010/11	2007/08
July	0	0	0	0
August	0	0	0	184
September	0	0	0	459
October	0	207	442	376
November	0	107	472	180
December	0	520	250	228
January	376	504	0	317
February	29	333	0	218
March	0	0	0	302
April	0	0	0	339
May	0	0	0	209
June	0	0	0	0.0
Total	**405**	**1671**	**1164**	**2812**

Table 3.12: MONTHLY EXTRACTIONS (ML) HORT BORE

Month	2012/13	2011/12	2010/11	2007/08
July	0	0	0	n/a
August	0	0	0	n/a
September	0	0	0	n/a
October	26	0	19	n/a
November	0	85	0	n/a
December	0	0	0	n/a
January	0	0	11	n/a
February	0	0	0	n/a
March	0	0	0	n/a
April	0	0	0	n/a
May	0	0	0	n/a
June	7	269	0	n/a
Total	**33**	**354**	**30**	n/a

The above data reflects decreased extraction of bore water and this can be attributed to good access to surface water via the allocation process and the temporary water market and the mounting costs of operating diesel and electrically powered bores.

3.34 Crop Water Use

Table 3.13 shows the crops grown in CICL's area of operation, their area, the quantity of irrigation water supplied by CICL, average crop water usage and the proportion of water supplied to each crop as a percentage of total water supplied by CICL.

Table 3.13: Crop Area, Total Crop Use, Crop Water Use and Proportion of Total Deliveries

Crop	Area (Ha)	Intensity (ML/Ha)	% of Use
Rice	19071	16.2	52.65%
Corn	4872	9.5	7.65%
Wheat	13698	3.1	7.15%
Soybeans	2583	8.7	3.85%
Pastures	6545	3.3	3.64%
Cotton	2089	8.5	3.02%
Barley	4221	2.0	1.42%
Canola	4182	1.8	1.26%
Sorghum	1337	1.7	0.39%
Lucerne	635	2.6	0.28%
Oats	1433	0.7	0.17%
Millet	181	5.0	0.15%
Sunflowers	122	4.6	0.10%
Forrest	97	3.7	0.06%
Pumpkins	62	5.9	0.06%
Clover	100	2.4	0.04%
Prunes	130	1.9	0.04%
Fababeans	122	2.1	0.04%
Other	3200	n/a	18.03%
Total	**64,680**		**100%**

It can be clearly seen that rice, corn/maize and cotton were the main summer crops, with wheat, barley and pasture being the main winter crops.

Table 3.14 shows the change in area over the last decade of six major crops in the Coleambally Irrigation District.

Table 3.14: Historical Comparison of Main Crop Areas and Proportion of Deliveries

Season	Rice		Corn/Maize		Soybeans		Cotton		Wheat		Pasture		Canola		
	Area (ha)	Proportion of delivery (%)	Area (ha)	Proportion of delivery (%)	Area (ha)	Proportion of delivery (%)	Area (ha)	Proportion of delivery (%)	Area (ha)	Proportion of delivery (%)	Area (ha)	Proportion of delivery (%)	Area (ha)	Proportion of delivery (%)	Total (%)
2012/13	19071	52.7	4872	7.7	2583	3.9	2089	3.0	13698	7.2	6545	3.6	4182	1.3	79.4
2011/12	16745	62.1	4767	8.2	2238	2.7	5280	7.9	15989	8.7	7472	4	5244	1.6	91.2
2010/11	14512	68.3	4367	7.2	1240	1.5	885	1.4	11334	5.1	8119	4.2	3381	1.5	89.2
2009/10	3668	46	311	2	495	1	0	0	10635	10	6903	12	2523	2	73
2008/09	2135	33.1	2472	3.4	308	1.4	0	0	4215	9.5	4481	16.3	1471	4.9	68.7
2007/08	90	1.4	941	1.2	152	0.7	0	0	6575	20	5004	20	1584	6.1	49.4
2006/07	8518	54.3	1863	7.6	478	0.8	0	0	12509	15.9	9958	7.8	1602	1	87.4
2005/06	18025	62.8	3306	7	2106	2.9	0	0	13610	8.4	15440	8.7	1748	0.9	90.6
2004/05	8142	44	3671	7.2	1495	2.2	0	0	20287	18.8	12865	10.8	2681	1.3	84.3
2003/04	12597	55.8	3545	5.7	1938	3.5	0	0	21192	15	12131	7.5	1763	0.7	88
2002/03	11395	46	4788	9.3	1788	1	0	0	21346	20.4	10183	7.4	2095	1.7	85.8
2001/02	27493	67.5	3808	4.2	3297	3.4	0	0	21103	9.2	11581	6.1	2191	0.6	91
2000/01	30440	73.9	4074	5.7	4551	5.9	0	0	14276	4.6	11998	4.7	2153	0.4	95.2
1999/00	24138	77.7	1178	3.1	2185	3.9	0	0	12649	6.1	7485	4.4	2152	0.7	95.9
1998/99	24491	73.8	1059	1.3	4339	5.7	0	0	13963	1.7	13879	8.1	2184	1.7	92.3
1997/98	24624	70.4			4998	7.5	0	0	14943	7.4	9964	6.1	2053	0.4	94.2

The table above shows that over time, irrigation water supplied by CICL is primarily used to grow rice. With a return to more normal allocations in the past two years, rice growing has rebounded to levels similar to 2005/06 year. Of note is the fact that although the rice area in 2012/13 increased in comparison to 2011/12, the proportion of water deliveries supplied to rice declined. It is also noted that the area devoted to cotton reduced because of reduce price on offer to growers.

3.4 Data Omissions and Discrepancies

This section identifies discrepancies and data omissions and details of any action undertaken or proposed to remedy the same (and in satisfaction of condition 12.4 of the amended approval 40CA401473 of August 2012).

Data Omission:

No data has been omitted in 2012/13. CICL has also chosen to use flow figures for CODA from the Wonga Rubicon Flume regulator, This regulator is downstream slightly of CODA but its installation has created a backwater effect on the CODA gauging site and therefore it is prudent to use the most accurate data available. Also as alluded to earlier in the report, the veracity of data derived from the CCD outfall into the Yanco Creek and the CODD figures in the Billabong creek which was intermittently again affected by backwater when the creek systems were at flood levels.is questionable.

3.5 Monitoring and Testing Data

NSW Office of Water requires all monitoring, testing, salinity and volume for surface and groundwater extractions in an unrestricted electronic format. A 'hard copy of the data is included at Appendix A2. The electronic data required under Section 12.7 of the Combined Licence Package will be provided on CD.

3.6 Quality Assurance and Control Standards

CICL maintained the quality standard ISO 9002 and environmental standard ISO 14001 until 2003. While it no longer formally does so, CICL continues to use the related procedures. The following section lists various parameters monitored in compliance with the licence conditions and explains the methodology used for data collection and analysis, and for the calibration of measuring devices.

3.7 Flow Monitoring

Coleambally Main Canal Off-take

Water extractions from the Murrumbidgee River are monitored at the Off-take of the Coleambally Main Canal using an Accusonic meter containing eight sensors for flow velocity measurement. The meter is installed as per the guidelines of the supplier and is calibrated using professional hydrographers. The Main Off-take has been calibrated regularly during the season and was within allowable tolerances.

Irrigators' Water Supply Points

Within CICL there are 721 water supply points. Of these, 410 are flume gates (designed/manufactured by Rubicon Systems Australia); 36 are Mace flow meters; 12 are Magflow meters; 49 are propeller flow meters and 220 are Stock & Garden meters. CICL carries out calibration of flume gates at the time of installation as well as upon request by the landholder. During 2012/13 CICL calibrated all flume gates through which water was being supplied for growing rice. The calibration was carried out by CICL staff who had received training from the manufacturers. The Mace, Magflow and propeller meters were calibrated at the time of installation and they were not re-calibrated during 2012/13. CICL notes that it is currently in the process of replacing all of the Mace, Magflow and propeller meters with flume gates.

Col Bore and Hort Bore

Apart from the Main Canal Off-take, CICL extracts water from Col Bore and Hort Bore deep groundwater bores. A Tempress propeller meter is installed at Col Bore and a Magflow meter at Hort Bore.

3.8 Salinity and Salt Load

Salinity at Water Extraction Works

CICL monitors monthly salinity levels at the Main Canal Off-take, Col Bore and Hort Bore using an YSI hand-held Salinity Meter. This is calibrated monthly using the standards supplied by NSW Office of Water. CICL uses two standard solutions for calibration purposes with salinities of 147µS/cm and 1,413µS/cm.

Salinity at Licensed Discharge Points

CICL uses data collected by NSW Office of Water at three licensed discharge points and one licensed monitoring point. This data is automatically collected continuously using salinity sensors and is communicated to NSW Office of Water using a radio telemetry system. The data is available on the web. The instrumentation at these sites is calibrated and maintained by the hydrographic unit of NSW Office of Water at Tumut.

Salt Load Calculation

The Salt Load is calculated by using the following formula:

Salt Load (kg) = [Salinity (µS/cm) x 640] x Flow (ML)

3.7 Pesticides in Supply and Drainage Water

CICL monitors a range of pesticides and nutrients in both supply and drainage water. These chemicals are measured by a National Accreditation and Testing Authority (NATA) accredited laboratory.

3.8 Turbidity and pH

CICL monitor these parameters in both supply and drainage using a hand-held pH meter and a hand-held turbidity meter. These meters are calibrated annually by NSW Office of Water's staff at Leeton.

3.9 Crop Type and Crop Area

This information is collected primarily from landholders through summer and winter crop type/area forms. Satellite imagery was used to verify that rice crops were sown on soils deemed suitable.

3.10 Crop Water Usage

Crop water usage is calculated on the water ordering and crop information provided by landholders.

3.11 Groundwater Levels and Groundwater Salinity

These parameters are measured by appropriately trained CICL staff. The methodology for groundwater levels and groundwater salinity monitoring was developed in conjunction with NSW Office of Water.

4. New Measures to Limit Groundwater Recharge and the Release of Salt

CICL introduced a new policy to replace the outgoing rice policy. This new policy, 'The CIA Water Use Policy' is no longer focused on the impact of rice production but on the overall cropping intensity on each farm and its impact across the CIA. CICL also returned to the practise of reading it piezometers twice a year.

5. Land and Water Management Plan (LWMP) Implementation

CICL has been co-ordinating the implementation of three Coleambally District LWMPs since the year 2000. The program continues to ensure that farms are designed and re-engineered to maximise water use efficiency and to adopt LWMP options targeting long-term sustainability.

The implementation of the three LWMP's has been one of the most successful projects in the area of natural resource management within the Murray Darling Basin (MDB). The project is a successful demonstration of community, government and industry partnership in the sustainable management of natural resources, whilst also delivering an increase in efficiency and productivity.

5.1 Coleambally LWMP

During 2009/10, the Federal Government withdrew their support of the LWMP incentive program. The NSW Government, through the CMA, continued its support, albeit at a greatly reduced level through to June 2013. During 2012/13, incentives for on-farm works to the value of $44,500 were paid. A total of one incentive was recorded for Biodiversity works. Details of these incentives are shown in Table 5.1.

Table 5.1: Financial history of LWMP incentives

Type of incentive	Total LWMP Incentives paid 2000-2011	Incentives Paid in 2012/13
Recycling	$4,774,526	na
Whole Farm Planning (WFP)	$980,816	na
WFP Verification	$355,278	na
Storage	$1,358,652	na
Rice Water Use Testing (RWUT)	$12,500	na
Net Recharge Management (NRM)	$316,314	na
Change in Land Use (CLU)	$1,280,230	na
Biodiversity	$523,953	$44,500
Pressurised Irrigation (PI)	$501,141	na
TOTAL	**$10,058,909**	**$44,500**

6. Water Management

The following report and Table 6.1 are intended to satisfy the conditions in 12.10 of the amended approval 40CA401473 of August 2012. It is noted however that the related data is extracted from reports provided to CICL's Board and that the Juy and August data is incorporated in September's monthly report and November's data is included in the December report (consistent with Board meeting dates).

The following tables display reconciled monthly volumes of water:

- taken through each authorised water supply work against the Approval Holder's water access licences;
- taken through each authorised water supply work against other water access licences; and
- released from each escape as an authorised credit

Table 6.1: 2012/13 Water taken through Water Supply Works against Water Access Licences (All readings are taken mid -month.)

Surface Water Licences (Works Approval 40CA401473)	**Jul**	**Aug**	**Sep**	**Oct**	***Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Totals**
General Security Access Licence 40 AL401471	0	0	5,921	93,407	108,461	125,092	33,948	7,194	0	0	0	374,023
General Security Access Licence 40 AL405267	0	0	0	0	0	0	0	4,876	0	0	0	4,876
Landholder High Security Access Licence 40AL401469	0	0	0	0	0	0	0	5,746	0	0	0	5,746
Town Water Supply High Security Access Licence 40AL401470	0	0	0	0	0	0	0	70	0	0	0	70
Outfall Drain High Security S & T Access Licence 40AL401472	0	0	0	0	0	0	0	3,497	0	0	0	3,497
Conveyance Loss AIlowance Access Licence 40AL402990	0	0	0	0	0	0	60,695	18,438	12,957	11,543	0	103,633
Converted High Security 40AL405230	0	0	0	0	0	0	0	5872	0	0	0	5,872
2nd Converted High Security 40AL405343	0	0	0	0	0	0	0	642	0	0	0	642
Supplementary Access Licence 40AL202991	0	0	25,996	0	0	0	0	0	0	0	0	25,996
	0	**0**	**31,917**	**93,407**	**108,461**	**125,092**	**94,643**	**46,335**	**12,957**	**11,543**	**0**	**524,354**
Aquifer Access Licence 40AL403806 & Supp 40AL403807												
Colbore (Works Approval 40CA403808)	0	0	0	0	0	376	29	0	0	0	0	405
Hortbore (Works Approval 40WA404593)	0	0	26	0	0	0	0	0	0	0	7	33
	0	**0**	**26**	**0**	**0**	**376**	**29**	**0**	**0**	**0**	**7**	**438**
Total Diversions	**0**	**0**	**31,942**	**93,407**	**108,461**	**125,468**	**94,672**	**46,335**	**12,957**	**11,543**	**7**	**524,792**

* November is included in December figures.

The following information is provided to satisfy condition 12.11 of the amended approval 40CA401473 of August 2012.

The monthly volumes of water released without credit from escapes

There were 1,849 ML released without credit from escapes during 2012/13 irrigation season. Refer Table 6.2.

The monthly volumes of water released from each drain

There was no ML released without credit from drains during 2012/13 irrigation season.

The monthly volumes of water delivered to customers and accounted by each water supply work

There was a total of **495,979** ML delivered to customers in 2012/13. Refer Table 6.2 for a monthly break-up of deliveries.

Table 6.2: 2012/13 Volume Released without Credit, Released from Drain, and Volume Released to Customers (ML)

2012/13	July	Aug	Sep	Oct	Dec*	Jan	Feb	Mar	Apr	May	Jun	Total
released without credit from escapes	0	0	1,205	982	1,824	789	1,123	1,334	1,022	205	2,104	10,588
released from each drain	0	0	0	0	0	0	0	0	0	0	0	0
delivered to customers	0	0	24,741	88,339	102,782	117,607	89,688	45,805	11,638	11,496	3,883	**495,979**

*November figures included in December figures.

The following information is provided to satisfy condition 12.12 of the Combined License Package.

The estimated annual volumes of net channel losses accounting for deliveries, escapes, recycling, evaporation, rainfall, change in storage and seepage

The channel losses through escape channels, evaporation, change in storage, seepage and gains in the channel system through rainfall, are shown in Table 6.3. The gains from rainfall and losses through evaporation have been calculated for the irrigation season only (2012/13 season). For the purpose of Table 6.3 the channel area has been estimated as 555ha.

Table 6.3: Net Channel Loss Accounting

Losses	Estimated volume (ML)
Escapes	10,588
Evaporation	8,512
Change in storage	-2654
Seepage	11,039
Total Losses	**27,485**
Gains	
Rainfall	1,327
Net Channel Losses	**28,812**

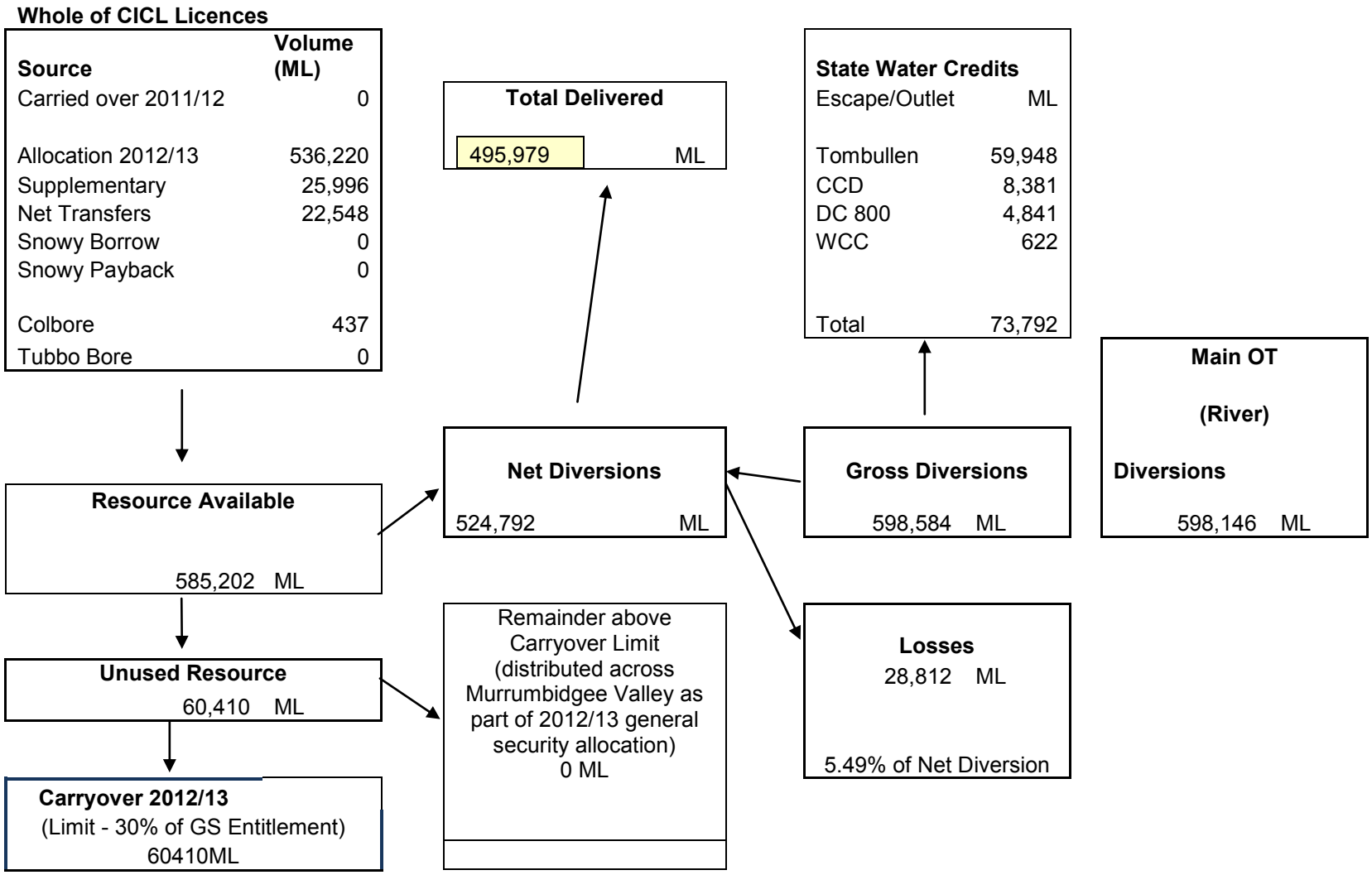
The estimated change in the volume of water held in off-line storages

There was no volume of water held in off-line storages for 2012/13.

The water balance for the entire area of operations or by major subdivisions thereof, if appropriate, as presented together with data from conditions 12.10 and 12.11

Figure 6.1 indicates the water balance including the above data and conditions for 2012/13.

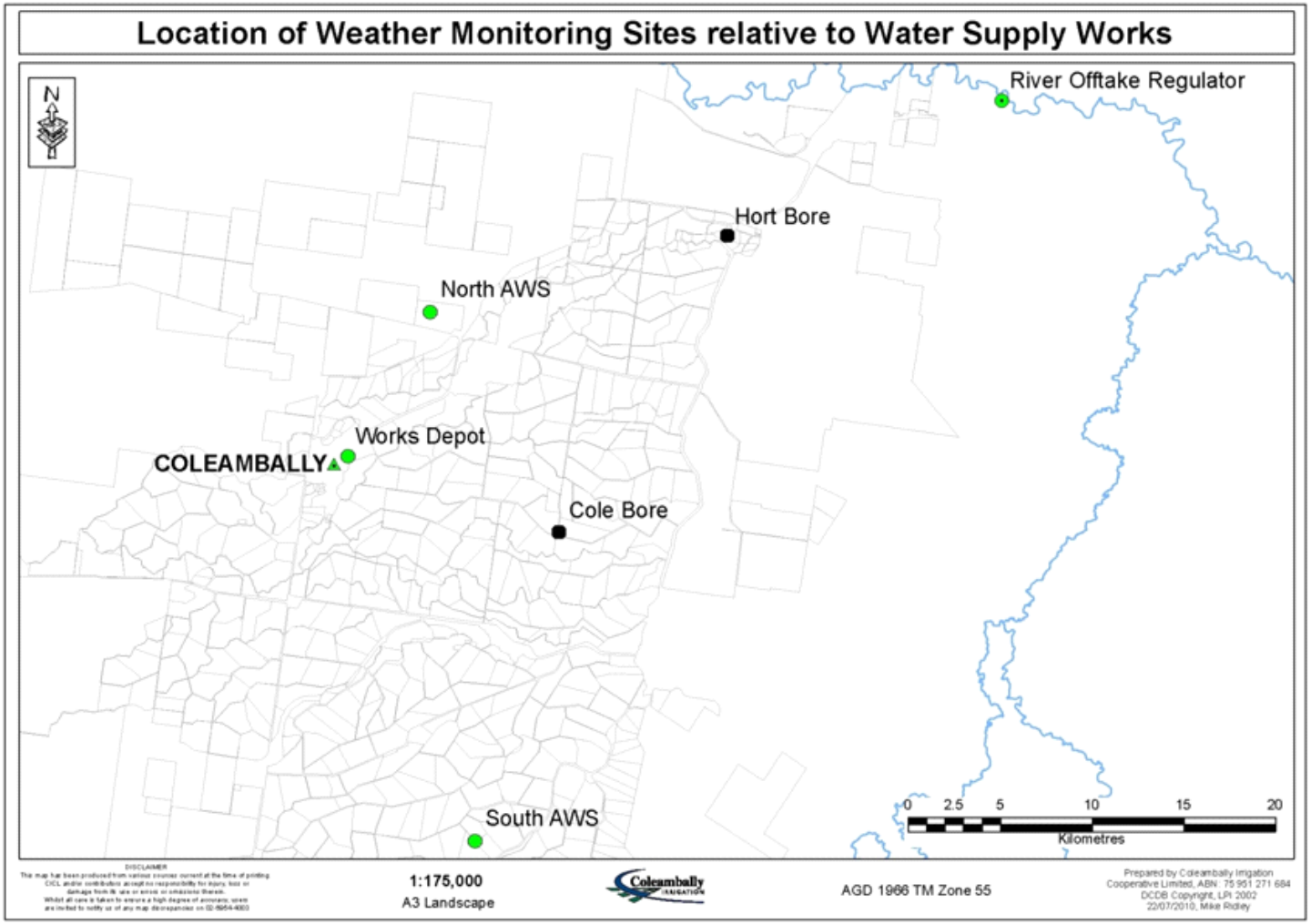
Figure 6.1: Water Use - Year to Date



Estimated Annual Rainfall at each Water Supply Work

A map depicting the locations of all weather monitoring sites relative to all water supply works is shown in Figure 6.2 below.

Figure 6.2: Location of Weather Monitoring Sites relative to Water Supply Works



Estimated Annual Evapo-transpiration / Rainfall at each Water Supply Work

Both North- and South- AWSs record many parameters—including Rainfall (logged as 'accumulative') and reference evapo-transpiration (ET_o). The equation used in the calculation of ET_o is the established ASCE Penman-Monteith, otherwise known as the FAO-PM (Penman-Monteith).

Geographically, the North-AWS is almost equidistant from both Hort-Bore and Cole-Bore water supply works and is significantly closer to both than the South-AWS. Rainfall and ET_o values from the North-AWS will therefore be used in this ACR2012.

As such, for the 2012/13 period and in the general area encompassing all water supply works, the annual Rainfall and ETo is recorded as 239mm and 1,534mm respectively.

Table 6.4: Rainfall and Evaporation AWS/1

AWS/1 / North-AWS	Rain (mm)	ETo (mm)
Jul	32	40.4
Aug	21.6	60.5
Sep	4.8	103.5
Oct	4.2	151.5
Nov	26.8	175.1
Dec	31.2	242.3
Jan	2.2	242.6
Feb	14.2	174.3
Mar	22.6	151
Apr	6.4	97.7
May	37.4	60
Jun	35.7	34.8
2012/13 TOTAL	**239.1**	**1533.7**

Water deliveries for:

- **Rice**

  Total deliveries for Rice as per ordering information indicated usage of 308,692 ML across 19,071ha of rice.

- **Horticulture**

  Total water delivered for Horticultural crops which included Pumpkins, Prunes, Grapes, Olives, Potatoes and (other) Vegetables was 610 ML across 192 ha.

- **All other summer crops (including pasture)**

  Total water delivered for all other summer crops (including pasture) was 90,514 ML across 11,819 ha.

- **Winter crops**

  Total water delivered for winter crops was 58,906ML across 23,562 ha.

- **Domestic and stock purposes**

  The water delivered for stock and domestic purposes was 1,329ML.

- **All other purposes**

  The water delivered for all other purposes (including farm forestry and biodiversity watering) totalled 35,928ML.

The land areas associated with all water deliveries above are estimated in Table 6.5 below:

Table 6.5: Water Deliveries and associated Land Areas for Irrigation Purposes 2012/13

Water deliveries for rice	308,692	ML	19,071	ha
Water deliveries for horticulture	610	ML	192	ha
Water deliveries for all other summer crops (including pasture)	90,514	ML	11,819	ha
Water deliveries for winter crops	58,906	ML	23,562	ha
Water deliveries for domestic and stock purposes	1,329	ML	….	---
Water deliveries for all other purposes	35,928	ML	---	---

Distribution of Irrigation Intensity

The irrigation intensity in at least three intensity ranges, for the main supply sub-Divisions/areas are represented in Table 6.6.

Table 6.6: Distribution of Irrigation Intensity (ML/ha)

Average Irrigation Intensity (ML/ha) across CIA Sub-Regions	Number of Farms within Region	Metered Irrigation within Region (ML)	Area of Region (ha)	Irrigation Intensity 2012/13
Region 1: Boona	125	79,562	33,452	2.38
Region 2: Coly	98	153,754	22,432	6.85
Region 3: Argoon	105	118,417	35,427	3.34
Region 4: Yamma	88	104,155	23,313	4.47
Region 5: WCC	37	10,538	317,218	0.03
Kerabury Private Channel	15	29,553	13,335	2.22

7. Salinity and Salt Load

The **Salinity and Salt Load** of extractions indicated below have been taken at the sites listed in Attachment 1-A of the Combined Licence Package, and in accordance with requirements set out in Attachment 1-B of the Combined Licence Package. The information is provided in satsfcation of requirement 12.14 in the Combined Licence Package.

Table 7.1: Volume of Water Entering CICL's Operational Area (ML), Salinity (µS/cm) and Salt Load (Tonnes) in 2012/13

Month	MAIN CANAL			COL BORE			HORT BORE		
	ML	µS/cm	SALT/T	ML	µS/cm	SALT/T	ML	µS/cm	SALT/T
July	0		0	0		0	0		0
August	23660	132	4894	0		0	0		0
September	32947	122	6265	0		0	26	320	13
October	97331	119	18153	0		0	0		0
November	82664	131	16958	0		0	0		0
December	105557	140	23085	0		0	0		0
January	133102	123	25577	376	620	364	0		0
February	72389	113	12744	29	722	33	0		0
March	32426	121	6125	0		0	0		0
April	11445	128	2289	0		0	0		0
May	6625	139	1434	0		0	0		0
June	0		0	0		0	7	320	4
Total	**598146**		**117524**	**405**		**397**	**33**		**17**
SALT TOTAL	**117938**								
ML TOTAL	**598584**								

The **Volume, Salinity and Salt Load of Discharges** from the sites listed in Attachment 1-A of the Combined Licence Package and in accordance with requirements set out in Attachment 1-B of the Combined License Package, satisfies requirement 12.15 in the Combined Licence Package and are displayed in Tables 7.2 to 7.4.

Table 7.2: Volume of Water exiting CICL's Operational Area (ML), Salinity (µS/cm) and Salt Load (Tonnes) in 2012/13

Month	DC 800@ OUTFALL			CODD @ BUNDY			CCD		
	ML	µS/cm	SALT/T	ML	µS/cm	SALT/T	ML	µS/cm	SALT/T
July	107	329	55	36	231	13	0		0
August	36	272	15	0		0	0		0
September	794	285	353	1	344	1	0		0
October	1149	275	495	26	201	8	1688	103	273
November	1106	281	485	81	279	35	406	131	83
December	617	362	349	11	392	7	416	88	57
January	2840	201	890	246	290	111	3725	70	408
February	1240	245	475	28	178	8	3064	60	286
March	962	443	666	23	172	6	356	75	42
April	518	411	332	23	238	9	3	75	0
May	341	458	244	0		0	0		0
June	986	236	364	77	172	21	0		0
Total	**10696**		**4725**	**553**		**219**	**9659**		**1149**
SALT TOTAL	**6093**								
ML TOTAL	**20907**								

Table 7.3: Volume of Water exiting CICL's Operational Area at CODA (ML), Salinity (µS/cm) and Salt Load (Tonnes) in 2012/13

Month	CODA @ OUTFALL		
	ML	µS/cm	Salt/T
July	0		0
August	89	385	53
September	644	308	310
October	2574	150	604
November	1709	126	336
December	2206	133	457
January	2874	105	472
February	1426	236	525
March	2274	276	981
April	229	555	199
May	1143	270	0
June	1863	212	618
Total SALT/T	**17033**		**4556**

Table 7.4 represents a **Simple Annual Salt Balance** comprising the imported, exported and retained Salt Load for the area associated with each separate water supply work. This satisfies requirement 12.16 in the amended approval 40CA401473 of August 2012.

Table 7.4: CID Simple Salt Balance (Tonnes) in 2012/13

IMPORTED SALT	Tonnes	EXPORTED SALT	Tonnes
MAIN CANAL	117524	CCD	1149
COL BORE	397	CODD	219
HORT BORE	17	DC800A	4725
		Tombullen	11875
TOTAL	**117938**	**TOTAL**	**17968**
Balance	**99969**		

The salt balance does not include the amount of salt going into the shallow or deep groundwater. It is acknowledged that some salt would be exported out of the area through both shallow groundwater and deep groundwater movement and this is further complicated by groundwater extractions by holders of private irrigator licences.

For this report, a conversion factor of 1,000 µS/cm in 1 L = 640 mg of salt has been used. Effectively 1 ML of water at an EC of 1000 µS/cm contains 640 kg of salt.

8. Groundwater Conditions

8.1 Groundwater Conditions within the Area of Operation

CICL has a network of piezometers throughout its Area of Operations which is used to monitor groundwater conditions. The primary readings are taken in on 1st September (+/- 2 weeks) with the data analysed using Arc Map GIS and MS Excel software.

In September 2013, all of CICL's 737 licensed piezometers were read. Of these, 52 were recorded as being dry, seven as blocked and seven damaged. Blocked piezometers will likely be cleared and damaged piezometers assessed for renewal during maintenance works scheduled for April annually.

Piezometers are read to an accuracy of +/- 5cm, with the data obtained presented as per the Licence monitoring requirements. Data analysis and mapping is performed on a split set of data:

1) Levels from the upper Shepparton aquifer via piezometers < 12m deep
2) Levels from the lower Shepparton aquifer via piezometers 12m - 60m deep

All Licence piezometers with a recorded depth are mapped, with the exception of any dry/blocked readings within 4m of the natural surface, and all those recorded as buried/damaged/flooded, as their inclusion would falsely influence groundwater modelling.

For comparative purposes, groundwater levels in the previous year and in the baseline year of 1998 are presented along with the current year. The inclusion of the previous year highlights the change in conditions from the last season to the present, whilst the inclusion of the baseline year allows a comparison with groundwater conditions in the year following CICL's privatisation.

Figures 8.1 and 8.2 are contour maps of the piezometric levels below natural surface for September 2013. A 3-D interpolated and gridded surface of piezometric levels was created from point measurements (depth to water below natural surface at each piezometer) by using the inverse distance weighted (IDW) method of interpolation. This method requires inputs of x- and y- coordinates for location and a z- coordinate for the piezometric level. An output grid cell size of 100m was created, giving a unit cell area of 1 ha. The number of neighbours sampled was 12 and a power of two as the exponent of distance.

Tables 8.1 and 8.2 are tabular representations of Figures 8.1 and 8.2 respectively.

Tab 8.1: Groundwater depth below natural surface; 0-12m piezometers; Sep 2013

Groundwater Depth Below Natural Surface (m)	2013 Area (ha)
0-1	194
1-2	3,543
2-4	45,141
4-6	25,577
6-8	10,081
8+	11,266
Total	**95,802**

From Table 8.1 for 0-12m depth piezometers 51% of the mapped groundwater area existed in the 0-4m zone in 2013.

Fig 8.1: Groundwater depth below natural surface; 0-12m piezometers; Sep 2013

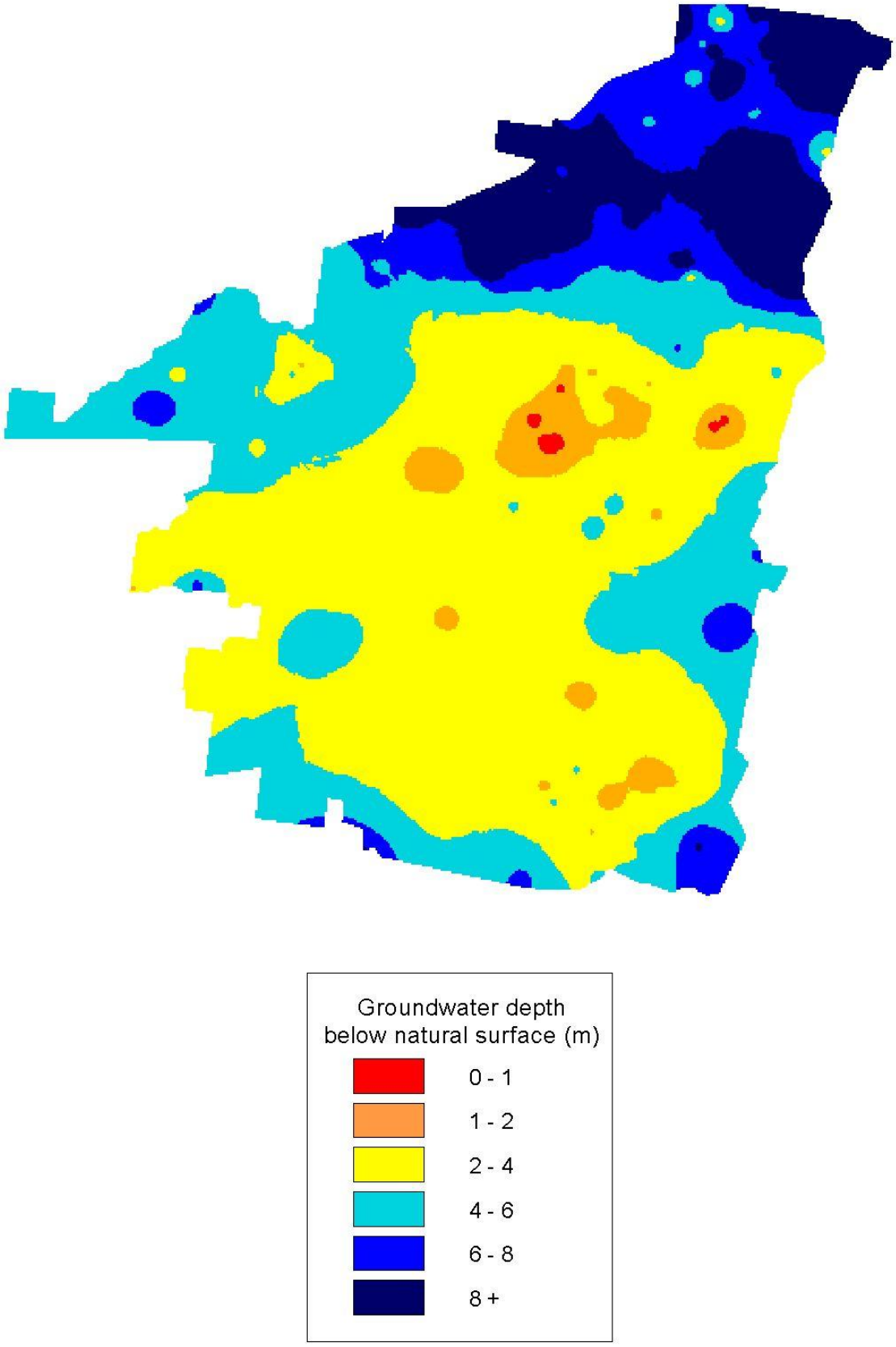
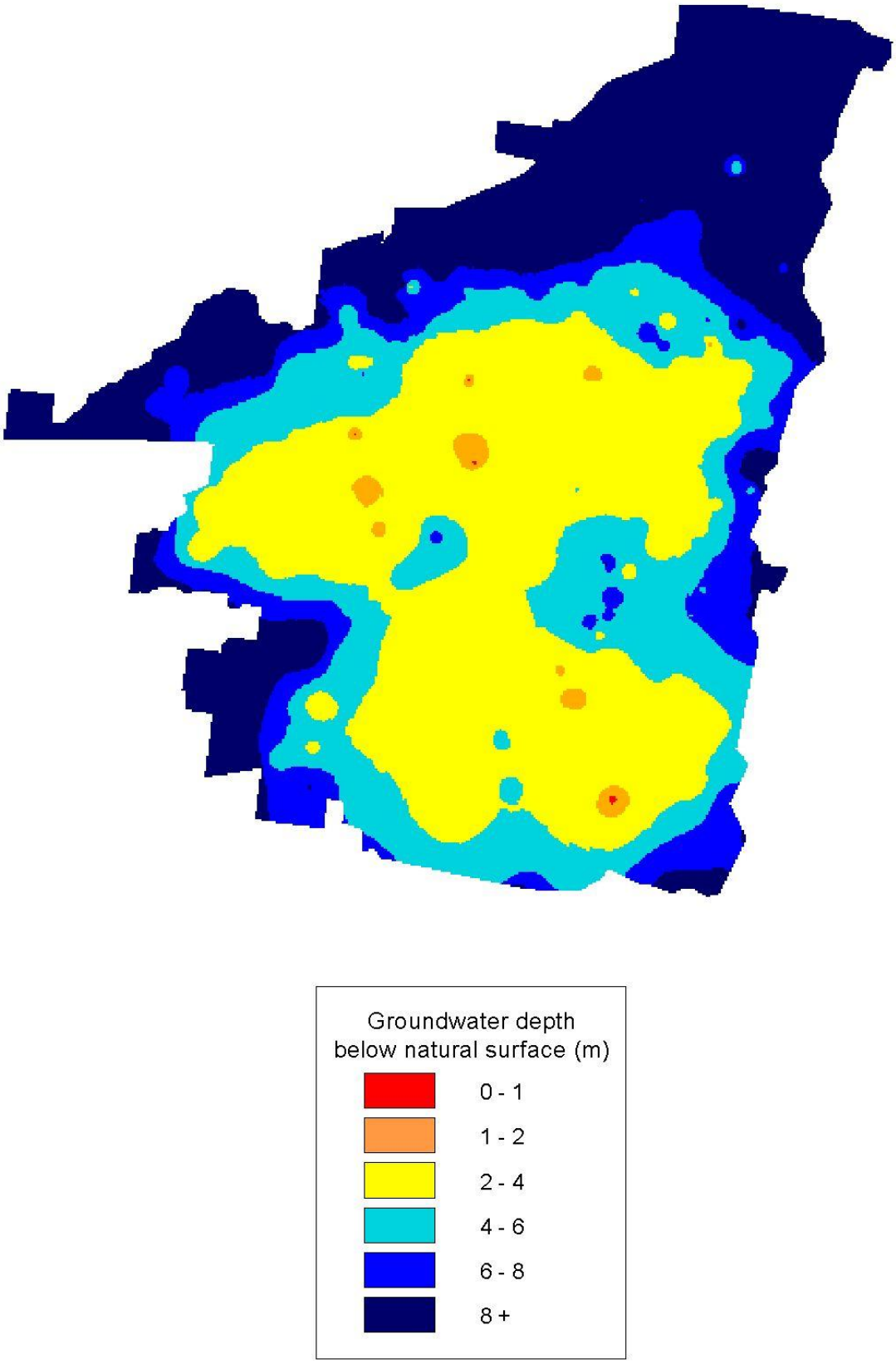


Fig 8.2: Groundwater depth below natural surface; 12-60m piezometers Sep 2013



Tab 8.2: Groundwater depth below natural surface; 12-60m piezometers; September 2013

Groundwater Depth Below Natural Surface (m)	2013 Area (ha)
0-1	16
1-2	828
2-4	36,189
4-6	20,833
6-8	11,045
8+	26,891
Total	**95,802**

From Table 8.2 for 12-60m depth piezometers 39% of the mapped groundwater area existed in the 0-4m zone in 2013.

Figures 8.3 and 8.4 depict the groundwater depth below natural surface, in the years 2013 and 1998, as converted to the Australian Height Datum (AHD) and mapped for all of the 0-12m and 12-60m piezometers, signifying the upper and lower parts of the Shepparton Aquifer, respectively. These levels represent the groundwater height above sea level and can be used to identify the direction of groundwater flow. In general, the direction of groundwater flow is WSW.

Tables 8.3 and 8.4 are tabular representations of Figures 8.3 and 8.4 respectively.

Tab 8.3: Groundwater depth below natural surface; 0-12m piezometers; Sep 2013 versus Sep 1998

Groundwater Depth Below Natural Surface (mAHD)	2013 Area (ha)	1998 Area (ha)
123 – 127 (higher)	2,377	6,381
119 - 122	30,798	42,337
115 - 118	37,693	34,921
111 - 114	22,667	11,432
107 - 110	2,267	731
94 – 106 (lower)	0	0
Total	**95,802**	**95,802**

Tab 8.4: Groundwater depth below natural surface; 12-60m piezometers; Sep 2013 versus Sep 1998

Groundwater Depth Below Natural Surface (mAHD)	2013 Area (ha)	1998 Area (ha)
123 – 127 (higher)	158	4,151
119 - 122	22,961	39,182
115 - 118	36,235	31,548
111 - 114	21,529	11,211
107 - 110	10,296	5,724
94 – 106 (lower)	4,623	3,986
Total	**95,802**	**95,802**

Fig 8.3: Groundwater level (AHD); 0-12 m and 12-60m piezometers; Sep 2013

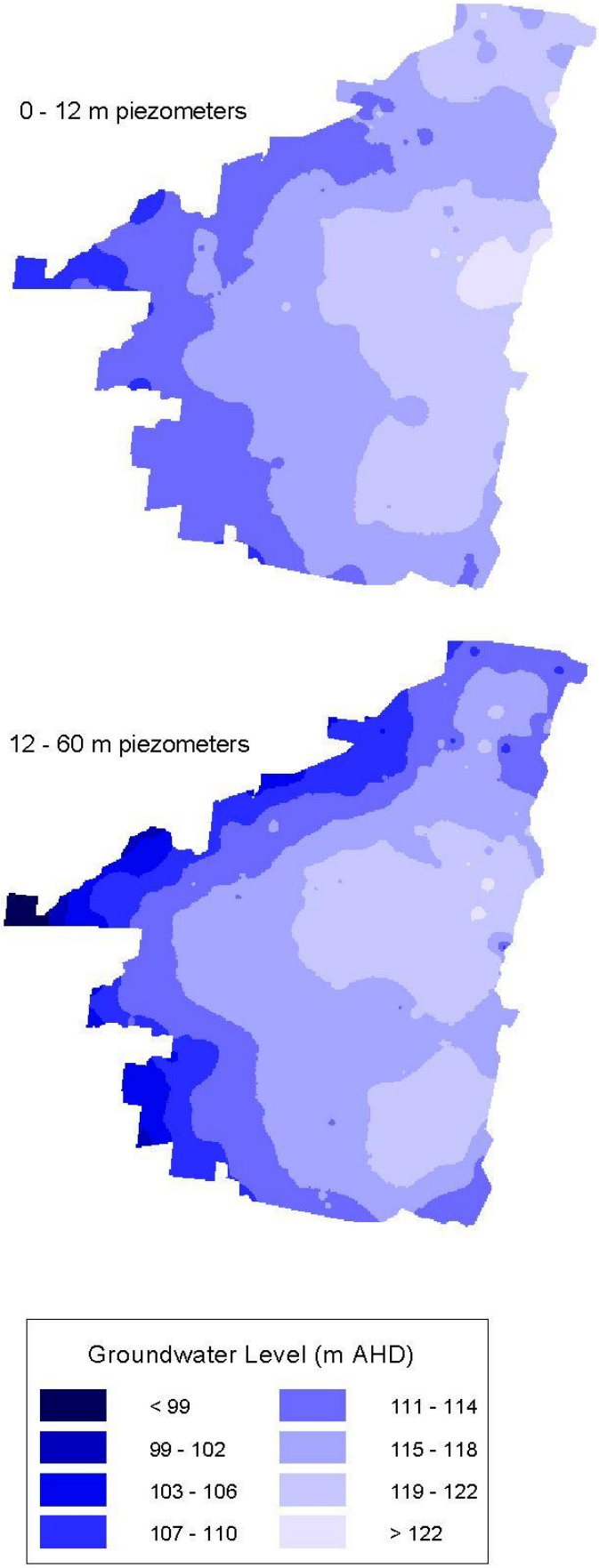
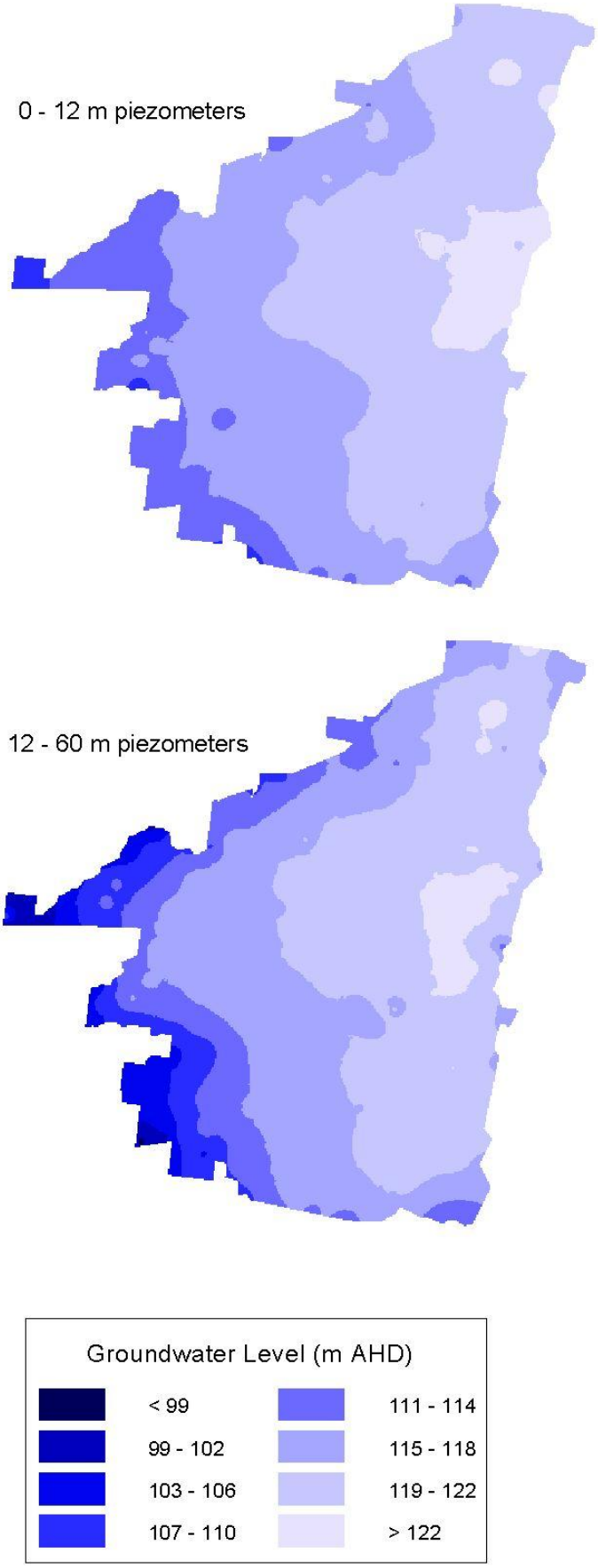


Fig 8.4: Groundwater level (AHD); 0-12 m & 12-60m piezometers; Sep 1998



From Tables 8.3 and 8.4, groundwater level is currently significantly lower than that in the historical reference (baseline) of 1998. Areas associated with the highest 123-127mAHD levels decreased by 4,004 ha and 3,993 ha for 0-12m and 12-60m piezometers, respective.

Figures 8.5 and 8.6 depict the changes in September groundwater depth below natural surface, from 2012 to 2013 and, as a comparison, from 1998 to 2013, for both 0-12m and 12-60m piezometers, respectively.

Negative values indicate areas with lower (deepening) groundwater and conversely, positive numbers indicate areas with higher (rising) groundwater.

Tables 8.5 and 8.6 are tabular representations of Figures 8.5 and 8.6 respectively.

Tab 8.5: Area of changed groundwater depth below natural surface; 0-12m piezometers; years 2012 to 2013, and years 1998 to 2013

Change in Groundwater Depth Below Natural Surface (m) [+ = rising][– = falling]	Years and Area of Changed Groundwater Depth (ha)	
	1998 to 2013	**2012 to 2013**
>4	0	0
2 to 4	0	8
0 to 2	21,924	95,710
-2 to 0	62,178	84
-4 to -2	11,620	0
<-4	80	0
Total	**95,802**	**95,802**

Tab 8.6: Area of changed groundwater depth below natural surface; 12-60m piezometers; years 2012 to 2013, and years 1998 to 2013

Change in Groundwater Depth Below Natural Surface (m) [+ = rising][– = falling]	Years and Area of Changed Groundwater Depth (ha)	
	1998 to 2013	**2012 to 2013**
>4	0	0
2 to 4	319	52
0 to 2	23,606	95,430
-2 to 0	47,750	320
-4 to -2	11,388	0
<-4	12,739	0
Total	**95,802**	**95,802**

From 1998 to 2013, Table 8.5 (0-12m piezometers) indicates that the majority (73,878 ha or 77%) of the CIA underwent a fall in groundwater conditions. Similarly for 1998-2013, Table 8.6 (12-60m piezometers) also indicates a vast majority (71,877 ha or 75%) having fallen in groundwater level. That is, for the majority of the CIA, groundwater conditions are still significantly 'deeper' in 2013 as compared to 1998.

Fig 8.5: Changes in groundwater depth below natural surface; 0-12m piezometers; years 2012 to 2013, and years 1998 to 2013

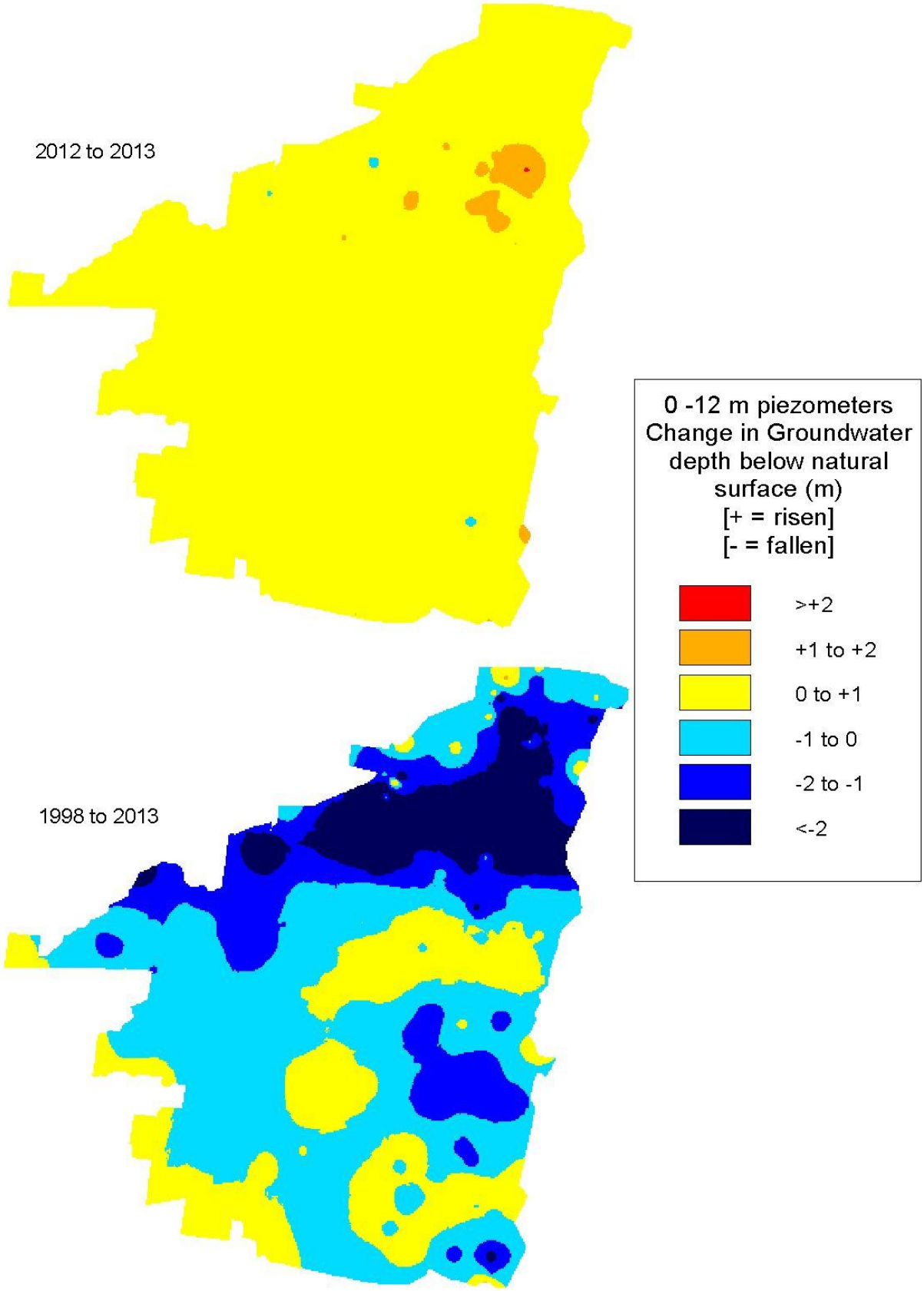


Fig 8.6: Changes in groundwater depth below natural surface; 12-60m piezometers; years 2012 to 2013, and years 1998 to 2013

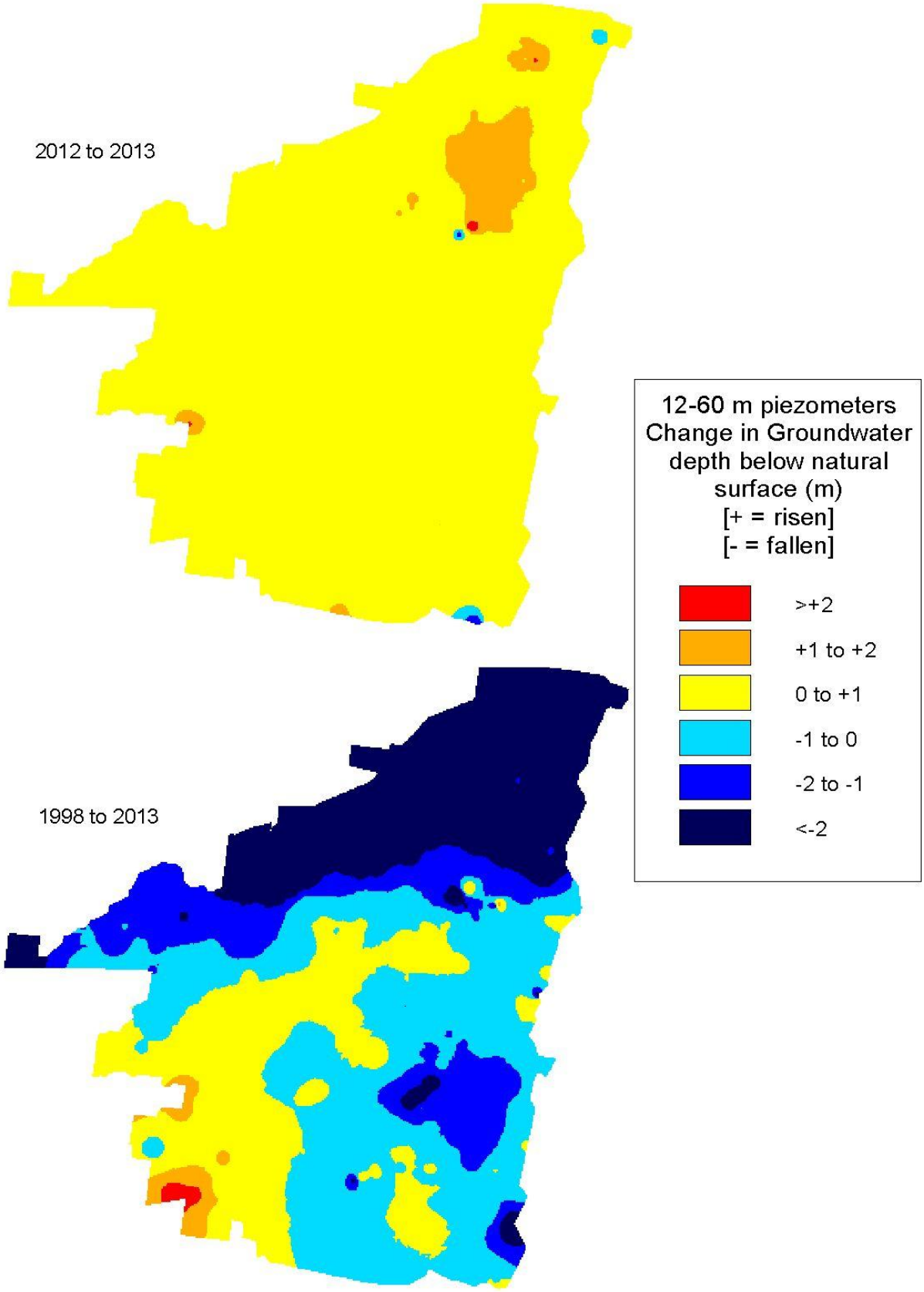


Table 8.5 (0-12m piezometers) indicates that in comparison the water table rose across 99% of the CIA in 2012-13. Table 8.6 (12-60m piezometers) indicates a similar rise.

Irrigation Bores located within CICL's Area of Operations comprising CIA, Kerarbury & WCC LWMP Areas

The total metered groundwater usage for the past two seasons and for the baseline season of 1998/99 is presented in Table 8.5. For the 2012/13 season, the total groundwater extraction within CICL's operational area was 68,940ML. This represents a slight increase over the previous year but the level is still low relative to past levels of extraction and this can be attributed to high surface water allocations, the low cost of temporary water and the mounting costs associated with operating diesel or electrically powered bores.

Table 8.5: Groundwater Extractions in CICL's Area of Operation in 2012/13

LWMP Area	Number of bore licences (2012/13)	Extraction 2012/13 (ML)	Extraction 2011/12 (ML)	Extraction 1998/99 (ML) [baseline]
Coleambally	54	33,778	16,691	28,714
Kerarbury	21	32,770	16,194	29,161
WCC/Outfall	29	8,504	4,240	11,065
Total	**102**	**75,052**	**37,085**	**68,940**

9. Environment Protection Licence

9.1 Water Quality

CICL's surface water quality program is aimed at monitoring supply and drainage water quality within CICL's operational area, including at the licensed discharge points. The program monitors flow, turbidity, dissolved oxygen, pH, salinity, chemical and nutrient levels at various points in compliance with licence conditions. CICL's water quality monitoring sites are shown in Figure 9.1.

There are three licensed drainage discharge points; Coleambally Outfall Drain monitoring site A (CODA) is used as a licensed site in place of Coleambally Outfall Drain monitoring site D (CODD) for the Rice Chemical Management Program (RCMP). Although the CODA site is not identified in the Environment Protection Licence (EPL), the site has been selected for its accessibility and is listed as an approved monitoring site. This arrangement has previously been agreed with the Department of Environment and Conservation (DEC) NSW Office of Water the NSW Office of Water.

The amended approval 40CA401473 of August 2012 refers to the above discharge points; however a different terminology has been used to identify these sites. Table 9.1 shows the various names used within the Environmental Protection Licence (EPL) and the amended approval 40CA401473 of August 2012(IC4).

At the licensed sites the flow, salinity and temperature of the drainage water are monitored continuously. Monthly water samples are collected from these sites and are analysed for chemicals as required by the EPL. Samples are also collected and analysed from one supply site at the Main Canal (CCS) and one escape site (CE-160-2). CCS is constantly monitored for salinity.

Figure 9.1: Water Quality Monitoring Sites

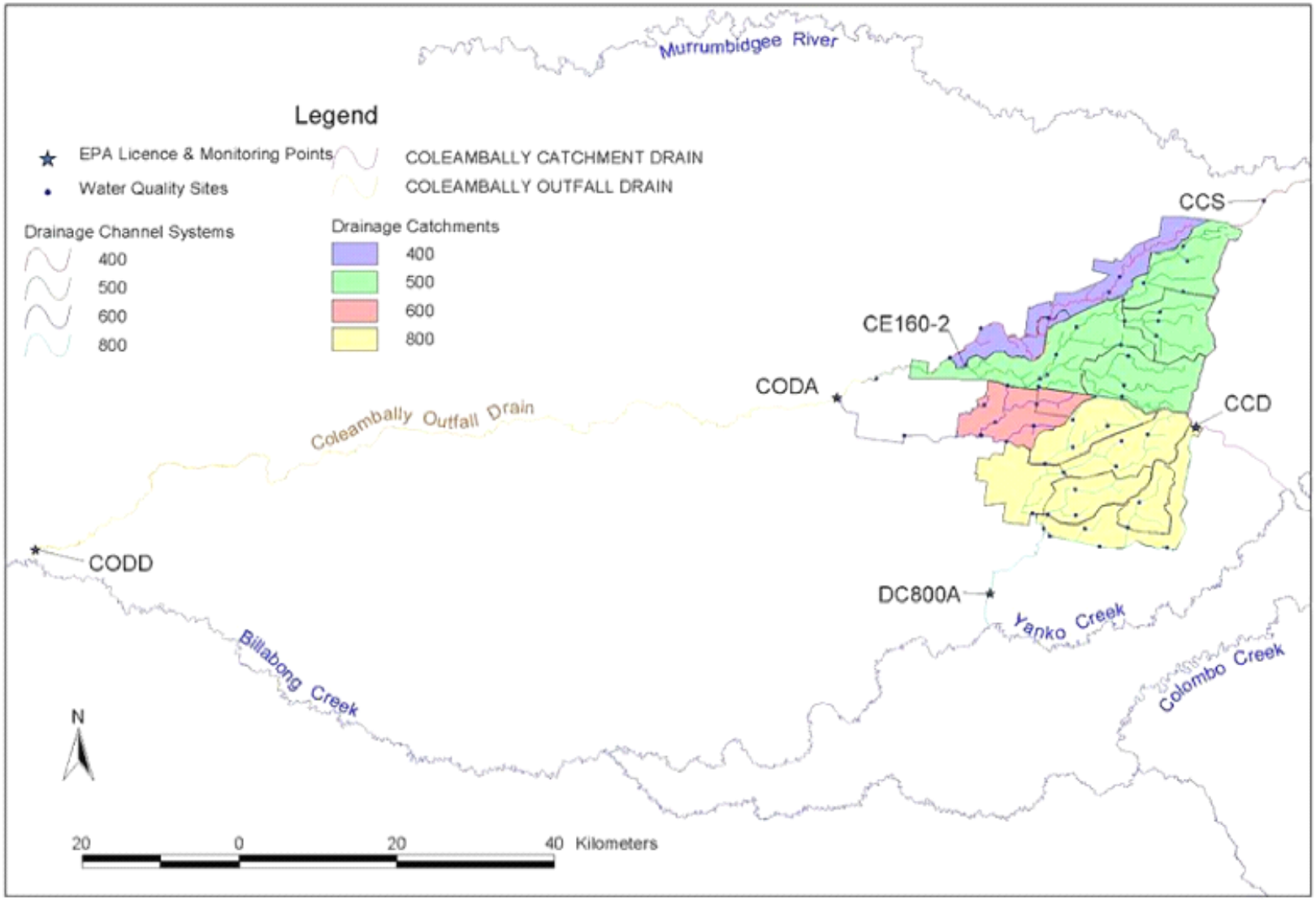


Table 9.1: Site Names used within the EPL and IC4

Site	Name in EPL	Name in Combined Licence Package
1	DC800A, Highway 321 (Kidman Way) near Bundure Rd	DC800 to Yanco Creek
2	CODA*	DC500 & 600 at WCCA
3	CODD, downstream of Moulamein-Wanganella Bridge	Bundy (Eurolie Creek)
4	Coleambally Catchment Drain at Oakvale Rd	

9.2 Rice Chemical Monitoring Program (RCMP)

From October to December each year samples are collected from 21 sites and are analysed for Molinate levels as part of the RCMP.

Weekly sampling commenced on 5th October and concluded on 20th December, 2012 with 7 positive detections of Molinate at the licence points over the notification level of 3.5ppb recorded.

Molinate levels are used as an indicator of the presence of other rice chemicals in the drainage water.

Please see appendix Table A9.2 for individual report results.

9.3 Chemical Use

Table 9.2: CICL Chemical Usage in 2012/13

Product	Litres or Kg	
Access	116	Boxthorns
Amitrol T	0	Umbrella Sedge in Drains
Dicamba (Kamba)	1960	Horehound
Eject / Oust / Excalibur	0	Around Flume Gates
Garlon	0	Willows along Main, cut bark application
Glyphosate	6000	Roundup on Mature weeds
Goal/ Cavalier/ Striker/ Oxen	0	St Johns Wort
LI700 / VC700 / Wilt(wetter)	20	Adjuvant
MCPA 750	20	Older Bathurst Burrs along Outfall Drain.
Smart 450	320	Weeds in trust blocks
Starane	1120	Cumbungi in Channels & Drains
Sulfomac 750	0	Regrowth along Outfall Drain
Surpass 300	5	Regrowth along Outfall Drain
Tordon	30	With Goal and Amitrol
Wetta (Hotup /Bowlem)	4000	Adjuvant
Total	**13611**	

9.4 Reportable Incidents

There were no reportable water quality incidents in 2012/13.

10. Appendices

10.1 A1 Groundwater (Piezometer) Monitoring Data

No	sub-region	Piezo depth range (m)	Top of pipe (m AHD)	Top of pipe above NS (m)	Natural Surface [NS] (m AHD)	Pipe depth below NS (m)	RD0913	Comm0913
1	Boona	12-60	128.60	0.08	128.52	20.60	17.30	
4	Boona	12-60	128.90	0.38	128.52	24.70	16.90	
5	Boona	12-60	128.00	0.20	127.80	20.60	15.45	
10	Boona	12-60	128.00	0.50	127.50	21.60	9.62	
17	Boona	12-60	124.40	0.20	124.20	27.00	16.85	
19	Boona	12-60	124.30	0.55	123.75	18.50	18.00	
25	Boona	12-60	125.00	0.00	125.00	26.90	12.28	
94	Boona	12-60	128.20	0.60	127.60	20.60	9.55	
96	Boona	12-60	127.30	0.25	127.05	24.40	12.07	
200	Boona	12-60	128.40	0.10	128.30	25.30	15.25	
201	Boona	12-60	128.40	0.10	128.30	32.40	8.65	
202	Boona	12-60	125.80	0.35	125.45	18.70	10.13	
203	Boona	12-60	124.80	0.35	124.45	26.90	13.53	
204	Boona	12-60	127.60	0.40	127.20	34.90	10.25	
207	Boona	12-60	124.10	0.40	123.70	25.90	17.29	
208	Boona	12-60	124.30	0.30	124.00	35.40	17.50	
376	Boona	12-60	127.30	0.44	126.86	31.90	15.20	
392	Boona	12-60	120.90	0.90	120.00	14.20	10.00	
396	Boona	12-60	122.10	0.73	121.37	32.50	4.17	
437	Boona	12-60	119.90	0.10	119.80	26.90	9.65	
443	Boona	12-60	121.10	0.28	120.82	26.10	10.25	
502	Boona	12-60	119.30	0.82	118.48	28.40	10.42	
503	Boona	12-60	120.50	0.20	120.30	27.60	13.13	
504	Boona	12-60	120.40	0.33	120.07	28.80	15.32	
507	Boona	12-60	120.60	0.20	120.40	39.00	20.35	
508	Boona	12-60	120.50	0.18	120.32	25.40	21.49	
509	Boona	12-60	119.20	0.05	119.15	21.90	20.00	
510	Boona	12-60	120.90	0.27	120.63	23.20	18.30	
520	Boona	12-60	121.80	0.28	121.52	21.60	14.46	
521	Boona	12-60	123.40	0.54	122.86	21.60	16.05	
594	Boona	12-60	121.80	0.41	121.39	17.70	12.82	
595	Boona	12-60	122.90	0.20	122.70	21.20	14.70	
596	Boona	12-60	123.10	0.25	122.85	23.30	14.96	
598	Boona	12-60	121.70	0.00	121.70	22.90	14.00	
614	Boona	12-60	122.70	0.45	122.25	15.50	15.73	
615	Boona	12-60	123.60	0.30	123.30	15.80	15.90	dry@rd15.90m
617	Boona	12-60	124.90	0.60	124.30	24.90	7.80	
618	Boona	12-60	124.60	0.46	124.14	12.60	7.70	
619	Boona	12-60	124.90	0.00	124.90	24.10	6.44	
620	Boona	12-60	123.90	0.30	123.60	26.90	8.42	
621	Boona	12-60	126.90	0.23	126.67	30.40	11.65	

622	Boona	12-60	125.90	0.63	125.27	22.10	10.13	
623	Boona	12-60	125.30	0.47	124.83	12.40	6.74	
624	Boona	12-60	127.20	0.00	127.20	19.80	10.13	
625	Boona	12-60	123.30	0.13	123.17	26.90	10.48	
629	Boona	12-60	129.80	0.30	129.50	29.40	15.46	
631	Boona	12-60	130.30	0.13	130.17	31.30	19.10	
635	Boona	12-60	129.60	0.31	129.29	31.90	17.95	
636	Boona	12-60	129.20	0.26	128.94	16.80	12.62	
637	Boona	12-60	128.90	0.24	128.66	28.20	11.23	
643	Boona	12-60	127.30	0.27	127.03	21.90	12.75	
644	Boona	12-60	127.30	0.45	126.85	12.30	12.75	dry@rd12.75m
645	Boona	0-12	126.60	0.32	126.28	11.90	7.88	
647	Boona	0-12	128.50	0.25	128.25	11.90	10.55	dry@rd10.55m
648	Boona	12-60	127.90	0.60	127.30	12.60	9.85	
651	Boona	12-60	126.40	0.50	125.90	12.90	8.63	
652	Boona	12-60	125.90	0.80	125.10	12.60	10.37	
653	Boona	12-60	127.00	0.00	127.00	21.80	10.38	
654	Boona	12-60	126.50	0.25	126.25	32.50	16.59	
656	Boona	12-60	126.40	0.00	126.40	27.30	15.05	
661	Boona	12-60	128.60	0.19	128.41	14.40	14.16	
662	Boona	12-60	126.50	0.28	126.22	13.80	12.43	
667	Boona	0-12	127.00	0.70	126.30	7.50	6.60	
697	Boona	12-60	123.40	0.54	122.86	21.90	18.02	
698	Boona	12-60	123.50	0.19	123.31	20.60	17.30	
725	Boona	12-60	126.30	0.25	126.05	27.10	12.24	
726	Boona	0-12	126.60	0.55	126.05	5.10	5.10	dry@rd5.10m
730	Boona	12-60	124.90	0.12	124.78	23.90	19.35	
732	Boona	12-60	124.90	0.28	124.62	23.20	5.20	blocked@rd5.20m
734	Boona	12-60	124.70	0.14	124.56	18.90		destroyed
738	Boona	0-12	126.50	0.25	126.25	10.90	9.65	
739	Boona	12-60	126.20	0.40	125.80	18.30	9.55	
752	Boona	0-12	127.30	0.36	126.94	11.80	10.27	
790	Boona	0-12	127.30	0.25	127.05	9.40	9.35	dry@rd9.35m
804	Boona	12-60	123.30	0.30	123.00	32.50	15.46	
805	Boona	0-12	123.30	0.25	123.05	11.80	11.56	dry@rd11.56m
806	Boona	12-60	123.50	0.27	123.23	34.70	14.75	
807	Boona	12-60	123.30	0.05	123.25	20.40	14.34	
834	Boona	12-60	127.30	0.15	127.15	36.40	18.74	
835	Boona	0-12	127.30	0.15	127.15	5.90	1.90	
836	Boona	12-60	126.20	0.20	126.00	23.60	15.95	
837	Boona	0-12	126.30	0.25	126.05	11.50	11.50	dry@rd11.50m
839	Boona	12-60	130.50	0.10	130.40	22.60	12.30	
843	Boona	12-60	127.30	0.10	127.20	21.70	17.55	
845	Boona	12-60	127.40	0.00	127.40	23.50	18.30	
846	Boona	12-60	126.80	0.05	126.75	20.90		destroyed
946	Boona	12-60	125.90	0.94	124.96	23.30		destroyed
949	Boona	0-12	128.60	0.17	128.43	10.50	10.80	dry@rd10.80m
952	Boona	12-60	126.00	0.00	126.00	30.30	13.45	
954	Boona	12-60	126.60	0.00	126.60	14.10	11.66	

964	Boona	12-60	124.20	0.13	124.07	27.50	14.54	
966	Boona	12-60	124.90	0.10	124.80	21.00	16.47	
967	Boona	12-60	123.80	0.20	123.60	26.60	13.28	
968	Boona	12-60	129.70	0.16	129.54	24.80	12.82	
969	Boona	12-60	130.00	0.45	129.55	14.30	12.52	
974	Boona	12-60	128.30	0.23	128.07	25.70	12.42	
977	Boona	12-60	129.90	0.13	129.77	24.00	17.92	
980	Boona	0-12	128.32	1.10	127.22	11.60	11.70	
983	Boona	12-60	130.10	0.00	130.10	33.20	19.78	
985	Boona	12-60	126.60	0.19	126.41	30.60	13.20	
986	Boona	0-12	126.70	0.30	126.40	11.10	10.87	
1154	Boona	12-60	122.20	0.00	122.20	27.90	10.82	
1165	Boona	12-60	122.50	0.23	122.27	32.30	12.30	
1166	Boona	0-12	122.70	0.05	122.65	9.20	9.20	dry@rd9.20m
1177	Boona	12-60	121.30	0.08	121.22	31.80	9.55	
1596	Boona	0-12	123.50	0.12	123.38	9.70	10.50	dry@10.50m
1616	Boona	0-12	121.80	0.16	121.64	5.60	6.90	dry@rd6.90m
1635	Boona	12-60	126.20	0.15	126.05	13.60	11.00	
1659	Boona	12-60	128.60	0.12	128.48	27.50	11.66	
1660	Boona	12-60	128.20	0.10	128.10	30.90	11.85	
1661	Boona	0-12	128.40	0.27	128.13	12.00	12.00	dry@rd12.00m
1740	Boona	12-60	118.90	0.34	118.56	25.70	21.14	
1780	Boona	0-12	123.20	0.20	123.00	10.80	10.50	
2141	Boona	12-60	130.64	0.30	130.34	22.40	18.15	
2142	Boona	12-60	130.60	0.17	130.43	23.30	17.30	
2288	Boona	0-12	123.00	0.15	122.85	11.10	11.73	
2377	Boona	0-12	119.85	0.25	119.60	10.50	10.23	
2456	Boona	0-12	120.61	0.20	120.41	10.80	10.80	dry@rd10.80m
2458	Boona	0-12	119.61	0.28	119.33	11.10	11.10	dry@rd11.10m
2723	Boona	0-12	123.05	0.22	122.83	7.40	7.28	
2727	Boona	0-12	122.83	0.24	122.59	5.20	6.40	dry@rd6.40m
4250	Boona	12-60	125.30	0.28	125.02	20.10	10.65	
4372	Boona	0-12	122.29	0.00	122.29	9.10	8.65	
4375	Boona	12-60	122.29	0.44	121.85	18.20	10.05	
4546	Boona	12-60	121.19	0.35	120.84	19.40	14.82	
4547	Boona	12-60	121.30	0.23	121.07	19.10	14.65	
4548	Boona	12-60	128.00	0.35	127.65	18.30	19.80	dry@rd19.80m
4558	Boona	12-60	127.10	0.20	126.90	21.50	16.03	
4912	Boona	12-60	129.20	0.20	129.00	13.70	14.00	dry@rd14.00m
4914	Boona	0-12	128.45	0.32	128.13	6.90	4.17	
5588	Boona	12-60	118.81	0.16	118.65	25.50	15.85	
5911	Boona	12-60	115.97	0.29	115.68	13.10	13.10	dry@rd13.10m
5915	Boona	0-12	116.34	0.18	116.16	8.80	8.80	dry@rd8.80m
5935	Boona	12-60	116.57	0.15	116.42	20.70	10.33	
6102	Boona	0-12	117.39	0.22	117.17	11.60	11.60	dry@rd11.60m
9320	Boona	12-60	129.49	0.00	129.49	13.80	13.80	dry@rd13.80m
9323	Boona	12-60	128.17	0.18	127.99	14.20	10.40	
9324	Boona	12-60	128.58	0.20	128.38	14.10	14.10	
9326	Boona	12-60	123.66	0.20	123.46	13.40	11.84	

9329	Boona	0-12	130.20	0.05	130.15	9.20	9.83	dry@rd9.83m
9331	Boona	0-12	124.95	0.33	124.62	7.10	7.53	
9376	Boona	0-12	128.25	0.27	127.98	4.50	4.50	dry@rd4.50m
9379	Boona	12-60	127.90	0.21	127.69	12.40	8.27	
12166	Boona	12-60	122.85	0.30	122.55	31.83	16.46	
12171	Boona	12-60	122.65	0.07	122.58	16.00	11.45	
12188	Boona	0-12	121.37	0.10	121.27	9.70	8.17	
12190	Boona	12-60	121.73	0.26	121.47	22.01	15.77	
12191	Boona	12-60	121.23	0.15	121.08	22.00	17.86	
12192	Boona	0-12	120.91	0.14	120.77	10.15	9.18	
12194	Boona	0-12	119.59	0.24	119.37	9.25	7.15	
12197	Boona	12-60	127.20	0.22	126.98	19.02	17.68	
12201	Boona	12-60	128.92	0.25	128.67	23.60		blocked@rd2.20m
12202	Boona	12-60	129.31	0.25	129.06	32.23	17.55	
12297	Boona	12-60	124.00	0.21	123.79	21.00		destroyed
12298	Boona	0-12	124.02	0.16	123.86	8.90	9.65	
12299	Boona	12-60	124.77	0.20	124.57	22.20	11.20	
12311	Boona	0-12	127.20	0.15	127.05	10.50	9.18	
12312	Boona	0-12	127.13	0.27	126.86	6.00	6.00	dry@rd6.00m
12313	Boona	12-60	126.64	0.29	126.35	19.00		damaged
12314	Boona	0-12	126.63	0.26	126.37	8.20	6.50	
12315	Boona	0-12	126.62	0.22	126.40	6.00	4.80	
12316	Boona	12-60	127.07	0.16	126.91	21.00	16.83	
12317	Boona	0-12	127.09	0.39	126.70	6.60	3.87	
12321	Boona	0-12	128.72	0.19	128.53	11.30	10.30	
12323	Boona	0-12	127.53	0.37	127.16	9.50	7.95	
12332	Boona	0-12	128.32	0.30	128.02	9.00	6.30	dry@rd6.30m
12333	Boona	0-12	127.51	0.26	127.25	9.40	10.80	dry@rd10.80m
12334	Boona	0-12	128.69	0.22	128.47	8.50	7.94	
12347	Boona	12-60	119.93	0.22	119.71	15.90	7.45	
12349	Boona	12-60	121.16	0.26	120.90	16.30	8.75	
12350	Boona	0-12	118.68	0.14	118.54	6.00	5.35	dry@rd5.35m
12381	Boona	0-12	124.69	0.30	124.39	9.00	10.00	dry@rd10.00m
12383	Boona	12-60	126.83	0.13	126.70	15.50	11.58	
12389	Boona	12-60	130.48	0.23	130.25	21.90	14.72	
12391	Boona	12-60	131.28	0.25	131.03	17.00	15.58	
12393	Boona	0-12	125.20	0.00	125.20	10.00	10.00	
12394	Boona	0-12	125.59	1.00	124.59	12.00	8.40	
12401	Boona	12-60	127.82	0.15	127.67	15.00	11.30	
12402	Boona	12-60	125.99	0.16	125.83	19.50	6.85	
12403	Boona	0-12	127.05	0.28	126.77	9.80	9.80	dry@rd9.80m
12404	Boona	12-60	125.86	0.27	125.59	12.70	9.85	
12405	Boona	12-60	125.94	0.29	125.65	14.50	9.83	
12406	Boona	12-60	125.38	0.22	125.16	17.00	9.72	
12407	Boona	12-60	126.24	0.23	126.01	12.10	11.45	
12409	Boona	0-12	125.84	0.05	125.79	11.30	9.85	
12430	Boona	0-12	126.34	0.25	126.09	9.80	9.95	dry@rd9.95m
12431	Boona	0-12	125.97	0.20	125.77	9.80	9.16	
12432	Boona	12-60	125.37	0.04	125.33	17.10	8.47	

12434	Boona	0-12	126.16	0.18	125.98	10.80	7.50	
12436	Boona	0-12	123.32	0.03	123.29	11.30		damaged
12437	Boona	0-12	124.34	0.11	124.23	8.00	3.47	
12438	Boona	0-12	123.89	0.10	123.79	8.80	5.95	
12512	Boona	12-60	129.21	0.34	128.87	22.50	17.20	
12514	Boona	12-60	131.26	0.34	130.92	16.30	13.48	
12528	Boona	12-60	126.96	0.20	126.76	17.50	17.80	dry@rd17.80m
12529	Boona	0-12	127.18	0.10	127.08	10.30	10.30	dry@rd10.30m
12534	Boona	12-60	126.72	0.17	126.55	15.80	4.50	
12542	Boona	12-60	125.80	0.00	125.32	11.77	10.18	
12564	Boona	12-60	125.60	0.30	125.30	19.50	14.56	
12567	Boona	12-60	127.70	0.25	127.45	18.00	15.18	
12568	Boona	0-12	128.70	0.10	128.60	12.00	12.60	dry@rd12.60m
12569	Boona	12-60	124.10	0.17	123.93	12.16	8.12	
12570	Boona	0-12	123.40	0.30	123.10	11.60	9.55	
12571	Boona	0-12	123.10	0.16	122.94	11.00	7.64	
12572	Boona	0-12	122.60	0.37	122.23	11.30	8.05	
12573	Boona	12-60	123.10	0.20	122.90	26.50	11.27	
12574	Boona	0-12	123.10	0.10	123.00	11.30	9.52	
12576	Boona	12-60	121.60	0.20	121.40	14.30	8.22	
12577	Boona	0-12	121.30	0.20	121.10	11.80	8.28	
12578	Boona	0-12	121.00	0.38	120.62	11.30	8.42	
12580	Boona	0-12	119.60	0.13	119.47	8.80	4.85	
12619	Boona	12-60	119.80	0.18	119.62	17.30	5.64	
12622	Boona	12-60	119.66	0.16	119.50	17.80	7.53	
12623	Boona	12-60	120.51	0.30	120.21	24.50	8.05	
12708	Boona	0-12	122.64	0.18	122.46	11.30	8.15	
12848	Boona	12-60	122.47	0.20	122.27	21.80	19.82	
12962	Boona	12-60	132.16	0.35	131.81	33.00	19.80	
12972	Boona	12-60	125.06	0.17	124.89	18.50	6.74	
12972	Boona	12-60	125.05	0.18	124.87	48.00	13.35	
12998	Boona	12-60	120.48	0.17	120.31	26.50	15.30	
12999	Boona	12-60	121.65	0.21	121.44	23.00	16.37	
13000	Boona	12-60	121.93	0.11	121.82	23.00	15.85	
13001	Boona	12-60	123.25	0.16	123.09	20.50	16.78	
13002	Boona	12-60	117.62	0.24	117.38	21.50	11.10	
13003	Boona	12-60	116.52	0.23	116.29	25.18	11.48	
13004	Boona	12-60	116.82	0.29	116.53	26.00	23.37	
13005	Boona	12-60	118.49	0.32	118.17	17.80	9.57	
496	Coly	12-60	118.90	1.30	117.60	27.10	2.25	
498	Coly	12-60	120.50	0.10	120.40	20.50	5.32	
499	Coly	12-60	118.20	0.38	117.82	23.80	3.34	
501	Coly	12-60	119.40	0.47	118.93	16.00	5.85	
626	Coly	12-60	122.90	0.23	122.67	25.50	6.61	
627	Coly	0-12	122.80	0.13	122.67	9.60	5.91	
630	Coly	12-60	128.20	0.56	127.64	19.30	9.90	
655	Coly	12-60	127.50	0.24	127.26	35.90	8.29	
657	Coly	12-60	126.90	0.00	126.90	36.50	8.64	
658	Coly	12-60	124.00	0.34	123.66	22.30	2.91	

659	Coly	0-12	124.30	0.63	123.67	10.20	6.50	
663	Coly	0-12	125.20	0.10	125.10	7.30	4.98	
664	Coly	12-60	125.90	0.16	125.74	19.10	6.19	
665	Coly	12-60	123.20	0.15	123.05	20.10	3.88	
668	Coly	12-60	123.20	0.00	123.20	26.50	6.92	
669	Coly	0-12	123.00	0.00	123.00	11.00	5.91	
673	Coly	12-60	125.10	0.05	125.05	24.90	3.30	
676	Coly	12-60	125.20	0.14	125.06	23.40	2.74	
677	Coly	12-60	125.00	0.05	124.95	15.50	2.63	
678	Coly	12-60	126.70	0.13	126.57	23.60	3.73	
679	Coly	12-60	126.70	0.50	126.20	13.70	3.71	
680	Coly	12-60	126.10	0.00	126.10	23.10	3.48	
681	Coly	12-60	125.90	0.00	125.90	18.70	3.44	
682	Coly	0-12	125.80	0.00	125.80	10.50	3.35	
683	Coly	12-60	126.50	0.00	126.50	23.80	4.16	
684	Coly	0-12	126.50	0.00	126.50	11.20	2.92	
685	Coly	12-60	127.40	0.10	127.30	12.70	4.55	
687	Coly	12-60	127.60	0.00	127.60	22.90	6.16	
688	Coly	12-60	127.80	0.20	127.60	13.70	6.33	
689	Coly	12-60	128.00	0.60	127.40	26.10	11.56	
690	Coly	12-60	127.90	0.26	127.64	27.70	10.42	
691	Coly	12-60	126.70	0.13	126.57	20.70	8.10	
692	Coly	12-60	126.70	0.20	126.50	15.80	7.42	
693	Coly	12-60	127.90	0.41	127.49	24.50	8.30	
695	Coly	12-60	126.40	0.05	126.35	20.40	6.25	
696	Coly	12-60	126.90	0.22	126.68	58.50	16.90	
700	Coly	12-60	123.10	0.17	122.93	24.60	1.95	
701	Coly	12-60	123.20	0.30	122.90	17.10	2.09	
702	Coly	0-12	122.90	0.13	122.77	11.20	1.88	
704	Coly	12-60	123.70	0.05	123.65	24.30	2.82	
708	Coly	12-60	123.80	0.08	123.72	26.20	2.96	
709	Coly	12-60	123.90	0.30	123.60	19.40	3.17	
711	Coly	12-60	125.60	0.00	125.60	27.10	3.24	
753	Coly	12-60	126.50	0.40	126.10	26.70	7.70	
757	Coly	12-60	126.90	0.32	126.58	30.40	8.05	
758	Coly	12-60	126.90	0.35	126.55	15.80	9.18	
762	Coly	12-60	126.10	0.00	126.10	25.90	3.54	
763	Coly	12-60	125.80	0.10	125.70	17.00	3.70	
764	Coly	12-60	124.80	0.10	124.70	20.90	3.80	
765	Coly	12-60	122.40	0.00	122.40	15.60	2.62	
766	Coly	0-12	122.30	0.00	122.30	3.90		dry@rd3.86m
768	Coly	12-60	122.40	0.05	122.35	21.40	2.45	
769	Coly	12-60	122.70	0.30	122.40	16.60	2.67	
789	Coly	12-60	128.10	0.44	127.66	23.70	8.60	
791	Coly	0-12	124.10	0.00	124.10	10.10	4.17	
792	Coly	0-12	124.10	0.06	124.04	4.90	4.24	
793	Coly	0-12	124.20	0.05	124.15	4.50	3.00	
794	Coly	0-12	124.30	0.12	124.18	4.20	1.78	
798	Coly	12-60	122.80	0.15	122.65	19.10	4.00	

799	Coly	0-12	122.90	0.27	122.63	10.90	4.06	
800	Coly	12-60	123.30	0.13	123.17	30.40	3.90	
801	Coly	0-12	123.30	0.18	123.12	8.30	4.11	
802	Coly	12-60	121.20	0.00	121.20	15.00	2.95	
803	Coly	0-12	121.20	0.00	121.20	7.70	2.95	
809	Coly	12-60	119.79	0.00	119.79	25.85	4.52	
810	Coly	12-60	119.82	0.08	119.74	17.10	4.58	
813	Coly	12-60	119.10	0.35	118.75	25.20	9.98	
814	Coly	0-12	118.70	0.00	118.70	7.40	4.43	
815	Coly	12-60	117.50	0.00	117.50	28.70	11.86	
821	Coly	12-60	119.20	0.02	119.18	25.90	4.15	
822	Coly	0-12	118.90	0.02	118.88	9.80	4.09	
826	Coly	0-12	114.90	0.25	114.65	5.80	5.38	dry@rd5.38m
828	Coly	0-12	114.90	0.86	114.60	9.80	8.18	
830	Coly	12-60	116.90	0.34	116.56	19.50	7.41	
831	Coly	0-12	116.90	0.05	116.85	6.30	3.75	
841	Coly	12-60	115.00	0.12	114.88	37.10	15.74	
1012	Coly	12-60	124.50	0.00	124.50	20.80	3.15	
1050	Coly	12-60	117.60	0.18	117.42	33.20	4.38	
1896	Coly	12-60	116.51	0.15	116.36	26.20	9.63	
1897	Coly	12-60	117.50	0.15	117.29	26.40	9.84	
6804	Coly	12-60	128.47	0.00	128.47	28.00	15.64	
9317	Coly	0-12	126.74	1.18	125.56	5.60	7.02	dry@rd7.02m
9318	Coly	0-12	125.67	0.13	125.54	4.70	4.12	
9325	Coly	12-60	127.08	0.11	126.97	16.40	8.09	
9327	Coly	12-60	125.01	0.40	124.61	31.20	5.69	
9349	Coly	0-12	121.58	0.34	121.24	9.50	2.04	
9351	Coly	0-12	122.43	0.20	122.23	4.00	0.50	
9352	Coly	0-12	122.87	0.10	122.77	8.50	3.06	
9353	Coly	0-12	123.31	0.16	123.15	6.40	3.90	
9354	Coly	0-12	123.25	0.12	123.13	6.70	3.33	
9355	Coly	0-12	122.75	0.25	122.50	6.40	3.18	
9356	Coly	12-60	122.26	0.12	122.14	13.60	2.31	
9357	Coly	0-12	122.10	0.12	121.98	4.30	2.25	
9358	Coly	12-60	121.56	0.22	121.34	12.95	2.65	
9359	Coly	0-12	122.73	0.00	122.73	6.90	3.13	
9380	Coly	0-12	124.52	0.30	124.22	11.50	3.08	
9381	Coly	0-12	124.42	0.22	124.20	11.30	3.02	
9388	Coly	0-12	121.45	0.25	121.20	11.50	0.95	
9393	Coly	0-12	122.13	0.10	122.03	5.18	1.51	
9394	Coly	0-12	120.74	0.25	120.49	7.50	0.86	
9395	Coly	0-12	121.66	0.16	121.50	10.80	1.80	
9396	Coly	0-12	122.37	0.15	122.22	9.40	1.76	
9397	Coly	12-60	123.38	0.28	123.23	16.50	2.22	
9398	Coly	0-12	123.35	0.12	123.23	6.77	1.28	
9399	Coly	0-12	122.36	0.20	122.16	5.18	1.36	
12101	Coly	0-12	121.85	0.19	121.66	3.05	1.49	
12102	Coly	0-12	122.90	0.14	122.76	5.50	1.72	
12103	Coly	0-12	126.38	0.14	126.24	3.60	0.96	

12104	Coly	0-12	127.07	0.30	126.77	3.20	1.17	
12116	Coly	0-12	124.37	0.00	124.37	6.30	3.37	
12178	Coly	0-12	121.52	0.16	121.36	9.35	2.88	
12179	Coly	0-12	120.36	0.23	120.13	6.10	3.61	
12180	Coly	0-12	121.23	0.23	121.00	7.21	4.74	
12199	Coly	12-60	123.49	0.02	123.47	27.17	5.22	
12200	Coly	12-60	123.57	0.17	123.40	14.38		blocked@rd2.10m
12245	Coly	12-60	129.33	0.21	129.12	18.30	16.04	
12247	Coly	12-60	128.81	0.18	128.63	23.10	14.88	
12250	Coly	12-60	127.94	0.16	127.78	24.40	15.45	
12251	Coly	12-60	128.32	0.13	128.19	22.40	13.70	
12253	Coly	12-60	127.42	0.46	126.96	20.06	13.56	
12272	Coly	12-60	129.17	0.14	129.03	24.60	15.42	
12351	Coly	0-12	120.62	0.26	120.36	7.20	5.46	
12395	Coly	12-60	125.88	0.17	125.71	15.60	4.35	
12396	Coly	0-12	125.67	0.05	125.62	6.90	1.61	
12397	Coly	12-60	124.37	0.17	124.20	13.00	2.75	
12398	Coly	12-60	123.36	0.17	123.19	13.00	5.51	
12399	Coly	12-60	126.07	0.42	125.65	17.70	4.01	
12410	Coly	0-12	126.89	0.28	126.61	10.10	3.65	
12411	Coly	0-12	126.38	0.14	126.24	9.00	3.10	
12412	Coly	0-12	124.67	0.29	124.38	11.80	4.87	
12413	Coly	12-60	126.41	0.27	126.14	19.00	3.84	
12441	Coly	12-60	127.06	0.17	126.89	18.10	6.21	
12442	Coly	12-60	126.87	0.20	126.67	18.50	5.29	
12445	Coly	12-60	126.19	0.80	126.19	19.50	3.44	
12448	Coly	0-12	126.15	0.38	125.77	3.50	3.05	
12449	Coly	0-12	126.34	0.00	126.34	2.87	2.52	
12481	Coly	0-12	124.83	0.10	124.73	11.70	6.58	
12482	Coly	0-12	124.53	0.17	124.36	11.30	4.49	
12483	Coly	12-60	124.68	0.18	124.50	12.80	3.68	
12484	Coly	12-60	124.88	0.22	124.66	20.30	5.12	
12485	Coly	12-60	124.91	0.32	124.59	20.00	1.65	
12486	Coly	0-12	124.93	0.30	124.63	9.30	3.84	
12487	Coly	0-12	125.89	0.12	125.77	10.30	3.94	
12488	Coly	0-12	126.17	0.21	125.96	7.00	4.82	
12489	Coly	12-60	126.19	0.00	126.19	14.20	6.02	
12490	Coly	12-60	126.39	0.12	126.27	12.80	5.98	
12491	Coly	12-60	126.62	0.15	126.47	14.30	5.50	
12555	Coly	0-12	123.30	0.15	123.15	11.30	3.98	
12556	Coly	12-60	123.10	0.00	123.10	13.80	3.38	
12557	Coly	12-60	122.60	0.15	122.45	17.80	2.96	
12558	Coly	12-60	121.60	0.21	121.39	20.80	2.98	
12559	Coly	12-60	120.90	0.15	120.75	22.00	2.30	
12560	Coly	12-60	121.10	0.18	120.92	14.00	2.73	
12562	Coly	12-60	120.90	0.04	120.86	14.50	3.24	
12563	Coly	12-60	120.20	1.12	120.11	15.00	3.97	
12620	Coly	12-60	121.80	0.30	121.50	17.00	1.18	
12621	Coly	12-60	121.53	0.10	121.43	15.80	2.86	

12624	Coly	0-12	121.60	0.13	121.47	10.80	3.86	
12625	Coly	0-12	121.90	0.20	121.60	8.80	2.91	
12626	Coly	0-12	122.20	0.08	122.12	9.50	3.12	
12627	Coly	0-12	122.20	0.19	122.01	8.80	3.37	
12628	Coly	12-60	123.30	0.00	123.15	16.00	5.34	
12629	Coly	12-60	121.30	0.12	121.18	18.80	4.44	
12630	Coly	12-60	121.80	0.15	121.58	17.30	2.75	
12631	Coly	12-60	121.90	0.30	121.60	18.50	2.97	
12648	Coly	12-60	123.00	0.18	122.82	23.30	2.95	
12666	Coly	12-60	120.10	0.21	119.89	25.80	5.00	
12676	Coly	12-60	127.40	0.14	127.26	16.30	5.44	
12677	Coly	12-60	126.40	0.15	126.25	20.00	3.78	
12678	Coly	12-60	125.50	0.22	125.28	19.30	3.44	
12679	Coly	12-60	124.50	0.16	124.34	23.80	3.40	
12680	Coly	12-60	123.40	0.10	123.30	24.30	3.74	
12709	Coly	12-60	122.71	0.11	122.60	14.80	4.84	
12710	Coly	0-12	124.07	0.00	124.07	11.30	4.02	
12751	Coly	12-60	123.29	0.00	123.29	14.00	5.66	
12753	Coly	12-60	124.70	0.80	123.70	16.30	8.71	
12759	Coly	0-12	122.15	0.15	122.00	8.30	4.65	
12760	Coly	12-60	123.10	0.08	123.02	18.30	5.64	
12841	Coly	12-60	123.30	0.25	123.05	18.30	5.14	
12842	Coly	12-60	123.40	0.25	123.15	15.40	4.02	
12843	Coly	12-60	123.40	0.27	123.13	18.90	3.30	
12844	Coly	12-60	123.40	0.22	123.18	17.30	3.84	
12845	Coly	12-60	123.00	0.19	122.81	22.80	3.32	
12846	Coly	12-60	124.80	0.28	124.52	17.80	7.28	
12963	Coly	0-12	130.65	0.15	130.50	19.00	18.80	dry@rd18.80m
12963	Coly	12-60	130.67	0.15	130.52	41.50	21.90	
12964	Coly	12-60	130.88	0.11	130.77	22.00	16.20	
12966	Coly	0-12	121.22	0.23	120.99	11.00	4.70	
12966	Coly	12-60	121.20	0.25	120.95	20.00	4.55	
12966	Coly	12-60	121.19	0.29	120.90	27.50	6.71	
12968	Coly	12-60	132.02	0.35	131.67	20.50	17.70	dry@rd17.70m
12968	Coly	12-60	131.96	0.29	131.67	42.00	21.76	
12969	Coly	12-60	130.92	0.22	130.66	24.50	19.42	
12970	Coly	12-60	130.26	0.22	130.04	19.50	18.80	
12973	Coly	0-12	125.92	0.19	125.73	7.50	3.66	
12973	Coly	12-60	125.84	0.06	125.78	23.00	3.62	
12973	Coly	12-60	125.90	0.10	125.80	44.50	15.15	
12976	Coly	0-12	127.93	0.18	127.75	1.90		dry@rd1.85m
12976	Coly	12-60	127.93	0.22	127.71	19.70	8.07	
12977	Coly	0-12	127.93	0.08	127.85	4.60	2.45	
12978	Coly	0-12	127.33	0.13	127.20	8.00	2.34	
12979	Coly	0-12	127.57	0.08	127.49	6.50	2.40	
12984	Coly	0-12	126.66	0.20	126.46	11.80	3.87	
12985	Coly	0-12	127.31	0.11	127.20	10.00	3.81	
12986	Coly	0-12	127.91	0.14	127.77	9.30	3.80	
12987	Coly	0-12	125.61	0.05	125.56	8.30	3.60	

12988	Coly	0-12	125.10	0.10	125.00	9.20	3.75	
12989	Coly	0-12	125.43	0.10	125.33	8.80	3.77	
12990	Coly	12-60	125.93	0.16	125.77	12.50	3.60	
12991	Coly	0-12	125.15	0.25	124.90	10.00	2.85	
12992	Coly	0-12	125.33	0.17	125.16	9.60	3.47	
12993	Coly	12-60	125.87	0.21	125.66	16.00	3.51	
12994	Coly	0-12	125.12	0.13	124.99	10.45	3.37	
12995	Coly	0-12	125.22	0.13	125.09	7.10	3.44	
12996	Coly	0-12	119.32	0.19	119.13	8.90	4.30	
12996	Coly	12-60	119.32	0.10	119.22	20.60	4.38	
13007	Coly	0-12	116.80	0.17	116.63	8.50	2.40	
13008	Coly	0-12	119.62	0.00	119.62	11.40	4.70	
13009	Coly	0-12	119.01	0.17	118.84	7.00	1.96	
13016	Coly	0-12	118.01	0.22	117.79	10.00	4.17	
13019	Coly	0-12	118.96	0.20	118.76	10.50	6.20	
13020	Coly	0-12	120.08	0.28	119.80	7.00	5.64	
13020	Coly	12-60	120.09	0.23	119.86	13.50	5.64	
13022	Coly	12-60	121.71	0.54	121.17	13.00	6.70	
13023	Coly	12-60	119.50	0.32	118.96	16.00	5.84	
13024	Coly	12-60	116.88	0.70	116.68	13.50	3.32	
13030	Coly	12-60	119.80	0.27	119.53	13.50	6.64	
13031	Coly	0-12	118.59	0.32	118.27	9.00	5.25	
13041	Coly	12-60	117.32	0.65	116.67	20.80	18.20	
13042	Coly	12-60	116.69	0.67	116.02	17.30	17.36	
13043	Coly	12-60	116.55	0.40	116.15	18.10	17.03	
767	Argoon	12-60	123.40	0.08	123.32	24.30	4.20	
770	Argoon	12-60	124.80	0.12	124.68	17.80	4.35	
771	Argoon	12-60	125.63	0.02	125.61	26.00	3.50	
772	Argoon	12-60	122.50	0.06	122.44	18.30	2.80	
773	Argoon	12-60	122.40	0.11	122.29	25.30	2.85	
774	Argoon	12-60	121.10	0.36	120.74	25.10	2.45	
776	Argoon	0-12	122.20	0.04	122.16	7.30	3.30	
778	Argoon	12-60	121.00	0.02	120.98	20.90	4.00	
779	Argoon	12-60	120.20	0.25	119.95	18.60	2.80	
987	Argoon	12-60	120.50	0.00	120.50	24.30	3.15	
992	Argoon	12-60	121.60	0.16	121.44	32.80	6.65	
993	Argoon	0-12	121.50	0.07	121.43	8.40	3.75	
1000	Argoon	12-60	118.90	0.06	118.84	24.90	1.95	
1001	Argoon	12-60	118.90	0.00	118.90	14.90	2.60	
1002	Argoon	12-60	118.50	0.00	118.50	15.20	2.45	
1003	Argoon	12-60	117.70	0.00	117.70	28.10	3.85	
1004	Argoon	12-60	117.80	0.20	117.60	15.00	3.20	
1006	Argoon	12-60	117.30	0.27	117.03	20.50	3.35	
1007	Argoon	0-12	117.10	0.17	116.93	6.10	3.15	
1008	Argoon	12-60	118.30	0.05	118.25	18.00	3.55	
1009	Argoon	12-60	118.80	0.08	118.72	18.10	3.25	
1015	Argoon	12-60	119.80	0.35	119.45	16.90	4.55	
1016	Argoon	0-12	119.60	0.16	119.44	8.00	4.25	
1018	Argoon	12-60	118.80	0.00	118.80	30.10	3.45	

1022	Argoon	0-12	119.10	0.15	118.95	6.50	3.65	
1048	Argoon	12-60	119.30	0.00	119.30	16.20		blocked@rd1.46m
1049	Argoon	0-12	118.50	0.10	118.40	11.40	6.05	
1052	Argoon	12-60	117.40	0.12	117.28	17.50	4.95	
1060	Argoon	0-12	118.40	0.17	118.23	5.10	2.55	
1061	Argoon	0-12	119.10	0.64	118.46	6.90	3.15	
1070	Argoon	12-60	119.10	0.08	119.02	37.60	13.00	
1071	Argoon	12-60	116.50	0.08	116.42	13.50	10.15	
1080	Argoon	0-12	118.90	0.07	118.83	6.40	2.30	
1082	Argoon	0-12	117.49	0.21	117.28	3.75	5.10	
1148	Argoon	12-60	114.40	0.15	114.25	32.30	17.70	
1149	Argoon	12-60	114.60	0.42	114.18	13.50		damaged
1150	Argoon	12-60	114.10	0.18	113.92	31.80	18.10	
1151	Argoon	12-60	114.60	0.37	114.23	16.40	15.00	dry@rd15.00m
1152	Argoon	0-12	118.70	0.15	118.55	9.80	3.95	
1168	Argoon	12-60	115.20	0.14	115.06	29.70	10.25	
1169	Argoon	12-60	115.53	0.08	115.45	15.60	8.60	
1170	Argoon	12-60	116.43	0.04	116.39	14.60	3.20	
1178	Argoon	12-60	113.60	0.10	113.50	31.20	18.15	
1179	Argoon	0-12	113.80	0.26	113.54	5.60	5.65	dry@rd5.65m
1180	Argoon	12-60	114.00	0.00	114.00	30.90	15.60	
1181	Argoon	12-60	114.70	0.12	114.58	18.90	16.15	
1190	Argoon	0-12	116.43	0.04	116.39	3.30	2.90	
1256	Argoon	0-12	116.30	0.07	116.23	8.60	2.60	
1257	Argoon	0-12	116.70	0.07	116.63	10.70	2.75	
1262	Argoon	0-12	114.90	0.00	114.90	11.10	6.35	
1263	Argoon	12-60	115.64	0.10	115.54	20.40	12.85	
1264	Argoon	12-60	115.90	0.35	115.55	15.00	13.10	
1279	Argoon	0-12	119.11	0.34	118.77	7.40	3.80	
1853	Argoon	12-60	114.10	0.26	113.84	19.70	19.15	
1868	Argoon	12-60	114.30	0.17	114.13	22.20	19.05	
1878	Argoon	12-60	114.80	0.12	114.68	18.60	18.50	dry@rd18.50m
2338	Argoon	12-60	119.72	0.12	119.60	25.00	4.55	
2428	Argoon	0-12	119.92	0.38	119.54	9.50	3.25	
2431	Argoon	0-12	118.90	0.24	118.56	9.10	2.00	
2519	Argoon	0-12	122.70	0.00	122.70	7.70	4.10	
2951	Argoon	0-12	124.00	0.13	123.87	6.90	4.30	
3371	Argoon	0-12	119.81	0.38	119.43	8.70	2.85	
4193	Argoon	0-12	123.31	0.11	123.20	7.60	5.25	
4237	Argoon	12-60	121.00	0.07	120.93	22.90	4.30	
4238	Argoon	12-60	122.20	0.05	122.15	24.40	3.70	
4941	Argoon	12-60	117.70	0.34	117.36	23.10	4.05	
4942	Argoon	12-60	116.65	0.18	116.47	12.20	2.95	
12181	Argoon	12-60	118.69	0.25	118.57	15.00	2.40	
12184	Argoon	12-60	119.46	0.05	119.41	16.50	1.75	
12346	Argoon	12-60	119.30	0.10	119.20	21.30	2.95	
12352	Argoon	12-60	115.81	0.20	115.61	27.00	15.75	
12354	Argoon	12-60	115.76	0.26	115.50	24.30	10.25	
12355	Argoon	12-60	115.80	0.23	115.57	28.00	5.40	

12373	Argoon	12-60	110.39	0.32	110.07	20.00	16.70	
12374	Argoon	12-60	112.61	0.44	112.17	23.30	21.25	dry@rd21.25m
12375	Argoon	12-60	110.26	0.19	110.07	24.00	20.10	dry@rd20.10m
12376	Argoon	12-60	113.34	0.15	113.19	32.00	20.10	
12377	Argoon	12-60	117.44	0.13	117.31	22.00	6.25	
12378	Argoon	12-60	119.28	0.19	119.09	30.00	8.05	
12379	Argoon	12-60	116.71	0.32	116.39	23.30	7.30	
12384	Argoon	12-60	119.28	0.27	119.01	16.00	8.40	
12387	Argoon	0-12	116.66	0.20	116.46	10.50	7.11	
12618	Argoon	12-60	120.70	0.05	120.65	18.80	1.90	
12633	Argoon	12-60	122.20	0.02	122.18	29.80	3.10	
12634	Argoon	12-60	122.50	0.22	122.23	17.50	1.10	
12635	Argoon	12-60	122.20	0.22	121.98	18.80	1.60	
12636	Argoon	12-60	121.90	0.27	121.63	18.80	3.15	
12638	Argoon	12-60	121.30	0.16	121.14	16.30	3.85	
12638	Argoon	12-60	121.30	0.23	121.07	47.80	14.15	
12640	Argoon	12-60	120.40	0.18	120.22	18.80	3.35	
12644	Argoon	12-60	120.90	0.22	120.68	19.00	2.95	
12645	Argoon	0-12	120.90	0.03	120.87	3.50	1.50	
12646	Argoon	12-60	121.20	0.24	120.96	21.50	2.70	
12647	Argoon	12-60	123.10	0.05	123.05	20.30	2.75	
12655	Argoon	12-60	122.00	0.32	121.68	13.00	3.30	
12658	Argoon	12-60	121.30	0.06	121.04	24.50	2.40	
12665	Argoon	12-60	119.80	0.20	119.60	30.00	3.45	
12672	Argoon	12-60	119.20	0.06	119.14	20.30	2.30	
12675	Argoon	12-60	118.90	0.07	118.83	23.30	1.55	
12681	Argoon	12-60	118.80	0.09	118.71	14.30	4.70	
12682	Argoon	12-60	118.50	0.24	118.26	25.30	3.30	
12683	Argoon	12-60	118.50	0.21	118.29	13.80	2.75	
12684	Argoon	12-60	119.50	0.23	119.27	13.30	2.30	
12686	Argoon	12-60	122.40	0.16	122.24	17.50	3.80	
12687	Argoon	12-60	124.80	0.26	124.54	16.30	3.70	
12688	Argoon	12-60	123.40	0.46	122.94	23.30	3.70	
12689	Argoon	12-60	123.60	0.26	123.34	20.80	7.10	
12690	Argoon	12-60	120.70	0.30	120.40	26.50	4.70	
12691	Argoon	12-60	122.00	0.11	121.89	27.30	6.95	
12701	Argoon	12-60	122.60	0.12	122.48	24.50	4.90	
12711	Argoon	12-60	122.53	0.12	122.41	17.80	6.45	
12854	Argoon	12-60	116.60	0.20	116.40	27.00	2.65	
12855	Argoon	0-12	116.60	0.23	116.37	8.80	2.45	
12880	Argoon	12-60	114.90	0.29	114.61	19.50	9.65	
12901	Argoon	0-12	114.90	0.21	114.69	4.80	2.20	
12943	Argoon	12-60	120.12	0.35	119.77	14.30	4.75	
12944	Argoon	0-12	120.12	0.25	119.87	2.28		dry@rd2.50m
12957	Argoon	12-60	118.16	0.34	117.82	44.20	5.30	
12958	Argoon	12-60	118.56	0.25	118.31	33.00	2.65	
12960	Argoon	12-60	122.24	0.22	122.02	40.50	9.15	
12967	Argoon	12-60	123.22	0.17	123.05	20.00	4.90	
12967	Argoon	12-60	123.22	0.15	123.07	24.50	4.80	

12975	Argoon	12-60	116.10	0.19	115.91	25.00	12.85	
13011	Argoon	0-12	120.12	0.09	120.03	5.00	1.75	
13011	Argoon	0-12	120.23	0.20	120.03	6.70	1.90	
13012	Argoon	0-12	119.92	0.17	119.75	5.00	1.80	
13012	Argoon	0-12	119.92	0.18	119.74	7.00	1.80	
13034	Argoon	0-12	116.23	0.65	115.58	7.08	5.90	
13035	Argoon	0-12	116.47	0.21	116.26	5.14	6.30	dry@rd6.30m
13036	Argoon	0-12	116.72	0.26	116.46	7.34	6.45	dry@rd6.45m
13037	Argoon	0-12	115.86	0.53	115.33	7.80	7.20	
13038	Argoon	12-60	116.22	0.67	115.55	15.44	11.50	
13040	Argoon	12-60	115.46	0.35	115.11	16.19	10.20	
755	Yamma	0-12	126.90	0.20	126.70	9.30	7.94	
756	Yamma	0-12	127.00	0.46	126.54	4.40	4.37	
781	Yamma	0-12	126.70	0.21	126.49	8.50	6.63	
4109	Yamma	12-60	125.38	0.25	125.65	17.90	7.65	
4113	Yamma	0-12	123.88	0.37	123.51	8.50	4.87	
4131	Yamma	12-60	124.91	0.33	124.64	26.20	6.31	
4137	Yamma	0-12	126.56	0.42	126.14	8.50	7.43	
4209	Yamma	12-60	125.60	0.30	125.30	12.20	5.21	
4239	Yamma	12-60	121.10	0.18	120.92	22.90	2.70	
4241	Yamma	12-60	124.66	0.19	124.47	17.10	4.81	
4242	Yamma	0-12	124.58	0.24	124.34	9.90	4.04	
4921	Yamma	0-12	119.30	0.17	119.13	10.70	2.55	
4925	Yamma	12-60	120.70	0.40	120.30	12.30	3.06	
4927	Yamma	0-12	120.50	0.12	120.38	11.70	2.25	
4929	Yamma	0-12	122.30	0.24	122.06	5.40	1.60	
4930	Yamma	12-60	121.50	0.40	121.10	13.70	1.70	
4934	Yamma	0-12	118.54	0.05	118.49	10.80	2.35	
4935	Yamma	0-12	118.00	0.28	117.72	10.80	2.35	
4936	Yamma	0-12	117.84	0.27	117.57	11.10	3.35	
4937	Yamma	12-60	117.95	0.24	117.71	25.20	3.30	
4938	Yamma	0-12	117.89	0.12	117.77	11.00	3.25	
4944	Yamma	0-12	123.88	0.28	123.60	8.40	3.57	
4956	Yamma	12-60	116.80	0.43	116.37	17.40	4.91	
4960	Yamma	12-60	118.60	0.12	118.48	28.70	3.42	
4962	Yamma	12-60	118.30	0.30	118.00	12.80	3.05	
4963	Yamma	0-12	118.60	0.13	118.47	9.70	3.55	
4999	Yamma	0-12	119.49	0.37	119.12	11.30	4.41	
5000	Yamma	12-60	119.40	0.13	119.27	14.90	4.43	
5001	Yamma	12-60	119.61	0.07	119.54	17.40	4.56	
5002	Yamma	0-12	119.97	0.42	119.55	10.50	5.51	
5003	Yamma	0-12	117.56	0.22	117.34	3.50		dry@rd3.61m
5004	Yamma	12-60	118.13	0.14	117.99	15.00	4.92	
5011	Yamma	12-60	120.87	0.29	120.58	17.10	4.63	
5436	Yamma	0-12	121.97	0.25	121.72	7.30	4.36	
5439	Yamma	0-12	122.03	0.19	121.84	4.30	1.89	
5443	Yamma	12-60	124.70	0.15	124.55	24.40	2.97	
5447	Yamma	12-60	123.83	0.13	123.70	23.40	3.44	
5448	Yamma	0-12	122.90	0.00	122.90	11.00	1.67	

5449	Yamma	0-12	122.63	0.32	122.31	9.40	1.34	
5528	Yamma	0-12	123.04	0.17	122.87	8.20	4.28	
5577	Yamma	0-12	122.88	0.00	122.88	8.50	8.16	
5952	Yamma	0-12	121.21	0.21	121.00	7.60	2.82	
5954	Yamma	0-12	120.71	0.14	120.57	11.80	2.38	
5955	Yamma	0-12	120.25	0.10	120.15	9.40	2.06	
5957	Yamma	0-12	120.14	0.24	119.90	10.10	7.50	
5960	Yamma	0-12	119.43	0.12	119.31	7.00	4.26	dry@rd4.26m
5961	Yamma	0-12	120.05	0.13	119.92	6.40	4.44	
5964	Yamma	12-60	121.00	0.35	120.65	20.20	8.56	
5965	Yamma	12-60	122.82	0.36	122.46	15.50	3.05	
6801	Yamma	12-60	127.46	0.20	127.26	20.70	10.83	
6802	Yamma	12-60	128.23	0.24	127.99	18.30	12.60	
6803	Yamma	12-60	128.29	0.32	127.97	16.20	12.66	
12205	Yamma	12-60	126.54	0.22	126.32	22.50	10.94	
12207	Yamma	12-60	125.30	0.16	125.14	12.75	8.42	
12210	Yamma	12-60	125.57	0.30	125.27	27.25	8.38	
12211	Yamma	12-60	125.57	0.30	125.27	17.30	8.37	
12215	Yamma	12-60	123.77	0.05	123.72	22.80	6.83	
12217	Yamma	12-60	124.38	0.35	124.03	22.50	4.74	
12218	Yamma	0-12	124.30	0.29	124.01	7.38	5.78	
12220	Yamma	12-60	122.97	0.02	122.95	15.80	4.78	
12221	Yamma	0-12	122.75	0.21	122.54	11.45	4.83	
12222	Yamma	0-12	121.82	0.18	121.64	10.00	5.18	
12223	Yamma	12-60	121.30	0.41	120.89	20.00	7.94	
12224	Yamma	12-60	121.36	0.15	121.21	20.05	8.40	
12225	Yamma	12-60	120.51	0.09	120.42	20.60	8.94	
12226	Yamma	0-12	120.98	0.06	120.92	10.10	6.39	
12229	Yamma	12-60	120.69	0.12	120.57	24.00	8.88	
12230	Yamma	0-12	122.36	0.38	121.98	9.80	8.10	
12232	Yamma	0-12	122.05	0.22	121.83	5.50	4.60	
12233	Yamma	0-12	122.02	0.19	121.83	5.50	4.14	
12234	Yamma	12-60	121.94	0.16	121.78	23.25	2.50	
12235	Yamma	0-12	121.30	0.14	121.16	6.15		blocked@rd2.60m
12237	Yamma	0-12	123.37	0.20	123.17	11.00	2.41	
12238	Yamma	12-60	120.67	0.18	120.49	17.80	1.04	
12239	Yamma	0-12	120.60	0.08	120.52	7.50	1.37	
12241	Yamma	0-12	121.90	0.17	121.73	8.50	2.67	
12242	Yamma	12-60	123.85	0.19	123.66	19.10	3.53	
12243	Yamma	12-60	123.35	0.15	123.20	18.90	3.62	
12244	Yamma	0-12	123.55	0.13	123.42	8.30	3.78	
12260	Yamma	12-60	127.29	0.40	126.89	12.05	8.20	
12261	Yamma	12-60	128.48	0.10	128.38	16.45	12.62	
12262	Yamma	12-60	129.32	0.05	129.27	19.10	15.24	
12263	Yamma	12-60	129.41	0.20	129.21	18.00	17.10	
12264	Yamma	0-12	129.41	0.13	129.28	10.30	11.10	dry@rd11.10m
12265	Yamma	12-60	126.90	0.20	126.70	17.20		blocked@rd1.50m
12266	Yamma	12-60	128.29	0.18	128.11	18.20	17.24	
12267	Yamma	0-12	128.29	0.30	127.99	10.10	10.10	

12268	Yamma	12-60	129.25	0.15	129.10	22.50	17.88	
12270	Yamma	12-60	128.32	0.15	128.17	23.55	19.20	
12271	Yamma	12-60	128.18	0.24	127.94	24.68	18.05	
12274	Yamma	0-12	115.80	0.24	115.56	10.40	10.40	
12275	Yamma	12-60	115.80	0.29	115.51	16.48	14.30	
12276	Yamma	12-60	115.42	0.15	115.27	18.30	14.38	
12277	Yamma	12-60	116.65	0.12	116.53	22.33	14.74	
12278	Yamma	12-60	120.66	0.16	120.50	21.78	9.60	
12279	Yamma	12-60	118.19	0.11	118.08	22.45	12.65	
12280	Yamma	12-60	117.61	0.29	117.32	19.50	14.64	
12294	Yamma	0-12	119.53	0.22	119.31	9.00	8.64	
12356	Yamma	12-60	115.93	0.16	115.77	23.50	8.20	
12357	Yamma	12-60	115.63	0.08	115.55	23.00	10.50	
12358	Yamma	0-12	115.63	0.20	115.43	11.00	10.46	
12362	Yamma	12-60	125.79	0.05	125.74	19.20	12.64	
12363	Yamma	12-60	125.63	0.25	125.38	21.70	13.63	
12364	Yamma	12-60	125.78	0.21	125.57	17.60	8.64	
12365	Yamma	12-60	125.31	0.23	125.08	20.00	13.11	
12366	Yamma	12-60	124.35	0.27	124.08	17.20	11.96	
12367	Yamma	12-60	126.73	0.08	126.65	19.00	10.38	
12368	Yamma	12-60	126.79	0.10	126.69	16.20	7.42	
12370	Yamma	12-60	115.34	0.07	115.27	20.00	13.62	
12371	Yamma	12-60	115.40	0.18	115.22	24.00	14.71	
12372	Yamma	12-60	114.83	0.10	114.73	20.00		blocked@rd2.28m
12420	Yamma	12-60	117.95	0.06	117.89	15.50	2.75	
12421	Yamma	0-12	118.05	0.11	117.94	7.30	2.68	
12454	Yamma	12-60	122.42	0.18	122.24	20.00	2.65	
12455	Yamma	0-12	122.43	0.12	122.31	10.50	2.45	
12458	Yamma	12-60	122.95	0.04	122.91	16.50	2.11	
12459	Yamma	12-60	123.81	0.17	123.64	17.50	2.86	
12460	Yamma	12-60	120.49	0.12	120.37	14.50	2.85	
12462	Yamma	12-60	120.37	0.05	120.32	16.50	2.20	
12465	Yamma	12-60	120.26	0.15	120.11	23.80	2.30	
12466	Yamma	12-60	119.75	0.23	119.52	34.00	5.75	
12467	Yamma	12-60	119.31	0.13	119.18	18.10	2.85	
12468	Yamma	12-60	118.46	0.15	118.31	19.50	2.30	
12471	Yamma	12-60	124.88	0.14	124.74	20.00	3.41	
12472	Yamma	0-12	124.67	0.24	124.43	4.80	2.72	
12473	Yamma	12-60	124.50	0.00	124.50	18.80	3.25	
12477	Yamma	12-60	124.23	0.10	124.13	18.50	3.79	
12502	Yamma	12-60	122.20	0.19	122.01	15.50	3.41	
12551	Yamma	12-60	111.27	0.48	110.79	19.80	16.04	
12552	Yamma	12-60	111.46	0.08	111.38	14.30	15.00	dry@rd15.00m
12553	Yamma	12-60	111.88	0.18	111.70	13.30	13.18	
12554	Yamma	12-60	114.02	0.20	113.82	24.50	16.38	
12961	Yamma	12-60	117.71	0.24	117.47	26.00	2.50	
12974	Yamma	0-12	123.60	0.29	123.31	10.00	3.18	
12974	Yamma	12-60	123.60	0.29	123.31	28.50	3.84	
12974	Yamma	12-60	123.52	0.21	123.31	50.50	13.98	

CI COD 1	WCC	12-60	82.88	0.33	82.55	23.50	11.90	
CI COD 10	WCC	12-60	102.73	0.33	102.40	42.20	22.50	
CI COD 2	WCC	12-60	86.62	0.33	86.29	22.50	13.92	
CI COD 3	WCC	12-60	91.94	0.37	91.57	22.00	14.65	
CI COD 4	WCC	12-60	99.20	0.33	98.87	15.50	15.70	dry@rd15.70m
CI COD 5	WCC	12-60	95.92	0.37	95.55	34.00	19.40	
CI COD 6	WCC	12-60	95.54	0.38	95.16	49.00	19.85	
CI COD 7	WCC	12-60	100.33	0.37	99.96	46.00	21.65	
CI COD 8	WCC	12-60	104.17	0.34	103.83	22.50	20.25	
CI COD 9	WCC	12-60	110.83	0.34	110.49	41.50	23.25	

10.2 A2 Drainage Salinity and Flow Data

Table A 2.1 Flow (ML) for DC 800 at Outfall into Yanco Creek

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1			19.4	10.3	78.9	16.0	92.9	58.3	21.7	70.6	0.1	34.3
2			17.9	10.1	99.4	10.7	87.5	57.3	24.6	58.9	0.3	85.5
3			9.6	8.3	99.3	16.2	101.8	65.0	27.9	46.0	0.3	162.6
4			4.0	42.2	101.2	17.7	125.3	65.5	25.3	37.6	0.1	116.9
5			20.3	84.9	91.6	15.0	118.2	65.3	21.7	31.7	0.1	71.7
6			15.8	87.7	79.6	13.1	132.3	63.7	18.3	26.7	0.7	54.6
7			13.5	94.9	49.3	9.2	103.1	59.8	15.7	26.2	0.9	54.0
8			27.7	84.5	47.8	5.7	96.0	64.9	14.6	28.9	1.3	60.6
9			23.6	79.8	58.9	3.1	118.8	56.7	15.8	27.4	0.6	59.8
10			17.2	86.5	54.2	1.3	106.5	54.3	18.0	23.6	0.4	45.3
11			11.2	40.9	36.8	0.8	99.5	49.8	17.3	19.0	0.2	27.8
12			23.8	34.6	27.1	0.3	105.0	48.7	17.6	15.6	0.2	31.3
13	2.5		18.8	33.8	22.8	9.7	94.1	58.9	16.4	13.0	0.8	25.9
14	17.5		41.6	22.7	17.6	22.9	104.7	62.0	14.0	12.3	1.3	25.3
15	21.0		41.5	17.6	16.6	28.6	100.0	58.1	13.5	12.6	1.7	27.5
16	27.8		36.4	20.1	11.5	35.1	81.5	53.9	17.3	12.6	7.0	19.4
17	20.3		37.6	16.4	8.7	34.8	84.8	51.6	19.1	11.1	10.1	15.0
18	10.8		45.7	16.4	11.6	30.0	89.6	46.4	17.2	9.6	6.3	14.0
19	3.8		42.9	22.3	15.0	24.3	97.0	43.1	18.2	9.2	6.6	14.0
20	1.4		52.9	24.0	16.6	20.4	85.8	38.1	17.7	8.5	10.2	12.9
21	0.7		48.6	26.7	10.5	20.9	89.6	21.8	19.6	7.3	11.4	12.8
22	0.4		32.7	23.5	9.2	15.9	80.7	12.6	21.1	2.7	8.7	9.4
23	0.2		39.3	21.6	11.6	29.6	81.9	11.5	25.8	2.4	14.6	2.4
24	0.1		38.3	22.3	25.2	23.8	79.1	12.7	41.1	1.7	23.0	0.9
25	0.1		26.6	30.3	20.2	12.5	73.4	13.2	40.0	1.2	41.0	0.9
26	0.1	0.6	23.9	32.6	17.8	10.2	76.5	13.0	40.4	0.6	35.3	0.5
27	0.1	7.1	22.8	27.5	15.4	12.1	74.9	14.2	76.7	0.5	37.1	0.2
28	0.0	8.7	16.2	27.6	17.9	21.0	67.4	19.7	81.6	0.2	40.7	0.1
29	0.0	8.4	10.6	22.4	16.3	34.5	70.4		81.0	0.1	33.7	0.1
30	0.0	2.2	13.8	24.6	17.5	52.7	65.5		82.3	0.1	24.3	0.1
31	0.0	9.2		52.4		69.4	56.6		80.2		22.0	

Table A 2.2 Salinity (µS/cm) for DC 800 at Outfall into Yanco Creek

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1			417.3	277.9	324.4	398	191	210.4	529.7	320.9	532.9	216.8
2			319.9	269.6	300	415.1	195	207	517.4	314.2	573.9	254.4
3			272.5	283.5	280.8	379.1	185.5	217.2	489.1	330.9	604.2	322.2
4			276.1	276.8	226.1	317.7	184.4	227.7	515.8	345.6	566.7	337.6
5			253.8	213.1	185.5	285.7	194.3	235.9	489.1	299	625.8	296.6
6			252.3	212.6	178.1	318.4	190.6	241.6	490.3	273.8	682.6	259.5
7			286.6	216.9	193.5	376.3	193.7	243.5	473.6	284.3	835	225.9
8			317.1	202.1	233.4	423.6	211.6	244	319	334.7	588	205.4
9			290.5	191	240.4	434.6	202.1	257.3	324.4	379.7	346.3	188.1
10			269.9	189.9	277.4	418.7	188.6	269	383.2	395.9	423.7	203.5
11			259.7	194.5	284.7	416.1	190.9	285	422.4	291.4	470.2	190.7
12			260.8	198	256.5	339.1	183.1	290	438.9	308.5	474.5	188.2
13	388.8		278.4	208	275.6	373.3	174.8	286.9	440.8	328	553.9	204.9
14	368		299.1	208.5	251.2	331.9	159.8	261.6	405.2	367.4	660.7	229.4
15	360.2		328.4	209.8	198.8	304.6	159.4	232.1	401.6	386.6	598	252.1
16	360		287.6	224.5	190.2	294.7	187.9	98.2	416.4	556.6	606.3	249
17	364.5		290.1	227.8	183.8	283.6	197.5	108.9	592.3	466.5	623.6	232.5
18	352.7		278.2	226.8	257.8	257.3	198.1	128.8	569.8	453.6	422.7	217.6
19	347.6		258.8	234.2	267.5	600.2	202.9	133.5	508.3	442.1	376.4	213.7
20	343		252.6	263.7	257.6	506.8	208.7	134.1	475.5	439.2	338	225.8
21	319.8		293.6	302.4	319.4	369.6	233.9	173.3	569.4	410.9	364.3	273.2
22	315.4		308.2	316.4	275.7	333.1	215.5	186.2	474.2	511.4	493	291.3
23	316.7		289.2	357.2	298.8	320.7	210.2	211.6	330.4	414.3	394.6	258.1
24	317.9		264	395.9	299.5	388.2	205.7	278.5	413.8	502.2	370.7	224.1
25	308.3		342.6	400.8	319	392.4	220.3	355.9	419.7	543.8	360.5	213.1
26	298.8	268.2	273.1	394.9	340.7	385.2	228.9	426	403.6	534	233.4	217.1
27	298.3	329.6	239.1	382.4	341.6	400.4	229	445.2	443.3	568.3	188	220.3
28	294.8	276.6	254.9	378.1	373.6	357.7	222.2	477.9	387.2	543.5	200.6	220.5
29	295	226	261.1	390.9	452.4	284.4	219.5		379.7	506.2	192.3	226.2
30	297.3	233.1	271	338.5	544.5	291.8	212.7		358.9	473.1	248.2	231.8
31	300.7	301.1		352.6		218.2	221.9		360.3		261.1	

Table A 2.3 Flow (ML) for CODA at West Coleambally Channel

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	0	0	12.0	99.8	44.3	200.3	86.0	53.7	99.6	31.4	43.6	14.5
2	0	0	8.7	100.7	48.6	125.2	99.9	59.9	86.6	30.4	40.5	80.6
3	0	0	7.1	100.5	64.4	157.0	92.1	67.4	110.3	22.1	33.5	123.5
4	0	0	8.4	113.3	61.5	153.1	100.1	70.8	80.0	19.7	54.3	188.7
5	0	0	11.4	120.5	50.3	144.9	105.3	85.3	56.7	17.4	46.0	213.4
6	0	0	8.9	120.0	50.3	150.0	71.5	78.1	126.2	15.9	45.1	193.6
7	0	0	4.8	115.5	50.4	132.3	40.3	69.8	128.5	13.5	42.0	164.5
8	0	0	8.3	120.2	50.2	1.6	49.2	65.1	120.0	9.2	63.2	158.7
9	0	0	25.4	120.3	50.3	0.0	61.7	57.7	126.6	8.1	72.9	35.2
10	0	0	33.5	120.1	50.4	0.0	70.2	10.8	133.1	6.6	80.3	55.7
11	0	0	31.6	120.2	50.3	0.0	74.5	20.9	125.2	3.0	90.7	37.8
12	0	0	31.3	103.2	50.2	0.0	115.3	24.2	87.3	3.0	90.5	47.4
13	0	0	34.7	100.5	50.0	0.0	116.5	22.2	63.2	1.3	96.4	120.8
14	0	0	59.9	100.1	49.9	0.0	135.4	18.4	72.4	0.1	100.3	49.5
15	0	0	39.0	95.1	49.9	0.0	147.2	15.8	64.5	1.0	83.2	48.3
16	0	0	22.4	80.6	49.9	0.0	102.9	10.9	64.6	0.0	20.3	139.1
17	0	0	20.0	80.0	49.4	0.0	112.9	5.3	64.4	0.0	13.3	57.2
18	0	0	20.9	67.7	41.9	0.0	129.4	2.8	73.6	0.0	6.4	14.7
19	0	0	4.6	53.3	41.9	0.0	145.5	0.8	69.4	0.0	0.0	15.3
20	0	0	0.0	50.6	40.1	18.2	153.3	1.2	71.0	0.0	37.3	25.6
21	0	0	0.0	51.9	40.3	85.2	155.3	18.5	60.1	0.0	13.1	15.5
22	0	0	0.0	55.8	40.4	100.2	155.0	77.1	38.0	0.0	12.0	12.1
23	0	0	0.0	60.1	46.8	100.2	126.3	118.1	44.4	6.1	10.9	9.6
24	0	0	0.0	60.3	75.7	100.2	80.1	118.6	67.3	1.3	11.1	9
25	0	6.6	0.0	60.1	100.4	100.3	69.9	48.4	63.3	0.0	10.2	6.8
26	0	16.4	0.0	59.9	100.0	102.3	69.7	72.5	55.2	0.0	6.8	5.9
27	0	8.0	0.0	59.8	100.0	119.6	60.4	116.0	32.6	0.0	4.1	5.8
28	0	15.6	65.9	55.3	100.3	124.0	11.6	116.1	31.0	0.0	4.2	5.3
29	0	17.8	93.0	45.4	100.6	101.6	29.7		23.9	0.0	4.6	4.9
30	0	12.4	92.1	40.5	10.1	95.3	56.7		14.0	38.9	3.3	4.4
31	0	12.2		42.7		94.9	50.0		21.1		3.4	

Table A 2.4 Salinity (µS/cm) for CODA at West Coleambally Channel

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	548.9	194.6	508.1	146.7	118.6	141.2	72.1	156.5	231.5	433.5	166.7	409.4
2	510.6	152.1	460.1	141.4	52.7	150.3	87.2	150.3	239.5	427.9	179.4	339
3	317.9		419.2	151.4	36.6	127.3	88.1	154.7	217.2	422.8	175.9	318.1
4	288.9		335.2	144	40	110.6	65.4	192.2	208.9	410.7	159.1	266.4
5	275.1		334.8	149.9	50.1	110.1	133.3	174.3	204	439.7	154.4	265.6
6	292.1		319.8	152.1	70.4	100.5	187.2	173.5	203.4	451.2	154.3	270.5
7	341.6		281.4	137.8	97.9	105.5	232	177.6	216.5	483.5	155	256.5
8	357.8		319.6	137.8	138.4	144.6	213.3	188	208.5	506.9	153	211.3
9	499.6		316.7	136.8	149		133.4	189.4	201.4	525.1	148.2	192.9
10	375.3		291.6	136.5	145.6		104.3	194.5	202	543.4	150.2	190.3
11	271.4		273.6	133.2	141.7	207.7	84.9	249.8	217.6	574.7	136.1	192.8
12	233.7		265.8	153.6	150.8	197.7	83.5	299.7	231.9	606.5	128.2	194.4
13	178.1		270.6	153	162.2	149.3	91.2	280.7	253.5	638.5	123.2	194.5
14	549.2		267.7	152.9	160.6	147	122.4	285.4	273.6	666.4	120.2	188.3
15	982		249.4	142	168.4	157.9	120.3	279.8	273	686.8	139.5	180.8
16	779.1		250.1	127.7	179.4	167.3	-13.9	288.7	273.3	702.5	167.1	177
17	707		260.8	130.2	181.5	190.7	34.1	323.6	267.7	716.9	315.1	180.8
18	636.6		373	127.6	92.8	214.8	37.8	340	264.6	735.9	492.7	185.6
19	560.7		355.9	122.1	18.2	193.8	41.9	344.7	265.8	754.2	387.2	189.3
20	522.8		329.4	129.9	93.4	190.2	75.2	354	280.4	768.3	428.9	161.5
21	275.5			143.4	158.7	165.6	98.3	358.1	290.4	807.4	493.4	155.5
22	222.9			154.3	171.4	66	120.6	249.9	282.1	849.9	460.5	163.7
23	234.4	589.6	339.5	169.5	166	89.8	136.6	178.6	290.6	855.2	414.1	169.8
24	247	457.7	332.3	179.4	153.3	129.3	147.1	190.7	307.3	430.5	392.1	176.7
25	242.6	448.9	318.2	195.1	148.3	120.3	120.8	204.9	324.9	398.9	397	183.1
26	225.1	432.1	285.1	198.8	141.8	140.5	112	202.8	335.3	367.7	408.6	186.8
27	213.9	339.7	266.3	195.1	132.3	79.5	99.2	201.5	362.4	368.8		191.5
28	204.3	333.3	299.8	195.6	154.8	68.9	106.2	212.6	380.6	373.8		190.6
29	212.8	458.4	155.3	180.4	157.3	60.5	102.5		401.5	379.9	415.8	189.2
30		395.3	157	100.7	137.7	58.4	107.7		419.6	322	415.1	194.3
31		434.9		133.1		61.5	115.4		433.7		412.1	

Table A 2.5 Flow (ML) for CCD at Coleambally Catchment Drain Outfall into Yanco Creek

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1				37.5	38.2		122.1	9.7	41.6	0.5	0.1	
2				46.6	80.2		132.1	4.7	31.7	0.2	0.1	
3				53.3	95.0		132.7	77.7	28.9	1.4		
4				63.6	41.2		133.4	105.2	17.0	0.9		
5				98.6	74.5		130.7	107.7	7.5	0.1		
6				100.3	77.2		129.3	144.9	4.2	0.0		
7				98.9			122.2	147.4	2.6			
8				98.9			135.7	144.9	2.1			
9				102.2			138.2	142.3	1.6			
10				87.0			128.7	140.2	1.1			
11				100.6			104.1	140.7	0.9			
12				104.5			128.1	141.0	0.8	0.0		
13				102.3			142.6	140.6	0.8			
14				102.7			144.3	139.1	0.8			
15				82.2			144.7	136.8	0.8			
16				91.8		41.9	141.1	137.8	0.5			
17				100.8		31.9	137.2	137.1				
18				99.6		3.3	137.7	135.5	0.1			
19				93.8		2.0	117.9	103.0	3.3			
20				22.2		2.4	106.7	96.2	3.3	0.0		
21				0.3		3.1	131.3	80.4	1.3	0.0		
22						2.5	138.5	112.1	1.1			
23						1.8	135.0	114.6	0.9			
24						1.8	117.4	113.7	0.9			
25						2.8	103.6	105.3	92.2			
26						2.1	96.5	76.3	76.3			
27						1.7	96.1	66.7	21.8	0.0		
28						39.9	102.0	62.7	4.9	0.0		
29						88.6	94.4		1.9	0.1		
30						95.5	57.6		2.7	0.1		
31						94.9	43.3		1.9			

Table A 2.6: Salinity (µS/cm), for CCD at Coleambally Catchment Drain Outfall into Yanco Creek

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1							59.6	63.4	82.4	40.3	70.7	
2				104.4	130.3		62.4	64.2	92.7	42.8		
3				112.3	128.7		67.3	67.2	72.7	65.8		
4				132.2	131.7		65.5	64.9	49.7	39.6		
5				104.5	135.4		64	67.5	64.8			
6				97.3	129.2		68.6	69.2	37.5			
7				93.6			71.3	69.3	38.7			
8				100.6			70	72.2	41.1			
9				99.5			66.2	70.8	46			
10				107.1			65.7	68.2	53.6			
11				101.3			69.1	64.5	60.6			
12				91.9			66.2	58.8	67.9			
13				97.3			64.8	54.3	100			
14				100			66	55.3	99.1			
15				98.2			69.3	52.7	90.1			
16				101.7			68.9	50.6	92.3			
17				95.3		66.2	68.9	50.6				
18				97.5		68.4	70.4	50				
19				102.8		77	68.8	54.5	103.6			
20				105.6		80.3	72.1	50.6	107.8			
21				125.1		83.4	80.2	53.5	108.2			
22						84	80.2	53.9	106.3			
23						96.7	78.6	54	108.7			
24						109	80.7	55.6	108			
25						120.4	79.2	58.7	103.8			
26						122.9	76.1	60.7	72.2			
27						135.6	72.9	55.6	47			
28						97.8	74.8	62.3	49.5			
29						59.2	71.6		52.8	65.8		
30						57.9	67.9		56.1	75.3		
31						57.9	66.4		56.2			

Table A 2.7: Flow (ML) for CODD at West Coleambally Channel at Bundy

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	3.7		0.0	0.0	8.5	0.0	0.0	0.4	0.0	7.0	0.0	0.0
2	5.7		0.0	0.0	5.0	0.1	0.0	3.2	0.7	6.3	0.0	0.0
3	5.0		0.0	0.0	1.9	0.2	0.0	4.0	0.5	4.8	0.0	0.0
4	3.0		0.0	0.0	3.3	0.2	0.3	1.4	0.3	2.3	0.0	0.0
5	1.4			0.0	2.2	0.3	0.8	0.1	0.3	2.0	0.0	0.0
6	0.9			0.0	2.1	0.3	0.2	1.4	0.4	0.9	0.0	0.0
7	0.5			0.0	2.2	0.1	0.8	3.6	0.4	0.2	0.0	0.0
8	0.2			0.0	1.7	0.0	1.1	2.7	0.4	0.0	0.0	0.0
9	0.1			0.0	1.9	0.0	0.3	1.7	0.3	0.0	0.0	0.0
10	0.4			0.0	1.8	0.0	0.1	1.1	0.4	0.0	0.0	0.0
11	0.4			0.0	1.4	0.0	0.0	0.9	0.4	0.0	0.0	0.0
12	0.7			0.0	1.0	0.0	0.0	0.5	0.3	0.0	0.0	0.0
13	1.2			0.0	1.4	0.3	0.0	0.0	0.3	0.0	0.0	14.9
14	1.6			0.0	1.2	0.8	0.0	0.0	0.6	0.0	0.0	8.1
15	1.3			0.0	4.5	1.3	0.0	0.0	0.5	0.0	0.0	9.6
16	1.3			0.0	6.8	0.6	0.0	0.0	0.4	0.0	0.0	7.6
17	1.1			0.0	4.9	0.5	0.4	0.4	0.7	0.0	0.0	2.7
18	1.2			0.0	3.4	0.3	0.8	0.9	0.4	0.0	0.0	0.0
19	0.9			0.0	2.5	0.0	0.1	1.2	0.0	0.0	0.0	0.0
20	0.8			0.0	1.5	0.5	31.7	0.5	0.0	0.0	0.0	0.0
21	0.6			0.0	0.9	0.2	59.6	0.1	0.0	0.0	0.0	0.1
22	0.4	0.0		0.0	0.8	2.7	44.0	0.1	0.0	0.0	0.0	1.6
23	0.2	0.0		0.0	0.7	1.2	28.1	0.0	0.0	0.0	0.0	0.3
24	0.2	0.0		0.9	0.7	0.8	17.9	0.7	0.0	0.0	0.0	0.0
25	0.8	0.0	0.8	0.0	4.9	0.8	10.5	0.2	0.0	0.0	0.0	3.3
26	0.8	0.0	0.3	0.0	4.7	0.0	7.3	0.6	0.0	0.0	0.0	4.4
27	0.7	0.0	0.0	0.0	3.5	0.0	8.9	1.6	0.0	0.0	0.0	6.3
28	0.6	0.0	0.0	0.0	2.4	0.0	9.3	0.6	0.0	0.0	0.0	7.9
29	0.4	0.0	0.0	4.2	2.0	0.0	11.5		6.4	0.0	0.0	6.3
30		0.0	0.0	10.1	0.9	0.0	8.7		3.9	0.0	0.0	3.7
31		0.0		11.1		0.0	3.6		5.3		0.0	

Table A 2.8: Salinity (µS/cm) for CODD West Coleambally Channel at Bundy

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	222.1	248	292.7	400	200.9	346.6	166.1	191.5	158.8	320.7		6.7
2	224.5	248.3	293.6	440	209.2	387		198.8	155.9	324.7		55
3	245.8	260.5	305.5	462.2	239.7	399.9		209.4	184.1	322.7		
4	252.6	269.2	320.3	494.2	281.2	407	278.2	209.1	208.5	270.2		
5	238.4	275.2	242.6	515.2	269.7	383.2	339	218.1	210.9	221.1		
6	237.4	274.6	334.2	445.8	265.1	442.7	334.1	217	215.7	234		
7	239.2	271.2	339	439.8	254.7	501.3	343.4	206.4	219.3	240.1		
8	244.2	275.2	352.7	381.3	265.3	526.2	328.3	206.6	216.5	214.8		
9	263	280.5	359.6	189.9	270.3	516.7	305.5	187.6	209.8	102.2		
10	242.5	279	334.6		278.4	548.3	311.6	176.8	192.4	256.9		
11	244.4	283.2	338.2		289.5	589.8	329.6	171.9	192.5	257.9		
12	228.7	278.7	332.4		288.4	601	321.7	177.8	195.5	258		13.6
13	214.3	280.2	317.1		275.7	532.1	294.6	185.8	187.3	259.4		121.4
14	206.3	285.7	302.3		267.5	390.9	275.1	182.3	171.3	45.5		218.3
15	186.9	285.2	304		298	336.9	321	160.9	172			242.3
16	192.5	288.4	307.7		268.6	318.6	356.8	153.9	164.7			270.3
17	193.7	269.2	316.1		256	308.8	319.3	171.1	153.7			257.6
18	187.9	187.1	321.3		263.1	320.1	326.1	162.5	166.7			227.6
19	191.3	228.6	323.8		279.3	350.1	302.2	159.7	181.7			193.2
20	205	239.2	355.9		286.3	343.3	283.3	157.5	193.6			149.4
21	217.6	255.5	364.4		280.7	354.2	260.4	156.4	193.4			169.6
22	222.2	271.1	378.5		268.4	324.2	260.8	162.4	179			138.6
23	224.9	275.3	432.4	15.5	275.8	328.4	255.9	162.5	70.7			144.9
24	227.1	253.8	393.7	255.9	282.7	312.4	267.7	170.7	47			143.2
25	247	253.5	398.6	285	347.8	285.1	301.7	166.9	49.9			185.2
26	258	264.4	385.2	314.6	315	298.3	309.8	161.7	58.6			230.2
27	264.9	259.6	391.8	332.8	300.1	320.4	370.5	153.5	33.2			236.7
28	262.1	272.7	414.2	370.9	326.6	318.9	446.1	148.3				222.9
29	260.5	291.5	385.5	399.9	337.1	327.8	398.2		331.8			202.4
30	255.4	291.8	381.4	294.1	315.5	345.9	318.2		313.2			185.1
31	249.6	287.1		188.5		375.1	251.1		316.4			

Table A 2.9: Flow (ML) for CCS at Coleambally Main Off-take

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1			935	1365	3600	5535	4387	3632	660	150	320	
2			1005	1833	3140	3693	4206	2907	865	200	300	
3			1275	1990	2655	3337	4472	3204	740	250	340	
4			1565	2190	2385	2981	4474	3379	1095	655	405	
5			1630	2134	2193	2935	4647	2858	1411	930	410	
6			1295	2315	1981	2885	4306	3005	1483	885	420	
7			1375	2325	1928	3160	4441	3040	1495	485	455	
8			1537	2510	2193	3280	4365	2920	1625	385	665	
9		381	1098	3110	1510	3210	4230	2950	1521	580	680	
10		765	1358	3200	1360	2960	4580	2835	1223	620	680	
11		878	1560	2920	1040	3285	4550	2710	1118	350	700	
12		838	1510	3225	1735	3516	4385	2761	1260	255	625	
13		1027	1515	3335	1850	3485	4380	2706	1120	250	625	
14		1094	1180	3205	2283	3469	4125	2850	1180	250		
15		891	960	3840	2365	2639	3808	3175	1070	230		
16		1192	980	3775	2346	2987	4034	3705	1140	255		
17		1750	937	3856	2477	2816	3883	3305	1820	270		
18		1470	998	3386	2471	2844	5300	2661	2340	590		
19		1100	756	3385	2391	3120	5985	2767	2250	710		
20		938	595	3572	2717	2725	5984	2665	1810	365		
21		1205	834	3415	4215	3550	5957	2386	1310	220		
22		1250	755	3642	4961	3390	5340	1942	1350	265		
23		1274	880	3826	3820	3530	4020	1734	355	350		
24		841	1040	4065	3125	3485	3445	1620	369	145		
25		1062	836	4075	3115	3480	3560	1622	240	190		
26		1002	1050	3610	3370	3400	3495	1375	395	250		
27		795	735	3543	3239	3682	3125	865	391	310		
28		1021	795	3224	2748	3896	3295	810	150	320		
29		916	673	3295	4351	3895	3495		140	370		
30		930	1285	3560	5100	4149	3388		260	360		
31		1040		3605		4238	3440		240			

Table A 2.10: Salinity (µS/cm) for CCS at Coleambally Main Off-take

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1			112.8	117.5	129.9	168.7	125.3	120.1	113.2	136.4	152	
2			115.4	114.8	123.2	165.8	125.7	114.6	114.1	124.8	151.9	
3			121	114	129	165.7	124	118.7	117.9	125.1	151.9	
4			127.2	117	128.6	167.2	125.9	120.3	118.2	123.4	151.4	
5			133.3	122.9	129.7	162.2	131.1	119.6	105.6	111.8	148.7	
6			139.1	121.6	130	157.9	132.1	119.2	104.5	105.5	145	
7			145.1	118.9	125.5	152.2	122.6	120.3	100.5	106.7	138.1	
8			147.5	116.8	123.7	147.1	119	122.6	93.6	113.2	134.9	
9		154.3	147.9	117.9	133.5	143.1	119.8	130.5	92.1	123.2	134.1	
10		151	143.5	118.8	132.7	139.4	115.8	121.7	93.7	130.1	129.9	
11		150.9	135.8	119.7	131.6	137.3	115	119.1	94.5	119.8	121.6	
12		148	127.3	117.7	132.9	136.4	116.5	114.4	96.1	113	120.7	
13		144.6	130.9	117.2	124.6	135.4	116.8	113.5	88.4	115.4	120.8	
14		143.1	137.1	107.8	115.7	139.3	122.4	113	87.6	115.5		
15		141.4	135.1	111.2	121.3	132.8	114.6	111.3	87.9	118.5		
16		139.7	119.5	131.5	132.1	129.1	121.4	112.4	96.1	123.4		
17		140.8	116.1	134.6	139.1	129.6	124	113	107.4	131.8		
18		138.7	113.9	118.9	133.2	130.2	124.1	110.1	130.1	128.7		
19		134.4	109.7	125.1	125.4	129.1	127.9	107.5	105.7	130.5		
20		130.1	103.8	107.2	134.1	146	123.9	104.5	111.4	130.6		
21		129.5	104.4	112.2	124.2	147.8	125.9	101.5	114.4	135.1		
22		129.6	107.5	114.8	122.8	133.4	124.6	96.4	122.3	132.4		
23		128.5	112	111.5	123.1	133.9	129	97.5	114.3	134.6		
24		123.8	108	116.4	127.7	136.3	130.5	103.5	143	135.6		
25		120.5	100.8	129.7	135.6	121.7	130.4	106.5	161	138.4		
26		119.8	96.7	135.5	139.2	117.8	113	107.7	155.8	142.1		
27		115.3	105.8	120.5	141.1	116.7	117.7	107	192.5	145.9		
28		114.7	119.2	118.7	144.5	119.1	122.4	108.2	189.8	148.8		
29		115.5	118.2	122.5	151	128.9	122.7		173.4	149.7		
30		116.4	116.6	119	153.8	131.2	122.9		163.6	150.7		
31		114.2		128.4		137.6	125.4		159			

10.3 A3 Ground Water Entering CICL's Operational Area

Table A3.1 & A3.2 Flow (ML), Salinity (µS/cm), Salt Load (Tonnes) at Col Bore and Flow (ML), Salinity (µS/cm), Salt Load (Tonnes) at Hort Bore for 2012/13

Table A3.1: COLBORE

Month	Jul			Aug			Sep			Oct			Nov			Dec		
	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T
TOTAL	0		0.0	0		0.0	0		0.0	0		0.0	0		0.0	0		0.0
Month	Jan			Feb			Mar			Apr			May			Jun		
	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T
TOTAL	376	620	364	29	722	33	0		0.0	0		0.0	0		0.0	0		0.0

Table A3.2: HORTBORE

Month	Jul			Aug			Sep			Oct			Nov			Dec		
	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T
TOTAL	0		0.0	0		0.0	26	320	13	0		0.0	0		0.0	0		0.0
Month	Jan			Feb			Mar			Apr			May			Jun		
	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T	ML	EC	Salt T
TOTAL	0		0.0	0		0.0	0		0.0	0		0.0	0		0.0	7	320	4

10.4 A4 Water Quality Data

Table A4.1 Nutrient (mg/L) and Pesticide Data (mg/L) for CCS at Coleambally Main Canal (Tubbo Wells) for 2012/13

Month	Oxidised Nitrogen as N	Soluble Phosphorous	Total Nitrogen	Total Phosphorous	Total Suspended Solids	Atrazine	Chlorpyrifos	Diazinon	Diuron	Endosulfan I	Endosulfan II	Malathion	Metolachlor	Molinate	Simazine	Thiobencarb	Trifluralin	2, 4-D
July	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Aug	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Sep	0.21	0.01	0.70	0.034	15	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	<0.10	0.17	NA	<0.10	NA
Oct	0.20	0.008	0.45	0.037	37	<0.10	<0.01	NA	<0.10	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	NA	<0.10	<1.00
Nov	0.30	0.015	0.61	0.039	25	<0.10	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	<1.00	<0.10	<1.00
Dec	0.02	0.008	0.23	0.019	31	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	<0.10	<0.10	<0.10	NA	<0.10	<1.00
Jan	0.14	0.015	0.34	0.033	41	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	<0.10	<0.10	NA	NA	<1.00
Feb	0.04	0.008	0.29	0.038	33	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	<0.10	<0.10	NA	NA	<1.00
Mar	0.02	0.006	0.28	0.049	29	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	NA	<0.10	NA	<0.10	NA
Apr	0.02	0.007	0.20	0.027	15	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	NA	<0.10	NA	<0.10	NA
May	0.02	0.007	0.22	0.028	17	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	NA	<0.10	NA	<0.10	NA
Jun	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NF	NA	NF

NF = No Flow or flow less than 5ML per day
NA = Not Applicable

Table A4.2 Nutrient (mg/L) and Pesticide Data (mg/L) for CODA at West Coleambally Channel for 2012/13

Month	Oxidised Nitrogen as N	Soluble Phosphorous	Total Nitrogen	Total Phosphorous	Total Suspended Solids	Atrazine	Chlorpyrifos	Diazinon	Diuron	Endosulfan I	Endosulfan II	Malathion	Metolachlor	Molinate	Simazine	Thiobencarb	Trifluralin	2, 4-D
July	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NA	NF
Aug	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NA	NF
Sep	0.55	0.013	5.3	0.179	41	7.70	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	<0.10	0.18	NA	<0.10	NA
Oct	0.06	0.006	0.57	0.065	50	2.6	<0.01	NA	<0.10	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	NA	<0.10	<1.00
Nov	0.05	0.009	0.66	0.065	64	0.19	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	0.16	0.20	<0.10	<1.00	<0.10	<1.00
Dec	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NF	NF	NF	NA	NF	NF
Jan	0.35	0.016	1.5	0.06	94	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	<0.10	<0.10	NA	NA	<1.00
Feb	0.09	0.01	0.63	0.094	190	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	<0.10	<0.10	NA	NA	<1.00
Mar	0.02	0.012	0.74	0.083	79	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	NA	<0.10	NA	<0.10	NA
Apr	0.04	0.01	1.00	0.116	240	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	NA	<0.10	NA	<0.10	NA
May	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NF	NA
Jun	0.04	0.014	0.54	0.071	58	0.37	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	NA	0.32	NA	NA	<1.00

NF = No Flow or flow less than 5ML per day
NA = Not Applicable

Table A4.3 Nutrient (mg/L) and Pesticide Data (mg/L) for DC800A at Outfall into Yanco Creek for 2012/13

Month	Oxidised Nitrogen as N	Soluble Phosphorous	Total Nitrogen	Total Phosphorous	Total Suspended Solids	Atrazine	Chlorpyrifos	Diazinon	Diuron	Endosulfan I	Endosulfan II	Malathion	Metolachlor	Molinate	Simazine	Thiobencarb	Trifluralin	2, 4-D
July	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NA	NF
Aug	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NA	NF
Sep	0.47	0.01	4.4	0.189	100	4.40	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	<1.00	0.19	NA	<0.10	NA
Oct	0.06	0.016	1.3	0.2	220	5.00	<0.01	NA	<0.10	<0.01	<0.01	<0.01	<0.10	<0.10	0.11	NA	<0.10	<1.00
Nov	0.08	0.013	1.3	0.123	84	0.74	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01	0.55	15.00	3.60	<1.00	<0.10	<1.00
Dec	0.01	0.029	1.6	0.035	57	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	<0.10	<0.10	<0.10	NA	<0.10	<1.00
Jan	0.05	0.015	0.44	0.059	180	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	<0.10	<0.10	NA	NA	<1.00
Feb	0.07	0.009	0.66	0.083	220	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	<0.10	<0.10	NA	NA	<1.00
Mar	0.05	0.015	0.98	0.104	310	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	NA	<0.10	NA	<0.10	NA
Apr	0.07	0.01	1.1	0.12	280	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	NA	<0.10	NA	<0.10	NA
May	0.03	0.011	0.75	0.055	60	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	NA	<0.10	NA	<0.10	NA
Jun	0.05	0.012	0.49	0.064	92	0.57	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	NA	5.50	NA	NA	<1.00

NF = No Flow or flow less than 5ML per day
NA = Not Applicable

Table A4.4 Nutrient (mg/L) and Pesticide Data (mg/L) for CCD at Coleambally Catchment Drain at Outfall into Yanco Creek for 2012/13

Month	Oxidised Nitrogen as N	Soluble Phosphorous	Total Nitrogen	Total Phosphorous	Total Suspended Solids	Atrazine	Chlorpyrifos	Diazinon	Diuron	Endosulfan I	Endosulfan II	Malathion	Metolachlor	Molinate	Simazine	Thiobencarb	Trifluralin	2, 4-D
July	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NA	NF
Aug	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NA	NF
Sep	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NF	NF	NA	NF	NA
Oct	0.11	0.006	0.36	0.04	27	<0.10	<0.01	NA	<0.10	<0.01	<0.01	<0.01	<0.10	<0.10	<0.10	NA	<0.10	<1.00
Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Dec	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NF	NF	NF	NA	NF	NF
Jan	0.08	0.01	0.29	0.029	34	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	<0.10	<0.10	NA	NA	<1.00
Feb	0.02	0.007	0.27	0.036	39	<0.10	<0.01	NA	<0.10	<0.01	<0.01	NA	NA	<0.10	<0.10	NA	NA	<1.00
Mar	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NF	NA
Apr	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NF	NA
May	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NF	NA
Jun	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NA	NF

NF = No Flow or flow less than 5ML per day
NA = Not Applicable

Table A4.5 Nutrient (mg/L) and Pesticide Data (mg/L) for CODD (WCC) at Bundy near Billabong Creek for 2012/13

Month	Oxidised Nitrogen as N	Soluble Phosphorous	Total Nitrogen	Total Phosphorous	Total Suspended Solids	Atrazine	Chlorpyrifos	Diazinon	Diuron	Endosulfan I	Endosulfan II	Malathion	Metolachlor	Molinate	Simazine	Thiobencarb	Trifluralin	2, 4-D
July	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NA	NF
Aug	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NA	NF
Sep	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NF	NF	NA	NF	NA
Oct	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF
Nov	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Dec	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NF	NF	NF	NA	NF	NF
Jan	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NF	NF	NA	NF	NF
Feb	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NF	NF	NA	NA	NF
Mar	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NF	NA
Apr	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NF	NA
May	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NF	NA
Jun	NF	NF	NF	NF	NF	NF	NF	NA	NF	NF	NF	NA	NA	NA	NF	NA	NA	NF

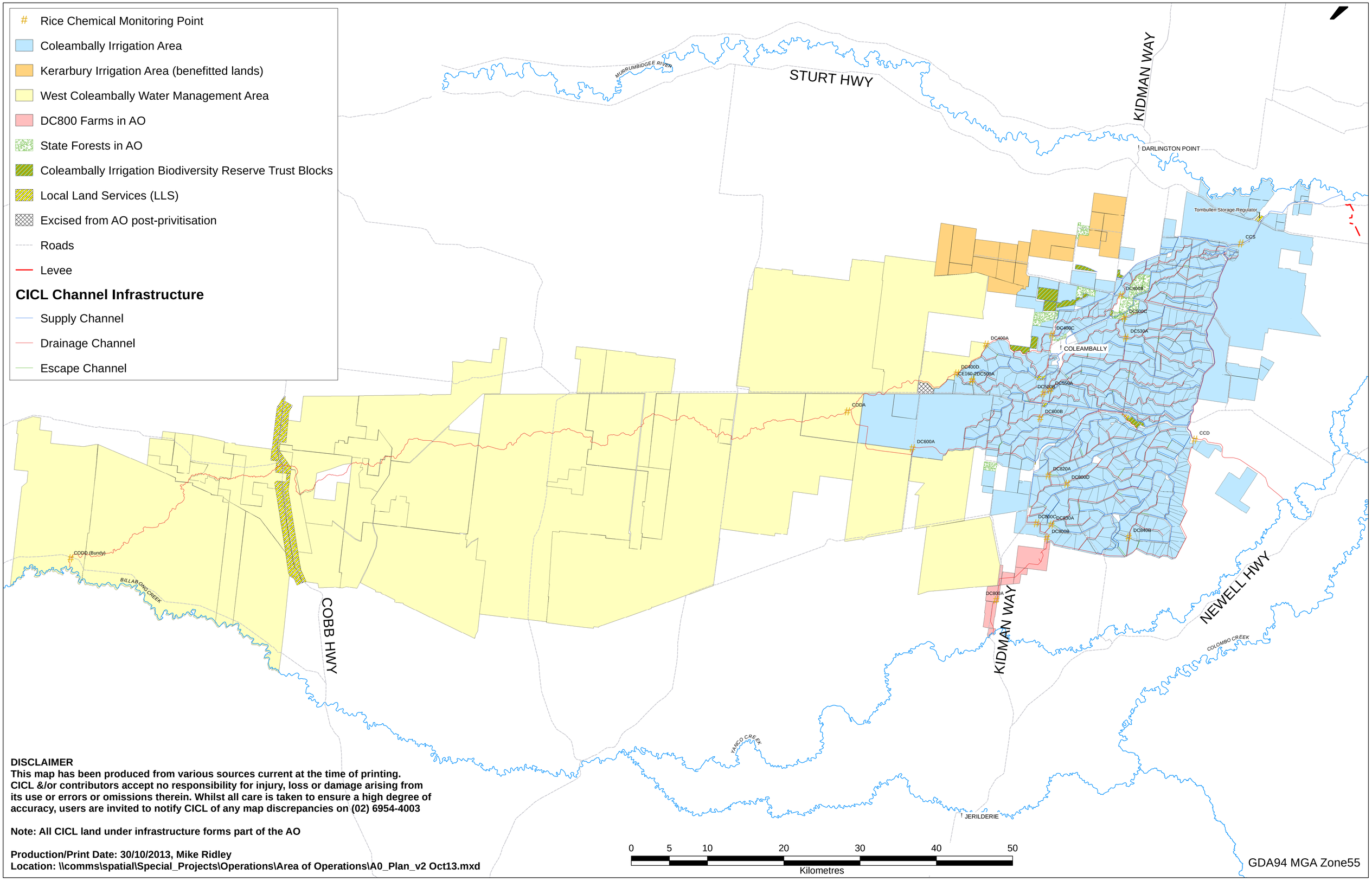
NF = No Flow or flow less than 5ML per day
NA = Not Applicable

10.5 A5 RCMP Results

TableA 5.1 RCMP Results 2012/13

Date	Sample Number	Sample point	Molinate results
2/10/2012	2054	Region:Argoon, Id:5, Acro:CODA	<LOR
2/10/2012	2059	Region:Yamma, Id:18, Acro:DC800A	<LOR
2/10/2012	2064	Region:Yamma, Id:39, Acro:CCD	<LOR
8/10/2012	2104	Region:Argoon, Id:5, Acro:CODA	<LOR
8/10/2012	2110	Region:Yamma, Id:18, Acro:DC800A	<LOR
8/10/2012	2115	Region:Yamma, Id:39, Acro:CCD	<LOR
15/10/2012	2222	Region:Argoon, Id:5, Acro:CODA	Molinate 2.1
15/10/2012	2228	Region:Yamma, Id:18, Acro:DC800A	<LOR
15/10/2012	2233	Region:Yamma, Id:39, Acro:CCD	<LOR
22/10/2012	2280	Region:Argoon, Id:5, Acro:CODA	Molinate 0.44
22/10/2012	2285	Region:Yamma, Id:18, Acro:DC800A	Molinate 0.65
22/10/2012	2290	Region:Yamma, Id:39, Acro:CCD	<LOR
29/10/2012	2339	Region:Argoon, Id:5, Acro:CODA	<LOR
29/10/2012	2345	Region:Yamma, Id:18, Acro:DC800A	<LOR
29/10/2012	2350	Region:Yamma, Id:39, Acro:CCD	<LOR
5/11/2012	2410	Region:Argoon, Id:5, Acro:CODA	Molinate 0.73
5/11/2012	2415	Region:Yamma, Id:18, Acro:DC800A	<LOR
5/11/2012	2420	Region:Yamma, Id:39, Acro:CCD	<LOR
12/11/2012	2469	Region:Argoon, Id:5, Acro:CODA	<LOR
12/11/2012	2474	Region:Yamma, Id:18, Acro:DC800A	Molinate 16
12/11/2012	2479	Region:Yamma, Id:39, Acro:CCD	<LOR
19/11/2012	2527	Region:Argoon, Id:5, Acro:CODA	<LOR
19/11/2012	2537	Region:Yamma, Id:18, Acro:DC800A	Molinate 16
26/11/2012	2581	Region:Argoon, Id:5, Acro:CODA	<LOR
26/11/2012	2584	Region:Yamma, Id:18, Acro:DC800A	<LOR
3/12/2012	2657	Region:Argoon, Id:5, Acro:CODA	<LOR
3/12/2012	2661	Region:Yamma, Id:18, Acro:DC800A	<LOR
3/12/2012	2666	Region:Yamma, Id:39, Acro:CCD	<LOR
10/12/2012	2718	Region:Yamma, Id:18, Acro:DC800A	<LOR
10/12/2012	2723	Region:Yamma, Id:39, Acro:CCD	<LOR
10/12/2012	2768	Region:Argoon, Id:5, Acro:CODA	<LOR
17/12/2012	2786	Region:Argoon, Id:5, Acro:CODA	<LOR
17/12/2012	2789	Region:Yamma, Id:18, Acro:DC800A	Molinate 1.1ug/L
17/12/2012	2794	Region:Yamma, Id:39, Acro:CCD	<LOR

CICL Area of Operations (AO) Plan



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Note: All CICL land under infrastructure forms part of the AO

Production/Print Date: 30/10/2013, Mike Ridley
Location: \\comms\spatial\Special_Projects\Operations\Area of Operations\A0_Plan_v2 Oct13.mxd

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Discharge Measurement Summary

Date Generated: Mon Sep 10 2012

File Information

File Name	202.011.sds
Start Date and Time	06/09/2012 12:09:04

Site Details

Site Name	Coleambally Offtake
Operator(s)	WGR/SJH

System Information

Sensor Type	3000 kHz ADP
Serial #	M925
CPU Firmware Version	9.6
Software Ver	1.20

Units

Distance	m
Velocity	m/s
Area	m2
Discharge	m3/s

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.1%	0.4%
Velocity	0.9%	2.2%
Width	0.1%	0.1%
Method	0.1%	-
# Stations	2.0%	-
Overall	**2.4%**	**2.5%**

Summary

Averaging Int.	40.0	Disch. Equation	Mid-Section
Start Edge	LEW	Rated Discharge	15.24
Profile	25x0.15 cells	# Stations	26
Blanking Dist	0.20	Total Width	40.50
Salinity	0.1 ppt	Total Area	112.73
Azimuth	309.5 deg	Mean Depth	2.78
Start Stage	3.620	Mean Velocity	0.12
End Stage	3.625	**Total Discharge**	**13.17**

Weather

Fair wind & overcast.

Measurement Results

St	Clock	Loc	Depth	Angle	MeanV	Area	Flow	%Q
1	12:09	5.75	0.000	0.0	0.000	0.000	0.0000	0.0
2	12:09	7.50	1.684	-18.4	0.057	3.578	0.2031	1.5
3	12:10	10.00	2.581	1.3	0.088	5.808	0.5113	3.9
4	12:12	12.00	3.143	-1.9	0.138	5.499	0.7579	5.8
5	12:13	13.50	3.335	-0.9	0.165	4.169	0.6887	5.2
6	12:14	14.50	3.410	-2.5	0.211	3.410	0.7202	5.5
7	12:16	15.50	3.473	6.2	0.195	3.473	0.6763	5.1
8	12:17	16.50	3.477	4.1	0.167	3.477	0.5814	4.4
9	12:18	17.50	3.440	-1.5	0.163	4.301	0.7030	5.3
10	12:20	19.00	3.266	0.3	0.197	4.083	0.8053	6.1
11	12:22	20.00	3.139	-2.5	0.173	3.139	0.5422	4.1
12	12:23	21.00	3.035	3.5	0.146	3.794	0.5544	4.2
13	12:25	22.50	2.995	2.7	0.159	4.492	0.7123	5.4
14	12:26	24.00	3.005	-2.9	0.159	4.508	0.7175	5.4
15	12:28	25.50	3.016	1.0	0.152	4.524	0.6886	5.2
16	12:29	27.00	3.022	2.5	0.144	4.534	0.6516	4.9
17	12:30	28.50	3.010	-4.3	0.150	4.515	0.6782	5.1
18	12:32	30.00	3.002	-8.5	0.152	4.503	0.6830	5.2
19	12:34	31.50	2.975	-3.2	0.102	5.207	0.5301	4.0
20	12:36	33.50	3.160	-5.1	0.098	6.321	0.6194	4.7
21	12:38	35.50	3.277	4.6	0.077	6.554	0.5052	3.8
22	12:39	37.50	3.240	-2.5	0.061	6.479	0.3946	3.0
23	12:40	39.50	3.121	-1.0	0.024	6.242	0.1516	1.2
24	12:42	41.50	2.752	21.6	0.006	5.504	0.0336	0.3
25	12:45	43.50	1.942	63.3	0.013	4.613	0.0615	0.5
26	12:45	46.25	0.000	0.0	0.000	0.000	0.0000	0.0

Report generated using SonTek Stationary Measurement software version 1.20

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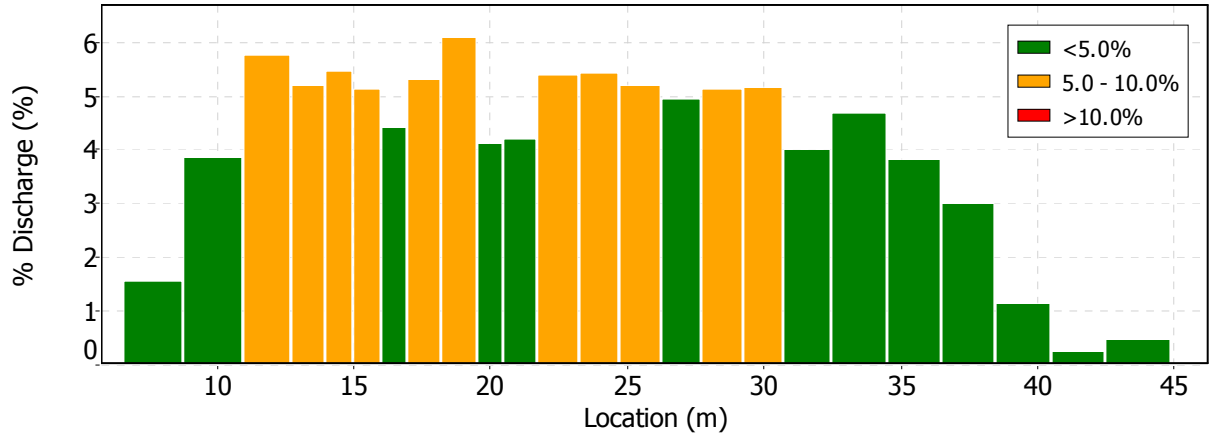
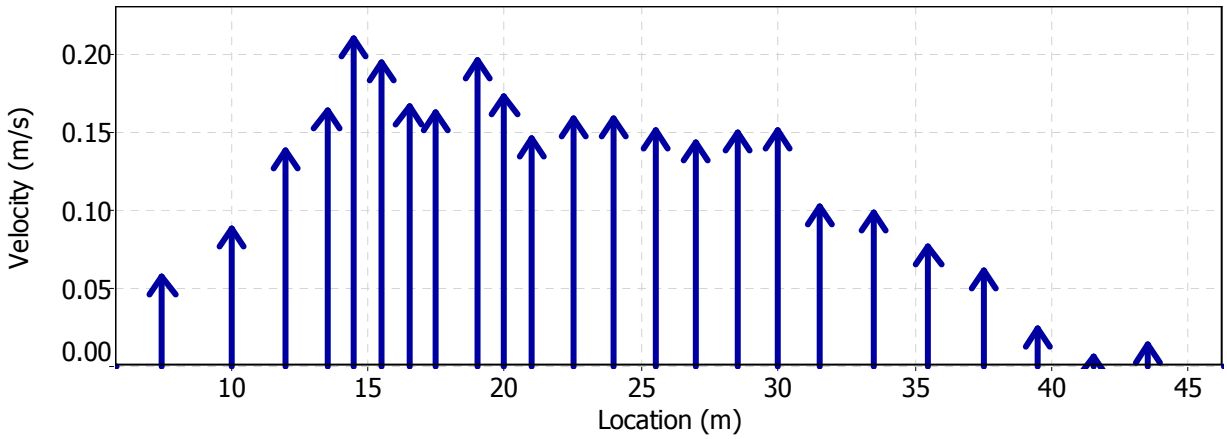
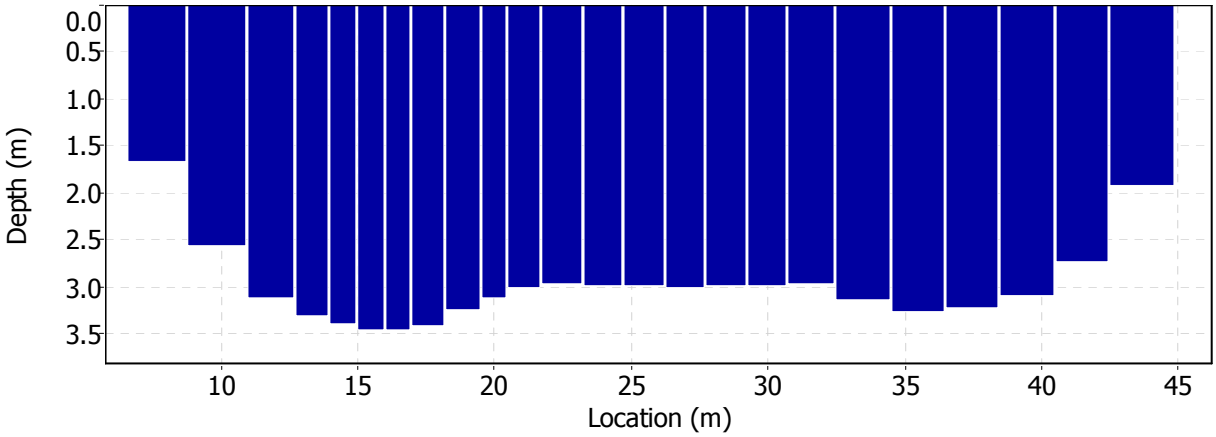
Discharge Measurement Summary

Date Generated: Mon Sep 10 2012

File Information		Site Details	
File Name	202.011.sds	Site Name	Coleambally Offtake
Start Date and Time	06/09/2012 12:09:04	Operator(s)	WGR/SJH







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Discharge Measurement Summary

Date Measured: Monday, October 01, 2012

Recorded file is located under My Documents|SonTek Data|YYYY_MM_DD|StationaryDataFiles

Site Information	
Site Name	Coleambally OFFTAKE
Station Number	202
Location	At the Accusonic

Measurement Information	
Party	SJH/WGR
Boat/Motor	Side Suspension
Meas. Number	012

System Information	
System Type	RS-M9
Serial Number	2169
Firmware Version	3.00

System Setup	
Tagline Azimuth (deg)	309.9
Salinity (ppt)	0.0
Rated Discharge (m3/s)	0.00
Discharge Method	Mid-Section
Measurement Quality	--

Units	
Distance	m
Velocity	m/s
Area	m2
Discharge	m3/s
Temperature	degC

Discharge Calculation Settings	
Track Reference	System (default)
Depth Reference	Vertical Beam

Discharge Results	
Total Area	106.09
Mean Velocity	0.14
Total Width	40.25
Total Q	14.52
Mean Flow Angle	2.37
Rated Discharge	0.00
Water Temperature (Independent)	0.00
Mean Water Temperature	14.61
Mean Weighted Gauge Height	3.44

Discharge Uncertainty		
Category	ISO	Stats
Depth	0.12%	1.05%
Velocity	0.14%	1.05%
Width	0.12%	0.12%
# Cells	0.12%	--
# Stations	2.20%	--
Instrument	0.25%	0.25%
Overall	2.22%	1.51%

Measurement Results

#	Time	Location	Water Surface Type	Temperature	Depth	Flow Angle	Mean Velocity	Area	Station Q	% Measured
1	11:38:20 AM	5.50	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0
2	11:38:20 AM	7.00	Open Water	14.8	1.22	-0.2	0.044	2.1	0.093	0.6
3	11:39:48 AM	9.00	Open Water	14.7	2.21	7.3	0.081	4.4	0.357	2.5
4	11:41:09 AM	11.00	Open Water	14.7	3.01	0.5	0.114	6.0	0.684	4.7
5	*11:42:34 AM*	*13.00*	*Open Water*	*14.7*	*3.24*	*3.6*	*0.137*	*6.5*	*0.888*	*6.1*
6	*11:44:09 AM*	*15.00*	*Open Water*	*14.6*	*3.39*	*5.3*	*0.158*	*6.8*	*1.073*	*7.4*
7	*11:45:29 AM*	*17.00*	*Open Water*	*14.6*	*3.35*	*1.2*	*0.169*	*6.7*	*1.136*	*7.8*
8	*11:47:08 AM*	*19.00*	*Open Water*	*14.5*	*2.97*	*-0.1*	*0.168*	*5.9*	*0.998*	*6.9*
9	*11:48:41 AM*	*21.00*	*Open Water*	*14.6*	*2.86*	*1.4*	*0.175*	*5.7*	*1.000*	*6.9*
10	*11:50:12 AM*	*23.00*	*Open Water*	*14.6*	*2.86*	*1.0*	*0.151*	*5.7*	*0.865*	*6.0*
11	*11:51:33 AM*	*25.00*	*Open Water*	*14.6*	*2.87*	*2.8*	*0.155*	*5.7*	*0.890*	*6.1*
12	*11:52:51 AM*	*27.00*	*Open Water*	*14.6*	*2.89*	*2.1*	*0.169*	*5.8*	*0.976*	*6.7*
13	*11:54:13 AM*	*29.00*	*Open Water*	*14.6*	*2.83*	*2.4*	*0.170*	*5.7*	*0.962*	*6.6*
14	*11:55:35 AM*	*31.00*	*Open Water*	*14.5*	*2.81*	*2.5*	*0.158*	*5.6*	*0.889*	*6.1*
15	*11:56:54 AM*	*33.00*	*Open Water*	*14.5*	*3.04*	*4.0*	*0.153*	*6.1*	*0.930*	*6.4*
16	*11:58:16 AM*	*35.00*	*Open Water*	*14.6*	*3.08*	*2.4*	*0.132*	*6.2*	*0.811*	*5.6*
17	11:59:38 AM	37.00	Open Water	14.6	3.09	3.7	0.115	6.2	0.708	4.9
18	12:01:06 PM	39.00	Open Water	14.7	3.01	4.0	0.104	6.0	0.625	4.3
19	12:02:26 PM	41.00	Open Water	14.6	2.46	4.4	0.083	4.9	0.408	2.8
20	12:03:53 PM	43.00	Open Water	14.7	1.68	1.5	0.059	4.0	0.233	1.6
21	12:03:53 PM	45.75	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0

Comments

sunny light wind blowing up stream

Compass Calibration

Passed Calibration
Calibration duration = 120 seconds
M3.00 = Magnetic influence is acceptable
Q9 = Magnetic field is uniform
H9 = Complete horizontal rotation
V6 = High pitch/roll

Recommendation(s):
The required duration of the compass calibration is between 1 and 2 minutes.

System Test

System Tes: PASS

Parameters and settings marked with a * are not constant for all files.

Report generated using SonTek RiverSurveyor Stationary Live v2.50

Discharge Measurement Summary

Date Measured: Wednesday, October 31, 2012

Recorded file is located under My Documents|SonTek Data|YYYY_MM_DD|StationaryDataFiles

Site Information	
Site Name	Coleambally O/T
Station Number	202
Location	At the Accusonic

Measurement Information	
Party	SJH/WGR
Boat/Motor	Platform
Meas. Number	013

System Information	
System Type	RS-M9
Serial Number	2169
Firmware Version	3.00

System Setup	
Tagline Azimuth (deg)	322.0
Salinity (ppt)	0.1
Rated Discharge (m3/s)	41.67
Discharge Method	Mid-Section
Measurement Quality	--

Units	
Distance	m
Velocity	m/s
Area	m2
Discharge	m3/s
Temperature	degC

Discharge Calculation Settings	
Track Reference	System (default)
Depth Reference	Vertical Beam

Discharge Results	
Total Area	106.51
Mean Velocity	0.40
Total Width	39.75
Total Q	42.21
Mean Flow Angle	0.23
Rated Discharge	41.67
% difference Q	1.30
Water Temperature (Independent)	20.00
Mean Water Temperature	20.23
Mean Weighted Gauge Height	0.00

Discharge Uncertainty		
Category	ISO	Stats
Depth	0.11%	0.69%
Velocity	0.11%	1.17%
Width	0.11%	0.11%
# Cells	0.11%	--
# Stations	1.82%	--
Instrument	0.25%	0.25%
Overall	1.85%	1.39%

Measurement Results

#	Time	Location	Water Surface Type	Temperature	Depth	Flow Angle	Mean Velocity	Area	Station Q	% Discharge
1	10:02:52 AM	5.00	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0
2	10:02:52 AM	7.00	Open Water	20.7	1.29	-1.7	0.152	2.6	0.391	0.9
3	10:04:23 AM	9.00	Open Water	20.6	2.25	-0.9	0.254	4.5	1.147	2.8
4	10:05:41 AM	11.00	Open Water	20.5	3.04	2.4	0.313	6.1	1.905	4.6
5	*10:06:59 AM*	*13.00*	*Open Water*	*20.4*	*3.27*	*0.8*	*0.353*	*6.5*	*2.311*	*5.5*
6	*10:08:17 AM*	*15.00*	*Open Water*	*20.4*	*3.45*	*2.3*	*0.354*	*6.0*	*2.132*	*5.1*
7	10:09:41 AM	16.50	Open Water	20.4	3.33	-0.3	0.407	5.0	2.033	4.9
8	10:11:05 AM	18.00	Open Water	20.3	3.01	-1.4	0.383	5.3	2.019	4.8
9	*10:12:31 AM*	*20.00*	*Open Water*	*20.3*	*2.93*	*-3.6*	*0.387*	*5.9*	*2.268*	*5.4*
10	10:13:48 AM	22.00	Open Water	20.3	2.89	-0.6	0.405	5.1	2.049	4.9
11	10:15:10 AM	23.50	Open Water	20.2	2.90	1.7	0.447	4.3	1.942	4.7
12	10:16:25 AM	25.00	Open Water	20.2	2.91	-2.1	0.433	4.4	1.894	4.5
13	10:17:42 AM	26.50	Open Water	20.2	2.91	-2.8	0.437	4.4	1.911	4.6
14	10:18:59 AM	28.00	Open Water	20.2	2.89	-0.1	0.471	4.3	2.047	4.9
15	10:20:16 AM	29.50	Open Water	20.2	2.85	-0.7	0.462	4.3	1.980	4.8
16	10:21:42 AM	31.00	Open Water	20.1	2.84	-0.3	0.476	4.3	2.029	4.9
17	10:22:59 AM	32.50	Open Water	20.1	2.97	1.1	0.467	4.5	2.081	5.0
18	10:25:14 AM	34.00	Open Water	20.1	3.08	-0.4	0.478	3.9	1.843	4.4
19	10:26:30 AM	35.00	Open Water	20.1	3.12	2.7	0.440	3.1	1.373	3.3
20	10:28:47 AM	36.00	Open Water	20.1	3.14	0.7	0.399	3.9	1.565	3.8
21	10:31:26 AM	37.50	Open Water	20.1	3.08	2.2	0.426	4.6	1.971	4.7
22	10:33:58 AM	39.00	Open Water	20.1	3.04	0.1	0.439	4.6	2.004	4.8
23	10:35:17 AM	40.50	Open Water	20.1	2.67	1.9	0.415	4.0	1.663	4.0
24	10:37:26 AM	42.00	Open Water	20.1	2.10	1.8	0.357	3.2	1.127	2.7
25	10:38:46 AM	43.50	Open Water	20.1	1.39	3.1	0.274	1.9	0.525	1.3
26	10:38:46 AM	44.75	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0

Comments

sunny ,no wind

Compass Calibration

Passed Calibration

Calibration duration = 93 seconds
M5.00 = Magnetic influence is acceptable
Q9 = Magnetic field is uniform
H9 = Complete horizontal rotation
V6 = High pitch/roll

Recommendation(s):

Avoid any changes to the instrument setup or its orientation to the magnetic influences detected during the compass calibration.

Measurements should be made in locations with similar magnetic influences as the location of the compass calibration.

System Test

System Tes: PASS

Parameters and settings marked with a * are not constant for all files.

Report generated using SonTek RiverSurveyor Stationary Live v2.50

□□

Discharge Measurement Summary

Date Measured: Friday, December 07, 2012

Recorded file is located under My Documents|SonTek Data|YYYY_MM_DD|StationaryDataFiles

Site Information	
Site Name	Main Canal @ Coleambally Offtake
Station Number	202
Location	Between Acusonic Posts

Measurement Information	
Party	Party 1 WGR/SJH
Boat/Motor	Platform
Meas. Number	14

System Information	
System Type	RS-M9
Serial Number	2169
Firmware Version	3.00

System Setup	
Tagline Azimuth (deg)	323.4
Salinity (ppt)	0.1
Rated Discharge (m3/s)	35.88
Discharge Method	Mid-Section
Measurement Quality	--

Units	
Distance	m
Velocity	m/s
Area	m2
Discharge	m3/s
Temperature	degC

Discharge Calculation Settings	
Track Reference	System (default)
Depth Reference	Vertical Beam

Discharge Results	
Total Area	105.20
Mean Velocity	0.34
Total Width	40.70
Total Q	35.93
Mean Flow Angle	-1.41
Rated Discharge	35.88
% difference Q	0.13
Water Temperature (Independent)	20.40
Mean Water Temperature	21.51
Mean Weighted Gauge Height	0.00

Discharge Uncertainty		
Category	ISO	Stats
Depth	0.10%	0.85%
Velocity	0.08%	1.30%
Width	0.10%	0.10%
# Cells	0.10%	--
# Stations	1.76%	--
Instrument	0.25%	0.25%
Overall	1.79%	1.57%

Measurement Results

#	Time	Location	Water Surface Type	Temperature	Depth	Flow Angle	Mean Velocity	Area	Station Q	% Discharge
1	11:02:42 AM	4.50	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0
2	11:02:42 AM	6.50	Open Water	22.1	0.93	0.2	0.159	1.9	0.296	0.8
3	11:04:06 AM	8.50	Open Water	21.9	1.94	-0.3	0.203	3.9	0.788	2.2
4	11:05:25 AM	10.50	Open Water	21.8	2.78	0.3	0.287	4.9	1.396	3.9
5	11:06:45 AM	12.00	Open Water	21.7	3.12	0.7	0.285	4.7	1.336	3.7
6	11:08:08 AM	13.50	Open Water	21.7	3.24	0.1	0.297	4.9	1.446	4.0
7	11:09:27 AM	15.00	Open Water	21.6	3.38	-1.0	0.303	5.1	1.536	4.3
8	11:11:34 AM	16.50	Open Water	21.5	3.40	-1.0	0.333	5.1	1.695	4.7
9	11:12:51 AM	18.00	Open Water	21.5	3.10	-2.6	0.352	4.6	1.634	4.6
10	11:14:06 AM	19.50	Open Water	21.5	2.91	-1.9	0.375	4.4	1.639	4.6
11	11:15:25 AM	21.00	Open Water	21.5	2.84	-3.1	0.356	4.3	1.519	4.2
12	11:16:51 AM	22.50	Open Water	21.5	2.83	-2.6	0.363	4.2	1.541	4.3
13	11:19:02 AM	24.00	Open Water	21.4	2.86	-4.0	0.376	4.3	1.613	4.5
14	11:20:30 AM	25.50	Open Water	21.4	2.90	-3.6	0.366	4.3	1.590	4.4
15	11:21:51 AM	27.00	Open Water	21.4	2.89	-2.9	0.367	4.3	1.588	4.4
16	11:23:08 AM	28.50	Open Water	21.4	2.82	-2.5	0.371	4.2	1.569	4.4
17	11:24:24 AM	30.00	Open Water	21.4	2.86	-4.0	0.389	4.3	1.665	4.6
18	11:25:51 AM	31.50	Open Water	21.4	2.79	-3.1	0.371	4.2	1.551	4.3
19	11:27:10 AM	33.00	Open Water	21.4	3.06	-0.2	0.369	4.6	1.698	4.7
20	11:29:15 AM	34.50	Open Water	21.4	3.07	-3.0	0.369	4.6	1.700	4.7
21	11:31:01 AM	36.00	Open Water	21.4	3.10	-2.8	0.404	3.9	1.562	4.4
22	11:32:20 AM	37.00	Open Water	21.4	3.08	-0.8	0.396	3.1	1.218	3.4
23	11:33:30 AM	38.00	Open Water	21.4	3.05	-0.7	0.392	3.0	1.196	3.3
24	11:34:43 AM	39.00	Open Water	21.4	3.00	-0.6	0.375	3.7	1.406	3.9
25	11:36:00 AM	40.50	Open Water	21.4	2.56	-0.3	0.353	4.5	1.579	4.4
26	11:37:20 AM	42.50	Open Water	21.4	1.81	1.9	0.273	4.3	1.166	3.2
27	11:37:20 AM	45.20	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0

Comments

Compass Calibration

Passed Calibration

Calibration duration = 87 seconds
M3.00 = Magnetic influence is acceptable
Q9 = Magnetic field is uniform
H9 = Complete horizontal rotation
V4 = Low pitch/roll

Recommendation(s):
Measurements should be made with low pitch/roll OR repeat calibration with more pitch/roll.

Avoid any changes to the instrument setup or its orientation to the magnetic influences detected during the compass calibration.

Measurements should be made in locations with similar magnetic influences as the location of the compass calibration.

System Test

System Tes: PASS

Discharge Measurement Summary

Date Measured: Tuesday, January 08, 2013

Recorded file is located under My Documents|SonTek Data|YYYY_MM_DD|StationaryDataFiles

Site Information	
Site Name	Coleambally OT
Station Number	202
Location	At the Accusonic

Measurement Information	
Party	SJH/WGR
Boat/Motor	Platform
Meas. Number	015

System Information	
System Type	RS-M9
Serial Number	2457
Firmware Version	3.00

System Setup	
Tagline Azimuth (deg)	322.7
Salinity (ppt)	0.0
Rated Discharge (m3/s)	49.42
Discharge Method	Mid-Section
Measurement Quality	--

Units	
Distance	m
Velocity	m/s
Area	m2
Discharge	m3/s
Temperature	degC

Discharge Calculation Settings	
Track Reference	System (default)
Depth Reference	Vertical Beam

Discharge Results	
Total Area	105.12
Mean Velocity	0.47
Total Width	41.00
Total Q	49.08
Mean Flow Angle	2.46
Rated Discharge	49.42
% difference Q	-0.68
Water Temperature (Independent)	27.00
Mean Water Temperature	28.61
Mean Weighted Gauge Height	0.00

Discharge Uncertainty		
Category	ISO	Stats
Depth	0.11%	1.00%
Velocity	0.18%	2.17%
Width	0.11%	0.11%
# Cells	0.11%	--
# Stations	2.03%	--
Instrument	0.25%	0.25%
Overall	2.06%	2.40%

Measurement Results

#	Time	Location	Water Surface Type	Temperature	Depth	Flow Angle	Mean Velocity	Area	Station Q	% Discharge
1	1:20:27 PM	4.00	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0
2	1:20:27 PM	6.60	Open Water	29.9	0.98	4.2	0.190	2.0	0.373	0.8
3	1:22:31 PM	8.00	Open Water	29.6	1.70	2.7	0.278	2.9	0.805	1.6
4	1:23:51 PM	10.00	Open Water	29.4	2.52	1.6	0.319	5.0	1.603	3.2
5	*1:25:06 PM*	*12.00*	*Open Water*	*29.3*	*3.08*	*2.6*	*0.416*	*6.2*	*2.565*	*5.2*
6	*1:26:42 PM*	*14.00*	*Open Water*	*29.1*	*3.26*	*3.1*	*0.423*	*6.5*	*2.757*	*5.6*
7	*1:29:05 PM*	*16.00*	*Open Water*	*28.9*	*3.43*	*2.8*	*0.428*	*6.9*	*2.935*	*5.9*
8	*1:32:03 PM*	*18.00*	*Open Water*	*28.8*	*3.12*	*2.6*	*0.474*	*5.5*	*2.590*	*5.2*
9	1:33:58 PM	19.50	Open Water	28.7	2.89	1.1	0.525	4.3	2.276	4.6
10	1:35:19 PM	21.00	Open Water	28.6	2.82	3.3	0.498	4.9	2.456	5.0
11	*1:37:34 PM*	*23.00*	*Open Water*	*28.5*	*2.83*	*1.2*	*0.453*	*5.7*	*2.563*	*5.2*
12	*1:40:00 PM*	*25.00*	*Open Water*	*28.4*	*2.87*	*-0.7*	*0.494*	*5.7*	*2.834*	*5.7*
13	*1:42:10 PM*	*27.00*	*Open Water*	*28.4*	*2.89*	*2.5*	*0.514*	*5.8*	*2.972*	*6.0*
14	*1:43:57 PM*	*29.00*	*Open Water*	*28.3*	*2.86*	*2.3*	*0.520*	*5.7*	*2.973*	*6.0*
15	*1:45:18 PM*	*31.00*	*Open Water*	*28.3*	*2.77*	*0.3*	*0.526*	*5.5*	*2.913*	*5.9*
16	*1:46:40 PM*	*33.00*	*Open Water*	*28.2*	*3.06*	*2.7*	*0.520*	*6.1*	*3.178*	*6.4*
17	1:48:04 PM	35.00	Open Water	28.2	3.08	3.1	0.534	4.6	2.462	5.0
18	1:50:06 PM	36.00	Open Water	28.1	3.09	2.9	0.532	3.9	2.053	4.2
19	1:51:31 PM	37.50	Open Water	28.1	3.07	3.1	0.535	4.6	2.464	5.0
20	*1:53:42 PM*	*39.00*	*Open Water*	*28.1*	*3.00*	*1.9*	*0.485*	*5.3*	*2.551*	*5.2*
21	1:55:30 PM	41.00	Open Water	28.0	2.38	8.3	0.468	4.8	2.226	4.5
22	1:57:12 PM	43.00	Open Water	28.0	1.65	4.9	0.464	3.3	1.536	3.1
23	1:57:12 PM	45.00	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0

Comments

Compass Calibration

Passed Calibration

CAUTION

Calibration duration = 79 seconds
M58.00 = Magnetic influence is acceptable
Q9 = Magnetic field is uniform
H9 = Complete horizontal rotation
V9 = High pitch/roll

Recommendation(s):
Avoid any changes to the instrument setup or its orientation to the magnetic influences detected during the compass calibration.

Measurements should be made in locations with similar magnetic influences as the location of the compass calibration.

System Test

System Tes: PASS

Parameters and settings marked with a * are not constant for all files.

Report generated using SonTek RiverSurveyor Stationary Live v2.50

Discharge Measurement Summary

Date Measured: Monday, February 04, 2013

Recorded file is located under My Documents|SonTek Data|YYYY_MM_DD|StationaryDataFiles

Site Information	
Site Name	Main Canal @ Offtake
Station Number	202
Location	Between Affra Posts

Measurement Information	
Party	Party 1 WGR/SJH
Boat/Motor	Platform
Meas. Number	16

System Information	
System Type	RS-M9
Serial Number	2169
Firmware Version	3.00

System Setup	
Tagline Azimuth (deg)	322.8
Salinity (ppt)	0.1
Rated Discharge (m3/s)	39.03
Discharge Method	Mid-Section
Measurement Quality	Excellent

Units	
Distance	m
Velocity	m/s
Area	m2
Discharge	m3/s
Temperature	degC

Discharge Calculation Settings	
Track Reference	System (default)
Depth Reference	Vertical Beam

Discharge Results	
Total Area	106.08
Mean Velocity	0.38
Total Width	41.00
Total Q	39.99
Mean Flow Angle	-1.21
Rated Discharge	39.03
% difference Q	2.47
Water Temperature (Independent)	22.50
Mean Water Temperature	22.45
Mean Weighted Gauge Height	0.00

Discharge Uncertainty		
Category	ISO	Stats
Depth	0.10%	0.73%
Velocity	0.08%	0.91%
Width	0.10%	0.10%
# Cells	0.10%	--
# Stations	1.76%	--
Instrument	0.25%	0.25%
Overall	1.79%	1.20%

Measurement Results

#	Time	Location	Water Surface Type	Temperature	Depth	Flow Angle	Mean Velocity	Area	Station Q	% Discharge
1	10:20:35 AM	4.00	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0
2	10:20:35 AM	6.00	Open Water	22.4	0.56	-0.6	0.107	1.1	0.121	0.3
3	10:22:07 AM	8.00	Open Water	22.4	1.80	2.3	0.258	3.6	0.932	2.4
4	10:23:59 AM	10.00	Open Water	22.4	2.68	-3.9	0.314	4.7	1.475	3.8
5	10:25:08 AM	11.50	Open Water	22.4	3.06	-1.5	0.303	4.6	1.395	3.6
6	10:26:18 AM	13.00	Open Water	22.4	3.24	-2.6	0.340	4.9	1.654	4.2
7	10:27:29 AM	14.50	Open Water	22.4	3.38	-4.6	0.365	5.1	1.850	4.7
8	10:28:52 AM	16.00	Open Water	22.4	3.36	-0.8	0.340	5.0	1.717	4.4
9	10:30:28 AM	17.50	Open Water	22.4	3.22	0.1	0.355	4.8	1.714	4.4
10	10:32:14 AM	19.00	Open Water	22.4	2.93	-3.1	0.389	4.4	1.709	4.4
11	10:33:40 AM	20.50	Open Water	22.4	2.85	-1.8	0.418	4.3	1.785	4.6
12	10:34:55 AM	22.00	Open Water	22.4	2.84	-1.3	0.420	4.3	1.791	4.6
13	10:36:09 AM	23.50	Open Water	22.4	2.88	-2.8	0.430	4.3	1.857	4.8
14	10:37:40 AM	25.00	Open Water	22.4	2.88	-3.8	0.398	4.3	1.720	4.4
15	10:38:56 AM	26.50	Open Water	22.4	2.91	-2.3	0.425	4.4	1.852	4.7
16	10:40:10 AM	28.00	Open Water	22.4	2.87	-1.2	0.434	4.3	1.867	4.8
17	10:41:23 AM	29.50	Open Water	22.5	2.91	-3.0	0.433	4.4	1.892	4.8
18	10:42:34 AM	31.00	Open Water	22.5	2.82	-4.2	0.418	4.2	1.765	4.5
19	10:43:51 AM	32.50	Open Water	22.5	2.96	-2.8	0.392	4.4	1.743	4.5
20	10:45:10 AM	34.00	Open Water	22.5	3.12	0.1	0.390	4.7	1.823	4.7
21	*10:46:24 AM*	*35.50*	*Open Water*	*22.5*	*3.14*	*-0.9*	*0.430*	*4.7*	*2.024*	*5.2*
22	*10:47:50 AM*	*37.00*	*Open Water*	*22.5*	*3.14*	*-0.4*	*0.423*	*4.7*	*1.989*	*5.1*
23	10:50:39 AM	38.50	Open Water	22.6	3.10	0.3	0.413	4.6	1.920	4.9
24	10:53:45 AM	40.00	Open Water	22.6	2.78	-0.4	0.386	4.9	1.878	4.8
25	10:55:04 AM	42.00	Open Water	22.6	2.01	1.1	0.319	4.0	1.282	3.3
26	10:56:19 AM	44.00	Open Water	22.6	0.89	5.5	0.175	1.3	0.235	0.6
27	10:56:19 AM	45.00	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0

Comments

Compass Calibration

Passed Calibration

Calibration duration = 73 seconds
M16.00 = Magnetic influence is acceptable
Q9 = Magnetic field is uniform
H9 = Complete horizontal rotation
V7 = High pitch/roll

Recommendation(s):
Avoid any changes to the instrument setup or its orientation to the magnetic influences detected during the compass calibration.

Measurements should be made in locations with similar magnetic influences as the location of the compass calibration.

System Test

System Tes: PASS

Discharge Measurement Summary

Date Measured: Wednesday, March 13, 2013

Recorded file is located under My Documents|SonTek Data|YYYY_MM_DD|StationaryDataFiles

Site Information	
Site Name	Coleambally Offtake
Station Number	202
Location	@ the accusonic

Measurement Information	
Party	SJH/WGR
Boat/Motor	Platform
Meas. Number	18

System Information	
System Type	RS-M9
Serial Number	2169
Firmware Version	3.00

System Setup	
Tagline Azimuth (deg)	324.2
Salinity (ppt)	0.1
Rated Discharge (m3/s)	0.00
Discharge Method	Mid-Section
Measurement Quality	--

Units	
Distance	m
Velocity	m/s
Area	m2
Discharge	m3/s
Temperature	degC

Discharge Calculation Settings	
Track Reference	System (default)
Depth Reference	Vertical Beam

Discharge Results	
Total Area	47.02
Mean Velocity	0.33
Total Width	35.00
Total Q	15.50
Mean Flow Angle	-4.10
Rated Discharge	0.00
Water Temperature (Independent)	0.00
Mean Water Temperature	27.72
Mean Weighted Gauge Height	1.83

Discharge Uncertainty		
Category	ISO	Stats
Depth	0.10%	1.24%
Velocity	0.13%	1.60%
Width	0.10%	0.10%
# Cells	0.10%	--
# Stations	1.76%	--
Instrument	0.25%	0.25%
Overall	1.79%	2.04%

Measurement Results

#	Time	Location	Water Surface Type	Temperature	Depth	Flow Angle	Mean Velocity	Area	Station Q	% Measured
1	12:12:18 PM	8.00	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0
2	12:12:18 PM	10.00	Open Water	28.3	0.91	-1.4	0.162	1.8	0.296	1.9
3	12:13:44 PM	12.00	Open Water	28.1	1.51	-3.7	0.260	2.3	0.589	3.8
4	12:14:56 PM	13.00	Open Water	28.0	1.66	-3.5	0.295	1.7	0.489	3.2
5	12:16:03 PM	14.00	Open Water	28.0	1.72	-2.3	0.326	1.7	0.559	3.6
6	12:17:16 PM	15.00	Open Water	27.9	1.83	-4.8	0.333	1.8	0.610	3.9
7	12:18:37 PM	16.00	Open Water	27.9	1.80	-3.0	0.348	1.8	0.626	4.0
8	12:19:48 PM	17.00	Open Water	27.8	1.76	-5.0	0.337	1.8	0.594	3.8
9	12:20:53 PM	18.00	Open Water	27.8	1.66	-3.6	0.357	1.7	0.594	3.8
10	12:21:58 PM	19.00	Open Water	27.8	1.47	-4.0	0.345	1.5	0.509	3.3
11	12:23:10 PM	20.00	Open Water	27.8	1.36	-6.8	0.321	1.4	0.438	2.8
12	12:24:21 PM	21.00	Open Water	27.7	1.31	-5.4	0.350	1.3	0.459	3.0
13	*12:25:38 PM*	*22.00*	*Open Water*	*27.7*	*1.30*	*-5.2*	*0.347*	*2.6*	*0.898*	*5.8*
14	*12:35:10 PM*	*25.00*	*Open Water*	*27.6*	*1.32*	*-7.7*	*0.354*	*3.0*	*1.054*	*6.8*
15	12:36:23 PM	26.50	Open Water	27.6	1.33	-6.7	0.397	1.7	0.659	4.3
16	12:37:40 PM	27.50	Open Water	27.6	1.33	-6.0	0.328	1.3	0.437	2.8
17	12:38:52 PM	28.50	Open Water	27.6	1.30	-7.4	0.364	1.3	0.472	3.0
18	12:40:05 PM	29.50	Open Water	27.6	1.34	-4.8	0.343	1.3	0.459	3.0
19	12:41:19 PM	30.50	Open Water	27.5	1.35	-5.6	0.335	1.3	0.451	2.9
20	12:42:28 PM	31.50	Open Water	27.6	1.25	-7.0	0.348	1.6	0.544	3.5
21	12:43:51 PM	33.00	Open Water	27.5	1.49	-3.8	0.314	2.2	0.704	4.5
22	*12:44:59 PM*	*34.50*	*Open Water*	*27.5*	*1.57*	*-4.0*	*0.356*	*2.3*	*0.836*	*5.4*

23	*12:46:10 PM*	*36.00*	*Open Water*	*27.5*	*1.61*	*-1.4*	*0.333*	*2.4*	*0.807*	*5.2*
24	*12:47:24 PM*	*37.50*	*Open Water*	*27.5*	*1.57*	*-1.5*	*0.371*	*2.4*	*0.876*	*5.6*
25	*12:48:34 PM*	*39.00*	*Open Water*	*27.5*	*1.56*	*-3.1*	*0.356*	*2.7*	*0.974*	*6.3*
26	12:49:47 PM	41.00	Open Water	27.6	1.08	-2.8	0.263	2.2	0.568	3.7
27	12:49:47 PM	43.00	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0

Comments

Top 2 transducers in air

Compass Calibration

Passed Calibration

Calibration duration = 76 seconds
M5.00 = Magnetic influence is acceptable
Q9 = Magnetic field is uniform
H9 = Complete horizontal rotation
V9 = High pitch/roll

Recommendation(s):
Avoid any changes to the instrument setup or its orientation to the magnetic influences detected during the compass calibration.

Measurements should be made in locations with similar magnetic influences as the location of the compass calibration.

System Test

System Tes: PASS

Discharge Measurement Summary

Date Measured: Wednesday, May 01, 2013

Recorded file is located under My Documents|SonTek Data|YYYY_MM_DD|StationaryDataFiles

Site Information	
Site Name	Coleambally Offtake
Station Number	202
Location	40m D/S of the accusonic

Measurement Information	
Party	SJH
Boat/Motor	Platform
Meas. Number	019

System Information	
System Type	RS-M9
Serial Number	2169
Firmware Version	3.00

System Setup	
Tagline Azimuth (deg)	326.6
Salinity (ppt)	0.1
Rated Discharge (m3/s)	3.47
Discharge Method	Mid-Section
Measurement Quality	--

Units	
Distance	m
Velocity	m/s
Area	m2
Discharge	m3/s
Temperature	degC

Discharge Calculation Settings	
Track Reference	System (default)
Depth Reference	Vertical Beam

Discharge Results	
Total Area	102.07
Mean Velocity	0.04
Total Width	40.00
Total Q	3.67
Mean Flow Angle	-1.61
Rated Discharge	3.47
% difference Q	5.69
Water Temperature (Independent)	0.00
Mean Water Temperature	17.46
Mean Weighted Gauge Height	3.29

Discharge Uncertainty		
Category	ISO	Stats
Depth	0.11%	1.24%
Velocity	0.66%	2.76%
Width	0.11%	0.11%
# Cells	0.11%	--
# Stations	1.82%	--
Instrument	0.25%	0.25%
Overall	1.96%	3.04%

Measurement Results

#	Time	Location	Water Surface Type	Temperature	Depth	Flow Angle	Mean Velocity	Area	Station Q	% Discharge
1	2:23:19 PM	4.50	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0
2	2:23:19 PM	8.00	Open Water	17.7	1.39	12.0	0.017	3.5	0.059	1.7
3	*2:24:50 PM*	*9.50*	*Open Water*	*17.7*	*2.35*	*-11.0*	*0.056*	*3.5*	*0.198*	*5.7*
4	*2:26:08 PM*	*11.00*	*Open Water*	*17.6*	*2.92*	*2.3*	*0.056*	*4.4*	*0.246*	*7.1*
5	*2:27:20 PM*	*12.50*	*Open Water*	*17.5*	*3.17*	*5.2*	*0.058*	*4.8*	*0.274*	*7.9*
6	*2:30:23 PM*	*14.00*	*Open Water*	*17.5*	*3.25*	*-4.0*	*0.050*	*4.9*	*0.242*	*7.0*
7	*2:31:52 PM*	*15.50*	*Open Water*	*17.5*	*3.35*	*2.2*	*0.060*	*5.0*	*0.300*	*8.6*
8	*2:34:09 PM*	*17.00*	*Open Water*	*17.4*	*3.09*	*2.3*	*0.052*	*4.6*	*0.242*	*7.0*
9	*2:36:28 PM*	*18.50*	*Open Water*	*17.4*	*2.90*	*0.7*	*0.043*	*4.3*	*0.185*	*5.3*
10	*2:38:11 PM*	*20.00*	*Open Water*	*17.4*	*2.91*	*10.3*	*0.043*	*4.4*	*0.186*	*5.4*
11	2:39:31 PM	21.50	Open Water	17.4	2.91	-10.9	0.035	4.4	0.154	4.4
12	2:40:43 PM	23.00	Open Water	17.4	2.92	-6.2	0.033	4.4	0.146	4.2
13	2:42:45 PM	24.50	Open Water	17.4	2.92	-6.5	0.036	4.4	0.158	4.5
14	2:44:10 PM	26.00	Open Water	17.4	2.95	-4.5	0.038	4.4	0.166	4.8
15	2:45:27 PM	27.50	Open Water	17.4	2.95	-17.5	0.036	4.4	0.159	4.6
16	2:46:38 PM	29.00	Open Water	17.4	3.00	-2.7	0.035	4.5	0.158	4.5
17	2:47:51 PM	30.50	Open Water	17.4	2.97	-1.2	0.035	4.4	0.156	4.5
18	2:49:24 PM	32.00	Open Water	17.4	2.93	-15.6	0.030	4.4	0.133	3.8
19	2:51:28 PM	33.50	Open Water	17.4	2.92	13.6	0.025	4.4	0.111	3.2
20	2:52:47 PM	35.00	Open Water	17.4	2.85	0.9	0.027	4.3	0.114	3.3
21	2:54:00 PM	36.50	Open Water	17.4	2.77	1.0	0.022	4.2	0.090	2.6
22	2:55:11 PM	38.00	Open Water	17.4	2.69	17.3	0.017	4.0	0.069	2.0

23	2:57:15 PM	39.50	Open Water	17.5	2.46	-2.2	0.017	3.7	0.064	1.8
24	2:58:35 PM	41.00	Open Water	17.5	2.23	-33.3	0.009	3.3	0.029	0.8
25	3:00:35 PM	42.50	Open Water	17.5	2.00	6.1	0.009	3.5	0.032	0.9
26	3:00:35 PM	44.50	N/A	0.0	0.00	0.0	0.000	0.0	0.000	0.0

Comments

light wind blowing upstream

Compass Calibration

Passed Calibration

Calibration duration = 81 seconds
M4.00 = Magnetic influence is acceptable
Q9 = Magnetic field is uniform
H9 = Complete horizontal rotation
V7 = High pitch/roll

Recommendation(s):
Avoid any changes to the instrument setup or its orientation to the magnetic influences detected during the compass calibration.

Measurements should be made in locations with similar magnetic influences as the location of the compass calibration.

System Test

System Tes: PASS

Discharge Measurement Summary

Date Measured: Friday, May 10, 2013

Recorded file is located under My Documents|SonTek Data|YYYY_MM_DD|StationaryDataFiles

Site Information	
Site Name	Colleambally offtake
Station Number	202
Location	@ the accusonic

Measurement Information	
Party	SJH/WGR
Boat/Motor	boat
Meas. Number	20

System Information	
System Type	RS-M9
Serial Number	2169
Firmware Version	3.00

System Setup	
Tagline Azimuth (deg)	323.4
Salinity (ppt)	0.1
Rated Discharge (m3/s)	9.55
Discharge Method	Mid-Section
Measurement Quality	--

Units	
Distance	m
Velocity	m/s
Area	m2
Discharge	m3/s
Temperature	degC

Discharge Calculation Settings	
Track Reference	System (default)
Depth Reference	Vertical Beam

Discharge Results	
Total Area	57.006
Mean Velocity	0.126
Total Width	36.000
Total Q	7.172
Maximum Measured Depth	2.040
Maximum Measured Speed	0.167
Mean Flow Angle	0.059
Rated Discharge	9.548
% difference Q	-24.889
Water Temperature (Independent)	0.000
Mean Water Temperature	15.323
Mean Weighted Gauge Height	2.040

Discharge Uncertainty		
Category	ISO	Stats
Depth	0.10%	2.04%
Velocity	0.22%	2.13%
Width	0.10%	0.10%
# Cells	0.10%	--
# Stations	1.70%	--
Instrument	0.25%	0.25%
Overall	1.75%	2.96%

Measurement Results

#	Time	Location	Water Surface Type	Temperature	Depth	Flow Angle	Mean Velocity	Area	Station Q	% Discharge
1	11:20:56 AM	1.00	N/A	0.0	0.00	0.0	0.000	0.000	0.000	0.0
2	11:20:56 AM	5.00	Open Water	15.4	1.77	5.3	0.091	4.430	0.405	4.2
3	11:22:19 AM	6.00	Open Water	15.4	1.86	4.9	0.102	2.788	0.285	3.0
4	*11:23:52 AM*	*8.00*	*Open Water*	*15.4*	*1.98*	*0.0*	*0.123*	*3.955*	*0.487*	*5.1*
5	11:25:29 AM	10.00	Open Water	15.3	1.99	4.9	0.141	2.980	0.421	4.4
6	11:26:44 AM	11.00	Open Water	15.3	1.92	2.2	0.135	1.924	0.260	2.7
7	11:28:01 AM	12.00	Open Water	15.3	1.73	-2.7	0.136	1.733	0.235	2.5
8	11:29:23 AM	13.00	Open Water	15.3	1.63	-2.2	0.138	1.626	0.224	2.3
9	11:30:50 AM	14.00	Open Water	15.3	1.58	1.6	0.139	1.578	0.219	2.3
10	11:32:12 AM	15.00	Open Water	15.3	1.57	-0.8	0.121	1.569	0.191	2.0
11	11:33:31 AM	16.00	Open Water	15.3	1.58	-2.5	0.145	1.576	0.228	2.4
12	11:35:04 AM	17.00	Open Water	15.3	1.60	0.9	0.129	1.595	0.206	2.2
13	11:36:17 AM	18.00	Open Water	15.3	1.59	-2.7	0.129	1.591	0.206	2.2
14	11:37:39 AM	19.00	Open Water	15.3	1.60	2.5	0.135	1.600	0.216	2.3
15	11:39:24 AM	20.00	Open Water	15.3	1.62	-1.0	0.130	1.619	0.211	2.2
16	11:40:56 AM	21.00	Open Water	15.3	1.63	-4.7	0.123	1.629	0.201	2.1
17	11:42:18 AM	22.00	Open Water	15.3	1.62	2.4	0.131	1.615	0.212	2.2
18	11:44:38 AM	23.00	Open Water	15.3	1.64	-1.6	0.135	1.644	0.223	2.3
19	11:45:55 AM	24.00	Open Water	15.4	1.60	-0.4	0.132	1.598	0.211	2.2
20	11:47:20 AM	25.00	Open Water	15.3	1.58	-4.3	0.131	1.583	0.207	2.2
21	11:49:35 AM	26.00	Open Water	15.3	1.80	-2.7	0.122	1.802	0.220	2.3
22	11:51:50 AM	27.00	Open Water	15.4	1.98	5.3	0.112	1.981	0.223	2.3

23	11:53:03 AM	28.00	Open Water	15.4	2.04	-0.6	0.123	2.040	0.252	2.6
24	11:54:50 AM	29.00	Open Water	15.4	2.03	-1.2	0.117	2.026	0.237	2.5
25	11:57:01 AM	30.00	Open Water	15.4	2.00	-2.3	0.135	3.004	0.407	4.3
26	*11:58:22 AM*	*32.00*	*Open Water*	*15.4*	*1.82*	*3.3*	*0.139*	*3.644*	*0.507*	*5.3*
27	*11:59:58 AM*	*34.00*	*Open Water*	*15.4*	*1.55*	*-1.9*	*0.124*	*3.880*	*0.480*	*5.0*
28	11:59:58 AM	37.00	N/A	0.0	0.00	0.0	0.000	0.000	0.000	0.0

Comments

Compass Calibration

Passed Calibration

Calibration duration = 82 seconds
M2.00 = Magnetic influence is acceptable
Q9 = Magnetic field is uniform
H9 = Complete horizontal rotation
V8 = High pitch/roll

Recommendation(s):
Avoid any changes to the instrument setup or its orientation to the magnetic influences detected during the compass calibration.

Measurements should be made in locations with similar magnetic influences as the location of the compass calibration.

System Test

System Tes: PASS

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