

REGIONAL INTERESTS DEVELOPMENT APPLICATION

CHARLIE FIELD COMPRESSION STATION

Supplementary Information

August 2015

Table of Contents

1.0	INTRODUCTION	1
1.1	Details of the Proponent	1
1.2	Public notification	1
1.3	Location of Development and current land use	1
2.0	DESCRIPTION OF RESOURCE ACTIVITIES	5
2.1	Background	5
2.2	Resource activities	5
2.3	Alternative location consideration	6
2.4	RPI Act requirements	6
3.0	AREAS OF REGIONAL INTEREST	7
3.1	Priority Agricultural Area	7
3.2	Priority Living Area	7
3.3	Strategic Environmental Area	7
3.4	Strategic Cropping Area	7
4.0	REQUIRED OUTCOME ASSESSMENT	8
5.0	CONCLUSION	9
	ATTACHMENT A RPS STRATEGIC CROPPING LAND VALIDATION REPORT	10

1.0 INTRODUCTION

BG International (Aus) Pty Limited (**QGC**) seeks a Regional Interest Development Approval (**RIDA**) under the *Regional Planning Interests Act 2014 (RPI Act)* for the construction and use of a Field Compression Station (**FCS**) and associated work space within Petroleum Lease (**PL**) 498 which is within a mapped Strategic Cropping Area (SCA).

This report has been prepared to provide supporting information for the RIDA and has been prepared in accordance with the RPI Act Guideline: *08/14 How to demonstrate that land in the strategic cropping area does not meet the criteria for strategic cropping land under the Regional Planning Interests Act 2014*. In particular, it provides:

- a description of the resource activity;
- the location of the proposed resource activity; and
- an assessment of the resource activity's compliance with the criteria detailed in the *Regional Planning Interests Regulation 2014 (RPI Regulation)* Schedule 3, Part 2. QGC submits that the proposed activity will not result in any impact on Strategic Cropping Land in the SCA.

1.1 Details of the Proponent

The FCS will be constructed, operated and maintained by a joint venture, currently comprising of BG International (AUS) Pty Limited, CNOOC Coal Seam Gas Company Pty Ltd and Tokyo Gas QCLNG Pty Ltd.

BG International (AUS) Pty Limited is the Principal applicant of the associated petroleum lease and Environmental Authority (**EA**) EPPG00700113.

1.2 Public notification

Division 4 of the RPI Act outlines the requirements for public notification of Regional Interest Assessment Applications.

The RPI Act requires a Regional Interest Assessment Application to be publically notified if:

- prescribed by a regulation as notifiable (and no exemption exists); or
- the Chief Executive has given the applicant a notice advising the activity is notifiable.

Section 34 (3) of the RPI Act provides for an exemption from notification if the Chief Executive is satisfied that there has been sufficient notification of the activity under another Act or law.

Prior to this application, public notification of the relevant EA has been undertaken as required under section 230 of the *Environmental Protection Act 1994 (EP Act)*. Notification of the FCS was published in the Chinchilla News and Toowoomba Chronicle newspapers on 6 March 2014 and the submission period ran until 3 April 2014. A copy of the notification is included as Attachment 4 of the application material. Furthermore, notification is not required as the land fails the SCL criteria.

On the basis that the proposed activity has been recently notified under the EP Act, QGC requests that this associated RIDA application be exempt from further notification under section 34(3) of the RPI Act.

1.3 Location of Development and current land use

The development is located within the Western Downs Regional Council (**WDRC**) local government area.

The region is predominantly rural, with the majority of the development area being freehold land that has been cleared and primarily used for cattle grazing.

The development area lies within an area where significant future natural gas extraction is planned. The FCS forms an integral part of the Surat Basin Acreage Project. The area of the proposed FCS location is overlapped by Mineral Development Licence (**MDL**) 449.

Activities associated with the Charlie FCS are proposed to be undertaken on the following properties:

Table 1: Properties subject to the application

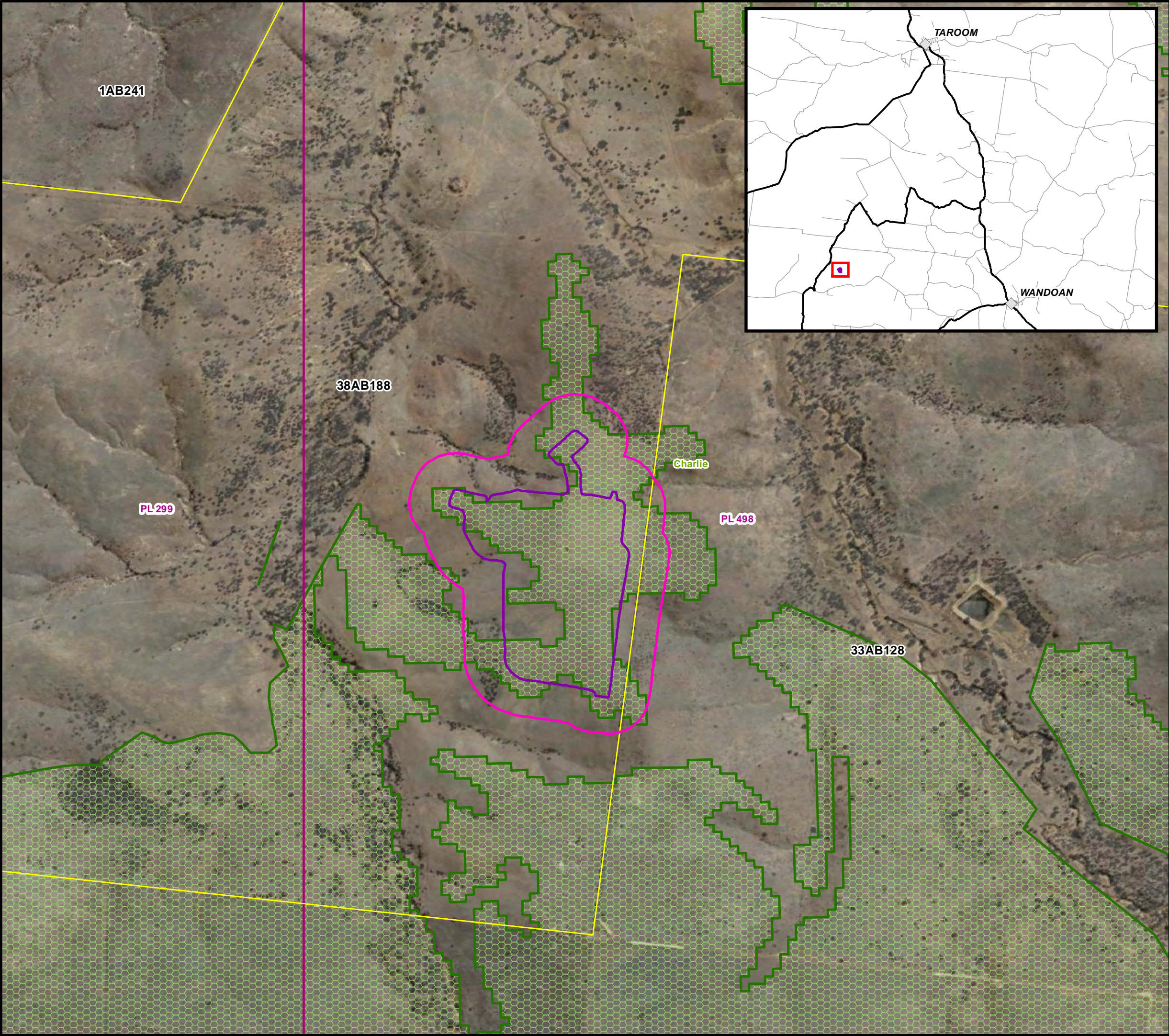
Lot(s)	Plan	Land Owner	Address
38	AB188	Elimatta Pastoral Pty Ltd	350 Bundi Road, Grosmont, QLD, 4419
33	AB128	QGC Pty Limited	2660-2782 Bundi Road, Grosmont, QLD, 4419

Both Lot 33 AB128 and Lot 33 AB188 contain land identified as SCL on the Department of Natural Resources and Mines' (**DNRM**) *Trigger Map for Strategic Cropping Land in Queensland v3.1*.

The properties are located within the Western Cropping Zone. The current land use of the lots consist of existing petroleum exploration infrastructure and rural activities.

Figure 1 shows the proposed location of the Charlie FCS, the area subject to this application and the mapped SCL.

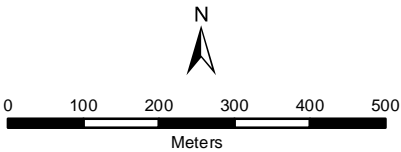
Figure 1: Location of Proposed Charlie FCS



Charlie FCS Strategic Cropping Land

- Legend**
- Charlie FCS Footprint
 - Charlie FCS 100m Buffer
 - Strategic Cropping Land
 - Surveyed Property Boundary
 - QGC Field
 - QGC PL

DATE: 07/08/15 CREATED BY: hibberde
MAP NO: M_41403_01



Map Projection: GDA 94 SCALE: 1:10,000 (A3)

DATA SOURCE: Tenements, DCDB - DNRM
Infrastructure - QGC

Note: Every effort has been made to ensure this information is spatially accurate. The location of this information should not be relied on as the exact field location.

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2.0 DESCRIPTION OF RESOURCE ACTIVITIES

2.1 Background

The Surat Basin Acreage Project Area represents a new phase in the progressive development of QGC's exploration areas which is complementary to QGC's existing operations and gas production portfolio.

This application seeks to authorise activities associated with the development of new infrastructure necessary to deliver natural gas from the Surat Basin Acreage to the Woleebee Creek Central Processing Plant (**CPP**) into QGC's portfolio of supplies to domestic and international gas markets, which includes sales of gas to the local gas market, power generation and supply to the existing Queensland Curtis LNG (**QCLNG**) facility on Curtis Island near Gladstone, Queensland. The project life span (including the construction period) is anticipated to be 30 years.

2.2 Resource activities

The Charlie Field Compressor Station (**FCS**) compresses gas which is received from the natural gas wells in the gas field before it is then transported down a pipeline to the Woleebee Creek CPP, where the gas is then further compressed. This compressed gas from the CPP is then transferred along the Gas Collection Header to the Export Pipeline (**PPL154**) which connects to the Liquefied Natural Gas (**LNG**) Facility on Curtis Island, off Gladstone.

The construction of the proposed Charlie FCS and activities proposed to be carried out include:

- Clearing of the FCS construction footprint including topsoil stripping and stockpiling;
- Site preparation including cut and fill, grading of site and surface water diversions;
- Transport, uncrating, assembly, and installation of all equipment;
- Installation of pipe supports on concrete footings with supports to include pipe clamps and saddles;
- Installation of all pipe work, flanges, blind flanges, spectacle blinds, gaskets, plugs, fittings and other materials and consumables;
- Trenching for and coating of underground pipe work, backfilling and removal of surplus soil;
- Installation of magnesium anodes for cathodic protection (CP) of underground pipe work;
- Supply and installation of flares;
- Installation of all mechanical items;
- Levelling, shimming and grouting of all items being erected on concrete footings;
- Installation of instrument air supply lines going to pneumatically-driven equipment, valves and instruments;
- Instrumentation and electrical installations;
- maintenance and surveillance activities during operations; and
- decommissioning and restoration.

Construction activities will commence once all permits, authorities and permissions have been granted and mobilisation activities have been completed.

The construction phase for the FCS is scheduled to take 12 - 18 months. Rehabilitation and restoration will occur upon construction completion and commissioning. The FCS is expected to be operational for 30 years. The FCS will be operational 24 hours a day, seven days a week.

2.3 Alternative location consideration

A number of alternative locations for the proposed Charlie FCS were assessed during QGC's internal assessment processes. However, the final proposed Charlie FCS location was determined to be the most suitable based on a number of factors such as;

- Topography;
- Existing land use; and
- Proximity to existing and proposed infrastructure.

2.4 RPI Act requirements

Section 7 of the RPI Act states what is considered an area of regional interest under the RPI Act:

Each of the following is an area of regional interest—

- (a) a priority agricultural area;*
- (b) a priority living area;*
- (c) the strategic cropping area;*
- (d) a strategic environmental area.*

Section 12(2) of the RPI Act states that:

A resource activity is –

- (a) an activity for which a resource authority is required to lawfully carry out; or*
- (b) for a provision about a resource authority or proposed resource authority – an authorised activity for the authority or proposed authority (if granted) under the relevant resource Act.*

Under section 12(1) of the RPI Act, a Resource Act includes the P&G Act. Section 13 (e) of the RPI Act provides that a resource authority includes a petroleum lease granted under that Act.

The Charlie FCS falls within the definition of a resource activity. It will be located on petroleum lease 498 and is authorised under the Surat Basin Acreage EA EPPG007700113.

3.0 AREAS OF REGIONAL INTEREST

Areas of Regional Interest (ARIs) are listed under Section 7 of the RPI Act. A desktop assessment has been carried out to identify which ARIs are mapped in the location of the proposed Charlie FCS.

3.1 Priority Agricultural Area

The proposed location of the FCS is not mapped as a Priority Agricultural Area (PAA). No further assessment is required against the PAA Required Outcome detailed in Schedule 2 Part 2 of the *Regional Planning Interests Regulation 2014* (RPI Regulation).

3.2 Priority Living Area

The proposed location of the FCS is not mapped as a Priority Living Area (PLA). No further assessment is required against the PLA Required Outcome detailed in Schedule 2 Part 3 of the RPI Regulation.

3.3 Strategic Environmental Area

The proposed location of the FCS is not mapped as a Strategic Environmental Area (SEA). No further assessment is required against the SEA Required Outcome detailed in Schedule 2 Part 5 of the RPI Regulation.

3.4 Strategic Cropping Area

The proposed location of the FCS is mapped as a Strategic Cropping Area (SCA). Section 10 of the RPI Act describes an SCA as follows:

- (1) *The strategic cropping area consists of the areas shown on the SCL trigger map as strategic cropping land.*
- (2) *In this section—*

strategic cropping land means land that is, or is likely to be, highly suitable for cropping because of a combination of the land's soil, climate and landscape features.

Section 4.0 of this report considers the proposed FCS location against the SCA Required Outcome detailed in Schedule 2 Part 4 of the RPI Regulation.

The proposed Charlie FCS location and 100m buffer as shown in Figure 1 covers an area of approximately 23.6ha of mapped SCL.

4.0 REQUIRED OUTCOME ASSESSMENT

Schedule 2, Part 4 of the RPI Regulation sets out the required outcome for activities carried out in an SCA as well as the prescribed solutions for the required outcomes.

Table 2 below assesses the proposed Charlie FCS against the required outcome for SCA.

Table 2: SCA Assessment Criteria Required Outcome 1

Required Outcome 1 – no impact on strategic cropping land The activity will not result in any impact on strategic cropping land within the strategic cropping area.
Prescribed Solution
PS1: The application demonstrates the activity will not be carried out on strategic cropping land that meets the criteria stated in schedule 3, part 2.
Evidence/Response
<p>A soil assessment was carried on the proposed Charlie FCS location against the criteria defined in Schedule 3 of the RPI Reg. The assessment carried out by RPS (ATTACHMENT A) over the proposed Charlie FCS location determined that the area did not meet the required SCL criteria.</p> <p>A total of 13 observation sites were assessed over the proposed Charlie FCS location. Of those 13 observations sites, three sites were analysed, one site detailed and nine sites checked. An assessment of those three analysed sites (CH_AN1, CH_AN2 and CH_AN3) against the criteria in Schedule 3 confirmed that the soils at the proposed Charlie FCS location failed the zonal criteria for the Western Cropping zone in particular depth, salinity and soil water storage respectively.</p> <p>As such, the soil at the proposed Charlie FCS location fails to meet the SCL criteria and is therefore not SCL.</p>

5.0 CONCLUSION

The proposed Charlie FCS is located within an SCA as identified in the SCL Trigger Map. QGC have demonstrated that the proposed Charlie FCS location within the SCA will not result in any impact on strategic cropping land as the soil at the location fails to meet the threshold SCL criteria for the Western Cropping zone.

The application demonstrates that the activity will not be carried out on Strategic Cropping Land and therefore the activity will not result in any impact on Strategic Cropping Land in the Strategic Cropping Area.

ATTACHMENT A RPS STRATEGIC CROPPING LAND VALIDATION REPORT



Strategic Cropping Area Criteria Assessment Report

QGC Charlie Field Compression Station (FCS)

Prepared by:

RPS AUSTRALIA EAST PTY LTD

743 Ann Street
FORTITUDE VALLEY QLD 4006

T: +61 7 3237 8899
F: +61 7 3237 8833
E: samuel.donald@rpsgroup.com.au

Prepared for:

QGC

275 George St,
Brisbane QLD 4000

T: +61 7 30248256
E: cameron.playsted@bg-group.com

Client Manager: Samuel Donald
Report Number: PR111136-68
Version / Date: Final / August 2015

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Document Status

Version	Purpose of Document	Orig	Review	Review Date
1	Draft Report	Samuel Donald	David Finney	18/06/2015
2	Draft Report	Ben Carroll	David Finney	16/07/2015
3	Final Report	Ben Carroll	David Finney	04/08/2015

Approval for Issue

Name	Signature	Date
David Finney		04/08/2015

Contents

1.0	INTRODUCTION	1
1.1	Background	1
1.2	Scope.....	2
2.0	APPROACH	5
2.2	Desktop Assessment.....	5
2.3	Field Survey	5
2.4	Laboratory for Soil Analysis	7
3.0	DESKTOP ASSESSMENT RESULTS	8
3.1	Land Resource Areas	8
3.2	Surface Geology.....	9
3.3	Airborne Gamma Radiation Survey Data.....	9
3.4	Topographic Data.....	9
4.0	FIELD ASSESSMENT RESULTS	13
5.0	DISCUSSION	15
6.0	CONCLUSIONS AND RECOMMENDATIONS	16
6.1	Recommendations	16

Tables

Table 2.1	Thresholds for SCL Criteria for the Western Cropping Zone	5
Table 2.2	SCL Field Assessment Types	6
Table 2.3	Map Unit Size and Density of the Four Types of Observation Sites Applicable	6
Table 3.1	Wandoan Land Resource Area	8
Table 3.2	Kiddell Land System.....	8
Table 3.3	Radiometric Method	9
Table 4.1	Number of Observation Sites for SMU 1	13
Table 4.2	Summarised Compliance against SCL Criteria	13

Figures

Figure 1.1	Assessment Area	3
Figure 1.2	Strategic Cropping Land Trigger Map	4
Figure 3.1	Land Resource Areas.....	10
Figure 3.2	Elevation.....	11
Figure 3.3	Airborne Gamma Radiation Survey Data.....	12
Figure 4.1	Soil Map Units	14
Figure 6.1	Verified SCL Trigger Map.....	17

Appendices

- Appendix 1 Soil Descriptions
- Appendix 2 Laboratory Analytical Certificates

1.0 Introduction

RPS was engaged by QGC to conduct an assessment of compliance of the proposed Charlie Field Compression Station (FCS) site with the prescribed solution for required outcome 1 of the Strategic Cropping Area assessment criteria, in support of an application for development approval under the Regional Planning Interests Act 2014. The site is located on Lot 38 on AB188 and a very small portion on the adjacent Lot 33 on AB128, approximately 38km west of Wandoan in the Western Downs Regional Council Local Government Area (**Figure 1.1**).

The assessment area includes the footprint of the proposed Charlie FCS and a 100 m buffer, to account for any changes in design, surrounding disturbance or minor expansion. The assessment area is located within the Western Cropping Zone Management Area and is mapped by the Department of Natural Resources and Mines' (DNRM) SCL Trigger map (Version 3.1) as 'Potential SCL' (**Figure 1.2**).

1.1 Background

On June 13 2014, the *Strategic Cropping Land Act 2011* was repealed and replaced by the *Regional Planning Interest Act 2014* (RPI Act). The RPI Act applies to Regulated Activities and Resource Activities (an activity for which a resource authority is required to lawfully carry out or an authorised activity under a relevant resource Act).

The RPI Act has identified four areas of regional interest including a Strategic Cropping Area (SCA), defined as '*an area of land that is highly suitable for cropping or likely to be highly suitable for cropping based on a particular combination of soil, climate and landscape features*'. The SCA consists of the areas shown on the SCL trigger map as Strategic Cropping Land (SCL).

A resource activity located within the SCA is required to obtain a regional interests development approval (RIDA) under the RPI Act. The *Regional Planning Interests Regulation 2014* (RPI Regulation) provides criteria for assessment or decision to be addressed by applicants in their application for a RIDA.

The prescribed solution for required outcome 1 of the RPI Regulation (SCA assessment criteria) – Managing impacts on strategic cropping land on property in the strategic cropping area requires the applicant demonstrate that '*the activity will not be carried out on strategic cropping land that meets the criteria for land stated in Schedule 3, Part 2*'. The criteria listed in Schedule 3, Part 2 of the RPI Regulation ('SCL criteria') relate to the following matters:

- (1) Slope
- (2) Rockiness
- (3) Gilgai
- (4) Soil Depth
- (5) Soil Wetness
- (6) Soil pH
- (7) Salinity
- (8) Soil Water Storage

1.2 Scope

As the RPI Act applies to the proposed Charlie FCS, the purpose of this assessment was to determine whether the assessment area is SCL for the purposes of meeting prescribed solution 1 of the SCA assessment criteria. To determine if the assessment area is SCL or non-SCL, RPS addressed the eight (8) SCL criteria thresholds for the Western Cropping Zone provided in Schedule 3, Part 2 of the RPI Regulation.

This report provides the following:

- Definition, description and plans of the assessment area;
- Approach to the validation assessment;
- Description of soil types and a map of identified soil units for the assessment area;
- Evaluation of soil properties against the relevant criteria thresholds; and
- Recommendations and an amended SCL trigger map for the site.

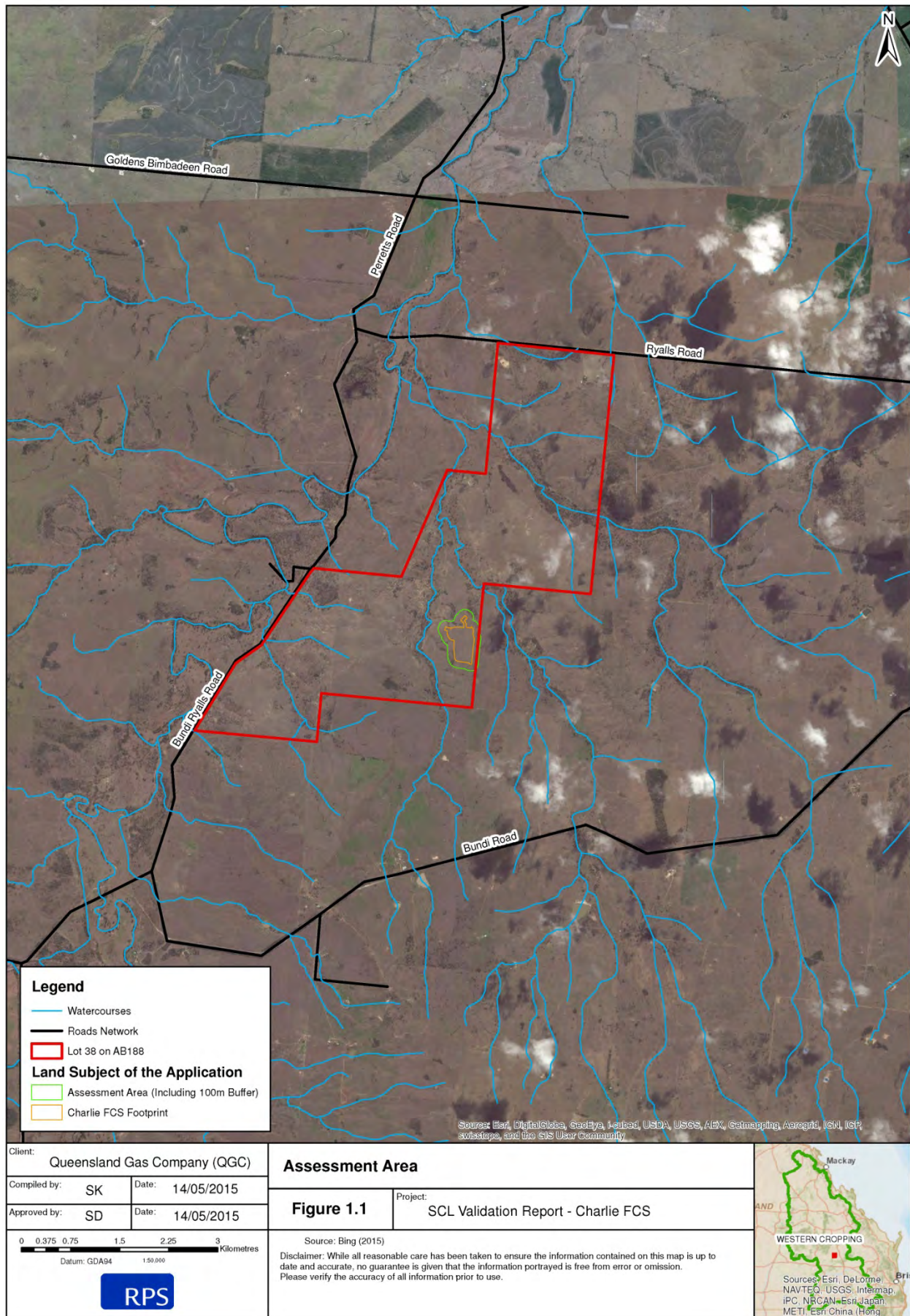


Figure 1.1 Assessment Area

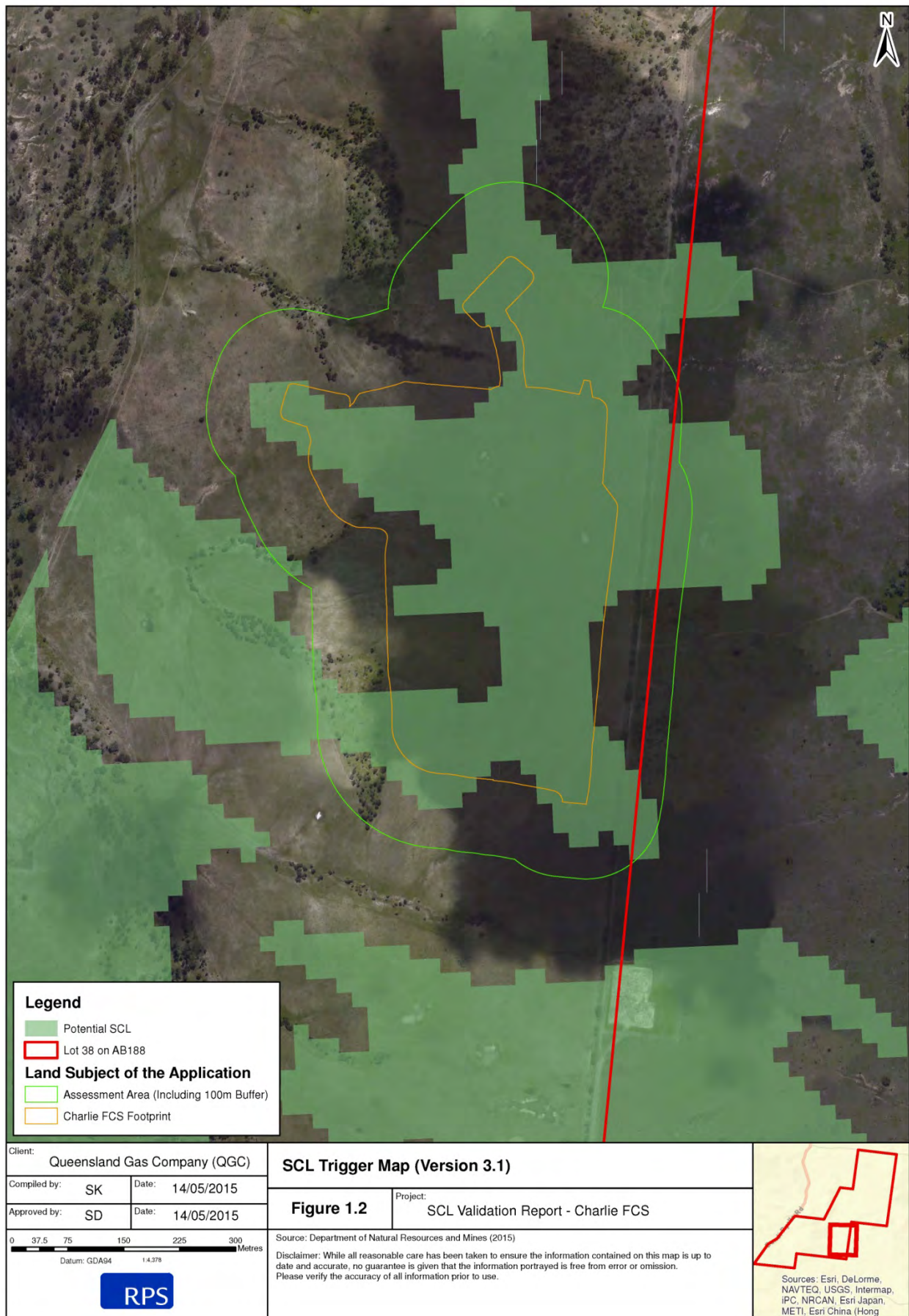


Figure 1.2 Strategic Cropping Land Trigger Map

2.0 Approach

The validation assessment was conducted in accordance with:

- Regional Planning Act (RPI) Guideline 08/14; *How to Demonstrate that Land in the Strategic Cropping Area does not meet the Criteria for Strategic Cropping Land*, (Department of State Development, Infrastructure and Planning, 2014) (hereafter 'the guidelines').

The eight (8) criteria threshold values for the Western Cropping Zone are provided in **Table 2.1**.

Table 2.1 Thresholds for SCL Criteria for the Western Cropping Zone

Criteria	Thresholds
Slope	Equal to or less than 3%
Rockiness	Equal to or less than 20% for rocks greater than 60mm in diameter
Gilgai	Less than 50% of land surface being gilgai of greater than 500mm in depth
Soil Depth	Equal to or greater than 600mm
Soil Wetness	Has favourable drainage
Soil pH	For rigid soils, the soil at 300mm and 600mm soil depth must be within the range of pH1:5 5.1 to pH1:5 8.9 inclusive For non-rigid soils, the soil at 300mm and 600mm soil depth must be greater than pH1:5 5.0.
Salinity	Chloride content is less than 800mg/kg at 600mm soil depth
Soil Water Storage	Equal to or greater than 100mm to a soil depth or soil physico-chemical limitation of equal to or less than 1000mm

2.2 Desktop Assessment

A desktop assessment included a review of the following:

- Land Resource Area manuals and/or Land Management manuals;
- Surface Geology;
- Airborne Gamma Radiation Survey Data;
- Soils and Land Information Database (SALI Database) (Department of Natural Resources and Mines, 2012);
- Topographic data; and
- QGC Soil Mapping (prepared by Land Resource Assessment and Management Pty Ltd (LRAM)).

The desktop assessment results were used to develop a Conceptual Site Model (CSM) of predicted soil types and soil map units (SMU) and their likely distribution within the assessment area. The desktop assessment was also used to guide the subsequent soil assessment, including site location selection.

2.3 Field Survey

The field survey was undertaken to accurately delineate the spatial extents of any SMUs across the assessment area and to address the eight above and below ground zonal criteria, in accordance with:

- The guidelines;
- Guidelines for Surveying Soil and Land Resources, 2nd Edition* ('blue book'); and
- Australian Soil and Land Survey Field Handbook, 3rd Edition* ('yellow book').

Demonstration of how mapped SCL met or did not meet the SCL criteria was undertaken in accordance with the requirements detailed in Appendix 1 of the guidelines.

There are four (4) types of SCL field assessment sites that can be used for zonal criteria assessment depending on the particular soil and land attributes of the assessment area and the type of evidence necessary. A brief description of each type of assessment site, when it is required and the nature of exposure used for this validation assessment are provided in **Table 2.2**.

Table 2.2 SCL Field Assessment Types

Site type	Description	Nature of exposure	Required
Exclusion Site	Sites used solely to delineate areas that fail the slope, rockiness or gilgai microrelief criteria.	NA	Evaluation of SCL criteria 1 (slope), 2 (rockiness) and 3 (gilgai)
Detailed Site	Sites that are described in sufficient detail to allow all major soil features of relevance to SCL to be clearly identified to a depth of up to 1,000 mm.	Excavated trench using backhoe. Dimensions were generally 1 m wide, 2 m long and 1.2 m deep	Identify soil types and characteristics and evaluation of SCL criteria 4 (soil depth) and 5 (soil wetness)
Analysed Site	Sites from which samples are collected and later analysed in a laboratory to confirm a soil map unit as SCL or non SCL.	Excavated trench using backhoe. Dimensions were generally 1 m wide, 2 m long and 1.2 m deep	Evaluation of SCL criteria 6 (soil pH), 7 (salinity) and 8 (soil water storage)
Check Site	Sites that are examined in sufficient detail to allocate the site to a soil type and soil map unit. Check sites are commonly used to accurately position the boundaries of soil map units or to describe the variability within a soil map unit.	Hand auger to no greater than 300 mm or to refusal.	Delineate soil map unit boundaries

The type and number of assessment sites required to satisfy the minimum sample density requirements provided by DSDIP (2014) are provided in **Table 2.3**.

Descriptions of the soil profiles were prepared in accordance with the 'yellow book'. The soil profile was then classified according to the Australian Soil Classification (Isbell 2002).

Soil sampling was conducted according to the distinct soil horizons identified during excavation and auger extraction as per the blue book, ensuring that no sample was collected across a horizon boundary and that multiple samples would be collected if the horizon was greater than 300 mm.

Table 2.3 Map Unit Size and Density of the Four Types of Observation Sites Applicable

	Western Cropping Zone
Minimum map unit area	10 ha
Minimum map unit width	80 m
Minimum density of sites in a map unit	1 site per 50 ha
Exclusion sites (criteria 2 and 3)	4
Check sites per map unit (criteria 4 to 8)	equal to or greater than 2
Detailed sites per map unit (criteria 4 and 5)	3
Analysed sites per map unit (criteria 6, 7 and 8)	3

2.4 Laboratory for Soil Analysis

Soil testing was performed by SGS Australia Pty Ltd (SGS), a National Association of Testing Authorities (NATA) accredited laboratory (accreditation No. 2120 for the Pinkenba laboratory). SGS maintain ISO/IEC 17025:2005 accreditation and have the technical expertise for the specific analytical methods.

SGS also maintain certification for the relevant methods in the Australasian Soil and Plant Analysis Council (ASPAC).

3.0 Desktop Assessment Results

There were no SALI Database sites within proximity to the assessment area or any mapped QGC soils (LRAM) across the assessment area.

3.1 Land Resource Areas

The following reports identified one (1) Land Resource Areas (LRA) and one (1) land system that occurred within the assessment area (**Figure 3.1**):

- Speck N.H., Wright R.L., Sweeney F.C., Perry R.A., Fitzpatrick E.A., Nix H.A., Gunn R.H., Wilson I.B. *Lands of the Dawson-Fitzroy Area, Queensland*, Land Research Series No.21, CSIRO, Australia, 1968; and
- Forster B.A., *Evaluation of Agricultural Land in Taroom Shire*, Land Resources Branch, Queensland Department of Primary Industries, Brisbane, 1985.

A brief summary of the LRA described by Forster (1985) to occur within the assessment area is included in **Table 3.1**. A brief summary of the land system described by Speck *et al.* (1968) is included in **Table 3.2**.

Table 3.1 Wandoan Land Resource Area

Characteristic	Description
Soil	Moderate to deep cracking clays, brown clays and black earths with shallower profiles on crests and sometimes with surface stone and rock shelf. Some profiles are non-cracking. Sodic and saline subsoils occur.
Depth	>1m
Texture	Clays
Fertility	Moderate to High Fertility
Dust and Erosion Hazard	Susceptible to Sheet and Gully Erosion
Landform	Undulating Plains and Rises
Land Classification	Class A2 – Arable land.
Geology	Jurassic labile sandstone, siltstone, mudstone and conglomerate

Table 3.2 Kiddell Land System

Characteristic	Description
Soil	Moderately deep to deep cracking clays with a stony or gravelly surface. Linear gilgai occur on lower slopes. Shallow texture contrast soils occur on colluvial and steeper erosional lower slopes.
Depth	NA
Texture	Sand/Loams /Clays. Predominantly light to medium clays
Fertility	NA
Dust and Erosion Hazard	NA
Landform	Undulating to nearly flat plains with sparse branching drainage pattern
Land Classification	Class A
Geology	Quaternary-late Tertiary colluviums-alluvium with weathered, subhorizontal to gently dipping shale and sandstone of Triassic and Jurassic age

3.2 Surface Geology

Detailed surface geology mapping indicated that the assessment area is underlain by Tithonian to Bajocian age quartz-rich arenite to rudite, described as calcareous lithic sandstone, siltstone, mudstone, coal and conglomerate. The geological unit is described as Injune Creek Group.

3.3 Airborne Gamma Radiation Survey Data

Ternary radiometric data images were sourced from Geoscience Australia using their Geophysical Archive Data Delivery System (**Figure 3.3**). The airborne gamma radiation survey data shows variations in levels of potassium (red), thorium (green) and uranium (blue) in the rocks and weathered materials (**Table 3.3**).

Table 3.3 Radiometric Method

Hues	Description
White-red	Actively eroding felsic volcanic and igneous rocks (high concentration of radioelements)
Green-blue	Ferruginous lags and weathered materials (relatively high thorium and low potassium responses)
Black	Ultramafic rocks and quartz-rich sandy materials such as quartzites, sandstones and unconsolidated sands (low radioelement concentrations)

The data was used to assist with delineating possible soil type boundaries by visual identification of broad patterns of radioactive isotope distribution in the landscape. As shown in **Figure 3.3** the assessment area and nearby surrounds consist primarily of weathered materials (green-blue), with areas of felsic volcanic and igneous rock to the east and west. The assessment area may contain two (2) soil types based on hue patterns and distributions.

3.4 Topographic Data

The existing surface gradient within the assessment area varies from approximately 254 m Australian Height Datum (AHD) in the west and north-west to 270 m AHD in the south-west (**Figure 3.2**). The slope grades to several drainage features and an ephemeral watercourse running west of the assessment area.

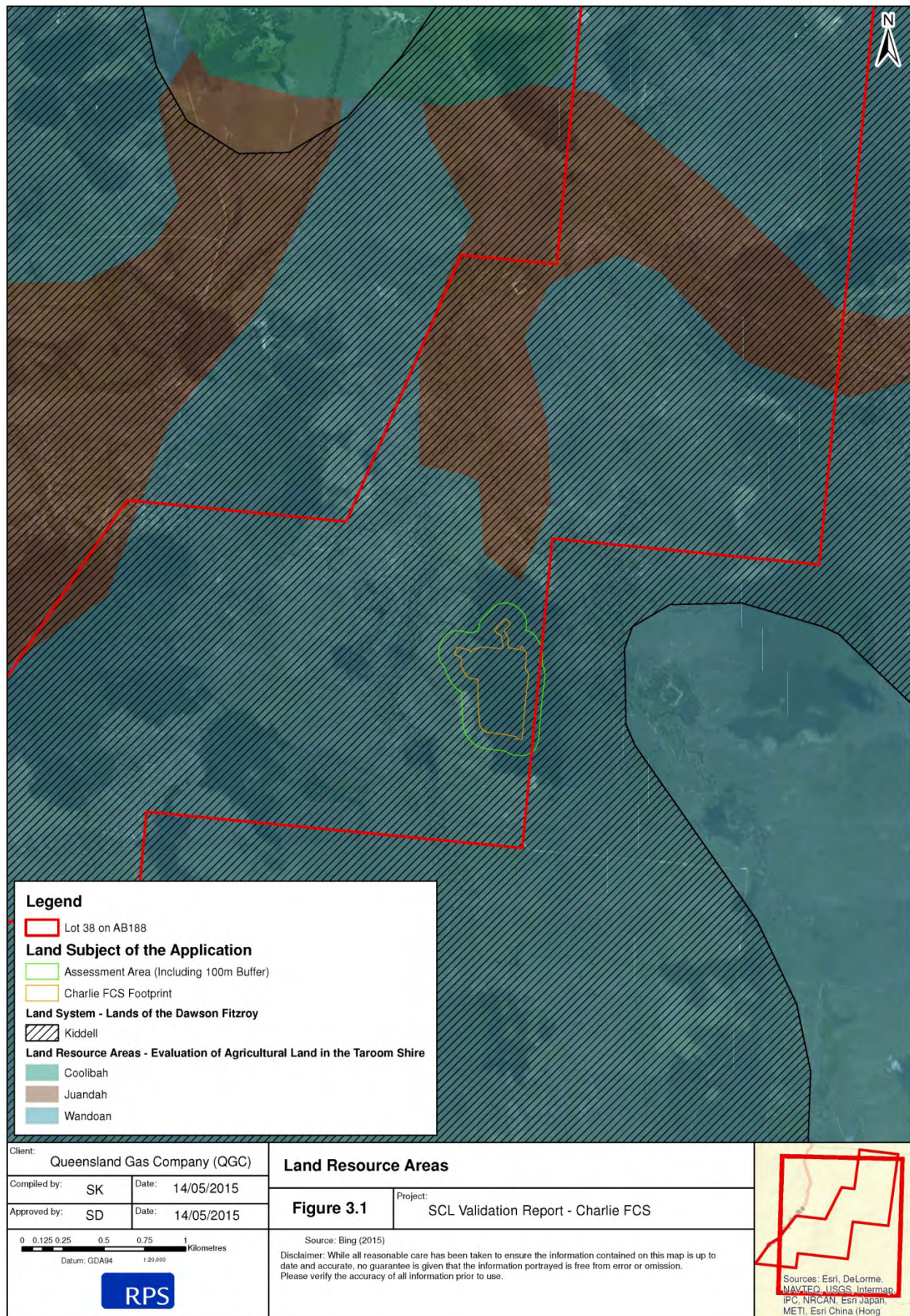


Figure 3.1 Land Resource Areas

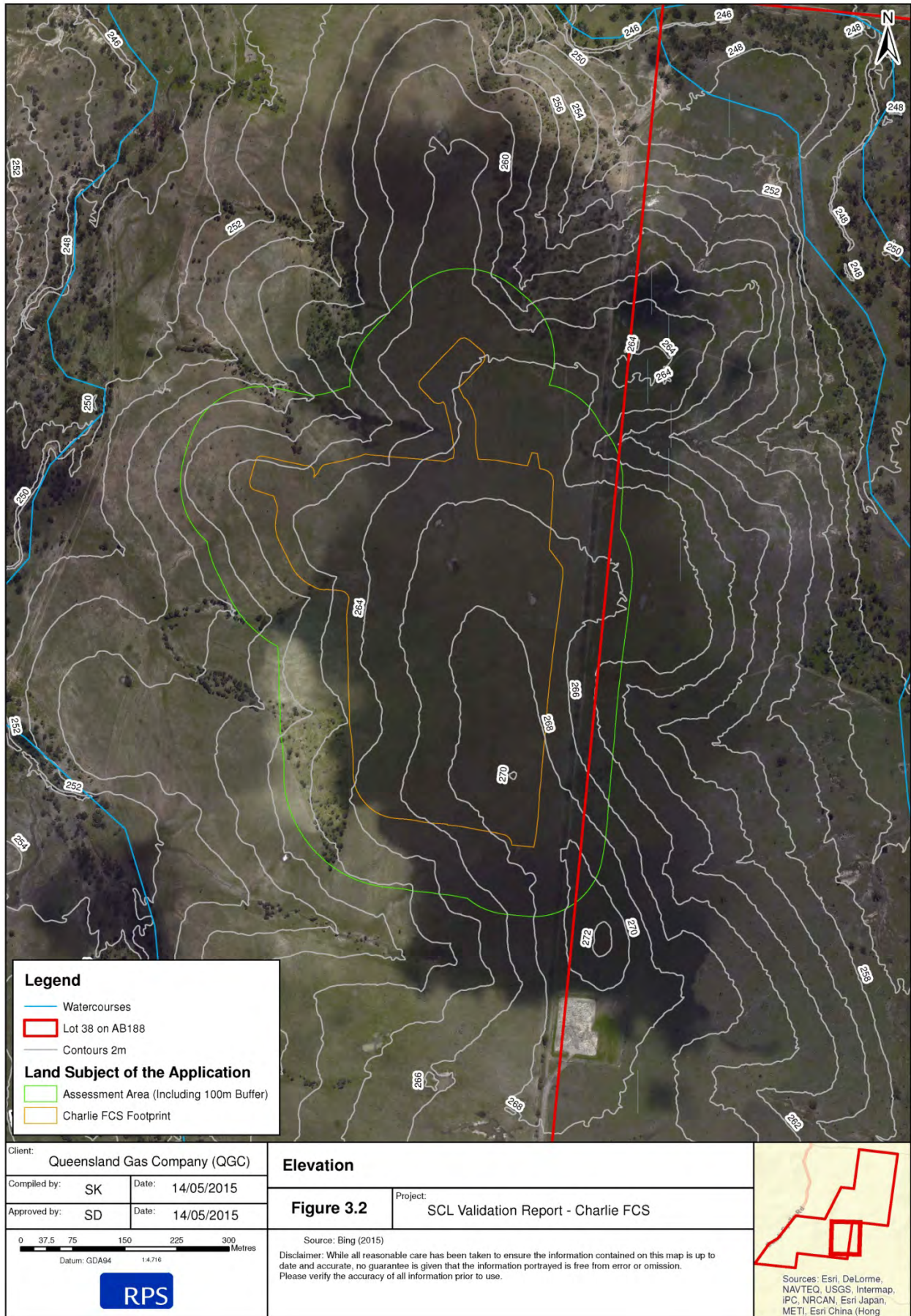


Figure 3.2 Elevation



Figure 3.3 Airborne Gamma Radiation Survey Data

4.0 Field Assessment Results

One (1) soil type was identified within the assessment area, described as a self-mulching Vertosol (SMU 1). A Brief description of the SMU and compliance with the minimum number of observation sites and density requirements for the Western Cropping Zone are provided in **Table 4.1** and **Table 4.2** below. The spatial extent and boundaries of the SMU across the assessment area is shown in **Figure 4.1**.

Table 4.1 Number of Observation Sites for SMU 1

Soil Map Unit	ASC Class	Area (ha)	Site type	Site ID	Sites	Required Sites
SMU 1	Vertosol	114.3 ha (SMU) 42.3 ha (assessment area)	Analysed	CH_AN1 CH_AN2 CH_AN3	3	Equal to or greater than 3
			Detailed	CH_DE3	1	NA
			Check	CH_CH1 CH_CH2 CH_CH3 CH_CH4 CH_CH5 CH_CH6 CH_CH7 CH_CH8 CH_CH9	9	Equal to or greater than 2
Total					13	11
Site Density					3.25ha/site	4 ha/site

Soil and landscape descriptions for each observation site are provided in **Appendix 1**. All relevant analytical data supporting the SCL evaluation are also provided in **Appendix 1**. Laboratory certificates of analysis are provided in **Appendix 2**. A summary of the compliance of analysed and detailed sites is provided in **Table 4.2**.

Table 4.2 Summarised Compliance against SCL Criteria

SMU	Site Type	Site ID	SCL Criteria					SCL Status
			4. Depth	5. Wetness	6. Soil pH	7. Salinity	8. SWS	
SMU 1	Analysed	CH_AN1	Non-Compliant	OK	OK	OK	Non-compliant	Non-compliant
	Analysed	CH_AN2	OK	OK	OK	Non-Compliant	Non-Compliant	Non-compliant
	Analysed	CH_AN3	OK	OK	OK	OK	Non-compliant	Non-compliant
	Detailed	CH_DE3	OK	OK	N/A	N/A	N/A	Compliant

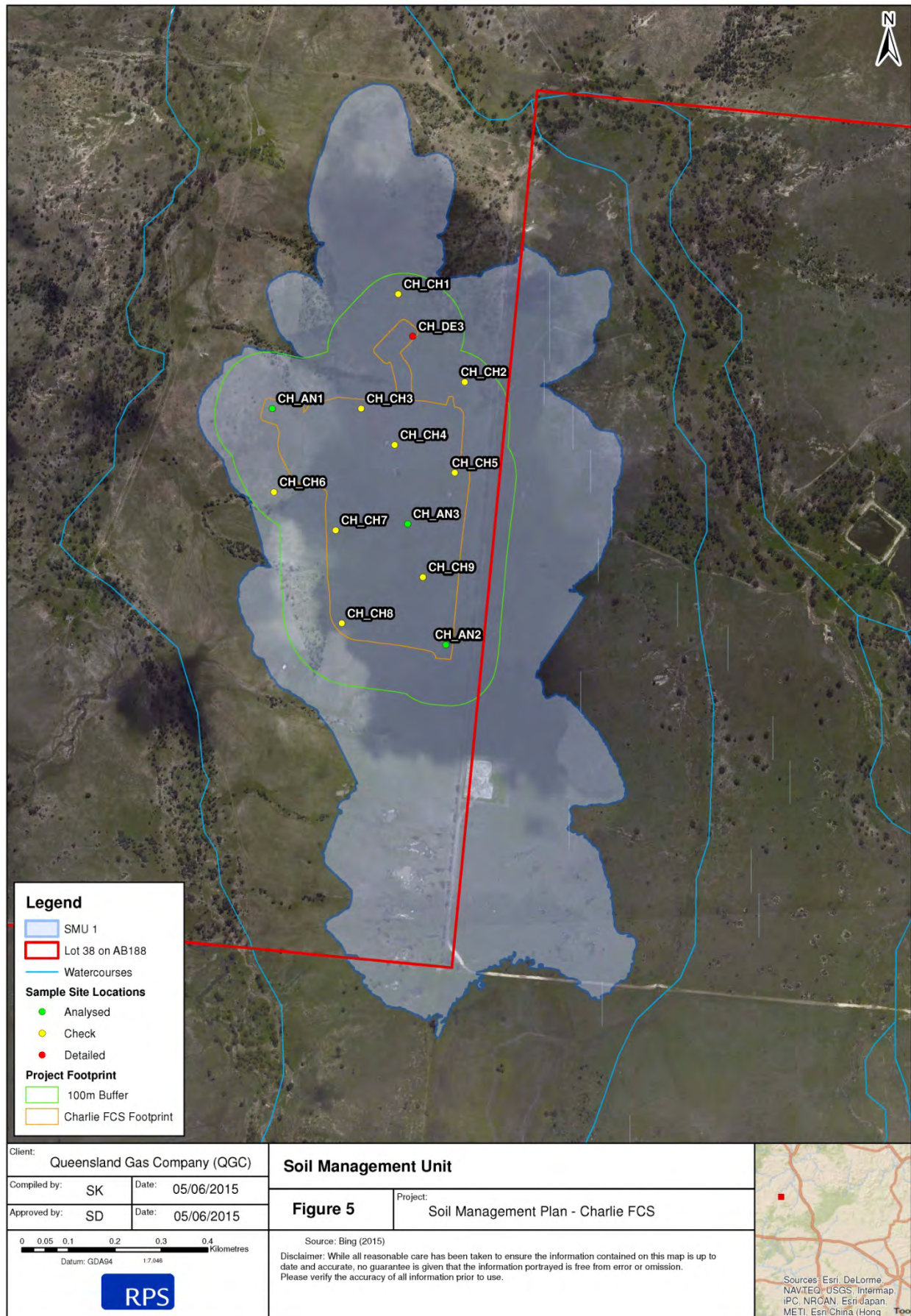


Figure 4.1 Soil Map Units

5.0 Discussion

Soils at the site were characterised by shallow to moderately deep, light to medium textured vertosols, with strongly alkaline, sodic, and saline subsoils and low to moderate soil water storage capacity. Effective rooting depth and hence water storage capacity was sometimes further limited by physiochemical limitations such as elevated chloride concentrations and gravel layers. All analysed sites exhibited soil water storage capacities well below the zonal threshold value (<100mm).

Pursuant to Schedule 3 Part 2 of the RPI Regulations, the assessment area is not SCL as the results of this validation assessment confirmed that the assessment area soils did not satisfy the SCL zonal criteria for the Western Cropping Zone.

6.0 Conclusions and Recommendations

- An RPI SCA criteria assessment was undertaken for the footprint of a proposed Coal Seam Gas Field Compression Station footprint at QGC's Elimatta property located approximately 32km south-west of Wandoan in the Western Downs Regional Council Local Government Area.
- The assessment area is located within the Western Cropping Zone Management Area and is mapped as 'Potential SCL' by the Department of Natural Resources and Mines' (DNRM) SCL trigger mapping.
- One Soil type was identified within the assessment area.
- The soil type failed the SCL zonal criteria due to soil depth (elevated soil chloride concentration) and/or limited soil water storage.
- The assessment of soil properties confirmed that the land at the assessment area failed the SCL Zonal criteria provided at Schedule 3, Part 2 of the RPI Regulation (2014) for the Western Cropping Zone.
- Pursuant to Schedule 3, Part 2 of the RPI Regulations (2014), the assessment area has been determined as non-SCL due to the SCL Zonal criteria for the Western Cropping Zone not being met.

6.1 Recommendations

- It is recommended that the site investigated in this SCL assessment is reclassified by the Department of Natural Resources and Mines (DNRM) as 'Decided non-SCL' on SCL trigger mapping (**Figure 6.1**).

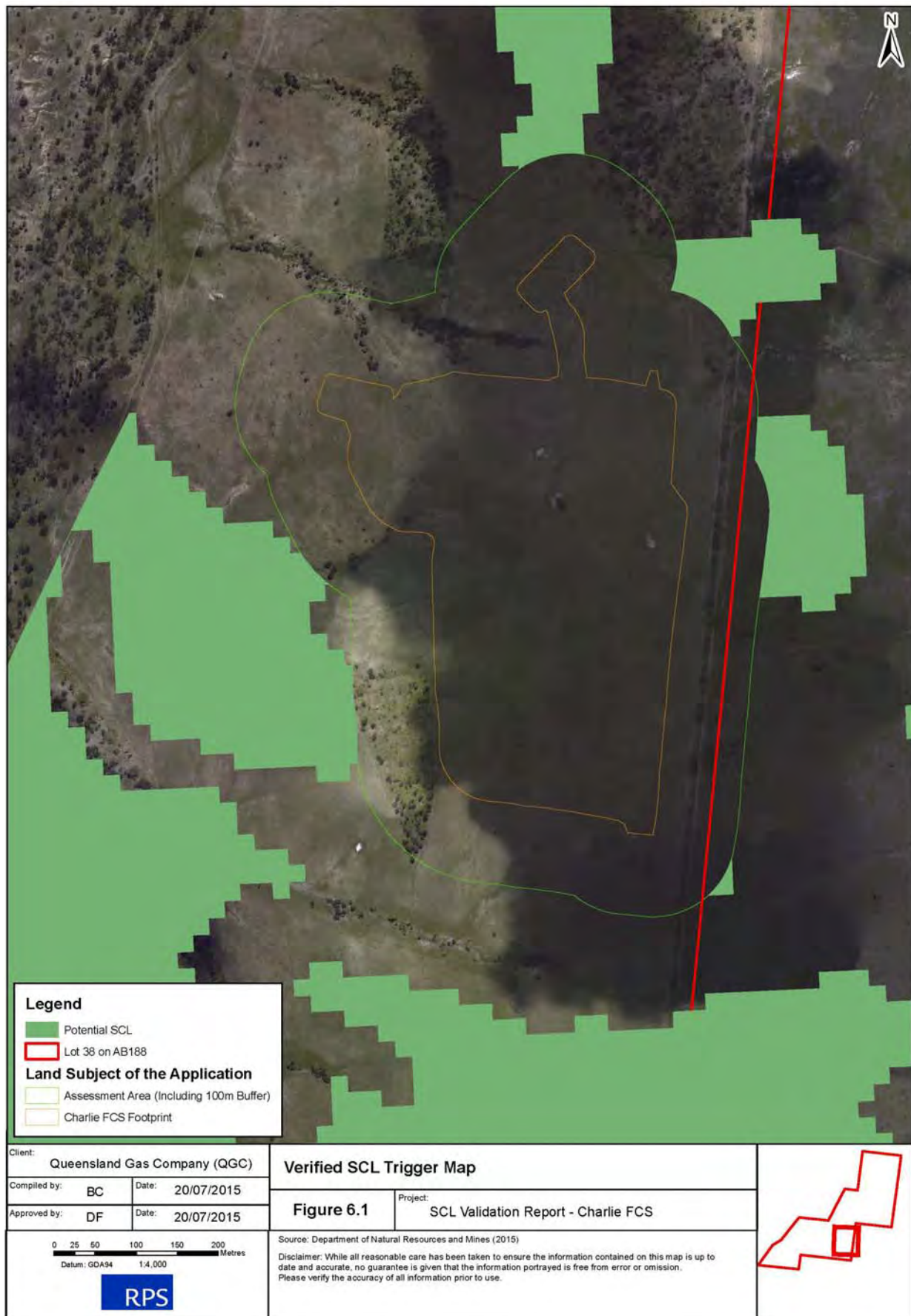


Figure 6.1 Verified SCL Trigger Map

Appendix I

Soil Descriptions

Classification – Vertosol

Analysed Sites

CH_AN1

Soil Profile Description of CH_AN1

CH_AN1		
Site Type		Analysed
Location		Latitude : -26.058796, Longitude : 149.638301 (GDA94 Zone 56)
Described by		Samuel Donald
Date		28 th May 2015
Nature of Exposure		Excavated Trench (Backhoe)
Site Description		
Geology		Injune Creek Group
Landform Pattern		Gently undulating rises
Landform Element		Very gently inclined mid slope
Permeability		Slowly
Microrelief		Nil
Drainage		Imperfectly drained
Slope		2 % (clinometer)
Rock Outcrops		Nil
Surface Coarse Fragments		20 % cover, 2 – 60mm, ironstone, sandstone, petrified wood
Surface Condition		Dry, self mulching, loose, soft, no surface cracks
Land Use / Disturbances		Complete clearing; pasture, native or improved, but never cultivated
Groundcover		90% grass (<i>Cenchrus ciliaris</i>), 5% surface coarse fragments, 5% bare
Classification		
ASC Classification		Brown Vertosol
Soil Map Unit		Soil Map Unit 1 –Self-mulching, Vertosol
Profile Morphology		
Soil Horizon	Depth (mm)	Soil Description
A11	0 – 70	Brown (10YR4/3), light clay, polyhedral with weak grade at 2-5mm, fine cracks (<5mm), weak, dry, many fine roots, moderately well drained, medium small pebbles, abrupt to -
A12	70 – 350	Strong brown (7.5YR4/6), medium heavy clay, sub-angular blocky with strong grade at 10-20mm, fine cracks (<5mm), strong, moderately moist, many fine roots, imperfectly drained, medium small pebbles, clear to -
B2	350 – 500	Dark yellowish brown (10YR4/4), medium heavy clay, sub-angular blocky with very strong grade at 10-20mm, very strong, moderately moist, few fine roots, imperfectly drained, many fine distinct red (2.5YR4/8) mottles, few strong calcareous nodules (<2mm),abundant medium to large pebbles (ironstone), gradual to -
C	500 – 1200	Yellow (10YR7/6), clay loam sandy, massive, firm, moderately moist, few fine roots, abundant coarse gravel (suspended sandstone parent material), very many strong calcareous fine nodules (<2mm) and coarse soft segregations (6-20mm) many weak ghost rock sandstone segregations (10-100mm).

CH_AN1



North



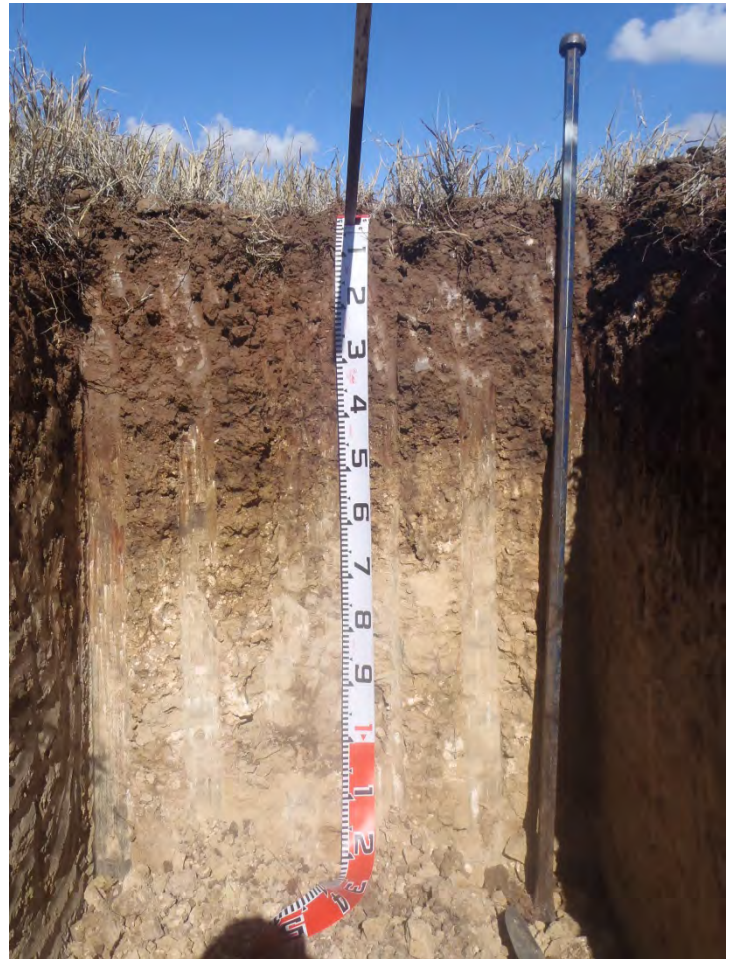
South



West



East



Assessment of Criterion 4 and 5

Criterion	Threshold Assessed	Assessment Method	Result	Compliance Status
Soil Depth (4)	Equal to or greater than 600 mm	Excavated trench (backhoe)	Weathered rock encountered from 500mm	Non-Compliant
Soil Wetness (5)	Has favourable drainage (no waterlogged layer within 1000mm of the surface)	Dominant soil colour and mottle colour	No waterlogged layer encountered	Compliant

Assessment of Criterion 6, 7 and 8

Parameter	Units	Threshold	Map Unit 1 (Grey Vertosol)								
Site ID			CH_AN1								
Soil	Rigid / Non-rigid		Non rigid								
Horizon			A11	A12		B2	C				
Laboratory ID			CH_AN1_0-70	CH_AN1_70-200	CH_AN1_200-350	CH_AN1_350-500	CH_AN1_500-700	CH_AN1_700-1000	CH_AN1_1000-1200	CH_AN1_300	CH_AN1_600
Upper Layer Interval	mm		0	70	200	350	500	700	1000	300	600
Lower Layer Interval	mm		70	200	350	500	700	1000	1200		
pH _{1:5} (water)		>5.0	6.73	6.08	6.41	8.48	8.97	9.16	9.29	6.51	8.87
Chloride	mg/kg	800	9	8	4	5	19	14	16	7	15
EC _{1:5}	dS/m	<0.56	0.07	0.04	0.04	0.15	0.14	0.12	0.13	N/A	N/A
CEC	cmol+/kg		11.3	28.3	28	35.5	35.4	35	29.1	N/A	N/A
Exchangeable Ca	cmol+/kg		7.33	21.6	21.3	30.4	29.5	29	23.6	N/A	N/A
Exchangeable Mg	cmol+/kg		2.66	5.68	5.60	4.21	4.72	4.80	4.27	N/A	N/A
Exchangeable Na	cmol+/kg		0.14	0.73	0.75	0.68	0.99	1.04	1.12	N/A	N/A
ESP	%		1.3	2.6	2.7	1.9	2.8	3	3.8	N/A	N/A
Ca : Mg			2.75	3.80	3.81	7.23	6.24	6.04	5.53	N/A	N/A
Sand	%		60	63	67	52	69	79	82	N/A	N/A
Silt	%		4	3	1	5	9	11	10	N/A	N/A
Clay	%		7	29	27	18	21	10	8	N/A	N/A
Soil Texture			Loamy Sand	Sandy Clay Loam	Sandy Clay Loam	Sandy Loam	Sandy Clay Loam	Sandy Loam	Loamy Sand	N/A	N/A
Look-up table SWS	mm / 100 mm		4	6	6	5	6	5	4	N/A	N/A
Effective Rooting Depth	mm		1000mm								
Total SWS	mm	>100	53								
Criterion 6 compliance	Compliant										
Criterion 7 compliance	Compliant										
Criterion 8 compliance	Non-compliant										

Applicable to rigid soils only

CH_AN2

Soil Profile Description of CH_AN2

CH_AN2		
Site Type		Analysed
Location		Latitude : -26.06347, Longitude : 149.641911 (GDA94 – Zone 56)
Described by		Samuel Donald
Date		28 th May 2015
Nature of Exposure		Excavated Trench (Backhoe)
Site Description		
Geology		Injune Creek Group
Landform Pattern		Gently undulating rises
Landform Element		Very gently inclined upper slope
Permeability		Slowly
Microrelief		Single melonhole depression (approx 0.5m) located approximately 30 m south-west
Drainage		Imperfectly drained
Slope		1-2 % (clinometer)
Rock Outcrops		Nil
Surface Coarse Fragments		20 % cover, 2 – 60mm, ironstone, sandstone, petrified wood
Surface Condition		Dry, self mulching, thin surface crust (2-5mm), 10 % surface cracks <5mm
Land Use / Disturbances		Complete clearing; pasture, native or improved, but never cultivated
Groundcover		90% grass (<i>Cenchrus ciliaris</i>), 5% surface coarse fragments, 5% bare
Classification		
ASC Classification		Grey Vertosol
Soil Map Unit		Soil Map Unit 1 –Self-mulching, Vertosol
Profile Morphology		
Soil Horizon	Depth (mm)	Soil Description
A11	0 – 120	Very dark grey (10YR3/1), light medium clay, polyhedral with moderate grade at 2-5mm, fine cracks (<5mm), weak, dry, many fine roots, imperfectly drained, moderately fine to medium pebbles, abrupt to -
A12	120 – 250	Very dark grey (10YR3/1), medium clay, sub-angular blocky with strong grade at 5-20mm, strong, moderately moist, many fine roots, imperfectly drained, few fine to medium pebbles, clear to -
B2	250 – 600	Dark grey (10YR4/1), medium heavy clay, sub-angular blocky with strong grade at 10-20mm, very strong, moderately moist, many fine roots, imperfectly drained, common fine distinct red (2.5YR4/8) mottles, very many strong calcareous nodules (<2mm), few fine to medium pebbles, clear to -
B3	600 – 900	Brown (10YR5/3), light clay, massive, very strong, moderately moist, many strong calcareous nodules (<2mm), few fine to medium pebbles, common weak ghost rock sandstone segregations (10-100mm), gradual to -
BC	900 – 1200	Yellow (10YR7/6), clay loam sandy, massive, very strong, moderately moist, many strong calcareous nodules (<2mm), few fine to medium pebbles, many weak ghost rock sandstone segregations (10-100mm).

CH_AN2



South



West



East



North



Assessment of Criterion 4 and 5

Criterion	Threshold Assessed	Assessment Method	Result	Compliance Status
Soil Depth (4)	Equal to or greater than 600 mm	Excavated trench (backhoe)	Presence of 'ghost rock' from 600mm	Compliant
Soil Wetness (5)	Has favourable drainage (no waterlogged layer within 1000mm of the surface)	Dominant soil colour and mottle colour	No waterlogged layer encountered	Compliant

Assessment of Criterion 6, 7 and 8

Parameter	Units	Threshold	Map Unit 1 (Grey Vertosol)							
Site ID			CH_AN2							
Soil	Rigid / Non-rigid		Non rigid							
Horizon			A11	A12	B21		B3	BC		
Laboratory ID			CH_AN2_0-120	CH_AN2_120-250	CH_AN2_250-450	CH-AN2_450-600	CH_AN2_600-900	CH_AN2_900-1200	CH_AN2_300	CH_AN2_600
Upper Layer Interval	mm		0	120	250	450	600	900	300	600
Lower Layer Interval	mm		120	250	450	600	900	1200		
pH _{1:5} (water)		>5.0	6.89	8.95	9.17	9.08	7.57	5.52	9.05	8.69
Chloride	mg/kg	800	34	23	136	837	1375	1155	188	1124
EC _{1:5}	dS/m		0.14	0.25	0.32	0.76	1.01	0.76	N/A	N/A
CEC	cmol+/kg		37.3	55.9	56.6	52.6	44.3	36.2	N/A	N/A
Exchangeable Ca	cmol+/kg		27.5	42.6	39.1	29.9	19.6	14.2	N/A	N/A
Exchangeable Mg	cmol+/kg		7.11	8.87	10	9.88	9.59	8.38	N/A	N/A
Exchangeable Na	cmol+/kg		0.16	4.16	7.17	12.6	14.9	13.5	N/A	N/A
ESP	%		0.4	7.4	12.7	23.9	33.7	37.3	N/A	N/A
Ca : Mg			3.87	4.80	3.91	3.03	2.04	1.70	N/A	N/A
Sand	%		63	62	71	69	64	74	N/A	N/A
Silt	%		8	1	5	5	9	9	N/A	N/A
Clay	%		17	34	16	20	27	15	N/A	N/A
Soil Texture			Sandy Loam	Sandy Clay	Sandy Clay Loam	Sandy Clay Loam	Clay Loam	Sandy Loam	N/A	N/A
Look-up table SWS	mm / 100 mm		5	4	6	6	8	5	N/A	N/A
Effective Rooting Depth	mm		450							
Total SWS	mm	>100	21							
Criterion 6 compliance	Compliant									
Criterion 7 compliance	Non-Compliant									
Criterion 8 compliance	Non-compliant									

Applicable to rigid soils only

CH_AN3

Soil Profile Description of CH_AN3

CH_AN3		
Site Type		Analysed
Location		Latitude : -26.061104, Longitude : 149.641157 (GDA94 Zone 56)
Described by		Samuel Donald
Date		28 th May 2015
Nature of Exposure		Excavated Trench (Backhoe)
Site Description		
Geology		Injune Creek Group
Landform Pattern		Gently undulating rises
Landform Element		Very gently inclined upper slope
Permeability		Slowly
Microrelief		Nil
Drainage		Imperfectly drained
Slope		<1 % (clinometer)
Rock Outcrops		Nil
Surface Coarse Fragments		20-30 % cover, 2 – 200mm, ironstone, sandstone, petrified wood
Surface Condition		Dry, self mulching, thin surface crust (2-5mm), 10 % surface cracks <5mm
Land Use / Disturbances		Complete clearing; pasture, native or improved, but never cultivated
Groundcover		90% grass (<i>Cenchrus ciliaris</i>), 5% surface coarse fragments, 5% bare
Classification		
ASC Classification		Grey Vertosol
Soil Map Unit		Soil Map Unit 1 –Self-mulching Vertosol
Profile Morphology		
Soil Horizon	Depth (mm)	Soil Description
A11	0 – 110	Very dark grey (10YR3/1), light clay, polyhedral with weak at 2-5mm, fine cracks (<5mm), weak, dry, many fine roots, moderately well drained, common small to medium pebbles, abrupt to -
A12	110 – 300	Very dark grey (10YR3/1), light medium clay, sub-angular blocky with strong grade at 10-20mm, fine cracks (<5mm), strong, moderately moist, many fine roots, imperfectly drained, very few distinct red (2.5YR4/6) mottles, few strong calcareous nodules (<2mm), few small to medium pebbles, clear to -
B21	300 – 500	Very dark grey (10YR3/1), medium clay, sub-angular blocky with strong grade at 10-20mm, fine cracks (<5mm), very strong, moderately moist, common fine roots, imperfectly drained, common fine prominent red (2.5YR4/6) mottles, many strong calcareous nodules (<2mm), few small to medium pebbles, clear to -
B22	500 – 700	Dark grey (10YR4/1), medium heavy clay, sub-angular blocky with strong grade at 10-20mm, fine cracks (<5mm), very strong, moderately moist, common fine roots, imperfectly drained, very few fine prominent dark red (2.5YR3/6) mottles, many strong calcareous nodules (<2mm), few small to medium pebbles, gradual to -
BC	700 – 1200	Pale brown (2.5Y7/6), sandy clay loam, massive, firm, moderately moist, many weak calcareous nodules (2-10mm), common weak ghost rock sandstone segregations (10-100mm)

CH_AN3



East



North



South



West



Assessment of Criterion 4 and 5

Criterion	Threshold Assessed	Assessment Method	Result	Compliance Status
Soil Depth (4)	Equal to or greater than 600 mm	Excavated trench (backhoe)	Weathered rock encountered from 700mm	Compliant
Soil Wetness (5)	Has favourable drainage (no waterlogged layer within 1000mm of the surface)	Dominant soil colour and mottle colour	No waterlogged layer encountered	Compliant

Assessment of Criterion 6, 7 and 8

Parameter	Units	Threshold	Map Unit 1 (Grey Vertosol)							
Site ID			CH_AN3							
Soil	Rigid / Non-rigid		Non rigid							
Horizon			A11	A12	B21	B22	BC			
Laboratory ID			CH_AN3_0-110	CH_AN3_100-300	CH_AN3_300-500	CH_AN3_500-700	CH_AN3_700-1000	CH_AN3_1000-1200	CH_AN3_300	CH_AN3_600
Upper Layer Interval	mm		0	110	300	500	700	700	300	600
Lower Layer Interval	mm		110	300	500	700	1200	1200		
pH _{1.5} (water)		>5.0, <9.0	6.87	8.57	9.23	9.29	9.49	7.12	8.91	9.35
Chloride	mg/kg	800	11	19	159	354	466	991	53	340
EC _{1.5}	dS/m	<0.56	0.10	0.12	0.31	0.46	0.47	0.69	N/A	N/A
CEC	cmol+/kg		23.8	26.8	43.4	40.5	25.1	31.7	N/A	N/A
Exchangeable Ca	cmol+/kg		17	20.8	32	27.3	13.1	13.7	N/A	N/A
Exchangeable Mg	cmol+/kg		4.49	3.40	5.66	5.68	4.27	5.32	N/A	N/A
Exchangeable Na	cmol+/kg		0.29	2.40	5.45	7.28	7.75	12.6	N/A	N/A
ESP	%		1.2	8.9	12.6	18	30.8	39.7	N/A	N/A
Ca : Mg			3.79	6.12	5.66	4.81	3.06	2.58	N/A	N/A
Sand	%		66	71	48	56	85	77	N/A	N/A
Silt	%		8	5	11	9	7	10	N/A	N/A
Clay	%		13	22	37	31	8	13	N/A	N/A
Soil Texture			Sandy Clay Loam	Sandy Clay Loam	Clay	Clay Loam	Loamy Sand	Sandy Loam	N/A	N/A
Look-up table SWS	mm / 100 mm		6	6	10	8	4	5	N/A	N/A
Effective Rooting Depth	mm		1000							
Total SWS	mm	>100	66							
Criterion 6 compliance			Compliant							
Criterion 7 compliance			Compliant							
Criterion 8 compliance			Non-compliant							

Applicable to rigid soils only

Detailed Sites**CH_DE3****Soil Profile Description of CH_DE3**

CH_DE3		
Site Type		Analysed
Location		Latitude : -26.057463, Longitude : 149.64137 (GDA94 Zone 56)
Described by		Samuel Donald
Date		28 th May 2015
Nature of Exposure		Excavated Trench (Backhoe)
Site Description		
Geology		Injune Creek Group
Landform Pattern		Gently undulating rises
Landform Element		Very gently inclined upper slope
Permeability		Slowly
Microrelief		Nil
Drainage		Imperfectly drained
Slope		<1 % (clinometer)
Rock Outcrops		Nil
Surface Coarse Fragments		20 % cover, 2 – 60mm, ironstone, sandstone, petrified wood
Surface Condition		Dry, self mulching, thin surface crust (2-5mm), 20 % surface cracks <5mm, some surface cracks 5-10mm
Land Use / Disturbances		Complete clearing; pasture, native or improved, but never cultivated
Groundcover		70% grass (<i>Cenchrus ciliaris</i>), 5% surface coarse fragments, 25% bare
Classification		
ASC Classification		Grey Vertosol
Soil Map Unit		Soil Map Unit 1 –Self-mulching, Vertosol
Profile Morphology		
Soil Horizon	Depth (mm)	Soil Description
A11	0 – 100	Very dark greyish brown (10YR3/2), light clay, polyhedral with weak at 2-5mm, fine cracks (<5mm), weak, dry, many fine roots, moderately well drained, common small to medium pebbles, clear to -
A12	100 – 300	Very dark grey (10YR3/1), medium clay, sub-angular blocky with strong grade at 10-20mm, fine cracks (<5mm), strong, moderately moist, many fine roots, imperfectly drained, very few distinct red (2.5YR4/6) mottles, few small to medium pebbles, clear to -
B21	300 – 450	Very dark grey (10YR3/1), medium clay, sub-angular blocky with strong grade at 20-50mm, fine cracks (<5mm), very strong, moderately moist, common fine roots, imperfectly drained, common fine prominent red (2.5YR4/6) mottles, many strong calcareous nodules (<2mm), common fine to medium pebbles, clear to -
B22	450 – 700	Dark brown (10YR3/3), light clay, sub-angular blocky with strong grade at 20-50mm, fine cracks (<5mm), very strong, moderately moist, common fine roots, imperfectly drained, common fine prominent red (2.5YR3/6) mottles, many weak calcareous soft segregations (2-6mm), many small to medium pebbles, gradual to -
B3	700 – 1000	Pale brown (2.5Y7/6), sandy clay loam, massive, firm, moderately moist, many weak calcareous soft segregations (2-6mm), many small to medium pebbles, gradual to -
BC	1000-1200	Yellowish brown (10YR5/8), sandy clay loam, massive, firm, moderately moist, many large pebbles, many weak calcareous segregations (2-6mm), common weak ghost rock sandstone segregations (10-100mm)

CH_DE3



North



South



West



East




Assessment of Criterion 4 and 5

Criterion	Threshold Assessed	Assessment Method	Result	Compliance Status
Soil Depth (4)	Equal to or greater than 600 mm	Excavated trench (backhoe)	Weathered rock encountered from 700mm	Compliant
Soil Wetness (5)	Has favourable drainage (no waterlogged layer within 1000mm of the surface)	Dominant soil colour and mottle colour	No waterlogged layer encountered	Compliant

Check Sites

Unique ID	Location	Confirming Attributes	Photo Evidence
CH-CH1	Latitude: -26.056632 Longitude: 149.641083 GDA94 Zone 56	<ul style="list-style-type: none"> Surface soil is self mulching with easily disturbed small aggregates Large, well structured aggregates at depth with high clay content Greyish brown to dark grey colour Complete clearing with improved pasture <20% surface coarse fragments 2-100mm 	
CH-CH2	Latitude: -26.058377 Longitude: 149.642462 GDA94 Zone 56	<ul style="list-style-type: none"> Surface soil is self mulching with easily disturbed small aggregates Large, well structured aggregates at depth with high clay content Greyish brown to dark grey colour Complete clearing with improved pasture 	
CH-CH3	Latitude: -26.058839 Longitude: 149.640219 GDA94 Zone 56	<ul style="list-style-type: none"> Surface soil is self mulching with easily disturbed small aggregates Large, well structured aggregates at depth with high clay content Greyish brown to dark grey colour Complete clearing with improved pasture 	

Unique ID	Location	Confirming Attributes	Photo Evidence
CH_CH4	Latitude: -26.059562 Longitude: 149.640922 GDA94 Zone 56	<ul style="list-style-type: none"> Surface soil is self mulching with easily disturbed small aggregates Large, well structured aggregates at depth with high clay content Greyish brown to dark grey colour Complete clearing with improved pasture Melonhole depression approximately 30 m west. <20% surface coarse fragments 2-100mm 	
CH_CH5	Latitude: -26.060135 Longitude: 149.642199 GDA94 Zone 56	<ul style="list-style-type: none"> Surface soil is self mulching with easily disturbed small aggregates Large, well structured aggregates at depth with high clay content Greyish brown to dark grey colour Complete clearing with improved pasture 	
CH_CH6	Latitude: -26.060421 Longitude: 149.638293 GDA94 Zone 56	<ul style="list-style-type: none"> Surface soil is self mulching with easily disturbed small aggregates Well structured aggregates at depth with high clay content Brown to greyish brown colour Complete clearing with improved pasture Reflects the weaker structured A11 horizon of CH_AN1 	

Unique ID	Location	Confirming Attributes	Photo Evidence
CH_CH7	Latitude: -26.061193 Longitude: 149.639601 GDA94 Zone 56	<ul style="list-style-type: none"> Surface soil is self mulching with easily disturbed small aggregates Well structured aggregates at depth with high clay content Greyish brown to dark grey colour Complete clearing with improved pasture <20% surface coarse fragments 2-100mm 	
CH_CH8	Latitude: -26.063005 Longitude: 149.639679 GDA94 Zone 56	<ul style="list-style-type: none"> Surface soil is self mulching with easily disturbed small aggregates Well structured aggregates at depth with high clay content Dark grey to dark greyish brown colour Complete clearing with improved pasture 	
CH_CH9	Latitude: -26.062148 Longitude: 149.641456 GDA94 Zone 56	<ul style="list-style-type: none"> Surface soil is self mulching with easily disturbed small aggregates Well structured aggregates at depth with high clay content Dark grey to dark greyish brown colour Complete clearing with improved pasture <20% surface coarse fragments 2-100mm 	

Appendix 2

Laboratory Analytical Certificates

Laboratory Results Matrix

Soil Type	Site number	Map reference	Laboratory batch	Batch sample numbers
Self-mulching, Vertosol	AN1		BA007194	001 - 009
Self-mulching, Vertosol	AN2		BA007194	010-017
Self-mulching, Vertosol	AN3		BA007194	017 - 025



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BA007194

Client:

RPS AUSTRALIA EAST PTY LTD

PO BOX 1559

FORTITUDE VALLEY QLD 4006

Order Number:

PR111136-68

Report Date:

22-June-2015

Received Date:

03-June-2015

Page 1/16

Analysis	Unit	BA007194.001 CH_AN1_0-70 Soil	BA007194.002 CH_AN1_70-200 Soil	BA007194.003 CH_AN1_200-350 Soil	BA007194.004 CH_AN1_350_500 Soil
ACIDITY					
pH - Water	pH units	6.73	6.08	6.41	8.48
pH - CaCl2	pH units	5.98	4.96	5.27	7.65
MAJOR ELEMENTS					
Nitrate Nitrogen	mg/kg	3	<1	<1	<1
Phosphorus - Colwell extr	mg/kg	21	<1	1	2
Potassium	mg/kg	464	128	123	77
Nitrogen	mg/kg	1410	1000	888	708
Ammonium Nitrogen	mg/kg	2.0	1.5	1.0	0.65
SECONDARY ELEMENTS					
Sulphur - KCl	mg/kg	2.4	3.4	3.5	3.8
Potassium - Colwell ext	mg/kg	751	130	122	87
Calcium	mg/kg	1470	4310	4270	6090
Magnesium	mg/kg	320	682	672	505
Calcium Carbonate	%	4.0	3.5	4.0	5.4
TRACE ELEMENTS					
Zinc	mg/kg	1.0	<0.1	<0.1	<0.1
Copper	mg/kg	0.3	0.1	<0.1	<0.1
Iron	mg/kg	13	31	24	6
Manganese	mg/kg	19	2	8	1
Boron	mg/kg	0.4	0.8	0.8	0.8
ORGANIC MATTER					
Organic Carbon	%	1.2	0.5	0.4	0.4
SALINITY					
Electrical Conductivity	dS/m	0.07	0.04	0.04	0.15
Chloride	mg/kg	9	8	4	5
Sodium	mg/kg	33	167	173	157
EXCHANGEABLE CATIONS					
Cation Exchange	meq/100g	11.3	28.3	28.0	35.5
Exchangeable Sodium	meq/100g	0.14	0.73	0.75	0.68
Exchangeable Sodium Percent	%	1.3	2.6	2.7	1.9
Exchangeable Potassium	meq/100g	1.19	0.33	0.31	0.20
Exchangeable Potassium Percent	%	10.5	1.2	1.1	0.6
Exchangeable Calcium	meq/100g	7.33	21.6	21.3	30.4
Exchangeable Calcium Percent	%	64.7	76.2	76.2	85.7
Exchangeable Magnesium	meq/100g	2.66	5.68	5.60	4.21
Exchangeable Magnesium Percent	%	23.5	20.1	20.0	11.8
Exchangeable Aluminium	meq/100g	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Exchangeable Aluminium Percent	%	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Calcium/Magnesium Ratio		2.75	3.80	3.81	7.23
OTHER					
Phosphorus Buffer Index		36.9	91.3	81.4	142.3
Soil Texture		FSL	SC	SC	SCL



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Page 2/16

Analysis	Unit	BA007194.001 CH_AN1_0-70 Soil	BA007194.002 CH_AN1_70-200 Soil	BA007194.003 CH_AN1_200-350 Soil	BA007194.004 CH_AN1_350-500 Soil
Dispersion Index		9	9	10	9
Colour		10YR 3/3	10YR 3/5	10YR 3/5	10YR 3/3
PHYSICAL TESTS					
Gravel	%	29	5	4	26
Coarse Sand	%	29	27	20	32
Fine Sand	%	31	36	47	20
Silt	%	4	3	1	5
Clay	%	7	29	27	18
Emerson Aggregate Test		2(1)	2(1)	2(1)	2(1)



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Page 3/16

Analysis	Unit	BA007194.005 CH_AN1_500-700 Soil	BA007194.006 CH_AN1_700-1000 Soil	BA007194.007 CH_AN1_1000-1200 Soil	BA007194.008 CH_AN1_300 Soil
ACIDITY					
pH - Water	pH units	8.97	9.16	9.29	6.51
pH - CaCl2	pH units	8.04	8.20	8.36	-
MAJOR ELEMENTS					
Nitrate Nitrogen	mg/kg	<1	<1	<1	-
Phosphorus - Colwell extr	mg/kg	<1	<1	<1	-
Potassium	mg/kg	72	65	51	-
Nitrogen	mg/kg	550	464	431	-
Ammonium Nitrogen	mg/kg	0.50	0.95	0.85	-
SECONDARY ELEMENTS					
Sulphur - KCl	mg/kg	3.2	3.0	2.8	-
Potassium - Colwell ext	mg/kg	111	87	96	-
Calcium	mg/kg	5890	5800	4720	-
Magnesium	mg/kg	566	576	512	-
Calcium Carbonate	%	4.9	4.9	3.0	-
TRACE ELEMENTS					
Zinc	mg/kg	<0.1	<0.1	<0.1	-
Copper	mg/kg	<0.1	<0.1	<0.1	-
Iron	mg/kg	3	3	2	-
Manganese	mg/kg	<1	<1	<1	-
Boron	mg/kg	0.4	0.4	0.2	-
ORGANIC MATTER					
Organic Carbon	%	<0.3	<0.3	<0.3	-
SALINITY					
Electrical Conductivity	dS/m	0.14	0.12	0.13	-
Chloride	mg/kg	19	14	16	7
Sodium	mg/kg	228	238	257	-
EXCHANGEABLE CATIONS					
Cation Exchange	meq/100g	35.4	35.0	29.1	-
Exchangeable Sodium	meq/100g	0.99	1.04	1.12	-
Exchangeable Sodium Percent	%	2.8	3.0	3.8	-
Exchangeable Potassium	meq/100g	0.18	0.17	0.13	-
Exchangeable Potassium Percent	%	0.5	0.5	0.5	-
Exchangeable Calcium	meq/100g	29.5	29.0	23.6	-
Exchangeable Calcium Percent	%	83.3	82.9	81.0	-
Exchangeable Magnesium	meq/100g	4.72	4.80	4.27	-
Exchangeable Magnesium Percent	%	13.3	13.7	14.7	-
Exchangeable Aluminium	meq/100g	Not Applicable	Not Applicable	Not Applicable	-
Exchangeable Aluminium Percent	%	Not Applicable	Not Applicable	Not Applicable	-
Calcium/Magnesium Ratio		6.24	6.04	5.53	-
OTHER					
Phosphorus Buffer Index		60.8	80.7	52.4	-
Soil Texture		SC	FSCL	SCL	-
Dispersion Index		9	9	9	-
Colour		10YR 4/5	10YR 6/5	2.5Y 6/4	-
PHYSICAL TESTS					
Gravel	%	1	<1	<1	-
Coarse Sand	%	40	47	51	-
Fine Sand	%	29	32	31	-



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Page 4/16

Analysis	Unit	BA007194.005 CH_AN1_500-700 Soil	BA007194.006 CH_AN1_700-1000 Soil	BA007194.007 CH_AN1_1000-1200 Soil	BA007194.008 CH_AN1_300 Soil
Silt	%	9	11	10	-
Clay	%	21	10	8	-
Emerson Aggregate Test		2(1)	2(1)	2(1)	-



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Page 5/16

Analysis	Unit	BA007194.009 CH_AN1_600 Soil	BA007194.010 CH_AN2_0-120 Soil	BA007194.011 CH_AN2_120-250 Soil	BA007194.012 CH_AN2_250-450 Soil
ACIDITY					
pH - Water	pH units	8.87	6.89	8.95	9.17
pH - CaCl ₂	pH units	-	6.21	7.90	8.14
MAJOR ELEMENTS					
Nitrate Nitrogen	mg/kg	-	16	<1	<1
Phosphorus - Colwell extr	mg/kg	-	53	2	1
Potassium	mg/kg	-	1010	114	99
Nitrogen	mg/kg	-	3580	1950	1680
Ammonium Nitrogen	mg/kg	-	7.0	2.0	1.5
SECONDARY ELEMENTS					
Sulphur - KCl	mg/kg	-	4.2	3.6	3.5
Potassium - Colwell ext	mg/kg	-	1412	124	94
Calcium	mg/kg	-	5490	8520	7830
Magnesium	mg/kg	-	853	1060	1200
Calcium Carbonate	%	-	5.4	10.4	12.8
TRACE ELEMENTS					
Zinc	mg/kg	-	1.2	0.2	0.1
Copper	mg/kg	-	0.5	0.3	0.1
Iron	mg/kg	-	19	11	8
Manganese	mg/kg	-	28	4	3
Boron	mg/kg	-	1.2	1.6	1.4
ORGANIC MATTER					
Organic Carbon	%	-	3.2	1.6	1.2
SALINITY					
Electrical Conductivity	dS/m	-	0.14	0.25	0.32
Chloride	mg/kg	15	34	23	136
Sodium	mg/kg	-	37	957	1650
EXCHANGEABLE CATIONS					
Cation Exchange	meq/100g	-	37.3	55.9	56.6
Exchangeable Sodium	meq/100g	-	0.16	4.16	7.17
Exchangeable Sodium Percent	%	-	0.4	7.4	12.7
Exchangeable Potassium	meq/100g	-	2.60	0.29	0.25
Exchangeable Potassium Percent	%	-	7.0	0.5	0.4
Exchangeable Calcium	meq/100g	-	27.5	42.6	39.1
Exchangeable Calcium Percent	%	-	73.6	76.2	69.2
Exchangeable Magnesium	meq/100g	-	7.11	8.87	10.0
Exchangeable Magnesium Percent	%	-	19.0	15.9	17.7
Exchangeable Aluminium	meq/100g	-	Not Applicable	Not Applicable	Not Applicable
Exchangeable Aluminium Percent	%	-	Not Applicable	Not Applicable	Not Applicable
Calcium/Magnesium Ratio		-	3.87	4.80	3.91
OTHER					
Phosphorus Buffer Index		-	65.7	110.0	105.6
Soil Texture		-	CL	SC	SC
Dispersion Index		-	9	10	11
Colour		-	10YR 2/1	10YR 2/1	2.5Y 3/1
PHYSICAL TESTS					
Gravel	%	-	12	3	7
Coarse Sand	%	-	23	14	12
Fine Sand	%	-	40	48	59



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Page 6/16

Analysis	Unit	BA007194.009 CH_AN1_600 Soil	BA007194.010 CH_AN2_0-120 Soil	BA007194.011 CH_AN2_120-250 Soil	BA007194.012 CH_AN2_250-450 Soil
Silt	%	-	8	1	5
Clay	%	-	17	34	16
Emerson Aggregate Test		-	2(1)	2(1)	2(2)



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Page 7/16

Analysis	Unit	BA007194.013 CH_AN2_450-600 Soil	BA007194.014 CH_AN2_600-900 Soil	BA007194.015 CH_AN2_900-1200 Soil	BA007194.016 CH_AN2_300 Soil
ACIDITY					
pH - Water	pH units	9.08	7.57	5.52	9.05
pH - CaCl2	pH units	8.27	6.93	4.77	-
MAJOR ELEMENTS					
Nitrate Nitrogen	mg/kg	<1	<1	2	-
Phosphorus - Colwell extr	mg/kg	1	<1	<1	-
Potassium	mg/kg	81	76	30	-
Nitrogen	mg/kg	1080	739	629	-
Ammonium Nitrogen	mg/kg	1.0	2.5	3.5	-
SECONDARY ELEMENTS					
Sulphur - KCl	mg/kg	4.9	4.1	1.8	-
Potassium - Colwell ext	mg/kg	76	111	63	-
Calcium	mg/kg	5980	3920	2850	-
Magnesium	mg/kg	1190	1150	1010	-
Calcium Carbonate	%	7.9	3.5	3.0	-
TRACE ELEMENTS					
Zinc	mg/kg	0.1	<0.1	<0.1	-
Copper	mg/kg	<0.1	<0.1	<0.1	-
Iron	mg/kg	5	7	12	-
Manganese	mg/kg	2	1	2	-
Boron	mg/kg	1.4	0.4	<0.2	-
ORGANIC MATTER					
Organic Carbon	%	0.6	0.3	<0.3	-
SALINITY					
Electrical Conductivity	dS/m	0.76	1.01	0.76	-
Chloride	mg/kg	837	1375	1155	188
Sodium	mg/kg	2890	3430	3100	-
EXCHANGEABLE CATIONS					
Cation Exchange	meq/100g	52.6	44.3	36.2	-
Exchangeable Sodium	meq/100g	12.6	14.9	13.5	-
Exchangeable Sodium Percent	%	23.9	33.7	37.3	-
Exchangeable Potassium	meq/100g	0.21	0.20	0.08	-
Exchangeable Potassium Percent	%	0.4	0.4	0.2	-
Exchangeable Calcium	meq/100g	29.9	19.6	14.2	-
Exchangeable Calcium Percent	%	56.9	44.2	39.3	-
Exchangeable Magnesium	meq/100g	9.88	9.59	8.38	-
Exchangeable Magnesium Percent	%	18.8	21.7	23.2	-
Exchangeable Aluminium	meq/100g	Not Applicable	Not Applicable	Not Applicable	-
Exchangeable Aluminium Percent	%	Not Applicable	Not Applicable	Not Applicable	-
Calcium/Magnesium Ratio		3.03	2.04	1.70	-
OTHER					
Phosphorus Buffer Index		71.6	43.4	32.1	-
Soil Texture		SCL	SC	SC	-
Dispersion Index		12	16	16	-
Colour		2.5Y 3/2	2.5Y 4/4	10YR 6/5	-
PHYSICAL TESTS					
Gravel	%	7	<1	2	-
Coarse Sand	%	19	25	29	-
Fine Sand	%	50	39	45	-



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Page 8/16

Analysis	Unit	BA007194.013 CH_AN2_450-600 Soil	BA007194.014 CH_AN2_600-900 Soil	BA007194.015 CH_AN2_900-1200 Soil	BA007194.016 CH_AN2_300 Soil
Silt	%	5	9	9	-
Clay	%	20	27	15	-
Emerson Aggregato Test		2(2)	2(4)	2(4)	-

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Page 9/16

Analysis	Unit	BA007194.017 CH_AN2_600 Soil	BA007194.018 CH_AN3_0-110 Soil	BA007194.019 CH_AN3_110-300 Soil	BA007194.020 CH_AN3_300-500 Soil
ACIDITY					
pH - Water	pH units	8.69	6.87	8.57	9.23
pH - CaCl ₂	pH units	-	6.19	7.20	8.09
MAJOR ELEMENTS					
Nitrate Nitrogen	mg/kg	-	13	<1	1
Phosphorus - Colwell extr	mg/kg	-	60	4	1
Potassium	mg/kg	-	794	90	89
Nitrogen	mg/kg	-	2550	1660	1390
Ammonium Nitrogen	mg/kg	-	2.0	2.0	1.5
SECONDARY ELEMENTS					
Sulphur - KCl	mg/kg	-	2.6	4.3	6.9
Potassium - Colwell ext	mg/kg	-	1057	116	95
Calcium	mg/kg	-	3400	4160	6410
Magnesium	mg/kg	-	539	408	679
Calcium Carbonate	%	-	3.5	4.0	10.9
TRACE ELEMENTS					
Zinc	mg/kg	-	1.1	0.3	0.1
Copper	mg/kg	-	0.3	0.2	<0.1
Iron	mg/kg	-	15	10	7
Manganese	mg/kg	-	18	4	2
Boron	mg/kg	-	0.8	0.8	1.4
ORGANIC MATTER					
Organic Carbon	%	-	2.1	1.2	1.1
SALINITY					
Electrical Conductivity	dS/m	-	0.10	0.12	0.31
Chloride	mg/kg	1124	11	19	159
Sodium	mg/kg	-	66	551	1250
EXCHANGEABLE CATIONS					
Cation Exchange	meq/100g	-	23.8	26.8	43.4
Exchangeable Sodium	meq/100g	-	0.29	2.40	5.45
Exchangeable Sodium Percent	%	-	1.2	8.9	12.6
Exchangeable Potassium	meq/100g	-	2.04	0.23	0.23
Exchangeable Potassium Percent	%	-	8.5	0.9	0.5
Exchangeable Calcium	meq/100g	-	17.0	20.8	32.0
Exchangeable Calcium Percent	%	-	71.4	77.5	73.9
Exchangeable Magnesium	meq/100g	-	4.49	3.40	5.66
Exchangeable Magnesium Percent	%	-	18.8	12.7	13.0
Exchangeable Aluminium	meq/100g	-	Not Applicable	Not Applicable	Not Applicable
Exchangeable Aluminium Percent	%	-	Not Applicable	Not Applicable	Not Applicable
Calcium/Magnesium Ratio		-	3.79	6.12	5.66
OTHER					
Phosphorus Buffer Index		-	48.4	57.9	82.8
Soil Texture		-	SCL	FSCL	FSCL
Dispersion Index		-	10	11	11
Colour		-	10YR 2/1	10YR 2/1	10YR 2/2
PHYSICAL TESTS					
Gravel	%	-	13	2	4
Coarse Sand	%	-	21	29	21
Fine Sand	%	-	45	42	27



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Page 10/16

Analysis	Unit	BA007194.017 CH_AN2_600 Soil	BA007194.018 CH_AN3_0-110 Soil	BA007194.019 CH_AN3_110-300 Soil	BA007194.020 CH_AN3_300-500 Soil
Silt	%	-	8	5	11
Clay	%	-	13	22	37
Emerson Aggregate Test		-	2(1)	2(2)	2(2)

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Page 11/16

Analysis	Unit	BA007194.021 CH_AN3_500-700 Soil	BA007194.022 CH_AN3_700-1000 Soil	BA007194.023 CH_AN3_1000-1200 Soil	BA007194.024 CH_AN3_300 Soil
ACIDITY					
pH - Water	pH units	9.29	9.49	7.12	8.91
pH - CaCl2	pH units	8.27	8.63	6.52	-
MAJOR ELEMENTS					
Nitrate Nitrogen	mg/kg	4	1	1	-
Phosphorus - Colwell extr	mg/kg	1	<1	<1	-
Potassium	mg/kg	77	25	27	-
Nitrogen	mg/kg	955	303	<300	-
Ammonium Nitrogen	mg/kg	1.0	0.85	1.5	-
SECONDARY ELEMENTS					
Sulphur - KCl	mg/kg	6.9	3.8	3.3	-
Potassium - Colwell ext	mg/kg	97	55	49	-
Calcium	mg/kg	5460	2610	2750	-
Magnesium	mg/kg	682	512	639	-
Calcium Carbonate	%	8.9	3.5	3.5	-
TRACE ELEMENTS					
Zinc	mg/kg	<0.1	<0.1	<0.1	-
Copper	mg/kg	<0.1	<0.1	<0.1	-
Iron	mg/kg	6	3	9	-
Manganese	mg/kg	2	<1	<1	-
Boron	mg/kg	1.4	0.4	0.2	-
ORGANIC MATTER					
Organic Carbon	%	0.8	<0.3	<0.3	-
SALINITY					
Electrical Conductivity	dS/m	0.46	0.47	0.69	-
Chloride	mg/kg	354	466	991	53
Sodium	mg/kg	1680	1780	2900	-
EXCHANGEABLE CATIONS					
Cation Exchange	meq/100g	40.5	25.1	31.7	-
Exchangeable Sodium	meq/100g	7.28	7.75	12.6	-
Exchangeable Sodium Percent	%	18.0	30.8	39.7	-
Exchangeable Potassium	meq/100g	0.20	0.06	0.07	-
Exchangeable Potassium Percent	%	0.5	0.3	0.2	-
Exchangeable Calcium	meq/100g	27.3	13.1	13.7	-
Exchangeable Calcium Percent	%	67.5	52.0	43.3	-
Exchangeable Magnesium	meq/100g	5.68	4.27	5.32	-
Exchangeable Magnesium Percent	%	14.0	17.0	16.8	-
Exchangeable Aluminium	meq/100g	Not Applicable	Not Applicable	Not Applicable	-
Exchangeable Aluminium Percent	%	Not Applicable	Not Applicable	Not Applicable	-
Calcium/Magnesium Ratio		4.81	3.06	2.58	-
OTHER					
Phosphorus Buffer Index		61.1	9.9	10.2	-
Soil Texture		SC	FSL	FSL	-
Dispersion Index		11	11	12	-
Colour		10YR 2/2	2.5Y 6/4	2.5Y 6/5	-
PHYSICAL TESTS					
Gravel	%	5	<1	<1	-
Coarse Sand	%	24	63	52	-
Fine Sand	%	32	22	25	-



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Page 12/16

Analysis	Unit	BA007194.021 CH_AN3_500-700 Soil	BA007194.022 CH_AN3_700-1000 Soil	BA007194.023 CH_AN3_1000-1200 Soil	BA007194.024 CH_AN3_300 Soil
Silt	%	9	7	10	-
Clay	%	31	8	13	-
Emerson Aggregate Test		2(2)	2(2)	2(2)	-



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Page 13/16

Analysis	Unit	BA007194.025 CH_AN3_600 Soil			
ACIDITY					
pH - Water	pH units	9.35			
pH - CaCl ₂	pH units	-			
MAJOR ELEMENTS					
Nitrate Nitrogen	mg/kg	-			
Phosphorus - Colwell extr	mg/kg	-			
Potassium	mg/kg	-			
Nitrogen	mg/kg	-			
Ammonium Nitrogen	mg/kg	-			
SECONDARY ELEMENTS					
Sulphur - KCl	mg/kg	-			
Potassium - Colwell ext	mg/kg	-			
Calcium	mg/kg	-			
Magnesium	mg/kg	-			
Calcium Carbonate	%	-			
TRACE ELEMENTS					
Zinc	mg/kg	-			
Copper	mg/kg	-			
Iron	mg/kg	-			
Manganese	mg/kg	-			
Boron	mg/kg	-			
ORGANIC MATTER					
Organic Carbon	%	-			
SALINITY					
Electrical Conductivity	dS/m	-			
Chloride	mg/kg	340			
Sodium	mg/kg	-			
EXCHANGEABLE CATIONS					
Cation Exchange	meq/100g	-			
Exchangeable Sodium	meq/100g	-			
Exchangeable Sodium Percent	%	-			
Exchangeable Potassium	meq/100g	-			
Exchangeable Potassium Percent	%	-			
Exchangeable Calcium	meq/100g	-			
Exchangeable Calcium Percent	%	-			
Exchangeable Magnesium	meq/100g	-			
Exchangeable Magnesium Percent	%	-			
Exchangeable Aluminium	meq/100g	-			
Exchangeable Aluminium Percent	%	-			
Calcium/Magnesium Ratio		-			
OTHER					
Phosphorus Buffer Index		-			
Soil Texture		-			
Dispersion Index		-			
Colour		-			
PHYSICAL TESTS					
Gravel	%	-			
Coarse Sand	%	-			
Fine Sand	%	-			



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SGS Food & Agriculture Laboratory

59 Bancroft Road

Pinkenba QLD 4008

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f +61 (0)7 3622 4770

BA007194

Page 14/16

Analysis	Unit	BA007194.025 CH_AN3_600 Soil			
Silt	%	-			
Clay	%	-			
Emerson Aggregate Test		-			

Analysed Between 03/06/2015 - 22/06/2015

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Pinkenba QLD 4008
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BA007194

Page 15/16

Method of Analysis			
Analysis	Unit	Det.Lim.	Method
pH - Water	pH units	0.01	SOL003/1/1
pH - CaCl2	pH units	0.01	SOL003/1/2
Electrical Conductivity	dS/m	0.01	SOL007/2/2
Nitrate Nitrogen	mg/kg	1	SOL011
Chloride	mg/kg	1	SOL011
Sulphur - KCl	mg/kg	0.1	SOL130
Phosphorus - Colwell extr	mg/kg	1	SOL040/SOL090
Potassium - Colwell ext	mg/kg	1	SOL040/SOL090
Sodium	mg/kg	1	SOL060
Potassium	mg/kg	1	SOL060
Calcium	mg/kg	1	SOL060
Magnesium	mg/kg	1	SOL060
Cation Exchange	meq/100g	0.01	SOL060
Exchangeable Sodium	meq/100g	0.01	SOL060
Exchangeable Sodium Percent	%	0.1	SOL060
Exchangeable Potassium	meq/100g	0.01	SOL060
Exchangeable Potassium Percent	%	0.1	SOL060
Exchangeable Calcium	meq/100g	0.01	SOL060
Exchangeable Calcium Percent	%	0.1	SOL060
Exchangeable Magnesium	meq/100g	0.01	SOL060
Exchangeable Magnesium Percent	%	0.1	SOL060
Exchangeable Aluminium	meq/100g	0.01	SOL060
Exchangeable Aluminium Percent	%	0.1	SOL060
Calcium/Magnesium Ratio		0.01	SOL060
Zinc	mg/kg	0.1	SOL070
Copper	mg/kg	0.1	SOL070
Iron	mg/kg	1	SOL070
Manganese	mg/kg	1	SOL070
Boron	mg/kg	0.2	SOL080
Organic Carbon	%	0.3	CAR002/SOL002/1
Phosphorus Buffer Index		0.1	SOL047
Soil Texture			SOL120
Dispersion Index			SOL121
Calcium Carbonate	%	0.1	SOL110
Gravel	%	1	SOL122
Coarse Sand	%	1	SOL122

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BA007194

Page 16/16

Fine Sand	%	1	SOL122
Silt	%	1	SOL122
Clay	%	1	SOL122
Nitrogen	mg/kg	300	PRN002
Emerson Aggregate Test			SOL125
Colour			
Ammonium Nitrogen	mg/kg	0.05	SOL012

The analyses presented in the report refer exclusively to the samples analysed.

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Robert Lascelles - Chief Chemist

For and on behalf of SGS Australia Pty Ltd

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