NEW HOPE GROUP

G.4.2 Landholder Bore Survey Results

New Acland Coal Mine Stage 3 Project Environmental Impact Assessment

LANDHOLDER BORE SURVEY

Version 1 - QE06644 | August 2013

New Acland Revised Stage 3 Project Environmental Impact Statement

Document title:	Landholder Bore Survey – New Acland Revised Stage 3 Project
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1. Introduction

1.1 Background

New Acland Coal Pty Ltd (NAC), part of the New Hope Group, currently operates the existing New Acland Coal Mine (the Mine) in southeast Queensland's Clarence-Moreton Basin. NAC is proposing to develop the New Acland Coal Mine Stage 3 Project (the revised Project), which involves the extension of the Mine's operating life to approximately 2029.

An Environmental Impact Statement (EIS) has been prepared for the revised Project that addresses the Terms of Reference (ToR) issued by the Queensland Coordinator-General. The ToR includes the requirement to include a survey of existing groundwater supply facilities (bores, wells or excavations) to the extent of any environmental harm. The information to be gathered for analysis is required to include:

- Locations.
- Pumping parameters.
- Drawdown and recharge at normal pumping rates.
- Seasonal variations (if records exist) of groundwater levels.
- The GPS location and depths of the potentially affected bores and the aquifers accessed by the bores.

The aim of the landholder bore survey (as outlined in the ToR) is to assist in the EIS assessment of the potential of the revised Project to impact on groundwater and how current users will be affected by any take of water associated with the revised Project. Furthermore, the survey was conducted in order to confirm and build on the information gathered from the DNRM database on groundwater occurrence and use in the vicinity of the revised Project.

To achieve this requirement of the ToR, SKM was engaged to undertake a field survey of landholder bores in the vicinity of the revised Project.

1.2 Methodology

Due to the large number of properties and groundwater bores adjacent the revised Project, only a selection of suitable, representative bores were targeted in the survey. The selection process was based on identifying properties within 3 km of the revised Project's boundaries, and then selecting a representative distribution of properties surrounding the revised Project site that contain bores for which the source aquifer is known in the DNRM database. The bores/properties selected comprise a mixture of both private and Acland Pastoral Company (APC, owned by New Hope Group) land.

Following selection of sites, landholders were contacted to request participation in the survey. Where landholders were willing to participate, they were also asked to be present during the survey to provide additional anecdotal and historical bore information. Of the 19 originally selected private landholders/properties, 12 chose to participate in the program.

Information collected for each bore included (where available/possible):

- location GPS co-ordinates
- current physical bore depth
- construction details
- source aquifer
- current condition and status
- details of pumping infrastructure
- drilling & construction logs

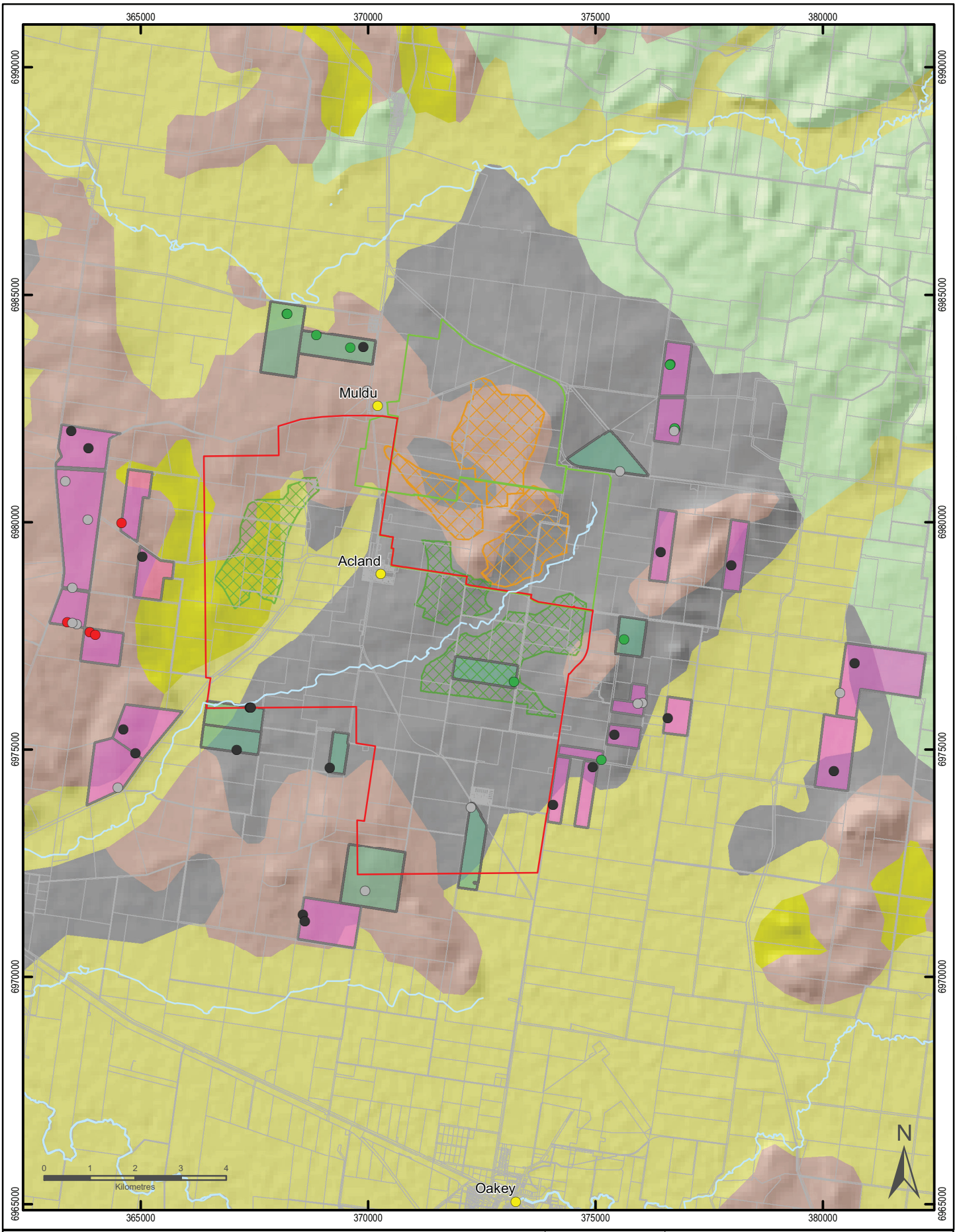
- licence details
- current and historical usage
- historical water quality information
- field groundwater parameters (SWL, EC/TDS, pH, temperature, DO and Redox)
- water samples for laboratory analysis

The following document presents the results of the landholder bore survey as the field data forms compiled during the bore survey program. The naming convention used is the Lot/Plan number for the property followed by the number of the bore in relation to the other bores visited on that property; eg the first bore visited on Lot/Plan 105 A342484 is denoted “105_A342484_01” etc.

Discussion and interpretation of the results is provided in **Chapter 6** of the revised Project’s EIS.

Figure 1 presents a locality plan for the landholder bore survey.

Full water chemistry laboratory results are available in **Appendix A**.



LEGEND

- Towns and Localities

Landholder Survey Bores defined by Aquifer

- Not Defined
- Basalt
- Walloon Coal Measures
- Marburg Sandstone
- Watercourse
- New Acland Coal Mine
- New Aland Coal Mine-Stage 3
- Cadastre
- Existing Permission
- Stage 3 Pit Areas

Cadastre- Survey Undertaken

- APC
- Public

Dominant Geology

- Basalt (Tm)
- Alluvium (Qa)
- Colluvium (TQs)
- Walloon Subgroup (Jw)
- Marburg Sandstone (Jbm)

NEW HOPE GROUP

SINCLAIR KNIGHT MERZ SKM

NEW ACLAND COAL MINE STAGE 3 PROJECT

Figure 1 - Location of Surveyed Landholder Bores

Scale 1:110,000 on A4
Projection: Australian Geodetic Datum – Zone 56 (AGD84)

Path: I:\QENV2\Projects\QE06644\Spatial\ArcGIS\01_Figures\01_SEIS\06_GroundwaterResources\130611_NewHope_Groundwater_Figure6-5_LocationOfSurveyedLandholderBores.mxd

Produced: 3/09/2013

2. Private Properties

Assessment Details - 3446_A341747_01	
Property name:	Mt Pleasant
Local bore name:	New home bore
Registered Number:	Unknown but believed to be RN 17125.
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	21/05/2013 4:25pm
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	3446 A341747
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock and domestic (garden)
GDA Latitude (decimal deg.):	27°18'11.2721"S
GDA Longitude (decimal deg.):	151°38'09.7750"E
Water licence number and details: (if available to view)	Not available
Bore Construction Details	
Construction details / log available?	Yes (refer photographs of drillers documentation)
Date Installed:	14/02/03
Surface casing dia. (mm), and material:	140mm, PVC (from drillers log)
Bore casing dia. (mm), and material:	125mm, PVC (from drillers log)
Bore casing stickup above ground (m):	0.49m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (from drillers log)
Top of screen (m bgl):	Intervals: 66-82m and 88-97m (from drillers log)
Bottom of screen (m bgl):	See above
Top of open hole (m bgl):	n.a.
Total depth (m):	100m (from drillers log)
Bore Condition Comments:	Bore is in good condition and fairly new.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Electric submersible, Grundfos SQ2 100N, powered by 4.5 kva Generator
Date installed:	24/04/03
Date of most recent use	Few weeks before assessment, exact date unknown
Any repairs?	No
Pump intake depth (m bgl):	Approximately 95 m bgl (based on records of quantities of rising main and electrical cable – refer photographs)
Interviewee's est. annual take (ML):	0.88 ML
Basis for estimate:	3.5 hours x two and a half times per week. (Assuming average flow rate of 0.54 L/s).
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock (130 head). Garden water.
Detail all other water sources for property:	4 other bores and 1 dam
Typical pumping rate of bore (L/s):	LH wanted a pump rate of 600 gallons/hour (0.63 L/sec), but currently just

	pumps at the rate provided by the current setup (approx. 0.4 – 0.45 L/s).
Does this rate vary annually or can the pump rate be varied?:	Can't be varied
Typical duration and frequency of pumping: (any seasonal variations?)	If windmill not blowing then relies on this bore heavily. Hot weather also increases usage (to approx. 3 times per week). Average 130 head of stock for year. Also used for garden watering in summer.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	0.79 L/s
Describe riser, headwork and water distribution details:	Outflow from bore cap through a steel pipe and valve. This then connects to black poly pipe and runs overground to property approximately 800m away. Poly pipe runs to 2 tanks near house (2,000 gallons each). The water is then distributed to troughs or the house.
Equipment condition:	Good
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Based on two sources (drillers record and landholder information) water level is between 24.4 m bgl and 26.4 m bgl.
Stable pumping water level (m bgl): (measured, including mins after pump on)	Not measured, but airline is present and potentially could be measured with appropriate airline fittings.
Water level measuring point	n.a. (refer above)
Interviewee / owner understanding of typical SWL / PWL (m bgl):	80 ft (24.4m bgl) – based on prior LH reading from gauge. From bore log: 26.4 m bgl.
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Yes, when bore was used for piggery. "6-9 ppm of salt" (anecdotal from LH, but values are anomalously low and not considered reliable; possibly should be 600-900 ppm). Some TDS values at different elevations during installation, see bore log in photos.
Any account of gas in the bore from interviewee?	Water can be smelly at times ("eggy smell", anecdotal from LH).
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is powered by generator situated on ground a couple of metres away. Could be a source of potential contamination, however bore is fairly well sealed with bore cap (so direct contamination down the bore unlikely).
Water quality sample collected during this assessment?	Yes. Sample taken directly at bore head, by disconnecting black poly pipe.
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Pictures	

Property name: Mt Pleasant		**Bore name & RN:** New home bore		**Sampling date:** 21/05/2013		**Sample collection point:** Outflow from bore head works		**Comments:**	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance /Colour**	**Odour?**	**TDS (mg/L)**
3:13	0.79	7.60	21.4	2418	8.63	-129.5	Clear	H_2S	1690
3:16	0.74	7.53	22.9	2553	6.46	-130.6	Slightly dark	none	1729
3:23	0.74	7.58	22.8	2574	3.85	-104.3	clear	"	1748
3:31	0.63	"	"	2553	3.10	-92.8	"	"	1735
3:40	0.58	7.43	23.3	2518	2.91	-68.5	"	"	1696
3:50	0.42	7.22	23.6	2544	2.59	-58.6	Clear but some debris. Water surging from bore	"	1703
3:56	0.44	7.14	23.7	2558	3.30	-60.2	"	"	1709
4:01	0.46	7.17	23.7	2552	3.55	-65.8	"	"	1703
4:04	0.4	7.26	23.7	2560	3.51	-67.8	"	"	1709

Total purge time:	51 mins
Estimated total purge volume:	1,768 L
Time sample collected:	4:04

Assessment Details – 6_RP25503_01	
Property name:	Silverdale
Local bore name:	Property bore
Registered Number:	Unknown. But believed to be RN 119074.
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM Database search
Assessment date and time:	22/05/2013
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	6 RP25503
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock and domestic
GDA Latitude (decimal deg.):	27°18'21.8057"S
GDA Longitude (decimal deg.):	151°46'00.9509"E
Water licence number and details: (if available to view)	No
Bore Construction Details	
Construction details / log available?	Yes, see copies in photographs
Date Installed:	19/02/1997
Surface casing dia. (mm), and material:	178mm PVC, 200mm steel (refer photo)
Bore casing dia. (mm), and material:	125mm PVC
Bore casing stickup above ground (m):	0.18m
Aquifer: (& source of information: log, anecdotal)	Marburg Sandstone (bore log)
Top of screen (m bgl):	126m bgl (bore log)
Bottom of screen (m bgl):	138m bgl (bore log)
Top of open hole (m bgl):	n.a.
Total depth (m):	138m (bore log)
Bore Condition Comments:	Good
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Electric submersible, make and model unknown (there is Davey water pressure tank at the surface near the well head, but this is not the pumping source), power source: Public (mains) electricity supply.
Date installed:	Unknown (bought in 2009, LH believed pump was new when property was purchased)
Date of most recent use	19/5/2013
Any repairs?	No
Pump intake depth (m bgl):	Not known
Interviewee's est. annual take (ML):	1.74 ML
Basis for estimate:	LH initial estimation: LH believes 10,000 gallons a week (1.98 ML a year), based on number of times filled tank. Alternate method of estimation: Once a fortnight for 7-8 hours (from LH); average 80 head cattle (from LH); average flow rate during assessment = 2.65 L/s which equates to 1.74 ML/yr.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Water for (average) 80 head of cattle and garden watering.
Detail all other water sources for	Rainwater for house. 3 dams on property.

property:	
Typical pumping rate of bore (L/s):	1.05 L/s (1000 gallons an hour, LH estimate). (This appears significantly lower than the rates measured during this survey, which did not decline significantly during the 50 mins of pumping, although the flow rate may decline over longer pumping periods).
Does this rate vary annually or can the pump rate be varied?:	Can be varied but never altered
Typical duration and frequency of pumping: (any seasonal variations?)	7-8 hours per fortnight is the LH estimate of average pumping throughout the year (more in summer and less in winter, although LH noted the increase and decrease is difficult to quantify)
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	3.07 L/s
Describe riser, headwork and water distribution details:	From the bore cap there is a galvanised steel outflow. Prior to passing through a valve, there is a T-piece with connection to a pressure tank on one side and pressure gauge on the other side. After the valve, the pipe connects to black poly pipe (60mm) which becomes buried and feeds into a concrete tank (estimated 20,000 gallons) approx. 300m away. This tank gravity feeds five troughs.
Equipment condition:	Good
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	60m bgl (from logs when bore was drilled). Not able to be measured during field survey.
Stable pumping water level (m bgl): (measured, including mins after pump on)	Not known (and not able to be measured).
Water level measuring point	n.a.
Interviewee / owner understanding of typical SWL / PWL (m bgl):	60m bgl (from time of drilling).
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is well protected with a small cage including tin roof (see photo). Gap down the side of the bore for unknown depth is a potential pathway for pollution, if present, although no obvious source observed (not known if grouted between PVC and outer steel casing).
Water quality sample collected during this assessment?	Yes
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Owner has only been at property since 2009, so limited knowledge of bore	
Photos	

Property name: Silverdale		Bore name & RN: Property bore		Sampling date: 22/05/2013		Sample collection point: At outflow from bore head works		Comments:	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance/Colour**	**Odour?**	**TDS (mg/L)**
8:17	2.7	7.76	23.0	1316	14.93	82.5	clear	Slight gassy smell initially	890
8:19	2.62	7.3	23.3	1326	5.74	-85.6	"	none	"
8:26	2.3	"	23.4	1324	2.88	-78.2	"	"	"
8:35	2.4	7.24	23.5	1332	2.49	-97.0	"	"	"
8:44	2.78	7.21	23.5	1333	2.46	-96.8	"	"	"
8:50	2.58	7.05	23.4	1331	2.49	-88.1	"	"	"
8:57	"	7.00	"	1332	2.44	-86.8	"	"	"
9:01	3.07	7.00	23.2	1321	2.34	-84.7	"	"	"
9:07	2.8	7.00	23.4	1333	2.23	-80.8	"	"	897

Total purge time:	50 mins
Estimated total purge volume:	7950 L
Time sample collected:	9:07

Assessment Details – 105_A342484_01	
Property name:	Hillgrove
Local bore name:	Main bore
Registered Number:	Unknown. Nearest RN is 48110 or 147259
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	20/05/2013 10:20am
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	105 a342484
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Farm worker
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock
GDA Latitude (decimal deg.):	27°22'27.9717"S
GDA Longitude (decimal deg.):	151°40'15.2766"E
Water licence number and details: (if available to view)	n.a.
Bore Construction Details	
Construction details / log available?	Log with construction details available.
Date Installed:	18/07/2000
Surface casing dia. (mm), and material:	As per bore casing
Bore casing dia. (mm), and material:	139mm, OD (from bore log), approx. 130mm ID, steel casing.
Bore casing stickup above ground (m):	0.47m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (based on anecdotal information from LH and bore log)
Top of screen (m bgl):	Bore is screened at 5 different intervals (across coal seams): 26-29m, 38-40m, 47-48m, 75-76m and 93-99m bgl (from drillers bore log).
Bottom of screen (m bgl):	99m bgl (from drillers bore log, refer above)
Top of open hole (m bgl):	n.a.
Total depth (m):	102m (from drillers bore log)
Bore Condition Comments:	Bore is fairly new and is in good condition. Structure appears in good condition. Power cable, airline and support cable are all fed into the bore through a hole in the bore cap.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Submersible, 3 hp Grundfos (old pump was stuck and couldn't be retrieved so was crushed at the base of the well with drill rig). Public (mains) electricity supply.
Date installed:	Current pump installed in 2011
Date of most recent use	Automatic. So used as required. (Interviewee didn't know last use).
Any repairs?	No
Pump intake depth (m bgl):	Not known – interview suggested 146m (and airline at 145m) however this is incorrect as it exceeds the bore depth (102m). Possibly could be 46m and 45m respectively, as this approximately matches the available SWL information and airline data (refer below).
Interviewee's est. annual take (ML):	0.6 ML
Basis for estimate:	Average head of cattle 40 and consumption estimated at 40 L per day (feeds seven troughs). (Estimate excludes garden usage, so likely to be higher).

Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Water for stock and sometimes for garden irrigation
Detail all other water sources for property:	One other bore, no dams. Rainwater used at house.
Typical pumping rate of bore (L/s):	Interviewee believes set at 600 gallons an hour (0.63 L/s)
Does this rate vary annually or can the pump rate be varied?:	As set, has not been changed.
Typical duration and frequency of pumping: (any seasonal variations?)	Automatic top up, pump switches on as required.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	Not assessed during site visit. When the bore was installed, testing recorded a maximum flow rate of 1,100 gallons/ hour (1.16 L/s).
Describe riser, headwork and water distribution details:	There is a "Grundfos 40" bore cap. This has a steel outflow with a flow tap valve connected to a 90 degree galvanised steel elbow (approx.. 45 mm). This then connects to a black poly-pipe prior to being buried. This flows to the top of a large plastic storage tank approx. 4m away. In turn this feeds seven troughs. There is a pump under the tank which is understood to pump water to the troughs (could not confirm operation of distribution pump as interviewee was not present when discovered).
Equipment condition:	Appears in good condition, fairly new and well kept. Protected from cattle by a fence.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Drillers log indicates a water level of 14.2m bgl after bore installation. At the time of the site survey, the airline read 40 - 41psi (approximately 29m of water above the airline), however the depth the airline is set is unknown.
Stable pumping water level (m bgl): (measured, including mins after pump on)	not known
Water level measuring point	Airline
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Drillers log indicates a water level of 14.2m bgl after bore installation.
Comments:	Interviewee believes the bore was originally drawing water from 5 "streams" but believes 3 "streams" have been "lost" - presumably referring to water level dropping below slotted intervals. (Interviewee blames mining activities). However there is no water level data to support the theory of the change in water level (or the cause).
Water Sampling Details	
Any historic water quality data available from owner?	Apparently sample taken when drilled - has copy but was not available at the time of the interview (and was not provided in later documentation).
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is well sealed. An barbed wire fence protects the immediate well-head surrounds. There is a storage shed approx. 100m away which appears to contain oil/fuel drums (or similar). A spraying vehicle was also filling up near this barn when we arrived, which could be a source of contaminant.
Water quality sample collected during this assessment?	No, unable to pump (due to automated nature of bore pump operation)
Sample type: (primary, duplicate, field blank)	n.a.
General Comments	
Tried to override the auto system to take a sample and test flow rate, but was unable to do this. Interviewee said that he did not want to tamper with the system further, so no further action was taken and the headworks were reconnected by the interviewee.	

20/06/2013 – Interviewee sent through bore log and information was able to be updated.

Photos

Assessment Details - 105_A342484_02	
Property name:	Hillgrove
Local bore name:	Windmill bore
Registered Number:	Unknown, nearest RN 48110 or 147259
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	20/05/2013 12:00
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	105 a342484
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Farm worker
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing (but not currently used)
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Domestic and backup for stock watering.
GDA Latitude (decimal deg.):	27°22'32.8617"S
GDA Longitude (decimal deg.):	151°40'17.0886"E
Water licence number and details: (if available to view)	Not available at time of interview
Bore Construction Details	
Construction details / log available?	Not available at time of interview
Date Installed:	Early 1900's (anecdotal)
Surface casing dia. (mm), and material:	As per bore bore casing
Bore casing dia. (mm), and material:	In 2012 the original tin casing was replaced with steel casing, as the casing was corroded. Steel measured as approx 165mm diameter.
Bore casing stickup above ground (m):	0.44m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (based on anecdotal information from LH)
Top of screen (m bgl):	Open hole
Bottom of screen (m bgl):	To base of bore (some tin casing may still be down the bore, as not all casing was retrieved.
Top of open hole (m bgl):	6m (anecdotal), only able to put 6m of new steel casing in the well.
Total depth (m):	600ft (183m)(anecdotal)
Bore Condition Comments:	The new bore surface casing appears to be in a good condition but condition below the surface casing is unknown. Past problems with bore casing suggest likely to be in poor condition. Old casing may still be in bore.
Bore Equipment Details	
Pump Installed?	No, sitting above ground
Pump type, make and model, power source:	Southern Cross windmill, Alderdyce windmill pump.
Date installed:	Current pump: 2004 (anecdotal)
Date of most recent use	Not used since 2011 (anecdotal)
Any repairs?	New buckets installed 2011 (anecdotal)
Pump intake depth (m bgl):	Not currently installed in the bore
Interviewee's est. annual take (ML):	18,000 gallons per year (0.1 ML/yr)
Basis for estimate:	Estimated from size of tanks. Interviewee believed tanks were around 1500 gallons in volume and estimated tanks were 'topped up' with 1500 gallons per month. (Above estimate is considered to be an underestimate given that the bore is allowed to run continuously as suggested below).
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Spraying water and backup stock water for 40 head of cattle

Detail all other water sources for property:	One other bore, no dams. Rainwater used at the house.
Typical pumping rate of bore (L/s):	Dependent on wind conditions
Does this rate vary annually or can the pump rate be varied?:	Dependent on wind conditions
Typical duration and frequency of pumping: (any seasonal variations?)	When working, the bore is allowed to run continuously.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	Not measured (no pump in bore)
Describe riser, headwork and water distribution details:	The bore headwork's (rising main, pump etc) are currently sitting to the side of the bore. Normally, the bore would have an outflow leading off the windmill rising main that would feed to water tanks adjacent the bore. (One fibreglass and one poly tank, both with 1800 gallons storage capacity). Feeds one tank and then overflow to adjoining tank. From the tanks the water is fed to the house garden tap or to one of two troughs.
Equipment condition:	The infrastructure is in place but the bore currently does not have a pump installed.
Comments:	After replacing the old tin casing with steel casing, attempts were made to put the rising main pipes back in the hole, but were unable to complete this due to an obstruction in the bore. The bore has been unequipped since 2011.
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Measured 13.46 m bgl (13.89m below TOC)
Stable pumping water level (m bgl): (measured, including mins after pump on)	n.a.
Water level measuring point	TOC (top of casing)
Interviewee / owner understanding of typical SWL / PWL (m bgl):	90ft (27m) is believed to be the SWL with a 2m drop during pumping (anecdotal from interviewee)
Comments:	Believes mine has had an impact on the water level in the bore and therefore on the rate at which the well pumps.
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	This bore is approx. 70 m from storage sheds, which contains oil drums and apparently chemicals for spraying. Represents a potential source of contamination. LH has attempted to seal bore casing with tape but the tape now has holes in it. Chemicals stored under water tanks (herbicide and wettng agent - see pictures).
Water quality sample collected during this assessment?	No (no pump in the bore)
Sample type: (primary, duplicate, field blank)	n.a.
General Comments	
Six rods above ground approx. 6m each, and one approx. 3m. Alderdyce pump also above ground. Two sample taps below tanks. The second tank does not appear to be currently connected. Details left with interviewee in case bore logs or any other documentation identified (however no information was subsequently received).	
Photos	

Assessment Details – 4_RP27422_01	
Property name:	My Way
Local bore name:	The bore
Registered Number:	Unknown, but believed to be RN107361.
Registered number source: (anecdotal, DNRM records, bore log etc)	Database search
Assessment date and time:	16/05/2013 08:00am
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	4 RP27422
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock and domestic
GDA Latitude (decimal deg.):	27°16'43.6931"S
GDA Longitude (decimal deg.):	151°45'16.6291"E
Water licence number and details: (if available to view)	Not received (but has letter of confirmation somewhere)
Bore Construction Details	
Construction details / log available?	LH has this information but was not available at the time of the interview (and was not received post-interview).
Date Installed:	1998 (anecdotal)
Surface casing dia. (mm), and material:	Same as the bore casing
Bore casing dia. (mm), and material:	150mm, steel
Bore casing stickup above ground (m):	0.35m
Aquifer: (& source of information: log, anecdotal)	Marburg Sandstone (Based on adjacent observation bore water level information and bore depth)
Top of screen (m bgl):	112m bgl (anecdotal)
Bottom of screen (m bgl):	120m bgl (anecdotal)
Top of open hole (m bgl):	n.a.
Total depth (m):	120m anecdotal
Bore Condition Comments:	Bore is in good condition. Bore casing shows surface corrosion but structure appears sound.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Electric submersible, possibly Grundfos 415V, public (mains) electricity supply.
Date installed:	2002 (anecdotal)
Date of most recent use	15/05/2013
Any repairs?	No
Pump intake depth (m bgl):	100m bgl (anecdotal)
Interviewee's est. annual take (ML):	1 ML (actual take likely to be somewhat higher due to increase in summer pumping)
Basis for estimate:	Two times per week; 5,000 gallons per week. Or, five hours pumping at typical rate indicated below.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock watering, average of 50 head. Toilet flushing and garden watering.
Detail all other water sources for property:	Three dams and one other bore not equipped. Rainwater for domestic use.

Typical pumping rate of bore (L/s):	1.05 L/s (based on LH observation of time to fill 5000 gallon tank, being 5hrs)
Does this rate vary annually or can the pump rate be varied?:	No, as set
Typical duration and frequency of pumping: (any seasonal variations?)	More in the summer, LH estimates around 50 % increase in summer.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	2.14 L/s
Describe riser, headwork and water distribution details:	After a 90 degree elbow on the bore cap, there is an outflow pipe with a valve (which is never touched). This then connects into a black poly pipe which discharges to the top of the water tank approx. 3 m away (5000 gallon tank). This in turn flows to another tank on the other side of the property before being distributed to approx. six troughs.
Equipment condition:	Appears in good condition.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Could not dip (refer above)
Stable pumping water level (m bgl): (measured, including mins after pump on)	Not measured
Water level measuring point	n.a.
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Anecdotal from LH: SWL of 86m when the pump was installed, and PWL of 4 m below SWL (after approx. 4 -5 hours of pumping).
Comments:	There is an airline installed in the bore. Reading of around 45 PSI before commencement of pumping (i.e around 31m of water above airline). Some leakage but stabilised around these values. At 8:54 reading 30 PSI (i.e around 21m of water above airline). Airline believed to be set at 100m (anecdotal from LH). Note that the airline figures somewhat contradict the LH estimates of SWL and PWL. If the pump and airline are assumed to be set around the top of the screen (assuming this is around 112m bgl, as described above) then the two sets of estimates are relatively close.
Water Sampling Details	
Any historic water quality data available from owner?	Not available from the current owner. However the owner believes the water quality has deteriorated.
Any account of gas in the bore from interviewee?	Yes, sometimes.
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is close to storage of vehicles and farm machinery.
Water quality sample collected during this assessment?	Yes
Sample type: (primary, duplicate, field blank)	Primary.
General Comments	
Photos	

Property name: My Way		Bore name & RN: The bore		Sampling date: 16/05/2013		Sample collection point: At outflow from head works		Comments:	
Time	Flow Rate (L/s)	pH	Temp (°C)	EC (µS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Water Appearance/Colour	Odour?	TDS (mg/L)
8:11	2.14	7.29	22.5	3766	17.66	-101.2	Clear	none	2588
8:13	1.5	6.88	23.8	3834	13.14	-108.1	Black (see picture)	A little gassy smell	2555
8:15	"	6.83	"	3852	10.05	-108.0	Black but clearing	"	2561
8:24	1.36	6.72	23.9	3895	3.51	-92.3	Clear	"	2587
8:31	"	6.69	24.0	3897	3.28	-91.0	" some black sediment	"	2587
8:37	1.5	6.67	24.0	3895	3.1	-91.0	"	"	2581
8:42	"	6.68	24.0	3893	3.45	-89.4	clear	None	2581
8:46	1.36	6.67	24.0	3892	3.28	-89.5	"	"	2581
8:54	"	6.65	23.8	3883	2.6	-89.7	"	"	"

Total purge time:	43 mins
Estimated total purge volume:	3870 L
Time sample collected:	8:54

Assessment Details - 4_RP27422_02	
Property name:	My Way
Local bore name:	Additional monitoring bore (label on bore cap is "21p")
Registered Number:	Unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	n.a.
Assessment date and time:	16/05/2013 08:50am
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	4 RP27422
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner of the property (but the bore is a New Hope monitoring bore).
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Monitoring
GDA Latitude (decimal deg.):	Easting: 376738
GDA Longitude (decimal deg.):	Northing: 6982063
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	No
Date Installed:	Unknown
Surface casing dia. (mm), and material:	Approx. 140mm, steel
Bore casing dia. (mm), and material:	50mm, PVC
Bore casing stickup above ground (m):	Not recorded (based on photographs, approx. 1m high)
Aquifer: (& source of information: log, anecdotal)	Marburg Sandstone (From NHC database)
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	
Bore Equipment Details	
Pump Installed?	No
Pump type, make and model, power source:	n.a.
Date installed:	n.a.
Date of most recent use	n.a.
Any repairs?	n.a.
Pump intake depth (m bgl):	n.a.
Interviewee's est. annual take (ML):	n.a.
Basis for estimate:	n.a.
Is bore use metered? Give details:	n.a.
Detail specific uses of the bore water:	n.a.
Detail all other water sources for property:	n.a.
Typical pumping rate of bore (L/s):	n.a.
Does this rate vary annually or can the pump rate be varied?:	n.a.
Typical duration and frequency of pumping:	n.a.

(any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	n.a.
Describe riser, headwork and water distribution details:	n.a.
Equipment condition:	n.a.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Water level at 81.71m below TOC at 9:15am but water level still recovering. Ideally the water level should have been measured before, during and after pumping of the D_Ballon_01 bore. However, based on water level measurements between 2007 and 2012 (by New Hope), groundwater levels at the bore have fluctuated between 81.8 and 80.3 m bgl.
Stable pumping water level (m bgl): (measured, including mins after pump on)	Unknown
Water level measuring point	TOC (top of casing)
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Unknown
Comments:	As one of New Hope's monitoring bores, there are a number of recorded water level measurements (see table after questionnaire)
Water Sampling Details	
Any historic water quality data available from owner?	Unknown
Any account of gas in the bore from interviewee?	Unknown
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is well sealed with a tight fitting bore cap. Storage of vehicles and farm machinery within 100m radius of the bore.
Water quality sample collected during this assessment?	No (no pump in the bore)
Sample type: (primary, duplicate, field blank)	n.a.
General Comments	
There was insufficient time to complete a full assessment on this bore.	
Photos	

Assessment Details - 4_RP27422_03	
Property name:	My Way
Local bore name:	Old bore
Registered Number:	Unknown, Closest bore with RN is 107361.
Registered number source: (anecdotal, DNRM records, bore log etc)	Database search
Assessment date and time:	16/05/2013 08:55am
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	4 RP27422
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing but unequipped
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Not currently used
Easting:	376728
Northing	6982006
Water licence number and details: (if available to view)	unknown
Bore Construction Details	
Construction details / log available?	No
Date Installed:	-
Surface casing dia. (mm), and material:	Approx. 140mm (estimated from photos), steel
Bore casing dia. (mm), and material:	As above
Bore casing stickup above ground (m):	Approx 150 – 200mm (estimate from photos)
Aquifer: (& source of information: log, anecdotal)	unknown
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	Old, significant corrosion on casing
Bore Equipment Details	
Pump Installed?	No
Pump type, make and model, power source:	n.a.
Date installed:	n.a.
Date of most recent use	unknown
Any repairs?	n.a.
Pump intake depth (m bgl):	n.a.
Interviewee's est. annual take (ML):	n.a.
Basis for estimate:	n.a.
Is bore use metered? Give details:	n.a.
Detail specific uses of the bore water:	Not used
Detail all other water sources for property:	The working bore on the property is “D_Ballon_01”(refer to that form for details)
Typical pumping rate of bore (L/s):	n.a.
Does this rate vary annually or can the pump rate be varied?:	n.a.
Typical duration and frequency of pumping: (any seasonal variations?)	n.a.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	n.a.
Describe riser, headwork and water distribution details:	n.a.

Equipment condition:	n.a.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Not measured
Stable pumping water level (m bgl): (measured, including mins after pump on)	n.a.
Water level measuring point	n.a.
Interviewee / owner understanding of typical SWL / PWL (m bgl):	n.a.
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	
Any account of gas in the bore from interviewee?	
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	
Water quality sample collected during this assessment?	
Sample type: (primary, duplicate, field blank)	
General Comments	
Due to time constraints only pictures and coordinates for this bore were taken. Some of the missing data for this bore may be available from the landholder but there was insufficient time to collect this at the time of the assessment.	
Photos	

Assessment Details - 2_RP49235_01	
Property name:	Glenoma
Local bore name:	Unequipped stock bore
Registered Number:	Unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM Database search
Assessment date and time:	10/05/2013
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	2 RP49235
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing but unequipped and has never being used.
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	If needed would be a stock bore.
GDA Latitude (decimal deg.):	27°19'04.5219"S
GDA Longitude (decimal deg.):	151°37'27.3298"E
Water licence number and details: (if available to view)	B94801 (copies taken)
Bore Construction Details	
Construction details / log available?	Yes, copy taken.
Date Installed:	05/12/1995 (bore log)
Surface casing dia. (mm), and material:	Steel 160mm diameter (OD)
Bore casing dia. (mm), and material:	As above
Bore casing stickup above ground (m):	0.39m
Aquifer: (& source of information: log, anecdotal)	Basalt (Bore log and anecdotal)
Top of screen (m bgl):	At intervals from 33-38m, 40-41m, 44-55m, 74-76m and 82-84m
Bottom of screen (m bgl):	As above
Top of open hole (m bgl):	NA
Total depth (m):	91m
Bore Condition Comments:	Bore is stored with an old oil drum covering it. It was drilled but then left unequipped as alternate bore drilled and used instead (d_janetski_02).
Bore Equipment Details	
Pump Installed?	No, never been equipped.
Pump type, make and model, power source:	NA
Date installed:	NA
Date of most recent use	NA
Any repairs?	NA
Pump intake depth (m bgl):	NA
Interviewee's est. annual take (ML):	NA
Basis for estimate:	NA
Is bore use metered? Give details:	NA
Detail specific uses of the bore water:	NA
Detail all other water sources for property:	3 bores total (2 equipped), 2 dams, rain water for domestic use.
Typical pumping rate of bore (L/s):	NA
Does this rate vary annually or can the pump rate be varied?:	NA
Typical duration and frequency of	NA

pumping: (any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	NA
Describe riser, headwork and water distribution details:	Open casing. Steel brace is supported on two planks of wood.
Equipment condition:	
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	23.35mbgl (measured ToC 23.74 m)
Stable pumping water level (m bgl): (measured, including mins after pump on)	NA
Water level measuring point	Top of casing
Interviewee / owner understanding of typical SWL / PWL (m bgl):	2006 SWL - 20.6mgl (anecdotal from LH)
Comments:	1995 SWL - 19.6 m bgl (according to bore log)
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Open and only covered with old oil drum.
Water quality sample collected during this assessment?	No
Sample type: (primary, duplicate, field blank)	NA
General Comments	
Photos	

Assessment Details - 2_RP49235_02	
Property name:	Glenoma
Local bore name:	Irrigation bore
Registered Number:	94285 (drill log)
Registered number source: (anecdotal, DNRM records, bore log etc)	Unknown
Assessment date and time:	10/05/2013
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	2 RP49235
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Irrigation. For up to 50 acres.
GDA Latitude (decimal deg.):	27°19'06.6639"S
GDA Longitude (decimal deg.):	151°37'31.5359"E
Water licence number and details: (if available to view)	94285R (copy taken), valid 10/07/2012 until 31/07/2022. Entitlement volume 54 ML/yr
Bore Construction Details	
Construction details / log available?	Yes
Date Installed:	9/12/95 (bore log)
Surface casing dia. (mm), and material:	152mm (6 inch casing), steel
Bore casing dia. (mm), and material:	102mm (4 inch riser), steel
Bore casing stickup above ground (m):	0m (anecdotal from LH)
Aquifer: (& source of information: log, anecdotal)	Basalt (Bore log and anecdotal)
Top of screen (m bgl):	46mbgl (bore log)
Bottom of screen (m bgl):	60mbgl (bore log)
Top of open hole (m bgl):	NA
Total depth (m):	60.6m (drilled to 89m then backfilled)(bore log)
Bore Condition Comments:	Bore casing is flush to ground (anecdotal and the headworks cover this). Steel head works. Unable to see condition of bore
Bore Equipment Details	
Pump Installed?	Yes.
Pump type, make and model, power source:	Vertical rotor. Unknown make and model. Diesel engine is 2 cylinder (Deutz, see pictures).
Date installed:	Anecdotal: 20/12/95
Date of most recent use	Wednesday 8th May 5pm.
Any repairs?	1996/1997. Whip shaft rod replaced. (anecdotal)
Pump intake depth (m bgl):	Anecdotal 46m
Interviewee's est. annual take (ML):	17.4 ML
Basis for estimate:	As a complete maximum estimate: 15 hours a day, 3,400 gallons an hour (12,870 L/hr) for all irrigation, 3 months a year.
Is bore use metered? Give details:	No, installed but not working.
Detail specific uses of the bore water:	Irrigation
Detail all other water sources for property:	3 bores total (2 equipped), 2 dams, rain water for domestic.
Typical pumping rate of bore (L/s):	3 L/s
Does this rate vary annually or can the pump rate be varied?:	Depends on number of sprinklers. Max 4,000 gallons an hour (4.2 L/s)

Typical duration and frequency of pumping: (any seasonal variations?)	5 hour shifts 15 hour days, 3 months of the year.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	5 L/s
Describe riser, headwork and water distribution details:	The bore is sealed. There is a diesel engine that drives the motor approximately 2 m away. Outflow from the bore is just above the bore cap and is taken away from the bore in 90mm diameter piping. Pipe run underground and is connected to another paddock for irrigation. There is an off take from the buried pipe on the other side of the bore which is used for irrigating the surrounding field. LH turns off this off take hydrant when he wants to irrigate the other field.
Equipment condition:	Fairly old. Diesel engine appears to be leaking
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	No airline and not able to dip
Stable pumping water level (m bgl): (measured, including mins after pump on)	NA
Water level measuring point	NA
Interviewee / owner understanding of typical SWL / PWL (m bgl):	No. SWL - 31.4 mbgl from logs when drilled.
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Once years ago. Not available when original bore put in (1982).
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Diesel engine very close to the bore appears to have leaked at some point over time. Fuel for engine is stored in white tank by bore. Lubricants and other unlabelled storage vessels are present, which could lead to contamination. Abandoned bore next to current is still open. Covered by 2 wooden stakes and oil drum, potential route for fast track contamination to the aquifer (diesel on floor around these bores).
Water quality sample collected during this assessment?	Yes
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Difficult to take sample. Had to get the LH to disconnect multiple connections and very difficult to do without damaging the farmers crop. Was not able to take multiple WQ samples due to the difficulty of disconnecting head works. Could not pump for long while disconnected, because the force of the water would start to damage crops. Abandoned bore (also drilled and constructed when this bore was installed) is located 0.5m away from current bore and is still open (covered by plank of wood). It is understood that this bore was not plumb and diviner said this location would yield quantities wanted. It was drilled but didn't yield what was expected, so a D_Janetzki_02 was drilled and used as supply bore.	
Photos	

Property name: Glenoma		Bore name & RN: Irrigation Bore		Sampling date: 10/05/2013		Sample collection point: At disconnected section on irrigation pipe		Comments:	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance/ Colour**	**Odour ?**	**TDS (mg/L)**
Pump start 8:40 and stopped at 8:48									
Restarted at 9:04 and sampled at 9:05	4	7.39	22.1	2557	4.91	16.4	Clear, a few grains of sediment in bucket	None	1761
Pump off and reconnected									
Restarted at 9:08									
Pump stopped at 9:25									
Disconnected irrigation and restarted pump to collect sample.									
Restarted at 9:34									
9:37	4	7.36	22.1	2299	1.98	20.5	Clear	None	1579
Total purge time:			31 mins						
Estimated total purge volume:			7440 L						
Time sample collected:			9:37						

Assessment Details - 1_RP809648_01	
Property name:	Glenoma
Local bore name:	Submersible
Registered Number:	NA
Registered number source: (anecdotal, DNRM records, bore log etc)	Unknown
Assessment date and time:	10/05/2013
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	1 RP809648
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock
GDA Latitude (decimal deg.):	27°18'57.2377"S
GDA Longitude (decimal deg.):	151°37'09.5576"E
Water licence number and details: (if available to view)	B86989 (copy taken)
Bore Construction Details	
Construction details / log available?	Yes, see bore log.
Date Installed:	31/08/1991 (bore log)
Surface casing dia. (mm), and material:	Anecdotal: 15 feet deep (4.6m), approximately 145mm diameter. Steel casing got stuck when trying to remove during drilling, so remained in place and welded to bore casing.
Bore casing dia. (mm), and material:	Steel, approximately 140mm
Bore casing stickup above ground (m):	0.34m
Aquifer: (& source of information: log, anecdotal)	Basalt (Bore log and anecdotal)
Top of screen (m bgl):	See bore log. Intervals: 27.5-33m, 46-49m, 58-62m, 83-87m.
Bottom of screen (m bgl):	As above
Top of open hole (m bgl):	NA
Total depth (m):	92.5m (bore log)
Bore Condition Comments:	Bore is corroded but in good condition. Structure is good. Has a clamp holding the surface casing in place. Surface and bore casing welded together.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Submersible, unknown make and model, public electric supply.
Date installed:	Current pump installed Nov 2006. Previous pump was installed in bore when drilled
Date of most recent use	Daily when water level in tank drops (auto top up system)
Any repairs?	None
Pump intake depth (m bgl):	85mbgl (anecdotal from LH)
Interviewee's est. annual take (ML):	0.015 ML
Basis for estimate:	60-80 cattle 20-40 litres per day all year round. Based on LH estimates of cattle consumption on land.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Water for 60-80 cattle
Detail all other water sources for property:	3 bores total(2 equipped), 2 dams, rain water for domestic.

Typical pumping rate of bore (L/s):	As set on day of visit (during pump test when drilled = 1.14 L/s)
Does this rate vary annually or can the pump rate be varied?:	No
Typical duration and frequency of pumping: (any seasonal variations?)	Auto top up on tank, so when needed the pump is automatically turned on. More taken in winter, less in summer
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	0.71 L/s
Describe riser, headwork and water distribution details:	At the top of the bore on the casing cap the water flows through a galvanised steel pipe and valve, which connects to a black poly pipe at 90 degree angle and become buried. Water is directed approximately 300m to storage tank towards the house. Concrete tank 20,000 gallon capacity (75 m^3) but only use 10,000 due to cracks.
Equipment condition:	Fair condition. Casing old but the bore is in a good condition
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Nov 2006 = 25mbgl. 1991 = 22.8mbgl (bore log) Unable to dip during assessment.
Stable pumping water level (m bgl): (measured, including mins after pump on)	NA
Water level measuring point	NA
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Unknown
Comments:	Airline reading after 10 mins pumping = 36 psi. LH turned bore on before SWL pressure could be taken. Unknown airline depth, anecdotal from LH near the pump. At 11:00 = 34psi
Water Sampling Details	
Any historic water quality data available from owner?	Possibly but owner unsure
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore has a steel cap, so if fairly well sealed but can be lifted off. Some gaps in lid for cables. Wire cage around bore to protect from cattle
Water quality sample collected during this assessment?	Yes
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Owner has been at property since 1970.	
Photos	

Property name: Glenoma		Bore name & RN: Submersible		Sampling date: 10/05/2013		Sample collection point: At outflow from bore headworks		Comments:	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance/Colour**	**Odour?**	**TDS (mg/L)**
10:20	0.71	7.8	22.2	939	2.22	-128.6	Slight discolouring. yellow	none	643
10:32	0.71	7.67	22.3	978	1.61	-122.3	Clearing	"	669
10:40	"	7.65	22.2	968	1.83	-118.7	clear	"	663
10:49	"	7.65	22.2	922	1.77	-128.5	Slightly discoloured	"	630
10:54	"	7.65	22.2	916	1.56	-127.1	clearer	"	630
11:00	"	7.66	22.1	913	1.16	-116.1	"	"	630

Total purge time:	40 mins
Estimated total purge volume:	1704 L
Time sample collected:	11:00

Assessment Details - 1_RP809648_02	
Property name:	Glenoma
Local bore name:	Unknown
Registered Number:	Unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	Unknown
Assessment date and time:	10/05/2013
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	1 RP809648
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Abandoned, possible destroyed (unable to located bore casing)
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Unknown
Easting:	363600E
Northing:	6977763N
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	No
Date Installed:	Unknown
Surface casing dia. (mm), and material:	Unknown
Bore casing dia. (mm), and material:	Unknown
Bore casing stickup above ground (m):	Unknown
Aquifer: (& source of information: log, anecdotal)	Unknown
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	Unknown
Bore Equipment Details	
Pump Installed?	No
Pump type, make and model, power source:	NA
Date installed:	NA
Date of most recent use	NA
Any repairs?	NA
Pump intake depth (m bgl):	NA
Interviewee's est. annual take (ML):	NA
Basis for estimate:	NA
Is bore use metered? Give details:	NA
Detail specific uses of the bore water:	NA
Detail all other water sources for property:	
Typical pumping rate of bore (L/s):	NA
Does this rate vary annually or can the pump rate be varied?:	NA
Typical duration and frequency of pumping:	NA

(any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	NA
Describe riser, headwork and water distribution details:	NA
Equipment condition:	NA
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	NA
Stable pumping water level (m bgl): (measured, including mins after pump on)	NA
Water level measuring point	NA
Interviewee / owner understanding of typical SWL / PWL (m bgl):	NA
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	NA
Any account of gas in the bore from interviewee?	NA
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	NA
Water quality sample collected during this assessment?	No
Sample type: (primary, duplicate, field blank)	NA
General Comments	
Bore Location was described by the LH. This bore is abandoned and unable to locate the bore casing. Believed destroyed.	
Photos	

Assessment Details - 1_RP809648_03	
Property name:	Glenoma
Local bore name:	
Registered Number:	Unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	Unknown
Assessment date and time:	10/05/2013
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	1 RP809648
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Abandoned
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Not used
GDA Latitude (decimal deg.):	363503E
GDA Longitude (decimal deg.):	6977797N
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	No
Date Installed:	Unknown
Surface casing dia. (mm), and material:	Unable to measure
Bore casing dia. (mm), and material:	Unable to measure
Bore casing stickup above ground (m):	Unable to measure
Aquifer: (& source of information: log, anecdotal)	Unknown
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	Unknown
Bore Equipment Details	
Pump Installed?	No
Pump type, make and model, power source:	NA
Date installed:	NA
Date of most recent use	NA
Any repairs?	NA
Pump intake depth (m bgl):	NA
Interviewee's est. annual take (ML):	NA
Basis for estimate:	NA
Is bore use metered? Give details:	NA
Detail specific uses of the bore water:	NA
Detail all other water sources for property:	NA
Typical pumping rate of bore (L/s):	NA
Does this rate vary annually or can the pump rate be varied?:	NA
Typical duration and frequency of pumping:	NA

(any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	NA
Describe riser, headwork and water distribution details:	NA
Equipment condition:	NA
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	NA
Stable pumping water level (m bgl): (measured, including mins after pump on)	NA
Water level measuring point	NA
Interviewee / owner understanding of typical SWL / PWL (m bgl):	NA
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Unknown
Any account of gas in the bore from interviewee?	Unknown
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is covered by what appears to be an old tin.
Water quality sample collected during this assessment?	No
Sample type: (primary, duplicate, field blank)	NA
General Comments	
Bore was covered by tin can and I was unable to take this off the bore. LH did not list this as an existing bore on property. Limited time was available when assessing this bore, so only basic information was recorded.	
Photos	

Assessment Details – 87AG105_01	
Property name:	Mooroomba
Local bore name:	Referred to as the "mines bore" but owner does not have name for bore.
Registered Number:	Unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	
Assessment date and time:	21/05/2013 08:00
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	87AG105
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Half owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing bore but not used.
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Never been used. This bore was initially installed by the mine and since been donated to LH (anecdotal)
GDA Latitude (decimal deg.):	27° 20'49.2276"S
GDA Longitude (decimal deg.):	151° 47'21.2668"E
Water licence number and details: (if available to view)	Not available
Bore Construction Details	
Construction details / log available?	Not available on day
Date Installed:	31/10/2006
Surface casing dia. (mm), and material:	PVC 140mm
Bore casing dia. (mm), and material:	As above
Bore casing stickup above ground (m):	0.2 m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (anecdotal from LH)
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	9.1mbgl (anecdotal)
Total depth (m):	54 m (anecdotal)
Bore Condition Comments:	Bore casing is broken above ground. LH knocked when slashing.
Bore Equipment Details	
Pump Installed?	No
Pump type, make and model, power source:	NA
Date installed:	NA
Date of most recent use	NA
Any repairs?	NA
Pump intake depth (m bgl):	NA
Interviewee's est. annual take (ML):	NA
Basis for estimate:	NA
Is bore use metered? Give details:	NA
Detail specific uses of the bore water:	NA
Detail all other water sources for property:	No working bores, 1 dam. Water supplied from Eden Farm (brothers farm).
Typical pumping rate of bore (L/s):	NA
Does this rate vary annually or can the pump rate be varied?:	NA
Typical duration and frequency of pumping:	NA

(any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	NA
Describe riser, headwork and water distribution details:	NA
Equipment condition:	NA
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	9.54mbToC measured (9.34mbgl)
Stable pumping water level (m bgl): (measured, including mins after pump on)	Unknown
Water level measuring point	Top of casing
Interviewee / owner understanding of typical SWL / PWL (m bgl):	LH believed SWL is 7mbgl
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Mine collected samples (anecdotal)
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore casing cracked and not capped in an open field, potential for contamination.
Water quality sample collected during this assessment?	No
Sample type: (primary, duplicate, field blank)	NA
General Comments	
No bores on this property are currently used. Water is piped from family property nearby from a productive bore.	
Photos	

Assessment Details - 1708A34828_01	
Property name:	Mooroomba
Local bore name:	The old mill
Registered Number:	Unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	
Assessment date and time:	21/05/13 9:15am
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	1708A34828
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Half owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing bore but unequipped and not operational. Windmill last used in 1978.
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Bore water was used for stock watering.
GDA Latitude (decimal deg.):	27°19'32.5407"S
GDA Longitude (decimal deg.):	151°47'38.5418"E
Water licence number and details: (if available to view)	NA
Bore Construction Details	
Construction details / log available?	Not available on day
Date Installed:	1960 anecdotal
Surface casing dia. (mm), and material:	125mm steel
Bore casing dia. (mm), and material:	As above
Bore casing stickup above ground (m):	0.18m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (anecdotal from LH)
Top of screen (m bgl):	40.67mbgl (2m of screen from TD (anecdotal))
Bottom of screen (m bgl):	42.67mbgl (anecdotal)
Top of open hole (m bgl):	NA
Total depth (m):	42.67 m (140ft deep (7 lengths of 20 ft)) (anecdotal)
Bore Condition Comments:	Bore is old but is in fairly good condition above ground. Corroded but structure seems good.
Bore Equipment Details	
Pump Installed?	No
Pump type, make and model, power source:	NA
Date installed:	NA
Date of most recent use	NA
Any repairs?	NA
Pump intake depth (m bgl):	NA
Interviewee's est. annual take (ML):	NA
Basis for estimate:	NA
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	NA
Detail all other water sources for property:	No working bores, 1 dam. Water supplied from Eden Farm (brothers farm).
Typical pumping rate of bore (L/s):	NA
Does this rate vary annually or can the pump rate be varied?:	NA
Typical duration and frequency of	NA

pumping: (any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	NA
Describe riser, headwork and water distribution details:	Surface casing, uncapped. The windmill structure is there but not usable.
Equipment condition:	NA
Comments:	Doesn't anticipate using this bore any time in the future. When bore was in use in 1978, it was the only bore supplying land.
Water Details	
Standing water level (m bgl): (measured or anecdotal)	15.6mbgl (15.78mbToC) measured
Stable pumping water level (m bgl): (measured, including mins after pump on)	Unknown
Water level measuring point	Top of casing
Interviewee / owner understanding of typical SWL / PWL (m bgl):	NA
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Yes
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is blocked by a piece of wood but unsealed.
Water quality sample collected during this assessment?	No
Sample type: (primary, duplicate, field blank)	NA
General Comments	
There is an old hand dug well approximately 10m away. LH has covered with old bore tank pieces (see photos). Believed to be 150ft deep.	
Photos	

Assessment Details - 1708A34828_02	
Property name:	Mooroomba
Local bore name:	Holm Park bore
Registered Number:	Unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	Unknown
Assessment date and time:	21/05/2013 10:00
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	1708A34828
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Half owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing bore but no longer used. Windmill not operational. Last used 1975.
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Bore water was used for stock and garden water.
GDA Latitude (decimal deg.):	27°19'53.6246"S
GDA Longitude (decimal deg.):	151°47'26.7874"E
Water licence number and details: (if available to view)	Not available
Bore Construction Details	
Construction details / log available?	Not available
Date Installed:	Approximately 200 years ago (anecdotal from LH)
Surface casing dia. (mm), and material:	Re-cased 1960. Steel 125mm diameter.
Bore casing dia. (mm), and material:	As above
Bore casing stickup above ground (m):	0.44m
Aquifer: (& source of information: log, anecdotal)	Unknown
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	122m (Anecdotal 400ft)
Bore Condition Comments:	New casing but inside old casing. Before windmill used to have a steam pump.
Bore Equipment Details	
Pump Installed?	Yes but not used.
Pump type, make and model, power source:	2 inch dual plunger, anecdotal. Windmill structure in place but does not appear in working order.
Date installed:	1970 (anecdotal)
Date of most recent use	1975 (anecdotal)
Any repairs?	No
Pump intake depth (m bgl):	61mbgl (200ft anecdotal)
Interviewee's est. annual take (ML):	NA
Basis for estimate:	NA
Is bore use metered? Give details:	NA
Detail specific uses of the bore water:	NA
Detail all other water sources for property:	No working bores, 1 dam. Water supplied from Eden Farm (brothers farm).
Typical pumping rate of bore (L/s):	NA
Does this rate vary annually or can the pump rate be varied?:	NA
Typical duration and frequency of pumping:	NA

(any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	NA
Describe riser, headwork and water distribution details:	Pump and windmill pipe is still in bore but the windmill is not usable and there is no infrastructure above ground if the bore was working.
Equipment condition:	Bore and windmill are old, there is some corrosion on windmill casing, structure compromised.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Unable to dip
Stable pumping water level (m bgl): (measured, including mins after pump on)	Unknown
Water level measuring point	NA
Interviewee / owner understanding of typical SWL / PWL (m bgl):	55mbgl (180ft anecdotal standing water level)
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Yes
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is open. Some scrap cars nearby and storage sheds. Potential source of contaminant.
Water quality sample collected during this assessment?	No
Sample type: (primary, duplicate, field blank)	NA
General Comments	
Photos	

Assessment Details - 18_RP36468_01	
Property name:	Homeward
Local bore name:	Paddock Cuskellys Bore
Registered Number:	Unknown (nearest registered bores 61033 or 66782)
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM Database search
Assessment date and time:	16/05/2013 1:00pm
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	17 RP36468
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Son of owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing windmill
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock
GDA Latitude (decimal deg.):	27°20'56.0504"S
GDA Longitude (decimal deg.):	151°37'48.3950"E
Water licence number and details: (if available to view)	Not available
Bore Construction Details	
Construction details / log available?	Not available
Date Installed:	Unknown
Surface casing dia. (mm), and material:	Steel, approximately 140mm diameter
Bore casing dia. (mm), and material:	As above
Bore casing stickup above ground (m):	Actual stickup =0.4m. SWL measured from side of casing where corroded and could gain access, which sticks up approx. 0.09m
Aquifer: (& source of information: log, anecdotal)	Unknown
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	Bore is heavily corroded and its structure is compromised
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	2 ½ inch windmill pump, unknown model and make, wind
Date installed:	Unknown, not touched since bought property 6 years ago.
Date of most recent use	Bore has been not been in use for 2 months, as no stock.
Any repairs?	No
Pump intake depth (m bgl):	18 mbgl to pump. Anecdotal based on interviewee calculation of the number of rods in the well.
Interviewee's est. annual take (ML):	Unknown
Basis for estimate:	Approximately 80 head of cattle in field for approximately 4 months of year. Runs continuously for this period.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock water only
Detail all other water sources for property:	9-10 working bores, 3-4 dams and use creek for some stock.
Typical pumping rate of bore (L/s):	As wind blows.
Does this rate vary annually or can the	Bore is turned off if it overflows.

pump rate be varied?:	
Typical duration and frequency of pumping: (any seasonal variations?)	4 months of year
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	NA, no wind and couldn't measure at outflow.
Describe riser, headwork and water distribution details:	The riser from the windmill (approx. 47 mm diameter) is secured in place at the top of the bore with steel headworks. The outflow for the windmill is just above this clamp and water is diverted to a steel pipe (approximately 40mm diameter). This connects to a black poly pipe approximately 40mm diameter which is buried and directs water to the green storage tank approximately 30m away. Black poly pipe that enters the tank at the top and flows from tank to trough for stock water under gravity
Equipment condition:	Windmill appears in good condition. The windmill pipe is corroded but is in good condition.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	13.01mbgl (13.10mbToC). Did not measure total depth as there was some friction on dipper around the SWL. Could be a blockage or casing collapse.
Stable pumping water level (m bgl): (measured, including mins after pump on)	NA
Water level measuring point	Corroded entry point on casing
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Interviewee assumes SWL is around 12m based on number of rods in well.
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore casing is highly corroded and has holes in the side of casing above ground. This could easily result in the introduction of insects and small animals to the bore
Water quality sample collected during this assessment?	No, wind only blew for 5 mins when at site then stopped completely.
Sample type: (primary, duplicate, field blank)	NA
General Comments	
Interview for all 3 bores scheduled for assessment had to be conducted when arrived at property in first 30 mins as interviewee had other work to do.	
Photos	

Assessment Details - 18_RP36468_02	
Property name:	Homeward
Local bore name:	House Paddock bore
Registered Number:	Unknown, but believed to be RN 83238
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM Database search
Assessment date and time:	16/05/13 11:00
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	18 RP36468
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Son of owner
Bore Details	
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock
GDA Latitude (decimal deg.):	27°20'14.6203"S
GDA Longitude (decimal deg.):	151°37'53.1116"E
Water licence number and details: (if available to view)	Not available
Bore Construction Details	
Construction details / log available?	Not available
Date Installed:	1980's (Anecdotal, LH has only owned plot for 6-7 years)
Surface casing dia. (mm), and material:	150mm White PVC
Bore casing dia. (mm), and material:	As above
Bore casing stickup above ground (m):	0.38m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (DNRM database search)
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	Bore structure in good condition. Side of bore next to engine is stained by either the generator fumes or from oil/ diesel. This can also be seen around the top of the bore
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Diesel motor with jet pump
Date installed:	1980's (anecdotal)
Date of most recent use	8/05/13
Any repairs?	Pump motor replaced 4 years ago
Pump intake depth (m bgl):	Unknown. Never lifted pump.
Interviewee's est. annual take (ML):	0.416 ML
Basis for estimate:	8,000 L per week all year. Anecdotal from interviewee based on how many times he tops up tanks.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Approximately 80 head of stock for 4 months of year
Detail all other water sources for property:	9-10 working bores, 3-4 dams and use the creek for some stock.
Typical pumping rate of bore (L/s):	5.25 L/s (Anecdotal 5,000 gallons/hour)
Does this rate vary annually or can the pump rate be varied?:	Can be varied and is varied but tends to be as assessment rate
Typical duration and frequency of	Depends on demand for water. More in summer and less in winter (anecdotal)

pumping: (any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	0.625 L/s (from sample tap)
Describe riser, headwork and water distribution details:	The diesel motor powers the jet pump. There are two poly pipes in the bore, one connected to the pump engine and the other an outflow (approximately 34mm and 40mm diameter, see pictures). The outflow is a galvanised steel pipe (40mm diam). The outflow runs to the ground past a valve and then splits into two perpendicular poly pipe outflows. The outflow feeds two tanks one approximately 1 km away (10,000 gallons) for purely stock. And another 2km towards the house (3,000 gallons), used for stock and some domestic use. Before the outflow reaches ground level, there is a T joint with a sample tap.
Equipment condition:	Diesel engine in good working order but appears to be leaking.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	17.95mbgl (Measured 18.33mbToC)
Stable pumping water level (m bgl): (measured, including mins after pump on)	18.19mbgl (measured 18.57mbToC at 11:24am)
Water level measuring point	Top of casing
Interviewee / owner understanding of typical SWL / PWL (m bgl):	
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	Sulphur rotten egg (H_2S smell at times from this bore)
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Yes, diesel motor has leaked and the floor around the bore is covered in oil and diesel fuel. There are a number of fuel cans in the shelter next to the bore. The position of the pump means that it is nearly over the bore and fluids could fall in the bore. Bore is open.
Water quality sample collected during this assessment?	Yes, during the test water was taken from the sample tap and all outflows to the bore were switched off.
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
The flow rate was taken from the sample tap, which is likely to be a restricted flow.	
Photos	

Assessment Details - 18_RP36468_03	
Property name:	Homeward
Local bore name:	Unknown
Registered Number:	Unknown, but believed to be RN 55126
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM Database search
Assessment date and time:	16/05/2013 3:30pm
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	18 RP36468
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Son of owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing but not used.
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Never been used by current owners (purchased land in 1996)
GDA Latitude (decimal deg.):	27°20'31.5464"S
GDA Longitude (decimal deg.):	151°38'02.8315"E
Water licence number and details: (if available to view)	Not available
Bore Construction Details	
Construction details / log available?	No
Date Installed:	Unknown
Surface casing dia. (mm), and material:	Steel, approximately 120mm
Bore casing dia. (mm), and material:	As above
Bore casing stickup above ground (m):	0.33m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (DNRM database search)
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	Bore is old and corroded but structure is still in a good condition.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Windmill , unknown, wind
Date installed:	Unknown
Date of most recent use	Unknown
Any repairs?	Unknown
Pump intake depth (m bgl):	Unknown
Interviewee's est. annual take (ML):	NA
Basis for estimate:	NA
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	NA
Detail all other water sources for property:	9-10 working bores, 3-4 dams and use the creek for some stock.
Typical pumping rate of bore (L/s):	NA
Does this rate vary annually or can the pump rate be varied?:	NA
Typical duration and frequency of pumping:	NA

(any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	NA
Describe riser, headwork and water distribution details:	Bore casing is held in place by a surface clamp. The windmill pipes are held in the bore attached to a wooden beam. The outflow leads to a galvanised steel pipe that appears to run just under the surface vegetation. Outflow from this pipe is unknown.
Equipment condition:	Windmill equipment is still in bore. Interviewee believes a storm blew windmill over and the windmill pump and rods are still in the bore.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Attempted to dip but obstructions in bore prevented measurements.
Stable pumping water level (m bgl): (measured, including mins after pump on)	NA
Water level measuring point	Top of casing
Interviewee / owner understanding of typical SWL / PWL (m bgl):	NA
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is open and unprotected. Vegetation grown up around bore.
Water quality sample collected during this assessment?	No
Sample type: (primary, duplicate, field blank)	NA

General Comments

LH did have other bores on the property but was unable to contact when finished with this bore.

Attempted to contact LH about accessing other bores but he was at appointment in Toowoomba and could not assist. He explained where other bore was but was unable to answer any questions.

Photos

Assessment Details - 23_D361484_01	
Property name:	Kurrajong
Local bore name:	The cottage bore
Registered Number:	Unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	n.a.
Assessment date and time:	14/05/2013
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	23 D361484
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock
GDA Latitude (decimal deg.):	27°16'40.9475"S
GDA Longitude (decimal deg.):	151°37'14.0470"E
Water licence number and details: (if available to view)	B87927 (see copy)
Bore Construction Details	
Construction details / log available?	Yes (see copy)
Date Installed:	13/12/1993 (from drillers log)
Surface casing dia. (mm), and material:	Same as bore casing
Bore casing dia. (mm), and material:	150mm, PVC
Bore casing stickup above ground (m):	0.24m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (estimate from bore depth and lithology in drillers log)
Top of screen (m bgl):	Screened intervals: 11.6-12.8m and 15.7-17.3m (from drillers log)
Bottom of screen (m bgl):	See above
Top of open hole (m bgl):	n.a.
Total depth (m):	22.8m (from drillers log)
Bore Condition Comments:	Bore appears to be in good condition
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Electric submersible, based on plate on control panel likely to be a Grundfos M2, 1.2 kW, 240V public (mains) supply.
Date installed:	1997 (anecdotal)
Date of most recent use	07/05/13
Any repairs?	No
Pump intake depth (m bgl):	LH does not know
Interviewee's est. annual take (ML):	0.7 ML (likely to higher due to increase use in summer)
Basis for estimate:	Approximately 45 cows and 2 horses year round. LH 'When the tank is down he switches on to top up' (7,000 gallon tank). 4 hours pumping every 10 days.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock (45 cows and 2 horses).
Detail all other water sources for property:	Windmill bore, 2 x dams, rainwater for domestic use.
Typical pumping rate of bore (L/s):	Was set at 1,200 gallons an hour (approx. 1.3 L/s) but LH not sure if doing that currently. This estimate appears correct, based on flow measurements conducted during this assessment.
Does this rate vary annually or can the pump rate be varied?:	No
Typical duration and frequency of pumping: (any seasonal variations?)	When hot pumps more frequently, e.g. in summer tops up tank for 4 hours every 7 days.
Measured Maximum Flow Rate of Bore	1.5 L/s

and Headworks at Site Visit (L/s)	
Describe riser, headwork and water distribution details:	A steel bore plate sits over PVC casing (which is fairly well sealed where the electric cables enter the bore). A 90 degree galvanised steel elbow (approx. 60mm diam.) connects to the bore plate, which in turn passes through a pressure gauge (not working) and then a valve before another galvanised steel 90 degree elbow, which is connected to black polypipe (approx. 40mm diam). The poly pipe becomes buried and leads to a 7,000 gallon tank around 200m away. This tank gravity feeds the water troughs.
Equipment condition:	Appears in good condition
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	9.1m bgl (13/12/1993), from drillers log.
Stable pumping water level (m bgl): (measured, including mins after pump on)	Not able to be measured
Water level measuring point	n.a.
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Not known
Comments:	Could not dip because of bore cap and insufficient space in the bore headworks.
Water Sampling Details	
Any historic water quality data available from owner?	No, although local school took some for a school project (unavailable however).
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is well sealed but there are a number of scrap vehicles nearby and a storage shed adjacent the bore (with a dirt floor) which contains a quad bike and other farm equipment. A large generator sits within 5m of the bore (not known if this is permanent). Several 44 gallon drums adjacent shed (unknown use). In summary, some potential for sources of contaminants.
Water quality sample collected during this assessment?	Yes, from headwork's outflow.
Sample type: (primary, duplicate, field blank)	Primary

General Comments

Difficulty taking flow rate and water sample. (No place to sample at the outflow tank and not easy to access). Had to turn the pump on and off to connect and disconnect headworks, due to proximity of the bore to the cottage. LH did not want the bore to flow near the cottage for any length of time, so water was pumped to the storage tank and the headworks were disconnected when samples or flow rates were required. Therefore limited field water quality readings were able to be taken during this assessment.

Photos

Property name: Kurrajong		Bore name & RN: The cottage bore		Sampling date: 14/05/2013		Sample collection point: Outflow from head works		Comments:	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance/Colour**	**Odour?**	**TDS (mg/L)**
8:40	1.36	7.66	21.1	1845	12.16	52	Clear	None	1203
8:49	1.36	6.83	21.7	1665	8.92	63.2	Clear	None	1157
9:05	1.5	6.91	21.8	1797	5.32	79.5	"	"	1170
9:25	1.36	7.00	21.7	1699	5.11	86.3	"	"	1177

Total purge time:	Approx. 45mins
Estimated total purge volume:	3780 L
Time sample collected:	9:25

Assessment Details - 23_D361484_02	
Property name:	Kurrajong
Local bore name:	Windmill
Registered Number:	64280
Registered number source: (anecdotal, DNRM records, bore log etc)	Nearest RN on database search and as recorded on drillers log
Assessment date and time:	14/05/2013
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	23 D361484
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock
GDA Latitude (decimal deg.):	27°16'53.2536"S
GDA Longitude (decimal deg.):	151°37'27.9851"E
Water licence number and details: (if available to view)	B64280 (see copy)
Bore Construction Details	
Construction details / log available?	Yes (see copy)
Date Installed:	8/12/1982 (from drillers log)
Surface casing dia. (mm), and material:	As per bore casing
Bore casing dia. (mm), and material:	150mm, OD (from bore log), steel. (Difficulty measuring on day - measured at approx 130mm)
Bore casing stickup above ground (m):	0.37m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (estimate from bore depth and lithology in drillers log)
Top of screen (m bgl):	7m bgl (from drillers log)
Bottom of screen (m bgl):	25m bgl (from drillers log)
Top of open hole (m bgl):	n.a.
Total depth (m):	34m (from drillers log)
Bore Condition Comments:	Bore is old but in reasonable condition. Visible steel casing has surface corrosion but structure appears sound. When dipped the dipper knocked some debris loose in the bore and it could be heard dropping into the water (potential corrosion of casing below ground level)
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Windmill, Raindrop 2 ½ inch pump (LH recollection). Southern Cross windmill approx. 30ft tower and 10ft wheel.
Date installed:	In 1984 the original windmill and pump were installed. The pump was replaced in 2003.
Date of most recent use	13/05/2013
Any repairs?	In 2007 pump buckets on the pump were replaced.
Pump intake depth (m bgl):	Approx 21.3m (70ft). (Anecdotal, from LH based on number of lengths of riser pipe in bore).
Interviewee's est. annual take (ML):	Annual estimate difficult to make (see below)
Basis for estimate:	Can range from 6 horses to 45 head of cattle. Currently 6 horses. Has 45 cattle on land for approx 4 months of the year. The remainder of the time only the horses. Bore runs constantly and tops up the tank. Annual estimate difficult.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock water, very occasionally used to water garden.
Detail all other water sources for property:	Bore fitted with electric submersible pump and two dams. Rainwater used at the house.
Typical pumping rate of bore (L/s):	Varied (with wind conditions)

Does this rate vary annually or can the pump rate be varied?:	Dependent on wind
Typical duration and frequency of pumping: (any seasonal variations?)	Generally constantly running. However if LH notices tank is full, will switch off. Even when switched off, windmill still pumps a small amount to keep tank topped up.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	Not pumping during site visit.
Describe riser, headwork and water distribution details:	Rising main is held in place by 2 wooden posts and cross beam. Approx. 0.3 m above the top of casing the outflow comes off a galvanised steel pipe (1 ½ inch diameter). This becomes buried and is transported via poly pipe to a water tank (5000 gallon, plastic tank adjacent the stables) approx 600m away. At the bore, above the storage tank outflow, there is a 'force pump', which takes water away when it sits above the first outflow (anecdotal from LH, see photos)
Equipment condition:	Equipment is old but in reasonable condition. LH indicated buckets on pump need changing.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Measured 9.9m bgl (10.36m below TOC)
Stable pumping water level (m bgl): (measured, including mins after pump on)	Not measured due to lack of wind
Water level measuring point	TOC (Top of casing)
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Owner unsure; from drillers log SWL was 8m bgl on 8/12/1982
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Some taken for a school project, 5-10 years ago (unavailable however).
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is open and vegetation is high around bore. When dipped could feel resistance and debris falling into water, which could be indication of casing corrosion. No obvious source of contamination observed around the bore.
Water quality sample collected during this assessment?	No wind to provide flow for taking sample.
Sample type: (primary, duplicate, field blank)	n.a.
General Comments	
Drillers log and license info obtained	
Photos	

Assessment Details - 1_RP27422_01	
Property name:	Highland Plain
Local bore name:	Owner refers to it as "Main Bore"
Registered Number:	Unknown but believed to be RN 38843
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	08/05/13 8:30am
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	1 RP27422
Property Owner Details	
Title and full name:	Michael Donohoe
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner.
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Domestic and stock
GDA Latitude (decimal deg.):	27°15'57.4390"S
GDA Longitude (decimal deg.):	151°43'13.8634"E
Water licence number and details: (if available to view)	N19799 (see copy)
Bore Construction Details	
Construction details / log available?	Yes, drillers log available (see copy)
Date Installed:	02/10/1972 (from drillers log)
Surface casing dia. (mm), and material:	Cannot see as sealed in concrete pad but LH believes the bore casing is the same as the surface casing (see pictures). Bore cap is approx. 0.24m diameter.
Bore casing dia. (mm), and material:	127mm (from bore log and water license), cannot see bore casing material however based on the age of the bore it is very likely to be steel.
Bore casing stickup above ground (m):	0.25m to bore cap.
Aquifer: (& source of information: log, anecdotal)	Marburg Sandstone (based on bore log and bore depth)
Top of screen (m bgl):	Unknown, but drillers log records water struck at 228 ft (69m), so likely screened here or lower
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	n.a.
Total depth (m):	73.2m (from water license) However, bore log records 262 ft (80m) as total depth of the bore.
Bore Condition Comments:	Bore is fairly old and has a fair degree of corrosion. Bore is fairly well sealed with only small opening for cables.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Electric submersible pump, Franklin 1.1 kW (based on plate in control box), 3-phase, electricity from public (mains) supply.
Date installed:	2010 (anecdotal from LH)
Date of most recent use	07/05/2013. Tested to make sure working for assessment. Typical use is 13 x 15 minute intervals, approximately 4 times a week (year-round).
Any repairs?	Not since 2010
Pump intake depth (m bgl):	At bore depth (73.2m) according to LH.
Interviewee's est. annual take (ML):	0.22 ML
Basis for estimate:	13 x 15mins for an average of four nights per week at an average flow rate of 0.09 L/sec. This depends on number of cattle in paddock and domestic use - figures above are LH estimate of average use.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Water for 50-70 cattle all year round. Domestic use includes toilet flushing and garden watering. House also has 7 horses which use the bore water.

Detail all other water sources for property:	Three dams on property and one abandoned bore (240 feet)
Typical pumping rate of bore (L/s):	0.09 L/sec
Does this rate vary annually or can the pump rate be varied?:	It can be varied by adjusting a valve but the LH has set this valve at a rate that suits his needs and produces a sustainable yield from the bore.
Typical duration and frequency of pumping: (any seasonal variations?)	LH reports fairly consistent use throughout year, including during summer.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	0.16 L/sec
Describe riser, headwork and water distribution details:	The bore has a steel cap (0.24m diameter). The outflow from the cap connects to a poly pipe, then through a valve before being buried. This travels along a short pipe (approx. 6m) and enters the top of the water tank (7,000 gallon tank).
Equipment condition:	Appears in fair condition. Some surficial corrosion on bore cap. Concrete pad is in good condition.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Airline is approx. 10ft above the pump (anecdotal) at 70.45m bgl. (Reading of 11 PSI indicates around 7m of water above the airline, hence either the anecdotal position of the airline, or the bore depth is incorrect).
Stable pumping water level (m bgl): (measured, including mins after pump on)	At 10:10am (after 50 mins of pumping) the airline reading was 1 PSI (which is around typical atmospheric pressure), and indicates the water level had essentially drawn to or below the airline.
Water level measuring point	Airline
Interviewee / owner understanding of typical SWL / PWL (m bgl):	10-12 ft (3-3.5m) of water above pump (note this conflicts with the evidence from the airline reading). Pump believed to be at total depth. So SWL is believed to be at 70.45m bgl (anecdotal from LH)
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Water quality test conducted approx 15 years ago. Results not available on day of interview.
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is fairly well sealed. Unable to see condition under the bore cap. Bore is unfenced and in a field used for stock (bore reasonably well sealed), but no other obvious sources of potential contamination.
Water quality sample collected during this assessment?	Yes
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Bore feeds concrete tank which has 7,000 gallon capacity. Currently only uses up to 5,000 gallon of this capacity due to deteriorating condition of the tank. Owner requested that it be recorded that the bore was originally equipped with a mono pump with a diesel motor. The flow rate was 350 gallons an hour (2003), but is now significantly reduced. (It is unclear however whether this is due to a change in the pump setting in the new pump, or a change groundwater levels, which has reduced available drawdown).	
Photos	

Property name: Highland Plain		Bore name & RN: Main Bore		Sampling date: 08/05/13		Sample collection point: At outflow to storage tank		Comments:	
Time	Flow Rate (L/s)	pH	Temp (°C)	EC (µS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Water Appearance/Colour	Odour?	TDS (mg/L)
9.20	0.17	6.88	20.4	2867	12.83	40.0	Slight orange discolouring	none	2035
9.28	0.14	6.9	21.0	2133	7.20	-14.7	"	"	1502
9.32	0.13	6.93	21.6	2223	5.36	-80.4	"	"	1547
9.38	0.12	6.91	22.2	2433	5.07	-52.9	"	"	1670
9.44	0.12	6.76	22.4	2588	4.78	-29.3	Slight orange discolouring, clearing	"	1775
9.50	0.07	6.72	22.0	2768	5.10	-9.5	Slight orange discolouring , clearing	"	1911
10.07	0.08	6.45	22.4	2889	5.73	-2.3	Clear	"	1983
10.14	0.07	6.66	22.4	3064	5.47	-2.1	clear	'	1989

Total purge time:	54 mins
Estimated total purge volume:	365 L
Time sample collected:	10:14

Assessment Details - 1_RP7422_02	
Property name:	Highland Plain
Local bore name:	-
Registered Number:	unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	unknown
Assessment date and time:	08/05/13 9:30am
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	1 RP27422
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing but unequipped and described as abandoned. LH commented that there was a blockage previously observed in the bore.
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Not used
GDA Latitude (decimal deg.):	27°15'57.8710"S
GDA Longitude (decimal deg.):	151°43'13.4554"E
Water licence number and details: (if available to view)	
Bore Construction Details	
Construction details / log available?	Not available
Date Installed:	unknown
Surface casing dia. (mm), and material:	As per bore casing
Bore casing dia. (mm), and material:	120mm, steel.
Bore casing stickup above ground (m):	0.27m
Aquifer: (& source of information: log, anecdotal)	Marburg Sandstone (adjacent bore to M_Donohoe_01, assumed replacement)
Top of screen (m bgl):	unknown
Bottom of screen (m bgl):	unknown
Top of open hole (m bgl):	unknown
Total depth (m):	73.15m anecdotal from LH
Bore Condition Comments:	Bore was believed to have something blocking it.
Bore Equipment Details	
Pump Installed?	No
Pump type, make and model, power source:	n.a.
Date installed:	n.a.
Date of most recent use	n.a.
Any repairs?	n.a.
Pump intake depth (m bgl):	n.a.
Interviewee's est. annual take (ML):	0
Basis for estimate:	Not used
Is bore use metered? Give details:	n.a.
Detail specific uses of the bore water:	Not used
Detail all other water sources for property:	Three dams on property and one working bore.
Typical pumping rate of bore (L/s):	n.a.
Does this rate vary annually or can the pump rate be varied?:	n.a.
Typical duration and frequency of pumping: (any seasonal variations?)	n.a.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	n.a.
Describe riser, headwork and water	n.a.

distribution details:	
Equipment condition:	n.a.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Did not dip as the LH indicated there has recently been something in the bore blocking it
Stable pumping water level (m bgl): (measured, including mins after pump on)	n.a.
Water level measuring point	n.a.
Interviewee / owner understanding of typical SWL / PWL (m bgl):	n.a.
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	Unknown
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is open and overgrown by vegetation.
Water quality sample collected during this assessment?	No
Sample type: (primary, duplicate, field blank)	n.a.
General Comments	
Bore was hidden. Landholder highlighted that there was a blockage in the casing. There was insufficient time to ask the LH questions regarding historical aspects of the bore etc.	
Photos	

Assessment Details - 1_RP25518_01	
Property name:	Malooka
Local bore name:	Briggamans Bore
Registered Number:	Unknown but believed to be RN 86675
Registered number source: (anecdotal, DNRM records, bore log etc)	Database search
Assessment date and time:	15/05/2013 08:00
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	1 RP25518
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner. Lives in Oakey during the week and at this property on the weekend.
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing, but not currently equipped.
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock
GDA Latitude (decimal deg.):	27°18'11.6173"S
GDA Longitude (decimal deg.):	151°45'04.7360"E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	LH looked for this but was not provided post-interview, so presumably could not locate the documents.
Date Installed:	unknown
Surface casing dia. (mm), and material:	As per bore casing
Bore casing dia. (mm), and material:	126mm, steel
Bore casing stickup above ground (m):	0.34m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (based on bore depth and DNRM database search)
Top of screen (m bgl):	n.a.
Bottom of screen (m bgl):	n.a.
Top of open hole (m bgl):	No screen - open hole after certain (unknown) depth
Total depth (m):	104m (from down-hole camera inspection)
Bore Condition Comments:	Original bore is 5ft below current ground level, as the bore is in a low spot and has been flooded and covered by sediment. Concrete pad found a few feet below ground. An extra section of casing has been added to the buried section of the bore to bring up to current ground level. (This is the joint which has rusted and why there is sediment coming into the bore). LH has then fixed this piece since it was extended. The windmill has been quoted at $5,000 to repair and LH is currently deciding whether or not to proceed. The bore is in reasonable condition but has had some historic corrosion issues. The camera inspection notes of 'manganese coming in at about 92-93m' may suggest there is around 10m of sediment built up in base of the bore, although the comment is somewhat cryptic.
Bore Equipment Details	
Pump Installed?	Not currently in use. Pump last in: 07/04/08. (Windmill pump)
Pump type, make and model, power source:	Unknown make and model.
Date installed:	Pump on pipes (currently above ground) was installed in 1998.
Date of most recent use	07/04/08
Any repairs?	General wear and tear. Replaced leathers in pump.
Pump intake depth (m bgl):	Approx. 78m bgl (based on 13 rods of 6m length currently on surface at the site)
Interviewee's est. annual take (ML):	unknown
Basis for estimate:	n.a.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock. Use volumes depends on season. Historically 150 head of cattle (oats

	crops feed cattle which is on this land). Currently 35 head of cattle. Dam is currently sufficient for cattle without bore.
Detail all other water sources for property:	One dam, rainwater for domestic purposes.
Typical pumping rate of bore (L/s):	n.a.
Does this rate vary annually or can the pump rate be varied?:	No
Typical duration and frequency of pumping: (any seasonal variations?)	Sometimes put brake on the windmill during windy times e.g. in August.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	n.a.
Describe riser, headwork and water distribution details:	Currently just bore casing above ground with the windmill structure and rods/ pump sitting above ground. When in use supplies the concrete tank 15 m away, with overflow feeding into dam. The tank water was used to supply troughs on the opposite side of the tank.
Equipment condition:	Equipment appears in reasonable condition (but not currently used).
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	53.03 m bgl (53.37 m below TOC minus 0.34m stick-up)
Stable pumping water level (m bgl): (measured, including mins after pump on)	n.a.
Water level measuring point	TOC (top of casing)
Interviewee / owner understanding of typical SWL / PWL (m bgl):	58m based on down-hole camera inspection in April 2008. LH believes this has been fairly consistent historically.
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is open and casing is corroded. Some casing corrosion issues in the past, which has required replacement of near surface casing. No obvious sources of potential contamination (excluding stock).
Water quality sample collected during this assessment?	No
Sample type: (primary, duplicate, field blank)	n.a.
General Comments	
Owner supplied VHS tape of down hole camera inspection conducted in 2008. (Didn't take this tape as it is his only copy). Copied details and took photos of the tape cover: "Bore 07/04/2008. Water level 58m, depth 104m, Mangineeze coming in at about 92-93m (build up in hole)" (Presumably 'mangineeze' means 'manganese').	
Photos	

Assessment Details - 3398_A341700_01	
Property name:	n.a.
Local bore name:	n.a. (Only bore on property)
Registered Number:	Unknown, but believed to be RN107255
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	09/05/2013 08:20am
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	3398 A341700
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock and domestic
GDA Latitude (decimal deg.):	27°17'46.8519"S
GDA Longitude (decimal deg.):	151°37'53.6470"E
Water licence number and details: (if available to view)	Owner does not know where this is.
Bore Construction Details	
Construction details / log available?	Landholder has this information, but couldn't find for interview.
Date Installed:	1995 (anecdotal)
Surface casing dia. (mm), and material:	150mm, only for a couple of metres bgl (anecdotal)
Bore casing dia. (mm), and material:	140mm (OD), PVC
Bore casing stickup above ground (m):	0.43m
Aquifer: (& source of information: log, anecdotal)	Basalt. (Anecdotal from LH and DNRM database search)
Top of screen (m bgl):	Unknown (screen is slotted PVC)
Bottom of screen (m bgl):	Approx. 20m bgl (65 feet, anecdotal from LH)
Top of open hole (m bgl):	n.a.
Total depth (m):	21.5m (anecdotal, based on 72 feet from LH)
Bore Condition Comments:	Rising main in bore casing is galvanised steel, approx. 45mm diameter. It is pulled to one side of the bore to overcome the problem of the bore not being plumb. In good condition. Bore is open.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Windmill (30ft tower), Southern Cross windmill, 2 ¼ inch pump, Alderdyce brass sleeve, plastic cup pump (anecdotal from LH). (From 'Black Woods' in Toowoomba - just a brass sleeve with neoprene buckets, from LH.)
Date installed:	1995, same as bore (anecdotal)
Date of most recent use	Switched off yesterday midday.
Any repairs?	Anecdotal: Only normal running repairs on the pump buckets (approx. 2008)
Pump intake depth (m bgl):	19.4mbgl (based on estimate of 65 feet from LH)
Interviewee's est. annual take (ML):	0.8 ML used from tank. Likely takes more than this however, as windmill is not switched off, e.g. around 3 ML/yr if assumed to be running at average the flow rate experienced during the inspection (0.1 L/sec)
Basis for estimate:	2,000 L per day for stock, plus toilet use estimate of 100 L per day.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock: 39 cows at present, can range from 25 to 50 throughout year. Domestic toilet flushing.
Detail all other water sources for property:	Rainwater for all other domestic. 4 dams on property
Typical pumping rate of bore (L/s):	Anecdotal from L.H.: 300 gallons per hour (0.3 L/sec). Maximum capacity of the bore is 410 gallons an hour (0.43 L/sec).
Does this rate vary annually or can the pump rate be varied?:	Constant, running all year (when wind conditions allow)

Typical duration and frequency of pumping: (any seasonal variations?)	Runs all year. Tank's overflow when full.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	0.12 L/sec
Describe riser, headwork and water distribution details:	The rising main is secured to one side of bore with a brace to overcome a deviation in the bore (i.e. not plumb). It is held in place with wooden posts and a cross beam. The rising main (approx. diameter of 45mm) rises above the top of casing by 0.32m, before a T piece. One arm leads to a sample tap and the other leads to an outflow to the tank. The outflow runs via a poly pipe for around 4.5 metres to the base of the storage tank. It then rises in a steel pipe (approx. 25mm diameter) and discharges at the top of the black plastic storage tank (capacity 5,000 gallons).
Equipment condition:	The equipment is in fair condition.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	11.67m bgl (measured)
Stable pumping water level (m bgl): (measured, including mins after pump on)	11.81m bgl 10:04 am measured (70 mins after commencement of pumping)
Water level measuring point	TOC (top of casing)
Interviewee / owner understanding of typical SWL / PWL (m bgl):	17m below TOC
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	LH comment: "Total salts (at drilling) 700 ppm"
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore does not have a cover, and hence there is some potential for contamination, however there is sufficient casing 'stick-up' that surface water inundation is very unlikely. No obvious sources of potential groundwater contaminants (excluding stock). Moderately high nitrates levels noted in sample results (5.4 mg/L).
Water quality sample collected during this assessment?	Yes
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
One other bore on the property (covered in in 1991). 'Punched' in 1989 but screen became blocked and unusable, so abandoned.	
Photos	

Property name: Na		Bore name & RN: Windmill		Sampling date: 09/05/2013		Sample collection point: At outflow from windmill headworks		Comments:	
Time	Flow Rate (L/s)	pH	Temp (°C)	EC (µS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Water Appearance/Colour	Odour?	TDS (mg/L)
8:55	0.07	7.53	20.9	890	13.45	99.0	Clear with some vegetation	"	618
9:02	0.09	7.28	21.4	887	7.88	102.7	"	"	"
9:07	0.12	7.21	21.4	888	6.88	106.9	Clear	"	"
9:14	0.14	7.19	21.5	891	6.15	108.4	"	"	"
9:20	0.12	7.21	21.3	880	5.82	110.3	"	"	"
9:27	0.11	7.13	21.3	886	5.87	95.7	"	"	"
9:34	0.1	7.04	21.3	888	5.94	89.8	"	'	"
9:43	0.10	7.14	21.4	886	5.45	95.9	"	"	"
9:56	0.1	7.15	21.3	880	5.46	108.4	"	"	"
10:04	0.10	7.15	21.3	882	5.54	98.9	"	"	"
Total purge time:			69 mins						
Estimated total purge volume:			435 L						
Time sample collected:			10:04						

Assessment Details – 2767_A341329_01	
Property name:	NA
Local bore name:	Domestic
Registered Number:	Unknown, but believed to be RN 87941.
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	08/05/2013 11:30am
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	2767 A341329
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Domestic and stock
GDA Latitude (decimal deg.):	27°20'39.5713"S
GDA Longitude (decimal deg.):	151°44"15.2637"E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	Yes, see copy
Date Installed:	08/01/08 (Bore log)
Surface casing dia. (mm), and material:	225mm OD, PVC.
Bore casing dia. (mm), and material:	140mm OD, PVC
Bore casing stickup above ground (m):	0.53m and outer casing 0.075m
Aquifer: (& source of information: log, anecdotal)	Marburg Sandstone (Bore Log and DNRM database search)
Top of screen (m bgl):	162mbgl (bore log)
Bottom of screen (m bgl):	180mbgl (bore log)
Top of open hole (m bgl):	NA
Total depth (m):	180m (bore log)
Bore Condition Comments:	Bore is in very good condition. Well sealed with no signs of damage.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Submersible, Marlow 4msp30tcp, electric supply from public supply.
Date installed:	08/01/2008
Date of most recent use	05/05/2013
Any repairs?	No
Pump intake depth (m bgl):	150m (from bore log)
Interviewee's est. annual take (ML):	0.104 ML (Weekly estimate 2,000L)
Basis for estimate:	Tops up tank twice a week, approximately 2,000L a week. (Tank is 22,500 L or 5,000 gallons)
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Domestic: gardens. Stock: 10 cows but can be up to 20. Currently 10 cows and 10 calf's
Detail all other water sources for property:	Dam on property supply most stock water. All other domestic water use is from rainwater which is collected from the roof and stored in tank next to house.
Typical pumping rate of bore (L/s):	10 L/sec (bore log)
Does this rate vary annually or can the	No variation.

pump rate be varied?:	
Typical duration and frequency of pumping: (any seasonal variations?)	Bore tops up tank automatically. LH believes he uses 22,500L a week in summer dry periods. When raining and in winter bore barely used.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	Not able to measure because land holder could not disconnect bore for flow rate measurement due to worries that the pipe could not be reconnected and that the flow rate was too powerful. Outflow flows directly into a tank, which could not be measured.
Describe riser, headwork and water distribution details:	At the top of the bore casing there is a steel bore cap. This connects to a steel outflow with a valve, the pump inlet and a pressure gauge. The stainless steel outflow then continues to a T joint, where a black poly pipe (diameter 0.04m) runs vertically down from this joint and becomes buried. The other direction leads to a sample tap. The buried poly pipe continues 17m to a storage tank, which it feeds into at the top.
Equipment condition:	Very good condition. No damage
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Airline pressure 95 psi (depth of airline unknown, but possibly around pump)
Stable pumping water level (m bgl): (measured, including mins after pump on)	At 1:25pm airline pressure was 65 psi
Water level measuring point	NA
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Not known
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Yes (collected 01/07/2008 and copies provided)
Any account of gas in the bore from interviewee?	Once in a dry period (2009/2010) when water was pumped to the tank the land holder commented on a rotten egg smell (H_2S) from water entering tank. Owner unsure of exact time.
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Minimum. Bore sealed effectively and maintained.
Water quality sample collected during this assessment?	Yes. Sample was only taken from tap on bore headwork's.
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Sample taken after 30 mins of pumping because LH had warned that bore would cut out when tank was full. Sample was collected when tank was almost full. LH didn't want to disconnect pipe from bore, as wasn't sure if could be reconnected properly and concern was raised about capturing water, due to rate of flow. Bore commenced pumping at 12:40. LH leaves the bore off and turns on when wants to top up the tank. Bore has an auto shut off when tank is full, so his estimation of usage he mentioned was a very rough estimate.	
Photos	

Property name: Bohan		Bore name & RN:		Sampling date: 08/05/2013		Sample collection point: sample tap		Comments:	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance/Colour**	**Odour?**	**TDS (mg/L)**
12.41pm	Na	7.33	26.6	1,753	11.69	-73.8	Clear	H_2S (egg smell)	1,105
12.48pm	"	7.33	26.7	1,761	7.08	-88.5	"	None	1,111
12.51pm	"	7.30	26.9	1,780	5.54	-96.0	"	H_2S	1,118
12.56pm	"	7.37	26.9	1,791	3.63	-85.5	"	H_2S	1,124
13.04pm	"	7.33	26.9	1,798	2.86	-83.7	"	H_2S	1,124
13.10pm	"	7.28	27.1	1,803	2.93	-81.2	"	H_2S	1,131
Total purge time:			29mins						
Estimated total purge volume:			NA						
Time sample collected:			13:10						

Assessment Details - 116_AG3153_01	
Property name:	Crofton
Local bore name:	House bore
Registered Number:	Unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	Database search
Assessment date and time:	14/05/2013 2:00pm
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	116 AG3153
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock and domestic (main bore)
GDA Latitude (decimal deg.):	27°18'32.6737"S
GDA Longitude (decimal deg.):	151°37'13.8899"E
Water licence number and details: (if available to view)	Not available
Bore Construction Details	
Construction details / log available?	Apparently yes, but not available at interview (and not provided post-interview)
Date Installed:	Not known but appears to be relatively new
Surface casing dia. (mm), and material:	approx. 210mm, PVC
Bore casing dia. (mm), and material:	approx. 150mm, PVC
Bore casing stickup above ground (m):	0.54m
Aquifer: (& source of information: log, anecdotal)	Unknown
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Approx. 70m (anecdotal)
Bore Condition Comments:	Bore is in good condition. Associated above ground infrastructure is in excellent condition. Bore casing is firmly grouted in place. Set on a small concrete pad.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Electric submersible, unknown, power is from public (mains) supply.
Date installed:	Approx. 12 months after bore installed
Date of most recent use	12/05/2013
Any repairs?	No
Pump intake depth (m bgl):	Unknown
Interviewee's est. annual take (ML):	3.5 ML
Basis for estimate:	150 head of cattle (40 L per head per day). 20,000 gallon (25,700 L) a week for garden watering.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock and some domestic
Detail all other water sources for property:	One dam (1/2 acre), rain water tank (265,000 L), and two other bores.
Typical pumping rate of bore (L/s):	As set (based on flow test during site visit, appears to be just under 2 L/s)
Does this rate vary annually or can the pump rate be varied?:	No
Typical duration and frequency of pumping: (any seasonal variations?)	Automatic top up. L.H. believes system pumps twice or three times a week.

Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	2.5 L/s
Describe riser, headwork and water distribution details:	Bore cap has an outflow with a valve attached. This connects to a black poly pipe (approx 50mm diameter) and flows to a concrete storage tank. This is then transported to the two plastic storage tanks (24,424 L capacity each) and distributed to troughs.
Equipment condition:	New. Very good condition.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Airline measured before pumping at 21.5 PSI (approx. 15m head of water above end of airline)
Stable pumping water level (m bgl): (measured, including mins after pump on)	Airline measured at 12:24 (i.e. at end of pumping)at 21 PSI (indicating less than one metre of drawdown during pumping).
Water level measuring point	Airline (not sure of depth of airline)
Interviewee / owner understanding of typical SWL / PWL (m bgl):	-
Comments:	-
Water Sampling Details	
Any historic water quality data available from owner?	Yes test when bore was installed to indicate whether water potable or not. (However no copies were available).
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is well sealed. Not set on a very large concrete pad. No obvious sources of potential contaminants.
Water quality sample collected during this assessment?	Yes
Sample type: (primary, duplicate, field blank)	Primary: P_loughlin_01
General Comments	
Wife of L.H. was present at site visit to show the location of the bore and instruct on pump operation (but was not able to answer questions in any detail). Spoke to L.H. on the phone at a later date and added additional information.	
Photos	

Property name:	Bore name & RN:	Sampling date:	Sample collection point:	Comments:
Crofton	House bore	14/05/2013	At outflow from head works	

Time	Flow Rate (L/s)	pH	Temp (°C)	EC (µS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Water Appearance/Colour	Odour?	TDS (mg/L)
11:38	2.14 l/s	7.58	22.2	2160	5.60	46.7	clear	None	1482
11:42	2.5 l/s	7.51	22.3	2091	5.48	42.7	clear	none	1436
11:48	2.14 l/s	7.48	22.3	2040	4.41	-16	"	"	1397
12:55	"	7.40	22.0	2015	2.95	-46.5	"	"	1391
12:04	2.5 l/s	7.43	22.3	2027	3.01	-48.4	"	"	
12:12	1.88 l/s	7.42	22.3	2024	2.57	-57.3	"	"	1384
12:24	1.88 l/s	7.44	22.3	2013	2.51	-58.7	"	"	1384
Total purge time:			46 mins						
Estimated total purge volume:			5989 L						
Time sample collected:			12:24						

Assessment Details - 116_AG3153_02	
Property name:	Crofton
Local bore name:	Hay shed bore
Registered Number:	unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	unknown
Assessment date and time:	14/05/2013 15:15
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	116 AG3153
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock and minor domestic use
GDA Latitude (decimal deg.):	27°17'16.7915"S
GDA Longitude (decimal deg.):	151°37'08.7365"E
Water licence number and details: (if available to view)	Unavailable at interview
Bore Construction Details	
Construction details / log available?	Unavailable at interview
Date Installed:	unknown
Surface casing dia. (mm), and material:	As per bore casing
Bore casing dia. (mm), and material:	140mm (approx.), steel
Bore casing stickup above ground (m):	0.08m
Aquifer: (& source of information: log, anecdotal)	unknown
Top of screen (m bgl):	unknown
Bottom of screen (m bgl):	unknown
Top of open hole (m bgl):	n.a.
Total depth (m):	Approx. 70m
Bore Condition Comments:	Very little of the bore can be seen. What can be seen looks in fair condition. The surface of the casing is corroded but the structure appears to be good.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Electric submersible, unknown make and model, power from portable generator (brought to site when needed)
Date installed:	Unknown, installed before current L.H. purchased property
Date of most recent use	February 2013
Any repairs?	Not on current pump
Pump intake depth (m bgl):	unknown
Interviewee's est. annual take (ML):	0.46 ML
Basis for estimate:	Usage similar to 'Middle Bore'. Used to provide water for 50 steers for four months per year. Used as reserve bore if issues with 'House bore'. Two days to fill concrete tank (40 hours). This occurs every 2 weeks for the 4 month period.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock
Detail all other water sources for property:	One dam (1/2 acre), rain water tank (265,000 L), two other bores.
Typical pumping rate of bore (L/s):	As set (from flow measurements during this site assessment typical rate appears to be around 0.8 L/s)
Does this rate vary annually or can the pump rate be varied?:	Always as set (flow rate not adjusted)
Typical duration and frequency of pumping:	Two days pumping to fill concrete tank (40 hours). This occurs every 2 weeks for a 4 month period (on an annual basis).

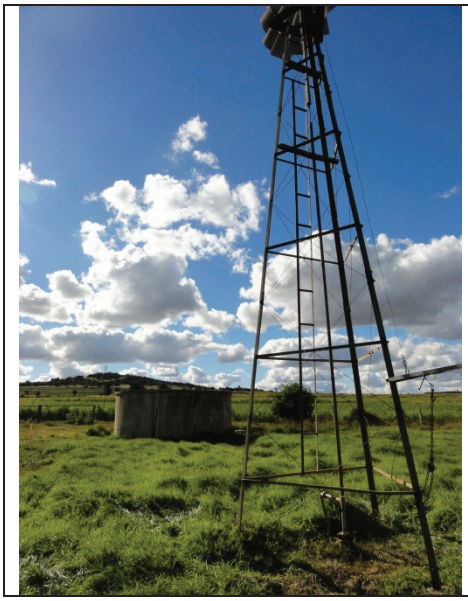
(any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	0.83 L/s
Describe riser, headwork and water distribution details:	Bore cap has an outflow which has a valve attached immediately above the outlet. This then leads through two 90 degree galvanised steel elbows (approx. 45mm diameter) and connects to black poly pipe (approx. 45mm diameter) which becomes buried. This poly pipe discharges 70m away, at the top of the concrete storage tank (near the hay shed). This in turn feeds to the concrete tank by the house and is then distributed to the troughs around the property.
Equipment condition:	Appears to be in good condition. The outflow seems to function correctly. The storage tank is currently empty.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Airline reading of 24 PSI, indicating around 17m of water above the end of the airline (but some uncertainty regarding accuracy of airline, as described above). Depth of airline placement also not known.
Stable pumping water level (m bgl): (measured, including mins after pump on)	14 PSI at 4:15 (after 50 minutes of pumping), indicating a pumping drawdown of around 7m.
Water level measuring point	Airline
Interviewee / owner understanding of typical SWL / PWL (m bgl):	
Comments:	Airline was leaking but managed to stabilise around readings.
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is well sealed and the space for cables is very small leaving little room for contaminants to enter directly down the bore. Hay barn approx. 50m away may contain some sources of contaminants but unlikely. Old windmill structure protects bore from cattle immediately around well head.
Water quality sample collected during this assessment?	Yes
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
L.H. interview conducted post site visit. After talking to L.H. added information to collected field data. L.H. searched for missing data but has not been provided, so presumably missing.	
Photos	

Property name: Crofton		Bore name & RN: Hay shed bore		Sampling date: 14/05/2013		Sample collection point: At outflow from bore head works		Comments:	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance/Colour**	**Odour?**	**TDS (mg/L)**
3:24	0.83	8.0	21.9	625	14.85	7.2	Clear	None	435
3:26	"	8.06	22.8	683	3.57	-70.1	"	"	461
3:29	"	8.22	22.7	728	1.50	-97.1	"	"	494
3:35	"	8.18	22.4	781	1.36	-45.3	Slightly discoloured	"	533
3:40	"	8.27	22.5	694	3.3	-44.0	Some small black grains in bucket. Water slightly discoloured	"	474
3:46	0.77	8.33	22.6	665	3.36	-25.2	Clearer but still with a few black grains	"	455
3:53	"	8.34	22.6	655	3.36	-18.2	Clear. Only 2 or 3 grains of black sediment	"	448
4:01	"	8.33	22.6	647	3.75	-13.8	"	"	442
4:06	0.83	8.33	22.6	646	3.65	-8.8	Clear but still a number of black sediment in bucket	"	442
4:15	0.77	8.39	22.4	640	3.67	-10.1	"	"	435

Total purge time:	51 mins
Estimated total purge volume:	2466 L
Time sample collected:	16:15

Assessment Details – 8_RP25526_01	
Property name:	Silverleigh
Local bore name:	Number 1 or Creightons Rd bore
Registered Number:	Unknown, but believed to be RN 48164
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	09/05/13 2:15pm
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	8 RP25526
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock
GDA Latitude (decimal deg.):	27°20'21.8473"S
GDA Longitude (decimal deg.):	151°44'26.0881"E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	No
Date Installed:	1973 (anecdotal, from LH)
Surface casing dia. (mm), and material:	As per bore casing
Bore casing dia. (mm), and material:	5 inch OD (approx. 125mm), steel
Bore casing stickup above ground (m):	Approx. 0.11m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (Bore depth and DNRM database search)
Top of screen (m bgl):	Not known
Bottom of screen (m bgl):	Not known
Top of open hole (m bgl):	n.a.
Total depth (m):	In 1996 hole was depthed at 136 m bgl by the windmill maintenance contractor (Russel Gierke); see comments below.
Bore Condition Comments:	Old bore but has been well maintained. Clamp around the top of the bore provides a tight seal.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	2 ½ inch Alderdice windmill pump, with Southern Cross 30ft tower.
Date installed:	1973 (same time as bore installation)
Date of most recent use	Constant
Any repairs?	1996, 2005, 2013: general 'wear and tear' maintenance to windmill pump and associated components.
Pump intake depth (m bgl):	85m bgl (Russel Gierke)
Interviewee's est. annual take (ML):	Based on stock numbers, estimated to be 0.6 ML, however bore runs constantly (when wind conditions suitable) and hence actual take is likely to be higher.
Basis for estimate:	LH uses 11,200 L/week based on water requirement for 40 stock, but bore runs constantly (i.e. when wind conditions suitable) and hence actual take is likely to be higher
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Cattle (average of approx. 40 across year)

Detail all other water sources for property:	Five other windmills and two bores fitted with electric submersible pumps on the property (no dams) and rainwater used at the house.
Typical pumping rate of bore (L/s):	Unknown (varies with wind conditions)
Does this rate vary annually or can the pump rate be varied?:	n.a.
Typical duration and frequency of pumping: (any seasonal variations?)	Varies according to daily and seasonal wind conditions.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	Unable to record due to bore setup. Could not disconnect any of the bore headworks pipes and could not access easily where the bore outflows to the tank.
Describe riser, headwork and water distribution details:	Approximately 0.44m above the top of the casing, the rising main for the windmill has an outflow - this is a steel pipe approx. 45mm in diameter. This pipe flows underground to a storage tank approx. 10m away and discharges at the top of the tank.
Equipment condition:	The equipment is well maintained. (Was receiving repairs on the day of the site assessment).
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	From the windmill maintenance contractor, Russel Gierke (refer comments below): 1996 = 39.3m bgl, 2005 = 48.1m bgl, 2013 = 55.16m bgl.
Stable pumping water level (m bgl): (measured, including mins after pump on)	Sealed headworks, unable to dip.
Water level measuring point	n.a.
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Refer above.
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Fairly well sealed with only minor openings in the headworks. Bore casing is fairly low to the ground. Storage sheds in the vicinity of the bore may contain potential contaminant sources, but unlikely. Bore does not have a concrete pad.
Water quality sample collected during this assessment?	Yes, from outflow before discharge to the tank.
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Russel Gierke of Downs Windmill and Pump Service was servicing a couple of windmill bores on the property at the time of the site assessment, and was able to supply total depth and water level readings from previous visits. Work on the bore finished at 2:00pm. Sampling was delayed as long as possible after this maintenance (to allow settlement of anything disturbed during pump repairs). However, this could potentially have impacted on the sample (e.g. stirring up silt in bore etc). It was extremely difficult to get an accurate flow rate. A visual estimate of 5L per minute was made, however the wind was weak at the time of this observation, and flows will vary significantly with wind speed.	
Photos	



Property name: Silverleigh		Bore name & RN: No. 1 or Creightons Rd bore		Sampling date: 09/05/13		Sample collection point: At outflow to storage tank		Comments:	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance/ Colour**	**Odour?**	**TDS (mg/L)**
2:34	Cannot get flow rate from outflow	7.60	22.5	1488	14.20	-62.6	Dark orange discolouring.	None	1020
2:48	"	7.42	22.1	1456	3.14	10.2	"	"	1001
3:00	"	7.36	22.0	1543	3.70	53.1	"	None	1060
3:13	"	7.14	21.5	1536	3.88	64.9	clearing	"	1066
Wind stopped 3:17.	"						Very slight orange discolouring	"	
Wind started at 3:25	"						"	"	
Took sample and final WQ at 3:40 after only continual wind	"						"	"	
3:40	"	7.43	21.6	1504	5.68	107.0	Clearing but still slight orange discolouring	"	1040

Total purge time:	58 mins
Estimated total purge volume:	not assessed
Time sample collected:	3:40

Assessment Details - 2_RP25510_01	
Property name:	Silverleigh
Local bore name:	"Joe's block"
Registered Number:	Unknown, but believed to be RN 61545
Registered number source: (anecdotal, DNRM records, bore log etc)	SKM DNRM Database search
Assessment date and time:	09/05/2013 12:15pm
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	2 RP25510
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock
GDA Latitude (decimal deg.):	27°20'10.6456"S
GDA Longitude (decimal deg.):	151°45'08.0809"E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	No
Date Installed:	Early 1900's (anecdotal from LH)
Surface casing dia. (mm), and material:	As per bore casing
Bore casing dia. (mm), and material:	130mm, steel
Bore casing stickup above ground (m):	0.47m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (Bore depth and DNRM database search)
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Approx. 54m (anecdotal from LH based on estimate of 180 feet)
Bore Condition Comments:	Bore appears in reasonable condition. Advised against dipping bore by LH due to possibility of getting dipper stuck. Couch grass growing within bore casing.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	2 ½ inch Alderdice windmill pump (anecdotal). Southern Cross 30ft tower.
Date installed:	Current pump installed in 2010 (anecdotal).
Date of most recent use	Runs constantly (when wind conditions suitable). Overflows when tank is full.
Any repairs?	No (as pump recently installed)
Pump intake depth (m bgl):	53.34m bgl (anecdotal from LH). 49m bgl from windmill maintenance contractor.
Interviewee's est. annual take (ML):	1.1 ML based on assumptions described below. However, actual take will be higher, due to bore running constantly and overflowing when tank is full.
Basis for estimate:	Approximately 600 cattle use the bore for 4-5days once per month. (LH suggested 30L per head of cattle per day).
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock
Detail all other water sources for property:	Five other windmills and two bores fitted with electric submersible pumps on the property (no dams) and rainwater used at the house.
Typical pumping rate of bore (L/s):	Unknown (varies with wind conditions)

Does this rate vary annually or can the pump rate be varied?:	n.a.
Typical duration and frequency of pumping: (any seasonal variations?)	Varies according to daily and seasonal wind conditions. Sometimes turned off in winter if overflowing. 0.1 to 0.2 L/s during site visit.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	0.2 L/s
Describe riser, headwork and water distribution details:	At 0.33m above the bore casing, the rising main diverts to an outflow pipe that connects to 1.5 inch poly pipe. A 90 degree elbow diverts the water to the ground, where the pipe becomes buried. This travels underground to a storage tank (10,000 gallons), where it enters the top of the tank. An overflow for the storage tank runs underground and back beyond the bore (poly pipe attached to a stake). The riser for the windmill is held in place in the bore with a metal bracket attached to two wooden stakes with a cross beam.
Equipment condition:	Fair condition, although quite old. Steel casing is fairly corroded.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	From the windmill maintenance contractor, Russel Gierke (refer comments below): 2005= 37.8m bgl, 2007= 37.2m bgl, 2011=37.2m bgl.
Stable pumping water level (m bgl): (measured, including mins after pump on)	Did not dip due to risk of getting dipper stuck.
Water level measuring point	
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Owner guess of 45.7 - 48.7 m bgl for SWL (but does not match with maintenance contractor estimates).
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore casing is open and has couch grass growing in the bore. Surface casing is corroded and the ground around the bore is very boggy due to overflow outlet, which has potential to cause contamination. (If the anecdotal evidence regarding the age of the bore is correct, a high level of down-hole bore corrosion is likely)
Water quality sample collected during this assessment?	Yes. Outflow pipe at the rising main elbow was disconnected to take sample directly from bore.
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Bore pumping continuously on arrival. Russel Gierke, of Downs Windmill and Pump Service, was servicing a couple of windmill bores on the property at the time of the site assessment, and was able to supply total depth and water level readings from previous visits.	
Photos	

Property name: Silverleigh		Bore name & RN: 'Joe's block'		Sampling date: 09/05/2013		Sample collection point: At outflow at head works		Comments:	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance/Colour**	**Odour?**	**TDS (mg/L)**
12:40	0.15	7.98	21.9	1699	15.41	61.9	Slight orange discolouration to water	none	1177
12:50	0.21	7.93	22.0	1739	6.05	53.5	"	none	1203
12:59	0.13	7.90	22.0	1721	5.49	68.1	"	none	1190
1:10	0.16	7.87	22.0	1733	4.23	61.1	"	none	1196
1:19	0.13	7.91	22.0	1710	3.93	31.1	"	none	1177
1:26	0.14	7.92	22.1	1716	3.98	31.3	"	none	1183
Total purge time:			46 mins						
Estimated total purge volume:			421 L						
Time sample collected:			1:26pm						

Assessment Details - 3_RP25495_01	
Property name:	Grand View
Local bore name:	Shed Bore
Registered Number:	Unknown but believed to be RN 9583
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	15/05/13 1:30pm
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	3 RP25495
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner (one of the owners)
Bore Details	
Bore type:	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock and domestic
GDA Latitude (decimal deg.):	27°20'4.0612"S
GDA Longitude (decimal deg.):	151°44'08.3876"E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	Available but owner could not retrieve at time of the interview
Date Installed:	Late 1990's (anecdotal from LH)
Surface casing dia. (mm), and material:	As per bore casing (refer below)
Bore casing dia. (mm), and material:	Approx. 140mm diameter, steel.
Bore casing stickup above ground (m):	0.18m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (DNRM database search)
Top of screen (m bgl):	158m bgl (bottom 12m of the bore is screened - anecdotal from LH)
Bottom of screen (m bgl):	170m bgl (as above)
Top of open hole (m bgl):	n.a.
Total depth (m):	170m (anecdotal from LH)
Bore Condition Comments:	Bore is old and has some surficial corrosion on casing, but otherwise appears to be in reasonable condition.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Electric submersible, Lovalla ARA, 1.5 kW electric motor (14 months old), public (mains) power supply (anecdotal from LH).
Date installed:	19/03/2012 (LH had written date of installation on wall of piggery)
Date of most recent use	15/3/2013, 9am
Any repairs?	New motor, March 2013. New pump mid-2011.
Pump intake depth (m bgl):	100m (anecdotal)
Interviewee's est. annual take (ML):	4.41 ML
Basis for estimate:	8 hours a day 7 days a week. With LH anecdotal flow rate of 1500 L/hr
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock (max 400 head cows and 400 pigs) (average 150 head cows and 150 pigs), domestic use for garden watering
Detail all other water sources for property:	Two dams and one other bore. Rainwater for all other domestic use.
Typical pumping rate of bore (L/s):	1500 L/hr (400 gallons/hr; anecdotal from LH)
Does this rate vary annually or can the	No

pump rate be varied?:	
Typical duration and frequency of pumping: (any seasonal variations?)	Maximum rate when maximum cattle (15 hours per day, 7 days a week). However has been fairly constant in the last 12 months, with no significant change in pumping durations.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	1 L/s (however unable to accurately gauge flow rate due to the position of the outflow.)
Describe riser, headwork and water distribution details:	The bore cap has an outflow which leads to a 180 degree galvanised steel joint. This becomes buried and leads to the large water tank near the entrance of the property. The bore outflow enters the top of the tank (10,000 gallons) from a black poly-pipe. The adjoining concrete tank (7,000 gallons) is used solely for spraying (weeds) and water is added to this when needed. There is an overflow discharge on the other side of the storage tank.
Equipment condition:	Headworks are old but appear to be in a good condition.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Approx. 90m (from time of pump installation – refer below). No airline and insufficient space in the bore annulus, so could not dip during the field survey.
Stable pumping water level (m bgl): (measured, including mins after pump on)	Unknown
Water level measuring point	n.a.
Interviewee / owner understanding of typical SWL / PWL (m bgl):	On 19/3/2012 when the pump was fitted the WL in the bore was 300ft (91m).
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Alders did a water quality test two months ago due to dispute about weed spray not working. A copy of results was not available.
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is well sealed but is surrounded by animal sheds, which could be a source of nutrients to the aquifer (however nitrate in the sample results was low). The bore is covered with a plastic cap.
Water quality sample collected during this assessment?	Yes. Sample had to be taken from the outflow to the storage tank, around 70m from bore, as pipes at the bore could not be disconnected.
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Could not take a flow rate due to the position of the outflow, but the LH gave a confident estimation of the flow rate of the bore as 1500 L/hr (0.42 L/s).	
Photos	

Property name: Grand View		Bore name & RN: Shed Bore		Sampling date: 15/05/13		Sample collection point: At outflow to storage tank		Comments:	
Time	Flow Rate (L/s)	pH	Temp (°C)	EC (µS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Water Appearance/Colour	Odour?	TDS (mg/L)
1:30	1 *	7.60	20.6	1577	3.94	-117.8	clear	none	1118
1:33	1 *	7.39	23.3	1664	2.31	-114.2	"	"	"
1:37	Unable to continue measuring flow rate safely	7.31	24.6	1710	1.27	-140.3	"	"	1124
1:44	"	7.29	25.1	1727	1.02	-139.6	"	"	1118
1:49	"	7.27	25.5	1743	0.77	-138.8	"	"	1124
2:00	"	7.26	25.9	1771	0.88	-129.4	"	"	1138
2:06	"	7.18	26	1771	0.77	-125.3	"	"	1131
2:12	"	7.20	26.1	1775	0.72	-125.4	"	"	1131

Total purge time:	42 mins
Estimated total purge volume:	2520 L
Time sample collected:	2:12

* Significant uncertainty due to method of measurement

Assessment Details - 3_RP25495_02	
Property name:	Grand View
Local bore name:	Windmill
Registered Number:	Unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	Unknown
Assessment date and time:	15/05/2013 3:00pm
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	5 RP25495
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Owner
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock
GDA Latitude (decimal deg.):	27°21'11.6951"S
GDA Longitude (decimal deg.):	11°43'36.4127"E
Water licence number and details: (if available to view)	Not available at interview
Bore Construction Details	
Construction details / log available?	No. (LH has owned the property for 28 years and the bore was present at the time of purchase).
Date Installed:	1930's (anecdotal)
Surface casing dia. (mm), and material:	As per bore casing
Bore casing dia. (mm), and material:	Approx. 130mm OD, steel (LH indicates it has corroded down to ground level)
Bore casing stickup above ground (m):	0.05m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (Based on a total bore depth of 61m, anecdotal)
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	61m (220ft anecdotal from LH)
Bore Condition Comments:	The bore is very old, and the fact that the casing above surface has corroded virtually to ground level is testament to this.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	2 ½ inch, brass windmill pump, unknown make and model, approx. 30ft windmill tower
Date installed:	28/02/2013
Date of most recent use	Constantly running (when suitable wind conditions present)
Any repairs?	No
Pump intake depth (m bgl):	30m (100ft anecdotal)
Interviewee's est. annual take (ML):	LH does not have an estimate of average flow rate, however the windmill operates constantly (when suitable wind). The bore will supply drinking water for an average of approximately 100 head of cattle. (On this basis, an approximate minimum supply could be calculated).
Basis for estimate:	n.a.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock; average 100 head cattle (gravity fed to troughs)
Detail all other water sources for property:	Two dams, one other bore and rainwater for all other domestic use.

Typical pumping rate of bore (L/s):	Unknown (varies with wind conditions)
Does this rate vary annually or can the pump rate be varied?:	Varies with wind conditions.
Typical duration and frequency of pumping: (any seasonal variations?)	The windmill is very rarely turned off, unless extremely windy and tank is constantly overflowing.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	Not able to be measured.
Describe riser, headwork and water distribution details:	Riser is held in place by two wooden stakes and a cross beam. The outflow from the bore is approximately 3m above ground level. From here it travels approx. 5m via a steel pipe to the water tank (5,000 gallons). The tank gravity feeds a number of water troughs in the area.
Equipment condition:	The windmill, riser and water tank appear in good condition. The LH indicated that he has had problems with corrosion of pipes in the well, which he has to replace regularly. (Even a period as short as two months has seen a hole develop in the rising main).
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Not measured
Stable pumping water level (m bgl): (measured, including mins after pump on)	Windmill barely pumping at the time of sampling, but had been pumping throughout the day. At 9.47m below TOC an obstruction was met, which couldn't be passed, and hence a water level couldn't be obtained.
Water level measuring point	Top of casing.
Interviewee / owner understanding of typical SWL / PWL (m bgl):	37m bgl (120ft, anecdotal)
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is nearly flush to ground level, which could allow the introduction of surface water (or potentially insects or larger fauna). The bore is in a field used for grazing and the windmill frame provides only limited protection around the well head.
Water quality sample collected during this assessment?	Could not sample because a) limited wind throughout assessment and b) it was not possible to safely sample the outflow.
Sample type: (primary, duplicate, field blank)	n.a.
General Comments	
Bore could not be sampled because of lack of wind and location of outflow. Interview was conducted before the site visit, as the LH was not available to accompany to the site.	
Photos	

3. Acland Pastoral Company

Assessment Details - 2_RP867691_01	
Property name:	Unknown
Local bore name:	Unknown
Registered Number:	Unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	Unknown
Assessment date and time:	22/05/2013
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	2 RP867691
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Abandoned
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Not used
Easting:	372257
Northing:	6973736
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	Unknown
Date Installed:	Unknown
Surface casing dia. (mm), and material:	Unknown
Bore casing dia. (mm), and material:	125mm, steel
Bore casing stickup above ground (m):	0.32m
Aquifer: (& source of information: log, anecdotal)	Unknown
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	Old and corroded but surface casing in adequate condition.
Bore Equipment Details	
Pump Installed?	No
Pump type, make and model, power source:	n.a.
Date installed:	n.a.
Date of most recent use	Old windmill structure lying on the ground beside bore.
Any repairs?	n.a.
Pump intake depth (m bgl):	n.a.
Interviewee's est. annual take (ML):	n.a.
Basis for estimate:	n.a.
Is bore use metered? Give details:	n.a.
Detail specific uses of the bore water:	n.a.
Detail all other water sources for property:	n.a.
Typical pumping rate of bore (L/s):	n.a.
Does this rate vary annually or can the pump rate be varied?:	n.a.
Typical duration and frequency of pumping: (any seasonal variations?)	n.a.

Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	n.a.
Describe riser, headwork and water distribution details:	n.a.
Equipment condition:	n.a.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	20.93m bgl (measured at time of inspection)
Stable pumping water level (m bgl): (measured, including mins after pump on)	n.a.
Water level measuring point	ToC
Interviewee / owner understanding of typical SWL / PWL (m bgl):	n.a.
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Unknown
Any account of gas in the bore from interviewee?	n.a.
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is open and in an open field. Vegetation is low around bore, which is likely due to grazing. No obvious sign of potential contamination source.
Water quality sample collected during this assessment?	No sample taken (no pump in the bore)
Sample type: (primary, duplicate, field blank)	n.a.

General Comments

Bore location was provided by APC manager. The bore was located and some basic measurements were able to be taken. The bore is not used and little information was available regarding this bore.

Photos

Assessment Details - 30_D361484_01	
Property name:	Balgowan
Local bore name:	WB131 (written on control box next to bore)
Registered Number:	Not confirmed but believed to be RN137014
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	07/06/2013 11:15am
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	30 D361484
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	APC Property Manager Ben Murrihead
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Mine water supply
GDA Latitude (decimal deg.):	27° 15'18.5566"S
GDA Longitude (decimal deg.):	151° 40'07.3906"E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	Yes, copies attached
Date Installed:	20/06/2007
Surface casing dia. (mm), and material:	Difficulty measuring surface casing, steel.
Bore casing dia. (mm), and material:	Bore sealed, unable to measure bore casing.
Bore casing stickup above ground (m):	0.11 m
Aquifer: (& source of information: log, anecdotal)	Marburg Sandstone (bore log)
Top of screen (m bgl):	Intervals from bore log: 120-130m, 145-152m and 178-186m. Slight discrepancy between bore log and construction diagram on following page.
Bottom of screen (m bgl):	Approximately 186m, although not clear from bore log.
Top of open hole (m bgl):	NA
Total depth (m):	192.5 m
Bore Condition Comments:	From what can be seen the bore looks in good condition with only very minor corrosion on outer bore casing.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Unknown, unknown, electricity source is used for the pump from a public supply
Date installed:	Estimated to be shortly after bore drilled 20/06/2007
Date of most recent use	Unknown
Any repairs?	Unknown
Pump intake depth (m bgl):	Unknown
Interviewee's est. annual take (ML):	Bore is currently switched off.
Basis for estimate:	NA
Is bore use metered? Give details:	Yes, flow meter on bore
Detail specific uses of the bore water:	Water used by mine
Detail all other water sources for property:	Unknown
Typical pumping rate of bore (L/s):	Unknown
Does this rate vary annually or can the pump rate be varied?:	Unknown

Typical duration and frequency of pumping: (any seasonal variations?)	Unknown
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	6.78 L/s
Describe riser, headwork and water distribution details:	Steel bore casing is set on a concrete platform. The top of the bore casing is at ground level. A steel circular bore cap (diameter 0.4m) sits on top of the bore casing. This connects to a black poly pipe (diameter 0.06m) and runs horizontally for 2.8m, passing through a number of instruments before transferring to a larger black poly pipe that becomes buried. A T joint is located approximately 2.4m from the borehole. This ends in an open pipe but is controlled by a valve (please see pictures for a detailed description of bore setup). The bore feeds into one storage tank and then another before being used by the mine. Both storage tanks are on the property
Equipment condition:	Appears in good condition. Little sign of wear and tear.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Unknown
Stable pumping water level (m bgl): (measured, including mins after pump on)	Unknown
Water level measuring point	Airline has a hole in it near the bore and therefore a reading could not be taken.
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Unknown
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Unknown
Any account of gas in the bore from interviewee?	Unknown
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is sealed well and there is limited chance of contamination.
Water quality sample collected during this assessment?	Yes
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Revisited on 15/05/2013 to pump and take sample. Bore logs have been sourced from B Murihead	
Photos	

Property name: Balgowan		Bore name & RN: WB131		Sampling date: 15/05/2013		Sample collection point: At sample tap attached to head works		Comments:	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance/Colour**	**Odour?**	**TDS (mg/L)**
10:08	6.78 L/s from flow meter on bore	7.21	25.4	2510	8.73	-121.6	Clear	None	1618
10:12	6.33	7.26	25.9	2557	5.99	-125.0	Black	Slight gassy smell	1638
10:16	6.09	7.25	26.1	2591	4.94	-134.1	Clear but slightly discoloured, orange	None	1644
10:20	5.97	7.26	26.0	2578	4.46	-128.8	"	"	1644
10:26	5.85	7.21	26.3	2595	4.23	-130.6	Still discoloured but clearing	Slight gassy smell	"
10:32	5.83	7.19	26.6	2611	5.09	-126.9	Clear	None	"
10:36	5.84	7.17	26.6	2610	4.59	-130.4	Clear	None	"
10:40	5.83	7.19	26.6	"	4.59	-123.9	Clear	"	"
10:45	5.73	7.29	25.8	2563	4.37	-120.0	Slight discoloured	Slight gassy smell	"

Total purge time:	37
Estimated total purge volume:	13,382 L
Time sample collected:	10:45

Assessment Details - 30_D361484_02	
Property name:	Balgowan
Local bore name:	Appears to be a monitoring bore next to APC-Balgowan-01
Registered Number:	NA
Registered number source: (anecdotal, DNRM records, bore log etc)	NA
Assessment date and time:	07/06/2013 12:15am
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	30 D361484
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	n/a
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Monitoring
GDA Latitude (decimal deg.):	27 ° 15’18.5206”S
GDA Longitude (decimal deg.):	151° 40’07.6786”E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	No
Date Installed:	Unknown
Surface casing dia. (mm), and material:	Approximately 200mm diameter, white PVC
Bore casing dia. (mm), and material:	50mm, white PVC
Bore casing stickup above ground (m):	Bore casing 0.38m, surface casing 0.04m
Aquifer: (& source of information: log, anecdotal)	Marburg Sandstone (Likely to be observation bore for APC_Balgowan_01)
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unable to determine with 100m dipper.
Bore Condition Comments:	Bore condition is good. Doesn’t appear that the bore has been completed properly. The inner casing is loose and is not grouted to surface casing in place.
Bore Equipment Details	
Pump Installed?	No
Pump type, make and model, power source:	NA
Date installed:	NA
Date of most recent use	NA
Any repairs?	NA
Pump intake depth (m bgl):	NA
Interviewee's est. annual take (ML):	NA
Basis for estimate:	NA
Is bore use metered? Give details:	NA
Detail specific uses of the bore water:	NA
Detail all other water sources for property:	NA
Typical pumping rate of bore (L/s):	NA
Does this rate vary annually or can the pump rate be varied?:	NA
Typical duration and frequency of	NA

pumping: (any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	NA
Describe riser, headwork and water distribution details:	Concrete platform. There is a large diameter (~200mm) white PVC casing surrounding a smaller capped (50 mm) white PVC casing.
Equipment condition:	NA
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	15.62mbgl measured
Stable pumping water level (m bgl): (measured, including mins after pump on)	NA
Water level measuring point	Top of inner casing
Interviewee / owner understanding of typical SWL / PWL (m bgl):	NA
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	NA
Any account of gas in the bore from interviewee?	NA
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore has a fitted cap.
Water quality sample collected during this assessment?	No
Sample type: (primary, duplicate, field blank)	NA
General Comments	
Photos	

Assessment Details - 32_RP30978_01	
Property name:	Balgowan
Local bore name:	WB98 Written on control box next to bore
Registered Number:	Unknown but believed to be RN 147105
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	07/05/2013 1:15pm
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	32 RP30978
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	APC Property Manager Ben Murrihead
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Currently not used. Rising main (poly pipe), not connected rendering it unusable. Power cable for pump is not connected to the bore.
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Mine water supply
GDA Latitude (decimal deg.):	27 ° 15’33.9168”S
GDA Longitude (decimal deg.):	151° 40’31.0309”E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	Yes (copies attached)
Date Installed:	25/09/2006 (bore log)
Surface casing dia. (mm), and material:	Approximately 200mm, steel.
Bore casing dia. (mm), and material:	As per surface casing, steel.
Bore casing stickup above ground (m):	0.17m
Aquifer: (& source of information: log, anecdotal)	Marburg Sandstone (Bore Log)
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	186m (bore log)
Bore Condition Comments:	From what can be seen the bore looks in good condition with only very minor corrosion on outer bore casing. Rising main not connected at surface.
Bore Equipment Details	
Pump Installed?	Unknown, pump could be installed as rising main remains in bore.
Pump type, make and model, power source:	Submersible, unknown make and model, public electricity supply.
Date installed:	Unknown
Date of most recent use	Unknown
Any repairs?	Unknown
Pump intake depth (m bgl):	Unknown
Interviewee's est. annual take (ML):	Bore is currently not connected to power.
Basis for estimate:	Unknown
Is bore use metered? Give details:	Unknown
Detail specific uses of the bore water:	Unknown
Detail all other water sources for property:	Unknown
Typical pumping rate of bore (L/s):	Unknown
Does this rate vary annually or can the pump rate be varied?:	Unknown
Typical duration and frequency of	Unknown

pumping: (any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	Bore appears to have a flow meter, not known if it's in working order.
Describe riser, headwork and water distribution details:	Steel bore casing is set on a concrete platform. A steel circular bore cap of diameter 0.4m sits on top of the bore casing and supports the rising main (diameter 0.06m). The rising main is currently not connected to the headworks and associated instrumentation which runs horizontally for 3m, before transferring to a larger black polypipe that is buried. A T joint is located approximately 2.12m from the borehole. This ends in an open pipe but is controlled by a valve (please see pictures for a detailed description of bore setup). The APC manager explained that the bore flows into one storage tank and then another before being used by the mine. Both storage tanks are on the property.
Equipment condition:	Surface casing appears in good condition with little sign of wear and tear. Not clear whether there is a pump currently in the bore, but rising main remains in bore. Rising main not connected to the surface infrastructure rendering the bore unusable in its current state. Power cable is not connected.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	24.45 m bgl (measured)
Stable pumping water level (m bgl): (measured, including mins after pump on)	NA
Water level measuring point	Airline has a hole in it near the bore and therefore a reading could not be taken
Interviewee / owner understanding of typical SWL / PWL (m bgl):	NA
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Unknown
Any account of gas in the bore from interviewee?	Unknown
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	In current state, the bore is not completely sealed, which is a potential source of contaminant (e.g. vegetation, insects etc.)
Water quality sample collected during this assessment?	No
Sample type: (primary, duplicate, field blank)	NA
General Comments	
Bore is currently not used. No power line attached to pump if in well.	
Photos	

Assessment Details - 32_BRP30978_02	
Property name:	Balgowan
Local bore name:	WB133 Written on control box next to bore
Registered Number:	Unknown but believed to be RN 86633
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	07/05/2013 2:15pm
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	32 RP30978
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	APC Property Manager Ben Murrihead
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Unknown
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Mine water supply
GDA Latitude (decimal deg.):	27 ° 15'42.9051"S
GDA Longitude (decimal deg.):	151 ° 41'08.5194"E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	No
Date Installed:	Unknown
Surface casing dia. (mm), and material:	Unknown, casing hidden below bore cap which is flush with the ground surface.
Bore casing dia. (mm), and material:	As above
Bore casing stickup above ground (m):	Ground level
Aquifer: (& source of information: log, anecdotal)	Walloons Coal Measures(Anecdotal from NHC)
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	Unknown, bore sealed below bore cap.
Bore Equipment Details	
Pump Installed?	Unknown
Pump type, make and model, power source:	If installed believed to be submersible, make and model unknown. Electricity source is available for the pump from a public supply.
Date installed:	Unknown
Date of most recent use	Unknown
Any repairs?	Unknown
Pump intake depth (m bgl):	Unknown
Interviewee's est. annual take (ML):	Bore is currently switched off.
Basis for estimate:	NA
Is bore use metered? Give details:	Unknown
Detail specific uses of the bore water:	Unknown
Detail all other water sources for property:	Unknown
Typical pumping rate of bore (L/s):	Unknown
Does this rate vary annually or can the pump rate be varied?:	Unknown
Typical duration and frequency of	Unknown

pumping: (any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	Unknown
Describe riser, headwork and water distribution details:	Steel bore casing is set on a concrete platform. A steel circular bore cap (diameter 0.4m) sits on top of the bore casing. This connects to a black poly pipe (diameter 0.055m). There are three potential outflows from the bore. One runs horizontally for 2.4m, passing through a number of instruments before transferring to a larger diameter black poly pipe that is buried. The destination of this outflow is not known. The second outflow branches off this poly pipe which is located approximately 1.6m from the borehole. Currently this ends in an open pipe but is controlled by a valve (please see pictures for a detailed description of bore setup). The third outflow is at a 90degree angle to the first and runs approximately 1m to a valve and then the poly pipe is buried underground. This bore feeds into one storage tank and then another before being used by the mine. Both storage tanks are on the property.
Equipment condition:	Headworks appear to be in good condition. Part of headworks is not sealed (open hole at top of poly pipe), and would need to be sealed appropriately before being used.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Unknown
Stable pumping water level (m bgl): (measured, including mins after pump on)	Unknown
Water level measuring point	NA
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Unknown
Comments:	A reading of 15psi was taken from the airline.
Water Sampling Details	
Any historic water quality data available from owner?	Unknown
Any account of gas in the bore from interviewee?	Unknown
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	In its current state, the bore has an open hole between the blue valve and the T joint, which is a potential source of contamination (e.g. vegetation, insects etc.)
Water quality sample collected during this assessment?	No
Sample type: (primary, duplicate, field blank)	NA
General Comments	
Photos	


CAUTION
BURIED
PIPE

Assessment Details - 32_Rp30978_03	
Property name:	Balgowan
Local bore name:	WB96 Written on control box next to bore
Registered Number:	Unknown but believed to be RN 119007
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	07/05/2013 3:15pm
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	32 RP30978
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	APC Property Manager Ben Murrihead
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Mine water supply
GDA Latitude (decimal deg.):	27° 15'43.3311"S
GDA Longitude (decimal deg.):	151° 41'58.1692"E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	Yes, see copy
Date Installed:	05/09/2006 (Bore Log)
Surface casing dia. (mm), and material:	220mm, steel
Bore casing dia. (mm), and material:	Unknown, bore sealed at surface
Bore casing stickup above ground (m):	0.15m
Aquifer: (& source of information: log, anecdotal)	Marburg Sandstone (Bore log and DNRM database search)
Top of screen (m bgl):	Unknown (interpreting bore log would estimate screen intervals 125-127m and 171-185m based on bore log comments but no definitive evidence to support this)
Bottom of screen (m bgl):	As above
Top of open hole (m bgl):	NA
Total depth (m):	186m
Bore Condition Comments:	Headworks are in good condition, minor corrosion on outer casing.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Submersible, unknown make and model, electricity source is used for the pump from a public supply.
Date installed:	Unknown
Date of most recent use	Unknown
Any repairs?	Unknown
Pump intake depth (m bgl):	Unknown
Interviewee's est. annual take (ML):	Bore is currently switched off.
Basis for estimate:	Unknown
Is bore use metered? Give details:	Flow meter labelled on side of bore
Detail specific uses of the bore water:	Mine manager states that bore is used for mine water supply
Detail all other water sources for property:	Unknown
Typical pumping rate of bore (L/s):	Unknown, however bore was pumped at 6 L/s during sampling (see next section)
Does this rate vary annually or can the	Unknown

pump rate be varied?:	
Typical duration and frequency of pumping: (any seasonal variations?)	Unknown
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	Unknown
Describe riser, headwork and water distribution details:	Steel bore casing is set on a concrete platform. A steel circular bore cap of diameter 0.36m sits on top of the bore casing. This connects to a black poly pipe (diameter 0.055m). The outflow runs horizontally for 3m, passing through a number of instruments before transferring to a larger black poly pipe that is buried. A T joint branches off this poly pipe and is located approximately 2.15m from the borehole. This ends in an open pipe but is controlled by a valve (please see pictures for a detailed description of bore setup). Mine manager (B Muirhead) explained that this bore feeds into one storage tank and then another before being used by the mine. Both storage tanks are on the property.
Equipment condition:	Appears in good condition.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Airline leaking
Stable pumping water level (m bgl): (measured, including mins after pump on)	Unknown
Water level measuring point	Unknown
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Unknown
Comments:	Leak in airline makes taking reading difficult.
Water Sampling Details	
Any historic water quality data available from owner?	Unknown
Any account of gas in the bore from interviewee?	Unknown
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is sealed and there are very few potential sources of contamination.
Water quality sample collected during this assessment?	Yes on 15/05/2013 from sample tap
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Revisited on 15/05/2013 in order to pump and take sample	
Photos	

Property name: Balgowan		Bore name & RN: WB96		Sampling date: 15/05/2013		Sample collection point: From sample tap at bore head works		Comments:	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance/Colour**	**Odour?**	**TDS (mg/L)**
11:14	6.3	7.44	25.2	3041	6.48	-100.4	Clear some black sediment	Gassy smell	1969
11:17	6.1	7.31	25.5	3056	5.04	-113.0	Clear grey water	"	"
11:22	6.06	7.32	25.6	2773	2.1	-103.4	Clear slightly grey water	None	1781
11:26	6.04	6.96	25.7	2975	3.01	-89.1	Clear	"	1904
11:31	6.03	7.11	25.5	3023	2.48	-84	"	"	1950
11:35	6.04	6.94	25.7	3057	3.18	-84.1	"	Slight gassy smell	1963
11:40	6.01	6.89	25.7	3059	2.53	-76.9	"	None	1963
11:43	6.03	6.88	25.7	3066	2.88	-78.6	"	"	1969
11:47	6.04	6.88	25.8	3067	3.06	-80.2	"	Slight gassy smell	1963
11:52	6.01	6.84	25.6	3063	2.04	-73.9	"	None	1969

Total purge time:	38 mins
Estimated total purge volume:	13,830 L
Time sample collected:	11:52

Assessment Details – 144AG2781_01	
Property name:	Balgowan
Local bore name:	Mine manager stated bore is referred to as the school bore
Registered Number:	Unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	Unknown
Assessment date and time:	07/05/2013 4:30pm
Field staff name:	C Dilley
Property Details	
Lot and Plan number:	144AG2781
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	n/a
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Unknown, but could be a monitoring bore.
Easting:	369978E
Northing:	6982898N
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	Unavailable
Date Installed:	Unknown
Surface casing dia. (mm), and material:	Unknown
Bore casing dia. (mm), and material:	Unknown
Bore casing stickup above ground (m):	Not measured
Aquifer: (& source of information: log, anecdotal)	Unknown
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	Unknown
Bore Equipment Details	
Pump Installed?	No
Pump type, make and model, power source:	NA
Date installed:	NA
Date of most recent use	NA
Any repairs?	NA
Pump intake depth (m bgl):	NA
Interviewee's est. annual take (ML):	NA
Basis for estimate:	NA
Is bore use metered? Give details:	NA
Detail specific uses of the bore water:	NA
Detail all other water sources for property:	NA
Typical pumping rate of bore (L/s):	NA
Does this rate vary annually or can the pump rate be varied?:	NA
Typical duration and frequency of pumping:	NA

(any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	NA
Describe riser, headwork and water distribution details:	NA
Equipment condition:	NA
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Not measured
Stable pumping water level (m bgl): (measured, including mins after pump on)	NA
Water level measuring point	Not measured
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Unknown
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Unknown
Any account of gas in the bore from interviewee?	Unknown
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is open (no cap), which is a potential source of contaminants.
Water quality sample collected during this assessment?	No
Sample type: (primary, duplicate, field blank)	NA
General Comments	
This bore was discovered as we were leaving site. There was not enough time to conduct an assessment, so only pictures and its position were taken. Referred to afterwards by APC Property Manager as the 'school bore'.	
Photos	

Assessment Details – 35RP25514_01	
Property name:	Bosse
Local bore name:	House bore
Registered Number:	Unknown but believed to be RN 94009
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	21-05-2013 11:00
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	35RP25514
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Assistant manager for APC land and tenant at property.
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock and domestic
GDA Latitude (decimal deg.):	27°19'43.6206"S
GDA Longitude (decimal deg.):	151°43'06.4131"E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	Unknown
Date Installed:	Early 1990's (anecdotal)
Surface casing dia. (mm), and material:	Approx. 125mm diameter, steel
Bore casing dia. (mm), and material:	As above
Bore casing stickup above ground (m):	0.41m
Aquifer: (& source of information: log, anecdotal)	Marburg Sandstone (Based on bore depth and DNRM database search)
Top of screen (m bgl):	60m (anecdotal)
Bottom of screen (m bgl):	80m (anecdotal)
Top of open hole (m bgl):	
Total depth (m):	190m (written on bore control box, measured when pump recently installed)
Bore Condition Comments:	Has a couple of corrosion holes in bore casing (anecdotal from interviewee). Surficial corrosion on surface casing but generally in good condition.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Electric submersible, Grundfos, 5.7 kW (3 hp), Public power supply
Date installed:	23/4/2013 (written on bore control box)
Date of most recent use	17/05/13
Any repairs?	No
Pump intake depth (m bgl):	127m bgl (from pump installation info)
Interviewee's est. annual take (ML):	0.2 ML
Basis for estimate:	10 horses, 1 tank a month in winter. 2 tanks a month in summer (10,000L)
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	All domestic (except drinking) and stock water for 10 horses
Detail all other water sources for property:	Only this bore
Typical pumping rate of bore (L/s):	1 – 1.1 L/s
Does this rate vary annually or can the pump rate be varied?:	Pump rate can be varied but hasn't been used.
Typical duration and frequency of	As above for estimate

pumping: (any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	1.25 L/s
Describe riser, headwork and water distribution details:	Outflow from the galvanised elbow fitted to bore cap flows through a galvanised steel pipe to an adjustable valve, which in turn connects to a poly pipe and becomes buried. This flows to the top of a storage tank approx 10m away. There is an overflow pipe that connects to another water tank. The water is then distributed to the troughs and house from this tank.
Equipment condition:	Appears to be in good condition
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	51m bgl (as written on pump control box in April 2013). Could not dip and there wasn't an airline.
Stable pumping water level (m bgl): (measured, including mins after pump on)	Unknown
Water level measuring point	n.a.
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Unknown
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is fairly well sealed and protected (located in garden). Stables nearby and storage sheds may potentially contain sources of contaminants, but unlikely.
Water quality sample collected during this assessment?	Yes, water was pumped to water tanks during the purging stage of sampling. During sampling the flow was diverted to an outflow approx 30m from the bore.
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Photos	

Property name: 221, Greenwood School Road		Bore name & RN: House bore		Sampling date: 21/05/2013		Sample collection point: from outflow 30m from bore		Comments:	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance/Colour**	**Odour?**	**TDS (mg/L)**
11:02	1.25	7.22	22.4	2470	11.63	-73.8	clear	none	1690
11:08	"	7.13	25.7	2462	2.76	-149.7	Slightly discoloured.	"	1586
11:12	"	7.14	26.2	2532	1.67	-176.5	"	"	1612
11:25	1.03	7.08	27.5	2713	0.97	-148.5	clear	"	1683
11:30	1.07	7.06	"	2749	0.97	-143.4	"	"	1703
11:36	1.03	"	27.6	2767	0.77	-140.7	"	"	1709
11:43	1.02	7.05	27.8	2777	1.3	-137.5	"	"	1706
11:49	1.09	7.06	"	2781	0.92	-135.7	"	"	1716
11:58	1.11	"	"	2784	1.05	"	"	"	1722

Total purge time:	56 mins
Estimated total purge volume:	3770 L
Time sample collected:	11:58

Assessment Details – 1SP121628_01	
Property name:	Kennedy
Local bore name:	Unknown
Registered Number:	Unknown
Registered number source: (anecdotal, DNRM records, bore log etc)	n.a.
Assessment date and time:	20/05/2013 2:00pm
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	1SP121628
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	n/a
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Unknown
GDA Latitude (decimal deg.):	27°17'13.7889"S
GDA Longitude (decimal deg.):	151°44'32.3300"E
Water licence number and details: (if available to view)	
Bore Construction Details	
Construction details / log available?	No
Date Installed:	Unknown
Surface casing dia. (mm), and material:	140-145mm diameter, PVC. (End of joint, hence slightly flared and difficult to measure exact diameter with bore plate).
Bore casing dia. (mm), and material:	140-145mm and PVC, if assumed the same as surface casing.
Bore casing stickup above ground (m):	0.23m
Aquifer: (& source of information: log, anecdotal)	Unknown
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	Bore appears in good condition.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Not known (Grundfos bore cap), mains electricity supply
Date installed:	Unknown
Date of most recent use	Unknown
Any repairs?	Unknown
Pump intake depth (m bgl):	Unknown
Interviewee's est. annual take (ML):	Unknown
Basis for estimate:	Unknown
Is bore use metered? Give details:	Does not appear to be metered
Detail specific uses of the bore water:	Unknown
Detail all other water sources for property:	Unknown
Typical pumping rate of bore (L/s):	1.25 L/s
Does this rate vary annually or can the pump rate be varied?:	Unknown
Typical duration and frequency of	Unknown

pumping: (any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	1.42 L/s
Describe riser, headwork and water distribution details:	The outflow from the top of the bore cap passes through a valve before splitting into two directions at a T-piece. There is a valve immediately downstream on each side of the T-piece, which then connects to a black poly pipe which is buried on each side.
Equipment condition:	Appears in good condition. No obvious signs of wear and tear or damage.
Comments:	Bore control panel displays kW hours used, which could potentially be used as a surrogate for flow meter estimated bore use.
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Airline reading of 50 psi before starting pump (which equates to approx. 35m water above the airline; depth of airline setting unknown , although often this is placed immediately above the pump)
Stable pumping water level (m bgl): (measured, including mins after pump on)	Airline reading when sample taken was 40 psi (i.e. drawdown of approx. 7m at end of pumping).
Water level measuring point	Airline
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Unknown
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Unknown
Any account of gas in the bore from interviewee?	Unknown
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Relatively well sealed, with no obvious sources of contaminants visible.
Water quality sample collected during this assessment?	Yes
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Photos	

Property name: Kennedy		Bore name & RN: Kennedy		Sampling date: 20/05/2013		Sample collection point: From outflow on bore head works		Comments:	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance/Colour**	**Odour?**	**TDS (mg/L)**
1:57	1.25	7.73	22.6	5725	20.87	-101.2	Clear	Slight H2S smell	3906
2:00	"	7.36	23.1	5787	6.55	-115.8	"	"	"
2:06	1.42	7.28	23.2	5798	1.75	-115.7	"	"	3913
2:12	1.25	7.26	"	5796	1.44	-116.7	"	None	3906
2:15	1.42	"	23.3	5807	1.37	-114.8	"	Slight H2S smell	"
2:20	1.25	"	23.2	5811	1.25	-110.4	"	"	3913
2:26	"	"	"	5822	1.07	-109.9	"	none	"
2:29	"	"	"	5832	1.20	-109.6	"	"	3919
2:35	"	"	23.3	5831	1.08	-107.4	"	Slight H2S smell	"

Total purge time:	38 mins
Estimated total purge volume:	2936 L
Time sample collected:	2:35

Assessment Details - 7_RP36452_01	
Property name:	Lermont Stud
Local bore name:	House Bore
Registered Number:	Unknown but believed to be RN 21812
Registered number source: (anecdotal, DNRM records, bore log etc)	Nearest RN from DNRM database search is RN 21812 but there is an old unused bore a few metres from this bore.
Assessment date and time:	20/05/2013 12:30
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	7 RP36452
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Assistant manager for APC Land
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock and domestic
GDA Latitude (decimal deg.):	27°22'11.5980"S
GDA Longitude (decimal deg.):	151°41'05.3777"E
Water licence number and details: (if available to view)	No
Bore Construction Details	
Construction details / log available?	No
Date Installed:	24/04/1993 (written on concrete step)
Surface casing dia. (mm), and material:	Approx. 150mm, steel.
Bore casing dia. (mm), and material:	As above
Bore casing stickup above ground (m):	0.41m
Aquifer: (& source of information: log, anecdotal)	Unknown
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	Bore is in good condition; casing has surface corrosion but structure is good. Concrete surface pad broken but otherwise in good working condition.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Submersible Red Jacket pump, Model: 266c. kW:2.2 (3 hp), Volt: 4.5, Amps: 5.7, 3 phase (as recorded on pump control panel), mains power
Date installed:	20/04/1993 (as recorded inside pump control panel)
Date of most recent use	17/05/2013 11:40am (anecdotal, from tenant)
Any repairs?	Unknown
Pump intake depth (m bgl):	Unknown
Interviewee's est. annual take (ML):	Pump rate unknown. Could potentially estimate volume based on interviewee estimate of bore operation: pumped for one hour every second day.
Basis for estimate:	
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock and domestic. All domestic use apart from drinking water. Stock: A few horses.
Detail all other water sources for property:	Two other bores, but not currently used (one equipped).
Typical pumping rate of bore (L/s):	Has an automatic start system. When a tap opens, the pump switches on. So rate depends on number of taps open but only one tap is opened at a time.

	Interviewee provided an anecdotal flow rate of 20L per minute, but based on visual observation of discharge, this is considered to be an underestimate of the actual rate.
Does this rate vary annually or can the pump rate be varied?:	Rate does not vary but annual operation varies, as described below.
Typical duration and frequency of pumping: (any seasonal variations?)	Greater frequency in summer; approximately 3 hours every second day instead of 1 hour.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	Unable to measure, as water only available from the sample tap.
Describe riser, headwork and water distribution details:	Outflow from the top of the bore plate passes through a pressure gauge control box and then splits off into two outflows. The first outflow connects to a poly pipe (50mm diameter) becomes buried and leads to a plastic tank behind the house (23,000 L). The other outflow again splits into two outflows (both black poly pipe approx. 40mm diameter). One of these outflows is to the base of a metal tank (2,000 L) behind the pump (approx. 10m away). It surfaces about 1 m from the bore at a sample tap and then becomes buried again. The other outflow becomes buried and its outflow is unknown (current tenants do not know where the end discharge point is located).
Equipment condition:	Equipment appears in good condition.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Could not dip due to lack of space at the bore headworks.
Stable pumping water level (m bgl): (measured, including mins after pump on)	Not known (but refer below for estimate of drawdown during pumping)
Water level measuring point	NA
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Airline reading before turned pump on of approx. 35 psi (around 24.5m water above airline). Airline reading at 12:37pm was 19 psi (around 13.5m), indicating around 11m of drawdown had occurred during pumping. (Location of end of airline below surface is not known).
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	No
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is fairly well sealed and covered by shelter. Near stables but limited obvious sources of contamination. Yard is clear / well kept.
Water quality sample collected during this assessment?	Yes, from sample tap. Obtained by leaving the only outflow to the metal tank behind the bore open (the discharge line on which the sample tap is located).
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Sampling was limited by how long the pump could be operated, as the tenant did not want water discharging onto land. Could only fill the tank and take a sample before the large tank was full (the small tank already had some water in it). The sample was taken from the tap, as the tenant didn't want to disconnect any of the head works.	
Photos	

Property name: Lermont Stud		Bore name & RN: House Bore		Sampling date: 20/05/2013		Sample collection point: At sample tap before outflow at storage tank.		Comments:	
Time	Flow Rate (L/s)	pH	Temp (°C)	EC (µS/cm)	Dissolved Oxygen (mg/L)	Redox (mV)	Water Appearance/Colour	Odour?	TDS (mg/L)
12:13	unknown	8.09	25.5	2270	20.02	-63.1	clear	None	1463
12:15	"	8.30	25.9	2276	9.47	-63.5	"	"	1456
12:18	"	8.40	26.0	2232	5.67	-64.8	"	"	1430
12:22	"	8.46	26.4	2293	4.54	-68.3	"	"	1450
12:25	"	8.48	26.6	2296	4.30	-67.3	"	"	"
12:28	"	8.48	26.5	2283	4.30	-66.2	"	"	1443
12:31	"	8.48	26.7	2312	4.21	-67.2	"	"	1456
12:34	"	8.49	26.6	2253	4.36	-68.0	"	"	1469
12:37	"	"	26.7	"	4.39	-68.3	"	"	1463

Total purge time:	24 mins
Estimated total purge volume:	n.a.
Time sample collected:	12:37

Assessment Details - 1_RP25512_01	
Property name:	Lutheran
Local bore name:	Unknown
Registered Number:	Unknown but believed to be RN 9564
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRM database search
Assessment date and time:	20/05/2013 3:30pm
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	1 RP25512
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	n/a.
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing but unequipped (i.e. no pumping equipment down the hole)
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Not currently used
GDA Latitude (decimal deg.):	27°19'13.5072"S
GDA Longitude (decimal deg.):	151°44'34.7169"E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	No
Date Installed:	Unknown
Surface casing dia. (mm), and material:	As per bore casing
Bore casing dia. (mm), and material:	130mm diameter, steel
Bore casing stickup above ground (m):	0.16m
Aquifer: (& source of information: log, anecdotal)	Marburg Sandstone (DNRM database search and depth to water)
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	Bore casing is corroded but structure appears to be in reasonable condition.
Bore Equipment Details	
Pump Installed?	No
Pump type, make and model, power source:	n.a.
Date installed:	n.a.
Date of most recent use	n.a.
Any repairs?	n.a.
Pump intake depth (m bgl):	n.a.
Interviewee's est. annual take (ML):	n.a.
Basis for estimate:	n.a.
Is bore use metered? Give details:	n.a.
Detail specific uses of the bore water:	n.a.
Detail all other water sources for property:	Unknown
Typical pumping rate of bore (L/s):	n.a.
Does this rate vary annually or can the pump rate be varied?:	n.a.
Typical duration and frequency of pumping:	n.a.

(any seasonal variations?)	
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	n.a.
Describe riser, headwork and water distribution details:	The bore is unequipped and does not have any head works but there are two tanks nearby, which would have previously been used in association with this bore. The outflow to the bore has a gauge but is not attached. This flows to the tanks (15,000 L each). The nearby electrical panel (on mains power pole) contains a 'newish' looking Lowara control box, indicating the bore has been equipped in the (relatively) recent past.
Equipment condition:	n.a.
Comments:	Infrastructure in place for pump, but not equipped
Water Details	
Standing water level (m bgl): (measured or anecdotal)	98.69m bgl (measured at 98.85m below TOC)
Stable pumping water level (m bgl): (measured, including mins after pump on)	n.a.
Water level measuring point	TOC
Interviewee / owner understanding of typical SWL / PWL (m bgl):	n.a.
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Unknown
Any account of gas in the bore from interviewee?	n.a.
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Hay storage sheds nearby may contain some sources of contaminants but unlikely. Bore is currently open (i.e. no bore cover/cap).
Water quality sample collected during this assessment?	No, bore is unequipped
Sample type: (primary, duplicate, field blank)	n.a.
General Comments	
Photos	

Assessment Details - 3441_A341742_01	
Property name:	Veitheers
Local bore name:	Feedlot bore
Registered Number:	Unknown.
Registered number source: (anecdotal, DNRM records, bore log etc)	n.a.
Assessment date and time:	17/05/2013 11:00am
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	3441 A341742
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	Assistant manager for APC Land
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Stock
GDA Latitude (decimal deg.):	27°20'43.4756"S
GDA Longitude (decimal deg.):	151°40'38.1320"E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	No
Date Installed:	Unknown
Surface casing dia. (mm), and material:	Approx. 120mm steel
Bore casing dia. (mm), and material:	120mm, steel
Bore casing stickup above ground (m):	0.15m
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (Based on depth and anecdotal information from interviewee)
Top of screen (m bgl):	30m (anecdotal)
Bottom of screen (m bgl):	46m (anecdotal)
Top of open hole (m bgl):	n.a.
Total depth (m):	Unknown
Bore Condition Comments:	Surficial corrosion on rising main but structure good.
Bore Equipment Details	
Pump Installed?	Yes
Pump type, make and model, power source:	Submersible. Based on control panel the pump is a 0.75 kW Franklin electric submersible (see pictures). Generator (single phase pump).
Date installed:	2002 approx. (anecdotal)
Date of most recent use	Oct 2012 (from interviewee)
Any repairs?	No
Pump intake depth (m bgl):	36m bgl (anecdotal)
Interviewee's est. annual take (ML):	0.53 ML
Basis for estimate:	5 hours a day, every day for 3 months of the year (when stock in field) Based on anecdotal information from interviewee. Average flow rate measured was 0.33 L/s.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Stock approx. 250 head
Detail all other water sources for property:	1 dam.
Typical pumping rate of bore (L/s):	0.32 L/s
Does this rate vary annually or can the pump rate be varied?:	Is not varied.

Typical duration and frequency of pumping: (any seasonal variations?)	Doesn't vary. When the dam is low, the bore is used to supplement stock water with bore water.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	0.36 L/s
Describe riser, headwork and water distribution details:	Old windmill frame and piping is in place but there is a submersible pump being used in bore. The submersible pump is attached to the windmill piping and uses this as the rising for the pump. The windmill casing is held in place by two wooden stakes and a cross beam. The outflow from the bore is a steel pipe (approx. 45 mm) this rises to about 2.5 m above ground. This connects to a black poly pipe (approx. 33mm diameter) which transfers the water over the top of an old metal tank (not used) and then discharges at the top of a concrete tank. The concrete tank gravity feeds cattle troughs (1 x trough at time of survey).
Equipment condition:	Appears in good condition. Windmill pipe (rising main) is old but appears to be in reasonable condition. Pump has not been pulled up since property transferred to APC, so pump condition is unknown.
Comments:	
Water Details	
Standing water level (m bgl): (measured or anecdotal)	Bore casing is open and appears possible to dip. However due to the submersible pump electrical cable winding around the windmill rising main, it is possible that the dip meter tape could get lodged. The interviewee was not aware of how the electrical cable is attached to the rising main. Due to the chance of the dipper becoming (permanently) snagged, an attempt was not made to measure the water level.
Stable pumping water level (m bgl): (measured, including mins after pump on)	Unknown, not measured (as described above)
Water level measuring point	n.a.
Interviewee / owner understanding of typical SWL / PWL (m bgl):	Unknown
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	Not aware of any tests
Any account of gas in the bore from interviewee?	No
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is open and low to ground. Barbed wire fence keeps cattle away from immediate vicinity of the bore, although the fence is in poor condition. Old battery sits approx. 2 m from the bore.
Water quality sample collected during this assessment?	Yes, sample taken just before the water enters the concrete tank. The head works arrangement meant that this was the first available outflow for sampling.
Sample type: (primary, duplicate, field blank)	Primary
General Comments	
Nearest bore with an RN is Bore 64302, approximately 1 km away. Interviewee believes that may be an old bore and that the bore described here was equipped as its replacement. Current condition of 64302 is unknown.	
Photos	

Property name: Veitheers		Bore name & RN: Feedlot bore		Sampling date: 17/05/2013		Sample collection point: at outflow before storage tanks		Comments:	
Time	**Flow Rate (L/s)**	**pH**	**Temp (°C)**	**EC (µS/cm)**	**Dissolved Oxygen (mg/L)**	**Redox (mV)**	**Water Appearance/Colour**	**Odour?**	**TDS (mg/L)**
10:06	0.32	8.95	19.3	733	17.87	61.0	Murky brown	none	533
10:08	0.36	7.49	22.9	2220	12.37	-98.7	Dark orange discolouration	none	1501
10:14	0.33	7.34	23.2	2215	5.56	-118.3	"	"	1495
10:19	0.32	7.32	23.4	2232	4.33	-119.9	"	"	1501
10:24	0.36	7.28	23.7	2251	2.76	-128.0	"	"	"
10:32	0.32	7.47	23.8	1907	1.97	-127	"	"	1267
10:39	0.31	7.56	23.8	1702	2.07	-119.4	"	"	1131
10:46	0.33	7.56	24.1	1658	1.74	-110.2	As above but darker shade of orange	"	1098
10:53	0.32	7.54	23.7	1651	1.69	-106.6	"	"	"
11:00	"	7.56	24.2	1676	1.94	-124.0	"	"	1092
11:06	0.31	7.61	"	1638	2.07	-127.2	"	"	1079

Total purge time:	60 mins
Estimated total purge volume:	1188 L
Time sample collected:	11:06

Assessment Details – 3470_A341746_01	
Property name:	Vols Lagoon Creek
Local bore name:	Vols Windmill
Registered Number:	Unknown but believed to be RN 94740
Registered number source: (anecdotal, DNRM records, bore log etc)	DNRW database search.
Assessment date and time:	13/05/2013 2:00pm
Field staff name:	C. Dilley
Property Details	
Lot and Plan number:	3470 A341746
Interviewee Details	
Interviewee relationship to property: (owner, tenant, manager etc)	APC Manager
Bore Details	
Status of bore: (existing, abandoned, destroyed)	Existing, but currently not working
Uses of bore: (Stock, feedlot, domestic, irrigation etc)	Feeds dam for stock, and historically for some irrigation
GDA Latitude (decimal deg.):	27°20'29.6751"S
GDA Longitude (decimal deg.):	151°39'23.9109"E
Water licence number and details: (if available to view)	Unknown
Bore Construction Details	
Construction details / log available?	No
Date Installed:	Unknown
Surface casing dia. (mm), and material:	As per bore casing
Bore casing dia. (mm), and material:	140mm diameter (OD), PVC
Bore casing stickup above ground (m):	0.48m (0.28m PVC 'stick-up' plus 0.20m for concrete pad)
Aquifer: (& source of information: log, anecdotal)	Walloon Coal Measures (based on DNRM database search)
Top of screen (m bgl):	Unknown
Bottom of screen (m bgl):	Unknown
Top of open hole (m bgl):	Unknown
Total depth (m):	Unknown
Bore Condition Comments:	Bore appears to be in good condition. Windmill tower and rising main in reasonable condition, but does not pump water.
Bore Equipment Details	
Pump Installed?	Ben Muirhead believes the pump has fallen off the end of the rising main.
Pump type, make and model, power source:	Unknown
Date installed:	Unknown
Date of most recent use	Windmill is turning but not producing water.
Any repairs?	Unknown
Pump intake depth (m bgl):	Unknown
Interviewee's est. annual take (ML):	Zero
Basis for estimate:	Dam stays relatively full without this bore; has not been pumped since Ben Muirhead started with New Hope approximately 7 years ago.
Is bore use metered? Give details:	No
Detail specific uses of the bore water:	Used to supply dam
Detail all other water sources for property:	Dams.
Typical pumping rate of bore (L/s):	Unknown
Does this rate vary annually or can the pump rate be varied?:	Currently not working – when operational will vary with wind conditions.

Typical duration and frequency of pumping: (any seasonal variations?)	Currently not working – when operational will vary with wind conditions.
Measured Maximum Flow Rate of Bore and Headworks at Site Visit (L/s)	Pump not working
Describe riser, headwork and water distribution details:	PVC bore casing is set in a concrete pad. The rising main is held in place with two wooden stakes and a cross beam. The outflow from the riser connects to a black poly pipe, which transports the water to a dam approx. 150m away.
Equipment condition:	Windmill in good condition
Comments:	Bore is not used. Ben believes the pump has fallen off the end of the rising main.
Water Details	
Standing water level (m bgl): (measured or anecdotal)	9.88m bgl (measured 10.36m below TOC).
Stable pumping water level (m bgl): (measured, including mins after pump on)	n.a.
Water level measuring point	Top of bore casing (TOC)
Interviewee / owner understanding of typical SWL / PWL (m bgl):	n.a.
Comments:	
Water Sampling Details	
Any historic water quality data available from owner?	n.a.
Any account of gas in the bore from interviewee?	n.a.
Any potential for contamination at bore? (fuel storage, open bore casing, no stickup, aquifer intermixing from casing degradation)	Bore is open and in middle of paddock. High vegetation growth around bore. No obvious sources of contamination observed.
Water quality sample collected during this assessment?	No (for reasons described above)
Sample type: (primary, duplicate, field blank)	n.a.
General Comments	
Photos	

Appendix A. Laboratory Results

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EB1312721**	Page	: 1 of 3
Client	: **SINCLAIR KNIGHT MERZ**	Laboratory	: Environmental Division Brisbane
Contact	: MR DERWIN LYONS	Contact	: Rebecca Kleinschmidt
Address	: P O BOX 3848 SOUTH BRISBANE QLD, AUSTRALIA 4101	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: dlyons@globalskm.com	E-mail	: rebecca.kleinschmidt@alsglobal.com
Telephone	: +61 07 3026 7100	Telephone	: +61 3552 8668
Facsimile	: +61 07 3026 7300	Facsimile	: +61 7 3352 3662
Project	: QE06644 029	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 27-MAY-2013
Sampler	: Chris Dilley	Issue Date	: 03-JUN-2013
Site	: ----		
		No. of samples received	: 4
Quote number	: EN/003/12	No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Jonathon Angell	Inorganic Coordinator	Brisbane Inorganics
Jonathon Angell	Inorganic Coordinator	Brisbane Inorganics
Jonathon Angell	Inorganic Coordinator	Brisbane Inorganics
Jonathon Angell	Inorganic Coordinator	Brisbane Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	C_Cooke_01	C-Norgaard_01	APC_Kennedy_01	APC_Bosse_01	----
				Client sampling date / time	21-MAY-2013 15:00	22-MAY-2013 15:00	20-MAY-2013 15:00	21-MAY-2013 15:00	----
Compound	CAS Number	LOR	Unit		EB1312721-001	EB1312721-002	EB1312721-003	EB1312721-004	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		242	237	311	229	----
Total Alkalinity as CaCO3	----	1	mg/L		242	237	311	229	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		33	20	394	48	----
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	1	mg/L		699	323	1500	696	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		55	53	232	92	----
Magnesium	7439-95-4	1	mg/L		14	26	127	23	----
Sodium	7440-23-5	1	mg/L		450	187	836	385	----
Potassium	7440-09-7	1	mg/L		6	8	21	16	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L		0.006	0.003	0.002	0.002	----
Manganese	7439-96-5	0.001	mg/L		0.045	0.025	0.008	0.027	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	----
Iron	7439-89-6	0.05	mg/L		0.24	1.28	1.77	3.31	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.1	0.3	<0.1	0.1	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.10	0.02	0.02	0.02	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.2	<0.1	0.5	0.4	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		0.3	<0.1	0.5	0.4	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		25.2	14.3	56.7	25.2	----
Total Cations	----	0.01	meq/L		23.6	13.1	58.9	23.6	----
Ionic Balance	----	0.01	%		3.32	4.17	1.90	3.22	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EB1312213**	Page	: 1 of 5
Client	: **SINCLAIR KNIGHT MERZ**	Laboratory	: Environmental Division Brisbane
Contact	: MR DERWIN LYONS	Contact	: Rebecca Kleinschmidt
Address	: P O BOX 3848 SOUTH BRISBANE QLD, AUSTRALIA 4101	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: dlyons@globalskm.com	E-mail	: rebecca.kleinschmidt@alsglobal.com
Telephone	: +61 07 3026 7100	Telephone	: +61 3552 8668
Facsimile	: +61 07 3026 7300	Facsimile	: +61 7 3352 3662
Project	: QE06644 029 New Acland Baseline	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: QE06644.029		
C-O-C number	: ----	Date Samples Received	: 21-MAY-2013
Sampler	: Christopher Dilley	Issue Date	: 29-MAY-2013
Site	: ----		
		No. of samples received	: 11
Quote number	: EN/003/12	No. of samples analysed	: 11

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

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- Analytical Results

General Comments

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Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics
		Brisbane Inorganics
		Brisbane Inorganics
		Brisbane Inorganics
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID: K_Biltoft_01	P_Loughlin_01	P_Loughlin_02	P_Loughlin_03	APC_Balgowan_01
				Client sampling date / time: 14-MAY-2013 09:30	14-MAY-2013 12:30	14-MAY-2013 14:20	14-MAY-2013 16:20	15-MAY-2013 10:45
				EB1312213-001	EB1312213-002	EB1312213-003	EB1312213-004	EB1312213-005
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	6	7	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	587	306	240	171	409
Total Alkalinity as CaCO3	----	1	mg/L	587	306	246	178	409
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	49	33	1	24	43
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	257	518	293	90	600
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	129	128	5	19	74
Magnesium	7439-95-4	1	mg/L	98	75	1	5	59
Sodium	7440-23-5	1	mg/L	116	182	273	121	354
Potassium	7440-09-7	1	mg/L	3	10	2	3	12
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	0.02	<0.01
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.004	0.003	0.003	0.018	0.001
Manganese	7439-96-5	0.001	mg/L	0.094	0.283	0.062	0.020	0.058
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	7439-89-6	0.05	mg/L	<0.05	0.22	<0.05	<0.05	5.17
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.4	0.5	0.5	0.2	0.5
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.10	0.05	<0.01	0.13	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.2	<0.1	1.1	0.1	0.6
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	0.3	<0.1	1.1	0.2	0.6
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	20.0	21.4	13.2	6.59	26.0
Total Cations	----	0.01	meq/L	19.6	20.7	12.3	6.70	24.2
Ionic Balance	----	0.01	%	0.94	1.61	3.74	0.76	3.47

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID: APC_Balgowan_05	R_Woodland_01	D_Ballon_01	G_Cooke_02	APC_Veitheers_01
				Client sampling date / time: 15-MAY-2013 12:00	15-MAY-2013 14:15	16-MAY-2013 08:45	16-MAY-2013 11:30	17-MAY-2013 11:00
				EB1312213-006	EB1312213-007	EB1312213-008	EB1312213-009	EB1312213-010
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	376	243	241	424	488
Total Alkalinity as CaCO3	----	1	mg/L	376	243	241	424	488
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	75	32	124	98	30
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	759	408	1020	410	233
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	87	50	132	133	27
Magnesium	7439-95-4	1	mg/L	75	19	72	95	11
Sodium	7440-23-5	1	mg/L	422	275	564	149	315
Potassium	7440-09-7	1	mg/L	11	9	15	12	3
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.002	0.001	0.001	0.002	0.004
Manganese	7439-96-5	0.001	mg/L	0.013	0.061	0.985	0.321	0.042
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	7439-89-6	0.05	mg/L	2.59	2.38	14.4	0.95	0.72
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.4	0.3	0.2	0.3	0.1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.01	<0.01	<0.01	<0.01	<0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	0.1	0.2	0.3
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	0.1	0.2	0.3
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	30.5	17.0	36.2	22.1	17.0
Total Cations	----	0.01	meq/L	29.2	16.2	37.4	21.2	16.0
Ionic Balance	----	0.01	%	2.25	2.36	1.71	1.92	2.82

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID: APC_Lermont_03	----	----	----	----
				Client sampling date / time: 17-MAY-2013 13:00	----	----	----	----
				EB1312213-011	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	**10**	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**187**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**197**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	----	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	**620**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**7**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	<1	----	----	----	----
Sodium	7440-23-5	1	mg/L	**447**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**2**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.002**	----	----	----	----
Manganese	7439-96-5	0.001	mg/L	**0.016**	----	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	----	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.1**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.01**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.5**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**0.5**	----	----	----	----
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**21.4**	----	----	----	----
Total Cations	----	0.01	meq/L	**19.8**	----	----	----	----
Ionic Balance	----	0.01	%	**3.86**	----	----	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **EB1311344**	Page	: 1 of 4
Client	: **SINCLAIR KNIGHT MERZ**	Laboratory	: Environmental Division Brisbane
Contact	: MR DERWIN LYONS	Contact	: Rebecca Kleinschmidt
Address	: P O BOX 3848 SOUTH BRISBANE QLD, AUSTRALIA 4101	Address	: 2 Byth Street Stafford QLD Australia 4053
E-mail	: dlyons@globalskm.com	E-mail	: rebecca.kleinschmidt@alsglobal.com
Telephone	: +61 07 3026 7100	Telephone	: +61 3552 8668
Facsimile	: +61 07 3026 7300	Facsimile	: +61 7 3352 3662
Project	: QE06644 029 New Acland Baseline	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: QE06644.029		
C-O-C number	: ----	Date Samples Received	: 13-MAY-2013
Sampler	: Christopher Dilley	Issue Date	: 20-MAY-2013
Site	: ----		
		No. of samples received	: 7
Quote number	: EN/003/12	No. of samples analysed	: 7

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
Andrew Epps	Metals Production Chemist	Brisbane Inorganics
Andrew Epps	Metals Production Chemist	Brisbane Inorganics

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LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Client sample ID: M_Donohoe_01	P_Bohan_01	M_Sherwin_01	R_Rosenberger_01	R_Rosenberger_02
				Client sampling date / time: 08-MAY-2013 10:00	08-MAY-2013 15:00	09-MAY-2013 10:00	09-MAY-2013 13:00	09-MAY-2013 15:30
				EB1311344-001	EB1311344-002	EB1311344-003	EB1311344-004	EB1311344-005
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**192**	**239**	**419**	**221**	**258**
Total Alkalinity as CaCO3	----	1	mg/L	**192**	**239**	**419**	**221**	**258**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**55**	**35**	**8**	**5**	**48**
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	**845**	**409**	**38**	**396**	**459**
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**71**	**53**	**70**	**48**	**18**
Magnesium	7439-95-4	1	mg/L	**90**	**21**	**40**	**14**	**4**
Sodium	7440-23-5	1	mg/L	**426**	**273**	**71**	**261**	**375**
Potassium	7440-09-7	1	mg/L	**12**	**9**	**2**	**7**	**6**
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	**0.004**	**0.003**	**0.017**	**0.010**	**0.006**
Manganese	7439-96-5	0.001	mg/L	**0.090**	**0.128**	<0.001	**0.355**	**0.017**
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	7439-89-6	0.05	mg/L	**1.11**	**0.38**	<0.05	<0.05	<0.05
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.2**	**0.3**	**0.5**	**0.2**	<0.1
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.05**	<0.01	**5.43**	**0.03**	**0.57**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	**0.2**	**0.5**	**0.3**	**0.4**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	<0.1	**0.2**	**5.9**	**0.3**	**1.0**
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	**28.8**	**17.0**	**9.61**	**15.7**	**19.1**
Total Cations	----	0.01	meq/L	**29.8**	**16.5**	**9.92**	**15.1**	**17.7**
Ionic Balance	----	0.01	%	**1.64**	**1.69**	**1.60**	**2.00**	**3.86**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	D_Janetzki_02	D_Janetzki_03	----	----	----
				Client sampling date / time	10-MAY-2013 09:30	10-MAY-2013 11:00	----	----	----
Compound	CAS Number	LOR	Unit		EB1311344-006	EB1311344-007	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		173	208	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		173	208	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		28	25	----	----	----
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	1	mg/L		740	181	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		131	60	----	----	----
Magnesium	7439-95-4	1	mg/L		63	32	----	----	----
Sodium	7440-23-5	1	mg/L		245	88	----	----	----
Potassium	7440-09-7	1	mg/L		11	7	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	<0.01	----	----	----
Arsenic	7440-38-2	0.001	mg/L		<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L		0.003	0.002	----	----	----
Manganese	7439-96-5	0.001	mg/L		0.049	0.304	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	----	----	----
Iron	7439-89-6	0.05	mg/L		<0.05	0.46	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.4	0.4	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		1.44	<0.01	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.4	<0.1	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		1.8	<0.1	----	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		24.9	9.78	----	----	----
Total Cations	----	0.01	meq/L		22.7	9.63	----	----	----
Ionic Balance	----	0.01	%		4.72	0.76	----	----	----