

APPENDIX

INLAND  
RAIL 

# H

## EMR Searches and Lab Certificates

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

# APPENDIX

# H

## EMR Searches and Laboratory Certificates

### **Appendix A** EMR Search Certificates

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT



Department of Environment and Science (DES)  
ABN 46 640 294 485  
400 George St Brisbane, Queensland 4000  
GPO Box 2454, Brisbane QLD 4001, AUSTRALIA  
www.des.qld.gov.au

**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487904      EMR Site Id: 49821      03 October 2018  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 1      Plan: SP163227

**EMR RESULT**

The above site IS included on the Environmental Management Register.

The site you have searched has been subdivided from the following site, which IS included on the EMR or the CLR.

Lot: 157      Plan: W311380  
Address: BRENNANS ROAD  
UNDULLAH QLD 4285

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The Department of Environment and Science may hold further information relating to the location of the dip site within this property.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

All search responses include particulars of land listed in the EMR/CLR when the search was generated. The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

**Administering Authority**



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**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487926      EMR Site Id: 25085      03 October 2018  
Cheque Number:  
Client Reference:

This response relates to a search request received for the site:  
Lot: 2      Plan: RP61267

**EMR RESULT**

The above site IS included on the Environmental Management Register.  
Lot: 2      Plan: RP61267  
Address: MT FLINDERS ROAD  
PEAK CROSSING 4306

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The Department of Environment and Science may hold further information relating to the location of the dip site within this property.

A site management plan has been prepared for this site and is included with this search response as Annexure 1. It has been determined that this site is suitable for the following uses, providing the site is used and managed according to the site management plan:

Conference centre activities.

Following the date of effect of the site management plan, subsequent uses of the site for notifiable activities or for situations where a hazardous contaminant is released into the soil may result in the need to review suitable uses or amend the attached site management plan.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

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## ANNEXURE 1 - SITE MANAGEMENT PLAN

LOT : 2 PLAN : RP61267 FILE REF : 902309 PRINTED: 03/10/2018

DATE OF EFFECT : 02/06/1999

### 1.0 Summary of Contamination

A Cattle dip was previously located on the site, refer to figure 1. Arsenic and ethion (an organophosphorus pesticide) are present in the soil in the vicinity of the former cattle dip, drain, draining yards and adjoining paddocks. Maximum concentrations of arsenic and ethion identified in the initial investigation were 4771 and 1890 mg/kg respectively. Refer to the attached figures 1&2.

### 2.0 Objectives of Plan

The objective of this Site Management Plan is to manage the contamination on the site in a manner which protects human health and the environment by the placement and maintenance of barriers between users of the site and the contamination, prevention of contamination migration from the site and application of controls on site use and excavation works.

### 3.0 Achievement and Management of Objectives:

The owner is to ensure that the following conditions are complied with in order to achieve and maintain the plan objectives:

**3.1** The managed area as indicated on the attached figure 2 is to be capped with a minimum of 300 mm of clean clay, graded to prevent ponding, the infiltration of water, and grassed to prevent erosion and the generation of dust. The grass cover is to be maintained in good condition at all times. The area is to remain as open space and not to be developed as an area frequently used by the public (eg picnic/barbecue or playground areas).

**3.2** A disposal permit under Section 118ZZF of the *Environmental Protection Act 1994* must be obtained before excavating and removing any contaminated soil from the site.

**3.3** A Workplace Health and Safety Plan which satisfies relevant obligations of the Workplace Health and Safety Act, subordinate legislation or its equivalent, is to be developed for all excavations in the managed area.

**3.4** Site works relating to excavation, removal and/or disposal of contaminated soils must include provisions which ensure that the environment is protected eg. preventing spread of contamination by controlling site run-off, spillage from haulage trucks or improper disposal of contaminated stormwater or seepage. All contamination, safety and excavation processes are to be documented and records kept which demonstrate Site Management Plan (SMP) compliance.

### 4.0 Monitoring Requirements

The owner is to undertake and document a biennial inspection of the site to ensure that the capping remains in good condition. Records are to be kept of the inspections and of any contaminated soil

removal under s3.2 of the SMP for review by the Environmental Protection Agency (EPA) which may undertake periodic site inspections. The biennial period is to commence from the effective date of this plan.

NOTE: This Site Management Plan (SMP) has been developed to manage site contamination present at the issue date. Subsequent uses of the site may result in the need to review the plan.

This SMP makes reference to a plan attachment that is available from the EPA if required.



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**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

GlobalX Terrain  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50511349      EMR Site Id: 52288      07 February 2019  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 3      Plan: SP167885

**EMR RESULT**

The above site IS included on the Environmental Management Register.  
Lot: 3      Plan: SP167885  
Address: LAWES ROAD  
WILLOWBANK 4306

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.

**LANDFILL** - disposing of waste (excluding inert construction and demolition waste).

**MINE WASTES** -

- (a) storing hazardous mine or exploration wastes, including, for example, tailings dams, overburden or waste rock dumps containing hazardous contaminants; or
- (b) exploring for, or mining or processing, minerals in a way that exposes faces, or releases groundwater, containing hazardous contaminants.

While sites are listed on the EMR using the lot and plan description, a mining lease may affect only a limited area of the lot. In many instances with rural properties, only a small area may be potentially affected by the mining activities and the ongoing landuse is unaffected. More detailed information relating to the location of the mining activities may be held by the Department of Environment and Science or the Department of Natural Resources, Mines and Energy.

**WASTE STORAGE, TREATMENT OR DISPOSAL** - storing, treating, reprocessing or disposing of regulated waste (other than at the place it is generated), including operating a nightsoil disposal site or sewage treatment plant where the site or plant has a design capacity that is more than the equivalent of 50, 000 persons having sludge drying beds or on-site disposal facilities.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

All search responses include particulars of land listed in the EMR/CLR when the search was generated.  
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

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**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487900      EMR Site Id: 33998      03 October 2018  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 6      Plan: SP131580

**EMR RESULT**

The above site IS included on the Environmental Management Register.

The site you have searched has been subdivided from the following site, which IS included on the EMR or the CLR.

Lot: 11      Plan: RP859737  
Address: LOT 11 WASHPOOL ROAD  
FLINDERS 4305

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The Department of Environment and Science may hold further information relating to the location of the dip site within this property.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

All search responses include particulars of land listed in the EMR/CLR when the search was generated. The EMR/CLR does NOT include:-

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**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487925      EMR Site Id: 24985      03 October 2018  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 13      Plan: RP892026

**EMR RESULT**

The above site IS included on the Environmental Management Register.  
Lot: 13      Plan: RP892026  
Address: 960 MIDDLE ROAD  
PEAK CROSSING 4306

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The Department of Environment and Science may hold further information relating to the location of the dip site within this property.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

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**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487927      EMR Site Id: 5594      03 October 2018  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 18      Plan: RP21384

**EMR RESULT**

The above site IS included on the Environmental Management Register.  
Lot: 18      Plan: RP21384  
Address: WASHPOOL ROAD  
PEAK CROSSING 4305

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The Department of Environment and Science may hold further information relating to the location of the dip site within this property.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

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**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487908      EMR Site Id: 4383      03 October 2018  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 19      Plan: W31189

**EMR RESULT**

The above site IS included on the Environmental Management Register.  
Lot: 19      Plan: W31189  
Address: BRENNANS DIP & UNDULLAH RD  
UNDULLAH 4285

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The Department of Environment and Science may hold further information relating to the location of the dip site within this property.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

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**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487858      EMR Site Id: 47882      03 October 2018  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 22      Plan: SP164832

**EMR RESULT**

The above site IS included on the Environmental Management Register.

The site you have searched has been subdivided from the following site, which IS included on the EMR or the CLR.

Lot: 2      Plan: RP47231  
Address: WYATT ROAD  
KAGARU 4285

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The Department of Environment and Science may hold further information relating to the location of the dip site within this property.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

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**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487922      EMR Site Id: 25806      03 October 2018  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 25      Plan: SP108209

**EMR RESULT**

The above site IS included on the Environmental Management Register.

The site you have searched has been subdivided from the following site, which IS included on the EMR or the CLR.

Lot: 2      Plan: RP24576  
Address: CUNNINGHAM HIGHWAY  
WILLOWBANK QLD 4306

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
**FERTILISER MANUFACTURE** - manufacturing agriculture fertiliser (other than the blending, formulation or mixing of fertiliser).

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

All search responses include particulars of land listed in the EMR/CLR when the search was generated.  
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**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487901      EMR Site Id: 5652      03 October 2018  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 45      Plan: RP22590

**EMR RESULT**

The above site IS included on the Environmental Management Register.  
Lot: 45      Plan: RP22590  
Address: LOT 45 WASHPOOL ROAD  
PEAK CROSSING 4306

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The Department of Environment and Science may hold further information relating to the location of the dip site within this property.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

All search responses include particulars of land listed in the EMR/CLR when the search was generated.  
The EMR/CLR does NOT include:-

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**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487902      EMR Site Id: 5638      03 October 2018  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 50      Plan: RP22590

**EMR RESULT**

The above site IS included on the Environmental Management Register.

Lot: 50      Plan: RP22590  
Address: LOT 50 WASHPOOL ROAD  
PEAK CROSSING QLD 4306

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The Department of Environment and Science may hold further information relating to the location of the dip site within this property.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

All search responses include particulars of land listed in the EMR/CLR when the search was generated.

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**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487924      EMR Site Id: 96441      03 October 2018  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 53      Plan: SP243512

**EMR RESULT**

The above site IS included on the Environmental Management Register.

The site you have searched has been subdivided from the following site, which IS included on the EMR or the CLR.

Lot: 2      Plan: RP24576  
Address: CUNNINGHAM HIGHWAY  
WILLOWBANK QLD 4306

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
**FERTILISER MANUFACTURE** - manufacturing agriculture fertiliser (other than the blending, formulation or mixing of fertiliser).

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

All search responses include particulars of land listed in the EMR/CLR when the search was generated.  
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**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487923      EMR Site Id: 96442      03 October 2018  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 54      Plan: SP243512

**EMR RESULT**

The above site IS included on the Environmental Management Register.

The site you have searched has been subdivided from the following site, which IS included on the EMR or the CLR.

Lot: 2      Plan: RP24576  
Address: CUNNINGHAM HIGHWAY  
WILLOWBANK QLD 4306

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
**FERTILISER MANUFACTURE** - manufacturing agriculture fertiliser (other than the blending, formulation or mixing of fertiliser).

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**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487928      EMR Site Id: 33999      03 October 2018  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 76      Plan: SP131580

**EMR RESULT**

The above site IS included on the Environmental Management Register.

The site you have searched has been subdivided from the following site, which IS included on the EMR or the CLR.

Lot: 11      Plan: RP859737  
Address: LOT 11 WASHPOOL ROAD  
FLINDERS 4305

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The Department of Environment and Science may hold further information relating to the location of the dip site within this property.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

All search responses include particulars of land listed in the EMR/CLR when the search was generated. The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

**Administering Authority**



Department of Environment and Science (DES)  
ABN 46 640 294 485  
400 George St Brisbane, Queensland 4000  
GPO Box 2454, Brisbane QLD 4001, AUSTRALIA  
www.des.qld.gov.au

**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487860      EMR Site Id: 53159      03 October 2018  
Cheque Number:  
Client Reference:

This response relates to a search request received for the site:  
Lot: 232      Plan: SP130091

**EMR RESULT**

The above site IS included on the Environmental Management Register.  
Lot: 232      Plan: SP130091  
Address: KAGARU  
KAGARU 4285

The site has been subject to contamination from a hazardous contaminant as follows:  
HAZARDOUS CONTAMINANT - This site has been subject to a hazardous contaminant. Refer to the summary given below.  
Possible high arsenic levels along rail corridor.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

All search responses include particulars of land listed in the EMR/CLR when the search was generated.  
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

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Department of Environment and Science (DES)  
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400 George St Brisbane, Queensland 4000  
GPO Box 2454, Brisbane QLD 4001, AUSTRALIA  
www.des.qld.gov.au

**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487862      EMR Site Id: 53419      03 October 2018  
Cheque Number:  
Client Reference:

This response relates to a search request received for the site:  
Lot: 251      Plan: SP130171

**EMR RESULT**

The above site IS included on the Environmental Management Register.  
Lot: 251      Plan: SP130171  
Address: LANEFIELD  
LANEFIELD 4340

The site has been subject to contamination from a hazardous contaminant as follows:  
HAZARDOUS CONTAMINANT - This site has been subject to a hazardous contaminant. Refer to the summary given below.  
Possible high arsenic levels along rail corridor.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

All search responses include particulars of land listed in the EMR/CLR when the search was generated.  
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

**Administering Authority**



Department of Environment and Science (DES)  
ABN 46 640 294 485  
400 George St Brisbane, Queensland 4000  
GPO Box 2454, Brisbane QLD 4001, AUSTRALIA  
www.des.qld.gov.au

**SEARCH RESPONSE**  
**ENVIRONMENTAL MANAGEMENT REGISTER (EMR)**  
**CONTAMINATED LAND REGISTER (CLR)**

UrbisPro Pty Ltd  
Level 6 / 410 Ann Street  
Brisbane QLD 4000

Transaction ID: 50487903      EMR Site Id: 4440      03 October 2018  
Client Reference:  
Cheque Number:

This response relates to a search request received for the site:  
Lot: 259      Plan: RP809310

**EMR RESULT**

The above site IS included on the Environmental Management Register.

Lot: 259      Plan: RP809310  
Address: LOT 259 WASHPOOL ROAD  
PEAK CROSSING QLD 4306

The site has been subject to the following Notifiable Activity or Hazardous Contaminant.  
LIVESTOCK DIP OR SPRAY RACE - operating a livestock dip or spray race facility.

For the majority of rural properties only a small area may be affected by the chemicals used in livestock dips and spray races. The Department of Environment and Science may hold further information relating to the location of the dip site within this property.

**CLR RESULT**

The above site is NOT included on the Contaminated Land Register.

**ADDITIONAL ADVICE**

All search responses include particulars of land listed in the EMR/CLR when the search was generated.  
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

**Administering Authority**

# APPENDIX

# H

## EMR Searches and Laboratory Certificates

### **Appendix B** Laboratory Certificates

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT



## CERTIFICATE OF ANALYSIS

**Work Order** : **EB1823609**  
**Client** : **TRILAB PTY LTD**  
**Contact** : **ADMIN RESULTS**  
**Address** : **346A BILSEN RD**  
**GEEBUNG QLD, AUSTRALIA 4031**  
**Telephone** : **----**  
**Project** : **Inland Rail CK2**  
**Order number** : **BNE 1909022**  
**C-O-C number** : **----**  
**Sampler** : **----**  
**Site** : **----**  
**Quote number** : **EN/333**  
**No. of samples received** : **3**  
**No. of samples analysed** : **3**

**Page** : 1 of 3  
**Laboratory** : Environmental Division Brisbane  
**Contact** : Customer Services EB  
**Address** : 2 Byth Street Stafford QLD Australia 4053  
**Telephone** : +61-7-3243 7222  
**Date Samples Received** : 28-Sep-2018 11:30  
**Date Analysis Commenced** : 03-Oct-2018  
**Issue Date** : 10-Oct-2018 13:15



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



## 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.**

- ED006(Exchangeable Cations on Alkaline Soils): Unable to calculate Magnesium/Potassium Ratio for some samples as the required results for Magnesium/Potassium are below LOR.
- ALS is not NATA accredited for the analysis of Exchangeable Aluminium and Exchange Acidity in soils when performed under ALS Method ED005.
- ALS is not NATA accredited for the analysis of Exchangeable Cations on Alkaline Soils when performed under ALS Method ED006.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H<sup>+</sup> + Al<sup>3+</sup>).
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



## Analytical Results

Sub-Matrix: SOIL  
 (Matrix: SOIL)

Client sample ID

				18091024/ 340-01-BH2215-D0000 0 / 0.00-0.10m	18091025/ 340-01-BH2215-D0004 0 / 0.40-0.50m	18091026/ 340-01-BH2215-D0010 0 / 1.00-1.10m	----	----
Client sampling date / time				28-Sep-2018 00:00	28-Sep-2018 00:00	28-Sep-2018 00:00	----	----
Compound	CAS Number	LOR	Unit	EB1823609-001	EB1823609-002	EB1823609-003	-----	-----
				Result	Result	Result	----	----
<b>EA002: pH 1:5 (Soils)</b>								
pH Value	----	0.1	pH Unit	6.3	7.7	8.4	----	----
<b>EA006: Sodium Adsorption Ratio (SAR)</b>								
Sodium Adsorption Ratio	----	0.01	-	10.8	26.4	25.7	----	----
<b>EA010: Conductivity (1:5)</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	144	382	493	----	----
<b>ED006: Exchangeable Cations on Alkaline Soils</b>								
Exchangeable Calcium	----	0.2	meq/100g	----	9.3	10.7	----	----
Exchangeable Magnesium	----	0.2	meq/100g	----	10.8	14.6	----	----
Exchangeable Potassium	----	0.2	meq/100g	----	0.4	<0.2	----	----
Exchangeable Sodium	----	0.2	meq/100g	----	4.5	7.4	----	----
Cation Exchange Capacity	----	0.2	meq/100g	----	25.1	32.8	----	----
Exchangeable Sodium Percent	----	0.2	%	----	17.9	22.6	----	----
Calcium/Magnesium Ratio	----	0.2	-	----	0.9	0.7	----	----
Magnesium/Potassium Ratio	----	0.2	-	----	27.6	----	----	----
<b>ED007: Exchangeable Cations</b>								
Exchangeable Calcium	----	0.1	meq/100g	10.5	----	----	----	----
Exchangeable Magnesium	----	0.1	meq/100g	13.0	----	----	----	----
Exchangeable Potassium	----	0.1	meq/100g	0.9	----	----	----	----
Exchangeable Sodium	----	0.1	meq/100g	2.7	----	----	----	----
Cation Exchange Capacity	----	0.1	meq/100g	27.2	----	----	----	----
Exchangeable Sodium Percent	----	0.1	%	10.0	----	----	----	----
Calcium/Magnesium Ratio	----	0.1	-	0.8	----	----	----	----
Magnesium/Potassium Ratio	----	0.1	-	14.0	----	----	----	----

## QUALITY CONTROL REPORT

<b>Work Order</b>	: <b>EB1823609</b>	Page	: 1 of 3
Client	: <b>TRILAB PTY LTD</b>	Laboratory	: Environmental Division Brisbane
Contact	: ADMIN RESULTS	Contact	: Customer Services EB
Address	: 346A BILSEN RD GEEBUNG QLD, AUSTRALIA 4031	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: Inland Rail CK2	Date Samples Received	: 28-Sep-2018
Order number	: BNE 1909022	Date Analysis Commenced	: 03-Oct-2018
C-O-C number	: ----	Issue Date	: 10-Oct-2018
Sampler	: ----		
Site	: ----		
Quote number	: EN/333		
No. of samples received	: 3		
No. of samples analysed	: 3		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



## 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 (%)
<b>EA002: pH 1:5 (Soils) (QC Lot: 1960457)</b>									
EB1823609-001	18091024/ 340-01-BH2215-D00000 / 0.00-0.10m	EA002: pH Value	----	0.1	pH Unit	6.3	6.4	0.00	0% - 20%
EB1823610-008	Anonymous	EA002: pH Value	----	0.1	pH Unit	7.9	8.1	2.38	0% - 20%
<b>EA010: Conductivity (1:5) (QC Lot: 1960456)</b>									
EB1823609-001	18091024/ 340-01-BH2215-D00000 / 0.00-0.10m	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	144	127	12.7	0% - 20%
EB1823610-008	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	193	216	11.4	0% - 20%
<b>ED006: Exchangeable Cations on Alkaline Soils (QC Lot: 1963744)</b>									
EB1823609-002	18091025/ 340-01-BH2215-D00040 / 0.40-0.50m	ED006: Exchangeable Calcium	----	0.2	meq/100g	9.3	9.3	0.00	0% - 20%
		ED006: Exchangeable Magnesium	----	0.2	meq/100g	10.8	10.9	0.00	0% - 20%
		ED006: Exchangeable Potassium	----	0.2	meq/100g	0.4	0.4	0.00	No Limit
		ED006: Exchangeable Sodium	----	0.2	meq/100g	4.5	4.4	2.80	0% - 20%
		ED006: Cation Exchange Capacity	----	0.2	meq/100g	25.1	24.9	0.597	0% - 20%
<b>ED007: Exchangeable Cations (QC Lot: 1963739)</b>									
EB1823609-001	18091024/ 340-01-BH2215-D00000 / 0.00-0.10m	ED007: Exchangeable Calcium	----	0.1	meq/100g	10.5	10.5	0.00	0% - 20%
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	13.0	13.0	0.00	0% - 20%
		ED007: Exchangeable Potassium	----	0.1	meq/100g	0.9	0.9	0.00	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	2.7	2.7	0.00	0% - 20%



## 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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
				Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)	
						LCS	Low	High	
<b>EA002: pH 1:5 (Soils) (QCLot: 1960457)</b>									
EA002: pH Value	----	----	pH Unit	----	4 pH Unit	100	98	102	
				----	7 pH Unit	100	98	102	
<b>EA006: Sodium Adsorption Ratio (SAR) (QCLot: 1961044)</b>									
EA006: Sodium Adsorption Ratio	----	0.01	-	<0.01	----	----	----	----	
<b>EA010: Conductivity (1:5) (QCLot: 1960456)</b>									
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	100	97	103	
<b>ED006: Exchangeable Cations on Alkaline Soils (QCLot: 1963744)</b>									
ED006: Exchangeable Calcium	----	0.2	meq/100g	<0.2	5.4 meq/100g	107	70	130	
ED006: Exchangeable Magnesium	----	0.2	meq/100g	<0.2	4.84 meq/100g	83.6	70	130	
ED006: Exchangeable Potassium	----	0.2	meq/100g	<0.2	2.73 meq/100g	100	70	130	
ED006: Exchangeable Sodium	----	0.2	meq/100g	<0.2	2.68 meq/100g	119	70	130	
ED006: Cation Exchange Capacity	----	0.2	meq/100g	<0.2	15.6 meq/100g	101	70	130	
<b>ED007: Exchangeable Cations (QCLot: 1963739)</b>									
ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	3.54 meq/100g	98.3	79	113	
ED007: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.15 meq/100g	99.1	85	115	
ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.635 meq/100g	96.0	70	122	
ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.382 meq/100g	88.6	76	112	
ED007: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	5.707 meq/100g	97.6	82	112	

## 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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

## QA/QC Compliance Assessment to assist with Quality Review

Work Order	: <b>EB1823609</b>	Page	: 1 of 4
Client	: <b>TRILAB PTY LTD</b>	Laboratory	: Environmental Division Brisbane
Contact	: ADMIN RESULTS	Telephone	: +61-7-3243 7222
Project	: Inland Rail CK2	Date Samples Received	: 28-Sep-2018
Site	: ----	Issue Date	: 10-Oct-2018
Sampler	: ----	No. of samples received	: 3
Order number	: BNE 1909022	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 Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
<b>EA002: pH 1:5 (Soils)</b>								
<b>Snap Lock Bag (EA002)</b> 18091024/ 340-01-BH2215-D00000 / 0.00-0.10m, 18091026/ 340-01-BH2215-D00100 / 1.00-1.10m	18091025/ 340-01-BH2215-D00040 / 0.40-0.50m,	28-Sep-2018	03-Oct-2018	05-Oct-2018	✓	03-Oct-2018	03-Oct-2018	✓
<b>EA006: Sodium Adsorption Ratio (SAR)</b>								
<b>Snap Lock Bag (EA006)</b> 18091024/ 340-01-BH2215-D00000 / 0.00-0.10m, 18091026/ 340-01-BH2215-D00100 / 1.00-1.10m	18091025/ 340-01-BH2215-D00040 / 0.40-0.50m,	28-Sep-2018	05-Oct-2018	27-Mar-2019	✓	05-Oct-2018	27-Mar-2019	✓
<b>EA010: Conductivity (1:5)</b>								
<b>Snap Lock Bag (EA010)</b> 18091024/ 340-01-BH2215-D00000 / 0.00-0.10m, 18091026/ 340-01-BH2215-D00100 / 1.00-1.10m	18091025/ 340-01-BH2215-D00040 / 0.40-0.50m,	28-Sep-2018	03-Oct-2018	05-Oct-2018	✓	03-Oct-2018	31-Oct-2018	✓
<b>ED005: Exchange Acidity</b>								
<b>Snap Lock Bag (ED005)</b> 18091024/ 340-01-BH2215-D00000 / 0.00-0.10m		28-Sep-2018	05-Oct-2018	26-Oct-2018	✓	08-Oct-2018	26-Oct-2018	✓
<b>Snap Lock Bag (ED005)</b> 18091025/ 340-01-BH2215-D00040 / 0.40-0.50m,	18091026/ 340-01-BH2215-D00100 / 1.00-1.10m	28-Sep-2018	08-Oct-2018	26-Oct-2018	✓	08-Oct-2018	26-Oct-2018	✓
<b>ED006: Exchangeable Cations on Alkaline Soils</b>								
<b>Snap Lock Bag (ED006)</b> 18091025/ 340-01-BH2215-D00040 / 0.40-0.50m,	18091026/ 340-01-BH2215-D00100 / 1.00-1.10m	28-Sep-2018	05-Oct-2018	26-Oct-2018	✓	08-Oct-2018	26-Oct-2018	✓
<b>Snap Lock Bag (ED006)</b> 18091024/ 340-01-BH2215-D00000 / 0.00-0.10m		28-Sep-2018	08-Oct-2018	26-Oct-2018	✓	08-Oct-2018	26-Oct-2018	✓
<b>ED007: Exchangeable Cations</b>								
<b>Snap Lock Bag (ED007)</b> 18091024/ 340-01-BH2215-D00000 / 0.00-0.10m		28-Sep-2018	05-Oct-2018	26-Oct-2018	✓	08-Oct-2018	26-Oct-2018	✓
<b>Snap Lock Bag (ED007)</b> 18091025/ 340-01-BH2215-D00040 / 0.40-0.50m,	18091026/ 340-01-BH2215-D00100 / 1.00-1.10m	28-Sep-2018	08-Oct-2018	26-Oct-2018	✓	08-Oct-2018	26-Oct-2018	✓
<b>ED008: Exchangeable Cations</b>								
<b>Snap Lock Bag (ED008)</b> 18091024/ 340-01-BH2215-D00000 / 0.00-0.10m		28-Sep-2018	05-Oct-2018	26-Oct-2018	✓	08-Oct-2018	26-Oct-2018	✓
<b>Snap Lock Bag (ED008)</b> 18091025/ 340-01-BH2215-D00040 / 0.40-0.50m,	18091026/ 340-01-BH2215-D00100 / 1.00-1.10m	28-Sep-2018	08-Oct-2018	26-Oct-2018	✓	08-Oct-2018	26-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	Method	Count		Rate (%)			Quality Control Specification
		QC	Reaular	Actual	Expected	Evaluation	
<b>Analytical Methods</b>							
<b>Laboratory Duplicates (DUP)</b>							
Electrical Conductivity (1:5)	EA010	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	1	100.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	2	50.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
<b>Laboratory Control Samples (LCS)</b>							
Electrical Conductivity (1:5)	EA010	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
<b>Method Blanks (MB)</b>							
Electrical Conductivity (1:5)	EA010	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	1	100.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations on Alkaline Soils	ED006	1	2	50.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Sodium Adsorption Ratio (SAR)	EA006	1	16	6.25	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
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3)
Sodium Adsorption Ratio (SAR)	EA006	SOIL	In house: Referenced to USEPA 600/2 - 78 - 54. The concentration as meq of Ca, Mg and Na are determined on saturated soil by water leach. Results are used to calculate SAR.
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3)
Exchange Acidity by 1M Potassium Chloride	ED005	SOIL	In house: referenced to Rayment and Lyons, (2011), method 15G1. This method is unsuitable for near neutral and alkaline soils. NATA accreditation does not cover performance of this service.
Exchangeable Cations on Alkaline Soils	ED006	SOIL	In house: Referenced to Soil Survey Test Method C5. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with alcoholic ammonium chloride at pH 8.5. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil.
Exchangeable Cations	ED007	SOIL	In house: Referenced to Rayment & Lyons (2011) Method 15A1. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Exchangeable Cations with pre-treatment	ED008	SOIL	In house: Referenced to Rayment & Higginson (2011) Method 15A2. Soluble salts are removed from the sample prior to analysis. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Preparation Methods	Method	Matrix	Method Descriptions
SAR Prep	EA006PR	SOIL	In house: Referenced to USEPA 600/2. Soil is brought to saturation with distilled water by capillary action.
Exchangeable Cations Preparation Method (Alkaline Soils)	ED006PR	SOIL	In house: Referenced to Rayment and Lyons 2011 method 15C1.
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Higginson (1992) method 15A1. A 1M NH <sub>4</sub> Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.