GeoTerra

XSTRATA COAL – TAHMOOR COLLIERY

END OF LONGWALL 24B SURFACE WATER, DAMS & GROUNDWATER MONITORING REPORT

Tahmoor, NSW

TA5-R2B

15 JANUARY 2008

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TA5-R2B (15 JANUARY, 2008)

GeoTerra

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Remembrance Driveway
TAHMOOR NSW 2573

Attention: Dave Clarkson

Dave,

RE: End of Longwall 24B Surface Water and Groundwater Monitoring Report

Please find enclosed a copy of the above mentioned report.

Yours faithfully

GeoTerra Pty Ltd

Andrew Dawkins (AuSIMM CP-Env)

Managing Geoscientist

Distribution:	Original	GeoTerra Pty Ltd
	1 electronic copy	XSTRATA Coal – Tahmoor Colliery

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Authorised on behalf of Geoterra Pty Ltd:	
Name:	Andrew Dawkins
Signature:	
Position:	Managing Geoscientist
Date:	15.01.2008

Date	Rev	Comments
17.12.2007		Initial Draft
14.01.2008	A	Incorporate Xstrata comments
15.01.2008	Final	

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1. INTRODUCTION

Xstrata Coal - Tahmoor Colliery (previously operated by Centennial Coal Pty Ltd) have extracted the Bulli Seam in Panels 22, 23A, 23B and 24B by retreat longwall mining within the Tahmoor North Lease Area since June 2004.

The four previous panels and the current panel (24A) are located underneath Tahmoor and Thirlmere villages, as well as surrounding urban and semi-rural areas as shown in **Drawing 1,** which are approximately 4km south of Picton in the Southern Coalfields of NSW.

This document provides a compilation of physical and geochemical groundwater, upland plateau stream and Bargo River stream monitoring that has been conducted in the vicinity of the subject panels since August 2004.

Surface water and groundwater features within the Longwall 22 to 26 monitoring area and 20mm subsidence zone (Geoterra, 2006) include;

- the Bargo River gorge
- the main channel and tributaries of Myrtle Creek, which flows ENE to the Nepean River,
- the main channel and tributaries of Redbank Creek, which flows ENE into Stonequarry Creek and subsequently, the Nepean River
- the southern tributary flanks of Matthews Creek, but not the stream channel or banks. Matthews Creek flows to the northeast and joins with Cedar Creek and Stonequarry Creek, then flows into Racecourse Creek and subsequently the Nepean River
- 55 small to medium, predominantly earthen wall dams, and;
- One Department of Water and Energy (DWE) licensed well, one licensed piezometer (P1) two unlicensed open uncased coal exploration bores (P2, P3) and an additional five DWE licensed private bores (P4, P5, P6, P7, P8).

The main channel of the Bargo River as well as Myrtle Creek and Redbank Creek are classified as Category 2 streams with 3rd order or higher channels (DIPNR, 2005), whilst the tributaries of Myrtle and Redbank Creeks are Category 1 streams, being 1st or 2nd order channels, and are defined as minor watercourses in the State Dams Policy.

The dams range from small garden ponds to medium sized urban dams and industrial effluent storage / treatment ponds.

Monitoring has been conducted between June 2004 and November 2007 by assessing the;

- ephemeral or perennial nature and flow in streams over the panels;
- creek bed and bank erosion and channel bedload;
- stream and dam water quality;
- stream bed and bank vegetation;
- nature of alluvial land along stream banks;
- presence, size and integrity of dams and their water levels,

- presence and use of groundwater bores, and;
- assessment of standing water levels and water quality.

2. SCOPE OF WORK

This report is intended to provide a summary of surface water and groundwater related monitoring conducted during and after extraction of Panels 22, 23A, 23B and 24B.

3. PREVIOUS STUDIES

Potential subsidence levels and impacts for Panels 24 to 28 were studied in 2005 (MSEC, 2006).

A pre-mining and an end of panel report on surface water and groundwater monitoring for Panels 22, 23A and 23B was prepared (Geoterra, 2004), along with a baseline assessment of surface water and groundwater systems prior to extraction of Panel 24 (Geoterra, 2006).

Ongoing monitoring of water flows and water quality in the Bargo River, plateau streams, dams and groundwater bores is being conducted throughout extraction of Panel 24A by colliery staff, Geoterra Pty Ltd and HCS Pty Ltd.

4. GENERAL DESCRIPTION

4.1 Mine Layout and Progression

Tahmoor Colliery has extracted coal by longwall mining Panels 1 to 24B to the south, southwest and northwest of the current panel (24A).

Panel 24A commenced on 15 November 2007 as outlined in **Table 1,** and is mining updip in the Bulli Seam from south to north.

TABLE 1 PANEL EXTRACTION DETAILS

Panel	Start	Finish	Length (m)	Depth of Cover (mbgl)
22	2/6/04	11/7/05	1877	420 – 432
23A	7/9/05	20/2/06	775.9	430 – 450
23B	15/3/06	21/8/06	771	430 – 440
24B	15/10/06	26/8/07	2071.8	430 – 440
24A	15/11/07	ongoing	-	420 - 448

None of the previous or proposed panels will undermine the gorge, with all panels stepped back from the gorge edge by at least 289m.

Panels 23A and 23B were subdivided in two sections with a gap of approximately 300m due to the presence of a doleritic dyke, whilst Panels 24A and 24B are also subdivided to manage subsidence underneath the Main Southern Railway line.

Extraction of Panels 22 to 26 will occur between 420m and 480m below surface, with the depth increasing to the northeast.

Seam thickness varies from 1.8m at the finish end of 24B/25 to 2.2m at the start of Longwall 26.

The panels are 283m wide rib to rib, with 34.5m to 40m wide chain pillars and are between 784m to 4140m long as shown in **Drawing 2** and **Drawing 3.**

4.2 Topography and Drainage

The plateaus are generally flat to undulating and incised by the Bargo River gorge which is up to 104m deep in the 20mm subsidence study area, with steep to vertical sandstone cliff faces and vegetated scree slopes, whilst the gorge and river bed comprise a series of exposed sandstone shelves interspersed with sandstone boulder fields and pools.

The study area is also overlain by the main channel and tributaries of Myrtle and Redbank Creeks, which flow both to the Nepean River, with the Nepean River being at least 900m outside the 20mm subsidence zone.

Both creeks drain the residential areas of Tahmoor and Thirlmere, as well as semi-rural fallow, orchard and grazing areas outside of the villages.

4.2.1 Bargo River

The Bargo River intersects the southeastern part of the Panel 22, Panel 23(A,B) and 24(A,B) study area, which covers approximately 1130m of the river bed, with the closest panel (24A) being at least 289m from the edge of the gorge and 354m from the centre of the river.

The Bargo River over Panels 12 and 13 has previously sustained up to 550mm of subsidence, 2mm/m of tensile and 3mm/m of compressive strain in the “potholes” area and Rockford Road Bridge (Geoterra, 2006) where the gorge was directly undermined.

4.2.1.1 Geomorphology

The river has dissected the Hawkesbury Sandstone plateau, forming significant scarps and discrete cliffs on either side of the gorge which ranges from 40m to 104m deep. Where the channel trends along the systematic joint direction, the cliff line is usually close to the channel. Cliffs are usually formed under competent sandstone which can contain stratigraphically controlled cavernous zones and ephemeral seeps.

The river bed drops by 40m within the study area along the river bed, with an average gradient of 35 mm/m. This exceeds the previously mined sections of Bargo River which have an average gradient of 5 mm/m as shown in **Figure 1**.

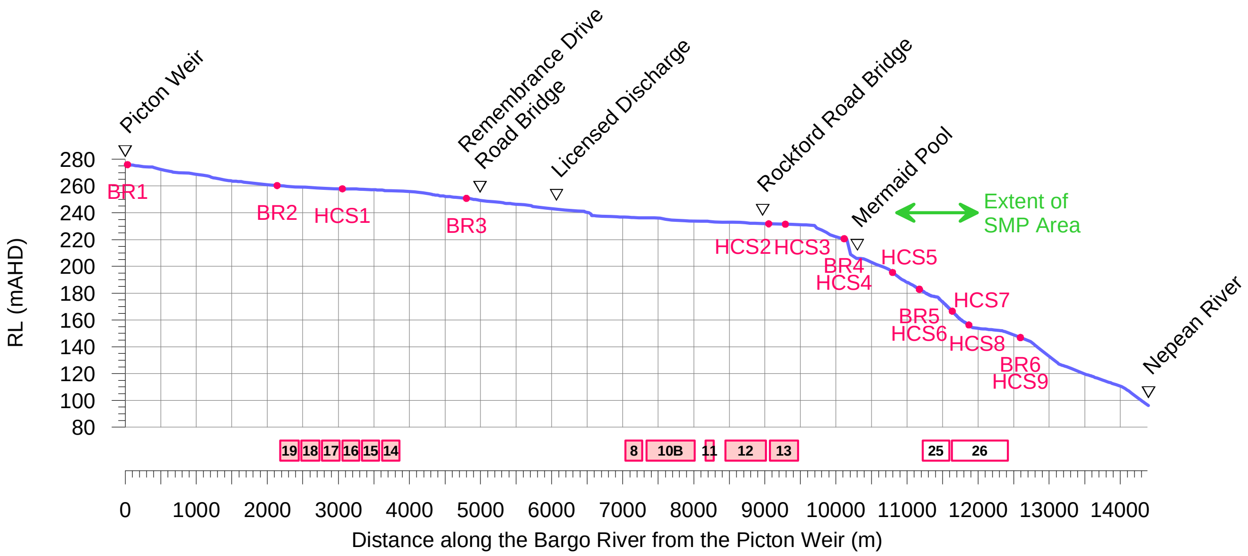


FIGURE 1 Bargo River from Picton Weir to Nepean River (MSEC, 2006)

Exposed bedrock and interspersed boulder fields are dominantly located in the base of the gorge and on the alluvial flanks, with minor sand deposits along the banks and, to a much lesser degree, within the river. The smaller rockbars are generally shallow and have small hydraulic gradients between pools (Rockbars 10, 11, 12) whilst the larger rockbars have maximum falls of 5m to 6m (Rockbars 8, 9), with lengths varying between 20m and 130m, with the longest being Rockbar 12.

4.2.1.2 Flow

The Bargo River flows into the Nepean River approximately 1.5km east of the Panel 22 to 26, 20mm subsidence zone, whilst its headwaters are located near the towns of Hill Top and Yerrinbool.

The Bargo River is regulated by Picton Weir, which is approximately 9km upstream of the study area. The weir was constructed in the late 19th century as a water supply structure near the town of Bargo and is now heavily silted, is no longer used and has a constant leak through a seized open valve and outlet pipe at the base of the weir.

Water flow in the Bargo River is derived from ephemeral unnamed first and second order gullies located on the western plateau in the study area, overflows from Picton Weir and streams draining off the eastern plateau.

Tahmoor Colliery has a DECC licensed discharge into Teatree Hollow, which flows into the Bargo River, with the discharge maintaining a continuous flow in the river, whilst Dogtrap Creek and Sugarloaf Gully flows are ephemeral.

Flows from Myrtle Creek and Redbank Creek (via Stonequarry and) Creeks do not enter the Bargo River, but discharge into the Nepean River approximately 4km to 7km along the stream channel downstream from the SMP area.

The majority of flow in the river is regulated by Picton Weir, which is upstream of Panel 19, and upstream of the Panel 22 to 24B study area. Flow from the weir varies depending on the frequency and intensity of rainfall, with flows between rain events typically less than 5 ML/day, gradually reducing in response to lowered head behind the weir. Overtopping has occurred on at least four occasions since early 2002, whilst the weir pond has been almost empty on a number of occasions during the last four years.

Due to Colliery discharges, flow in the Bargo River is continuous downstream of Teatree Hollow, except where natural partial sub-surface diversions occur through rockbars and boulder fields. If the Colliery discharge did not occur, the river would probably consist of disconnected pools after periods of extended dry weather.

Regular flow monitoring of the Bargo River in the Panel 22 to 24B study area has been conducted since January 2006 through manual flow gauging, reference to embedded nails and pressure transducer recording of river heights at locations shown in **Table 2**, with the locations plotted as shown in **Drawing 2** and **Drawing 3**.

TABLE 2 HCS Pty Ltd Bargo River Flow Monitoring Locations

Site	Description	Parameter	Method
Bargo River Up	Upstream of Teatree Hollow site	Pool depth, flow	Logger / Flow meter
Teatree Up	Upstream of Teatree Hollow	Pool depth, flow	Logger / Flow meter
Teatree	Flow from Teatree Hollow licensed discharges	Pool depth, flow	Logger / Flow meter
Rockford Road	Rockford Road Bridge	Pool depth, flow	Logger / Flow meter
Mermaid Pool	Upstream of Mermaid Pool	Pool depth, flow	Logger / Flow meter
Pencil Falls (Pool N) Old HCS5 site	Near the confluence with "Turkey Creek"	Pool depth, flow	Logger / Flow meter
Pool 12 (Pool K) Old HCS6 site	Upstream of Pool K	Pool depth, flow	Logger / Flow meter
Pool 10 (Pool K) Old HCS7 site	Midstream in Pool J	Pool depth, flow	Logger / Flow meter
Pool 8 (Pool H) Old HCS8 site	Midstream in Pool H	Pool depth, flow	Logger / Flow meter

4.2.1.3 Water Quality

Bargo River water quality in the study area primarily depends on the volume and quality of flow from the licensed discharges into Teatree Hollow during low rainfall periods, with the Teatree Hollow outflow forming the majority or total flow in the river under dry conditions.

The mine discharge generally conforms to DECC license criteria, however they are elevated in salinity (to 1780uS/cm), alkalinity (to 897mg/L), copper (to 8ug/L), zinc (to 220ug/L), nickel (to 57ug/L) and arsenic (to 71ug/L) compared to the ANZECC trigger values for protection of 95% of freshwater aquatic species.

By the time the Teatree Hollow outflow joins the Bargo River and enters the study area, the river water quality improves, but still exhibits the influence of the licensed discharge.

This signature may, in the future, potentially mask the effects on the Bargo River water quality from increased groundwater seepage or rock bar throughflow following subsidence, particularly for iron, nickel and zinc, whilst the elevated alkalinity could also potentially enhance precipitation of metal hydroxides in groundwater seepage to the river.

A potentially enhanced groundwater seepage of up to 0.2ML/day may have a minor effect in comparison to the licensed discharge flow volumes, even during prolonged dry weather.

4.2.1.4 Ferruginous Seeps

Groundwater seepage of up to 0.2ML/day potentially discharges from the cliffs in the vicinity of the study area.

Five pools within the study area were observed to contain small ferruginous seeps as shown in **Drawing 4, Photographs 1** to **6** and **Table 3.**

Seepage rates are all very low (<0.5L/sec), with the flows occurring as a "slow bleed" from joints and bedding discontinuities, which occur as thin sheet films of outflow that are generally "swamped" by the main channel flow during medium to high flows.

Mixing zones within the river pools are also very limited to being less than 1m from the source discharge point, with discolouration of the river bank at the outflow point, although no discolouration or "plumes" within the main river or its substrate have been observed to date.

TABLE 3 FERRUGINOUS SEEPS

Pool	No. of Seeps	Flow Rate
F	1	<0.5L/sec
i	1	<0.5L/sec
K	1	<0.5L/sec
V (East)	2	<0.5L/sec
V (West)	6	<0.5L/sec
W (South)	2	<0.5L/sec
W (West)	1	<0.5L/sec

Leaching of diffuse iron sulfide (marcasite), iron carbonate (siderite) and iron hydroxides from the matrix cement and secondary deposits within the sandstone gorge walls precipitates where low flow seeps discharge into the river as orange-brown iron "seeps".

At the point of discharge, sulfuric acid is generated and dissolved, reduced species of iron, manganese, nickel and zinc, which can exceed the ANZECC 95% protection of aquatic species trigger values, precipitate as a gelatinous layer at the seepage point in the gorge wall and as stream bed substrate as a naturally occurring process.

The effect of the seepage is lowered through dilution with the river's alkaline buffering capacity ($HCO3^-$ & OH^- species) sourced from the mine discharge waters, with increased acidity, dissolved metals and low dissolved oxygen in the river observed within 1m of the discharge point. The extent of the effect depends on the proportional mixing between the river flow volume and seepage flow rates.

Downstream dilution of the discharge as well as precipitation of metallic hydroxides, adsorption of dissolved Ni and Zn onto iron hydroxide and binding / adsorption onto dissolved / total organic carbon significantly can improve water quality downstream of the seepage point.

The river can also be affected by elevated salinity close to the discharge point, however this diminishes over a short distance (<5m) downstream of the mixing zone.

PHOTOGRAPH 1 POOL F Seep

PHOTOGRAPH 2 POOL i Seep

PHOTOGRAPH 3 POOL K Seep

PHOTOGRAPH 4 POOL V Seep East

PHOTOGRAPH 5 POOL V Seep West

PHOTOGRAPH 6 POOL W Seep West

4.2.1.5 Recreation

The Bargo River within the study area is an area of environmental sensitivity and is listed as an Indicative Place on the Register of the National Estate due to its aesthetic significance with its diverse flora and fauna, significant cliffs, cascades and pools. The river is also of significance to the local indigenous community.

The river is used for various recreational activities such as bushwalking and swimming, primarily in the vicinity of the Scout Camp and Mermaid Pool, which is shown in **Photograph 7.**

PHOTOGRAPH 7 Mermaid Pool

Mermaid Pool is approximately 1km south and upstream of longwalls 22 to 24B and is upstream of the 20mm subsidence zone.

4.2.2 Myrtle Creek

Myrtle Creek flows directly into the Nepean River approximately 1.7km northwest of the 20mm subsidence zone. Its headwaters are located upstream of Panel 22 and generally consist of small grass covered channels over and upstream of Panel 22, that become larger and more incised downstream of Panels 23 to 26.

The western headwaters of Myrtle Creek have been undermined to date by Longwalls 3, 4, 20, 22, 23B and 24B.

The riparian flanks have been significantly altered by residential development in Tahmoor, whilst the channel has not been significantly affected except where general rubbish or solid waste has been dumped in the creek or it is overgrown by invasive weeds.

The stream bed and banks are generally well vegetated, and do not show significant erosion or bank instability.

No DWE registered water extraction is listed within the creek, however an unlicensed pump is present over the middle of Longwall 25, off Castlereagh Street.

4.2.3 Redbank Creek

Redbank Creek drains into Stonequarry Creek over the proposed Panel 34, which subsequently flows to the Nepean River approximately 3km downstream of the SMP area.

To date, Redbank Creek has not been undermined.

Within the study area it has a poorly defined, small channel with a wetland upstream of the Panel 23, 20mm subsidence envelope. The creek overlies the western end of Panel 25 as a small channel with an incised bed 1m to 2m deep which evolves into a channel up to 3m deep and 10m wide downstream of Panel 26.

The headwaters of Redbank Creek, outside of the proposed 20mm subsidence zone, lie within the residential development area of Thirlmere, with housing and road development significantly affecting the banks of the creek.

Over Panels 25 and 26, the creek flows out of the main residential area, through the urban fringe of Thirlmere.

The local residents have undertaken bed and bank restoration works at isolated locations over Panels 24 to 26, such as a Landcare wetland restoration area located near the intersection of Turner Street and Thirlmere Way, whilst the local Council subsequently conducted weed eradication works between the wetlands and Windeyer Street.

The creek does not exhibit significant bed and bank erosion, and is not significantly eroded due to the high vegetative and weed cover along the creek banks.

4.2.4 Unnamed Gullies

The study area on the western plateau contains two unnamed ephemeral 1st and 2nd order streams over the eastern end of Panel 24 (within Inghams Turkey processing plant site) and over Panel 27 (within Pepes duck farm), which have small, grassed to minimally incised channels in essentially open grassed and lightly wooded country.

On the eastern plateau, Teatree Hollow and Dogtrap Creek enter the Bargo River approximately 5km and 2km upstream, whilst Sugarloaf Gully discharges from the eastern plateau, 1.2km downstream of the SMP area.

4.2.5 Dams

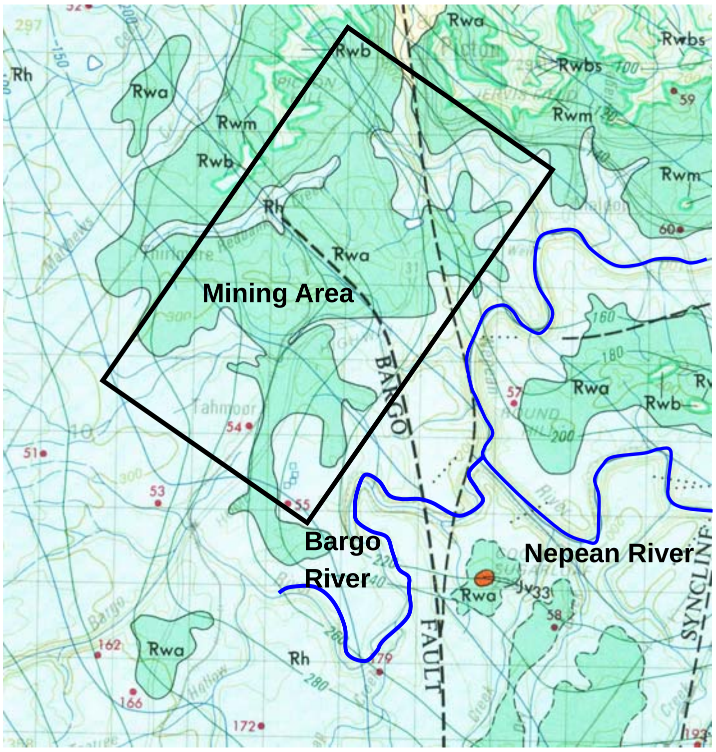
Surface runoff into the Tahmoor / Thirlmere streams and subsequently into the Bargo or Nepean Rivers is regulated by 17 dams over Panels 22 to 24B as shown in **Drawing 2**.

The dams are constructed of earthen walls that collect and store surface runoff that would otherwise drain directly into Myrtle Creek.

4.3 Geology

The plateau and Bargo River bed is underlain by the fine to medium to coarse grained Hawkesbury Sandstone, with Wianamatta Shale outcrop increasing to the north of the lease area, to the north of Myrtle Creek where a thin clayey soil profile has developed that is highly localised and variable across the area.

The surface geology of the study area is shown in **Figure 2**.



LEGEND

Rwb Wianamatta Gp shale, carb. claystone

Rwm Fine to medium lithic sandstone

Rwa Wianamatta Gp laminite, siltstone

Rh Hawkesbury Sandstone

FIGURE 2 Tahmoor / Thirlmere Surface Geology

Further details on the area's geology structure and stratigraphy are outlined in (Geoterra, 2006).

4.4 Hydrogeology

The Bargo River is a 'gaining' system, where groundwater flows from the plateau under a regional hydraulic gradient to the river, with groundwater flow being dominantly horizontal within confined flow along discrete layers that are underlain by fine grained or relatively impermeable strata.

The Hawkesbury Sandstone sequence exposed in the gorge is characteristic of sedimentary deposition and erosion in a braided stream with individual facies representing local sedimentary processes that generally do not persist across the area.

The Hawkesbury Sandstone within the Sydney Basin generally provides low yielding aquifers with low hydraulic conductivities.

Five DWE registered bores, 1 well and two uncased coal exploration bores are located within the study area as shown in **Drawing 1** and **Table 4**.

TABLE 4 GROUNDWATER BORE DETAILS

GW	Drilled	Depth (m)	SWL (m)	Aquifer	YIELD (L/s)	EC (mg/L)	pH	Purpose
SMP AREA								
P1 (GW pending)	2004	48	Fig 11	18 - 20	0.75	2650	5.30	monitoring
P2	-	150	Fig 11	-	-	2295	5.61	coal explor.
P3	-	100	Fig 11	-	-	850	6.13	coal explor.
P4 (GW67570)	1988	85	Fig 11	-	0.22	8210	6.63	domestic
P5 (GW63525)	1954 / 1990	76 / 91	Fig 11	60-66 & 70-91	1.0	3550	5.65	stck dom irr
P6 (GW42788)	1976	148	Fig 11	105 - 135	1.52	-	-	agriculture
P7 (GW105254)	2002	163	80.0	113-156	0.67	138	-	domestic
Douglas (P8) (GW105148)	1995	120	33.0	50 - 117	0.30	250	-	domestic
Well 1	-	4	Fig 11	-	-	365	7.05	domestic

Note: All bore water supply is from Hawkesbury Sandstone

\# redrill depth for bore replaced by Tahmoor Colliery

\- no data available

Fig 11 See Figure 11 for SWL data

Groundwater has been obtained from sandstone aquifers with yields ranging from 0.2L/sec to 5.0L/sec between 18m and 138m below surface. DWE bore data indicates it is likely that significant aquifers are intersected below depths of approximately 18m to 60m, depending on whether the bore is spudded on top of a hill or in a valley. Shallower, low yielding groundwater may be present above that depth range as perched ephemeral aquifers.

Alluvial sediments within the plateau gullies and river bed are too shallow to be used as aquifers for groundwater supply.

5. MONITORING

5.1 Subsidence

The maximum monitored subsidence, tilt and strain following extraction of Panel 24B is shown in **Table 5**.

5.1.1 Plateau and Streams

Subsidence within Myrtle Creek has generated stream bed and / or bank cracking in two locations over Panels 22 and 23B, along with soil cracks in the upper bank and flanks over Panel 23B site as shown in **Drawing 3.**

TABLE 5 Maximum Post Panel 24B Plateau Subsidence (MSEC, 2008)

Parameter	**PREDICTED**	**OBSERVED**
Vertical subsidence (mm)	866	819
Tilt (mm/m)	4.7	5.7
Tensile Strain (mm/m)	0.8	0.8
Compressive Strain (mm/m)	1.5	4.2

It was assessed (MSEC, 2008) that the additional tilts and strains above predicted levels after extraction of Panel 24B were due to anomalous ground movements.

Redbank Creek has not been undermined and has no observed subsidence tilt or strain effects to date.

5.1.2 Bargo River Gorge

To date, no observed subsidence effects have been noted in the Bargo River up to the final extraction of Panel 24B as shown in **Table 6**.

TABLE 6 Maximum Post Panel 24B Bargo Gorge Subsidence (MSEC, 2008)

Parameter	**Predicted Post LW24A and B**	**Observed Post LW24B**
Cumulative Upsidence (mm)	28	Nil
Cumulative Valley Closure (mm)	59	Nil

5.2 Bargo River

5.2.1 River Bed Geomorphology

The series of pools, rockbars, waterfalls and boulder fields along the river bed within the Panel 22 to 24B study area have been inspected irregularly since December 2004, with a minimum of monthly inspections commencing in January 2006 by staff from the colliery, Geoterra Pty Ltd and HCS Pty Ltd.

No change to the river bed geomorphology was observed up to the end of extraction of Panel 24B.

5.2.2 River Flow

A summary of flow monitoring in the Bargo River and Teatree Hollow through the use of monthly manual flow readings, daily water level logging and ratings curves developed by HCS Pty Ltd since January 2006 is shown in **Table 7** and **Figure 3**.

The flow data is available in “EXCEL” spreadsheet format, however due to the large file size, the data is not included in hard copy in this report, apart from being presented as summaries and plots of the raw data.

TABLE 7 FLOW MONITORING SUMMARY TO 7/11/07

	Barg Up	u/s TT	TT LD	Rkfd	M PL	Pen FL	PL K	PL J	PL H	Rain
STD DEV	1.90	18.28	1.58	11.36	17.10	21.18	13.38	18.81	19.00	9.97
MAX	13.90	193.00	18.40	143.00	152.00	185.00	115.00	182.00	182.00	79.00
MIN	0.27	0.09	1.39	0.79	1.30	1.92	1.44	1.84	3.20	0.50
MEAN	2.36	5.36	4.86	8.66	10.54	11.14	9.03	9.95	10.78	6.07
MEDIAN	1.86	1.16	4.60	6.30	6.33	6.31	5.90	5.42	6.54	2.50

It should be noted that due to lack of calibration based on ratings curves that have primarily been developed to date during low flow periods, data during the higher flows at all sites may be either absent, or estimated, particularly between the June 2006 rainfall event and mid July 2007.

Some anomalous maximum flow data from upstream of Teatree Hollow upstream is also present in the data base supplied by HCS Pty Ltd, however the minimum, mean and median flow data shows an increase in flows down the gorge.

Data is also missing due to vandalism of the Mermaid Pool site during May 2007 and in the Bargo River (Upstream) site between December 2006 and mid February 2007.

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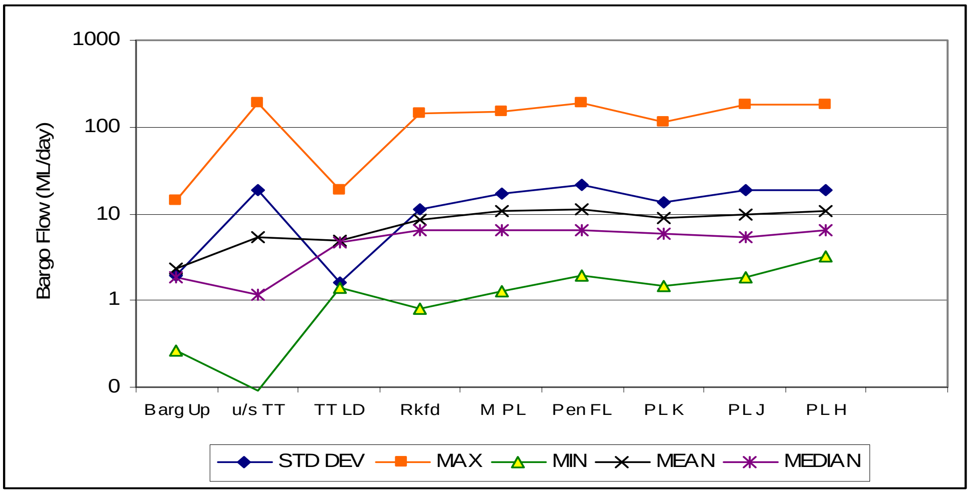


FIGURE 3 Plot of Bargo River Flow Summary Data

To date, flows upstream of Teatree Hollow are generally around 1.16ML/day, and range from 0.09ML/day to 193ML/day (see previous comment), whilst downstream of the mine's licensed discharge in Teatree Hollow at Rockford Road Bridge, flows are generally around 6.30ML/day, ranging from 0.79ML/day to 143ML/day.

River flows upstream of Teatree Hollow are modulated by the lack of instantaneous release through the damming effect of Picton Weir during dry periods, as the pool has generally been below the spill height during the monitoring period, with a relatively constant slow release through a broken gate valve in the dam wall.

Flows downstream of Teatree Hollow are primarily affected by the quantum of daily release from the mine's licensed discharge, as well as catchment runoff and groundwater seeps. A plot of the median flow rates in **Figure 4** indicates that the licensed discharge from the colliery into Teatree Hollow generally contributes around 4.6ML/day (ranging from

1.39ML/day to 18.40ML/day) into the Bargo River.

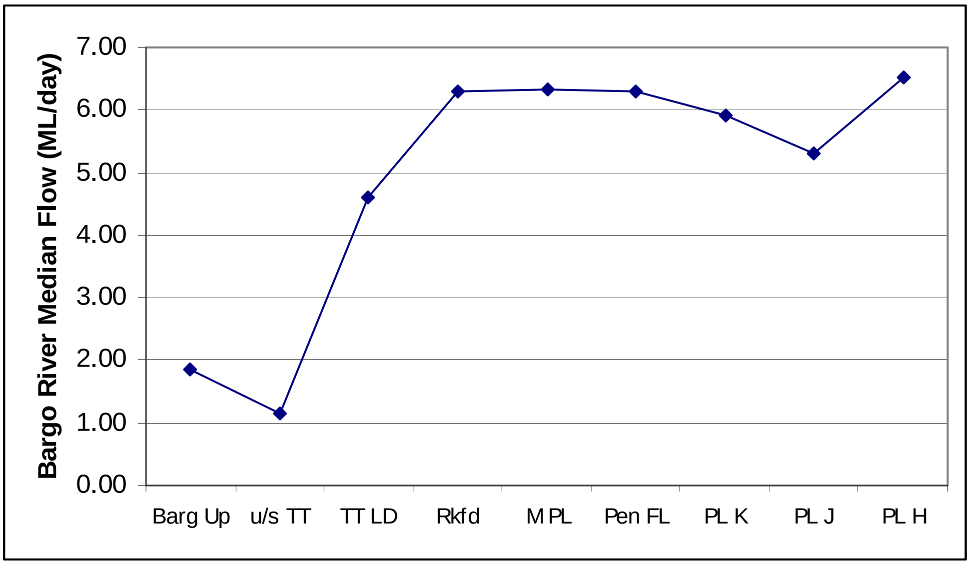


FIGURE 4 Median Flow Rates

The plot also indicates, that, based on median flows, there is an essentially equivalent overland flow between Rockford Road Bridge and Pencil Falls (Pool N), with a loss of around 1.0ML/day of overland flow between Pencil Falls and Pool J, which resurfaces at Pool H. The area where the loss of overland flow occurs equates to the steeper gradient section of the river shown in **Figure 1**, where the density of boulder fields and bedrock throughflow increases.

Variability in river flow downstream of Teatree Hollow is due to;

- Teatree Hollow discharge changes;
- Sub-surface diversion through washed out joints and bedding plane discontinuities;
- Flow through boulder fields
- Variable rate of groundwater seepage, and;
- Runoff after rain events.

Based on data supplied by HCS Pty Ltd since January 2006, **Table 8** indicates a median difference in Bargo River flow between Pencil Falls Pool and Pool K equating to a flow loss of 0.11Ml/day, a 0.04ML/day loss between Pool K and Pool J, whilst a gain of 1.41ML/day occurs between Pool J and Pool H.

The gain in flow between Pool J and Pool H indicates that generally around 1.41ML/day of flow is not being measured around Pool J (at surface) as it is flowing through boulder fields and washed out bedding planes, fractures and joints in the river bed strata.

It should be noted that the maximum and minimum difference between pool flows is highly affected by inaccuracies reported during high flow events, particularly during the June 2006 flood event, and that the absolute numbers should be viewed with caution until the ratings curves are further adjusted for higher flow periods.

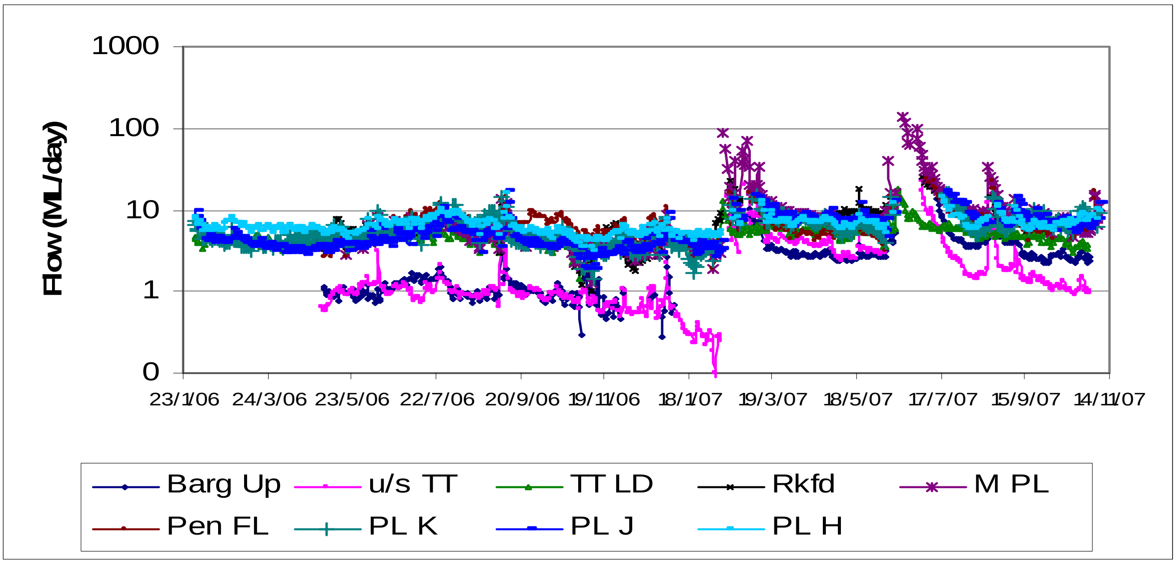
The "adjusted" values exclude all estimated readings, which are dominantly from the February and June 2007 periods.

The adjusted dataset indicates similar median loss or gain of flow to the unadjusted data set, however the maximum and minimum ranges are significantly lower. The adjusted data indicates a both losses and gains of flows of up to 5.2ML/day between Pencil Falls Pool and Pool K, up to 4.10ML/day between Pool K and Pool J and up to 4.44ML/day between Pool J and Pool H.

TABLE 8 FLOW DIFERENCE BETWEEN POOL N AND POOL H

	Pool N to Pool K	Pool N to Pool K adjusted	Pool K to Pool J	PL K to PL J adjusted	Pool J to Pool H	PL J to PL H adjusted
STD DEV	7.96	*1.98*	6.37	*1.27*	2.07	*1.61*
MAX	5.10	*5.10*	75.00	*4.10*	14.20	*3.54*
MIN	-80.00	*-5.20*	-11.00	*-4.06*	-6.10	*-4.44*
MEAN	-1.34	*-0.22*	0.93	*-0.11*	0.84	*0.85*
MEDIAN	-0.11	*-0.09*	-0.04	*-0.13*	1.41	*1.46*

Maximum daily rainfall during the monitoring period has been up to 79mm/day (12/2/07), and as a result, the longer term drought runoff system that was evident in the early period of monitoring has subsequently reverted to a runoff regime more dominated by surface runoff baseflow and bank storage depletion, with a lesser dominance of groundwater seepage and discharge from the Teatree Hollow licensed discharge as shown in **Figure 5**.



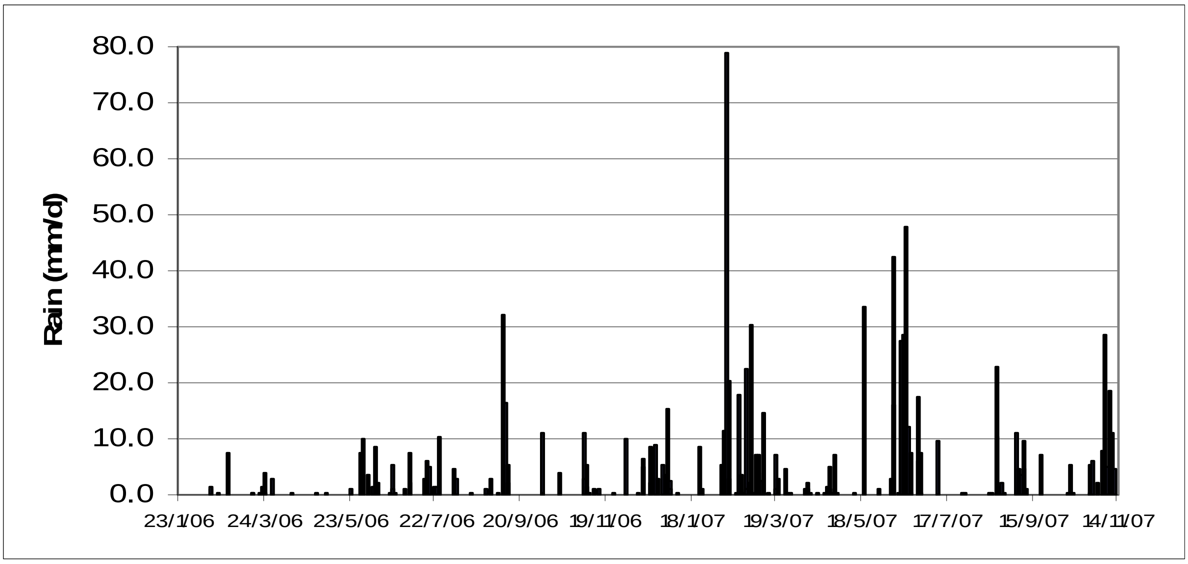


FIGURE 5 Bargo River Flows and Rainfall

5.2.3 Flow Diversions

Field assessment has identified five locations with varying levels of flow diversion as shown in **Drawing 4**.

Diversions can comprise flow through boulder races or open joints, washed out bedding planes and discontinuities in rock bars underneath and downstream of a pool.

The most notable diversion in the study area is between Pools H and F, through Rock Bar G, where all flow monitored to date passes through cross bedded laminae with a bedding discontinuity at the top and base of the cross set as shown in **Photograph 8.**

No overland flow has been observed over Rock Bar G during the monitoring period, however it is likely to have occurred during the June 2007 flood event (when gauging access to the site was not possible).

With current data, at least 16.6ML/day of flow is required for Pool H to be full and overflowing, with ongoing monitoring required to assess the pools “cease to flow” rate.

PHOTOGRAPH 8 Rock Bar G (Upstream) Rock bar G (Downstream)

5.2.4 River Water Quality

Water quality in the Bargo River is highly variable, and often exceeds the ANZECC 2000 (95% protection of aquatic species) trigger levels for pH, salinity, nickel, zinc, arsenic and Total N, and to a lesser degree, Total P, aluminium and copper as shown in **Appendix A.**

At present, the river water quality in the study area is primarily determined by the volume and quality of flow from the mine's licensed discharge into Teatree Hollow, along with the very large variability of runoff in the catchment and the wide range of urban, agricultural and industrial pollutant sources in the river.

Baseflow in the river has been dominated by Teatree Hollow outflow during the drought affected period, and it is likely that, without the discharge, the river downstream of Teatree Hollow could have intermittent flow periods after rain, with the river forming a series of disconnected pools behind rock bars after extended dry periods.

Heavy rains in June 2007 reduced the dominance of the mine discharge on water quality, so that only Total Nitrogen exceeded ANZECC 2000 criteria downstream of Teatree Hollow. The rains in February 2007 did not significantly affect the subsequent ANZECC criteria exceedances in water quality in March 2007.

Field monitored water quality in the Bargo River as shown in **Figure 6** during the earlier stage of monitoring, initially changed from around pH 4.4 to 5.8, upstream of Teatree Hollow, to pH 8.2 to 8.9 downstream of Teatree Hollow. In the latter phase of monitoring, the disparity between upstream and downstream pH has reduced as a higher proportion of rainfall runoff compared to groundwater baseflow is entering the river, with the upstream / downstream change now being from pH 7.8 to 8.5. With flow down the gorge pH becomes slightly more acidic, with a notable acidification during the June 2007 runoff event.

The change in salinity from upstream to downstream of Teatree Hollow has been relatively constant and significant throughout the monitoring period (EC from 150-398 to 161-2220µS/cm), followed by an overall reduction in salinity with flow down the gorge during the general mine discharge dominated flow periods. The reduction in salinity is less distinct when there is a higher proportion of rainfall runoff in the catchment.

No particular pattern has emerged from the dissolved oxygen monitoring, whilst a distinct cyclical seasonal change in water temperature between 10^oC in winter and 24^oC in summer is observed. The Teatree Hollow discharge is generally warmer than the Bargo River, and it is generally observed that the river water cools down with transit through the gorge. No obvious water temperature changes due to upwelling of groundwater is evident in the data to date.

The Teatree Hollow discharge was generally more oxidised than the Bargo River in the initial stages of monitoring, however the disparity between the two is less evident in the later data.

The mine installed a polyaluminium chloride (with occasional acetic acid in LDP4) water treatment system in the licensed discharge from Teatree Hollow during November 2006, which significantly reduced suspended solids in the discharge to the Bargo River.

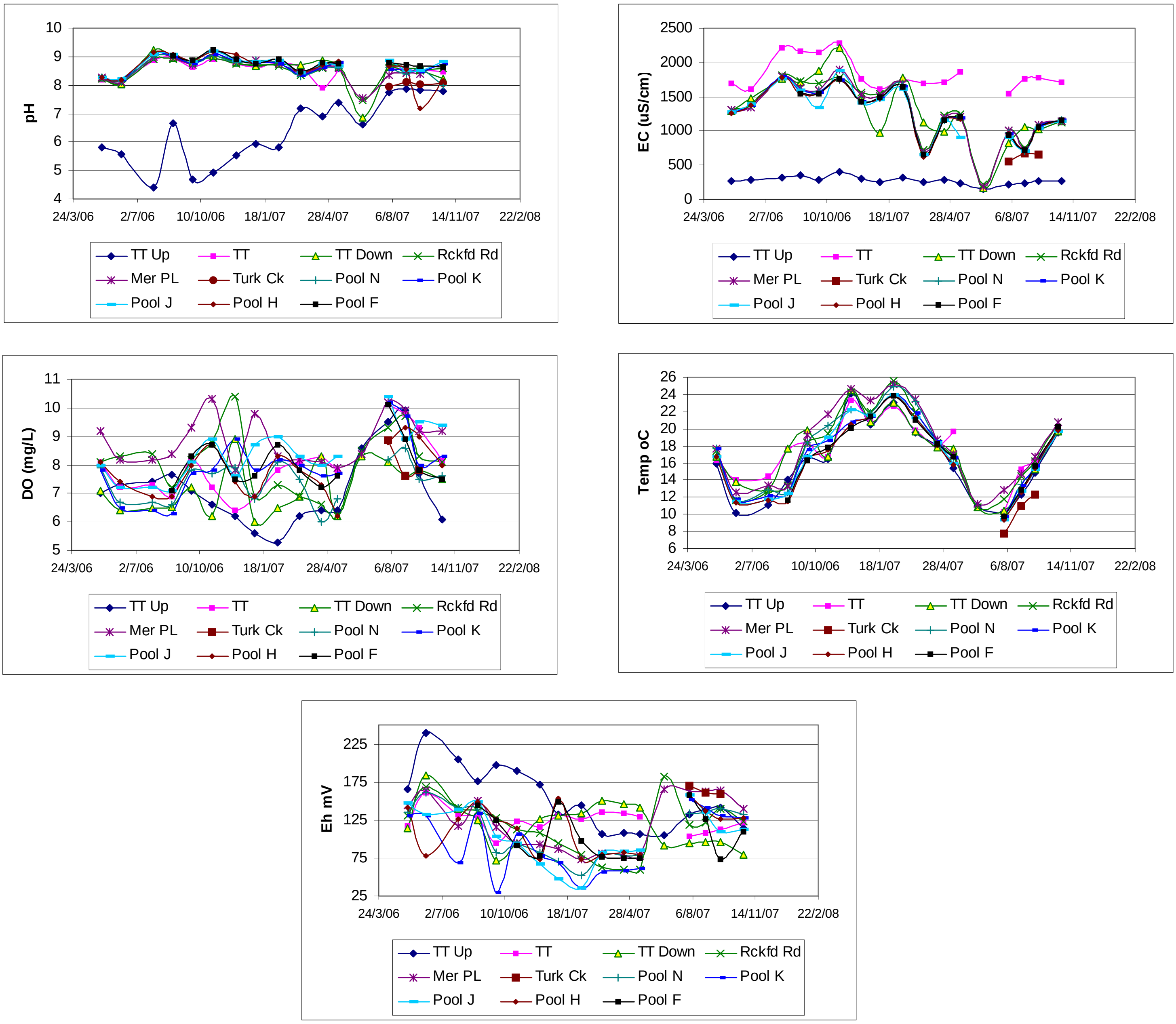


FIGURE 6 BARGO RIVER FIELD WATER QUALITY

Under "dry" flow conditions, with Teatree Hollow discharge dominating the river flow, the water progresses from being HCO3-Cl dominant immediately downstream of Picton Weir, through Na-Cl dominant to the confluence with Teatree Hollow, after which it becomes Na-HCO3 dominant through the study area, then slightly altering to Na-HCO3-Cl dominant toward the confluence with the Nepean River.

During the wetter period in June / July 2007, the river was Na- Mg-Cl dominated upstream of Teatree Hollow, Na-HCO3 dominant in Teatree Hollow, then Na-Mg-Cl dominant in June and Na-HCO3-Cl in July downstream of Teatree Hollow.

Downstream of Teatree Hollow, the river was Na-HCO3 dominant in July and Na-Cl-HCO3 in June 2007.

As shown in **Figure 7** significant rises of up to 4mg/L for total nitrogen downstream of Teatree Hollow have been noted, whilst total phosphorous does not indicate a definitive rise due to inflow from Teatree Hollow. Total phosphorous does however rise significantly at the confluence of the licensed discharge and runoff in an unnamed creek draining from the Inghams Turkey plant via “Pencil Falls”..

Total (unfiltered) iron does not generally show a distinctive rise with Teatree Hollow inflow, and does not generally show any notable rise downstream of the identified groundwater seeps.

Filterable manganese in the Bargo River notably drops from up to 1.2mg/L, to at or below the detection limit, on mixing with Teatree Hollow discharge and downstream of the confluence, primarily due to the buffering action of bicarbonate in the Teatree Hollow discharge and the associated change to more alkaline pH in the river. As previously stated however, the rise in pH between upstream and downstream of Teatree Hollow is becoming less marked as the river becomes more rainfall / runoff than groundwater baseflow dominated since the February 2007 and June 2007 rains.

Filterable copper does not show a distinctive rise with inflow from Teatree Hollow.

Filterable zinc shows a distinctive rise downstream of the Teatree Hollow inflow by up to 0.09mg/L, which gradually reduces with flow downstream. Following, and since the February 2007 rains, zinc has shown a more marked rise in Teatree Hollow discharge, however by the time the river flow reaches Pool N, the zinc concentration is similar to before the February 2007 rains.

Filterable nickel and arsenic also show a distinctive rise within Teatree Hollow to 0.12mg/L and 0.1mg/l respectively, which reduce at the confluence with the Bargo River to a maximum of 0.08mg/L and 0.08mg/L respectively. The dissolved metals then generally stay at the same “mixed” downstream concentration with further flow downstream following and since the February 2007 rains.

Filterable aluminium generally peaks in Teatree Hollow at up to 0.09mg/L and then gradually reduces on mixing with, and continued flow downstream in Bargo River, except for the March and August 2007 sampling events, where it generally rose with flow downstream.

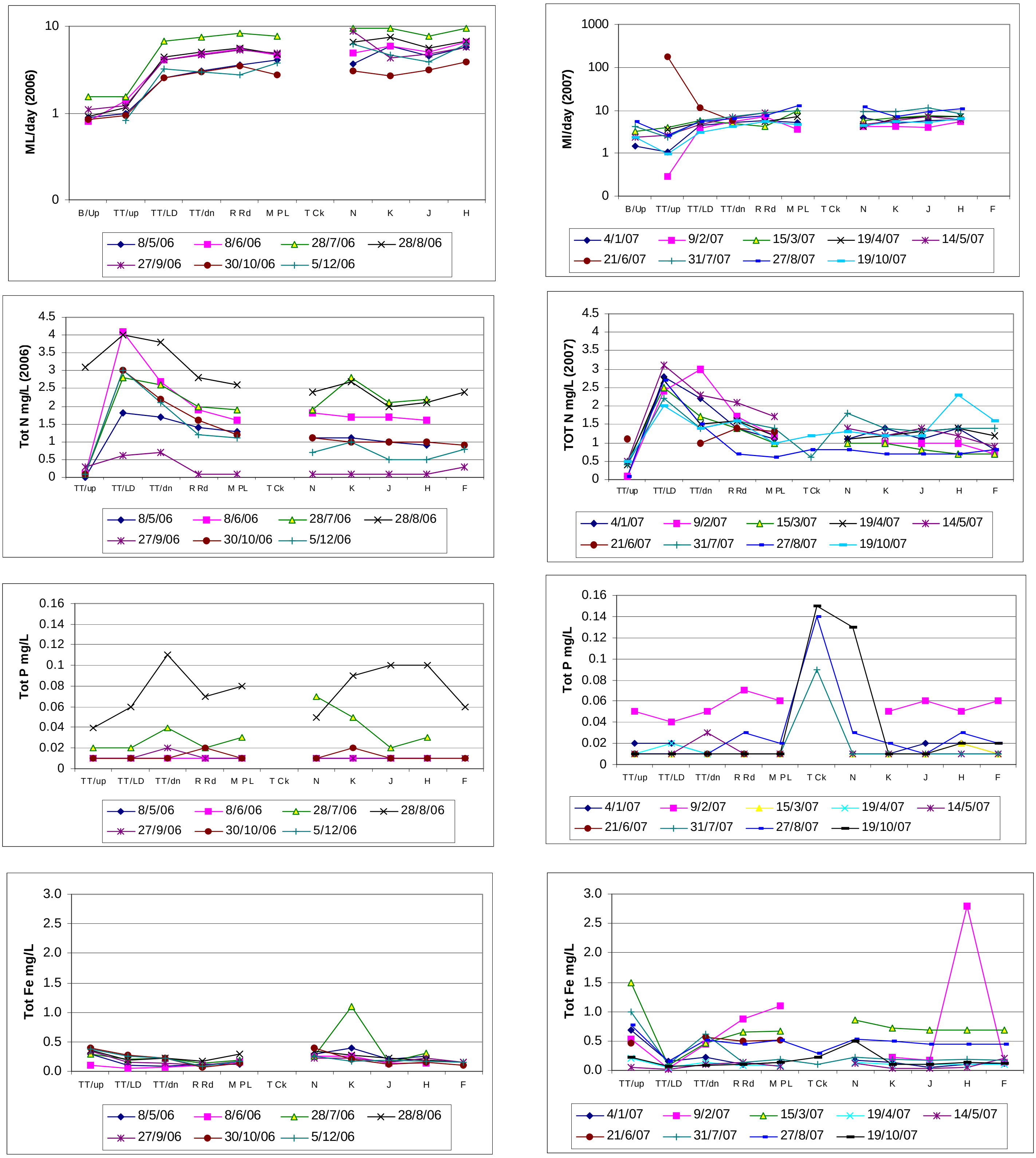


FIGURE 7(A) BARGO RIVER WATER QUALITY ANALYSES

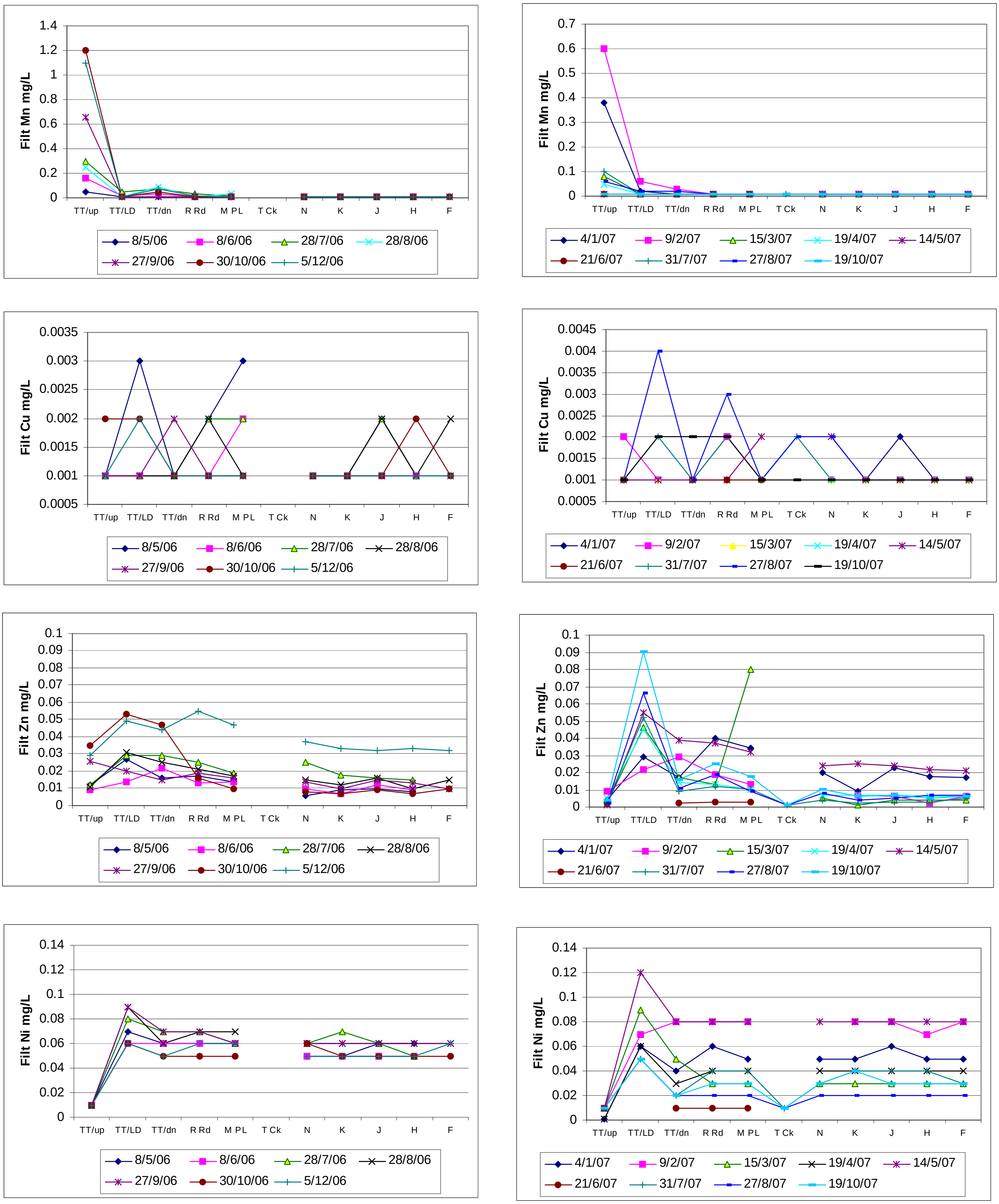


FIGURE 7 (B) BARGO RIVER WATER QUALITY ANALYSES

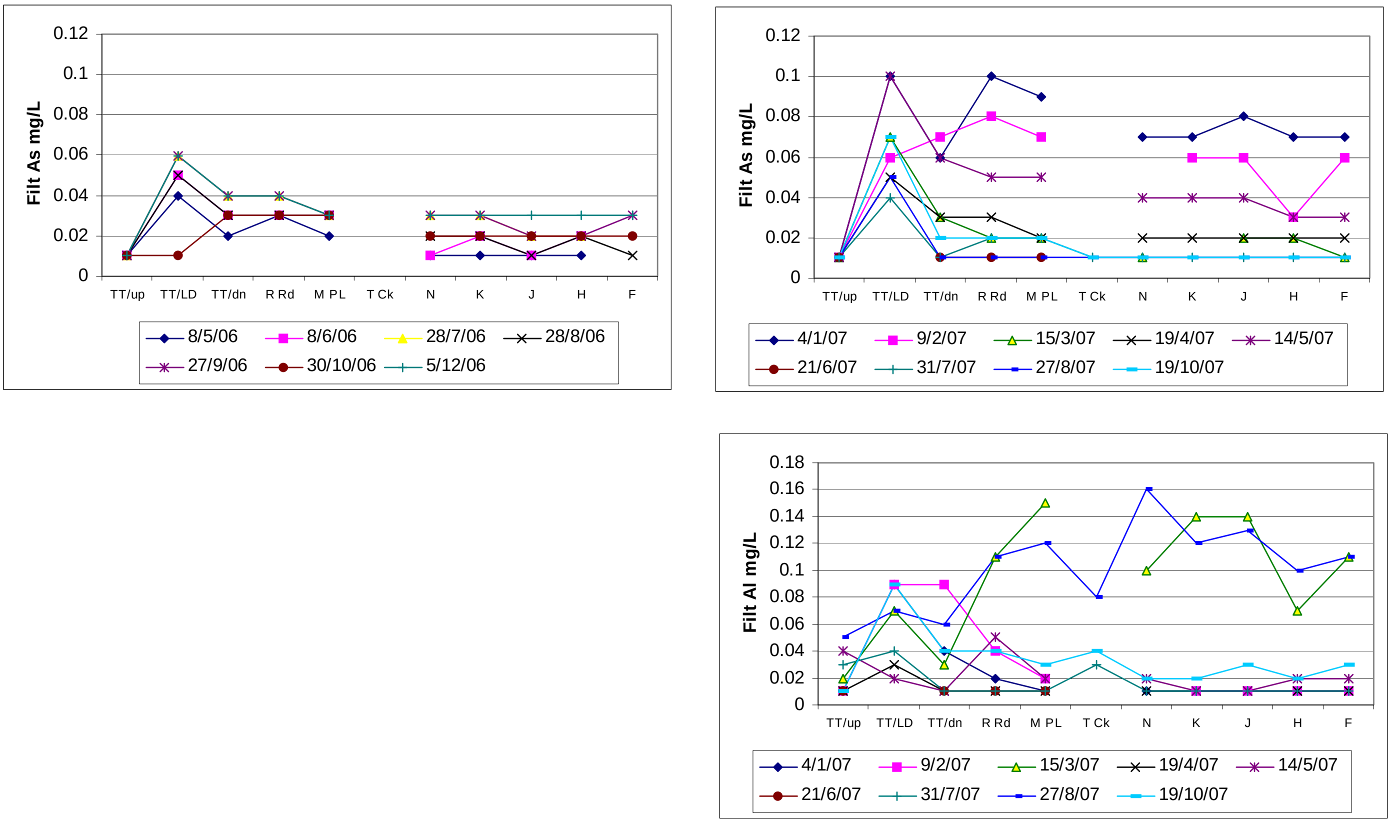
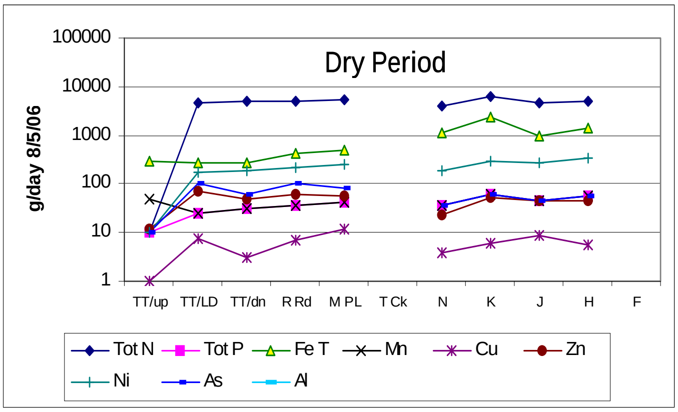


FIGURE 7(C) BARGO RIVER WATER QUALITY ANALYSES

Total flux of selected parameters in the river shown for a selected "dry" and "wet" sampling event in **Figure 8** was derived by multiplying the monitored / interpreted river flow at selected points in the gorge with the relevant laboratory analysis. Based on the calculated data (which is primarily reliant on the accuracy of the measured flow data), the main input from the mine discharge is

- total nitrogen, with a rise downstream of Teatree Hollow of up to almost 3 orders of magnitude in the dry and 2 in the wet period, followed by;
- nickel with a 1 to 2 order of magnitude rise, then;
- zinc and arsenic with a rise of over 1 order of magnitude.

It should be noted that where analyses were below the lower detection limit (LDL), the LDL was used in the calculations, thereby marginally enhancing the actual flux of that parameter at that point in time.



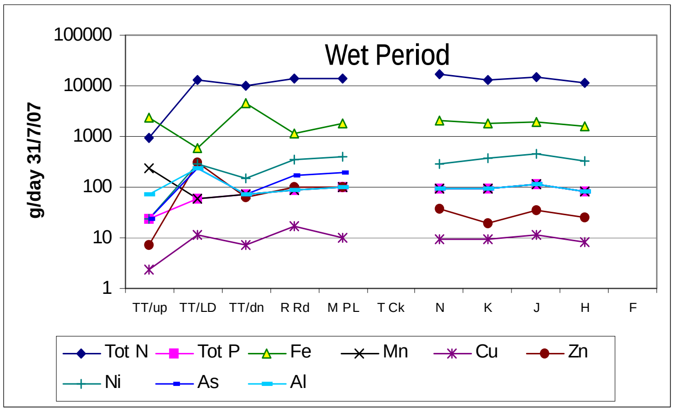


FIGURE 8 BARGO RIVER ANALYTE FLUX

5.2.5 Ferruginous Seeps

To date, monitoring and laboratory analysis has not indicated any significant adverse effect on river water salinity, pH, discolouration or dissolved metals within any pool containing a ferruginous groundwater seep.

No changes to seep flow rate, seepage outflow points or water quality effects in the Bargo River have been observed during extraction of Panels 22, 23A , 23B and 24B.

5.3 Teatree Hollow

5.3.1 Stream Flow

See previous sections.

5.3.2 Water Quality

See previous sections.

5.4 Myrtle and Redbank Creeks

Subsidence has occurred in Myrtle Creek over Panel 22, 23B and 24B with no adverse effect observed on stream flow, stream bed stability, stream bank stability or water quality.

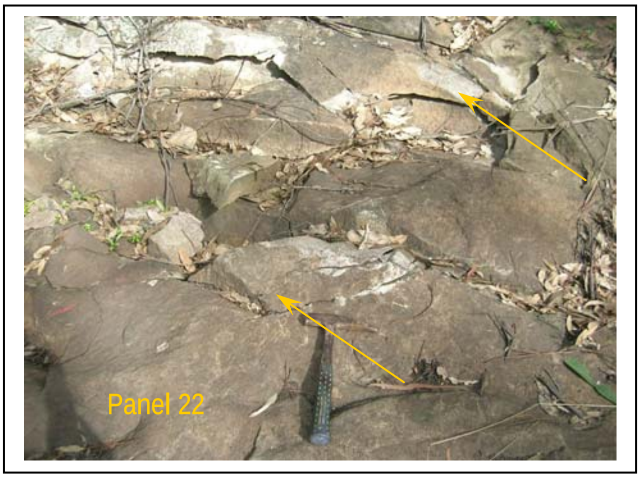
5.4.1 Subsidence Effects

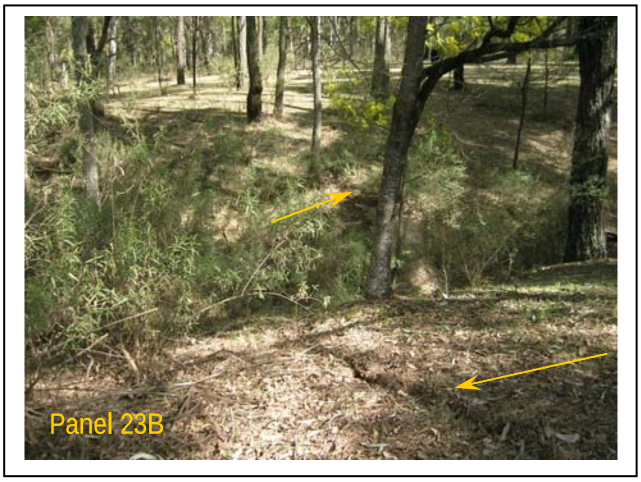
Cracking of the soil and bedrock over Panels 22 and 23B have been observed in Myrtle Creek as shown in **Photograph 9** from locations shown in **Drawing 2**.

Redbank Creek has not been undermined to date by Panels 22 to 24B.

The bedrock cracking in Myrtle Creek is up to 10mm wide and is limited to the base of the creek within a small rock bar over Panel 22, whilst the soil cracking occurred at the southern end of Panel 23B, close to the barrier pillar between Panels 23A and 23B.

The soil cracking was up to 65mm wide and extended into the soil to approximately 1.5m - 2.0m over an approximate length of 40m, however, the crack did not develop within the bed of Myrtle Creek, even though it was observed on both the upper banks and flank of the creek.





PHOTOGRAPH 9 Myrtle Creek Cracks

No creek bed cracking has been observed over Panel 24B, and no observable adverse effects on stream bed or bank stability have been observed in Myrtle Creek or the small unnamed gullies within the Panel 22, 23A, 23B and 24B subsidence area during the monitoring period.

Even though soil cracking has been noted in Myrtle Creek over Panel 23B, it is not anticipated that the bed or bank stability will be adversely affected as the crack can be easily rehabilitated and revegetated prior to the next main flow event.

The bedrock crack located over Panel 22 is within a small, restricted sandstone rock bar outcrop and has not observably had an adverse effect on stream flow, and therefore, no rehabilitation of the Panel 22 cracking is proposed.

A remnant subsidence “high” in Myrtle Creek of up to 0.75m is located over the chain pillar between Panels 22 and 23B, and approximately 0.4m over the Longwall 23B and 24B chain pillar, however due to the low quantum of subsidence and high vegetative cover in the creek, no erosion from the creek bed or banks or sediment accumulation in subsidence troughs has been observed.

Reversal of flow in the creek has not occurred due to subsidence as the creek gradient exceeds the subsidence tilt in the stream bed.

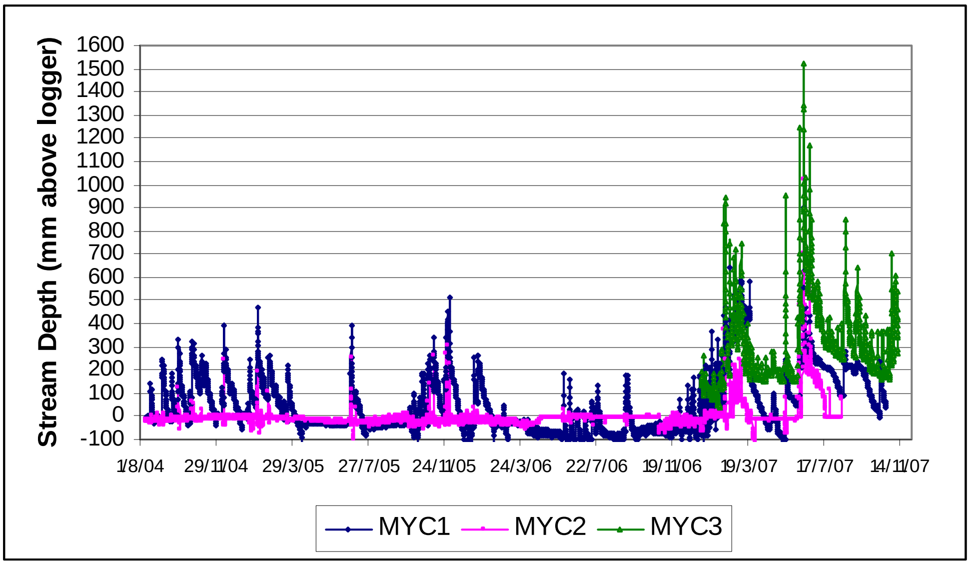
5.4.2 Myrtle and Redbank Creek Flow

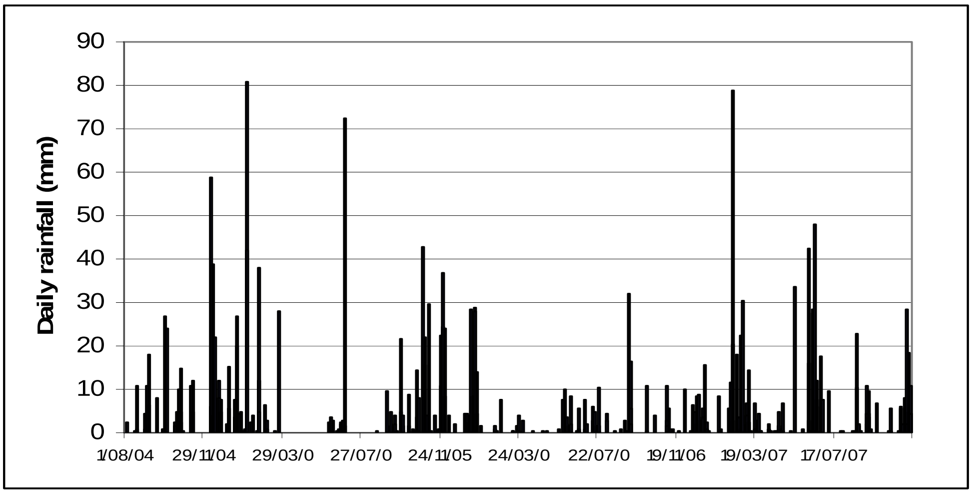
Stream depth monitoring using water depth transducers and loggers was instigated in Myrtle Creek prior to extraction of Panels 22 to 23B and subsequently extended into lower Myrtle Creek and Redbank Creek in April 2005.

The raw data is contained in an “EXCEL” spreadsheet, which is not included with this report, however data summaries and plots are presented this document.

Both creeks had extended periods of no-flow during the monitoring period due to lack of rainfall runoff prior to the February 2007 rains, with interspersed short periods of flow followed by static pondage as the creeks gradually dried up.

No change in stream flow has been observed within Myrtle Creek or Redbank Creek during or after extraction of Panels 22 to 24B, with creek flow at monitored locations shown in **Figure 9**.





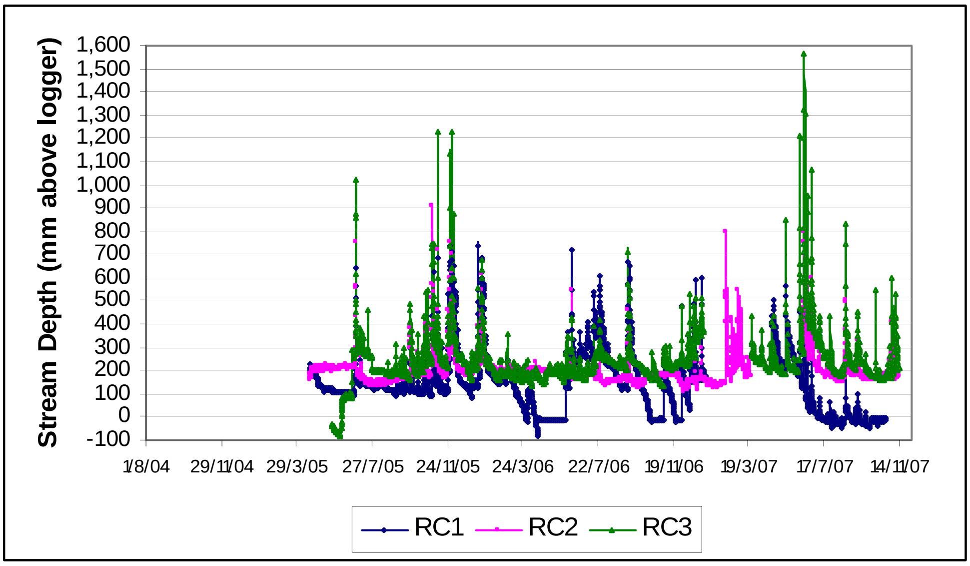


FIGURE 9 Stream Water Depth in Myrtle and Redbank Creeks

Perennial pondage has been noted to occur at locations MYC3, RC2 and RC3.

5.4.3 Myrtle and Redbank Creek Water Quality

Field and laboratory water quality monitoring and analysis from samples collected in Myrtle Creek and Redbank Creek between December 2004 and the present is shown in **Appendix B**. Prior to the February 2007 rains, Myrtle Creek has been generally dry at MYC1, however MYC2 and MYC3 are generally ponded. Myrtle Creek has a pH range between 5.31 and 8.34, with EC between 125uS/cm and 2630uS/cm, with the creek becoming generally more alkaline and saline downstream as shown in **Figure 10**.

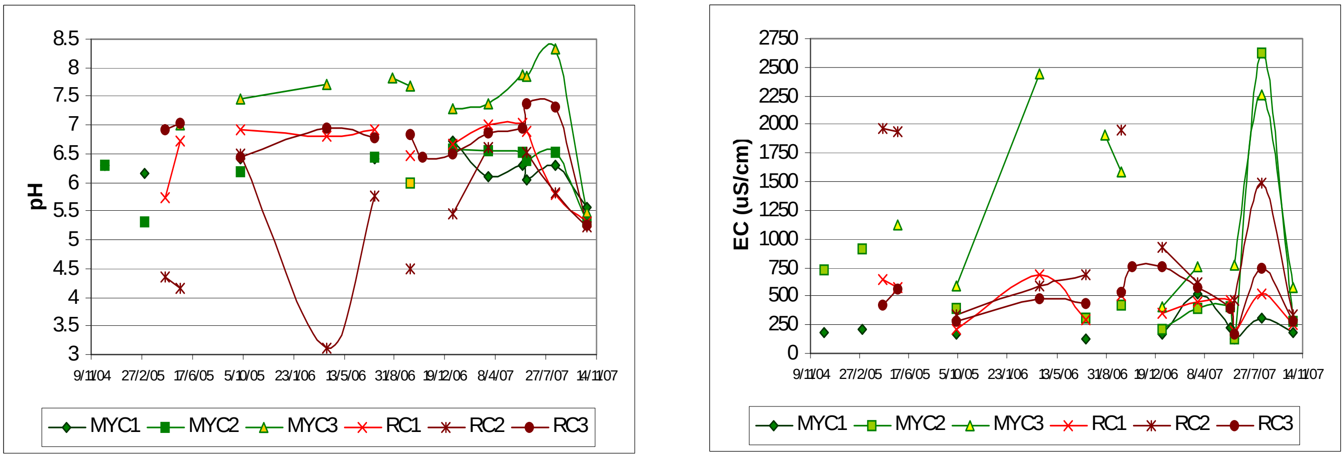


FIGURE 10 Upland Stream Field Water Quality

Prior to the February 2007 rains, Redbank Creek has been generally dry at RC1, however a perennial pond is located at RC2, and RC3 is generally ponded. Redbank Creek has a pH range between 4.15 and 7.38, with EC between 163uS/cm and 1950uS/cm, with the creek becoming generally being more acidic and saline in the RC2 pond, which also contains high levels of iron from a permanent groundwater seep into the creek as shown in **Photograph 10** and **Table 9**.

PHOTOGRAPH 10 Iron Hydroxide in Redbank Creek (RC2)

TABLE 9 Myrtle / Redbank Creek Water Sampling Summary to November 2007

	pH	EC	TN	TP	Fe(T)	Al (f)	Cu (f)	Zn (f)	Ni (f)	TOC
SITE	_	uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MYC1	5.58-6.72	128-514	0.7-3.7	0.01-0.13	1.0-3.0	0.01-1.0	0.002-0.007	0.005-0.01	0.01	11-27
MYC2	5.31-6.6	125-2630	0.8-5.7	0.03-0.66	2.5-23	0.01-0.24	0.001-0.004	0.002-0.009	0.01	7-18
MYC3	5.47-8.34	406-2440	29-190	5.2-30	0.94-4.2	0.01-0.1	0.001-0.009	0.004-0.027	0.01	17-47
RC1	5.3-7.03	195-694	0.5-7.6	0.01-0.11	1.1-3.2	0.01-0.1	0.001-0.007	0.007-0.015	0.01	7-11
RC2	4.15-6.6	338-1950	0.1-3.5	0.01-0.1	2.2-7	0.01-0.1	0.001-0.005	0.04-0.079	0.01-0.04	1-8
RC3	5.26-7.36	163-748	1-2.7	0.01-0.14	1.2-3	0.01-0.1	0.001-0.004	0.001-0.011	0.01	6-13

Water sampling indicates Myrtle Creek can have total nitrogen up to 190mg/L and total phosphorous at site MYC3. The high nutrient levels in this pond originate as the site is a watering hole for a mob of goats that live around the now decommissioned Jay-R Horse Stud, whilst is also downstream of an abattoir.

Myrtle Creek can also exceed the ANZECC 2000 trigger levels for filterable copper (<0.009mg/L), zinc (<0.027mg/L) and aluminium (<1.0mg/L).

Water sampling indicates Redbank Creek can have total nitrogen up to 7.6mg/L and total phosphorous to 0.14mg/L. Redbank Creek can also exceed the ANZECC 2000 trigger levels for filterable copper (<0.007mg/L), zinc (<0.079mg/L) and nickel (<0.04mg/L).

No observable adverse effects on water quality in Redbank Creek or Myrtle Creek due to subsidence have been observed following extraction of Panels 22 to 24B.

5.5 Unnamed Gullies

No stream flow or water quality monitoring has been conducted in the unnamed gullies over the eastern edge of the study area near the Bargo River gorge, nor in Dogtrap Creek or Sugarloaf Gully as they have been mostly dry up to February 2007, with flow being ephemeral and highly dependent on short term interflow storage following rainfall / runoff and groundwater seepage in their respective catchments.

Water quality and semi-quantitative water flow monitoring in the gully "Turkey Creek" that drains the Inghams turkey processing plant, which is located on the western plateau over Panel 24A and flows into the Bargo River, commenced in July 2007. The Turkey Creek water quality results are discussed in the Bargo River section of this report, where the creek water enters the Bargo via "Pencil Falls".

5.6 Dams

A total of 17 dams are located within the Panels 22 to 24B 20mm subsidence zone as shown in **Drawing 2** and **Table 10**.

The dams are all located within rural residential properties.

Field inspection and photographing of the dams was conducted prior to and after undermining of each dam, between November 2004 and November 2007.

The majority of dams are constructed through a combination of excavation and emplacement of an earthen bund wall, with one dam constructed within Myrtle Creek, whilst the small dams are excavations on the slopes of Myrtle Creek with a small earthen bund wall at the downslope end.

All dams were low due to the lack of recharge prior to the February and June 2007 rains, then significantly rose after the rains.

No evidence of adverse effects due to subsidence have been observed following site inspections or reported by landowners.

TABLE 10 Dams Over Panels 22 to 24B

Dam	Size	Construction	Subsidence Effects
K86e	Small	Small earth bank on slopes	None observed or reported
K86f	Small	Small earth bank on slopes	None observed or reported
MO8i	Small	Small earth bank on slopes	None observed or reported
MO8j	Small	Small earth bank on slopes	None observed or reported
MO8k / MO9j	medium	2 dams sharing common wall	None observed or reported
MO9i	Medium	Earth Wall in Myrtle Creek	None observed or reported
O13d	Small	Small earth bank on slopes	None observed or reported
O14e	Medium	Medium earth bank on slopes	None observed or reported
O15d	Medium	Medium earth bank on slopes	None observed or reported
O16d	Medium	Medium earth bank on slopes	None observed or reported
O17e	Small	Small earth bank on slopes	None observed or reported
Q06n	Medium	Medium earth bank on slopes	None observed or reported
Q08h	Medium	Medium earth bank on slopes	None observed or reported
W06c	Medium	Medium earth bank on slopes	None observed or reported
W07c	Medium	Medium earth bank on slopes	None observed or reported
W08e	Medium	Medium earth bank on slopes	None observed or reported

5.7 Groundwater

5.7.1 Groundwater Levels

Regular manual and data logger based standing water level monitoring in the study area began in June 2004 with the drilling of P1 by the colliery, which is located on the southwest periphery of Panel 22, with water levels monitored every 12 hours.

Piezometers P2 and P3 also have water levels monitored at 12 hourly intervals in remnant coal exploration bores over Panel 23B and the chain pillar between Panels 25 and 26.

Piezometer P4 is a manually monitored bore in an undeveloped, unsecured block of land, 300m northeast of Panel 26. P5 is a disused private bore 950m north west of Panel 26 that was used for general domestic / irrigation water, with water levels logged at twelve hourly intervals.

Piezometer P6 was originally drilled as a water supply bore for the Jay-R-horse stud, 1.1km east of Panel 26, however it was never used as the water was too deep. The standing water levels are manually monitored in P6, whilst the private bore P7 is located over Panel 26 and the private bore P8 (Douglas) is located 450m south of Panel 24A over ground that has only been undermined by first working driveages. Piezometer P8 does not have access into the bore wellhead, and as a result, standing water levels are not currently monitored.

Of the suite of monitoring bores and piezometers, only P7 and P8 are currently used for domestic garden water supply.

A plot of water levels shown in **Figure 11**, with manual readings listed in **Appendix C**, indicates that the groundwater level in P1, which is 450m south of Panel 22, fell by approximately 4.3m due to extraction of Panel 22 over 7 months between mid / late November 2004 to early / mid December 2004. This was superimposed on a gradual, drought related decline of around 0.1mm / month, which existed both before and after extraction of Panels 22, 23A and 23B. Piezometer P1 then continued to fall a further 1.63m over 24 months to mid June 2007, after which it has risen by 0.77m in the last 6 months. The initial decline is interpreted to result from both drought and mining related effects, with the longer period, lower gradient decline due to both the advance of the panel away from the piezometer to the west and the advance of mining into adjacent panels further to the north.

No correlation between groundwater level recovery and rainfall recharge is apparent in P1 until around mid June 2007, however the recovery would also be due to the progression of coal extraction further to the north in Panels 23 and 24.

At the same time that P1 dropped, P2 (located in Glenanne Place over Panel 23) initially rose by around 2.2m, then fell by less than 1m below the pre-Panel 22 extraction period water level. The cause of the initial rise in P2, and its subsequent 3.3m fall over 7 months to late July 2005 is interpreted to be related to both a delayed response to rain that fell in late 2004/early 2005 and the far field effect of subsidence following extraction of Panel 22. When Panel 22 ceased extraction, P2 rose by around 0.5m, then remained relatively static until Panel 23A was completed in late February 2006 after which it rose by approximately 2.1m.

When Panel 23B started extraction and undermined P2, the groundwater fell by approximately 6.1m. The P2 water level then recovered by approximately 2.15m when Panel 23B finished then fell again by around 6.3m during extraction of Panel 24B, with a rise of 1.8m which coincided with a both a reduction in panel advance and the June 2006 rains. Water levels in P2 have continued to rise since the June 2007 rains and completion of Panel 24B.

Groundwater levels in P3 (over Longwall 25/26 chain pillar) do not appear to have significantly responded to extraction of Panels 22 and 23A/23B and essentially rose by 2.4m over the time that Panels 22, 23A and 23B were extracted. Water levels in P3 fell by around 2.2m when Panel 24B was extracted, with the fall reverting to a rise of 4.4m following the June 2006 rains, whilst the panel was still being extracted. The rise then subsequently reverted to a 1.1m water level decline, which then rose again toward the end of panel 24B extraction, and the 4.7m rise is still continuing after completion of Panel 24B.

No significant change in Piezometers P4, P5, P6 and Well 1 have been observed during extraction of Panels 22 to 24B, with P4 being essentially static, P5 falling by 0.3m and P6 falling by 0.25m over the monitoring period.

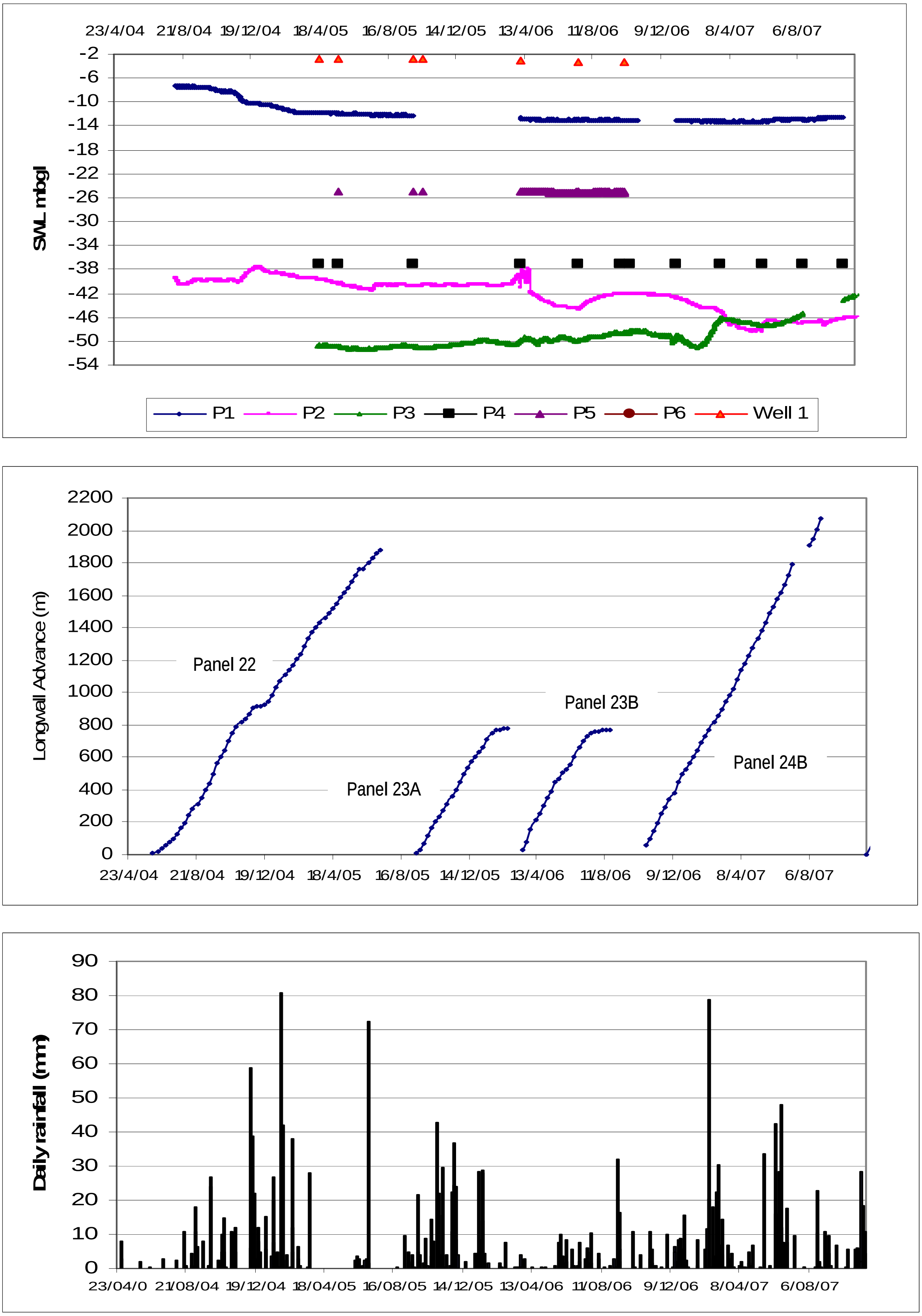


FIGURE 11 Standing Water Levels and Panel Extraction

5.7.2 Groundwater Quality

Groundwater in the study area has generally brackish salinity (564µS/cm to 14,940µS/cm) with acid to circum-neutral pH (3.53 to 7.36) as shown in **Figure 12**.

Laboratory analyses indicate that the bore water generally is outside ANZECC 2000 criteria (default trigger values for physical & chemical stressors in SE Aust upland rivers / 95% protection of freshwater species / livestock / irrigation) for;

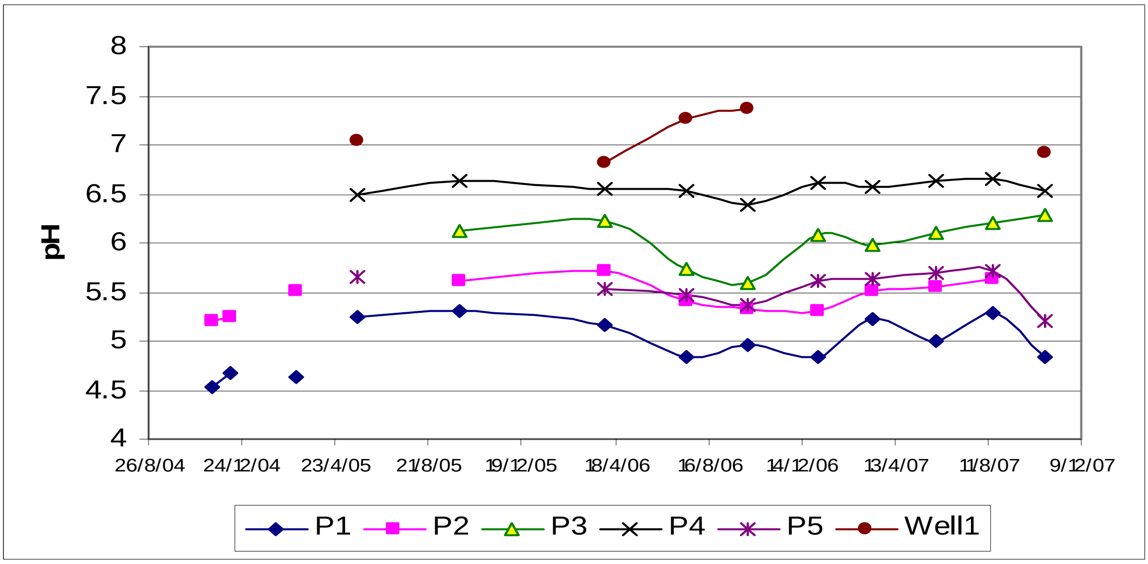
- pH,
- electrolytical conductivity,
- sodium,
- hardness,
- total nitrogen, total phosphorous, as well as,
- filterable manganese, copper, zinc, nickel, aluminium and, to a small degree, lead

The exceedance varying depending on the applicable guideline applied for the end use of the water as shown in **Appendix C.**

Groundwater in the SMP area is suitable for selected livestock and limited irrigation use, but not for potable water.

No complaints regarding groundwater quality changes have been reported in the study area during the monitoring period.

Adverse changes to groundwater quality of the subsided bores has not been observed, with no distinctive increase in dissolved total iron or salinity and no distinctive lowering of pH.



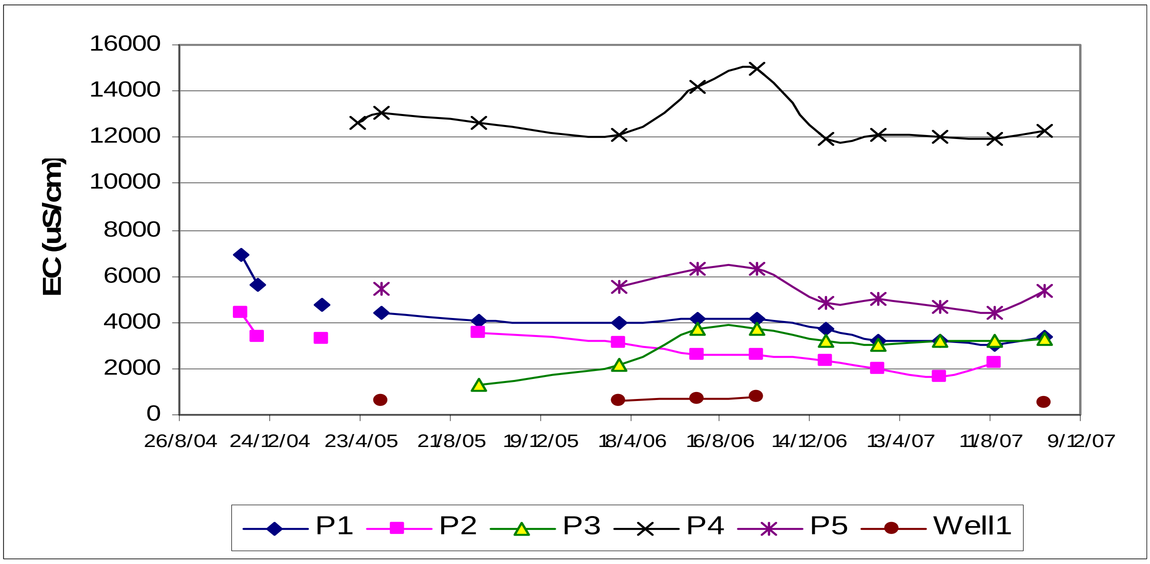


FIGURE 12 Field Groundwater Quality

6. REFERENCES

ANZECC 2000 Australian and New Zealand Guidelines For Fresh and Marine Water Quality

Geoterra, 2004 Longwall Panels 22 and 23 Surface Water, Stream, Alluvial Land and Groundwater Subsidence Management and Monitoring

Geoterra Pty Ltd, 2006 Longwall Panels 24 to 26 Surface Water & Groundwater Subsidence Management Plan

Mine Subsidence Engineering Consultants Pty Ltd 2003 The Prediction of Subsidence Parameters and the Assessment of Mine Subsidence Impacts on Natural Features and Surface Infrastructure (In support of a section 138 application)

Mine Subsidence Engineering Consultants Pty Ltd 2006A The Prediction of Subsidence Parameters and the Assessment of Mine Subsidence Impacts on Surface and Sub Surface Features Due to Mining Longwalls 24 to 26 at Tahmoor Colliery in Support of and SMP Application

Mine Subsidence Engineering Consultants Pty Ltd 2006B End of Panel Monitoring report for Longwall 23B at Tahmoor Colliery

Mine Subsidence Engineering Consultants Pty Ltd 2008 End of Panel Subsidence Monitoring Report for Longwall 24B at Tahmoor Colliery

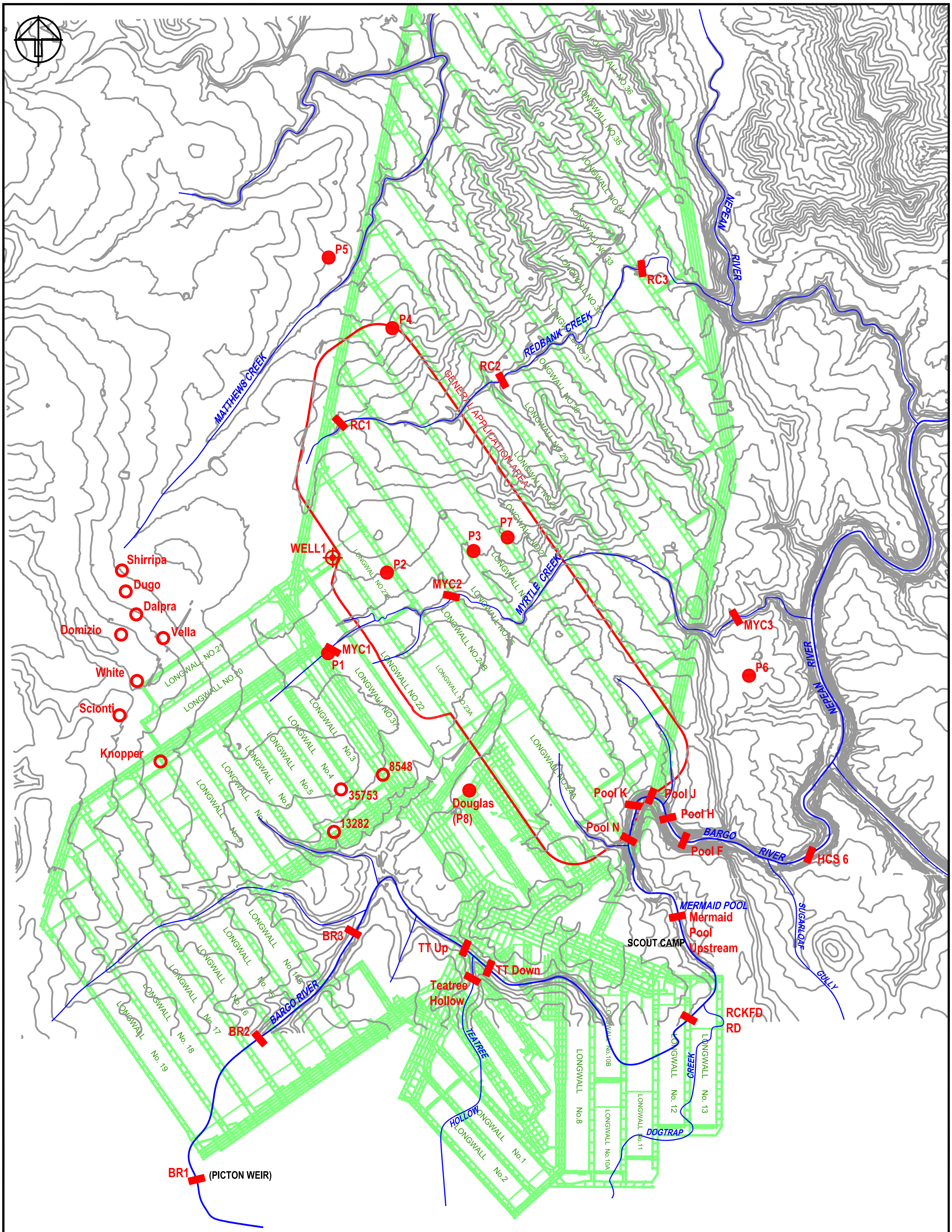
LIMITATIONS

This report was prepared in accordance with the scope of services set out in the contract between Geoterra Pty Ltd (Geoterra) and the client, or where no contract has been finalised, the proposal agreed to by the client. To the best of our knowledge the report presented herein accurately reflects the clients requirements when it was printed. However, the application of conditions of approval or impacts of unanticipated future events could modify the outcomes described in this document.

In preparing this report, Geoterra has relied upon information and documentation provided by the client and / or third parties. Geoterra did not attempt to independently verify the accuracy or completeness of that information. To the extent that the conclusions and recommendations in this report are based in whole or in part on such information, they are contingent on its validity. Geoterra assume the client will make their own enquiries in regard to conclusions and recommendations made in this document. Geoterra accept no responsibility for any consequences arising from any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to Geoterra.

The findings contained in this report are the result of discrete / specific methodologies used in accordance with normal practices and standards. To the best of our knowledge, they represent a reasonable interpretation of the general condition of the site in question. Under no circumstances, however, can it be considered that these findings represent the actual state of the site at all points.

Interpretations and recommendations provided in this report are opinions provided for our Client's sole use in accordance with the specified brief. As such they do not necessarily address all aspects of water, soil or rock conditions on the subject site. The responsibility of Geoterra is solely to its client and it is not intended that this report be relied upon by any third party. This report shall not be reproduced either wholly or in part without the prior written consent of Geoterra.



LEGEND

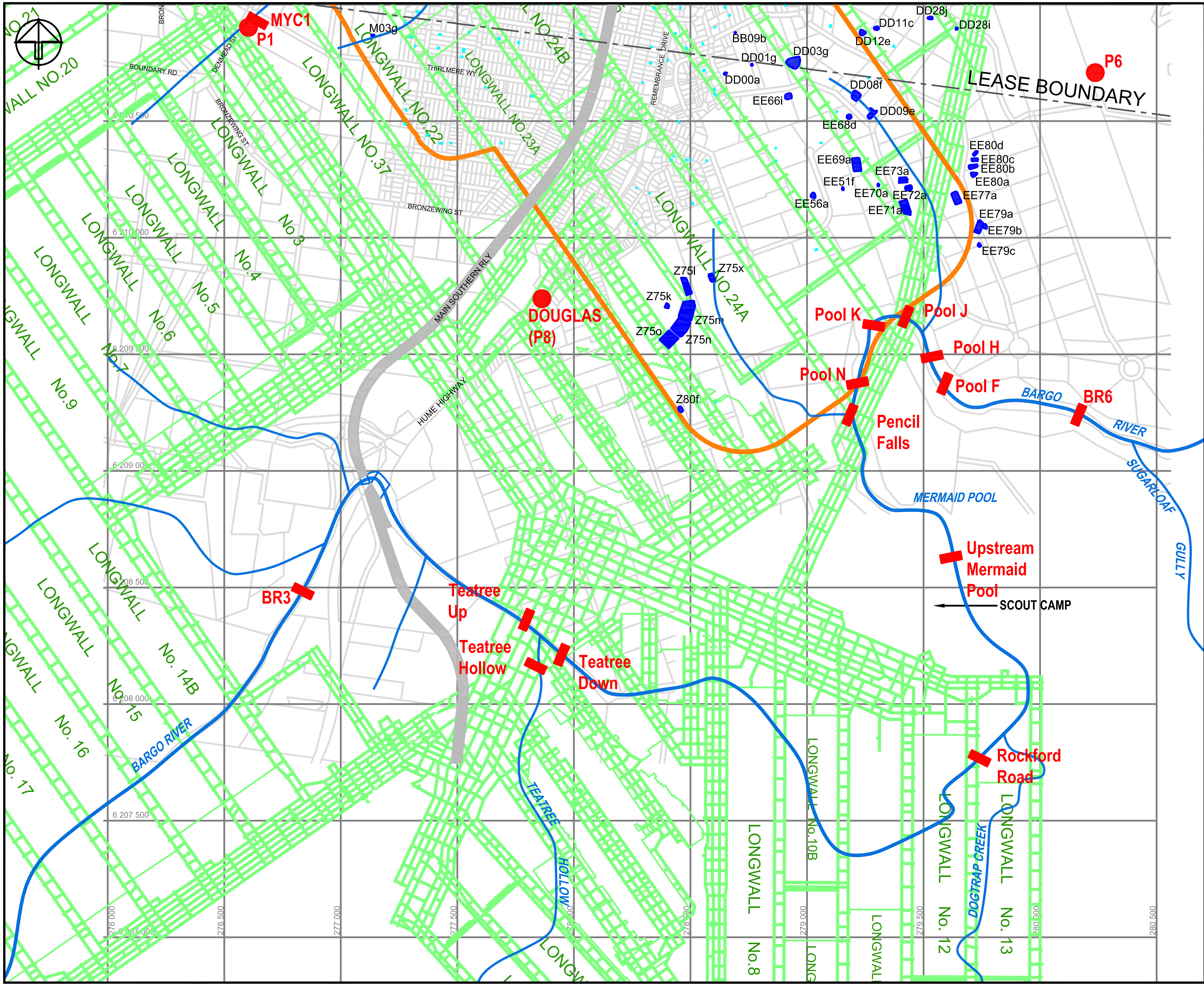
- PIEZOMETER LOCATIONS
- STREAM MONITORING LOCATIONS
- WELL LOCATION
- DNR REGISTERED BORE

PROJECT:	TA5-R2
DRAWN:	A. DAWKINS
DATE:	18 DEC 2007
SCALE:	1:30 000

XSTRATA COAL PTY LTD
TAHMOOR COLLIERY
PANELS 22 TO 26
MONITORING SITES

GeoTerra

DRAWING1



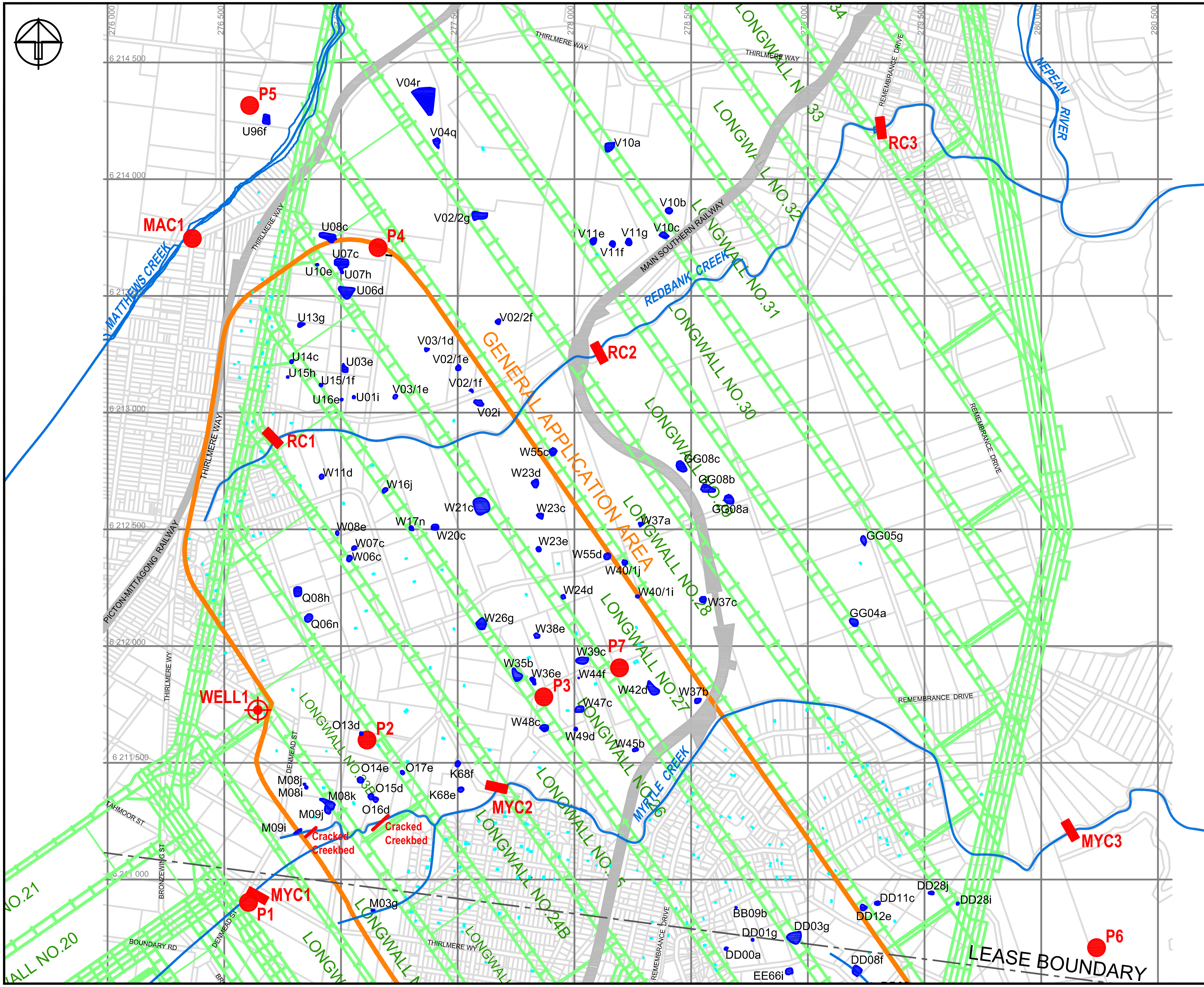
PROJECT:	TA5-R2
DRAWN:	A. DAWKINS
DATE:	18 DEC 2007
SCALE:	1:15 000

XSTRATA COAL TAHMOOR COLLIERY LONGWALLS 24 TO 26

Monitoring Sites (South)

DRAWING 2

GeoTerra



LEGEND

- DAMS
- PIEZOMETER / BORE
- STREAM SITE
- WELL

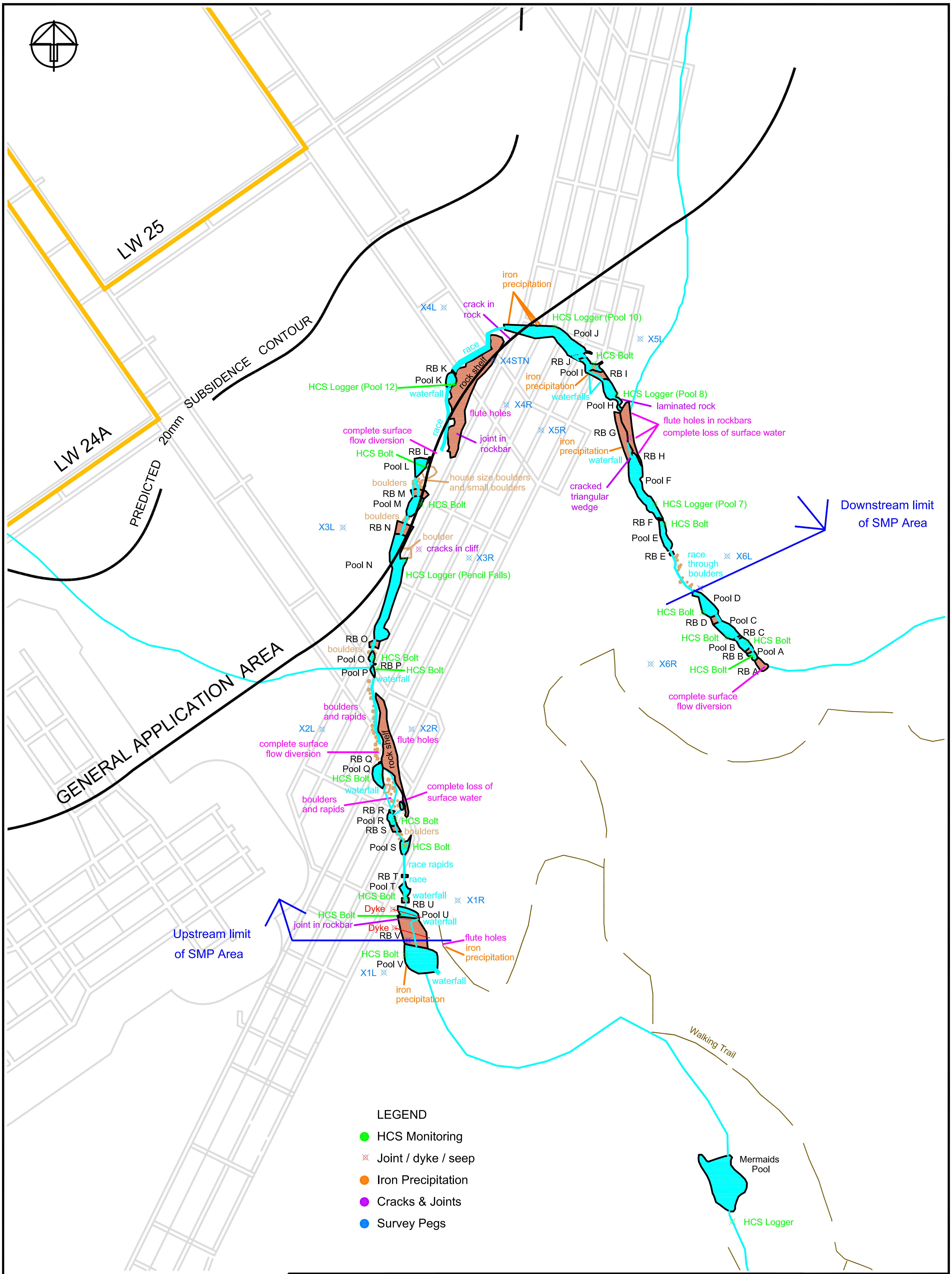
PROJECT:	TA5-R2
DRAWN:	A. DAWKINS
DATE:	18 DEC 2007
SCALE:	1:15 000

XSTRATA COAL TAHMOOR COLLIERY LONGWALLS 24 TO 26

Monitoring Sites (North)

DRAWING 3

GeoTerra



LEGEND

- HCS Monitoring
- Joint / dyke / seep
- Iron Precipitation
- Cracks & Joints
- Survey Pegs

PROJECT:	TA5-R2	XSTRATA COAL PTY LTD TAHMOOR COLLIERY PANELS 22 TO 26 MONITORING SITES	GeoTerra
DRAWN:	A. DAWKINS		
DATE:	14 JAN 2008		DRAWING 4
SCALE:			

APPENDIX A

Bargo River Water Quality Monitoring Data

BARGO RIVER FLOW (ML/day)

	8/5/06	8/6/06	28/7/06	28/8/06	27/9/06	30/10/06	5/12/06
B/Up	0.890	0.810	1.540	0.910	1.090	0.840	
TT/up	0.999	1.390	1.536	1.155	1.222	0.935	0.820
TT/LD	2.556	4.079	6.673	4.411	4.073	2.547	3.210
TT/dn	***3.056***	***4.774***	***7.441***	***4.989***	***4.684***	***3.015***	***2.975***
R Rd	3.555	5.469	8.209	5.566	5.295	3.482	***2.740***
M PL	4.072	4.603	7.683	4.748	4.904	2.765	3.740
T Ck							
N	3.713	4.908	9.368	6.555	8.840	3.095	6.150
K	5.898	5.976	9.386	7.582	4.289	2.718	4.690
J	4.531	5.016	7.664	5.535	4.780	3.172	3.910
H	5.710	6.550	9.380	6.710	5.830	3.900	6.270

	4/1/07	9/2/07	15/3/07	19/4/07	14/5/07	21/6/07	31/7/07	27/8/07	19/10/07
B/Up	***1.480***		3.290		2.410		4.300	5.320	2.360
TT/up	1.090	0.290	3.920	3.600	2.550	***177.000***	2.400	2.570	0.970
TT/LD	4.49	3.800	5.800	5.240	4.780	11.320	5.760	5.430	3.030
TT/dn	***5.140***	***5.530***	***4.970***		***6.815***	***5.660***	***7.185***	***6.555***	***4.200***
R Rd	5.790	7.260	***4.140***	***5.320***	8.850		8.610	7.680	5.370
M PL	5.260	3.640	9.520	7.130			9.810	12.500	4.630
T Ck									
N	6.820	4.210	5.800	4.190	4.600		9.480	12.000	4.320
K	4.800	4.100	6.820	6.460	5.630		9.370	7.260	5.320
J	5.670	4.080	7.600	7.010	7.090		11.700	9.070	5.090
H	5.930	5.420	7.110	7.140	5.920		8.200	10.800	6.370

NOTE ***7.441*** denotes uncertain or estimated flow

	ST Dev	Max	Min	Median	ANZECC	6.5-7.5																
pH						8/5/06	8/6/06	28/7/06	28/8/06	27/9/06	30/10/06	5/12/06	4/1/07	9/2/07	15/3/07	19/4/07	14/5/07	21/6/07	31/7/07	27/8/07	19/9/07	25/10/07
	1.15	7.87	4.40	6.60	TT Up	5.82	5.58	4.4	6.64	4.7	4.94	5.55	5.93	5.83	7.2	6.89	7.4	6.6	7.76	7.87	7.81	7.8
	0.28	8.94	7.90	8.64	TT	8.2	8.19	8.88	8.94	8.65	8.9	8.75	8.65	8.74	8.63	7.9	8.54		8.64	8.56	8.52	8.48
	0.53	9.23	6.85	8.69	TT Down	8.26	8.03	9.23	8.96	8.78	9.02	8.79	8.69	8.77	8.71	8.86	8.65	6.85	8.65	8.58	8.55	8.21
	0.38	8.96	7.45	8.61	Rckfd Rd	8.22	8.07	8.92	8.9	8.85	8.96	8.77	8.71	8.69	8.34	8.61	8.71	7.45	8.61	8.41	8.52	8.59
	0.39	9.11	7.56	8.62	Mer PL	8.25	8.12	8.99	8.99	8.71	9.11	8.83	8.88	8.75	8.41	8.63	8.61	7.56	8.33	8.42	8.39	
	0.07	8.10	7.95	8.06	Turk Ck														7.95	8.1	8.03	8.08
SMP area	0.32	9.04	7.98	8.64	Pool N	8.26	8.13	9	9.04	8.76	9.04	8.81	8.89	8.79	8.32	8.65	8.59		8.62	8.38	8.59	7.98
	0.28	9.09	8.18	8.75	Pool K	8.28	8.18	9.08	9.04	8.76	9.09	8.87	8.79	8.75	8.34	8.65	8.78		8.57	8.51	8.48	8.75
	0.28	9.20	8.22	8.83	Pool J	8.26	8.22	9.06	9.07	8.84	9.2	8.87	8.82	8.88	8.44	8.76	8.69		8.86	8.49	8.5	8.83
	0.51	9.21	7.18	8.73	Pool H	8.25	8.18	9.16	9.07	8.87	9.21	9.08	8.76	8.93	8.44	8.7	8.82		8.67	8.56	7.18	8.13
	0.19	9.23	8.47	8.78	Pool F				9.05	8.87	9.23	8.91	8.74	8.93	8.47	8.78	8.76		8.81	8.71	8.67	8.65

	ST Dev	Max	Min	Median	ANZECC	30-350																
EC uS/cm						8/5/06	8/6/06	28/7/06	28/8/06	27/9/06	30/10/06	5/12/06	4/1/07	9/2/07	15/3/07	19/4/07	14/5/07	21/6/07	31/7/07	27/8/07	19/9/07	25/10/07
	54.80	398.00	150.30	270.00	TT Up	265	292	316	348	279	398	299	255	316	246	282	234	150.3	223	231	270	267
	234.24	2290.00	1552.00	1751.50	TT	1695	1616	2210	2160	2140	2290	1755	1604	1748	1703	1705	1870		1552	1757	1771	1707
	486.28	2220.00	160.90	1211.00	TT Down	1296	1484	1761	1709	1877	2220	1469	965	1774	1130	984	1211	160.9	824	1049	1029	1133
	438.60	1804.00	218.00	1308.00	Rckfd Rd	1308	1398	1804	1722	1690	1785	1563	1552	1689	729	1221	1239	218	1010	750	1091	1126
	441.97	1890.00	191.00	1306.00	Mer PL	1306	1342	1793	1632	1586	1890	1522	1513	1692	688	1196	1211	191	1014	718	1090	1147
	60.50	670.00	561.00	661.00	Turk Ck														561	670	661	
SMP area	343.92	1777.00	654.00	1326.50	Pool N	1269	1384	1777	1593	1571	1748	1446	1477	1671	654	1161	1202		973	705	1055	1154
	346.96	1800.00	652.00	1326.50	Pool K	1278	1375	1800	1591	1568	1751	1432	1474	1651	652	1158	1190		949	699	1055	1151
	362.13	1880.00	651.00	1308.50	Pool J	1267	1391	1770	1598	1350	1880	1410	1464	1607	651	1154	898		914	707	1041	1149
	340.77	1771.00	627.00	1319.00	Pool H	1264	1374	1771	1548	1541	1743	1421	1478	1648	627	1156	1182		954	718	1047	1152
	350.89	1763.00	651.00	1204.00	Pool F				1552	1541	1763	1427	1485	1642	651	1153	1204		941	715	1054	1161

DO mg/L	ST Dev	Max	Min	Median		8/5/06	8/6/06	28/7/06	28/8/06	27/9/06	30/10/06	5/12/06	4/1/07	9/2/07	15/3/07	19/4/07	14/5/07	21/6/07	31/7/07	27/8/07	19/9/07	25/10/07
	1.27	9.90	5.30	7.00	TT Up	7	7.3	7.4	7.65	7.1	6.6	6.2	5.6	5.3	6.2	6.4	6.4	8.6	9.5	9.9	7.7	6.1
	1.04	10.10	6.40	7.95	TT	8.1	7.2	7.3	6.9	8.2	7.2	6.4	6.9	7.8	8.12	8.28	7.8		10.1	9.8	9.3	8.15
	0.88	8.90	6.00	7.10	TT Down	7.1	6.4	6.5	6.55	7.2	6.2	8.9	6	6.5	6.9	8.3	6.2	8.3	8.1	7.6	7.8	7.5
	1.13	10.40	6.20	8.20	Rckfd Rd	8.1	8.3	8.4	7.2	8.2	8.8	10.4	6.9	7.3	6.9	6.6	6.2	8.5	9.3	9.7	8.3	8.1
	0.83	10.30	7.80	8.40	Mer PL	9.2	8.2	8.2	8.4	9.3	10.3	7.8	9.8	8.3	8.2	8.1	7.9	8.4	10.2	9.9	9.2	9.2
	0.67	8.85	7.60	7.80	Turk Ck														8.85	7.6	7.8	
SMP area	0.72	8.60	6.00	7.55	Pool N	7.9	6.7	6.7	6.6	7.8	7.7	7.9	6.8	8.1	7.5	6	6.8		8.2	8.6	7.5	7.6
	1.06	10.20	6.30	7.80	Pool K	7.8	6.5	6.4	6.3	7.7	7.8	8.9	7.8	8.2	8	7.6	7.7		10.2	9.7	8	8.3
	0.92	10.40	7.10	8.30	Pool J	8	7.2	7.2	7.1	8.1	8.9	7.6	8.7	9	8.3	8	8.3		10.4	8.9	9.5	9.4
	0.87	9.30	6.20	7.90	Pool H	8.1	7.4	6.9	6.9	8	8.7	7.4	6.9	8.3	7.8	7.3	6.2		8.8	9.3	9	8
	0.85	10.10	7.10	7.80	Pool F				7.1	8.3	8.7	7.5	7.6	8.7	7.8	7.2	7.6		10.1	8.9	7.8	7.5

Temp oC	ST Dev	Max	Min	Median		8/5/06	8/6/06	28/7/06	28/8/06	27/9/06	30/10/06	5/12/06	4/1/07	9/2/07	15/3/07	19/4/07	14/5/07	21/6/07	31/7/07	27/8/07	19/9/07	25/10/07
	4.33	24.10	10.20	16.00	TT Up	16	10.2	11.1	14.1	16.6	16.5	24.1	20.5	23.1	19.6	17.9	15.4	11	10.3	12.3	14.9	19.6
	3.35	23.30	10.30	17.80	TT	16.4	14.1	14.4	17.5	18.4	16.7	23.3	20.8	22.6	19.8	18.1	19.7		10.3	15.2	16.2	19.7
	4.03	24.50	10.40	17.70	TT Down	16.7	13.8	13	17.7	19.8	16.7	24.5	20.8	23.1	19.7	17.8	17.7	10.8	10.4	13	15.2	19.7
	4.55	25.60	10.80	17.40	Rckfd Rd	17.4	11.6	12.6	13.4	18.3	19.4	24.2	22	25.6	22	18.4	16.7	10.8	11.8	14.4	16.2	20.8
	4.59	25.20	11.20	17.70	Mer PL	17.7	12.6	13.4	13.3	19.3	21.7	24.7	23.3	25.2	23.4	18.7	17	11.2	12.8	14.7	16.7	20.7
	2.30	12.30	7.80	10.90	Turk Ck														7.8	10.9	12.3	
SMP area	4.51	24.90	9.80	18.05	Pool N	17.7	11.6	12.8	12.6	18.4	20.3	22.3	21.9	24.9	23.2	18.4	16.6		9.8	13.5	15.5	19.8
	4.16	24.00	9.70	17.60	Pool K	17.7	11.8	12.2	12.4	17.5	18.6	20.8	21.4	24	21.9	18.5	16.6		9.7	13.4	15.6	19.7
	4.37	24.00	9.40	16.70	Pool J	16.7	11.5	11.8	12.4	16.7	19	22.2	21.6	24	21.3	18.4	16		9.4	12.7	15.3	19.7
	4.27	23.90	9.40	16.55	Pool H	16.7	11.4	11.7	11.5	16.4	17.6	20.5	21.4	23.9	21.3	18.1	15.8		9.4	12.6	15.4	19.8
	4.13	23.80	9.70	17.80	Pool F				11.6	16.4	17.8	20.1	21.5	23.8	21	18.2	16.7		9.7	12.9	15.6	20.2

Eh mV	ST Dev	Max	Min	Median		8/5/06	8/6/06	28/7/06	28/8/06	27/9/06	30/10/06	5/12/06	4/1/07	9/2/07	15/3/07	19/4/07	14/5/07	21/6/07	31/7/07	27/8/07	19/9/07	25/10/07
	40.29	239.00	104.50	141.50	TT Up	166	239	205	176	197	190	171	132	144	106	108	106	104.5	132.1	139	141.5	114
	15.26	161.00	95.00	124.35	TT	117	161	132.7	127.3	95	123	115	130	125.7	135.1	133.2	129		104	108	112	122
	29.40	183.00	72.00	124.10	TT Down	114	183	140	124.1	72	95	126.8	131	133.5	149.8	145.1	141	91	95	95.5	96.6	80
	35.53	182.00	59.80	121.00	Rckfd Rd	130	168	141	136.6	128	112	107.3	95	79.2	62	59.8	59.8	182	119	121	139.5	122.7
	36.30	166.00	73.80	117.00	Mer PL	145	164	117	150.6	115	95	93.7	87	73.8	81.4	79.2	78	166	163	163	164.4	139.5
	5.57	170.00	159.80	161.00	Turk Ck														170	161	159.8	
SMP area	33.97	161.00	52.10	112.60	Pool N	135	161	141	139	83	93	81.9	69.6	52.1	78.9	77.3	79		134	135	139.2	132.2
	41.11	151.70	29.00	92.25	Pool K	131	130	69	134.1	29	107	77.5	68.6	35	57.3	58.5	61		151.7	141	130.1	127.5
	36.80	157.30	35.00	107.10	Pool J	148	132	138	148.5	104	95	68	48	35	81.8	83.3	85		157.3	135	110.2	112.9
	31.27	157.80	72.70	126.00	Pool H	141	78	126	148.3	126	114	73.3	154	72.7	79.1	82	79		157.8	136	126.1	128.2
	31.22	158.50	74.00	97.00	Pool F				145	125	91.6	78.5	149	97	76.7	75.4	75.4		158.5	126	74	109.5

ANZECC												1.9		0.0014	0.0034	0.008	0.011		0.055	0.024 (III) / 0.013(V)	0.011						0.25	0.02
22/12/2004	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC		Tot N	Tot P
BR1		15	8.2	10	8.5	65	0.24	8	380	0.22				0.004	0.001	0.035				0.01	0.01						0.8	0.01
Pool N		160	9.5	10	9.2	68	0.21	7	390	0.28				0.001	0.001	0.008				0.01	0.01						0.8	0.01
HCS6		150	10	10	9.6	75	0.21	8	360	0.25				0.001	0.001	0.008				0.01	0.01						0.7	0.01
8/05/2006	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC		Tot N	Tot P
BR3	125	32	4.3	1.2	3.7	62	0.01	7	8																			
TT Up	115	31	1.9	1.4	4.1	60	0.001	6	4	0.29	0.04	0.08	0.05	0.001	0.001	0.012	0.01	0.1	0.1	0.01	0.01				3		0.01	0.01
TT	930	325	18	23	13	93	0.43	7	880	0.11	0.01	0.01	0.01	0.003	0.001	0.027	0.07	0.2	0.1	0.04	0.01				2		1.8	0.01
TT Down	740	255	16	17	11	86	0.01	6	680	0.09	0.01	0.01	0.01	0.001	0.001	0.016	0.06	0.1	0.1	0.02	0.01				3		1.7	0.01
Rckfd Rd	720	250	16	18	12	75	0.31	7	660	0.12	0.01	0.01	0.01	0.002	0.001	0.017	0.06	0.1	0.1	0.03	0.01				2		1.4	0.01
Mer PL	710	240	15	17	12	79	0.28	7	610	0.12	0.01	0.01	0.01	0.003	0.001	0.014	0.06	0.1	0.1	0.02	0.01				2		1.3	0.01
Turk Ck																												
Pool N	680	235	15	16	12	79	0.3	6	580	0.30	0.01	0.01	0.01	0.001	0.001	0.006	0.05	0.1	0.1	0.01	0.01				2		1.1	0.01
Pool K	680	240	14	17	12	79	0.3	6	600	0.40	0.01	0.04	0.01	0.001	0.001	0.009	0.05	0.1	0.1	0.01	0.01				2		1.1	0.01
Pool J	710	245	14	17	12	76	0.3	6	610	0.21	0.01	0.01	0.01	0.002	0.001	0.01	0.06	0.2	0.1	0.01	0.01				7		1	0.01
Pool H	700	240	14	16	12	79	0.3	7	640	0.25	0.01	0.01	0.01	0.001	0.001	0.008	0.06	0.1	0.1	0.01	0.01				2		0.9	0.01
Pool F																												
8/06/2006	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC		Tot N	Tot P
TT Up	120	34	1.9	2.1	5.4	69	0.01	7	5	0.11	0.02	0.26	0.16	0.001	0.001	0.009	0.01	0.1	0.1	0.01	0.01				2		0.1	0.01
TT	1040	395	18	30	15	85	0.36	8	1000	0.06	0.01	0.02	0.02	0.001	0.001	0.014	0.06	0.1	0.1	0.05	0.01				2		4.1	0.01
TT Down	860	310	24	23	14	79	0.3	7	760	0.07	0.01	0.06	0.03	0.001	0.001	0.022	0.06	0.1	0.1	0.03	0.01				1		2.7	0.01
Rckfd Rd	890	290	21	21	13	80	0.33	8	710	0.10	0.01	0.01	0.01	0.001	0.001	0.013	0.06	0.1	0.1	0.03	0.01				1		1.9	0.01
Mer PL	810	290	19	20	13	91	0.34	7	690	0.16	0.01	0.01	0.01	0.002	0.001	0.014	0.06	0.1	0.1	0.03	0.01				1		1.6	0.01
Turk Ck																												
Pool N	810	295	17	19	13	86	0.33	8	690	0.26	0.01	0.01	0.01	0.001	0.001	0.01	0.05	0.1	0.1	0.01	0.01				0.1		1.8	0.01
Pool K	770	275	17	19	13	79	0.32	7	650	0.26	0.01	0.01	0.01	0.001	0.001	0.007	0.05	0.1	0.1	0.02	0.01				2		1.7	0.01
Pool J	780	285	17	19	13	84	0.31	8	620	0.13	0.01	0.01	0.01	0.001	0.001	0.012	0.05	0.1	0.1	0.01	0.01				2		1.7	0.01
Pool H	770	280	16	19	13	80	0.32	8	630	0.14	0.01	0.01	0.01	0.001	0.001	0.009	0.05	0.1	0.1	0.02	0.01				2		1.6	0.01
Pool F																												
28/07/2006	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC	TSS	Tot N	Tot P
TT Up	110	28	2.7	2.1	5.3	60	0.1	5	7	0.29	0.06	0.4	0.3	0.001	0.001	0.012	0.01	0.1	0.1	0.01	0.01				1	3	0.1	0.02
TT	1140	420	25	28	15	74	0.46	9	1200	0.20	0.01	0.05	0.05	0.001	0.001	0.029	0.08	0.1	0.1	0.06	0.01				2	18	2.8	0.02
TT Down	960	335	26	23	14	69	0.92	10	970	0.22	0.01	0.09	0.07	0.001	0.001	0.029	0.07	0.1	0.1	0.04	0.01				2	19	2.6	0.04
Rckfd Rd	900	320	23	23	14	74	0.38	7	830	0.14	0.03	0.04	0.03	0.002	0.001	0.025	0.07	0.1	0.1	0.04	0.01				1	8	2	0.02
Mer PL	875	320	220	22	14	75	0.4	6	850	0.19	0.01	0.02	0.02	0.002	0.001	0.019	0.06	0.1	0.1	0.03	0.01				1	2	1.9	0.03
Turk Ck																												
Pool N	805	285	20	22	13	74	0.39	4	730	0.25	0.01	0.02	0.01	0.001	0.001	0.025	0.06	0.1	0.1	0.03	0.01				0.1	2	1.9	0.07
Pool K	850	305	19	22	14	73	0.42	5	780	1.10	0.01	0.02	0.01	0.001	0.001	0.018	0.07	0.1	0.1	0.03	0.01				2	37	2.8	0.05
Pool J	835	300	19	21	14	74	0.4	4	760	0.16	0.01	0.01	0.01	0.002	0.001	0.016	0.06	0.1	0.1	0.02	0.01				0.1	2	2.1	0.02
Pool H	830	305	19	21	14	73	0.39	4	770	0.31	0.01	0.01	0.01	0.001	0.001	0.015	0.05	0.1	0.1	0.02	0.01				1	2	2.2	0.03
Pool F																												

												1.9		0.0014	0.0034	0.008	0.011		0.055	0.024 (III) / 0.013(V)	0.011						0.25	0.02
28/08/2006	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Fe**	**Fe Filt**	**Mn**	**Filt Mn**	**Filt Cu**	**Filt Pb**	**Filt Zn**	**Filt Ni**	**Al**	**Filt Al**	**Filt As**	**Filt Se**	**Filt Sr**	**Filt Ba**	**Filt Li**	**TOC**	**TSS**	**Tot N**	**Tot P**
TT Up	135	40	2.2	1.3	6	68	0.1	7	10	0.36	0.01	0.32	0.25	0.001	0.001	0.011	0.01	0.1	0.1	0.01	0.01				0.1	2	3.1	0.04
TT	1230	440	13	31	17	73	0.27	13	1230	0.19	0.01	0.01	0.01	0.001	0.001	0.031	0.09	0.1	0.1	0.05	0.01				2	5	4	0.06
TT Down	960	330	21	23	15	73	0.23	12	930	0.22	0.01	0.15	0.09	0.001	0.001	0.025	0.06	0.1	0.1	0.03	0.01				2	23	3.8	0.11
Rckfd Rd	1010	355	22	24	16	73	0.27	9	950	0.17	0.01	0.02	0.01	0.002	0.001	0.021	0.07	0.1	0.1	0.03	0.01				2	3	2.8	0.07
Mer PL	950	340	20	24	15	72	0.26	9	870	0.29	0.01	0.03	0.03	0.001	0.001	0.017	0.07	0.1	0.1	0.03	0.01				1	3	2.6	0.08
Turk Ck																												
Pool N	960	345	19	23	15	76	0.27	9	890	0.34	0.01	0.02	0.01	0.001	0.001	0.015	0.06	0.1	0.1	0.02	0.01				2	5	2.4	0.05
Pool K	945	345	19	23	15	73	0.26	11	900	0.28	0.01	0.02	0.01	0.001	0.001	0.012	0.06	0.1	0.1	0.02	0.01				2	3	2.7	0.09
Pool J	940	340	18	22	17	74	0.27	9	850	0.22	0.01	0.01	0.01	0.002	0.001	0.016	0.06	0.1	0.1	0.01	0.01				1	4	2	0.1
Pool H	950	350	18	24	15	74	0.27	11	850	0.19	0.01	0.01	0.01	0.001	0.001	0.01	0.06	0.1	0.1	0.02	0.01				2	4	2.1	0.1
Pool F	940	345	18	24	15	73	0.26	9	850	0.16	0.01	0.01	0.01	0.002	0.001	0.015	0.06	0.1	0.1	0.01	0.01				2	3	2.4	0.06
27/09/2006	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Fe**	**Fe Filt**	**Mn**	**Filt Mn**	**Filt Cu**	**Filt Pb**	**Filt Zn**	**Filt Ni**	**Al**	**Filt Al**	**Filt As**	**Filt Se**	**Filt Sr**	**Filt Ba**	**Filt Li**	**TOC**	**TSS**	**Tot N**	**Tot P**
TT Up	75	15	2.9	1	5.9	38	0.1	6	4	0.35	0.01	0.72	0.66	0.001	0.001	0.026	0.01	0.1	0.1	0.01	0.01				1	2	0.3	0.01
TT	1210	440	12	28	17	81	0.35	11	1210	0.15	0.01	0.01	0.01	0.001	0.001	0.02	0.09	0.1	0.1	0.06	0.01				1	2	0.6	0.01
TT Down	1020	350	21	24	16	82	0.33	11	990	0.14	0.01	0.03	0.01	0.002	0.001	0.015	0.07	0.1	0.1	0.04	0.01				2	16	0.7	0.02
Rckfd Rd	900	310	19	22	14	76	0.39	21	840	0.11	0.01	0.01	0.01	0.001	0.001	0.019	0.07	0.1	0.1	0.04	0.01				1	2	0.1	0.01
Mer PL	910	325	18	20	14	73	0.38	20	890	0.18	0.01	0.01	0.01	0.001	0.001	0.016	0.06	0.1	0.1	0.03	0.01				1	3	0.1	0.01
Turk Ck																												
Pool N	830	285	17	19	14	73	0.34	15	790	0.22	0.01	0.01	0.01	0.001	0.001	0.014	0.06	0.1	0.1	0.03	0.01				1	2	0.1	0.01
Pool K	830	290	18	19	14	73	0.34	15	770	0.23	0.01	0.01	0.01	0.001	0.001	0.01	0.06	0.1	0.1	0.03	0.01				1	3	0.1	0.01
Pool J	810	275	18	19	14	73	0.34	15	760	0.15	0.01	0.01	0.01	0.001	0.001	0.015	0.06	0.1	0.1	0.02	0.01				1	3	0.1	0.01
Pool H	810	275	18	20	14	73	0.33	14	760	0.23	0.01	0.01	0.01	0.001	0.001	0.013	0.06	0.1	0.1	0.02	0.01				1	3	0.1	0.01
Pool F	770	255	17	18	14	72	0.32	14	720	0.16	0.01	0.01	0.01	0.001	0.001	0.01	0.06	0.1	0.1	0.02	0.01				1	2	0.3	0.01
30/10/2006	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Fe**	**Fe Filt**	**Mn**	**Filt Mn**	**Filt Cu**	**Filt Pb**	**Filt Zn**	**Filt Ni**	**Al**	**Filt Al**	**Filt As**	**Filt Se**	**Filt Sr**	**Filt Ba**	**Filt Li**	**TOC**	**TSS**	**Tot N**	**Tot P**
TT Up	125	33	3	1.2	6.5	76	0.1	4	1	0.39	0.03	1.2	1.2	0.002	0.001	0.035	0.01	0.1	0.1	0.01	0.01				4	2	0.1	0.01
TT	1250	450	14	30	20	86	0.31	12	1250	0.28	0.02	0.01	0.01	0.002	0.001	0.053	0.06	0.1	0.1	0.01	0.01				3	5	3	0.01
TT Down	1070	390	18	24	18	86	0.29	11	1090	0.23	0.02	0.06	0.05	0.001	0.001	0.047	0.05	0.1	0.1	0.03	0.01				3	2	2.2	0.01
Rckfd Rd	960	335	17	23	15	79	0.42	10	920	0.07	0.01	0.01	0.01	0.001	0.001	0.016	0.05	0.1	0.1	0.03	0.01				2	2	1.6	0.02
Mer PL	910	330	14	23	14	79	0.42	8	890	0.14	0.01	0.01	0.01	0.001	0.001	0.01	0.05	0.1	0.1	0.03	0.01				2	2	1.2	0.01
Turk Ck																												
Pool N	920	340	13	21	14	81	0.41	9	830	0.39	0.01	0.01	0.01	0.001	0.001	0.008	0.06	0.1	0.1	0.02	0.01				2	2	1.1	0.01
Pool K	900	330	13	22	15	82	0.4	7	790	0.21	0.01	0.01	0.01	0.001	0.001	0.007	0.05	0.1	0.1	0.02	0.01				1	2	1	0.02
Pool J	910	330	13	22	15	80	0.41	8	800	0.12	0.01	0.01	0.01	0.001	0.001	0.009	0.05	0.1	0.1	0.02	0.01				1	2	1	0.01
Pool H	910	335	13	23	15	81	0.4	8	820	0.16	0.01	0.01	0.01	0.002	0.001	0.007	0.05	0.1	0.1	0.02	0.01				2	2	1	0.01
Pool F	920	340	13	22	15	82	0.4	9	840	0.11	0.01	0.01	0.01	0.001	0.001	0.01	0.05	0.1	0.1	0.02	0.01				2	2	0.9	0.01
5/12/2006	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Fe**	**Fe Filt**	**Mn**	**Filt Mn**	**Filt Cu**	**Filt Pb**	**Filt Zn**	**Filt Ni**	**Al**	**Filt Al**	**Filt As**	**Filt Se**	**Filt Sr**	**Filt Ba**	**Filt Li**	**TOC**	**TSS**	**Tot N**	**Tot P**
TT Up	140	40	3.2	0.9	7.3	83	0.1	8	6	0.38	0.06	1.1	1.1	0.001		0.029	0.01		0.01	0.01					1	2	0.1	
TT	1120	410	20	27	14	80	0.59	8	1040	0.26	0.01	0.02	0.01	0.002		0.049	0.06		0.04	0.06					4	30	3	
TT Down	870	350	19	20	12	85	0.41	7	790	0.22	0.03	0.23	0.07	0.001		0.044	0.05		0.05	0.04					4	17	2.1	
Rckfd Rd	970	370	14	23	14	91	0.42	9	880	0.09	0.01	0.02	0.02	0.001		0.055	0.06		0.02	0.04					3	5	1.2	
Mer PL	920	350	13	22	14	89	0.41	11	840	0.17	0.01	0.02	0.01	0.001		0.047	0.06		0.01	0.03					3	2	1.1	
Turk Ck																												
Pool N	890	320	12	20	13	88	0.35	10	790	0.25	0.04	0.02	0.01	0.001		0.037	0.05		0.01	0.03					3	2	0.7	
Pool K	890	330	12	21	13	87	0.39	8	790	0.18	0.02	0.01	0.01	0.001		0.033	0.05		0.01	0.03					3	2	1	
Pool J	920	345	12	20	13	91	0.36	10	800	0.19	0.02	0.01	0.01	0.001		0.032	0.05		0.01	0.03					3	2	0.5	
Pool H	1000	380	12	21	13	92	0.37	10	840	0.18	0.03	0.01	0.01	0.001		0.033	0.05		0.01	0.03					3	2	0.5	
Pool F	900	340	11	21	13	90	0.35	11	790	0.16	0.02	0.01	0.01	0.001		0.032	0.06		0.01	0.03					3	2	0.8	

												1.9		0.0014	0.0034	0.008	0.011		0.055	0.024 (III) / 0.013(V)	0.011						0.25	0.02
4/01/2007	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Fe**	**Fe Filt**	**Mn**	**Filt Mn**	**Filt Cu**	**Filt Pb**	**Filt Zn**	**Filt Ni**	**Al**	**Filt Al**	**Filt As**	**Filt Se**	**Filt Sr**	**Filt Ba**	**Filt Li**	**TOC**	**TSS**	**Tot N**	**Tot P**
TT Up	125	31	1.1	3.1	6.1	66	0.1	8	4	0.68	0.05	0.46	0.38	0.001		0.004	0.001		0.01	0.01					3	2	0.1	0.02
TT	1070	375	26	14	16	81	0.4	8	1020	0.15	0.01	0.02	0.02	0.001		0.029	0.06		0.09	0.1					3	10	2.8	0.02
TT Down	780	275	16	18	14	76	0.24	7	700	0.23	0.01	0.05	0.01	0.001		0.017	0.04		0.04	0.06					2	13	2.2	0.01
Rckfd Rd	920	330	21	15	15	78	0.33	6	850	0.10	0.01	0.01	0.01	0.001		0.04	0.06		0.02	0.1					3	2	1.4	0.01
Mer PL	910	325	21	14	16	81	0.33	7	830	0.13	0.01	0.01	0.01	0.001		0.034	0.05		0.01	0.09					3	2	1.1	0.01
Turk Ck																												
Pool N	840	310	22	13	15	84	0.36	7	750	0.18	0.01	0.01	0.01	0.001		0.02	0.05		0.01	0.07					2	2	1.1	0.01
Pool K	880	320	20	13	15	84	0.35	8	780	0.14	0.01	0.01	0.01	0.001		0.009	0.05		0.01	0.07					2	2	1.4	0.01
Pool J	870	310	21	13	15	83	0.35	8	780	0.05	0.01	0.01	0.01	0.002		0.023	0.06		0.01	0.08					3	2	1.1	0.02
Pool H	870	310	23	13	15	81	0.35	8	750	0.11	0.01	0.01	0.01	0.001		0.018	0.05		0.01	0.07					3	2	1.4	0.02
Pool F	850	300	21	13	15	84	0.35	7	755	0.12	0.01	0.01	0.01	0.001		0.017	0.05		0.01	0.07					3	2	0.8	0.01
9/02/2007	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Fe**	**Fe Filt**	**Mn**	**Filt Mn**	**Filt Cu**	**Filt Pb**	**Filt Zn**	**Filt Ni**	**Al**	**Filt Al**	**Filt As**	**Filt Se**	**Filt Sr**	**Filt Ba**	**Filt Li**	**TOC**	**TSS**	**Tot N**	**Tot P**
TT Up	140	39	3.3	1.3	8.5	88	0.1	2	4	0.53	0.01	0.83	0.6	0.002		0.009	0.01		0.01	0.01					1	2	0.1	0.05
TT	1020	395	8	26	14	82	0.54	5	1010	0.04	0.01	0.06	0.06	0.001		0.022	0.07		0.09	0.06					1	3	2.4	0.04
TT Down	1030	380	14	27	16	78	0.51	5	1010	0.44	0.01	0.18	0.03	0.001		0.029	0.08		0.09	0.07					2	37	3	0.05
Rckfd Rd	920	360	14	25	16	79	0.48	5	840	0.87	0.01	0.02	0.01	0.002		0.019	0.08		0.04	0.08					1	3	1.7	0.07
Mer PL	910	355	13	25	16	80	0.44	4	810	1.10	0.01	0.02	0.01	0.001		0.013	0.08		0.02	0.07					2	2	1.2	0.06
Turk Ck																												
Pool N											0.01	0.01	0.01	0.001														
Pool K	890	340	12	24	16	81	0.39	4	760	0.22	0.01	0.01	0.01	0.001		0.007	0.08		0.01	0.06					2	2	1	0.05
Pool J	880	340	12	22	16	81	0.41	4	770	0.17	0.01	0.01	0.01	0.001		0.006	0.08		0.01	0.06					1	1	1	0.06
Pool H	830	330	11	23	16	80	0.4	5	730	2.80	0.01	0.01	0.01	0.001		0.002	0.07		0.01	0.03					4	8	1	0.05
Pool F	890	350	11	22	16	81	0.4	4	800	0.14	0.01	0.01	0.01	0.001		0.006	0.08		0.01	0.06					1	1	0.7	0.06
15/03/2007	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Fe**	**Fe Filt**	**Mn**	**Filt Mn**	**Filt Cu**	**Filt Pb**	**Filt Zn**	**Filt Ni**	**Al**	**Filt Al**	**Filt As**	**Filt Se**	**Filt Sr**	**Filt Ba**	**Filt Li**	**TOC**	**TSS**	**Tot N**	**Tot P**
TT Up	115	29	2.2	2.2	4.6	55	0.1	6	13	1.50	0.84	0.08	0.08	0.001		0.002	0.01		0.02	0.01					6	2	0.5	0.01
TT	1000	385	8.4	26	15	70	0.38	9	1080	0.09	0.01	0.01	0.01	0.001		0.046	0.09		0.07	0.07					3	2	2.5	0.01
TT Down	610	220	10	14	1	62	0.24	8	580	0.46	0.07	0.01	0.01	0.001		0.017	0.05		0.03	0.03					4	5	1.7	0.01
Rckfd Rd	450	155	11	9.4	8.9	56	0.19	8	400	0.65	0.37	0.01	0.01	0.001		0.013	0.03		0.11	0.02					5	4	1.4	0.01
Mer PL	435	140	10	9.1	8.3	54	0.18	8	370	0.67	0.42	0.01	0.01	0.001		0.08	0.03		0.15	0.02					6	3	1	0.01
Turk Ck																												
Pool N	410	135	9.8	8.7	8	54	0.17	9	340	0.85	0.38	0.01	0.01	0.001		0.005	0.03		0.1	0.01					6	4	1	0.01
Pool K	400	135	9.8	9.2	8.1	55	0.17	9	340	0.72	0.46	0.01	0.01	0.001		0.001	0.03		0.14	0.02					6	3	1	0.01
Pool J	395	135	9.6	8.8	8	55	0.17	8	340	0.69	0.43	0.01	0.01	0.001		0.004	0.03		0.14	0.02					6	2	0.8	0.01
Pool H	400	130	10	8.8	8.2	55	0.18	8	340	0.69	0.41	0.01	0.01	0.001		0.004	0.03		0.07	0.01					6	3	0.7	0.02
Pool F	410	135	9.8	8.7	8.2	55	0.18	7	350	0.68	0.44	0.01	0.01	0.001		0.004	0.03		0.11	0.01					5	2	0.7	0.01
19/04/2007	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Fe**	**Fe Filt**	**Mn**	**Filt Mn**	**Filt Cu**	**Filt Pb**	**Filt Zn**	**Filt Ni**	**Al**	**Filt Al**	**Filt As**	**Filt Se**	**Filt Sr**	**Filt Ba**	**Filt Li**	**TOC**	**TSS**	**Tot N**	**Tot P**
TT Up	115	30	2.1	1.8	5.7	60	0.1	5	6	0.20	0.07	0.07	0.05	0.001		0.005	0.001		0.01	0.01					3	2	0.4	0.01
TT	1180	460	10	28	15	73	0.34	8	1190	0.05	0.01	0.01	0.01	0.001		0.045	0.06		0.03	0.05					2	2	2.7	0.02
TT Down	650	230	12	14	11	67	0.23	6	620	0.14	0.06	0.02	0.01	0.001		0.014	0.03		0.01	0.03					2	3	1.5	0.01
Rckfd Rd	780	300	13	18	12	70	0.31	8	730	0.09	0.03	0.01	0.01	0.001		0.013	0.04		0.01	0.03					2	2	1.6	0.01
Mer PL	790	295	13	18	12	71	0.31	8	750	0.09	0.05	0.01	0.01	0.001		0.01	0.04		0.01	0.02					2	2	1.2	0.01
Turk Ck																												
Pool N	765	295	12	17	12	72	0.31	7	680	0.14	0.02	0.01	0.01	0.001		0.007	0.04		0.01	0.02					2	2	1.1	0.01
Pool K	780	290	13	17	12	70	0.32	9	680	0.10	0.03	0.01	0.01	0.001		0.007	0.04		0.01	0.02					2	2	1.2	0.01
Pool J	765	285	11	17	11	71	0.31	8	680	0.11	0.03	0.01	0.01	0.001		0.007	0.04		0.01	0.02					2	2	1.3	0.01
Pool H	760	280	13	16	12	71	0.31	8	690	0.11	0.04	0.01	0.01	0.001		0.006	0.04		0.01	0.02					2	2	1.4	0.01
Pool F	775	285	12	17	12	74	0.3	8	680	0.10	0.02	0.01	0.01	0.001		0.006	0.04		0.01	0.02					2	2	1.2	0.01

	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC	TSS	Tot N	Tot P
												1.9		0.0014	0.0034	0.008	0.011		0.055	0.024 (III) / 0.013(V)	0.011						0.25	0.02
14/05/2007	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Fe**	**Fe Filt**	**Mn**	**Filt Mn**	**Filt Cu**	**Filt Pb**	**Filt Zn**	**Filt Ni**	**Al**	**Filt Al**	**Filt As**	**Filt Se**	**Filt Sr**	**Filt Ba**	**Filt Li**	**TOC**	**TSS**	**Tot N**	**Tot P**
TT Up	120	30	2.5	2.5	5.5	60	0.1	6	5	0.05	0.02	0.03	0.01	0.001		0.001	0.01		0.04	0.01					3	2	0.5	0.01
TT	1160	435	25	33	18	72	0.48	26	1030	0.02	0.01	0.03	0.01	0.001		0.055	0.12		0.02	0.1					3	2	3.1	0.01
TT Down	730	265	17	20	13	65	0.32	15	590	0.10	0.04	0.06	0.01	0.001		0.039	0.08		0.01	0.06					4	18	2.3	0.03
Rckfd Rd	810	285	18	22	13	66	0.32	17	770	0.14	0.05	0.01	0.01	0.001		0.037	0.08		0.05	0.05					3	4	2.1	0.01
Mer PL	800	280	18	21	13	67	0.3	17	790	0.07	0.02	0.01	0.01	0.002		0.032	0.08		0.02	0.05					3	2	1.7	0.01
Turk Ck																												
Pool N	775	270	18	21	13	65	0.31	15	710	0.12	0.04	0.01	0.01	0.002		0.024	0.08		0.02	0.04					3	3	1.4	0.01
Pool K	765	260	18	21	13	65	0.31	16	720	0.03	0.01	0.01	0.01	0.001		0.025	0.08		0.01	0.04					3	2	1.2	0.01
Pool J	770	260	18	21	13	65	0.32	17	730	0.04	0.01	0.01	0.01	0.001		0.024	0.08		0.01	0.04					3	2	1.4	0.01
Pool H	670	225	18	20	13	65	0.3	15	600	0.05	0.02	0.01	0.01	0.001		0.022	0.08		0.02	0.03					3	2	1.2	0.01
Pool F	770	270	18	21	13	65	0.31	19	710	0.20	0.05	0.01	0.01	0.001		0.021	0.08		0.02	0.03					3	3	0.9	0.01
21/06/2007	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Fe**	**Fe Filt**	**Mn**	**Filt Mn**	**Filt Cu**	**Filt Pb**	**Filt Zn**	**Filt Ni**	**Al**	**Filt Al**	**Filt As**	**Filt Se**	**Filt Sr**	**Filt Ba**	**Filt Li**	**TOC**	**TSS**	**Tot N**	**Tot P**
TT Up	65	15	1.3	1.6	3.3	33	0.11	2	6	0.47	0.18	0.04	0.01	0.001		0.002	0.01		0.01	0.01		0.01	0.01	0.01	7	6	1.1	0.01
TT																												
TT Down	60	19	1.4	1.8	3.3	33	0.11	2	14	0.56	0.29	0.04	0.01	0.001		0.002	0.01		0.01	0.01		0.01	0.02	0.01	7	3	1	0.01
Rckfd Rd	120	33	2.8	2.5	4	34	0.1	5	55	0.50	0.32	0.03	0.01	0.001		0.003	0.01		0.01	0.01		0.02	0.01	0.04	7	5	1.4	0.01
Mer PL	115	32	2.9	2.6	3.9	34	0.1	6	53	0.51	0.3	0.02	0.01	0.001		0.003	0.01		0.01	0.01		0.02	0.13	0.03	8	7	1.3	0.01
Turk Ck																												
Pool N																												
Pool K										NO	ACCESS		DUE	TO	FLOOD													
Pool J																												
Pool H																												
Pool F																												
31/07/2007	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Fe**	**Fe Filt**	**Mn**	**Filt Mn**	**Filt Cu**	**Filt Pb**	**Filt Zn**	**Filt Ni**	**Al**	**Filt Al**	**Filt As**	**Filt Se**	**Filt Sr**	**Filt Ba**	**Filt Li**	**TOC**	**TSS**	**Tot N**	**Tot P**
TT Up	10	31	2.6	2	5.4	57	0.01	7	9	1.00	0.3	0.15	0.1	0.001		0.003	0.01		0.03	0.01		0.01	0.02	0.001	3	2	0.4	0.01
TT	1100	420	22	2.4	16	68	0.33	11	1130	0.10	0.02	0.01	0.01	0.002		0.052	0.05		0.04	0.04		0.33	2.2	0.83	4	2	2.2	0.01
TT Down	460	160	9.2	8.1	9.3	63	0.18	8	400	0.62	0.07	0.05	0.01	0.001		0.009	0.02		0.01	0.01		0.11	0.76	0.42	4	2	1.4	0.01
Rckfd Rd	710	245	13	15	12	63	0.29	10	670	0.13	0.01	0.01	0.01	0.002		0.012	0.04		0.01	0.02		0.18	1.2	0.72	3	2	1.6	0.01
Mer PL	690	240	14	15	11	66	0.3	11	630	0.19	0.01	0.01	0.01	0.001		0.01	0.04		0.01	0.02		0.17	1.1	0.8	3	2	1.4	0.01
Turk Ck	300	77	8.6	12	10	160	0.15	3	32	0.10	0.01	0.01	0.01	0.002		0.001	0.01		0.03	0.01		0.05	0.15	0.01	9	2	0.6	0.09
Pool N	655	230	13	14	11	63	0.28	11	620	0.22	0.01	0.01	0.01	0.001		0.004	0.03		0.01	0.01		0.15	1.1	0.74	3	2	1.8	0.01
Pool K	650	235	13	14	11	64	0.28	10	600	0.19	0.01	0.01	0.01	0.001		0.002	0.04		0.01	0.01		0.16	1	0.75	3	19	1.4	0.01
Pool J	640	225	13	14	11	63	0.29	10	600	0.17	0.01	0.01	0.01	0.001		0.003	0.04		0.01	0.01		0.15	1	0.71	3	2	1.3	0.01
Pool H	630	220	13	14	11	62	0.28	9	580	0.19	0.01	0.01	0.01	0.001		0.003	0.04		0.01	0.01		0.13	1	0.72	3	2	1.4	0.01
Pool F	645	225	13	14	11	64	0.27	10	590	0.18	0.01	0.01	0.01	0.001		0.005	0.03		0.01	0.01		0.16	1.1	0.69	4	2	1.4	0.01
27/08/2007	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Fe**	**Fe Filt**	**Mn**	**Filt Mn**	**Filt Cu**	**Filt Pb**	**Filt Zn**	**Filt Ni**	**Al**	**Filt Al**	**Filt As**	**Filt Se**	**Filt Sr**	**Filt Ba**	**Filt Li**	**TOC**	**TSS**	**Tot N**	**Tot P**
TT Up	110	30	2.7	1.6	5.7	54	0.1	7	15	0.77	0.39	0.07	0.06	0.001		0.002	0.01		0.05	0.01		0.01	0.01	0.001	4	2	0.1	0.01
TT	1150	425	18	24	16	65	0.28	16	1170	0.15	0.03	0.02	0.02	0.004		0.066	0.05		0.07	0.05		0.31	2.4	1.2	3	2	2.7	0.01
TT Down	465	160	9	9	9.6	61	0.13	9	390	0.51	0.04	0.04	0.02	0.001		0.011	0.02		0.06	0.01		0.12	0.98	0.39	5	3	1.5	0.01
Rckfd Rd	460	155	10	9.1	9.3	60	0.15	10	400	0.44	0.01	0.02	0.01	0.003		0.019	0.02		0.11	0.01		0.14	1	0.38	4	2	0.7	0.03
Mer PL	425	150	10	8.9	9.2	60	0.14	10	370	0.52	0.04	0.01	0.01	0.001		0.009	0.02		0.12	0.01		0.12	0.91	0.35	4	2	0.6	0.02
Turk Ck	350	93	10	13	12	190	0.1	7	22	0.30	0.01	0.01	0.01	0.002		0.001	0.01		0.08	0.01		0.05	0.26	0.001	7	3	0.8	0.14
Pool N	430	145	10	9.2	9.5	58	0.14	9	360	0.53	0.07	0.03	0.01	0.002		0.008	0.02		0.16	0.01		0.12	0.91	0.33	4	7	0.8	0.03
Pool K	430	145	10	9	9.3	57	0.14	10	360	0.50	0.08	0.01	0.01	0.001		0.004	0.02		0.12	0.01		0.12	0.95	0.32	5	2	0.7	0.02
Pool J	435	150	10	9	9.4	56	0.15	9	370	0.45	0.04	0.01	0.01	0.001		0.005	0.02		0.13	0.01		0.12	0.97	0.33	5	2	0.7	0.01
Pool H	425	140	11	9.9	9.6	59	0.14	10	350	0.44	0.01	0.01	0.01	0.001		0.007	0.02		0.1	0.01		0.11	0.87	0.33	3	4	0.7	0.03
Pool F	430	150	11	9.6	9.5	61	0.14	10	370	0.44	0.01	0.01	0.01	0.001		0.007	0.02		0.11	0.01		0.13	0.96	0.33	4	3	0.8	0.02

												1.9		0.0014	0.0034	0.008	0.011		0.055	0.024 (III) / 0.013(V)	0.011						0.25	0.02
19/10/2007	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	DOC	TSS	Tot N	Tot P
TT Up	125	36	2.9	2.4	5.5	71	0.1	7	1	0.22	0.02	0.01	0.01	0.001		0.004	0.01		0.001	0.01		0.01	0.03	0.002	3	2	0.5	0.01
TT	1210	455	11	28	16	76	0.42	8	1160	0.07	0.01	0.01	.01.01	0.002		0.09	0.05		0.09	0.07		0.27	2.1	1.3	3	5	2	0.01
TT Down	610	215	10	14	11	71	0.26	10	520	0.08	0.01	0.01	0.01	0.002		0.016	0.02		0.04	0.02		0.15	1.3	0.56	4		1.4	0.01
Rckfd Rd	740	275	12	17	12	70	0.26	10	670	0.11	0.01	0.01	0.01	0.002		0.025	0.03		0.04	0.02		0.14	1.4	0.72	4	2	1.6	0.01
Mer PL	730	265	11	16	13	68	0.27	12	630	0.14	0.01	0.01	0.01	0.001		0.018	0.03		0.03	0.02		0.15	1.2	0.7	3	2	1	0.01
Turk Ck	320	80	9.6	15	12	175	0.15	2	21	0.23	0.01	0.01	0.01	0.001		0.001	0.01		0.04	0.01		0.05	0.24	0.001	9	2	1.2	0.15
Pool N	725	260	12	16	12	74	0.27	9	690	0.50	0.01	0.06	0.01	0.001		0.01	0.03		0.02	0.01		0.13	1.1	0.65	3	2	1.3	0.13
Pool K	705	250	12	16	12	69	0.28	10	630	0.11	0.01	0.01	0.01	0.001		0.006	0.04		0.02	0.01		0.14	1.2	0.67	4	110	1.2	0.01
Pool J	690	245	12	15	12	69	0.28	5	620	0.10	0.01	0.01	0.01	0.001		0.007	0.03		0.03	0.01		0.16	1.2	0.66	4	2	1.2	0.01
Pool H	695	250	12	15	11	69	0.28	9	620	0.14	0.01	0.01	0.01	0.001		0.005	0.03		0.02	0.01		0.13	1	0.65	3	2	2.3	0.02
Pool F	700	245	12	16	12	71	0.28	8	650	0.12	0.01	0.01	0.01	0.001		0.006	0.03		0.03	0.01		0.14	1	0.66	4	2	1.6	0.02

	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC	TSS	Tot N	Tot P
TT	930	325	18	23	13	93	0.43	7	880	0.11	0.01	0.01	0.01	0.003	0.001	0.027	0.07	0.2	0.1	0.04	0.01				2		1.8	0.01
TT	1040	395	18	30	15	85	0.36	8	1000	0.06	0.01	0.02	0.02	0.001	0.001	0.014	0.06	0.1	0.1	0.05	0.01				2		4.1	0.01
TT	1140	420	25	28	15	74	0.46	9	1200	0.20	0.01	0.05	0.05	0.001	0.001	0.029	0.08	0.1	0.1	0.06	0.01				2	18	2.8	0.02
TT	1230	440	13	31	17	73	0.27	13	1230	0.19	0.01	0.01	0.01	0.001	0.001	0.031	0.09	0.1	0.1	0.05	0.01				2	5	4	0.06
TT	1210	440	12	28	17	81	0.35	11	1210	0.15	0.01	0.01	0.01	0.001	0.001	0.02	0.09	0.1	0.1	0.06	0.01				1	2	0.6	0.01
TT	1250	450	14	30	20	86	0.31	12	1250	0.28	0.02	0.01	0.01	0.002	0.001	0.053	0.06	0.1	0.1	0.01	0.01				3	5	3	0.01
TT	1120	410	20	27	14	80	0.59	8	1040	0.26	0.01	0.02	0.01	0.002		0.049	0.06		0.04	0.06					4	30	3	
TT	1070	375	26	14	16	81	0.4	8	1020	0.15	0.01	0.02	0.02	0.001		0.029	0.06		0.09	0.1					3	10	2.8	0.02
TT	1020	395	8	26	14	82	0.54	5	1010	0.04	0.01	0.06	0.06	0.001		0.022	0.07		0.09	0.06					1	3	2.4	0.04
TT	1000	385	8.4	26	15	70	0.38	9	1080	0.09	0.01	0.01	0.01	0.001		0.046	0.09		0.07	0.07					3	2	2.5	0.01
TT	1180	460	10	28	15	73	0.34	8	1190	0.05	0.01	0.01	0.01	0.001		0.045	0.06		0.03	0.05					2	2	2.7	0.02
TT	1160	435	25	33	18	72	0.48	26	1030	0.02	0.01	0.03	0.01	0.001		0.055	0.12		0.02	0.1					3	2	3.1	0.01
TT																												
TT	1100	420	22	2.4	16	68	0.33	11	1130	0.10	0.02	0.01	0.01	0.002		0.052	0.05		0.04	0.04		0.33	2.2	0.83	4	2	2.2	0.01
TT	1150	425	18	24	16	65	0.28	16	1170	0.15	0.03	0.02	0.02	0.004		0.066	0.05		0.07	0.05		0.31	2.4	1.2	3	2	2.7	0.01
TT	1210	455	11	28	16	76	0.42	8	1160	0.07	0.01	0.01	.01.01	0.002		0.09	0.05		0.09	0.07		0.27	2.1	1.3	3	5	2	0.01
Std Dv	93.16	35.93	6.17	7.69	1.74	7.59	0.09	5.05	106.95	0.08	0.01	0.02	0.02	0.00	0.00	0.02	0.02	0.04	0.03	0.02	0.00	0.03	0.15	0.25	0.92	8.35	0.85	0.01
Max	1250	460	26	33	20	93	0.59	26	1250	0.28	0.03	0.06	0.06	0.004	0.001	0.09	0.12	0.2	0.1	0.1	0.01	0.33	2.4	1.3	4	30	4.1	0.06
Min	930	325	8	2.4	13	65	0.27	5	880	0.02	0.01	0.01	0.01	0.001	0.001	0.014	0.05	0.1	0.02	0.01	0.01	0.27	2.1	0.83	1	2	0.6	0.01
Median	1140	420	18	28	16	76	0.38	9	1130	0.11	0.01	0.01	0.01	0.001	0.001	0.045	0.06	0.1	0.09	0.06	0.01	0.31	2.2	1.2	3	3	2.7	0.01

	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC	TSS	Tot N	Tot P
TT Up	115	31	1.9	1.4	4.1	60	0.001	6	4	0.29	0.04	0.08	0.05	0.001	0.001	0.012	0.01	0.1	0.1	0.01	0.01				3		0.01	0.01
TT Up	120	34	1.9	2.1	5.4	69	0.01	7	5	0.11	0.02	0.26	0.16	0.001	0.001	0.009	0.01	0.1	0.1	0.01	0.01				2		0.1	0.01
TT Up	110	28	2.7	2.1	5.3	60	0.1	5	7	0.29	0.06	0.4	0.3	0.001	0.001	0.012	0.01	0.1	0.1	0.01	0.01				1	3	0.1	0.02
TT Up	135	40	2.2	1.3	6	68	0.1	7	10	0.36	0.01	0.32	0.25	0.001	0.001	0.011	0.01	0.1	0.1	0.01	0.01				0.1	2	3.1	0.04
TT Up	75	15	2.9	1	5.9	38	0.1	6	4	0.35	0.01	0.72	0.66	0.001	0.001	0.026	0.01	0.1	0.1	0.01	0.01				1	2	0.3	0.01
TT Up	125	33	3	1.2	6.5	76	0.1	4	1	0.39	0.03	1.2	1.2	0.002	0.001	0.035	0.01	0.1	0.1	0.01	0.01				4	2	0.1	0.01
TT Up	140	40	3.2	0.9	7.3	83	0.1	8	6	0.38	0.06	1.1	1.1	0.001		0.029	0.01		0.01	0.01					1	2	0.1	
TT Up	125	31	1.1	3.1	6.1	66	0.1	8	4	0.68	0.05	0.46	0.38	0.001		0.004	0.001		0.01	0.01					3	2	0.1	0.02
TT Up	140	39	3.3	1.3	8.5	88	0.1	2	4	0.53	0.01	0.83	0.6	0.002		0.009	0.01		0.01	0.01					1	2	0.1	0.05
TT Up	115	29	2.2	2.2	4.6	55	0.1	6	13	1.50	0.84	0.08	0.08	0.001		0.002	0.01		0.02	0.01					6	2	0.5	0.01
TT Up	115	30	2.1	1.8	5.7	60	0.1	5	6	0.20	0.07	0.07	0.05	0.001		0.005	0.001		0.01	0.01					3	2	0.4	0.01
TT Up	120	30	2.5	2.5	5.5	60	0.1	6	5	0.05	0.02	0.03	0.01	0.001		0.001	0.01		0.04	0.01					3	2	0.5	0.01
TT Up	65	15	1.3	1.6	3.3	33	0.11	2	6	0.47	0.18	0.04	0.01	0.001		0.002	0.01		0.01	0.01		0.01	0.01	0.01	7	6	1.1	0.01
TT Up	10	31	2.6	2	5.4	57	0.01	7	9	1.00	0.3	0.15	0.1	0.001		0.003	0.01		0.03	0.01		0.01	0.02	0.001	3	2	0.4	0.01
TT Up	110	30	2.7	1.6	5.7	54	0.1	7	15	0.77	0.39	0.07	0.06	0.001		0.002	0.01		0.05	0.01		0.01	0.01	0.001	4	2	0.1	0.01
TT Up	125	36	2.9	2.4	5.5	71	0.1	7	1	0.22	0.02	0.01	0.01	0.001		0.004	0.01		0.001	0.01		0.01	0.03	0.002	3	2	0.5	0.01
Std Dv	33.28	7.26	0.64	0.60	1.19	14.29	0.04	1.83	3.86	0.37	0.22	0.39	0.38	0.00	0.00	0.01	0.00	0.00	0.04	0.00	0.00	0.00	0.01	0.00	1.86	1.08	0.75	0.01
Max	140	40	3.3	3.1	8.5	88	0.11	8	15	1.5	0.84	1.2	1.2	0.002	0.001	0.035	0.01	0.1	0.1	0.01	0.01	0.01	0.03	0.01	7	6	3.1	0.05
Min	10	15	1.1	0.9	3.3	33	0.001	2	1	0.05	0.01	0.01	0.01	0.001	0.001	0.001	0.001	0.1	0.001	0.01	0.01	0.01	0.01	0.001	0.1	2	0.01	0.01
Median	117.5	31	2.55	1.7	5.6	60	0.1	6	5.5	0.37	0.045	0.205	0.13	0.001	0.001	0.007	0.01	0.1	0.035	0.01	0.01	0.01	0.015	0.0015	3	2	0.2	0.01

	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC	TSS	Tot N	Tot P
TT Down	740	255	16	17	11	86	0.01	6	680	0.09	0.01	0.01	0.01	0.001	0.001	0.016	0.06	0.1	0.1	0.02	0.01				3		1.7	0.01
TT Down	860	310	24	23	14	79	0.3	7	760	0.07	0.01	0.06	0.03	0.001	0.001	0.022	0.06	0.1	0.1	0.03	0.01				1		2.7	0.01
TT Down	960	335	26	23	14	69	0.92	10	970	0.22	0.01	0.09	0.07	0.001	0.001	0.029	0.07	0.1	0.1	0.04	0.01				2	19	2.6	0.04
TT Down	960	330	21	23	15	73	0.23	12	930	0.22	0.01	0.15	0.09	0.001	0.001	0.025	0.06	0.1	0.1	0.03	0.01				2	23	3.8	0.11
TT Down	1020	350	21	24	16	82	0.33	11	990	0.14	0.01	0.03	0.01	0.002	0.001	0.015	0.07	0.1	0.1	0.04	0.01				2	16	0.7	0.02
TT Down	1070	390	18	24	18	86	0.29	11	1090	0.23	0.02	0.06	0.05	0.001	0.001	0.047	0.05	0.1	0.1	0.03	0.01				3	2	2.2	0.01
TT Down	870	350	19	20	12	85	0.41	7	790	0.22	0.03	0.23	0.07	0.001		0.044	0.05		0.05	0.04					4	17	2.1	
TT Down	780	275	16	18	14	76	0.24	7	700	0.23	0.01	0.05	0.01	0.001		0.017	0.04		0.04	0.06					2	13	2.2	0.01
TT Down	1030	380	14	27	16	78	0.51	5	1010	0.44	0.01	0.18	0.03	0.001		0.029	0.08		0.09	0.07					2	37	3	0.05
TT Down	610	220	10	14	1	62	0.24	8	580	0.46	0.07	0.01	0.01	0.001		0.017	0.05		0.03	0.03					4	5	1.7	0.01
TT Down	650	230	12	14	11	67	0.23	6	620	0.14	0.06	0.02	0.01	0.001		0.014	0.03		0.01	0.03					2	3	1.5	0.01
TT Down	730	265	17	20	13	65	0.32	15	590	0.10	0.04	0.06	0.01	0.001		0.039	0.08		0.01	0.06					4	18	2.3	0.03
TT Down	60	19	1.4	1.8	3.3	33	0.11	2	14	0.56	0.29	0.04	0.01	0.001		0.002	0.01		0.01	0.01		0.01	0.02	0.01	7	3	1	0.01
TT Down	460	160	9.2	8.1	9.3	63	0.18	8	400	0.62	0.07	0.05	0.01	0.001		0.009	0.02		0.01	0.01		0.11	0.76	0.42	4	2	1.4	0.01
TT Down	465	160	9	9	9.6	61	0.13	9	390	0.51	0.04	0.04	0.02	0.001		0.011	0.02		0.06	0.01		0.12	0.98	0.39	5	3	1.5	0.01
TT Down	610	215	10	14	11	71	0.26	10	520	0.08	0.01	0.01	0.01	0.002		0.016	0.02		0.04	0.02		0.15	1.3	0.56	4		1.4	0.01
Std Dv	265.76	97.63	6.42	6.94	4.49	13.30	0.20	3.12	281.72	0.18	0.07	0.06	0.03	0.00	0.00	0.01	0.02	0.00	0.04	0.02	0.00	0.06	0.54	0.24	1.52	10.66	0.79	0.03
Max	1070	390	26	27	18	86	0.92	15	1090	0.62	0.29	0.23	0.09	0.002	0.001	0.047	0.08	0.1	0.1	0.07	0.01	0.15	1.3	0.56	7	37	3.8	0.11
Min	60	19	1.4	1.8	1	33	0.01	2	14	0.07	0.01	0.01	0.01	0.001	0.001	0.002	0.01	0.1	0.01	0.01	0.01	0.01	0.02	0.01	1	2	0.7	0.01
Median	760	270	16	19	12.5	72	0.25	8	690	0.22	0.015	0.05	0.01	0.001	0.001	0.017	0.05	0.1	0.055	0.03	0.01	0.115	0.87	0.405	3	13	1.9	0.01

	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC	TSS	Tot N	Tot P
Rckfd Rd	720	250	16	18	12	75	0.31	7	660	0.12	0.01	0.01	0.01	0.002	0.001	0.017	0.06	0.1	0.1	0.03	0.01				2		1.4	0.01
Rckfd Rd	890	290	21	21	13	80	0.33	8	710	0.10	0.01	0.01	0.01	0.001	0.001	0.013	0.06	0.1	0.1	0.03	0.01				1		1.9	0.01
Rckfd Rd	900	320	23	23	14	74	0.38	7	830	0.14	0.03	0.04	0.03	0.002	0.001	0.025	0.07	0.1	0.1	0.04	0.01				1	8	2	0.02
Rckfd Rd	1010	355	22	24	16	73	0.27	9	950	0.17	0.01	0.02	0.01	0.002	0.001	0.021	0.07	0.1	0.1	0.03	0.01				2	3	2.8	0.07
Rckfd Rd	900	310	19	22	14	76	0.39	21	840	0.11	0.01	0.01	0.01	0.001	0.001	0.019	0.07	0.1	0.1	0.04	0.01				1	2	0.1	0.01
Rckfd Rd	960	335	17	23	15	79	0.42	10	920	0.07	0.01	0.01	0.01	0.001	0.001	0.016	0.05	0.1	0.1	0.03	0.01				2	2	1.6	0.02
Rckfd Rd	970	370	14	23	14	91	0.42	9	880	0.09	0.01	0.02	0.02	0.001		0.055	0.06		0.02	0.04					3	5	1.2	
Rckfd Rd	920	330	21	15	15	78	0.33	6	850	0.10	0.01	0.01	0.01	0.001		0.04	0.06		0.02	0.1					3	2	1.4	0.01
Rckfd Rd	920	360	14	25	16	79	0.48	5	840	0.87	0.01	0.02	0.01	0.002		0.019	0.08		0.04	0.08					1	3	1.7	0.07
Rckfd Rd	450	155	11	9.4	8.9	56	0.19	8	400	0.65	0.37	0.01	0.01	0.001		0.013	0.03		0.11	0.02					5	4	1.4	0.01
Rckfd Rd	780	300	13	18	12	70	0.31	8	730	0.09	0.03	0.01	0.01	0.001		0.013	0.04		0.01	0.03					2	2	1.6	0.01
Rckfd Rd	810	285	18	22	13	66	0.32	17	770	0.14	0.05	0.01	0.01	0.001		0.037	0.08		0.05	0.05					3	4	2.1	0.01
Rckfd Rd	120	33	2.8	2.5	4	34	0.1	5	55	0.50	0.32	0.03	0.01	0.001		0.003	0.01		0.01	0.01		0.02	0.01	0.04	7	5	1.4	0.01
Rckfd Rd	710	245	13	15	12	63	0.29	10	670	0.13	0.01	0.01	0.01	0.002		0.012	0.04		0.01	0.02		0.18	1.2	0.72	3	2	1.6	0.01
Rckfd Rd	460	155	10	9.1	9.3	60	0.15	10	400	0.44	0.01	0.02	0.01	0.003		0.019	0.02		0.11	0.01		0.14	1	0.38	4	2	0.7	0.03
Rckfd Rd	740	275	12	17	12	70	0.26	10	670	0.11	0.01	0.01	0.01	0.002		0.025	0.03		0.04	0.02		0.14	1.4	0.72	4	2	1.6	0.01
Std Dv	238.94	90.30	5.30	6.39	3.06	12.93	0.10	4.18	234.83	0.24	0.11	0.01	0.01	0.00	0.00	0.01	0.02	0.00	0.04	0.02	0.00	0.07	0.62	0.33	1.65	1.77	0.59	0.02
Max	1010	370	23	25	16	91	0.48	21	950	0.87	0.37	0.04	0.03	0.003	0.001	0.055	0.08	0.1	0.11	0.1	0.01	0.18	1.4	0.72	7	8	2.8	0.07
Min	120	33	2.8	2.5	4	34	0.1	5	55	0.07	0.01	0.01	0.01	0.001	0.001	0.003	0.01	0.1	0.01	0.01	0.01	0.02	0.01	0.04	1	2	0.1	0.01
Median	850	295	15	19.5	13	73.5	0.315	8.5	750	0.125	0.01	0.01	0.01	0.001	0.001	0.019	0.06	0.1	0.075	0.03	0.01	0.14	1.1	0.55	2.5	2.5	1.6	0.01

	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC	TSS	Tot N	Tot P
Mer PL	710	240	15	17	12	79	0.28	7	610	0.12	0.01	0.01	0.01	0.003	0.001	0.014	0.06	0.1	0.1	0.02	0.01				2		1.3	0.01
Mer PL	810	290	19	20	13	91	0.34	7	690	0.16	0.01	0.01	0.01	0.002	0.001	0.014	0.06	0.1	0.1	0.03	0.01				1		1.6	0.01
Mer PL	875	320	220	22	14	75	0.4	6	850	0.19	0.01	0.02	0.02	0.002	0.001	0.019	0.06	0.1	0.1	0.03	0.01				1	2	1.9	0.03
Mer PL	950	340	20	24	15	72	0.26	9	870	0.29	0.01	0.03	0.03	0.001	0.001	0.017	0.07	0.1	0.1	0.03	0.01				1	3	2.6	0.08
Mer PL	910	325	18	20	14	73	0.38	20	890	0.18	0.01	0.01	0.01	0.001	0.001	0.016	0.06	0.1	0.1	0.03	0.01				1	3	0.1	0.01
Mer PL	910	330	14	23	14	79	0.42	8	890	0.14	0.01	0.01	0.01	0.001	0.001	0.01	0.05	0.1	0.1	0.03	0.01				2	2	1.2	0.01
Mer PL	920	350	13	22	14	89	0.41	11	840	0.17	0.01	0.02	0.01	0.001		0.047	0.06		0.01	0.03					3	2	1.1	
Mer PL	910	325	21	14	16	81	0.33	7	830	0.13	0.01	0.01	0.01	0.001		0.034	0.05		0.01	0.09					3	2	1.1	0.01
Mer PL	910	355	13	25	16	80	0.44	4	810	1.10	0.01	0.02	0.01	0.001		0.013	0.08		0.02	0.07					2	2	1.2	0.06
Mer PL	435	140	10	9.1	8.3	54	0.18	8	370	0.67	0.42	0.01	0.01	0.001		0.08	0.03		0.15	0.02					6	3	1	0.01
Mer PL	790	295	13	18	12	71	0.31	8	750	0.09	0.05	0.01	0.01	0.001		0.01	0.04		0.01	0.02					2	2	1.2	0.01
Mer PL	800	280	18	21	13	67	0.3	17	790	0.07	0.02	0.01	0.01	0.002		0.032	0.08		0.02	0.05					3	2	1.7	0.01
Mer PL	115	32	2.9	2.6	3.9	34	0.1	6	53	0.51	0.3	0.02	0.01	0.001		0.003	0.01		0.01	0.01		0.02	0.13	0.03	8	7	1.3	0.01
Mer PL	690	240	14	15	11	66	0.3	11	630	0.19	0.01	0.01	0.01	0.001		0.01	0.04		0.01	0.02		0.17	1.1	0.8	3	2	1.4	0.01
Mer PL	425	150	10	8.9	9.2	60	0.14	10	370	0.52	0.04	0.01	0.01	0.001		0.009	0.02		0.12	0.01		0.12	0.91	0.35	4	2	0.6	0.02
Mer PL	730	265	11	16	13	68	0.27	12	630	0.14	0.01	0.01	0.01	0.001		0.018	0.03		0.03	0.02		0.15	1.2	0.7	3	2	1	0.01
Std Dv	232.03	89.98	51.67	6.23	3.12	13.86	0.10	4.15	235.30	0.28	0.12	0.01	0.01	0.00	0.00	0.02	0.02	0.00	0.05	0.02	0.00	0.07	0.49	0.35	1.91	1.34	0.55	0.02
Max	950	355	220	25	16	91	0.44	20	890	1.1	0.42	0.03	0.03	0.003	0.001	0.08	0.08	0.1	0.15	0.09	0.01	0.17	1.2	0.8	8	7	2.6	0.08
Min	115	32	2.9	2.6	3.9	34	0.1	4	53	0.07	0.01	0.01	0.01	0.001	0.001	0.003	0.01	0.1	0.01	0.01	0.01	0.02	0.13	0.03	1	2	0.1	0.01
Median	805	292.5	14	19	13	72.5	0.305	8	770	0.175	0.01	0.01	0.01	0.001	0.001	0.015	0.055	0.1	0.065	0.03	0.01	0.135	1.005	0.525	2.5	2	1.2	0.01

	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC	TSS	Tot N	Tot P
Pool N	680	235	15	16	12	79	0.3	6	580	0.30	0.01	0.01	0.01	0.001	0.001	0.006	0.05	0.1	0.1	0.01	0.01				2		1.1	0.01
Pool N	810	295	17	19	13	86	0.33	8	690	0.26	0.01	0.01	0.01	0.001	0.001	0.01	0.05	0.1	0.1	0.01	0.01				0.1		1.8	0.01
Pool N	805	285	20	22	13	74	0.39	4	730	0.25	0.01	0.02	0.01	0.001	0.001	0.025	0.06	0.1	0.1	0.03	0.01				0.1	2	1.9	0.07
Pool N	960	345	19	23	15	76	0.27	9	890	0.34	0.01	0.02	0.01	0.001	0.001	0.015	0.06	0.1	0.1	0.02	0.01				2	5	2.4	0.05
Pool N	830	285	17	19	14	73	0.34	15	790	0.22	0.01	0.01	0.01	0.001	0.001	0.014	0.06	0.1	0.1	0.03	0.01				1	2	0.1	0.01
Pool N	920	340	13	21	14	81	0.41	9	830	0.39	0.01	0.01	0.01	0.001	0.001	0.008	0.06	0.1	0.1	0.02	0.01				2	2	1.1	0.01
Pool N	890	320	12	20	13	88	0.35	10	790	0.25	0.04	0.02	0.01	0.001		0.037	0.05		0.01	0.03					3	2	0.7	
Pool N	840	310	22	13	15	84	0.36	7	750	0.18	0.01	0.01	0.01	0.001		0.02	0.05		0.01	0.07					2	2	1.1	0.01
Pool N											0.01	0.01	0.01	0.001														
Pool N	410	135	9.8	8.7	8	54	0.17	9	340	0.85	0.38	0.01	0.01	0.001		0.005	0.03		0.1	0.01					6	4	1	0.01
Pool N	765	295	12	17	12	72	0.31	7	680	0.14	0.02	0.01	0.01	0.001		0.007	0.04		0.01	0.02					2	2	1.1	0.01
Pool N	775	270	18	21	13	65	0.31	15	710	0.12	0.04	0.01	0.01	0.002		0.024	0.08		0.02	0.04					3	3	1.4	0.01
Pool N																												
Pool N	655	230	13	14	11	63	0.28	11	620	0.22	0.01	0.01	0.01	0.001		0.004	0.03		0.01	0.01		0.15	1.1	0.74	3	2	1.8	0.01
Pool N	430	145	10	9.2	9.5	58	0.14	9	360	0.53	0.07	0.03	0.01	0.002		0.008	0.02		0.16	0.01		0.12	0.91	0.33	4	7	0.8	0.03
Pool N	725	260	12	16	12	74	0.27	9	690	0.50	0.01	0.06	0.01	0.001		0.01	0.03		0.02	0.01		0.13	1.1	0.65	3	2	1.3	0.13
Std Dv	163.41	63.87	3.86	4.53	1.97	10.29	0.08	3.03	159.46	0.19	0.09	0.01	0.00	0.00	0.00	0.01	0.02	0.00	0.05	0.02	0.00	0.02	0.11	0.22	1.53	1.62	0.58	0.04
Max	960	345	22	23	15	88	0.41	15	890	0.85	0.38	0.06	0.01	0.002	0.001	0.037	0.08	0.1	0.16	0.07	0.01	0.15	1.1	0.74	6	7	2.4	0.13
Min	410	135	9.8	8.7	8	54	0.14	4	340	0.12	0.01	0.01	0.01	0.001	0.001	0.004	0.02	0.1	0.01	0.01	0.01	0.12	0.91	0.33	0.1	2	0.1	0.01
Median	790	285	14	18	13	74	0.31	9	700	0.255	0.01	0.01	0.01	0.001	0.001	0.01	0.05	0.1	0.1	0.02	0.01	0.13	1.1	0.65	2	2	1.1	0.01

	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC	TSS	Tot N	Tot P
Pool K	680	240	14	17	12	79	0.3	6	600	0.40	0.01	0.04	0.01	0.001	0.001	0.009	0.05	0.1	0.1	0.01	0.01				2		1.1	0.01
Pool K	770	275	17	19	13	79	0.32	7	650	0.26	0.01	0.01	0.01	0.001	0.001	0.007	0.05	0.1	0.1	0.02	0.01				2		1.7	0.01
Pool K	850	305	19	22	14	73	0.42	5	780	1.10	0.01	0.02	0.01	0.001	0.001	0.018	0.07	0.1	0.1	0.03	0.01				2	37	2.8	0.05
Pool K	945	345	19	23	15	73	0.26	11	900	0.28	0.01	0.02	0.01	0.001	0.001	0.012	0.06	0.1	0.1	0.02	0.01				2	3	2.7	0.09
Pool K	830	290	18	19	14	73	0.34	15	770	0.23	0.01	0.01	0.01	0.001	0.001	0.01	0.06	0.1	0.1	0.03	0.01				1	3	0.1	0.01
Pool K	900	330	13	22	15	82	0.4	7	790	0.21	0.01	0.01	0.01	0.001	0.001	0.007	0.05	0.1	0.1	0.02	0.01				1	2	1	0.02
Pool K	890	330	12	21	13	87	0.39	8	790	0.18	0.02	0.01	0.01	0.001		0.033	0.05		0.01	0.03					3	2	1	
Pool K	880	320	20	13	15	84	0.35	8	780	0.14	0.01	0.01	0.01	0.001		0.009	0.05		0.01	0.07					2	2	1.4	0.01
Pool K	890	340	12	24	16	81	0.39	4	760	0.22	0.01	0.01	0.01	0.001		0.007	0.08		0.01	0.06					2	2	1	0.05
Pool K	400	135	9.8	9.2	8.1	55	0.17	9	340	0.72	0.46	0.01	0.01	0.001		0.001	0.03		0.14	0.02					6	3	1	0.01
Pool K	780	290	13	17	12	70	0.32	9	680	0.10	0.03	0.01	0.01	0.001		0.007	0.04		0.01	0.02					2	2	1.2	0.01
Pool K	765	260	18	21	13	65	0.31	16	720	0.03	0.01	0.01	0.01	0.001		0.025	0.08		0.01	0.04					3	2	1.2	0.01
Pool K																												
Pool K	650	235	13	14	11	64	0.28	10	600	0.19	0.01	0.01	0.01	0.001		0.002	0.04		0.01	0.01		0.16	1	0.75	3	19	1.4	0.01
Pool K	430	145	10	9	9.3	57	0.14	10	360	0.50	0.08	0.01	0.01	0.001		0.004	0.02		0.12	0.01		0.12	0.95	0.32	5	2	0.7	0.02
Pool K	705	250	12	16	12	69	0.28	10	630	0.11	0.01	0.01	0.01	0.001		0.006	0.04		0.02	0.01		0.14	1.2	0.67	4	110	1.2	0.01
Std Dv	163.77	64.72	3.48	4.76	2.19	9.57	0.08	3.30	156.46	0.28	0.12	0.01	0.00	0.00	0.00	0.01	0.02	0.00	0.05	0.02	0.00	0.02	0.13	0.23	1.40	30.46	0.69	0.02
Max	945	345	20	24	16	87	0.42	16	900	1.1	0.46	0.04	0.01	0.001	0.001	0.033	0.08	0.1	0.14	0.07	0.01	0.16	1.2	0.75	6	110	2.8	0.09
Min	400	135	9.8	9	8.1	55	0.14	4	340	0.03	0.01	0.01	0.01	0.001	0.001	0.001	0.02	0.1	0.01	0.01	0.01	0.12	0.95	0.32	1	2	0.1	0.01
Median	780	290	13	19	13	73	0.32	9	720	0.22	0.01	0.01	0.01	0.001	0.001	0.007	0.05	0.1	0.1	0.02	0.01	0.14	1	0.67	2	2	1.2	0.01

	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC	TSS	Tot N	Tot P
Pool J	710	245	14	17	12	76	0.3	6	610	0.21	0.01	0.01	0.01	0.002	0.001	0.01	0.06	0.2	0.1	0.01	0.01				7		1	0.01
Pool J	780	285	17	19	13	84	0.31	8	620	0.13	0.01	0.01	0.01	0.001	0.001	0.012	0.05	0.1	0.1	0.01	0.01				2		1.7	0.01
Pool J	835	300	19	21	14	74	0.4	4	760	0.16	0.01	0.01	0.01	0.002	0.001	0.016	0.06	0.1	0.1	0.02	0.01				0.1	2	2.1	0.02
Pool J	940	340	18	22	17	74	0.27	9	850	0.22	0.01	0.01	0.01	0.002	0.001	0.016	0.06	0.1	0.1	0.01	0.01				1	4	2	0.1
Pool J	810	275	18	19	14	73	0.34	15	760	0.15	0.01	0.01	0.01	0.001	0.001	0.015	0.06	0.1	0.1	0.02	0.01				1	3	0.1	0.01
Pool J	910	330	13	22	15	80	0.41	8	800	0.12	0.01	0.01	0.01	0.001	0.001	0.009	0.05	0.1	0.1	0.02	0.01				1	2	1	0.01
Pool J	920	345	12	20	13	91	0.36	10	800	0.19	0.02	0.01	0.01	0.001		0.032	0.05		0.01	0.03					3	2	0.5	
Pool J	870	310	21	13	15	83	0.35	8	780	0.05	0.01	0.01	0.01	0.002		0.023	0.06		0.01	0.08					3	2	1.1	0.02
Pool J	880	340	12	22	16	81	0.41	4	770	0.17	0.01	0.01	0.01	0.001		0.006	0.08		0.01	0.06					1	1	1	0.06
Pool J	395	135	9.6	8.8	8	55	0.17	8	340	0.69	0.43	0.01	0.01	0.001		0.004	0.03		0.14	0.02					6	2	0.8	0.01
Pool J	765	285	11	17	11	71	0.31	8	680	0.11	0.03	0.01	0.01	0.001		0.007	0.04		0.01	0.02					2	2	1.3	0.01
Pool J	770	260	18	21	13	65	0.32	17	730	0.04	0.01	0.01	0.01	0.001		0.024	0.08		0.01	0.04					3	2	1.4	0.01
Pool J																												
Pool J	640	225	13	14	11	63	0.29	10	600	0.17	0.01	0.01	0.01	0.001		0.003	0.04		0.01	0.01		0.15	1	0.71	3	2	1.3	0.01
Pool J	435	150	10	9	9.4	56	0.15	9	370	0.45	0.04	0.01	0.01	0.001		0.005	0.02		0.13	0.01		0.12	0.97	0.33	5	2	0.7	0.01
Pool J	690	245	12	15	12	69	0.28	5	620	0.10	0.01	0.01	0.01	0.001		0.007	0.03		0.03	0.01		0.16	1.2	0.66	4	2	1.2	0.01
Std Dv	163.91	64.35	3.64	4.49	2.43	10.23	0.08	3.58	151.30	0.17	0.11	0.00	0.00	0.00	0.00	0.01	0.02	0.04	0.05	0.02	0.00	0.02	0.13	0.21	2.00	0.69	0.53	0.03
Max	940	345	21	22	17	91	0.41	17	850	0.69	0.43	0.01	0.01	0.002	0.001	0.032	0.08	0.2	0.14	0.08	0.01	0.16	1.2	0.71	7	4	2.1	0.1
Min	395	135	9.6	8.8	8	55	0.15	4	340	0.04	0.01	0.01	0.01	0.001	0.001	0.003	0.02	0.1	0.01	0.01	0.01	0.12	0.97	0.33	0.1	1	0.1	0.01
Median	780	285	13	19	13	74	0.31	8	730	0.16	0.01	0.01	0.01	0.001	0.001	0.01	0.05	0.1	0.1	0.02	0.01	0.15	1	0.66	3	2	1.1	0.01

	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC	TSS	Tot N	Tot P
Pool H	700	240	14	16	12	79	0.3	7	640	0.25	0.01	0.01	0.01	0.001	0.001	0.008	0.06	0.1	0.1	0.01	0.01				2		0.9	0.01
Pool H	770	280	16	19	13	80	0.32	8	630	0.14	0.01	0.01	0.01	0.001	0.001	0.009	0.05	0.1	0.1	0.02	0.01				2		1.6	0.01
Pool H	830	305	19	21	14	73	0.39	4	770	0.31	0.01	0.01	0.01	0.001	0.001	0.015	0.05	0.1	0.1	0.02	0.01				1	2	2.2	0.03
Pool H	950	350	18	24	15	74	0.27	11	850	0.19	0.01	0.01	0.01	0.001	0.001	0.01	0.06	0.1	0.1	0.02	0.01				2	4	2.1	0.1
Pool H	810	275	18	20	14	73	0.33	14	760	0.23	0.01	0.01	0.01	0.001	0.001	0.013	0.06	0.1	0.1	0.02	0.01				1	3	0.1	0.01
Pool H	910	335	13	23	15	81	0.4	8	820	0.16	0.01	0.01	0.01	0.002	0.001	0.007	0.05	0.1	0.1	0.02	0.01				2	2	1	0.01
Pool H	1000	380	12	21	13	92	0.37	10	840	0.18	0.03	0.01	0.01	0.001		0.033	0.05		0.01	0.03					3	2	0.5	
Pool H	870	310	23	13	15	81	0.35	8	750	0.11	0.01	0.01	0.01	0.001		0.018	0.05		0.01	0.07					3	2	1.4	0.02
Pool H	830	330	11	23	16	80	0.4	5	730	2.80	0.01	0.01	0.01	0.001		0.002	0.07		0.01	0.03					4	8	1	0.05
Pool H	400	130	10	8.8	8.2	55	0.18	8	340	0.69	0.41	0.01	0.01	0.001		0.004	0.03		0.07	0.01					6	3	0.7	0.02
Pool H	760	280	13	16	12	71	0.31	8	690	0.11	0.04	0.01	0.01	0.001		0.006	0.04		0.01	0.02					2	2	1.4	0.01
Pool H	670	225	18	20	13	65	0.3	15	600	0.05	0.02	0.01	0.01	0.001		0.022	0.08		0.02	0.03					3	2	1.2	0.01
Pool H																												
Pool H	630	220	13	14	11	62	0.28	9	580	0.19	0.01	0.01	0.01	0.001		0.003	0.04		0.01	0.01		0.13	1	0.72	3	2	1.4	0.01
Pool H	425	140	11	9.9	9.6	59	0.14	10	350	0.44	0.01	0.01	0.01	0.001		0.007	0.02		0.1	0.01		0.11	0.87	0.33	3	4	0.7	0.03
Pool H	695	250	12	15	11	69	0.28	9	620	0.14	0.01	0.01	0.01	0.001		0.005	0.03		0.02	0.01		0.13	1	0.65	3	2	2.3	0.02
Std Dv	171.93	71.56	3.73	4.77	2.19	9.82	0.07	2.89	156.11	0.68	0.10	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.04	0.02	0.00	0.01	0.08	0.21	1.23	1.71	0.64	0.02
Max	1000	380	23	24	16	92	0.4	15	850	2.8	0.41	0.01	0.01	0.002	0.001	0.033	0.08	0.1	0.1	0.07	0.01	0.13	1	0.72	6	8	2.3	0.1
Min	400	130	10	8.8	8.2	55	0.14	4	340	0.05	0.01	0.01	0.01	0.001	0.001	0.002	0.02	0.1	0.01	0.01	0.01	0.11	0.87	0.33	1	2	0.1	0.01
Median	770	280	13	19	13	73	0.31	8	690	0.19	0.01	0.01	0.01	0.001	0.001	0.008	0.05	0.1	0.07	0.02	0.01	0.13	1	0.65	3	2	1.2	0.015

	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC	TSS	Tot N	Tot P
Pool F																												
Pool F																												
Pool F																												
Pool F	940	345	18	24	15	73	0.26	9	850	0.16	0.01	0.01	0.01	0.002	0.001	0.015	0.06	0.1	0.1	0.01	0.01				2	3	2.4	0.06
Pool F	770	255	17	18	14	72	0.32	14	720	0.16	0.01	0.01	0.01	0.001	0.001	0.01	0.06	0.1	0.1	0.02	0.01				1	2	0.3	0.01
Pool F	920	340	13	22	15	82	0.4	9	840	0.11	0.01	0.01	0.01	0.001	0.001	0.01	0.05	0.1	0.1	0.02	0.01				2	2	0.9	0.01
Pool F	900	340	11	21	13	90	0.35	11	790	0.16	0.02	0.01	0.01	0.001		0.032	0.06		0.01	0.03					3	2	0.8	
Pool F	850	300	21	13	15	84	0.35	7	755	0.12	0.01	0.01	0.01	0.001		0.017	0.05		0.01	0.07					3	2	0.8	0.01
Pool F	890	350	11	22	16	81	0.4	4	800	0.14	0.01	0.01	0.01	0.001		0.006	0.08		0.01	0.06					1	1	0.7	0.06
Pool F	410	135	9.8	8.7	8.2	55	0.18	7	350	0.68	0.44	0.01	0.01	0.001		0.004	0.03		0.11	0.01					5	2	0.7	0.01
Pool F	775	285	12	17	12	74	0.3	8	680	0.10	0.02	0.01	0.01	0.001		0.006	0.04		0.01	0.02					2	2	1.2	0.01
Pool F	770	270	18	21	13	65	0.31	19	710	0.20	0.05	0.01	0.01	0.001		0.021	0.08		0.02	0.03					3	3	0.9	0.01
Pool F																												
Pool F	645	225	13	14	11	64	0.27	10	590	0.18	0.01	0.01	0.01	0.001		0.005	0.03		0.01	0.01		0.16	1.1	0.69	4	2	1.4	0.01
Pool F	430	150	11	9.6	9.5	61	0.14	10	370	0.44	0.01	0.01	0.01	0.001		0.007	0.02		0.11	0.01		0.13	0.96	0.33	4	3	0.8	0.02
Pool F	700	245	12	16	12	71	0.28	8	650	0.12	0.01	0.01	0.01	0.001		0.006	0.03		0.03	0.01		0.14	1	0.66	4	2	1.6	0.02
Std Dv	178.39	72.89	3.62	5.06	2.39	10.33	0.08	3.82	165.93	0.17	0.12	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.05	0.02	0.00	0.02	0.07	0.20	1.27	0.58	0.55	0.02
Max	940	350	21	24	16	90	0.4	19	850	0.68	0.44	0.01	0.01	0.002	0.001	0.032	0.08	0.1	0.11	0.07	0.01	0.16	1.1	0.69	5	3	2.4	0.06
Min	410	135	9.8	8.7	8.2	55	0.14	4	350	0.1	0.01	0.01	0.01	0.001	0.001	0.004	0.02	0.1	0.01	0.01	0.01	0.13	0.96	0.33	1	1	0.3	0.01
Median	772.5	277.5	12.5	17.5	13	72.5	0.305	9	715	0.16	0.01	0.01	0.01	0.001	0.001	0.0085	0.05	0.1	0.025	0.02	0.01	0.14	1	0.66	3	2	0.85	0.01

	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Fe	Fe Filt	Mn	Filt Mn	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Al	Filt Al	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC	TSS	Tot N	Tot P
Turk Ck	300	77	8.6	12	10	160	0.15	3	32	0.10	0.01	0.01	0.01	0.002		0.001	0.01		0.03	0.01		0.05	0.15	0.01	9	2	0.6	0.09
Turk Ck	350	93	10	13	12	190	0.1	7	22	0.30	0.01	0.01	0.01	0.002		0.001	0.01		0.08	0.01		0.05	0.26	0.001	7	3	0.8	0.14
Turk Ck	320	80	9.6	15	12	175	0.15	2	21	0.23	0.01	0.01	0.01	0.001		0.001	0.01		0.04	0.01		0.05	0.24	0.001	9	2	1.2	0.15
Std Dv	25.17	8.50	0.72	1.53	1.15	15.00	0.03	2.65	6.08	0.10	0.00	0.00	0.00	0.00		0.00	0.00		0.03	0.00		0.00	0.06	0.01	1.15	0.58	0.31	0.03
Max	350	93	10	15	12	190	0.15	7	32	0.3	0.01	0.01	0.01	0.002		0.001	0.01		0.08	0.01		0.05	0.26	0.01	9	3	1.2	0.15
Min	300	77	8.6	12	10	160	0.1	2	21	0.1	0.01	0.01	0.01	0.001		0.001	0.01		0.03	0.01		0.05	0.15	0.001	7	2	0.6	0.09
Median	320	80	9.6	13	12	175	0.15	3	22	0.23	0.01	0.01	0.01	0.002		0.001	0.01		0.04	0.01		0.05	0.24	0.001	9	2	0.8	0.14

APPENDIX B

Plateau Stream Water Quality Monitoring Data

MYRTLE CREEK WATER QUALITY

	pH	EC	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Tot N	Tot P	Fe Tot	Fe Filt	Filt Mn	Filt Al	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC
ANZECC	6.5-8.5	<350										0.25	0.02			1.9	0.055	0.0014	0.0034	0.008	0.011	0.024 (III) 0.013(V)	0.011				
MYC1	6.64	198	87	10	11	4.8	5.6	11	<0.1	6	71																
MYC1	6.29	186	120	10	15	4.3	4.5	10	0.1	6	80	0.9	0.05														
MYC1	6.17	209																									
MYC1	6.4	165																									
MYC1	6.42	128																									
MYC1	6.72	162																									
MYC1	6.11	514	120	21	6.1	8.1	8.8	40	0.1	5	69	2.2	0.1	2.70	1.2	0.09	0.06	0.007	0.001	0.005	0.01	0.01	0.01				18
MYC1	6.31	224																									
MYC1	6.06	128	45	8.1	2.3	1.5	3.5	15	0.1	2	22	0.7	0.01	1.00	0.33	0.01	0.01	0.007	0.001	0.008	0.01	0.01	0.01	0.01	0.02	0.01	11
MYC1	6.29	302	120	21	8.2	6	7.4	40	0.1	4	58	0.7	0.01	1.30	0.54	0.02	0.01	0.002		0.007	0.01	0.01		0.01	0.02	0.001	11
MYC1	5.58	177.4	92	7.5	12	6.1	5.6	15	0.13	5	61	3.7	0.13	3.00	2	0.06	1	0.003		0.01	0.01	0.01		0.01	0.02	0.001	27
max	6.72	514	120	21	15	8.1	8.8	40	0.13	6	80	3.7	0.13	3	2	0.09	1	0.007	0.001	0.01	0.01	0.01	0.01	0.01	0.02	0.01	27
min	5.58	128	45	7.5	2.3	1.5	3.5	10	0.1	2	22	0.7	0.01	1	0.33	0.01	0.01	0.002	0.001	0.005	0.01	0.01	0.01	0.01	0.02	0.001	11
median	6.29	186	106	10	9.6	5.4	5.6	15	0.1	5	65	0.9	0.05	2	0.87	0.04	0.035	0.005	0.001	0.0075	0.01	0.01	0.01	0.01	0.02	0.001	14.5

	pH	EC	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Tot N	Tot P	Fe Tot	Fe Filt	Filt Mn	Filt Al	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC
MYC2	6.6	419	170	27	20	2.8	13	68	0.1	5	81																
MYC2	6.3	732	475	55	32	4.3	25	160	0.1	15	92	0.8	0.05														
MYC2	5.31	906																									
MYC2	6.2	391																									
MYC2	6.43	315																									
MYC2	6	421	210	28	17	3.5	13	55	0.14	22	120	5.7	0.66	22.00	13	0.08	0.1	0.001	0.001	0.008	0.01	0.01	0.01				17
MYC2	6.58	208																									
MYC2	6.54	387	185	27	19	5.8	15	55	0.12	5	110	2.9	0.24	23.00	10	0.54	0.01	0.003	0.001	0.006	0.01	0.01	0.01				18
MYC2	6.52	412																									
MYC2	6.38	125	50	10	4.3	2.2	3.2	19	0.1	2	21	1.1	0.08	2.50	0.4	0.01	0.02	0.004	0.001	0.009	0.01	0.01	0.01	0.02	0.02	0.01	7
MYC2	6.53	2630	550	105	28	5.3	46	290	0.1	12	110	1.4	0.03	6.20	0.06	0.85	0.01	0.001		0.002	0.01	0.01		0.05	0.04	0.029	10
MYC2	5.32	281	145	20	11	4.9	13	39	0.13	5	82	2.2	0.11	3.30	1.8	0.02	0.24	0.001		0.003	0.01	0.01		0.05	0.03	0.001	13
max	6.6	2630	550	105	32	5.8	46	290	0.14	22	120	5.7	0.66	23	13	0.85	0.24	0.004	0.001	0.009	0.01	0.01	0.01	0.05	0.04	0.029	18
min	5.31	125	50	10	4.3	2.2	3.2	19	0.1	2	21	0.8	0.03	2.5	0.06	0.01	0.01	0.001	0.001	0.002	0.01	0.01	0.01	0.02	0.02	0.001	7
median	6.405	401.5	185	27	19	4.3	13	55	0.1	5	92	1.8	0.095	6.2	1.8	0.08	0.02	0.001	0.001	0.006	0.01	0.01	0.01	0.05	0.03	0.01	13

	pH	EC	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Tot N	Tot P	Fe Tot	Fe Filt	Filt Mn	Filt Al	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC
MYC3		925	600	120	25	50	13	120	0.24	10	320																
MYC3		1121																									
MYC3	7.47	583																									
MYC3	7.72	2440	1390	250	34	120	16	240	0.34	40	820	180	30	2.00	0.85	0.26	0.1	0.008	0.001	0.012	0.01	0.01	0.01				47
MYC3	7.69	1581	740	180	22	63	13	110	0.32	22	580	69	20	1.20	1	0.18	0.1	0.001	0.001	0.004	0.01	0.01	0.01				32
MYC3	7.3	406																									
MYC3	7.38	764	400	63	16	26	11	83	0.18	17	250	29	6.1	1.30	0.69	0.18	0.01	0.003	0.001	0.013	0.01	0.01	0.01				27
MYC3	7.88	2410																									
MYC3	7.84	768	375	84	23	25	11	76	0.17	20	240	61	6.8	4.20	0.41	0.08	0.01	0.004	0.003	0.02	0.01	0.01	0.01	0.05	0.02	0.01	28
MYC3	8.34	2260	1150	120	31	58	16	130	0.26	14	190	190	25	0.94	0.3	0.43	0.01	0.009		0.027	0.01	0.01		0.03	0.02	0.002	40
MYC3	5.47	573	265	45	12	23	12	47	0.19	20	150	48	5.2	1.20	0.53	0.02	0.06	0.004		0.016	0.01	0.01		0.04	0.03	0.001	17
max	8.34	2440	1390	250	34	120	16	240	0.34	40	820	190	30	4.2	1	0.43	0.1	0.009	0.003	0.027	0.01	0.01	0.01	0.05	0.03	0.01	47
min	5.47	406	265	45	12	23	11	47	0.17	10	150	29	5.2	0.94	0.3	0.02	0.01	0.001	0.001	0.004	0.01	0.01	0.01	0.03	0.02	0.001	17
median	7.69	925	600	120	23	50	13	110	0.24	20	250	65	13.4	1.25	0.61	0.18	0.035	0.004	0.001	0.0145	0.01	0.01	0.01	0.04	0.02	0.002	30

REDBANK CREEK WATER QUALITY

	pH	EC	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Tot N	Tot P	Fe Tot	Fe Filt	Filt Mn	Filt Al	Filt Cu	Filt Pb	Filt Zn	Filt Ni	Filt As	Filt Se	Filt Sr	Filt Ba	Filt Li	TOC
ANZECC	**6.5-8.5**	**<350**										**0.25**	**0.02**			**1.9**	**0.055**	**0.0014**	**0.0034**	**0.008**	**0.011**	**0.024 (III) 0.013(V)**	**0.011**				
RC1		460	300	40	54	6.8	11	42	0.13	2	270																
RC1	6.73	650																									
RC1	6.82	694	300	57	38	7.2	10	60	0.19	14	210	7.6	0.1	1.90	0.07	0.1	0.1	0.001	0.001	0.015	0.01	0.01	0.01				11
RC1	6.91	301																									
RC1	6.47	507	265	53	33	5	7.3	44	0.2	19	190	2.1	0.05	3.20	0.29	0.01	0.1	0.001	0.001	0.01	0.01	0.01	0.01				9
RC1	7.01	449																									
RC1	7.03	460																									
RC1	6.9	195	55	11	6.4	1.7	3.5	19	0.12	5	30	1.8	0.11	2.80	0.08	0.01	0.02	0.007	0.001	0.008	0.01	0.01	0.01	0.02	0.09	0.01	7
RC1	6.8	516	290	58	30	3.8	10	84	0.1	29	120	0.5	0.04	1.4	0.28	0.03	0.01	0.006		0.011	0.01	0.01		0.04	0.03	0.002	8
RC1	5.3	246	120	17	14	3.5	7.4	27	0.14	8	71	1.3	0.01	1.10	0.8	0.01	0.04	0.003		0.007	0.01	0.01		0.04	0.01	0.001	7
max	7.03	694	300	58	54	7.2	11	84	0.2	29	270	7.6	0.11	3.2	0.8	0.1	0.1	0.007	0.001	0.015	0.01	0.01	0.01	0.04	0.09	0.01	11
min	5.3	195	55	11	6.4	1.7	3.5	19	0.1	2	30	0.5	0.01	1.1	0.07	0.01	0.01	0.001	0.001	0.007	0.01	0.01	0.01	0.02	0.01	0.001	7
median	6.82	460	277.5	46.5	32	4.4	8.7	43	0.14	11	155	1.8	0.05	1.9	0.28	0.01	0.04	0.003	0.001	0.01	0.01	0.01	0.01	0.04	0.03	0.002	8
	pH	**EC**	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Tot N**	**Tot P**	**Fe Tot**	**Fe Filt**	**Filt Mn**	**Filt Al**	**Filt Cu**	**Filt Pb**	**Filt Zn**	**Filt Ni**	**Filt As**	**Filt Se**	**Filt Sr**	**Filt Ba**	**Filt Li**	**TOC**
RC2		1325	860	220	14	3.4	59	540	0.1	5	1																
RC2	4.15	1931																									
RC2	5.09	1950	1030	220	15	3.6	56	610	0.1	7	1	0.4	0.1	3.50	0.35	3.4	0.1	0.005	0.003	0.035	0.04	0.01	0.01				1
RC2	5.76	688																									
RC2	4.49	1949	950	210	75	3.2	53	490	0.25	13	200	0.1	0.01	4.20	0.02	2	0.1	0.001	0.001	0.026	0.02	0.01	0.01				1
RC2	6.6	615																									
RC2	6.6	650																									
RC2	6.52	457	225	51	12	3.7	13	110	0.14	12	35	1.9	0.01	4.20	1.3	0.01	0.01	0.003	0.001	0.004	0.01	0.01	0.01	0.04	0.05	0.01	8
RC2	5.82	1490	720	180	19	4.7	48	440	0.1	11	1	0.1	0.01	7	0.01	2.1	0.01	0.001		0.079	0.01	0.01		0.05	0.1	0.024	3
RC2	5.23	338	170	32	10	3.9	11	71	0.23	8	40	3.5	0.01	2.20	1.5	0.12	0.05	0.001		0.042	0.01	0.01		0.04	0.03	0.003	6
max	6.6	1950	1030	220	75	4.7	59	610	0.25	13	200	3.5	0.1	7	1.5	3.4	0.1	0.005	0.003	0.079	0.04	0.01	0.01	0.05	0.1	0.024	8
min	4.15	338	170	32	10	3.2	11	71	0.1	5	1	0.1	0.01	2.2	0.01	0.01	0.01	0.001	0.001	0.004	0.01	0.01	0.01	0.04	0.03	0.003	1
median	5.76	1006.5	790	195	15	3.65	50.5	465	0.12	9.5	18	0.4	0.01	4.2	0.35	2	0.05	0.001	0.001	0.035	0.01	0.01	0.01	0.04	0.05	0.01	3
RC3		445	290	51	32	6.4	16	55	0.2	6	230																
RC3	6.93	566																									
RC3	6.95	482	220	44	26	5.6	11	57	0.31	13	150	2.6	0.14	1.20	0.08	0.04	0.1	0.001	0.001	0.004	0.01	0.01	0.01				10
RC3	6.79	438																									
RC3	6.83	527	250	50	24	4.2	11	64	0.24	11	150	2.7	0.06	3.00	0.95	0.04	0.1	0.001	0.001	0.003	0.01	0.01	0.01				9
RC3	7	465	290	61	19	6.9	16	120	0.18	10	87	1	0.05	1.20	0.52	0.03	0.03	0.003	0.001	0.002	0.01	0.01	0.01				13
RC3	6.94	397																									
RC3	7.38	163	75	12	7	3.1	4.3	19	0.14	8	34	1.8	0.07	2.60	0.37	0.01	0.01	0.004	0.001	0.009	0.01	0.01	0.01	0.02	0.02	0.01	6
RC3	7.32	748	360	78	24	5.8	18	150	0.1	14	110	1.2	0.01	2.4	0.25	0.21	0.01	0.001		0.001	0.01	0.01		0.05	0.04	0.003	9
RC3	5.26	281	145	26	7.3	4.4	9.7	47	0.17	9	55	1.9	0.03	1.80	1.3	0.02	0.07	0.001		0.011	0.01	0.01		0.04	0.02	0.002	9
max	7.38	748	360	78	32	6.9	18	150	0.31	14	230	2.7	0.14	3	1.3	0.21	0.1	0.004	0.001	0.011	0.01	0.01	0.01	0.05	0.04	0.01	13
min	5.26	163	75	12	7	3.1	4.3	19	0.1	6	34	1	0.01	1.2	0.08	0.01	0.01	0.001	0.001	0.001	0.01	0.01	0.01	0.02	0.02	0.002	6
median	6.94	455	250	50	24	5.6	11	57	0.18	10	110	1.85	0.055	2.1	0.445	0.035	0.05	0.001	0.001	0.0035	0.01	0.01	0.01	0.04	0.02	0.003	9

APPENDIX C

Groundwater Level (Manual Readings) and Quality Monitoring Data

SWL	TAHMOOR	GROUND	WATER	(mbtoc)					
	P1	P2	P3	P4	P5	P6	P7	P8	Well1
3/06/2004	11.5								
18/06/2004	7.49								
25/06/2004		38.07							
12/10/2004	7.97	40.45b							
15/11/2004									
9/12/2004	10.38	39.53							
4/03/2005									
5/03/2005	11.87								
17/03/2005									
15/04/2005			50.76						
19/04/2005									
22/05/2005	12.16								
26/05/2005		40.73	51.08	37.32	25.23				3.72
30/09/2005	13.25		50.95	37.32		94.51			
17/10/2005		41.17							
5/04/2006	12.93	39.27	50.04	37.31	24.5	94.35			2.97
18/07/2006	13.22	44.9	49.86	37.32	25.35	94.56			3.25
30/09/2006	12.52		48.59	37.32		94.51			3.35
5/10/2006	13.25					94.63			
17/10/2007		41.17		37.32					
5/01/2007	13.36		49.1	37.31		94.73			
23/03/2007	13.45		46.17	37.38		95.04			
6/06/2007	13.46		47.39	37.34					
21/06/2007	13.3		47.33						
16/08/2007	13.24	38.24	45.42	37.26	24.95	94.8			
24/10/2007	12.79		43.1	37.34	25.54	94.86			
21/11/2007			42.22						

TAHMOOR THIRLEMERE GROUNDWATER ANALYSES

	ANZECC	6.5-7.5	30-350										0.25	0.02			1.9	0.055	0.0014	0.0034	0.008	0.011	0.013(V)	0.011
Location	**Date**	**Fld pH**	**EC**	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Tot N**	**Tot P**	**Fe Tot**	**Fe Filt**	**Filt Mn**	**Filt Al**	**Cu**	**Pb**	**Zn**	**Ni**	**As**	**Se**
P1	8/12/2004	5.3	2650		850	11	1.6	150	1800	<0.1	5	1	0.8	0.1										
	28/02/2005																							
	7/04/2006	5.17	3140	2010	600	7.6	2.1	110	1250	0.1	10	1	0.3	0.1	65.00	37	4.5	0.1	0.002	0.001	0.38	0.11	0.01	0.01
	5/10/2006	4.96	2660	1720	480	13	1.3	99	1110	0.1	5	1	0.9	0.01	37.00	21	2.8	0.1	0.003	0.002	0.31	0.12	0.01	0.01
	5/01/2007	4.84	3720																					
	16/03/2007	5.22	3230	2600	460	7.7	1.2	91	990	<0.1	7	1	0.4	0.01	48.00	36	3.4	0.04	0.008	0.006	0.27	0.11	0.01	0.01
	6/06/2007	5	3240																					
	16/08/2007	5.29	3010																					
	24/10/2007	4.83	3330																					

Location	**Date**	**Fld pH**	**EC**	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Tot N**	**Tot P**	**Fe Tot**	**Fe Filt**	**Filt Mn**	**Filt Al**	**Cu**	**Pb**	**Zn**	**Ni**	**As**	**Se**
P2	8/12/2004	5.61	2295		370	27	7.2	110	940	0.19	31	1	0.9	0.1										
	28/02/2005																							
	7/04/2006	5.71	3020	1910	495	35	9.6	135	1200	0.27	47	9	0.3	0.13	28.00	12	5.4	0.1	0.001	0.001	0.45	0.13	0.01	0.01
	5/10/2006	5.32	1620	1050	250	14	2.7	76	650	0.1	12	1	0.3	0.13	7.20	1.7	3.5	0.1	0.002	0.004	0.53	0.08	0.01	0.01
	5/01/2007	5.3	2330																					
	16/03/2007	5.52	2030	1600	225	13	4.6	67	590	0.13	22	1	0.6	0.06	41.00	28	3.5	0.07	0.003	0.007	0.34	0.11	0.01	0.01
	6/06/2007	5.56	1683																					
	16/08/2007	5.64	2290																					
	24/10/2007																							

Location	**Date**	**Fld pH**	**EC**	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Tot N**	**Tot P**	**Fe Tot**	**Fe Filt**	**Filt Mn**	**Filt Al**	**Cu**	**Pb**	**Zn**	**Ni**	**As**	**Se**
P3	8/12/2004																							
	28/02/2005																							
	7/04/2006	6.22	1580	1020	275	20	3.9	61	600	0.2	5	88	1	0.11	75.00	36	3.6	0.1	0.001	0.001	0.011	0.07	0.01	0.01
	5/10/2006	5.59	2500	1600	390	22	3	105	960	0.21	27	4	0.1	0.04	64.00	50	3.6	0.1	0.001	0.001	0.1	0.09	0.01	0.01
	5/01/2007	6.08	3240																					
	16/03/2007	5.97	3070	2790	365	18	4.5	110	970	0.21	19	33	1.3	0.11	150.00	85	4.3	0.06	0.001	0.003	0.85	0.21	0.01	0.01
	6/06/2007	6.1	3230																					
	16/08/2007	6.21	3200																					
	24/10/2007	5.28	3260																					

Location	**Date**	**Fld pH**	**EC**	**TDS**	**Na**	**Ca**	**K**	**Mg**	**Cl**	**F**	**SO4**	**HCO3**	**Tot N**	**Tot P**	**Fe Tot**	**Fe Filt**	**Filt Mn**	**Filt Al**	**Cu**	**Pb**	**Zn**	**Ni**	**As**	**Se**
P4	8/12/2004																							
	28/02/2005	6.63	10925	7100	1600	180	55	585	3830	0.31	150	1210												
	7/04/2006	6.55	10700	6890	1580	185	59	565	3740	0.37	145	1160	0.2	0.1	1.30	0.03	0.66	0.01	0.002	0.001	0.005	0.01	0.01	0.01
	5/10/2006	6.39	10500	6750	1490	185	58	625	3690	0.27	150	1240	0.1	0.01	0.52	0.5	0.59	0.01	0.001	0.001	0.006	0.01	0.01	0.01
	5/01/2007	6.62	11900																					
	16/03/2007	6.57	12150	11100	1630	185	54	580	3780	0.25	140	1250	0.3	0.1	1.80	0.39	0.63	0.01	0.002	0.001	0.01	0.01	0.01	0.01
	6/06/2007	6.63	12060																					
	16/08/2007	6.66	11970																					
	24/10/2007	6.53	12250																					

TAHMOOR THIRLEMERE GROUNDWATER ANALYSES

Location	Date	Fld pH	EC	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Tot N	Tot P	Fe Tot	Fe Filt	Filt Mn	Filt Al	Cu	Pb	Zn	Ni	As	Se
	ANZECC	6.5-7.5	30-350										0.25	0.02			1.9	0.055	0.0014	0.0034	0.008	0.011	0.013(V)	0.011
P5	8/12/2004																							
	28/02/2005	5.65	3940	2560	730	8.3	21	145	1510	0.77	67	86												
	7/04/2006	5.53	4450	2880	850	8.8	23	145	1700	79	72	82	0.6	0.1	3.40	0.08	5	0.01	0.001	0.001	0.3	0.14	0.01	0.01
	5/10/2006	5.36	4150	2900	795	8.4	22	155	1620	0.7	72	96	0.1	0.01	4.80	0.09	4.2	0.01	0.001	0.001	0.28	0.11	0.01	0.01
	5/01/2007	5.61	4850																					
	16/03/2007	5.64	5000	4100	765	7.9	21	155	1590	0.85	66	89	0.6	0.01	4.20	0.06	4.2	0.01	0.001	0.001	0.23	0.15	0.01	0.01
	6/06/2007	5.7	4630																					
	16/08/2007	5.71	4440																					
	24/10/2007	5.2	5370																					
P6	no	access	to bore																					

Location	Date	Fld pH	EC	TDS	Na	Ca	K	Mg	Cl	F	SO4	HCO3	Tot N	Tot P	Fe Tot	Fe Filt	Filt Mn	Filt Al	Cu	Pb	Zn	Ni	As	Se
Well1	28/02/2005	7.05	460	300	51	41	8.1	8.5	74	0.1	22	170												
	7/04/2006	6.82	420	270	46	38	6.7	7.9	80	0.14	36	100	1	0.1	0.86	0.18	0.16	0.01	0.003	0.001	0.055	0.01	0.01	0.01
	5/10/2006	7.36	500	320	56	40	7.1	9.9	90	0.2	43	130	0.9	0.04	1.20	0.05	0.08	0.01	0.001	0.001	0.063	0.06	0.01	0.01
	24/10/2007	6.91	480																					