



**ROCKHAMPTON DOWNS PROJECT,
TENEMENTS EL27193, EL27194, EL27195, EL27891.**

**COMBINED ANNUAL EXPLORATION REPORT
FOR THE PERIOD ENDING 26TH OCTOBER 2010**

NORTHERN TERRITORY

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Executive Summary

Works completed at the Rockhampton Downs Project during the first year of tenure included an open file literature review, compilation and review of publicly available geological maps and geophysical data, XRF analysis of 308 water bore cuttings from 12 holes, an AAPA register search, acquisition of NRETAS environmental data and the compilation of a Mining Management Plan for the project.

On 7th May 2010 Vale applied for an AAPA Authority certificate over EL27193, EL27194 and EL27195, however at the time of reporting the AAPA certificate was pending.

Vale does not intend to commence on-ground works until consultation with traditional owners has been held and any restricted works areas have been identified.

In the next year it is hoped that the NLC will organize meetings with traditional owners and that an AAPA Authority Certificate will be granted to Vale, thereby allowing field work to commence.

On site works proposed for 2011 include helicopter supported geological mapping, rock chip sampling and RC drilling.

1 Introduction

1.1 Location and Access

The Rockhampton Downs Project is comprised of contiguous tenements located on the Alroy (SE53-15), Brunette Downs (SE53-11) and Helen Springs (SE53-10) 1:250,000 map sheets straddling parts of Rockhampton Downs (NT Por 1484), and Brunette Downs (NT Por 1483) stations. The tenements are approximately 90 km north east of Tennant Creek at the nearest point and 235km north east of Tennant Creek at the north easternmost corner. The project encompasses the Rockhampton Downs and Brunette Downs homesteads.

Access to the tenements can be gained by travelling from Tennant Creek, 23km north along the Stuart Highway then turning east onto The Barkly Highway at Three Ways then 97km along the Barkly Highway to the Rockhampton Downs Road turning to the north and proceeding 35km to Rockhampton Downs Homestead. Internal access is via a network of station tracks.

1.2 Tenement Details

The Rockhampton Downs Project is comprised of four contiguous tenements held by Vale Australia EA Pty Ltd and Operated by Vale Exploration Pty under Authorization 0559-02.

EL27193 excludes NT Por 4472; Kujuluwa Aboriginal Corp Living Area.

EL27194 excludes NT Por 2439; Wogayala Aboriginal Corp Living Area.

Table 1: Rockhampton Downs Project Tenement Details

<i>Tenement Number</i>	<i>Holder</i>	<i>Area (Blocks)</i>	<i>Area (km²)</i>	<i>Date of Grant</i>	<i>Date of Expiry</i>	<i>Expenditure (Year 1)</i>
EL27193	Vale Australia EA Pty Ltd	500	1626.17	26/10/2009	25/10/2015	88,000.00
EL27194	Vale Australia EA Pty Ltd	407	1323.04	26/10/2009	25/10/2015	88,000.00
EL27195	Vale Australia EA Pty Ltd	485	1573.66	26/10/2009	25/10/2015	88,000.00
EL27891	Vale Australia EA Pty Ltd	77	250.58	22/07/2010	21/07/2016	22,000.00
Total Expenditure Commitment:						\$286,000.00

1.3 Native Title

There are two Native title claims over the Rockhampton Downs Project:

- Brunchilly DC01/31 is registered (covers the western portion of EL27194);
- Rockhampton Brunette Downs DC03/1 is not registered (entirely covers EL27193 and EL27195, and covers all but the western extremity of EL27194).

The Rockhampton Brunette Downs DC03/1 was not accepted for registration on 4/8/2008. As a result, the claimants and the NLC who represent them do not have the 'right to negotiate' over land under this claim.

1.4 Historical, Aboriginal, Heritage Sites

The Attack Creek Historical Reserve (NT Portion 624) is located on the eastern side of the Stuart Highway, approximately 72km north of Tennant Creek near Attack Creek. The site is not prescribed¹, and occurs outside the tenements but is close to an access route. At the site is 'the Stuart Memorial', a memorial to explorer John McDouall Stuart, the first non-Aboriginal person to enter the area and his two companions who were forced to abandon their expedition and turn back from a place he called Attack Creek after confrontation with Warumungu people.

The Lake Sylvester and De Burgh System (which includes Lake Sylvester and Corella Lake) is listed on the Register of the National Estate as a place of natural significance (Place ID: 101667), and the Lake Sylvester System is a 'Site of Conservation Significance' in the N.T. The Lake Sylvester System is a significant inland Australian wetland, home to several varieties of fish and frequented by large numbers of birds, including migratory species. It is an internationally important migration stop-over site for Oriental Pratincole (*Glareola Maldivarum*) and Oriental Plover (*Charadrius veredus*) because the system supports more than 1% of the flyaway population of each species. It is also an important breeding site.

Tarrabool Lake is listed on the Register of the National Estate as a place of natural significance (Place ID: 103047), and is a 'Site of Conservation Significance' in the N.T. It is frequented by large numbers of birds, including migratory species, is an important breeding site for waterbirds, and supports the largest known colony in the N.T. of Australian Pelicans (*Pelecanus conspicillatus*) and the largest known colony in the N.T. of Straw necked ibis (*Threskiornis spinicollis*). Tarrabool Lake is the only known breeding locality in the N.T. for Painted Snipe (*Rostratula benghalensis*).

Table 2: Heritage Sites

<i>Name</i>	<i>Register</i>	<i>Class</i>	<i>Location & Comments</i>
Attack Creek Historical Reserve	Not Registered (NT Portion 624)	Historic	Marked by Stuart Memorial. Outside of the tenement area, however access passes close to it.
Lake Sylvester (and De Burgh) Systems	Register of the National Estate - Place ID: 101667	Natural	Occurs partly within tenements EL27193, EL27195.
Tarrabool Lake	Register of the National Estate - Place ID: 103047	Natural	In wet years the perimeter extends into the Northern portion of EL27191 (Brunchilly) and the Northern end of EL27194 and the NW corner of EL27195 (Rockhampton Downs).

An inspection of the Aboriginal Areas Protection Authority (AAPA) Register was conducted for EL27193, EL27194 and EL27195 on 9th September 2009. This inspection identified several sacred sites within the tenements (see Table 3). The AAPA gave no indication of the nature of the sites identified.

An AAPA register search was conducted over EL27891 on 18th February 2010. There were no registered or recorded sites identified on this tenement.

¹ If a park is prescribed it is an offence to possess, consume, transport or sell alcohol in the park

Table 3: AAPA - Aboriginal Cultural / Sacred Sites² within each tenement

<i>Tenement</i>	<i>Sites Present</i>	<i>Location & Comments</i>
EL27193	<ul style="list-style-type: none"> • 6 x Recorded Site Centroids, • 3 x Registered Sites • 1 x Restricted works area 	Recorded site [C1995/006] on/just outside Nth tenement boundary, Registered sites 6060-1, 6060-8, 6060-10; Restricted works area in NE corner of tenement
EL27194	None identified	None identified
EL27195	<ul style="list-style-type: none"> • 1 x Recorded Site Centroid; • 1 x Registered Site 	E side of tenement; Registered site 6060-3

On 9th November 2009, Vale applied for an AAPA Authority Certificate over tenements EL27193 – EL27195³ (EL27891 was not granted at this time), however at the time of reporting the AAPA certificate was pending.

1.5 Climate and Hydrology

The Rockhampton Downs region is semi-arid with annual rainfall of 414.2mm⁴. The climate is characterized by distinct wet and dry seasons with the majority of rain falling between November and March. The predominant wind direction is from the east.

Table 4: Climate Statistics – Brunette Downs (BOM 2010)

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Mean Maximum Temperature °C⁵	37.0	36.3	35.2	33.6	29.9	26.8	26.7	29.6	33.4	36.7	38.0	38.5
Highest Temperature °C	44.3	45.5	42.5	39.1	38.1	34.7	36.0	37.4	40.3	44.2	44.3	45.5
Mean days ≥ 40 °C	6.8	4.5	1.0	0.0	0.0	0.0	0.0	0.0	0.1	3.5	8.7	10.6
Mean Minimum Temperature °C	24.5	24.2	22.3	19.2	15.1	11.4	10.6	12.5	16.6	20.6	23.0	24.4
Lowest Temperature °C	16.5	16.1	11.4	8.7	4.0	1.7	1.4	1.7	5.0	7.5	13.2	15.0
Mean Rainfall (mm)⁶	106.2	100.1	54.2	14.8	8.1	7.1	4.5	1.4	6.0	15.3	28.8	67.1
Mean number of days of rain	8.2	8.2	4.8	1.6	1.0	0.7	0.6	0.3	0.8	2.0	3.7	6.1

² Sites identified in AAPA Register Inspection

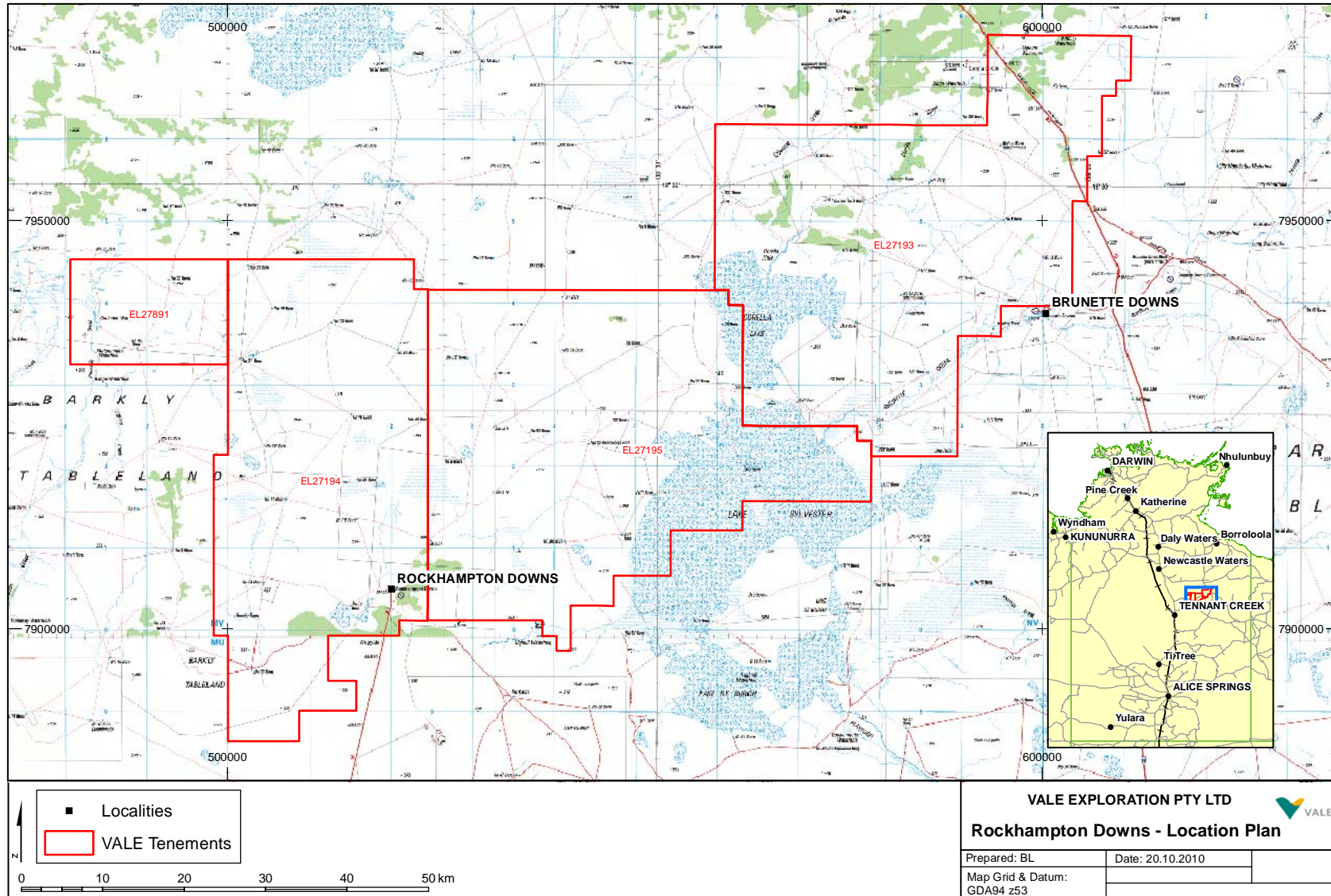
³ An AAPA Authority Certificate was not lodged for EL27891 as it had not been granted at this time.

⁴ Rainfall measurements from 1891 - 2010 (i.e. 116 years data)

⁵ Temperature measurements from 1957 - 2010

⁶ Rainfall measurements from 1949 - 2010

Figure 1: Rockhampton Downs Tenement Location Plan



1.6 Land Area Type

The Rockhampton Downs project is mostly within the Mitchell Grass Downs (MGD), but also covers a portion of the Davenport Murchison Ranges (DMR) bioregion. These bioregions are further described below.

MGD: Lies over the Georgina and Dunmurra basins containing sedimentary rocks of Cretaceous, Tertiary and Cambrian ages and soils are predominantly cracking clays. The vegetation is predominantly *Eucalyptus microtheca* low open-woodland with Bluebush (*Chenopodium auricomum*) sparse-shrubland understory, and Mitchell Grass (*Astrebla*) grassland on the Barkly tableland.

DMR: Comprises low but rugged rocky hills formed from folded volcanics, sandstone, siltstone and conglomerates. Soils are generally shallow lithosols, but fine grained alluvial soils occur in the valleys and surrounding plains. Vegetation includes hummock grasslands and low open woodlands dominated by eucalypt and Acacia species. (Baker *et al.*, 2005).

On the eastern side of the project, Brunchilly Creek drains into Lake Sylvester and Copella Lake, both ephemeral wetlands, overlapping portions of EL27193 and EL27195. These lakes are part of a larger basin network known as the Lake Sylvester System, a site of conservation significance, and one of the largest and most outstanding freshwater wetlands in inland Australia.

During exceptionally wet years, these lakes join with De Burgh and West Corella Lakes (which are outside the tenement area) to form a single 'mega-lake' with an area of about 2000 km².

The lakes provide a diversity of wetland habitats including broad areas of grassland, lignum (*Muehlenbeckia florulenta*) and bluebush shrublands and fringing areas of open eucalypt and acacia woodland. grass/sedge communities, including broad bands of lignum. The northern edge of the Lake and Newcastle Creek are fringed by River Red Gum (*Eucalyptus camaldulensis*) and coolibah (*Eucalyptus coolabah*).

Physiography

The Rockhampton Downs Project comprises of one physiographic unit.

'Downs country, with swamps and lakes' occurs on the Rockhampton Downs Project and easternmost two thirds of the Brunchilly Project. The downs country is lower than nearby areas of sand plain and the ranges. It is largely covered by black soils supporting Mitchell and Flinders grass.

1.6.1 Flora

Vegetation communities within the project area are *Astrebla* low tussock grassland, with smaller pockets of *Chenopodium* open chenopod shrubland and *Eucalyptus* low open woodland. The southernmost tip of EL27194 is dominated by *Corymbia* Low open woodland (see Figure 2).⁷ There is a single record of one threatened species, *Austrobryonia argillicola* (formerly known as *Mukia* sp Tobermorey Station – D. E. Albrecht 6322), occurring near Brunette Downs Homestead within the Rockhampton Downs Project. This species is classified as Endangered under the EPBC Act and is endemic to inland northern Australia in the north-eastern Lake Eyre Basin of the NT and QLD, mainly in the catchments of the Georgina, Diamantina and Thompson Rivers. It inhabits grasslands, mostly associated with Mitchell Grass on cracking clays (D. Albrecht *pers. comm.*, 2009).

Parkinsonia aculeata, an introduced weed, is known to occur within the north east portion of Lake Tarrabool and as an infestation in Lake Sylvester so may also occur within the Rockhampton Downs project area. Other weeds that may occur within the project area are tabled overleaf.

Table 5: Introduced Flora (Weeds) that may occur within Rockhampton Downs Project

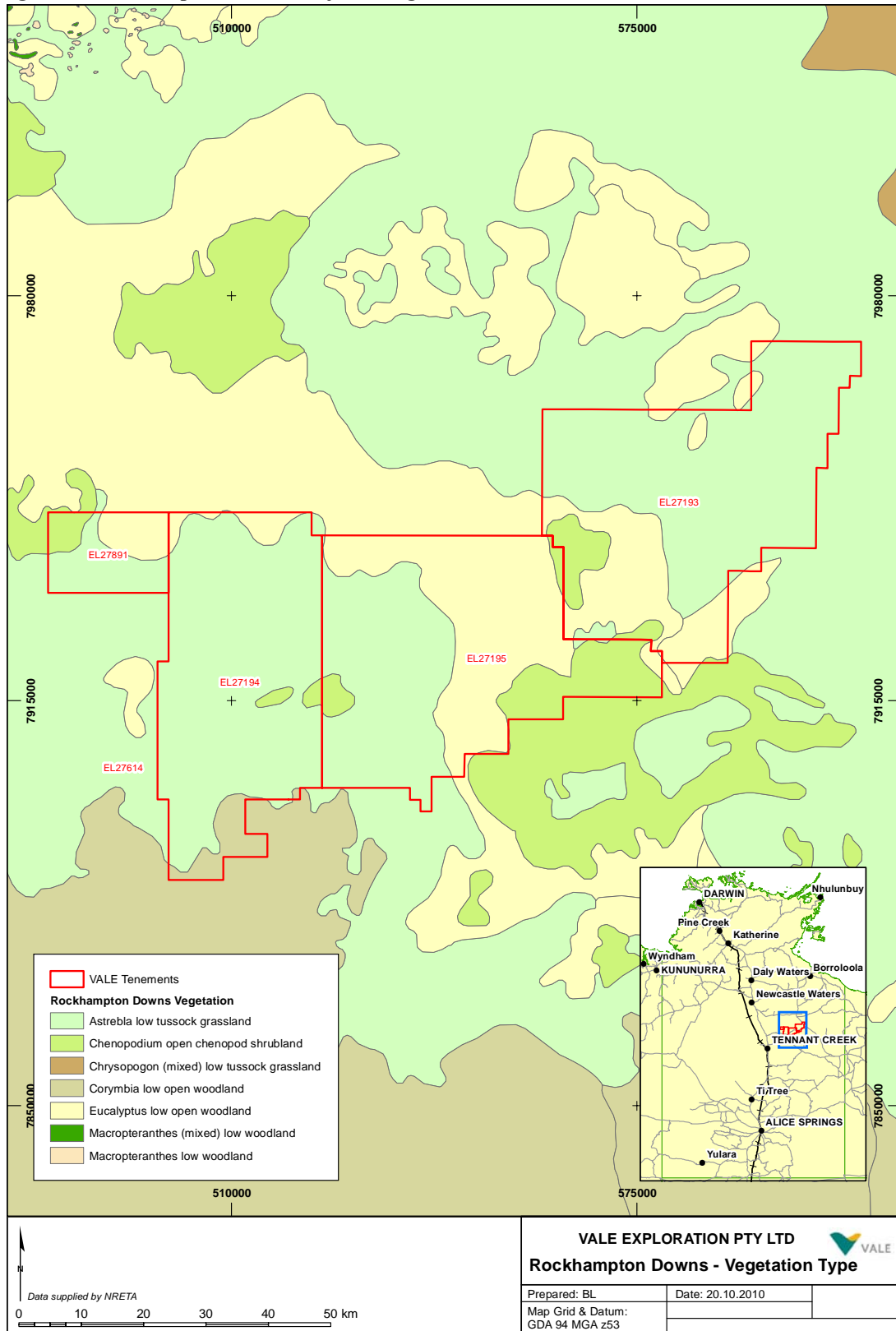
<i>Species Name</i>	<i>Generic Name</i>	<i>Where</i>	<i>Type of Presence</i>
<i>Acacia nilotica</i>	Prickly Acacia		Possible
<i>Calotropis procera</i>	Rubberbush		Possible
<i>Noogoora burr</i>	Xanthium Occidentale		Possible
<i>Prosopis spp.</i>	Mesquite	Elliott 5662 Map sheet ⁸	Present – density unknown
<i>Parkinsonia aculeata</i>	Parkinsonia	Lake Sylvester; Lake Tarrabool - in the NE of the main lake	Infestation
<i>Tamarix aphylla</i>	Athel Pine	Helen Springs 5661 Map Sheet ⁹	Occasional and localized occurrences

⁷ Figure 2 Produced with Digital Vegetation Mapping data purchased from NRETAS October 2009.

⁸ NRETAS – 1:100,000 Grid Maps of Weed Distribution

⁹ NRETAS – 1:100,000 Grid Maps of Weed Distribution

Figure 2: Rockhampton Downs Project – Vegetation Plan



1.6.2 Fauna

Two species protected by the *EPBC Act 1999* have been recorded in surveys conducted within the Rockhampton Downs project.

- 1) The Yellow Chat (*Epthianura crocea*), is a wading bird. Nine sightings were recorded within the Lake Sylvester System within the Rockhampton Downs project in 1993, an exceptionally wet year. One sighting was recorded in 1999.
- 2) The Australia Painted Snipe (*Rostratula australis*) was recorded in Lake Sylvester on the boundary of EL27193 and EL27195 in 1906. There have been no subsequent recordings of this species within the Lake Sylvester system, however it was recorded at Tarrabool Lake in 1993.

The Australia Bustard (*Ardeotis Australis*) has been recorded within the Rockhampton Downs Project. This species is not considered to be vulnerable, endangered or critically endangered under the *EPBC Act*, however it is considered vulnerable by the NT Government and is protected by the *Territory Parks and Wildlife Conservation Act 2009*.

The Lake Sylvester System, which overlaps the tenement area (incorporating Lake Sylvester and Corrella Lake) is recognized as a Site of Conservation Significance by the NT Government as it supports internationally significant numbers of at least nine significant waterbird species. Major waterbird breeding events typically occur after flooding, then receding waters provide habitat for migratory shorebirds.

In wet years significant numbers of terns feed over the lakes and grassland. Aggregations can be internationally significant (eg in 1995 >1% of global populations of Gull-billed terns were counted) (Jaensch and Bellchambers 1997 as cited by NRETAS, 2009a 2009b).

A search of NRETAS¹⁰ data found that the following vulnerable species have been recorded within the project area (see Figure 3).

¹⁰ NRETAS - NT Department of Natural Resources, Environment, the Arts and Sport

Table 6: Vulnerable Fauna Species Recorded within the Project Area

<i>Species Name</i>	<i>Generic Name</i>	EPBC ¹¹ Status	TPWC ¹² Status
<i>Ardeotis australis</i>	Australia Bustard (Bush Turkey)	No Status	Vulnerable
<i>Epthianura crocea</i>	Yellow Chat	<i>ssp macgregori</i> <i>Yellow Chat</i> (<i>Dawson</i>) is Critically endangered, <i>ssp tunneyi</i> <i>Yellow Chat</i> (<i>AlligatorRivers</i>) is Endangered	<i>ssp tunneyi</i> <i>Yellow Chat</i> (<i>AlligatorRivers</i>) is Endangered
<i>Rostratula australis</i> , <i>Rostratula benghalensis s.</i> <i>lat</i>	Australian Painted Snipe	Vulnerable	Vulnerable

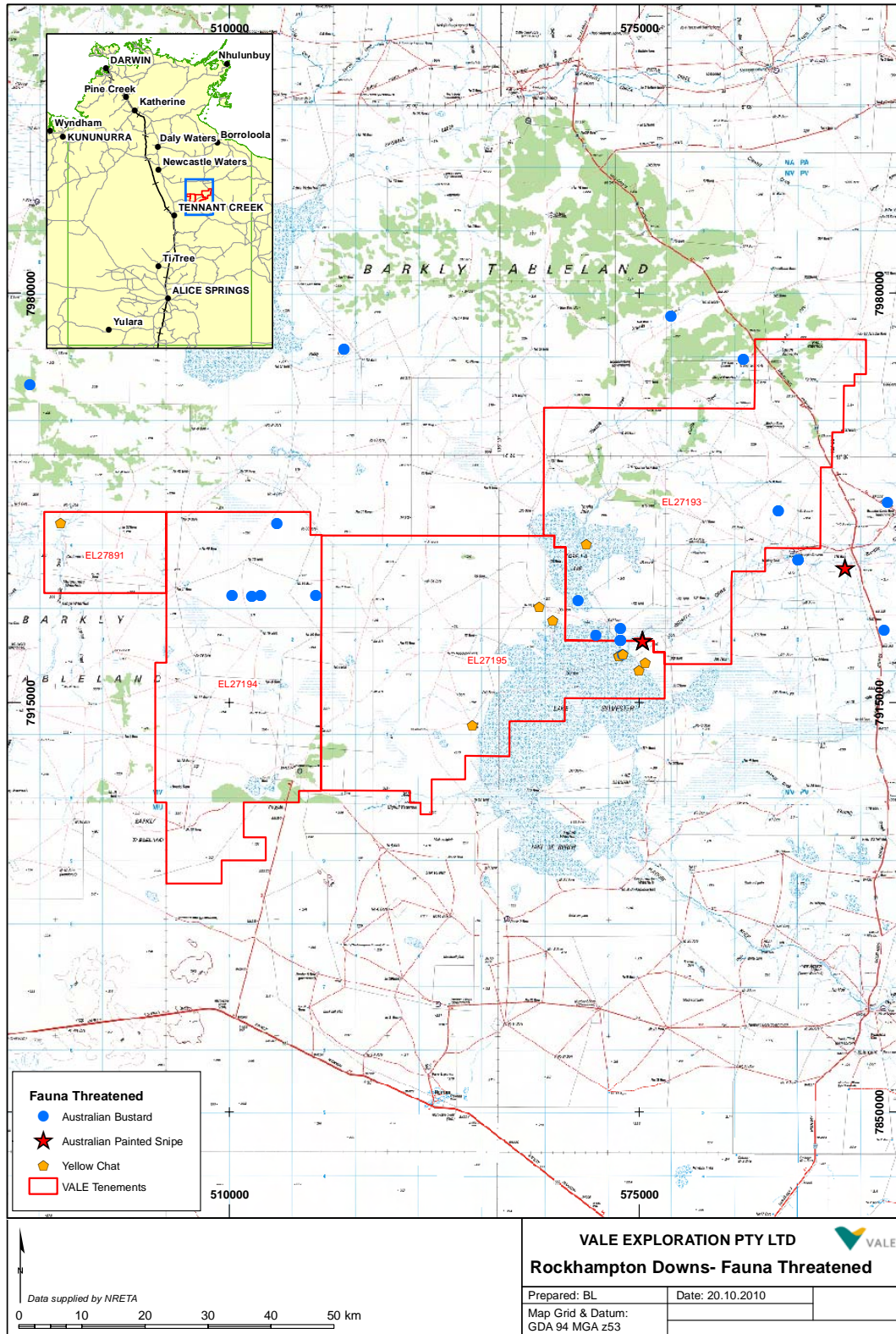
A search of the Australian Government Department of the environment, water, heritage and the arts website, 'protected Matters Search tool' identified 3 threatened species and 8 migratory bird species within a rectangular search area encompassing the tenements. These species may also occur within the tenements, however birds listed as migratory or marine are most likely to be located in the vicinity of Lake Tarrabool or within Lake Sylvester or Corella Lake.

The search tool indicates that it is likely that the Mulgara will occur within the tenement area, however to date it has not been recorded on the tenements.

¹¹ Environmental Protection and Biodiversity Conservation Act 1999

¹² Territory Parks and Wildlife Conservation Act

Figure 3: Rockhampton Downs Project – Fauna Plan



2 Regional Geology

The Rockhampton Downs Project covers Cambrian sediments of the Georgina Basin. The sediments of the Georgina Basin range in age from late Proterozoic to early Palaeozoic. To the north they overlie mid-Proterozoic sediments of the South Nicholson and McArthur Basins, to the east they unconformably overlie mid-Proterozoic rocks of the Cloncurry-Mt Isa Block. On the southern margin of the basin, basin sediments overly sediments of the Arunta block, whilst to the west they unconformably overly basement composed of rocks of the early Proterozoic Hatches Creek and Warramunga Groups and their equivalents (Cook, P, 1986).

The Georgina Basin sediments show complex facies relationships and no single stratigraphic column can be provided for the Georgina Basin (Smith, 1972; Cook 1986). The following simple schematic section can be used as a broad guide as to stratigraphic units containing known phosphorite. It should be noted that although Rio Tinto geologists who worked on the Wonarah project considered that the Wonarah deposit occurred within the Gum Ridge Formation (Lilley, 2002) the Wonarah deposit is identified here as occurring in the Wonarah Formation, as others consider that the phosphorite interval on the Alexandria-Wonarah basement high is more likely to be the basal Wonarah Formation (Kruse *et al.*, 2010)

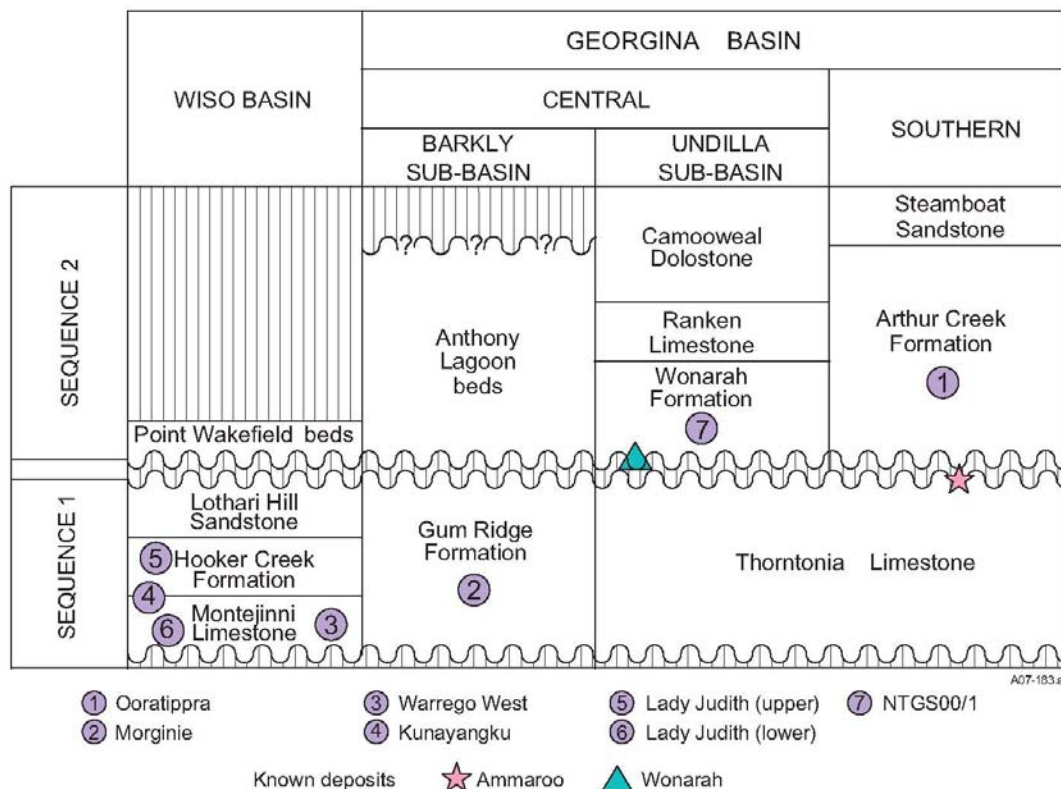


Figure 4: Schematic west to east stratigraphic transect across Wiso and Georgina Basins showing stratigraphic location of phosphate occurrences identified. (Khan *et al.*, 2007). Undilla Sub Basin after Kruse and Radke 2007, southern Georgina Basin after Dunster *et al.*, 2007.

Major phosphate deposition occurred in the Middle Cambrian (Templetonian), an interval which corresponds to large scale sea level rise and was the time of maximum phosphate deposition with up to 100m of siltstones fine sandstones, cherts and phosphorites being deposited around the eastern margins of the basin and adjacent to the Alexandria-Wonarah high (Cook, 1986).

3 Local Geology

The Rockhampton Downs project is located on the Alroy (SE53-15) and Brunette Downs (SE53-11) 1:250,000 and the Brunette 6060, Corella Creek 6061, Frewena 5959, Paradise Bore 6161 and Rockhampton Downs 5960 1:100,000 map sheets.

The following is a summary of observations based on the 1:250,000 Alroy and Brunette Downs Map sheets.

Outcrop within the project is limited with basement largely concealed beneath Cenozoic sediments. The topography within the project is dominated by Corella Lake and Lake Sylvester which comprise of Quaternary claypans, sheetwash: silt and clay (Qp). Peripherhal to these are grey black clay rich soil, marginal to the lakes (Czbt). A number of Lacustrine ridges (chert pebbles and cobbles in packed quartz sand - Czg) have also been mapped within the project. Brunette Limestone (Czn), the basal Canozoic unit in this area, is known to outcrop in the central portion of EL27195.

Middle Cambrian Barkly Group Anthony Lagoon beds have been mapped within the tenements, along the southern and eastern margins of Corella Lake and Lake Sylvester. A number of small outcrops of Anthony Lagoon beds have been mapped in the southern half of EL27194 and a single small outcrop has also been mapped to the east of Brunette limestone in central EL27195.

In addition to geological mapping, there are two existing diamond drill holes within the Rockhampton Downs project (BN04DD01 and NTGS02/1), and one diamond drill hole [Brunette Downs 1] immediately outside the project, (to the east of Brunette Downs Homestead); that give valuable insight into the stratigraphy within the Rockhampton Downs Project.

All three drill holes intersected Anthony Lagoon Formation, underlain by Gum Ridge Formation. BN04DD01 intersected Helen Springs Volcanics, whereas the eastern holes intersected South Nicholson Group sediments beneath Gum Ridge Formation. A stratigraphic section of this hole has been included, for reference (Kruse *et al.*, 2010).

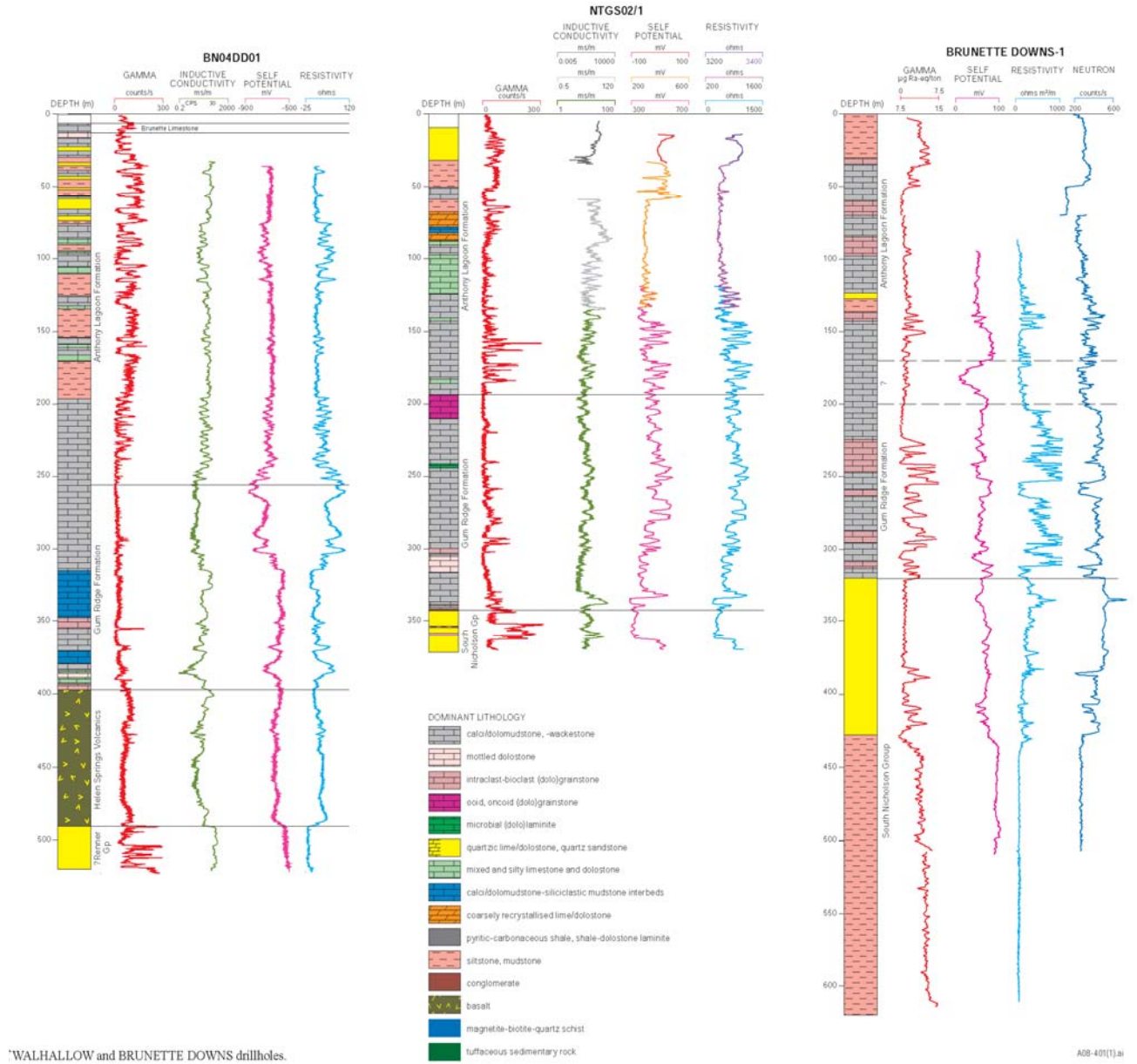
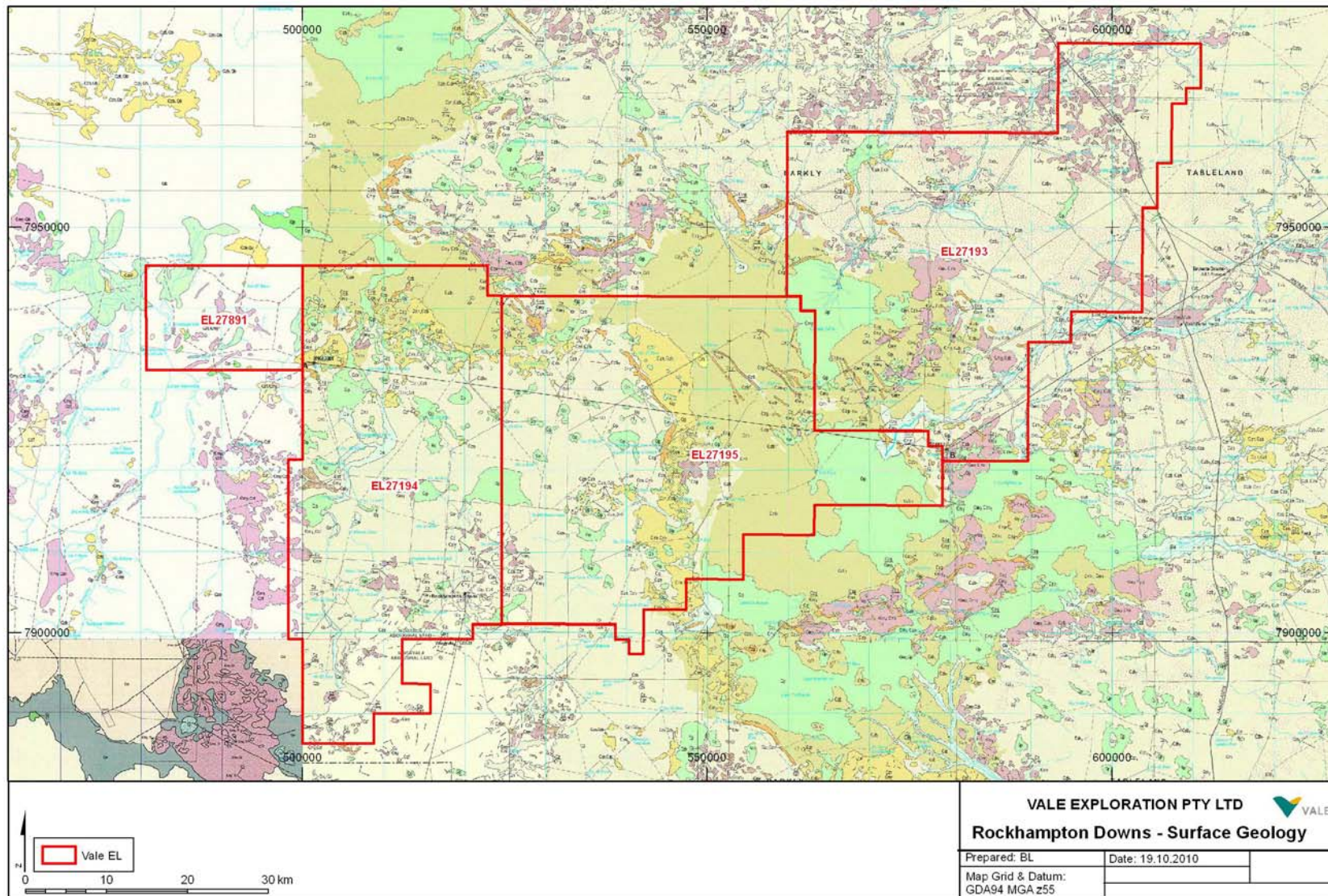


Figure 5: Stratigraphic Drill Holes (Kruse et al, 2010)

Figure 6: Rockhampton Downs Project – Geology



4 Previous Exploration

Only five previous explorers have held exploration tenements overlying or partially overlapping the Rockhampton Downs ELs. The majority of exploration has been for phosphate with minor base metal and copper-gold exploration.

The last previous phosphate exploration on the Rockhampton Downs project area was in 1968. These tenements overlapped Vale's EL 27193, the eastern and southern parts of EL 27195 and the southern half of EL 27194.

Only four historic exploration drill holes have been collared within the Rockhampton Downs applications. Two of these holes record minor indications of phosphatic sediment.

EL 27195 and EL 27194 are also essentially untested for phosphate. Significant potential exists for phosphate mineralisation within EL 27193, with indications of some phosphogenesis in the north east of the application.

Exploration activity on each of the historic tenements is summarized below:

AP1801, AP2160

CR 1968-0030, CR 1968-0044, CR 1969-0022, CR 1969-0024, CR 1970-0038

IMC Development Corporation

August 1967 to August 1968

Exploration was directed towards the delineation of the north-western limits of the lower Middle Cambrian phosphorate unit.

Work consisted of mapping, radiometric traversing, analysis of BMR gravity, radiometric logging of open bore holes and scout drilling.

Sand and travertine were found to mask the Cambrian geology.

Radioactivity contrast was too low to detect trends of underlying rock units.

12 drill holes totaling 1435ft were drilled on AP1801. Drilling was part of a wider project that intersected phosphate at Wonarah and Alexandria. Only one of the IMC holes (B3) was within Vales Rockhampton Downs Project area. It is approximately 30m deep and intersected silt, chert, sand partly calcareous and red beds. No phosphorite was intersected.

IMC concluded that much of the clastic facies in the Brunette Downs area though Middle Cambrian in age is 'phosphate basement'.

AP1919
CR 1968-0046
Tipperary Land Corporation
May 1968 to November 1968

The target was phosphate. Tenure was mostly north of Vale's EL27193 and only partially overlies this tenement.

21 holes were drilled for 2867ft (950m). Of these holes TLC 16 and TLC17 are within Vale's EL27193 and holes TLC 4 and TLC 5 are located immediately outside of EL27193. Phosphate was identified with the ammonium molybdate test within three of these holes:

TLC 4:

- 115ft to 130ft claystone, pale brown, dolomitic or argillaceous dolomite, trace of phosphate.
- 145ft to 157.5ft mudstone, reddish brown, calcareous, trace of phosphate.

TLC 5:

- 97.5ft to 100ft Chert, grey and brown with cream dolomite bands and phosphatic non-carbonate very thin band associated with brown chert.

TLC 17:

- light brown siltstone with trace of phosphate from 4ft to 10ft beneath black soil.

These responses were not considered sufficiently strong to justify chemical analysis.

AP2081
CR 1968-0016
Continental Oil Company of Australia Ltd
1968

The tenement was taken out to test for western extensions of known phosphatic units at Alroy.

Four holes totaling 458ft were drilled. Only one of these holes (SY-4) is collared within Vale's EL 27194. No phosphate was detected with a vanadomolybdate reagent.

EL2709
CR 1982-0283
The Shell Company of Australia Limited
April 1981 to June 1982

The target was stratiform sulphide base metals.

Exploration consisted of ground gravity and magnetic surveys over regional gravity and magnetic features. Chemically analysis of water bores was also completed. Fluorine, sulphate, calcium and magnesium were analysed.

EL2878
CR 1982-0187
The Shell Company of Australia Limited
May 1981 to April 1982

The target was Tennant Creek type copper-gold mineralisation.

Work consisted of compiling water bore information to determine if Precambrian basement was intersected.

Five regional ground magnetic traverses were completed to locate a magnetic ridge.

EL4314
CR 1986-0077, CR 1985-0041
AOG Minerals Limited, Ashton Mining Limited, Aberfoyle Exploration Pty Limited,
Australian Diamond Exploration N.L.
December 1983 to November 1985

The target was kimberlite pipes.

24 gravel and 27 loam samples were collected. At each gravel sample site approximately 30 to 35kg of minus 4mm material was collected from a stream heavy mineral trap. Each loam sample was collected as a surface scrape of 15 to 20kg of material. Samples were processed at Ashton's Perth laboratory where they were concentrated by Wilfley table and heavy liquid separation. The heavy liquid used was tetrabromoethane which has an SG of 2.96. Any apatite (SG 3.19) in the sample should at this stage have gone to the concentrate. Sizing and magnetic and electrostatic separation of the concentrates followed, which probably excluded any apatite. Concentrates were only observed for diamonds.

No evidence of kimberlites was found.

EL4316**CR 1986-0081, CR 1985-0014****AOG Minerals Limited, Ashton Mining Limited, Aberfoyle Exploration Pty Limited,
Australian Diamond Exploration N.L.
December 1983 to December 1985**

The target was kimberlite pipes.

71 gravel and 20 loam samples were collected. Sample processing was the same as for samples from EL4314. Samples were only observed for diamonds.

No evidence of kimberlites was found.

EL4329**CR 1986-0292, CR 1985-0236, CR1984-0223****AOG Minerals Limited, Ashton Mining Limited, Aberfoyle Exploration Pty Limited,
Australian Diamond Exploration N.L.
August 1983 to July 1986**

The target was kimberlite pipes.

Work undertaken included regional gravel and loam sampling, airborne magnetic and thematic mapper surveys.

11 gravel and 20 loam samples were collected. Gravel and loam samples were collected and processed as per EL4314.

No evidence of kimberlites was found.

EL4330**CR 1986-0293, CR 1985-0232, CR 1984-0224****AOG Minerals Limited, Ashton Mining Limited, Aberfoyle Exploration Pty Limited,
Australian Diamond Exploration N.L.
August 1983 to July 1986**

The target was kimberlite pipes.

Work undertaken included regional gravel and loam sampling, airborne magnetic and thematic mapper surveys.

25 gravel and 97 loam samples were collected. Gravel and loam samples were collected and processed as per EL4314.

No evidence of kimberlites was found.

EL4332**CR 1986-0084****AOG Minerals Limited, Ashton Mining Limited, Aberfoyle Exploration Pty Limited,
Australian Diamond Exploration N.L.
February 1985 to November 1985**

The target was kimberlite pipes.

65 loam samples were collected and processed as per EL4314.

No evidence of kimberlites was found.

EL4335**CR 1987-0217, CR 1985-0235, CR 1984-0226****AOG Minerals Limited, Ashton Mining Limited, Aberfoyle Exploration Pty Limited,
Australian Diamond Exploration N.L.
August 1983 to August 1987**

The target was kimberlite pipes.

Work undertaken included regional gravel sampling, airborne magnetic and thematic mapper surveys.

44 gravel samples were taken from trap sites in streams. Sampling and processing of the samples was as described in the preceding ELs.

No evidence of kimberlites was found.

EL4336**CR 1986-0017, CR 1986-0018, CR 1984-0228****AOG Minerals Limited, Ashton Mining Limited, Aberfoyle Exploration Pty Limited,
Australian Diamond Exploration N.L.
August 1983 to August 1985**

The target was kimberlite pipes.

Airborne magnetic and airborne thematic mapper surveys were conducted over the licence.

23 gravel samples were collected and processed as per EL4314. 9 rock samples were also collected, results from which were not reported.

EL4344**CR 1986-0019, CR 1986-0020, CR 1984-0231****AOG Minerals Limited, Ashton Mining Limited, Aberfoyle Exploration Pty Limited,****Australian Diamond Exploration N.L.****August 1983 to August 1985**

The target was kimberlite pipes. Airborne magnetic and airborne thematic mapper surveys were conducted over the licence.

21 gravel and 10 loam samples were collected and processed as per EL4314.

EL4346**CR 1986-0023, CR 1985-0309, CR 1984-0232****AOG Minerals Limited, Ashton Mining Limited, Aberfoyle Exploration Pty Limited,****Australian Diamond Exploration N.L.****August 1984 to August 1985**

The target was kimberlite pipes.

Airborne magnetic and airborne thematic mapper surveys were conducted over the licence.

No targets were followed up.

EL4935**CR 1988-0002, CR 1988-0231, CR 1988-0239****Northern Cement Pty Ltd****1987 to 1988**

The exploration program sought high grade gypsum for use in cement manufacture.

Work included an initial helicopter reconnaissance program of creeks, black soil plains and lake margins. Samples collected from three sites were sufficiently encouraging to warrant auger drilling. Eleven auger holes were drilled, the deepest of which was 3m. Samples only record SO₃ and gypsum.

EL 8559**CR 1994-0806****Stockdale Prospecting Limited****October 1993 to July 1994**

The licence was acquired to explore for diamondiferous diatremes.

Work consisted of an aeromagnetic and radiometric survey which identified 7 discrete anomalies, one of which was considered worthy of follow-up. A subsequent detailed helicopter-borne magnetic survey downgraded the anomaly.

No drilling or sampling was completed.

EL 8562
CR 1994-0804
Stockdale Prospecting Limited
October 1993 to July 1994

The licence was acquired to explore for diamondiferous diatremes.

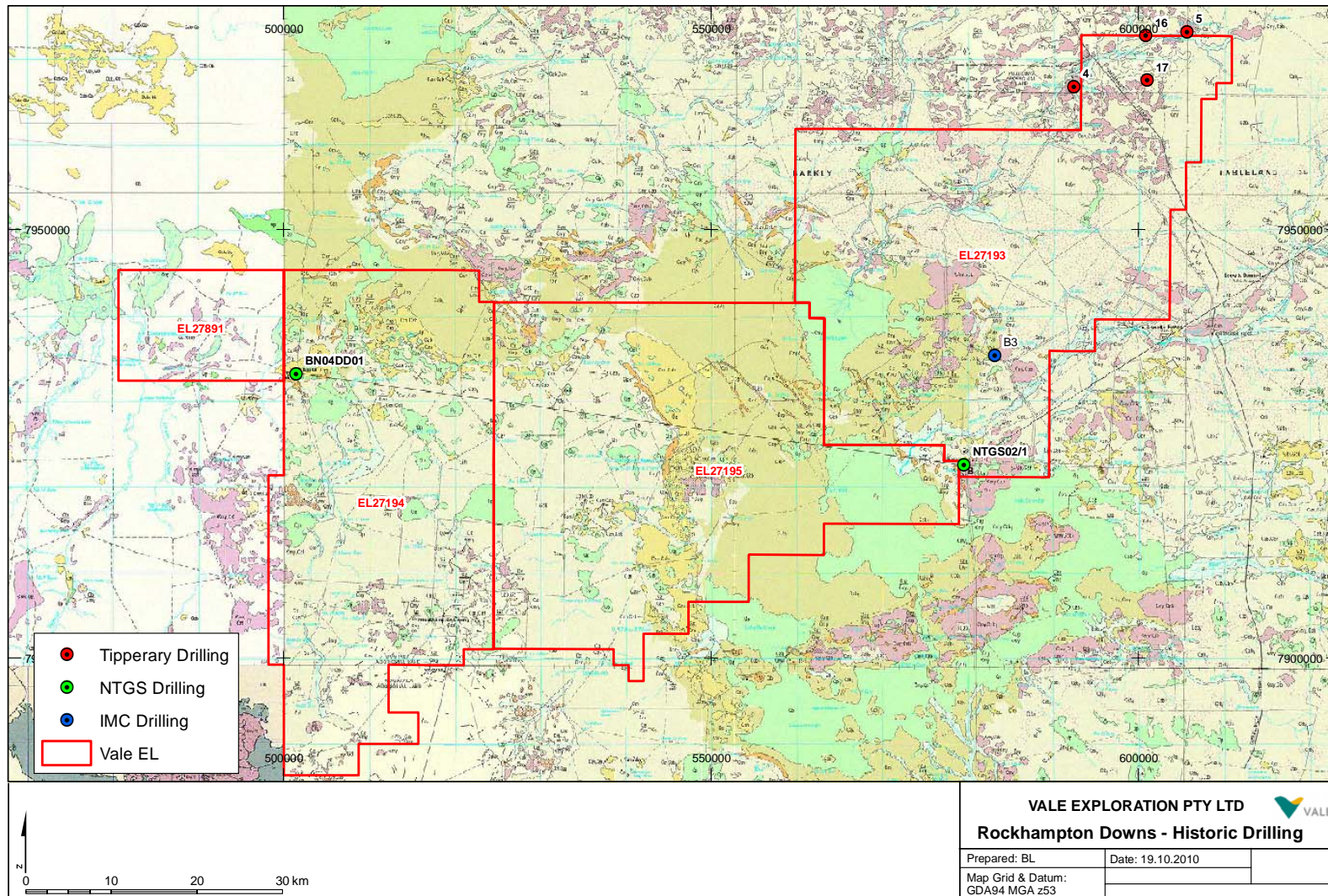
Work consisted of an aeromagnetic and radiometric survey which identified 8 discrete anomalies, two of which were considered worthy of follow-up. A detailed helicopter-borne magnetic survey over one anomaly and a ground magnetometer survey over the other downgraded the anomalies.

No drilling or sampling was completed.

EL23130 and 23131
CR 2004-0046
De Beers Australia
13th January 2004

The report is a letter only stating that EL23128-23131 were surrendered by De Beers on 13th January 2004. No on-ground work of any description was undertaken on any of the tenements during the period of grant. The only work done was the assessment of publicly available data.

Figure 7: Rockhampton Downs Project – Historic Drill Holes



5 Current Exploration

Works completed at the Rockhampton Downs Project during the first year of tenure included an open file literature review, compilation and review of publicly available geological maps, an AAPA register search, acquisition of NRETAS environmental data and the compilation of a Mining Management Plan for the project.

5.1 Water Bore Analyses

Vale commissioned the CSIRO to undertake XRF analyses of a number of water bore cuttings from several of its Georgina Phosphate projects (Appendix 3).

Small composite samples of drill cuttings obtained from historic Northern Territory water bore drilling are housed in the NTGS Farrell Crescent core yard in Winnellie, Darwin. Samples are stored in small plastic vials and each sample generally represents a 3 metre interval. The small sample size and NRETAS requirement that samples could only be analysed by 'non-destructive means' meant they could not be assayed by conventional methods hence the use of a portable XRF instrument.

XRF analysis of 308 water bore chip samples from 12 historic water bore holes within the Rockhampton Downs project area was completed as part of the CSIRO commission (Figure 8, Appendix 3).

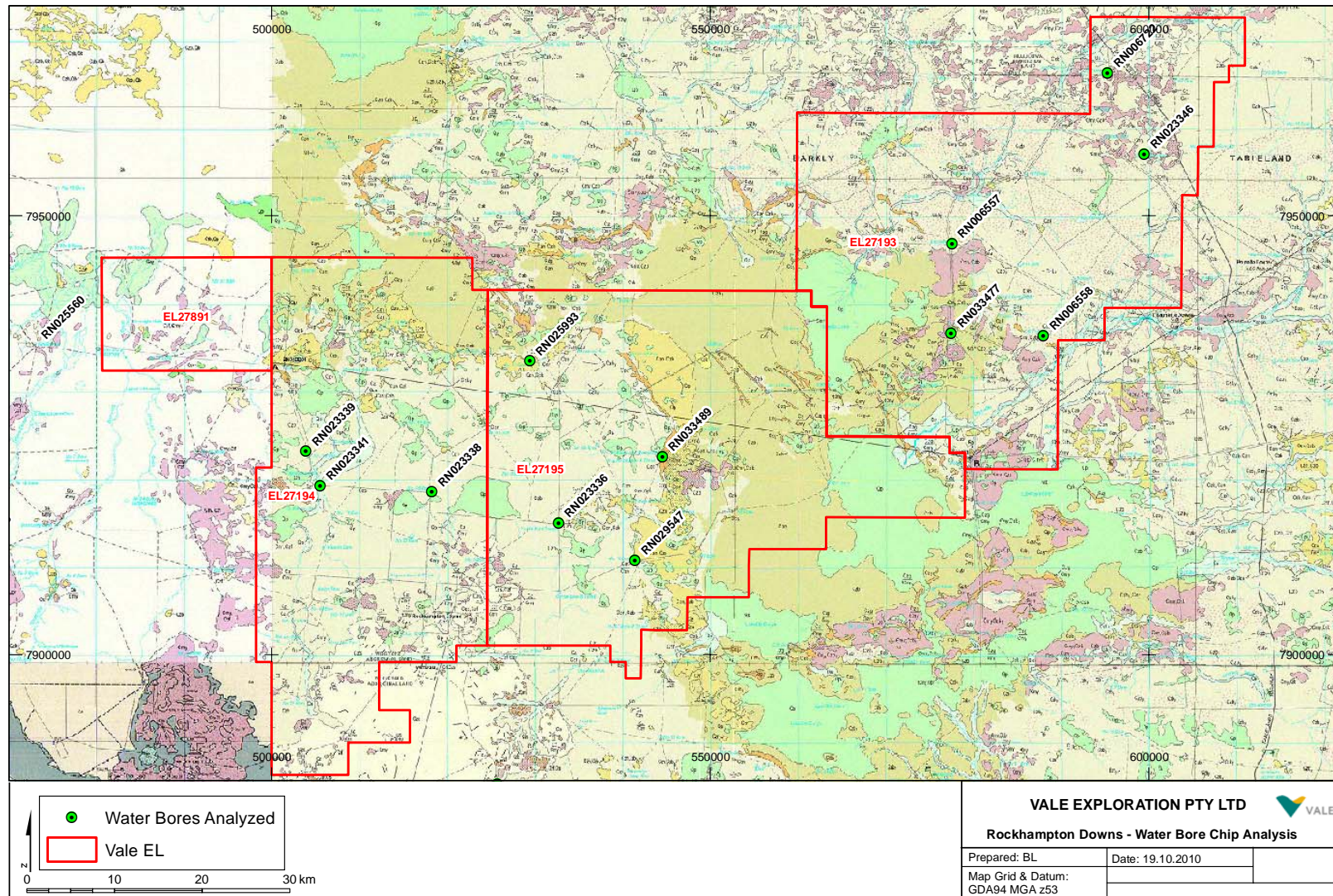
Samples were prepared for analysis by pouring enough material to half-fill a plastic measuring vial with a kapton-film viewing window and gently tapping the vial on the bench to settle and compact the material. After analysis, samples were transferred back to their original vial, and the measuring vial cleaned with ethanol. Samples were analysed for P, K, U, Th, S, Cl, Ca, Ti, V, Cr, Mn and Fe using the Innov-X Systems™ X-50™ portable XRF (Wells *et al.*, 2009).

When initial XRF analyses were complete, an extrapolation involving the XRF analyses of known P standards was used to correct the XRF P analyses of water bore samples. (Wells *et al.*, 2009).

A copy of this report, which contains confidential results pertaining to several of Vale's authorized projects in the NT, was submitted to NT DoR along with raw data on 11th December 2009. Raw XRF analytical data was also submitted at this time.

Several high P portable XRF analyses were returned from water bores located on the Rockhampton Downs Project. The significance of these results is uncertain due to possible contamination from open hole drilling methods, small sample size, potentially unrepresentative nature of the stored sample and the precision of the portable XRF.

Figure 8: Rockhampton Downs Project – Portable XRF Analysis of Water Bores



5.2 Literature Review

Open file reports covering the Brunchilly and Rockhampton Downs Projects were obtained from NT DoR and a review of historic exploration conducted within these projects was undertaken in late 2009.

5.3 Consultation with Traditional Owners

An inspection of the Aboriginal Areas Protection Authority (AAPA) Register was conducted on 9th September 2009. This inspection identified several sacred sites within the tenements (see Section 1.4).

On 9th November 2009, Vale applied for an AAPA Authority Certificate over tenements EL27193, EL27194 and EL27195¹³. At the time of reporting the AAPA certificate was pending.

The majority of the project (with the exception of the westernmost portion of EL27194) is not covered by Aboriginal land nor by registered native title claim and as such an AAPA certificate identifying restricted works areas is all that is required with respect to consultation with traditional owners.

A request was made to the NLC to hold a consultation with traditional owners, but at time of reporting this meeting had not taken place.

5.4 Conclusions

Vale has not undertaken any ground disturbing exploration during the first year of tenure. Works completed at the Rockhampton Downs Project during the first year of tenure included an open file literature review, compilation and review of publicly available geological maps and geophysical data, XRF analysis of water bore cuttings, an AAPA register search, acquisition of NRETAS environmental data and the compilation of a Mining Management Plan for the project.

On 7th May 2010 Vale applied for an AAPA Authority certificate over EL27193, EL27194 and EL27195. At the time of reporting the AAPA certificate was pending.

Vale does not intend to commence on-ground works until consultation with traditional owners has been held and any restricted works areas have been identified.

In the next year it is hoped that the NLC will organise meetings with traditional owners and that an AAPA Authority Certificate will be granted to Vale, thereby allowing works to commence on the project.

On site works proposed for 2011 include helicopter supported geological mapping, rock chip sampling and RC drilling.

¹³ An AAPA Authority Certificate was not lodged for EL27891 as it had not been granted at this time.

6 References

- Bureau of Meteorology, 2010.
http://www.bom.gov.au/climate/averages/tables/cw_015085_All.shtml
Accessed 22nd September 2010.
- Baker, B., Price, O., Woinarski, J., Gold, S., Connors, G., Fisher, A., Hempel, C. 2005.
Northern Territory Bioregions Assessment of key Biodiversity Values and Threats. Department of Natural Resources, Environment and the Arts.
- Bonn Convention (BONN). Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).
- China-Australia Migratory Bird Agreement (CAMBA), 1986. Australian Treaty Series 1988 No 22. Department of Foreign Affairs and Trade, Canberra. Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment (Canberra, 20 October 1986), Entry into force: 1 September 1988.
- Cook, P. 1986. Phosphate Deposits of the Georgina Basin, Northern Australia. Phosphate Deposits of the World – Volume 1: Proterozoic and Cambrian Phosphorates, Edited by PJ Cook and JH Shergold, p533, Cambridge University Press, 1986.
- Dunster J. N., Kruse P.D., Duffett M.L., and Ambrose G.J., 2007. Geology and Resource Potential of the Southern Georgina Basin. Northern Territory Geological Survey, Digital Information Package DIP007.
- Jaensch and Bellchambers 1997 . Wetlands International as cited by NRETAS, 2009a, 2009b
- Japan-Australia Migratory Bird Agreement (JAMBA), 1974.
Australia Treaty Series 1981 No. 6. Agreement between the Government of Australia and the government of Japan for the Protection of Migratory Birds in danger of Extinction and their Environment. Tokyo, 6 February 1974. Entry into force: 30 April 1981.
- Kruse PD and Radke (in press 2007)
- Kruse, P.D., Maier, R. C., Khan, M., and Dunster, J. N. 2010 Walhallow, Brunette Downs, Aloy, Frew River, Northern Territory SE53-07, SE53-11, SE53-15 and SF53-03 1:250,000 Geological Map Series Explanatory Notes.
- Lilley, G. J. 2002. Partial Relinquishment Report for the period ending 2nd July 2002, for EL22167 Wonarah 5 and EL22168 Wonarah 6, Frew River SF53-03, Avon Downs SE53-04, Northern

Territory. Rio Tinto Exploration Pty Ltd. Northern Territory Geological Survey, Open File company Report CR2000-0102.

NRETAS, 2009a. Northern Territory Government Sites of Conservation Significance, Lake Sylvester System. Department of Natural Resources, Environment, the Arts and Sport (NRETAS).

NRETAS, 2009b. Northern Territory Government Sites of conservation Significance, Tarrabool Lake. Department of Natural Resources, Environment, the Arts and Sport (NRETAS).

Randal M. A., and Brown M. C.
1:250,000 Geological Series – Explanatory Notes on the Helen Springs Geological Sheet, N.T. Sheet SE53-10 International Index.

Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA), 2006.
Agreement Between the government of Australia and the Government of the Republic of Korea on the Protection of Migratory Birds and Exchange of Notes, Canberra, 6 December 2006. Entry into force, 13 July 2007.

Russell-Smith J. 2002. Pre-contact Aboriginal, and contemporary fire regimes of the savanna landscapes of northern Australia: patterns, changes and ecological responses. In 'Australian fire regimes: Contemporary patterns (April 1998 – March 2000) and changes since European settlement' (J Russell-Smith, R Craig, AM Gill R Smith and JE Williams). Department of the Environment and Heritage, Australia: State of the Environment Second Technical Paper Series No. 2 (Biodiversity), Canberra.

Smith, K. G. 1972. Stratigraphy of the Georgina Basin. Bureau Mineral Resources, Geology and Geophysics Australia Bulletin, 111, 156pp.

Wells, M., Cardy, M., and Hackett, A. 2009
Phosphorus analysis of Water bore Chips using portable XRF Analysis. Report prepared by CSIRO for Vale Exploration, dated 10th August 2009.

EPBC Act Protected Matters Report dated 22nd September 2009.
http://www.environment.gov.au/cgi-bin/erin/ert/epbc/epbc_report.pl

NT DME Emergency Contacts, 2009.
http://www.nt.gov.au/d/Minerals_Energy/index.cfm?header=Emergency%20Contacts

APPENDIX 1

PHOSPHOROUS ANALYSIS OF WATER BORE CHIPS USING PORTABLE XRF ANALYSIS – CSIRO REPORT

APPENDIX 2

PORTABLE XRF DATA – WATER BORE CHIP ANALYSIS