B4. Priority Site Register

PRIORITY SITES REGISTER

Information as at 31 October 2019

The Priority Sites Register is updated monthly and the information on it may not be accurate, current or complete and may be subject to change without notice.

EPA has a key responsibility in protecting beneficial uses of land. Many of these uses are regulated or controlled through a range of measures to prevent contamination of land and groundwater. Land contaminated by former waste disposal, industrial and similar activities is frequently discovered during changes to land use - for example, from industrial to residential use. In most cases these can be managed at the time that the change of land use occurs. Some sites however, present a potential risk to human health or to the environment and must be dealt with as a priority. Such sites are typically subject to clean-up and/or management under EPA directions.

WHAT ARE PRIORITY SITES?

Priority Sites are sites for which EPA has issued a Clean Up Notice pursuant to section 62A, or a Pollution Abatement Notice pursuant to section 31A or 31B (relevant to land and/or groundwater) of the *Environment Protection Act 1970.* Typically these are sites where pollution of land and/or groundwater presents a potential risk to human health or to the environment. The condition of these sites is not compatible with the current or approved use of the site without active management to reduce the risk to human health and the environment. Such management can include clean up, monitoring and/or institutional controls.

The Priority Sites Register does not list sites managed by voluntary agreements or sites subject to management by planning controls (e.g. sites managed in accordance with a section 173 agreement under the *Planning and Environment Act 1987*). Land purchasers should be aware of these limitations and make their own enquiries. A site is listed on the Priority Sites Register when EPA issues a Clean Up Notice or a Pollution Abatement Notice (relevant to land and/or groundwater). A notice is a means by which EPA formalises requirements to manage pollution. Sites are removed from the Priority Sites Register once all conditions of a Notice have been complied with. This is formalised through a Notice of Revocation pursuant to section 60B of the Act.

DISCLAIMER

Users of this site accept all risks and responsibilities for losses, damages, costs and other consequences resulting directly or indirectly from use of this site and information from it.

To the maximum permitted by law, the EPA excludes all liability to any person directly or indirectly from using this site and information from it.

FURTHER INFORMATION

Additional information is available from:
EPA Information Centre
200 Victoria Street
Carlton VIC 3053
1300 EPA VIC (1300 372 842)
www.epa.vic.gov.au

Municipality	Suburb	Address	Issue	Notice Number
Ararat Rural City Council	ARARAT	26 Grano ST	Former Industrial Site. Requires assessment and/or clean up.	0090001739
Ballarat City Council	BALLARAT	1003 Humffray ST	Former Industrial Site. Requires assessment and/or clean up.	0090001857
Ballarat City Council	BALLARAT	Volume 6747 Folio 250	Current Industrial Site. Requires assessment and/or clean up.	0090001913
Ballarat City Council	Black Hill	Crown Allotment 13A Section 35 Township of Ballarat East	Former Landfill. Requires ongoing management.	0090009627
Ballarat City Council	BUNKERS HILL	856 Greenhalghs RD	Current Industrial Site. Requires ongoing management.	0090004647
Ballarat City Council	MOUNT CLEAR	3 WHITEHORSE RD	Former Landfill. Requires ongoing management.	0090003912
Ballarat City Council	MOUNT CLEAR	Whitehorse RD	Former Landfill. Requires assessment and/or clean up.	0090004207
Ballarat City Council	Sebastopol	Crown Allotment A Section 9	Gun, pistol or rifle range. Requires assessment and/or clean up.	0090010221
Banyule City Council	GREENSBOROUGH	131 - 135 GRIMSHAW ST	Current Service Station. Requires assessment and/or clean up.	0090010564
Bass Coast Shire Council	GLEN FORBES	1685 BASS HWY	Current landfill. Requires assessment and/or clean up.	0090009939
Bass Coast Shire Council	WONTHAGGI	C/a 15 Section 58 Cameron St	Former Landfill. Requires ongoing management.	0090006816

Municipality	Suburb	Address	Issue	Notice Number
Baw Baw Shire Council	ELLINBANK	196 PETERS RD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090010472
Baw Baw Shire Council	JINDIVICK	15 BEATTIE RD	Illegal dumping. Requires assessment and/or clean up.	0090008457
Baw Baw Shire Council	TRAFALGAR SOUTH	200 GILES RD	Former Landfill. Requires ongoing management.	0090007302
Bayside City Council	Brighton	(Part) Lot 2/TP963646N (As per Section 5, Figure 1.0	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090010012
Bayside City Council	BRIGHTON	322 NEW ST	Former Service Station. Requires assessment and/or clean up.	0090008943
Bayside City Council	BRIGHTON	326 NEW ST	Former Industrial Site. Requires assessment and/or clean up.	0090008944
Bayside City Council	Cheltenham	Lot 3, PS802507T 322-328 Bay Road	Former Industrial Site. Requires assessment and/or clean up.	0090010027
Bayside City Council	CHELTENHAM	Lot 2, PS802507T 322-328 Bay Road	Current Industrial Site. Requires ongoing management.	0090008422
Bayside City Council	CHELTENHAM	322 - 328 BAY RD	Former Industrial Site. Requires assessment and/or clean up.	0090010025
Bayside City Council	CHELTENHAM	Lot 2, PS802507T 322-328 Bay Road	Former Industrial Site. Requires assessment and/or clean up.	0090010026
Bayside City Council	CHELTENHAM	322 - 328 BAY RD	Former Industrial Site. Requires assessment and/or clean up.	0090010028
Bayside City Council	Sandringham	Part Lot 1/TP125095-excludes Scout Hall Lot 2/LP62334	Former Industrial Site. Requires ongoing management.	0090007233
Brimbank City Council	Albion	SUNSHINE ENERGY PARK 570A Ballarat Road And	Former Landfill. Requires ongoing management.	0090007761
Brimbank City Council	ALBION	Carrington Drive Reserve 137A Denton Avenue ST ALBANS	Former Landfill. Requires ongoing management.	0090005541
Brimbank City Council	ARDEER	22 - 24 REID ST	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090007084
Brimbank City Council	ARDEER	14A & 14-18 REID STREET	Current Industrial Site. Requires assessment and/or clean up.	0090008190
Brimbank City Council	BROOKLYN	594 GEELONG RD	Former Landfill. Requires ongoing management.	0090003478
Brimbank City Council	BROOKLYN	44 - 60 Mcdonald RD	Former Landfill. Requires ongoing management.	0090003589
Brimbank City Council	BROOKLYN	44 - 60 Mcdonald RD	Former Landfill. Requires ongoing management.	0090003591
Brimbank City Council	BROOKLYN	174 OLD GEELONG RD	Former Landfill. Requires ongoing management.	0090006102
Brimbank City Council	BROOKLYN	52 - 60 MARKET RD	Former Landfill. Requires ongoing management.	0090007782
Brimbank City Council	Cairnlea	Lot C of Draft Plan of Subdivision PS 801014Y	Contaminated soil is retained and managed onsite. Requires ongoing management.	0090005971
Brimbank City Council	DEER PARK	765 BALLARAT RD	Former Industrial Site. Requires assessment and/or clean up.	0090001886
Brimbank City Council	DEER PARK	753 Tilburn RD	Contaminated soil is retained and managed onsite. Requires assessment and/or clean up.	0090009143
Brimbank City Council	KEILOR DOWNS	Green Gully RD	Former Landfill. Requires ongoing management.	0090005738
Brimbank City Council	SUNSHINE	16 - 20 THIRD AV	Current Industrial Site. Requires assessment and/or clean up.	0090003227
Brimbank City Council	SUNSHINE NORTH	49 AUBURN AV	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090007459
Brimbank City Council	SUNSHINE NORTH	49 AUBURN AV	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090007621
Brimbank City Council	SUNSHINE NORTH	26 - 30 BALDWIN AVENUE 74 - 82 DAVIES AVENUE	Current Industrial Site. Requires assessment and/or clean up.	0090010168
Brimbank City Council	SUNSHINE NORTH	47 MCINTYRE RD	Former Industrial Site. Requires ongoing management.	0090010443
Brimbank City Council	SUNSHINE NORTH	47 MCINTYRE RD	Former Industrial Site. Requires ongoing management.	0090010479
Brimbank City Council	SYDENHAM	362 SYDENHAM RD	Former Landfill. Requires assessment and/or clean up.	0090000921
Brimbank City Council	SYDENHAM	362 SYDENHAM RD	Former Landfill. Requires ongoing management.	0090003753
Buloke Shire Council	BIRCHIP	CA 53B-D Parish of Wirmbirchip, SUNRAYSIA HWY	Former Landfill. Requires ongoing management.	0090009001
Buloke Shire Council	CHARLTON	21 DAVIES ST	Current petroleum storage site. Requires assessment and/or clean up.	0090009910

Municipality	Suburb	Address	Issue	Notice Number
Buloke Shire Council	DONALD	22 (LOTS 40-45\LP8761) NAPIER ST	Former petroleum storage site. Requires assessment and/or clean up.	0090007710
Campaspe Shire Council	BAMAWM EXTENSION	1133 ECHUCA-MITIAMO RD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090001745
Campaspe Shire Council	DIGGORA	ODONNELL RD	Former Landfill. Requires ongoing management.	0090006552
Campaspe Shire Council	ECHUCA	436 MCKENZIE RD	Former Landfill. Requires ongoing management.	0090007220
Campaspe Shire Council	ECHUCA	176 - 190 OGILVIE AV	Former petroleum storage site. Requires assessment and/or clean up.	0090008435
Campaspe Shire Council	ECHUCA	110 - 112 STURT ST	Former Service Station. Requires ongoing management.	0090008471
Campaspe Shire Council	KYABRAM	Graham RD	Former Landfill. Requires ongoing management.	0090007207
Cardinia Shire Council	PAKENHAM	725 Five Mile Road	Former Landfill. Requires ongoing management.	0090003597
Cardinia Shire Council	PAKENHAM	725 Five Mile Road	Former Landfill. Requires ongoing management.	0090009837
Casey City Council	CRANBOURNE	Lot 7, 9, 10, 11 & 12 Stevensons Rd	Former Landfill. Requires ongoing management.	0090006965
Casey City Council	Narre Warren	former Narre Warren Landfill 184	Former Landfill. Requires ongoing management.	0090003600
Casey City Council	Narre Warren	former Narre Warren Landfill 184	Former Landfill. Requires ongoing management.	0090010222
Central Goldfields Shire Council	CARISBROOK	129 WILLIAMS RD	Former Landfill. Requires ongoing management.	0090006580
Central Goldfields Shire Council	Maryborough	82 (Lot 1\TP9631G) Sutton RD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090009435
Central Goldfields Shire Council	MARYBOROUGH	53 - 55 HIGH ST	Current Service Station. Requires assessment and/or clean up.	0090005850
Central Goldfields Shire Council	TALBOT	5360 BALLARAT-MARYBOROUGH RD	Solid inert waste has been dumped at the site. Requires assessment and/or clean up.	0090009597
Colac-Otway Shire Council	COLAC	2 - 34 BRUCE ST	Former Landfill. Requires assessment and/or clean up.	0090010150
Colac-Otway Shire Council	COLAC	2 - 34 BRUCE ST	Former Landfill. Requires assessment and/or clean up.	0090010151
Corangamite Shire Council	GLENORMISTON	Terang-Mortlake RD	Former Landfill. Requires ongoing management.	0090003621
Corangamite Shire Council	GLENORMISTON	Terang-Mortlake RD	Former Landfill. Requires ongoing management.	0090003622
Corangamite Shire Council	TERANG	59 BEND RD	Current Industrial Site. Requires assessment and/or clean up.	0090007044
Corangamite Shire Council	TERANG	59 BEND RD	Current Industrial Site. Requires assessment and/or clean up.	0090007045
Darebin City Council	NORTHCOTE	LOT 1 LP124227 56 BRICKWORKS LANE	Former Landfill. Requires ongoing management.	0090003493
Darebin City Council	NORTHCOTE	LOT 1 LP124227 56 BRICKWORKS LANE	Former Landfill. Requires assessment and/or clean up.	0090010375
Darebin City Council	NORTHCOTE	LOT 1 LP124227 56 BRICKWORKS LANE	Former Landfill. Requires ongoing management.	0090010376
Darebin City Council	PRESTON	67 - 79 High ST	Former Service Station. Requires assessment and/or clean up.	0090001449
Darebin City Council	PRESTON	194 - 202 Bell ST	Former Industrial Site. Requires assessment and/or clean up.	0090006966
Darebin City Council	RESERVOIR	3B Newlands Road (formerly Lot 87 Newlands Rd) which includes 3A, rear 3B	Former Landfill. Requires ongoing management.	0090003508
East Gippsland Shire Council	BAIRNSDALE	68 GILES ST	Former Landfill. Requires ongoing management.	0090006577
East Gippsland Shire Council	ORBOST	44 SALISBURY ST	Former Service Station. Requires assessment and/or clean up.	0090008454
Frankston City Council	3200	CA 2108 CA 2006	Former Landfill. Requires ongoing management.	0090003594
Frankston City Council	3200	CA 2108 CA 2006	Former Landfill. Requires ongoing management.	0090009785
Frankston City Council	3200	CA 2108 CA 2006	Former Landfill. Requires ongoing management.	0090009786
Frankston City Council	LANGWARRIN	75 Quarry RD	Current landfill. Requires assessment and/or clean up.	0090009522
Glen Eira City Council	Caulfield South	724A glen Huntly RD	Contaminated soil is retained and managed onsite. Requires assessment and/or clean up.	0090010399

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Municipality	Suburb	Address	Issue	Notice Number
Glen Eira City Council	CAULFIELD SOUTH	818 Glen Huntly RD	Former Service Station. Requires ongoing management.	0090009502
Glen Eira City Council	MCKINNON	94 - 100 MCKINNON RD	Current Service Station. Requires assessment and/or clean up.	0090010039
Greater Bendigo City Council	California Gully	CA 269H, 115, 116, 117, 118, 119, Sec N Cnr Bright St & Wingoon Drive	Historical deposit of mine tailings. Requires assessment and/or clean up.	0090009604
Greater Bendigo City Council	California Gully	CA252B Sec N, Pearce St Parish of Sandhurst	Historical deposit of mine tailings. Requires assessment and/or clean up.	0090009641
Greater Bendigo City Council	CALIFORNIA GULLY	45 Sandhurst RD	Current Service Station. Requires assessment and/or clean up.	0090010085
Greater Bendigo City Council	FLORA HILL	67 HAVLIN ST	Former Landfill. Requires ongoing management.	0090009138
Greater Bendigo City Council	HEATHCOTE	90 HIGH ST	Former Service Station. Requires assessment and/or clean up.	0090007629
Greater Bendigo City Council	HUNTLY	29 CAELLIS RD	Current Industrial Site. Requires assessment and/or clean up.	0090007149
Greater Bendigo City Council	Jackass Flat	CA 269N, Sec N & CA 2, Sec F11 Parish Sandhurst	Historical deposit of mine tailings. Requires assessment and/or clean up.	0090009599
Greater Bendigo City Council	Jackass Flat	Government Road south of CA 119, Sec N & Prouses Road between Bright St, south to	Historical deposit of mine tailings. Requires assessment and/or clean up.	0090009606
Greater Bendigo City Council	JACKASS FLAT	CA 269F & 269L, Section N Parish of Sandhurst, Averys Road	Historical deposit of mine tailings. Requires assessment and/or clean up.	0090009643
Greater Bendigo City Council	Maiden Gully	CA 64B, Parish of Sandhurst Sparrowhawk Road	Historical deposit of mine tailings. Requires assessment and/or clean up.	0090009608
Greater Bendigo City Council	MAIDEN GULLY	195 - 221 MARONG RD	Historical deposit of mine tailings. Requires assessment and/or clean up.	0090009609
Greater Bendigo City Council	North Bendigo	CA 2081 Parish of Sandhurst	Historical deposit of mine tailings. Requires ongoing management.	0090009821
Greater Bendigo City Council	West Bendigo	Liddell's Calcine Sands Derwent Gully Road	Historical deposit of mine tailings. Requires ongoing management.	0090007892
Greater Dandenong City Council	Bangholme	Cnr Thompson Road and Worsley Road	Current Industrial Site. Requires ongoing management.	0090007162
Greater Dandenong City Council	DANDENONG SOUTH	185 Dandenong-Hastings RD	Former Landfill. Requires ongoing management.	0090004214
Greater Dandenong City Council	DANDENONG SOUTH	Greens Road GREENS RD	Current waste water treatment plant. Requires ongoing management.	0090006097
Greater Dandenong City Council	SPRINGVALE	917 Princes HWY	Former Industrial Site. Requires ongoing management.	0090007482
Greater Dandenong City Council	SPRINGVALE	310 Springvale RD	Current Service Station. Requires assessment and/or clean up.	0090010415
Greater Dandenong City Council	Springvale South	98-100 Clarke Road	Former Landfill. Requires ongoing management.	0090007896
Greater Dandenong City Council	SPRINGVALE SOUTH	81 - 143 CLARKE RD	Former Landfill. Requires ongoing management.	0090000608
Greater Dandenong City Council	SPRINGVALE SOUTH	81 - 143 CLARKE RD	Former Landfill. Requires ongoing management.	0090003693
Greater Dandenong City Council	SPRINGVALE SOUTH	168-222 CLARKE ROAD	Former Landfill. Requires ongoing management.	0090006951
Greater Dandenong City Council	SPRINGVALE SOUTH	81 - 143 CLARKE RD	Former Landfill. Requires assessment and/or clean up.	0090008992
Greater Geelong City Council	BALLAN	1 6511 Western FWY	Current Service Station. Requires ongoing management.	0090006079
Greater Geelong City Council	Belmont	180 - 182 Barwon Heads RD	Former Service Station. Requires ongoing management.	0090009781
Greater Geelong City Council	BELMONT	180 - 182 Barwon Heads RD	Former Service Station. Requires ongoing management.	0090009284
Greater Geelong City Council	charlemont	100 tannery RD	Accidental spill/leak (non-industrial site). Requires assessment and/or clean up.	0090010421
Greater Geelong City Council	CONNEWARRE	1421 BARWON HEADS RD	Solid inert waste has been dumped at the site. Requires assessment and/or clean up.	0090009930
Greater Geelong City Council	CORIO	83 Purnell RD	Current Service Station. Requires ongoing management.	0090002343

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Municipality	Suburb	Address	Issue	Notice Number
Greater Geelong City Council	CORIO	1500 - 1580 BIDDLECOMBE AV	Former Landfill. Requires ongoing management.	0090004271
Greater Geelong City Council	CORIO	90 REFINERY RD	Current petroleum storage site. Requires ongoing management.	0090006483
Greater Geelong City Council	CORIO	Off Harpur RD	Former petroleum storage site. Requires ongoing management.	0090010189
Greater Geelong City Council	DRYSDALE	97 High ST	Current Service Station. Requires ongoing management.	0090001808
Greater Geelong City Council	EAST GEELONG	101 - 161 HEARNE PDE	Gun, pistol or rifle range. Requires assessment and/or clean up.	0090006642
Greater Geelong City Council	GEELONG NORTH	1 - 39 Roseneath ST	Former chemical storage facility. Requires assessment and/or clean up.	0090001664
Greater Geelong City Council	GEELONG WEST	34 - 38 GORDON AV	Former Industrial Site. Requires ongoing management.	0090009916
Greater Geelong City Council	LARA	Princes HWY	Accidental spill/leak (non-industrial site). Requires assessment and/or clean up.	0090001012
Greater Geelong City Council	LOVELY BANKS	195 STACEYS RD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090010406
Greater Geelong City Council	MANIFOLD HEIGHTS	35 - 37 Shannon AV	Former petroleum storage site. Requires ongoing management.	0090010191
Greater Geelong City Council	MOOLAP	132 - 140 HAYS RD	Current Industrial Site. Requires ongoing management.	0090009865
Greater Geelong City Council	NORLANE	5 - 19 PRINCES HWY	Former Industrial Site. Requires assessment and/or clean up.	0090004126
Greater Geelong City Council	NORLANE	60 - 80 NORTH SHORE RD	Current Industrial Site. Requires assessment and/or clean up.	0090004132
Greater Geelong City Council	NORTH GEELONG	343 - 363 MELBOURNE RD	Former Industrial Site. Requires assessment and/or clean up.	0090004124
Greater Geelong City Council	NORTH SHORE	2 - 40 SEA BREEZE PDE	Current Industrial Site. Requires assessment and/or clean up.	0090010256
Greater Geelong City Council	POINT HENRY	420 Point Henry RD	Contaminated soil is retained and managed onsite. Requires ongoing management.	0090008914
Greater Geelong City Council	POINT HENRY	420 Point Henry RD	Former Industrial Site. Requires assessment and/or clean up.	0090009457
Greater Shepparton City Council	COSGROVE	205 COSGROVE-LEMNOS RD	Former Landfill. Requires ongoing management.	0090006807
Greater Shepparton City Council	MURCHISON	310 WOOLSHED RD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090009822
Greater Shepparton City Council	Shepparton East	Lot 1 TP879282U Midland Highway	Illegal dumping. Requires assessment and/or clean up.	0090010181
Greater Shepparton City Council	SHEPPARTON EAST	35 SWAINSTON RD	Current chemical storage facility. Requires assessment and/or clean up.	0090009938
Greater Shepparton City Council	SHEPPARTON EAST	35 SWAINSTON RD	Illegal dumping. Requires ongoing management.	0090010065
Greater Shepparton City Council	SHEPPARTON NORTH	280 Daldy RD	Former Industrial Site. Requires assessment and/or clean up.	0090001776
Hepburn Shire Council	CRESWICK	C/A45a Section 48A Township of Creswick Parish of Creswick	Former Landfill. Requires ongoing management.	0090006899
Hepburn Shire Council	DAYLESFORD	47 RAGLAN ST	Current Service Station. Requires ongoing management.	0090008622
Hepburn Shire Council	TRENTHAM	10 STATION ST	Current Industrial Site. Requires assessment and/or clean up.	0090008722
Hobsons Bay City Council	ALTONA	401 - 435 Kororoit Creek RD	Current Industrial Site. Requires assessment and/or clean up.	0090003368
Hobsons Bay City Council	ALTONA	541 - 583 Kororoit Creek RD	Current Industrial Site. Requires assessment and/or clean up.	0090005374
Hobsons Bay City Council	ALTONA	25 LINNET ST	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090006781
Hobsons Bay City Council	ALTONA	351 - 381 MILLERS RD	Current Industrial Site. Requires ongoing management.	0090007005
Hobsons Bay City Council	ALTONA	351 - 381 MILLERS RD	Current petroleum storage site. Requires ongoing management.	0090008552

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Municipality	Suburb	Address	Issue	Notice Number
Hobsons Bay City Council	ALTONA	471 - 513 KOROROIT CREEK RD	Current Industrial Site. Requires assessment and/or clean up.	0090009008
Hobsons Bay City Council	ALTONA	521 - 537 Kororoit Creek RD	Former Industrial Site. Requires assessment and/or clean up.	0090009679
Hobsons Bay City Council	ALTONA MEADOWS	306 - 316 QUEEN ST	Current Service Station. Requires ongoing management.	0090006760
Hobsons Bay City Council	ALTONA NORTH	40 - 68 KYLE RD	Former Landfill. Requires ongoing management.	0090003527
Hobsons Bay City Council	ALTONA NORTH	400 - 498 Grieve PDE	Current Industrial Site. Requires assessment and/or clean up.	0090008356
Hobsons Bay City Council	ALTONA NORTH	2 NEW ST	Former Industrial Site. Requires assessment and/or clean up.	0090009060
Hobsons Bay City Council	ALTONA NORTH	40 - 68 KYLE RD	Former Landfill. Requires assessment and/or clean up.	0090010258
Hobsons Bay City Council	ALTONA NORTH	40 - 68 KYLE RD	Former Landfill. Requires ongoing management.	0090010517
Hobsons Bay City Council	BROOKLYN	Hardie RD	Former Landfill. Requires ongoing management.	0090003487
Hobsons Bay City Council	NEWPORT	411 DOUGLAS PDE	Current petroleum storage site. Requires assessment and/or clean up.	0090006881
Hobsons Bay City Council	NEWPORT	Underground Section Of Petroleum Pipelines That Run Under Champion Rd	Accidental spill/leak (non-industrial site). Requires assessment and/or clean up.	0090006968
Hobsons Bay City Council	NEWPORT	148 - 150 MASON ST	Current Industrial Site. Requires assessment and/or clean up.	0090009196
Hobsons Bay City Council	SPOTSWOOD	144 - 150 HALL ST	Current Industrial Site. Requires assessment and/or clean up.	0090003301
Hobsons Bay City Council	SPOTSWOOD	512 - 578 Melbourne RD	Railway yard. Requires ongoing management.	0090005636
Hobsons Bay City Council	SPOTSWOOD	39 - 81 BURLEIGH ST	Current Industrial Site. Requires ongoing management.	0090008619
Hobsons Bay City Council	YARRAVILLE	29 FRANCIS STREET	Current petroleum storage site. Requires ongoing management.	0090007570
Horsham Rural City Council	Horsham	Lot 1 TP894637 Parish of Horsham	Former petroleum storage site. Requires assessment and/or clean up.	0090009145
Horsham Rural City Council	HORSHAM	15 - 17 MILL ST	Former petroleum storage site. Requires assessment and/or clean up.	0090009146
Horsham Rural City Council	Longerenong	Corner of West and Centre Roads	Current Industrial Site. Requires assessment and/or clean up.	0090007170
Hume City Council	ATTWOOD	7 SAINSBURY CT	Illegal dumping. Requires assessment and/or clean up.	0090008272
Hume City Council	BULLA	315 Loemans RD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090000177
Hume City Council	BULLA	500 SUNBURY RD	Current landfill. Requires ongoing management.	0090008885
Hume City Council	BULLA	500 SUNBURY RD	Current landfill. Requires ongoing management.	0090010148
Hume City Council	CAMPBELLFIELD	468 - 472 MAHONEYS RD	Former Landfill. Requires ongoing management.	0090003496
Hume City Council	CAMPBELLFIELD	1-71 & 2-70 BOLINDA RD	Former Landfill. Requires ongoing management.	0090007850
Hume City Council	CAMPBELLFIELD	1735 Sydney RD	Current Industrial Site. Requires assessment and/or clean up.	0090008237
Hume City Council	CAMPBELLFIELD	166 Northbourne RD	Current Industrial Site. Requires assessment and/or clean up.	0090008413
Hume City Council	CAMPBELLFIELD	16 - 18 THORNYCROFT ST	Current chemical storage facility. Requires assessment and/or clean up.	0090009826
Hume City Council	CAMPBELLFIELD	16 - 18 THORNYCROFT ST	Current chemical storage facility. Requires assessment and/or clean up.	0090010248
Hume City Council	CRAIGIEBURN	61 - 151 CRAIGIEBURN RD	Former Landfill. Requires ongoing management.	0090003107
Hume City Council	CRAIGIEBURN	61 - 151 CRAIGIEBURN RD	Former Landfill. Requires ongoing management.	0090003475
Hume City Council	DIGGERS REST	205 BULLA-DIGGERS REST RD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090007300
Hume City Council	Greenvale	Mitchell Lasry Quarry 555 Mickleham Road	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090007757
Hume City Council	KEILOR	145 Annandale RD	Former Landfill. Requires ongoing management.	0090007798

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Municipality	Suburb	Address	Issue	Notice Number
Hume City Council	MELBOURNE AIRPORT	206 - 300 WESTERN AV	Former Landfill. Requires ongoing management.	0090004621
Hume City Council	SOMERTON	70 CLIFFORDS RD	Current Industrial Site. Requires ongoing management.	0090007724
Hume City Council	SUNBURY	45 - 55 DEVERALL RD	Illegal dumping. Requires assessment and/or clean up.	0090005274
Hume City Council	SUNBURY	53 - 55 HORNE ST	Current Service Station. Requires assessment and/or clean up.	0090009620
Hume City Council	WILDWOOD	275 KONAGADERRA RD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090006247
Kingston City Council	ASPENDALE	105 NEPEAN HWY	Former Service Station. Requires assessment and/or clean up.	0090009807
Kingston City Council	CHELSEA	84 - 130 THAMES PROM	Former Landfill. Requires ongoing management.	0090003613
Kingston City Council	Cheltenham	2-6 Railway Road	Former Industrial Site. Requires ongoing management.	0090008070
Kingston City Council	CHELTENHAM	1228 NEPEAN HWY	Former Industrial Site. Requires ongoing management.	0090009112
Kingston City Council	CHELTENHAM	5 - 13 ELMA RD	Current Industrial Site. Requires assessment and/or clean up.	0090009240
Kingston City Council	CLAYTON SOUTH	8 Elder ST	Former Landfill. Requires ongoing management.	0090003610
Kingston City Council	CLAYTON SOUTH	Cnr Deals RD & Heatherton RD	Former Landfill. Requires ongoing management.	0090006972
Kingston City Council	CLAYTON SOUTH	654 - 718 CLAYTON RD	Former Landfill. Requires ongoing management.	0090007014
Kingston City Council	CLAYTON SOUTH	Cnr Clayton & Ryans RDS	Former Landfill. Requires ongoing management.	0090007125
Kingston City Council	CLAYTON SOUTH	FRASER RD	Former Landfill. Requires assessment and/or clean up.	0090007756
Kingston City Council	CLAYTON SOUTH	FRASER RD	Former Landfill. Requires ongoing management.	0090008726
Kingston City Council	CLAYTON SOUTH	623-633 HEATHERTON ROAD, CLAYTON SOUTH VIC 3169	Former Landfill. Requires ongoing management.	0090008747
Kingston City Council	CLAYTON SOUTH	1486 - 1550 CENTRE RD	Former Industrial Site. Requires ongoing management.	0090009073
Kingston City Council	CLAYTON SOUTH	RYANS and DEALS RD	Former Landfill. Requires ongoing management.	0090009103
Kingston City Council	CLAYTON SOUTH	Cnr Deals RD & Heatherton RD	Former Landfill. Requires ongoing management.	0090009156
Kingston City Council	CLAYTON SOUTH	654 - 718 CLAYTON RD	Former Landfill. Requires assessment and/or clean up.	0090009525
Kingston City Council	DINGLEY	370 - 418 Old Dandenong RD	Former Landfill. Requires ongoing management.	0090008100
Kingston City Council	Dingley Village	Spring Road & Rowan Road DINGLEY VILLAGE VIC 3172	Former Landfill. Requires ongoing management.	0090007189
Kingston City Council	DINGLEY VILLAGE	Spring Road & Rowan Road DINGLEY VILLAGE VIC 3172	Former Landfill. Requires assessment and/or clean up.	0090003857
Kingston City Council	HEATHERTON	16 BALL RD	Former Landfill. Requires ongoing management.	0090008425
Kingston City Council	HEATHERTON	Crn Henry Street and Old Dandenong Road	Former Landfill. Requires ongoing management.	0090008924
Kingston City Council	HEATHERTON	91 - 185 KINGSTON RD	Contaminated soil is retained and managed onsite. Requires assessment and/or clean up.	0090009562
Kingston City Council	MOORABBIN	1 10 Ebden ST	Former Industrial Site. Requires ongoing management.	0090002273
Kingston City Council	MOORABBIN	422 - 424 SOUTH RD	Current Service Station. Requires assessment and/or clean up.	0090010030
Kingston City Council	MOORABBIN	57 KEYS RD	Current chemical storage facility. Requires assessment and/or clean up.	0090010462
Kingston City Council	OAKLEIGH SOUTH	19-71 CARROLL RD	Former Landfill. Requires ongoing management.	0090007021
Kingston City Council	OAKLEIGH SOUTH	19-71 CARROLL RD	Former Landfill. Requires assessment and/or clean up.	0090010298
Knox City Council	WANTIRNA SOUTH	1180 HIGH STREET RD 251 GEORGE ST	Former Landfill. Requires ongoing management.	0090006480
Knox City Council	WANTIRNA SOUTH	14 COPPELIA ST	Former Landfill. Requires ongoing management.	0090007017
Latrobe City Council	HAZELWOOD	Brodribb RD	Former Industrial Site. Requires assessment and/or clean up.	0090010255
Latrobe City Council	HAZELWOOD	Brodribb RD	Former Industrial Site. Requires assessment and/or clean up.	0090010271

PRIORITY SITES REGISTER

Information as at 31 October 2019

Municipality	Suburb	Address	Issue	Notice Number
Latrobe City Council	HAZELWOOD	Brodribb RD	Former Industrial Site. Requires assessment and/or clean up.	0090010272
Latrobe City Council	HAZELWOOD	Brodribb RD	Former Industrial Site. Requires assessment and/or clean up.	0090010273
Latrobe City Council	Hazelwood North	Lot 2, PS533418 Monash Way	Illegal dumping. Requires assessment and/or clean up.	0090008833
Latrobe City Council	Hernes Oak	SPI : 9L\PP3273 PFI : 52587509	Former Landfill. Requires ongoing management.	0090007200
Latrobe City Council	MORWELL	Lot RES1 PS449978 MARYVALE ROAD	Former Landfill. Requires ongoing management.	0090007555
Latrobe City Council	MORWELL	145 - 147 PRINCES DR	Former Service Station. Requires assessment and/or clean up.	0090008958
Latrobe City Council	MORWELL	412 COMMERCIAL RD	Former Industrial Site. Requires assessment and/or clean up.	0090010035
Latrobe City Council	TRARALGON	130 - 132 SEYMOUR ST	Former Industrial Site. Requires assessment and/or clean up.	0090010339
Latrobe City Council	TRARALGON SOUTH	Loy Yang B3/4 Bartons Lane	Ash pond with a Groundwater Attenuation Zone. Requires ongoing management.	0090002894
Loddon Shire Council	YARRAWALLA	413 YARRAWALLA WEST RD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090010146
Macedon Ranges Shire Council	BULLENGAROOK	531 Hobbs RD	Former Landfill. Requires ongoing management.	0090006708
Macedon Ranges Shire Council	GISBORNE	9 STATION RD	Former petroleum storage site. Requires assessment and/or clean up.	0090008336
Macedon Ranges Shire Council	KYNETON	Redesdale (Lot 24D\PP2979) RD	Former Landfill. Requires ongoing management.	0090006370
Macedon Ranges Shire Council	KYNETON	2 PIPER ST	Former Service Station. Requires ongoing management.	0090009675
Macedon Ranges Shire Council	Kyneton South	450 Central RD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090010369
Macedon Ranges Shire Council	LANCEFIELD	Baynton (Lot 16 LP208950) RD	Former Landfill. Requires ongoing management.	0090005294
Macedon Ranges Shire Council	LANCEFIELD	SHOWLERS LANE ROAD RESERVE	Former Landfill. Requires ongoing management.	0090010270
Macedon Ranges Shire Council	ROMSEY	2 33 MAIN ST	Current Service Station. Requires assessment and/or clean up.	0090005361
Manningham City Council	PARK ORCHARDS	20 - 26 STINTONS RD	Illegal dumping. Requires assessment and/or clean up.	0090005987
Manningham City Council	PARK ORCHARDS	20 - 26 STINTONS RD	Illegal dumping. Requires assessment and/or clean up.	0090005988
Manningham City Council	PARK ORCHARDS	20 - 26 STINTONS RD	Illegal dumping. Requires assessment and/or clean up.	0090005989
Manningham City Council	PARK ORCHARDS	20 - 26 STINTONS RD	Illegal dumping. Requires assessment and/or clean up.	0090006690
Mansfield Shire Council	MANSFIELD	Monkey Gully RD	Former Landfill. Requires ongoing management.	0090007633
Maribyrnong City Council	3012	1 AMANDA RD TOTTENHAM	Current chemical storage facility. Requires ongoing management.	0090009424
Maribyrnong City Council	BRAYBROOK	30 - 38 SOUTH RD	Former Industrial Site. Requires assessment and/or clean up.	0090010277
Maribyrnong City Council	FOOTSCRAY	LOTS 1 AND 2 ON TITLE PLAN 606602F (FARNSWORTH AVE)	Former Landfill. Requires ongoing management.	0090008310
Maribyrnong City Council	MAIDSTONE	9 - 15 WILLIAMSON RD	Former Industrial Site. Requires assessment and/or clean up.	0090003767
Maribyrnong City Council	MAIDSTONE	9 - 15 WILLIAMSON RD	Former Industrial Site. Requires assessment and/or clean up.	0090009654
Maribyrnong City Council	TOTTENHAM	550 GEELONG RD	Former Industrial Site. Requires assessment and/or clean up.	0090002056
Maribyrnong City Council	TOTTENHAM	550 GEELONG RD	Illegal dumping. Requires assessment and/or clean up.	0090004455
Maribyrnong City Council	TOTTENHAM	420 Somerville Road	Former Industrial Site. Requires assessment and/or clean up.	0090009472
Maribyrnong City Council	TOTTENHAM	LOT 2 102 OLYMPIA STREET	Current Industrial Site. Requires assessment and/or clean up.	0090010365

Municipality	Suburb	Address	Issue	Notice Number
Maribyrnong City Council	TOTTENHAM	LOT 2 102 OLYMPIA STREET	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090010366
Maribyrnong City Council	WEST FOOTSCRAY	1 - 19 Graingers RD	Former chemical storage facility. Requires assessment and/or clean up.	0090006322
Maribyrnong City Council	YARRAVILLE	1 - 3 High ST	Former Industrial Site. Requires ongoing management.	0090000134
Maribyrnong City Council	YARRAVILLE	221 Whitehall ST	Former Industrial Site. Requires ongoing management.	0090003331
Maribyrnong City Council	YARRAVILLE	325 WHITEHALL STREET	Former Industrial Site. Requires assessment and/or clean up.	0090006664
Maribyrnong City Council	YARRAVILLE	325 WHITEHALL STREET	Former Industrial Site. Requires assessment and/or clean up.	0090008694
Maribyrnong City Council	YARRAVILLE	2A FRANCIS ST	Former Industrial Site. Requires assessment and/or clean up.	0090009551
Maroondah City Council	RINGWOOD	385 - 389 CANTERBURY RD	Current Service Station. Requires ongoing management.	0090006274
Maroondah City Council	RINGWOOD EAST	18 Mount Dandenong RD	Current Service Station. Requires ongoing management.	0090008258
Melbourne City Council	CARLTON	46-78 Bouverie Street 185-195 Queensberry Street	Former Industrial Site. Requires assessment and/or clean up.	0090008725
Melbourne City Council	CARLTON	46-78 Bouverie Street 185-195 Queensberry Street	Former Industrial Site. Requires assessment and/or clean up.	0090008997
Melbourne City Council	KENSINGTON	71 - 89 HOBSONS RD	Contaminated soil is retained and managed onsite. Requires assessment and/or clean up.	0090007064
Melbourne City Council	Melbourne	447 Collins Street	Accidental spill/leak (non-industrial site). Requires assessment and/or clean up.	0090008808
Melbourne City Council	NORTH MELBOURNE	233 - 239 FLEMINGTON RD	Current Service Station. Requires assessment and/or clean up.	0090008723
Melbourne City Council	PORT MELBOURNE	2 WEST GATE FWY	Current Service Station. Requires assessment and/or clean up.	0090007492
Melbourne City Council	PORT MELBOURNE	1 WEST GATE FWY	Current Service Station. Requires assessment and/or clean up.	0090007721
Melbourne City Council	PORT MELBOURNE	226 LORIMER ST	Contaminated soil is retained and managed onsite. Requires assessment and/or clean up.	0090008042
Melbourne City Council	TRUGANINA	8 Nicholson Street East Melbourne	Former Landfill. Requires ongoing management.	0090009751
Melton Shire Council	COBBLEBANK	28 - 52 FERRIS RD	Former Landfill. Requires ongoing management.	0090005053
Melton Shire Council	COBBLEBANK	43 - 67 FERRIS RD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090008182
Melton Shire Council	PLUMPTON	627 - 703 PLUMPTON RD	Solid inert waste has been dumped at the site. Requires assessment and/or clean up.	0090003893
Melton Shire Council	PLUMPTON	627 - 703 PLUMPTON RD	Illegal dumping. Requires assessment and/or clean up.	0090004146
Melton Shire Council	RAVENHALL	714 Christies Road and 227 Riding Boundary Road RIDING BOUNDARY ROAD	Current landfill. Requires ongoing management.	0090009120
Mildura Rural City Council	KOORLONG	Twentieth ST	Former Landfill. Requires ongoing management.	0090005267
Mildura Rural City Council	KOORLONG	4463 BENETOOK AV	Solid inert waste has been dumped at the site. Requires assessment and/or clean up.	0090009260
Mildura Rural City Council	MILDURA	220 - 222 TENTH ST	Former petroleum storage site. Requires assessment and/or clean up.	0090005846
Mildura Rural City Council	MILDURA	211 - 217 NINTH ST	Former petroleum storage site. Requires ongoing management.	0090009396
Mildura Rural City Council	MILDURA	13 SCHERGER DR	Current landfill. Requires ongoing management.	0090010173
Mildura Rural City Council	WERRIMULL	ALLOTMENT 5 PARISH OF MURRNROONG KING STREET	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090009110
Mitchell Shire Council	BROADFORD	High ST	Former Landfill. Requires ongoing management.	0090003542
Mitchell Shire Council	SEYMOUR	Lot 1\TP41415 HUME AND HOVELL ROAD	Former Landfill. Requires ongoing management.	0090007542
Mitchell Shire Council	Wallan East	LOT Z PS 818938 Newbridge Subdivision	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090009466

PRIORITY SITES REGISTER

Information as at 31 October 2019

Municipality	Suburb	Address	Issue	Notice Number
Moira Shire Council	NUMURKAH	Parish Of Katunga C/a 14 Sect D Naring Rd	Former Landfill. Requires ongoing management.	0090007551
Moira Shire Council	YARRAWONGA	81 Channel RD	Former Landfill. Requires ongoing management.	0090008056
Monash City Council	CLAYTON	1555 - 1615 CENTRE RD	Current Industrial Site. Requires assessment and/or clean up.	0090009962
Monash City Council	GLEN WAVERLEY	310 - 336 SPRINGVALE RD	Current Industrial Site. Requires ongoing management.	0090006390
Monash City Council	OAKLEIGH EAST	108 - 112 FERNTREE GULLY RD	Former Landfill. Requires ongoing management.	0090006175
Moonee Valley City Council	ASCOT VALE	556 MT ALEXANDER RD	Current Service Station. Requires ongoing management.	0090007960
Moorabool Shire Council	FISKVILLE	4549 Geelong-Ballan RD	Contaminated soil is retained and managed onsite. Requires assessment and/or clean up.	0090009700
Moorabool Shire Council	MADDINGLEY	1 PS908919 Side Of Kerrs RD	Former Landfill. Requires ongoing management.	0090003631
Moreland City Council	BRUNSWICK	699-701 PARK STREET, 2-4 SYDNEY ROAD 182, 184-186, 188 AND 190-192 BRUNSWICK	Former Industrial Site. Requires assessment and/or clean up.	0090008501
Moreland City Council	BRUNSWICK	225 and 227-231 Barkly Street and 1-77 Amelia Street	Former Industrial Site. Requires ongoing management.	0090009119
Moreland City Council	BRUNSWICK EAST	4 - 6 BARKLY ST	Former Industrial Site. Requires assessment and/or clean up.	0090009126
Moreland City Council	COBURG	36-38 CHARLES ST	Former petroleum storage site. Requires assessment and/or clean up.	0090010379
Moreland City Council	COBURG NORTH	46 - 54 Newlands RD	Current Service Station. Requires ongoing management.	0090009742
Mornington Peninsula Shire Council	CRIB POINT	2 Lens ST	Former Landfill. Requires ongoing management.	0090003619
Mornington Peninsula Shire Council	CRIB POINT	2 Lens ST	Former Landfill. Requires ongoing management.	0090010060
Mornington Peninsula Shire Council	DROMANA	107 - 109 POINT NEPEAN RD	Current petroleum storage site. Requires assessment and/or clean up.	0090008942
Mornington Peninsula Shire Council	HASTINGS	33 CEMETERY RD	Current petroleum storage site. Requires assessment and/or clean up.	0090010009
Mornington Peninsula Shire Council	MOUNT ELIZA	254-450 MOOROODUC HWY	Former Landfill. Requires ongoing management.	0090000477
Mornington Peninsula Shire Council	MOUNT ELIZA	254-450 MOOROODUC HWY	Former Landfill. Requires ongoing management.	0090003744
Mornington Peninsula Shire Council	RED HILL	87 Arthurs Seat RD	Current Service Station. Requires assessment and/or clean up.	0090009981
Mornington Peninsula Shire Council	ROSEBUD WEST	119 Truemans RD	Former Landfill. Requires ongoing management.	0090003616
Mornington Peninsula Shire Council	TUERONG	435 BALNARRING RD	Current landfill. Requires ongoing management.	0090007893
Mornington Peninsula Shire Council	TYABB	15-21 MCKIRDYS RD	Former Landfill. Requires ongoing management.	0090007677
Mount Alexander Shire Council	Castlemaine	74 Tomkies Road Lane	Contaminated soil is retained and managed onsite. Requires ongoing management.	0090004156
Moyne Shire Council	ALLANSFORD	5331 Great Ocean RD	Current Industrial Site. Requires ongoing management.	0090004322
Moyne Shire Council	PORT FAIRY	Badhams LANE	Former Landfill. Requires ongoing management.	0090003625
Nillumbik Shire Council	KANGAROO GROUND	105 GRAHAM RD	Former Landfill. Requires ongoing management.	0090007781
Nillumbik Shire Council	YARRAMBAT	290 - 304 Yan Yean RD	Former Landfill. Requires ongoing management.	0090007767
Northern Grampians Shire Council	Stawell	Crown Allotment 136K Parish of Illawarra	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090006261
Port Phillip City Council	PORT MELBOURNE	337 WILLIAMSTOWN RD	Former petroleum storage site. Requires assessment and/or clean up.	0090008757
Shire of Nilumbik	Plenty	Crown Allotment 2043 Parish of Morang 103 Goldsworthy Lane	Former Landfill. Requires assessment and/or clean up.	0090010389
South Gippsland Shire Council	AGNES	614 BARRY RD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090009029
South Gippsland Shire Council	FOSTER	4090 SOUTH GIPPSLAND HWY	Former Landfill. Requires ongoing management.	0090008734

PRIORITY SITES REGISTER

Information as at 31 October 2019

Municipality	Suburb	Address	Issue	Notice Number
South Gippsland Shire Council	LEONGATHA SOUTH	630 ROUGHEADS RD	Former Landfill. Requires ongoing management.	0090006475
Strathbogie Shire Council	VIOLET TOWN	190 Mcdiarmids RD	Former Landfill. Requires ongoing management.	0090008902
Surf Coast Shire Council	ANGLESEA	CAMP RD	Former Industrial Site. Requires assessment and/or clean up.	0090006380
Surf Coast Shire Council	Winchelsea	84 Hopkins Street CA 33 Township of Winchelsea	Gun, pistol or rifle range. Requires assessment and/or clean up.	0090008921
Surf Coast Shire Council	Winchelsea	84 Hopkins Street CA 33 Township of Winchelsea	Gun, pistol or rifle range. Requires assessment and/or clean up.	0090008985
Swan Hill Rural City Council	Swan Hill	3 Hastings Street	Former petroleum storage site. Requires assessment and/or clean up.	0090006980
Swan Hill Rural City Council	SWAN HILL	5 - 7 HASTINGS ST	Former petroleum storage site. Requires assessment and/or clean up.	0090010176
Towong Shire Council	BETHANGA	4 MARTIN ST	Former Landfill. Requires ongoing management.	0090003554
Wangaratta Rural City Council	North Wangaratta	21 Detour Rd (Lot 1 PS 423200)	Gun, pistol or rifle range. Requires assessment and/or clean up.	0090010395
Wangaratta Rural City Council	WANGARATTA SOUTH	99 SHANLEY ST	Current Industrial Site. Requires assessment and/or clean up.	0090007165
Warrnambool City Council	WARRNAMBOOL	Braithwaite ST	Former Landfill. Requires ongoing management.	0090007563
Warrnambool City Council	WARRNAMBOOL	16 ALBERT ST	Current Industrial Site. Requires assessment and/or clean up.	0090010501
Wellington Shire Council	DUTSON	1950 Longford-Loch Sport Road	Current Industrial Site. Requires assessment and/or clean up.	0090010183
Wellington Shire Council	HEYFIELD	Lot 2 LP131215 TYSON ROAD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090010069
Wellington Shire Council	KILMANY	Lot 1 & Part Lot 2 LP79840 Parish of Wooun Dellah	Current landfill. Requires ongoing management.	0090009815
Wellington Shire Council	LONGFORD	GARRETTS RD	Current Industrial Site. Requires assessment and/or clean up.	0090008496
Wellington Shire Council	LONGFORD	GARRETTS RD	Current Industrial Site. Requires assessment and/or clean up.	0090008551
Wellington Shire Council	MAFFRA	95 SELLINGS RD	Current landfill. Requires ongoing management.	0090009831
Wellington Shire Council	MAFFRA	87 POWERSCOURT ST	Current Service Station. Requires assessment and/or clean up.	0090010447
Wellington Shire Council	SALE	2-14 McMillan Street	Former Industrial Site. Requires assessment and/or clean up.	0090009164
Wellington Shire Council	WEST SALE	Cnr Princes Highway and Sale-Cowarr Road	Current Industrial Site. Requires ongoing management.	0090007151
Wellington Shire Council	YARRAM	5507 HYLAND HWY	Former Landfill. Requires ongoing management.	0090003055
West Wimmera Shire Council	Kaniva	Crown Allotment 11 Parish of Beewar	Illegal dumping. Requires assessment and/or clean up.	0090010326
Whitehorse City Council	BOX HILL	14 Federation ST	Former Landfill. Requires ongoing management.	0090003499
Whittlesea City Council	EPPING	480 COOPER STREET LOT 1 PS504515	Former Landfill. Requires ongoing management.	0090003490
Whittlesea City Council	EPPING	490 COOPER ST	Former Landfill. Requires ongoing management.	0090003502
Whittlesea City Council	EPPING	490 COOPER ST	Former Landfill. Requires ongoing management.	0090010155
Whittlesea City Council	EPPING	490 COOPER ST	Former Landfill. Requires ongoing management.	0090010156
Whittlesea City Council	EPPING	490 COOPER ST	Former Landfill. Requires ongoing management.	0090010157
Whittlesea City Council	EPPING	480 COOPER STREET LOT 1 PS504515	Former Landfill. Requires ongoing management.	0090010159
Whittlesea City Council	EPPING	480 COOPER STREET LOT 1 PS504515	Former Landfill. Requires ongoing management.	0090010160
Whittlesea City Council	EPPING	480 COOPER STREET LOT 1 PS504515	Former Landfill. Requires ongoing management.	0090010161
Whittlesea City Council	EPPING	335 OHERNS RD LOT 1 TP102498	Former Landfill. Requires ongoing management.	0090010162
Whittlesea City Council	EPPING	335 OHERNS RD LOT 1 TP102498	Former Landfill. Requires ongoing management.	0090010163
Whittlesea City Council	THOMASTOWN	338 - 342 SETTLEMENT RD	Former petroleum storage site. Requires ongoing management.	0090007336

PRIORITY SITES REGISTER

Information as at 31 October 2019

Municipality	Suburb	Address	Issue	Notice Number
Whittlesea City Council	WHITTLESEA	125 HOLTS RD	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090006944
Whittlesea City Council	WOLLERT	585 SUMMERHILL RD	Contaminated soil is retained and managed onsite. Requires assessment and/or clean up.	0090009575
Wodonga Rural City Council	WODONGA	3437 Beechworth-Wodonga RD	Former Landfill. Requires ongoing management.	0090003548
Wodonga Rural City Council	WODONGA	CARROLLS LANE LOT 1TP423757	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090008268
Wodonga Rural City Council	WODONGA	CARROLLS LANE LOT 1TP423757	Industrial waste has been dumped at the site. Requires assessment and/or clean up.	0090009546
Wyndham City Council	LAVERTON NORTH	65 LEAKES RD	Current Industrial Site. Requires assessment and/or clean up.	0090006945
Wyndham City Council	LAVERTON NORTH	103 - 105 Pipe RD	Current Industrial Site. Requires assessment and/or clean up.	0090007881
Wyndham City Council	LAVERTON NORTH	19 LITTLE BOUNDARY RD	Current Industrial Site. Requires ongoing management.	0090008784
Wyndham City Council	LAVERTON NORTH	25 LITTLE BOUNDARY RD	Current Industrial Site. Requires assessment and/or clean up.	0090009011
Wyndham City Council	LAVERTON NORTH	88 - 90 WILLIAM ANGLISS DR	Current Industrial Site. Requires assessment and/or clean up.	0090010563
Wyndham City Council	LITTLE RIVER	490 EDGARS RD	Illegal dumping. Requires assessment and/or clean up.	0090004276
Yarra City Council	COLLINGWOOD	65 - 69 KEELE ST	Current Service Station. Requires assessment and/or clean up.	0090010217
Yarra Ranges Shire Council	KILSYTH	2 76 Fussell RD	Former Industrial Site. Requires assessment and/or clean up.	0090009524
West Wimmera Shire Council	KANIVA	Crown Allotment 11 Parish of Beewar Volume 09811 Folio 411 Kaniva-Edenhope RD	Potentially contaminated site currently under investigation. Required assessment and likely cleanup/management.	N/A

B5. EPA License

PREMISES REF NO: 71425 - CONDITIONS

Premises Address: 200 SOUTH STATION ST
WALLAN VIC 3756

Scheduled Categories: A03 Sewage Treatment

General Conditions

LI_G1	Waste from the premises must not be discharged to the environment except in accordance with this licence.
LI_G2	You must immediately notify EPA of non-compliance with any condition of this licence.
LI_G3	By 30 September each year you must submit an annual performance statement to EPA for the previous financial year in accordance with the Annual Performance Statement Guidelines (EPA Publication 1320).
LI_G4	Documents and monitoring records used for preparation of the annual performance statement must be retained at the premises for seven years from the date of each statement.
LI_G5	You must implement a monitoring program that enables you and EPA to determine compliance with this licence.

Amenity Conditions

LI_A1	Offensive odours must not be discharged beyond the boundaries of the premises.

Waste Acceptance Conditions

Licence does not have any waste acceptance conditions.

Waste Management Conditions

Licence does not have any waste management conditions.

Landfill Conditions

Licence does not have any landfill conditions.

Air Conditions

Licence does not have any discharge to air conditions.

Water Conditions

LI_DW1	Stormwater discharged from the premises must not be contaminated with waste.
LI_DW2	Discharge of waste to surface waters must be in accordance with the 'Discharge to Water' Table.
LI_DW2.1.6	Discharge from the premises must meet the following dilution factors: (a) A minimum dilution factor of 1:2.3 when the ammonia concentration is below 1 mg/L; (b) A minimum dilution factor of 1:5 when the ammonia concentration is between 1 mg/L and 2 mg/L; and (c) A minimum dilution factor of 1:10 when the ammonia concentration is between 2 mg/L and 3 mg/L.
LI_DW2.8	Discharge of treated wastewater during wet weather conditions must be in accordance with specifications in "Discharge to Water" section of EPA Publication 1322 'Licence Management Guidelines'.
LI_DW3	The mixing zone extends 1.7 kilometres for ammonia, 5.4 kilometres for total nitrogen and 22.8 kilometres for total phosphorous downstream of the licensed waste discharge points.
LI_DW6	Discharge of waste to surface waters may only take place between April and October inclusive until 2021 and in accordance with condition DW2

Discharge to Water Table - Discharge Limits

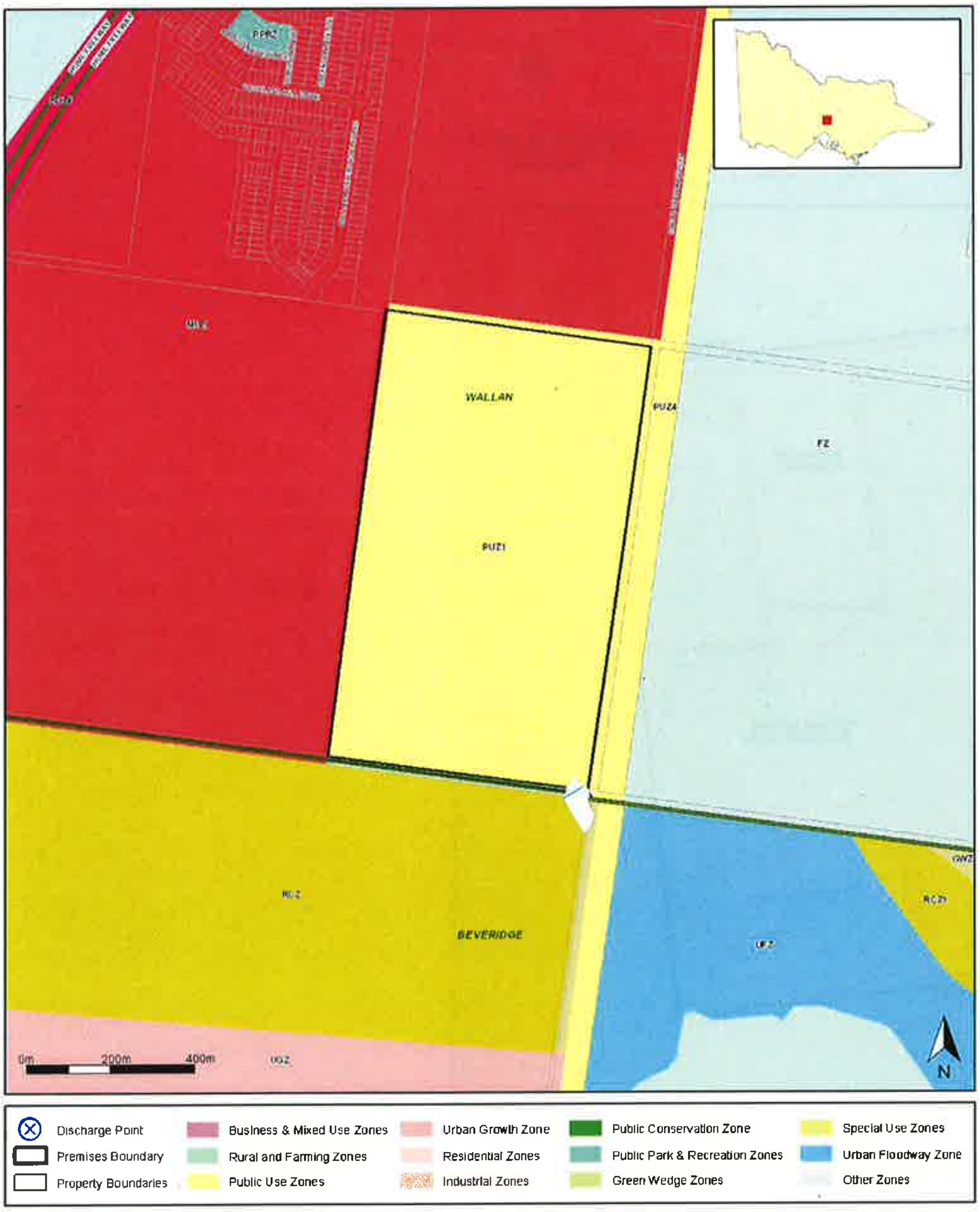
Discharge Point No	Description of Discharge Points	Indicator	Limit Type	Unit	Discharge Limit
DP1 + DP2	Discharge Point 1 and Discharge Point 2	Flow Rate	Max Daily flow	ML/D	13
		Ammonia	Annual Median	mg/l	1
		Ammonia	Maximum	mg/l	3
		Biochemical oxygen demand (5 day)	Annual Median	mg/l	5
		Escherichia Coli	Annual Median	Org/ml	100
		Suspended solids	Annual Median	mg/l	10
		Total nitrogen	90th Percentile	mg/l	10
		Total phosphorus	Maximum	mg/l	2
		pH	Maximum	pH	9
		pH	Minimum	pH	6

mg/l = Milligrams/litre
ML/D = Megalitre per day
Org/ml = Organisms/100 Milliliter
pH = pH Units

Land Conditions

LI_DL1	You must not contaminate land or groundwater.
LI_DL2	Discharge of wastewater to land must not adversely affect the land.
LI_DL4	Deposit of biosolids to land must not adversely affect the land.

PREMISES REF NO: 71425 - SCHEDULE 1A - LOCALITY PLAN

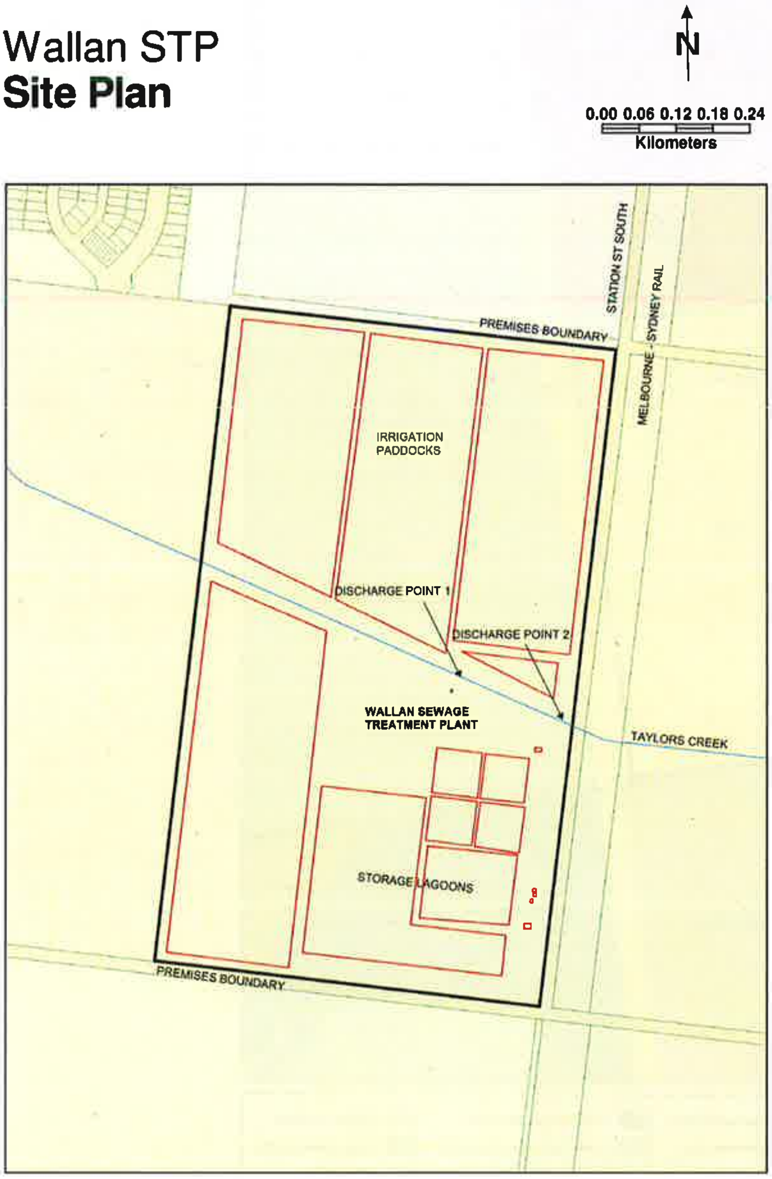


Licence	74181
Company Name	YARRA VALLEY WATER CORPORATION
ACN	066 902 501
Premises Address	200 SOUTH STATION ST WALLAN VIC 3756
Issued	05/10/2009
Date Amended	05/07/2017

Before relying on the information in this map, users should carefully evaluate its accuracy, currency, completeness and relevance for their purposes, and should obtain any appropriate professional advice relevant to their particular circumstances.

PREMISES REF NO: 71425 - SCHEDULE 1B - PREMISES PLAN

Wallan STP
Site Plan



Licence	74181
Company Name	YARRA VALLEY WATER CORPORATION
ACN	066 902 501
Premises Address	200 SOUTH STATION ST WALLAN VIC 3756
Issued	05/10/2009
Date Amended	05/07/2017

Before relying on the information in this map, users should carefully evaluate its accuracy, currency, completeness and relevance for their purposes, and should obtain any appropriate professional advice relevant to their particular circumstances.

B.6 Energy Safe Victoria Cathodic Protection System Search

B6. Energy Safe Victoria Cathodic Protection System Search

View of all CPS registration records

Filters: (**InstallationCity = WALLAN**)

Type	CPS ID	Status	Op (A)	Street Address	Suburb	Owner	Date Approved
Galvanic Anodes	CPS-00087	OPERATIONAL	0.1	WALLAN - WHITTLESEA RD, RAILWAY CROSSING	WALLAN	AUSTRALIAN GAS NETWORKS (VIC) PTY LTD	3/10/1979
Impressed Current	CPS-00571	OPERATIONAL	2	WALLAN - WHITTLESEA RD	WALLAN	GASNET AUSTRALIA (OPERATIONS) PTY LTD	1/09/2004
Galvanic Anodes	CPS-10348	OPERATIONAL	0.15	WALLAN-WHITTLESEA RD- RAIL PROPERTY	WALLAN	AUSTRALIAN GAS NETWORKS (VIC) PTY LTD	4/08/1999
Galvanic Anodes	CPS-12311	OPERATIONAL	0.15	UNITED SERVICE STATION, 11-24 HIGH STREET	WALLAN	UNITED PETROLEUM PTY LTD	5/03/2003
Galvanic Anodes	CPS-12733	OPERATIONAL	0.1	CALTEX WOOLWORTHS PETROL, 81 HIGH STREET	WALLAN	WOOLWORTHS PETROL	6/10/2004
Impressed Current	CPS-12854	OPERATIONAL	1	NORTHERN HIGHWAY AT OLD ROAD EASEMENT, APPROX. 460M NORTH OF MACSFIELD ROAD	WALLAN	YARRA VALLEY WATER	1/02/2006
Galvanic Anodes	CPS-13957	OPERATIONAL	0.1	BP SERVICE STATION, HUME HIGHWAY (SOUTH BOUND)	WALLAN	AA HOLDINGS PTY LTD	4/06/2008
Galvanic Anodes	CPS-13958	OPERATIONAL	0.1	BP SERVICE STATION, HUME HIGHWAY (NORTH BOUND)	WALLAN	AA HOLDINGS PTY LTD	4/06/2008
Galvanic Anodes	CPS-16809	OPERATIONAL	0.2	SPRINGRIDGE BOULEVARD, 22M WEST OF SILVER WATTLE DVE	WALLAN	YARRA VALLEY WATER	7/12/2011
Galvanic Anodes	CPS-16810	OPERATIONAL	0.1	SPRINGRIDGE BLVD, 19.5M WEST OF SILVER WATTLE DRV	WALLAN	YARRA VALLEY WATER	7/12/2011
Galvanic Anodes	CPS-16811	OPERATIONAL	0.2	SPRINGRIDGE BLVD, 19.5M WEST OF SILVER WATTLE DVE	WALLAN	YARRA VALLEY WATER	7/12/2011
Galvanic Anodes	CPS-16887	OPERATIONAL	0.35	PIPETRACK, 9.2M EAST OF ENTRANCE TO TANK SITE	WALLAN	YARRA VALLEY WATER	4/04/2012
Galvanic Anodes	CPS-16888	OPERATIONAL	0.3	PIPETRACK, 44M STH OF SILVER WATTLE DRIVE	WALLAN	YARRA VALLEY WATER	4/04/2012
Galvanic Anodes	CPS-16890	OPERATIONAL	0.4	NORTHERN HIGHWAY, 22.5M WEST OF ENTRANCE TO TANK SITE	WALLAN	YARRA VALLEY WATER	4/04/2012
Galvanic Anodes	CPS-20304	OPERATIONAL	0.195	Springridge Boulevard, 43m West of Boronia Ave	WALLAN	YARRA VALLEY WATER	6/06/2019
Galvanic Anodes	CPS-20334	OPERATIONAL	0.195	Springridge Bvd, 43m West of Boronia Ave	WALLAN	YARRA VALLEY WATER	3/07/2019
Galvanic Anodes	CPS-20335	OPERATIONAL	0.12	Springridge Bvd, 3m East of Daffodil Cres	WALLAN	YARRA VALLEY WATER	3/07/2019

COPY

Regulation 12(2)

SCHEDULE 2
STATE ELECTRICITY COMMISSION OF VICTORIA
CATHODIC PROTECTION REGULATIONS 1988
PERMISSION TO INSTALL AND OPERATE CATHODIC PROTECTION

This is to certify that permission has been granted to install and operate the cathodic protection system described below.

Owner of structure to be protected:

Name STRATUS NETWORKS

Address 1 WOOD STREET THOMASTOWN

Consultant engaged (if any):

Name CATHODIC PROTECTION SYSTEMS

Address PO BOX 83 CLIFTON HILL

Structure to be protected: 100 MSGM

Drawing Reference No.: CLONBINANE0814

System Location: WALLAN-WHITTLESEA RD- RAIL
PROPERTY, WALLAN

Type of system: GALVANIC ANODE

Operating current: 0.15 amperes.

Date of application: 04/07/99

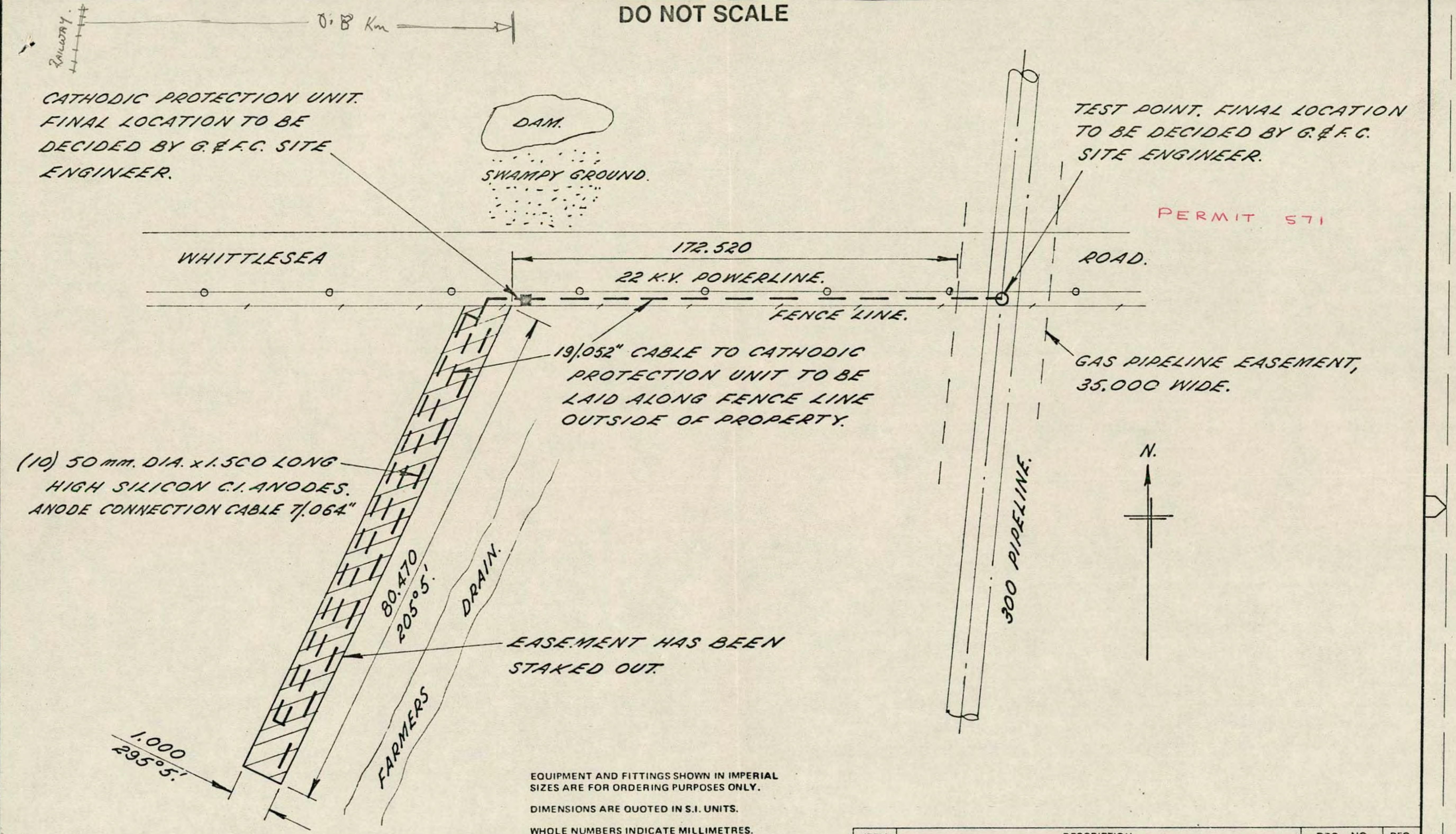
Date of Permit: 04/08/99

Permit Reference No.: 10348

The permit is conditional on the installation being installed and operated in accordance with the design details given in the application.

I LONGMUIR for
CHIEF ELECTRICAL INSPECTOR

DO NOT SCALE



PERMIT 571

EQUIPMENT AND FITTINGS SHOWN IN IMPERIAL SIZES ARE FOR ORDERING PURPOSES ONLY.

DIMENSIONS ARE QUOTED IN S.I. UNITS.

WHOLE NUMBERS INDICATE MILLIMETRES.

DECIMALIZED EXPRESSIONS TO THREE PLACES OF DECIMALS INDICATES METRES UNLESS OTHERWISE NOTED.

ITEM	DESCRIPTION	DRG. NO.	REQ.

DISTRICT PLAN NO.	FIELD BOOK	LEVEL BOOK	LEVEL DATUM

NO.	DATE	REVISION	BY	CKD.
A.	20/8/75	CABLE SIZES ADDED.	K.W.	

REFERENCE DRAWINGS	DRG. NO.
ANODE BED DETAIL.	20667.
EASEMENT.	ET-1436.
ROUTE PLAN.	16117.

GAS AND FUEL CORPORATION
OF VICTORIA
ENGINEERING DEPARTMENT

SCALE N.T.S.
DRAWN K.W. 29-1-75.
CHECKED MWM 4-2-75

CORROSION MITIGATION:- ANODE BED.
KEON PARK -- WODONGA PIPELINE.
WHITTLESEA ROAD. - LOCATION No 2.

CHIEF DRAFTSMAN
ENGINEER
CHIEF ENGINEER

A3 16647/A.

PERMIT No 571

NOTE THAT THE COMMA REPLACES THE DOT AS A DECIMAL SIGN ON THIS DRAWING. REFER AS 1100 PART 6 1973.

METRES 200 150 100 50 0 200 400 600 800 1000 1200 1400 1600 1800 METRES

DIMENSIONS ARE IN METRES — PIPE SIZES ARE IN MILLIMETRES

TYPE OF PIPE

C2	CAST IRON
C3	CAST IRON MECHANICAL JOINT
C4	CAST IRON SOUTHERN
C5	CAST IRON A.I.S.
C6	CAST IRON METTERS CLOW
C7	CAST IRON STAVELEY
C8	CAST IRON STANTON
C9	CAST IRON STANTON — STAVELEY
C10	CAST IRON LEAD JOINTED
F2	FIBRO CEMENT
S2	STEEL
S3	STEEL COATED AND SCREWED
S4	STEEL COATED AND WELDED
S5	STEEL GALVANISED
S6	STEEL COATED GIBAULT JOINTS
S7	STEEL PLASTIC COATED AND WELDED
S8	STEEL PLASTIC COATED AND SCREWED
P2	PLASTIC POLYETHYLENE
P3	PLASTIC POLY VINYL CHLORIDE
W2	WROUGHT IRON GALVANISED

FITTINGS

B.P.	BLADDER PLATE
C.	CAP
P.	PLUG
R.	REDUCER
F. & F.	FLANGE & FAUCET PIECE
F. & S.	FLANGE & SPIGOT PIECE
St.	STOOL
Sd.	SADDLE
T.	TEE
T.B.	TEE BOSSED
T. Sp.	TEE SPLIT
Th.	THIMBLE
Th. B.	THIMBLE BOSSED
Th. Sp.	THIMBLE SPLIT
Th. Sp. B.	THIMBLE SPLIT BOSSED
90°	BEND
3,1	OFFSET
C.1,0	COVER
V12-22	SECTIONALIZATION VALVE No. 12 SECTION 22

K	KIOSK
P	PIT
●	SYPHON
○	PURGE, PRESSURE POINT
⋈	VALVE
	VALVE INSULATED
	FLANGE BLANK
	INSULATED FLANGE, COUPLING
	ENCASING PIPE
+	CROSS
(V)	VERTICAL BEND
(C.B.)	COMBINED BEND
L.T.	LONGTHREAD
C.T.	CAP TAPPED
W.T.	WILLIAMSON TEE
W.S.	WILLIAMSON SHORT STOPP
L.S.	LINE STOPPER
T.S.	TEE SERVICE
T.V.	TEE VALVE
D.E.	DEAD END EXTENSION

NOTATIONS

H102	REGULATOR H102 IN REG. REGISTER
G.A.16253	SERVICE REGULATOR GENERAL ARRANGEMENT DRG. 16253
N.T.I.	NOT TIED IN
E.O.M.	END OF MAIN
2/74	DATE MAIN LAID — FEB 1974
C.L.2/74	DATE MAIN CLEANED—FEB 1974
V. 7210	V.F.C. TRANSMISSION MAIN RECORD DRG.
R. 1121	TRANSMISSION MAIN RECORD DRG.
E.T. 19	GAS EASEMENT DRAWINGS
D.D. 15	GAS EASEMENT LONGFORD—DANDENONG
B.C. 10	GAS EASEMENT BROOKLYN—CORIO
M.M.B.W.4/25	M.M.B.W. PLANNING BOOK 4 PAGE 25
M.D. 175	MAINS DETAIL No. 175
S.D. 175	SERVICE DETAIL No. 175
M.D.B. 1/20	MAINS DETAIL BOOK 1 PAGE 20
S.D.B. 1/20	SERVICE DETAIL BOOK 1 PAGE 20
C.R.B. 6464	C.R.B. SURVEY PLAN 6464
12756	G.F.C. SUBDIVISION NUMBER
25	ALLOTMENT NUMBER
G.G. 61/967	GOVERNMENT GAZETTE 1961, PAGE 967

PRESSURE RANGES

LOW PRESSURE	0 kPa — 7 kPa	
MEDIUM PRESSURE	7 kPa — 200 kPa	
HIGH PRESSURE	100 kPa — 515 kPa	🟦
TRANSMISSION PRESSURE	IN EXCESS OF 515 kPa	

REFERENCES (C. 75/7, ETC.) ARE CORRESPONDENCE NUMBERS RELATING TO PARTICULAR AUTHORITIES AND ARE AVAILABLE FROM THE PLAN ROOM.

BASIC CADASTRAL INFORMATION TAKEN FROM:

SHIRE OF KILMORE

NOTICE

THE GAS AND FUEL CORPORATION HAS TAKEN CARE TO ENSURE THAT THE LOCATIONS OF GAS MAINS SHOWN ON THIS PLAN ARE ACCURATE.

HOWEVER, SOME VARIATIONS FROM RECORDS DO EXIST AND COMPLETE ACCURACY CANNOT BE GUARANTEED.

IN ALL INSTANCES, IT IS ESSENTIAL THAT THE POSITION OF THE PIPES CONCERNED BE PROVED ON SITE BY HAND EXCAVATION.

NOTICE IS HEREBY GIVEN THAT IT IS AN OFFENCE TO DAMAGE CORPORATION PROPERTY. (GAS AND FUEL CORPORATION ACT 1958, SECTION 36)

SHEET INDEX

CLONBINANE

07-15	08-15	09-15
07-14	08-14	09-14
07-13	08-13	09-13

DISTRICT CENTRE: ESSENDON

REVISIONS

DATE	CHECKED	DATE	CHECKED

GAS AND FUEL CORPORATION OF VICTORIA

ENGINEERING DEPARTMENT

MUNICIPALITY OF KILMORE

CHIEF DRAFTSMAN 2-5-79

C.G. Bland
CHIEF ENGINEER

Nº CLONBINANE 2500
08-14
NUMBER OF OVERLAYS 1

GHF
JR

CLONBINANE 08-14
OVERLAY 1
BLUE

Permit No. 00087

PERMIT # 87.

B7. Previous Reports

ENVIRONMENTAL SITE ASSESSMENT

PROVIDED BY:

LRM GLOBAL PTY LTD

FOR WORKS:

30 ROWES LANE WALLAN

FOR:

DARRAWEIT PROPERTY TRUST PTY LTD

OCTOBER 2018

CONFIDENTIAL

TABLE OF CONTENTS

TABLES IN TEXT

APPENDICES

AUTHORISED BY:

Mr. Brendan Paule Environmental Consultant LRM Global Pty Ltd Liability & Risk Management	Signed: Date: 15/10/2018
Mr. Andrew Jacob Environmental Consultant LRM Global Pty Ltd Liability & Risk Management	Signed: Date: 15/10/2018

DISTRIBUTION LIST:

No. of Copies	Status	Date	Prepared for:
Copy 1	Final	15/10/2018	Client – Darraweit Property Trust Pty Ltd
Copy 2	Final	15/10/2018	Assessor - LRM Global Pty Ltd

ABBREVIATIONS

AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CHCs	Chlorinated Hydrocarbons
EIL	Ecological Investigation Levels
EPA	Environment Protection Authority
HALVOL	Halogenated Volatile Organics
HIL	Health Investigation Levels
LRM	LRM Global – Liability & Risk Management Consulting
m BGL	Metres below ground level
MAH's	Monocyclic Aromatic Hydrocarbons
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
OCPs	Organochlorine Pesticides
OPPs	Organophosphorous Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PID	Photoionisation Detector
QA/QC	Quality Assurance / Quality Control
SVCHCS	Semi-volatile Chlorinated Hydrocarbons
SVOCs	Semi-volatile Organic Compounds
TDS	Total Dissolved Solids
TCLP	Total Concentration Leachability Potential
TIT	Triple Interceptor Trap
TOC	Total Organic Carbon
TRHs	Total Petroleum Hydrocarbons
USEPA	United States Environmental Protection Agency
VHCs	Volatile Halogenated Hydrocarbons
VOCs	Volatile Organic Compounds

EXECUTIVE SUMMARY

LRM Global Pty Ltd (LRM) was engaged by Darraweit Property Trust Pty Ltd (the client) to complete an Environmental Site Assessment (ESA) of the property at 30 Rowes Lane, Wallan (former battery egg farm) for the purposes of pre-sale due diligence.

The proposed site is intended to be developed for low – medium density residential use.

The site is approximately 30.4 ha in size and is presently occupied by structures associated with the former use as a battery hen farm. The site's current condition does not suggest any significant sources of contamination.

The scope of the ESA comprised the following:

- Undertake a site inspection by a qualified environmental scientist;
- Conduct a soil contamination assessment via a soil sampling program;
- Determine if the land was contaminated as a result of past activities;
- Determine if any soil contaminants are at concentrations which pose an adverse human health or environmental threat to the existing and / or proposed land-use;
- Assess the data collected from the sampling and analysis program against policies, regulations, guidelines and standards currently adopted in the state of Victoria. Data exceeding the appropriate requirements is evaluated in terms of the risks posed by the contamination and remedial measures to be undertaken to minimise those risks; and
- Provide a report for inclusion with sale documents.

The investigation involved the excavation of 22 soil bores and 27 test-pits totalling 49 locations. Soil samples were analysed for likely contaminants of concern including herbicides, pesticides, various inorganics, TRH/MAHs, PCBs and heavy metals.

On the basis of the visual aspects of the site and results of soil analysis, the following conclusions can be drawn:

- No exceedances of the adopted human health soil criteria were identified in any of the soil samples analysed;
- Screening via a photo-ionisation detector did not reveal any indication of volatile hydrocarbon contamination;
- Asbestos containing materials were not identified at any point during the assessment; and
- Contaminant concentrations within soil do not preclude the proposed future site use.
- No further soil assessment is recommended.
- No requirements for a groundwater assessment were identified.
- No high risk items such as underground fuel storage tanks were identified nor any significant sources of contamination.

1.0 INTRODUCTION

LRM Global was engaged by Darraweit Property Trust Pty Ltd to complete an Environmental Site Assessment of the property at 30 Rowes Lane, Wallan. The site owner wishes to take the site to market and requires an environmental report to document any significant issues with site soils that may impact future residential development.

The site is approximately 30.4 ha in size and is presently occupied by the former battery hen farm sheds. The site is bordered to the east by Rowes Lane and to the north by Darraweit Road. The current site condition does not suggest any significant sources of contamination.

2.0 ASSESSMENT OBJECTIVES AND SCOPE

2.1 Assessment Objective

The objective of the Environmental Site Assessment was to assess soil conditions via the advancement of grid-based and targeting sampling locations across the site, with samples collected from near surface and at depth. Samples collected were to be submitted to a NATA accredited laboratory for analysis, and the findings of the assessment presented in a report that meets client requirements.

2.2 Scope

The scope of the ESA comprised the following:

- Undertake a site inspection by a qualified environmental scientist;
- Conduct a soil contamination assessment via a soil sampling program;
- Determine if the land was contaminated as a result of past activities;
- Determine if any soil contaminants are at concentrations which pose an adverse human health or environmental threat to the existing and / or proposed land-use;
- Assess the data collected from the sampling and analysis program against policies, regulations, guidelines and standards currently adopted in the state of Victoria. Data exceeding the appropriate requirements is evaluated in terms of the risks posed by the contamination and remedial measures to be undertaken to minimise those risks; and
- Provide a report for inclusion with sale documents.

3.0 BACKGROUND

3.1 Site Location and Identification

The site is located at 30 Rowes Lane, Wallan and is accessible from Darraweit Road and a private entrance on Rowes lane. The site is approximately 30.4 ha in area and is presently occupied by the former battery hen farm sheds.

Table 1: *Site Identification Information*

Site address	30 Rowes Lane, Wallan and Darraweit Road, Wallan
Total site area	Approx. 30.4 ha
Title	Lot 1 LP149223 Lot 2 LP149223 Lot 3 LP149223
Local Government Area	Mitchell Council
Current owner	Darraweit Property Trust Pty Ltd

The site location is presented in **Appendix A**, **Figure 1**.

3.2 Planning Property Report

The Victorian Department of Environment, Land, Water and Planning (DELWP) Planning Property Report (PPR) for the site was reviewed to determine the property's zoning as well as any overlays potentially affecting the site.

Lot 1 LP149223

The site is zoned as 'Farming Zone *(FZ)*'.

The site is located within a designated bushfire prone zone.

Lot 2 LP149223

The site is zoned as 'Farming Zone *(FZ)*'.

The site is located within a designated bushfire prone zone.

Lot 3 LP149223

The site is zoned as 'Farming Zone *(FZ)*', with the significant portions overlaid by an Erosion Management Overlay Schedule (EMO). The far south western portion has a Vegetation Protection Order (VPO1) overlay.

The central northern portion also has an Aboriginal Cultural Heritage Sensitivity overlay.

The site is located within a designated bushfire prone zone.

3.3 Local Topography

The site is part of a regional valley structure that a forms a local low through the centre of the property running north to south. The site is highest on the eastern and western boundaries, sloping from approximately 380 m above Mean Sea Level (MSL) to 340 m above MSL midway across the southern boundary.

Topographic information was provided by VicPlan.

3.4 Local Geology

The information provided by the Geological Survey of Victoria shows the site is at an intersection of four stratigraphic units:

- Late Pleistocene to early Holocene non-marine sedimentary alluvial flood plain deposits.
- Pleistocene non-marine sedimentary Gully Alluvium, hill wash and fan deposits
- Pliocene extrusive sedimentary basalt flows.
- Late Silurian marine sedimentary Kilmore Siltstone.

Geological information was taken from the Geological Survey of Victoria plan 1:50,000 Geological Map Series Kilmore 7823-2 Zone 55.

The Atlas of Australia Acid Sulphate Soils suggests that there is an extremely low probability of acid sulphate soil occurrence at the site.

4.0 SAMPLE AND ANALYSIS PLAN

All soil samples were submitted under Chain of Custody documentation and couriered, on ice, to a NATA accredited laboratory for analysis, namely, Envirolab Services Pty Ltd.

Based on the location of the site and its former use as a battery hen farm, significant site contamination was considered to be unlikely, however, an intrusive investigation was recommended and undertaken to determine actual contamination status.

Field methodologies are described in detail in the following sections and the systematic analytical program that was undertaken is described in Table 2 below.

Samples were collected from gridded and targeted locations: gridded locations were either analysed for a NEPM HIL full suite, metals, pH and PAHs or metals, pH, TRH/BTEX.
Targeted locations were either tested for TRH, PCBs or nutrients.

Samples were taken from 49 locations, 41 of the sampled locations were gridded and the remaining 8 were targeting the footprint of former or current structures, two aboveground fuel tanks and an electrical substation. The analysis at gridded and targeted locations is described in Table 2 below.

Table 2: *Soil Sample Locations as per Sample Analysis Plan*

Sample Locations	Purpose	Structure of concern	Analysis
29/08/2018			
TP01_0.1, TP13_0.1, TP21_0.1, TP29_0.1 and BH35_0.1	Grid Sample Location	-	NEPM Suite
TP02_0.1, TP06_0.1,TP08_0.1, TP11_0.1, TP14_0.1, TP17_0.1, TP19_0.1, TP23_0.1, TP25_0.1, TP27_0.1, TP31_0.1, BH04_0.1, BH34_0.1, BH36_0.1, BH38_0.1, BH40_0.1, BH42_0.1 AND BH44_0.1	Grid Sample Location	-	Metals, pH and PAHs
TP05_0.1, TP07_0.1, TP10_0.1, TP12_0.1, TP15_0.1, TP18_0.1, TP20_0.1, TP22_0.1, TP24_0.1, TP26_0.1, TP28_0.1, TP32_0.1, BH33_0.1, BH37_0.1, BH39_0.1, BH41_0.1, BH43_0.1 and BH45_0.1.	Grid Sample Location	-	Metals, pH and TRH/BTEX
BH46_0.1, and BH47_0.1	Targeted Sample Location	Remaining chicken shed	Nutrient suite and pH
BH48_0.1 and BH49_0.1	Targeted Sample Location	Remaining chicken shed	Metals, pH, PAHs and Nutrient suite
BH50_0.1	Targeted Sample Location	Remaining chicken shed	Metals, pH, TRH/BTEX and Nutrient suite
BH09_0.1, BH51_0.1	Targeted Sample Location	Fuel tanks	TRH
BH16_0.1	Targeted Sample Location	Electrical substation	PCBs

5.0 SOIL ASSESSMENT CRITERIA

In assessing the presence of soil contamination present and considering the purpose of this assessment, the data will be evaluated against levels presented in the NEPM Schedule B (1) Guidelines on the Investigation Levels for Soil and Groundwater [National Protection (Assessment of Site Contamination) Measure 2013] and Victorian Environment Protection Authority (Vic EPA) Industrial Waste Resource Guidelines (IWRG) Publication 621, 2009.

The most appropriate criteria for the proposed development are the NEPM HIL Setting A for low density residential land use. Soil results were also compared against IWRG621 criteria for the purposes of off-site disposal, if required.

6.0 FIELD SOIL INVESTIGATION

6.1 Objectives

- Determine if the property was contaminated as a result of activities on-site.

  Determine if the contaminants are at concentrations which pose an adverse human health or environmental risk under the proposed land use as a low to medium density residential development.

- Assess the data collected from the sampling and analysis program against policies, regulations, guidelines and standards currently adopted in the state of Victoria.

6.2 Soil Sampling Methodology

The sampling technique adopted for the assessment was in accordance with *Australian Standard 4482:1 – 2005, Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 1: Non-Volatile and Semi volatile Compounds and Part 2: Volatile Compounds*.

Refer to Appendix B for typical soil sampling procedures.

The sampling regime adopted was based on a grid format across the site as well as targeted sampling locations of current and former structures and any visually observed impacts. The field soil investigation works were undertaken on 6th September 2018. A plan showing all soil sample locations is provided as Figure 2, Appendix A.

7.0 SOIL ASSESSMENT RESULTS

The following presents a summary of the key findings of the soil assessment. Tabulated data compared against relevant adopted criteria is attached within Appendix C.

Concentrations of BTEX, CHCs, halogenated benzenes, halogenated hydrocarbons, halogenated phenols, herbicides, inorganics, MAHs, OCPs, OPPs, PAH/phenols, pesticides, PCBs and solvents were reported below the laboratory limit of reporting for all soil samples analysed from the site.

Concentrations of selected heavy metals, nutrients and TRH fractions were reported above the laboratory limit of reporting but below the adopted criteria in selected soil samples analysed from the site.

7.1 Soil Analytical Results Criteria Exceedances

7.1.1 NEPM HIL A CRITERIA – Residential Land Use

One marginal exceedance of NEPM HIL A criteria was noted at BH44 for arsenic. At this sample location intralab duplicate (Dup02) and interlab triplicate (Split02) samples were collected. This exceedance was noted only in Split02 with the reported value not reflected in either the primary sample (BH44_0.1) or the Dup02. Conservatively, the Split02 result was adopted for the purposes of this assessment, however, the result is considered consistent with naturally occurring levels associated with the geology for the area and not a result of site derived contamination.

7.1.2 IWRG621 Criteria

Minor exceedances of Fill Material upper-limits for arsenic, nickel and zinc were noted in a number of locations. The table below summarises these exceedances.

Sample ID	Exceeding Chemical	Fill Material upper-limit (mg/kg)	Concentration (mg/kg)
BH34_0.1	Arsenic	30	31
TP19_0.1			24
BH44-0.1			54
BH04_0.1	Nickel	60	74
BH38_0.1			71
BH39_0.1			120
BH41_0.1			230
BH42_0.1			67
BH43_0.1			92
TP10_0.1			82
BH33_0.1	Zinc	200	290

Statistical analysis was undertaken on the above heavy metal exceedances in the form of 95% Upper Confidence Limit (UCL) calculations to determine site wide classification using ProUCL.

When excluding anomalous locations (BH41_0.1 and BH44_0.1) the 95% UCL generated with ProUCL for the site for arsenic, nickel and zinc are 14.03 mg/kg, 43.26 mg/kg and 51.33 mg/kg respectively. All of the generated 95% UCLs for the above contaminants are below Fill Material upper-limits.

As BH41_0.1 and BH44_0.1 both exceed 2.5 times the Fill Material upper-limit for zinc and arsenic respectively, these locations must be excluded from UCL calculations. This would otherwise classify the material as Category C Waste, however, all samples were collected from natural material and the identified levels are within the normal background range for the geology of the area and are not considered a result of site derived contamination.

Refer to Figure 4 for details.

7.1.3 Asbestos

Suspect asbestos containing materials were assessed and a separate asbestos survey report is attached in Appendix D.

8.0 DISCUSSION

The site has been assessed via a soil analysis program throughout the soil profile. Samples were collected from varying layers within the natural soil profile as fill material was not identified during the assessment.

The soil profile across the site was generally consistent throughout as per the geology described in Section 3.4 of this report.

There are no exceedances of the health-based investigation levels adopted for the site in any of the primary soil samples collected. However, a marginal exceedance within a split sample was identified for arsenic (105 mg/kg collected from BH44) which is considered within the normal background range for the geology of the area and not a result of site contamination.

A number of marginal exceedances of Fill Material upper-limits were noted, however, are considered to be representative of the naturally occurring, background concentrations associated with the geology of the area.

A number of small above ground fuel tanks were identified with targeted soil samples collected beneath them. No exceedances of hydrocarbon contamination were reported at these locations indicating that no significant leaks or spills have occurred.

8.1 HUMAN HEALTH AND ENVIRONMENTAL RISKS

8.1.1 Human Health

The risk based investigation levels developed by the National Environmental Health Forum (NEHF) and incorporated under the NEPM ‘Assessment of Site Contamination’ for low density residential land use scenarios (A levels) are appropriate for the site.

One marginal exceedance of NEPM HIL Setting A was noted in Split02 collected at BH44. This exceedance was for arsenic, and as discussed in section 7.1.1, the value reported for arsenic in sample Split02 was not reflected in the accompanying primary (BH44_0.1) or intralab duplicate (Dup02) samples. These levels are within the normal background range for the geology of the area and resulting UCL calculations lowered this level to below the adopted HIL.

No other exceedances of NEPM HIL Setting A were noted during the assessment and therefore are not considered to pose a risk to the proposed future use of the site.

8.1.2 Soil Disposal

Fill material upper-limits were exceeded at 11 locations, however, all exceedances are within the naturally occurring background range for the geology of the area and are not considered a result of site derived contamination.

As discussed in Section 7.1.2, statistical analysis using ProUCL was used to provide a disposal classification for the entire site. The output from ProUCL stated that the 95% UCL for contaminants of concern was below Fill Material upper-limits and as such the area assessed would fall under Fill Material classification. The amount and distribution of samples collected and analysed may not meet landfill requirements if off-site disposal of soil is required and further investigation may be necessary if bulk excavation and removal of soil is planned.

9.0 CONCLUSIONS AND RECOMMENDATIONS

On the basis of the visual aspects of the site and results of soil analysis, the following conclusions can be drawn:

- No exceedances of the adopted human health soil criteria were identified in any of the soil samples analysed;
- Screening via a photo-ionisation detector did not reveal any indication of volatile hydrocarbon contamination;
- Asbestos containing materials were not identified at any point during the assessment; and
- Contaminant concentrations within soil do not preclude the proposed future site use.
- No further soil assessment is recommended.
- No requirements for a groundwater assessment were identified.

Final Statement

Based on the accumulated data collected during the soil assessment, no significant human-health or environmental risks were identified that would preclude the proposed residential development.

No high risk items such as underground fuel storage tanks were identified nor any significant sources of contamination.

10.0 QUALITY ASSURANCE AND QUALITY CONTROL

All soil samples were analysed by a NATA accredited laboratory, namely Envirolab Services Pty Ltd. The laboratory followed internal quality control procedures, e.g. routine analysis of standard solutions, reference materials, reagent blanks, laboratory duplicates and spiked samples.

The quality control program consisted of LRM Global submitting three field duplicates and three split samples for analysis. The primary samples and field duplicates and splits were separately procured at relevant sample locations and were not homogenised in the field. The results are used to measure the accuracy of the laboratory's analysis techniques.

The quality assurance program also consisted of LRM Global submitting a rinsate blank and trip blank for analysis. These results were used to ensure there was no cross contamination from sampling equipment used in the field or during transportation to the receiving laboratory.

QA/QC Program

Frequency of Quality Control Checks

The number of LRM soil QA/QC samples compared to the requirements of the AS4482.1 are provided below:

Table 3: *QA/QC – Frequency of QA/QC Requirements*

Quality Control Samples	Minimum Number of QA/QC Samples required	No. of LRM Primary Assessment Soil Samples Analysed	No. of LRM QA/QC Assessment Soil Samples
Duplicate Sample	1 in 20	3	3
Triplicate Sample	1 in 20	3	3

Overall Precision and Accuracy Indicators

Three duplicates, three splits, one rinsate and one trip sample were collected and submitted to the laboratory as part of the soil contamination investigation. The duplicate and split samples were analysed for the contaminants of concern associated with the site. The majority of RPDs relating to the soil samples were within acceptable criteria.

As 83% of duplicate and triplicate RPDs are within the acceptable limits, the data is considered repeatable and reliable. Refer to Table 4 within Appendix C for RPD results.

The rinsate blank revealed that no cross-contamination occurred during the collection of soil samples. The trip blank revealed that no cross-contamination occurred during transportation of the soil samples.

Laboratory Internal QA/QC

To assess the extent of matrix bias or interference on analyte recovery and sample to sample precision, numerous spike recovery appraisals were conducted by the laboratory. Recovery percentages for the soil spikes were generally between the LRM acceptable ranges of 70 – 130%, or 30 – 150% for phenols, indicating little negative or positive bias on reported analyte concentrations.

Recovery ranges for all analyte classes tested were within acceptable ranges.

Field Blanks

A trip blank was laboratory prepared in 40 mL glass vials with a Teflon septum lids and pre-prepared with hydrochloric acid. The trip blank accompanied the samples throughout the entire sampling procedure and during delivery to the receiving laboratory. The trip blank was analysed for TRH C_6-C_9 and BTEX. All concentrations analysed within the trip blank were reported below the laboratory limit of reporting.

A rinsate blank was collected from the third stage of the decontamination procedure (the first stage being a solution of deionised water and ‘Decon 90’; the second stage – tap water; and the third stage is deionised water only) to ensure the decontamination procedure is effective and being appropriately undertaken. The rinsate sample collected during the soil sampling program was analysed for TRH and BTEX. All concentrations analysed within the rinsate blank were reported below the laboratory limit of reporting.

Holding Times

Holding time requirements were met during the works undertaken as part of this report. It should also be noted that all samples were stored at the laboratory in the dark at temperatures of approximately 4°C, thus minimising any photo-degradation or microbiological degradation of samples.

Practical Quantitation Limits

All analytical determinations were made by NATA registered laboratories achieving limits of reporting common in analytical chemistry and practicable given the quantities of samples normally submitted and sample preparation protocols normally observed.

Overall QA/QC Adequacy

It is concluded that the quality control procedures have confirmed that overall data supplied by the laboratories is adequate to arrive at the conclusions of this report.

11.0 STATEMENT OF LIMITATIONS

This report has been prepared for Darraweit Property Trust Pty Ltd for the purpose set out herein. The services performed by LRM Global Pty Ltd have been conducted with the level of quality and expertise generally associated with activities of this nature by an environmental consulting practice.

Responsibility is disclaimed for any loss or damage other than to Darraweit Property Trust Pty Ltd. LRM Global Pty Ltd does not accept any responsibility suffered by any other party whatsoever including, but not limited to, negligence on the part of LRM Global Pty Ltd.

This report is for the use of Crystal Group Pty Ltd and its appointed agents. LRM Global Pty Ltd does not intend that any other person accept or rely upon it. This report shall only be presented in full, except where written approval with comments is provided by LRM Global Pty Ltd.

The information contained in this report is considered to be accurate on the date of issue in accordance with the current conditions of the site. Whilst the report is accurate to the best of our knowledge and belief, LRM Global Pty Ltd cannot guarantee completeness or accuracy of any descriptions or conclusions based on supplied information, including but not limited to, information provided by previous site assessors and data arising from investigations by any other third party.

References

AS 4482.1 – 2005 *Guide to investigation and sampling of potentially contaminated soil, Part 1: Non- Volatile and semi-volatile compounds*

AS 4482.2 – 1999 *Guide to sampling and investigation of potentially contaminated soil, Part 2: Volatile substances*

NEPM Assessment of Site Contamination, 1999 NEPC

NEPM Discussion paper, for NEPC 2006

NEPM Schedule B (9) Guideline on Protection of Health and the Environment during the Assessment of Site Contamination, 2013 for NEPC

Schedule B(1) Guideline on Investigation levels for Soil and groundwater NEPM, 1999 NEPC

Schedule B(1) Guideline on Investigation levels for Soil and groundwater NEPM, 2013 NEPC

Schedule B(2) Guideline on Data Collection, Sample Design and Reporting NEPM, 1999 NEPC

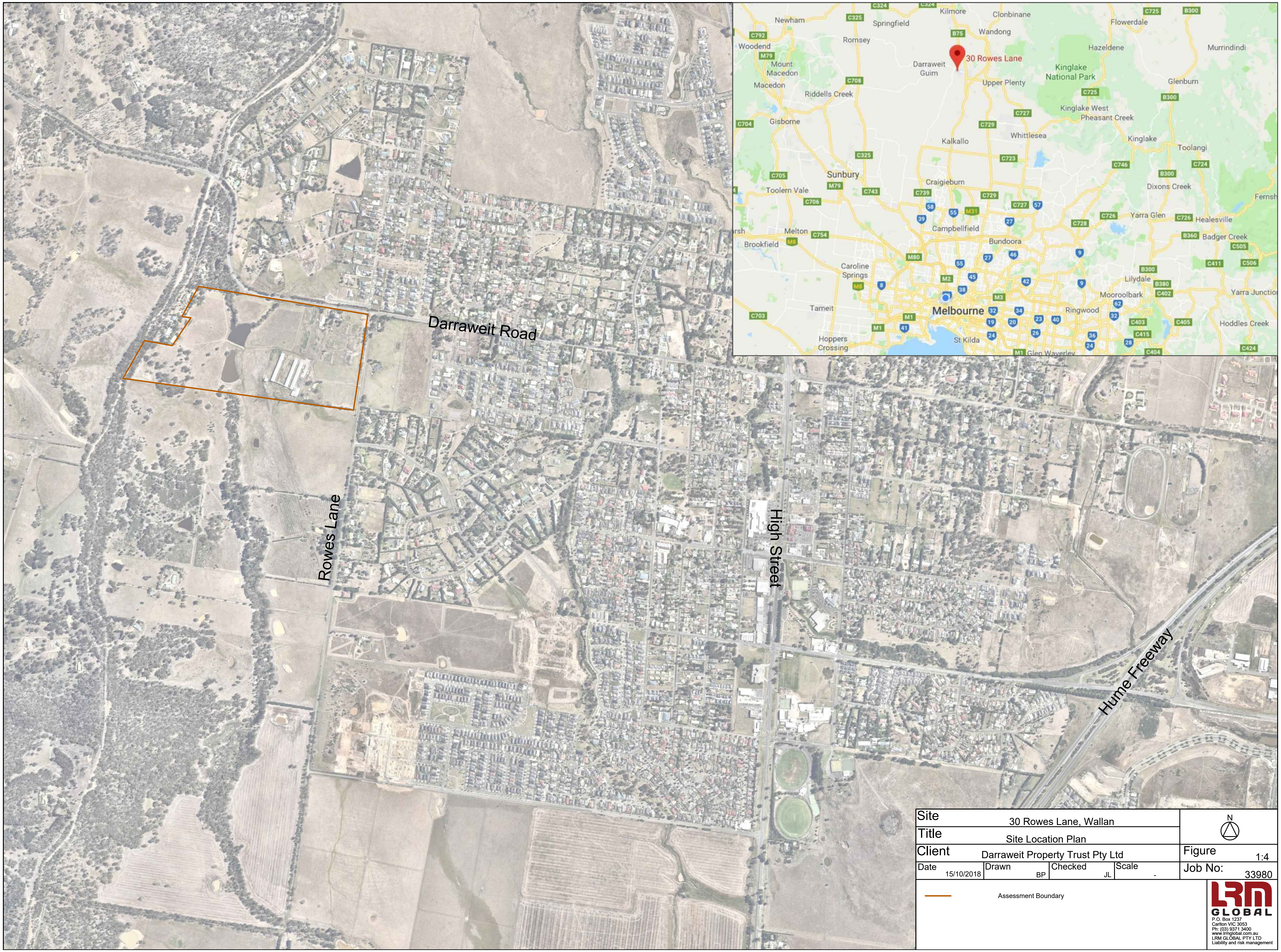
Schedule B (7a) Guideline on Health Based Investigation Levels National Environmental Protection (Assessment of Site Contamination) Measure, 1999 NEPC, Revised July 1999

SEPP Prevention and Management of Contaminated Land in Victoria, EPA Vic 2002

SEPP (Prevention and Management of Cont. Land) No. s 95, 2002 Government Gazette

APPENDIX A

FIGURES



Site
30 Rowes Lane, Wallan

Title
Site Location Plan

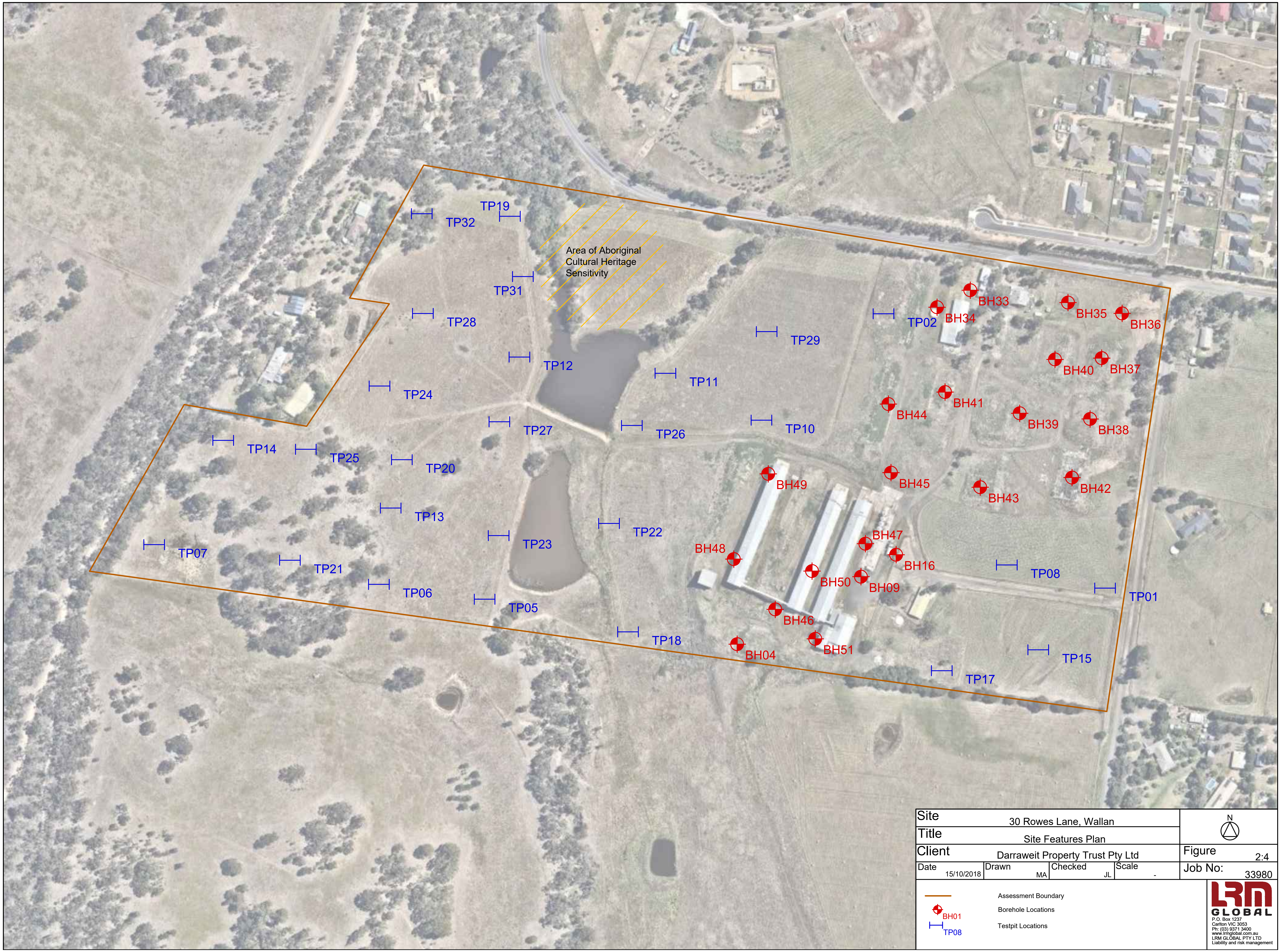
Client
Darraweit Property Trust Pty Ltd

Figure
1:4

Date	Drawn	Checked	Scale	Job No:
15/10/2018	BP	JL	-	33980

— Assessment Boundary

LRM GLOBAL
P.O. Box 1237
Carlton VIC 3053
Ph: (03) 9371 3400
www.lrmglobal.com.au
LRM GLOBAL PTY LTD
Liability and risk management



Site	30 Rowes Lane, Wallan		
Title	Site Features Plan		
Client	Darraweit Property Trust Pty Ltd	Figure	2:4
Date 15/10/2018	Drawn MA	Checked JL	Scale -

Job No: 33980

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Carlton VIC 3053
Ph: (03) 9371 3400
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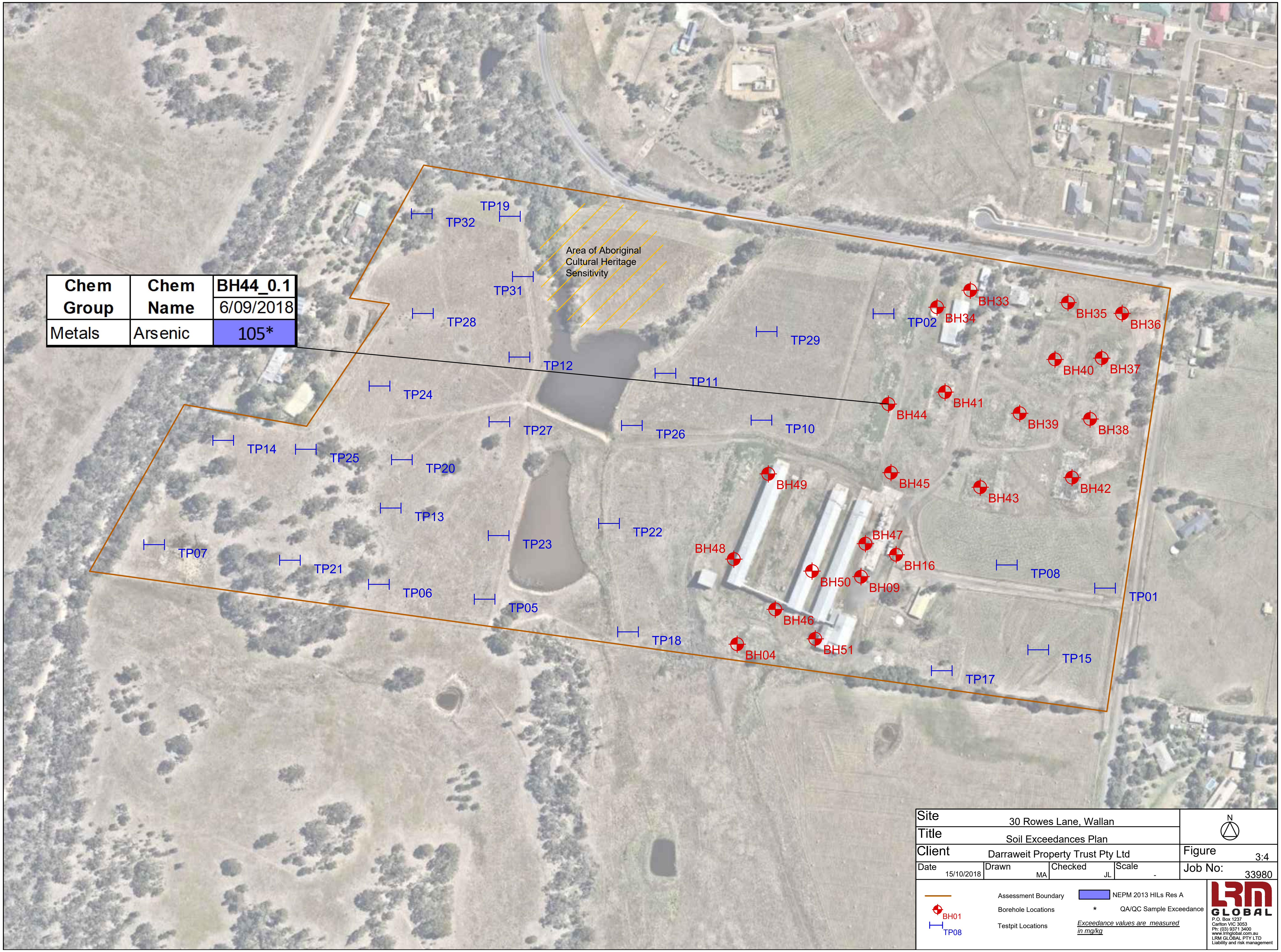
LRM GLOBAL PTY LTD
Liability and risk management



Chem Group	Chem Name	BH44_0.1
		6/09/2018
Metals	Arsenic	105*

Site 30 Rowes Lane, Wallan

Title Soil Exceedances Plan

Client Darraweit Property Trust Pty Ltd

Figure 3:4

Date 15/10/2018

Drawn MA

Checked JL

Scale -

Job No: 33980

—	Assessment Boundary	▨	NEPM 2013 HILs Res A
⊕ BH01	Borehole Locations	*	QA/QC Sample Exceedance
├─┤ TP08	Testpit Locations		

Exceedance values are measured in mg/kg

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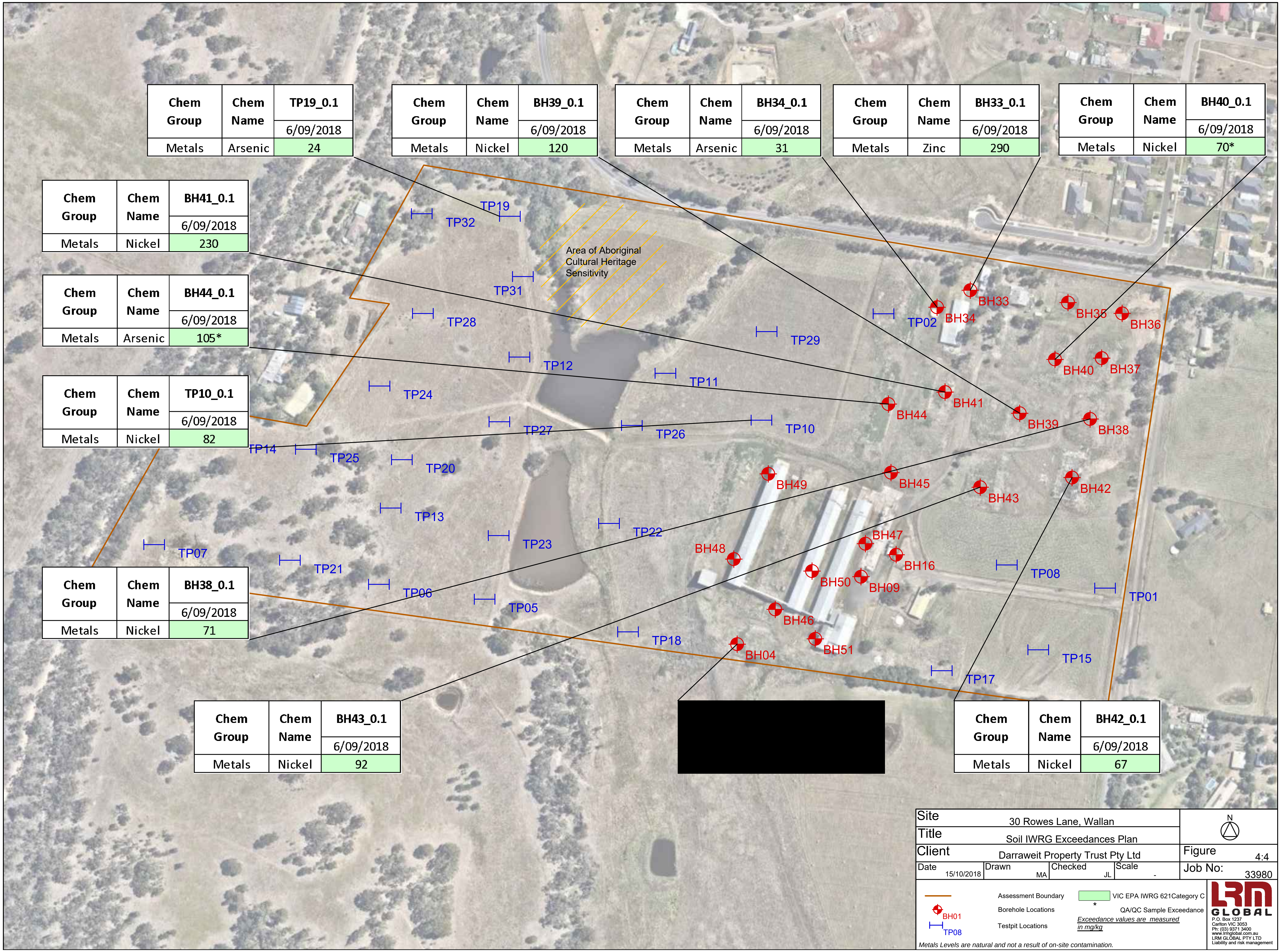

[redacted]

Chem Group	Chem Name	TP19_0.1
		6/09/2018
Metals	Arsenic	24

Chem Group	Chem Name	BH39_0.1
		6/09/2018
Metals	Nickel	120

Chem Group	Chem Name	BH34_0.1
		6/09/2018
Metals	Arsenic	31

Chem Group	Chem Name	BH33_0.1
		6/09/2018
Metals	Zinc	290

Chem Group	Chem Name	BH40_0.1
		6/09/2018
Metals	Nickel	70*

Chem Group	Chem Name	BH41_0.1
		6/09/2018
Metals	Nickel	230

Chem Group	Chem Name	BH44_0.1
		6/09/2018
Metals	Arsenic	105*

Chem Group	Chem Name	TP10_0.1
		6/09/2018
Metals	Nickel	82

Chem Group	Chem Name	BH38_0.1
		6/09/2018
Metals	Nickel	71

Chem Group	Chem Name	BH43_0.1
		6/09/2018
Metals	Nickel	92

Chem Group	Chem Name	BH42_0.1
		6/09/2018
Metals	Nickel	67

Site	30 Rowes Lane, Wallan						
Title	Soil IWRG Exceedances Plan						
Client	Darraweit Property Trust Pty Ltd					Figure	4:4
Date	15/10/2018	Drawn	MA	Checked	JL	Scale	-
						Job No:	33980

Assessment Boundary

🟩 VIC EPA IWRG 621Category C

BH01 Borehole Locations

* QA/QC Sample Exceedance

TP08 Testpit Locations

Exceedance values are measured in mg/kg

Metals Levels are natural and not a result of on-site contamination.

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Carlton VIC 3053
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RANGE	No. OF LOTS	AVERAGE	% OF LOTS
☐ - 1999m²	193	667m²	85·0
▨ 2000m² - 3999m²	30	2086m²	13·2
🟦 4000m² +	4	4066m²	1·8
TOTAL	227		100%

Millar Merrigan
Land Development Consultants

TOWN PLANNING
URBAN DESIGN
CIVIL ENGINEERING
LAND SURVEYING
PROJECT MANAGEMENT

Quality Endorsed Company

MILLAR & MERRIGAN PTY. LTD. ACN 005 541 668

126 MERRINDALE DRIVE, CROYDON, VICTORIA *Telephone* (03) 8720 9500 *Facsimile* (03) 8720 9501
All Correspondence to PO BOX 247 CROYDON VIC 3136 *Ausdoc* DX 13608 CROYDON

THIS PLAN IS SUBJECT TO THE APPROVAL OF VARIOUS STATUTORY AUTHORITIES.

DIMENSIONS SHOWN HEREON ARE SUBJECT TO SURVEY.

ADJOINING PROPERTY BOUNDARIES SHOWN HEREON HAVE BEEN TAKEN FROM THE VICMAP DIGITAL BASE MAPS SUPPLIED TO MILLAR & MERRIGAN UNDER LICENCE AGREEMENT FROM LAND VICTORIA. THE ACCURACY OF THIS INFORMATION HAS NOT BEEN VERIFIED AND IS SUITABLE ONLY FOR THE PURPOSE OF THIS APPLICATION.

CONTOUR VERTICAL INTERVAL 1 METRES.

15 0 30 60
LENGTHS ARE METRES

▨ 6m WIDE BUILDING RESTRICTION/LANDSCAPE BUFFER ZONE

CONTOURS SHOWN HAVE BEEN INTERPOLATED FROM LEVELS TAKEN BY THIS OFFICE FEBRUARY 2005 AND ARE TO AHD.

CONTOUR VERTICAL INTERVAL 1 METRES.

TOTAL SITE AREA :	30·41ha
No. OF LOTS :	227
DENSITY :	7·5 lots/ha
AVERAGE LOT AREA :	914m²
RESERVE AREA (13% OF SITE)	3·941ha

AMG ZONE 55

PROPOSED SUBDIVISION

LOTS 1, 2 & 3 ON LP149223N
WALLAN-DARRAWEIT ROAD, WALLAN
MITCHELL SHIRE COUNCIL

DESIGNED PJM 20/2/2006
DRAWN GDJ 27/2/2006
CHECKED GDJ/PSF 27/2/2006
MELWAYS 249 A-5

SCALE 1:1500
SHEET 1 OF 1
DRAWING No. 12370T1
VERSION: 3: 21/9/2007
Original Sheet Size A1

APPENDIX B

SOIL SAMPLING PROCEDURES

Planning

Prior to soil sampling at a site, detailed planning is undertaken to review relevant site documentation, environmental standards, regulations and policies, as well as consultation with project stockholders directly interested or involved in the soil sampling works.

The planning phase of soil sampling works, details to the field scientist the proposed excavation method, the likely number and location of soil samples to be collected, the required analysis of the soil samples, the volume of soil samples to be collected and the appropriate sampling containers required.

Excavation is carried out with consideration to the following;

- Depth of assessment required;
- Likely encountered geology, including fill and natural material;
- Ease of access;
- Acceptable site disturbance; and
- Required analysis.

The volumes of soil samples collected and the sample containers used are determined, in consultation with the elected NATA accredited laboratory and vary based on the intended analysis required for soil samples at the project site.

Cleaning Procedures

All sampling equipment is thoroughly cleaned before use and between the collection of soil samples to minimise the risk of cross contamination. This included all hand augers, trowels, scoops etc. and any other applicable equipment that was used. The cleaning procedure for all sampling equipment involved:

- Removal of all soil adhering to the sampling equipment with the use of a brush and washing in tap water;
- Wash the sampling equipment in a bucket with DECON 90 solution (or similar phosphate-free laboratory detergent);
- Rinse the sampling equipment in a second bucket with tap water; and
- Rinse the sampling equipment in a third bucket with de-ionised water.

As part of quality assurance and control of the sampling process, a ‘Rinsate Blank’ sample is taken using de-ionised water off the sampling equipment after the cleaning procedure has been completed. This ‘Rinsate Blank’ sample is analysed and the results used to indicate the effectiveness and integrity of the cleaning procedure.

Sample Collection

The field scientist wore new, clean, nitrile gloves when handling all soil samples and cleaning soil sampling equipment. Soil samples were collected from consolidated material and placed into pre-washed glass jars with tight fitting screw top lids provided by the laboratory to prevent the loss of volatile contaminants.

Each sample jar was labelled with the following information:

- LRM Global Job Number;
- Project Name;
- Date of Sampling; and
- Sample Name/Number (including depth of sample), all samples were given a unique name/number.

As per Australian Standards AS 4482.2 1999, using the zero headspace procedures, care is taken to disturb the soil as little as possible before being placed into the single-use jars and the sample ‘exactly fits,’ giving zero headspace.

A duplicate of all soil samples is collected in a PID bag, where screening of the head space with the PID to detect volatile organic compounds in soil gases is undertaken. The PID is ‘zeroed’ and then calibrated using a 100 ppm standard gas solution of Isobutylene as field works initiate and annually as specified by the manufacturer calibrated and serviced by an appropriately qualified technician.

Sample Transportation and Documentation

Chain-of-custody documentation is completed for all soil samples collected at the project site. The COC includes the information listed above and the chemical analyses required for each sample.

All samples were cooled upon collection prior to analysis. This includes transportation and on-site storage. Samples were stored on-site and during transport in a laboratory chiller box with adequate ice bricks. Samples were transported by the field scientist who also completed the chain-of-custody documentation upon delivery to the receiving NATA accredited laboratories.

The COC, as per AS44821.1 2005, included the following information:

- Names and details of:
  - Person transferring samples.
  - Receiving Laboratory.
  - Client.
- Time and date of;
  - Samples being collected.
  - Samples received by the laboratory.
- Analysis required and turn-around-time.
- Samples with expected high contaminant levels.

APPENDIX C

ANALYTICAL RESULTS TABLES, LABORATORY REPORTS, COCS

Table 1
Soil NEPM Table
30 Rowes Lane Wallan

													Field ID	BH04_0.1	BH09_0.1	BH16_0.1	BH33_0.1	BH34_0.1	BH35_0.1	BH36_0.1	BH37_0.1	BH38_0.1	BH39_0.1	BH40_0.1	Dup01	Split01	BH41_0.1	BH42_0.1	BH43_0.1	BH44_0.1	Dup02	Split02	BH45_0.1	BH46_0.1	BH47_0.1	Dup03	Split03	BH48_0.1	BH49_0.1	BH50_0.1	BH51_0.1	TP01_0.1
													Sampled Date	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018
													LocCode	BH04	BH09	BH16	BH33	BH34	BH35	BH36	BH37	BH38	BH39	BH40	BH40_0.1	Split01	BH41	BH42	BH43	BH44	BH44_0.1	Split02	BH45	BH46	BH47	BH47_0.1	Split03	BH48	BH49	BH50	BH51	TP01
				NEPM 2013 Table 1A(1) HILs Res A Soil	NEPM 2013 Table 1A(3)				NEPM 2013 Table 1A(3)				NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil																													
Chem_Group	**ChemName**	**Units**	**EQL**		0-1m	1-2m	2-4m	>4m	0-1m	1-2m	2-4m	>4m																														
	Benzo(a)pyrene TEQ (LOR)	mg/kg												0.2	-	-	-	0.2	0.2	0.2	-	0.2	-	0.2	-	-	-	0.2	-	0.2	-	-	-	-	-	-	-	0.2	0.2	-	-	0.2
	DCPA (Chlorthal) Diacid	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Benzo(a)pyrene TEQ calc (Half)	mg/kg												0.1	-	-	-	0.1	0.1	0.1	-	0.1	-	0.1	-	-	-	0.1	-	0.1	-	-	-	-	-	-	-	0.1	0.1	-	-	0.1
	Benzo(a)pyrene TEQ calc (Zero)	mg/kg												0	-	-	-	0	0	0	-	0	-	0	-	-	-	0	-	0	-	-	-	-	-	-	-	0	0	-	-	0
Misc Inorg - soil NEPM	Organic Nitrogen as N	mg/kg	10											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2600	1600	-	-	1100	700	6100	-	-
OCP	Organochlorine pesticides EPAVic	mg/kg												-	-	-	-	-	<1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.8
	Other organochlorine pesticides EPAVic	mg/kg												-	-	-	-	-	<1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.3
Phenols	Phenols (non-halogenated) EPAVic	mg/kg												-	-	-	-	-	<8.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<8.4
	Phenols(halogenated) EPAVic	mg/kg												-	-	-	-	-	<4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<4.2
Phenoxy Acid Herbicides in Soi	2,6-D	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
BTEX	Benzene	mg/kg	0.2		4	6	9	20	0.7	1	2	3		-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	-	-	<0.2	-	<0.2	-	-	-	<0.2	-	-	-	-	-	-	<0.2	<0.2	<0.2
	Ethylbenzene	mg/kg	0.5		NL[#1]	NL[#1]	NL[#1]	NL[#1]	NL[#1]	NL[#1]	NL[#1]	NL[#1]		-	<1	-	<1	-	<0.5	-	<1	-	<1	-	-	-	<1	-	<1	-	-	-	<1	-	-	-	-	-	-	<1	<1	<0.5
	Toluene	mg/kg	0.5		NL[#1]	NL[#1]	NL[#1]	NL[#1]	480	NL[#1]	NL[#1]	NL[#1]		-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5
	Xylene (m & p)	mg/kg	1											-	<2	-	<2	-	<1	-	<2	-	<2	-	-	-	<2	-	<2	-	-	-	<2	-	-	-	-	-	-	<2	<2	<1
	Xylene (o)	mg/kg	0.5											-	<1	-	<1	-	<0.5	-	<1	-	<1	-	-	-	<1	-	<1	-	-	-	<1	-	-	-	-	-	-	<1	<1	<0.5
	Xylene Total	mg/kg	1		NL[#1]	NL[#1]	NL[#1]	NL[#1]	110	310	NL[#1]	NL[#1]		-	<1	-	<1	-	<1	-	<1	-	<1	-	-	-	<1	-	<1	-	-	-	<1	-	-	-	-	-	-	<1	<1	<1
	C6-C10 less BTEX (F1)	mg/kg	25		310[#2]	480[#2]	NL[#1]	NL[#1]	50[#2]	90[#2]	150[#2]	290[#2]		-	<25	-	<25	-	<25	-	<25	-	<25	-	-	-	<25	-	<25	-	-	-	<25	-	-	-	-	-	-	<25	<25	<25
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,1,1-trichloroethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,1,2,2-tetrachloroethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,1,2-trichloroethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,1-dichloroethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,1-dichloroethene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,1-dichloropropene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,2,3-trichloropropane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,2-dibromo-3-chloropropane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,2-dichloroethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,2-dichloropropane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,3-dichloropropane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	2,2-dichloropropane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Bromochloromethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Bromodichloromethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Bromoform	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Carbon tetrachloride	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Chlorodibromomethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Chloroethane	mg/kg	1											-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
	Chloroform	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Chloromethane	mg/kg	1											-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
	cis-1,2-dichloroethene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	cis-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Dibromomethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Hexachlorobutadiene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Trichloroethene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Tetrachloroethene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	trans-1,2-dichloroethene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	trans-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Vinyl chloride	mg/kg	1											-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
	Chlorinated hydrocarbons EPAVic	mg/kg												-	-	-	-	-	<8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<8
	Other chlorinated hydrocarbons EPAVic	mg/kg												-	-	-	-	-	<6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<6.5
Halogenated Benzenes	1,2,3-trichlorobenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,2,4-trichlorobenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,2-dichlorobenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,3-dichlorobenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,4-dichlorobenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	2-chlorotoluene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	4-chlorotoluene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Bromobenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Chlorobenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Hexachlorobenzene	mg/kg	0.1	10										-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Halogenated Hydrocarbons	1,2-dibromoethane	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Bromomethane	mg/kg	1											-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
	Dichlorodifluoromethane	mg/kg	1											-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
	Trichlorofluoromethane	mg/kg	1											-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
Halogenated Phenols	2,3,4,6-tetrachlorophenol	mg/kg	0.2											-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	2,4,5-trichlorophenol	mg/kg	0.2											-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	2,4,6-trichlorophenol	mg/kg	0.2											-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	2,4-dichlorophenol	mg/kg	0.2											-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	2,6-dichlorophenol	mg/kg	0.2											-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	2-chlorophenol	mg/kg	0.2											-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
	Pentachlorophenol	mg/kg	1	100										-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
Herbicides	2,4,5-Trichlorophenoxy Acetic Acid	mg/kg	0.5	600										-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	2,4,5-TP (Silvex)	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	2,4-dichlorophenoxybutanoic acid	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Hedonal	mg/kg	0.5	900										-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	2,4-Dichlorprop	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	2,4,6-Trichlorophenoxy-acetic acid	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	2-Chlorophenoxyacetic acid	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	4-Chlorophenoxy acetic acid	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Acifluorfen	mg/kg	2											-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2
	Atrazine	mg/kg	0.5	320										-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Bromoxynil	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Clopyralid	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Dicamba	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Dinoseb	mg/kg	1											-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
	2-Methyl-4-chlorophenoxyacetic acid	mg/kg	0.5	600										-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	2-Methyl-4-Chlorophenoxy Butanoic Acid	mg/kg	0.5	600										-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Mecoprop	mg/kg	0.5	600										-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Triclopyr	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
Inorganics	Ammonia	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	9.5	-	-	4.8	7	37	-	-
	Cyanide (Free)	mg/kg	0.5	250										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Kjeldahl Nitrogen Total	mg/kg	10											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2600	1600	-	-	1100	710	6100	-	-
	Moisture	%	0.1											26	8.2	62	27	17	9.8	15	17	21	21	21	22	-	25	30	20	14	13	-	14	20	11	12	-	21	19	22	24	22
	Nitrate (as N)	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2	<0.5	-	-	<0.5	7.7	1.3	-	-
	Nitrite (as N)	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	-	-
	Phosphate (as P)	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	0.9	-	-	0.5	<0.5	2	-	-
	pH (aqueous extract)	pH_Units												7.6	-	-	6.3	6.6	-	5.6	5.3	6.1	6.2	6.6	-	-	5	5.7	5.1	4.9	-	-	8.5	7.8	5.3	-	-	4.4	4.3	4.9	-	-
Lead	Lead	mg/kg	1	300[#3]										11	-	-	37	35	12	29	7	10	8	14	15	18	7	7	8	16	12	12	3	-	-	5	7	7	6	7	-	10
MAH	1,2,4-trimethylbenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	1,3,5-trimethylbenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Isopropylbenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	n-butylbenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	n-propylbenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	p-isopropyltoluene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	sec-butylbenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Styrene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	tert-butylbenzene	mg/kg	0.5											-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
	Monocylic aromatic hydrocarbons EPAVic	mg/kg												-	<4.7	-	<4.7	-	<3.2	-	<4.7	-	<4.7	-	-	-	<4.7	-	<4.7	-	-	-	<4.7	-	-	-	-	-	-	<4.7	<4.7	<3.2
Metals	Arsenic	mg/kg	4	100[#4]										<4	-	-	17	31	4	<4	<4	<4	<4	<4	<4	<5	<4	<4	<4	54	85	105	7	-	-	7	6	7	5	7	-	19
	Beryllium	mg/kg	1	60										-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
	Boron	mg/kg	3	4500										-	-	-	-	-	<3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<3
	Cadmium	mg/kg	0.4	20										<0.4	-	-	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<1	<0.4	<0.4	<0.4	<0.4	0.4	<1	<0.4	-	-	<0.4	<1	<0.4	<0.4	<0.4	-	<0.4
	Chromium (hexavalent)	mg/kg	1	100										-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
	Chromium (III+VI)	mg/kg	1											110	-	-	41	24	26	20	77	120	170	130	140	170	240	120	160	42	45	69	36	-	-	20	24	51	52	64	-	27

Table 1
Soil NEPM Table
30 Rowes Lane Wallan

Darraweit Property Trust Pty Ltd

				NEPM 2013 Table 1A(1) HILs Res A Soil	NEPM 2013 Table 1A(3)				NEPM 2013 Table 1A(3)				NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil
Chem_Group	**ChemName**	**Units**	**EQL**		0-1m	1-2m	2-4m	>4m	0-1m	1-2m	2-4m	>4m	
	Cobalt	mg/kg	1	100									
	Copper	mg/kg	1	6000									
	Manganese	mg/kg	1	3800									
	Mercury	mg/kg	0.1	40[#5]									
	Nickel	mg/kg	1	400									
	Phosphorus	mg/kg	10										
	Selenium	mg/kg	2	200									
	Zinc	mg/kg	1	7400									
Organochlorine Pesticides	4,4-DDE	mg/kg	0.1										
	a-BHC	mg/kg	0.1										
	Aldrin	mg/kg	0.1										
	b-BHC	mg/kg	0.1										
	Chlordane (cis)	mg/kg	0.1										
	Chlordane (trans)	mg/kg	0.1										
	d-BHC	mg/kg	0.1										
	DDD	mg/kg	0.1										
	DDT	mg/kg	0.1										
	DDT+DDE+DDD	mg/kg	0.1	240									
	Dieldrin	mg/kg	0.1										
	Endosulfan I	mg/kg	0.1										
	Endosulfan II	mg/kg	0.1										
	Endosulfan sulphate	mg/kg	0.1										
	Endrin	mg/kg	0.1	10									
	Endrin aldehyde	mg/kg	0.1										
	g-BHC (Lindane)	mg/kg	0.1										
	Heptachlor	mg/kg	0.1	6									
	Heptachlor epoxide	mg/kg	0.1										
	Methoxychlor	mg/kg	0.1	300									
	Toxaphene	mg/kg	2	20									
Organophosphorous Pesticides	Chlorpyrifos	mg/kg	0.1	160									
Other	3,5-Dichlorobenzoic acid	mg/kg	0.5										
	Actril (loxynil)	mg/kg	1										
PAH	Polycylic aromatic hydrocarbons EPAVic	mg/kg											
PAH/Phenols	2,4-dimethylphenol	mg/kg	0.2										
	2,4-dinitrophenol	mg/kg	2										
	2-methylphenol	mg/kg	0.2										
	2-nitrophenol	mg/kg	0.2										
	4-chloro-3-methylphenol	mg/kg	2										
	4-methylphenol	mg/kg	0.4										
	4-nitrophenol	mg/kg	4										
	Acenaphthene	mg/kg	0.1										
	Acenaphthylene	mg/kg	0.1										
	Anthracene	mg/kg	0.1										
	Benz(a)anthracene	mg/kg	0.1										
	Benzo(a) pyrene	mg/kg	0.05										
	Benzo(b+k)fluoranthene	mg/kg	0.2										
	Benzo(g,h,i)perylene	mg/kg	0.1										
	Chrysene	mg/kg	0.1										
	Cresol Total	mg/kg	0.2	400									
	Dibenz(a,h)anthracene	mg/kg	0.1										
	Fluoranthene	mg/kg	0.1										
	Fluorene	mg/kg	0.1										
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1										
	Naphthalene	mg/kg	0.1		NL[#1]	NL[#1]	NL[#1]	NL[#1]	5	NL[#1]	NL[#1]	NL[#1]	
	PAHs (Sum of total)	mg/kg	0.05	300[#6]									
	Phenanthrene	mg/kg	0.1										
	Phenol	mg/kg	0.2	3000									
	Phenolics Total	mg/kg	0.2										
	Picloram	mg/kg	0.5	4500									
	Pyrene	mg/kg	0.1										
Pesticides	Bifenthrin	mg/kg	0.5	600									
	Mirex	mg/kg	0.5	10									
Polychlorinated Biphenyls	Arochlor 1016	mg/kg	0.1										
	Arochlor 1221	mg/kg	0.1										
	Arochlor 1232	mg/kg	0.1										
	Arochlor 1242	mg/kg	0.1										
	Arochlor 1248	mg/kg	0.1										
	Arochlor 1254	mg/kg	0.1										
	Arochlor 1260	mg/kg	0.1										
	PCBs (Sum of total)	mg/kg	0.1	1[#7]									
Solvents	Cyclohexane	mg/kg	1										
TPH	C10-C16	mg/kg	50										1000[#8]
	C16-C34	mg/kg	100										2500
	C34-C40	mg/kg	100										10000
	F2-NAPHTHALENE	mg/kg	50		NL[#1]	NL[#1]	NL[#1]	NL[#1]	280[#9]	NL[#1]	NL[#1]	NL[#1]	
	C10 - C40 (Sum of total)	mg/kg	50										
	C6-C10	mg/kg	25										700[#8]

Field ID	BH04_0.1	BH09_0.1	BH16_0.1	BH33_0.1	BH34_0.1	BH35_0.1	BH36_0.1	BH37_0.1	BH38_0.1	BH39_0.1	BH40_0.1	Dup01	Split01	BH41_0.1	BH42_0.1
Sampled Date	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018
LocCode	BH04	BH09	BH16	BH33	BH34	BH35	BH36	BH37	BH38	BH39	BH40	BH40_0.1	Split01	BH41	BH42
Cobalt	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
Copper	53	-	-	18	12	5	4	24	33	48	23	23	24	68	45
Manganese	-	-	-	-	-	40	-	-	-	-	-	-	-	-	-
Mercury	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	74	-	-	19	10	5	4	57	71	120	53	52	70	230	67
Phosphorus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-
Zinc	94	-	-	290	59	23	14	20	70	61	58	58	83	140	170
4,4-DDE	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
a-BHC	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
Aldrin	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
b-BHC	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
Chlordane (cis)	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
Chlordane (trans)	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
d-BHC	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
DDD	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
DDT	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
DDT+DDE+DDD	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
Dieldrin	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
Endosulfan I	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
Endosulfan II	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
Endosulfan sulphate	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
Endrin	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
Endrin aldehyde	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
g-BHC (Lindane)	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
Heptachlor	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
Methoxychlor	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
Toxaphene	-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-
Chlorpyrifos	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-
3,5-Dichlorobenzoic acid	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-
Actril (loxynil)	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-
Polycylic aromatic hydrocarbons EPAVic	<1.35	<1	-	<1	<1.35	<1.35	<1.35	<1	<1.35	<1	<1.35	-	-	<1	<1.35
2,4-dimethylphenol	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-
2,4-dinitrophenol	-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-
2-methylphenol	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-
2-nitrophenol	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-
4-chloro-3-methylphenol	-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-
4-methylphenol	-	-	-	-	-	<0.4	-	-	-	-	-	-	-	-	-
4-nitrophenol	-	-	-	-	-	<4	-	-	-	-	-	-	-	-	-
Acenaphthene	<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1
Acenaphthylene	<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1
Anthracene	<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1
Benz(a)anthracene	<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1
Benzo(a) pyrene	<0.05	-	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05
Benzo(b+k)fluoranthene	<0.2	-	-	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	-	-	<0.2
Benzo(g,h,i)perylene	<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1
Chrysene	<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1
Cresol Total	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1
Fluoranthene	<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1
Fluorene	<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1
Indeno(1,2,3-c,d)pyrene	<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1
Naphthalene	<0.1	<1	-	<1	<0.1	<0.1	<0.1	<1	<0.1	<1	<0.1	-	-	<1	<0.1
PAHs (Sum of total)	<0.05	-	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05
Phenanthrene	<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1
Phenol	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-
Phenolics Total	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-
Picloram	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-
Pyrene	<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1
Bifenthrin	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-
Mirex	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-
Arochlor 1016	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-
Arochlor 1221	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-
Arochlor 1232	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-
Arochlor 1242	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-
Arochlor 1248	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-
Arochlor 1254	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-
Arochlor 1260	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-
PCBs (Sum of total)	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-
Cyclohexane	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-
C10-C16	-	<50	-	<50	-	<50	-	<50	-	<50	-	-	-	<50	-
C16-C34	-	500	-	140	-	<100	-	<100	-	<100	-	-	-	<100	-
C34-C40	-	120	-	<100	-	<100	-	<100	-	<100	-	-	-	<100	-
F2-NAPHTHALENE	-	<50	-	<50	-	<50	-	<50	-	<50	-	-	-	<50	-
C10 - C40 (Sum of total)	-	630	-	140	-	<50	-	<50	-	<50	-	-	-	<50	-
C6-C10	-	<25	-	<25	-	<25	-	<25	-	<25	-	-	-	<25	-

Field ID	BH43_0.1	BH44_0.1	Dup02	Split02	BH45_0.1	BH46_0.1	BH47_0.1	Dup03	Split03	BH48_0.1	BH49_0.1	BH50_0.1	BH51_0.1	TP01_0.1
Sampled Date	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018
LocCode	BH43	BH44	BH44_0.1	Split02	BH45	BH46	BH47	BH47_0.1	Split03	BH48	BH49	BH50	BH51	TP01
Cobalt	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Copper	39	16	16	15	12	-	-	13	14	16	4	21	-	4
Manganese	-	-	-	-	-	-	-	-	-	-	-	-	-	43
Mercury	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1
Nickel	92	23	21	27	18	-	-	10	15	22	4	26	-	5
Phosphorus	-	-	-	-	-	4100	430	-	-	320	93	850	-	-
Selenium	-	-	-	-	-	-	-	-	-	-	-	-	-	<2
Zinc	54	27	30	35	14	-	-	34	60	24	22	59	-	8
4,4-DDE	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
a-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Aldrin	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
b-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Chlordane (cis)	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Chlordane (trans)	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
d-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
DDD	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
DDT	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
DDT+DDE+DDD	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Dieldrin	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Endosulfan I	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Endosulfan II	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Endosulfan sulphate	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Endrin	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Endrin aldehyde	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
g-BHC (Lindane)	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Heptachlor	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Heptachlor epoxide	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Methoxychlor	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Toxaphene	-	-	-	-	-	-	-	-	-	-	-	-	-	<2
Chlorpyrifos	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
3,5-Dichlorobenzoic acid	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
Actril (loxynil)	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
Polycylic aromatic hydrocarbons EPAVic	<1	<1.35	-	-	<1	-	-	-	-	<1.35	<1.35	<1	<1	<1.35
2,4-dimethylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
2,4-dinitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	<2
2-methylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
2-nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
4-chloro-3-methylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	<2
4-methylphenol	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.4
4-nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	<4
Acenaphthene	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Acenaphthylene	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Anthracene	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Benz(a)anthracene	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Benzo(a) pyrene	-	<0.05	-	-	-	-	-	-	-	<0.05	<0.05	-	-	<0.05
Benzo(b+k)fluoranthene	-	<0.2	-	-	-	-	-	-	-	<0.2	<0.2	-	-	<0.2
Benzo(g,h,i)perylene	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Chrysene	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Cresol Total	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
Dibenz(a,h)anthracene	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Fluoranthene	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Fluorene	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Indeno(1,2,3-c,d)pyrene	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Naphthalene	<1	<0.1	-	-	<1	-	-	-	-	<0.1	<0.1	<1	<1	<0.1
PAHs (Sum of total)	-	<0.05	-	-	-	-	-	-	-	<0.05	<0.05	-	-	<0.05
Phenanthrene	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Phenol	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
Phenolics Total	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2
Picloram	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
Pyrene	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1
Bifenthrin	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
Mirex	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5
Arochlor 1016	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Arochlor 1221	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Arochlor 1232	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Arochlor 1242	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Arochlor 1248	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Arochlor 1254	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Arochlor 1260	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
PCBs (Sum of total)	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1
Cyclohexane	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
C10-C16	<50	-	-	-	<50	-	-	-	-	-	-	<50	<50	<50
C16-C34	<100	-	-	-	<100	-	-	-	-	-	-	190	<100	<100
C34-C40	<100	-	-	-	<100	-	-	-	-	-	-	<100	<100	<100
F2-NAPHTHALENE	<50	-	-	-	<50	-	-	-	-	-	-	<50	<50	<50
C10 - C40 (Sum of total)	<50	-	-	-	<50	-	-	-	-	-	-	190	<50	<50
C6-C10	<25	-	-	-	<25	-	-	-	-	-	-	<25	<25	<25

Env Stds Comments

#1:Derived soil HSL exceeds soil saturation concentraiton

#2:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.

#3:Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be

Table 1
Soil NEPM Table
30 Rowes Lane Wallan

													Field ID	TP02_0.1	TP05_0.1	TP06_0.1	TP07_0.1	TP08_0.1	TP10_0.1	TP11_0.1	TP12_0.1	TP13_0.1	TP14_0.1	TP15_0.1	TP17_0.1	TP18_0.1	TP19_0.1	TP20_0.1	TP21_0.1	TP22_0.1	TP23_0.1	TP24_0.1	TP25_0.1	TP26_0.1	TP27_0.1	TP28_0.1	TP29_0.1	TP31_0.1	TP32_0.1
													Sampled Date	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018
													LocCode	TP02	TP05	TP06	TP07	TP08	TP10	TP11	TP12	TP13	TP14	TP15	TP17	TP18	TP19	TP20	TP21	TP22	TP23	TP24	TP25	TP26	TP27	TP28	TP29	TP31	TP32
				NEPM 2013 Table 1A(1) HILs Res A Soil	NEPM 2013 Table 1A(3)				NEPM 2013 Table 1A(3)				NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil																										
Chem_Group	**ChemName**	**Units**	**EQL**		0-1m	1-2m	2-4m	>4m	0-1m	1-2m	2-4m	>4m																											
	Benzo(a)pyrene TEQ (LOR)	mg/kg												0.2	-	0.2	-	0.2	-	0.2	-	0.2	0.2	-	0.2	-	0.2	-	0.2	-	0.2	-	0.2	-	0.2	-	0.2	0.2	-
	DCPA (Chlorthal) Diacid	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Benzo(a)pyrene TEQ calc (Half)	mg/kg												0.1	-	0.1	-	0.1	-	0.1	-	0.1	0.1	-	0.1	-	0.1	-	0.1	-	0.1	-	0.1	-	0.1	-	0.1	0.1	-
	Benzo(a)pyrene TEQ calc (Zero)	mg/kg												0	-	0	-	0	-	0	-	0	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	0	-
Misc Inorg - soil NEPM	Organic Nitrogen as N	mg/kg	10											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OCP	Organochlorine pesticides EPAVic	mg/kg												-	-	-	-	-	-	-	-	<1.8	-	-	-	-	-	-	<1.8	-	-	-	-	-	-	-	<1.8	-	-
	Other organochlorine pesticides EPAVic	mg/kg												-	-	-	-	-	-	-	-	<1.3	-	-	-	-	-	-	<1.3	-	-	-	-	-	-	-	<1.3	-	-
Phenols	Phenols (non-halogenated) EPAVic	mg/kg												-	-	-	-	-	-	-	-	<8.4	-	-	-	-	-	-	<8.4	-	-	-	-	-	-	-	<8.4	-	-
	Phenols(halogenated) EPAVic	mg/kg												-	-	-	-	-	-	-	-	<4.2	-	-	-	-	-	-	<4.2	-	-	-	-	-	-	-	<4.2	-	-
Phenoxy Acid Herbicides in Soi	2,6-D	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
BTEX	Benzene	mg/kg	0.2		4	6	9	20	0.7	1	2	3		-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2
	Ethylbenzene	mg/kg	0.5		NL$^{\#1}$	NL$^{\#1}$	NL$^{\#1}$	NL$^{\#1}$	NL$^{\#1}$	NL$^{\#1}$	NL$^{\#1}$	NL$^{\#1}$		-	<1	-	<1	-	<1	-	<1	<0.5	-	<1	-	<1	-	<1	<0.5	<1	-	<1	-	<1	-	<1	<0.5	-	<1
	Toluene	mg/kg	0.5		NL$^{\#1}$	NL$^{\#1}$	NL$^{\#1}$	NL$^{\#1}$	480	NL$^{\#1}$	NL$^{\#1}$	NL$^{\#1}$		-	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5	-	<0.5
	Xylene (m & p)	mg/kg	1											-	<2	-	<2	-	<2	-	<2	<1	-	<2	-	<2	-	<2	<1	<2	-	<2	-	<2	-	<2	<1	-	<2
	Xylene (o)	mg/kg	0.5											-	<1	-	<1	-	<1	-	<1	<0.5	-	<1	-	<1	-	<1	<0.5	<1	-	<1	-	<1	-	<1	<0.5	-	<1
	Xylene Total	mg/kg	1		NL$^{\#1}$	NL$^{\#1}$	NL$^{\#1}$	NL$^{\#1}$	110	310	NL$^{\#1}$	NL$^{\#1}$		-	<1	-	<1	-	<1	-	<1	<1	-	<1	-	<1	-	<1	<1	<1	-	<1	-	<1	-	<1	<1	-	<1
	C6-C10 less BTEX (F1)	mg/kg	25		310$^{\#2}$	480$^{\#2}$	NL$^{\#1}$	NL$^{\#1}$	50$^{\#2}$	90$^{\#2}$	150$^{\#2}$	290$^{\#2}$		-	<25	-	<25	-	<25	-	<25	<25	-	<25	-	<25	-	<25	<25	<25	-	<25	-	<25	-	<25	<25	-	<25
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,1,1-trichloroethane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,1,2,2-tetrachloroethane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,1,2-trichloroethane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,1-dichloroethane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,1-dichloroethene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,1-dichloropropene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,2,3-trichloropropane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,2-dibromo-3-chloropropane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,2-dichloroethane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,2-dichloropropane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,3-dichloropropane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2,2-dichloropropane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Bromochloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Bromodichloromethane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Bromoform	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Carbon tetrachloride	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Chlorodibromomethane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Chloroethane	mg/kg	1											-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	Chloroform	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Chloromethane	mg/kg	1											-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	cis-1,2-dichloroethene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	cis-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Dibromomethane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Hexachlorobutadiene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Trichloroethene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Tetrachloroethene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	trans-1,2-dichloroethene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	trans-1,3-dichloropropene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Vinyl chloride	mg/kg	1											-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	Chlorinated hydrocarbons EPAVic	mg/kg												-	-	-	-	-	-	-	-	<8	-	-	-	-	-	-	<8	-	-	-	-	-	-	-	<8	-	-
	Other chlorinated hydrocarbons EPAVic	mg/kg												-	-	-	-	-	-	-	-	<6.5	-	-	-	-	-	-	<6.5	-	-	-	-	-	-	-	<6.5	-	-
Halogenated Benzenes	1,2,3-trichlorobenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,2,4-trichlorobenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,2-dichlorobenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,3-dichlorobenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,4-dichlorobenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2-chlorotoluene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	4-chlorotoluene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Bromobenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Chlorobenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Hexachlorobenzene	mg/kg	0.1	10										-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
Halogenated Hydrocarbons	1,2-dibromoethane	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Bromomethane	mg/kg	1											-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	Dichlorodifluoromethane	mg/kg	1											-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	Trichlorofluoromethane	mg/kg	1											-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
Halogenated Phenols	2,3,4,6-tetrachlorophenol	mg/kg	0.2											-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2,4,5-trichlorophenol	mg/kg	0.2											-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2,4,6-trichlorophenol	mg/kg	0.2											-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2,4-dichlorophenol	mg/kg	0.2											-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2,6-dichlorophenol	mg/kg	0.2											-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2-chlorophenol	mg/kg	0.2											-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	Pentachlorophenol	mg/kg	1	100										-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
Herbicides	2,4,5-Trichlorophenoxy Acetic Acid	mg/kg	0.5	600										-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2,4,5-TP (Silvex)	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2,4-dichlorophenoxybutanoic acid	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Hedonal	mg/kg	0.5	900										-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2,4-Dichlorprop	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2,4,6-Trichlorophenoxy-acetic acid	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2-Chlorophenoxyacetic acid	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	4-Chlorophenoxy acetic acid	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Acifluorfen	mg/kg	2											-	-	-	-	-	-	-	-	<2	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	<2	-	-
	Atrazine	mg/kg	0.5	320										-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Bromoxynil	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Clopyralid	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Dicamba	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Dinoseb	mg/kg	1											-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	2-Methyl-4-chlorophenoxyacetic acid	mg/kg	0.5	600										-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2-Methyl-4-Chlorophenoxy Butanoic Acid	mg/kg	0.5	600										-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Mecoprop	mg/kg	0.5	600										-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Triclopyr	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
Inorganics	Ammonia	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyanide (Free)	mg/kg	0.5	250										-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Kjeldahl Nitrogen Total	mg/kg	10											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Moisture	%	0.1											15	21	13	17	29	18	16	25	15	20	29	19	24	16	22	28	24	22	17	22	18	12	24	19	25	28
	Nitrate (as N)	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nitrite (as N)	mg/kg	0.1											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phosphate (as P)	mg/kg	0.5											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	pH (aqueous extract)	pH_Units												5.7	6.2	5.1	5.7	-	6	6.7	5.8	-	5.9	6.3	6.2	5.6	5.8	5.7	-	6.3	5.9	5.6	4.5	6.5	6	5.7	-	5.5	5.4
Lead	Lead	mg/kg	1	300$^{\#3}$										9	7	11	8	10	9	7	17	8	12	7	9	10	7	8	9	9	9	7	29	8	14	9	9	11	13
MAH	1,2,4-trimethylbenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,3,5-trimethylbenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Isopropylbenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	n-butylbenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	n-propylbenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	p-isopropyltoluene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	sec-butylbenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Styrene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	tert-butylbenzene	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Monocylic aromatic hydrocarbons EPAVic	mg/kg												-	<4.7	-	<4.7	-	<4.7	-	<4.7	<3.2	-	<4.7	-	<4.7	-	<4.7	<3.2	<4.7	-	<4.7	-	<4.7	-	<4.7	<3.2	-	<4.7
Metals	Arsenic	mg/kg	4	100$^{\#4}$										<4	9	14	<4	<4	<4	<4	10	<4	<4	<4	14	<4	24	<4	6	5	<4	<4	<4	<4	6	6	17	5	<4
	Beryllium	mg/kg	1	60										-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	Boron	mg/kg	3	4500										-	-	-	-	-	-	-	-	<3	-	-	-	-	-	-	<3	-	-	-	-	-	-	-	<3	-	-
	Cadmium	mg/kg	0.4	20										<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
	Chromium (hexavalent)	mg/kg	1	100										-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	Chromium (III+VI)	mg/kg	1											16	24	7	13	80	100	78	17	11	18	76	22	34	12	8	10	33	14	9	20	27	17	16	26	13	9

Table 1
Soil NEPM Table
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													Field ID	TP02_0.1	TP05_0.1	TP06_0.1	TP07_0.1	TP08_0.1	TP10_0.1	TP11_0.1	TP12_0.1	TP13_0.1	TP14_0.1	TP15_0.1	TP17_0.1	TP18_0.1	TP19_0.1	TP20_0.1	TP21_0.1	TP22_0.1	TP23_0.1	TP24_0.1	TP25_0.1	TP26_0.1	TP27_0.1	TP28_0.1	TP29_0.1	TP31_0.1	TP32_0.1
													Sampled Date	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018
													LocCode	TP02	TP05	TP06	TP07	TP08	TP10	TP11	TP12	TP13	TP14	TP15	TP17	TP18	TP19	TP20	TP21	TP22	TP23	TP24	TP25	TP26	TP27	TP28	TP29	TP31	TP32
				NEPM 2013 Table 1A(1) HILs Res A Soil	NEPM 2013 Table 1A(3)				NEPM 2013 Table 1A(3)				NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil																										
Chem_Group	ChemName	Units	EQL		0-1m	1-2m	2-4m	>4m	0-1m	1-2m	2-4m	>4m																											
	Cobalt	mg/kg	1	100										-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2	-	-	-	-	-	-	-	8	-	-
	Copper	mg/kg	1	6000										6	7	7	2	22	31	26	6	1	4	27	5	4	1	4	5	12	3	3	4	6	2	2	5	3	4
	Manganese	mg/kg	1	3800										-	-	-	-	-	-	-	-	42	-	-	-	-	-	-	71	-	-	-	-	-	-	-	77	-	-
	Mercury	mg/kg	0.1	40[#5]										<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	1	400										5	5	5	4	26	82	51	7	3	10	42	6	7	3	5	5	11	4	3	9	7	3	3	6	5	5
	Phosphorus	mg/kg	10											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Selenium	mg/kg	2	200										-	-	-	-	-	-	-	-	<2	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	<2	-	-
	Zinc	mg/kg	1	7400										21	4	14	7	27	38	26	10	4	19	28	9	8	3	12	17	13	4	4	20	12	3	6	19	8	14
Organochlorine Pesticides	4,4-DDE	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	a-BHC	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Aldrin	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	b-BHC	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Chlordane (cis)	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Chlordane (trans)	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	d-BHC	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	DDD	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	DDT	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	DDT+DDE+DDD	mg/kg	0.1	240										-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Dieldrin	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Endosulfan I	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Endosulfan II	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Endosulfan sulphate	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Endrin	mg/kg	0.1	10										-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Endrin aldehyde	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	g-BHC (Lindane)	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Heptachlor	mg/kg	0.1	6										-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Heptachlor epoxide	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Methoxychlor	mg/kg	0.1	300										-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Toxaphene	mg/kg	2	20										-	-	-	-	-	-	-	-	<2	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	<2	-	-
Organophosphorous Pesticides	Chlorpyrifos	mg/kg	0.1	160										-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
Other	3,5-Dichlorobenzoic acid	mg/kg	0.5											-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Actril (Ioxynil)	mg/kg	1											-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
PAH	Polycylic aromatic hydrocarbons EPAVic	mg/kg												<1.35	<1	<1.35	<1	<1.35	<1	<1.35	<1	<1.35	<1.35	<1	<1.35	<1	<1.35	<1	<1.35	<1	<1.35	<1	<1.35	<1	<1.35	<1	<1.35	<1.35	<1
PAH/Phenols	2,4-dimethylphenol	mg/kg	0.2											-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2,4-dinitrophenol	mg/kg	2											-	-	-	-	-	-	-	-	<2	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	<2	-	-
	2-methylphenol	mg/kg	0.2											-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2-nitrophenol	mg/kg	0.2											-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	4-chloro-3-methylphenol	mg/kg	2											-	-	-	-	-	-	-	-	<2	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	<2	-	-
	4-methylphenol	mg/kg	0.4											-	-	-	-	-	-	-	-	<0.4	-	-	-	-	-	-	<0.4	-	-	-	-	-	-	-	<0.4	-	-
	4-nitrophenol	mg/kg	4											-	-	-	-	-	-	-	-	<4	-	-	-	-	-	-	<4	-	-	-	-	-	-	-	<4	-	-
	Acenaphthene	mg/kg	0.1											<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Acenaphthylene	mg/kg	0.1											<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Anthracene	mg/kg	0.1											<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Benz(a)anthracene	mg/kg	0.1											<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Benzo(a) pyrene	mg/kg	0.05											<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	-
	Benzo(b+k)fluoranthene	mg/kg	0.2											<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	-
	Benzo(g,h,i)perylene	mg/kg	0.1											<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Chrysene	mg/kg	0.1											<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Cresol Total	mg/kg	0.2	400										-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	Dibenz(a,h)anthracene	mg/kg	0.1											<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Fluoranthene	mg/kg	0.1											<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Fluorene	mg/kg	0.1											<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1											<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Naphthalene	mg/kg	0.1		NL[#1]	NL[#1]	NL[#1]	NL[#1]	5	NL[#1]	NL[#1]	NL[#1]		<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<0.1	<1
	PAHs (Sum of total)	mg/kg	0.05	300[#6]										<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	-
	Phenanthrene	mg/kg	0.1											<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Phenol	mg/kg	0.2	3000										-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	Phenolics Total	mg/kg	0.2											-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	Picloram	mg/kg	0.5	4500										-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Pyrene	mg/kg	0.1											<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
Pesticides	Bifenthrin	mg/kg	0.5	600										-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Mirex	mg/kg	0.5	10										-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
Polychlorinated Biphenyls	Arochlor 1016	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Arochlor 1221	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Arochlor 1232	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Arochlor 1242	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Arochlor 1248	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Arochlor 1254	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Arochlor 1260	mg/kg	0.1											-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	PCBs (Sum of total)	mg/kg	0.1	1[#7]										-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
Solvents	Cyclohexane	mg/kg	1											-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
TPH	C10-C16	mg/kg	50										1000[#8]	-	<50	-	<50	-	<50	-	<50	<50	-	<50	-	<50	-	<50	<50	<50	-	<50	-	<50	-	<50	<50	-	<50
	C16-C34	mg/kg	100										2500	-	<100	-	<100	-	<100	-	<100	<100	-	<100	-	<100	-	<100	<100	<100	-	<100	-	<100	-	<100	<100	-	<100
	C34-C40	mg/kg	100										10000	-	<100	-	<100	-	<100	-	<100	<100	-	<100	-	<100	-	<100	<100	<100	-	<100	-	<100	-	<100	<100	-	<100
	F2-NAPHTHALENE	mg/kg	50		NL[#1]	NL[#1]	NL[#1]	NL[#1]	280[#9]	NL[#1]	NL[#1]	NL[#1]		-	<50	-	<50	-	<50	-	<50	<50	-	<50	-	<50	-	<50	<50	<50	-	<50	-	<50	-	<50	<50	-	<50
	C10 - C40 (Sum of total)	mg/kg	50											-	<50	-	<50	-	<50	-	<50	<50	-	<50	-	<50	-	<50	<50	<50	-	<50	-	<50	-	<50	<50	-	<50
	C6-C10	mg/kg	25										700[#8]	-	<25	-	<25	-	<25	-	<25	<25	-	<25	-	<25	-	<25	<25	<25	-	<25	-	<25	-	<25	<25	-	<25

Env Stds Comments
#1:Derived soil HSL exceeds soil saturation concentraiton
#2:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#3:Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be

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Table 2
Soil IWRG Table
30 Rowes Lane Wallan

						Field ID	BH04_0.1	BH09_0.1	BH16_0.1	BH33_0.1	BH34_0.1	BH35_0.1	BH36_0.1	BH37_0.1	BH38_0.1	BH39_0.1	BH40_0.1	Dup01	Split01	BH41_0.1	BH42_0.1	BH43_0.1	BH44_0.1	Dup02	Split02	BH45_0.1	BH46_0.1	BH47_0.1	Dup03	Split03	BH48_0.1	BH49_0.1	BH50_0.1	BH51_0.1	TP01_0.1	TP02_0.1	TP05_0.1	TP06_0.1	TP07_0.1
						Sampled Date	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018
						LocCode	BH04	BH09	BH16	BH33	BH34	BH35	BH36	BH37	BH38	BH39	BH40	BH40_0.1	Split01	BH41	BH42	BH43	BH44	BH44_0.1	Split02	BH45	BH46	BH47	BH47_0.1	Split03	BH48	BH49	BH50	BH51	TP01	TP02	TP05	TP06	TP07
Chem_Group	**ChemName**	**Units**	**EQL**	Vic EPA IWRG 621 Category C	Vic EPA IWRG 621 Category C	Vic EPA IWRG 621 Category C																																	
	Benzo(a)pyrene TEQ (LOR)	mg/kg					0.2	-	-	-	0.2	0.2	0.2	-	0.2	-	0.2	-	-	-	0.2	-	0.2	-	-	-	-	-	-	-	0.2	0.2	-	-	0.2	0.2	-	0.2	-
	DCPA (Chlorthal) Diacid	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Benzo(a)pyrene TEQ calc (Half)	mg/kg					0.1	-	-	-	0.1	0.1	0.1	-	0.1	-	0.1	-	-	-	0.1	-	0.1	-	-	-	-	-	-	-	0.1	0.1	-	-	0.1	0.1	-	0.1	-
	Benzo(a)pyrene TEQ calc (Zero)	mg/kg					0	-	-	-	0	0	0	-	0	-	0	-	-	-	0	-	0	-	-	-	-	-	-	-	0	0	-	-	0	0	-	0	-
Misc Inorg - soil NEPM	Organic Nitrogen as N	mg/kg	10				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2600	1600	-	-	1100	700	6100	-	-	-	-	-	-
OCP	Organochlorine pesticides EPAVic	mg/kg		1			-	-	-	-	-	<1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.8	-	-	-	-
	Other organochlorine pesticides EPAVic	mg/kg			10	50	-	-	-	-	-	<1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.3	-	-	-	-
Phenols	Phenols (non-halogenated) EPAVic	mg/kg		60	560	2200	-	-	-	-	-	<8.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<8.4	-	-	-	-
	Phenols(halogenated) EPAVic	mg/kg		1	10	320	-	-	-	-	-	<4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<4.2	-	-	-	-
Phenoxy Acid Herbicides in Soi	2,6-D	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
BTEX	Benzene	mg/kg	0.2	1	4	16	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	-	-	<0.2	-	<0.2	-	-	-	<0.2	-	-	-	-	-	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2
	Ethylbenzene	mg/kg	0.5				-	<1	-	<1	-	<0.5	-	<1	-	<1	-	-	-	<1	-	<1	-	-	-	<1	-	-	-	-	-	-	<1	<1	<0.5	-	<1	-	<1
	Toluene	mg/kg	0.5				-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	-	<0.5	-	<0.5	-	-	-	<0.5	-	-	-	-	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5
	Xylene (m & p)	mg/kg	1				-	<2	-	<2	-	<1	-	<2	-	<2	-	-	-	<2	-	<2	-	-	-	<2	-	-	-	-	-	-	<2	<2	<1	-	<2	-	<2
	Xylene (o)	mg/kg	0.5				-	<1	-	<1	-	<0.5	-	<1	-	<1	-	-	-	<1	-	<1	-	-	-	<1	-	-	-	-	-	-	<1	<1	<0.5	-	<1	-	<1
	Xylene Total	mg/kg	1				-	<1	-	<1	-	<1	-	<1	-	<1	-	-	-	<1	-	<1	-	-	-	<1	-	-	-	-	-	-	<1	<1	<1	-	<1	-	<1
	C6-C10 less BTEX (F1)	mg/kg	25				-	<25	-	<25	-	<25	-	<25	-	<25	-	-	-	<25	-	<25	-	-	-	<25	-	-	-	-	-	-	<25	<25	<25	-	<25	-	<25
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,1,1-trichloroethane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,1,2,2-tetrachloroethane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,1,2-trichloroethane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,1-dichloroethane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,1-dichloroethene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,1-dichloropropene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,2,3-trichloropropane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,2-dibromo-3-chloropropane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,2-dichloroethane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,2-dichloropropane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,3-dichloropropane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	2,2-dichloropropane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Bromochloromethane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Bromodichloromethane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Bromoform	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Carbon tetrachloride	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Chlorodibromomethane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Chloroethane	mg/kg	1				-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
	Chloroform	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Chloromethane	mg/kg	1				-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
	cis-1,2-dichloroethene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	cis-1,3-dichloropropene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Dibromomethane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Hexachlorobutadiene	mg/kg	0.5		2.8	11	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Trichloroethene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Tetrachloroethene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	trans-1,2-dichloroethene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	trans-1,3-dichloropropene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Vinyl chloride	mg/kg	1		1.2	4.8	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
	Chlorinated hydrocarbons EPAVic	mg/kg		1			-	-	-	-	-	<8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<8	-	-	-	-
	Other chlorinated hydrocarbons EPAVic	mg/kg			10	50	-	-	-	-	-	<6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<6.5	-	-	-	-
Halogenated Benzenes	1,2,3-trichlorobenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,2,4-trichlorobenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,2-dichlorobenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,3-dichlorobenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,4-dichlorobenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	2-chlorotoluene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	4-chlorotoluene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Bromobenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Chlorobenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Hexachlorobenzene	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
Halogenated Hydrocarbons	1,2-dibromoethane	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Bromomethane	mg/kg	1				-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
	Dichlorodifluoromethane	mg/kg	1				-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
	Trichlorofluoromethane	mg/kg	1				-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
Halogenated Phenols	2,3,4,6-tetrachlorophenol	mg/kg	0.2				-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
	2,4,5-trichlorophenol	mg/kg	0.2				-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
	2,4,6-trichlorophenol	mg/kg	0.2				-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
	2,4-dichlorophenol	mg/kg	0.2				-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
	2,6-dichlorophenol	mg/kg	0.2				-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
	2-chlorophenol	mg/kg	0.2				-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
	Pentachlorophenol	mg/kg	1				-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
Herbicides	2,4,5-Trichlorophenoxy Acetic Acid	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	2,4,5-TP (Silvex)	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	2,4-dichlorophenoxybutanoic acid	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Hedonal	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	2,4-Dichlorprop	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	2,4,6-Trichlorophenoxy-acetic acid	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	2-Chlorophenoxyacetic acid	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	4-Chlorophenoxy acetic acid	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Acifluorfen	mg/kg	2				-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2	-	-	-	-
	Atrazine	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Bromoxynil	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Clopyralid	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Dicamba	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Dinoseb	mg/kg	1				-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
	2-Methyl-4-chlorophenoxyacetic acid	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	2-Methyl-4-Chlorophenoxy Butanoic Acid	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Mecoprop	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Triclopyr	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Inorganics	Ammonia	mg/kg	0.5				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	9.5	-	-	4.8	7	37	-	-	-	-	-	-
	Cyanide (Free)	mg/kg	0.5				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Kjeldahl Nitrogen Total	mg/kg	10				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2600	1600	-	-	1100	710	6100	-	-	-	-	-	-
	Moisture	%	0.1				26	8.2	62	27	17	9.8	15	17	21	21	21	22	-	25	30	20	14	13	-	14	20	11	12	-	21	19	22	24	22	15	21	13	17
	Nitrate (as N)	mg/kg	0.5				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2	<0.5	-	-	<0.5	7.7	1.3	-	-	-	-	-	-
	Nitrite (as N)	mg/kg	0.1				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	-	-	-	-	-	-
	Phosphate (as P)	mg/kg	0.5				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	0.9	-	-	0.5	<0.5	2	-	-	-	-	-	-
	pH (aqueous extract)	pH_Units		4≤ and ≤9			7.6	-	-	6.3	6.6	-	5.6	5.3	6.1	6.2	6.6	-	-	5	5.7	5.1	4.9	-	-	8.5	7.8	5.3	-	-	4.4	4.3	4.9	-	-	5.7	6.2	5.1	5.7
Lead	Lead	mg/kg	1	300	1500	6000	11	-	-	37	35	12	29	7	10	8	14	15	18	7	7	8	16	12	12	3	-	-	5	7	7	6	7	-	10	9	7	11	8
MAH	1,2,4-trimethylbenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	1,3,5-trimethylbenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Isopropylbenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	n-butylbenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	n-propylbenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	p-isopropyltoluene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	sec-butylbenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Styrene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	tert-butylbenzene	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Monocylic aromatic hydrocarbons EPAVic	mg/kg		7	70	240	-	<4.7	-	<4.7	-	<3.2	-	<4.7	-	<4.7	-	-	-	<4.7	-	<4.7	-	-	-	<4.7	-	-	-	-	-	-	<4.7	<4.7	<3.2	-	<4.7	-	<4.7
Metals	Arsenic	mg/kg	4	20	500	2000	<4	-	-	17	31	4	<4	<4	<4	<4	<4	<4	<5	<4	<4	<4	54	85	105	7	-	-	7	6	7	5	7	-	19	<4	9	14	<4
	Beryllium	mg/kg	1				-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
	Boron	mg/kg	3				-	-	-	-	-	<3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<3	-	-	-	-
	Cadmium	mg/kg	0.4	3	100	400	<0.4	-	-	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<1	<0.4	<0.4	<0.4	<0.4	0.4	<1	<0.4	-	-	<0.4	<1	<0.4	<0.4	<0.4	-	<0.4	<0.4	<0.4	<0.4	<0.4
	Chromium (hexavalent)	mg/kg	1	1	500	2000	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
	Chromium (III+VI)	mg/kg	1				110	-	-	41	24	26	20	77	120	170	130	140	170	240	120	160	42	45	69	36	-	-	20	24	51	52	64	-	27	16	24	7	13

Table 2
Soil IWRG Table
30 Rowes Lane Wallan

Darraweit Property Trust Pty Ltd

						Field ID	BH04_0.1	BH09_0.1	BH16_0.1	BH33_0.1	BH34_0.1	BH35_0.1	BH36_0.1	BH37_0.1	BH38_0.1	BH39_0.1	BH40_0.1	Dup01	Split01	BH41_0.1	BH42_0.1	BH43_0.1	BH44_0.1	Dup02	Split02	BH45_0.1	BH46_0.1	BH47_0.1	Dup03	Split03	BH48_0.1	BH49_0.1	BH50_0.1	BH51_0.1	TP01_0.1	TP02_0.1	TP05_0.1	TP06_0.1	TP07_0.1
						Sampled Date	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018
						LocCode	BH04	BH09	BH16	BH33	BH34	BH35	BH36	BH37	BH38	BH39	BH40	BH40_0.1	Split01	BH41	BH42	BH43	BH44	BH44_0.1	Split02	BH45	BH46	BH47	BH47_0.1	Split03	BH48	BH49	BH50	BH51	TP01	TP02	TP05	TP06	TP07
				Vic EPA IWRG 621 Category C	Vic EPA IWRG 621 Category C	Vic EPA IWRG 621 Category C																																	
Chem_Group	**ChemName**	**Units**	**EQL**																																				
	Cobalt	mg/kg	1				-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
	Copper	mg/kg	1	100	5000	20000	53	-	-	18	12	5	4	24	33	48	23	23	24	68	45	39	16	16	15	12	-	-	13	14	16	4	21	-	4	6	7	7	2
	Manganese	mg/kg	1				-	-	-	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	-	-	-	-
	Mercury	mg/kg	0.1	1	75	300	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	1	60	3000	12000	74	-	-	19	10	5	4	57	71	120	53	52	70	230	67	92	23	21	27	18	-	-	10	15	22	4	26	-	5	5	5	5	4
	Phosphorus	mg/kg	10				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4100	430	-	-	320	93	850	-	-	-	-	-	-
	Selenium	mg/kg	2	10	50	200	-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2	-	-	-	-
	Zinc	mg/kg	1	200	35000	140000	94	-	-	290	59	23	14	20	70	61	58	58	83	140	170	54	27	30	35	14	-	-	34	60	24	22	59	-	8	21	4	14	7
Organochlorine Pesticides	4,4-DDE	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	a-BHC	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Aldrin	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	b-BHC	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Chlordane (cis)	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Chlordane (trans)	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	d-BHC	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	DDD	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	DDT	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	DDT+DDE+DDD	mg/kg	0.1		50	50	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Dieldrin	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Endosulfan I	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Endosulfan II	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Endosulfan sulphate	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Endrin	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Endrin aldehyde	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	g-BHC (Lindane)	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Heptachlor	mg/kg	0.1		1.2	4.8	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Heptachlor epoxide	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Methoxychlor	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Toxaphene	mg/kg	2				-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2	-	-	-	-
Organophosphorous Pesticides	Chlorpyrifos	mg/kg	0.1				-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
Other	3,5-Dichlorobenzoic acid	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Actril (loxynil)	mg/kg	1				-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
PAH	Polycylic aromatic hydrocarbons EPAVic	mg/kg		20			<1.35	<1	-	<1	<1.35	<1.35	<1.35	<1	<1.35	<1	<1.35	-	-	<1	<1.35	<1	<1.35	-	-	<1	-	-	-	-	<1.35	<1.35	<1	<1	<1.35	<1.35	<1	<1.35	<1
PAH/Phenols	2,4-dimethylphenol	mg/kg	0.2				-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
	2,4-dinitrophenol	mg/kg	2				-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2	-	-	-	-
	2-methylphenol	mg/kg	0.2				-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
	2-nitrophenol	mg/kg	0.2				-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	2				-	-	-	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2	-	-	-	-
	4-methylphenol	mg/kg	0.4				-	-	-	-	-	<0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.4	-	-	-	-
	4-nitrophenol	mg/kg	4				-	-	-	-	-	<4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<4	-	-	-	-
	Acenaphthene	mg/kg	0.1				<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	-
	Acenaphthylene	mg/kg	0.1				<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	-
	Anthracene	mg/kg	0.1				<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	-
	Benz(a)anthracene	mg/kg	0.1				<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	-
	Benzo(a) pyrene	mg/kg	0.05	1	5	20	<0.05	-	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-	<0.05	-	-	-	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	-	<0.05	-
	Benzo(b+k)fluoranthene	mg/kg	0.2				<0.2	-	-	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	-	-	<0.2	-	<0.2	-	-	-	-	-	-	-	<0.2	<0.2	-	-	<0.2	<0.2	-	<0.2	-
	Benzo(g,h,i)perylene	mg/kg	0.1				<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	-
	Chrysene	mg/kg	0.1				<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	-
	Cresol Total	mg/kg	0.2				-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.1				<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	-
	Fluoranthene	mg/kg	0.1				<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	-
	Fluorene	mg/kg	0.1				<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1				<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	-
	Naphthalene	mg/kg	0.1				<0.1	<1	-	<1	<0.1	<0.1	<0.1	<1	<0.1	<1	<0.1	-	-	<1	<0.1	<1	<0.1	-	-	<1	-	-	-	-	<0.1	<0.1	<1	<1	<0.1	<0.1	<1	<0.1	<1
	PAHs (Sum of total)	mg/kg	0.05	20	100	400	<0.05	-	-	-	<0.05	<0.05	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-	<0.05	-	-	-	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	-	<0.05	-
	Phenanthrene	mg/kg	0.1				<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	-
	Phenol	mg/kg	0.2				-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
	Phenolics Total	mg/kg	0.2				-	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	-
	Picloram	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Pyrene	mg/kg	0.1				<0.1	-	-	-	<0.1	<0.1	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	-	<0.1	-
Pesticides	Bifenthrin	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
	Mirex	mg/kg	0.5				-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-
Polychlorinated Biphenyls	Arochlor 1016	mg/kg	0.1				-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Arochlor 1221	mg/kg	0.1				-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Arochlor 1232	mg/kg	0.1				-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Arochlor 1242	mg/kg	0.1				-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Arochlor 1248	mg/kg	0.1				-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Arochlor 1254	mg/kg	0.1				-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	Arochlor 1260	mg/kg	0.1				-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
	PCBs (Sum of total)	mg/kg	0.1	2	0	0	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-
Solvents	Cyclohexane	mg/kg	1				-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-
TPH	C10-C16	mg/kg	50				-	<50	-	<50	-	<50	-	<50	-	<50	-	-	-	<50	-	<50	-	-	-	<50	-	-	-	-	-	-	<50	<50	<50	-	<50	-	<50
	C16-C34	mg/kg	100				-	500	-	140	-	<100	-	<100	-	<100	-	-	-	<100	-	<100	-	-	-	<100	-	-	-	-	-	-	190	<100	<100	-	<100	-	<100
	C34-C40	mg/kg	100				-	120	-	<100	-	<100	-	<100	-	<100	-	-	-	<100	-	<100	-	-	-	<100	-	-	-	-	-	-	<100	<100	<100	-	<100	-	<100
	F2-NAPHTHALENE	mg/kg	50				-	<50	-	<50	-	<50	-	<50	-	<50	-	-	-	<50	-	<50	-	-	-	<50	-	-	-	-	-	-	<50	<50	<50	-	<50	-	<50
	C10 - C40 (Sum of total)	mg/kg	50				-	630	-	140	-	<50	-	<50	-	<50	-	-	-	<50	-	<50	-	-	-	<50	-	-	-	-	-	-	190	<50	<50	-	<50	-	<50
	C6-C10	mg/kg	25				-	<25	-	<25	-	<25	-	<25	-	<25	-	-	-	<25	-	<25	-	-	-	<25	-	-	-	-	-	-	<25	<25	<25	-	<25	-	<25

Env Stds Comments

Table 2
Soil IWRG Table
30 Rowes Lane Wallan

						Field ID	TP08_0.1	TP10_0.1	TP11_0.1	TP12_0.1	TP13_0.1	TP14_0.1	TP15_0.1	TP17_0.1	TP18_0.1	TP19_0.1	TP20_0.1	TP21_0.1	TP22_0.1	TP23_0.1	TP24_0.1	TP25_0.1	TP26_0.1	TP27_0.1	TP28_0.1	TP29_0.1	TP31_0.1	TP32_0.1
						Sampled Date	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018
						LocCode	TP08	TP10	TP11	TP12	TP13	TP14	TP15	TP17	TP18	TP19	TP20	TP21	TP22	TP23	TP24	TP25	TP26	TP27	TP28	TP29	TP31	TP32
				Vic EPA IWRG 621 Category C	Vic EPA IWRG 621 Category C	Vic EPA IWRG 621 Category C																						
Chem_Group	**ChemName**	**Units**	**EQL**																									
	Benzo(a)pyrene TEQ (LOR)	mg/kg					0.2	-	0.2	-	0.2	0.2	-	0.2	-	0.2	-	0.2	-	0.2	-	0.2	-	0.2	-	0.2	0.2	-
	DCPA (Chlorthal) Diacid	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Benzo(a)pyrene TEQ calc (Half)	mg/kg					0.1	-	0.1	-	0.1	0.1	-	0.1	-	0.1	-	0.1	-	0.1	-	0.1	-	0.1	-	0.1	0.1	-
	Benzo(a)pyrene TEQ calc (Zero)	mg/kg					0	-	0	-	0	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	0	-
Misc Inorg - soil NEPM	Organic Nitrogen as N	mg/kg	10				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OCP	Organochlorine pesticides EPAVic	mg/kg		1			-	-	-	-	<1.8	-	-	-	-	-	-	<1.8	-	-	-	-	-	-	-	<1.8	-	-
	Other organochlorine pesticides EPAVic	mg/kg			10	50	-	-	-	-	<1.3	-	-	-	-	-	-	<1.3	-	-	-	-	-	-	-	<1.3	-	-
Phenols	Phenols (non-halogenated) EPAVic	mg/kg		60	560	2200	-	-	-	-	<8.4	-	-	-	-	-	-	<8.4	-	-	-	-	-	-	-	<8.4	-	-
	Phenols(halogenated) EPAVic	mg/kg		1	10	320	-	-	-	-	<4.2	-	-	-	-	-	-	<4.2	-	-	-	-	-	-	-	<4.2	-	-
Phenoxy Acid Herbicides in Soi	2,6-D	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
BTEX	Benzene	mg/kg	0.2	1	4	16	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2
	Ethylbenzene	mg/kg	0.5				-	<1	-	<1	<0.5	-	<1	-	<1	-	<1	<0.5	<1	-	<1	-	<1	-	<1	<0.5	-	<1
	Toluene	mg/kg	0.5				-	<0.5	-	<0.5	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5	-	<0.5
	Xylene (m & p)	mg/kg	1				-	<2	-	<2	<1	-	<2	-	<2	-	<2	<1	<2	-	<2	-	<2	-	<2	<1	-	<2
	Xylene (o)	mg/kg	0.5				-	<1	-	<1	<0.5	-	<1	-	<1	-	<1	<0.5	<1	-	<1	-	<1	-	<1	<0.5	-	<1
	Xylene Total	mg/kg	1				-	<1	-	<1	<1	-	<1	-	<1	-	<1	<1	<1	-	<1	-	<1	-	<1	<1	-	<1
	C6-C10 less BTEX (F1)	mg/kg	25				-	<25	-	<25	<25	-	<25	-	<25	-	<25	<25	<25	-	<25	-	<25	-	<25	<25	-	<25
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,1,1-trichloroethane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,1,2,2-tetrachloroethane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,1,2-trichloroethane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,1-dichloroethane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,1-dichloroethene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,1-dichloropropene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,2,3-trichloropropane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,2-dibromo-3-chloropropane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,2-dichloroethane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,2-dichloropropane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,3-dichloropropane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2,2-dichloropropane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Bromochloromethane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Bromodichloromethane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Bromoform	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Carbon tetrachloride	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Chlorodibromomethane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Chloroethane	mg/kg	1				-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	Chloroform	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Chloromethane	mg/kg	1				-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	cis-1,2-dichloroethene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	cis-1,3-dichloropropene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Dibromomethane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Hexachlorobutadiene	mg/kg	0.5		2.8	11	-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Trichloroethene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Tetrachloroethene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	trans-1,2-dichloroethene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	trans-1,3-dichloropropene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Vinyl chloride	mg/kg	1		1.2	4.8	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	Chlorinated hydrocarbons EPAVic	mg/kg		1			-	-	-	-	<8	-	-	-	-	-	-	<8	-	-	-	-	-	-	-	<8	-	-
	Other chlorinated hydrocarbons EPAVic	mg/kg			10	50	-	-	-	-	<6.5	-	-	-	-	-	-	<6.5	-	-	-	-	-	-	-	<6.5	-	-
Halogenated Benzenes	1,2,3-trichlorobenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,2,4-trichlorobenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,2-dichlorobenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,3-dichlorobenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,4-dichlorobenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2-chlorotoluene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	4-chlorotoluene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Bromobenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Chlorobenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Hexachlorobenzene	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
Halogenated Hydrocarbons	1,2-dibromoethane	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Bromomethane	mg/kg	1				-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	Dichlorodifluoromethane	mg/kg	1				-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	Trichlorofluoromethane	mg/kg	1				-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
Halogenated Phenols	2,3,4,6-tetrachlorophenol	mg/kg	0.2				-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2,4,5-trichlorophenol	mg/kg	0.2				-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2,4,6-trichlorophenol	mg/kg	0.2				-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2,4-dichlorophenol	mg/kg	0.2				-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2,6-dichlorophenol	mg/kg	0.2				-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2-chlorophenol	mg/kg	0.2				-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	Pentachlorophenol	mg/kg	1				-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
Herbicides	2,4,5-Trichlorophenoxy Acetic Acid	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2,4,5-TP (Silvex)	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2,4-dichlorophenoxybutanoic acid	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Hedonal	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2,4-Dichlorprop	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2,4,6-Trichlorophenoxy-acetic acid	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2-Chlorophenoxyacetic acid	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	4-Chlorophenoxy acetic acid	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Acifluorfen	mg/kg	2				-	-	-	-	<2	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	<2	-	-
	Atrazine	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Bromoxynil	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Clopyralid	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Dicamba	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Dinoseb	mg/kg	1				-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	2-Methyl-4-chlorophenoxyacetic acid	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	2-Methyl-4-Chlorophenoxy Butanoic Acid	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Mecoprop	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Triclopyr	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
Inorganics	Ammonia	mg/kg	0.5				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyanide (Free)	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Kjeldahl Nitrogen Total	mg/kg	10				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Moisture	%	0.1				29	18	16	25	15	20	29	19	24	16	22	28	24	22	17	22	18	12	24	19	25	28
	Nitrate (as N)	mg/kg	0.5				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nitrite (as N)	mg/kg	0.1				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Phosphate (as P)	mg/kg	0.5				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	pH (aqueous extract)	pH_Units		4≤ and ≤9			-	6	6.7	5.8	-	5.9	6.3	6.2	5.6	5.8	5.7	-	6.3	5.9	5.6	4.5	6.5	6	5.7	-	5.5	5.4
Lead	Lead	mg/kg	1	300	1500	6000	10	9	7	17	8	12	7	9	10	7	8	9	9	9	7	29	8	14	9	9	11	13
MAH	1,2,4-trimethylbenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	1,3,5-trimethylbenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Isopropylbenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	n-butylbenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	n-propylbenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	p-isopropyltoluene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	sec-butylbenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Styrene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	tert-butylbenzene	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Monocylic aromatic hydrocarbons EPAVic	mg/kg		7	70	240	-	<4.7	-	<4.7	<3.2	-	<4.7	-	<4.7	-	<4.7	<3.2	<4.7	-	<4.7	-	<4.7	-	<4.7	<3.2	-	<4.7
Metals	Arsenic	mg/kg	4	20	500	2000	<4	<4	<4	10	<4	<4	<4	14	<4	24	<4	6	5	<4	<4	<4	<4	6	6	17	5	<4
	Beryllium	mg/kg	1				-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	Boron	mg/kg	3				-	-	-	-	<3	-	-	-	-	-	-	<3	-	-	-	-	-	-	-	<3	-	-
	Cadmium	mg/kg	0.4	3	100	400	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
	Chromium (hexavalent)	mg/kg	1	1	500	2000	-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
	Chromium (III+VI)	mg/kg	1				80	100	78	17	11	18	76	22	34	12	8	10	33	14	9	20	27	17	16	26	13	9

Table 2
Soil IWRG Table
30 Rowes Lane Wallan

						Field ID	TP08_0.1	TP10_0.1	TP11_0.1	TP12_0.1	TP13_0.1	TP14_0.1	TP15_0.1	TP17_0.1	TP18_0.1	TP19_0.1	TP20_0.1	TP21_0.1	TP22_0.1	TP23_0.1	TP24_0.1	TP25_0.1	TP26_0.1	TP27_0.1	TP28_0.1	TP29_0.1	TP31_0.1	TP32_0.1
						Sampled Date	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018	6/09/2018
						LocCode	TP08	TP10	TP11	TP12	TP13	TP14	TP15	TP17	TP18	TP19	TP20	TP21	TP22	TP23	TP24	TP25	TP26	TP27	TP28	TP29	TP31	TP32
				Vic EPA IWRG 621 Category C	Vic EPA IWRG 621 Category C	Vic EPA IWRG 621 Category C																						
Chem_Group	ChemName	Units	EQL																									
	Cobalt	mg/kg	1				-	-	-	-	2	-	-	-	-	-	-	2	-	-	-	-	-	-	-	8	-	-
	Copper	mg/kg	1	100	5000	20000	22	31	26	6	1	4	27	5	4	1	4	5	12	3	3	4	6	2	2	5	3	4
	Manganese	mg/kg	1				-	-	-	-	42	-	-	-	-	-	-	71	-	-	-	-	-	-	-	77	-	-
	Mercury	mg/kg	0.1	1	75	300	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	mg/kg	1	60	3000	12000	26	82	51	7	3	10	42	6	7	3	5	5	11	4	3	9	7	3	3	6	5	5
	Phosphorus	mg/kg	10				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Selenium	mg/kg	2	10	50	200	-	-	-	-	<2	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	<2	-	-
	Zinc	mg/kg	1	200	35000	140000	27	38	26	10	4	19	28	9	8	3	12	17	13	4	4	20	12	3	6	19	8	14
Organochlorine Pesticides	4,4-DDE	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	a-BHC	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Aldrin	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	b-BHC	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Chlordane (cis)	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Chlordane (trans)	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	d-BHC	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	DDD	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	DDT	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	DDT+DDE+DDD	mg/kg	0.1		50	50	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Dieldrin	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Endosulfan I	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Endosulfan II	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Endosulfan sulphate	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Endrin	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Endrin aldehyde	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	g-BHC (Lindane)	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Heptachlor	mg/kg	0.1		1.2	4.8	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Heptachlor epoxide	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Methoxychlor	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Toxaphene	mg/kg	2				-	-	-	-	<2	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	<2	-	-
Organophosphorous Pesticides	Chlorpyrifos	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
Other	3,5-Dichlorobenzoic acid	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Actril (Ioxynil)	mg/kg	1				-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
PAH	Polycylic aromatic hydrocarbons EPAVic	mg/kg		20			<1.35	<1	<1.35	<1	<1.35	<1.35	<1	<1.35	<1	<1.35	<1	<1.35	<1	<1.35	<1	<1.35	<1	<1.35	<1	<1.35	<1.35	<1
PAH/Phenols	2,4-dimethylphenol	mg/kg	0.2				-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2,4-dinitrophenol	mg/kg	2				-	-	-	-	<2	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	<2	-	-
	2-methylphenol	mg/kg	0.2				-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	2-nitrophenol	mg/kg	0.2				-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	4-chloro-3-methylphenol	mg/kg	2				-	-	-	-	<2	-	-	-	-	-	-	<2	-	-	-	-	-	-	-	<2	-	-
	4-methylphenol	mg/kg	0.4				-	-	-	-	<0.4	-	-	-	-	-	-	<0.4	-	-	-	-	-	-	-	<0.4	-	-
	4-nitrophenol	mg/kg	4				-	-	-	-	<4	-	-	-	-	-	-	<4	-	-	-	-	-	-	-	<4	-	-
	Acenaphthene	mg/kg	0.1				<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Acenaphthylene	mg/kg	0.1				<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Anthracene	mg/kg	0.1				<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Benz(a)anthracene	mg/kg	0.1				<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Benzo(a) pyrene	mg/kg	0.05	1	5	20	<0.05	-	<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	-
	Benzo(b+k)fluoranthene	mg/kg	0.2				<0.2	-	<0.2	-	<0.2	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2	-
	Benzo(g,h,i)perylene	mg/kg	0.1				<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Chrysene	mg/kg	0.1				<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Cresol Total	mg/kg	0.2				-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	Dibenz(a,h)anthracene	mg/kg	0.1				<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Fluoranthene	mg/kg	0.1				<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Fluorene	mg/kg	0.1				<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1				<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Naphthalene	mg/kg	0.1				<0.1	<1	<0.1	<1	<0.1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<1	<0.1	<0.1	<1
	PAHs (Sum of total)	mg/kg	0.05	20	100	400	<0.05	-	<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	<0.05	-
	Phenanthrene	mg/kg	0.1				<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
	Phenol	mg/kg	0.2				-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	Phenolics Total	mg/kg	0.2				-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	-	<0.2	-	-
	Picloram	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Pyrene	mg/kg	0.1				<0.1	-	<0.1	-	<0.1	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1	-
Pesticides	Bifenthrin	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
	Mirex	mg/kg	0.5				-	-	-	-	<0.5	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	<0.5	-	-
Polychlorinated Biphenyls	Arochlor 1016	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Arochlor 1221	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Arochlor 1232	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Arochlor 1242	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Arochlor 1248	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Arochlor 1254	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	Arochlor 1260	mg/kg	0.1				-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
	PCBs (Sum of total)	mg/kg	0.1	2	0	0	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	<0.1	-	-
Solvents	Cyclohexane	mg/kg	1				-	-	-	-	<1	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	<1	-	-
TPH	C10-C16	mg/kg	50				-	<50	-	<50	<50	-	<50	-	<50	-	<50	<50	<50	-	<50	-	<50	-	<50	<50	-	<50
	C16-C34	mg/kg	100				-	<100	-	<100	<100	-	<100	-	<100	-	<100	<100	<100	-	<100	-	<100	-	<100	<100	-	<100
	C34-C40	mg/kg	100				-	<100	-	<100	<100	-	<100	-	<100	-	<100	<100	<100	-	<100	-	<100	-	<100	<100	-	<100
	F2-NAPHTHALENE	mg/kg	50				-	<50	-	<50	<50	-	<50	-	<50	-	<50	<50	<50	-	<50	-	<50	-	<50	<50	-	<50
	C10 - C40 (Sum of total)	mg/kg	50				-	<50	-	<50	<50	-	<50	-	<50	-	<50	<50	<50	-	<50	-	<50	-	<50	<50	-	<50
	C6-C10	mg/kg	25				-	<25	-	<25	<25	-	<25	-	<25	-	<25	<25	<25	-	<25	-	<25	-	<25	<25	-	<25

Env Stds Comments

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.19/10/2018 3:04:35 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Nickel

General Statistics			
Total Number of Observations	50	Number of Distinct Observations	29
		Number of Missing Observations	0
Minimum	3	Mean	28.34
Maximum	230	Median	10
SD	40.62	Std. Error of Mean	5.745
Coefficient of Variation	1.433	Skewness	2.984

Normal GOF Test		
Shapiro Wilk Test Statistic	0.654	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.947	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.266	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.125	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	37.97	95% Adjusted-CLT UCL (Chen-1995)	40.38
		95% Modified-t UCL (Johnson-1978)	38.38

Gamma GOF Test		
A-D Test Statistic	2.462	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.791	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.193	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.13	Data Not Gamma Distributed at 5% Significance Level
Data Not Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	0.795	k star (bias corrected MLE)	0.761
Theta hat (MLE)	35.63	Theta star (bias corrected MLE)	37.24
nu hat (MLE)	79.55	nu star (bias corrected)	76.11
MLE Mean (bias corrected)	28.34	MLE Sd (bias corrected)	32.49
		Approximate Chi Square Value (0.05)	57.01
Adjusted Level of Significance	0.0452	Adjusted Chi Square Value	56.52

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	37.83	95% Adjusted Gamma UCL (use when n<50)	38.16

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.901	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.947	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.166	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.125	Data Not Lognormal at 5% Significance Level
Data Not Lognormal at 5% Significance Level		

Lognormal Statistics			
Minimum of Logged Data	1.099	Mean of logged Data	2.598
Maximum of Logged Data	5.438	SD of logged Data	1.203

Assuming Lognormal Distribution			
95% H-UCL	43.12	90% Chebyshev (MVUE) UCL	44.14
95% Chebyshev (MVUE) UCL	51.88	97.5% Chebyshev (MVUE) UCL	62.62
99% Chebyshev (MVUE) UCL	83.72		

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs			
95% CLT UCL	37.79	95% Jackknife UCL	37.97
95% Standard Bootstrap UCL	37.84	95% Bootstrap-t UCL	42.28
95% Hall's Bootstrap UCL	45.94	95% Percentile Bootstrap UCL	38.38
95% BCA Bootstrap UCL	40.98		
90% Chebyshev(Mean, Sd) UCL	45.58	95% Chebyshev(Mean, Sd) UCL	53.38
97.5% Chebyshev(Mean, Sd) UCL	64.22	99% Chebyshev(Mean, Sd) UCL	85.5

Suggested UCL to Use			
95% Chebyshev (Mean, Sd) UCL	53.38		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Zinc

General Statistics			
Total Number of Observations	50	Number of Distinct Observations	35
		Number of Missing Observations	0
Minimum	3	Mean	37.14
Maximum	290	Median	20.5
SD	49.78	Std. Error of Mean	7.041
Coefficient of Variation	1.34	Skewness	3.35

Normal GOF Test		
Shapiro Wilk Test Statistic	0.635	**Shapiro Wilk GOF Test**

5% Shapiro Wilk Critical Value	0.947	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.246	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.125	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	48.94	95% Adjusted-CLT UCL (Chen-1995)	52.28
		95% Modified-t UCL (Johnson-1978)	49.5

Gamma GOF Test			
A-D Test Statistic	0.98	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.78	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.132	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.129	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics			
k hat (MLE)	1.01	k star (bias corrected MLE)	0.963
Theta hat (MLE)	36.76	Theta star (bias corrected MLE)	38.57
nu hat (MLE)	101	nu star (bias corrected)	96.3
MLE Mean (bias corrected)	37.14	MLE Sd (bias corrected)	37.85
		Approximate Chi Square Value (0.05)	74.67
Adjusted Level of Significance	0.0452	Adjusted Chi Square Value	74.1

Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	47.9	95% Adjusted Gamma UCL (use when n<50)	48.27

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.975	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.947	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0716	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.125	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics			
Minimum of Logged Data	1.099	Mean of logged Data	3.044
Maximum of Logged Data	5.67	SD of logged Data	1.069

Assuming Lognormal Distribution			
95% H-UCL	53.81	90% Chebyshev (MVUE) UCL	56.38
95% Chebyshev (MVUE) UCL	65.36	97.5% Chebyshev (MVUE) UCL	77.83
99% Chebyshev (MVUE) UCL	102.3		

Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			

Nonparametric Distribution Free UCLs			
95% CLT UCL	48.72	95% Jackknife UCL	48.94
95% Standard Bootstrap UCL	48.93	95% Bootstrap-t UCL	56.96
95% Hall's Bootstrap UCL	68.51	95% Percentile Bootstrap UCL	49.32
95% BCA Bootstrap UCL	52.32		
90% Chebyshev(Mean, Sd) UCL	58.26	95% Chebyshev(Mean, Sd) UCL	67.83
97.5% Chebyshev(Mean, Sd) UCL	81.11	99% Chebyshev(Mean, Sd) UCL	107.2

Suggested UCL to Use			
95% H-UCL	53.81		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Arsenic

General Statistics			
Total Number of Observations	24	Number of Distinct Observations	14
		Number of Missing Observations	26
Minimum	4	Mean	19.58
Maximum	105	Median	8
SD	25.91	Std. Error of Mean	5.289
Coefficient of Variation	1.323	Skewness	2.486

Normal GOF Test			
Shapiro Wilk Test Statistic	0.609	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.916	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.301	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.177	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	28.65	95% Adjusted-CLT UCL (Chen-1995)	31.15
		95% Modified-t UCL (Johnson-1978)	29.1

Gamma GOF Test			
A-D Test Statistic	1.921	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.769	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.225	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.183	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Gamma Statistics

k hat (MLE)	1.126	k star (bias corrected MLE)	1.013
Theta hat (MLE)	17.39	Theta star (bias corrected MLE)	19.33
nu hat (MLE)	54.04	nu star (bias corrected)	48.62
MLE Mean (bias corrected)	19.58	MLE Sd (bias corrected)	19.46
		Approximate Chi Square Value (0.05)	33.61
Adjusted Level of Significance	0.0392	Adjusted Chi Square Value	32.73

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	28.33	95% Adjusted Gamma UCL (use when n<50)	29.09

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.871	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.916	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.216	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.177	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	1.386	Mean of logged Data	2.469
Maximum of Logged Data	4.654	SD of logged Data	0.918

Assuming Lognormal Distribution

95% H-UCL	28.69	90% Chebyshev (MVUE) UCL	28.6
95% Chebyshev (MVUE) UCL	33.6	97.5% Chebyshev (MVUE) UCL	40.54
99% Chebyshev (MVUE) UCL	54.16		

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Distribution Free UCLs

95% CLT UCL	28.28	95% Jackknife UCL	28.65
95% Standard Bootstrap UCL	28.45	95% Bootstrap-t UCL	37.25
95% Hall's Bootstrap UCL	36.65	95% Percentile Bootstrap UCL	28.42
95% BCA Bootstrap UCL	31.54		
90% Chebyshev(Mean, Sd) UCL	35.45	95% Chebyshev(Mean, Sd) UCL	42.64
97.5% Chebyshev(Mean, Sd) UCL	52.61	99% Chebyshev(Mean, Sd) UCL	72.21

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	42.64		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Table 4
QA/QC Soil RPDs
30 Rowes Lane Wallan

Darraweit Property Trust Pty Ltd

Field Duplicates (SOIL)
Filter: Lab_Report_Nu

			Lab Report Number	14823	14823		14823	14823		14823	14823	
			Field ID	BH40_0.1	Dup01	**RPD**	BH44_0.1	Dup02	**RPD**	BH48_0.1	Dup03	**RPD**
			Sampled Date/Time	6/09/2018	6/09/2018		6/09/2018	6/09/2018		6/09/2018	6/09/2018	
Chem_Gr	**ChemNam**	**Units**	**EQL**									
Lead	Lead	mg/kg	1 (Primary): 5 (Interlab)	14.0	15.0	7	16.0	12.0	29	7.0	5.0	33
Metals	Arsenic	mg/kg	4 (Primary): 5 (Interlab)	<4.0	<4.0	0	54.0	85.0	45	7.0	7.0	0
	Cadmium	mg/kg	0.4 (Primary): 1 (Interlab	<0.4	<0.4	0	<0.4	0.4	0	<0.4	<0.4	0
	Chromium	mg/kg	1 (Primary): 2 (Interlab)	130.0	140.0	7	42.0	45.0	7	**51.0**	**20.0**	**87**
	Copper	mg/kg	1 (Primary): 5 (Interlab)	23.0	23.0	0	16.0	16.0	0	16.0	13.0	21
	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
	Nickel	mg/kg	1 (Primary): 2 (Interlab)	53.0	52.0	2	23.0	21.0	9	**22.0**	**10.0**	**75**
	Zinc	mg/kg	1 (Primary): 5 (Interlab)	58.0	58.0	0	27.0	30.0	11	**24.0**	**34.0**	**34**

Field Duplicates (SOIL)
Filter: Lab_Report_Number in

			Lab Report Number	14823	EM1814545		14823	EM1814545		14823	EM1814545	
			Field ID	BH40_0.1	Split01	**RPD**	BH44_0.1	Split02	**RPD**	BH48_0.1	Split03	**RPD**
			Sampled Date/Time	6/09/2018	6/09/2018		6/09/2018	6/09/2018		6/09/2018	6/09/2018	
Chem_Gr	**ChemNam**	**Units**	**EQL**									
Lead	Lead	mg/kg	1 (Primary): 5 (Interlab)	14.0	18.0	25	16.0	12.0	29	7.0	7.0	0
Metals	Arsenic	mg/kg	4 (Primary): 5 (Interlab)	<4.0	<5.0	0	**54.0**	**105.0**	**64**	7.0	6.0	15
	Cadmium	mg/kg	0.4 (Primary): 1 (Interlab	<0.4	<1.0	0	<0.4	<1.0	0	<0.4	<1.0	0
	Chromium	mg/kg	1 (Primary): 2 (Interlab)	130.0	170.0	27	**42.0**	**69.0**	**49**	**51.0**	**24.0**	**72**
	Copper	mg/kg	1 (Primary): 5 (Interlab)	23.0	24.0	4	16.0	15.0	6	16.0	14.0	13
	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
	Nickel	mg/kg	1 (Primary): 2 (Interlab)	53.0	70.0	28	23.0	27.0	16	22.0	15.0	38
	Zinc	mg/kg	1 (Primary): 5 (Interlab)	**58.0**	**83.0**	**35**	27.0	35.0	26	**24.0**	**60.0**	**86**

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-30 x EQL); 30 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those

Table 5
Rinsate and Trip Blank Analytical Results
30 Rowes Lane Wallan

			SDG	ENVIROLAB 2018-09-10T00:00:00	ENVIROLAB 2018-09-10T00:00:00
			Field ID	Rinsate	Trip
			Sampled Date	6/09/2018	6/09/2018
			Sample Type	Rinsate	Trip Blank
Chemical Group	**Chemical Name**	**Units**	**EQL**		
BTEX	Benzene	µg/L	1	<1	<1
	Ethylbenzene	µg/L	1	<1	<1
	Toluene	µg/L	1	<1	<1
	Xylene (m & p)	µg/L	2	<2	<2
	Xylene (o)	µg/L	1	<1	<1
	C6-C10 less BTEX (F1)	mg/l	0.01	<0.01	<0.01
PAH/Phenols	Naphthalene	µg/L	1	<1	<1
TPH	C10-C16	mg/l	0.05	<0.05	
	C16-C34	mg/l	0.1	<0.1	
	C34-C40	mg/l	0.1	<0.1	
	F2-NAPHTHALENE	mg/l	0.05	<0.05	
	C6 - C9	µg/L	10	<10	<10
	C10 - C14	µg/L	50	<50	
	C15 - C28	µg/L	100	<100	
	C29-C36	µg/L	100	<100	
	C6-C10	mg/l	0.01	<0.01	<0.01

P.O. Box 1237
Carlton VIC 3053
enquiries@lrmglobal.com.au

CHAIN OF CUSTODY

Job Number 33980

ATTENTION Envirolab

CLIENT Crystal Group Pty Ltd

LOCATION 30 - 70 Rowes Lane Wallan

Sheet 1 of 7

	Sample Number	Sample Date	Sample Type	Analysis Required	No. of Containers	Turn-around Time Required
1	TP01_0.1	6.09.2018	Soil	NEPM HIL Full Suit	1	Standard
2	TP02_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
3	TP05_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
4	TP05_0.3	6.09.2018	Soil	Hold	1	Standard
5	TP06_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
6	TP06_0.3	6.09.2018	Soil	Hold	1	Standard
7	TP07_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
8	TP07_0.3	6.09.2018	Soil	Hold	1	Standard
9	TP08_0.1	6.09.2018	Soil	Metals 8, PAHs	1	Standard
10	TP10_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
11	TP10_0.3	6.09.2018	Soil	Hold	1	Standard
12	TP11_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
13	TP11_0.3	6.09.2018	Soil	Hold	1	Standard
14	TP12_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard

Job No: 14823
Date Received: 10/9/18
Time [illegible]ed: 16:50
Received by: CP
Temp: [✓ Cool]/Ambient 5°C
Cooling: Ice/[✓ Icepack]
Security: [✓ Intact]/Broken

Total number of containers 14

Additional information::

Email Results To	Tick
jon.lawson@lrmglobal.com.au	√
kevin.b@lrmglobal.com.au	
ajacob@lrmglobal.com.au	
acampbell@lrmglobal.com.au	
bpaule@lrmglobal.com.au	√

Sampled by: BP, JL

Checked by: BP, JL

Additional Comments

Chain of custody must be signed and dated by LRM, courier, and laboratory.

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	ORGANISATION	DATE / TIME
Brendan Paule	LRM Global	06/09/2018		ELS	7/9/18

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	RECEIVED FOR LABORATORY BY (Sig)

LRM GLOBAL

P.O. Box 1237
Carlton VIC 3053
enquiries@lrmglobal.com.au

CHAIN OF CUSTODY

Job Numbei 33980

ATTENTION	Envirolab
CLIENT	Crystal Group Pty Ltd
LOCATION	30 - 70 Rowes Lane Wallan

Sheet 2 of 7

	Sample Number	Sample Date	Sample Type	Analysis Required	No. of Containers	Turn-around Time Required
15	TP12_0.3	6.09.2018	Soil	Hold	1	Standard
16	TP13_0.1	6.09.2018	Soil	NEPM HIL Full Suit	1	Standard
17	TP13_0.3	6.09.2018	Soil	Hold	1	Standard
18	TP14_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
19	TP14_0.3	6.09.2018	Soil	Hold	1	Standard
20	TP15_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
21	TP17_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
22	TP17_0.3	6.09.2018	Soil	Hold	1	Standard
23	TP18_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
24	TP18_0.3	6.09.2018	Soil	Hold	1	Standard
25	TP19_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
26	TP19_0.3	6.09.2018	Soil	Hold	1	Standard
27	TP20_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
28	TP20_0.3	6.09.2018	Soil	Hold	1	Standard

Additional information::

Email Results To	Tick
jon.lawson@lrmglobal.com.au	√
kevin.b@lrmglobal.com.au	
ajacob@lrmglobal.com.au	
acampbell@lrmglobal.com.au	
bpaule@lrmglobal.com.au	√

Chain of custody must be signed and dated by LRM, courier, and laboratory.

Total number of containers 14

Sampled by: BP, JL

Checked by: BP, JL

Additional Comments

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	ORGANISATION	DATE / TIME
Brendan Paule	LRM Global	06/09/2018			

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	RECEIVED FOR LABORATORY BY (Sig)

P.O. Box 1237
Carlton VIC 3053
enquiries@lrmglobal.com.au

CHAIN OF CUSTODY

Job Numbeı 33980

Sheet 3 of 7

ATTENTION Envirolab
CLIENT Crystal Group Pty Ltd
LOCATION 30 - 70 Rowes Lane Wallan

	Sample Number	Sample Date	Sample Type	Analysis Required	No. of Containers	Turn-around Time Required
29	TP21_0.1	6.09.2018	Soil	NEPM HIL Full Suit	1	Standard
30	TP21_0.3	6.09.2018	Soil	Hold	1	Standard
31	TP22_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
32	TP22_0.3	6.09.2018	Soil	Hold	1	Standard
33	TP23_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
34	TP23_0.3	6.09.2018	Soil	Hold	1	Standard
35	TP24_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
36	TP25_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
37	TP25_0.3	6.09.2018	Soil	Hold	1	Standard
38	TP26_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
39	TP26_0.3	6.09.2018	Soil	Hold	1	Standard
40	TP27_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
41	TP27_0.3	6.09.2018	Soil	Hold	1	Standard
42	TP28_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard

Total number of containers 14

Additional information::

Email Results To	Tick
jon.lawson@lrmglobal.com.au	√
kevin.b@lrmglobal.com.au	
ajacob@lrmglobal.com.au	
acampbell@lrmglobal.com.au	
bpaule@lrmglobal.com.au	√

Sampled by: BP, JL

Checked by: BP, JL

Additional Comments

Chain of custody must be signed and dated by LRM, courier, and laboratory.

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	ORGANISATION	DATE / TIME
Brendan Paule	LRM Global	06/09/2018			

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	RECEIVED FOR LABORATORY BY (Sig)

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P.O. Box 1237
Carlton VIC 3053
enquiries@lrmglobal.com.au

CHAIN OF CUSTODY

Job Numbei 33980

Sheet 4 of 7

ATTENTION Envirolab
CLIENT Crystal Group Pty Ltd
LOCATION 30 - 70 Rowes Lane Wallan

	Sample Number	Sample Date	Sample Type	Analysis Required	No. of Containers	Turn-around Time Required
43	TP28_0.3	6.09.2018	Soil	Hold	1	Standard
44	TP29_0.1	6.09.2018	Soil	NEPM HIL Full Suit	1	Standard
45	TP29_0.3	6.09.2018	Soil	Hold	1	Standard
46	TP31_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
47	TP31_0.3	6.09.2018	Soil	Hold	1	Standard
48	TP32_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
49	TP32_0.3	6.09.2018	Soil	Hold	1	Standard
50	BH04_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
51	BH04_0.3	6.09.2018	Soil	Hold	1	Standard
52	BH09_0.1	6.09.2018	Soil	TRH	1	Standard
53	BH16_0.1	6.09.2018	Soil	PCBs	1	Standard
54	BH33_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
55	BH33_0.3	6.09.2018	Soil	Hold	1	Standard
56	BH34_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard

Additional information::

Total number of containers 14

Email Results To	Tick
jon.lawson@lrmglobal.com.au	√
kevin.b@lrmglobal.com.au	
ajacob@lrmglobal.com.au	
acampbell@lrmglobal.com.au	
bpaule@lrmglobal.com.au	√

Sampled by: BP, JL

Checked by: BP, JL

Additional Comments

Chain of custody must be signed and dated by LRM, courier, and laboratory.

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	ORGANISATION	DATE / TIME
Brendan Paule	LRM Global	06/09/2018			

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	RECEIVED FOR LABORATORY BY (Sig)

P.O. Box 1237
Carlton VIC 3053
enquiries@lrmglobal.com.au

CHAIN OF CUSTODY

Job Numbei 33980

Sheet 5 of 7

ATTENTION Envirolab
CLIENT Crystal Group Pty Ltd
LOCATION 30 - 70 Rowes Lane Wallan

	Sample Number	Sample Date	Sample Type	Analysis Required	No. of Containers	Turn-around Time Required
57	BH34_0.3	6.09.2018	Soil	Hold	1	Standard
58	BH35_0.1	6.09.2018	Soil	NEPM HIL Full Suit	1	Standard
59	BH35_0.3	6.09.2018	Soil	Hold	1	Standard
60	BH36_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
61	BH36_0.3	6.09.2018	Soil	Hold	1	Standard
62	BH37_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
63	BH37_0.3	6.09.2018	Soil	Hold	1	Standard
64	BH38_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
65	BH38_0.3	6.09.2018	Soil	Hold	1	Standard
66	BH39_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
67	BH39_0.3	6.09.2018	Soil	Hold	1	Standard
68	BH40_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
69	BH40_0.3	6.09.2018	Soil	Hold	1	Standard
70	BH41_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard

Total number of containers 14

Additional information::

Email Results To	Tick
jon.lawson@lrmglobal.com.au	√
kevin.b@lrmglobal.com.au	
ajacob@lrmglobal.com.au	
acampbell@lrmglobal.com.au	
bpaule@lrmglobal.com.au	√

Sampled by: BP, JL

Checked by: BP, JL

Additional Comments

Chain of custody must be signed and dated by LRM, courier, and laboratory.

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	ORGANISATION	DATE / TIME
Brendan Paule	LRM Global	06/09/2018			

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	RECEIVED FOR LABORATORY BY (Sig)

P.O. Box 1237
Carlton VIC 3053
enquiries@lrmglobal.com.au

CHAIN OF COUSTODY

Job Numbe 33980

ATTENTION	Envirolab	Sheet 6 of 7
CLIENT	Crystal Group Pty Ltd	
LOCATION	30 - 70 Rowes Lane Wallan	

	Sample Number	Sample Date	Sample Type	Analysis Required	No. of Containers	Turn-around Time Required
71	BH41_0.3	6.09.2018	Soil	Hold	1	Standard
72	BH42_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
73	BH42_0.3	6.09.2018	Soil	Hold	1	Standard
74	BH43_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
75	BH43_0.3	6.09.2018	Soil	Hold	1	Standard
76	BH44_0.1	6.09.2018	Soil	Metals 8, PAHs, pH	1	Standard
77	BH44_0.3	6.09.2018	Soil	Hold	1	Standard
78	BH45_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, pH	1	Standard
79	BH45_0.3	6.09.2018	Soil	Hold	1	Standard
80	BH46_0.1	6.09.2018	Soil	Nutrient suite (TKN, NO2, NO3, Org N, NH3,Tot P, PO4_P), pH	1	Standard
81	BH46_0.3	6.09.2018	Soil	Hold	1	Standard
82	BH47_0.1	6.09.2018	Soil	Nutrient suite (TKN, NO2, NO3, Org N, NH3,Tot P, PO4_P), pH	1	Standard
83	BH47_0.3	6.09.2018	Soil	Hold	1	Standard
84	BH48_0.1	6.09.2018	Soil	Metals 8, PAHs, Nutrient suite (TKN, NO2, NO3, Org N, NH3,Tot P, PO4_P), pH	1	Standard

Additional information::

Total number of containers 14

Email Results To	**Tick**
jon.lawson@lrmglobal.com.au	√
kevin.b@lrmglobal.com.au	
ajacob@lrmglobal.com.au	
acampbell@lrmglobal.com.au	
bpaule@lrmglobal.com.au	√

Sampled by: BP, JL

Checked by: BP, JL

Additional Comments

Chain of custody must be signed and dated by LRM, courier, and laboratory.

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	ORGANISATION	DATE / TIME
Brendan Paule	LRM Global	06/09/2018			

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	RECEIVED FOR LABORATORY BY (Sig)

LRM GLOBAL

P.O. Box 1237
Carlton VIC 3053
enquiries@lrmglobal.com.au

CHAIN OF CUSTODY

Job Numbe 33980

Sheet 7 of 7

ATTENTION	Envirolab
CLIENT	Crystal Group Pty Ltd
LOCATION	30 - 70 Rowes Lane Wallan

	Sample Number	Sample Date	Sample Type	Analysis Required	No. of Containers	Turn-around Time Required
85	BH48_0.3	6.09.2018	Soil	Hold	1	Standard
86	BH49_0.1	6.09.2018	Soil	Metals 8, PAHs, Nutrient suite (TKN, NO2, NO3, Org N, NH3,Tot P, PO4_P), pH	1	Standard
87	BH49_0.3	6.09.2018	Soil	Hold	1	Standard
88	BH50_0.1	6.09.2018	Soil	Metals 8, TRH/BTEX, Nutrient suite (TKN, NO2, NO3, Org N, NH3,Tot P, PO4_P), pH	1	Standard
89	BH50_0.3	6.09.2018	Soil	Hold	1	Standard
90	BH51_0.1	6.09.2018	Soil	TRH	1	Standard
91	BH51_0.3	6.09.2018	Soil	Hold	1	Standard
92	Dup01	6.09.2018	Soil	Metals 8	1	Standard
93	Dup02	6.09.2018	Soil	Metals 8	1	Standard
94	Dup03	6.09.2018	Soil	Metals 8	1	Standard
95	Trip	6.09.2018	Water	TRH	2	Standard
96	Rinsate	6.09.2018	Water	TRH/BTEX	3	Standard

Additional information::

Total number of containers 15

Email Results To	**Tick**
jon.lawson@lrmglobal.com.au	√
kevin.b@lrmglobal.com.au	
ajacob@lrmglobal.com.au	
acampbell@lrmglobal.com.au	
bpaule@lrmglobal.com.au	√

Sampled by: BP, JL

Checked by: BP, JL

Additional Comments

Chain of custody must be signed and dated by LRM, courier, and laboratory.

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	ORGANISATION	DATE / TIME
Brendan Paule	LRM Global	06/09/2018			

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	RECEIVED FOR LABORATORY BY (Sig)

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500   fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 14823

Client Details

Client	LRM Global
Attention	Brendan Paule
Address	65 Stubbs Street, Kensington, VIC, 3031

Sample Details

Your Reference	**33980 - 30-70 Rowes Lane Wallan**
Number of Samples	94 Soil, 2 Water
Date samples received	07/09/2018
Date completed instructions received	10/09/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	18/09/2018
Date of Issue	18/09/2018

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Results Approved By
Chris De Luca, Senior Chemist

Authorised By

Pamela Adams, Laboratory Manager

VOCs in soil						
Our Reference		14823-1	14823-16	14823-29	14823-44	14823-58
Your Reference	UNITS	TP01_0.1	TP13_0.1	TP21_0.1	TP29_0.1	BH35_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	12/09/2018	12/09/2018	12/09/2018	13/09/2018	14/09/2018
Dichlorodifluoromethane	mg/kg	<1	<1	<1	<1	<1
Chloromethane	mg/kg	<1	<1	<1	<1	<1
Vinyl Chloride	mg/kg	<1	<1	<1	<1	<1
Bromomethane	mg/kg	<1	<1	<1	<1	<1
Chloroethane	mg/kg	<1	<1	<1	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1	<1	<1	<1
1,1-Dichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-dichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-dichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-dichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
bromochloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
chloroform	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,2-dichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-trichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-dichloropropene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Cyclohexane	mg/kg	<1	<1	<1	<1	<1
carbon tetrachloride	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
dibromomethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
trichloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
bromodichloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-dichloropropene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-dichloropropene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-trichloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-dichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
dibromochloromethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dibromoethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1,2-tetrachloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
chlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
bromoform	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

VOCs in soil						
Our Reference	UNITS	14823-1	14823-16	14823-29	14823-44	14823-58
Your Reference		TP01_0.1	TP13_0.1	TP21_0.1	TP29_0.1	BH35_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
m+p-xylene	mg/kg	<1	<1	<1	<1	<1
styrene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-tetrachloroethane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
o-Xylene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-trichloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
isopropylbenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
bromobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
n-propyl benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-chlorotoluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-chlorotoluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,3,5-trimethyl benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
tert-butyl benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-trimethyl benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-dichlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
sec-butyl benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-dichlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-isopropyl toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
n-butyl benzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dibromo-3-chloropropane	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-trichlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
hexachlorobutadiene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-trichlorobenzene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate Dibromofluoromethane	%	100	99	99	98	97
Surrogate aaa-Trifluorotoluene	%	85	96	103	93	101
Surrogate Toluene-d_8	%	98	97	98	98	99
Surrogate 4-Bromofluorobenzene	%	87	86	87	85	93

Client Reference: 33980 - 30-70 Rowes Lane Wallan

vTRH(C6-C10)/BTEXN in Soil						
Our Reference	UNITS	14823-1	14823-3	14823-7	14823-10	14823-14
Your Reference		TP01_0.1	TP05_0.1	TP07_0.1	TP10_0.1	TP12_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
vTRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	88	106	109	111	105

vTRH(C6-C10)/BTEXN in Soil						
Our Reference	UNITS	14823-16	14823-20	14823-23	14823-27	14823-29
Your Reference		TP13_0.1	TP15_0.1	TP18_0.1	TP20_0.1	TP21_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
vTRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	103	98	105	103	111

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		14823-31	14823-35	14823-38	14823-42	14823-44
Your Reference	UNITS	TP22_0.1	TP24_0.1	TP26_0.1	TP28_0.1	TP29_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
vTRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	94	100	106	99	99

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		14823-48	14823-52	14823-54	14823-58	14823-62
Your Reference	UNITS	TP32_0.1	BH09_0.1	BH33_0.1	BH35_0.1	BH37_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	14/09/2018	14/09/2018	14/09/2018
vTRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	94	110	97	95	96

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		14823-66	14823-70	14823-74	14823-78	14823-88
Your Reference	UNITS	BH39_0.1	BH41_0.1	BH43_0.1	BH45_0.1	BH50_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
vTRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	100	104	109	114	84

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		14823-90
Your Reference	UNITS	BH51_0.1
Date Sampled		06/09/2018
Type of sample		Soil
Date extracted	-	12/09/2018
Date analysed	-	14/09/2018
vTRH C_6 - C_{10}	mg/kg	<25
TRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	102

TRH Soil C10-C40 NEPM						
Our Reference		14823-1	14823-3	14823-7	14823-10	14823-14
Your Reference	UNITS	TP01_0.1	TP05_0.1	TP07_0.1	TP10_0.1	TP12_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	100	92	92	93	92

TRH Soil C10-C40 NEPM						
Our Reference		14823-16	14823-20	14823-23	14823-27	14823-29
Your Reference	UNITS	TP13_0.1	TP15_0.1	TP18_0.1	TP20_0.1	TP21_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	92	93	91	89	90

TRH Soil C10-C40 NEPM						
Our Reference		14823-31	14823-35	14823-38	14823-42	14823-44
Your Reference	UNITS	TP22_0.1	TP24_0.1	TP26_0.1	TP28_0.1	TP29_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	12/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	90	85	85	86	88

TRH Soil C10-C40 NEPM						
Our Reference		14823-48	14823-52	14823-54	14823-58	14823-62
Your Reference	UNITS	TP32_0.1	BH09_0.1	BH33_0.1	BH35_0.1	BH37_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
TRH $>C_{10}-C_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH $>C_{10}$ - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH $>C_{16}-C_{34}$	mg/kg	<100	500	140	<100	<100
TRH $>C_{34}-C_{40}$	mg/kg	<100	120	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	630	140	<50	<50
Surrogate o-Terphenyl	%	87	82	88	85	83

TRH Soil C10-C40 NEPM						
Our Reference		14823-66	14823-70	14823-74	14823-78	14823-88
Your Reference	UNITS	BH39_0.1	BH41_0.1	BH43_0.1	BH45_0.1	BH50_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	14/09/2018	14/09/2018	14/09/2018
TRH $>C_{10}-C_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH $>C_{10}$ - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH $>C_{16}-C_{34}$	mg/kg	<100	<100	<100	<100	190
TRH $>C_{34}-C_{40}$	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	190
Surrogate o-Terphenyl	%	83	83	86	85	88

TRH Soil C10-C40 NEPM		
Our Reference		14823-90
Your Reference	UNITS	BH51_0.1
Date Sampled		06/09/2018
Type of sample		Soil
Date extracted	-	12/09/2018
Date analysed	-	14/09/2018
TRH $>C_{10}-C_{16}$	mg/kg	<50
TRH $>C_{10}$ - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH $>C_{16}-C_{34}$	mg/kg	<100
TRH $>C_{34}-C_{40}$	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	86

PAHs in Soil						
Our Reference		14823-1	14823-2	14823-5	14823-9	14823-12
Your Reference	UNITS	TP01_0.1	TP02_0.1	TP06_0.1	TP08_0.1	TP11_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	18/09/2018	18/09/2018	18/09/2018	18/09/2018	18/09/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0	0	0	0	0
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.1	0.1	0.1	0.1	0.1
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	0.2	0.2	0.2	0.2	0.2
Surrogate p-Terphenyl-d_{14}	%	90	86	84	88	86

PAHs in Soil						
Our Reference		14823-16	14823-18	14823-21	14823-25	14823-29
Your Reference	UNITS	TP13_0.1	TP14_0.1	TP17_0.1	TP19_0.1	TP21_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	18/09/2018	18/09/2018	18/09/2018	18/09/2018	18/09/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0	0	0	0	0
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.1	0.1	0.1	0.1	0.1
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	0.2	0.2	0.2	0.2	0.2
Surrogate p-Terphenyl-d_{14}	%	86	90	88	94	86

PAHs in Soil						
Our Reference		14823-33	14823-36	14823-40	14823-44	14823-46
Your Reference	UNITS	TP23_0.1	TP25_0.1	TP27_0.1	TP29_0.1	TP31_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	18/09/2018	18/09/2018	18/09/2018	18/09/2018	18/09/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0	0	0	0	0
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.1	0.1	0.1	0.1	0.1
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	0.2	0.2	0.2	0.2	0.2
Surrogate p-Terphenyl-d_{14}	%	94	92	92	94	86

PAHs in Soil						
Our Reference		14823-50	14823-56	14823-58	14823-60	14823-64
Your Reference	UNITS	BH04_0.1	BH34_0.1	BH35_0.1	BH36_0.1	BH38_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	18/09/2018	18/09/2018	18/09/2018	15/09/2018	15/09/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0	0	0	0	0
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.1	0.1	0.1	0.1	0.1
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	0.2	0.2	0.2	0.2	0.2
Surrogate p-Terphenyl-d_{14}	%	100	80	86	90	88

PAHs in Soil						
Our Reference		14823-68	14823-72	14823-76	14823-84	14823-86
Your Reference	UNITS	BH40_0.1	BH42_0.1	BH44_0.1	BH48_0.1	BH49_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	15/09/2018	15/09/2018	15/09/2018	15/09/2018	15/09/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	0	0	0	0	0
Benzo(a)pyrene TEQ calc (Half)	mg/kg	0.1	0.1	0.1	0.1	0.1
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	0.2	0.2	0.2	0.2	0.2
Surrogate p-Terphenyl-d_{14}	%	82	86	96	88	84

Speciated Phenols in Soil						
Our Reference	UNITS	14823-1	14823-16	14823-29	14823-44	14823-58
Your Reference		TP01_0.1	TP13_0.1	TP21_0.1	TP29_0.1	BH35_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	18/09/2018	18/09/2018	18/09/2018	18/09/2018	18/09/2018
Phenol	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
2-Chlorophenol	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
2-Methylphenol	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
3/4-Methylphenol	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
2-Nitrophenol	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
2,4-Dimethylphenol	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
2,4-Dichlorophenol	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
2,6-Dichlorophenol	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
2,4,5-Trichlorophenol	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
2,4,6-Trichlorophenol	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
2,4-Dinitrophenol	mg/kg	<2	<2	<2	<2	<2
4-Nitrophenol	mg/kg	<4	<4	<4	<4	<4
2,3,4,6-Tetrachlorophenol	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pentachlorophenol	mg/kg	<1	<1	<1	<1	<1
4-Chloro-3-Methylphenol	mg/kg	<2	<2	<2	<2	<2
Total +ve Cresols	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Total +ve Phenols	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate Phenol-d_6	%	88	90	86	90	80

OCP in Soil - NEPM						
Our Reference		14823-1	14823-16	14823-29	14823-44	14823-58
Your Reference	UNITS	TP01_0.1	TP13_0.1	TP21_0.1	TP29_0.1	BH35_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	18/09/2018	18/09/2018	18/09/2018	18/09/2018	18/09/2018
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobenzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve reported Aldrin + Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve reported DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Toxaphene	mg/kg	<2	<2	<2	<2	<2
Surrogate p-Terphenyl-d_{14}	%	90	86	86	94	86

OP in Soil - NEPM						
Our Reference		14823-1	14823-16	14823-29	14823-44	14823-58
Your Reference	UNITS	TP01_0.1	TP13_0.1	TP21_0.1	TP29_0.1	BH35_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	18/09/2018	18/09/2018	18/09/2018	18/09/2018	18/09/2018
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	90	86	86	94	86

PCBs in Soil						
Our Reference		14823-1	14823-16	14823-29	14823-44	14823-53
Your Reference	UNITS	TP01_0.1	TP13_0.1	TP21_0.1	TP29_0.1	BH16_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	18/09/2018	18/09/2018	18/09/2018	18/09/2018	18/09/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	90	86	86	94	96

PCBs in Soil		
Our Reference		14823-58
Your Reference	UNITS	BH35_0.1
Date Sampled		06/09/2018
Type of sample		Soil
Date extracted	-	12/09/2018
Date analysed	-	18/09/2018
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate p-Terphenyl-d_{14}	%	86

Synthetic Pyrethroids - NEPM						
Our Reference		14823-1	14823-16	14823-29	14823-44	14823-58
Your Reference	UNITS	TP01_0.1	TP13_0.1	TP21_0.1	TP29_0.1	BH35_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	18/09/2018	18/09/2018	18/09/2018	18/09/2018	18/09/2018
Bifenthrin	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Triazine Herbicides in Soil						
Our Reference		14823-1	14823-16	14823-29	14823-44	14823-58
Your Reference	UNITS	TP01_0.1	TP13_0.1	TP21_0.1	TP29_0.1	BH35_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	18/09/2018	18/09/2018	18/09/2018	18/09/2018	18/09/2018
Atrazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Phenoxy Acid Herbicides in Soil						
Our Reference		14823-1	14823-16	14823-29	14823-44	14823-58
Your Reference	UNITS	TP01_0.1	TP13_0.1	TP21_0.1	TP29_0.1	BH35_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date Extracted	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	15/09/2018	15/09/2018	15/09/2018	15/09/2018	15/09/2018
Clopyralid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3,5-Dichlorobenzoic acid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
o-Chlorophenoxy acetic acid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-CPA	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dicamba	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Mecoprop	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPA	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloroprop	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-D	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoxynil	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Triclopyr	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-TP (Silvex)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-T	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPB	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dinoseb	mg/kg	<1	<1	<1	<1	<1
2.4-DB	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ioxynil	mg/kg	<1	<1	<1	<1	<1
Picloram	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
DCPA (Chlorthal) Diacid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acifluorfen	mg/kg	<2	<2	<2	<2	<2
2,4,6-T	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-D	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate: 2,4-DCPA	%	98	93	95	87	92

NEPM screen metals in soil						
Our Reference	UNITS	14823-1	14823-2	14823-3	14823-5	14823-7
Your Reference		TP01_0.1	TP02_0.1	TP05_0.1	TP06_0.1	TP07_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Arsenic	mg/kg	19	<4	9	14	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	27	16	24	7	13
Copper	mg/kg	4	6	7	7	2
Lead	mg/kg	10	9	7	11	8
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	5	5	5	4
Zinc	mg/kg	8	21	4	14	7
Beryllium	mg/kg	<1	[NA]	[NA]	[NA]	[NA]
Boron	mg/kg	<3	[NA]	[NA]	[NA]	[NA]
Cobalt	mg/kg	2	[NA]	[NA]	[NA]	[NA]
Manganese	mg/kg	43	[NA]	[NA]	[NA]	[NA]
Selenium	mg/kg	<2	[NA]	[NA]	[NA]	[NA]

NEPM screen metals in soil						
Our Reference	UNITS	14823-9	14823-10	14823-12	14823-14	14823-16
Your Reference		TP08_0.1	TP10_0.1	TP11_0.1	TP12_0.1	TP13_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Arsenic	mg/kg	<4	<4	<4	10	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	80	100	78	17	11
Copper	mg/kg	22	31	26	6	1
Lead	mg/kg	10	9	7	17	8
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	26	82	51	7	3
Zinc	mg/kg	27	38	26	10	4
Beryllium	mg/kg	[NA]	[NA]	[NA]	[NA]	<1
Boron	mg/kg	[NA]	[NA]	[NA]	[NA]	<3
Cobalt	mg/kg	[NA]	[NA]	[NA]	[NA]	2
Manganese	mg/kg	[NA]	[NA]	[NA]	[NA]	42
Selenium	mg/kg	[NA]	[NA]	[NA]	[NA]	<2

NEPM screen metals in soil						
Our Reference		14823-18	14823-20	14823-21	14823-23	14823-25
Your Reference	UNITS	TP14_0.1	TP15_0.1	TP17_0.1	TP18_0.1	TP19_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Arsenic	mg/kg	<4	<4	14	<4	24
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	18	76	22	34	12
Copper	mg/kg	4	27	5	4	1
Lead	mg/kg	12	7	9	10	7
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	10	42	6	7	3
Zinc	mg/kg	19	28	9	8	3

NEPM screen metals in soil						
Our Reference		14823-27	14823-29	14823-31	14823-33	14823-35
Your Reference	UNITS	TP20_0.1	TP21_0.1	TP22_0.1	TP23_0.1	TP24_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Arsenic	mg/kg	<4	6	5	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	8	10	33	14	9
Copper	mg/kg	4	5	12	3	3
Lead	mg/kg	8	9	9	9	7
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	5	11	4	3
Zinc	mg/kg	12	17	13	4	4
Beryllium	mg/kg	[NA]	<1	[NA]	[NA]	[NA]
Boron	mg/kg	[NA]	<3	[NA]	[NA]	[NA]
Cobalt	mg/kg	[NA]	2	[NA]	[NA]	[NA]
Manganese	mg/kg	[NA]	71	[NA]	[NA]	[NA]
Selenium	mg/kg	[NA]	<2	[NA]	[NA]	[NA]

NEPM screen metals in soil						
Our Reference		14823-36	14823-38	14823-40	14823-42	14823-44
Your Reference	UNITS	TP25_0.1	TP26_0.1	TP27_0.1	TP28_0.1	TP29_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Arsenic	mg/kg	<4	<4	6	6	17
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	20	27	17	16	26
Copper	mg/kg	4	6	2	2	5
Lead	mg/kg	29	8	14	9	9
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	9	7	3	3	6
Zinc	mg/kg	20	12	3	6	19
Beryllium	mg/kg	[NA]	[NA]	[NA]	[NA]	<1
Boron	mg/kg	[NA]	[NA]	[NA]	[NA]	<3
Cobalt	mg/kg	[NA]	[NA]	[NA]	[NA]	8
Manganese	mg/kg	[NA]	[NA]	[NA]	[NA]	77
Selenium	mg/kg	[NA]	[NA]	[NA]	[NA]	<2

NEPM screen metals in soil						
Our Reference		14823-46	14823-48	14823-50	14823-54	14823-56
Your Reference	UNITS	TP31_0.1	TP32_0.1	BH04_0.1	BH33_0.1	BH34_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Arsenic	mg/kg	5	<4	<4	17	31
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	9	110	41	24
Copper	mg/kg	3	4	53	18	12
Lead	mg/kg	11	13	11	37	35
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	5	74	19	10
Zinc	mg/kg	8	14	94	290	59

NEPM screen metals in soil						
Our Reference		14823-58	14823-60	14823-62	14823-64	14823-66
Your Reference	UNITS	BH35_0.1	BH36_0.1	BH37_0.1	BH38_0.1	BH39_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Arsenic	mg/kg	4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	26	20	77	120	170
Copper	mg/kg	5	4	24	33	48
Lead	mg/kg	12	29	7	10	8
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	4	57	71	120
Zinc	mg/kg	23	14	20	70	61
Beryllium	mg/kg	<1	[NA]	[NA]	[NA]	[NA]
Boron	mg/kg	<3	[NA]	[NA]	[NA]	[NA]
Cobalt	mg/kg	2	[NA]	[NA]	[NA]	[NA]
Manganese	mg/kg	40	[NA]	[NA]	[NA]	[NA]
Selenium	mg/kg	<2	[NA]	[NA]	[NA]	[NA]

NEPM screen metals in soil						
Our Reference		14823-68	14823-70	14823-72	14823-74	14823-76
Your Reference	UNITS	BH40_0.1	BH41_0.1	BH42_0.1	BH43_0.1	BH44_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Arsenic	mg/kg	<4	<4	<4	<4	54
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	130	240	120	160	42
Copper	mg/kg	23	68	45	39	16
Lead	mg/kg	14	7	7	8	16
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	53	230	67	92	23
Zinc	mg/kg	58	140	170	54	27

NEPM screen metals in soil						
Our Reference		14823-78	14823-80	14823-82	14823-84	14823-86
Your Reference	UNITS	BH45_0.1	BH46_0.1	BH47_0.1	BH48_0.1	BH49_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Arsenic	mg/kg	7	[NA]	[NA]	7	5
Cadmium	mg/kg	<0.4	[NA]	[NA]	<0.4	<0.4
Chromium	mg/kg	36	[NA]	[NA]	51	52
Copper	mg/kg	12	[NA]	[NA]	16	4
Lead	mg/kg	3	[NA]	[NA]	7	6
Mercury	mg/kg	<0.1	[NA]	[NA]	<0.1	<0.1
Nickel	mg/kg	18	[NA]	[NA]	22	4
Zinc	mg/kg	14	[NA]	[NA]	24	22
Phosphorus	mg/kg	[NA]	4,100	430	320	93

NEPM screen metals in soil					
Our Reference		14823-88	14823-92	14823-93	14823-94
Your Reference	UNITS	BH50_0.1	Dup01	Dup02	Dup03
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil
Date digested	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Arsenic	mg/kg	7	<4	85	7
Cadmium	mg/kg	<0.4	<0.4	0.4	<0.4
Chromium	mg/kg	64	140	45	20
Copper	mg/kg	21	23	16	13
Lead	mg/kg	7	15	12	5
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	26	52	21	10
Zinc	mg/kg	59	58	30	34
Phosphorus	mg/kg	850	[NA]	[NA]	[NA]

Misc Inorg - soil NEPM						
Our Reference		14823-1	14823-2	14823-3	14823-5	14823-7
Your Reference	UNITS	TP01_0.1	TP02_0.1	TP05_0.1	TP06_0.1	TP07_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Free Cyanide in soil	mg/kg	<0.5	[NA]	[NA]	[NA]	[NA]
Hexavalent Chromium, Cr^{6+}	mg/kg	<1	[NA]	[NA]	[NA]	[NA]
pH 1:5 soil:water	pH Units	[NA]	5.7	6.2	5.1	5.7

Misc Inorg - soil NEPM						
Our Reference		14823-10	14823-12	14823-14	14823-16	14823-18
Your Reference	UNITS	TP10_0.1	TP11_0.1	TP12_0.1	TP13_0.1	TP14_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Free Cyanide in soil	mg/kg	[NA]	[NA]	[NA]	<0.5	[NA]
Hexavalent Chromium, Cr^{6+}	mg/kg	[NA]	[NA]	[NA]	<1	[NA]
pH 1:5 soil:water	pH Units	6.0	6.7	5.8	[NA]	5.9

Misc Inorg - soil NEPM						
Our Reference		14823-20	14823-21	14823-23	14823-25	14823-27
Your Reference	UNITS	TP15_0.1	TP17_0.1	TP18_0.1	TP19_0.1	TP20_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
pH 1:5 soil:water	pH Units	6.3	6.2	5.6	5.8	5.7

Misc Inorg - soil NEPM						
Our Reference		14823-29	14823-31	14823-33	14823-35	14823-36
Your Reference	UNITS	TP21_0.1	TP22_0.1	TP23_0.1	TP24_0.1	TP25_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Free Cyanide in soil	mg/kg	<0.5	[NA]	[NA]	[NA]	[NA]
Hexavalent Chromium, Cr^{6+}	mg/kg	<1	[NA]	[NA]	[NA]	[NA]
pH 1:5 soil:water	pH Units	[NA]	6.3	5.9	5.6	4.5

Misc Inorg - soil NEPM

Our Reference		14823-38	14823-40	14823-42	14823-44	14823-46
Your Reference	UNITS	TP26_0.1	TP27_0.1	TP28_0.1	TP29_0.1	TP31_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Free Cyanide in soil	mg/kg	[NA]	[NA]	[NA]	<0.5	[NA]
Hexavalent Chromium, Cr^{6+}	mg/kg	[NA]	[NA]	[NA]	<1	[NA]
pH 1:5 soil:water	pH Units	6.5	6.0	5.7	[NA]	5.5

Misc Inorg - soil NEPM

Our Reference		14823-48	14823-50	14823-54	14823-56	14823-58
Your Reference	UNITS	TP32_0.1	BH04_0.1	BH33_0.1	BH34_0.1	BH35_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Free Cyanide in soil	mg/kg	[NA]	[NA]	[NA]	[NA]	.0.0
Hexavalent Chromium, Cr^{6+}	mg/kg	[NA]	[NA]	[NA]	[NA]	<1
pH 1:5 soil:water	pH Units	5.4	7.6	6.3	6.6	[NA]

Misc Inorg - soil NEPM

Our Reference		14823-60	14823-62	14823-64	14823-66	14823-68
Your Reference	UNITS	BH36_0.1	BH37_0.1	BH38_0.1	BH39_0.1	BH40_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
pH 1:5 soil:water	pH Units	5.6	5.3	6.1	6.2	6.6

Misc Inorg - soil NEPM

Our Reference		14823-70	14823-72	14823-74	14823-76	14823-78
Your Reference	UNITS	BH41_0.1	BH42_0.1	BH43_0.1	BH44_0.1	BH45_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
pH 1:5 soil:water	pH Units	5.0	5.7	5.1	4.9	8.5

Misc Inorg - soil NEPM						
Our Reference		14823-80	14823-82	14823-84	14823-86	14823-88
Your Reference	UNITS	BH46_0.1	BH47_0.1	BH48_0.1	BH49_0.1	BH50_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
pH 1:5 soil:water	pH Units	7.8	5.3	4.4	4.3	4.9
TKN as N in soil	mg/kg	2,600	1,600	1,100	710	6,100
Nitrate as N in soil	mg/kg	2.2	<0.5	<0.5	7.7	1.3
Organic Nitrogen as N	mg/kg	2,600	1,600	1,100	700	6,100
Ammonia as N in soil	mg/kg	18	9.5	4.8	7.0	37
Phosphate as P in soil	mg/kg	12	0.9	0.5	<0.5	2
Nitrite as N in soil	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Moisture						
Our Reference		14823-1	14823-2	14823-3	14823-5	14823-7
Your Reference	UNITS	TP01_0.1	TP02_0.1	TP05_0.1	TP06_0.1	TP07_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Moisture	%	22	15	21	13	17

Moisture						
Our Reference		14823-9	14823-10	14823-12	14823-14	14823-16
Your Reference	UNITS	TP08_0.1	TP10_0.1	TP11_0.1	TP12_0.1	TP13_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Moisture	%	29	18	16	25	15

Moisture						
Our Reference		14823-18	14823-20	14823-21	14823-23	14823-25
Your Reference	UNITS	TP14_0.1	TP15_0.1	TP17_0.1	TP18_0.1	TP19_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Moisture	%	20	29	19	24	16

Moisture						
Our Reference		14823-27	14823-29	14823-31	14823-33	14823-35
Your Reference	UNITS	TP20_0.1	TP21_0.1	TP22_0.1	TP23_0.1	TP24_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Moisture	%	22	28	24	22	17

Moisture						
Our Reference		14823-36	14823-38	14823-40	14823-42	14823-44
Your Reference	UNITS	TP25_0.1	TP26_0.1	TP27_0.1	TP28_0.1	TP29_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Moisture	%	22	18	12	24	19

Moisture						
Our Reference		14823-46	14823-48	14823-50	14823-52	14823-53
Your Reference	UNITS	TP31_0.1	TP32_0.1	BH04_0.1	BH09_0.1	BH16_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Moisture	%	25	28	26	8.2	62

Moisture						
Our Reference		14823-54	14823-56	14823-58	14823-60	14823-62
Your Reference	UNITS	BH33_0.1	BH34_0.1	BH35_0.1	BH36_0.1	BH37_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Moisture	%	27	17	9.8	15	17

Moisture						
Our Reference		14823-64	14823-66	14823-68	14823-70	14823-72
Your Reference	UNITS	BH38_0.1	BH39_0.1	BH40_0.1	BH41_0.1	BH42_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Moisture	%	21	21	21	25	30

Moisture						
Our Reference		14823-74	14823-76	14823-78	14823-80	14823-82
Your Reference	UNITS	BH43_0.1	BH44_0.1	BH45_0.1	BH46_0.1	BH47_0.1
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Moisture	%	20	14	14	20	11

Moisture						
Our Reference		14823-84	14823-86	14823-88	14823-90	14823-92
Your Reference	UNITS	BH48_0.1	BH49_0.1	BH50_0.1	BH51_0.1	Dup01
Date Sampled		06/09/2018	06/09/2018	06/09/2018	06/09/2018	06/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	12/09/2018	12/09/2018	12/09/2018	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Moisture	%	21	19	22	24	22

Moisture			
Our Reference		14823-93	14823-94
Your Reference	UNITS	Dup02	Dup03
Date Sampled		06/09/2018	06/09/2018
Type of sample		Soil	Soil
Date prepared	-	12/09/2018	12/09/2018
Date analysed	-	13/09/2018	13/09/2018
Moisture	%	13	12

vTRH(C6-C10)/BTEXN in Water			
Our Reference		14823-95	14823-96
Your Reference	UNITS	Trip	Rinsate
Date Sampled		06/09/2018	06/09/2018
Type of sample		Water	Water
Date extracted	-	10/09/2018	10/09/2018
Date analysed	-	10/09/2018	10/09/2018
TRH C_6 - C_9	µg/L	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10
Benzene	µg/L	<1	<1
Toluene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
o-xylene	µg/L	<1	<1
Naphthalene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	101	104
Surrogate toluene-d8	%	99	100
Surrogate 4-BFB	%	96	96

TRH Water(C10-C40) NEPM		
Our Reference		14823-96
Your Reference	UNITS	Rinsate
Date Sampled		06/09/2018
Type of sample		Water
Date extracted	-	11/09/2018
Date analysed	-	12/09/2018
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	85

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 12 hours.
Inorg-013	Cyanide - total determined colourimetrically after distillation, based on APHA latest edition, 4500-CN_C,E. Free cyanide determined colourimetrically after filtration and confirmed by diffusion. Solids are extracted in a caustic media prior to distillation and analysis.
Inorg-024	Hexavalent Chromium (Cr6+) - determined colourimetrically by discrete analyser.
Inorg-055	Nitrate - determined colourimetrically. Soils are analysed following a water extraction.
Inorg-055	Nitrite - determined colourimetrically based on APHA latest edition NO2- B. Soils are analysed following a water extraction.
Inorg-057	Ammonia - determined colourimetrically based on EPA350.1 and APHA latest edition 4500-NH3 F, Soils are analysed following a KCl extraction.
Inorg-060	Phosphate determined colourimetrically based on EPA365.1 and APHA latest edition 4500 P E. Soils are analysed following a water extraction.
Inorg-062	TKN - determined colourimetrically based on APHA latest edition 4500 Norg.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Note, For OCs the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Note, the Total +ve Cresols or Phenols PQL is reflective of the lowest individual PQL and is therefore" Total +ve Cresols or Phenols" is simply a sum of the positive individual Cresols or Phenols.

Method ID	Methodology Summary
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD or GC-MS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
ORG-031	Acid herbicides and speciated phenols in soil by DCM:Acetone extraction with derivatisation and determination by GC-MS. Haloacetic acids in waters are derivatised and analysed by GC-ECD. Acid herbicides, speciated phenols, carbamates and ureas in water by DCM extraction with derivatisation and determination by GC-MS. Analysed by MPL, NATA accrediation 2901.

QUALITY CONTROL: VOCs in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	14823-29
Date extracted	-			12/09/2018	1	12/09/2018	12/09/2018		12/09/2018	12/09/2018
Date analysed	-			12/09/2018	1	12/09/2018	12/09/2018		12/09/2018	13/09/2018
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	72	65
cis-1,2-dichloroethene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
bromochloromethane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
chloroform	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	74	68
2,2-dichloropropane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	74	67
1,1,1-trichloroethane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	72	65
1,1-dichloropropene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-014	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
dibromomethane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
trichloroethene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	80	74
bromodichloromethane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	73	67
trans-1,3-dichloropropene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
dibromochloromethane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	74	66
1,2-dibromoethane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Tetrachloroethene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	76	68
1,1,1,2-tetrachloroethane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
chlorobenzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
bromoform	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
m+p-xylene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
styrene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
o-Xylene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	14823-29
1,2,3-trichloropropane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
isopropylbenzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
bromobenzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
n-propyl benzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
2-chlorotoluene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
4-chlorotoluene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
tert-butyl benzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
sec-butyl benzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
4-isopropyl toluene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
n-butyl benzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	0.5	Org-014	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-014	101	1	100	98	2	100	98
Surrogate aaa-Trifluorotoluene	%		Org-014	110	1	85	103	19	115	88
Surrogate Toluene-d_8	%		Org-014	99	1	98	98	0	100	98
Surrogate 4-Bromofluorobenzene	%		Org-014	86	1	87	86	1	89	89

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	14823-29
Date extracted	-			12/09/2018	1	12/09/2018	12/09/2018		12/09/2018	12/09/2018
Date analysed	-			12/09/2018	1	12/09/2018	12/09/2018		12/09/2018	13/09/2018
vTRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	77	75
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	77	75
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	81	78
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	75	75
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	75	74
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	74	74
Naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	116	1	88	105	18	107	105

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	14823-90
Date extracted	-			[NT]	48	12/09/2018	12/09/2018		12/09/2018	12/09/2018
Date analysed	-			[NT]	48	13/09/2018	13/09/2018		14/09/2018	14/09/2018
vTRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	48	<25	<25	0	90	101
Benzene	mg/kg	0.2	Org-016	[NT]	48	<0.2	<0.2	0	93	105
Toluene	mg/kg	0.5	Org-016	[NT]	48	<0.5	<0.5	0	94	105
Ethylbenzene	mg/kg	1	Org-016	[NT]	48	<1	<1	0	89	98
m+p-xylene	mg/kg	2	Org-016	[NT]	48	<2	<2	0	88	98
o-Xylene	mg/kg	1	Org-016	[NT]	48	<1	<1	0	89	98
Naphthalene	mg/kg	1	Org-014	[NT]	48	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	48	94	109	15	112	98

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	78	12/09/2018	12/09/2018		[NT]	[NT]
Date analysed	-			[NT]	78	14/09/2018	14/09/2018		[NT]	[NT]
vTRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	78	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	78	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	78	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	78	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	78	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	78	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-014	[NT]	78	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	78	114	106	7	[NT]	[NT]

QUALITY CONTROL: TRH Soil C10-C40 NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	14823-54
Date extracted	-			12/09/2018	16	12/09/2018	12/09/2018		12/09/2018	12/09/2018
Date analysed	-			13/09/2018	16	12/09/2018	12/09/2018		12/09/2018	13/09/2018
TRH $>C_{10}-C_{16}$	mg/kg	50	Org-003	<50	16	<50	<50	0	73	78
TRH $>C_{16}-C_{34}$	mg/kg	100	Org-003	<100	16	<100	<100	0	81	67
TRH $>C_{34}-C_{40}$	mg/kg	100	Org-003	<100	16	<100	<100	0	67	66
Surrogate o-Terphenyl	%		Org-003	88	16	92	91	1	89	84

QUALITY CONTROL: TRH Soil C10-C40 NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	14823-88
Date extracted	-			[NT]	44	12/09/2018	12/09/2018		12/09/2018	12/09/2018
Date analysed	-			[NT]	44	13/09/2018	13/09/2018		13/09/2018	14/09/2018
TRH $>C_{10}-C_{16}$	mg/kg	50	Org-003	[NT]	44	<50	<50	0	74	77
TRH $>C_{16}-C_{34}$	mg/kg	100	Org-003	[NT]	44	<100	<100	0	67	60
TRH $>C_{34}-C_{40}$	mg/kg	100	Org-003	[NT]	44	<100	<100	0	67	#
Surrogate o-Terphenyl	%		Org-003	[NT]	44	88	88	0	79	85

QUALITY CONTROL: TRH Soil C10-C40 NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	70	12/09/2018	12/09/2018		[NT]	[NT]
Date analysed	-			[NT]	70	13/09/2018	13/09/2018		[NT]	[NT]
TRH $>C_{10}-C_{16}$	mg/kg	50	Org-003	[NT]	70	<50	<50	0	[NT]	[NT]
TRH $>C_{16}-C_{34}$	mg/kg	100	Org-003	[NT]	70	<100	<100	0	[NT]	[NT]
TRH $>C_{34}-C_{40}$	mg/kg	100	Org-003	[NT]	70	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	70	83	86	4	[NT]	[NT]

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QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	14823-58
Date extracted	-			12/09/2018	16	12/09/2018	12/09/2018		12/09/2018	12/09/2018
Date analysed	-			18/09/2018	16	18/09/2018	18/09/2018		18/09/2018	18/09/2018
Naphthalene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	72	66
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	60	66
Acenaphthene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	84	63
Phenanthrene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	72	66
Anthracene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	60	63
Pyrene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	60	66
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	76	72
Benzo(b,j&k)fluoranthene	mg/kg	0.2	Org-012	<0.2	16	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	16	<0.05	<0.05	0	64	75
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	88	16	86	90	5	88	84

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	14823-86
Date extracted	-			[NT]	44	12/09/2018	12/09/2018		12/09/2018	12/09/2018
Date analysed	-			[NT]	44	18/09/2018	18/09/2018		15/09/2018	15/09/2018
Naphthalene	mg/kg	0.1	Org-012	[NT]	44	<0.1	<0.1	0	72	74
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	44	<0.1	<0.1	0	76	84
Acenaphthene	mg/kg	0.1	Org-012	[NT]	44	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	44	<0.1	<0.1	0	72	75
Phenanthrene	mg/kg	0.1	Org-012	[NT]	44	<0.1	<0.1	0	72	74
Anthracene	mg/kg	0.1	Org-012	[NT]	44	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	44	<0.1	<0.1	0	64	64
Pyrene	mg/kg	0.1	Org-012	[NT]	44	<0.1	<0.1	0	64	64
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	44	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	44	<0.1	<0.1	0	76	75
Benzo(b,j&k)fluoranthene	mg/kg	0.2	Org-012	[NT]	44	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	44	<0.05	<0.05	0	80	91
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	44	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	44	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	44	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	[NT]	44	94	90	4	84	84

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	72	12/09/2018	12/09/2018		[NT]	[NT]
Date analysed	-			[NT]	72	15/09/2018	15/09/2018		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	72	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	72	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	72	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	72	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	72	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	72	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	72	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	72	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	72	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	72	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j&k)fluoranthene	mg/kg	0.2	Org-012	[NT]	72	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	72	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	72	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	72	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	72	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	[NT]	72	86	86	0	[NT]	[NT]

QUALITY CONTROL: Speciated Phenols in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	14823-58
Date extracted	-		Org-012	12/09/2018	16	12/09/2018	12/09/2018		12/09/2018	12/09/2018
Date analysed	-		Org-012	18/09/2018	16	18/09/2018	18/09/2018		18/09/2018	18/09/2018
Phenol	mg/kg	0.2	Org-012	<0.2	16	<0.2	<0.2	0	80	66
2-Chlorophenol	mg/kg	0.2	Org-012	<0.2	16	<0.2	<0.2	0	76	66
2-Methylphenol	mg/kg	0.2	Org-012	<0.2	16	<0.2	<0.2	0	80	66
3/4-Methylphenol	mg/kg	0.4	Org-012	<0.4	16	<0.4	<0.4	0	[NT]	[NT]
2-Nitrophenol	mg/kg	0.2	Org-012	<0.2	16	<0.2	<0.2	0	[NT]	[NT]
2,4-Dimethylphenol	mg/kg	0.2	Org-012	<0.2	16	<0.2	<0.2	0	[NT]	[NT]
2,4-Dichlorophenol	mg/kg	0.2	Org-012	<0.2	16	<0.2	<0.2	0	[NT]	[NT]
2,6-Dichlorophenol	mg/kg	0.2	Org-012	<0.2	16	<0.2	<0.2	0	84	75
2,4,5-Trichlorophenol	mg/kg	0.2	Org-012	<0.2	16	<0.2	<0.2	0	[NT]	[NT]
2,4,6-Trichlorophenol	mg/kg	0.2	Org-012	<0.2	16	<0.2	<0.2	0	[NT]	[NT]
2,4-Dinitrophenol	mg/kg	2	Org-012	<2	16	<2	<2	0	[NT]	[NT]
4-Nitrophenol	mg/kg	4	Org-012	<4	16	<4	<4	0	76	79
2,3,4,6-Tetrachlorophenol	mg/kg	0.2	Org-012	<0.2	16	<0.2	<0.2	0	[NT]	[NT]
Pentachlorophenol	mg/kg	1	Org-012	<1	16	<1	<1	0	[NT]	[NT]
4-Chloro-3-Methylphenol	mg/kg	2	Org-012	<2	16	<2	<2	0	[NT]	[NT]
Surrogate Phenol-d_6	%		Org-012	88	16	90	94	4	94	94

QUALITY CONTROL: OCP in Soil - NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	14823-58
Date extracted	-			12/09/2018	16	12/09/2018	12/09/2018		12/09/2018	12/09/2018
Date analysed	-			18/09/2018	16	18/09/2018	18/09/2018		18/09/2018	18/09/2018
alpha-BHC	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	68	66
Hexachlorobenzene	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	64	63
gamma-BHC	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	64	63
delta-BHC	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	60	83
Heptachlor Epoxide	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	64	63
gamma-Chlordane	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	60	66
alpha-chlordane	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	60	66
Dieldrin	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	60	66
Endrin	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	72	63
Endrin Aldehyde	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	60	96
Methoxychlor	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.5	Org-012	<0.5	16	<0.5	<0.5	0	[NT]	[NT]
Toxaphene	mg/kg	2	Org-012	<2	16	<2	<2	0	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	88	16	86	90	5	88	84

QUALITY CONTROL: OP in Soil - NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	14823-58
Date extracted	-			12/09/2018	16	12/09/2018	12/09/2018		12/09/2018	12/09/2018
Date analysed	-			18/09/2018	16	18/09/2018	18/09/2018		18/09/2018	18/09/2018
Chlorpyrifos	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	68	72
Surrogate p-Terphenyl-d_{14}	%		Org-012	88	16	86	90	5	88	84

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	14823-58
Date extracted	-			12/09/2018	16	12/09/2018	12/09/2018		12/09/2018	12/09/2018
Date analysed	-			18/09/2018	16	18/09/2018	18/09/2018		18/09/2018	18/09/2018
Aroclor 1016	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	90	78
Aroclor 1260	mg/kg	0.1	Org-012	<0.1	16	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%		Org-012	88	16	86	90	5	88	84

QUALITY CONTROL: Synthetic Pyrethroids - NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	14823-58
Date extracted	-			12/09/2018	16	12/09/2018	12/09/2018		12/09/2018	12/09/2018
Date analysed	-			18/09/2018	16	18/09/2018	18/09/2018		18/09/2018	18/09/2018
Bifenthrin	mg/kg	0.5	Org-012	<0.5	16	<0.5	<0.5	0	72	116

QUALITY CONTROL: Triazine Herbicides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	14823-58
Date extracted	-			12/09/2018	16	12/09/2018	12/09/2018		12/09/2018	12/09/2018
Date analysed	-			18/09/2018	16	18/09/2018	18/09/2018		18/09/2018	18/09/2018
Atrazine	mg/kg	0.5	Org-012	<0.5	16	<0.5	<0.5	0	68	72

QUALITY CONTROL: Phenoxy Acid Herbicides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Clopyralid	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
3,5-Dichlorobenzoic acid	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
o-Chlorophenoxy acetic acid	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-CPA	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dicamba	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	91	[NT]
Mecoprop	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	95	[NT]
MCPA	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	96	[NT]
Dichloroprop	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4-D	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	89	[NT]
Bromoxynil	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Triclopyr	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4,5-TP (Silvex)	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4,5-T	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	83	[NT]
MCPB	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dinoseb	mg/kg	1	ORG-031	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2.4-DB	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ioxynil	mg/kg	1	ORG-031	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Picloram	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
DCPA (Chlorthal) Diacid	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acifluorfen	mg/kg	2	ORG-031	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4,6-T	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,6-D	mg/kg	0.5	ORG-031	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate: 2,4-DCPA	%		ORG-031	100	[NT]	[NT]	[NT]	[NT]	87	[NT]

QUALITY CONTROL: NEPM screen metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	14823-9
Date digested	-			13/09/2018	3	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Date analysed	-			13/09/2018	3	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	3	9	9	0	98	#
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	3	<0.4	<0.4	0	99	81
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	3	24	21	13	95	92
Copper	mg/kg	1	Metals-020 ICP-AES	<1	3	7	4	55	101	106
Lead	mg/kg	1	Metals-020 ICP-AES	<1	3	7	9	25	94	75
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	3	<0.1	<0.1	0	119	112
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	3	5	6	18	96	86
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	3	4	4	0	95	77
Beryllium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	108	92
Boron	mg/kg	3	Metals-020 ICP-AES	<3	[NT]	[NT]	[NT]	[NT]	111	94
Cobalt	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	99	84
Manganese	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	103	78
Selenium	mg/kg	2	Metals-020 ICP-AES	<2	[NT]	[NT]	[NT]	[NT]	100	#
Phosphorus	mg/kg	10	Metals-020 ICP-AES	<10	[NT]	[NT]	[NT]	[NT]	89	116

Client Reference: 33980 - 30-70 Rowes Lane Wallan

QUALITY CONTROL: NEPM screen metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	14823-50
Date digested	-			[NT]	21	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Date analysed	-			[NT]	21	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Arsenic	mg/kg	4	Metals-020 ICP-AES	[NT]	21	14	16	13	98	81
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	[NT]	21	<0.4	<0.4	0	99	80
Chromium	mg/kg	1	Metals-020 ICP-AES	[NT]	21	22	35	46	95	77
Copper	mg/kg	1	Metals-020 ICP-AES	[NT]	21	5	5	0	101	111
Lead	mg/kg	1	Metals-020 ICP-AES	[NT]	21	9	11	20	94	76
Mercury	mg/kg	0.1	Metals-021 CV-AAS	[NT]	21	<0.1	<0.1	0	119	93
Nickel	mg/kg	1	Metals-020 ICP-AES	[NT]	21	6	8	29	96	110
Zinc	mg/kg	1	Metals-020 ICP-AES	[NT]	21	9	11	20	95	72
Beryllium	mg/kg	1	Metals-020 ICP-AES	[NT]	[NT]	[NT]	[NT]	[NT]	108	90
Boron	mg/kg	3	Metals-020 ICP-AES	[NT]	[NT]	[NT]	[NT]	[NT]	111	93
Cobalt	mg/kg	1	Metals-020 ICP-AES	[NT]	[NT]	[NT]	[NT]	[NT]	99	87
Manganese	mg/kg	1	Metals-020 ICP-AES	[NT]	[NT]	[NT]	[NT]	[NT]	103	79
Selenium	mg/kg	2	Metals-020 ICP-AES	[NT]	[NT]	[NT]	[NT]	[NT]	100	78
Phosphorus	mg/kg	10	Metals-020 ICP-AES	[NT]	[NT]	[NT]	[NT]	[NT]	89	##

Client Reference: 33980 - 30-70 Rowes Lane Wallan

QUALITY CONTROL: NEPM screen metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	14823-92
Date digested	-			[NT]	38	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Date analysed	-			[NT]	38	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Arsenic	mg/kg	4	Metals-020 ICP-AES	[NT]	38	<4	<4	0	100	#
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	[NT]	38	<0.4	<0.4	0	101	74
Chromium	mg/kg	1	Metals-020 ICP-AES	[NT]	38	27	34	23	98	72
Copper	mg/kg	1	Metals-020 ICP-AES	[NT]	38	6	6	0	99	101
Lead	mg/kg	1	Metals-020 ICP-AES	[NT]	38	8	9	12	98	70
Mercury	mg/kg	0.1	Metals-021 CV-AAS	[NT]	38	<0.1	<0.1	0	108	95
Nickel	mg/kg	1	Metals-020 ICP-AES	[NT]	38	7	9	25	99	84
Zinc	mg/kg	1	Metals-020 ICP-AES	[NT]	38	12	13	8	98	75
Beryllium	mg/kg	1	Metals-020 ICP-AES	[NT]	[NT]	[NT]	[NT]	[NT]	110	85
Boron	mg/kg	3	Metals-020 ICP-AES	[NT]	[NT]	[NT]	[NT]	[NT]	110	83
Cobalt	mg/kg	1	Metals-020 ICP-AES	[NT]	[NT]	[NT]	[NT]	[NT]	101	78
Manganese	mg/kg	1	Metals-020 ICP-AES	[NT]	[NT]	[NT]	[NT]	[NT]	104	##
Selenium	mg/kg	2	Metals-020 ICP-AES	[NT]	[NT]	[NT]	[NT]	[NT]	102	#
Phosphorus	mg/kg	10	Metals-020 ICP-AES	[NT]	[NT]	[NT]	[NT]	[NT]	90	##

QUALITY CONTROL: NEPM screen metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date digested	-			[NT]	64	13/09/2018	13/09/2018		[NT]	[NT]
Date analysed	-			[NT]	64	13/09/2018	13/09/2018		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	[NT]	64	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	[NT]	64	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020 ICP-AES	[NT]	64	120	120	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020 ICP-AES	[NT]	64	33	34	3	[NT]	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	[NT]	64	10	9	11	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021 CV-AAS	[NT]	64	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	[NT]	64	71	68	4	[NT]	[NT]
Zinc	mg/kg	1	Metals-020 ICP-AES	[NT]	64	70	80	13	[NT]	[NT]

QUALITY CONTROL: NEPM screen metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date digested	-			[NT]	93	13/09/2018	13/09/2018		[NT]	[NT]
Date analysed	-			[NT]	93	13/09/2018	13/09/2018		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	[NT]	93	85	70	19	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	[NT]	93	0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020 ICP-AES	[NT]	93	45	38	17	[NT]	[NT]
Copper	mg/kg	1	Metals-020 ICP-AES	[NT]	93	16	13	21	[NT]	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	[NT]	93	12	14	15	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021 CV-AAS	[NT]	93	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	[NT]	93	21	19	10	[NT]	[NT]
Zinc	mg/kg	1	Metals-020 ICP-AES	[NT]	93	30	26	14	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - soil NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			14/09/2018	3	14/09/2018	14/09/2018		14/09/2018	[NT]
Date analysed	-			14/09/2018	3	14/09/2018	14/09/2018		14/09/2018	[NT]
Free Cyanide in soil	mg/kg	0.5	Inorg-013	<0.5	[NT]	[NT]	[NT]	[NT]	91	[NT]
Hexavalent Chromium, Cr^{6+}	mg/kg	1	Inorg-024	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	3	6.2	5.9	5	100	[NT]
TKN as N in soil	mg/kg	10	Inorg-062	<10	80	2600	2100	21	112	[NT]
Nitrate as N in soil	mg/kg	0.5	Inorg-055	<0.5	80	2.2	2.2	0	88	[NT]
Organic Nitrogen as N	mg/kg	10	Inorg-062	<10	80	2600	2100	21	[NT]	[NT]
Ammonia as N in soil	mg/kg	0.5	Inorg-057	<0.5	80	18	18	0	96	[NT]
Phosphate as P in soil	mg/kg	0.5	Inorg-060	<0.5	80	12	13	8	103	[NT]
Nitrite as N in soil	mg/kg	0.1	Inorg-055	<0.1	80	<0.1	<0.1	0	103	[NT]

QUALITY CONTROL: Misc Inorg - soil NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	21	14/09/2018	14/09/2018		14/09/2018	[NT]
Date analysed	-			[NT]	21	14/09/2018	14/09/2018		14/09/2018	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	21	6.2	5.8	7	101	[NT]

QUALITY CONTROL: Misc Inorg - soil NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	48	14/09/2018	14/09/2018		[NT]	[NT]
Date analysed	-			[NT]	48	14/09/2018	14/09/2018		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	48	5.4	5.4	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - soil NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	70	14/09/2018	14/09/2018		[NT]	[NT]
Date analysed	-			[NT]	70	14/09/2018	14/09/2018		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	70	5.0	5.0	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - soil NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	80	14/09/2018	14/09/2018		[NT]	[NT]
Date analysed	-			[NT]	80	14/09/2018	14/09/2018		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	80	7.8	7.8	0	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			10/09/2018	[NT]	[NT]	[NT]	[NT]	10/09/2018	[NT]
Date analysed	-			10/09/2018	[NT]	[NT]	[NT]	[NT]	10/09/2018	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	97	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	97	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	92	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate Dibromofluoromethane	%		Org-016	104	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate toluene-d8	%		Org-016	100	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-BFB	%		Org-016	98	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: TRH Water(C10-C40) NEPM					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			11/09/2018	[NT]	[NT]	[NT]	[NT]	11/09/2018	[NT]
Date analysed	-			11/09/2018	[NT]	[NT]	[NT]	[NT]	11/09/2018	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	102	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	102	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
Surrogate o-Terphenyl	%		Org-003	96	[NT]	[NT]	[NT]	[NT]	89	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

TKN and Acid herbicides analysed by MPL, report 215957.

METALS: The RPD for duplicate results 14823-3 for Copper is accepted due to the inhomogeneous nature of the sample. Triplicate analysis confirms this.

Percent recovery not available for Arsenic & Selenium due to matrix interference, however an acceptable recovery was achieved for the LCS.

Percent recovery is not possible to report due to the high concentration of Manganese & Phosphorus in the samples. However an acceptable recovery was obtained for the LCS.

The RPD for duplicate results 14823-21 for Chromium is accepted due to the inhomogeneous nature of the sample. Triplicate analysis confirms this.

TRH_S: # Percent recovery is not possible to report due to sample matrix interferences.

LRM

P.O. Box 1237
Carlton VIC 3053
enquiries@lrmglobal.com.au

CHAIN OF COUSTODY

Job Numbei 33980

Sheet 1 of 1

ATTENTION Envirolab
CLIENT Crystal Group Pty Ltd
LOCATION 30 - 70 Rowes Lane Wallan

	Sample Number	Sample Date	Sample Type	Analysis Required	No. of Containers	Turn-around Time Required
1	Split01	6.09.2018	Soil	Metals 8	1	Standard
2	Split02	6.09.2018	Soil	Metals 8	1	Standard
3	Split03	6.09.2018	Soil	Metals 8	1	Standard

Environmental Division
Melbourne
Work Order Reference
EM1814545
Telephone : + 61-3-8549 9600

Total number of containers 3

Additional information::

Email Results To	**Tick**
jon.lawson@lrmglobal.com.au	√
kevin.b@lrmglobal.com.au	
ajacob@lrmglobal.com.au	
acampbell@lrmglobal.com.au	
bpaule@lrmglobal.com.au	√

Sampled by: BP, JL

Checked by: BP, JL

Additional Comments

Splits to ALS

Chain of custody must be signed and dated by LRM, courier, and laboratory.

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	ORGANISATION	DATE / TIME
Brendan Paule	LRM Global	06/09/2018	(ALS)		11/9 14:30

RELINQUISHED BY (Signature)	ORGANISATION	DATE / TIME	RECEIVED BY (Signature)	RECEIVED FOR LABORATORY BY (Sig)

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order : **EM1814545**
Client : **LRM GLOBAL**
Contact : MR JON LAWSON
Address : P.BOX.1237
CARLTON VIC 3053
Telephone : ----
Project : 33980
Order number :
C-O-C number : ----
Sampler : BP, JL
Site : 3-70 Rowes Lane Wallan
Quote number : EN-333-17 Seconday work
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 2
Laboratory : Environmental Division Melbourne
Contact : Shirley LeCornu
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61-3-8549 9630
Date Samples Received : 11-Sep-2018 14:30
Date Analysis Commenced : 12-Sep-2018
Issue Date : 14-Sep-2018 10:18

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC

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.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**Split01**	**Split02**	**Split03**	**----**	**----**
			Client sampling date / time	06-Sep-2018 00:00	06-Sep-2018 00:00	06-Sep-2018 00:00	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1814545-001**	**EM1814545-002**	**EM1814545-003**	**--------**	**--------**
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**20.6**	**15.3**	**14.9**	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	**105**	**6**	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg	**170**	**69**	**24**	----	----
Copper	7440-50-8	5	mg/kg	**24**	**15**	**14**	----	----
Lead	7439-92-1	5	mg/kg	**18**	**12**	**7**	----	----
Nickel	7440-02-0	2	mg/kg	**70**	**27**	**15**	----	----
Zinc	7440-66-6	5	mg/kg	**83**	**35**	**60**	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	----	----

Environmental

QUALITY CONTROL REPORT

Work Order : **EM1814545**

Client : **LRM GLOBAL**
Contact : MR JON LAWSON
Address : P.BOX.1237
CARLTON VIC 3053
Telephone : ----
Project : 33980
Order number :
C-O-C number : ----
Sampler : BP, JL
Site : 3-70 Rowes Lane Wallan
Quote number : EN-333-17 Seconday work
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 3

Laboratory : Environmental Division Melbourne
Contact : Shirley LeCornu
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61-3-8549 9630
Date Samples Received : 11-Sep-2018
Date Analysis Commenced : 12-Sep-2018
Issue Date : 14-Sep-2018

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC

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

Key :
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
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
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1927563)									
EM1814225-008	Anonymous	EA055: Moisture Content	----	0.1	%	9.4	9.0	4.44	No Limit
EM1814562-003	Anonymous	EA055: Moisture Content	----	0.1	%	4.0	4.3	7.87	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1926468)									
EM1814532-009	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	6	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	12	11	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	60	66	9.37	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	49	63	26.2	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	79	66	18.3	0% - 50%
EM1814545-002	Split02	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	69	60	15.1	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	27	17	43.9	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	105	94	11.5	0% - 20%
		EG005T: Copper	7440-50-8	5	mg/kg	15	12	18.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	12	12	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	35	29	17.8	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1926469)									
EM1814532-009	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1814545-002	Split02	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Recovery Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG005T: Total Metals by ICP-AES (QCLot: 1926468)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	93.4	78	107
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	93.3	76	108
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	97.5	78	110
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	93.2	78	108
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	92.1	78	106
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	102	80	109
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	98.9	79	110
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1926469)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	78.6	77	104

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	*SpikeRecovery(%)*	*Recovery Limits (%)*	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG005T: Total Metals by ICP-AES (QCLot: 1926468)							
EM1814532-011	Anonymous	EG005T: Lead	7439-92-1	50 mg/kg	94.3	76	124
EM1814532-011	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	94.5	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.5	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	79.9	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	101	82	124
		EG005T: Nickel	7440-02-0	50 mg/kg	86.9	78	120
		EG005T: Zinc	7440-66-6	50 mg/kg	91.6	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1926469)							
EM1814532-011	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	86.3	76	116

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1814545**	Page	: 1 of 4
Client	: **LRM GLOBAL**	Laboratory	: Environmental Division Melbourne
Contact	: MR JON LAWSON	Telephone	: +61-3-8549 9630
Project	: 33980	Date Samples Received	: 11-Sep-2018
Site	: 3-70 Rowes Lane Wallan	Issue Date	: 14-Sep-2018
Sampler	: BP, JL	No. of samples received	: 3
Order number	:	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) Split01, Split02, Split03	**06-Sep-2018**	**----**	----	----	**12-Sep-2018**	20-Sep-2018	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) Split01, Split02, Split03	**06-Sep-2018**	**12-Sep-2018**	05-Mar-2019	✓	**12-Sep-2018**	05-Mar-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) Split01, Split02, Split03	**06-Sep-2018**	**12-Sep-2018**	04-Oct-2018	✓	**13-Sep-2018**	04-Oct-2018	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			*Quality Control Specification*
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	17	**11.76**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)

APPENDIX D

DIV 5 ASBESTOS REPORT

LRM GLOBAL PTY LTD
65 Stubbs St.
Kensington Victoria 3031
ABN: 34 116 540 277
(03) 9371 3400

Alister Oldham
Crystal Group P/L
22 Church Street
Whittlesea
Victoria 3757

07/09/2018

Dear Alister Oldham,

Please find enclosed our Asbestos Division 5 Survey, conducted at Darraweit Road Wallan VIC - Chicken egg farm on 06/09/2018. This work was conducted for Crystal Group P/L.

If any further information is required or if you have any further queries regarding this information please do not hesitate to contact our office on (03) 9371 3400.

Yours faithfully,

[redacted]

Michael Nguyen
OH&S Consultant
LRM Global Pty Ltd

Our Ref: 34935

ASBESTOS DIVISION 5 SURVEY

Darraweit Road Wallan VIC - Chicken egg farm

Report For:
CRYSTAL GROUP P/L
Report Date:
07/09/2018

TABLE OF CONTENTS

Report Date:	Report ID/Ref:	Primary Auditor:	Authorised by:
07/09/2018	34935	Michael Nguyen	

1.0 EXECUTIVE SUMMARY

LRM Global Pty Ltd was engaged by Crystal Group P/L to undertake an Asbestos Division 5 Survey at Darraweit Road Wallan VIC - Chicken egg farm. The survey was undertaken by Michael Nguyen of LRM Global Pty Ltd on 06/09/2018. The aim of the survey is to identify, assess the risk and recommend control measures for nominated hazardous material at the site prior to commencement of refurbishment or demolition works. The degree of accuracy of this report is subject to the accessibility of areas suspected to contain hazardous materials, therefore only accessible and representative materials were inspected.

The following hazardous materials were included in the survey:

- Asbestos

Survey Site Description:

This large farm site is an old chicken egg farm which contains 3 houses on the property, numerous metal sheds and three long, large chicken sheds mainly constructed out of metal.

1.1 General Findings

LRM Global was engaged by Crystal Group P/L to carry out a Division 5 asbestos assessment of the property located at Darraweit Road, Wallan VIC - Wallan Chicken Egg Farm, for due diligence purposes. The findings are as follows:

Asbestos Containing Materials (ACM)

ACM was identified in the following locations:

Location	Item / Friability	Condition / Priority Level	Recommendations
House (1) - Entry to property, east : External walls (throughout) / Chimney	Fibre cement sheet / Non-friable	Good / 3	Removal prior to demolition works
Egg Store Shed - External area, west side: Bench top	Fibre cement sheet / Non-friable	Good / 3	Removal prior to demolition works
Egg Store Shed - External area, North side: Electrical switchboard	Zelemite panel / Non-friable	Good / 3	Removal prior to demolition works

Chicken Sheds (x3) (south of Property) - External grounds: Loose debris	Fibre cement sheet loose debris / Non-friable	Poor / 1	Removal

It is recommend that removal of all identified asbestos containing items should be carried out prior to any future demolition works impacting the area. All removal works should be carried out by a licensed asbestos removal contractor and in accordance with Occupational Health and Safety Regulations 2017, Part 4.4. Asbestos.

Furthermore, for all areas/items that were inaccessible and/or had restricted access must be 'assumed positive' to contain asbestos, as per Occupational Health and Safety Regulations 2017, Part 4.4 Asbestos. Ensure that a *Division 6* of all inaccessible areas/items to be carried out prior to any future works impacting on this property.

A list of these areas/items can be found in Appendix D of this report. A full list of items assessed can be found in Appendix A of this report.

1.2 Risk Analysis Findings - Asbestos

Table A: Asbestos Materials Identified (Priority rating of 1 or 2)

Area 1	Surface	Material Type	Friability	Risk	Control Recommendation
Chicken Sheds (x3) - South of property External areas	Grounds (east side)	Debris	Non Friable	Priority 1	Removal

1.3 Risk Analysis Findings - Other Hazardous Materials

No hazardous materials were identified with a priority rating of 1 or 2. Please refer to Appendix A for full audit details including any hazardous materials with priority rating of 3 or 4.

1.4 Definitions for Risk Priority Rating 1 & 2

Priority 1: Hazards with High Risk Potential

A Priority 1 item is defined as an area containing hazardous materials, which are either damaged or are being exposed to continual disturbance. Due to these conditions there is an increased potential for exposure and/or transfer of the material to other parts with continued unrestricted use of this area. It is recommended that these areas are isolated, air-monitoring be conducted (if appropriate) and the hazardous material(s) are promptly removed. After abatement works are completed, a re-inspection should be conducted to confirm that the hazardous materials have been satisfactorily removed.

Priority 2: Hazards with Elevated Risk Potential

A Priority 2 item is defined as an area containing hazardous materials with a potential for disturbance due to the following conditions:

1. Material has been disturbed or damaged and its current condition, while not posing an immediate hazard, is unstable.
2. The material is accessible and can when disturbed present an exposure risk. The material could pose an exposure risk if workers are in close proximity.

2.0 SCOPE OF WORKS

LRM Global was engaged by Crystal Group P/L to carry out a Division 5 asbestos assessment of the property located at Darraweit Road, Wallan VIC - Wallan Chicken Egg Farm, for due diligence purposes. A visual assessment of the buildings was carried out, and sampling was conducted where required.

Our professional judgement and experience was used in the identification and location of asbestos and nominated hazardous materials in accessible and representative areas. However, it is not possible without substantial stripping and demolition of the buildings to guarantee that every source of asbestos and hazardous material was detected. Hence care should be exercised when opening any previously not inspected and non-accessible areas (See Appendix D for a detailed listing of areas Not Accessible and/or Not Inspected).

Should any personnel come across any suspected hazardous material or materials unknown to them, work should cease immediately in the affected areas until further sampling and investigation is performed.

2.1 Regulatory Requirements

This report satisfies the regulatory requirements of the Occupational Health and Safety Regulations - 2017 - Part 4.4 - Asbestos, Division 5 - Asbestos in Workplaces, Subdivisions 2 and 3. Duties of persons who manage or control workplaces and Duties of Employers are required to:

> *"... A person who manages or controls a workplace must, so far as is reasonably practicable, identify all asbestos present that is under the person's management or control."*

If asbestos is identified as present:

> *“...the person who manages or controls the workplace must determine -*
> *(a) the location of the asbestos; and*
> *(b) the likely source of asbestos that is not fixed or installed; and*
> *(c) in relation to asbestos-containing material —*
>
> > *(i) the type of asbestos-containing material; and*
> > *(ii) whether the asbestos-containing material is friable or non-friable; and*
> > *(iii) the condition of the asbestos-containing material; and*
> > *(iv) whether the asbestos-containing material is likely to sustain damage or deterioration; and*
>
> *(d) so far as is possible, any activities likely to be carried out at the workplace that are, in view of their nature or design, likely to damage or disturb the asbestos.”*

> *“In relation to asbestos that is identified, the person who manages or controls the workplace must ensure that -*
>
> *(a) the presence and location of the asbestos are clearly indicated; and*
> *(b) if reasonably practicable, the indication is by labelling.”*

The requirements listed above are detailed in the tables contained within this report.

2.2 Our Methodology

The Asbestos and hazardous materials and risk assessment survey was carried out in accordance with the following guidelines and procedures:

Asbestos Materials

This component of the survey was carried out in accordance with the guidelines documented in the Code of Practice - The Management and Control of Asbestos in Workplaces [NOHSC: 2018(2005)]. Specific risk assessment factors adopted for evaluating asbestos based materials and prioritisation of asbestos risks for abatement during this survey are outlined in Appendix E and F of this report. Bulk samples collected during the survey were analysed by Polarised Light Microscopy supplemented using Dispersion Staining Techniques. For further details and information regarding hazardous materials please refer to Appendix F.

3.0 SURVEY FINDINGS & DOCUMENTATION

3.1 Detailed Survey Findings

All data collected during this survey is itemised in detail within Appendix A. The findings outline the location, material, hazard type, risk assessment and control recommendations for identified hazardous materials. To view a summarised table based on Risk Priority levels 1 and 2 please refer to section 1 of this report.

3.2 Sampling & Laboratory Analysis Results

All samples collected during this survey were analysed at a NATA accredited laboratory. All NATA certified laboratory certificates (analysis results) have been collated in Appendix B.

3.3 Photographic Records

To supplement the collected survey data, photographic records and other documentation may have been utilised. Please refer to Appendix C.

3.4 Areas Not Accessed / Not Inspected

Given the constraints of practicable access encountered during the risk assessment survey, areas that have been regarded as "Non-Accessible" have been noted in detail. These areas are itemised in Appendix D. It should be noted that inaccessible areas are to be deemed as containing asbestos materials until otherwise confirmed by a hygienist. We advise that should refurbishment, demolition or maintenance operations entail possible disturbance of materials in these locations, further investigation and sampling of specific areas should be conducted as part of an asbestos management and abatement programme prior to any works proceeding. It should be noted that the presence of any residual asbestos insulation and applications on steel members, concrete surfaces, pipe work, equipment and adjacent areas from prior abatement or refurbishment works cannot be ascertained without extensive removal and damage to existing insulation, fittings and finishes.

4.0 RECOMMENDATIONS & CONCLUSIONS

Asbestos:

It is recommend that removal of all identified asbestos containing items should be carried out prior to any future demolition works impacting the area. All removal works should be carried out by a licensed asbestos removal contractor and in accordance with Occupational Health and Safety Regulations 2017, Part 4.4. Asbestos.

All areas/items that were inaccessible and/or had restricted access must be 'assumed positive' to contain asbestos, as per Occupational Health and Safety Regulations 2017, Part 4.4 Asbestos. Ensure that a *Division 6* of all inaccessible areas/items to be carried out prior to any future works impacting on this property.

A list of these areas/items can be found in Appendix D of this report. A full list of items assessed can be found in Appendix A of this report.

LABELLING

It is a requirement of the Occupational Health and Safety Regulations - 2017 - Part 4.4 - Asbestos for the employer or occupier to ensure that the presence and location of asbestos materials are clearly identified and where practicable by labelling. This report details items that require labelling and it is recommended to ensure that where possible, an asbestos warning label is placed in all locations to clearly identify the presence of asbestos materials. The asbestos warning label should be affixed to an asbestos based material or access point to an area containing asbestos materials in order to warn personnel of potential exposure to asbestos fibres if the material is disturbed or if this area is to be accessed.

CRYSTAL GROUP P/L:34935
ASBESTOS DIVISION 5 SURVEY

APPENDIX A:

Detailed Survey Findings

This Detailed Survey Findings table shows all audit entries taken during the survey at on 06/09/2018.

APPENDIX A: 34935

Audit Location: Darraweit Road Wallan VIC - Chicken egg farm
Client: Crystal Group P/L
Survey Company LRM Global Pty Ltd
Audit Ref: 34935
Audit Date: 2018-09-06 00:00:00

Title	Surface or Plant/Equipment Type	Source or Item Description	Hazardous Material Type	Photo	Sample	Assessment Status	Friability	Condition	Damage or Deterioration Potential	Activity Level	Accessibility	Priority Level	Re-inspection Schedule	Quantity	Control Recommendation	Comments
Chicken Sheds (x3) - South of property - External areas	Corridor joining sheds - Floor	Timber									Unrestricted Access					
Chicken Sheds (x3) - South of property - External areas	Corridors joining sheds - Walls / Roof	Metal sheeting									Unrestricted Access					
Chicken Sheds (x3) - South of property - External areas	Duct and exhaust units	Metal									Unrestricted Access					
Chicken Sheds (x3) - South of property - External areas	Grounds (east side)	Debris	Asbestos	34935-P-Debris		Positive	Non Friable	Poor	Low	Low	Unrestricted Access	Priority 1			Removal	ACM Debris found randomly around the property. Believe to be from pre-existing sheds. Works to be carried out in accordance with Victorian Occupational Health and Safety Regulations 2017.
Chicken Sheds (x3) - South of property - External areas	Meat / Cool room shed (South east area) - Walls and Roof	Metal throughout									Unrestricted Access					
Chicken Sheds (x3) - South of property - External areas	Roof	Metal									Unrestricted Access					
Chicken Sheds (x3) - South of property - External areas	Shed - South west of Chicken sheds	Metal throughout									Unrestricted Access					
Chicken Sheds (x3) - South of property - External areas	South side of middle chook shed - Sub floor lining	Fibre cement sheeting	Asbestos	34935-P01	34935-01	Negative					Unrestricted Access					Appears to be new.
Chicken Sheds (x3) - South of property - External areas	Sub floor areas	Metal framework / Timber / Biological matter									Unrestricted Access					Loads of debris throughout. Possible ACM debris.
Chicken Sheds (x3) - South of property - External areas	Walls (throughout)	Metal sheeting / Metal framework / Concrete									Unrestricted Access					Visually assessed only.
Chicken Sheds (x3) - South of property - Internal areas	Chook shed (Far west side) - Walls	Metal clad with insulation									Unrestricted Access					SMF insulation visually assessed from a damaged wall panel from south west side of the chook shed.
Chicken Sheds (x3) - South of property - Internal areas	Chook Shed - Walls	Metal									Unrestricted Access					Where accessed and assessed. Unable to gain entry to most of the sheds.
Chicken Sheds (x3) - South of property - Internal areas	Floor	Timber / Metal frame work and stumps									Unrestricted Access					Where assessed.
Chicken Sheds (x3) - South of property - Internal areas	Meat / Cool room shed (South east area) - Internal (throughout)	Unknown	Asbestos			Assumed positive		Unknown			No Access	Priority 4				No entry gained into this part of the shed. Lock doors. Futher investigation may be required to determine the presence of ACM.
Egg Store Shed - External	Bench top (north west side of shed)	Fibre cement sheeting	Asbestos	34935-P02	34935-02	Positive	Non Friable	Fair	Low	Low	Unrestricted Access	Priority 3			Removal	Remove prior to demolition works. All future works impacting this item should be carried out in accordance with Victorian Occupational Health and Safety Regulations 2017.
Egg Store Shed - External	Roof / Walls	Metal									Unrestricted Access					
Egg Store Shed - External	Storage tanks (around Store)	Metal / Concrete / Timber Framework									Unrestricted Access					Visually assessed only.

APPENDIX A: 34935

Audit Location: Darraweit Road Wallan VIC - Chicken egg farm
Client: Crystal Group P/L
Survey Company LRM Global Pty Ltd
Audit Ref: 34935
Audit Date: 2018-09-06 00:00:00

Title	Surface or Plant/Equipment Type	Source or Item Description	Hazardous Material Type	Photo	Sample	Assessment Status	Friability	Condition	Damage or Deterioration Potential	Activity Level	Accessibility	Priority Level	Re-inspection Schedule	Quantity	Control Recommendation	Comments
Egg Store Shed - External	Switchboard (North side)	Zelemite panel	Asbestos	34935-P-SwitchBoard		Assumed positive	Non Friable	Good	Low	Low	Unrestricted Access	Priority 3			Removal	Visually assessed only. Remove prior to any demolition. Unable to sample panel due to the unknown live electrical status. Future works impacting on this item, all works should be carried out in accordance with Victorian Occupational Health and Safety Regulations 2017.
Egg Store Shed - External	Switchboard box	Fibre cement sheet infill	Asbestos	34935-P03	34935-03	Negative					Unrestricted Access					Looks like timber.
Egg Store Shed - Internal	All areas	Unknown	Asbestos			Assumed positive		Unknown			No Access	Priority 4				No internal access. Locked. Further investigation required to determine the presence of ACM prior to any major demolition and/or refurbishment works impacting this shed, where these works should be carried out in accordance with OHS Regulations 2017.
House (1) - Entry to property (east) - External areas	Chimney	Fibre cement sheeting	Asbestos		34935-04 (Ref)	Positive	Non Friable	Fair	Low	Low	Unrestricted Access	Priority 3			Removal	Visually assessed only. Same material used for the walls. Removal of this item should be carried out in accordance with Victorian Occupational Health and Safety Regulations 2017.
House (1) - Entry to property (east) - External areas	Eave lining	Fibre cement sheet	Asbestos			Assumed positive		Good			Restricted Access	Priority 4				Visually assessed only, unable to sample due to height restrictions. Further investigation may be required prior to any future demolition works, where these works should be carried out in accordance with the Occupational Health and Safety Regulations 2017.
House (1) - Entry to property (east) - External areas	Entry porch - Walls	Fibre cement sheeting	Asbestos	34935-P05	34935-05	Negative					Unrestricted Access					Appears to be new type material
House (1) - Entry to property (east) - External areas	Roof	Ceramic tiles / Metal sheet (porch)									Unrestricted Access					
House (1) - Entry to property (east) - External areas	Walls (throughout)	Fibre cement sheet / Timber	Asbestos	34935-P04	34935-04	Positive	Non Friable	Fair	Low	Low	Unrestricted Access	Priority 3			Removal	False brick decal pattern on fibre cement sheet. Prior to any future demolition works impacting this item, removal of this item should be carried out in accordance with Victorian Occupational Health and Safety Regulations 2017.
House (1) - Entry to property (east) - Internal	Ceiling	Plaster									Unrestricted Access					
House (1) - Entry to property (east) - Internal	Floor	Carpet									Unrestricted Access					Where visually assessed.
House (1) - Entry to property (east) - Internal	Walls (throughout)	Plaster									Unrestricted Access					Visually assessed only. Possible fibre cement sheet in some areas. Further investigation may be required prior to any future demolition works.
House (2) - Entry to property (west) - External areas	Eaves	Fibre cement sheeting	Asbestos			Assumed positive		Good			Restricted Access	Priority 4				Visually assessed only. Unable to sample due to height restrictions. Further investigation may be required prior to any major future demolition works, where these works should be carried out in accordance with the OHS Regulations 2017.
House (2) - Entry to property (west) - External areas	Roof	Metal sheeting									Unrestricted Access					
House (2) - Entry to property (west) - External areas	Walls	Timber									Unrestricted Access					Visually assessed.
House (2) - Entry to property (west) - Internal	Floor	Carpet									Restricted Access					Visually assessed only. Home occupied with tenants. Further investigation may be required once property is made vacant.
House (2) - Entry to property (west) - Internal	Walls / Ceiling - Throughout	Plaster									Restricted Access					Home occupied with tenants. Visually assessed only. Further investigation may be required once property is vacant.
House (3) - East of Chicken Sheds - External	Eaves	Unknown	Asbestos			Assumed positive		Unknown			Restricted Access	Priority 4				Restricted access to eave lining due to height restrictions. Could not tell if it was timber of cement sheet. Further investigation required prior to any major demolition works.

APPENDIX A: 34935

Audit Location:	Darraweit Road Wallan VIC - Chicken egg farm
Client:	Crystal Group P/L
Survey Company	LRM Global Pty Ltd
Audit Ref:	34935
Audit Date:	2018-09-06 00:00:00

Title	Surface or Plant/Equipment Type	Source or Item Description	Hazardous Material Type	Photo	Sample	Assessment Status	Friability	Condition	Damage or Deterioration Potential	Activity Level	Accessibility	Priority Level	Re-inspection Schedule	Quantity	Control Recommendation	Comments
House (3) - East of Chicken Sheds - External	Roof	Metal									Unrestricted Access					Visually assessed only.
House (3) - East of Chicken Sheds - External	Walls	Brick									Unrestricted Access					Visually assessed only.
House (3) - East of Chicken Sheds - Internal	Throughout	Unknown	Asbestos			Assumed positive		Unknown			No Access	Priority 4				No internal access due to property being occupied. Further investigation may be required once property is made vacant.

CRYSTAL GROUP P/L:34935
ASBESTOS DIVISION 5 SURVEY

APPENDIX B:

Laboratory Analysis Results

All laboratory analysis results for samples taken during this survey are attached in this appendix

LRM GLOBAL
Liability & Risk Management Consulting

LRM Global Pty Ltd
65 Stubbs Street
Kensington VIC 3031

Fax: (03) 9371 3499
Email: enquiries@lrmglobal.com.au
Web: www.lrmglobal.com.au
Telephone: (03) 9371 3400
ABN: 34 116 540 277

Qualitative Identification of Asbestos in Bulk Samples

Crystal Group P/L
22 Church Street
Whittlesea VIC 3757

Client Ref: 34935

Job Number: 34935.000
Batch Number: .
Received Date: September 10, 2018
Analysed Date: September 10, 2018
No of Samples: 5

Dear Alister Oldham,

This report presents the analytical results of samples collected for asbestos analysis from Darraweit Road Wallan VIC - Wallan Egg Farm.

Methodology:
The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining Method. (**LRM Global ID Method 1**) and AS4964 - 2004

Analytical Results:

Sample No.	Sample Description	Result
34935-01	The sample consisted of fibre cement sheet Location: Rear middle chicken shed Sample Dimensions: 1.0cm X 1.0cm X 0.5cm	No Asbestos Detected Organic Fibre Detected
34935-02	The sample consisted of fibre cement sheet Location: Egg Store shed, west side - Bench top Sample Dimensions: 1.0cm X 1.0cm X 0.5cm	Chrysotile Asbestos Detected Organic Fibre Detected
34935-03	The sample consisted of fibre cement sheet Location: Egg Store shed - North side, switchboard box Sample Dimensions: 1.0cm X 1.0cm X 0.5cm	No Asbestos Detected Organic Fibre Detected
34935-04	The sample consisted of fibre cement sheet Location: House (1) - East of entry to property - External Walls Sample Dimensions: 1.0cm X 1.0cm X 0.5cm	Chrysotile Asbestos Detected Organic Fibre Detected
34935-05	The sample consisted of fibre cement sheet Location: House (1) - East of entry to property - Porch entry walls Sample Dimensions: 1.0cm X 1.0cm X 0.5cm	No Asbestos Detected Organic Fibre Detected

Approved Identifier
Karu Jayasundara

Report Issued by
Karu Jayasundara

WORLD RECOGNISED
ACCREDITATION

Accreditation No: 15684

Accredited for compliance with ISO/IEC 17025
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian Standards.

CRYSTAL GROUP P/L:34935
ASBESTOS DIVISION 5 SURVEY

APPENDIX C:

Photographic Records & Drawings

34935-P-Debris

Debris - Positive for asbestos
Chicken Sheds (x3) - South of property - External areas: Grounds (east side)

34935-P-SwitchBoard

Switchboard panel - Assumed positive for asbestos
Egg Store Shed - External: Switchboard (North side)

34935-P01

Fibre cement sheet - Negative for asbestos.
Chicken Sheds (x3) - South of property - External areas: South side of middle chook shed - Sub floor lining

34935-P02

Fibre cement sheet - Positive for asbestos
Egg Store Shed - External: Bench top (north west side of shed)

34935-P03

Fibre cement sheet - Negative for asbestos.
Egg Store Shed - External: Switchboard box

34935-P04

Fibre cement sheet - Positive for asbestos.
House (1) - Entry to property (east) - External areas: Walls (throughout)

34935-P05

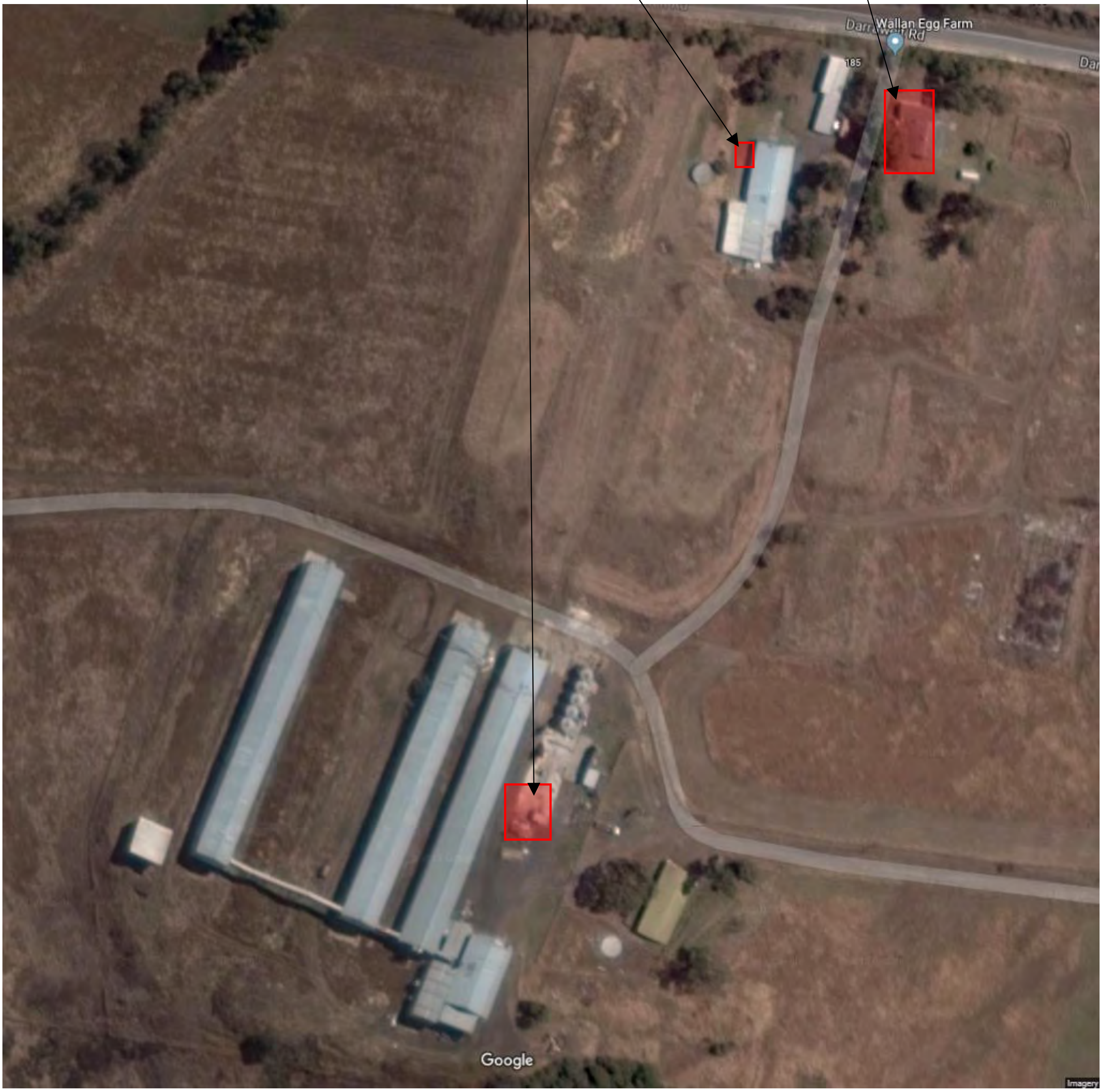
Fibre cement sheet - Negative for asbestos.
House (1) - Entry to property (east) - External areas: Entry porch - Walls

LRM Global Pty Ltd
65 Stubbs St, Kensington, Victoria 3031
www.lrmglobal.com.au

Site Aerial Diagram – Wallan Egg Farm

Areas where asbestos was mainly identified -

- House (1) – Entry to property, east - All external walls and chimney lining;
- Egg Store shed – North west area – Bench top
- ACM Debris – East side of chicken Sheds (x3)



CRYSTAL GROUP P/L:34935
ASBESTOS DIVISION 5 SURVEY

APPENDIX D:

Areas Not Accessible / Not Inspected

Table: Audit areas/locations identified as having 'No Access' or 'Restricted Access'

Area 1	Surface or Plant/Equipment Type	Material Type	Comments	Control Recommendation
House (2) - Entry to property (west) Internal	Walls / Ceiling - Throughout	Plaster	Home occupied with tenants. Visually assessed only. Further investigation may be required once property is vacant.	
House (2) - Entry to property (west) Internal	Floor	Carpet	Visually assessed only. Home occupied with tenants. Further investigation may be required once property is made vacant.	
Chicken Sheds (x3) - South of property Internal areas	Meat / Cool room shed (South east area) - Internal (throughout)	Unknown	No entry gained into this part of the shed. Lock doors. Futher investigation may be required to determine the presence of ACM.	
Egg Store Shed Internal	All areas	Unknown	No internal access. Locked. Further investigation required to determine the presence of ACM prior to any major demolition and/or refurbishment works impacting this shed, where these works should be carried out in accordance with OHS Regulations 2017.	
House (1) - Entry to property (east) External areas	Eave lining	Fibre cement sheet	Visually assessed only, unable to sample due to height restrictions. Further investigation may be required prior to any future demolition works, where these works should be carried out in accordance with the Occupational Health and Safety Regulations 2017.	
House (2) - Entry to property (west) External areas	Eaves	Fibre cement sheeting	Visually assessed only. Unable to sample due to height restrictions. Further investigation may be required prior to any major future demolition works, where these works should be carried out in accordance with the OHS Regulations 2017.	
House (3) - East of Chicken Sheds External	Eaves	Unknown	Restricted access to eave lining due to height restrictions. Could not tell if it was timber of cement sheet. Further investigation required prior to any major demolition works.	
House (3) - East of Chicken Sheds Internal	Throughout	Unknown	No internal access due to property being occupied. Further investigation may be required once property is made vacant.	

CRYSTAL GROUP P/L:34935
ASBESTOS DIVISION 5 SURVEY

APPENDIX E:

Risk Assessment Criteria

Hazard Potential Risk Assessment Factors

The risk assessment factors utilised in this report relate to the potential of exposure of personnel during refurbishment or demolition works (excluding programmed hazardous material removal works). This assessment is based on the following factors:

- Health risk potential of the material;
- Condition of the material;
- Location of the material;
- and Potential of disturbance.

Where these factors have indicated that there is a possibility of exposure to a hazard, appropriate recommendations for the removal or containment of the material in question are made.

Risk Status Priority Rating for Control of Hazardous Materials

The following schedule of risk status priority rating is adopted to assist in the programming of the removal or containment of risks of hazardous materials in the building.

PRIORITY 1: Hazard with Elevated Risk Potential

Area has hazardous materials, which are either damaged or are being exposed to continual disturbance. Due to these conditions there is an increased potential for exposure and/or transfer of the material to other parts with continued unrestricted use of this area.

It is recommended that the area is isolated, air-monitoring be conducted (if appropriate) and the hazardous material is promptly removed. After abatement works are completed a re-inspection should be conducted to confirm that the hazardous materials have been satisfactorily removed.

PRIORITY 2: Hazard with High Risk Potential

Area has hazardous materials with a potential for disturbance due to the following conditions:

1. Material has been disturbed or damaged and its current condition, while not posing an immediate hazard, is unstable.
2. The material is accessible and can when disturbed present an exposure risk.
3. The material could pose an exposure risk if workers are in close proximity.

PRIORITY 3: Hazard with Low to Medium Risk Potential

Area has hazardous materials where:

1. The condition of the hazardous material is stable and has a low potential for disturbance or;
2. The hazardous material is outside the work area or scope of works and will remain in-situ upon

completion of the project.

PRIORITY 4: Area inaccessible - Hazard Undetermined

An area which has not been accessed during the survey is assumed to contain:

1. Asbestos containing materials as per the Occupational Health and Safety Regulations - 2017 - Part 4.4 - Asbestos 226 / 233
2. Other nominated hazardous materials.

In these circumstances a further assessment must be undertaken when accessibly to the area is available to determine whether asbestos materials are present.

:
ASBESTOS SURVEY

APPENDIX F:

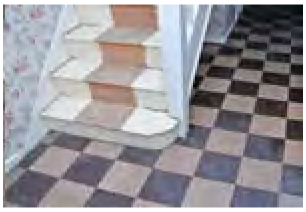
Hazardous Materials Information

Hazardous materials typically identified within building structures, ship or plant can be generally classified into 5 main types with the following classifications:

Hazardous Material	Classification	Exposure Standard
Asbestos materials	Category 1 Carcinogen	0.1 f/mL
Synthetic Mineral Fibre	Category 3 Carcinogen	0.5 f/mL
Lead	-	0.15mg/m3
Polychlorinated biphenyls (PCB's)	R33 N; R50-53	0.5mg/m3 (54% Chlorine)
Chloroflurohydrocarbons (CFC's)	Category 3 Carcinogen; R40 R64 Xn; R48/20	-
Biological Hazards		

1) Asbestos Materials Overview

Asbestos containing materials can be classified into two main groups friable and non-friable; the table below lists the common material found in buildings in the two groups.



PVC or vinyl floor tiles with added asbestos (low %) chrysotile (non-friable)

Open electrical switchboard with asbestos flash guard (non-friable)

Asbestos textiles were widely used as a reinforcing material in friction products. e.g. conveyor and fan belts, brake and clutch linings (non-friable)

Fire retardant door insulation (friable)

Spray coating on a building walkway (friable)

Loose fibres - friable

Asbestos rope seal on drying oven (non- friable)


Chrysotile tape scrim


Metal clad gas Flue containing chrysotile lining (non-friable)


Friable asbestos roof cladding (friable)


Asbestos thermal insulation (friable)


Asbestos brake lining on output shaft of AC motor (friable)

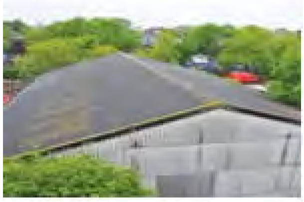

Amosite and chrysotile packing on a water pipe (friable)


Asbestos bitumen coating under metal cladding (non-friable)


Chrysotile pebble dash exterior wall coating (non-friable)


Wall plasters containing asbestos (non-friable)


Asbestos cement (AC)


AC roof and wall cladding (non-friable)


AC downpipe (friable)


Friable asbestos debris (friable)


AC moulding gutter (friable)

1.1) Duties of Persons Who Manage or Control Workplaces

- Asbestos risk assessments are compulsory for employers across Victoria, requiring identification of asbestos type and assessment of exposure risk. Material sampling must be used to confirm or otherwise the presence of asbestos. This complies with the Occupational Health and Safety Regulations - 2017 - Part 4.4 - Asbestos.
- Employers are required to implement controls according to the hierarchy of controls to ensure risk of exposure to employees and building occupants and public is controlled.
- Materials identified as containing asbestos should be removed from any proposed work area or satisfactorily contained prior to commencement of refurbishment or demolition works.
- Asbestos materials should only be removed by a registered asbestos removal contractor as per the Occupational Health and Safety Regulations - 2017 - Part 4.4 - Asbestos.
- It is a requirement of the Occupational Health and Safety Regulations - 2017 - Part 4.4 - Asbestos for the building owner or occupier to ensure that the presence and location of asbestos materials are clearly identified and where practicable, the identification is to be by labelling.
- In the event of any proposed refurbishment or demolition, it is recommended that a current asbestos audit is made available or undertaken prior to the refurbishment or demolition. A risk assessment and

management of all works requires the consideration of the disturbance to any asbestos materials.
- The asbestos register should be maintained accurately and updated if changes occur. Re-inspection of the building must be undertaken as per Occupational Health and Safety Regulations - 2017 - Part 4.4 - Asbestos 228 - Asbestos register to be kept current
- Asbestos register to be kept current :
  - within 5 years from last audit date;
  - where there has been a change in the condition of the asbestos containing materials;
  - Where the asbestos containing material has been removed, enclosed or sealed;
  - Where there is evidence to indicate that the previous risk assessment does not adequately assess the current risk associated with the asbestos containing material;
  - The asbestos register updated accordingly.

Atmospheric monitoring must be provided if it is necessary to determine whether there is a risk associated with the presence of asbestos containing materials or that the exposure standard might be exceeded.

1.2) Records

Records of asbestos audits and registers and abatement records should all be kept. The occupier must be able to provide a copy of the most recent record of results to employers, employees or contractor engaged to work or occupy space within the building or structure as per ‘Work Health and Safety Regulations 2011’. Records are to contain all risk assessments, all details of management of remaining asbestos and all details of asbestos removal and disposal. It is recommended that the physical condition and health risk assessment should be conducted annually to maintain the asbestos materials and an up-date the register.

2.0) Synthetic Mineral Fibre Overview

2.1) Definition

Synthetic mineral fibres (SMF) is a generic term used to collectively describe a number of amorphous (non-crystalline) fibrous materials. Commonly referred to as “Man Made Mineral Fibres” (MMMF).

2.2) References

- Worksafe Australia National Code of Practice for Synthetic Mineral Fibres - 1990
- Victorian Occupational Health & Safety Act 2004

2.3) Types of Synthetic Mineral Fibre Materials

Synthetic mineral fibre (SMF) materials, include fibreglass, rockwool and ceramic fibre based products. These products are used in a number of areas throughout buildings. These materials are generally used as insulation within ceilings and walls, as well as heating hot water pipe work and associated mechanical equipment. SMF materials are classified as bonded and unbonded materials. Unbonded SMF material includes loose fill fibreglass or rockwool dry wall or ceiling insulation, and sprayed rockwool to structural steel and acoustic finishes i.e. Roberts M34. Bonded SMF insulation materials include sectional fibreglass and rockwool pipe insulation; ceiling batts, duct blankets (lined and unlined with mesh/foil), dry wall batts insulation and acoustic mineral fibre ceiling tiles etc.

2.4) Duties of Persons In Control of the Area

- When using Synthetic Mineral Fibre, so far as is workable, select materials or product forms so as to minimise the release of fibres and/or dust;
- Engage appropriately qualified contractors to perform works entailing Synthetic Mineral Fibre material;
- Action shall be taken to apply appropriate control strategies on a continuing basis. The aim of these strategies is to reduce exposure to Synthetic Mineral Fibre to the lowest workable levels. Personal protection should not be used to replace other control measures unless they are deemed inadequate or not workable; and
- Ensure appropriate site maintenance throughout building.

2.5) Management of Synthetic Mineral Fibre (SMF)

In all cases, it is essential that SMF materials be handled appropriately to control dust and debris as they are irritating to the skin and mucous membranes. SMF fibres are generally thick and will scratch and puncture the skin causing rashes and irritation to the skin, nose and eye if exposed to high levels of dust and debris. Protective eyewear therefore should be worn if handling SMF materials above the head, i.e. entering ceiling cavities.

2.6) Overall Strategy Action should be taken on a continuing basis to achieve

the lowest workable exposure levels of Synthetic Mineral Fibre. The provision of engineering controls, greater attention to plant cleanliness, in particular within plant rooms and air handling units, and the containment of waste material may achieve this. Additionally, the use of binders or work practices which reduce the liberation of fibres and the provision of appropriate personal protective equipment can help reduce Synthetic Mineral Fibre levels to personnel and the environment.

2.7) Handling and Disposal of SMF Material

- Caution is required when handling SMF products in order to minimise airborne SMF fibre levels. It is recommended that the following code of practice be closely adhered to when handling such materials:
- Synthetic Mineral Fibres, Worksafe Australia, National Standard and National Code of Practice - May

1990.

- Occupational Health and Safety Commission, Document OHS No 34, October 1991 - Safe Use of Synthetic Mineral Fibres, Draft Code of Practice.
- Essentially, SMF materials should be handled in such a way as to minimise dust and disturbance of the materials. Where SMF materials are installed or removed, then suitable controls and appropriate personal protection are to be provided. Consultation should be sought with regard to appropriate procedures prior to the handling of such materials. Disposal of Synthetic Mineral Fibre material should be undertaken in accordance with Victorian EPA requirements.

3) Polychlorinated Biphenyls (PCBs)

3.1) Definition

Polychlorinated Biphenyls (PCBs) are a group of chlorinated organic compounds. PCBs are very stable chemicals that resist change over time and from temperature variation. They are fire resistant and very good insulators.

3.2) References

- Australian & New Zealand Environment and Conservation Council (ANZECC) “Identification of PCB-Containing Capacitors” - 1997
- Environmental Protection Authority "National Polychlorinated Biphenyls Management Plan 2000

3.3) Types of PCB's Used

The major type of PCB matrix has been as an insulating fluid inside transformers and capacitors. These transformers and capacitors range in size but generally are encased within a cylindrical or rectangular metal casing. PCBs have been commonly used in closed or semi-closed systems such as electrical transformers, heat transfer systems, hydraulic fluids, feeder cabling and in the metal case capacitors to fluorescent lights, sodium vapour and mercury vapour lights, and starter capacitors to electrical motors. PCBs will generally only be found in capacitors made before the late 1970's (though some electrical equipment imported after this period may contain PCBs). High voltage and medium voltage feeder cables prior to the use of PVC insulation, particularly the armoured type of cabling may contain PCBs in concentrations sufficient to be a scheduled PCB waste. Importation of PCBs in Australia was banned in 1976. However, they are still present extensively in transformers and capacitors in electrical equipment manufactured prior to this date.

3.4) Duties of Centre Manager

- Notification to EPA where the site holds more than 10kg of PCB's. Notification should include - concentration, quantity and location; and
- Establish an environment improvement plan (EIP) that includes a disposal schedule and appropriate certificates of disposal.

3.5) Handling and Disposal

The management of PCB is outlined in the policy document issued by ANZECC Polychlorinated Biphenyls Management Plan, November 1996. This plan sets out timelines for the eventual phase out and replacement of PCB within workplaces in Australia.

The Victorian Environmental Protection Authority has deemed Polychlorinated Biphenyls to be a prescribed waste. Proper procedures must be undertaken when disposing of items containing PCBs. Registered waste disposal companies are licensed to dispose of Polychlorinated Biphenyls material.

Not all materials containing PCBs are required to be removed. The management strategy depends on the priority of the area in which the material is located and the classification of the PCB containing material. The PCB concentration classifies a material as one of the following:

- PCB Free - materials and wastes are defined for the purposes of the PCB Management Plan as those materials or wastes containing PCBs at concentrations of 2 mg/kg or less.
- Scheduled PCB materials and wastes contain PCBs at levels greater than or equal to either 50mg/kg or 50g
- Non-Scheduled PCB materials or waste contain PCBs at concentration levels between those defined above.

- Basic personal protection equipment should be worn for the removal of capacitors from light fittings, in respect to eye and hand protection.

A building is classified as a priority or non-priority area. A priority area is defined as an area which requires a particularly high level of protection. Such areas include but are not limited to, schools, hospitals, food processing plants, animal feed lots, aquatic spawning areas and endangered species habitats. The PCB quantity for similar equipment such as capacitors in fluorescent light fittings is based on the aggregate weight of PCB in these units.

3.6) Disposal of PCB Materials and Waste

Waste PCBs and cloths and any fouled protective clothing must be disposed of as PCB contaminated waste in a plastic lined drum. The drum must be leak-proof in a sound and clean condition and must be able to be securely locked. The drums should be labelled as follows:

Warning "Caution Contains PCB's"	Packaging Group	II
UN No.2315	Class	6.1
HAZCHEM code 4X		

Pending removal of filled drums, the PCB waste should be stored in a secure location not accessible to the general public or building tenants. This area should be well ventilated and must not contain other Dangerous Goods.

4) Lead Based Paints

4.1) Definition

Lead:
Lead is a naturally occurring metal. Pure lead can combine with other substances to form various lead compounds. Therefore pure lead, lead alloys such as soldier or brass, inorganic lead compounds and lead salts are considered lead containing compounds under the Occupational Health & Safety (Lead) Regulations, 2000.

Lead Paint:
Any paint containing greater than 1% by dry weight of lead.

4.2) References

- Occupational Health and Safety Regulations - 2017 - Part 4.3 "Lead"
- Australian standard (AS 4361.2 - 1998) Guide to Lead Paint management Part 2: Residential and commercial buildings

4.3) Lead Processes

The duties contained in the lead regulations only apply to workplaces where lead processes are undertaken. A lead process is a process that generates lead dust, fumes or mist. These may include the following activities:

- Exposure to lead dust or fumes arising from the oxy-welding of lead based materials; and
- Exposure to lead dust or fumes arising from the use of a power tool to remove any surface containing greater than 1% by dry weight of lead and the handling of waste from this process.

4.4) Duties of Facility Managers

- The Facility Manager has the responsibility under the regulations to protect your employees from excessive exposure to lead;
- These duties extend to any contractors and their employees that you hire to work for you; and
- If other people are carrying out tasks on your behalf, you have a responsibility to ensure that the person has the appropriate training, education or experience to carry them out correctly.

4.5) Management of Lead Painted Surfaces

- The health risk associated with lead occurs via an accumulative effect within the human body. Depending on the amount of exposure, side effects of the lead poisoning would not be apparent for many years. It is therefore recommended that workers associated with lead processes (as prescribed in the regulations) have regular medical examinations to monitor the amount of lead in the system.
- The most common exposure risks faced by workers are the inhalation of lead dust or fumes. The creation of the hazards generally relates to abrading or burning lead or lead coated surfaces. Other common sources of lead dust or fumes are as follows:
- Lead based paints - when removing paint by sanding or heat (e.g. Creating dust), or when welding or cutting steel coated with lead or lead based paints;
- Welding, oxy cutting of steel coated with lead based paint or primer; o Dismantling of equipment containing lead;
- The abatement of lead painted surfaces and reduction of potential lead exposure risks to workers and the environment requires a review of the potential exposure pathways to lead dust in the project. Local authority requirements, public safety and health requirements, site preparation, waste disposal and contamination control all need to be fully considered therefore, prior to the commencement of the project.
- Lead exposure is likely where painted surfaces are to be removed or treated by mechanically sanding, scraping or other cleaning techniques creating airborne dust and fall-out contaminating ground and building surfaces. Accordingly, lead abatement work must fully contain and control airborne emissions and remove resultant lead contaminated dusts and sludges from work surfaces. The painting contractors must prepare a waste management plan prior to any lead paint management work.
- Workers must also be fully protected against exposure with personnel protective clothing and respiratory protection and employers of these workers must fully comply with the Occupational Health and Safety Regulations - 2017 - Part 4.3 "Lead", including organising medical testing of their employees.
- The Australian Standard Guide to Lead Paint Management Part 2: Residential and Commercial Buildings AS 4361.2-1998 provides guidance for the management of lead-paint on non-industrial structures such as residential, commercial and public buildings. It should also be recognised that that the proposed work site may already be contaminated by lead, caused by earlier paint contamination from poor maintenance or repairing. It may be necessary to determine background levels in surrounding soil within the area where lead removal processes are to take place.
- The options available for the management of lead painted surfaces include:
    - Report and Document;
    - Stabilise the paint;
    - Carrying out lead paint abatement (removal); and
    - A combination of these options.

4.6) Regulatory Requirements

The National Standard for the Control of Inorganic Lead at Work states: "..that a job in which the blood lead level of the employee might be expected to rise above 1.45 milimole per litre of blood, is a lead-risk job."

Examples of processes that would be considered as a lead-risk job area as follows:

- Any work, which exposes a person to dust or fumes of lead arising from the manufacture or handling of dry lead compounds;
- Any work in connection with the manufacture, assembly, handling or repair of, or parts of electrical accumulators (batteries) which involves the manipulation of dry lead compounds, pasting or casting of lead;
- Breaking up or dismantling of lead accumulators and the sorting, packing and handling of plates or another parts containing lead removed or recovered from those accumulators;
- Spraying with molten lead or alloys containing greater than five (5) percent by weight of lead;
- Melting or casting of lead alloys containing ten (10) percent or more by weight of lead in which the temperature of the molten material exceeds 500 C;
- Recovery of lead from its ores, oxides or other compounds by a thermal reduction process;
- By machine grinding, discing, buffing or cutting by power tools lead or alloy containing greater than five (5) percent lead by weight;
- Machine sanding or buffing of surfaces coated with paint containing greater than five (5) percent lead by weight;
- Any process whereby electric arc, oxy-acetylene, oxy gas, plasma arc or a flame is applied, for the purposes of welding, cutting or cleaning, to the surface of any metal which is coated with lead;

5) Biological Hazards

5.1) Overview

A bio-hazardous agent is one that is biological in nature, capable of self-replication and has a capacity to produce deleterious effects upon other biological organisms, particularly humans. Biological agents or substances which could be bio-hazards should include, but not be limited to, infectious or parasitic agents, non-infectious micro-organisms such as some fungi, yeast and algae, plants and plant products, and animal and animal products which cause occupational disease. Note: The above table is a selection of common areas that could harbour biological hazards and should not be regarded as a complete list of hazardous areas. * These biological hazards were not examined in this report. They should be addressed separately if symptoms and or concerns are identified.

5.2) Health Risk

- Biological agents can cause infection to exposed persons through oral, respiratory, mucous membranes, skin puncture and penetration through the skin. This would be chiefly an issue for laboratory technicians handling cultures and blood sera, and for nursing staff during the care of patients with infectious disease. Similarly, cleaners and staff involved in disinfection sterilisation and disposal of infectious waste must adopt safe work procedures to prevent risk of infection.
- Human bio-hazards are a higher risk to persons handling materials contaminated with human waste and blood, or during culturing bacteria, viruses or parasites. Items that come into contact with mucous membranes or non-intact skin are classified as semi-critical items and require high-level disinfection. Similarly, those items that enter sterile body tissues or blood, such as catheters and surgical instruments, also require complete sterilisation.
- Environmental surfaces, such as floors, walls, table-tops and benches are termed non-critical items and are not usually involved in the transmission of infections. Non-critical items are those that come into contact with skin but not with mucous membranes. A detergent, with or without low-level disinfectant activity, is sufficient for the usual, general cleaning of these surfaces.
- Medical equipment surface, such as those on switches and knobs of patient monitoring equipment, may play a role in the transmission of infectious diseases. Provided that these are cleaned with intermediate-level disinfectants, the risk of further transmission of infectious agents would be eliminated.

5.3) Management of Biological Hazards

Handling and Disposal Methods

- The procedures for the safe removal and disposal of the biological hazard will vary depending on the type, location, condition and the potential for exposure the hazard represents. It is recommended that a detailed scope of works be produced for the safe work methods for removal and disposal of the hazard.
- The procedures and safety requirements adopted should be in accordance with the relevant regulations or Australian Standard that applies to the particular hazard to be removed.
- As a basic work method, the area where a biological hazard is identified should be isolated and signposted until proper abatement and disposal procedures are formulated.

CRYSTAL GROUP P/L:34935
ASBESTOS DIVISION 5 SURVEY

APPENDIX G:

Disclaimer

This report was prepared for solely for the purpose set out herein and it is not intended that any other person uses or rely on it. Whilst this report is accurate to the best of our knowledge and belief LRM Global Pty Ltd cannot guarantee completeness or accuracy of any descriptions or conclusions based on information supplied to it during site surveys, visits and interviews. Responsibility is disclaimed for any loss or damage, including but not limited to, any loss or damage suffered by arising from the use of this report or suffered by any other person for any reason whatsoever.

The following should also be noted:

While the survey has attempted to locate all the hazardous materials within the site it should be noted that the survey was a visual inspection and a limited sampling program was conducted. Only those hazardous materials that were physically accessible could be located and identified. Therefore it is possible that materials, which may be concealed within inaccessible areas/voids, may not have been located during the survey. Such inaccessible areas fall into a number of categories.

(a) Locations behind locked doors.
(b) Inset set ceilings or wall cavities.
(c) Those areas accessible only by dismantling equipment or performing minor localised demolition works.
(d) Service shafts, ducts etc., concealed within the building structure.
(e) Voids or internal areas of plant, equipment, air conditioning ducts etc.
(f) Totally inaccessible areas such as voids and cavities created and intimately concealed within the building structure. These voids are only accessible during major demolition works.
(g) Height restricted areas.

Only minor destructive surveying and sampling techniques were employed to gain access to those areas documented in appendix A. Consequently, without substantial demolition of the building, it is not possible to guarantee that every source of hazardous material has been detected.

During the course of normal site works care should be exercised when entering any previously inaccessible areas or areas mentioned above and it is imperative that work cease pending further sampling if materials suspected of containing asbestos or unknown materials are encountered. Therefore during any refurbishment or demolition works, further investigations may be required should any suspect material be observed in previously inaccessible areas.

This Asbestos Division VI survey report should not be used for the purposes of costing for removal or programming of future refurbishment or demolition works unless accompanied by an appropriate and site-specific scope of works. The scope of work should be inclusive of the required refurbishment or demolition works that the survey was intended for use. This risk assessment report should be read in its entirety and must not be copied, distributed or referred to in part only.

TM

Yarra Valley
Water

Wallan Reclaimed Water Re-Use Scheme

Camerons Lane Lots 8 & 9

Preliminary Assessment of Groundwater Monitoring Results

May 2008

File reference: M:\INFRASTRUCTURE SERVICES\Treatment Plant and Trade Waste Division\Treatment Plant Planning\6 STPs\13 Wallan (STP075)\Effluent Recycling\Wallan Lot 8 & 9\Soil and Borelog Investigations\Wallan RRS Prelim GW Assessment May08.doc

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1. Introduction

The Camerons Lane Reuse Scheme was developed as part of Goulburn Valley Water's (GVW) re-use strategy for effluent from the Wallan Sewage Treatment Plant (STP). Stage 1 of the scheme has been completed and covers 92 ha. Stage 2 will develop the remaining 66 ha of the site in the future. The reuse scheme is located at Lots 8 and 9 of Camerons Lane, located south of Wallan, on the western side of the Hume Freeway. The ownership of the Wallan STP and Camerons Lane Lots 8 and 9 was transferred from GVW to Yarra Valley Water (YVW) in January 2006. Irrigation with recycled water of Class C standard commenced at Lots 8 and 9 in early 2006 for pasture establishment for cattle grazing purposes. Approximately 360 ML of Class C water has been utilised for irrigation at the site from early 2006 to March 2008.

Prior to the commencement of irrigation with Class C recycled water, GVW commissioned Sinclair Knight Merz (SKM) in 2005 to conduct a hydrogeological assessment to determine background groundwater conditions at Lots 8 and 9. SKM performed an evaluation of sampling results with a focus on the protection of beneficial use segments as defined in the State Environment Protection Policy (SEPP) (EPA 1997). The SEPP stipulates that groundwater quality should be maintained to protect existing and potential beneficial uses of groundwater resources. The evaluation by SKM indicated that beneficial uses of groundwater in the vicinity of the site are predominately in segments B to C. Segments B to C includes irrigation water, stock water, industry, ecosystem protection, and buildings and structures. As the most likely uses of the groundwater in the area would involve irrigation and stock watering, the relevant guidelines in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ, 2000) were utilised as an indication of the quality limits to which the groundwater should be maintained (from here onwards, these guidelines shall be referred to as the 'Guidelines').

This report aims to provide a preliminary assessment of groundwater monitoring data obtained since irrigation with Class C water commenced against background conditions as determined by SKM in 2005, and the relevant guideline values. A more detailed independent assessment of the groundwater monitoring results is planned after additional data is collected following the 2008 irrigation period. Therefore, this report includes:

- a brief background of the groundwater monitoring network and Class C water quality;
- groundwater level monitoring results, and a comparison of post January 2006 groundwater levels with background levels;
- groundwater quality results, and a comparison of groundwater quality results against relevant guidelines and background levels.

2. Background

2.1 Groundwater monitoring

The groundwater monitoring network for Lots 8 and 9 consisted of 21 boreholes and windmills in 2002, of which 12 are still in operation in 2008 (see Appendix 1 for location of borehole sampling sites). Over this period, boreholes and windmills have been removed from operation for various reasons, including boreholes deteriorating or being destroyed during construction of the irrigation scheme. Groundwater levels and quality have been monitored at least annually at the site since 2002. YVW commenced quarterly monitoring in October 2006.

2.2 Class C recycled water for irrigation

The Class C water supplied from the Wallan STP for irrigation at Lots 8 and 9 Camerons Lane contains various parameters for which relevant guidelines values are specified by ANZECC & ARMCANZ (2000). A summary of Class C water quality from the Wallan STP in 2006/07 is given in Table 1. Approximately 360 ML of Class C water was utilised for irrigation at Lots 8 and 9 from early 2006 when irrigation started to April 2008.

Table 1: Wallan Class C water quality results for 2006/07

Parameter	Units	Median
pH	Units	7.9
Biological Oxygen Demand (BOD)	mg/L	12
Suspended Solids (SS)	mg/L	31
Total Phosphorus (TP)	mg/L	12.5
Total Nitrogen (TP)	mg/L	32
Nitrite (NO_2)	mg/L	0.32
Nitrate (NO_3)	mg/L	2.45
Ammonia (NH_3)	mg/L	20
Organic Nitrogen	mg/L	10
Total Kjeldahl Nitrogen (TKN)	mg/L	31
Total Dissolved Solids (TDS)	mg/L	820^
Electrical Conductivity (EC)	uS/cm	825
Sodium Adsorption Ratio (SAR)	Units	6^
E. *coli*	orgs/100mL	132

^ Single annual result.

3. Analysis of monitoring data

3.1 Groundwater standing water levels

Of the 21 boreholes in the monitoring network in 2002, standing water levels were recorded for 12 boreholes in both the pre and post-irrigation periods (Figure 1). A relatively consistent slight downward trend in groundwater standing water levels over time has been detected spanning both the pre and post irrigation periods for these 12 boreholes. The standing water levels at the commencement of monitoring in 2002 ranged from 3.47 m to 10.3 m. The standing water level is measured from the top of borehole casing to the water top level in the bore. In March 2008, the groundwater levels generally dropped, with the standing water levels ranging from 3.63 m to 10.91 m. This slight drop in groundwater levels could possibility be due to the dry conditions experienced between 2002 and 2008.

Boreholes 5, 6 and 10 showed increases in groundwater levels. For borehole 5 (BH5), the reported standing water level changed from 9.7 m in 2004 to 7.8 m in 2007. This result can be attributed to an alteration of the well head fitting of BH5 and removal of the post to enable the lateral irrigator to operate in 2006. BH5 was previously surveyed to the Australian Height Datum in March 2002 and this was used to estimate the water levels although alterations of the well head fitting could change the height of the casing. Therefore the elevation to top of casing will need to be re-surveyed and results should be adjusted accordingly. The latest results for boreholes 6 and 10 indicated an increase in groundwater levels.

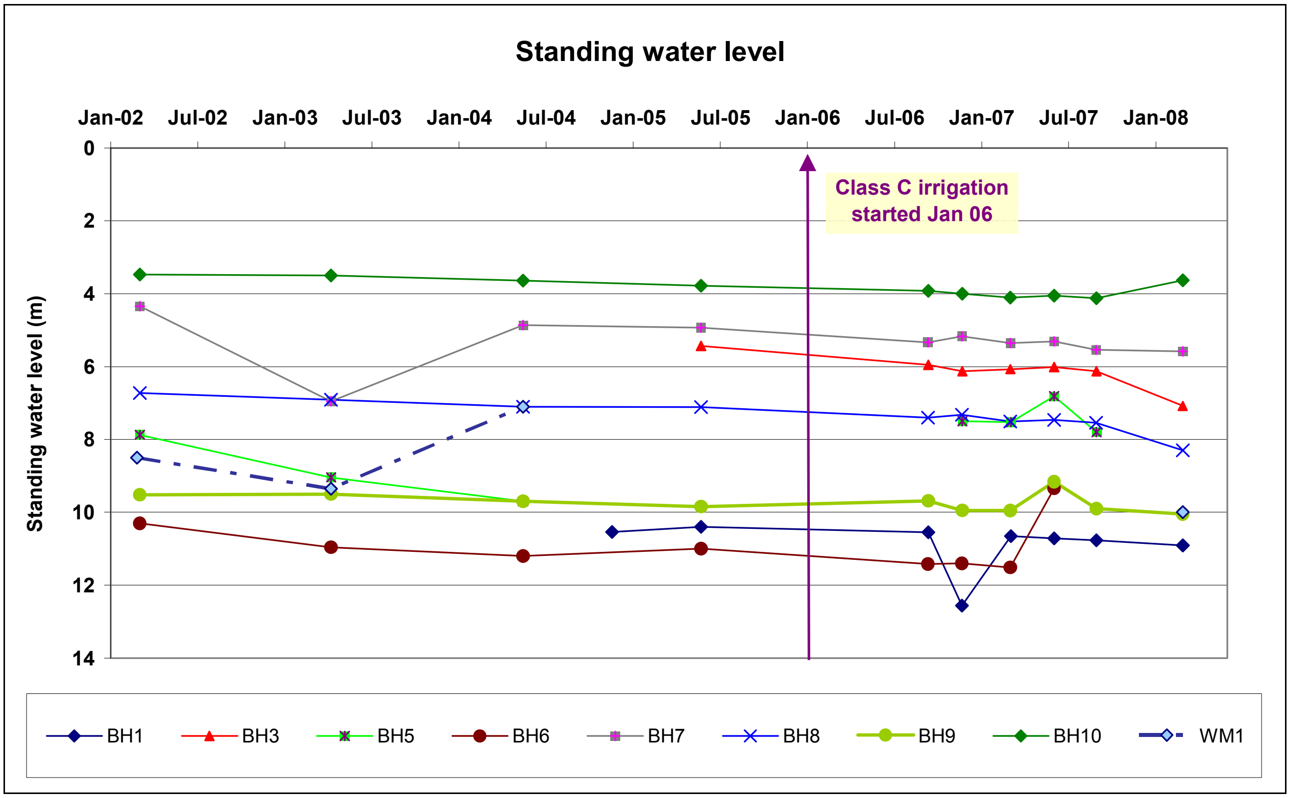


Figure 1: Groundwater levels from on-site bores with data in the pre and post irrigation periods

Groundwater standing water level data for all 21 groundwater bores are shown in Appendix 2 and depicted in Figure 2. For windmill 3 (WM3), the low groundwater level of 26.21m in 2003 may have occurred due to the bore being in operation at the time of monitoring. Groundwater levels could not be recorded for all operational bores over the monitoring period for reasons such as unable to pass equipment through the tops of bores, monitoring equipment could not reach the water table or the bores were dry.

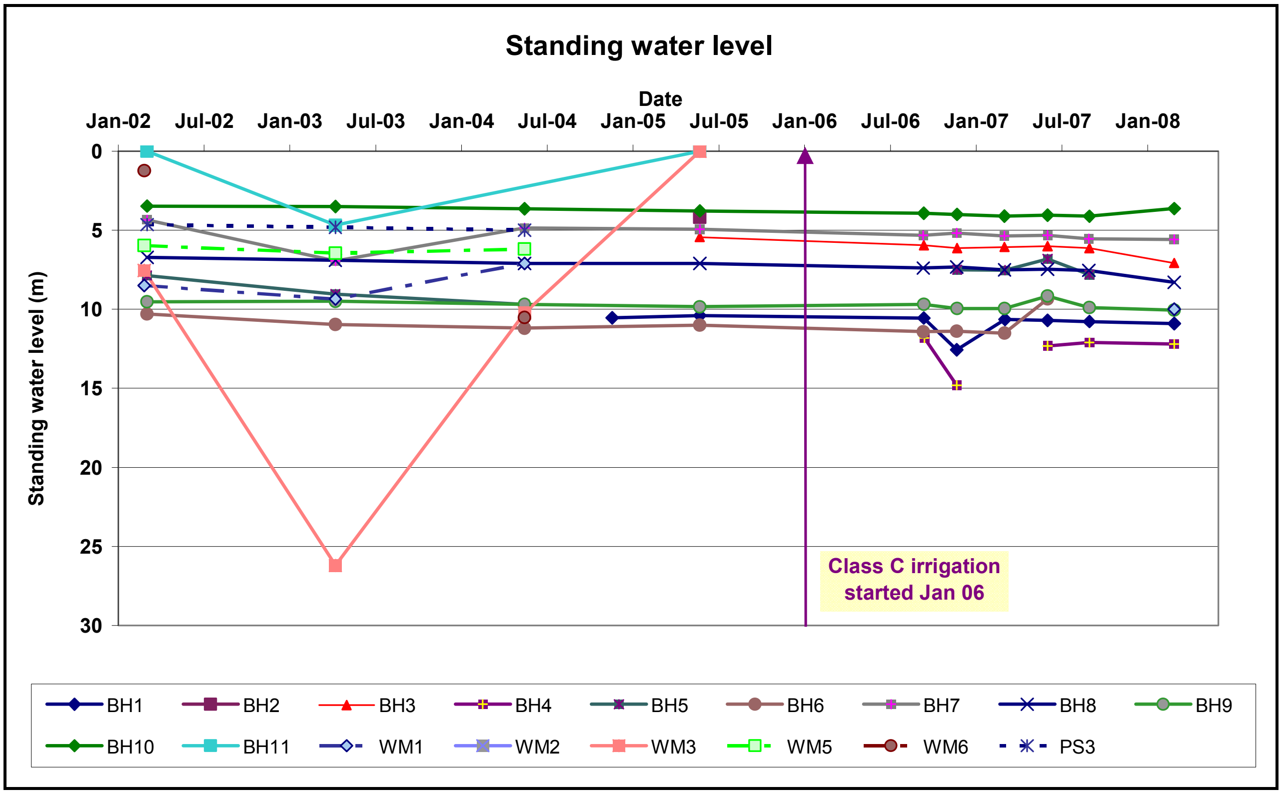


Figure 2: Groundwater levels from all on-site bores

3.2 Groundwater quality

Groundwater sampling from bores has occurred at the site since 2002 with the latest sample results from March 2008. A total of 36 water quality parameters were tested, and these results are shown in Appendix 2.

Eight of the 36 parameters were assessed by SKM in 2005 to establish background conditions and are discussed in the next section. Thirteen of the 36 parameters which have trigger values in the Guidelines for irrigation and stock water are shown below in Table 2 together with the maximum results in the pre and post-irrigation periods.

Table 2: Groundwater quality results and trigger values

Parameter	Unit	Trigger values		Maximum results		Comments
		Irrigation water*	Stock water	Pre-irrigation^	Post-irrigation	
Calcium (Ca)	mg/L		1,000	NA	100	Maximum result(s) below trigger value(s).
Sodium (Na)	mg/L	230 - 460 moderately tolerant crops		NA	1,000	Median value of 270 mg/L within the guidelines. Results above 460 mg/L from BH3, 5 & 10. BH 3 & 10 located north of irrigation area. Only BH5 located within irrigation area. No pre-irrigation data available.
Chloride (Cl)	mg/L	350 - 700 moderately tolerant crops		NA	2,300	Median value of 590 mg/L within the guidelines. Results above 700 mg/L from BH3, 5, 9 & 10. BH 3, 9 & 10 located north of irrigation area. Only BH5 located within irrigation area. No pre-irrigation data available.
Sulphate (SO_4)	mg/L		1,000	NA	160	Maximum result(s) below trigger value(s).
Cadmium (Cd)	mg/L	STV 0.05; LTV 0.01	0.01	NA	0.002	Maximum result(s) below trigger value(s).
Copper (Cu)	mg/L		0.4 (most sensitive livestock - sheep)	NA	0.04	Maximum result(s) below trigger value(s).
Mercury (Hg)	mg/L		0.002	NA	<0.001	Maximum result(s) below trigger value(s).
Zinc (Zn)	mg/L		20	NA	0.75	Maximum result(s) below trigger value(s).
Arsenic (As)	mg/L	STV 2.0; LTV 0.1	0.5 - 5	NA	0.02	Maximum result(s) below trigger value(s).
Chromium (Cr)	mg/L	STV 0.1; LTV 1	1	NA	0.02	Maximum result(s) below trigger value(s).
Molybdenum (Mo)	mg/L	STV 0.2; LTV 10	0.15	NA	<0.01	Maximum result(s) below trigger value(s).
Selenium (Se)	mg/L	STV 0.02; LTV 0.05	0.02	NA	0.015	Maximum result(s) below trigger value(s).
pH	pH units	Guidance range 6 - 8.5 to limit corrosion & fouling of pumping, irrigation & stock watering systems		12.1	9.3	pH 9.0 - 9.3 from WM2, 5 & 6. WM2 & 6 located on eastern boundary of site. WM5 located north of irrigation area. Maximum pH results of Class C water in 2006/07 and 2007/08 (year to March 2008) was pH 8.1.

* STV – Short-term Trigger Value (short-term use – up to 20 years). LTV - Long-term Trigger Value (short-term use – up to 100 years). Moderately tolerant crops classification selected by SKM to establish background conditions.

^ NA – Not applicable, background condition in pre-irrigation period not assessed.

Majority of results for the thirteen parameters in Table 2 were within the Guidelines. Three parameters (sodium, chloride and pH) recorded maximum results above the trigger values. However, for two of the parameters (sodium and chloride), no pre-irrigation data was available and therefore a comparison with pre-irrigation conditions cannot be made. SKM (2005) concluded that the groundwater flow direction is generally to the south. Thus elevated results for sodium and chloride from boreholes north of the irrigated area are unlikely to be caused by irrigation with Class C water. The guidance range for pH of 6 – 8.5 is to limit the corrosion and fouling of pumping, irrigation and stock watering systems. The slightly elevated pH levels of 9.0 – 9.3 was recorded for three windmills, however a general increase in pH for all boreholes in the irrigated area was not observed (Figure 3). Maximum pH results recorded for Class C water in 2007/08 and 2008/09 (to March 2008) was 8.1. Future monitoring results for Sodium, Chloride and pH should be assessed to determine if irrigation with Class C water is the cause of the elevated results.

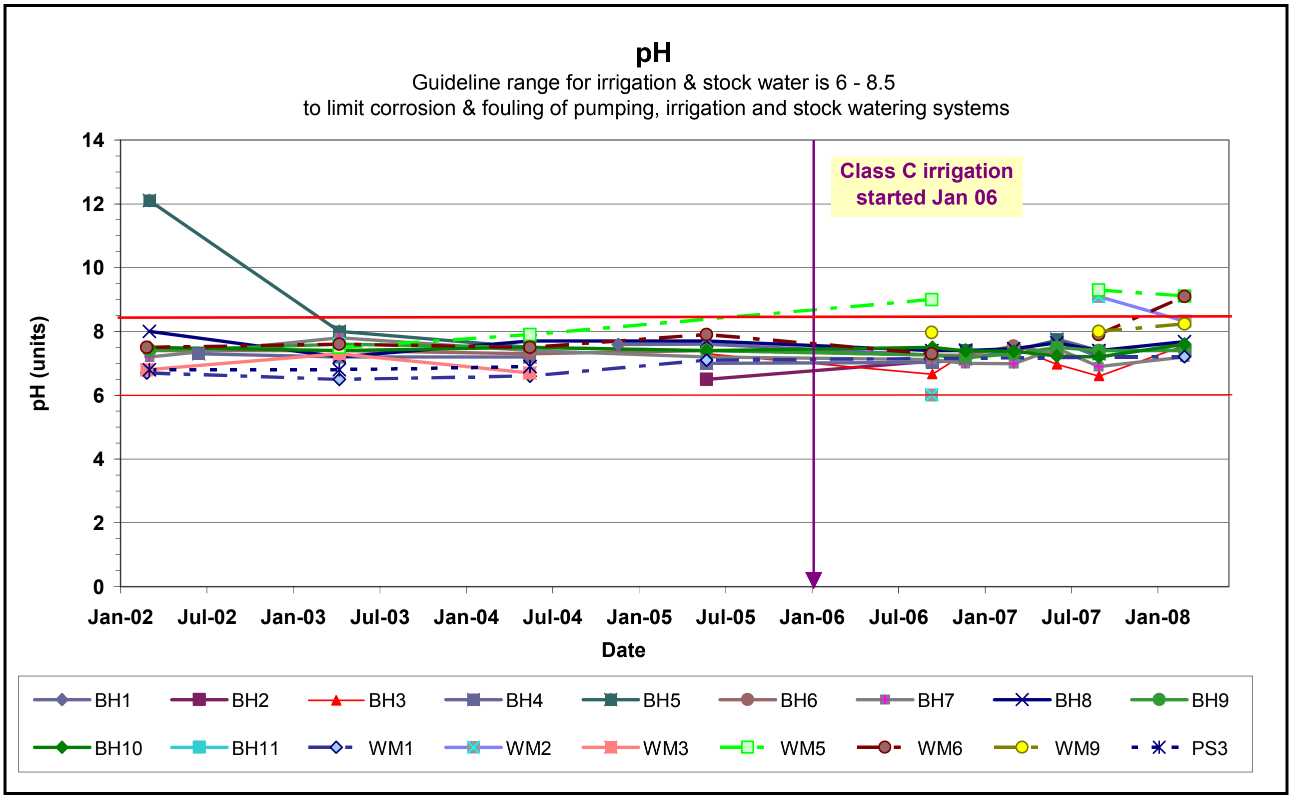


Figure 3: pH results for borehole samples

3.2.1 Comparison with background levels

An assessment by SKM in 2005 aimed to provide an indication of background conditions for eight groundwater quality parameters of particular significance to the beneficial reuse potential of the groundwater in the area. Five parameters are assessed against trigger levels in the Guidelines as listed in Table 3, and a further three parameters without trigger levels (ammonia, Biological Oxygen Demand, Total Kjeldahl Nitrogen) are analysed. The relevant trigger values in Table 3 from the Guidelines for the site were determined by SKM (2005).

Table 3: Guideline trigger values for selected parameters

Parameter	Trigger values	
	Irrigation water	Stock water
Total Dissolved Solids	1,140-2,700 mg/L, av. 1,920 mg/L (root zone salinity for moderately tolerant crops)	2,000 mg/L (no adverse effect for all livestock)
Thermotolerant coliforms, including E. *coli*	Median <10 orgs/100 mL water	Median <100 orgs/100 mL water
Nitrate as N (nitrogen)	Not specified	< 90 mg/L
Nitrite as N (nitrogen)	Not specified	< 9 mg/L
Total Phosphorus	Short-term trigger value (up to 20 years): 0.8 - 12 mg/L Long-term trigger value (up to 100 years): 0.05 mg/L (to minimize bioclogging of irrigation equipment only)	Not specified

Total Dissolved Solids

Total Dissolved Solids (TDS) is a measure of organic and inorganic matter, and ions dissolved in solution. It is often used to give an indication of salinity. High salinity levels in soils can reduce plant productivity and in extreme cases cause die off of crops or native vegetation.

The TDS values were found to range 300 – 5,000 mg/L and 400 – 7,300 mg/L from bores samples in the pre and post-irrigation periods respectively (Figure 4). The value of 7,300 mg/L from borehole 6 (BH6) in March 2007 was an extreme outlier and the subsequent TDS result from June 2007 was 1,100 mg/L, which is within the pre-irrigation TDS range of 1,100 – 1,400 mg/L. In the post-irrigation period, the majority of the bores sampled had TDS values below the recommended trigger values of 2,700 mg/L for irrigation water and 2,000 mg/L for stock watering. TDS results exceeding guideline trigger values appear unlikely to be related to irrigation, as the exceedence results originated from bores which also showed high TDS results prior to irrigation.

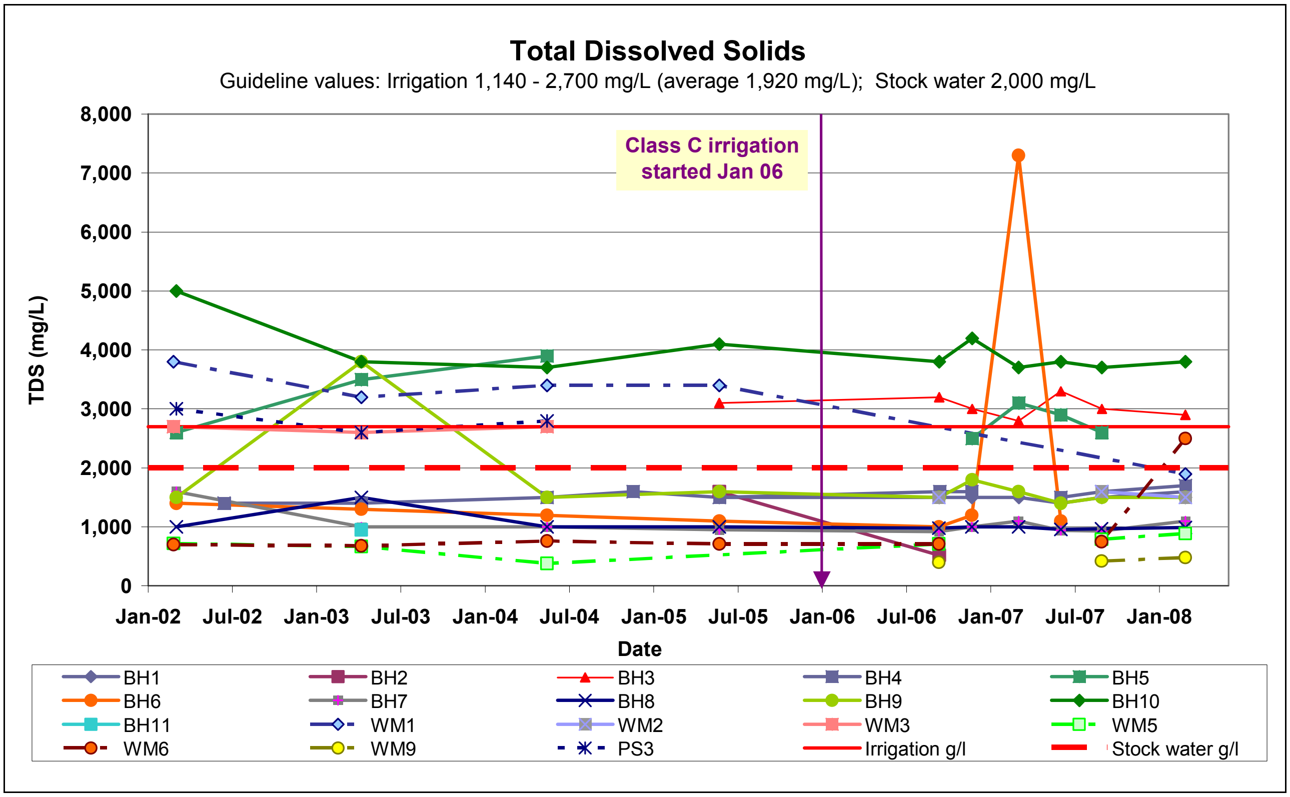


Figure 4: Total Dissolved Solids results for borehole samples

Ammonia

Ammonia is produced from the breakdown of organic nitrogen derived from animal or plant material. Ammonia is used as an indicator of organic nitrogen, and exists as either the ammonium ion (NH_4^+) or ammonia (NH_3).

Trigger values for irrigation water and stock water for ammonia are not specified in the Guidelines. The concentration of ammonia as nitrogen (N) was found to be less than 1 mg/L in all bores for the entire monitoring period with the exception of two results (Figure 5). The value of 12.0 mg/L for borehole 4 in June 2002 was anomalous as all subsequent readings were less than 1 mg/L. A reading of 250 mg/L from windmill 1 (WM1) in March 2008 is unusual because all previous readings dating back to 2002 were 0.1 mg/L or less. Windmill 1 is located north of the irrigated area, however the ammonia result from the next quarterly sample from this borehole should be assessed to determine if this high reading indicates an upwards trend or was a one-off anomaly. The ammonia concentrations have remained relatively stable over the monitoring period, with the median and 75th percentile value for ammonia in both the pre and post-irrigation periods at 0.1 mg/L.

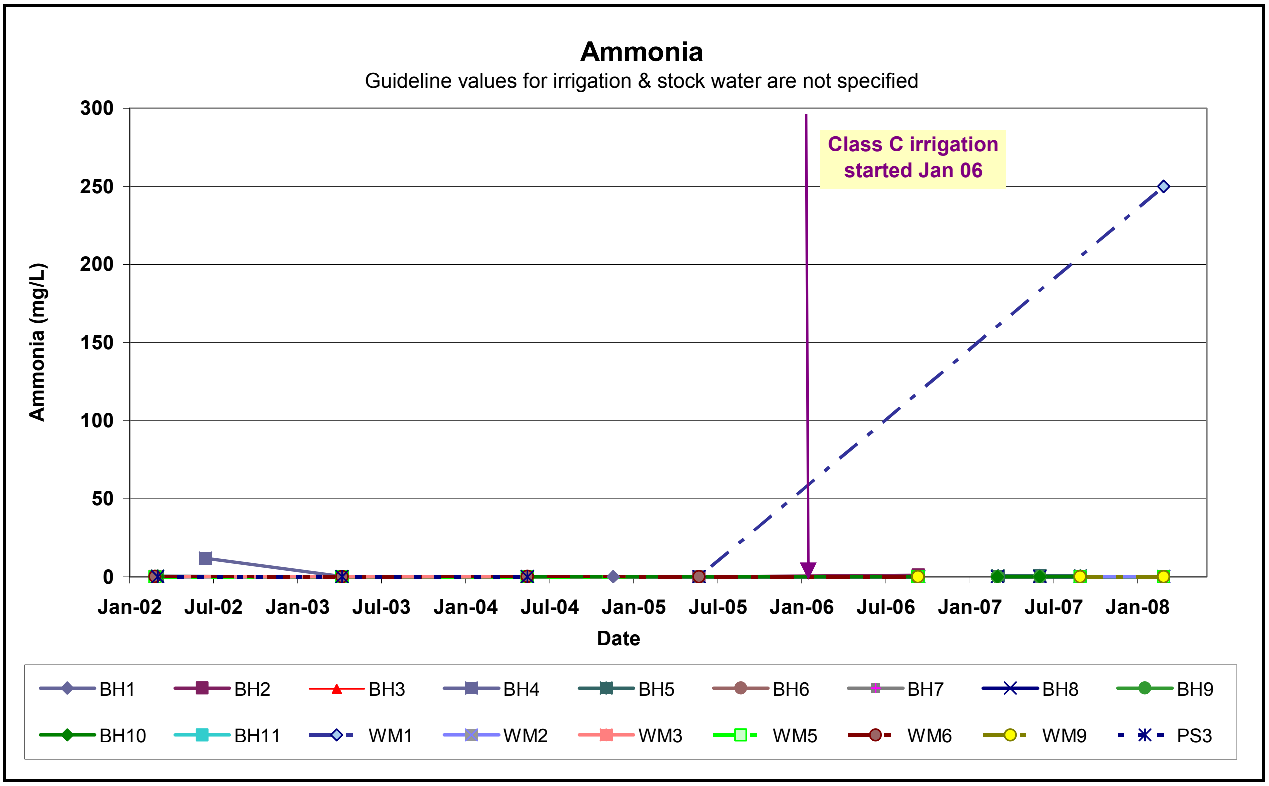


Figure 5: Ammonia results for borehole samples

Nitrate and Nitrite

Nitrate is formed from the oxidation of organic wastes by bacteria. Intensive farming practices can lead to increasing amounts of nitrate in some waters, particularly groundwater. The nitrite ion can be formed by the reduction of nitrate in poorly oxygenated waters and is relatively unstable. Chemical and biological processes can result in further reduction of nitrite to various compounds including ammonia, or oxidation back to nitrate.

Both nitrate and nitrite can be toxic to animals, and nitrite is more toxic than nitrate. The trigger values for nitrite and nitrate as nitrogen (N) in stock water are less than 9 and 90 mg/L respectively. No guideline values have been specified for irrigation waters.

The nitrite as N (nitrogen) concentration was found to range from below 0.01 mg/L to 0.82 mg/L in bores sampled over the pre-irrigation period, and below 0.01 mg/L to 0.42 mg/L in the post-irrigation period (Figure 6). Thus, the concentrations have been relatively stable and well below the recommended trigger value of 9 mg/L for stock water.

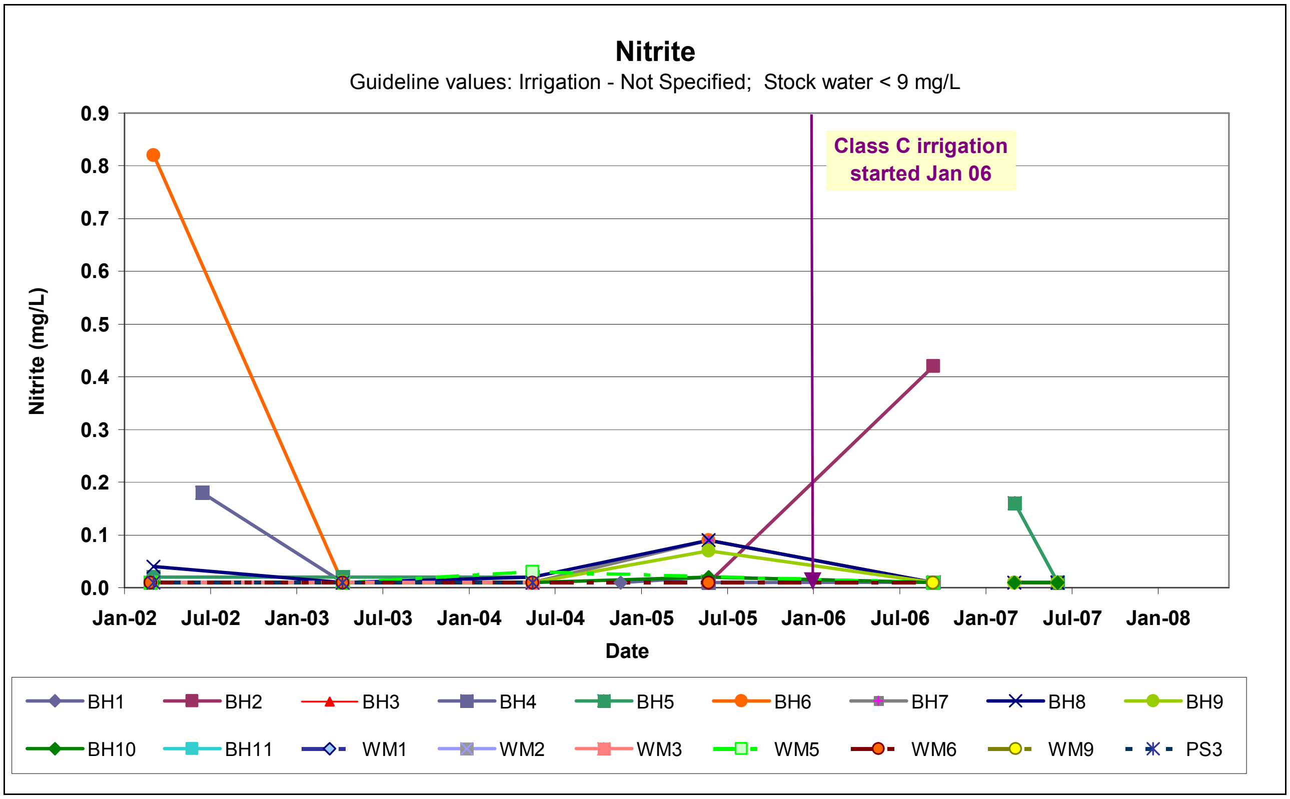


Figure 6: Nitrite as N results for borehole samples

The nitrate as N (nitrogen) concentration measured in groundwater ranged from below 0.01 mg/L to 9.7 mg/L in bores sampled over the pre-irrigation period, and below 0.01 mg/L to 24 mg/L in the post-irrigation period (Figure 7). The 24 mg/L result is unlikely to be related to irrigation with Class C water as it was recorded at borehole 2 (BH2) given that SKM (2005) concluded groundwater is flowing south from the site and BH2 is located north of the irrigated area. These concentrations are well below the trigger value of 90 mg/L for stock water. Excluding three outlying values, the nitrate results across the site have remained relatively stable over the monitoring period.

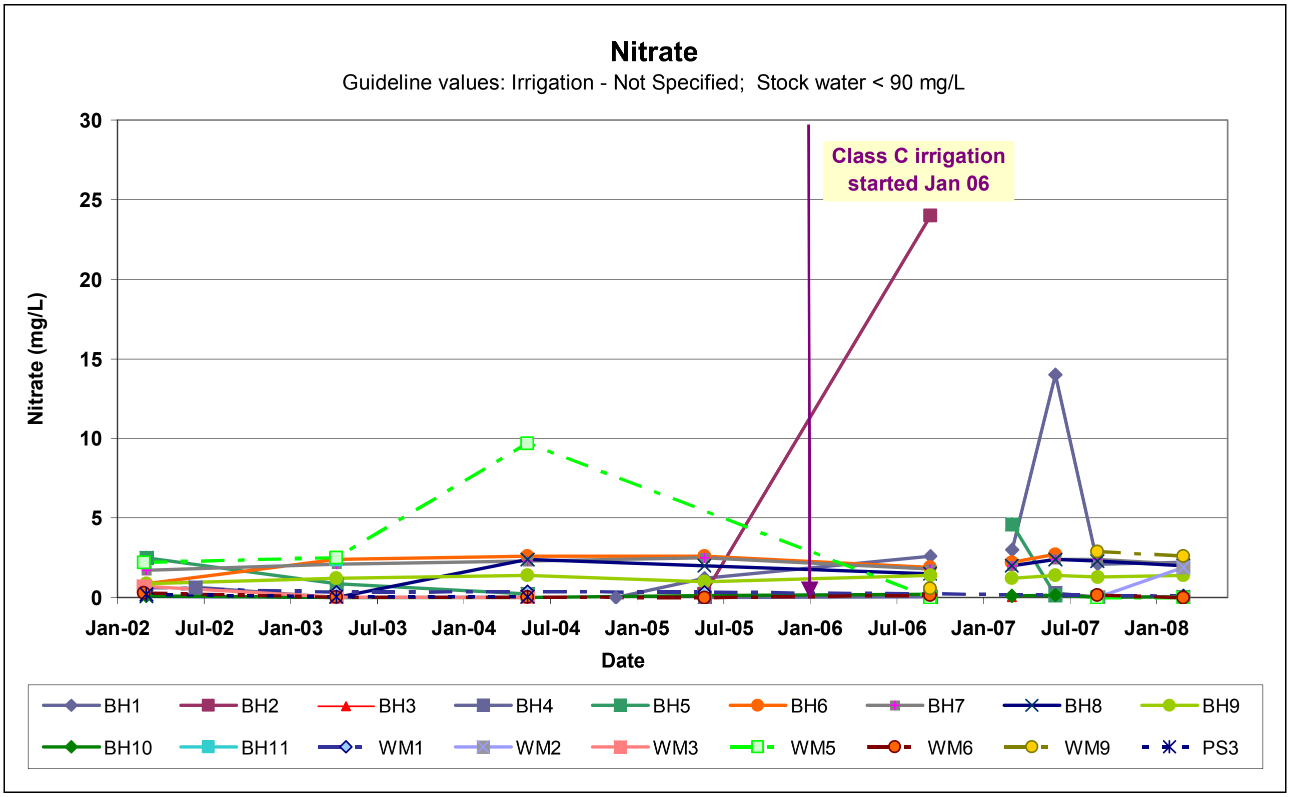


Figure 7: Nitrate as N results for borehole samples

Total Kjeldahl Nitrogen

Total Kjeldahl Nitrogen (TKN) gives an indication of the total organic nitrogen and ammonia present in a solution. A trigger value for irrigation water or stock watering water quality for TKN is not specified in the Guidelines.

With the exception of one outlier in each of the pre and post-irrigation periods, the TKN values were found to range from below 0.3 to 4.7 mg/L in bores sampled over the pre-irrigation period, and below 0.1 to 3.1 mg/L in the post-irrigation period (Figure 8). TKN concentrations have remained relatively low at the site over the monitoring period, with all but two samples collected having TKN concentrations of less than 5.0 mg/L. The 250 mg/L result was recorded for windmill 1 (WM1) which is located north of the irrigated area, however future TKN results for WM1 should be monitored to determine if the 250 mg/L was an anomaly or an indication of an upwards trend.

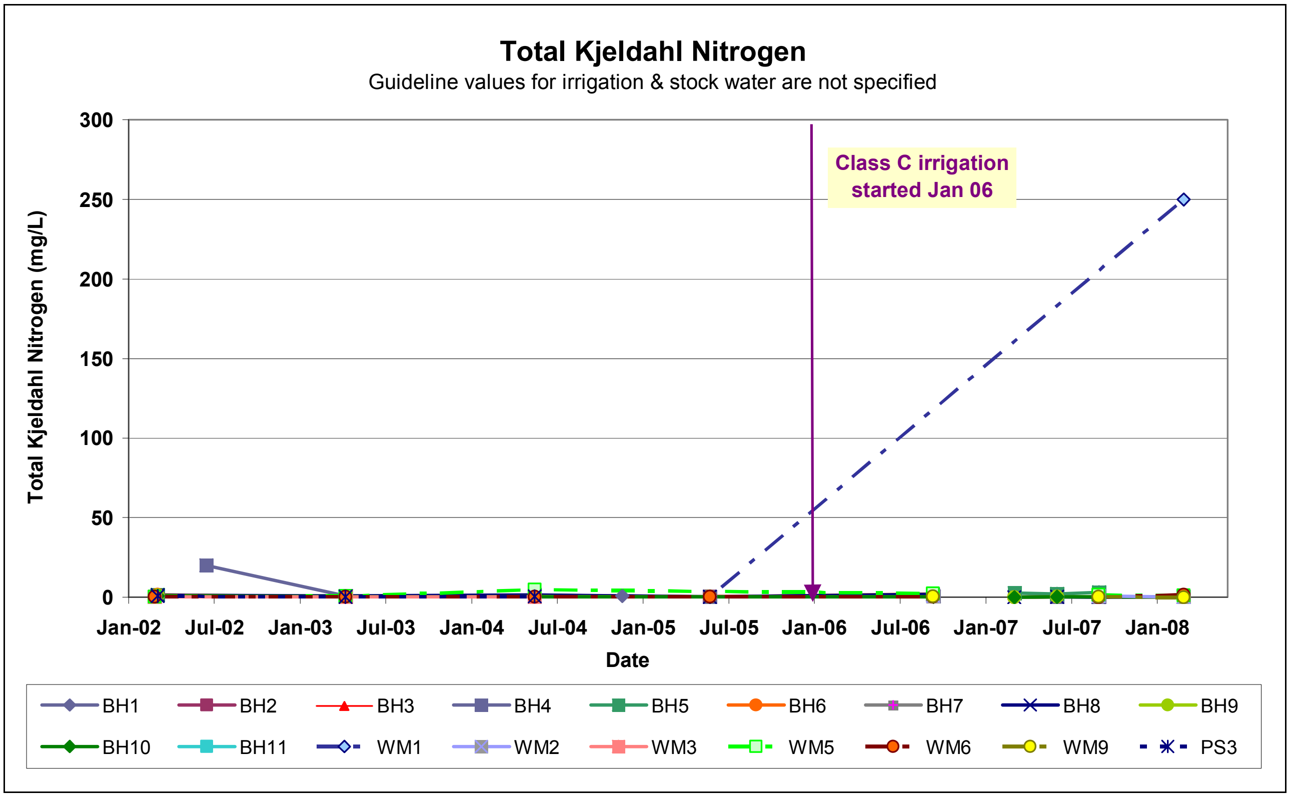


Figure 8: Total Kjeldahl Nitrogen results for borehole samples

Total Phosphorus

Total Phosphorus is the sum of organic and inorganic phosphorus. Phosphorus is a nutrient that can stimulate rapid growth of microorganisms and excessive Phosphorus concentrations can lead to algae blooms in surface water. According to the Guidelines for irrigation waters, the short-term (up to 20 years) trigger range for phosphorus is 0.8-12 mg/L. The long-term (up to 100 years) trigger value of 0.05 mg/L is for the purposes of minimising bioclogging of irrigation equipment only.

Apart from two outliers of 7.6 mg/L in March 2008 and 10 mg/L in October 2006, the range of Total Phosphorus concentrations recorded across the site has remained fairly stable since 2002. In the pre-irrigation period, the Total Phosphorus values ranged from less than 0.01 to 1.3 mg/L. In the post- irrigation period, the majority of values ranged from less than 0.05 to 1.1 mg/L (Figure 9). The two outlying values of 7.6 and 10 mg/L originated from borehole 2 and windmill 1, both located north of the Wallan Recycled Reservoir Storage and outside of the irrigated area. All concentrations, including outliers, were within the short-term trigger values of 0.8 to 12 mg/L for irrigation water.

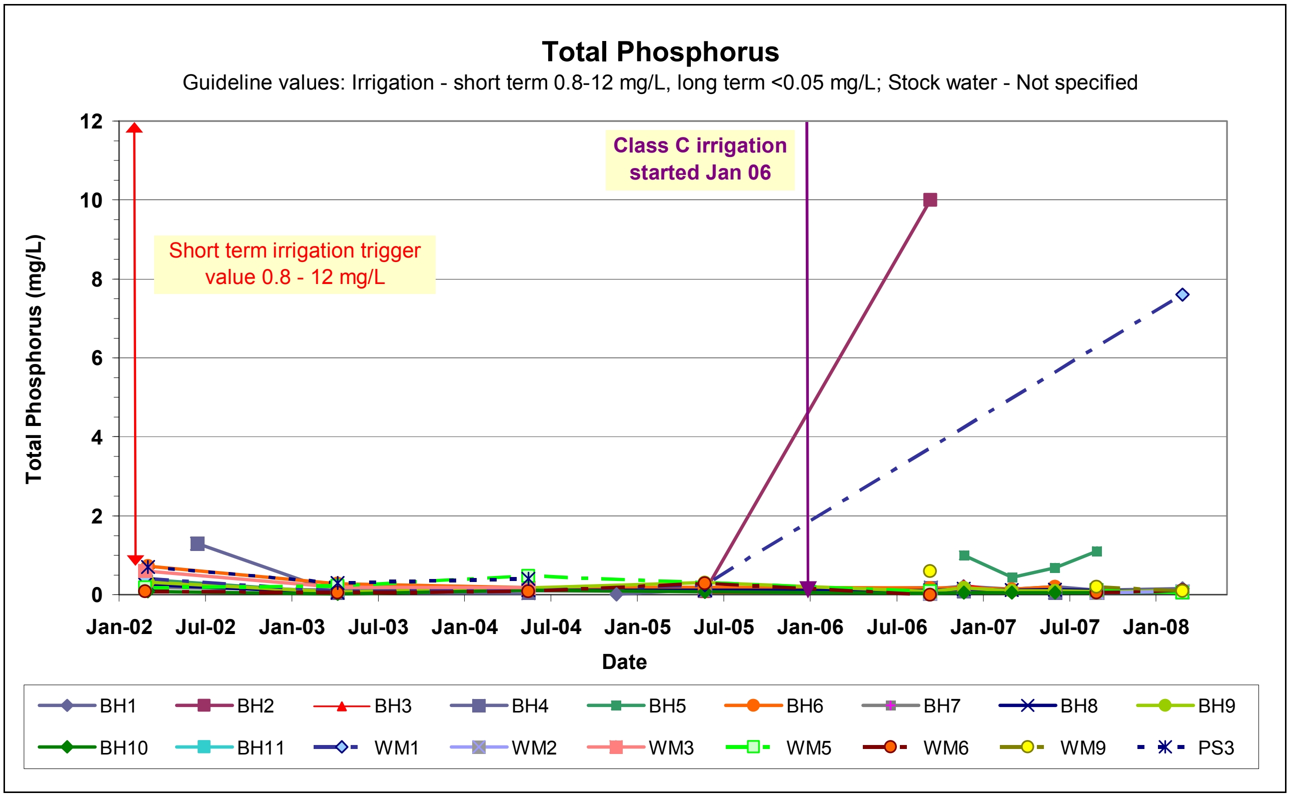


Figure 9: Total Phosphorus results for borehole samples

Biochemical Oxygen Demand

Biochemical Oxygen Demand (BOD) is the amount of oxygen required by microorganisms to decompose the organic matter in a sample of water. A BOD level of 1-2 mg/L is considered very good, 3-5 mg/L moderately clean, 6-9 mg/L somewhat polluted and at levels greater than 100 mg/L, the water supply is considered very polluted with organic waste (SKM 2005).

A BOD median value of less than 2 mg/L and a 75th percentile value of 5 mg/L for the sample set taken over the monitoring period indicates that the majority of samples can be considered very good to moderately clean (Figure 10). Five samples with outlier values greater than 100 mg/L, which indicates highly polluted groundwater, were recorded prior to the commencement of irrigation in 2006. In the post-irrigation period, about 12% (8 out of 64) samples taken had BOD values of greater than 6 mg/L, indicating somewhat polluted groundwater samples from borehole BH3 and windmills WM1, WM5 and WM6. Of these boreholes, BH3 and WM5 also recorded BOD values greater than 6 in the pre-irrigation period. Windmill 1 is located north of the irrigated area. Windmill 6 is located on the eastern boundary of the irrigated area and should be monitored to determine if BOD levels remain elevated in the future.

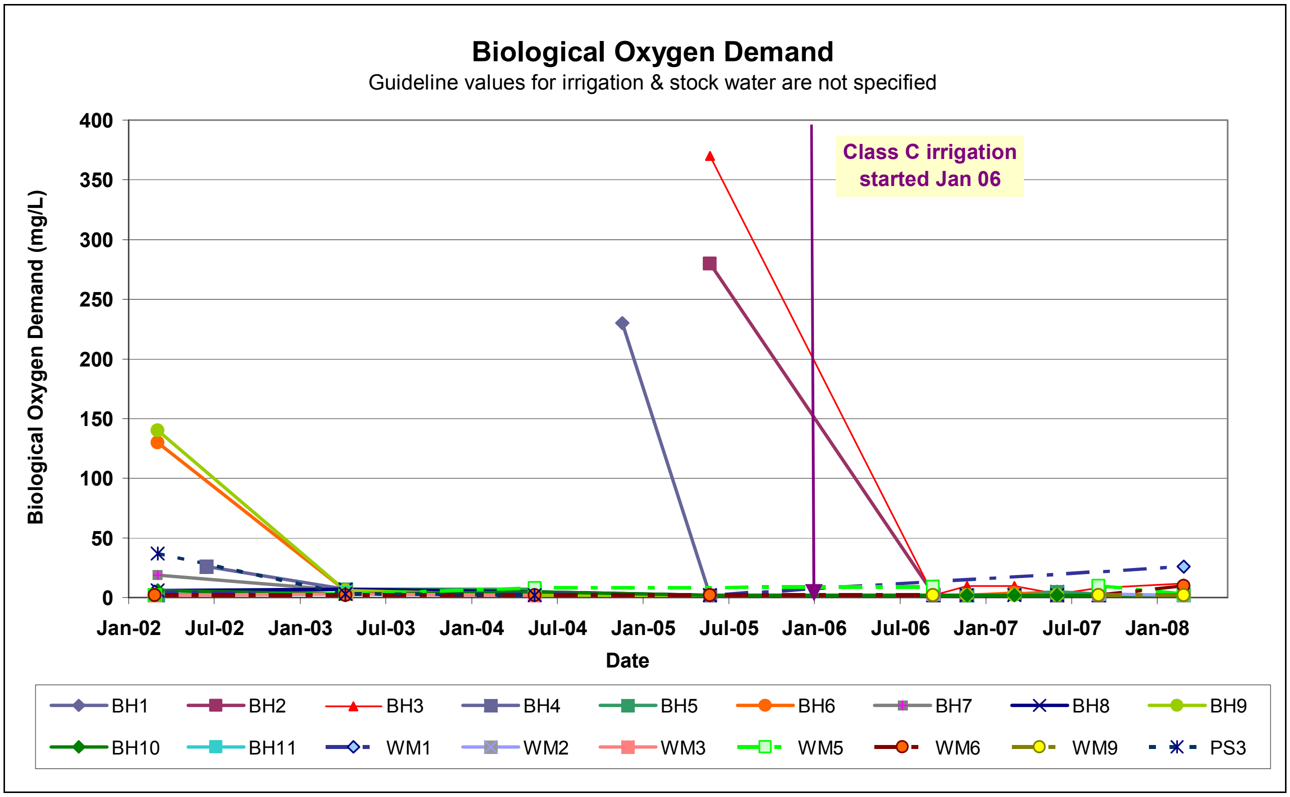


Figure 10: Biological Oxygen Demand results for borehole samples

E. *coli*

E. coli is a thermotolerant coliform (also known as faecal coliform) predominately found in the faeces of humans and other warm-blooded animals. The detection of E. *coli* is commonly used as an indication of faecal contamination, and therefore the possible presence of microbial pathogens. However, the detection of E. *coli* does not specifically indicate the presence of pathogenic organisms. The E.*coli* guideline trigger median value for irrigation water of 10 orgs/100mL applies to the highest beneficial use of irrigation water, the irrigation of raw human food crops. In comparison, the trigger median value for irrigation of pasture and fodder for dairy animals (without withholding period) is 100 orgs/100mL. For stock watering purposes, the trigger median value is 100 orgs/100 mL. The Guidelines state that investigations of likely causes of elevated thermotolerant coliforms levels are warranted when 20% of results exceed four times the median guideline value.

Median values were calculated per sampling interval and are shown in Table 4. A sampling interval includes the days over which sampling was conducted for the set of boreholes, and spans a maximum of three consecutive days. In the pre-irrigation period, the median value ranged from 0 to 74 orgs/100 mL. Two median values exceeded the trigger value for irrigation water (10 orgs/100 mL), however no values exceeded the trigger value for stock water (100 orgs/100 mL). In the post-irrigation period, the median values ranged from 0 to 9.99 orgs/mL, and hence no exceedence of the trigger values for irrigation or stock water were recorded for the post-irrigation period.

Table 4: Median E.*coli* results for borehole samples

Sampling Interval	E. *coli* median value* (orgs/100mL)
26/02/02	9.99
4/03/02	0
17/06/02	74
14/04/03	9.99
26/05/04	47.5
1/12/04	9.99
8/06/05	0
January 2006 – Irrigation commenced	
3-5/10/06	0
2/03/07	9.99
27-28/03/07	9.99
28/06/07	10
25-26/09/07	9.99
27/03/08	2

* Laboratory results recorded as <10 orgs/ mL was regarded as 9.99 orgs/mL for the purposes of calculating the median value.

Individual data points for E. *coli* samples showed high variability in the pre and post irrigation periods (Figure 11). The individual data points have also been graphed excluding outliers to highlight the variability (Figure 12). In the post-irrigation period, two extreme outlier results were recorded, 5,800 and 780 orgs/100mL from at borehole 5 in March and June 2007 respectively. These results do not appear to indicate an ongoing elevated trend at borehole 5 as 10 orgs/ 100mL was recorded in September 2007.

No particular trends in *E. coli* levels are apparent at the site that can be attributed to irrigation with Class C water, and median values have not exceeded trigger values for irrigation and stock water in the post-irrigation period.

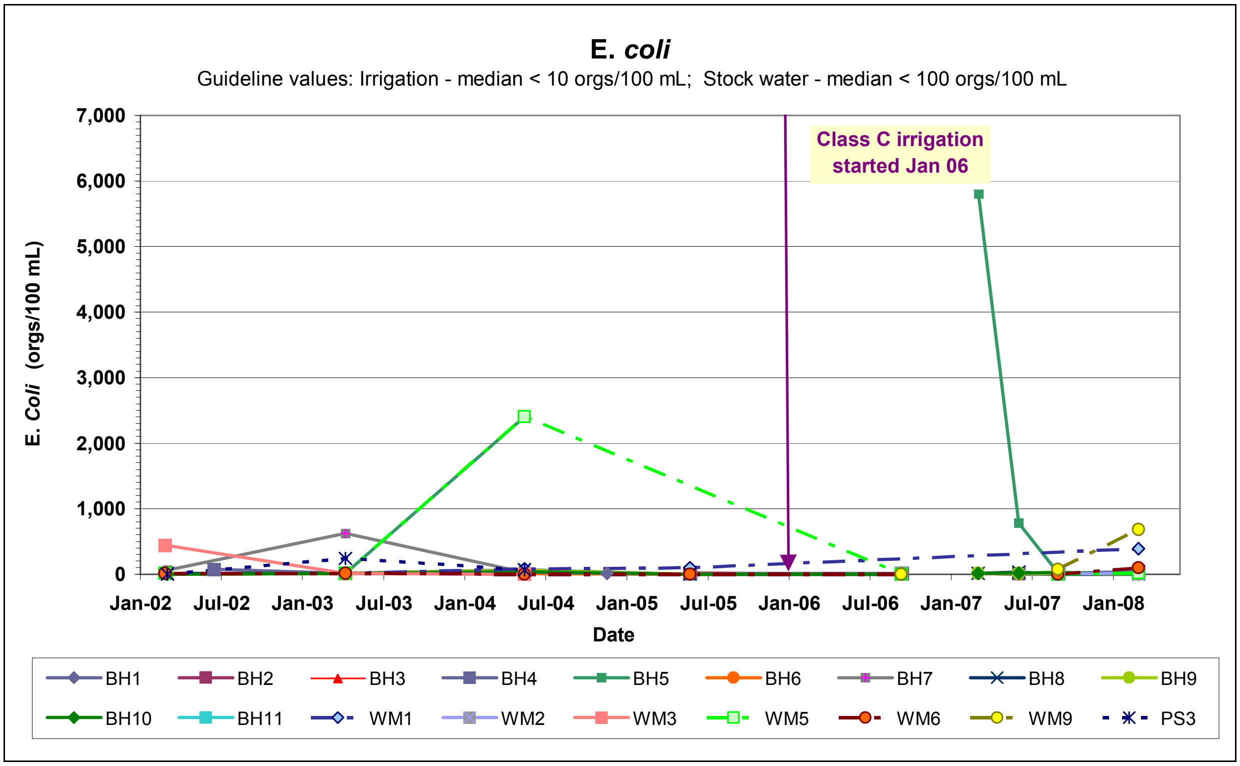


Figure 11: E. *coli* results for borehole samples

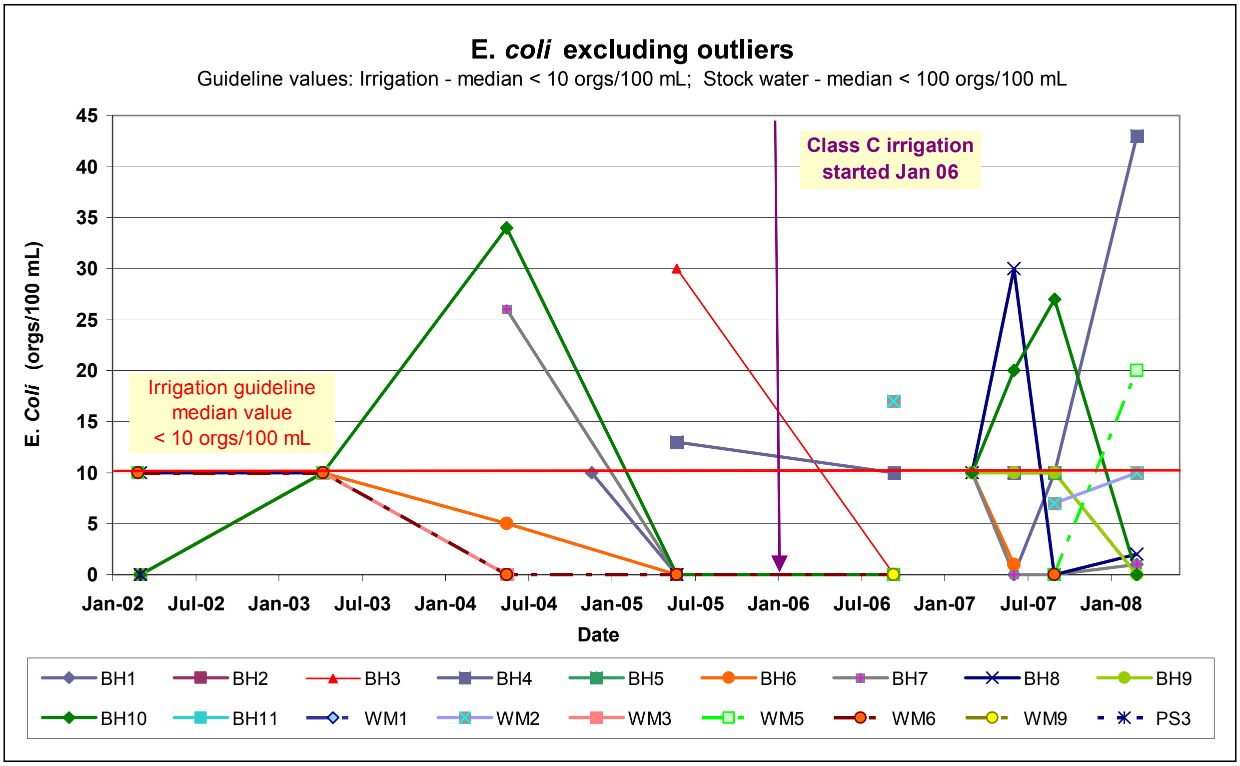


Figure 12: E. *coli* results for borehole samples excluding outliers

4. Conclusions

The main findings from this preliminary assessment of groundwater data from the post-irrigation period are summarised below:

- The slight downward trend in groundwater levels recorded in the pre-irrigation period has continued.

For groundwater quality parameters where the background conditions were assessed by SKM (2005) with trigger values in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ, 2000), the following were found:

- Majority of TDS results in the post-irrigation period are below the recommended trigger values. TDS results exceeding trigger values appear unlikely to be related to irrigation, as the exceedence results originated from bores which also showed high TDS results prior to irrigation.
- Nitrite and nitrate as N (nitrogen) concentrations have remained relatively stable, and well below the recommended trigger values.
- Total Phosphorus concentrations recorded across the irrigated area has stayed fairly steady, and were within the short-term trigger values for irrigation water.
- The median E. *coli* concentration results have not exceeded trigger values for irrigation and stock water in the post-irrigation period.

For the other thirteen groundwater quality parameters with trigger values in the Guidelines, the main findings were:

- Ten of the thirteen parameters complied with the Guidelines.
- Results for Sodium, Chloride and pH were recorded above trigger values, however no definite trend due to irrigation could be deduced.

For additional parameters analysed by SKM previously, the following were found:

- Ammonia concentrations have remained relatively stable.
- TKN concentrations have stayed low at the site, with majority of TKN concentrations less than 5.0 mg/L.
- BOD levels showed high variability in the pre and post-irrigation periods, and no significant change in BOD levels in the post-irrigation period was observed. Majority of samples taken indicate the groundwater samples were very good to moderately clean.

Recommendations from this preliminary assessment are:

- Assess the current borehole network for monitoring effectiveness, and determine any changes necessary.
  - If borehole 5 is assessed to remain in the monitoring network, re-survey elevation to top of casing of borehole 5.
- Monitor water levels for boreholes 6 and 10 to determine if an upwards trend is occurring.

- Future monitoring results for Sodium, Chloride and pH should be assessed to determine if irrigation with Class C water was the cause of the elevated results observed.
- TKN for windmill 1 should be monitored to determine if the 250 mg/L result was an anomaly or an indication of an upwards trend.
- Windmill 6 should be monitored to determine if BOD levels remain elevated in the future.
- Future ammonia results for windmill 1 should be evaluated to determine if the high reading of 250 mg/L indicates an upwards trend or was a one-off anomaly.

The recommendations listed above shall be considered for inclusion in the scope of the independent assessment to be conducted after additional data is available following the 2008 irrigation period.

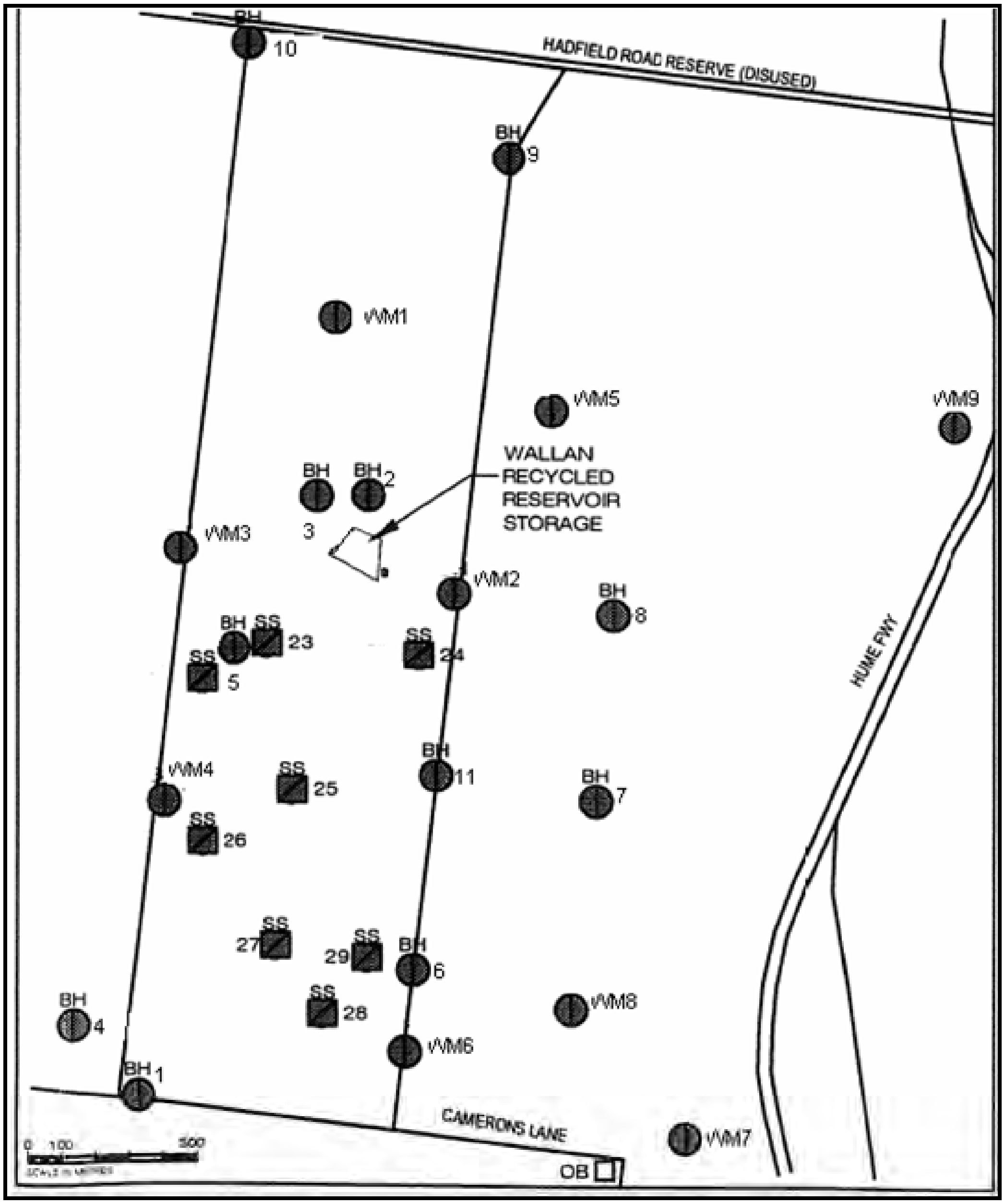
References

ANZECC & ARMCANZ (Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand) 2000, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

Environmental Protection Authority 1997, *State Environment Protection Policy (Groundwaters of Victoria)*, Publication 592.

SKM 2005, *Wallan Reclaimed Water Re-Use Site – Hydrological Assessment*.

Appendix 1 – Location of sampling sites



Note: Round symbols indicate borehole sampling sites. Square symbols indicate soil sampling sites.

Figure 13: Location of sampling sites

Appendix 2 – Groundwater level & quality data

Appendix 2 -
Groundwater level and quality monitoring results

		BOREHOLE WALRRSBH1 (S9020401-01)								
		1/12/2004	8/06/2005	4/10/2006	14/12/2006	28/03/2007	28/06/2007	26/09/2007	27/03/2008	27/03/2008 duplicate
Parameter	**Unit**									
Water level	m	10.54	10.4	10.55	12.56	10.65	10.71	10.77	10.91	10.91
Calcium (Ca)	mg/L			44	42	41	42	40		
Magnesium (Mg)	mg/L			160	180	170	170	170		
Potassium (K)	mg/L			5.1	5.8	3.3	4.4	4.5		
Sodium (Na)	mg/L			280	290	290	320	290		
Bicarbonate (HCO$_{3)}$	mg/L			700	690	710	730	560		
Chloride (Cl)	mg/L			670	560	500	590	600		
Sulphate (SO$_{4)}$	mg/L			28	29	41	66	29		
Cadnium (Cd)	mg/L			<0.001	<0.001	<0.001	<0.002	<0.002		
Copper (Cu)	mg/L			<0.01	<0.01	<0.01	<0.01	<0.01		
Mercury (Hg)	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001		
Iron (Fe)	mg/L			0.11	0.23	0.54	0.3	<0.2		
Tin (Sn)	mg/L			<0.01	<0.01	<0.01	<0.01	<0.01		
Zinc (Zn)	mg/L			0.05	0.04	<0.01	<0.02	0.03		
Arsenic (As)	mg/L			<0.001	0.001	0.002	<0.01	<0.01		
Chromium (Cr)	mg/L			<0.01	<0.01	<0.01	<0.01	<0.01		
Molybdenum (Mo)	mg/L			<0.01	<0.01	<0.01	<0.01	<0.01		
Selenium (Se)	mg/L			0.004	0.005	0.011	<0.01	<0.01		
TDS	mg/L		1,500	1,500	1,500	1,500	1,400	1,500	1,600	1,500
BOD	mg/L	230	<2	<2	<2	<2	<2	<2	<2	<2
Total P	mg/L	<0.01	0.14	0.15	0.21	0.14	0.2	0.12	0.16	0.16
Nitrate N	mg/L	<0.01	1.2	2.6		3	14	2.1	2.2	2.4
Nitrite N	mg/L	<0.01	0.02	<0.01		<0.01	<0.01			
Ammonia	mg/L	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1
TKN	mg/L	0.9	0.4	0.6		<0.1	0.3	0.2	<0.1	<0.1
Total coliforms	Orgs/100mL			0		390	580	100	310	270
E.Coli	Orgs/100mL	<10	0	0		<10	0	<10	0	1
pH	pH units	7.59	7.6	7.26	7.15	7.4	7.72	7.2	7.6	7.6
EC	uS/cm	3,340	2,830	2,703	2,750	2,700	2,714	2,700	2,587	2,587
Redox	mV			288	206.8	213	413	416	316	316
Dissolved Oxygen (DO)	mg/L	1.89	5.42	6	6.1	6.8	2.8	4.6	4.7	4.7
Turbidity	NTU			6.9	6.58	1.5	12.3	7.9		
Temperature	^{o}C	17.3	18.3	15.3	19.1	18.1	12.3	14.6	14.06	14.06
Hardness	mg/L							800		
CO3 as CaCO3	mg/L							170		
OH as CaCO3	mg/L							<2		
Alkalinity (CaCO3)	mg/L							730		

Appendix 2 -
Groundwater level and quality monitoring results

		BOREHOLE WALRRSBH2 (S9020401-02)					BOREHOLE WALRRSBH3 (S9020401-03)						
		8/06/2005	4/10/2006	15/12/2006	27/03/2007	28/06/2007	8/06/2005	4/10/2006	15/12/2006	27/03/2007	28/06/2007	26/09/2007	27/03/2008
Parameter	**Unit**												
Water level	m	4.18	No Depth	No sample. Tap not working	No sample. Tap not working	No sample. Tap not working	5.43	5.951	6.125	6.07	6.01	6.13	7.08
Calcium (Ca)	mg/L		12					100	100	97	92	94	
Magnesium (Mg)	mg/L		12					290	300	300	280	290	
Potassium (K)	mg/L		15					14	17	17	11	13	
Sodium (Na)	mg/L		130					880	820	720	700	710	
Bicarbonate (HCO$_3$)	mg/L		81					1300	1200	1300	1300	1300	
Chloride (Cl)	mg/L		130					1700	1400	1300	1500	1500	
Sulphate (SO$_4$)	mg/L		60					55	6	<1	33	31	
Cadnium (Cd)	mg/L		<0.001					<0.001	0.002	<0.001	<0.002	<0.002	
Copper (Cu)	mg/L		<0.01					<0.01	<0.01	<0.01	<0.01	<0.01	
Mercury (Hg)	mg/L		<0.001					<0.001	<0.001	<0.001	<0.001	<0.001	
Iron (Fe)	mg/L		0.3					0.32	0.35	0.46	1.3	1.2	
Tin (Sn)	mg/L		<0.01					<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc (Zn)	mg/L		0.09					0.08	0.06	<0.01	0.02	<0.02	
Arsenic (As)	mg/L		0.002					0.001	0.001	0.001	<0.01	<0.01	
Chromium (Cr)	mg/L		<0.01					0.02	<0.01	<0.01	<0.01	<0.01	
Molybdenum (Mo)	mg/L		<0.01					<0.01	<0.01	<0.01	<0.01	<0.01	
Selenium (Se)	mg/L		<0.001					0.006	0.006	0.003	<0.01	<0.01	
TDS	mg/L	1,600	520				3,100	3,200	3,000	2,800	3,300	3,000	2,900
BOD	mg/L	280	3				370	<2	10	10	3	8	12
Total P	mg/L	0.08	10				0.04	0.03	0.25	0.09	<0.05	0.07	0.07
Nitrate N	mg/L	0.23	24				0.02	0.23		0.02	0.18	<0.01	<0.01
Nitrite N	mg/L	<0.01	0.42				<0.01	<0.01		<0.01	<0.01		
Ammonia	mg/L	<0.1	<1				<0.1	<0.1		0.2	<0.1	0.4	0.6
TKN	mg/L	<0.3	<1				1	<0.3		0.4	<0.3	0.5	0.6
Total coliforms	Orgs/100mL		1600					0		<10	440	63	2000
E.Coli	Orgs/100mL	0	0				30	0		<10	<10	<10	0
pH	pH units	6.5	7.07				7.3	6.66	7.32	7.5	6.97	6.6	7.56
EC	uS/cm	2,940	825				5,310	5,699	5,250	5,400	5,460	5,600	4,876
Redox	mV		192					86	-242.1	-176	170	122	138
Dissolved Oxygen (DO)	mg/L	2.18	3.5				2.22	3.3	1	1.6	1.6	0.3	2.2
Turbidity	NTU		9.9					600	15.4	5	7.1	11	
Temperature	°C	6	21.41				15.4	15.53	23.2	16.5	14.2	14.5	13.93
Hardness	mg/L											1400	
CO3 as CaCO3	mg/L											<2	
OH as CaCO3	mg/L											<2	
Alkalinity (CaCO3)	mg/L											1300	

Appendix 2 -
Groundwater level and quality monitoring results

Parameter	Unit	BOREHOLE WALRRSBH4 (141975)									
		17/06/2002	14/04/2003	26/05/2004	1/12/2004	8/06/2005	5/10/2006	14/12/2006	28/06/2007	26/09/2007	27/03/2008
Water level	m						11.82	14.8	12.31	12.11	12.21
Calcium (Ca)	mg/L						49	36	45	44	
Magnesium (Mg)	mg/L						130	100	130	130	
Potassium (K)	mg/L						11	11	9.5	13	
Sodium (Na)	mg/L						370	290	420	370	
Bicarbonate (HCO_3)	mg/L						810	800	800	710	
Chloride (Cl)	mg/L						610	630	610	580	
Sulphate (SO_4)	mg/L						46	57	54	46	
Cadnium (Cd)	mg/L						<0.001	<0.001	<0.002	<0.002	
Copper (Cu)	mg/L						<0.01	<0.01	<0.01	<0.01	
Mercury (Hg)	mg/L						<0.001	<0.001	<0.001	<0.001	
Iron (Fe)	mg/L						0.94	2.2	0.8	0.6	
Tin (Sn)	mg/L						<0.01	<0.01	<0.01	<0.01	
Zinc (Zn)	mg/L						0.13	0.06	0.05	<0.02	
Arsenic (As)	mg/L						<0.001	0.002	<0.01	<0.01	
Chromium (Cr)	mg/L						<0.01	<0.01	<0.01	<0.01	
Molybdenum (Mo)	mg/L						<0.01	<0.01	<0.01	<0.01	
Selenium (Se)	mg/L						0.002	0.003	<0.01	<0.01	
TDS	mg/L	1,400	1,400	1,500	1,600	1,500	1,600	1,600	1,500	1600	1700
BOD	mg/L	26	7	3		<2	<2	<2	<2	<2	<2
Total P	mg/L	1.3	0.05	0.04		0.11	0.18	0.1	<0.05	<0.05	0.06
Nitrate N	mg/L	0.67	0.01	0.02		<0.01	0.04		0.29	0.02	0.06
Nitrite N	mg/L	0.18	0.01	<0.01		<0.01	0.01		<0.01		
Ammonia	mg/L	12	0.3	<0.1		<0.1	<0.1		<0.1	0.1	0.3
TKN	mg/L	20	0.8	<0.3		<0.3	0.4		<0.3	0.1	0.3
Total coliforms	Orgs/100mL						<10		280	99	>2400
E.Coli	Orgs/100mL	74	10	0		13	<10		10	<10	43
pH	pH units	7.3	7.2	7.2		7	7.03	7.14	7.76	7.4	7.4
EC	uS/cm	2,001	2,200	2,530		2,940	2,899	2,900	2,850	2800	2911
Redox	mV						177	174.3	286	313.0	318
Dissolved Oxygen (DO)	mg/L		1.15	9.11		2.07	3	4.4	2.4	1.3	3.8
Turbidity	NTU						130	22	5.8	16	
Temperature	°C	14.8	17.3	13.7		18.6	15.19	19.9	13.3	15.1	12.38
Hardness	mg/L									660	
CO3 as CaCO3	mg/L									90	
OH as CaCO3	mg/L									<2	
Alkalinity (CaCO3)	mg/L									800	

Appendix 2 -
Groundwater level and quality monitoring results

Parameter	Unit	BOREHOLE WALRRSBH5 (145709)								BOREHOLE WALRRSBH6 (145710)							
		4/03/2002	14/04/2003	26/05/2004	8/06/2005	15/12/2006	28/03/2007	28/06/2007	26/09/2007	4/03/2002	14/04/2003	26/05/2004	8/06/2005	3/10/2006	14/12/2006	27/03/2007	28/06/2007
Water level	m	7.87	9.04	9.7	0	7.5	7.52	6.81	7.80	10.3	10.96	11.2	11	11.42	11.4	11.51	9.34
Calcium (Ca)	mg/L					77	87	87	71					30	29	29	29
Magnesium (Mg)	mg/L					170	220	220	180					110	110	110	110
Potassium (K)	mg/L					17	11	12	14					3.4	4.6	4.7	4.3
Sodium (Na)	mg/L					790	830	720	660					230	250	270	270
Bicarbonate (HCO_3)	mg/L					530	690	760	520					580	570	600	580
Chloride (Cl)	mg/L					1300	1500	1500	1300					400	390	380	360
Sulphate (SO_4)	mg/L					160	120	81	82					34	37	37	23
Cadnium (Cd)	mg/L					<0.001	<0.001	<0.002	<0.002					<0.001	<0.001	<0.001	<0.002
Copper (Cu)	mg/L					<0.01	0.02	<0.01	<0.01					<0.01	<0.01	<0.01	<0.01
Mercury (Hg)	mg/L					<0.001	<0.001	<0.001	<0.001					<0.001	<0.001	<0.001	<0.001
Iron (Fe)	mg/L					1.1	2.1	2.1	2.4					0.07	0.15	<0.05	0.4
Tin (Sn)	mg/L					<0.01	<0.01	<0.01	<0.01					<0.01	<0.01	<0.01	<0.01
Zinc (Zn)	mg/L					0.12	0.08	<0.02	0.03					0.13	0.14	<0.01	<0.02
Arsenic (As)	mg/L					0.02	0.015	0.01	0.01					<0.001	<0.001	0.001	<0.01
Chromium (Cr)	mg/L					<0.01	<0.01	<0.01	<0.01					<0.01	<0.01	<0.01	<0.01
Molybdenum (Mo)	mg/L					<0.01	<0.01	<0.01	<0.01					<0.01	<0.01	<0.01	<0.01
Selenium (Se)	mg/L					0.01	0.015	<0.01	<0.01					0.003	0.004	0.001	<0.01
TDS	mg/L	2,600	3,500	3,900		2,500	3,100	2,900	2600	1,400	1,300	1,200	1,100	1,000	1,200	7,300	1,100
BOD	mg/L	<2	7	7		<2	3	5	3	130	6	<2	<2	<2	<2	4	<2
Total P	mg/L	0.38	0.05	0.12		1	0.44	0.68	1.1	0.72	0.28	0.18	0.19	0.17	0.17	0.14	0.2
Nitrate N	mg/L	2.5	0.86	0.24			4.6	0.17	<0.01	0.88	2.4	2.6	2.6	1.9		2.2	2.7
Nitrite N	mg/L	0.02	0.02	0.02			0.16	0.01		0.82	<0.01	<0.01	0.09	<0.01		<0.01	<0.01
Ammonia	mg/L	0.5	<0.1	0.1			0.7	0.9	0.6	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1
TKN	mg/L	1.5	0.4	0.7			2.7	2	3.1	1.7	<0.3	1.3	<0.3	2.1		<0.1	<0.3
Total coliforms	Orgs/100mL						>24000	20000	52					2		<10	17
E.Coli	Orgs/100mL	0	10	2400			5800	780	10	0	<10	5	0	0		<10	1
pH	pH units	12.1	8	7.5		7.42	7.4	7.72	7.3	7.4	7.4	7.3	7.4	7.26	7.25	7.54	7.3
EC	uS/cm	5,170	6,180	6,960		4,470	5,500	5,160	4700	2,320	2,130	2,330	2,020	2,055	2,080	2,100	2,242
Redox	mV					-86.2	-31	260	210.0					253	187.1	232.6	414
Dissolved Oxygen (DO)	mg/L	8.74	1.59	7.24		1.6	3.2	3.5	0.7	8.74	1.59	6.54	5.96	8.7	7.2	9.6	5.7
Turbidity	NTU					27.5	51.3	96.8	140					15	3.28	3.4	22.8
Temperature	°C	16.1	15.9	14.5		15.7	16.6	13.1	14.2	17.8	16.2	14.7	17.1	17.91	20.4	17.8	12.4
Hardness	mg/L								920								
CO3 as CaCO3	mg/L								150								
OH as CaCO3	mg/L								<2								
Alkalinity (CaCO3)	mg/L								670								

Appendix 2 -
Groundwater level and quality monitoring results

		BOREHOLE WALRRSBH7 (145712)									
Parameter	**Unit**	4/03/2002	14/04/2003	26/05/2004	8/06/2005	3/10/2006	14/12/2006	27/03/2007	28/06/2007	25/09/2007	27/03/2008
Water level	m	4.34	6.95	4.86	4.93	5.33	5.165	5.35	5.31	5.54	5.58
Calcium (Ca)	mg/L					46	40	48	46	43	
Magnesium (Mg)	mg/L					97	89	97	98	95	
Potassium (K)	mg/L					6.5	7.6	8.1	5.4	7.2	
Sodium (Na)	mg/L					170	160	200	190	160	
Bicarbonate ($HCO_{3)}$	mg/L					390	380	420	400	340	
Chloride (Cl)	mg/L					410	370	410	390	420	
Sulphate ($SO_{4)}$	mg/L					15	21	20	16	18	
Cadnium (Cd)	mg/L					<0.001	<0.001	<0.001	<0.002	<0.002	
Copper (Cu)	mg/L					<0.01	<0.01	<0.01	<0.01	<0.01	
Mercury (Hg)	mg/L					<0.001	<0.001	<0.001	<0.001	<0.001	
Iron (Fe)	mg/L					0.12	0.22	<0.05	0.4	0.3	
Tin (Sn)	mg/L					<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc (Zn)	mg/L					0.06	0.11	<0.01	0.05	0.02	
Arsenic (As)	mg/L					<0.001	<0.001	0.002	<0.01	<0.01	
Chromium (Cr)	mg/L					<0.01	<0.01	<0.01	<0.01	<0.01	
Molybdenum (Mo)	mg/L					<0.01	<0.01	<0.01	<0.01	<0.01	
Selenium (Se)	mg/L					0.002	0.003	0.004	<0.01	<0.01	
TDS	mg/L	1,600	1,000	1,000	950	920	1,000	1,100	940	930	1,100
BOD	mg/L	19	6	3	<2	<2	<2	<2	<2	<2	<2
Total P	mg/L	0.19	0.12	0.1	0.09	0.09	0.11	0.12	0.11	0.1	0.11
Nitrate N	mg/L	1.7	2.1	2.3	2.5	1.8		2	2.4	2.4	2.1
Nitrite N	mg/L	<0.01	<0.01	<0.01	0.09	<0.01		0.01	<0.01		
Ammonia	mg/L	0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1
TKN	mg/L	1.1	<0.3	1.4	<0.3	1.9		<0.1	<0.3	<0.1	0.1
Total coliforms	Orgs/100mL					0		10	25	1	88
E.Coli	Orgs/100mL	61	620	26	0	0		<10	0	0	1
pH	pH units	7.2	7.8	7.4	7.2	7.12	7	6.99	7.47	6.9	7.2
EC	uS/cm	2,500	1,806	2,030	1,787	1,799	1,760	1,900	1,831	1,800	1,731
Redox	mV					251	214.1	251	416	377	261
Dissolved Oxygen (DO)	mg/L	5.27	1.66	5.3	5.1	4.8	4.2	3.6	1.7	2	2.8
Turbidity	NTU					2.6	6.29	3	13.7	11	
Temperature	^{o}C	17.3	15.7	13	17.7	14.86	18.2	15.7	12.2	17	13.7
Hardness	mg/L									500	
CO3 as CaCO3	mg/L									36	
OH as CaCO3	mg/L									<2	
Alkalinity (CaCO3)	mg/L									380	

Appendix 2 -
Groundwater level and quality monitoring results

		BOREHOLE WALRRSBH8 (145713)										BOREHOLE WALRRSBH9 (145714)									
		4/03/2002	14/04/2003	26/05/2004	8/06/2005	3/10/2006	14/12/2006	27/03/2007	28/06/2007	25/09/2007	27/03/2008	4/03/2002	14/04/2003	26/05/2004	8/06/2005	4/10/2006	15/12/2006	27/03/2007	28/06/2007	26/09/2007	27/03/2008
Parameter	**Unit**																				
Water level	m	6.72	6.91	7.1	7.11	7.4	7.326	7.51	7.46	7.54	8.3	9.52	9.5	9.7	9.84	9.688	9.946	9.95	9.16	9.9	10.05
Calcium (Ca)	mg/L					39	38	36	36	36						65	65	58	65	60	
Magnesium (Mg)	mg/L					88	93	82	84	85						160	180	160	170	170	
Potassium (K)	mg/L					3.8	7.4	3.8	3.3	4.9						6.5	13	9	4.8	5.6	
Sodium (Na)	mg/L					220	230	230	230	200						260	270	260	260	260	
Bicarbonate (HCO_3)	mg/L					440	440	430	430	380						600	560	650	640	560	
Chloride (Cl)	mg/L					400	400	390	370	420						750	730	610	640	650	
Sulphate (SO_4)	mg/L					16	17	18	14	17						17	15	19	14	17	
Cadnium (Cd)	mg/L					<0.001	<0.001	<0.001	<0.002	<0.002						<0.001	0.002	<0.001	<0.002	<0.002	
Copper (Cu)	mg/L					<0.01	<0.01	<0.01	<0.01	<0.01						<0.01	<0.01	<0.01	<0.01	<0.01	
Mercury (Hg)	mg/L					<0.001	<0.001	<0.001	<0.001	<0.001						<0.001	<0.001	<0.001	<0.001	<0.001	
Iron (Fe)	mg/L					0.1	0.2	<0.05	0.2	0.4						0.18	0.35	0.29	0.3	0.3	
Tin (Sn)	mg/L					<0.01	<0.01	<0.01	<0.01	<0.01						<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc (Zn)	mg/L					0.08	0.09	<0.01	<0.02	<0.02						0.2	0.001	<0.01	<0.02	0.08	
Arsenic (As)	mg/L					<0.001	<0.001	0.002	<0.01	<0.01						<0.001	0.001	0.002	<0.01	<0.01	
Chromium (Cr)	mg/L					<0.01	<0.01	<0.01	<0.01	<0.01						<0.01	<0.01	<0.01	<0.01	<0.01	
Molybdenum (Mo)	mg/L					<0.01	<0.01	<0.01	<0.01	<0.01						<0.01	<0.01	<0.01	<0.01	<0.01	
Selenium (Se)	mg/L					0.003	0.003	<0.001	<0.01	<0.01						0.004	0.006	0.004	<0.01	<0.01	
TDS	mg/L	1,000	1,500	1,000	1,000	980	1,000	1,000	960	970	990	1,500	3,800	1,500	1,600	1,500	1,800	1,600	1,400	1,500	1,500
BOD	mg/L	6	7	5	<2	<2	<2	<2	<2	<2	<2	140	6	<2	<2	<2	<2	<2	<2	<2	<2
Total P	mg/L	0.26	0.05	0.12	0.12	0.11	0.15	0.12	0.13	0.11	0.09	0.32	0.06	0.17	0.31	0.09	0.17	0.1	0.1	0.08	0.1
Nitrate N	mg/L	0.07	<0.01	2.4	2	1.5		2	2.4	2.3	2	0.88	1.2	1.4	1	1.4		1.2	1.4	1.3	1.4
Nitrite N	mg/L	0.04	<0.01	0.02	0.09	<0.01		<0.01	<0.01			<0.01	0.01	<0.01	0.07	<0.01		<0.01	<0.01		
Ammonia	mg/L	0.3	0.3	0.2	<0.1	<0.1		<0.1	<0.1	<0.1	0.3	0.2	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	0.2	<0.1
TKN	mg/L	1.3	0.8	1.7	<0.3	1.9		<0.1	<0.3	<0.1	0.3	1	<0.3	0.6	<0.3	<0.3		<0.1	<0.3	0.2	<0.1
Total coliforms	Orgs/100mL					0		>24000	160	0	>2400					0		<10	10	140	53
E.Coli	Orgs/100mL	<10	<10	68	0	0		<10	30	0	2	0	<10	61	0	0		<10	10	<10	0
pH	pH units	8	7.2	7.7	7.7	7.4	7.4	7.46	7.64	7.4	7.68	7.4	7.6	7.5	7.4	7.26	7.18	7.3	7.5	7.4	7.41
EC	uS/cm	2,001	2,200	1,910	1,901	1,877	1,857	1,900	1,802	1,800	1,730	2,610	7,050	2,510	2,850	2,804	2,780	2,800	2,747	2,700	2,578
Redox	mV					260	140	212	413	378	253					253	194.5	238.3	308	274	289
Dissolved Oxygen (DO)	mg/L	4.8	1.15	7.31	6.71	4.9	7.8	6.5	3	6.2	6.1	5.1	1.85	7.11	6.53	7.6	6.5	5.8	5.2	2.6	6
Turbidity	NTU					18.2	3.83	1.8	11.3	11						12.8	4.61	5.1	16.5	10	
Temperature	^{o}C	15.8	17.3	15.5	16.5	14.35	18.4	16.7	12.9	15	14.2	17.1	16.1	13.8	16.5	18.07	14.6	17.3	14.4	15.2	14.55
Hardness	mg/L									440										840	
CO3 as CaCO3	mg/L									50										72	
OH as CaCO3	mg/L									<2										<2	
Alkalinity (CaCO3)	mg/L									430										630	

Appendix 2 -
Groundwater level and quality monitoring results

		BOREHOLE WALRRSBH10 (145715)										**BOREHOLE WALRRSBH11 (145711)**		
		4/03/2002	14/04/2003	26/05/2004	8/06/2005	4/10/2006	15/12/2006	27/03/2007	28/06/2007	26/09/2007	27/03/2008	4/03/2002	14/04/2003	8/06/2005
Parameter	**Unit**													
Water level	m	3.47	3.5	3.64	3.78	3.92	4	4.1	4.05	4.12	3.63	0	4.69	0
Calcium (Ca)	mg/L					49	48	42	47	45				
Magnesium (Mg)	mg/L					320	340	310	320	330				
Potassium (K)	mg/L					14	14	14	9.1	13				
Sodium (Na)	mg/L					1000	1000	930	890	920				
Bicarbonate (HCO$_{3)}$	mg/L					850	870	890	900	840				
Chloride (Cl)	mg/L					2300	2300	1900	2000	2100				
Sulphate (SO$_{4)}$	mg/L					120	110	120	82	130				
Cadnium (Cd)	mg/L					<0.001	<0.001	<0.001	<0.002	<0.002				
Copper (Cu)	mg/L					<0.01	<0.01	<0.01	<0.01	<0.01				
Mercury (Hg)	mg/L					<0.001	<0.001	<0.001	<0.001	<0.001				
Iron (Fe)	mg/L					0.16	0.6	0.41	0.7	0.8				
Tin (Sn)	mg/L					<0.01	<0.01	<0.01	<0.01	<0.01				
Zinc (Zn)	mg/L					0.17	0.23	0.03	<0.02	0.04				
Arsenic (As)	mg/L					0.004	0.005	0.004	<0.01	<0.01				
Chromium (Cr)	mg/L					<0.01	<0.01	<0.01	<0.01	<0.01				
Molybdenum (Mo)	mg/L					<0.01	<0.01	<0.01	<0.01	<0.01				
Selenium (Se)	mg/L					0.007	0.012	0.007	<0.01	<0.01				
TDS	mg/L	5,000	3,800	3,700	4,100	3,800	4,200	3,700	3,800	3,700	3,800		950	
BOD	mg/L	6	3	5	<2	<2	<2	<2	2	<2	<2		4	
Total P	mg/L	0.08	0.02	0.12	0.07	0.03	0.05	0.05	<0.05	<0.05	0.06		0.12	
Nitrate N	mg/L	0.11	<0.01	<0.01	0.13	0.21		0.1	0.15	0.03	0.05		2.4	
Nitrite N	mg/L	<0.01	<0.01	<0.01	0.02	<0.01		<0.01	<0.01				<0.01	
Ammonia	mg/L	0.2	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1		<0.1	
TKN	mg/L	0.8	0.4	<0.3	<0.3	<0.3		<0.1	<0.3	0.2	0.2		<0.3	
Total coliforms	Orgs/100mL					0		<10	74	2400	160			
E.Coli	Orgs/100mL	0	<10	34	0	0		<10	20	27	0		<10	
pH	pH units	7.5	7.4	7.5	7.4	7.5	7.39	7.38	7.23	7.2	7.6		7.6	
EC	uS/cm	8,500	6,760	7,140	6,870	6,843	6,870	7,000	6,250	6,600	6,274		1,703	
Redox	mV					225	199.9	60	296	170	290			
Dissolved Oxygen (DO)	mg/L	6.43	2.15	6.52	5.26	6.6	3.2	2.4	1.9	0.6	2.6		1.54	
Turbidity	NTU					42.3	22.6	15.7	18.7	23				
Temperature	°C	16.8	15.9	13.5	16.4	16.36	15.1	16.5	14.2	14.6	14.64		17.7	
Hardness	mg/L									1500				
CO3 as CaCO3	mg/L									70				
OH as CaCO3	mg/L									<2				
Alkalinity (CaCO3)	mg/L									910				

Appendix 2 -
Groundwater level and quality monitoring results

Parameter	Unit	BOREHOLE WALLRRSBHWM1 (WM1)					BOREHOLE WALRRSBHWM2 (WM2)					
		26/02/2002	14/04/2003	26/05/2004	8/06/2005	27/03/2008	3/10/2006	14/12/2006	27/03/2007	27/06/2007	25/09/2007	27/03/2008
Water level	m	8.5	9.35	7.1		10	No Depth	No Depth	No Depth	No Depth	None taken	
Calcium (Ca)	mg/L						35				8.7	
Magnesium (Mg)	mg/L						130				130	
Potassium (K)	mg/L						4.8				6.7	
Sodium (Na)	mg/L						360				400	
Bicarbonate (HCO_3)	mg/L						770				580	
Chloride (Cl)	mg/L						560				640	
Sulphate (SO_4)	mg/L						27				27	
Cadnium (Cd)	mg/L						<0.001				<0.002	
Copper (Cu)	mg/L						0.01				0.02	
Mercury (Hg)	mg/L						<0.001				<0.001	
Iron (Fe)	mg/L						0.1				<0.2	
Tin (Sn)	mg/L						<0.01				<0.01	
Zinc (Zn)	mg/L						0.03				<0.02	
Arsenic (As)	mg/L						<0.001				<0.01	
Chromium (Cr)	mg/L						<0.01				<0.01	
Molybdenum (Mo)	mg/L						<0.01				<0.01	
Selenium (Se)	mg/L						0.003				<0.01	
TDS	mg/L	3,800	3,200	3,400	3,400	1,900	1,500				1,600	1,500
BOD	mg/L	<5	<2	3	<2	26	3				3	<2
Total P	mg/L	0.41	0.09	0.11	0.24	7.6	0.03				<0.05	0.08
Nitrate N	mg/L	0.62	0.34	0.36	0.33	0.1	0.1				<0.01	1.9
Nitrite N	mg/L	<0.01	<0.01	<0.01	<0.01		<0.01					
Ammonia	mg/L	0.1	<0.1	<0.1	<0.1	250	<0.1				<0.1	<0.1
TKN	mg/L	<0.3	<0.3	<0.3	<0.3	250	0.8				0.8	0.1
Total coliforms	Orgs/100mL					16000	>2400				160	170
E.Coli	Orgs/100mL	10	<10	79	100	390	17				7	<10
pH	pH units	6.7	6.5	6.6	7.1	7.21	6.01				9.1	8.32
EC	uS/cm	8,450	5,700	6,200	6,520	4,374	2,848	2,920	2,910	2,520	2,800	2,456
Redox	mV					108	252				387	242
Dissolved Oxygen (DO)	mg/L	2.97	2.33	4.18	2.78	1.9	18.6				16.1	7.7
Turbidity	NTU						1.1				10	
Temperature	°C	15.2	15.7	12.1	15.6	12.91	13.11	15.1	15	7.6	16.5	13.74
Hardness	mg/L										580	
CO3 as CaCO3	mg/L										180	
OH as CaCO3	mg/L										<2	
Alkalinity (CaCO3)	mg/L										750	

Appendix 2 -
Groundwater level and quality monitoring results

		BOREHOLE WALRRSBHWM3 (WM3)				BOREHOLE WALRRSBHWM5 (WM5)							
		26/02/2002	14/04/2003	26/05/2004	8/06/2005	26/02/2002	14/04/2003	26/05/2004	3/10/2006	27/03/2007	27/06/2007	25/09/2007	27/03/2008
Parameter	**Unit**												
Water level	m	7.55	26.21	10.24	0	5.97	6.45	6.2	No Depth	No Depth	No Depth	None taken	
Calcium (Ca)	mg/L								16			15	
Magnesium (Mg)	mg/L								78			79	
Potassium (K)	mg/L								5.4			7.2	
Sodium (Na)	mg/L								170			150	
Bicarbonate (HCO$_3$)	mg/L								330			330	
Chloride (Cl)	mg/L								290			280	
Sulphate (SO$_4$)	mg/L								9			14	
Cadnium (Cd)	mg/L								<0.001			<0.002	
Copper (Cu)	mg/L								<0.01			<0.01	
Mercury (Hg)	mg/L								<0.001			<0.001	
Iron (Fe)	mg/L								<0.05			<0.2	
Tin (Sn)	mg/L								<0.01			<0.01	
Zinc (Zn)	mg/L								<0.01			0.03	
Arsenic (As)	mg/L								<0.001			<0.01	
Chromium (Cr)	mg/L								<0.01			<0.01	
Molybdenum (Mo)	mg/L								<0.01			<0.01	
Selenium (Se)	mg/L								0.001			<0.01	
TDS	mg/L	2,700	2,600	2,700		720	670	380	710			790	890
BOD	mg/L	<2	3	2		<2	3	8	9			10	3
Total P	mg/L	0.61	0.19	0.18		0.18	0.22	0.48	0.09			0.12	<0.05
Nitrate N	mg/L	0.72	0.02	<0.01		2.2	2.5	9.7	<0.01			<0.01	<0.01
Nitrite N	mg/L	<0.01	<0.01	<0.01		<0.01	<0.01	0.03	<0.01				
Ammonia	mg/L	<0.3	<0.1	<0.1		<0.1	<0.1	0.1	<0.1			<0.1	<0.1
TKN	mg/L	<0.3	<0.3	<0.3		<0.3	0.8	4.7	2.3			1.7	1
Total coliforms	Orgs/100mL								1			91	24000
E.Coli	Orgs/100mL	440	<10	0		<10	<10	2,400	0			0	20
pH	pH units	6.8	7.3	6.7			7.5	7.9	9			9.3	9.11
EC	uS/cm	4,750	4,470	4,720		1,525	1,342	744	1,367	1,488	1,260	1,400	1,481
Redox	mV								219			414	274
Dissolved Oxygen (DO)	mg/L	4.87	1.86	3.2		6.5	1.3	6.05	13.6			17.6	10.2
Turbidity	NTU								9.9			38	
Temperature	°C	17.2	17.9	12.5		15.9	17	13.4	18	14.6	7.5	14.7	13.31
Hardness	mg/L											360	
CO3 as CaCO3	mg/L											72	
OH as CaCO3	mg/L											<2	
Alkalinity (CaCO3)	mg/L											400	

		BOREHOLE WALRRSBHWM6 (WM6)									
Parameter	**Unit**	26/02/2002	14/04/2003	26/05/2004	8/06/2005	3/10/2006	14/12/2006	27/03/2007	27/06/2007	25/09/2007	27/03/2008
Water level	m	1.24		10.53		No Depth	No Depth	No Depth	No Depth	None taken	
Calcium (Ca)	mg/L					23				21	
Magnesium (Mg)	mg/L					36				34	
Potassium (K)	mg/L					3.6				4.6	
Sodium (Na)	mg/L					230				200	
Bicarbonate (HCO$_3$)	mg/L					510				450	
Chloride (Cl)	mg/L					180				170	
Sulphate (SO$_4$)	mg/L					8				9	
Cadnium (Cd)	mg/L					<0.001				<0.002	
Copper (Cu)	mg/L					0.04				0.02	
Mercury (Hg)	mg/L					<0.001				<0.001	
Iron (Fe)	mg/L					0.09				0.3	
Tin (Sn)	mg/L					<0.01				<0.01	
Zinc (Zn)	mg/L					0.75				0.34	
Arsenic (As)	mg/L					<0.001				<0.01	
Chromium (Cr)	mg/L					<0.01				<0.01	
Molybdenum (Mo)	mg/L					<0.01				<0.01	
Selenium (Se)	mg/L					<0.001				<0.01	
TDS	mg/L	700	680	760	710	710				750	2,500
BOD	mg/L	<2	<2	<2	2	<2				<2	10
Total P	mg/L	0.09	0.05	0.09	0.29	0				0.05	0.11
Nitrate N	mg/L	0.3	0.02	0.02	<0.01	0.16				0.16	<0.01
Nitrite N	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01					
Ammonia	mg/L	0.2	<0.1	0.2	<0.1	<0.1				<0.1	<0.1
TKN	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3				<0.1	1.6
Total coliforms	Orgs/100mL					0				0	960
E.Coli	Orgs/100mL	<10	<10	0	0	0				0	98
pH	pH units	7.5	7.6	7.5	7.9	7.3				7.9	9.1
EC	uS/cm	1,435	1,191	1,337	1,315	1,290	1,280	1,360	1,270	1,300	3,917
Redox	mV					240				370	314
Dissolved Oxygen (DO)	mg/L	3.07	1.69	3.69	7.31	12.1				10.9	6.2
Turbidity	NTU					23.4				8.5	
Temperature	^{o}C	16.6	18.4	13.8	18.2	16.3	19.8	18.1	8.8	15.3	9.41
Hardness	mg/L									190	
CO3 as CaCO3	mg/L									62	
OH as CaCO3	mg/L									<2	
Alkalinity (CaCO3)	mg/L									510	

Appendix 2 -
Groundwater level and quality monitoring results

Parameter	Unit	BOREHOLE WALRRSBHWM9 (WM9)					BOREHOLE 145708 (PS 3)		
		3/10/2006	14/12/2006	27/03/2007	25/09/2007	27/03/2008	4/03/2002	14/04/2003	26/05/2004
Water level	m	No Depth	No Depth	No Depth	None taken		4.64	4.81	5
Calcium (Ca)	mg/L	21			21				
Magnesium (Mg)	mg/L	42			42				
Potassium (K)	mg/L	5.1			6.4				
Sodium (Na)	mg/L	81			65				
Bicarbonate (HCO_3)	mg/L	440			180				
Chloride (Cl)	mg/L	160			150				
Sulphate (SO_4)	mg/L	7			8				
Cadnium (Cd)	mg/L	<0.001			<0.002				
Copper (Cu)	mg/L	<0.01			<0.01				
Mercury (Hg)	mg/L	<0.001			<0.001				
Iron (Fe)	mg/L	0.06			<0.2				
Tin (Sn)	mg/L	<0.01			<0.01				
Zinc (Zn)	mg/L	0.05			0.02				
Arsenic (As)	mg/L	<0.001			<0.01				
Chromium (Cr)	mg/L	<0.01			<0.01				
Molybdenum (Mo)	mg/L	<0.01			<0.01				
Selenium (Se)	mg/L	0.001			<0.01				
TDS	mg/L	400			420	480	3,000	2,600	2,800
BOD	mg/L	<2			<2	<2	37	3	<2
Total P	mg/L	0.1			0.14	0.15	0.13	0.02	0.1
Nitrate N	mg/L	0.58			2.9	2.6	0.2	0.04	0.04
Nitrite N	mg/L	<0.01					<0.01	<0.01	<0.01
Ammonia	mg/L	<0.1			<0.1	<0.1	0.1	<0.1	<0.1
TKN	mg/L	0.6			0.2	<0.1	0.7	<0.3	0.4
Total coliforms	Orgs/100mL	1			170	1200			
E.Coli	Orgs/100mL	0			71	680	0	240	65
pH	pH units	7.97			8	8.24	6.8	6.8	6.9
EC	uS/cm	818	848	752	800	786	5,340	4,540	4,920
Redox	mV	247			374	268			
Dissolved Oxygen (DO)	mg/L	10.6			11.2	9.2	7.57	1.71	5.9
Turbidity	NTU	15.3			7.2				
Temperature	°C	17.49	18.4	28.6	15.5	15.49	16.9	16.4	12.9
Hardness	mg/L				230				
CO3 as CaCO3	mg/L				16				
OH as CaCO3	mg/L				<2				
Alkalinity (CaCO3)	mg/L				200				

Lots 8 & 9 Camerons Lane Reuse Scheme

May 12

2008

Assessment of soil monitoring data for 2006 to 2007

By Arris Pty Ltd

Arris Project: H0509ds

Project Leader: Dr Daryl Stevens

12 May 2008

For Yarra Valley Water

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Created by

Arris Pty Ltd
646A Bridge St
Richmond Vic 3121
PO Box 5143
Burnley Vic 3121
t 03 9421 1701
m 0418 802 621

Head Office
Waite Campus
University of Adelaide
PO Box 206
Highgate SA 5063

t 08 8303 6706
f 08 8303 6752
ACN 092 739 574

File name Arris report soils

Client Cynthia Wong, Planning Engineer - Treatment Plants Planning, Infrastructure Services, Yarra Valley Water
Ph: +61 3 9872 2496, Fax: +61 3 9872 1367
email: cwong@yvw.com.au
www.yvw.com.au

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Contents

BRIEF

Assess current soils data for the Wallan recycled water scheme at Lots 8 and 9 Camerons Lane to identify any detrimental agronomic or environmental impacts on soils and plants irrigated with recycled water.

BACKGROUND

Site size

The recycled water irrigation site investigated in this report is located at Lots 8 & 9 Camerons Lane. Lot 8 is located south of Lot 9. Lots 8 & 9 are split in the centre approximately and referred to as the eastern & western side.

The ultimate irrigation scheme will comprise of 158 ha of land. Stage 1 of the scheme has been completed and covers 92 ha. Stage 2 will develop the remaining 66 ha in the future.

Irrigation commenced in January 2006 approximately.

Soil types

The irrigation area consists of a number of soil types formed primarily on basalt formations. A small area of the western portion of the site is located on the sedimentary Kilmore siltstone formation. Soil texture in the top soils is predominantly a light to medium clay with some loamy components. Soil texture in the subsoil is generally a medium to heavy clay.

Plants grown

The eastern side of the Wallan recycled water irrigation site has predominately perennial ryegrass. On the western side, there is predominately perennial ryegrass with some clovers, phalaris, fescue and paspalum.

Recycled water use

Summary of water used for irrigation:

2006	142.8 ML
2007	165.6 ML
2008	51 ML (Jan – April)

On average this equates to approximately 2 ML/ha/year across the whole site.

Recycled water quality

Table 1 Summary of Class C water quality from Wallan Sewage Treatment Plant 2006/07

Parameter	Units	Median	90th Percentile	Average
pH	Units	7.9	8	7.9
Biological Oxygen Demand (BOD)	mg/L	12	31	18
Suspended Solids (SS)	mg/L	31	72	40
Total Phosphorus (TP)	mg/L	12.5	15.9	13.2
Total Nitrogen (TN)	mg/L	32	44	34
Nitrite (NO2)	mg/L	0.32	0.69	0.41
Nitrate (NO3)	mg/L	2.45	4.6	2.61
Ammonia (NH3)	mg/L	20	26	20
Organic Nitrogen (ORG N)	mg/L	10	20.7	11.4
Total Kjeldahl Nitrogen (TKN)	mg/L	31	40	33
Electrical Conductivity (EC)	uS/cm	825	930	832
Sodium Adsorption Ratio (SAR)	Units	6	6	6

Effluent from Wallan Sewage Treatment Plant transferred to Wallan Recycled Reservoir Storage for irrigation'

See Appendix – Table 3 for detailed (Heavy Metals and Volatile Organic Compounds) water quality data (three samples). These data indicate that the total aluminium concentrations in recycled water range from 1.5 to 7.2 mg/L (Table 3). Two of these readings are above the long term trigger value (LTV) of 5 mg/L (ANZECC and ARMCANZ 2000). Given the low pH of the soil (Aluminium is more plant available and toxic at pH <5.5) the form of aluminium in water should be determined (i.e. will it be plant available or is it soil mineral not available or toxic to plants?). A measure of phytotoxic aluminium (Al) in the soil should also be integrated into the soil analysis program.

SOIL ANALYSIS

A summary of soil data for 2006 and 2007 is listed below:

Table 2 Soil analysis for sample from the Camerons Lane Reuse Scheme (2006 and 2007)

			EC	ECe	pH	TN	NOx	TKN	TP	OM	Cl	S	Al	CEC	ESP	SAR
Sample	Year	Depth	µS/cm	dS/m	CaCl	mg/L								meq/100g	%	mmol/L)$^{0.5}$
WAL5	2006	0-10	600	4.2	4.5	2700			190	6	85	870	6200	12	10	30
WAL5	2007	0-10	290	2.0	4.9	2300	1	2300	170	5	82	550	3900	13	9.1	1.8
WAL5	2006	20-30	150	0.8	4.6	1100			86	3	110	260	6100	8	7	38
WAL5	2007	20-30	180	0.9	4.9	900	1.7	900	78	<2	62	270	3000	12	6.6	2.4
WAL6	2006	0-10	490	3.4	4.4	3100			230	6	89	830	12000	14	10	29
WAL6	2007	0-10	240	1.7	4.9	2500	0.6	2500	170	5	84	510	5200	21	6.1	2.1
WAL6	2006	20-30	200	1.0	4.6	1500			97	4	110	230	15000	17	7	32
WAL6	2007	20-30	210	1.1	4.4	1600	2.1	1600	73	3	70	310	7800	21	8.9	4.7
WAL7	2006	0-10	440	3.1	4.4	2800			200	7	67	580	14000	19	6	25
WAL7	2007	0-10	210	1.5	4.8	2100	11	2100	130	5	39	380	7700	26	4.3	1.7
WAL7	2006	20-30	170	0.9	4.4	910			93	4	200	360	24000	15	7	29
WAL7	2007	20-30	160	0.8	4.7	1600	8.2	1600	59	4	60	310	10000	32	5.3	2.9
WAL8	2006	0-10	430	3.0	4.3	2800			200	7	71	660	14000	14	8	29
WAL8	2007	0-10	160	1.1	5.1	2100	9.8	2100	47	5	130	250	12000	24	7.2	3
WAL8	2006	20-30	120	0.6	4.5	1000			83	3	150	110	15000	13	6	20
WAL8	2007	20-30	130	0.7	4.7	1200	8.2	1200	61	3	72	260	8400	32	6.1	2.3
WAL9	2006	0-10	380	2.7	4.5	260			230	6	43	590	12000	13	7	22
WAL9	2007	0-10	180	1.3	4.9	2200	1.9	2200	120	5	68	280	8200	25	5.9	3.5
WAL9	2006	20-30	130	0.7	4.8	900			88	3	150	130	19000	22	4	24
WAL9	2007	20-30	140	0.7	4.8	1300	2.6	1300	53	3	87	360	11000	21	9.5	3.3
WAL10	2006	0-10	670	4.7	4.5	3600			270	7	35	820	13000	18	6	28
WAL10	2007	0-10	250	1.8	4.7	3900	39	3900	240	7	17	490	8300	37	2.2	0.93
WAL10	2006	20-30	280	1.4	4.7	1700			130	5	21	470	19000	25	4	32
WAL10	2007	20-30	190	1.0	4.9	1300	26	1300	47	4	17	330	9400	28	2.7	1.4
WAL11	2006	0-10	290	2.0	4.7	2500			180	5	31	470	19000	21	4	33
WAL11	2007	0-10	200	1.4	5.1	2900	21	2900	170	6	29	520	7700	29	1.7	0.51
WAL11	2006	20-30	160	0.8	4.9	1500			110	4	140	220	19000	26	3	41
WAL11	2007	20-30	110	0.6	5.3	1200	7.1	1200	74	4	7	160	12000	31	3	1.4
WAL12	2006	0-10	860	6.0	4.5	3800			230	7	53	2000	13000	22	4	28
WAL12	2007	0-10	300	2.1	5	2400	16	2400	140	5	33	730	7100	22	1.8	0.44
WAL12	2006	20-30	510	2.6	4.6	1500			120	5	19	690	20000	24	4	31
WAL12	2007	20-30	120	0.6	5.1	1500	10	1500	50	4	17	290	7600	32	1.9	0.84
	Average		280	1.8	4.7	1958	10.4	1937	132	4.8	70.3	478	11550	22	5.6	2.1
	Median		205	1.3	4.7	1650	8.2	1850	120	5.0	67.5	370	11500	22	6.0	2.0
	95%ile		632	4.4	5.1	3690	29.3	3150	235	7.0	150.0	848	19450	32	9.7	3.8

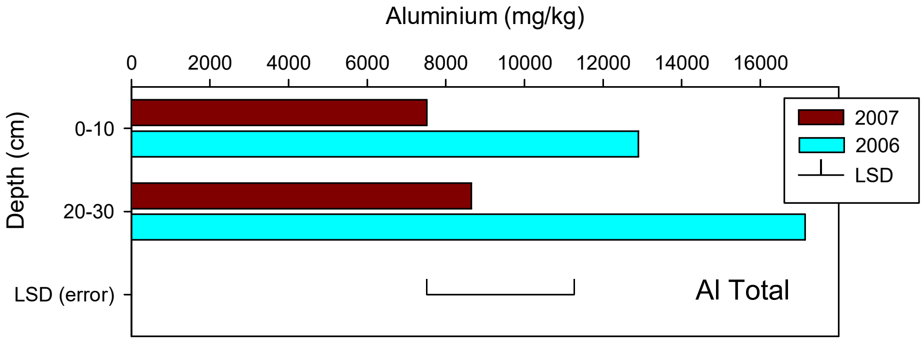
Sampled dates: 4/07/2006 & 4/9/2007. Data supplied by Yarra Valley Water

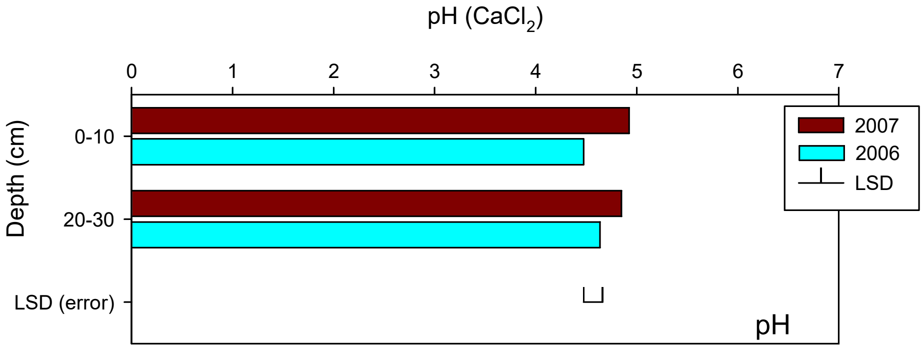
Note: EC – Electrical conductivity soil:water 1:5 extract; ECe – Soil salinity electrical conductivity, calculated us a factor of 7 for 0-10 cm soil depth and 5 for 20-30 cm soil depth (Cass *et al.* 1995); pH – a measure of acidity or alkalinity; TN - Total Nitrogen; NOx – Nitrate and Nitrite; TKN - Total Kjeldahl Nitrogen; TP - Total Phosphorus; OM – Organic matter; Cl – Chloride; Sulphate - S; Al – Aluminium; CEC – Cation Exchange Capacity; SAR – Sodium Adsorption Ratio.

Statistical and graphical software were used to determine analysis of variance (ANOVA) at $p < 0.05$. That is, if there was a 95% probability that the means were different this was considered significantly different. A least significance difference (LSD) has been drawn on all graphs to indicate how great the difference between years and depths needs to be before it is considered significantly different relative to the variability of the soil sampling area (see graphs below).

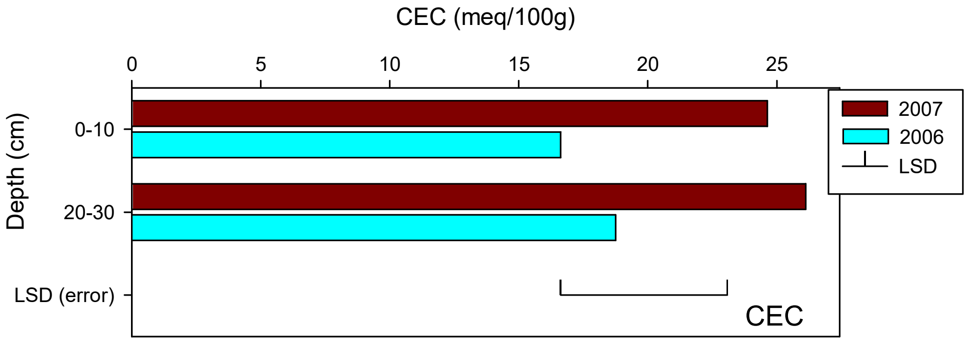
These data indicate:

- Total soil aluminium (Al) has decreased significantly from 2006 to 2007 (see graphs below). This is the measure of total aluminium in the soil and not relevant as a measure of Al toxicity. There is no rationale for this change other than the soil pH has increased on average from 4.5 to 5 (pH $CaCl_2$). The increase in soil pH is mostly likely due to the pH of the recycled water used (7.9 - Table 1) or any lime amendment applied to the irrigated pasture. Theoretically, an increase in soil pH should only decrease the amount of Al in soil solutions (plant available) and have little effect on total Aluminium in soils (Peverill *et al.* 1999).
- The increase in soil pH is beneficial as soil pH should ideally be above 5.5 ($CaCl_2$) and lime should be applied to increase soil pH to avoid Al and Manganese (Mn) toxicity. If the current rate of pH change continues due to recycled water use, one more year of recycled water use may also achieve ideal soil pH values.





- The cation exchange capacity (CEC) has increased significantly in 2007 compared with 2006 (see graph below). Increased CEC is usually beneficial for soils as it helps hold nutrients to make them accessible to the plants. This increase suggests laboratory variability in analysis.



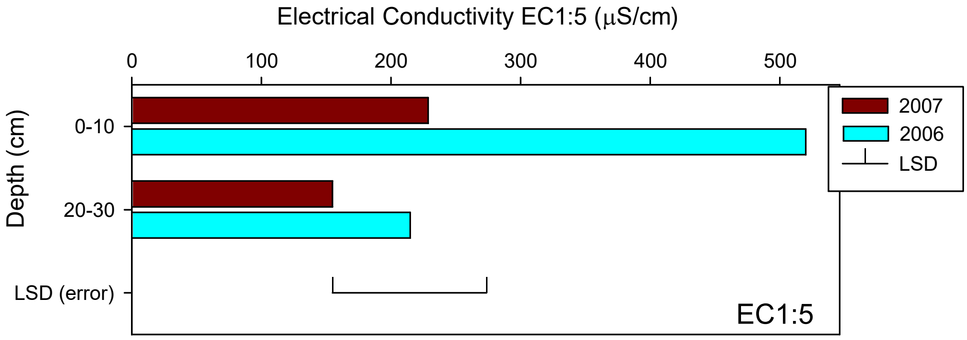
- Electrical conductivity has decreased significantly in 2007 from 2006 in the top 0-10cm (see graphs below). Decreases at 20-30cm were not considered significant and averages are within the variance found across the field site. Overall, soil electrical conductivity is relatively low and suitable in soil textures of light to heavy clays for production of the pastures specified in the area.

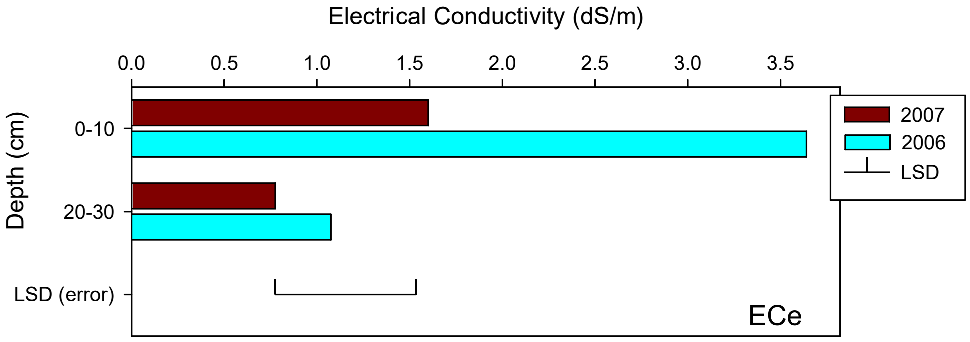
  The soil salinity electrical conductivity (ECe) threshold for yield reduction (NRMMC and EPHC 2006) for ryegrass, clovers, phalaris, fescue and paspalum are:

  - Perennial ryegrass – 5.6 dS/m
  - Clover – 2 to 8 dS/m depending on species
  - Phalaris – 4 dS/m
  - Fescue – 2 to 8 dS/m depending on species
  - Paspalum – 3 to 40 dS/m depending on species

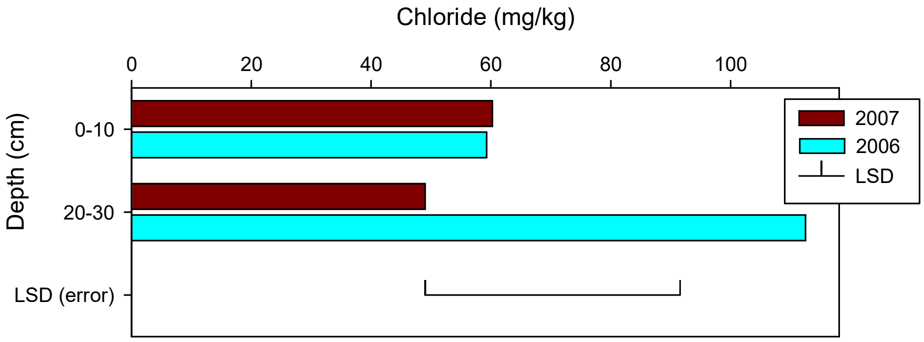
- On average the soil ECe in 2007 was below the most salt sensitive pasture species irrigated with recycled water (see graphs below). However, on average some 0 – 10 cm depth soil samples exceed these in 2006 (outliners shown in Appendix - Figure 8). These observations suggest that irrigation with recycled water may have improved soil salinity by leaching salts below the 20-30cm depth. It could also mean that rainfall was greater leading to increased leaching in 2007 compared with 2006. Estimates of rainfall at the study site were 285mm in 2006 and 490mm in 2007, supporting this theory. Addition of fertiliser, lime or gypsum in 2006 could also explain the higher EC in the top soil in 2006.

  If increased leaching is responsible then deeper leaching of N and P may be an ongoing monitoring requirement if there are risks of N and P moving offsite or into groundwater where N and P could pose environmental risks in aquatic systems.



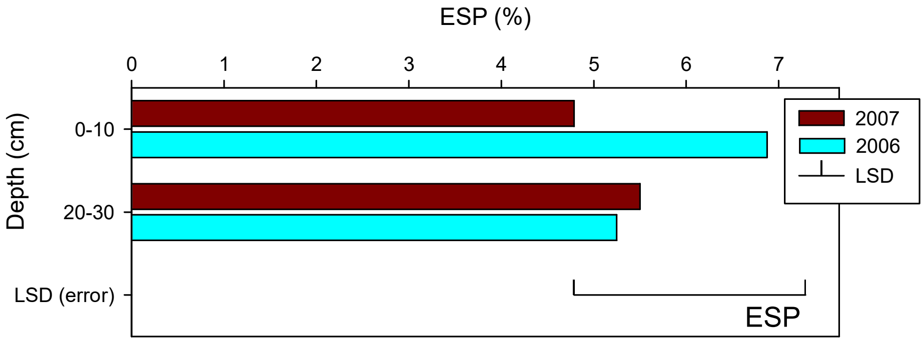


- Chloride concentrations in soils were below levels which may impact on plants grown on site (see graph below). There were no significant changes between 2006 to 2007 in the 0-10cm soil sample, however, there was a significant decrease in the 20-30cm sample.

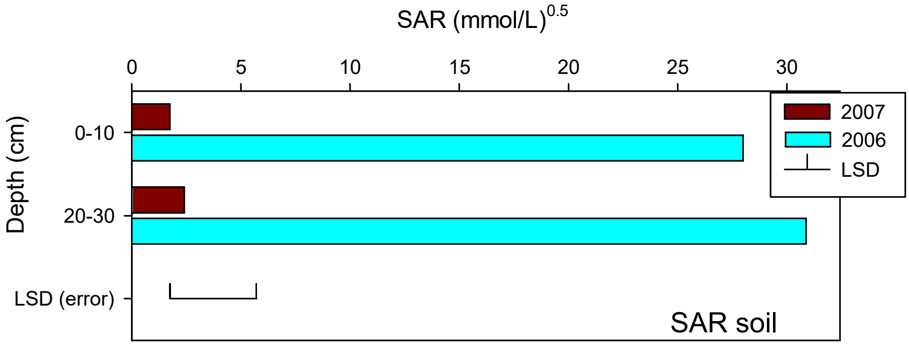


Total water soluble chloride

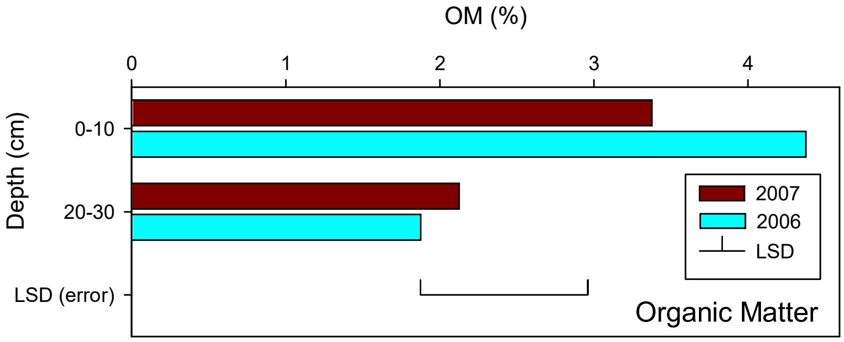
- Difference in Exchangeable Sodium Percentage (ESP) were not considered significant (see graph below), however a similar trend to EC was noted for the top soil (0-10cm lower in 2007). On average, these ESPs are below what is considered sodic (6% - ANZECC and ARMCANZ 2000). However, some soils gave a reading above 6% in 2007 (Table 2) indicating addition of lime may be required to manage sodicity in these soils. The SAR of the recycled water is 6 (Table 1) which is reaching a level that may have a detrimental impact on sensitive soils so changes in soil ESP over the next 2 years should be monitored closely.



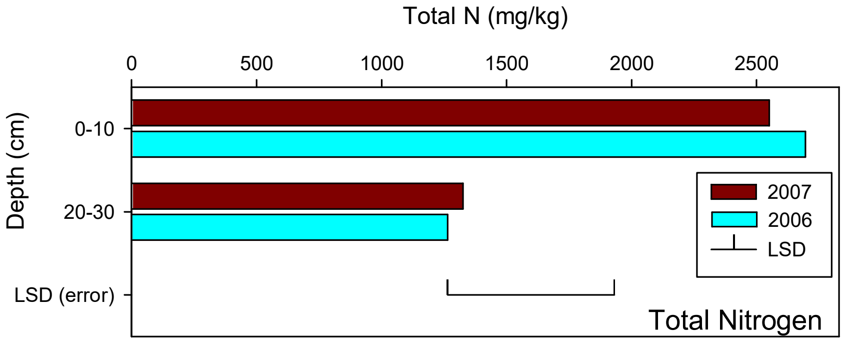
- Soil Sodium Adsorption Ratio (SAR) was much lower for 2007 (see graph below). However, the raw data was not available to check for 2006. These data indicate that there may have been an analytical error in 2006. The 2007 data are on average low and considered suitable for soil with texture medium to heavy clay. Soil SAR is an indirect measure of ESP and these differences between SAR do not reflect the findings for ESP above; which on the sample soil will have a good correlation. The 2006 SAR has been ignored as it is considered an analytical error. Yarra Valley Water has checked the 2006 lab report and these data are as reported.

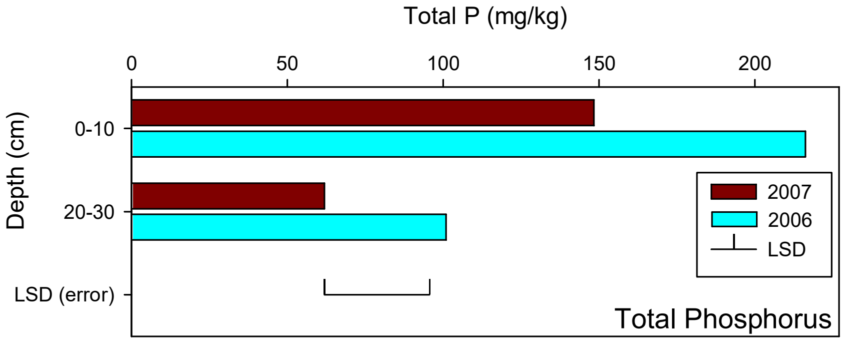


- Organic matter (OM) concentrations have not changed significantly from the 2006 to 2007 sampling (see graph below). As expected, OM was lower in the lower soil depths, which is typical of pasture production systems. The trend of lower OM in 2007 may also be related to an increased pH, which would increase the functionality of soil microbes that breakdown OM.



- Total N and P concentrations have not significantly increased from 2006 to 2007 (see graphs below), indicating the irrigation systems are not overloading soils with N and P (NRMMC and EPHC 2006). In fact, total P concentrations decreased significantly across the sample site. This suggests that the P balance overall is negative and sufficient P to meet pasture requirements may not be applied with the current use of recycled water and any fertilisation program. Ideally, plant available N and P in soil should be measured in the future, as this can be used for agronomic advice regarding fertiliser requirements and, if excessive, could pose a risk to the nearby environment.


Total N (mg/kg)
0
500
1000
1500
2000
2500
Depth (cm)
0-10
20-30
LSD (error)
2007
2006
LSD
Total Nitrogen


Total P (mg/kg)
0
50
100
150
200
Depth (cm)
0-10
20-30
LSD (error)
2007
2006
LSD
Total Phosphorus

SUMMARY

This preliminary assessment of soils data from the Wallan recycled water irrigation site indicates:

- Recycled water has generally improved many indicators of soil health measured as part of the monitoring program from 2006 to 2007.
- Addition of lime may be required to manage sodicity in the future – a watching brief is required at this stage.
- Soil pH may rise to desired levels through the use of recycled water. This could also be managed through the addition of lime.
- The risks from deep leaching of N and P may need to be considered, and if appropriate soil sampling modified to manage these risks.

Some soil tests currently undertaken should be stopped and more appropriate tests adopted to manage the risks associated with recycled water use. This includes:

- Changing the aluminium test to phytotoxic aluminium concentrations in soils – NOT total aluminium.
- Changing to plant available N and P concentrations in soils – NOT total N and P concentrations.
- If measuring ESP don't measure soil SAR as it measures the same soil parameter.

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APPENDIX

Boreholes and soil sample sites

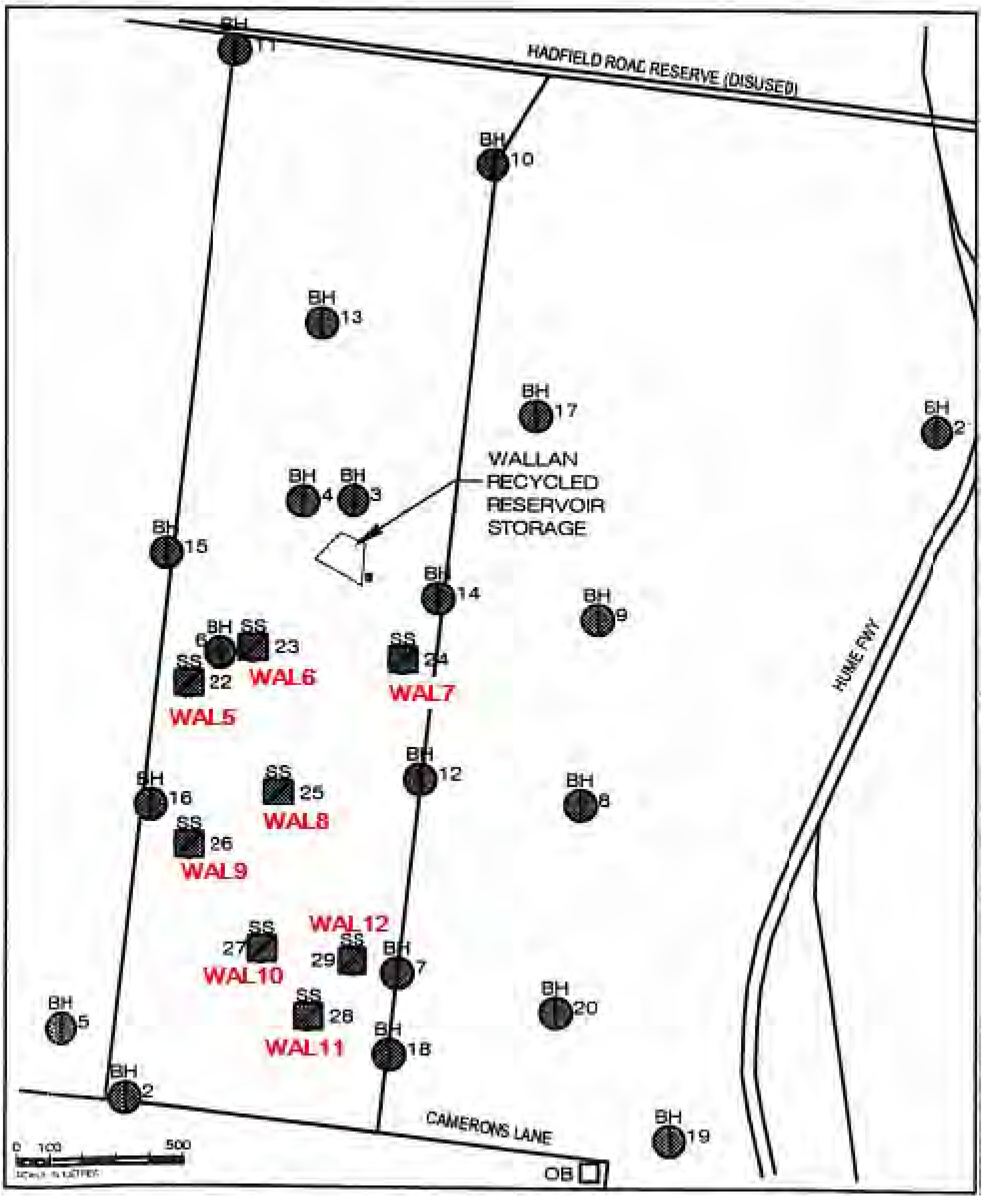

Figure 1 Soil sampling points relative to Wallan Recycled Water Reservoir. Soil sample points in red with prefix WAL.

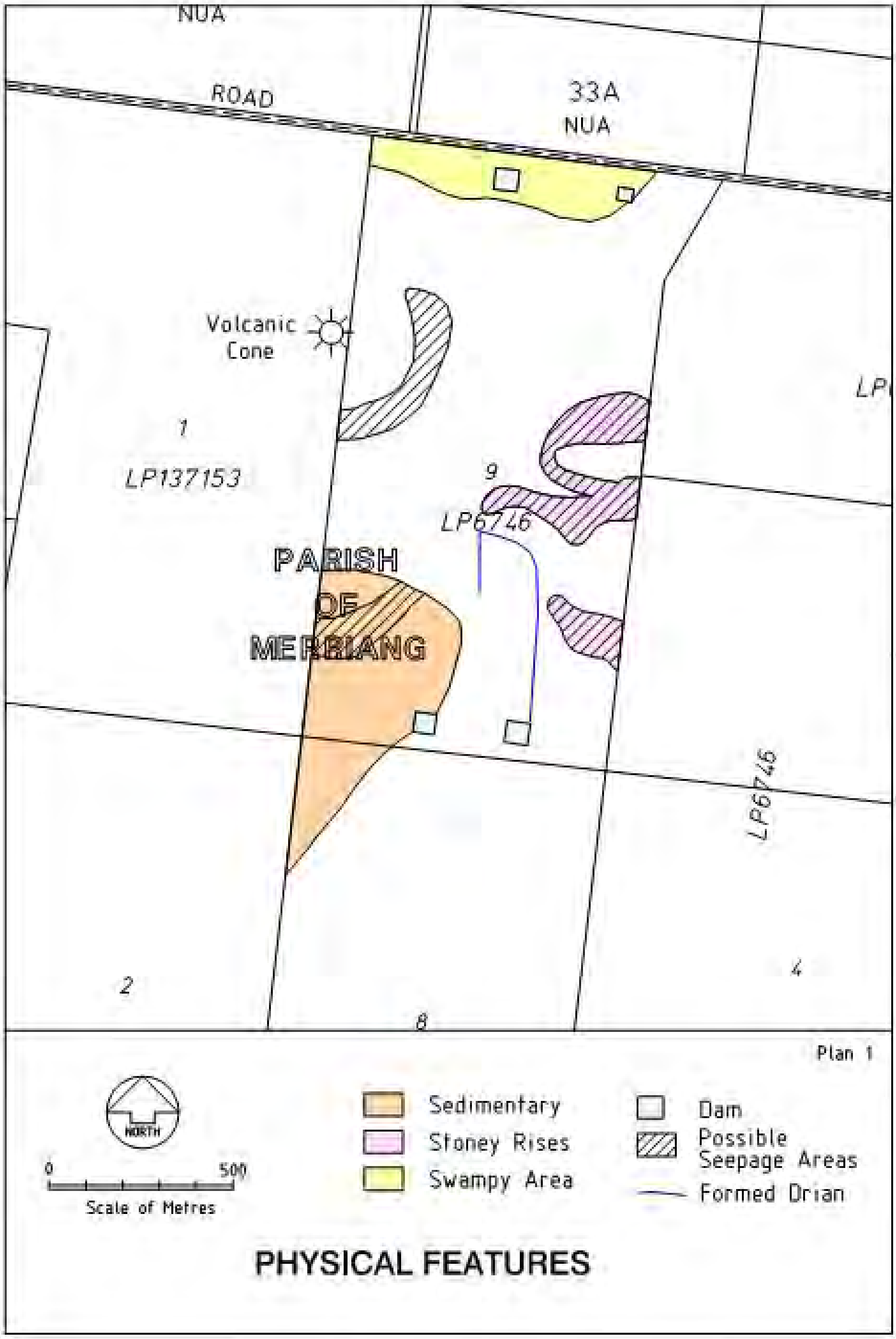

Figure 2 **Lot 9 – Physical features of soil irrigation with recycled water at Wallan**

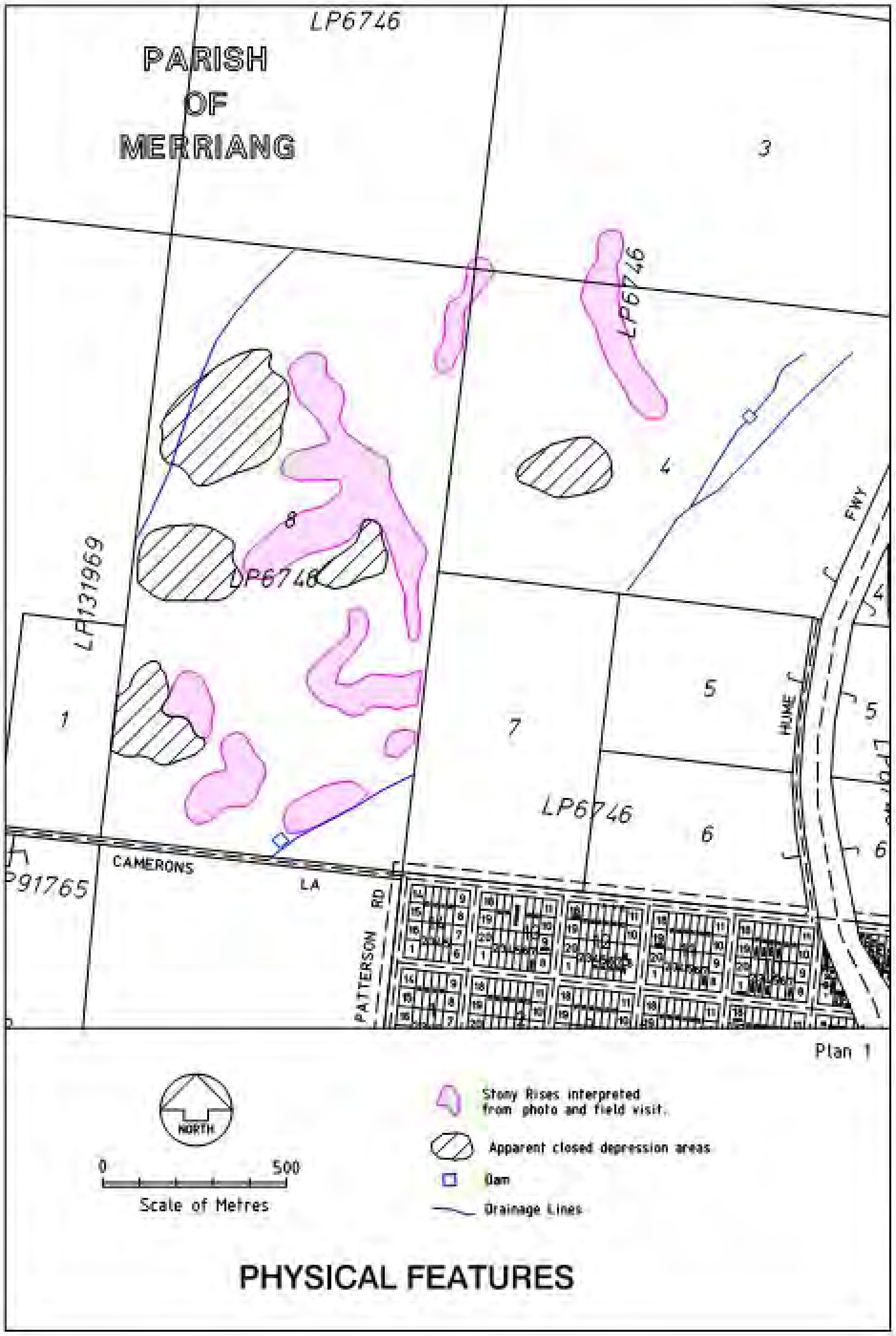

Figure 3 Lot 8 – Physical features of soil irrigation with recycled water at Wallan

Soil pits

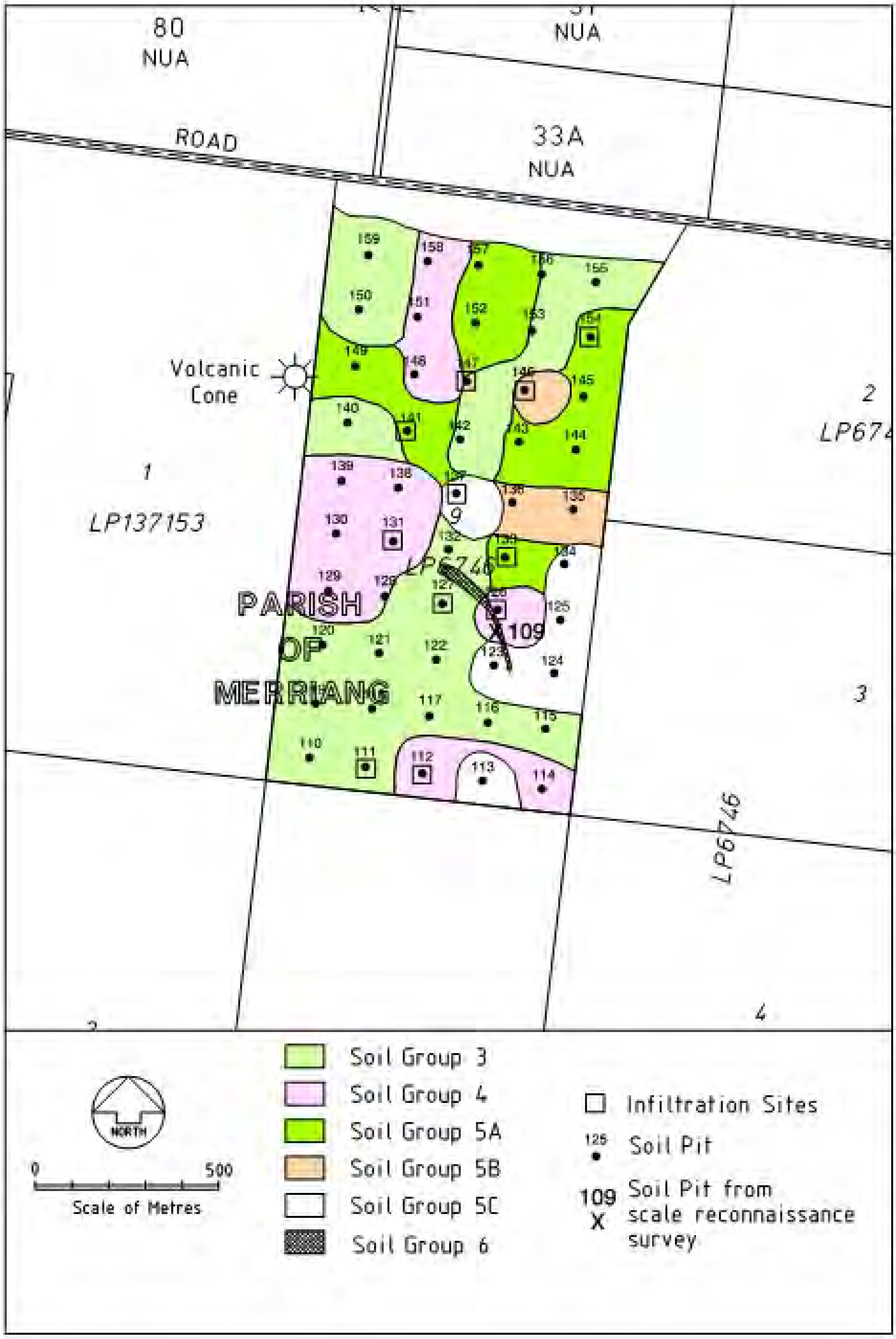

Figure 4 Lot 9 - Soil pit location and soil grouping

Figure 5 Lot 9 - Soil pit descriptions

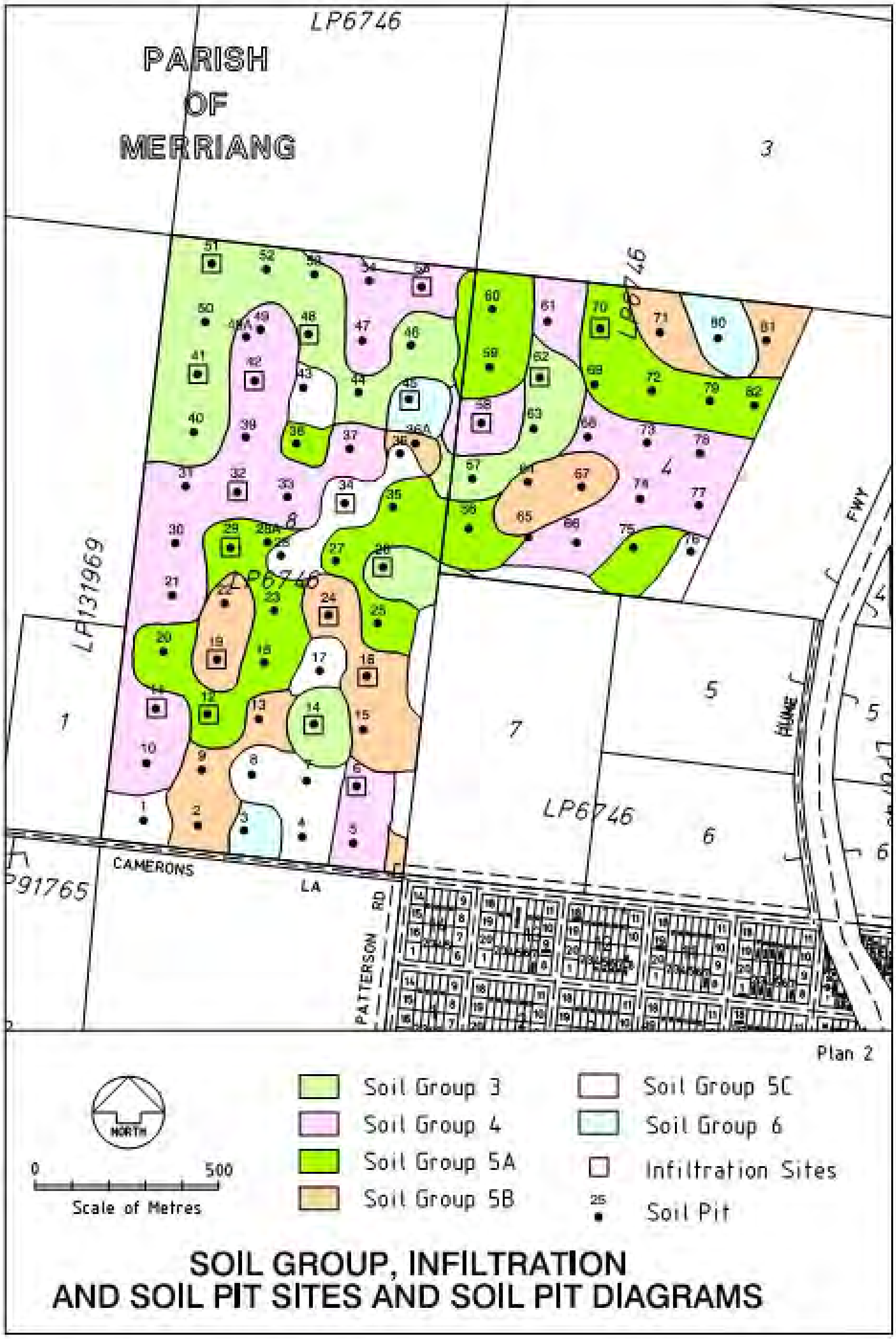

Figure 6 Lot 8 - Soil pit location and soil grouping

Figure 7 Lot 8 - Soil pit descriptions

Detailed analysis of recycled water quality at Wallan irrigation site

Table 3 Summary of detailed analysis of recycled water quality supplied to Wallan irrigation site

Parameter	Unit	Value and date sampled		
		27/04/07	12/10/2007	16/4/2008
pH - pH, Units	Units	8.1	7.6	#N/A
BOD5 - Biochemical Oxygen Demand, 5 Day	mg/L	9	13	#N/A
BOD5 Filt - BOD 5 Day (Filt)	mg/L	3	10	#N/A
TKN/TP (HL) - Phosphorus, total as P	mg P / L	17	12	#N/A
SS - Suspended solids	mg/L	19	5	#N/A
EC - Electrical Conductivity @ 25C	uS/cm	1100	830	#N/A
SO4 DA - Sulphate, as SO4	mg/L	58	60	#N/A
TCN - Total Combined Nitrogen	mg/L	23	30	#N/A
NH3 as N (SFA) - Ammonia, as N	mg N / L	13	11	#N/A
MS Total Metals - Aluminium	mg/L	1.5	7.2	5.5
MS Total Metals - Antimony	mg/L	<0.01	<0.01	<0.01
MS Total Metals - Arsenic	mg/L	0.005	<0.01	<0.01
MS Total Metals - Barium	mg/L	0.08	0.05	0.04
MS Total Metals - Beryllium	mg/L	<0.01	<0.01	<0.01
MS Total Metals - Boron	mg/L	0.22	<0.5	<0.2
MS Total Metals - Cadmium	mg/L	<0.001	<0.002	<0.002
MS Total Metals - Chromium	mg/L	<0.01	0.02	0.01
MS Total Metals - Cobalt	mg/L	<0.01	<0.01	<0.01
MS Total Metals - Copper	mg/L	<0.01	0.01	<0.01
MS Total Metals - Iron	mg/L	1.2	5.8	3.0
MS Total Metals - Lead	mg/L	<0.01	<0.01	<0.01
MS Total Metals - Manganese	mg/L	0.08	0.02	<0.01
MS Total Metals - Mercury	mg/L	<0.001	<0.001	<0.001
MS Total Metals - Molybdenum	mg/L	<0.01	<0.01	<0.01
MS Total Metals - Nickel	mg/L	0.01	0.01	<0.01
MS Total Metals - Selenium	mg/L	<0.001	<0.01	<0.01
MS Total Metals - Silver	mg/L	<0.01	<0.05	<0.01
MS Total Metals - Strontium	mg/L	0.13	0.08	0.08
MS Total Metals - Thallium	mg/L	<0.01	<0.01	<0.01
MS Total Metals - Tin	mg/L	<0.01	<0.01	<0.01
MS Total Metals - Titanium	mg/L	0.03	0.04	0.27
MS Total Metals - Vanadium	mg/L	0.01	0.01	0.02
MS Total Metals - Zinc	mg/L	0.01	0.02	<0.01
MAH - Benzene	mg/L	<0.001	<0.001	<0.001
MAH - Toluene	mg/L	<0.001	<0.001	<0.001
MAH - Ethyl Benzene	mg/L	<0.001	<0.001	<0.001
MAH - Xylenes	mg/L	<0.003	<0.003	<0.003
MAH - Styrene	mg/L	<0.001	<0.001	<0.001
MAH - Cumene	mg/L	<0.001	<0.001	<0.001
MAH - 1,2,4-Trimethylbenzene	mg/L	<0.001	<0.001	<0.001
HVOL - 1,1,1,2-Tetrachloroethane	mg/L	<0.001	<0.1	<0.001
HVOL - 1,1,2,2-Tetrachloroethane	mg/L	<0.001	<0.1	<0.001
HVOL - 1,1- Dichloroethane	mg/L	<0.001	<0.1	<0.001
HVOL - 1,1-Dichloroethene	mg/L	<0.001	<0.1	<0.001

Parameter	Unit	Value and date sampled		
		27/04/07	12/10/2007	16/4/2008
HVOL - 1,1-Dichloropropene	mg/L	<0.001	<0.1	<0.001
HVOL - 1,2,3-Trichloropropane	mg/L	<0.001	<0.1	<0.001
HVOL - 1,2-Dibromo-3-chloropropane	mg/L	<0.001	<0.1	<0.001
HVOL - 1,2-Dibromoethane	mg/L	<0.001	<0.1	<0.001
HVOL - 1,2-Dichloroethene [cis]	mg/L	<0.001	<0.1	<0.001
HVOL - 1,2-Dichloroethene [trans]	mg/L	<0.001	<0.1	<0.001
HVOL - 1,2-Dichloroethane	mg/L	<0.001	<0.1	<0.001
HVOL - 1,2-Dichloropropane	mg/L	<0.001	<0.1	<0.001
HVOL - 1,3-Dichloropropane	mg/L	<0.001	<0.1	<0.001
HVOL - 1,3-Dichloropropene [cis]	mg/L	<0.001	<0.1	<0.001
HVOL - 1,3-Dichloropropene [trans]	mg/L	<0.001	<0.1	<0.001
HVOL - 2,2-Dichloropropane	mg/L	<0.001	<0.1	<0.001
HVOL - 2-Chlorotoluene	mg/L	<0.001	<0.1	<0.001
HVOL - 4-Chlorotoluene	mg/L	<0.001	<0.1	<0.001
HVOL - Bromochloromethane	mg/L	<0.001	<0.1	<0.001
HVOL - Bromodichloromethane	mg/L	<0.001	<0.1	<0.001
HVOL - Bromobenzene	mg/L	<0.001	<0.1	<0.001
HVOL - Bromoform (Tribromomethane)	mg/L	<0.001	<0.1	<0.001
HVOL - Carbon Tetrachloride	mg/L	<0.001	<0.1	<0.001
HVOL - Chloroform (Trichloromethane)	mg/L	<0.001	<0.1	<0.001
HVOL - Chlorobenzene	mg/L	<0.001	<0.1	<0.001
HVOL - Dibromochloromethane	mg/L	<0.001	<0.1	<0.001
HVOL - Dibromomethane	mg/L	<0.001	<0.1	<0.001
HVOL - Dichloromethane	mg/L	<0.005	<0.5	<0.005
HVOL - Trichlorofluoromethane (CFC11)	mg/L	<0.002	<0.2	<0.002
HVOL - Tetrachloroethene	mg/L	<0.001	<0.1	<0.001
HVOL - Vinyl Chloride (Monomer)	mg/L	<0.002	<0.2	<0.002
HVOL - 1,1,1-Trichloroethane	mg/L	<0.001	<0.1	<0.001
HVOL - 1,1,2-Trichlorethane	mg/L	<0.001	<0.1	<0.001
HVOL - Trichloroethene	mg/L	<0.001	<0.1	<0.001
SOLVENTS - Acetone	mg/L	<0.01	<0.01	<0.01
SOLVENTS - Acrylonitrile	mg/L	<0.01	<0.01	<0.01
SOLVENTS - Ethylhexyl Acrylate	mg/L	<0.01	<0.01	<0.01
SOLVENTS - Isopropanol (Isopropyl Alcohol)	mg/L	<0.01	<0.01	<0.01
SOLVENTS - Methylethyl Ketone	mg/L	<0.01	<0.01	<0.01
SOLVENTS - Methyl Isobutyl Ketone	mg/L	<0.01	<0.01	<0.01
Alg. ScCnt - Algal analyses		#N/A	NR IND	#N/A
Colilert - E.coli MPN Colilert	orgs/100mL	#N/A	<10	#N/A

#N/A = not available

Variability of ECe

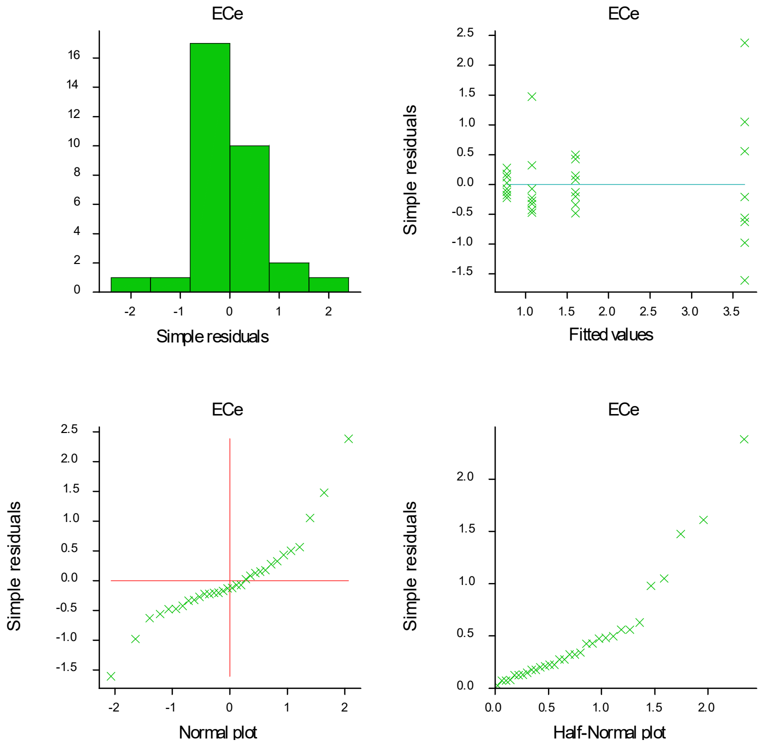

Figure 8 **Residual plots for soil ECe values indicating outliners**

Beveridge North West PSP

METROPOLITAN PLANNING AUTHORITY

Groundwater Quality Assessment

VW07335_P2_A_FINAL | V2

VW07335

June 2014

Beveridge North West PSP

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Client name:	Metropolitan Planning Authority
Client no:	VW07335
Project manager:	Corey Bannister
Author:	William Rodger / Corey Bannister
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Jacobs Group (Australia) Pty Limited
ABN 37 001 024 095
Floor 11, 452 Flinders Street
Melbourne VIC 3000
PO Box 312, Flinders Lane
T +61 3 8668 3000
F +61 3 8668 3001
www.jacobs.com

Document history and status

Revision	Date	Description	By	Review	Approved
V1	11/04/14	Review + edits to e-copy	W Rodger	C Bannister	C Bannister
V2	13/06/14	MPA comments	W Rodger	C Bannister	C Bannister

Contents

Important note about your report

The sole purpose of this report and the associated services performed by Jacobs is assess the water quality within previously installed wells at the Beveridge North West PSP in accordance with the scope of services set out in the contract between Jacobs and the Client. That scope of services, as described in this report, was developed with the Client.

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

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1. Introduction

1.1 Background

Sinclair Knight Merz Pty Ltd (Jacobs SKM) was commissioned by the Metropolitan Planning Authority (MPA) to undertake additional groundwater assessment at Lot 8 and 9 Camerons Lane, Beveridge within the Beveridge North West 1059 Precinct Structure Plan (PSP) area. This additional investigation is in accordance with recommendations made in the earlier desktop environmental, hydrological and geotechnical assessment prepared by SKM in October 2013 (SKM, 2013). These properties are owned by Yarra Valley Water and are hereafter collectively referred to as 'the Site'. A site location plan is presented in Figure 1 while the layout (with sampling locations) is presented in Figure 2.

The Beveridge North West PSP Area has been identified as potential future land supply primarily for residential land use, although also with a view to various commercial and community land uses. The aim of the earlier assessment completed in 2013 was to identify opportunities and constraints to the proposed land development which may potentially be caused by existing or past land uses, and site and sub-surface conditions. The YVW site that is the subject of this assessment was observed to be a potentially source of groundwater contamination, since it is currently used for irrigation using recycled water from the nearby Wallan Sewage Treatment Plant (STP). This report documents the additional sampling and analysis program that was undertaken in order to identify the nature, extent and significance of contamination (if any) resulting from this source that may preclude the beneficial uses of groundwater relevant under the proposed future site development.

1.2 Scope of works

The following scope of works was undertaken as part of this assessment:

- Collection of 13 primary groundwater and effluent samples from the site and the immediate perimeter as well as relevant quality control samples
- Laboratory analysis of water samples for contaminants of primary concern
- Comparison of laboratory results against relevant assessment criteria endorsed by EPA Victoria for the protection of human health and the environment
- Comparison of laboratory results against historical results obtained at the site by YVW to assess longer term contaminant concentration trends
- Preparation of a summary report documenting the tasks completed as part of the assessment as well as conclusions and recommendations in relation to the current condition of the site

1.3 Abbreviations and acronyms

- ALS – Australian Laboratory Services
- AS – Australian Standard
- COC – Chain of custody
- DQO – Data quality objectives
- EIL – Ecological investigation level
- EPA – Environment Protection Authority (Victoria)
- ESA – Environmental site assessment
- GAA – Growth Areas Authority (now Metropolitan Planning Authority)
- GVW – Goulburn Valley Water
- HIL – Health investigation level

- HSEC – Health, safety environment and community
- MDL – Method detection limit
- MPA – Metropolitan Planning Authority
- NATA – National Association of Testing Authorities
- NEPC – National Environment Protection Council
- NEPM – National Environment Protection (Assessment of Site Contamination) Amendment Measure
- PQL – Practicable quantitation limit
- PSP – Precinct Structure Plan
- QA/QC – Quality assurance / quality control
- RPD – Relative percentage difference
- SEPP – State Environmental Protection Policy
- SKM – Sinclair Knight Merz
- STP – Sewage treatment plant
- USEPA – United States Environment al Protection Agency
- YVW – Yarra Valley Water

2. Site use and previous investigation

2.1 Site use

The water re-use scheme that currently operates at the site was established by Goulburn Valley Water (GVW) before ownership was transferred to YVW in January 2006 - at this time, irrigation commenced at the site. The water re-use scheme was established by GVW to make use of treated effluent from the nearby Wallan STP. Prior to 2006 historical aerial imagery indicates the site (and much of the surrounding area) was used for agricultural purposes.

Irrigation of the site is ongoing at four main locations. Two boom irrigators operate to the south of the winter storage facility, one in each of the paddocks either side of the access road between Camerons Lane and winter storage reservoir. Each of these irrigators operates over an area of approximately 50 hectares (ha). Two further centre-pivot irrigators operate to the north of the winter storage area, one occupying an area of 10 ha and the other 40 ha. The existing winter storage reservoir currently occupies an area of 5 ha. Figure 2 illustrates the location of the irrigators at the site while Plate 2.1 below provides a selection of photographs if the equipment.

Boom irrigators operating at Lot 8

Boom irrigators at Lot 8, illustrating the spraying mechanism

Plate 2.1 : Boom irrigators in operation at the site

2.2 Previous investigations

This section summarises the previous investigation reports reviewed by SKM as part of this assessment that relate to groundwater.

2.2.1 SKM, 2002 – Wallan Reclaimed Water Re-Use Site: Hydrogeological Assessment

In 2002, GVW commissioned SKM to undertake a hydrogeological assessment to determine background groundwater conditions at Lot 8 and 9 (17 wells). The assessment was undertaken pre-irrigation and provides some relevant “baseline” data.

Groundwater flow direction was determined to be towards the south which is consistent with the latest 2014 assessment (see Figure 4). Groundwater salinity ranged from 920 to 8,500 µS/cm, which is consistent with the latest 2014 assessment (see Section 5.5 for further information). Concentrations of nitrate (as N mg/L) varied between 0.11 – 3.2 mg/L, nitrite from <0.01 – 0.82 mg/L and ammonia <0.01 to 0.5 mg/L across the 17 sampled wells.

A comparison between the current 2014 data vs SKM’s 2002 (pre irrigation) data is provided in Section 5.5.

2.2.2 YVW, 2008 – Camerons Lane Lots 8 & 9: Preliminary Assessment of Groundwater Monitoring Results

In 2008 Yarra Valley Water prepared an assessment report documenting the results of periodic groundwater monitoring events undertaken across a network of 18 groundwater monitoring bores and windmills at the site. The purpose of the assessment was to confirm that the irrigation of the site using recycled water was not having a detrimental impact upon groundwater quality and the relevant beneficial use segments as defined in the State Environmental Protection Policy (SEPP). Laboratory results were compared against background results obtained by SKM prior to commencement of irrigation, in order to assess groundwater quality trends. These results were also compared against the ANZECC & ARMCANZ (2000) assessment criteria for the relevant protected beneficial uses which included stock watering, irrigation water, industrial use of groundwater, ecosystem protection and buildings and structures.

Yarra Valley Water concluded that the majority of parameters generally reported stable concentrations trends between pre and post irrigation monitoring. Where exceedances of the relevant criteria were observed, these were either:

- For analytes that also reported exceedances prior to irrigation commencing and were therefore deemed unlikely to have resulted from the irrigation itself (i.e. TDS)
- For analytes that were not tested for during pre-irrigation monitoring and therefore results could not be attributed to irrigation (i.e. sodium, chloride and pH)

The report also provides a summary of the water quality parameters for the recycled irrigation water, which was derived from the Wallan Sewage Treatment Plant. The discharged water is rated as Class C recycled water, which can be used for the following uses (as described by YVW):

> *'Class C may be used for a number of uses including for cooked or processed human food crops including wine grapes and olives. It can also be used for livestock grazing and fodder and for human food crops grown over a meter above the ground and eaten raw such as apples, pears, table grapes and cherries. It can be used by councils for specific purposes but there are restrictions around human contact'*

While nutrient concentrations (nitrate, nitrite and ammonia) as well as E.coli are generally raised, concentrations of metals, selected solvents, volatile organics and monocyclic aromatic hydrocarbons (MAHs) were generally reported below laboratory limits of detection.

3. Investigation methodology

3.1 Selection of sampling locations

Samples were obtained from 13 targeted locations at the site between 11 and 13 March 2014. Twelve of these locations were groundwater sampling locations while a further treated effluent / recycled water sample was collected from the winter storage facility (sample EFF). The treated effluent contained in the winter storage facility is used to irrigate the site. Sampling locations are presented in Figure 2.

Groundwater samples were predominantly collected from locations around the immediate perimeter of Lots 8 and 9, as well as a single location near the existing winter storage reservoir towards the centre of the site. While bores were previously located within a number of the irrigated paddocks, these appear to have been removed since the previous groundwater monitoring report was prepared in 2008. Jacobs SKM assumes these have been removed due to their obstruction of the boom irrigators or other farm machinery. Despite the lack of monitoring wells towards to interior of the site, the perimeter wells selected will provide an indication of potential off-site migration of contaminants of concern at the site (if any) that supplement the results obtained for WSBH, located in the vicinity of the winter storage reservoir.

Treated effluent sampling location EFF has been selected, as it provides a valuable reference against which groundwater quality results for the site can be compared. In order to restrict access to the winter storage reservoir itself, YVW has installed a dedicated sampling point on the external wall of one of the administration buildings nearby. It is from this location that a treated effluent sample was collected (refer Plate 3.1).

3.2 Sampling methodology

Fieldwork undertaken as part of the additional investigations was completed in accordance with Jacobs SKM's standard work procedures for the investigation of contaminated sites. A site-specific Health, Safety, Environment and Community (HSEC) plan was also prepared and implemented by the field team throughout the investigations.

Groundwater samples were collected using a range of methods, depending upon the nature of the groundwater bores installed, the above-ground infrastructure present as well as borehole yields. Sampling methods adopted for the investigation included:

- Low flow (micropurge) sampling
- Disposable bailer
- Foot valve
- Direct sampling from taps or other above-ground sampling points

Low flow sampling was preferentially adopted for the investigation with the general sampling procedure described below.

The depth to water and total depth measurements of each groundwater monitoring well was recorded using a multi-phase interface probe that detects water levels and the presence of non-aqueous phase liquids. To ensure representative groundwater samples were collected from each monitoring well, wells were purged using low flow sampling techniques with a bladder pump and dedicated tubing. Physical and chemical water quality parameters were recorded at regular intervals and once these parameters had stabilised, groundwater samples were collected. During purging, the pumping rate as well as the SWL was recorded to ensure that drawdown of groundwater was minimised and suitable representative samples were collected for laboratory analysis. Where necessary the pumping rate (cycles per minute) was reduced.

Physical and chemical water quality indicator data was recorded using a TPS 90FL multi parameter meter. Parameters recoded included conductivity, reduction/oxidation (redox) potential, pH, dissolved oxygen (mg/L and percentage saturation) and temperature. Stabilisation of parameters was considered to have been reached when three consecutive field measurements were reported within the following ranges:

- Dissolved oxygen (DO) +/- 10%
- Electrical conductivity (EC) +/-3%
- pH +/-0.05; and
- Redox potential +/-10mV

Where stabilisation of all of the above field measurements could not be achieved, sampling was undertaken when the majority of parameters had stabilised. The stabilisation criteria adopted are derived from EPA Victoria *Groundwater Sampling Guidelines*.

Samples were collected in appropriately preserved sampling containers specific to the required analysis. These containers were provided by the primary laboratory (Eurofins-MGT). To assess dissolved metal concentrations, each sample was also field filtered using a disposable 0.45 µM Stericup filter prior to chemical preservation. Samples were immediately placed in a chilled esky before being transferred to the primary laboratory under appropriate chain of custody (CoC) documentation (presented in Appendix D).

Fresh tubing, bladders and Stericup filters dedicated to each location were used when sampling. All non-dedicated sampling equipment was decontaminated between sampling locations to prevent cross contamination. Fresh disposable nitrile gloves were also used at each sampling location.

Low flow sampling methods were preferentially adopted for the investigation. However, in some cases this methodology could not be applied. Alternative sampling approaches were used in the following circumstances:

- Insufficient groundwater. At location BH12 the volume of groundwater in the well was insufficient to allow the low flow sampling equipment to operate effectively (i.e. a water column of less than 1m). As such, a disposable bailer was used for sampling. The well was purged dry and allowed to recharge before a sample was collected for laboratory analysis.
- Poor well recharge. BH11 reported a poor recharge rate using the low flow sampling kit with groundwater drawdown in the well equivalent to the volume of water removed during purging. This was the case even at the lowest possible rate of extraction. As such, groundwater samples collected were not considered representative of the wider aquifer. Therefore, a disposable bailer was used to sample the well instead. Purging using a bailer induced in increased rate of groundwater recharge in the well. As such, the bore could not be purged dry before sampling. Instead, water quality parameters were recorded at regular intervals and a sample for laboratory analysis was collected once these parameters stabilised.
- Partial obstruction of the well. A number of bores were installed with windmills for stock watering purposes. A typical example is presented in Plate 3.1. The existing pumping infrastructure in these wells prevented the use of the low flow sampling pump. As such, sampling was undertaken using a disposable foot valve and LDPE tubing. Where the mill was operational and therefore being continually purged (i.e. BH18) a sample was collected immediately. Where the mill was not operational (i.e. BH15 and BH17) groundwater was purged until water quality parameters stabilised.
- Complete obstruction of the well or sampling points. Where the well or sampling location was obstructed completely samples were instead collected from taps or other connected sampling points. These locations include:
  - BH5 where a sample was collected from a garden tap fed by the target bore (refer Plate 3.1)
  - The bore adjacent to the winter storage facility (named WSBH) where a sample was collected from a tap inside the main building
  - The winter storage facility where an effluent sample (EFF) was collected from a dedicated sampling point outside the compound (refer Plate 3.1)

- BH14 where mill infrastructure necessitated the sample being collected from the mill discharge pipe to an adjacent storage tank

Windmill sampling location BH18. Restricted access to the well

Windmill sampling location BH17 with restricted access to the well

Effluent sampling location (EFF). Pump used to obtain sample

BH5 sampled directly from a tap connected to the bore

Plate 3.1 : Examples of sampling locations

Sampling methods adopted during the investigation are summarised in Table 3.1.

Table 3.1 : Summary of sampling methods adopted

Location		**Sampling method**	**Comments**
ID	**Description**		
BH2	South west corner of Lot 8	Micropurge	
BH5	South west corner of Lot 8	Tap	No direct access to bore
BH7	Eastern perimeter of Lot 8	Micropurge	
BH10	North east corner or Lot 9	Micropurge	
BH11	North west corner of Lot 9	Bailer	Poor recharge rate
BH12	Eastern perimeter of Lot 8	Bailer	Insufficient groundwater for micropurge
BH14	Eastern perimeter of Lot 9	Windmill discharge	
BH15	Western perimeter of Lot 8	Foot valve	Windmill. Restricted access to bore
BH16	Western perimeter of Lot 8	Micropurge	

Location		Sampling method	Comments
ID	Description		
BH17	Eastern perimeter of Lot 9	Foot valve	Windmill. Restricted access to bore
BH18	Eastern perimeter of Lot 8	Foot valve	Windmill. Restricted access to bore
WSBH	Bore adjacent to winter storage	Tap	No direct access to bore
EFF	Treated effluent from winter storage	Tap	No access to winter storage reservoir

3.3 Laboratory analysis

In total, thirteen primary samples and four quality control samples were submitted for laboratory analysis for contaminants of concern. Eurofins-MGT was selected as the primary laboratory to conduct analysis while Australian Laboratory Services (ALS) was used as the secondary quality control laboratory. Both laboratories are accredited by the National Association of Testing Authorities (NATA) for the analyses undertaken. A summary of the samples submitted for analysis is presented in Section 3.3.1 and 3.3.2 below.

3.3.1 Primary samples

Primary groundwater and effluent samples were submitted for analysis as presented in Table 3.2.

Table 3.2 : Summary of analysis of primary water samples

Analysis Suite		Total Samples
Groundwater suite	Dissolved metals (16), nutrients, inorganics and TDS	12
Surface water / effluent	Total metals (16), nutrients, inorganics and TDS	1

NOTES:

- Metals (16) - As, Be, B, Cd, Ca, Cr, Co, Cu, Mg, Mn, Ni, Pb, K, Na, Hg, Zn
- Nutrients – ammonia, nitrate, nitrite, total Kjeldahl nitrogen, total nitrogen
- Inorganics – sulphate, fluoride, total cyanide

3.3.2 Quality control samples

Four quality control samples were submitted for analysis as presented in Table 3.3.

Table 3.3 : Summary of quality control samples

Quality Control Samples		Total Samples
Blind duplicate (intralab duplicate)	Total metals (16), nutrients, inorganics and TDS	1
Split duplicate (interlab duplicate)	Total metals (16), nutrients, inorganics and TDS	1
Rinsate blanks	Total metals (16), nutrients, inorganics	2

NOTES:

- Metals (16) - As, Be, B, Cd, Ca, Cr, Co, Cu, Mg, Mn, Ni, Pb, K, Na, Hg, Zn
- Nutrients – ammonia, nitrate, nitrite, total Kjeldahl nitrogen, total nitrogen
- Inorganics – sulphate, fluoride, total cyanide

Analysis was undertaken in order to satisfy quality criteria outlined in AS 5667.1:1998 *‘Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples’* (Standards Australia, 1998) as well as EPA Victoria *Groundwater Sampling Guidelines* (2000). A discussion of Quality Assurance/Quality Control procedures and results is provided in Appendix A.

3.4 Analytical data validation

Analytical data validation is the process of assessing whether data are in compliance with method requirements and project specifications. The primary objectives of this process are to ensure that data of known quality are reported, and to identify if the data can be used to fulfil the overall project objectives.

The data validation guidelines adopted are based upon data validation guidance documents published by the United States Environmental Protection Agency (USEPA). The process involves the checking of analytical procedure compliance and an assessment of the accuracy and precision of the analytical data from a range of quality control measurements, generated from both the sampling and analytical programs.

Specific elements that have been checked and assessed for this investigation were:

- Preservation and storage of samples upon collection and during transport to the laboratory
- Sample holding times
- Use of appropriate analytical procedures
- Required limits of reporting
- Frequency of conducting quality control measurements
- Laboratory blank results
- Field duplicate results
- Surrogate spike results
- The occurrence of apparently unusual or anomalous results, e.g. laboratory results that appear to be inconsistent with field observations and measurements

4. Regulatory framework

4.1 Legislation and policy

4.1.1 Environment Protection Act 1970

The *Environment Protection Act 1970* established the Victorian Environment Protection Authority (EPA) and made provisions with respect to the powers, duties, and functions of the EPA and the protection of the environment. The Act provides for environmental audits, which are used to provide an authoritative opinion on the suitability of potentially contaminated land for future use, and form an integral part of the land use planning and approval process. The Act also provides the basis for the various environmental health and waste policies / regulations, which provide the framework for the assessment and management of the environmental quality of land, surface waters and groundwater in Victoria.

4.1.2 The Planning and Environment Act 1987

The *Planning and Environment Act 1987* is administered by the Department of Transport, Planning and Local Infrastructure (DTPLI) and sets out the requirements of planning authorities when preparing planning schemes or amendments to planning schemes. The Act requires planning authorities to "take into account any significant effects which it considers the scheme or amendment might have on the environment or which it considers the environment might have on any use or development envisaged in the scheme or amendment".

Under Section 12 (2) (a) of the Planning and Environment Act 1987, *'Ministerial Direction No. 1 – Potentially Contaminated Land'* requires planning authorities to satisfy themselves that the environmental conditions of land proposed to be used for a sensitive use, agriculture or public open space are, or will be, suitable for that use. This is generally done through the completion of an environmental site assessment and audit process.

4.1.3 Groundwater State Environment Protection Policy 1997

The State Environment Protection Policy (Groundwaters of Victoria) (Groundwater SEPP) defines a range of protected beneficial uses for defined segments of the groundwater environment, which are based on groundwater salinity (total dissolved solids or TDS). The EPA considers that groundwater is *polluted* where current and/or future protected beneficial uses for the relevant segment are precluded. Beneficial uses of groundwater are considered to be precluded when relevant groundwater quality objectives set out in the groundwater SEPP for those beneficial uses have been exceeded, or where non-aqueous phase liquid is present.

Where groundwater has been polluted, groundwater must be cleaned up such that the protection of beneficial uses is restored, or to cleaned up the extent practicable.

The SEPP identifies the following beneficial uses of groundwater that are to be protected:

- Maintenance of marine ecosystems
- Maintenance of freshwater ecosystems
- Potable water supply (desirable)
- Potable mineral water supply
- Agriculture, parks and gardens
- Stock watering
- Industrial water use
- Primary contact recreation (e.g. bathing, swimming)
- Buildings and structures.

Not all of the above beneficial uses are relevant to the PSP area under the proposed future use scenario for the site. Those that are relevant are discussed further in Section 5.3.2 in the context of the reported groundwater salinity (TDS).

4.2 Guidelines and standards

4.2.1 National Environment Protection (Assessment of Site Contamination) Amendment Measure (NEPM) 2013

The NEPM is the national guideline for assessing contaminated sites and was prepared by the National Environment Protection Council (NEPC). The NEPM is implemented in each Australian jurisdiction under the *National Environment Protection Measures (Implementation) Act 1998 (Commonwealth)*. The NEPM document ensures there is a nationally consistent approach to the assessment of contamination. The NEPM provides guidance on the methods of site contamination assessment, environmental and health based investigation levels for soil and groundwater contaminants, human and environmental health risk assessment and reporting requirements. The original NEPM published in 1999 has been recently superseded by a version published in April 2013.

In accordance with the Groundwater SEPP, groundwater quality objectives for protected beneficial uses are primarily sourced from the National Environment Protection (Assessment of Site Contamination) Amendment Measure (NEPC, 2013) ('the NEPM'), specifically those provided in Schedule B(1) of the NEPM, 'Guideline on the Investigation Levels for Soil and Groundwater.'

Groundwater investigation levels (GILs) are defined as 'the concentration of a contaminant in groundwater above which further investigation (point of extraction) or a response (point of use) is required'.

4.2.2 EPA Victoria guidance documents

EPA Victoria has published a number of guideline documents relating to the assessment of groundwater quality in Victoria. These are discussed below.

Groundwater Sampling Guidelines (2000) were published by the EPA under the *Environment Protection Act 1970*. The guidelines have been developed to assist those involved in groundwater sampling to reduce the potential for error, allowing subsequent groundwater management decisions to be based on representative groundwater quality data.

Hydrogeological Assessment (Groundwater Quality) Guidelines published by the EPA in 2006 provide a detailed overview of the requirements for hydrogeological assessments in order to aid owners, developers, potential purchasers and regulators to identify the risk to health and the environment from potential contamination.

The Industrial Waste Resource Guidelines (Sampling and Analysis of Waters, Wastewaters, Soils and Wastes) was published by the EPA in 2009 and provides general direction on appropriate sampling, preservation, storage, analytical and quality assurance procedures.

4.2.3 Australian Standard 5667

Australian Standard 5667.1:1998 *'Water Quality Sampling - Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples'* as well as Australian Standard 5667.1:1998 *'Water Quality Sampling - Part 11: Guidance on sampling of groundwaters'* provide general principles to be applied to the physical, chemical and microbiological analysis of waters and waste waters. These standards include the principles to be applied to the design of sampling programs, general guidance on sampling techniques, procedures for the preservation and transport of samples.

5. Summary of groundwater results

5.1 General observations and well integrity

A search of the *Visualising Victoria's Groundwater* website indicates that seven of the 12 boreholes selected by Jacobs SKM for sampling are registered by DEPI. While detailed borelogs were not available, a general driller's description of the lithology is provided for five of these. This information is summarised in Table 5.1 and Appendix C.

Table 5.1 : Summary of registered bores

Well Name	Registered ID	Total Depth (mbgl)[1]	Description of Lithology	Bore Condition for Sampling
BH2	S9020401/1	15	Basalt overlain by clay and topsoil	Moderate
BH5	79155	14.63	Weathered basalt	Unknown
BH7	145710	13.7	No information	Good
BH10	145714	20.6	Basalt overlain by clay and topsoil	Good
BH11	145715	18.2	Basalt overlain by clay and topsoil	Good
BH12	145711	15.8	Basalt overlain by clay and topsoil	Good
BH14	N/A	N/A[2]	N/A	Good
BH15	N/A	N/A[2]	N/A	Moderate
BH16	N/A	41.6[3]	N/A	Poor
BH17	N/A	N/A[2]	N/A	Moderate
BH18	N/A	N/A[2]	N/A	Moderate
WSBH	S9020401/2	25	No information	Good

NOTES:

1. Registered depth (DEPI)
2. Bore depth could not be established in the field due to well obstruction.
3. Bore depth recorded in the field

During the sampling event, boreholes were observed in varying conditions as described above. Windmill bores (BH14, BH15, BH17 and BH18) were generally in moderate to good condition. Due to the installation of pumping equipment, the top of the wells were not fully sealed at the surface and it is possible that foreign materials and exposure to the environment, more generally, may impact on reported results.

Groundwater wells installed with monument gatics were generally in good condition. These include BH7, BH10, BH11, BH12 and WSBH. BH2 was the only exception where the protective cover had been removed.

BH16 was observed to be in poor condition. It appeared that this bore was formerly a windmill although this structure has now been removed. As such, the top of the well was not sealed to prevent foreign materials entering the well.

Examples of groundwater bore installations are presented in Plate 5.1 while the implications of the condition of the bores are discussed in greater detail in Section 5.4.

Windmill bore BH17. Surface water can readily enter the well

BH16. Former windmill bore no longer sealed

Plate 5.1 : Examples of groundwater bore installations

5.2 Groundwater levels / flow direction

Groundwater was encountered between 5 mbgl and 10 mbgl. However, towards the western perimeter of Lot 8 (BH12) groundwater was encountered at approximately 16 mbgl. These observations correspond well with spatial data obtained from the Victorian Department of Environment and Primary Industry (DEPI) presented in Figure 3.

Groundwater height data indicates the groundwater flow direction is towards the south, towards the creek at the southern end of the site, which is consistent with the previous 2002 SKM assessment (SKM, 2002). A groundwater contour plan is provided as Figure 4.

5.3 Physical and chemical water quality parameters

5.3.1 Field measurements

Physical and chemical groundwater quality parameters were recorded as part of the groundwater sampling program. The parameters reported at stabilisation are presented in Table 5.2. Groundwater sampling forms are provided in Appendix B.

Table 5.2 : Summary of physical and chemical water quality parameters

Well ID[1]	Sample Date	Dissolved Oxygen		EC (mS/cm)	pH	Redox (mV)	Temp (^{o}C)	Comments
		% Sat[1]	mg/L					
BH2	11/03/14	56.4	5.18	2.68	7.29	145	17.6	Clear sample
BH5	11/03/14	43.9	3.61	2.83	7.11	144	23.3	Clear sample
BH7	12/03/14	74.2	6.89	2.12	7.12	90	17.0	Clear sample
BH10	11/03/14	45.0	4.07	2.66	7.15	66	18.3	Clear sample
BH11	12/03/14	38.9	3.72	6.09	7.18	22	15.6	Slightly cloudy
BH12	12/03/14	91.8	8.60	3.88	8.01	141	16.6	High sediment, brown
BH14	12/03/14	22.9	2.11	2.07	6.87	105	17.3	Clear with some flocculent
BH15	13/03/14	61.0	5.81	2.88	7.45	175	15.8	High sediment, brown
BH16	12/03/14	14.3	1.34	3.41	6.41	9	16.5	Slight sediment
BH17	13/03/14	51.9	4.80	1.28	7.41	99	17.2	Slight sediment

Well ID[1]	Sample Date	Dissolved Oxygen		EC	pH	Redox	Temp	Comments
		% Sat[1]	mg/L	(mS/cm)		(mV)	(^{o}C)	
BH18	13/03/14	24.3	2.24	1.29	7.63	139	17.4	Slight sediment, pale brown
WSBH	13/03/14	23.8	2.21	2.59	6.35	143	17.1	Clear
EFF	13/03/14	28.5	2.56	0.972	7.62	87	18.7	Cloudy

NOTES:

1. Percentage saturation is an estimated value that has been calculated based on concentration in mg/L, water temperature and site altitude (300 mADH).

Reported water quality parameters indicate that the groundwater across the site is characterised by a fairly neural pH with a relatively low salinity, ranging from 1.28 mS/cm (BH17) to 6.09 mS/cm (BH7). The results for reduction/oxidation (redox) potential are positive which is indicative of oxidising conditions. Dissolved oxygen concentrations vary across the site, although concentrations are all below saturation. Samples collected using either a foot valve or a disposable bailer generally report higher dissolved oxygen concentration. These sampling methods agitate the sample to a greater degree than low flow techniques and can result in increased aeration and consequently dissolved oxygen concentrations.

5.3.2 Laboratory total dissolved solids

Laboratory TDS concentrations for groundwater (which are an indicator of salinity) ranged from 700 mg/L to 3,500 mg/L during the most recent round of groundwater monitoring. The average TDS concentration is 1,656 mg/L. In accordance with the Groundwater SEPP, the sampled aquifer is classified as Segment A2 (501 – 1,000 mg/L) based on the lowest reported TDS concentration. As such, the beneficial uses of groundwater to be protected include:

- Maintenance of ecosystems
- Potable water supply (acceptable)
- Potable mineral water supply
- Agriculture, parks and gardens
- Stock watering
- Industrial use
- Primary contact recreation
- Buildings and structures

Of these, use of groundwater for mineral water supply is not considered relevant. Regional groundwater is not considered typical of mineral waters which are naturally effervescent and high in bicarbonate concentrations.

The following sections present the results obtained as part of the most recent sampling event in comparison with the relevant assessment criteria for each of the beneficial uses identified above.

5.4 Laboratory analytical results

Comparison of laboratory results against criteria for individual beneficial uses is detailed in Sections 5.4.1 to 5.4.4 below.

5.4.1 Comparison of laboratory results against human health criteria

Laboratory analytical results were compared against the following criteria for the protection of human health:

- Australian drinking water guidelines (ADWG) (NHMRC & NRMMC, 2011)
- Guidelines for managing risks in recreational waters (GMRRW) (NHMRC, 2008)

These criteria consider the suitability of groundwater at the site for the potable water supply and primary contact recreation protected beneficial uses of groundwater.

Analytes reporting exceedances of the assessment criteria are summarised in Table 5.3 below with tabulated results presented in Data Table A at the end of the report.

Table 5.3 : Summary of exceedances of the assessment criteria for the protection of human health

Contaminant of Concern		**Concentration Range**[1]		**No. Results**[2]	**No. Samples Exceeding Human Health Criteria**		
					ADWG		**GMRRW**
Group	**Analyte**	**Minimum**	**Maximum**		**Health**	**Aesthetic**	
Metals	Manganese	<5	750	15	**2**	**4**	None
	Nickel	<1	26	15	**1**	N/A	None
Inorganics	Nitrite (as N)	<2	3,800	15	**3**(3)	N/A	None
	Sodium	157 mg/L	720 mg/L	15	N/A	**11**	N/A
	TDS	620 mg/L	3,500 mg/L	15	N/A	**15**	N/A

NOTES:

1. Units are µg/L unless stated otherwise
2. Includes primary and duplicate samples
3. These nitrite exceedances are from samples collected directly from the winter storage effluent holding pond (EFF)

5.4.2 Comparison of laboratory results against ecological criteria

Laboratory results were compared against the following criteria for the protection of ecosystems:

- Australian water quality guidelines for fresh water (AWQG) (ANZECC & ARMCANZ, 2000)

These criteria consider the suitability of groundwater at the site for the maintenance of ecosystems beneficial use. The maintenance of ecosystems beneficial use is considered to apply to groundwater at the point of discharge to the relevant surface water receptor, in this case, the heavily modified unnamed creek running along the southern portion of site (see Figure 5). Based on the groundwater contour plan, this creek is directly down gradient from site (see Figure 4).

The creek has been heavily modified, including the construction of several storage dams along its alignment - storage dams have been constructed in the southern portion of site, immediately offsite to the south (on the quarry site) and further south, on the recently constructed golf course. As part of construction of the golf course, the actual alignment of the creek has also been re-shaped / moved (see Figure 5). Given the highly modified nature of the creek, an 80% level of ecosystem protection has been assigned for the creek (ANZECC 80% level of ecosystem protection guidelines have been used).

Analytes reporting exceedances of the assessment criteria are summarised in Table 5.4 below with tabulated results presented in Data Table B at the end of the report.

Table 5.4 : Summary of exceedances of the assessment criteria for the protection of ecosystems

Contaminant of Concern		**Concentration Range**[1]		**No. Results**[2]	**No. Samples Exceeding AWQG**
Group	**Analyte**	**Minimum**	**Maximum**		
Metals	Copper	<1	300	15	**8**
	Nickel	<1	26	15	**1**
	Zinc	<1	360	15	**4**
Inorganics	Total Cyanide	<5	23	15	**1**(3)

NOTES:

1. Units are µg/L unless stated otherwise
2. Includes primary and duplicate samples
3. Cyanide exceedance is from a sample collected directly from the winter storage effluent holding pond (EFF)

5.4.3 Comparison of laboratory results against primary use criteria

Laboratory results were compared against the following criteria for the primary use of groundwater:

- Irrigation water short term trigger values (ANZECC, 2000) – up to 20 years
- Recommended water quality trigger values for livestock drinking water (ANZECC & ARMCANZ, 2000)

The irrigation short term trigger value (up to 20 years) was deemed to be applicable for the assessment. These criteria consider the suitability of groundwater at the site for the agriculture, parks and gardens as well as stock watering beneficial uses.

Analytes reporting exceedances of the assessment criteria are summarised in Table 5.5 below with tabulated results presented in Data Table C at the end of the report.

Table 5.5 : Summary of exceedances of the assessment criteria for the primary use of groundwater

Contaminant of Concern		**Concentration Range[1]**		**No. Results[2]**	**No. Samples Exceeding Primary Use Criteria**	
					Irrigation Trigger Values (TV)	**Stock Watering**
Group	**Analyte**	**Minimum**	**Maximum**		**Short Term TV**	
Inorganics	TDS	620 mg/L	3,500 mg/L	15	None	**2**

NOTES:

1. Units are µg/L unless stated otherwise
2. Includes primary and duplicate samples

5.4.4 Comparison of laboratory results against industrial use and buildings and structures criteria

Laboratory results were compared against the following criteria for the use of groundwater for industrial purposes and for the protection of buildings and structures:

- Criteria for the industrial use of groundwater (ANZECC, 1992)
- Exposure classification criteria for concrete piles in soil (AS 2159-2009) (Standards Australia, 2009)

Tabulated results presented in Data Table C at the end of the report.

Groundwater results for the site reported no exceedances of the relevant criteria for either beneficial use.

5.5 Comparison with 2002 analytical data

A comparison between SKM's available 2002 and recent data has been made, to help to assess changes in groundwater conditions over time. Analytical data was available for 6 wells across the site (nitrate, nitrite, ammonia and TDS data) and a comparison is presented in Table 5.6 below.

Table 5.6 : Comparison – 2002 vs 2014 groundwater analytical data

Analyte	**Nitrate (mg/L)**		**Nitrite (mg/L)**		**Ammonia (mg/L)**		**TDS (mg/L)**	
Yr sampled / Well ID	**2002**	**2014**	**2002**	**2014**	**2002**	**2014**	**2002**	**2014**
BH10 / PS2	0.88	1.6	<0.01	<0.02	0.2	<0.01	1500	1600
BH11 / PS1	0.11	<0.02	<0.01	<0.02	0.2	**0.03**	5000	3500
BH15 / WM3	0.72	**5**	<0.01	<0.02	<0.3	<0.01	2700	1700
BH17 / WM5	2.2	3.2	<0.01	<0.02	<0.1	<0.01	720	700
BH18 / WM6	0.3	0.22	<0.01	<0.02	0.2	**<0.01**	700	770
BH7 / PS5	0.88	**2.8**	0.82	**<0.02**	<0.1	<0.01	1400	1200

NOTES:

1. 2002 data is referred to as "Baseline" Data
2. **5** – Concentration significantly increased since 2002 assessment
3. **5** – concentration significantly decreased since 2002 assessment

Concentrations of nitrate, nitrite and ammonia were detected "pre-irrigation" (in 2002), showing these contaminant concentrations were reflective of background and likely regional conditions. The comparison in Table 5.6 shows that concentrations of the analytes have remained relatively consistent over the past 12 years (including TDS), with some increases in nitrate concentrations in two wells (BH15 and BH7).

Jacobs SKM note that all the above concentrations (excluding TDS) are still below applicable criteria used for this assessment (see Section 5.4. and Tables section).

5.6 Discussion of impact on beneficial uses of groundwater

Groundwater is considered to be polluted where groundwater quality is such that the groundwater is unsuitable for a beneficial use (that is, a beneficial use is precluded) and / or it affects beneficial uses of other segments of the environment, such as soil and air.

Groundwater beneath the site has been classified as Segment A2 in accordance with SEPP Groundwaters of Victoria. As discussed in Section 5.3.2, the protection of the following beneficial uses of the groundwater at the site have been assessed:

- Maintenance of ecosystems
- Potable water supply (acceptable)

- Agriculture, parks and gardens
- Industrial water use
- Primary contact recreation (e.g. bathing, swimming)
- Buildings and structures

A discussion of contaminant concentration exceedances of the groundwater quality criteria for each of the beneficial uses is outlined below.

- *Maintenance of ecosystems:* Maintenance of ecosystem criteria were exceeded for copper, nickel and zinc. In several samples. Based on the known previous and current site use (no significant source of these analytes identified), these exceedances are likely reflective of background / regional conditions. Jacobs SKM note there was also an exeedance for cyanide, however, this was a surface water sample collected from the winter storage effluent pond (EFF) and was not collected from underlying groundwater
- *Potable water supply (acceptable):* Potable water supply criteria were exceeded for manganese, nickel, sodium and TDS in several samples. Based on the known previous and current site use (no significant source of these analytes identified), these exceedances are likely reflective of background / regional conditions. Jacobs SKM note there were also 3 nitrite exceedances reported, however, these were surface water samples collected from the winter storage effluent pond (EFF) and were not collected from underlying groundwater
- *Agriculture, parks and gardens (irrigation):* Stock irrigation TDS criteria was exceeded in two samples. Jacobs SKM note that TDS concentrations are likely reflective of background / regional conditions (see Table 5.6)
- *Industrial water / Buildings and Structures:* There were no reported exceedances for these beneficial uses
- *Primary contact recreation (e.g. bathing, swimming):* There were no reported exceedances for this beneficial use

Based on the groundwater sampling program undertaken, exceedances of groundwater quality objectives for heavy metals, sodium and TDS are likely reflective of background or regional conditions. Therefore, no beneficial uses of groundwater are considered to be precluded based on the detected concentrations of contaminants.

5.7 Analytical data quality

It is considered that the QA/QC program was in accordance with recommended good practice (e.g. AS4482.1-2005). Overall the program is adequate considering the scope and nature of the assessment program undertaken. The data are considered sufficiently reliable for the purpose for which they have been obtained and used.

Further discussion in relation to data validation, quality assurance and control is provided in Appendix A.

6. Conclusions and recommendations

6.1 Conclusions

Based on the results of the groundwater sampling and laboratory analysis undertaken, heavy metals, sodium, nitrate and TDS were reported above adopted assessment guidelines. Concentrations of heavy metals and sodium are likely reflective of background / regional conditions, given no significant source of these contaminants were identified as part of the recent Jacobs SKM desktop assessment (Jacobs SKM, 2014). Concentrations of TDS and nitrate are likely mostly reflective of background / regional conditions, based on concentrations reported as part of SKM's 2002 "pre irrigation" groundwater sampling program (SKM, 2002). Jacobs SKM note that some increases in nitrate concentrations were reported as part of the 2014 groundwater sampling program, however, concentrations were still below applicable guidelines adopted for the assessment.

Elevated nitrite and cyanide were reported in the surface water sample collected from the winter storage facility, which holds the treated effluent used for irrigation. However, no contaminant concentrations of these contaminants were reported above adopted assessment guidelines as part of the actual groundwater sampling program.

Therefore, no beneficial uses of groundwater are considered to be precluded based on the detected concentrations of contaminants.

6.2 Recommendations

The groundwater well network should be periodically monitored by YVW (or other) while irrigation is being undertaken to help ensure the underlying groundwater quality remains acceptable for the relevant protected beneficial uses. If groundwater quality deterioration is reported during this routine monitoring this should act as a trigger for further detailed assessment and / or management. Deterioration in this case could be:

- A notable increase in concentrations of contaminants of concern in groundwater above the concentrations that have historically been reported at the site
- Reported exceedances of relevant assessment criteria for protected beneficial uses of groundwater at the site.

7. References

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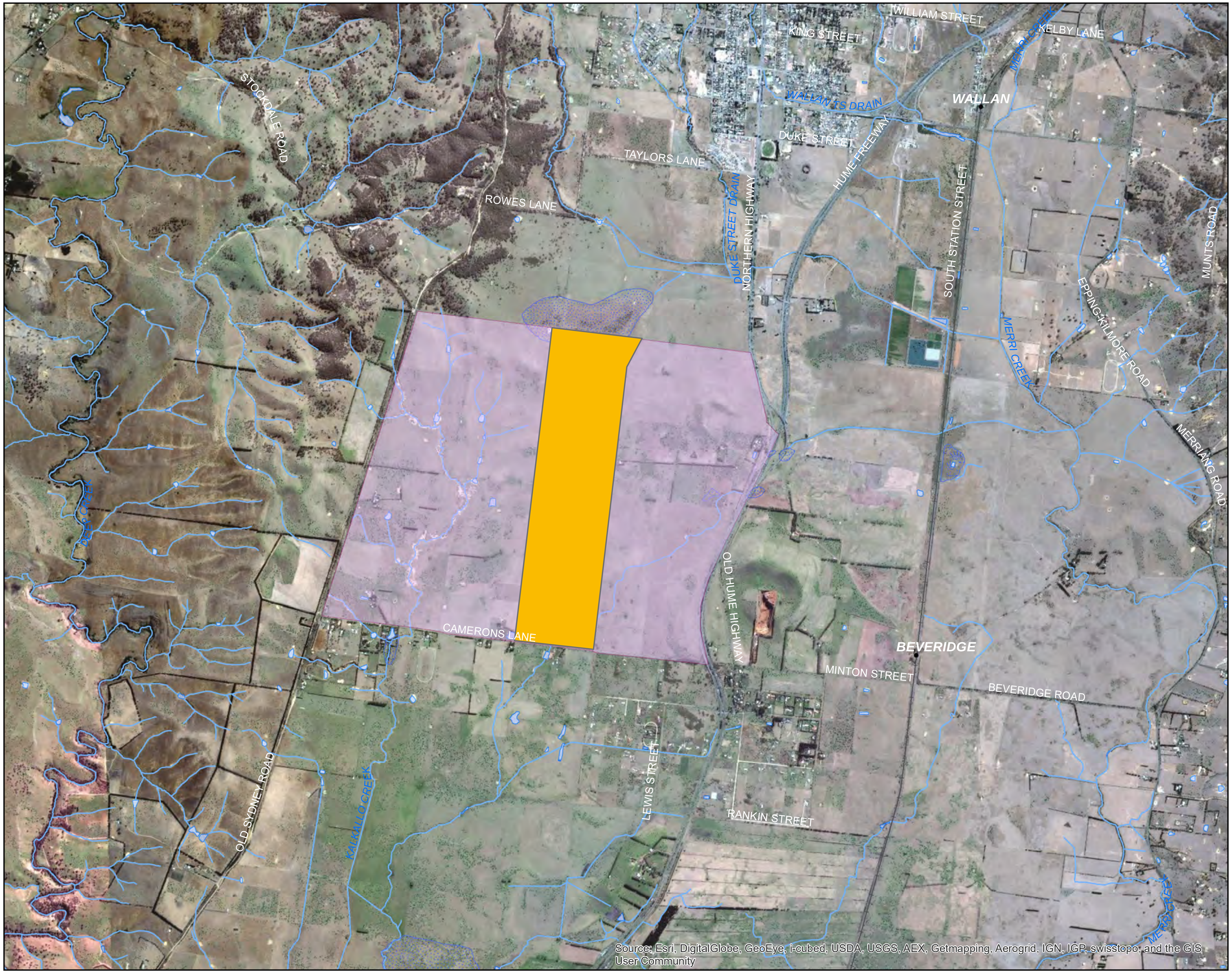
Figures

[Figure 1 - Locality Map]



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

LEGEND

- 🟧 Lot 8 & 9 Camerons Lane
- ▭ PSP Boundary
- ┼ Rail
- ▭ Lake
- ▨ Flat
- ▨ Wetland Swamp
- ─ Watercourse

JACOBS SKM

DATA SOURCES
[Contains Vicmap Information © State of Victoria 2013, © Commonwealth of Australia (Geoscience Australia) 2006 Geodata Topo 250k Series 3]

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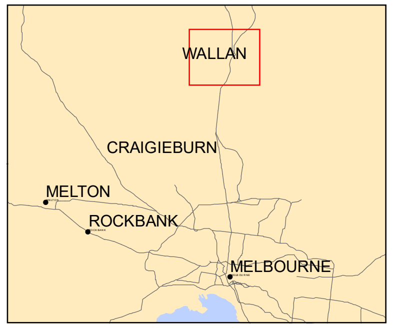

METROPOLITAN PLANNING AUTHORITY
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[Figure 2 - Site Layout : Lot 8 and 9 Camerons Road]

LEGEND

● Effluent Sample
● Groundwater Well
▨ Winter Storage Reservoir
▨ Irrigators
— Watercourse
— Freeway
— Sub-arterial
— Local Road

JACOBS SKM

DATA SOURCES
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MPA METROPOLITAN PLANNING AUTHORITY
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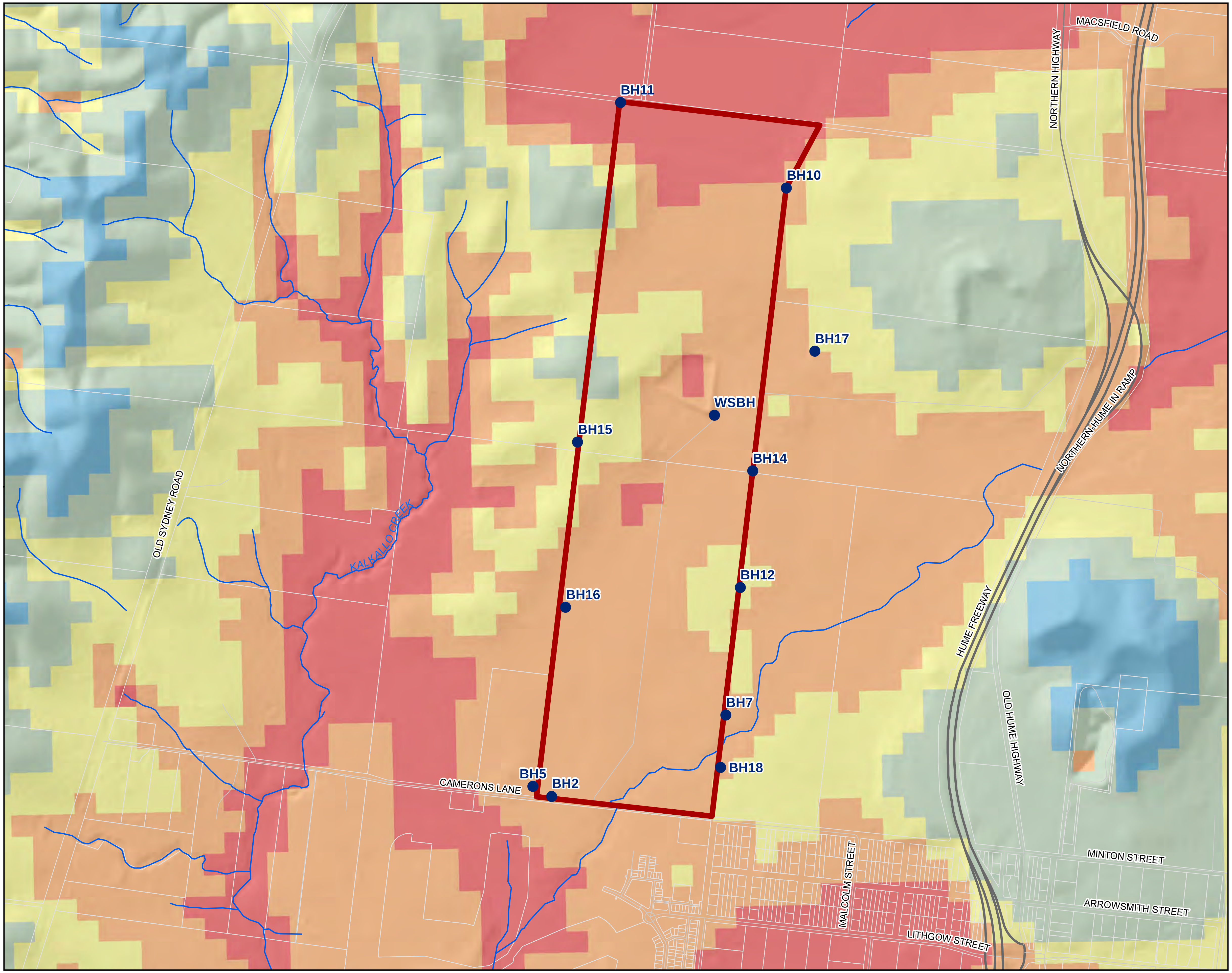
[Figure 3 - Depth to Watertable : Lot 8 and 9 Camerons Road]



LEGEND

● Groundwater Well

▭ Lot 8 & 9 Camerons Lane

— Watercourse

— Freeway

— Sub-arterial

— Local Road

Depth to watertable (mbgl)

🟥	5
🟧	10
🟨	20
🟩	50
🟦	100

DATA SOURCES
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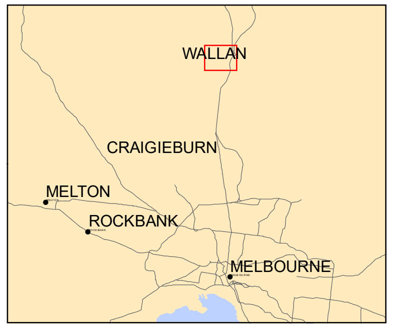
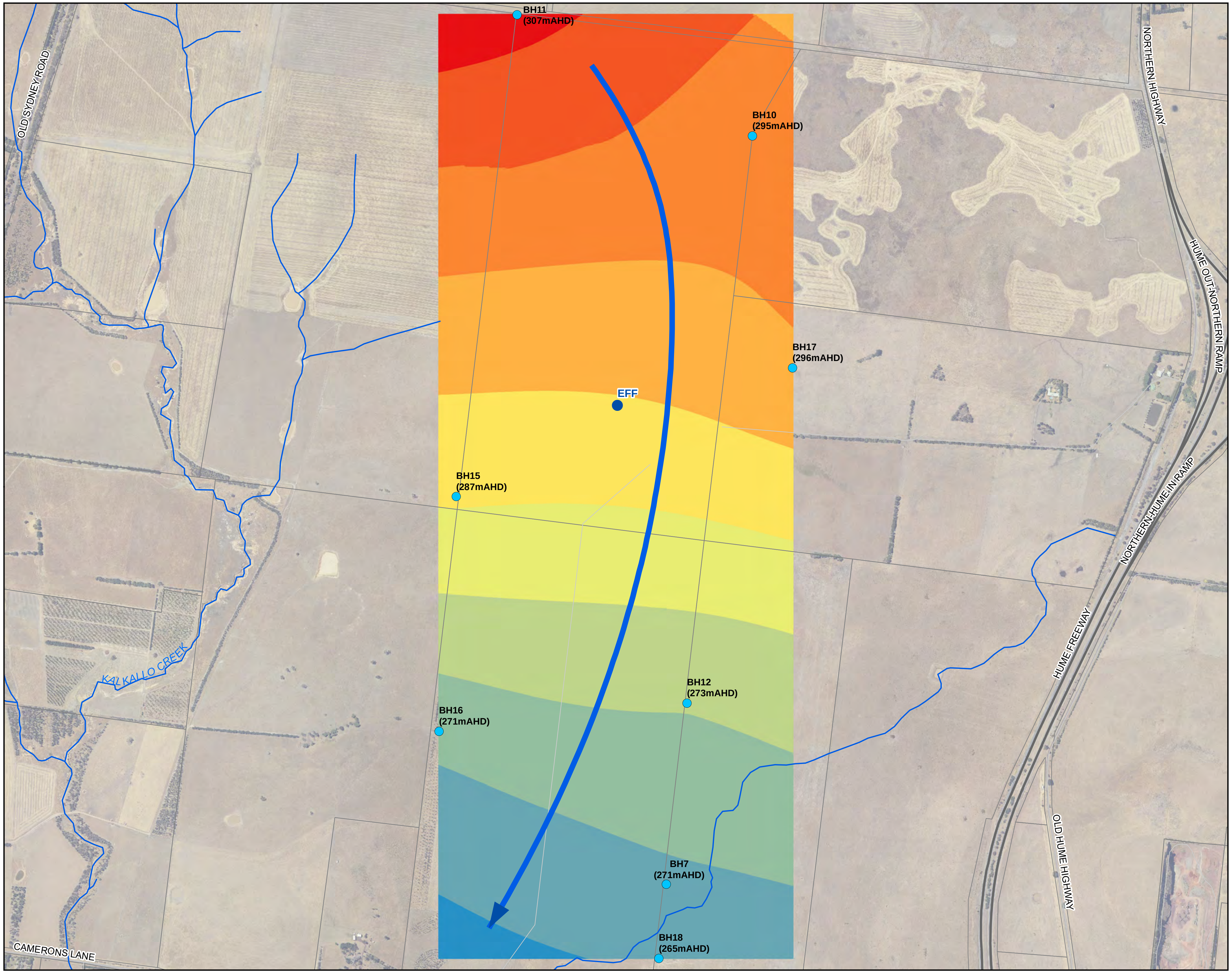


[Figure 4: Groundwater Contour Plan]



LEGEND

● Effluent Sample

● Groundwater Well

◀ GroundWaterDirection

— Watercourse

☐ Cadastre Parcel

Ground Water Height (mADH)

🟦 260 - 265

🟦 265 - 270

🟩 270 - 275

🟩 275 - 280

🟨 280 - 285

🟨 285 - 290

🟧 290 - 295

🟧 295 - 300

🟧 300 - 305

🟥 305 - 310

DATA SOURCES
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[GDA 94 | MGA Zone 55]
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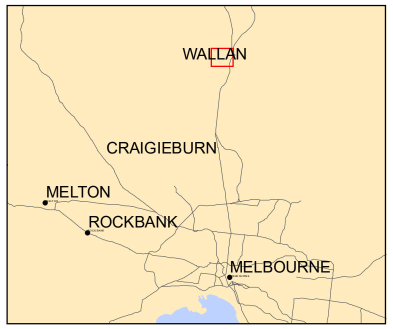
Meters



METROPOLITAN PLANNING AUTHORITY
partners in planning and infrastructure coordination

JACOBS SKM

[Stage 2 - Beveridge North West PSP Additional Groundwater Assessment | VW07335]

[Figure 5 - Heavily Modified Creek]

LEGEND

▭ PSP Boundary

▭ Storage Dam

—+— Rail

— Heavily Modified Creek

NOTES

DATA SOURCES
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[GDA 94 | MGA Zone 55]
1:50,000

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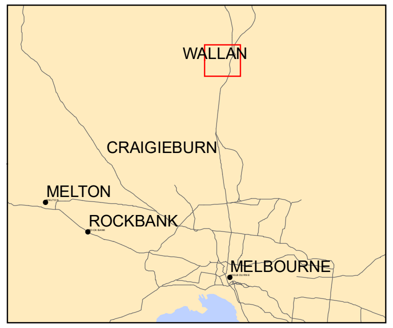
Meters



METROPOLITAN PLANNING AUTHORITY

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11 Apr 2014 | Path: I:\VWES\Admin\Administration\GeoEnvironmental\Environmental_Management\B-ProjectsProposals\Projects\Beveridge NW Site Suitability Assessment\Tech\Spatial\ArcGIS\VW07335_A3_HeavilyModifiedCreek.mxd

Tables

TABLE A :

Comparison of groundwater results against criteria for the protection of human health

					Well Code	BH10	BH11	BH12	BH14	BH15	BH16	BH17	BH18	BH2	BH5	BH7	EFF	EFF	EFF	WSBH
					Field ID	BH10	BH11	BH12	BH14	BH15	BH16	BH17	BH18	BH2	BH5	BH7	1303-QA1	1303-QA2	EFF	WSBH
					Sample Type	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Blind D	Split D	Primary	Primary
					Sampled Date	11/03/2014	11/03/2014	12/03/2014	12/03/2014	13/03/2014	12/03/2014	13/03/2014	13/03/2014	11/03/2014	11/03/2014	12/03/2014	13/03/2014	13/03/2014	13/03/2014	13/03/2014
					Monitoring Round	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March "14	March '14	March '14
					Lab Report Number	411557	411868	411868	411868	411868	411868	411868	411868	411557	411557	411868	411868	EM1402371	411868	411868
					Sample Description	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	Effluent	Effluent	Effluent	GW
Chemical Name	**Units**	**EQL**	**Australian Drinking Water Guidelines (ADWG, 2011) Human Health Criteria**	**Australian Drinking Water Guidelines (ADWG, 2011) Aesthetic Criteria**	**Recreational Water Quality (GMRRW, 2008)**															
Metals																				
Arsenic	µg/L		**10**		**100**	<1	5	3	<1	<1	<1	<1	<1	<1	<1	<1	3	3	3	<1
Beryllium	µg/L		**60**		**600**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	µg/L		**4000**		**40000**	<50	<50	<50	<50	<50	<50	<50	90	50	<50	<50	70	190	70	<50
Cadmium	µg/L		**2**		**20**	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2
Calcium	µg/L	500				57,000	33,000	16,000	19,000	40,000	78,000	28,000	19,000	36,000	40,000	32,000	21,000	16000	18,000	79,000
Chromium (III+VI)	µg/L					3	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	<1	8	<1	<1
Cobalt	µg/L					<1	11	<1	<1	<1	3	<1	<1	<1	<1	<1	1	4	1	1
Copper	µg/L		**2000**	**1000**	**20000**	<1	<1	3	47	300	24	2	7	<1	13	1	2	9	2	12
Lead	µg/L		**10**		**10**	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	2	<1	<1
Magnesium	µg/L	500				170000	290000	230000	110000	140000	240000	82000	40000	160000	130000	130000	21000	17000	18000	170000
Manganese	µg/L		**500**	**100**	**5000**	<5	**240**	38	<5	12	**750**	<5	6	<5	36	13	38	**118**	29	**600**
Mercury	µg/L		**1**		**10**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	µg/L		**20**		**200**	<1	**26**	2	1	<1	1	<1	<1	<1	<1	1	5	8	5	3
Potassium	µg/L	500				5300	10,000	16,000	3600	42,000	33,000	18,000	25,000	5000	10,000	22,000	39,000	21000	47,000	21,000
Zinc	µg/L	1		**3000**		7	5	11	30	150	320	14	360	11	16	7	3	20	<1	98
Inorganics																				
Ammonia as N	µg/L	10				<10	30	270	<10	<10	<10	<10	<10	<10	<10	<10	<10	200	<10	<10
Cyanide Total	mg/L	0.004	**0.08**		**0.8**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	0.023	<0.005
Fluoride	mg/L	0.1	**1.5**		**15**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	0.8	0.7	<0.5
Kjeldahl Nitrogen Total	mg/L	0.1				<0.2	<0.2	1.6	<0.2	2.7	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	3.2	3.1	<0.2
Nitrate (as N)	mg/L	0.01	**11.287**		**113**	1.6	<0.02	7.3	1.9	5	<0.02	3.2	0.22	2.4	<0.02	2.8	5.5	6.82	5.8	0.08
Nitrite (as N)	mg/L	0.01	**0.912**		**9.2**	<0.02	<0.02	0.22	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**3.8**	**1.39**	**3.6**	<0.02
Nitrogen (Total Oxidised)	mg/L	0.01				1.6	<0.05	7.6	1.9	5	<0.05	3.2	0.22	2.4	<0.05	2.8	9.3	8.21	9.4	0.08
Nitrogen (Total)	µg/L	100				1600	<200	9200	1900	7700	<200	3200	220	2400	<200	2800	9300	11,400	13,000	<200
Sodium	mg/L	0.5		**180**		**270**	**720**	**580**	**330**	**400**	**460**	**180**	**250**	**290**	**360**	**280**	**180**	157	**180**	**340**
Sulphate as S	mg/L	5				<5	43	16	11	14	10	<5	<5	7.4	12	12	14	34	14	12
TDS	mg/L	10		**600**		**1600**	**3500**	**2200**	**1300**	**1700**	**2000**	**700**	**770**	**1600**	**1500**	**1200**	**700**	**1540**	**620**	**1800**

TABLE B :

Comparison of groundwater results against criteria for the protection of ecosystems

Well Code	BH10	BH11	BH12	BH14	BH15	BH16	BH17	BH18	BH2	BH5	BH7	EFF	EFF	EFF	WSBH
Field ID	BH10	BH11	BH12	BH14	BH15	BH16	BH17	BH18	BH2	BH5	BH7	1303-QA1	1303-QA2	EFF	WSBH
Sample Type	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Blind D	Split D	Primary	Primary
Sampled Date	11/03/2014	11/03/2014	12/03/2014	12/03/2014	13/03/2014	12/03/2014	13/03/2014	13/03/2014	11/03/2014	11/03/2014	12/03/2014	13/03/2014	13/03/2014	13/03/2014	13/03/2014
Monitoring Round	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March "14	March '14	March '14
Lab Report Number	411557	411868	411868	411868	411868	411868	411868	411868	411557	411557	411868	411868	EM1402371	411868	411868
Sample Description	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	Effluent	Effluent	Effluent	GW

Chemical Name	**Units**	**EQL**	**Freshwater ecosystems (80%) (ANZECC, 2000)**															
Metals																		
Arsenic	µg/L			<1	5	3	<1	<1	<1	<1	<1	<1	<1	<1	3	3	3	<1
Beryllium	µg/L			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	µg/L		**1300**	<50	<50	<50	<50	<50	<50	<50	90	50	<50	<50	70	190	70	<50
Cadmium	µg/L		**0.8**	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2
Calcium	µg/L	500		57,000	33,000	16,000	19,000	40,000	78,000	28,000	19,000	36,000	40,000	32,000	21,000	16000	18,000	79,000
Chromium (III+VI)	µg/L			3	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	<1	8	<1	<1
Cobalt	µg/L			<1	11	<1	<1	<1	3	<1	<1	<1	<1	<1	1	4	1	1
Copper	µg/L		**2.5**	<1	<1	**3**	**47**	**300**	**24**	2	**7**	<1	**13**	1	2	**9**	2	**12**
Lead	µg/L		**9.4**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.002	<1	<1
Magnesium	µg/L	500		170000	290000	230000	110000	140000	240000	82000	40000	160000	130000	130000	21000	17000	18000	170000
Manganese	µg/L		**3600**	<5	240	38	<5	12	750	<5	60	<5	36	13	38	118	29	600
Mercury	µg/L		**5.4**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	µg/L		**17**	<1	**26**	2	1	<1	1	<1	<1	<1	<1	1	5	8	5	3
Potassium	µg/L	500		5300	10,000	16,000	3600	42,000	33,000	18,000	25,000	5000	10,000	22,000	39,000	21000	47,000	21,000
Zinc	µg/L	1	**31**	7	5	11	30	**150**	**320**	14	**360**	11	16	7	3	20	<1	**98**
Inorganics																		
Ammonia as N	µg/L	10		<10	30	270	<10	<10	<10	<10	<10	<10	<10	<10	<10	200	<10	<10
Cyanide Total	mg/L	0.004	**0.018**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	**0.023**	<0.005
Fluoride	mg/L	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	0.8	0.7	<0.5
Kjeldahl Nitrogen Total	mg/L	0.1		<0.2	<0.2	1.6	<0.2	2.7	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	3.2	3.1	<0.2
Nitrate (as N)	mg/L	0.01	**17**	1.6	<0.02	7.3	1.9	5	<0.02	3.2	0.22	2.4	<0.02	2.8	5.5	6.82	5.8	0.08
Nitrite (as N)	mg/L	0.01		<0.02	<0.02	0.22	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	3.8	1.39	3.6	<0.02
Nitrogen (Total Oxidised)	mg/L	0.01		1.6	<0.05	7.6	1.9	5	<0.05	3.2	0.22	2.4	<0.05	2.8	9.3	8.21	9.4	0.08
Nitrogen (Total)	µg/L	100		1600	<200	9200	1900	7700	<200	3200	220	2400	<200	2800	9300	11,400	13,000	<200
Sodium	mg/L	0.5		270	720	580	330	400	460	180	250	290	360	280	180	157	180	340
Sulphate as S	mg/L	5		<5	43	16	11	14	10	<5	<5	7.4	12	12	14	34	14	12
TDS	mg/L	10		1600	3500	2200	1300	1700	2000	700	770	1600	1500	1200	700	1540	620	1800

TABLE C :

Comparison of groundwater results against criteria for the primary use of groundwater

				Well Code	BH10	BH11	BH12	BH14	BH15	BH16	BH17	BH18	BH2	BH5	BH7	EFF	EFF	EFF	WSBH
				Field ID	BH10	BH11	BH12	BH14	BH15	BH16	BH17	BH18	BH2	BH5	BH7	1303-QA1	1303-QA2	EFF	WSBH
				Sample Type	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Blind D	Split D	Primary	Primary
				Sampled Date	11/03/2014	11/03/2014	12/03/2014	12/03/2014	13/03/2014	12/03/2014	13/03/2014	13/03/2014	11/03/2014	11/03/2014	12/03/2014	13/03/2014	13/03/2014	13/03/2014	13/03/2014
				Monitoring Round	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March "14	March '14	March '14
				Lab Report Number	411557	411868	411868	411868	411868	411868	411868	411868	411557	411557	411868	411868	EM1402371	411868	411868
				Sample Description	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	Effluent	Effluent	Effluent	GW
Chemical Name	**Units**	**EQL**	**Irrigation Water Short-Term Trigger Values (ANZECC, 2000) - up to 20 years**	**Stock Watering (ANZECC, 2000)**															
Metals																			
Arsenic	µg/L		**2000**	**500**	<1	5	3	<1	<1	<1	<1	<1	<1	<1	<1	3	3	3	<1
Beryllium	µg/L		**500**		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	µg/L			**5000**	<50	<50	<50	<50	<50	<50	<50	90	50	<50	<50	70	190	70	<50
Cadmium	µg/L		**50**	**10**	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2
Calcium	µg/L	500			57,000	33,000	16,000	19,000	40,000	78,000	28,000	19,000	36,000	40,000	32,000	21,000	16000	18,000	79,000
Chromium (III+VI)	µg/L		**1000**	**1000**	3	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	<1	8	<1	<1
Cobalt	µg/L		**100**	**1000**	<1	11	<1	<1	<1	3	<1	<1	<1	<1	<1	1	4	1	1
Copper	µg/L		**5000**	**400[#1]**	<1	<1	3	47	300	24	2	7	<1	13	1	2	9	2	12
Lead	µg/L		**5000**	**100**	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	2	<1	<1
Magnesium	µg/L	500			170000	290000	230000	110000	140000	240000	82000	40000	160000	130000	130000	21000	17000	18000	170000
Manganese	µg/L		**10,000**		<5	240	38	<5	12	750	<5	60	<5	36	13	38	118	29	0.6
Mercury	µg/L		**2**	**2**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	µg/L		**2000**	**1000**	<1	26	2	1	<1	1	<1	<1	<1	<1	1	5	8	5	3
Potassium	µg/L	500			5300	10,000	16,000	3600	42,000	33,000	18,000	25,000	5000	10,000	22,000	39,000	21000	47,000	21,000
Zinc	µg/L	1	**5000**	**20000**	7	5	11	30	150	320	14	360	11	16	7	3	20	<1	98
Inorganics																			
Ammonia as N	µg/L	10			<10	30	270	<10	<10	<10	<10	<10	<10	<10	<10	<10	200	<10	<10
Cyanide Total	mg/L	0.004			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	0.023	<0.005
Fluoride	mg/L	0.1	**2**	**2**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	0.8	0.7	<0.5
Kjeldahl Nitrogen Total	mg/L	0.1			<0.2	<0.2	1.6	<0.2	2.7	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	3.2	3.1	<0.2
Nitrate (as N)	mg/L	0.01			1.6	<0.02	7.3	1.9	5	<0.02	3.2	0.22	2.4	<0.02	2.8	5.5	6.82	5.8	0.08
Nitrite (as N)	mg/L	0.01			<0.02	<0.02	0.22	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	3.8	1.39	3.6	<0.02
Nitrogen (Total Oxidised)	mg/L	0.01			1.6	<0.05	7.6	1.9	5	<0.05	3.2	0.22	2.4	<0.05	2.8	9.3	8.21	9.4	0.08
Nitrogen (Total)	µg/L	100	**25000**		1600	<200	9200	1900	7700	<200	3200	220	2400	<200	2800	9300	11,400	13,000	<200
Sodium	mg/L	0.5			270	720	580	330	400	460	180	250	290	360	280	180	157	180	340
Sulphate as S	mg/L	5			<5	43	16	11	14	10	<5	<5	7.4	12	12	14	34	14	12
TDS	mg/L	10		**2000[#2]**	1600	**3500**	**2200**	1300	1700	2000	700	770	1600	1500	1200	700	1540	620	1800

Comments

#1 Trigget value for sheep adopted
#2 Poultry

TABLE D :

Comparison of groundwater results against criteria for Industrial use, buildings and structures

Well Code	BH10	BH11	BH12	BH14	BH15	BH16	BH17	BH18	BH2	BH5	BH7	EFF	EFF	EFF	WSBH
Field ID	BH10	BH11	BH12	BH14	BH15	BH16	BH17	BH18	BH2	BH5	BH7	1303-QA1	1303-QA2	EFF	WSBH
Sample Type	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Blind D	Split D	Primary	Primary
Sampled Date	11/03/2014	11/03/2014	12/03/2014	12/03/2014	13/03/2014	12/03/2014	13/03/2014	13/03/2014	11/03/2014	11/03/2014	12/03/2014	13/03/2014	13/03/2014	13/03/2014	13/03/2014
Monitoring Round	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March '14	March "14	March '14	March '14
Lab Report Number	411557	411868	411868	411868	411868	411868	411868	411868	411557	411557	411868	411868	EM1402371	411868	411868
Sample Description	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	Effluent	Effluent	Effluent	GW

Chemical Name	**Units**	**EQL**	**Industrial Use of Groundwater (ANZECC 1992)**	**Piling Design (AS2159-2009)**															
Metals																			
Arsenic	µg/L				<1	5	3	<1	<1	<1	<1	<1	<1	<1	<1	3	3	3	<1
Beryllium	µg/L				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	µg/L				<50	<50	<50	<50	<50	<50	<50	90	50	<50	<50	70	190	70	<50
Cadmium	µg/L				<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2
Calcium	µg/L	500	**420000**		57,000	33,000	16,000	19,000	40,000	78,000	28,000	19,000	36,000	40,000	32,000	21,000	16000	18,000	79,000
Chromium (III+VI)	µg/L	1			3	<1	<1	<1	<1	<1	3	<1	<1	<1	<1	<1	8	<1	<1
Cobalt	µg/L	1			<1	11	<1	<1	<1	3	<1	<1	<1	<1	<1	1	4	1	1
Copper	µg/L	1			<1	<1	3	47	300	24	2	7	<1	13	1	2	9	2	12
Lead	µg/L	1			<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	2	<1	<1
Magnesium	µg/L	500			170000	290000	230000	110000	140000	240000	82000	40000	160000	130000	130000	21000	17000	18000	170000
Manganese	µg/L				<5	240	38	<5	12	750	<5	60	<5	36	13	38	118	29	600
Mercury	µg/L				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	µg/L				<1	26	2	1	<1	1	<1	<1	<1	<1	1	5	8	5	3
Potassium	µg/L	500			5300	10,000	16,000	3600	42,000	33,000	18,000	25,000	5000	10,000	22,000	39,000	21000	47,000	21,000
Zinc	µg/L	1			7	5	11	30	150	320	14	360	11	16	7	3	20	<1	98
Inorganics																			
Ammonia as N	µg/L	10			<10	30	270	<10	<10	<10	<10	<10	<10	<10	<10	<10	200	<10	<10
Cyanide Total	mg/L	0.004			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.004	0.023	<0.005
Fluoride	mg/L	0.1			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	0.8	0.7	<0.5
Kjeldahl Nitrogen Total	mg/L	0.1			<0.2	<0.2	1.6	<0.2	2.7	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	3.2	3.1	<0.2
Nitrate (as N)	mg/L	0.01			1.6	<0.02	7.3	1.9	5	<0.02	3.2	0.22	2.4	<0.02	2.8	5.5	6.82	5.8	0.08
Nitrite (as N)	mg/L	0.01			<0.02	<0.02	0.22	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	3.8	1.39	3.6	<0.02
Nitrogen (Total Oxidised)	mg/L	0.01			1.6	<0.05	7.6	1.9	5	<0.05	3.2	0.22	2.4	<0.05	2.8	9.3	8.21	9.4	0.08
Nitrogen (Total)	µg/L	100			1600	<200	9200	1900	7700	<200	3200	220	2400	<200	2800	9300	11,400	13,000	<200
Sodium	mg/L	0.5			270	720	580	330	400	460	180	250	290	360	280	180	157	180	340
Sulphate as S	mg/L	5		**1000**	<5	43	16	11	14	10	<5	<5	7.4	12	12	14	34	14	12
TDS	mg/L	10	**35000**		1600	3500	2200	1300	1700	2000	700	770	1600	1500	1200	700	1540	620	1800

TABLE E :

QA QC

Field Duplicate and Split Samples

Sample ID	EFF	1303-QA1	Diff	Average	RPD$^{(1)}$	EFF	1303-QA2	Diff	Average	RPD$^{(1)}$
Analyte / Laboratory	Eurofins	Eurofins				Eurofins	ALS			
Metals										
Arsenic	3	3	0	3	0	3	3	0	3	0
Beryllium	<1	<1	NA	NA	NA	<1	<1	NA	NA	NA
Boron	70	70	0	70	0	70	190	120	130	**92**
Cadmium	<0.2	<0.2	NA	NA	NA	<0.2	<0.1	NA	NA	NA
Calcium	18,000	21,000	3000	19500	15	18,000	16000	2,000	17000	12
Chromium (III+VI)	<1	<1	NA	NA	NA	<1	8	NA	NA	NA
Cobalt	1	1	0	1	0	1	4	3	2.5	**120**
Copper	2	2	0	2	0	2	9	7	5.5	**127**
Lead	<1	<1	NA	NA	NA	<1	2	NA	NA	NA
Magnesium	18000	21000	3000	19500	15	18000	17000	1000	17500	6
Manganese	29	38	9	33.5	27	29	118	89	73.5	**121**
Mercury	<0.1	<0.1	NA	NA	NA	<0.1	<0.1	NA	NA	NA
Nickel	5	5	0	5	0	5	8	3	6.5	46
Potassium	47,000	39,000	8,000	43000	19	47,000	21000	26,000	34000	**76**
Zinc	<1	3	NA	NA	NA	<1	20	NA	NA	NA
Inorganics			NA	NA	NA					
Ammonia as N	<10	<10	NA	NA	NA	<10	200	NA	NA	NA
Cyanide Total	0.023	<0.005	NA	NA	NA	0.023	<0.004	NA	NA	NA
Fluoride	0.7	0.6	0.1	0.65	15	0.7	0.8	0.1	0.75	13
Kjeldahl Nitrogen Total	3.1	<0.2	NA	NA	NA	3.1	3.2	0.1	3.15	3
Nitrate (as N)	5.8	5.5	0.3	5.65	5	5.8	6.82	1.02	6.31	16
Nitrite (as N)	3.6	3.8	0.2	3.7	5	3.6	1.39	2.21	2.495	**89**
Nitrogen (Total Oxidised)	9.4	9.3	0.1	9.35	1	9.4	8.21	1.19	8.805	14
Nitrogen (Total)	13,000	9300	3,700	11150	33	13,000	11,400	1,600	12200	13
Sodium	180	180	0	180	0	180	157	23	168.5	14
Sulphate as S	14	14	0	14	0	14	34	20	24	**83**
TDS	620	700	80	660	12	620	1540	920	1080	**85**

(1) RPD - Relative Percentage Difference

Rinsate Blank Results

			March 2014 Sampling Program	
Sample			R1-1203	1103-R1
Medium	Units	EQL	Water	Water
Date			12/04/2014	11/03/2014
Laboratory			Eurofins	Eurofins
Metals				
Arsenic	mg/L	0.001	< 0.001	< 0.001
Beryllium	mg/L	0.001	< 0.001	< 0.001
Boron	mg/L	0.05	< 0.05	< 0.05
Cadmium	mg/L	0.0002	< 0.0002	< 0.0002
Calcium	mg/L	0.5	< 0.5	< 0.5
Chromium (III+VI)	mg/L	0.001	< 0.001	< 0.001
Cobalt	mg/L	0.001	< 0.001	< 0.001
Copper	mg/L	0.001	< 0.001	< 0.001
Lead	mg/L	0.001	< 0.001	< 0.001
Magnesium	mg/L	0.5	< 0.5	< 0.5
Manganese	mg/L	0.005	< 0.005	< 0.005
Mercury	mg/L	0.001	< 0.001	< 0.001
Nickel	mg/L	0.001	< 0.001	< 0.001
Potassium	mg/L	0.5	< 0.5	< 0.5
Zinc	mg/L	0.001	< 0.001	< 0.001
Inorganics				
Ammonia as N	mg/L	0.01	< 0.01	< 0.01
Cyanide Total	mg/L	0.005	< 0.005	< 0.005
Fluoride	mg/L	0.5	< 0.5	< 0.5
Kjeldahl Nitrogen Total	mg/L	0.2	< 0.2	< 0.2
Nitrate (as N)	mg/L	0.02	< 0.02	< 0.02
Nitrite (as N)	mg/L	0.02	< 0.02	< 0.02
Nitrogen (Total)	µg/L	0.2	< 0.2	< 0.2
Sodium	mg/L	0.5	< 0.5	< 0.5
Sulphate as S	mg/L	5	< 5	< 5

Appendix A. Quality assurance/ quality control

A.1 Scope

This appendix describes the testing methods and quality assurance/quality control (QA/QC) procedures used for analysis of samples obtained during the field activities. This includes:

- Sampling procedures which followed good practice, including sample storage/transport and equipment decontamination procedures
- Well-established and approved analytical methods used by NATA-accredited laboratories
- An adequate number (in compliance with EPA Victoria sampling guidelines) of field blind duplicate samples analysed at the primary laboratory (Eurofins-MGT) for the primary contaminants of potential concern
- An adequate number (in compliance with EPA Victoria sampling guidelines) of field split duplicate samples analysed at the secondary laboratory (ALS) for the principal contaminants of potential concern
- An adequate number (in compliance with EPA Victoria sampling guidelines) of rinsate samples for the principal contaminants of potential concern
- Intra-laboratory QC protocols, including analysis of matrix spike/matrix spike duplicates, laboratory duplicate analysis and method (reagent) blanks
- Other QA/QC protocols in accordance with SKM procedures, based on accepted good practice and relevant guidelines or Australian Standards

The results of the QA/QC Program are detailed in the following sections.

A.2 Field QA/QC

Quality control sampling and analysis is regularly conducted as part of SKM's QA/QC program to validate the integrity of field procedures and assess the reliability of laboratory analyses. The following table outlines the quality control samples collected during the project field activities and the analyses conducted on these samples.

Table A.1 : Quality control samples

Sample type	Sample ID	Analysis conducted	Comments
Blind duplicate	1303-QA1	Total metals (16), nutrients, inorganics and TDS	1303-QA1 is a duplicate of EFF
Split duplicate	1303-QA2	Total metals (16), nutrients, inorganics and TDS	1303-QA2 is a duplicate of EFF
Rinsate blank	1103-R1	Total metals (16), nutrients, inorganics	Collected from rinsate off the sampling pump
Rinsate blank	R1-1203	Total metals (16), nutrients, inorganics	Collected from rinsate off the sampling pump

NOTES:

- Metals (16) - As, Be, B, Cd, Ca, Cr, Co, Cu, Mg, Mn, Ni, Pb, K, Na, Hg, Zn
- Nutrients – ammonia, nitrate, nitrite, total Kjeldahl nitrogen, total nitrogen
- Inorganics – sulphate, fluoride, total cyanide

A.2.1 Sample frequency

A set of soil blind/split duplicate samples were obtained at a frequency of 1 set per 13 primary samples.

The rinsate blank sample was obtained at the rate of one sample per day of field activities per item of dedicated equipment. While sampling was undertaken over three days, on 13 March disposable foot valves were used for undertaking the sampling.

A trip blank was not submitted for analysis as part of the assessment. A trip blank is a blank sample pre-prepared by the laboratory and sent with the sample containers. The trip blank is meant to remains with the samples until they are returned to the laboratory. It is analysed to assess whether concentrations of volatile compounds (if any) can be attributed to cross-contamination during transport and storage of the samples rather than from site sources. Volatile organic contaminants are not considered primary contaminants of concern at the site and therefore a trip blank was not considered necessary.

A.2.2 Duplicate results

The relative precision of duplicate results was assessed by the magnitude of the Relative Percentage Difference (RPD), calculated as follows:

$$\text{RPD (\%)} = \frac{D_1 - D_2}{(D_1 + D_2) / 2} \text{ x100}$$

Where:

D_1=duplicate result 1

D_2=duplicate result 2

An acceptable range for field RPDs is <30-50%. This variation can be expected to be higher for organic compounds than for inorganics, and for low concentrations of analytes. Discussions with laboratories indicate that if detected concentrations are less than five times the detection limit, higher RPDs (up to the theoretical maximum of 200%) are common and may be considered acceptable depending on specific circumstances.

The results of field duplicate analyses and RPD calculations are shown in Table E and can be summarised as follows.

Field blind duplicate (Eurofins-MGT / Eurofins-MGT)

The data quality objective of RPD<30-50% was not exceeded in any sample pairs

Field split duplicate (Eurofins-MGT / ALS)

The data quality objective of RPD<30-50% was exceeded on eight occasions (76 – 127%), for several heavy metals and nitrite, sulphate and TDS

The above exceedances of the data quality objective can likely be attributed to the differences that may exist in the sample preparation and laboratory analysis performed by the two laboratories.

Given both laboratories are NATA accredited, and the field blind duplicates showed satisfactory agreement, the results from the Eurofins-MGT (primary laboratory) laboratory analysis program are deemed to be acceptable.

A.2.3 Rinsate results

Following completion of groundwater sampling using the low flow technique on 11 and 13 March, a rinsate blank sample was taken from the sampling pump. The rinsate samples were collected to assess the potential for cross-contamination between groundwater sampling locations as a result of inadequate equipment decontamination procedures. The rinsate water used to collect the rinsate samples was laboratory provided deionised water. Rinsate results are presented in Table E.

Samples were noted collected on other sampling days, as dedicated / disposable well sampling equipment was used (foot valve or bailer).

Analysis of the rinsate blank sample indicated that no contaminant concentrations were reported above laboratory detection limits. Therefore, decontamination procedures adopted throughout the investigation are deemed adequate.

A.3 Sample holding times

Table A.2 below summarises the approved sample holding times for groundwater samples for particular contaminants of concern, as referenced by Table 1, Schedule B(3) of the NEPM (NEPC, 2013).

Table A.2 : Water analyte holding times

Analyte	Maximum holding time
Metals	6 months
Chromium (Cr VI or Hexavalent)	28 days
Cyanide	14 days
Nitrate	2 days
Nitrite	2 days
TDS	7 days
Ammonia	28 days

A review of the analytical reports indicates that all samples were extracted within the prescribed holding times.

A.4 Laboratory internal QA/QC

All samples were collected in the field by SKM personnel, placed into laboratory prepared sample containers and transferred to the laboratory using appropriate sample preservation procedures and chain-of-custody (CoC) documentation (presented in Appendix D). Samples were submitted to Eurofins-MGT of Oakleigh, Victoria. Split duplicate samples were forwarded to ALS. The analytical data as presented by Eurofins-MGT and ALS is presented in Appendix E. Eurofins-MGT and ALS's analytical methods are certified by the National Association of Testing Authorities (NATA). These methods are also documented in the original laboratory reports.

All analytical laboratories used by SKM are required to adhere to NATA-endorsed testing methodologies and conduct regular quality control checks on their analyses. SKM requires these laboratories to regularly provide results of control/method blanks, repeat duplicates and recoveries.

- Spiked sample recovery tests were performed in the assessment and validation programs by the primary laboratory for key indicators, with acceptable recoveries in the range 70 – 130%. All spiked sample recoveries were reported within this range.
- Internal laboratory duplicate analyses were undertaken for key indicators during the assessment, with consistent agreement between duplicate data pairs – the 30% data quality objective was not exceeded
- Reagent (method) blank analyses by the laboratory did not detect any contaminants, indicating no contamination from laboratory sources

A.5 Suitability of method detection limits

Eurofins-MGT and ALS's practical quantification limits/method detection limits were reviewed and compared with the adopted assessment criteria. All PQLs/MDLs were below the relevant criterion for all analytes.

A.6 Conclusions and statement of analytical reliability

It is considered that the QA/QC program was in accordance with recommended good practice (e.g. AS5667.1-1998 and EPA Victoria *Groundwater Sampling Guidelines*), with some minor non-compliances with data quality objectives noted above. Overall the program is adequate considering the scope and nature of the assessment program undertaken. The data are considered sufficiently reliable for the purpose for which they have been obtained and used.

Appendix B. Groundwater sampling sheets

WELL DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

WELL No: BH2

SKM

Project No: VW07335 **Project Name:** Beveridge PSP - GW Sampling **Date:** 11 /04/2014

Development

Performed By: ____ Well Diameter : 50mm

Development Method ____

Time Started ____ SWL (start) ____ Volume Removed ____ Bore Depth (start) ____

Time Stopped ____ SWL (end) ____ Discharge Rate ____ Bore Depth (end) ____

Comments ____ NAPL Present

(If yes, thickness) ____

Purging

Performed By: C.Bannister / W Rodger

Purge Method Micropurge Kit

Time Started 9:20 SWL (start) 8.318 Volume Removed 7L Bore Depth (start) 15.860 TOC

Time Stopped 10:13 SWL (end) ____ Discharge Rate 3CPM Bore Depth (end) ____

Comments Clear from start. Well cap in place but not a cover on well. NAPL Present

(If yes, thickness) No

Sampling

Performed By: C.Bannister / W Rodger

Sampling Method Micropurge Kit Sampling Depth ~~14m~~ 13.5m bTOC.

Time Started ~~9:45~~ 10:13 SWL (start) 8.62 (top of well)

Time Stopped 10:20 SWL (end) 8.65 "

Tubing Type twin

Comments Started at CPM 4, reduced to CPM 3

Duplicate Sample Collected? Y [✓ N] Duplicate Sample ID: —

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Comments (colour, turbidity, odours, sheen, etc)
9:45	0.5	1.56mS	7.39	20.0	197	5.44ppm		8.062 4CPM Clear
9:50	1.0	2388 µS	7.19	18.2	183	5.13		8.069 3CPM Clear
9:54	3.0	2.68mS	7.15	19.9	174	4.81		8.064 " Clear
9:59	4.0	2.68	7.18	17.6	162	4.83		8.066 " Clear
10:04	5.0	2.68	7.25	17.6	155	5.08		8.65 " "
10:09	6.0	2.67	7.28	17.5	150	5.11		8.66 " "
10:13	7.0	2.68	7.29	17.6	145	5.18		8.65 " "
Stabilisation Criteria		+/- 3%	+/- 0.05	+/- 10%	+/- 10%	+/- 10%		

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*

____ m (-) ____ (=) ____

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME

____ (X) ____ (=) ____ L

Refer to Work Instructions WI113, WI114 and WI115

WELL DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

WELL No: BH5

SKM

Project No: VW07335
Project Name: Beveridge PSP - GW Sampling
Date: 11 /04/2014

Development

Performed By:
Well Diameter : 50mm
Development Method
Time Started
SWL (start)
Volume Removed
Bore Depth (start)
Time Stopped
SWL (end)
Discharge Rate
Bore Depth (end)
Comments
NAPL Present
(If yes, thickness)

Purging

Performed By: C.Bannister / W Rodger
Purge Method ~~Micropurge~~ Kit Tap - ran tap for 5 minutes.
Time Started 10:50
SWL (start) /
Volume Removed 30L
Bore Depth (start) /
Time Stopped
SWL (end) /
Discharge Rate
Bore Depth (end) /
Comments Bore conected to a nearby tap. Ran tap to purge then sampled.
NAPL Present /
(If yes, thickness) /

Sampling

Performed By: C.Bannister / W Rodger
Sampling Method ~~Micropurge Kit~~ Tap.
Sampling Depth
Time Started
SWL (start)
Time Stopped
SWL (end)
Tubing Type
Comments

Duplicate Sample Collected? Y / N
Duplicate Sample ID:

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Comments (colour, turbidity, odours, sheen, etc)
10:50	30L	2.74mS	7.08	23.3	166	2.71ppm		Clear. Collected from tap.
10:52	35 L	2.81	7.11	23.2	162	3.67		Clear Collected from tap.
10:55	45L	2.83	7.11	23.3	144	3.61		Clear. Collected from tap.
Stabilisation Criteria		+/- 3%	+/- 0.05	+/- 10%	+/- 10%	+/- 10%		

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
__________ m (-) __________ (=) __________

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
__________ (X) __________ (=) __________ L

Refer to Work Instructions WI113, WI114 and WI115

WELL DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

WELL No: BH7

SKM

Project No: VW07335 **Project Name:** Beveridge PSP - GW Sampling **Date:** 12/04/2014

Development

Performed By: Well Diameter : 50mm
Development Method
Time Started SWL (start) Volume Removed Bore Depth (start)
Time Stopped SWL (end) Discharge Rate Bore Depth (end)
Comments NAPL Present
(If yes, thickness)

Purging

Performed By: C.Bannister / W Rodger
Purge Method Micropurge Kit mbTOW
Time Started 16.29 SWL (start) 9.230 Volume Removed 7 Litre Bore Depth (start) 15.00mTOW.
Time Stopped 16.44 SWL (end) Discharge Rate 4CPM Bore Depth (end)
Comments NAPL Present
(If yes, thickness) No.

Sampling

Performed By: C.Bannister / W Rodger
Sampling Method Micropurge Kit Sampling Depth 14mTOW
Time Started 16:44 SWL (start) 9.240
Time Stopped SWL (end) 9.240.
Tubing Type twin
Comments Clear sample, good recharge.

Duplicate Sample Collected? ~~Y~~/[✓ N] Duplicate Sample ID: —

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Comments (colour, turbidity, odours, sheen, etc)
16:29	0.5	2104 mS	7.27	19.4	119	7.57 ppm		9.240 clear 4CPM
16:31	1.0	2109	7.22	17.8	110	7.24		9.240 clear ''
16:35	3.0	2116	7.21	17.1	101	6.98		9.240 clear ''
16:37	4.0	2117	7.14	17.1	100	6.87		9.240 clear ''
16:39	5.0	2113	7.14	16.9	97	6.89		'' '' ''
16:41	6.0	2117	7.09	16.9	94	6.82		'' '' ''
16:44	7.0	2118	7.12	17.0	90	6.89		'' '' ''
Stabilisation Criteria		+/- 3%	+/- 0.05	+/- 10%	+/- 10%	+/- 10%		

Sampled @ 7 Litres.

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
________ m (-)________ (=) ________

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
________(X) ________ (=) ________ L

Refer to Work Instructions WI113, WI114 and WI115

0418543904

WELL DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

WELL No: BH10

SKM

Project No: VW07335 **Project Name:** Beveridge PSP - GW Sampling **Date:** 11 /04/2014

Development

Performed By: Well Diameter : 50mm
Development Method
Time Started SWL (start) Volume Removed Bore Depth (start)
Time Stopped SWL (end) Discharge Rate Bore Depth (end)
Comments NAPL Present
(If yes, thickness)

Purging

Performed By: C.Bannister / W Rodger Top of well
Purge Method Micropurge Kit
Time Started 15:15 SWL (start) 9.800 TOW Volume Removed 5L Bore Depth (start) 20.130 TOW
Time Stopped 15:31 SWL (end) ~~[illegible]~~ Discharge Rate 4→3 CPM Bore Depth (end)
Comments Reduced cycles from CPM 4 to 3 after 1 Litre. GW level stabilised NAPL Present
(If yes, thickness) No

Sampling

Performed By: C.Bannister / W Rodger
Sampling Method Micropurge Kit Sampling Depth
Time Started 15:31 SWL (start) 9.700
Time Stopped 15:40 SWL (end) 9.760
Tubing Type twin
Comments clear sample

Duplicate Sample Collected? Y [✓ N] Duplicate Sample ID: —

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Comments (colour, turbidity, odours, sheen, etc)
15:15	0.5	2.77mS	7.30	21.5	75	5.03ppm		9.700 4CPM Clear
15:18	1.0	2.73	7.22	19.1	69	4.39ppm		9.670 " "
15:20	2.0	2.70	7.19	18.3	67	4.20		9.750 3 CPM "
15:23	3.0	2.68	7.15	18.3	67	3.94		9.730 " "
15:27	4.0	2.66	7.14	18.4	66	3.93		9.750 " "
15:31	5.0	2.66	7.15	18.3	66	4.07		9.760 " "
	Sapled @	5.0 litres.		Clear.				
Stabilisation Criteria		+/- 3%	+/- 0.05	+/- 10%	+/- 10%	+/- 10%		

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
______ m (-) ______ (=) ______

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
______ (X) ______ (=) ______ L

Refer to Work Instructions WI113, WI114 and WI115

WELL DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

WELL No: BH11

SKM

Project No: VW07335 **Project Name:** Beveridge PSP - GW Sampling **Date:** 11 /04/2014

Development

Performed By: ______ Well Diameter : 50mm
Development Method ______
Time Started ______ SWL (start) ______ Volume Removed ______ Bore Depth (start) ______
Time Stopped ______ SWL (end) ______ Discharge Rate ______ Bore Depth (end) ______
Comments ______ NAPL Present
(If yes, thickness) ______

Purging

Performed By: C.Bannister / W Rodger
Purge Method Micropurge Kit
Time Started 13:45 SWL (start) 4.055 bTOW top of well Volume Removed ______ Bore Depth (start) 18.850 bTOW
Time Stopped ______ SWL (end) ______ Discharge Rate ______ Bore Depth (end) ______
Comments ______ NAPL Present
(If yes, thickness) ______

Sampling

Performed By: C.Bannister / W Rodger
Sampling Method Micropurge Kit Sampling Depth 17mbTOW
Time Started ______ SWL (start) 3.760 bTOW
Time Stopped ______ SWL (end) ______
Tubing Type Twin
Comments V. slightly milky, clearing quickly. Started CPM4, changed to CPM1.
Duplicate Sample Collected? Y [✓ N] Duplicate Sample ID: —

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Comments (colour, turbidity, odours, sheen, etc)
13:58	0.5	6.29mS	7.21	19.5	161	1.92ppm		3.760 CPM4 slightly milky.
14:00	1.0	6.35	7.07	18.3	6	1.17		4.04 CPM3 clearing
14:04	1.5	6.35	7.04	18.8	-15	0.94		4.16 CPM1 clearing
14:09	2.0	6.35	7.05	19.9	-30	0.70		4.39 " "
14:16	2.5	6.35	7.08	20.8	-36	0.64		4.48 " "
No recharge - Left to bail with disposable bailer to purge dry.								
						12/3/14		
Bailed:								
9:45	40L	5.87	7.19	15.9	104	4.10ppm		
9:47	45L	6.35	7.15	15.7	61	6.61ppm		
9:49	47L	6.13	7.13	15.6	46	8.04		
9:51	50L	6.26	7.16	15.6	33	8.76		
9:53	52L	6.35	7.19	15.6	26	4.46		
9:55	54L	6.09	7.18	15.6	22	3.72		
	Sampled using bailer.							
Stabilisation Criteria		+/- 3%	+/- 0.05	+/- 10%	+/- 10%	+/- 10%		

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
______ m (-)______ (=) ______

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
______(X) ______ (=) ______ L

Refer to Work Instructions WI113, WI114 and WI115

WELL DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

WELL No: BH12

SKM

Project No: VW07335 **Project Name:** Beveridge PSP - GW Sampling **Date:** 12 /04/2014

Development

Performed By: ______ Well Diameter : 50mm

Development Method ______

Time Started ______ SWL (start) ______ Volume Removed ______ Bore Depth (start) ______

Time Stopped ______ SWL (end) ______ Discharge Rate ______ Bore Depth (end) ______

Comments ______ NAPL Present

(If yes, thickness) ______

Purging

Performed By: C.Bannister / W Rodger

Purge Method Micropurge Kit Bailer

Time Started 15:47 SWL (start) 16.10 mTOC Volume Removed ______ Bore Depth (start) 17.30 mbTOC

Time Stopped ______ SWL (end) ______ Discharge Rate ______ Bore Depth (end) ______

Comments Bailer to sample (only 1m of water in the well. NAPL Present

(If yes, thickness) ______

Sampling

Performed By: C.Bannister / W Rodger

Sampling Method ~~Micropurge~~ Kit Bailer Sampling Depth ______

Time Started ______ SWL (start) ______

Time Stopped ______ SWL (end) ______

~~Tubing Type~~ ______

Comments Sediment in well.

Duplicate Sample Collected? Y / N Duplicate Sample ID: ______

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Comments (colour, turbidity, odours, sheen, etc)
15:47	1L	3.89mS	8.15	17.3	160	2.52		Sediment, brown.
15:49	3L	3.88	8.01	16.6	141	8.60		"
	Purged Dry.							
Stabilisation Criteria		+/- 3%	+/- 0.05	+/- 10%	+/- 10%	+/- 10%		

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*

______ m (-) ______ (=) ______

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME

______ (X) ______ (=) ______ L

Refer to Work Instructions WI113, WI114 and WI115

WELL DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

WELL No: BH14

SKM

Project No: VW07335 **Project Name:** Beveridge PSP - GW Sampling **Date:** 12 /04/2014

Development

Performed By: ______ Well Diameter : 50mm
Development Method ______
Time Started ______ SWL (start) ______ Volume Removed ______ Bore Depth (start) ______
Time Stopped ______ SWL (end) ______ Discharge Rate ______ Bore Depth (end) ______
Comments ______ NAPL Present
(If yes, thickness) ______

Purging

Performed By: C.Bannister / W Rodger
Purge Method Micropurge Kit
Time Started ______ SWL (start) ______ Volume Removed ______ Bore Depth (start) ______
Time Stopped ______ SWL (end) ______ Discharge Rate ______ Bore Depth (end) ______
Comments ______ NAPL Present
(If yes, thickness) ______

Sampling

Performed By: C.Bannister / W Rodger
Sampling Method ~~Micropurge Kit~~ Sampled from windmill. Sampling Depth ______
Time Started ______ SWL (start) ______
Time Stopped ______ SWL (end) ______
Tubing Type ______
Comments ______

Duplicate Sample Collected? Y / N Duplicate Sample ID: ______

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Comments (colour, turbidity, odours, sheen, etc)
11:30	/	2074µS	6.87	17.3	105	2.11		Clear. minor floc during sampling.
Sampled from windmill, at top of bore.								
Stabilisation Criteria		+/- 3%	+/- 0.05	+/- 10%	+/- 10%	+/- 10%		

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
______ m (-) ______ (=) ______

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
______ (X) ______ (=) ______ L

Refer to Work Instructions WI113, WI114 and WI115

WELL DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

WELL No: BH15

SKM

Project No: VW07335

Project Name: Beveridge PSP - GW Sampling

Date: 13 /04/2014

Development

Performed By:

Well Diameter : 50mm

Development Method

Time Started

Time Stopped

SWL (start)

SWL (end)

Volume Removed

Discharge Rate

Comments

Bore Depth (start)

Bore Depth (end)

NAPL Present

(If yes, thickness)

Purging

Performed By: C.Bannister / W Rodger

Purge Method Micropurge Kit foot value.

Time Started 9:10

Time Stopped 9:24

SWL (start) 9.05 mTOW

SWL (end)

Volume Removed

Discharge Rate

Comments

Bore Depth (start) N/A (couldn't get

Bore Depth (end) dipper past pump

NAPL Present in bore).

(If yes, thickness)

Sampling

Performed By: C.Bannister / W Rodger

Sampling Method ~~Micropurge Kit~~ Foot value

Time Started 9:45

Time Stopped 9:50

Tubing Type 16Ø single line (foot value)

Comments High sediment load. brown sample. Bore purged dry before sampling

Sampling Depth

SWL (start)

SWL (end)

Duplicate Sample Collected? Y / [✓ N]

Duplicate Sample ID:

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Comments (colour, turbidity, odours, sheen, etc)
9:10	2	2.86	7.39	16.0	200	4.02		footvalue. Brown, high sediment
9:16	12	2.88	7.41	15.9	194	4.66		
9:18	20	2.86	7.59	15.6	188	5.17		
9:20	25	2.87	7.37	15.7	182	5.50		10:33 mTOW
9:24	30	2.88	7.45	15.8	175	5.81		
Stabilisation Criteria		+/- 3%	+/- 0.05	+/- 10%	+/- 10%	+/- 10%		

Purged dry. Left for 20 mins to recharge.

Sampled

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*

_______________ m (-) _______________ (=) _______________

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME

_______________ (X) _______________ (=) _______________ L

Refer to Work Instructions WI113, WI114 and WI115

WELL DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

WELL No: BH16

SKM

Project No: VW07335 **Project Name:** Beveridge PSP - GW Sampling **Date:** 12 /04/2014

Top of Well.

Development

Performed By:
Well Diameter : 50mm
Development Method
Time Started
SWL (start)
Volume Removed
Bore Depth (start)
Time Stopped
SWL (end)
Discharge Rate
Bore Depth (end)
NAPL Present
(If yes, thickness)
Comments

Purging

Performed By: C.Bannister / W Rodger
Purge Method Micropurge Kit 1P. BTOW
Time Started 13:B4
SWL (start) 6.030
Volume Removed 8L
Bore Depth (start) 41.600 BTOW
Time Stopped
SWL (end)
Discharge Rate CPM4
Bore Depth (end)
NAPL Present
(If yes, thickness) No
Comments

Sampling

Performed By: C.Bannister / W Rodger
Sampling Method Micropurge Kit ✓
Sampling Depth 25m bTOW
Time Started 13:30
SWL (start) 6.030
Time Stopped 13:35
SWL (end) 6.030
Tubing Type Twin
Comments Slight sediment in well.

Duplicate Sample Collected? Y / N Duplicate Sample ID:

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Comments (colour, turbidity, odours, sheen, etc)	
13:B4	0.5	3.38mS	6.46	18.1	14	1.87		6.030 ~~Clear~~ CPM4	Slight sediment
13:16	1.0	3.41	6.46	16.7	9	1.16		6.030 ~~Clea~~ "	"
13:18	2.0	3.41	6.38	16.6	6	0.85		6.030 — "	"
13:20	3.0	3.40	6.37	16.7	6	0.91		6.030 — "	"
13:22	4.0	3.40	6.35	16.5	6	0.97		6.030 — "	"
13:24	5.0	3.39	6.35	16.4	7	1.05		6.030 — "	"
13:26	6.0	3.38	6.40	16.5	8	1.14		— "	"
13:28	7.0	3.38	6.41	16.5	9	1.27		— "	"
13:30	8.0	3.41	6.41	16.5	9	1.34		— "	"
	Sampled @	8.0 Litres							
Stabilisation Criteria		+/- 3%	+/- 0.05	+/- 10%	+/- 10%	+/- 10%			

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
______ m (-) ______ (=) ______

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
______ (X) ______ (=) ______ L

.Refer to Work Instructions WI113, WI114 and WI115

WELL DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

WELL No: BA17

SKM

Project No: VW07335 **Project Name:** Beveridge PSP - GW Sampling **Date:** 13 /04/2014

Development

Performed By:
Well Diameter : 50mm
Development Method
Time Started SWL (start) Volume Removed Bore Depth (start)
Time Stopped SWL (end) Discharge Rate Bore Depth (end)
Comments
NAPL Present
(If yes, thickness)

Purging

Performed By: C.Bannister / W Rodger
Purge Method ~~Micropurge Kit~~ foot valve
Time Started 12:41 SWL (start) 6.70 m TOC Volume Removed Bore Depth (start) /
Time Stopped 12:55 SWL (end) Discharge Rate / Bore Depth (end) /
Comments Windmill. Not pumping.
NAPL Present
(If yes, thickness) N/A

Sampling

Performed By: C.Bannister / W Rodger
Sampling Method ~~Micropurge Kit~~ foot valve
Sampling Depth
Time Started 12:55 SWL (start)
Time Stopped 13:00 SWL (end)
Tubing Type
Comments

Duplicate Sample Collected? Y [✓ N] Duplicate Sample ID: /

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Comments (colour, turbidity, odours, sheen, etc)
12:41	1L	1252µs	7.67	19.4	116	5.45	6.70m	clear/very slight sediment.
12:43	5L	1273	7.50	17.8	113	4.84		" "
12:46	10L	1301	7.48	17.6	105	4.74		6.89m "
12:49	15L	1275	7.44	17.5	105	5.02		clear with some sediment
12:52	20L	1263	7.44	17.3	103	4.45		
12:54	25L	1284	7.41	17.2	99	4.80		clear, some sediment.
Stabilisation Criteria		+/- 3%	+/- 0.05	+/- 10%	+/- 10%	+/- 10%		

Sampled at 25L. foot valve. Mill not pumping.

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
________ m (-) ________ (=) ________

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
________ (X) ________ (=) ________ L

Refer to Work Instructions WI113, WI114 and WI115

WELL DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

WELL No: RH18

SKM

Project No: VW07335 **Project Name:** Beveridge PSP - GW Sampling **Date:** 13 /04/2014

Development

Performed By: ______ Well Diameter : 50mm
Development Method ______
Time Started ______ SWL (start) ______ Volume Removed ______ Bore Depth (start) ______
Time Stopped ______ SWL (end) ______ Discharge Rate ______ Bore Depth (end) ______
Comments ______ NAPL Present ______
(If yes, thickness) ______

Purging

Performed By: C.Bannister / W Rodger
Purge Method ~~Micropurge Kit~~ Foot value
Time Started 10:15 SWL (start) 10.750. Volume Removed ______ Bore Depth (start) ______
Time Stopped 10:28. SWL (end) ______ Discharge Rate ______ Bore Depth (end) ______
Comments Brown colour (pale) with some Sediment. NAPL Present ______
(If yes, thickness) ______

Sampling

Performed By: C.Bannister / W Rodger
Sampling Method ~~Micropurge Kit~~ Foot value Sampling Depth /
Time Started 10:28 SWL (start) /
Time Stopped 10:35 SWL (end) /
Tubing Type Single line 160 (footvalue)
Comments ______

Duplicate Sample Collected? Y [✓ N] Duplicate Sample ID: —

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Comments (colour, turbidity, odours, sheen, etc)
10:28	5L	1289 uS	7.63	17.4	139	2.24		Some sediment. Slight brown colour.
Well operational - no purging required. Sampled immediately								
Stabilisation Criteria		+/- 3%	+/- 0.05	+/- 10%	+/- 10%	+/- 10%		

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
______ m (-) ______ (=) ______

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
______ (X) ______ (=) ______ L

Refer to Work Instructions WI113, WI114 and WI115

(winter storage borehole)

WELL DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

WELL No: WSBH

SKM

Project No: VW07335 **Project Name:** Beveridge PSP - GW Sampling **Date:** 13 /04/2014

Development

Performed By: Well Diameter : 50mm
Development Method
Time Started SWL (start) Volume Removed Bore Depth (start)
Time Stopped SWL (end) Discharge Rate Bore Depth (end)
Comments NAPL Present
(If yes, thickness)

Purging

Performed By: C.Bannister / W Rodger
Purge Method ~~Micropurge Kit~~ Run for 20 seconds before sample
Time Started ✓ SWL (start) ✓ Volume Removed ✓ Bore Depth (start) ✓
Time Stopped ✓ SWL (end) ✓ Discharge Rate ✓ Bore Depth (end) ✓
Comments NAPL Present
(If yes, thickness) NO -

Sampling

Performed By: C.Bannister / W Rodger
Sampling Method ~~Micropurge~~ Kit Tap. Sampling Depth ✓
Time Started 11:10 SWL (start) ✓
Time Stopped 11:15 SWL (end) ✓
Tubing Type Tap
Comments Bore at rear of main building. Tap inside building used to collect sample.
Duplicate Sample Collected? Y [✓ N] Duplicate Sample ID: —

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Comments (colour, turbidity, odours, sheen, etc)
11:10	✓	2586µS	6.35	17.1	143	2.21ppm		Clear.
Stabilisation Criteria		+/- 3%	+/- 0.05	+/- 10%	+/- 10%	+/- 10%		

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
_______________ m (-)_____________ (=) ___________

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
_______________(X) ____________________ (=) ______________ L

Refer to Work Instructions WI113, WI114 and WI115

WELL DEVELOPMENT, PURGING AND GROUNDWATER SAMPLING DATA SHEET

WELL No: EFF

SKM

Project No: VW07335
Project Name: Beveridge PSP - GW Sampling
Date: 13 /04/2014

Development

Performed By:
Well Diameter : 50mm
Development Method
Time Started
SWL (start)
Volume Removed
Bore Depth (start)
Time Stopped
SWL (end)
Discharge Rate
Bore Depth (end)
Comments
NAPL Present
(If yes, thickness)

Purging

Performed By: C.Bannister / W Rodger
Purge Method ~~Micropurge Kit~~ TAP
Time Started /
SWL (start) /
Volume Removed /
Bore Depth (start) /
Time Stopped /
SWL (end) /
Discharge Rate /
Bore Depth (end) /
Comments
NAPL Present
(If yes, thickness) No

Sampling

Performed By: C.Bannister / W Rodger
Sampling Method ~~Micropurge~~ Kit TAP
Sampling Depth /
Time Started 11:20
SWL (start) /
Time Stopped 11:25
SWL (end) /
Tubing Type TAP.
Comments Effluent sampling point. → no cyanide bottle
Duplicate Sample Collected? [✓ Y] N
Duplicate Sample ID: Blind: 1303/QA1 Split: 1303/QA2

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/L)	Comments (colour, turbidity, odours, sheen, etc)
11:22	/	972 μS	7.62	18.7	87	2.56 ppm		Cloudy.
Sampled from a tap outside the main building								
next to the YVW winter storage area.								
Stabilisation Criteria		+/- 3%	+/- 0.05	+/- 10%	+/- 10%	+/- 10%		

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
__________ m (-)__________ (=) __________

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
__________(X) __________ (=) __________ L

Refer to Work Instructions WI113, WI114 and WI115

Appendix C. Lithology of registered bores

Visualising Victoria's Groundwater

Bore Details: 79155

Printable Version

Lithology details for bore: 79155

Log Type	From (m)	To (m)	Description
Driller	0.00	14.63	WEATHERED BASALT

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Visualising Victoria's Groundwater

Bore Details: 145710

Printable Version

Lithology details for bore: 145710

Log Type	From (m)	To (m)	Description
Driller	0.00	1.00	TOPSOIL & SUBSOIL
Driller	1.00	2.00	CLAY & LOOSE ROCKS
Driller	2.00	2.10	BROWN CLAY
Driller	2.10	2.70	GREY CLAY
Driller	2.70	2.90	LIGHT BROWN CLAY
Driller	2.90	4.30	HARD BLUESTONE
Driller	4.30	12.00	WEATHERED BASALT
Driller	12.00	13.70	VERY HARD BLUESTONE

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Bore Details: 145714

Printable Version

Lithology details for bore: 145714

Log Type	From (m)	To (m)	Description
Driller	0.00	1.00	TOP SOIL & RUBBLE
Driller	1.00	1.80	RED BROWN CLAY
Driller	1.80	16.70	VERY HARD BLUESTONE
Driller	16.70	17.30	FRACTURED BLUESTONE
Driller	17.30	20.60	HARD BLUESTONE

Bore Details: 145715

Printable Version

Lithology details for bore: 145715

Log Type	From (m)	To (m)	Description
Driller	0.00	1.00	GREY TOPSOIL & CLAY
Driller	1.00	3.10	GREY CLAY
Driller	3.10	4.30	RED BROWN CLAY
Driller	4.30	7.40	LIGHT GREY CLAY
Driller	7.40	17.20	WEATHERED BASALT
Driller	17.20	18.20	YELLOW CLAY

VVG
Visualising
Victoria's
Groundwater

Bore Details: 145711

Printable Version

Lithology details for bore: 145711

Log Type	From (m)	To (m)	Description
Driller	0.00	0.50	TOPSOIL & BOULDERS
Driller	0.50	1.20	GREY CLAY
Driller	1.20	1.40	YELLOW CAY
Driller	1.40	9.00	VERY HARD BLUESTONE
Driller	9.00	13.00	WEATHERED BASALT
Driller	13.00	15.80	VERY HARD BLUESTONE

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Appendix D. Chain of custody documentation

SKM

Sinclair Knight Merz Pty Ltd
PO Box 2500
Malvern, VIC 3144
ABN 37 001 024 095

Ph: +61 3 9248 3100
Fx: +61 3 9248 3364

CHAIN OF CUSTODY &

LAB: Eurofins
ADDRESS: 3-5 Kingston Town Close, Oakeligh
PHONE: 9564 7055
FAX: 9564 7190

Page 1 **of** 1

PROJECT # VW07335
PROJECT NAME Beveridge PSP GW Sampling Progam - Mar 14
SAMPLE COLLECTOR'S NAME Corey Bannister
LAB JOB #

PRELIM. RESULTS BY: ☐ VERBAL ☐ FAX ☑ EMAIL
FINAL REPORT BY: Std TAT
SEND TO EMAIL ADDRESS(ES):
Sampler: cbannister @globalskm.com
Proj Mgr: cbannister @globalskm.com
LAB QUOTE REF:
SKM ORDER No: Batch 1

SAMPLE ID	DEPTH (metres)	LAB #	MATRIX				PRESERVATION METHOD				SAMPLING DATE	No. OF CONTAINERS	METHOD CODE & ANALYSIS REQUIRED													COMMENTS (see below)		
			WATER	SOIL	AIR	SLUDGE	ICE	ACID-IFIED	OTHER	NONE			Metals (As, Be, B, Cd, Ca, Co, Cr, Cu, Ni, Pb, Mg, Mn, K, Na, Hg, Zn)	Nutrients (ammonia, nitrate, nitrite, total Kjeldahl nitrogen, total nitrogen)	Inorganics (sulphate, fluoride, total cyanide)	TDS										(1)	(2)	(3)
BH2			X				X				11/3	4	X	X	X	X										☐	☐	☐
BH5			X				X				11/3	4	X	X	X	X										☐	☐	☐
BH10			X				X				11/3	4	X	X	X	X										☐	☐	☐
																										☐	☐	☐
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TOTALS			1	1	0	0							0	1	0	0	0	0	2	0	0	0	0	0	0			

Relinquished by (SIGN/PRINT):	Date	Time	Received by (SIGN/PRINT):	Date	Time		
Corey B of SKM	12/3	8am	of			Custody Seals Intact?	Yes / No
of			Catherine of EF/ mgt	12/3	12:59pm	Sample Receipt Temp.	°C

Additional Comments/Instructions:
All final lab reports to be provided electronically as .pdf and datafile to both emails above. (1) Sample highly contaminated; (2) Sample unfiltered - lab to filter prior to metals analysis; (3) TPH chromatogram required in prelim. and final reports (if TPH detected)

411557

Tony

SKM

Sinclair Knight Merz Pty Ltd
PO Box 2500
Malvern, VIC 3144
ABN 37 001 024 095
Ph: +61 3 9248 3100
Fx: +61 3 9248 3364

CHAIN OF CUSTODY &

LAB: Eurofins
ADDRESS: 3-5 Kingston Town Close, Oakeligh
PHONE: 9564 7055
FAX: 9564 7190

Page 1 **of** 1

PROJECT # VW07335
PROJECT NAME Beveridge PSP GW Sampling Progam - Mar 14
SAMPLE COLLECTOR'S NAME Corey Bannister
LAB JOB #

PRELIM. RESULTS BY: ☐ VERBAL ☐ FAX ☑ EMAIL
FINAL REPORT BY: Std TAT
SEND TO EMAIL ADDRESS(ES):
Sampler: Corey.Bannister @jacobs.com
Proj Mgr: Corey.Bannister @jacobs.com
LAB QUOTE REF:
SKM ORDER No: Batch 1

SAMPLE ID	DEPTH (metres)	LAB #	MATRIX				PRESERVATION METHOD				SAMPLING DATE	No. OF CONTAINERS	METHOD CODE & ANALYSIS REQUIRED													COMMENTS	(see below)		
			WATER	SOIL	AIR	SLUDGE	ICE	ACID-IFIED	OTHER	NONE			Metals (As, Be, B, Cd, Ca, Co, Cr, Cu, Ni, Pb, Mg, Mn, K, Na, Hg, Zn)	Nutrients (ammonia, nitrate, nitrite, total Kjeldahl nitrogen, total nitrogen)	Inorganics (sulphate, fluoride, total cyanide)	TDS											(1)	(2)	(3)
EFF			X				X				13/3/14	4	X	X	X	X											☐	☐	☐
WSBH			X				X				13/3/14	4	X	X	X	X											☐	☐	☐
BH15			X				X				13/3/14	4	X	X	X	X										Eurofins mgt	☐	☐	☐
BH18			X				X				13/3/14	4	X	X	X	X											☐	☐	☐
BH7			X				X				12/3/14	4	X	X	X	X										Report #	☐	☐	☐
BH17			X				X				13/3/14	4	X	X	X	X											☐	☐	☐
BH12			X				X				12/3/14	4	X	X	X	X										411868	☐	☐	☐
BH14			X				X				12/3/14	4	X	X	X	X											☐	☐	☐
BH16			X				X				12/3/14	4	X	X	X	X											☐	☐	☐
BH11			X				X				11/3/14	4	X	X	X	X											☐	☐	☐
			X				X																				☐	☐	☐
1303-QA1			X				X				13-Mar-14	3	X	X	X	X											☐	☐	☐
1303-QA2			X				X				13-Mar-14	4														Please send to ALS	☐	☐	☐
R1-1203			X				X				12-Mar-14	4	X	X	X												☐	☐	☐
1103-R1			X				X				11-Mar-14	4	X	X	X												☐	☐	☐
																											☐	☐	☐
																											☐	☐	☐
																										*Please see sample bottles for	☐	☐	☐
																										sampling dates	☐	☐	☐
																											☐	☐	☐
																										Sample 1303-QA1 - please analyse	☐	☐	☐
																										for cyanide from inorganics bottle	☐	☐	☐
																										(no bottle for cyanide)	☐	☐	☐
																											☐	☐	☐
																											☐	☐	☐
TOTALS			15	1	0	0							13	13	13	13	0	0	2	0	0	0	0	0	0				

Relinquished by (SIGN/PRINT): Corey B of SKM
Date 14-Mar-14 **Time** 10.15am
Received by (SIGN/PRINT): John of Eurofins mgt
Date 14/3/14 **Time** 12:53pm
Custody Seals Intact? [✓ Yes] / No

Relinquished by (SIGN/PRINT): of
Date **Time**
Received by (SIGN/PRINT): of
Date **Time**
Sample Receipt Temp. °C

Additional Comments/Instructions:
All final lab reports to be provided electronically as .pdf and datafile to both emails above. (1) Sample highly contaminated; (2) Sample unfiltered - lab to filter prior to metals analysis; (3) TPH chromatogram required in prelim. and final reports (if TPH detected)

COC - second batch

SKM

Sinclair Knight Merz Pty Ltd
PO Box 2500
Malvern, VIC 3144
ABN 37 001 024 095

Ph: +61 3 9248 3100
Fx: +61 3 9248 3364

CHAIN OF CUSTODY &

LAB: ALS
ADDRESS:
PHONE:
FAX:

Page 1 **of** 1

PROJECT # VW07335

PROJECT NAME Beveridge PSP GW Sampling Progam - Mar 14

SAMPLE COLLECTOR'S NAME Corey Bannister

LAB JOB #

PRELIM. RESULTS BY: ☐ VERBAL ☐ FAX ☑ EMAIL

FINAL REPORT BY: Std TAT

SEND TO EMAIL ADDRESS(ES):
Sampler: Corey.Bannister @jacobs.com
Proj Mgr: Corey.Bannister @jacobs.com

LAB QUOTE REF:

SKM ORDER No: Batch 1

SAMPLE ID	**DEPTH (metres)**	**LAB #**	**MATRIX**				**PRESERVATION METHOD**				**SAMPLING DATE**	**No. OF CONTAINERS**	**METHOD CODE & ANALYSIS REQUIRED**													**COMMENTS**	(see below)		
			WATER	SOIL	AIR	SLUDGE	ICE	ACID-IFIED	OTHER	NONE			Metals (As, Be, B, Cd, Ca, Co, Cr, Cu, Ni, Pb, Mg, Mn, K, Na, Hg, Zn)	Nutrients (ammonia, nitrate, nitrite, total Kjeldahl nitrogen, total nitrogen)	Inorganics (sulphate, fluoride, total cyanide)	TDS											(1)	(2)	(3)
① 1303-QA2			X				X				13-Mar-14	4	X	X	X	X											☐	☐	☐
																										☐	☐	☐
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TOTALS			1	1	0	0							1	1	1	1	0	0	2	0	0	0	0	0	0				

Environmental Division
Melbourne
Work Order
EM1402371
Telephone : +61-3-8549 9600

Relinquished by (SIGN/PRINT): Corey B of SKM
Date 14-Mar-14 Time 10.15am
Received by (SIGN/PRINT): Ru (Ars of
Date 17/3/14 Time 10.55 am
Custody Seals Intact? Yes / No

Relinquished by (SIGN/PRINT): of
Date Time
Received by (SIGN/PRINT): of
Date Time
Sample Receipt Temp. °C

Additional Comments/Instructions:
All final lab reports to be provided electronically as .pdf and datafile to both emails above. (1) Sample highly contaminated; (2) Sample unfiltered - lab to filter prior to metals analysis; (3) TPH chromatogram required in prelim. and final reports (if TPH detected)

COC - second batch

Appendix E. Laboratory certificates of analysis

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Jacobs SKM
PO Box 312 Flinders Lane
Melbourne
VIC 8009

Attention: **Corey Bannister**

Report **411557-W**
Client Reference BEVERIDGE PSP GW SAMPLING PROGRAM - MAR 14 VW07335
Received Date Mar 12, 2014

Client Sample ID			**BH2**	**BH5**	**BH10**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M14-Ma08465**	**M14-Ma08466**	**M14-Ma08467**
Date Sampled			**Mar 11, 2014**	**Mar 11, 2014**	**Mar 11, 2014**
Test/Reference	LOR	Unit			
Ammonia (as N)	0.01	mg/L	< 0.01	< 0.01	< 0.01
Cyanide (total)	0.005	mg/L	< 0.005	< 0.005	< 0.005
Fluoride	0.5	mg/L	< 0.5	< 0.5	< 0.5
Nitrate (as N)	0.02	mg/L	2.4	< 0.02	1.6
Nitrite (as N)	0.02	mg/L	< 0.02	< 0.02	< 0.02
Sulphate (as S)	5	mg/L	7.4	12	< 5
Total Dissolved Solids	10	mg/L	1600	1500	1600
Total Nitrogen Set (as N)					
Nitrate & Nitrite (as N)	0.05	mg/L	2.4	< 0.05	1.6
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	< 0.2	< 0.2	< 0.2
Total Nitrogen (as N)	0.2	mg/L	2.4	< 0.2	1.6
Heavy Metals					
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Beryllium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Boron (filtered)	0.05	mg/L	0.05	< 0.05	< 0.05
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	0.003
Cobalt (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	0.013	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Manganese (filtered)	0.005	mg/L	< 0.005	0.036	< 0.005
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Zinc (filtered)	0.001	mg/L	0.011	0.016	0.007
Alkali Metals					
Calcium	0.5	mg/L	36	40	57
Magnesium	0.5	mg/L	160	130	170
Potassium	0.5	mg/L	5.0	10	5.3
Sodium	0.5	mg/L	290	360	270

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Ammonia (as N)	Melbourne	Mar 13, 2014	28 Day
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Cyanide (total)	Melbourne	Mar 12, 2014	14 Day
- Method: USEPA 9010 Cyanide			
Fluoride	Melbourne	Mar 12, 2014	28 Day
- Method: LM-LTM-INO-4300 (Fluoride by Ion Chromatography)			
Nitrate (as N)	Melbourne	Mar 13, 2014	2 Day
- Method: APHA 4500-NO3 Nitrate Nitrogen by FIA			
Nitrite (as N)	Melbourne	Mar 13, 2014	2 Day
- Method: APHA 4500-NO2 Nitrite Nitrogen by FIA			
Sulphate (as S)	Melbourne	Mar 12, 2014	28 Day
- Method: In house MGT1110A (SO4 by Discrete Analyser)			
Total Dissolved Solids	Melbourne	Mar 17, 2014	7 Day
- Method: APHA 2540C Total Dissolved Solids			
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Melbourne	Mar 13, 2014	28 Day
- Method: APHA 4500-NO3/NO2 Nitrate-Nitrite Nitrogen by FIA			
Total Kjeldahl Nitrogen (as N)	Melbourne	Mar 13, 2014	7 Day
- Method: APHA 4500 TKN			
Heavy Metals (filtered)	Melbourne	Mar 12, 2014	180 Day
- Method: USEPA 6020 Heavy Metals			
Mobil Metals : Metals M15	Melbourne	Mar 12, 2014	28 Day
- Method: USEPA 6010/6020 Heavy Metals & USEPA 7470/71 Mercury			
Alkali Metals	Melbourne	Mar 12, 2014	180 Day
- Method: USEPA 6010 Alkali Metals			

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

[redacted]

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Cyanide (total)	mg/L	< 0.005			0.005	Pass	
Fluoride	mg/L	< 0.5			0.5	Pass	
Nitrate (as N)	mg/L	< 0.02			0.02	Pass	
Nitrite (as N)	mg/L	< 0.02			0.02	Pass	
Sulphate (as S)	mg/L	< 5			5	Pass	
Total Dissolved Solids	mg/L	< 10			10	Pass	
Method Blank							
Total Nitrogen Set (as N)							
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Beryllium (filtered)	mg/L	< 0.001			0.001	Pass	
Boron (filtered)	mg/L	< 0.05			0.05	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Cobalt (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Manganese (filtered)	mg/L	< 0.005			0.005	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.001			0.001	Pass	
Method Blank							
Alkali Metals							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
LCS - % Recovery							
Ammonia (as N)	%	99			70-130	Pass	
Cyanide (total)	%	109			70-130	Pass	
Fluoride	%	99			70-130	Pass	
Nitrate (as N)	%	102			70-130	Pass	
Nitrite (as N)	%	92			70-130	Pass	
Sulphate (as S)	%	109			70-130	Pass	
LCS - % Recovery							
Total Nitrogen Set (as N)							
Nitrate & Nitrite (as N)	%	102			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	92			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	87			80-120	Pass	
Boron (filtered)	%	91			80-120	Pass	
Cadmium (filtered)	%	88			80-120	Pass	
Chromium (filtered)	%	88			80-120	Pass	
Cobalt (filtered)	%	86			80-120	Pass	
Copper (filtered)	%	87			80-120	Pass	
Lead (filtered)	%	87			80-120	Pass	
Manganese (filtered)	%	88			80-120	Pass	

[redacted]

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mercury (filtered)			%	80			70-130	Pass	
Nickel (filtered)			%	86			80-120	Pass	
Zinc (filtered)			%	89			80-120	Pass	
LCS - % Recovery									
Alkali Metals									
Calcium			%	89			70-130	Pass	
Magnesium			%	88			70-130	Pass	
Potassium			%	80			70-130	Pass	
Sodium			%	83			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
				Result 1					
Ammonia (as N)	M14-Ma08323	NCP	%	99			70-130	Pass	
Cyanide (total)	M14-Ma05350	NCP	%	104			70-130	Pass	
Fluoride	M14-Ma08094	NCP	%	101			70-130	Pass	
Nitrate (as N)	M14-Ma08323	NCP	%	104			70-130	Pass	
Nitrite (as N)	M14-Ma08323	NCP	%	86			70-130	Pass	
Sulphate (as S)	M14-Ma08436	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Total Nitrogen Set (as N)				Result 1					
Nitrate & Nitrite (as N)	M14-Ma08323	NCP	%	104			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	M14-Ma10615	NCP	%	87			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	M14-Ma08600	NCP	%	85			70-130	Pass	
Beryllium (filtered)	M14-Ma08600	NCP	%	81			75-125	Pass	
Boron (filtered)	M14-Ma08600	NCP	%	78			75-125	Pass	
Cadmium (filtered)	M14-Ma08600	NCP	%	76			70-130	Pass	
Chromium (filtered)	M14-Ma08600	NCP	%	83			70-130	Pass	
Cobalt (filtered)	M14-Ma08600	NCP	%	80			75-125	Pass	
Copper (filtered)	M14-Ma08600	NCP	%	77			70-130	Pass	
Lead (filtered)	M14-Ma08600	NCP	%	80			70-130	Pass	
Manganese (filtered)	M14-Ma08600	NCP	%	81			70-130	Pass	
Mercury (filtered)	M14-Ma09544	NCP	%	92			70-130	Pass	
Nickel (filtered)	M14-Ma08600	NCP	%	77			70-130	Pass	
Zinc (filtered)	M14-Ma08600	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Alkali Metals				Result 1					
Calcium	M14-Ma08462	NCP	%	92			70-130	Pass	
Magnesium	M14-Ma08462	NCP	%	100			70-130	Pass	
Potassium	M14-Ma08462	NCP	%	82			70-130	Pass	
Sodium	M14-Ma08462	NCP	%	98			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	M14-Ma08323	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Cyanide (total)	M14-Ma07187	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Fluoride	M14-Ma08094	NCP	mg/L	0.63	0.61	3.0	30%	Pass	
Nitrate (as N)	M14-Ma08323	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Nitrite (as N)	M14-Ma08323	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Sulphate (as S)	M14-Ma08754	NCP	mg/L	180	180	<1	30%	Pass	

[redacted]

Duplicate									
Total Nitrogen Set (as N)				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	M14-Ma08323	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Total Kjeldahl Nitrogen (as N)	M14-Ma10615	NCP	mg/L	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	M14-Ma08600	NCP	mg/L	0.0017	0.0016	1.6	30%	Pass	
Beryllium (filtered)	M14-Ma08600	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Boron (filtered)	M14-Ma08600	NCP	mg/L	0.35	0.34	2.5	30%	Pass	
Cadmium (filtered)	M14-Ma08600	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	M14-Ma08600	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cobalt (filtered)	M14-Ma08600	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	M14-Ma08600	NCP	mg/L	0.013	0.013	3.5	30%	Pass	
Lead (filtered)	M14-Ma08600	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Manganese (filtered)	M14-Ma08600	NCP	mg/L	0.031	0.030	4.7	30%	Pass	
Mercury (filtered)	M14-Ma09544	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	M14-Ma08600	NCP	mg/L	0.0065	0.0064	2.6	30%	Pass	
Zinc (filtered)	M14-Ma08600	NCP	mg/L	0.095	0.095	<1	30%	Pass	
Duplicate									
Alkali Metals				Result 1	Result 2	RPD			
Calcium	M14-Ma09226	NCP	mg/L	5.4	5.7	5.0	30%	Pass	
Magnesium	M14-Ma09226	NCP	mg/L	46	47	2.0	30%	Pass	
Potassium	M14-Ma08462	NCP	mg/L	25	28	14	30%	Pass	
Sodium	M14-Ma09226	NCP	mg/L	190	190	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Dissolved Solids	M14-Ma08467	CP	mg/L	1600	1600	3.0	30%	Pass	

[redacted]

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Adrian Tabacchiera	Client Services
Emily Rosenberg	Senior Analyst-Metal (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)

Glenn Jackson
Laboratory Manager

[redacted]

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Jacobs SKM
PO Box 312 Flinders Lane
Melbourne
VIC 8009

Attention: **Corey Bannister**

Report **411868-W**
Client Reference BEVERIDGE PSP GW SAMPLING PROGRAM MAR 14 VW07335
Received Date Mar 14, 2014

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**EFF** **Water** **M14-Ma10861** **Mar 13, 2014**	**WSBH** **Water** **M14-Ma10862** **Mar 13, 2014**	**BH15** **Water** **M14-Ma10863** **Mar 13, 2014**	**BH18** **Water** **M14-Ma10864** **Mar 13, 2014**
Ammonia (as N)	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Cyanide (total)	0.005	mg/L	0.023	< 0.005	< 0.005	< 0.005
Fluoride	0.5	mg/L	0.7	< 0.5	< 0.5	< 0.5
Nitrate (as N)	0.02	mg/L	5.8	0.08	5.0	0.22
Nitrite (as N)	0.02	mg/L	3.6	< 0.02	< 0.02	< 0.02
Sulphate (as S)	5	mg/L	14	12	14	< 5
Total Dissolved Solids	10	mg/L	620	1800	1700	770
Total Nitrogen Set (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	9.4	0.08	5.0	0.22
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	3.1	< 0.2	2.7	< 0.2
Total Nitrogen (as N)	0.2	mg/L	13	< 0.2	7.7	0.22
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	0.003	< 0.001	< 0.001	< 0.001
Beryllium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Boron (filtered)	0.05	mg/L	0.07	< 0.05	< 0.05	0.09
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt (filtered)	0.001	mg/L	0.001	0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.002	0.012	0.30	0.007
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Manganese (filtered)	0.005	mg/L	0.029	0.60	0.012	0.060
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.005	0.003	< 0.001	< 0.001
Zinc (filtered)	0.001	mg/L	< 0.001	0.098	0.15	0.36
Alkali Metals						
Calcium	0.5	mg/L	18	79	40	19
Magnesium	0.5	mg/L	18	170	140	40
Potassium	0.5	mg/L	47	21	42	25
Sodium	0.5	mg/L	180	340	400	250

Client Sample ID			**BH7**	**BH17**	**BH12**	**BH14**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M14-Ma10865**	**M14-Ma10866**	**M14-Ma10867**	**M14-Ma10868**
Date Sampled			**Mar 12, 2014**	**Mar 13, 2014**	**Mar 12, 2014**	**Mar 12, 2014**
Test/Reference	LOR	Unit				
Ammonia (as N)	0.01	mg/L	< 0.01	< 0.01	0.27	< 0.01
Cyanide (total)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Fluoride	0.5	mg/L	< 0.5	< 0.5	< 0.5	< 0.5
Nitrate (as N)	0.02	mg/L	2.8	3.2	7.3	1.9
Nitrite (as N)	0.02	mg/L	< 0.02	< 0.02	0.22	< 0.02
Sulphate (as S)	5	mg/L	12	< 5	16	11
Total Dissolved Solids	10	mg/L	1200	700	2200	1300
Total Nitrogen Set (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	2.8	3.2	7.6	1.9
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	< 0.2	< 0.2	1.6	< 0.2
Total Nitrogen (as N)	0.2	mg/L	2.8	3.2	9.2	1.9
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	0.003	< 0.001
Beryllium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Boron (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	0.003	< 0.001	< 0.001
Cobalt (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.001	0.002	0.003	0.047
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.001
Manganese (filtered)	0.005	mg/L	0.013	< 0.005	0.038	< 0.005
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.001	< 0.001	0.002	0.001
Zinc (filtered)	0.001	mg/L	0.007	0.014	0.011	0.030
Alkali Metals						
Calcium	0.5	mg/L	32	28	16	19
Magnesium	0.5	mg/L	130	82	230	110
Potassium	0.5	mg/L	22	18	16	3.6
Sodium	0.5	mg/L	280	180	580	330

Client Sample ID			**BH16**	**BH11**	**1303-QA1**	**R1-1203**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M14-Ma10869**	**M14-Ma10870**	**M14-Ma10871**	**M14-Ma10872**
Date Sampled			**Mar 12, 2014**	**Mar 11, 2014**	**Mar 13, 2014**	**Mar 12, 2014**
Test/Reference	LOR	Unit				
Ammonia (as N)	0.01	mg/L	< 0.01	0.03	< 0.01	< 0.01
Cyanide (total)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Fluoride	0.5	mg/L	< 0.5	< 0.5	0.6	< 0.5
Nitrate (as N)	0.02	mg/L	< 0.02	< 0.02	5.5	< 0.02
Nitrite (as N)	0.02	mg/L	< 0.02	< 0.02	3.8	< 0.02
Sulphate (as S)	5	mg/L	10	43	14	< 5
Total Dissolved Solids	10	mg/L	2000	3500	700	-
Total Nitrogen Set (as N)						
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	9.3	< 0.05
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	< 0.2	< 0.2	< 0.2	< 0.2
Total Nitrogen (as N)	0.2	mg/L	< 0.2	< 0.2	9.3	< 0.2

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**BH16** **Water** **M14-Ma10869** **Mar 12, 2014**	**BH11** **Water** **M14-Ma10870** **Mar 11, 2014**	**1303-QA1** **Water** **M14-Ma10871** **Mar 13, 2014**	**R1-1203** **Water** **M14-Ma10872** **Mar 12, 2014**
Heavy Metals						
Arsenic	0.001	mg/L	-	-	-	< 0.001
Arsenic (filtered)	0.001	mg/L	< 0.001	0.005	0.003	-
Beryllium	0.001	mg/L	-	-	-	< 0.001
Beryllium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Boron	0.05	mg/L	-	-	-	< 0.05
Boron (filtered)	0.05	mg/L	< 0.05	< 0.05	0.07	-
Cadmium	0.0002	mg/L	-	-	-	< 0.0002
Cadmium (filtered)	0.0002	mg/L	0.0002	< 0.0002	< 0.0002	-
Chromium	0.001	mg/L	-	-	-	< 0.001
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Cobalt	0.001	mg/L	-	-	-	< 0.001
Cobalt (filtered)	0.001	mg/L	0.003	0.011	0.001	-
Copper	0.001	mg/L	-	-	-	< 0.001
Copper (filtered)	0.001	mg/L	0.024	< 0.001	0.002	-
Lead	0.001	mg/L	-	-	-	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Manganese	0.005	mg/L	-	-	-	< 0.005
Manganese (filtered)	0.005	mg/L	0.75	0.24	0.038	-
Mercury	0.0001	mg/L	-	-	-	< 0.0001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	-
Nickel	0.001	mg/L	-	-	-	< 0.001
Nickel (filtered)	0.001	mg/L	0.001	0.026	0.005	-
Zinc	0.001	mg/L	-	-	-	< 0.001
Zinc (filtered)	0.001	mg/L	0.32	0.005	0.003	-
Alkali Metals						
Calcium	0.5	mg/L	78	33	21	< 0.5
Magnesium	0.5	mg/L	240	290	21	< 0.5
Potassium	0.5	mg/L	33	10	39	< 0.5
Sodium	0.5	mg/L	460	720	180	< 0.5

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**1103-R1** **Water** **M14-Ma10873** **Mar 11, 2014**
Ammonia (as N)	0.01	mg/L	< 0.01
Cyanide (total)	0.005	mg/L	< 0.005
Fluoride	0.5	mg/L	< 0.5
Nitrate (as N)	0.02	mg/L	< 0.02
Nitrite (as N)	0.02	mg/L	< 0.02
Sulphate (as S)	5	mg/L	< 5
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	< 0.2
Total Nitrogen (as N)	0.2	mg/L	< 0.2

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**1103-R1** **Water** **M14-Ma10873** **Mar 11, 2014**
Heavy Metals			
Arsenic	0.001	mg/L	< 0.001
Beryllium	0.001	mg/L	< 0.001
Boron	0.05	mg/L	< 0.05
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Cobalt	0.001	mg/L	< 0.001
Copper	0.001	mg/L	< 0.001
Lead	0.001	mg/L	< 0.001
Manganese	0.005	mg/L	< 0.005
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	< 0.001
Zinc	0.001	mg/L	< 0.001
Alkali Metals			
Calcium	0.5	mg/L	< 0.5
Magnesium	0.5	mg/L	< 0.5
Potassium	0.5	mg/L	< 0.5
Sodium	0.5	mg/L	< 0.5

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	**Testing Site**	**Extracted**	**Holding Time**
Ammonia (as N)	Melbourne	Mar 14, 2014	28 Day
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Cyanide (total)	Melbourne	Mar 14, 2014	14 Day
- Method: USEPA 9010 Cyanide			
Fluoride	Melbourne	Mar 18, 2014	28 Day
- Method: LM-LTM-INO-4300 (Fluoride by Ion Chromatography)			
Nitrate (as N)	Melbourne	Mar 14, 2014	2 Day
- Method: APHA 4500-NO3 Nitrate Nitrogen by FIA			
Nitrite (as N)	Melbourne	Mar 14, 2014	2 Day
- Method: APHA 4500-NO2 Nitrite Nitrogen by FIA			
Sulphate (as S)	Melbourne	Mar 14, 2014	28 Day
- Method: In house MGT1110A (SO4 by Discrete Analyser)			
Total Dissolved Solids	Melbourne	Mar 20, 2014	7 Day
- Method: APHA 2540C Total Dissolved Solids			
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Melbourne	Mar 14, 2014	28 Day
- Method: APHA 4500-NO3/NO2 Nitrate-Nitrite Nitrogen by FIA			
Total Kjeldahl Nitrogen (as N)	Melbourne	Mar 14, 2014	7 Day
- Method: APHA 4500 TKN			
Heavy Metals	Melbourne	Mar 14, 2014	180 Day
- Method: USEPA 6010/6020 Heavy Metals			
Heavy Metals (filtered)	Melbourne	Mar 14, 2014	180 Day
- Method: USEPA 6020 Heavy Metals			
Mobil Metals : Metals M15	Melbourne	Mar 14, 2014	28 Day
- Method: USEPA 6010/6020 Heavy Metals & USEPA 7470/71 Mercury			
Alkali Metals	Melbourne	Mar 14, 2014	180 Day
- Method: USEPA 6010 Alkali Metals			

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram
ug/l: micrograms per litre
ppb: Parts per billion
org/100ml: Organisms per 100 millilitres
MPN/100mL: Most Probable Number of organisms per 100 millilitres
mg/l: milligrams per litre
ppm: Parts per million
%: Percentage
NTU: Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Fluoride	mg/L	< 0.5			0.5	Pass	
Nitrate (as N)	mg/L	< 0.02			0.02	Pass	
Nitrite (as N)	mg/L	< 0.02			0.02	Pass	
Sulphate (as S)	mg/L	< 5			5	Pass	
Total Dissolved Solids	mg/L	< 10			10	Pass	
Method Blank							
Total Nitrogen Set (as N)							
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Beryllium	mg/L	< 0.001			0.001	Pass	
Beryllium (filtered)	mg/L	< 0.001			0.001	Pass	
Boron	mg/L	< 0.05			0.05	Pass	
Boron (filtered)	mg/L	< 0.05			0.05	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Cobalt	mg/L	< 0.001			0.001	Pass	
Cobalt (filtered)	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Manganese	mg/L	< 0.005			0.005	Pass	
Manganese (filtered)	mg/L	< 0.005			0.005	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.001			0.001	Pass	
Method Blank							
Alkali Metals							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
LCS - % Recovery							
Ammonia (as N)	%	90			70-130	Pass	
Fluoride	%	91			70-130	Pass	
Nitrate (as N)	%	107			70-130	Pass	
Nitrite (as N)	%	96			70-130	Pass	
Sulphate (as S)	%	108			70-130	Pass	
LCS - % Recovery							
Total Nitrogen Set (as N)							
Nitrate & Nitrite (as N)	%	107			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	98			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Heavy Metals							
Arsenic	%	93			80-120	Pass	
Arsenic (filtered)	%	94			80-120	Pass	
Beryllium	%	90			80-120	Pass	
Boron	%	85			80-120	Pass	
Boron (filtered)	%	98			80-120	Pass	
Cadmium	%	90			80-120	Pass	
Cadmium (filtered)	%	93			80-120	Pass	
Chromium	%	89			80-120	Pass	
Chromium (filtered)	%	92			80-120	Pass	
Cobalt	%	89			80-120	Pass	
Cobalt (filtered)	%	93			80-120	Pass	
Copper	%	88			80-120	Pass	
Copper (filtered)	%	93			80-120	Pass	
Lead	%	90			80-120	Pass	
Lead (filtered)	%	91			80-120	Pass	
Manganese	%	89			80-120	Pass	
Manganese (filtered)	%	91			80-120	Pass	
Mercury	%	80			75-125	Pass	
Mercury (filtered)	%	80			70-130	Pass	
Nickel	%	89			80-120	Pass	
Nickel (filtered)	%	91			80-120	Pass	
Zinc	%	92			80-120	Pass	
Zinc (filtered)	%	94			80-120	Pass	
LCS - % Recovery							
Alkali Metals							
Calcium	%	80			70-130	Pass	
Magnesium	%	81			70-130	Pass	
Potassium	%	98			70-130	Pass	
Sodium	%	81			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Ammonia (as N)	M14-Ma09777	NCP	%	82			70-130	Pass	
Nitrate (as N)	M14-Ma09777	NCP	%	104			70-130	Pass	
Nitrite (as N)	M14-Ma09777	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Total Nitrogen Set (as N)				Result 1					
Nitrate & Nitrite (as N)	M14-Ma09777	NCP	%	104			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	M14-Ma10233	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	M14-Ma11361	NCP	%	92			70-130	Pass	
Beryllium (filtered)	M14-Ma11361	NCP	%	78			75-125	Pass	
Boron (filtered)	M14-Ma11361	NCP	%	79			75-125	Pass	
Cadmium (filtered)	M14-Ma11361	NCP	%	82			70-130	Pass	
Chromium (filtered)	M14-Ma11361	NCP	%	89			70-130	Pass	
Cobalt (filtered)	M14-Ma11361	NCP	%	86			75-125	Pass	
Copper (filtered)	M14-Ma11361	NCP	%	85			70-130	Pass	
Lead (filtered)	M14-Ma11361	NCP	%	86			70-130	Pass	
Manganese (filtered)	M14-Ma11361	NCP	%	84			70-130	Pass	
Nickel (filtered)	M14-Ma11361	NCP	%	81			70-130	Pass	
Zinc (filtered)	M14-Ma11361	NCP	%	77			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Alkali Metals				Result 1					
Calcium	M14-Ma10190	NCP	%	116			70-130	Pass	
Magnesium	M14-Ma10190	NCP	%	118			70-130	Pass	
Potassium	M14-Ma09241	NCP	%	108			70-130	Pass	
Sodium	M14-Ma10233	NCP	%	89			70-130	Pass	
Spike - % Recovery									
				Result 1					
Cyanide (total)	M14-Ma10867	CP	%	75			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Mercury (filtered)	M14-Ma10868	CP	%	84			70-130	Pass	
Spike - % Recovery									
				Result 1					
Fluoride	M14-Ma10871	CP	%	97			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M14-Ma10322	NCP	%	81			75-125	Pass	
Beryllium	M14-Ma10322	NCP	%	77			75-125	Pass	
Boron	M14-Ma09244	NCP	%	91			75-125	Pass	
Cadmium	M14-Ma10322	NCP	%	75			75-125	Pass	
Chromium	M14-Ma10322	NCP	%	81			75-125	Pass	
Cobalt	M14-Ma10322	NCP	%	77			75-125	Pass	
Copper	M14-Ma09244	NCP	%	92			75-125	Pass	
Lead	M14-Ma10322	NCP	%	82			75-125	Pass	
Manganese	M14-Ma10322	NCP	%	83			75-125	Pass	
Mercury	M14-Ma11981	NCP	%	78			70-130	Pass	
Nickel	M14-Ma09244	NCP	%	84			75-125	Pass	
Zinc	M14-Ma09244	NCP	%	87			75-125	Pass	
Spike - % Recovery									
				Result 1					
Sulphate (as S)	M14-Ma10873	CP	%	106			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	M14-Ma09777	NCP	mg/L	0.030	0.030	7.0	30%	Pass	
Nitrate (as N)	M14-Ma09777	NCP	mg/L	0.070	0.060	15	30%	Pass	
Nitrite (as N)	M14-Ma09777	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Total Nitrogen Set (as N)				Result 1	Result 2	RPD			
Nitrate & Nitrite (as N)	M14-Ma09777	NCP	mg/L	0.070	0.060	15	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	M14-Ma09544	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Beryllium (filtered)	M14-Ma09544	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Boron (filtered)	M14-Ma09544	NCP	mg/L	0.17	0.17	1.3	30%	Pass	
Cadmium (filtered)	M14-Ma09544	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	M14-Ma09544	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cobalt (filtered)	M14-Ma09544	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	M14-Ma09544	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	M14-Ma09544	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Manganese (filtered)	M14-Ma09544	NCP	mg/L	0.31	0.31	2.3	30%	Pass	
Nickel (filtered)	M14-Ma09544	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	M14-Ma09544	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
				Result 1	Result 2	RPD			
Total Dissolved Solids	M14-Ma10862	CP	mg/L	1800	1900	5.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Cyanide (total)	M14-Ma10867	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Mercury (filtered)	M14-Ma10868	CP	mg/L	< 0.0001	0.0002	200	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
Total Dissolved Solids	M14-Ma10870	CP	mg/L	3500	3700	5.0	30%	Pass	
Duplicate									
Alkali Metals				Result 1	Result 2	RPD			
Calcium	M14-Ma10870	CP	mg/L	33	35	5.0	30%	Pass	
Magnesium	M14-Ma10870	CP	mg/L	290	300	3.0	30%	Pass	
Potassium	M14-Ma10870	CP	mg/L	10	11	4.0	30%	Pass	
Sodium	M14-Ma10870	CP	mg/L	720	720	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Fluoride	M14-Ma10871	CP	mg/L	0.6	0.6	2.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M14-Ma10322	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Beryllium	M14-Ma10322	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Boron	M14-Ma10322	NCP	mg/L	0.18	0.17	3.4	30%	Pass	
Cadmium	M14-Ma10322	NCP	mg/L	< 0.0002	< 0.0005	<1	30%	Pass	
Chromium	M14-Ma10322	NCP	mg/L	0.013	0.013	3.6	30%	Pass	
Cobalt	M14-Ma10322	NCP	mg/L	0.014	0.013	6.1	30%	Pass	
Copper	M14-Ma10322	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	M14-Ma10322	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Manganese	M14-Ma10322	NCP	mg/L	0.027	0.027	<1	30%	Pass	
Mercury	M14-Ma11665	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M14-Ma10322	NCP	mg/L	0.064	0.064	<1	30%	Pass	
Zinc	M14-Ma10322	NCP	mg/L	0.033	0.032	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Sulphate (as S)	M14-Ma10873	CP	mg/L	< 5	< 5	<1	30%	Pass	
Duplicate									
Total Nitrogen Set (as N)				Result 1	Result 2	RPD			
Total Kjeldahl Nitrogen (as N)	M14-Ma10873	CP	mg/L	< 0.2	< 0.2	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins | mgt's Acceptance Criteria as stipulated in SOP 05. Refer to Glossary Page of this report for further details

Authorised By

Adrian Tabacchiera	Client Services
Emily Rosenberg	Senior Analyst-Metal (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)

Glenn Jackson
Laboratory Manager

[redacted]

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

CERTIFICATE OF ANALYSIS

Work Order	: **EM1402371**	Page	: 1 of 4
Client	: **SINCLAIR KNIGHT MERZ**	Laboratory	: Environmental Division Melbourne
Contact	: MR COREY BANNISTER	Contact	: Carol Walsh
Address	: P O BOX 312 FLINDERS LANE MELBOURNE VIC AUSTRALIA 8009	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: cbannister@globalskm.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 03 9248 3100	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 9248 3364	Facsimile	: +61-3-8549 9601
Project	: VW07335 Beveridge PSP GW Sampling Program - Mar 14	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 17-MAR-2014
Sampler	: CB	Issue Date	: 21-MAR-2014
Site	: ----		
		No. of samples received	: 1
Quote number	: EN/003/13	No. of samples analysed	: 1

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.

WORLD RECOGNISED ACCREDITATION

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*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Herman Lin	Laboratory Manager	Melbourne 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.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

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

- **EK026SF : EM1402322-001 matrix spike failed for total cyanide due to possible sample interference. This has been confirmed by re-analysis.**
- **TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**1303-QA2**	----	----	----	----
			Client sampling date / time	13-MAR-2014 15:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1402371-001**	**----**	**----**	**----**	**----**
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	10	mg/L	**1540**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**34**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**16**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**17**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**157**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**21**	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	**0.003**	----	----	----	----
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	**0.008**	----	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.009**	----	----	----	----
Cobalt	7440-48-4	0.001	mg/L	**0.004**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.008**	----	----	----	----
Lead	7439-92-1	0.001	mg/L	**0.002**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	**0.020**	----	----	----	----
Manganese	7439-96-5	0.001	mg/L	**0.118**	----	----	----	----
Boron	7440-42-8	0.05	mg/L	**0.19**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EK026SF: Total CN by Segmented Flow Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.8**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.20**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0.01	mg/L	**1.39**	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**6.82**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**1303-QA2**	----	----	----	----
			Client sampling date / time	13-MAR-2014 15:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1402371-001**	**----**	**----**	**----**	**----**
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued								
Nitrite + Nitrate as N	----	0.01	mg/L	**8.21**	----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**3.2**	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**11.4**	----	----	----	----

Appendix C – Groundwater bores

Table 0-1. Summary of registered groundwater bores

Summary of registered groundwater bores within the Wallan South and Wallan East PSP areas

Bore ID	PSP area	Easting z55	Northing z55	Date completed	Use	Total depth (m)	Elevation top of casing (mAHD)	Screen top (m)	Screen bottom (m)	Yield (L/s)	TDS (mg/L)	Intersected aquifer (interpretation from drilling logs)
98215	Wallan East	324854.2	5857288	25/06/1980	Stock/ domestic	57	301.28	50	57	0.51	4030	Bedrock
98216	Wallan East	324627.2	5856995	15/05/1980	Stock/ domestic	42	299.18	30	42	0.51	3900	Bedrock
141733	Wallan East	324453.2	5856934	11/12/1999	Stock/ domestic	42	299.02	36	42	0.76	-	Bedrock
98220	Wallan East	324613.2	5857584	23/11/1981	Stock/ domestic	73	301.24	28	30	-	-	Full log says clay, which is anomalous.
98218	Wallan East	324263.2	5857284	20/04/1982	Stock/ domestic	50	299.4	20	26	1.8	3607.5	n/a
98219	Wallan East	324013.2	5856884	28/11/1981	Stock/ domestic	36.5	298.08	16	36.5	0.32	2990	n/a
98224	Wallan East	323713.2	5856984	29/09/1982	Stock/ domestic	297.9	12	34	0.63	-	n/a	
98225	Wallan East	324173.2	5856984	27/09/1982	Stock/ domestic	23	298.83	17	23	2	-	n/a
98223	Wallan East	323983.2	5857024	24/09/1982	Stock/ domestic	22	297.96	19	22	0.13	-	Newer Volcanics
98226	Wallan East	324963.2	5856884	8/10/1982	Stock/ domestic	36	299.61	30	36	2	-	Newer Volcanics
98229	Wallan East	324613.2	5857384	25/09/1982	Stock/ domestic	31	300.5	16	28	0.38	-	Newer Volcanics
98213	Wallan East	323981.2	5857652	1/10/1979	Stock/ domestic	10.66	300.74	-	-	#N/A	-	n/a
98221	Outside Wallan South	318613.2	5858384	11/09/1982	Stock/ domestic	94.4	383.94	48	60	#N/A	-	n/a
145714	Outside Wallan South	319781.2	5854267	1/03/2002	Investigation	20.6	310.29	-	-	#N/A	-	n/a
98234	Wallan South	321163.2	5855634	7/10/1985	Stock/ domestic	92	301.12	86	-	0.88	1820	bedrock
98217	Wallan South	318733.2	5858304	4/04/1981	Stock/ domestic	63	394.86	53	63	#N/A	-	n/a
98238	Wallan South	319403.2	5858084	22/10/1988	Stock/ domestic	66	372.62	4.5	66	#N/A	-	n/a
98240	Wallan South	319433.2	5857924	1/03/1991	Stock/ domestic	109	357.05	3	109	#N/A	-	n/a
145715	Wallan South	319001.2	5854668	1/03/2002	Investigation	18.2	304.39	14.2	17.2	#N/A	-	n/a
98201	Wallan South	321433.2	5855519	16/03/1971	Stock/ domestic	43.89	299.5	2.74	-	1.14	-	Newer Volcanics
98230	Wallan South	321513.2	5855984	27/03/1983	Stock/ domestic	117	308.01	-	-	0.63	1560	n/a
330483	Wallan South	321190.2	5854946	10/05/1974	Non-groundwater	37.49	304.18	-	-	#N/A	83.2	n/a

Appendix D - Summary of Potential for Contamination

Table 0-2. Summary of Site Characterisation – Potential for Contamination

Table summarising the contamination potential for each site within the Wallan South and Wallan East PSP, based on the land uses with potential to contaminate land presented in Table 2 of Planning Practice Note 30 (DELWP, 2021). Proposed further assessment is based on the approach presented in Table 3 of PPN30, assuming sensitive future use and a new use

Property No.	Site Use / Activity	Description / Findings	Site Inspection[1]	Potential for Contamination	Recommended Further Action
1	Likely poultry farming	Whilst this property could not be accessed, the imagery on Google Map appears to indicate a rural residence with adjoining shed in the north-eastern portion of the property.	No	Medium	Proceed to Preliminary Risk Screening Assessment
2, 3, and 4	Former battery egg farm	Three elongated buildings were located in the central portion of the site which were formerly used as chicken sheds. A machinery shed was located adjacent to the chicken shed which housed the plant and equipment. Various oils and chemicals were also observed in the machinery shed including two 205 litre drums containing diesel. Sheep grazing was noted during the site inspection. Animal manure was observed on the site surface across the property as well as within the former chicken sheds. Numerous stockpiles of soils were located to the west of the chicken sheds with building rubble noted in some stockpiles. Residences were located in the northern and south-eastern portion of the property. Two dams were located in the western portion of the property which potentially receive surface water from an unnamed creek entering from the northern site boundary.	Yes	Medium	Proceed to Preliminary Risk Screening Assessment
5	Likely poultry farming	Whilst this property could not be accessed, the imagery on Google Map appears to indicate a rural residence in the northern portion of the property. Two large buildings are located in the southern portion of the property however it is difficult to deduce the potential use from the imagery.	No	Medium	Proceed to Preliminary Risk Screening Assessment
6 - 7	Vacant lands	No features evident on the site	No	Low	No further action required - General Environmental Duty Applies
8, and 9	Farm building and residence	Whilst these properties could not be accessed, the imagery on Google Map appear to indicate farm residence with various outbuildings, although likely used for domestic use rather than agricultural use.	No	Low	No further action required - General Environmental Duty Applies
10	Farm building and residence	Farm residence with a horse stable.	Yes	Low	No further action required - General Environmental Duty Applies
11 -21	Vacant lands	No features evident on the site	No	Low	No further action required - General Environmental Duty Applies
22	Farm building and residence	Whilst this property could not be accessed, the imagery on Google Map appear to indicate farm residence with various outbuildings, although likely used for domestic use rather than agricultural use.	No	Low	No further action required - General Environmental Duty Applies
23-28	Vacant lands	No features evident on the site	No	Low	No further action required - General Environmental Duty Applies
29	Farm building and residence	Whilst this property could not be accessed, the imagery on Google Map appear to indicate farm residence with various outbuildings, although likely used for domestic use rather than agricultural use.	No	Low	No further action required - General Environmental Duty Applies
30	Vacant land	No features evident on the site	No	Low	No further action required - General Environmental Duty Applies
31, 32, 33, and 34	Farm building and residence	Whilst these properties could not be accessed, the imagery on Google Map appear to indicate farm residence with various outbuildings, although likely used for domestic use rather than agricultural use.	No	Low	No further action required - General Environmental Duty Applies
35	Vacant land	No features evident on the site	No	Low	No further action required - General Environmental Duty Applies
36, 37, 38, 329,	Rail siding	These properties were viewed from the closest publicly accessible areas. The rail sidings were located adjacent to the	No	Medium	Proceed to Preliminary Risk Screening Assessment

Property No.	Site Use / Activity	Description / Findings	Site Inspection[1]	Potential for Contamination	Recommended Further Action
40, 41, and 42		main running line. No notable features were observed along the rail siding.			
43	Farm building and residence	Farm residence with various outbuildings, although likely used for domestic use rather than agricultural use. Various oils and chemicals in small quantity were also observed in the machinery shed. A horse stable was located at the rear of the property.	Yes	Low	No further action required - General Environmental Duty Applies
44	Farm building and residence	Whilst this property could not be accessed, the imagery on Google Map appear to indicate farm residence with various outbuildings, although likely used for domestic use rather than agricultural use.	No	Low	No further action required - General Environmental Duty Applies
45	Vacant land??	No features evident on the site	No	Low	No further action required - General Environmental Duty Applies
46, 47, 48, 429, 520, 51, and 52	Farm building and residence	Whilst these properties could not be accessed, the imagery on Google Map appear to indicate farm residence with various outbuildings, although likely used for domestic use rather than agricultural use.	No	Low	No further action required - General Environmental Duty Applies
53, and 54	Vacant lands	No features evident on the site	No	Low	No further action required - General Environmental Duty Applies
55, 56, and 57	Farm building and residence	Whilst these properties could not be accessed, the imagery on Google Map appear to indicate farm residence with various outbuildings, although likely used for domestic use rather than agricultural use.	No	Low	No further action required - General Environmental Duty Applies

NOTES:

Yes – denotes properties that were accessed for the purposes of completing a site inspection (with landowner permission)

No – denotes properties that were not directly accesses for the purposes of completing a site inspection, but where observations may have been made via publicly accessible areas