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No. 12,231

EL 4629, EL 4630 AND EL 4750

**MOUNT KINGSTON EAST AND MOUNT HARVEY
(THE DENISON RANGE PROJECT)**

**JOINT ANNUAL REPORTS TO LICENCES'
EXPIRY/SURRENDER, FOR THE PERIOD
13/12/2010 TO 12/6/2013**

Submitted by
Afmeco Mining and Exploration Pty Ltd
and AREVA Resources Australia Pty Ltd
2013

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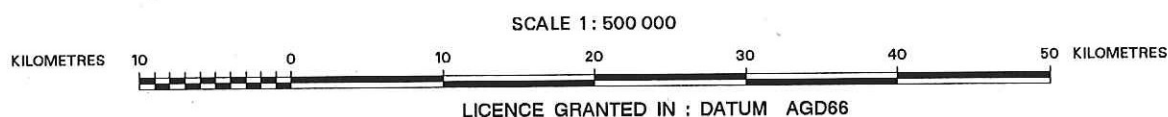
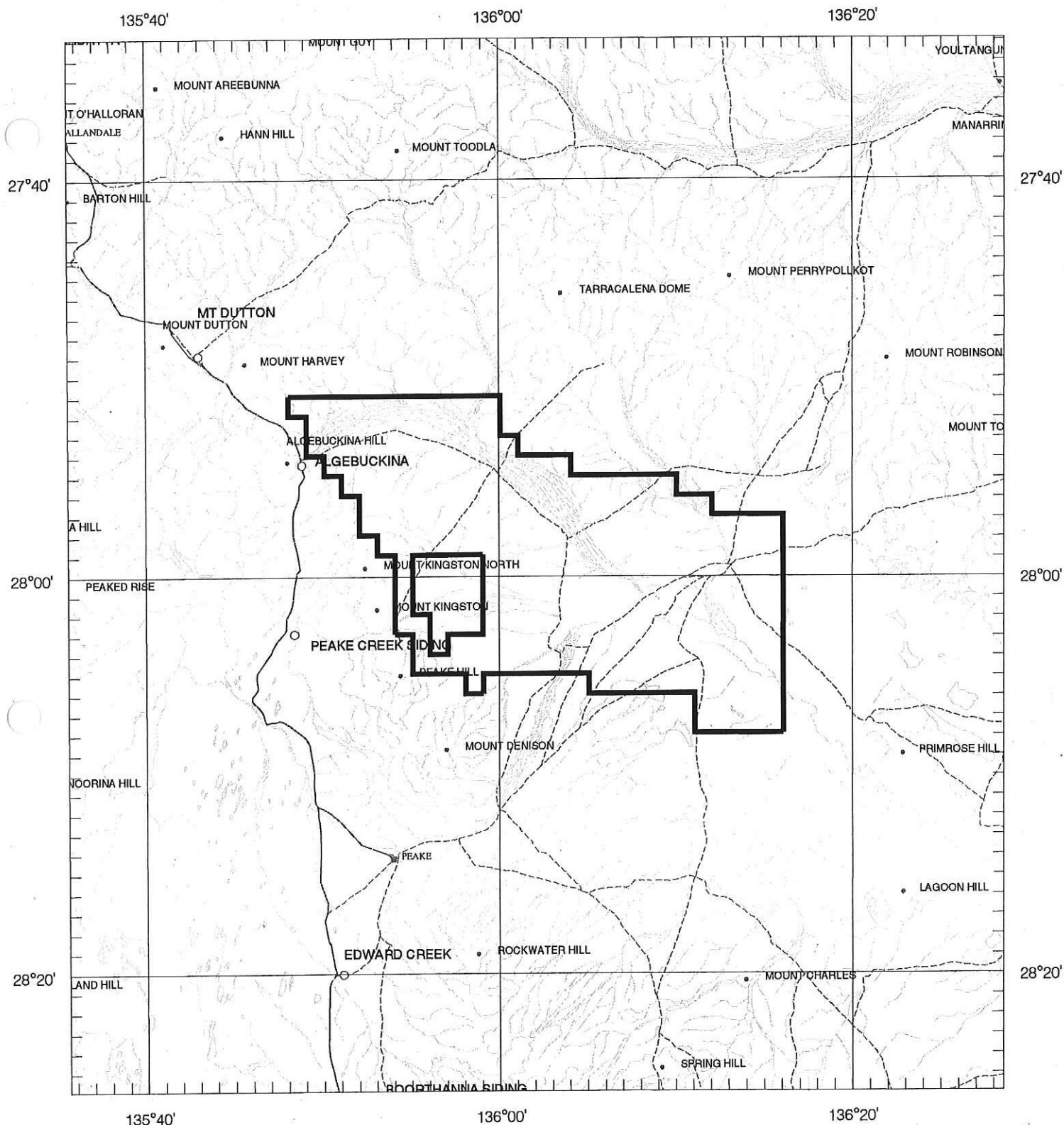
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Government of South Australia

Department for Manufacturing,
Innovation, Trade, Resources and Energy

SCHEDULE A



APPLICANT : AFMECO MINING AND EXPLORATION PTY LTD

FILE REF : 106/10

TYPE : MINERAL ONLY

AREA : 820 km² (approx.)

1:250000 MAPSHEETS : OODNADATTA WARRINA

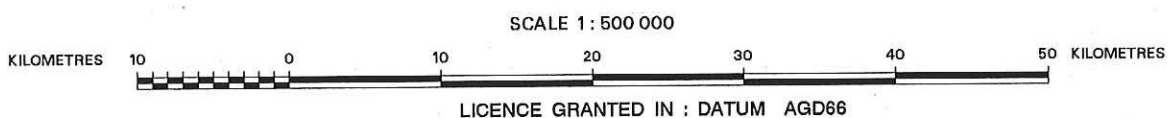
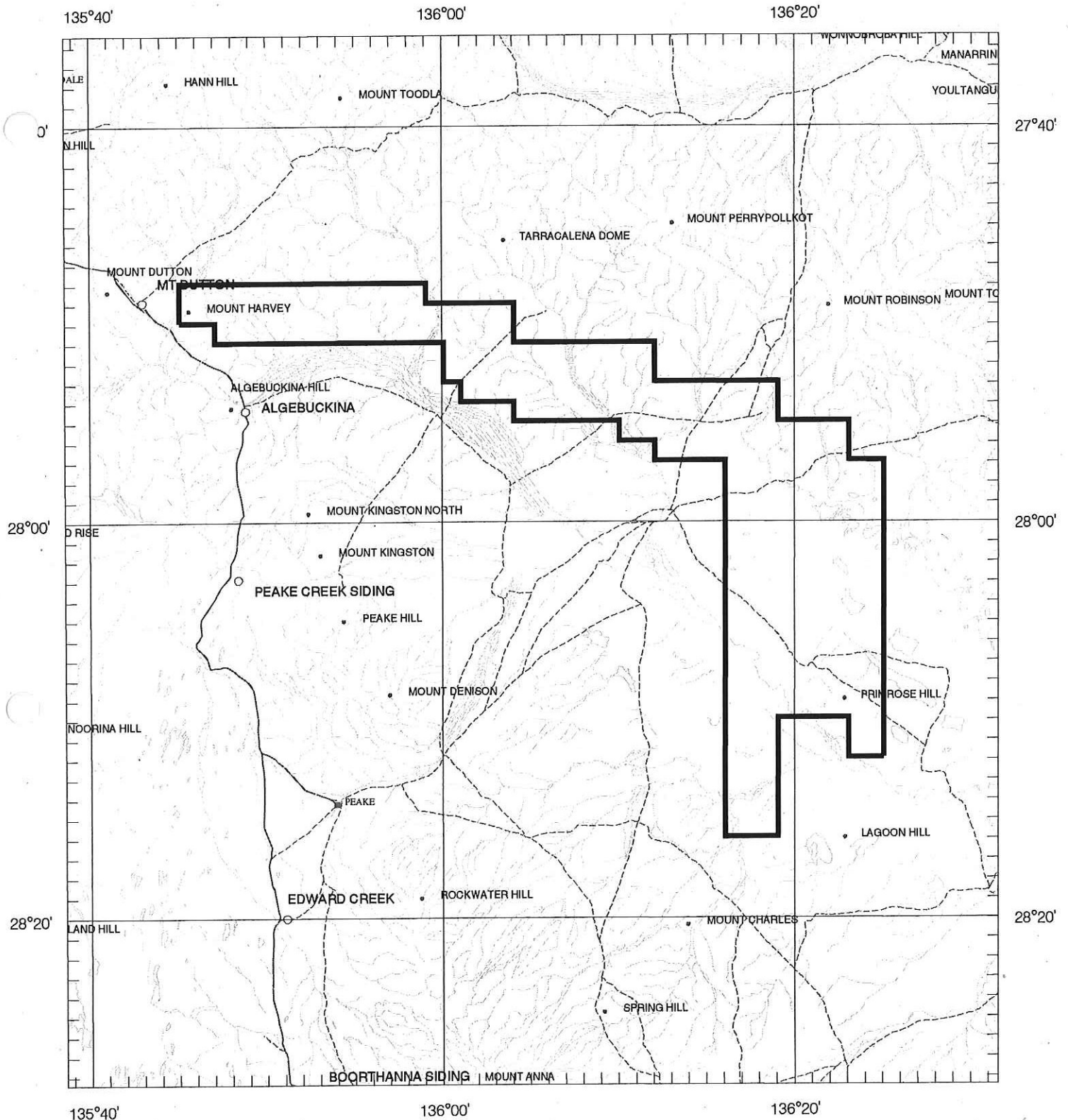
LOCALITY : MOUNT KINGSTON EAST AREA - Approximately 70 km southeast of Oodnadatta

DATE GRANTED : 13-Dec-2010

DATE EXPIRED : 12-Dec-2012

EL NO : 4629

SCHEDULE A



APPLICANT : AFMECO MINING AND EXPLORATION PTY LTD

FILE REF : 109/10

TYPE : MINERAL ONLY

AREA : 817 km² (approx.)

1:250000 MAPSHEETS : OODNADATTA WARRINA

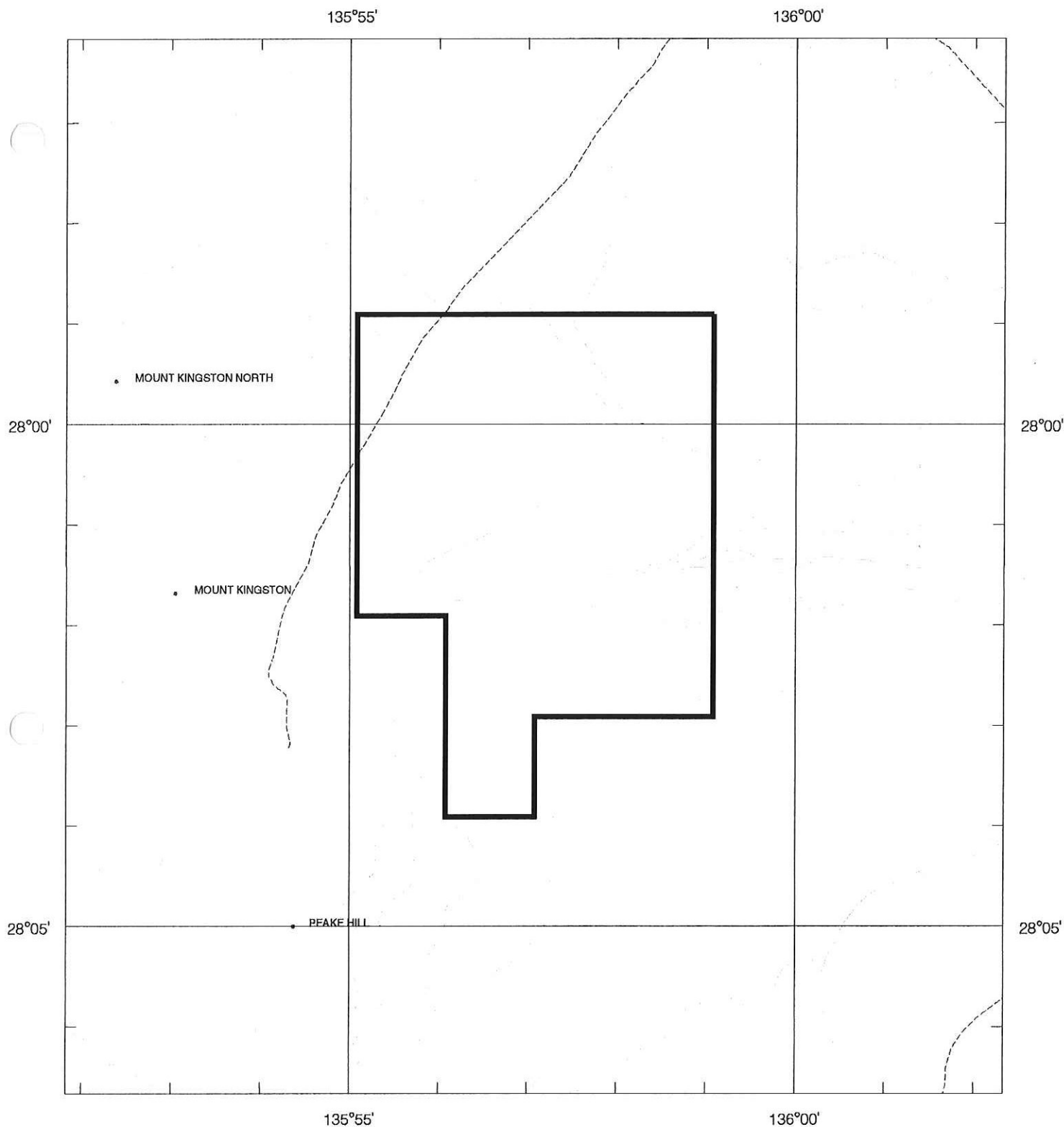
LOCALITY : MOUNT HARVEY AREA - Approximately 80 km southeast of Oodnadatta

DATE GRANTED : 13-Dec-2010

DATE EXPIRED : 12-Dec-2012

EL NO : 4630

SCHEDULE A



SCALE 1 : 100 000
METRES 2000 0 2 4 6 8 10 KILOMETRES
LICENCE GRANTED IN : DATUM AGD66



APPLICANT : **AFMECO MINING AND EXPLORATION PTY LTD**

FILE REF : **378/10**

TYPE : **MINERAL ONLY**

AREA : **48 km² (approx.)**

1:250000 MAPSHEETS : **OODNADATTA WARRINA**

LOCALITY : **MOUNT KINGSTON EAST AREA - Approximately 70 km southeast of Oodnadatta**

DATE GRANTED : **20-Jun-2011**

DATE EXPIRED : **19-Jun-2013**

EL NO : **4750**

<i>Verified by:</i>	<i>Authorised by:</i>
JOE POTTER	JOE POTTER

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- D. Geological Cross-Sections
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Digital Data accompanying this report

1. Down-hole Geophysics

<i>File name</i>	<i>File size</i>	<i>File type</i>
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EL4629_EL4630_EL4750_2012_A_003_DownholeSurveys.txt	594 KB	.txt

2. Drilling

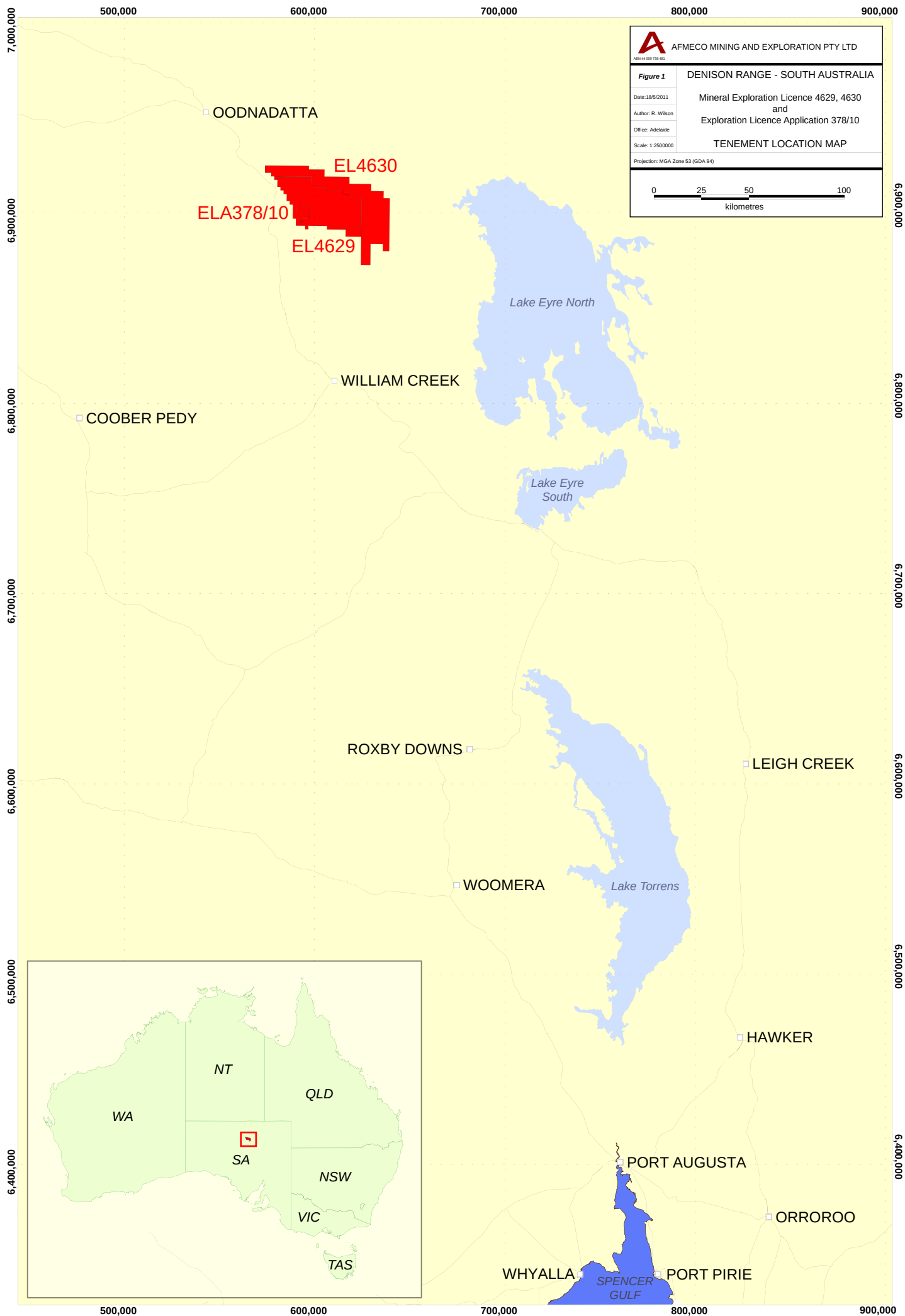
<i>File name</i>	<i>File size</i>	<i>File type</i>
EL4629_EL4630_EL4750_2012_A_004_DrillCollars.txt	3 KB	.txt
EL4629_EL4630_EL4750_2012_A_005_DrillCollars.txt	3 KB	.txt
EL4629_EL4630_EL4750_2012_A_006_LithoLogs.txt	16 KB	.txt
EL4629_EL4630_EL4750_2012_A_007_LithoLogs.txt	6 KB	.txt
EL4629_EL4630_EL4750_2012_A_008_LithoCodes.txt	1 KB	.txt
EL4629_EL4630_EL4750_2012_A_009_LithCodes.txt	3 KB	.txt
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Summary

The Denison Range Project is targeting sandstone-hosted uranium mineralisation in the Mesozoic sandstones located to the east of uranium-rich basement sequences of the Palaeo- to Mid-Proterozoic Peake and Denison Inliers. During the first year of activity a first pass rotary mud drill program was carried out on EL4629 and EL4750 to assess stratigraphy, oxidation state and the nature of potential sandstone uranium traps.

<i>Tenement</i>	<i>Activity</i>	<i>Details</i>
<i>EL 4629</i>	<i>Reporting</i>	<i>Government:</i> Annual summary report. <i>In-house:</i> Compilation of previous exploration work.
	<i>Rotary Mud Drilling</i>	9 holes totalling 2,112m
<i>EL 4630</i>	<i>Reporting</i>	<i>Government:</i> Annual summary report. <i>In-house:</i> Compilation of previous exploration work.
<i>EL 4750</i>	<i>Reporting</i>	<i>Government:</i> Annual summary report. <i>In-house:</i> Compilation of previous exploration work.
	<i>Rotary Mud Drilling</i>	2 holes totalling 442m

Keywords: Sandstone uranium, Cadna-Owie Formation, Algebuckina Sandstone, Great Artesian Basin, Rotary Mud Drilling



1 INTRODUCTION, HISTORY AND EXPLORATION RATIONALE

Exploration Licences (EL) 4629, 4630 and 4750 cover an area of 1,685 km² and are located approximately 70km southeast of Oodnadatta (Figure 1). The tenements are located on Peake, Allandale and Macumba Stations.

1.1 Exploration Rationale

The Denison Range Project is targeting sandstone-hosted uranium mineralisation in the Mesozoic sandstones located to the east of uranium-rich basement sequences of the Palaeo- to Mid-Proterozoic Peake and Denison Inliers. Potential for sediment-hosted uranium was recognised in overlying Mesozoic sediments by limited historic exploration, with uranium mineralisation encountered on the western side of the inliers. The Denison Range Project area is believed to be more prospective as palaeo-drainage from the uranium-rich basement is interpreted to cross the Project area in a W-E orientation and hence Afmeco's interest to the east of the Inliers.

The target horizon for sandstone-hosted uranium is the Jurassic Algebuckina Sandstone and the overlying Cadna-owie Formation where oxidised uranium bearing fluids percolate through porous sandstones and become fixed when they intersect reducing environments. These pyritic and weakly carbonaceous sandstones are up to 150m thick and disconformably overlain by Cretaceous Bulldog Shale. This region is prospective for uranium mineralisation as it contains the key criteria required for the formation of a uranium deposit (source, transport and trap).

1.2 Historic Exploration

Historically, there have been at least 17 different companies exploring the area since 1973 with limited exploration conducted over the Denison Range Project area. Most exploration has occurred on the western side of the Denison Range and has predominantly been for copper-gold. Within the tenement boundaries two historic drill holes were drilled – GA 01 drilled for stratigraphy/coal by Getty Oil Development Co in 1984 and LHDH 15 drilled for uranium/water by Chevron Exploration Corporation in 1973. Neither hole intersected the

entire sediment package nor targeted basement; GA 01 was terminated at 305.0m in Algebuckina Sandstone and LHDH 15 ended at 86.9m in the Cadna-owie Formation. This area remains under explored with very little historical data in terms of depth to basement, redox boundaries and stratigraphical information.

<i>Company</i>	<i>Year</i>	<i>Activity</i>	<i>Comment</i>
Uranez Australia	1973-1975	Ground radiometric surveys	- Follow up airborne radiometric surveys on selected areas - Basement outcrop is characterized by anomalous uranium concentrations
Britas Diamonds and Stockdale Prospecting	1978-1984	Ground radiometric surveys	- Several radiometric anomalies identified - Anomaly R1 – calcrete and siliceous travertine in contact with U-rich Wirricurrie Granite - Anomalies R2 & R3 – within volcanics. Mineralisation described as disseminated and low grade through the basalt
Red Metals	2006-present	Mud rotary drilling	12 wide-spaced rotary mud holes for 704m to test redox boundary identified by historical drilling - Best assay (from 2m sample) 2m @ 213ppm U and 329ppm V within weathered clay-rich saprolite underlying Mesozoic sedimentary sequence - Enrichments in nickel and copper are associated with uranium

Table 1: Denison Range Project - Historical uranium exploration

2 TENURE

EL 4629 and 4630 were granted to Afmeco Mining and Exploration (AFMEX) on the 13th of December 2010 for a period of two years. The minimum expenditure commitment for this period is \$220,000 and \$220,000 respectively for 4629 and 4630.

EL 4750 was granted to AFMEX on the 20th of June 2011 for a period of two years. The minimum expenditure commitment for this period is \$70,000.

3 GEOLOGY

3.1 Regional geology

The Peake and Denison Ranges are composed of a series of northerly trending Precambrian Inliers (Figure 2). The oldest rocks of the Peake and Denison Inliers are the Lower Proterozoic metamorphics of the Peake Series which outcrop extensively in the Peake-Denison Range. They consist of interlayered slates, phyllites, schists, quartzites, gneisses, migmatites and basic rocks. Granitoids in the Peake Inlier record a magmatic event which gave rise to U-rich granites between 1555-1530 Ma.

Overlying the Peake Metamorphics are the Upper Proterozoic Adelaidean Sediments which were deposited in a subsiding fault-bounded trough, the northern extension of the Adelaide Geosyncline. The Adelaidean Sediments consist of a basal conglomerate overlain by dolomite and volcanics, followed by a thick sedimentary sequence of shales, sandstones, siltstones and glacial tillites. The contact between the Peake Series and the Adelaidean Sediments is marked by faulting and frequently the emplacement of basic dykes.

Extensive continental sedimentation in the Great Artesian Basin commenced during the Jurassic and is represented by Algebuckina Sandstone which outcrops at the margins of the Inliers.

Algebuckina Sandstone is disconformably overlain by the Lower Cretaceous Cadna-owie Formation which marks the start of widespread marine transgression. Conformably overlying the Cadna-owie Formation is the Cretaceous marine Bulldog Shale. This unit is composed primarily of a medium to dark grey, clayey and silty mudstone with thin layers of coarse silt and fine sand.

The Precambrian sediments show evidence of extensive folding and faulting. The dominant structural feature is a series of NNW trending faults with extensively faulted anticlines and

well preserved synclines. There has been a major wrench thrust and reverse faulting in the area which probably occurred at the same time as in the Flinders Ranges in the early Palaeozoic. The Peake and Denison Ranges were formed during the Tertiary as uplifted fault blocks. The displacement along the faults was upwards of 500m. Jurassic and Cretaceous sediments and Tertiary silcrete were strongly upturned adjacent to the Ranges during the late Miocene.

3.2 Stratigraphy

The sedimentary record for the Denison Range Project shows a progressive change from continental fluvial conditions in the Late Jurassic to epicontinental marine environment in the Early Cretaceous. This is represented by the following three formations:

Bulldog Shale (Upper Cretaceous)

The Bulldog Shale is predominantly a medium to dark grey, clayey and silty mudstone with thin interbedded coarse silt and very fine sand layers which is bioturbated and fossiliferous. The Bulldog Shale is the most widely distributed and lithologically uniform Mesozoic unit in the Western Great Artesian Basin. It was deposited in a near shore to open marine environment. The thickness varies due to erosion but can reach up to 200+ metres thick. The Bulldog Shale conformably overlays the Cadna-owie Formation.

Cadna-owie Formation (Lower Cretaceous)

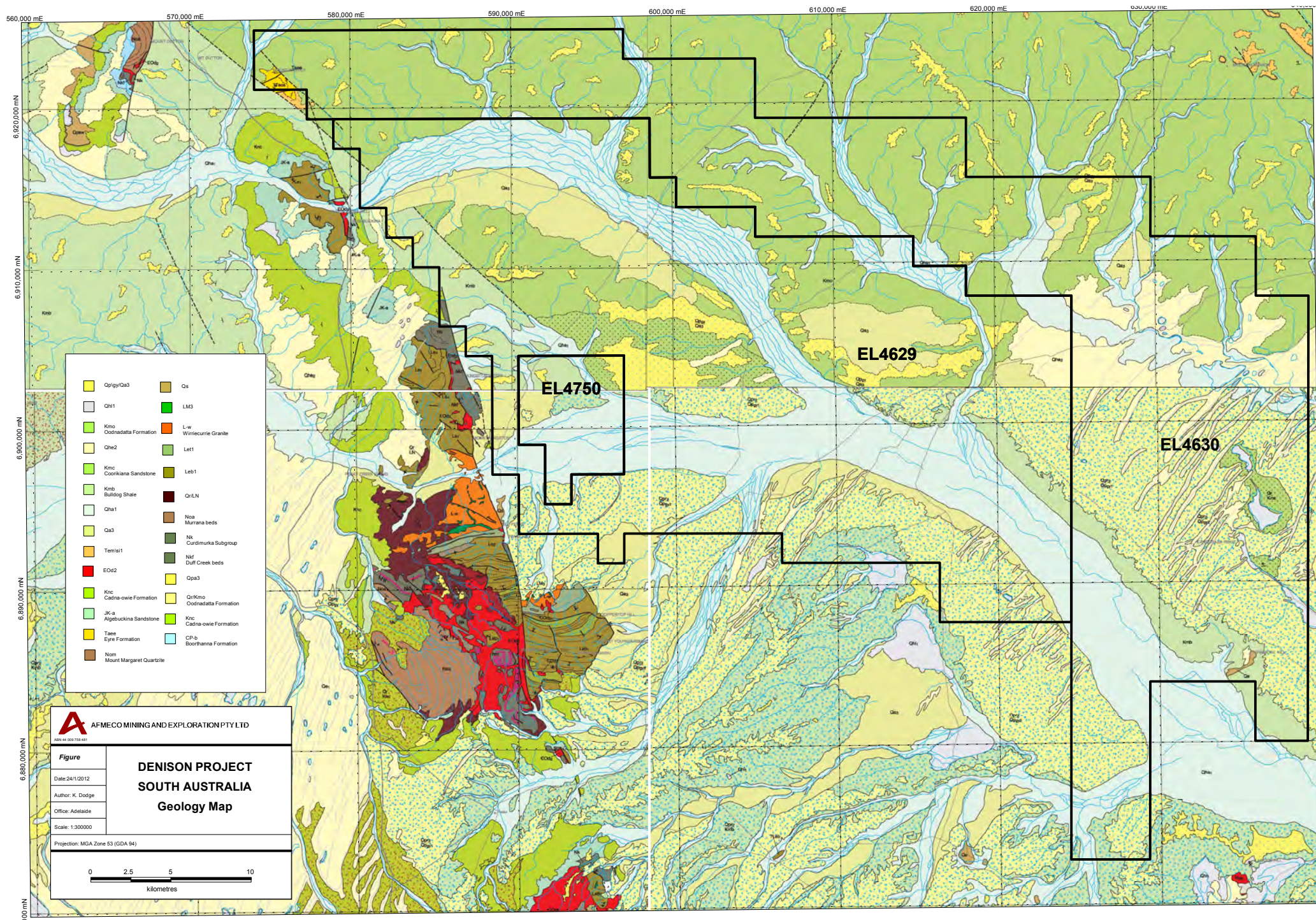
The formation consists of mainly silty and clayey, very fine to medium quartz sandstone with thin interbeds of claystone and siltstone, and irregular bands of pebbly medium to very coarse grained sandstone. Calcareous beds (rarely lignitic) occur occasionally within this formation and a carbonaceous horizon commonly marks the transition from the overlying Bulldog Shale and occasionally into the underlying Algebuckina Sandstone. It has a similar distribution as the Algebuckina Sandstone, and was deposited in a shallow-water marine to fluvial-deltaic environment. Thicknesses range from 5 to 65 metres. The Cadna-owie Formation disconformably overlies the Algebuckina Sandstone.

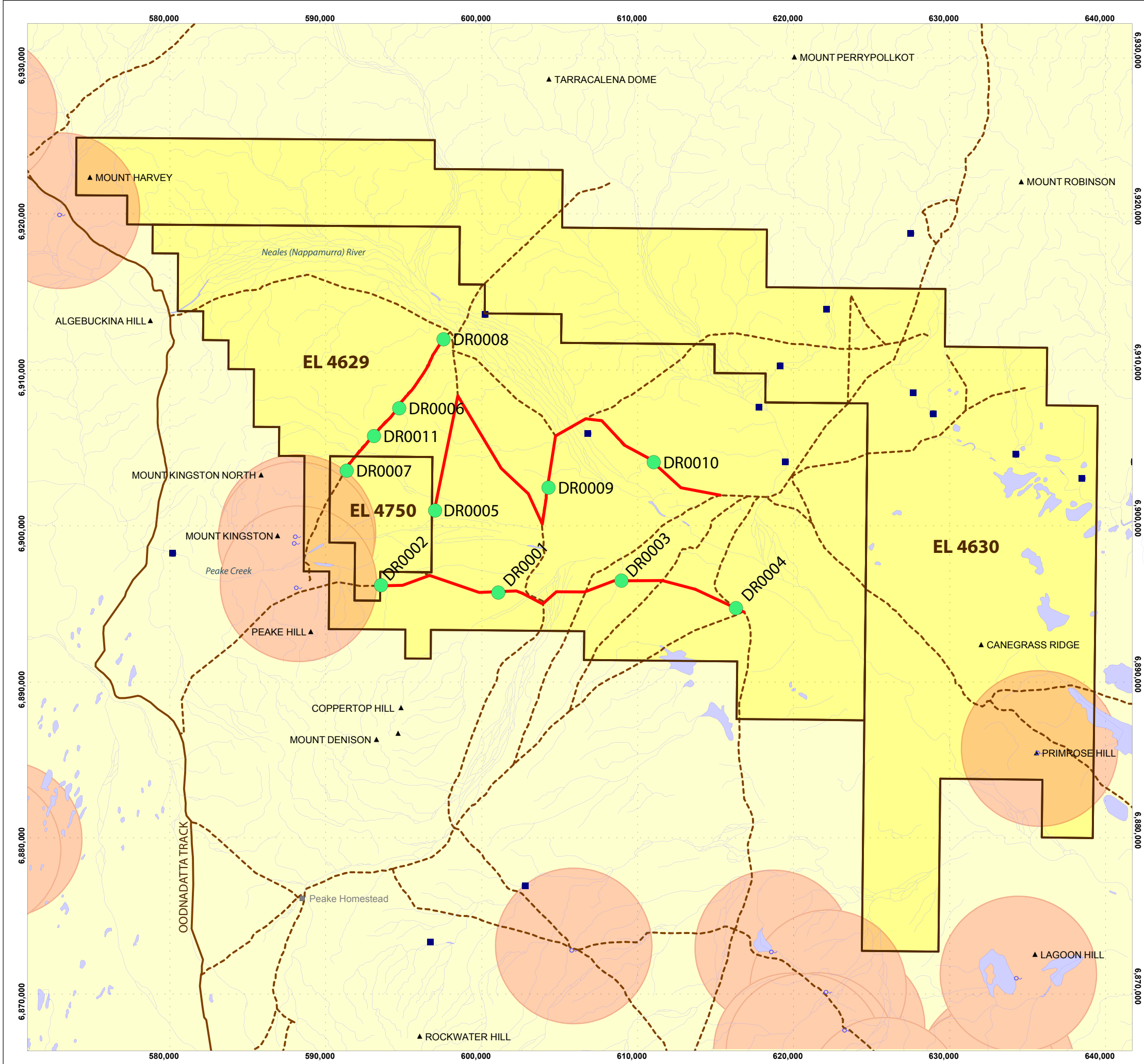
Algebuckina Sandstone (Jurassic)

The Algebuckina Sandstone mostly comprises fine to coarse grained and locally pebbly, quartz sandstone. The sandstone has variable clay content with minor interbedded micaceous claystone which typically becomes coarser with depth. Pebbly and conglomeratic layers can occur throughout the unit. The sandstone is exposed around the flanks and outliers on the Peake and Denison Ranges and can be poorly developed where it overlies basement saprolitic lithologies at relatively shallow depths (30-65m). Thicknesses range from 20 to more than 70 metres north and northeast of the Denison Inlier. Occasionally the basal part of the Algebuckina Sandstone is host to black organic rich layers.

Basement

Drilling to the west of the Denison Ranges occasionally intersected Precambrian basement. Basement has been described as quartzite and quartz-feldspar-biotite gneiss of the Paleoproterozoic Peake Series and has been reached at depths of 80 to 150+ metres. Saprolitic clay-sericite altered schist and granite are also recorded. Based on regional geophysics and drill data the basement east of the ranges varies from 200m (2011 drilling by Afmeco) in the SW part of the tenement and appears to be eastward-dipping with depths reaching 300-350m (based on water bore depths). The sedimentary sequence to the east of the Denison Inlier appears to be thicker with the Bulldog Shale increasing in thickness to the north-east.





**DENISON RANGE
SOUTH AUSTRALIA**
Mineral Exploration Licence 4629, 4630
& 4750

EXPLORATION INDEX MAP
13-12-2010 to 12-12-2011

Figure 3

SCALE 1 : 250 000
0 2.5 5 10
kilometres

Projection: MGA Zone 53 (GDA 94)
Prepared by R. Wilson

- Rotary Mud Drillhole
- Cleared Drill Transect 2011
- Exploration Licence (Afmeco)
- 5km radius around Mound Spring

Topographic Features

- | | |
|--------------|------------------|
| □ Town | — Highway |
| ○ Locality | — Secondary road |
| ■ Homestead | — Minor road |
| ▲ Hill | - - - Track |
| ○ Spring | — Drainage |
| ■ Water Hole | — Lake |



4 WORK COMPLETED DURING REPORTING PERIOD

4.1 Rotary Mud Drilling

The 2011 drilling program was designed as a first pass drilling program to assess stratigraphy, oxidation state and the nature of potential sandstone uranium traps to better focus future drilling programs (Figure 3).

Between the 12th October 2011 and the 16th of November 2011, 11 rotary mud holes were drilled by Thompson Drilling totalling 2,554 metres (Table 2). Drill holes were vertical with an average depth of 232m and a maximum depth of 286m. Drill holes were terminated once Precambrian basement was intersected.

Cutting samples were collected systematically every two metres for record purposes. Complete chip tray sections were taken for all holes, 250 gram bag samples were taken for all sand intersects. Cutting samples of complete holes DR0003, DR0005, DR0007 and DR0010 were sampled for PIRSA sample submission (submission forms are currently being assessed).

Down-hole probing was contracted to Borehole Wireline Pty Ltd. Several types of geophysical measurements were carried out for each hole as summarised in Table 3. Down-hole tool specifications are given in Appendix A.

<i>HoleID</i>	<i>Date_Start</i>	<i>Date_End</i>	<i>Easting</i> <i>MGA94 Z53</i>	<i>Northing</i> <i>MGA94 Z53</i>	<i>Elevation</i>	<i>Total</i> <i>Depth (m)</i>	<i>Azimuth</i>	<i>Dip</i>
DR0001	12/10/2011	14/10/2011	600991	6895783	50	226	0	-90
DR0002	15/10/2011	16/10/2011	593417	6896319	49	218	0	-90
DR0003	18/10/2011	20/10/2011	608944	6896481	38	228	0	-90
DR0004	18/10/2011	22/10/2011	616314	6894657	30	242	0	-90
DR0005	23/10/2011	24/10/2011	596957	6901044	42	216	0	-90
DR0006	4/11/2011	6/11/2011	594688	6907569	59	286	0	-90
DR0007	6/11/2011	7/11/2011	591264	6903636	48	224	0	-90
DR0008	9/11/2011	14/11/2011	597583	6911948	64	225	0	-90
DR0009	9/11/2011	10/11/2011	604284	6902445	42	216	0	-90
DR0010	11/11/2011	12/11/2011	611094	6904000	43	221	0	-90
DR0011	15/11/2011	16/11/2011	593049	6905822	48	252	0	-90
TOTAL						2,554 m		

Table 2 – Denison Range Project: 2011 Collar information

	Run	1				2					
	Measurement	Gamma	Calliper	Induction		Gamma	SP	Resistivity		Deviation	
				Shallow	Deep			Shallow	Deep	Inclination	Azimuth
	Speed (m/min)	5				5					
	Step (cm)	10				10					
Tenement	Drillhole										
EL4629	DR0001	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EL4750	DR0002	✓	✓	✓	✓	✓	✓	X	X	✓	✓
EL4629	DR0003	✓	✓	✓	✓	✓	✓	X	X	✓	✓
EL4629	DR0004	✓	✓	✓	✓	✓	✓	X	X	✓	✓
EL4629	DR0005	✓	✓	✓	✓	X	X	X	X	X	X
EL4629	DR0006	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EL4750	DR0007	✓	✓	✓	✓	✓	✓	X	X	✓	✓
EL4629	DR0008	✓	✓	✓	✓	✓	✓	X	X	✓	✓
EL4629	DR0009	✓	X	X	X	X	✓	X	X	✓	✓
EL4629	DR0010	✓	✓	✓	✓	✓	✓	X	X	✓	✓
EL4629	DR0011	✓	✓	✓	✓	✓	✓	X	X	✓	✓

Table 3: Denison Range Project - Detail of down-hole geophysical survey runs for each drill hole

4.2 Drilling Results

4.2.1 Mineralisation

Weak gamma anomalies were observed mainly at the contact between the Algebuckina Sandstone and the Basement where the basement has an elevated background compared to the sands of the Algebuckina. Anomalies were also detected within the Algebuckina Sandstone at the contact between oxidised sand and organic reduced sands and silts.

Weak anomalies are also observed at discontinuities between lithologies i.e. at the contact between porous oxidised sand and overlying/underlying reduced clays and silts.

Whilst the results from the 2011 drilling program are not significantly anomalous (<100 ppm) there is evidence of uranium being present within the system. The mineralisation appears to be related to redox change and the 2012 program will have an emphasis on finding a redox boundary where uranium can be fixed. Table 4 details the findings from the 2011 drilling program.

<i>Drill Hole</i>	<i>From (m)</i>	<i>To (m)</i>	<i>GT %o (ppm eU308)</i>	<i>GT 25ppm cut off</i>	<i>GT 50ppm cut off</i>	<i>GT 100ppm cut off</i>	<i>Max ppm</i>	<i>Depth (m)</i>
DR0001	8.9	221.6	1.614	0.175	0.000	0.000	35	210.6
DR0002	0	217.2	1.723	0.120	0.000	0.000	38	205.4
DR0003	-0.4	224.5	1.551	0.000	0.000	0.000	23	223.1
DR0004	-0.2	239.3	1.828	0.041	0.011	0.000	56	232.7
DR0005	0	207.2	1.378	0.000	0.000	0.000	16	194.5
DR0006	12.4	287.7	1.773	0.000	0.000	0.000	21	256.3
DR0007	12	224.4	1.445	0.000	0.000	0.000	18	217.1
DR0008	15.7	224.2	1.517	0.000	0.000	0.000	20	224.1
DR0009	11.4	215.3	1.388	0.002	0.000	0.000	25	213.4
DR0010	12	219.5	1.461	1.607	0.000	0.000	15	207
DR0011	12.1	251.8	1.668	1.835	0.016	0.008	77	220.5

Table 4: Denison Range Project - 2011 Collar Grade Thickness Information

4.2.2 Redox Potential

The sand units intersected during the 2011 drilling campaign were predominately reduced with pyrite and occasional organic matter (observed in three holes up to 6m thick). Intervals of weakly oxidised sands were seen within the Algebuckina Sandstone typically at the top of the unit.

Oxidised Algebuckina Sandstone outcropping around the flanks of the ranges indicates the potential for a redox boundary in closer proximity to the range front, where oxidised fluids are able to enter the system.

4.3 Environmental Rehabilitation

Drillholes were sited to ensure minimal impact to vegetation and soils. All drilling occurred along existing station tracks in order to minimise the impact.

All drill holes were constructed and abandoned in accordance with PIRSA Information Sheet M21; *Mineral Exploration Drillholes – General Specifications for Construction and Backfilling*. At the date of writing this report, all drillholes and pads were rehabilitation and completion of track rehabilitation was underway.

As all drill holes intersected artesian aquifers, at the completion of drilling and down-hole probing, holes were cemented in such a way as to prevent the flow of water to the surface.

Photomonitoring sites were established and monitored pre and post drilling, post rehabilitation and will continue to be monitored periodically.

An exploration rehabilitation/compliance report will be submitted to PIRSA at the completion of rehabilitation to detail rehabilitation methods and present photomonitoring.

5 WORK EXPENDITURE

5.1 Work Expenditure

5.1.1 EL 4629

OPERATIONS REPORT – EXPLORATION EXPENDITURE

Annual Summary Report			
Tenement Type:	Exploration Licence	Number:	4629
Reporting Period:	From: 13/12/2010	To:	12/12/2011

SUMMARY OF COSTS FOR EXPLORATION ACTIVITIES	
A. EXPLORATION ACTIVITIES:	\$642,790.65
B. ABORIGINAL HERITAGE SURVEYS:	\$0.00
C. ANNUAL TENEMENT RENT AND RATES	\$14,864.00
D. ADMINISTRATION/OVERHEADS:	\$97,912.78
E. LAND ACCESS/NATIVE TITLE COSTS:	\$20,659.95
TOTAL EXPENDITURE:	\$776,227.38

DETAILED ACTIVITY LISTING

Tenement Type:	Exploration Licence	Number:	4629
Reporting Period:	From: 13/12/2010	To:	12/12/2011
A. Mineral-Exploration Activities			
Salaries		\$115,838.24	
		\$11,733.73	
Consultants - General		\$1,255.28	
Consultants - Geological		\$731.83	
Drilling - Rotary Mud		\$363,332.90	
Water Analysis		\$124.83	
Geophysics - Downhole		\$34,645.38	
Consumables		\$249.44	
Maps		\$116.59	
Camp Costs		\$2,816.36	
Drafting/office supplies		\$123.66	
Equipment - Maintenance		\$194.27	
Equipment Hire		\$11,461.66	
Field equipment		\$9,903.50	
Safety clothing & Equipment		\$141.90	
Communications (phone, fax, etc)		\$4,358.21	
Site Repairs & Maintenance		\$84.36	
Travel - Accommodation		\$1,867.90	
Travel - Airtaxes		\$2,905.02	
Travel - Other		\$910.89	
Vehicles		\$71,307.31	
Fuel		\$6,713.83	
Computer Costs		\$2,173.56	
		Sub-total	\$642,790.65
B. Aboriginal Heritage Surveys			
(none)			
(none)			
		Sub-total	\$0.00
C. Annual Tenement Rent			
Tenement rental		\$7,039.00	
Tenement Advertising		\$580.00	
Tenement application fees		\$7,245.00	
		Sub-total	\$14,864.00
D. Administration and Overheads			
Operator overheads		\$97,912.78	
		Sub-total	\$97,912.78
E. Land Access/Native Title			
Aboriginal Heritage Surveys		\$14,818.13	
Aboriginal Agreement Payments		\$3,500.00	
Legal - Other		\$2,341.82	
		Sub-total	\$20,659.95
TOTAL EXPENDITURE			\$776,227.38

5.1.2 EL 4630

OPERATIONS REPORT – EXPLORATION EXPENDITURE

Annual Summary Report			
Tenement Type:	Exploration Licence	Number:	4630
Reporting Period:	From: 13/12/2010	To:	12/12/2011

SUMMARY OF COSTS FOR EXPLORATION ACTIVITIES	
A. EXPLORATION ACTIVITIES:	\$88,997.18
B. ABORIGINAL HERITAGE SURVEYS:	\$0.00
C. ANNUAL TENEMENT RENT AND RATES	\$14,814.05
D. ADMINISTRATION/OVERHEADS:	\$16,867.43
E. LAND ACCESS/NATIVE TITLE COSTS:	\$8,638.37
TOTAL EXPENDITURE:	\$129,317.03

DETAILED ACTIVITY LISTING

Tenement Type:	Exploration Licence	Number:	4630
Reporting Period:	From: 13/12/2010	To:	12/12/2011

A. Mineral-Exploration Activities		
Salaries	\$64,030.70	
Contract Labour	\$4,956.20	
Consultants - Geological	\$731.83	
Consultants - General	\$1,255.27	
Water Analysis	\$124.83	
	\$162.98	
Maps	\$116.60	
Camp Costs	\$1,965.23	
Drafting/office supplies	\$123.66	
Equipment - Maintenance	\$167.82	
Equipment Hire	\$1,109.99	
Field equipment	\$1,882.00	
Safety clothing & Equipment	\$141.90	
Communications (phone, fax, etc)	\$1,062.21	
Travel - Accommodation	\$1,075.53	
Travel - Airfares	\$1,846.48	
Travel - Other	\$533.42	
Vehicles	\$2,191.86	
Fuel	\$3,345.11	
Computer Costs	\$2,173.56	
	Sub-total	\$88,997.18
B. Aboriginal Heritage Surveys		
(none)		
(none)		
	Sub-total	\$0.00
C. Annual Tenement Rent		
Tenement rental	\$7,013.65	
Tenement Advertising	\$580.00	
Tenement application fees	\$7,220.40	
	Sub-total	\$14,814.05
D. Administration and Overheads		
Operator overheads	\$16,867.43	
	Sub-total	\$16,867.43
E. Land Access/Native Title		
Aboriginal Heritage Surveys	\$3,824.87	
Aboriginal Agreement Payments	\$3,500.00	
Legal - Other	\$1,313.50	
	Sub-total	\$8,638.37
TOTAL EXPENDITURE		\$129,317.03

5.1.3 EL 4750

OPERATIONS REPORT – EXPLORATION EXPENDITURE

Annual Summary Report			
Tenement Type:	Exploration Licence	Number:	4750
Reporting Period:	From: 13/12/2010	To:	12/12/2011

SUMMARY OF COSTS FOR EXPLORATION ACTIVITIES	
A. EXPLORATION ACTIVITIES:	\$105,838.07
B. ABORIGINAL HERITAGE SURVEYS:	\$0.00
C. ANNUAL TENEMENT RENT AND RATES	\$931.60
D. ADMINISTRATION/OVERHEADS:	\$15,323.80
E. LAND ACCESS/NATIVE TITLE COSTS:	\$1,891.00
TOTAL EXPENDITURE:	\$123,984.47

DETAILED ACTIVITY LISTING

Tenement Type:	Exploration Licence	Number:	4750
Reporting Period:	From: 13/12/2010	To:	12/12/2011

A. Mineral-Exploration Activities		
Salaries	\$19,218.03	
	\$3,308.02	
Consultants - General	\$569.60	
Drilling - Rotary Mud	\$42,325.60	
Geophysics - Downhole	\$8,661.35	
Water Analysis	\$40.65	
Consumables	\$95.45	
Camp Costs	\$775.75	
Drafting/office supplies	\$13.07	
Equipment Maintenance	\$52.11	
Equipment Hire	\$2,949.27	
Field equipment	\$2,859.96	
Safety clothing & Equipment	\$48.20	
Communications (phone, fax, etc)	\$1,108.08	
Site Repairs & Maintenance	\$21.09	
Travel - Accommodation	\$530.36	
Travel - Airfares	\$865.77	
Travel - Other	\$219.13	
Vehicles	\$20,340.01	
Fuel	\$1,840.57	
	<i>Sub-total</i>	\$105,838.07
B. Aboriginal Heritage Surveys		
(none)		
(none)		
	<i>Sub-total</i>	\$0.00
C. Annual Tenement Rent		
Tenement rental	\$393.60	
Tenement Advertising		
Tenement application fees	\$538.00	
	<i>Sub-total</i>	\$931.60
D. Administration and Overheads		
Operator overheads	\$15,323.80	
	<i>Sub-total</i>	\$15,323.80
E. Land Access/Native Title		
Aboriginal Heritage Surveys	\$1,245.31	
Legal - Other	\$645.69	
	<i>Sub-total</i>	\$1,891.00

TOTAL EXPENDITURE**\$123,984.47**

6 CONCLUSIONS

The Cretaceous-Jurassic Formations to the east of the Peake and Denison Ranges have shown the potential to be excellent targets for sandstone-hosted uranium mineralisation due to the following:

- Thick sequences of gently dipping, porous, shallow-water marine to fluvial-deltaic sandstone proximal to the source.
- Rich, radiogenic granitic/volcanic basement source (65-70 ppm U).
- Present day drainage from the uranium-bearing basement rocks and flows east across the Denison tenements; thus representing a long-lived recharge of uraniumiferous, oxidised fluids.
- Presence of reducing elements; pyrite and organic matter.
- A redox boundary exists on the western side of the Peake and Denison Inliers, proximal to the source rocks as discovered by Red Metals in 2007.

This first pass drilling program enabled Afmeco to assess stratigraphy, oxidation state and the nature of potential sandstone uranium traps to better focus future drilling programs. The results of this program were encouraging enough to warrant follow-up drilling in 2012 with a main focus on finding a redox boundary closer to the ranges (source).

References

Rogers, P.A. & Freeman, P.J. 1961. Geology – South Australia – Warrina Region. 1:250,000 geological series – explanatory notes. Geological Survey of South Australia.

APPENDIX A

GEOVISTA PROBE DETAILS

Natural Gamma Sonde

The Geovista digital Natural Gamma Ray Sonde can be used on its own or in combination with other Geovista sondes for correlation purposes. The spectral gamma version can operate in both spectral and in 5 window mode

Specifications:

Gross Gamma Sonde

Weight:	3.5kg
Length / Diam.	0.7m / 38mm or 28mm
Detector (NaI)	50mm x 25mm (38mm sonde only)
Max. Press. /Temp.	20MPa / 80°C

Spectral Gamma Sonde

Weight:	6.30kg
Length / Diam.	0.9m / 60mm
Detector (NaI)	150mm x 38 mm
Max. Press. /Temp.	20MPa / 80°C
No. of Channels	256
Energy Range	100keV to 2.8MeV
Resolution	10% @ 137Cs



Caliper Sonde

The GeoVista Two-Arm caliper probe can be used on its own, in combination with other GeoVista sondes, or with a second caliper sonde to provide a low cost Four-Arm caliper.

Alternatively a single Four-Arm caliper with independent arms is available for larger boreholes.

The addition of a Geovista Verticality sonde would yield a Borehole Geometry Log.

Specifications:

	2-Arm	4-Arm
Weight	5.5 kg	18.0kg
Length	1.15	1.18m
Diameter	38mm	80mm
Accuracy	±5mm	±5mm
Max. Pressure	20MPa	20MPa
Max. Temp.	80°C	80°C
Range	45 – 600 mm	85 to 1000mm



Geovista reserve the right to change the products' list and specifications without prior notice

EM Induction Sonde

Provides logs in low conductivity mud, air-filled and plastic lined boreholes. Performance is best in higher conductivity formations. The Dual Induction configuration allows for a deep and medium penetration differentiating between invaded and uninvaded zones. Probes can be used on their own or in combination with other Geovista sondes.

Specifications:

	Single Induction	Dual Induction
Weight:	6.5 kg	7.5 kg
Length	1.83 m	1.85 m
Diameter	43 mm	43 mm
TX-RX Spacings	39"	24" & 32"
Operating frequency	39 kHz	25 kHz
Conductivity Range	3 to 3000 mmho	3 to 3000 mmho
Max. Pressure	20MPa	20MPa
Max. Temperature	80°C	80°C

Induced Polarisation Sonde

The Geovista IP sonde measures apparent formation chargeability to detect the presence of disseminated ore bodies. In addition, an SP curve can also be recorded to help locate massive ore bodies.

Specifications:

Length / Weight / Ø:	1.8 m / 7.0 kg / 42 mm
Method of measurement:	Time Domain with 220 ms cycle time
Electrode spacing:	40 cm spacing, in Wenner array configuration
Max. Temp.:	80° C
Max. Press.:	20M Pa

Magnetic Susceptibility Sonde

This is a two coil EM induction sonde designed to measure formation conductivity and magnetic susceptibility.

Specifications:

Length / Weight / Ø:	2.0 m / 6.5 kg / 36 mm
TX to RX spacing:	85 cm
Apparent Susceptibility range:	0 to 7000 mS/m
Apparent Conductivity range:	0 to 90 x 10 ⁻³ SI units
Max. Temp.:	50°C
Max. Press.:	10M Pa



Geovista reserve the right to change the products' list and specifications without prior notice

Normal Resistivity Sonde

The Geovista digital Normal Resistivity Sonde can be used on its own or in combination with other Geovista sondes for efficient logging and correlation purposes. The SP can be recorded with the sonde either powered on or off, using the 16" electrode and a surface fish.

Specifications:

Weight	8kg
Length	2.27m
Diameter	42mm
64"N & 16"N Resistivity Range	1 to 10,000 Ohmm
SPR	1 to 10,000 Ohm
SP Range	-2.5V to +2.5V
Current return	Cable armour
Measure return	Bridle electrode
Max. Pressure	20MPa
Max. Temperature	80°C

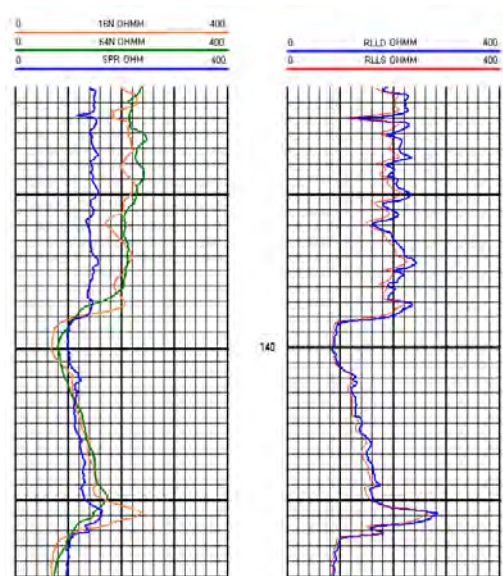
Dual Guard Focused Resistivity Sonde

Provides a Medium and a Deep LL3 focussed resistivity log with finer vertical resolution than the traditional Normal Resistivity sonde.

Performance is also better in higher conductivity mud and higher resistivity formations. This probe can be used on its own or in combination with other Geovista sondes.

Specifications:

Weight	8.0 kg
Length	2.37m
Diameter	38 mm
LLD & LLS Resistivity Range	1 to 10,000 Ohmm
SP Range	-2.5V to +2.5V
Max. Pressure	20MPa
Max. Temperature	80°C



Geovista reserve the right to change the products' list and specifications without prior notice

Verticality Sonde

The Geovista digital Verticality probe can be used in open boreholes or in non-magnetic casing. It can be run on its own or in combination with other Geovista sondes for correlation purposes or to save run time.

Specifications:

Weight / Length/ Ø:	3.5 kg / 0.60 m / 38 mm
Inclination Accuracy:	±0.4° (<i>Higher accuracy sensor available</i>)
Range:	0 to 180°
Azimuth Accuracy:	±2.0°
Range:	0 to 360°
Max. Pressure	20MPa
Max. Temperature	80°C

Inclinometer Sonde

The Geovista inclinometer probe measures borehole inclination only. It can be used on its own or in combination with other Geovista sondes.

Specifications:

Weight / Length/ Ø:	3.5 kg / 0.60 m / 38 mm
Inclination Accuracy:	±0.5°
Range:	0 to 30° (<i>Extended Range avail-</i>
Max. Pressure	20MPa
Max. Temperature	80°C

Casing Collar Locator (CCL)

The Geovista CCL sonde is used to locate casing joints in a borehole. The probe can be used on its own or in combination with other Geovista sondes for correlation purposes in cased holes.

Specifications:

Weight / Length /	3.9kg / 0.65m / 38mm
Detector	1" Coils and magnets assembly
Max. Press. / Temp.	20MPa / 80°C

Quatrz Pressure Gauge (QPG)

The Geovista QPG probe is used to log pressure variations in the borehole fluid column. The probe can be used on its own or in combination with other Geovista sondes.

Specifications:

Weight / Length /	4.0kg / 0.73m / 38mm
Accuracy / Resolution:	± 1 dBar / ± 0.1 dBar
Max. Press. / Temp.	20MPa / 80°C



Geovista reserve the right to change the prod-

APPENDIX B

DRILL HOLE LOGS EL4629

AFMECO Mining and Exploration Pty Ltd

State : South Australia

Project : DENISON RANGE

Tenement : EI 4629

Drilled depth : 228 m

Logged depth: 227 m

Azimuth : 0

Tenement	Nb.	Repeat Nb.
DB	0003	1

System : UTM GDA94-z53

X: 608944.00
Y: 6896481.00

Z: 38.00 Radar data +/- 5 m

Drilling company : Thompson Drilling

Drill rig :		RIG 18	
Drilling diameter	from	to	

130	mm	0	122
133	mm	122	228
	mm		

Casing diameter		from	to (m)
Internal	External		
160 mm	177 mm	0	42
mm	mm		
mm	mm		

GEOLOGIST: D. FREEMAN

Start: 20/10/20 **End:** 20/10/20

Drilling fluid: Polymer mix

Fluid Loss: start: XXX m

Fluid level : 169m

Grouting from '110

LITHOLOGIES LEGEND

☐ Clay

☐ Clay and Silt

LOGGING
Date : 21/10/2019

Probe ID	Ac. s
----------	-------

Time since end of drilling (min): 30

<i>syst.</i>	<i>Measurement</i>	<i>Run</i>
--------------	--------------------	------------

Acquisition systems Geovista

<i>Top (m)</i>	<i>Bottom (m)</i>	<i>Step (cm)</i>	<i>S.(m/mn)</i>
----------------	-------------------	------------------	-----------------

Stack GR 3161 CALI 3280 DILL 3601	Geovista	Total Gamma	yes	1	GL	227.89	10	5
		Deep Form. Induction	yes					
		Short Form. Induction	yes					
		Caliper	yes					
Stack GR 3346 DLL3 3672 MDEV 3449	Geovista	Total Gamma	yes	2	GL	225.42	10	5
		Deep Form. Resistivity	NO					
		Short Form. Resistivity	NO					
		SP	yes					
		Mag Deviation	yes					
Graveling Interval: 100 m to 100 m / 100 m to 200 m								

Density: XXX @ XXX m / XXX @ XXX m / XXX @

Viscosity XXX @ XXX m / XXX @ XXX m / XXX @ XXX m / XXX @ XXX m / XXX @ XXX m / XXX @ XXX m

SPP Gamma Before: 45-55 cps After: 45-55 cps

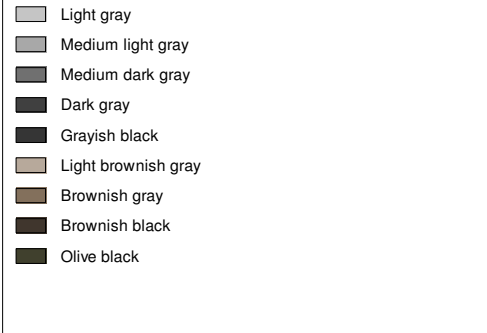
Remarks: BLADE 5 1/4 0 - 122

1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600 7700 7800 7900 8000 8100 8200 8300 8400 8500 8600 8700 8800 8900 9000 9100 9200 9300 9400 9500 9600 9700 9800 9900 10000

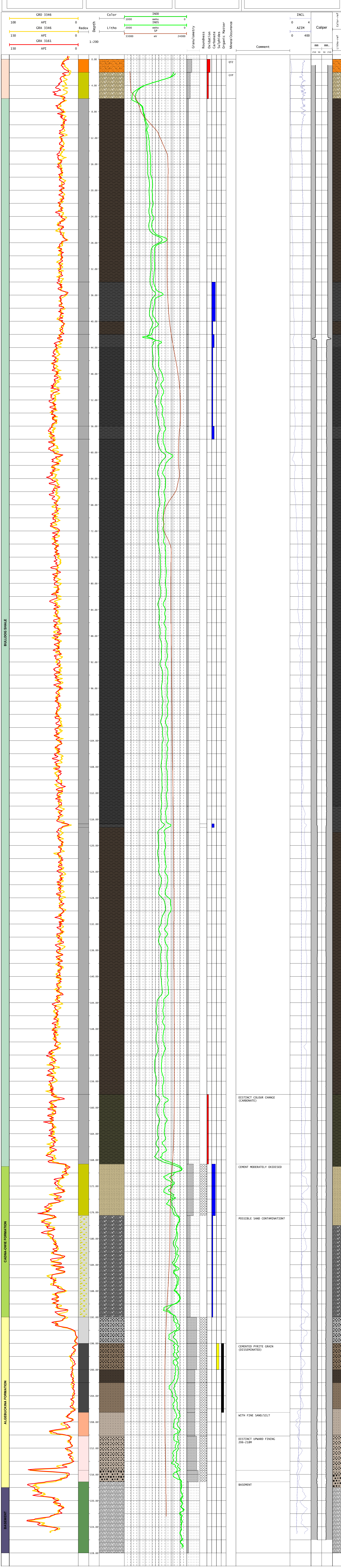
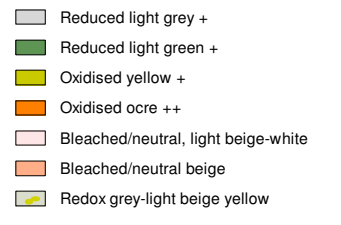
Clay and Silt

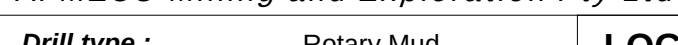


lowish brown



Reduced grey ++





Scale: 1/200

Penetration: EL 4029

Dip : 90 °

Y: 6894657
Z: 30 Radar data +/- 5 m

<i>Drilling diameter</i>	<i>from</i>	<i>to (m)</i>
--------------------------	-------------	---------------

Internal	External		
160 mm	177 mm	0	42
mm	mm		
mm	mm		

Fluid Loss: start: XXX m end: XXX m

Conditions of hole abandonment :
Grouting from 2.42 m to 0 m

LITHOLOGIES LEGEND

 Silt

Time since end of drilling (min): 30

Probe ID	Ref. Syst.	Measurement	Unit
01		Total Gamma	yes

<i>Top (m)</i>	<i>Bottom (m)</i>	<i>Step (cm)</i>	<i>S.(m/mn)</i>
----------------	-------------------	------------------	-----------------

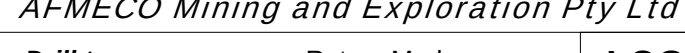
Sampling Intervals:168 m to 240 m

Density: XXX @ XXX m / XXX @ XXX m / XXX @ XXX m / XXX @ XXX m / XXX @ XXX m / XXX @ XXX m

SPP Gamma	Before: 45-55 cps	After: 45-55 cps
------------------	-------------------	------------------

Page 10 of 10

[illegible]



Scale: 1/200

Tenement : EL 4629

Dip : 90 °

Y: 6904000
Z: 43 Radar data +/- 5 m

Drill rig : BOURNE 1250

<i>Internal</i>	<i>External</i>		
160 mm	177 mm	0	43
mm	mm		
mm	mm		

Conditions of hole abandonment

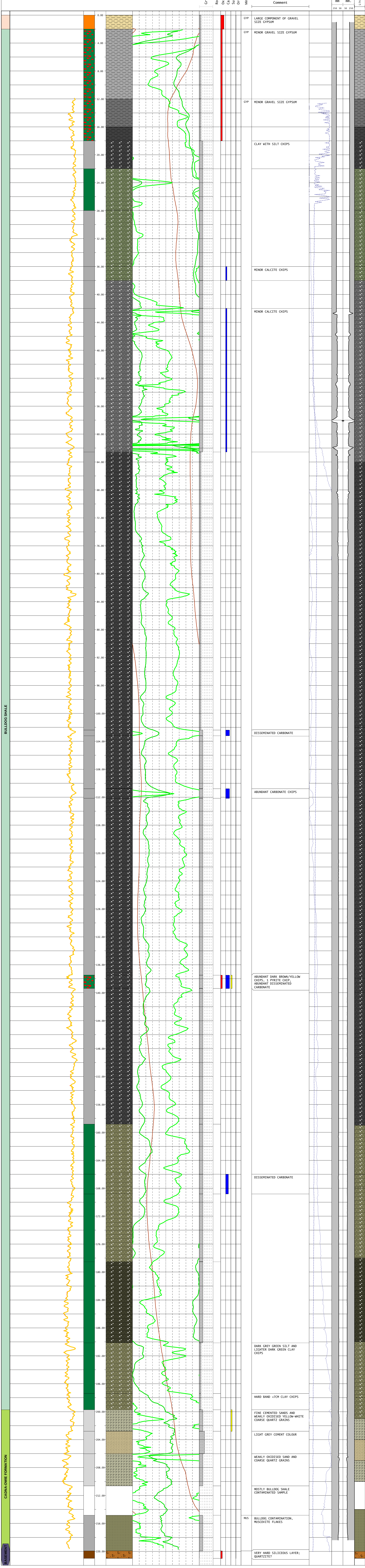
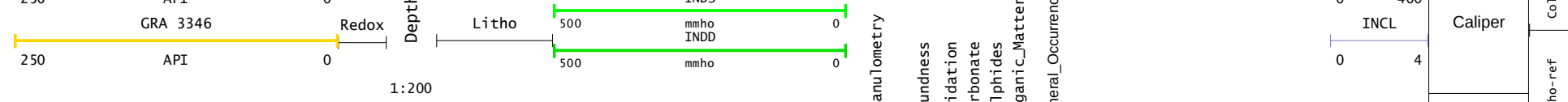
Recorder: JMD

1350000	
1350000	1350000

SPP Gamma Before: 40-55 cps After: 45-60 cps

Remarks: STATIC DLL3 VALUES, INTERMITTENT PROBLEM.

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	



APPENDIX C

DRILL HOLE LOGS EL4630

Drilling company : Thompson

Drilling diameter	from
--------------------------	-------------

Drilling diameter	16 mm
153	

130 mm	0	172
133 mm	172	224
Casing diameter	from	to (m)

<i>Internal</i>	<i>External</i>		
160 mm	177 mm	0	42
mm	mm		
mm	mm		

GEOLOGIST: R WILSON

21.01.2011 5

Start: 6/11/11 **End :** 7/11/11

Drilling fluid: Polymer mix

— 114 —

Fluid Loss: start: XXX m end: XX

Logging
 Date: 7/11/14

Date : 7/11/11

Time since end of drilling (min): 22

Time since end of drilling (min): 30

Test	Measurement	Days
------	-------------	------

yst.	Measurement	Run
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11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474
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neobacter. PMID
associated

Acquisition systems

T_{top} (mm)	B_{bottom} (mm)	Δt_{top} (s/mm)	δ (mm/mm/s)
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Top (m)	Bottom (m)	Step (cm)	S.(m/mh)
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	1	2	3	4
1	1			
2		1		
3			1	
4				1

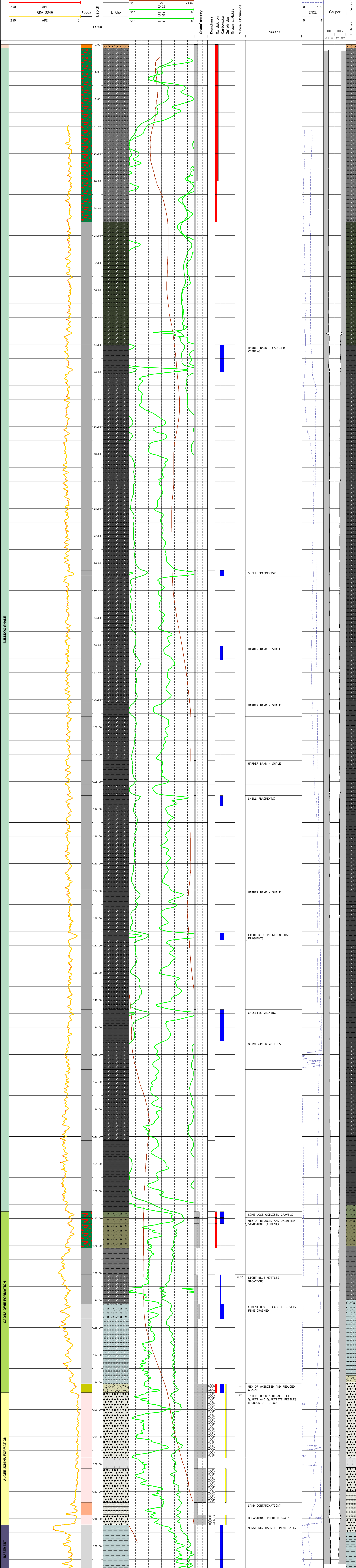
Slack			
000000	Deer Farms Induction	1000	

GR 3161	Deep Form. Induction	yes	1	21	234.5	10	6
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CALL 2280	Geovista	Chart Frame Induction	1	GL	224.5	10	6
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CALI 3280	Short Form. Induction	yes
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DII I 3601	Caliper			
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APPENDIX D

GEOLOGICAL CROSS SECTIONS



AFMECO MINING AND EXPLORATION

ABN 44 009 758 481

DENISON RANGE SOUTH AUSTRALIA

Mineral Exploration Licence 4629

4630 & 4750

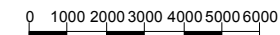
Profile 1
DR0001 - DR0004

SECTION SPECIFICATIONS:

REF. PT. E, N	604870 m	6895600 m
EXTENTS	33280 m	325 m
SECTION TOP, BOT	58.4 m	-266.6 m
TOLERANCE +/-	1003 m	
VERTICAL EXAG.	100	

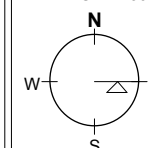
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(m)



GDA94 / Australian Map Grid zone 53

AZIMUTH = 90°



PROFILES

Gamma cps (GRO-3346)

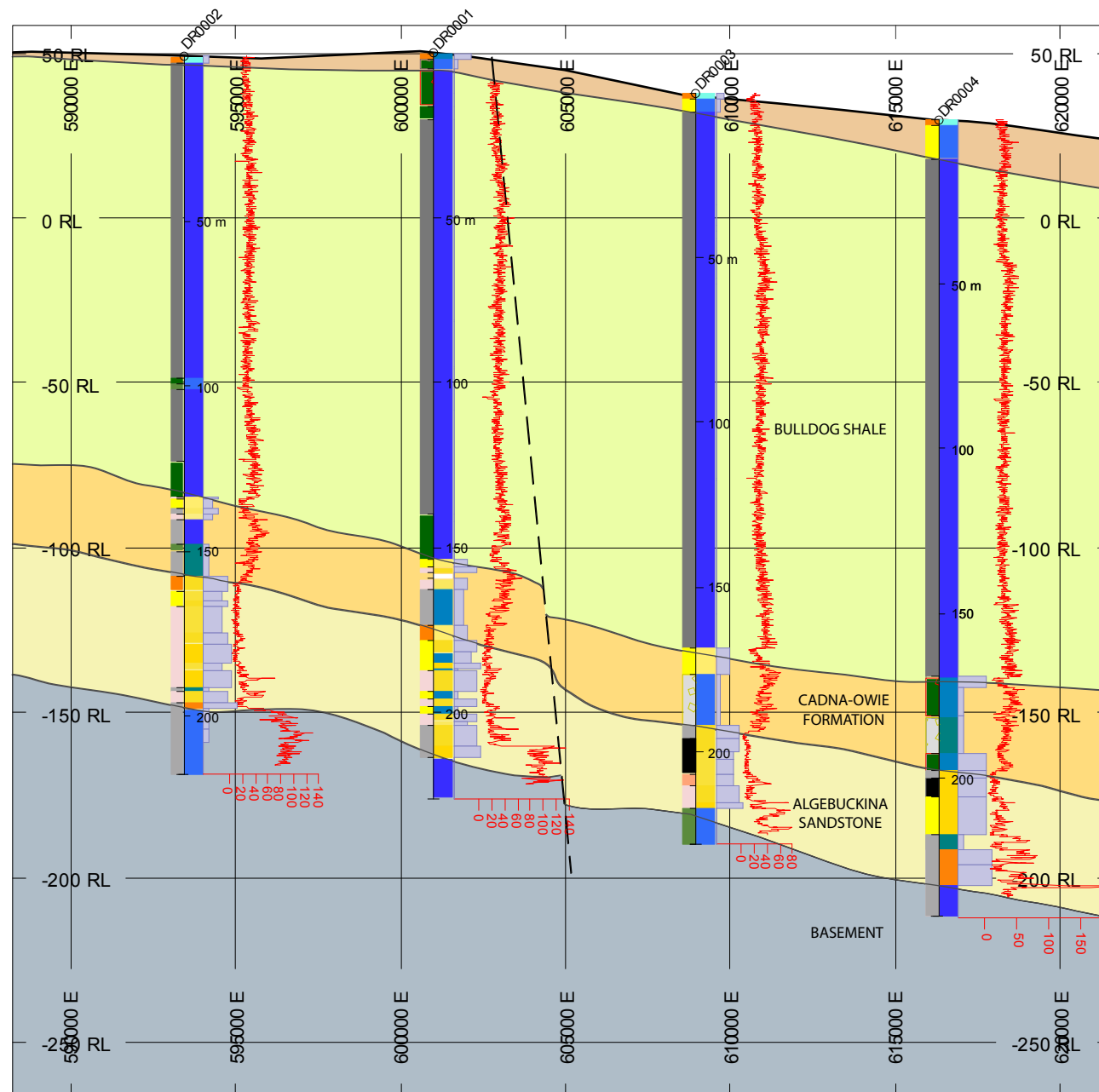
Granulometry (min 1, max 8)

REDOX CODES

Reduced black
Reduced grey
Reduced light grey
Reduced green
Reduced light green
Transitional redox green with red patches
Transitional redox brown with green patches
Oxidised yellow
Oxidised ocre
Bleached / neutral, light beige-white
Bleached / neutral beige
Transitional redox grey-light beige yellow

LITHOLOGY CODES

No recovery
Clay
Silt
Clay and silt
Clay and sand
Sand and silt
Sands, silt/clay
Very fine grained sand
Fine grained sand
Medium grained sand
Coarse grained sand
Very coarse grained sand
Gravel
Fine sandstone
Coarse sandstone





AFMECO MINING AND EXPLORATION

ABN 44 009 758 481

DENISON RANGE SOUTH AUSTRALIA

Mineral Exploration Licence 4629
4630 & 4750

Profile 2
DR0006 - DR0007 - DR0008 - DR0011

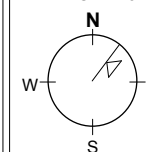
SECTION SPECIFICATIONS:

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EXTENTS	16640 m	325 m
SECTION TOP, BOT	69.73 m	-255.3 m
TOLERANCE +/-	202.2 m	
VERTICAL EXAG.	50	

SCALE 1 : 100 000
(m)

0 500 1000 1500 2000 2500 3000
GDA94 / Australian Map Grid zone 53

AZIMUTH = 37°



PROFILES

Gamma cps (GRO-3346)

Granulometry (min 1, max 8)

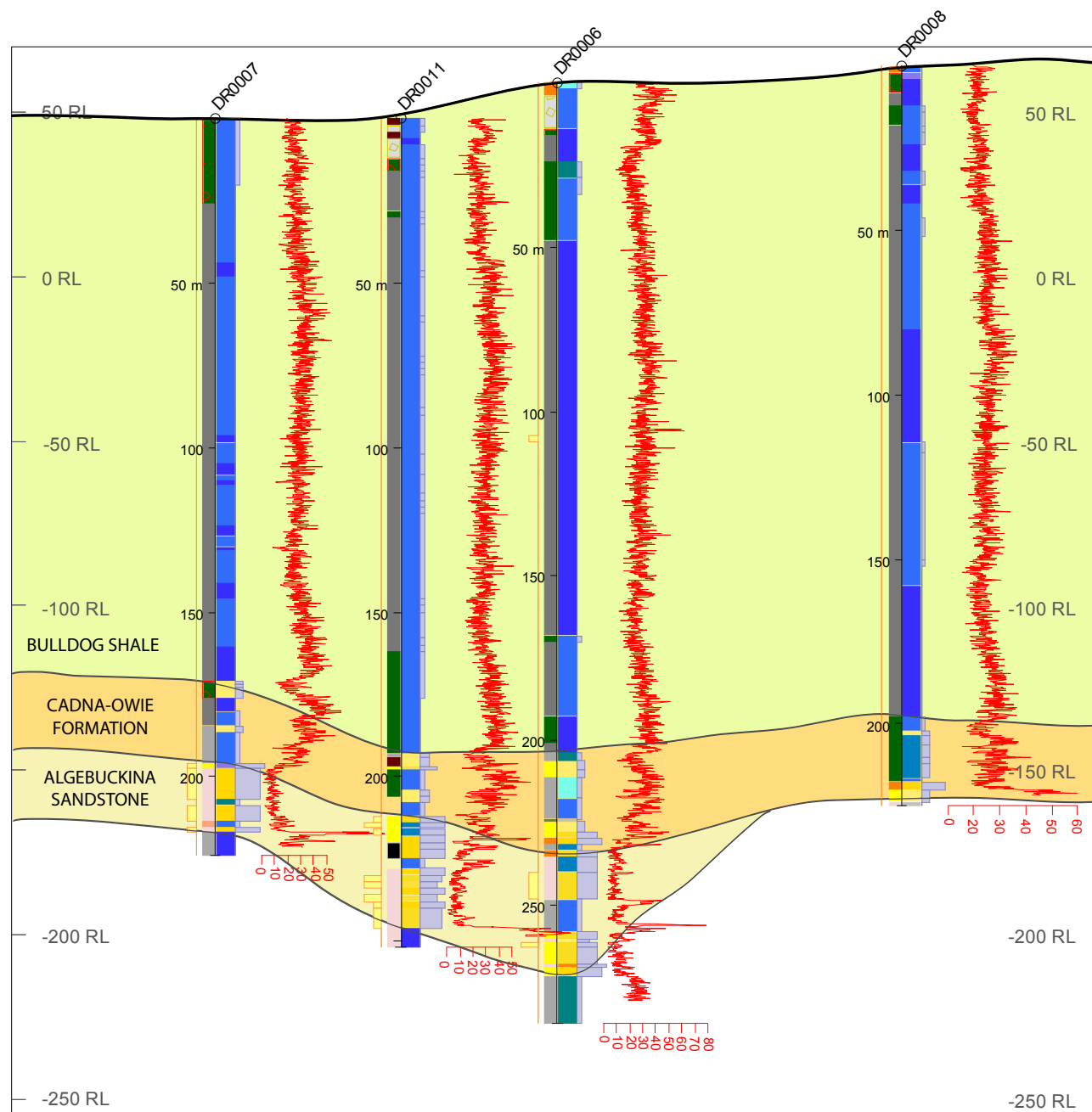
Sulphide Content (min 0, max 3)

REDOX CODES

Reduced black	Transitional redox green with red patches	Oxidised yellow	Bleached / neutral, light beige-white
Reduced grey	Transitional redox brown with green patches	Oxidised ocre	Bleached / neutral beige
Reduced light grey			Transitional redox grey-light beige yellow
Reduced green			
Reduced light green			

LITHOLOGY CODES

No recovery	Very fine grained sand
Clay	Fine grained sand
Silt	Medium grained sand
Clay and silt	Coarse grained sand
Clay and sand	Very coarse grained sand
Clayey gravel	Gravel
Sand and silt	Fine sandstone
Sands, silt/clay	Coarse sandstone





AFMECO MINING AND EXPLORATION

ABN 44 009 758 481

DENISON RANGE
SOUTH AUSTRALIA
Mineral Exploration Licence 4629
4630 & 4750

Profile 3
DR0005 - DR0009 - DR0010

SECTION SPECIFICATIONS:

REF. PT. E, N	604036 m	6902470 m
EXTENTS	20800 m	270.8 m
SECTION TOP, BOT	49.75 m	-221.1 m
TOLERANCE +/-	84.15 m	
VERTICAL EXAG.	75	

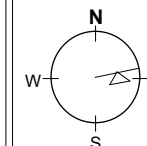
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(m)

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AZIMUTH = 78°



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- Gamma cps (GRO-3161)

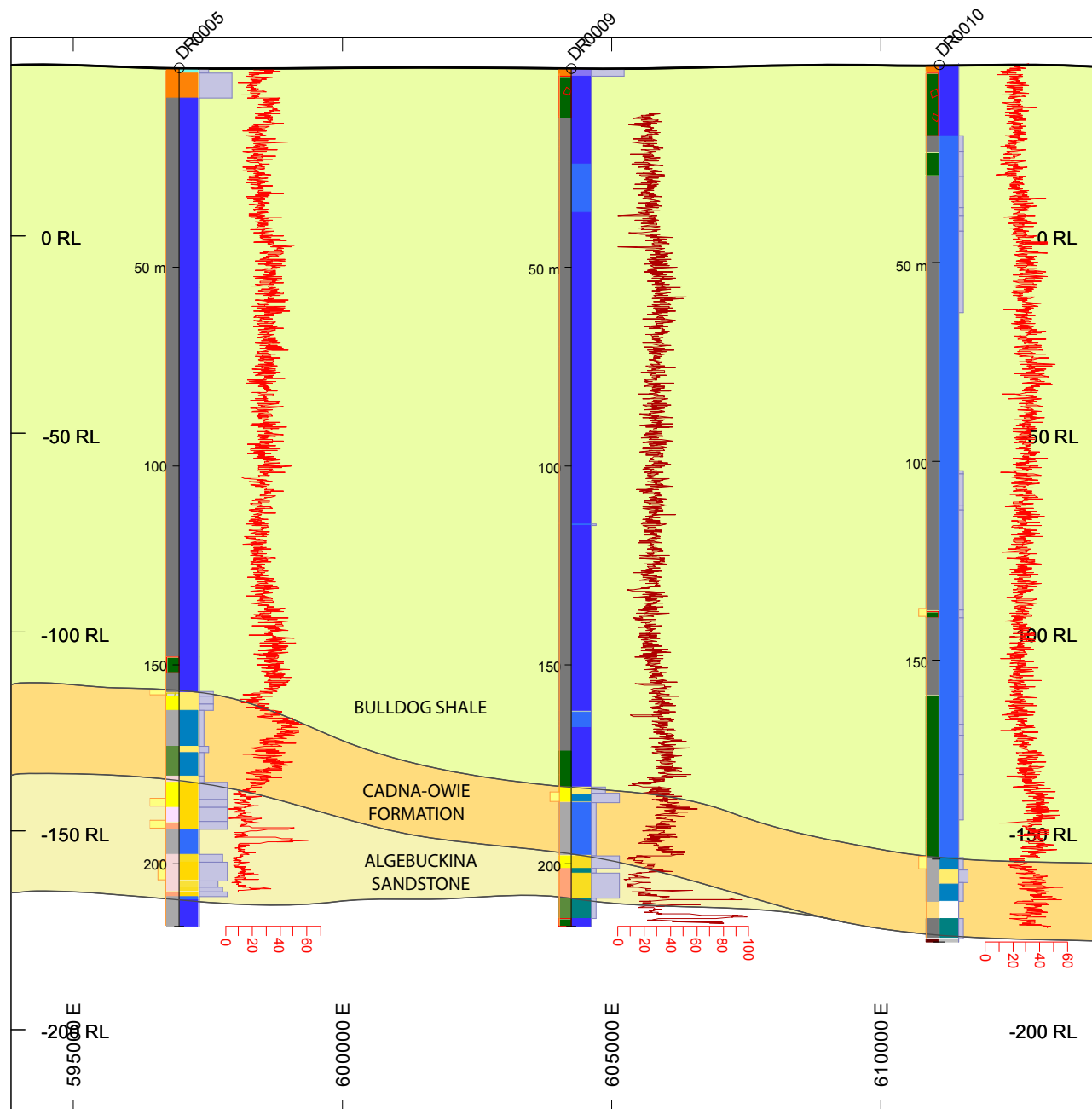
- Granulometry (min 1, max 8)
- Sulphide Content (min 0, max 3)

REDOX CODES

- Reduced black
- Reduced grey
- Reduced light grey
- Reduced green
- Reduced light green
- Transitional redox green with red patches
- Transitional redox brown with green patches
- Oxidised yellow
- Oxidised ocre
- Bleached / neutral, light beige-white
- Bleached / neutral beige
- Transitional redox grey-light beige yellow

LITHOLOGY CODES

- No recovery
- Clay
- Silt
- Clay and silt
- Clay and sand
- Clayey gravel
- Sand and silt
- Sands, silt/clay
- Very fine grained sand
- Fine grained sand
- Medium grained sand
- Coarse grained sand
- Very coarse grained sand
- Gravel
- Fine sandstone
- Coarse sandstone

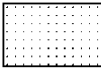
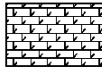
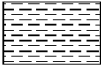
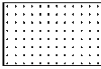
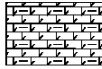
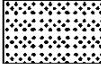
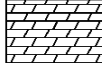
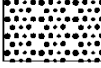
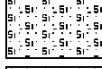
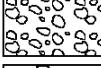
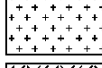
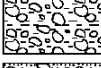
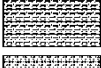
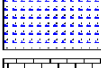
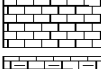
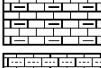
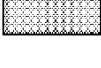


APPENDIX E

LEGENDS USED FOR GEOLOGICAL LOGS

Lithology

Codes

NR		FNSA		DOLS	
CL		MDSA		CYDOLS	
CBCL		CSSA		DO	
CLSA		VCSA		GY	
GVCL		CBSA		SZ	
SL		GV		XB-F	
CBSL		CYGV		XB-M	
CLSL		SAGV		XB-V	
SASL		CASS			
SASLCL		LS			
KSL		LSCL			
VFSA		LSSA			

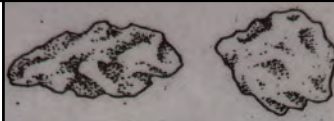
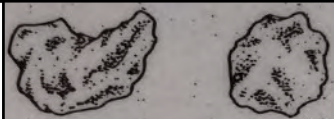
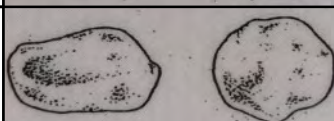
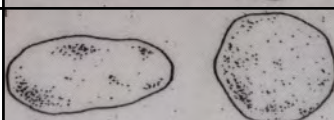
Codes descriptions

Code	Description	Code	Description	Code	Description
NR	no recovery	VFSA	Very F grained sand	LSCL	limestone and clay
CL	clay	FNSA	F grained sand	LSSA	sandy limestone
CBCL	carbonaceous clay	MDSA	M grained sand	DOLS	dolomitic limestone
CLSA	clay and sand	CSSA	C grained sand	CYDOLS	clayey dolomitic limestone
GVCL	gravel-rich clay	VCSA	very C grained sand	DO	dolomite
SL	silt	CBSA	carbonaceous sand	GY	gypsum
CBSL	carbonaceous silt	GV	gravel	SZ	silcrete
CLSL	clay and silt	CYGV	clayey gravel	XB-F	felsic basement
SASL	sand and silt	SAGV	sand and gravel	XB-M	mafic basement
SASLCL	sands, silt/clay	CASS	calcic sandstone	XB-V	volcaniclastics
KSL	Kaolinitic silts/clays	LS	limestone		

Granulometry

<i>G code</i>	<i>Description</i>	<i>Grain size (mm)</i>
8	Gravel and above	> 2.0
7	Very coarse grained sand	1.0-2.0
6	Coarse grained sand	1/2-1.0
5	Medium grained sand	1/4-1/2
4	Fine grained sand	1/8-1/4
3	Very fine grained sand	1/16-1/8
2	Silt	< 1/16
1	Clay	
0	Chemical rocks/crystalline basement	
-999	No sample	

Roundness

<i>Code</i>	<i>Description</i>	
NS	No sample	
NA	rocks with grain size < 63 microns	
VA	very angular	
A	angular	
S	subangular	
D	subrounded	
R	rounded	
WR	well rounded	

Calcite content

<i>Ca Code</i>	<i>Observations</i>	<i>Description</i>	<i>Intensity</i>		
0	Not visible	Test HCl negative			
1	With hand lense or binocular	Test HCl positive	+		
2	Without lense	Test HCl positive	+	+	
3	Abundant	Test HCl positive	+	+	+

Organic matter

<i>OM Code</i>	<i>Observations</i>	<i>Description</i>	<i>Intensity</i>		
0	Not visible	No OM			
1	With hand lense or binocular	Little OM	+		
2	Without lense	OM	+	+	
3	Abundant	Lots of OM	+	+	+

Sulphides

<i>Sulf Code</i>	<i>Observations</i>	<i>Description</i>	<i>Intensity</i>		
0	Not visible	No sulphide			
1	With hand lense or binocular	Little sulphide	+		
2	Without lense	Sulphides	+	+	
3	Abundant	Lots of sulphides	+	+	+

Fe-oxyhydroxides

<i>Ox Code</i>	<i>Observations</i>	<i>Description</i>	<i>Intensity</i>		
0		No oxyhydroxides			
1	Yellow	A few oxyhydroxides	+		
2	Ochres-rusty color	Oxyhydroxides	+	+	
3	Red-purple and black	Oxyhydroxides	+	+	+

Redox state

<i>Redox Code</i>	<i>Description</i>
RDB	reduced black +++
RDG	reduced grey ++
RDIG	reduced light grey +
ROGBe	transitional redox grey-beige
RDGn	reduced green ++
RDIGn	reduced light green +
ROGn	transitional redox green with red patches
ROBn	transitional redox brown with green patches
OXY	oxidised yellow +
OXR	oxidised red +++
OXO	oxidised ocre ++
OXBr	oxidised brown +
OX0	oxidised red primary
NW	bleached/neutral light beige-white
NBe	bleached/neutral beige
ROGY	transitional redox grey-light beige yellow

Redox colour chart

+++	RDB		ROGn	ROGY	ROGBe	ROBn	OXR	OX0	NBe	NW
++	RDG	RDGn	ROGn	ROGY	ROGBe	ROBn	OXO	OX0	NBe	NW
+	RDIG	RDIGn	ROGn	ROGY	ROGBe	ROBn	OXY	OXBr	OX0	NBe
	<i>Reduced</i>		<i>Transitional</i>				<i>Oxidized</i>		<i>Neutral</i>	



DENISON RANGE PROJECT JOINT ANNUAL TECHNICAL REPORT

EL4629, EL4630 & EL4750

13 DECEMBER 2011 – 12 DECEMBER 2012

LICENSEE: AREVA RESOURCES AUSTRALIA PTY LTD
OPERATOR: AREVA RESOURCES AUSTRALIA PTY LTD

R. WILSON
FEBRUARY 2013

SUMMARY

Project Name:	Denison Range
Exploration Licence:	4629, 4630 and 4750
Holder/Operator:	Areva Resources Australia Pty Ltd 68 Greenhill Road WAYVILLE SA 5034
Report Type:	Combined annual technical report
Reporting Period:	13 December 2011 – 12 December 2012
Author:	Rachael Wilson 08 8292 9300 rachael.wilson@areva.com
Date of Report:	11 th February 2013
Sheet Name (250k):	Warrina (H5303), Oodnadatta (G5315)
Sheet Name (100k):	Warrina (6041), Algebuckina (6042), Umbum (6141), Woodmurra (6142)
Landholder:	Peake Station – S. Kidman & Co. Ltd
Target Commodity:	Uranium

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DIGITAL DATA ACCOMPANYING THIS REPORT

1. DOWN-HOLE GEOPHYSICS

FILE NAME	FILE TYPE	FILE SIZE
EL4629_EL4630_EL4750_2013_A_002_DownholeSurveys.LAS	LAS	434 KB
EL4629_EL4630_EL4750_2013_A_003_DownholeSurveys.LAS	LAS	320 KB
EL4629_EL4630_EL4750_2013_A_004_DownholeSurveys.LAS	LAS	541 KB
EL4629_EL4630_EL4750_2013_A_005_DownholeSurveys.LAS	LAS	581 KB

2. DRILLING

FILE NAME	FILE TYPE	FILE SIZE
EL4629_EL4630_EL4750_2013_A_006_DrillCollars.txt	txt	3 KB
EL4629_EL4630_EL4750_2013_A_007_DrillCollars.txt	txt	3 KB
EL4629_EL4630_EL4750_2013_A_008_LithoLogs.txt	txt	9 KB
EL4629_EL4630_EL4750_2013_A_009_LithoLogs.txt	txt	5 KB
EL4629_EL4630_EL4750_2013_A_010_LithoCodes.txt	txt	1 KB
EL4629_EL4630_EL4750_2013_A_011_LithoCodes.txt	txt	3 KB
EL4629_EL4630_EL4750_2013_A_012_LithoCodes.txt	txt	1 KB
EL4629_EL4630_EL4750_2013_A_013_LithoCodes.txt	txt	1 KB
EL4629_EL4630_EL4750_2013_A_014_LithoCodes.txt	txt	1 KB
EL4629_EL4630_EL4750_2013_A_015_LithoCodes.txt	txt	1 KB
EL4629_EL4630_EL4750_2013_A_016_LithoCodes.txt	txt	1 KB
EL4629_EL4630_EL4750_2013_A_017_LithoCodes.txt	txt	1 KB
EL4629_EL4630_EL4750_2013_A_018_LithoCodes.txt	txt	1 KB

SUMMARY OF ACTIVITIES

The Denison Range Project targets sandstone-hosted uranium mineralisation in the Mesozoic sandstones located to the east of uranium-enriched basement sequences of the Palaeo- to Mid-Proterozoic Peake and Denison Inliers.

During 2011, Areva conducted a first pass drilling program to assess stratigraphy, oxidation state and the nature of potential sandstone uranium traps. The results from 2011 highlighted thick sequences of porous reduced sands in proximity to uranium-bearing basement rocks.

During 2012, a supplementary drilling program was designed to identify a redox boundary closer to the supposed radiogenic source within EL4629 and 4750. Results unfortunately indicate the target sandstones are reduced.

ACTIVITY	DETAILS	TENEMENT
Rotary Mud Drilling	3 holes – 664 metres	EL4629
	1 hole – 198 metres	EL4750

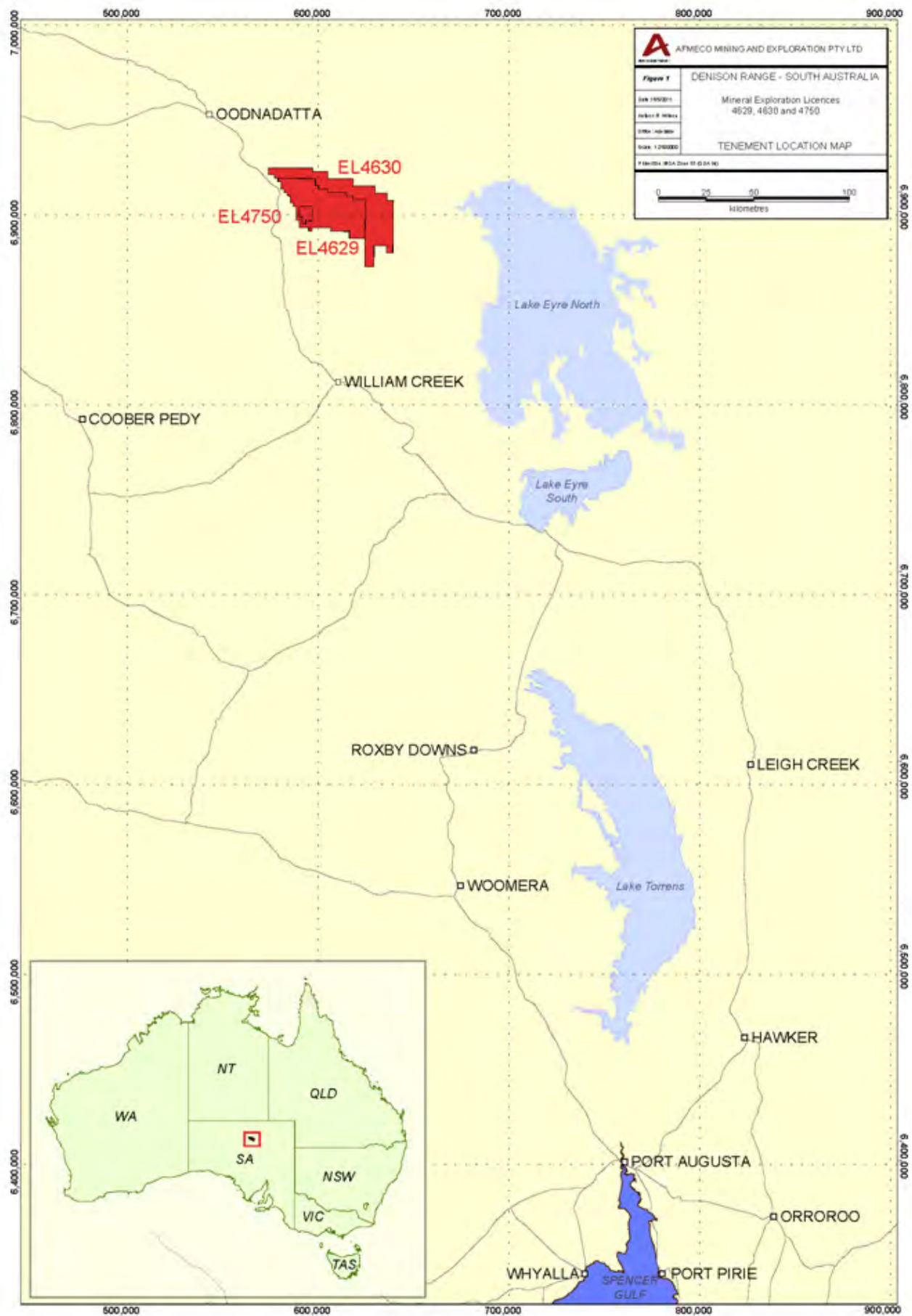


Figure 1: Denison Range Project - Locality Map

1. INTRODUCTION, HISTORY AND EXPLORATION RATIONALE

1.1. LOCATION AND ACCESS

The Denison Range Project is located in the Eromanga Basin in northern South Australia approximately 70 km southeast of Oodnadatta (Figure 1). The Project covers an area of 1,685 km² and comprises Exploration Licenses (EL) 4629 (Mount Kingston East 1), 4630 (Mount Harvey) and 4750 (Mount Kingston East 2). Access to the Denison Range Project from Coober Pedy is east via the William Creek Road and north along the Oodnadatta Track. Numerous pastoralist tracks access the interior of the tenement.

The tenements are located on Peake, Allandale and Macumba Stations and lie within the Arabunna Native Title Determined Area.

1.2. TENEMENT DETAILS

EL4629 and 4630 were granted to Areva Resources Australia Pty Ltd (formerly Afmeco Mining and Exploration Pty Ltd) on the 13th December 2010 for a period of two years (renewals currently pending). EL4750 was granted to Areva on the 20th of June 2011 for a period of two years.

Table 1: Denison Range Project - Tenement Summary

TENEMENT	DATE GRANTED	AREA (KM ²)	EXPENDITURE COMMITMENT (ANNUAL)
EL4629	13/12/2010	820	\$110,000
EL4630	13/12/2010	817	\$110,000
EL4750	20/06/2011	48	\$35,000
TOTAL		1,685	\$255,000

1.3. HISTORIC EXPLORATION

Historically, there have been at least 17 different companies exploring the area since 1973 with limited exploration conducted over the Denison Range Project area. Most exploration has occurred on the western side of the Denison Range and has predominantly been for copper-gold.

Uranium exploration commenced in the region in 1973 by Uranerz Australia Pty Ltd. Initial airborne radiometric surveys were followed by car and foot airborne radiometric surveys in selected areas where anomalies were identified. The spatial distribution of geochemical data available from DMITRE's SARIG database defines a zone of anomalous uranium concentrations

in the Proterozoic basement sequences. The distribution of uranium assays reported by mineral explorers suggests several basement outcrops contain anomalous uranium concentrations.

Ground radiometric surveys were carried out by Stockdale Prospecting in the early 1980's with several airborne radiometric anomalies identified and confirmed by ground proofing. Anomaly R1 (also reported by DMITRE) consisted of calcrete and siliceous travertine in contact with the U-rich, coarse-grained to porphyritic Wirricurrie Granite (1787 ± 6 Ma). Yellow secondary uranium minerals were observed in the calcrete samples, and a link with uraniferous springs was suggested.

In 2007, Red Metal conducted a broadly spaced drilling program to test redox boundaries identified by historical drilling on the western side of the Inliers. Anomalous gamma responses occurred within reducing carbonaceous horizons in host sandstones and claystones. These occurrences were mostly seen at the Cadna-owie/Algebuckina transition and within highly carbonaceous claystone horizons underlying the Algebuckina Sandstone. Carbonaceous horizons were also seen locally within the Cadna-owie Formation and Algebuckina Sandstone.

Table 2: Denison Range Project - Historical uranium exploration

COMPANY	YEAR	ACTIVITY	COMMENT
Uranerz Australia	1973-1975	Ground radiometric surveys	- Follow up airborne radiometric survey on selected areas - Basement outcrops characterised by anomalous uranium concentrations
Britas Diamonds and Stockdale Prospecting	1978-1984	Ground radiometric surveys	- Several radiometric anomalies identified - Anomaly R1 – calcrete and siliceous travertine in contact with U-rich Wirricurrie Granite - Anomalies R2 and R3 – within volcanics. Mineralisation described as disseminated and low grade through the basalt
Red Metals	2006 - present	Mud rotary drilling	12 wide-spaced rotary mud holes for 704m to test redox boundary identified by historical drilling - Best assay (from 2m composite sample) 2m @ 213ppm U and 329ppm V within weathered clay-rich saprolite underlying Mesozoic sedimentary sequence - Enrichments in nickel and copper are associated with uranium

1.4. EXPLORATION RATIONALE

The Denison Range Project targets sandstone-hosted uranium mineralisation in Mesozoic sandstones located to the east of uranium-enriched basement sequences of the Palaeo- to Mid-Proterozoic Peake and Denison Inliers. The concept being that uranium is leached from the U-enriched rocks of the Peake and Denison Inliers whereby, potentially oxidised uranium bearing fluids percolate through porous sandstones until reaching reduced Mesozoic units sequestering and potentially concentrating the uranium.

Evidence for uranium remobilisation in the basement (such as secondary uranium minerals; intervals with >300ppm in drill cuttings; elevated U in basalt) suggest some disseminated uraninite (or pitchblende) may be present in these basement units. The presence of Cambrian leucogranites (potentially anatexis-related) intruding both basement and Neoproterozoic cover sequences indicate granite or pegmatite-hosted uraniferous concentrations could exist in these granites comparable to the Mount Babbage and Painter Inlier. The presence of numerous uranium occurrences in the basement, as well as evidence for uranium mobility, provides a basis for the potential existence of sandstone-hosted uranium mineralisation in the on-lapping Mesozoic Basin sequence.

The rationale for the selection of this project area was based on the following reasons:

- The target area comprises a Jurassic sandstone succession up to 150m thick that is overlain by Cretaceous shales
- The basin deepens to the NE with the drainage direction orientated across the tenement area from the uranium-enriched Middle Proterozoic basement units
- Structural control of the drainage system and basin succession is evident from geophysical data – the area is dissected by several NW- and NE-trending normal faults, and an E-W orientated basement ridge which may have influenced drainage and the development of potential roll front systems
- Scarce drillhole data suggests depth to basement reaches approximately 400m in the NE portion of the target area
- Uranium enrichment of up to several 100's of ppm has been recorded along the interface of altered basement and the overlying Mesozoic succession recorded in some holes.

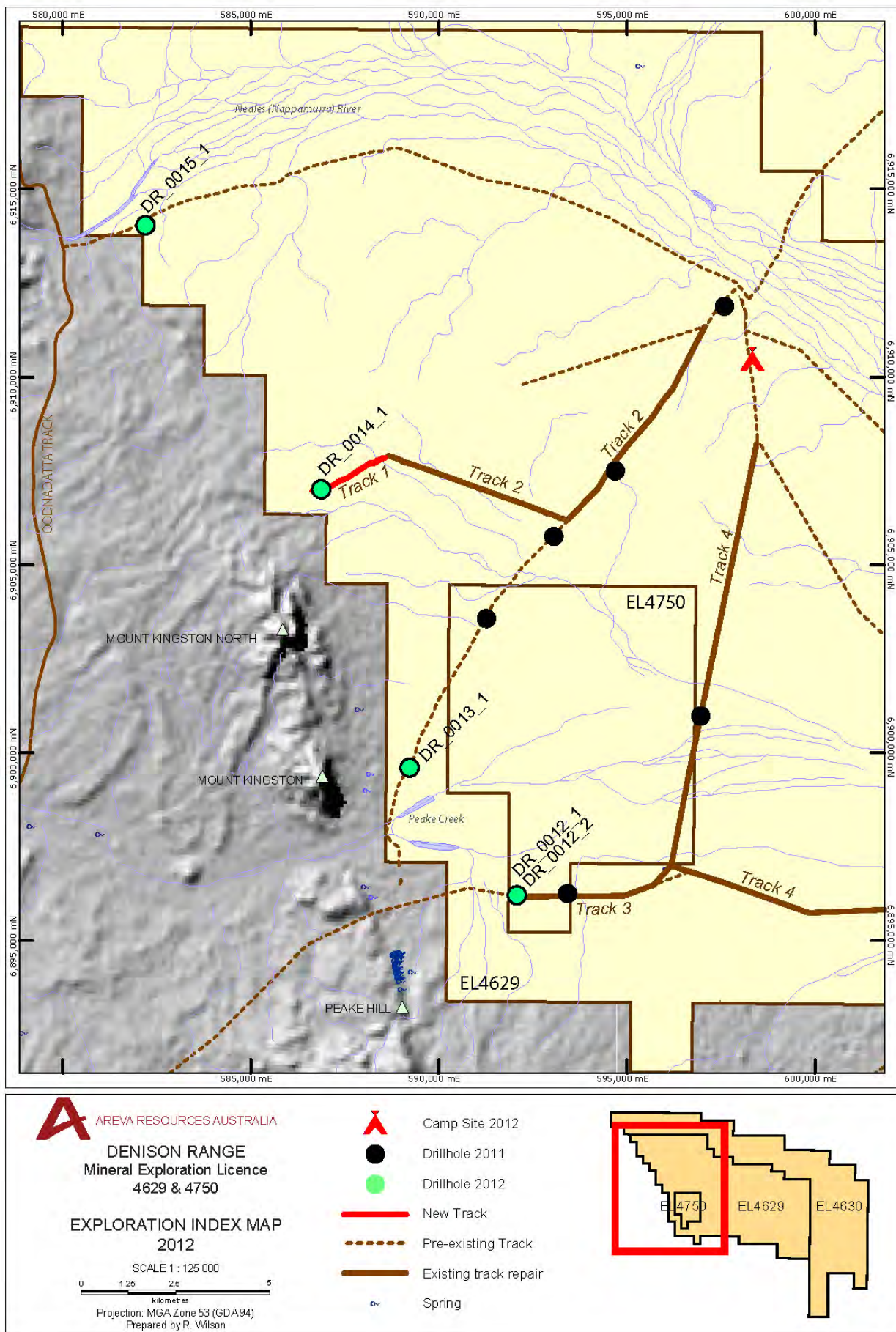


Figure 2: Denison Range Project – Exploration Index Map 2012

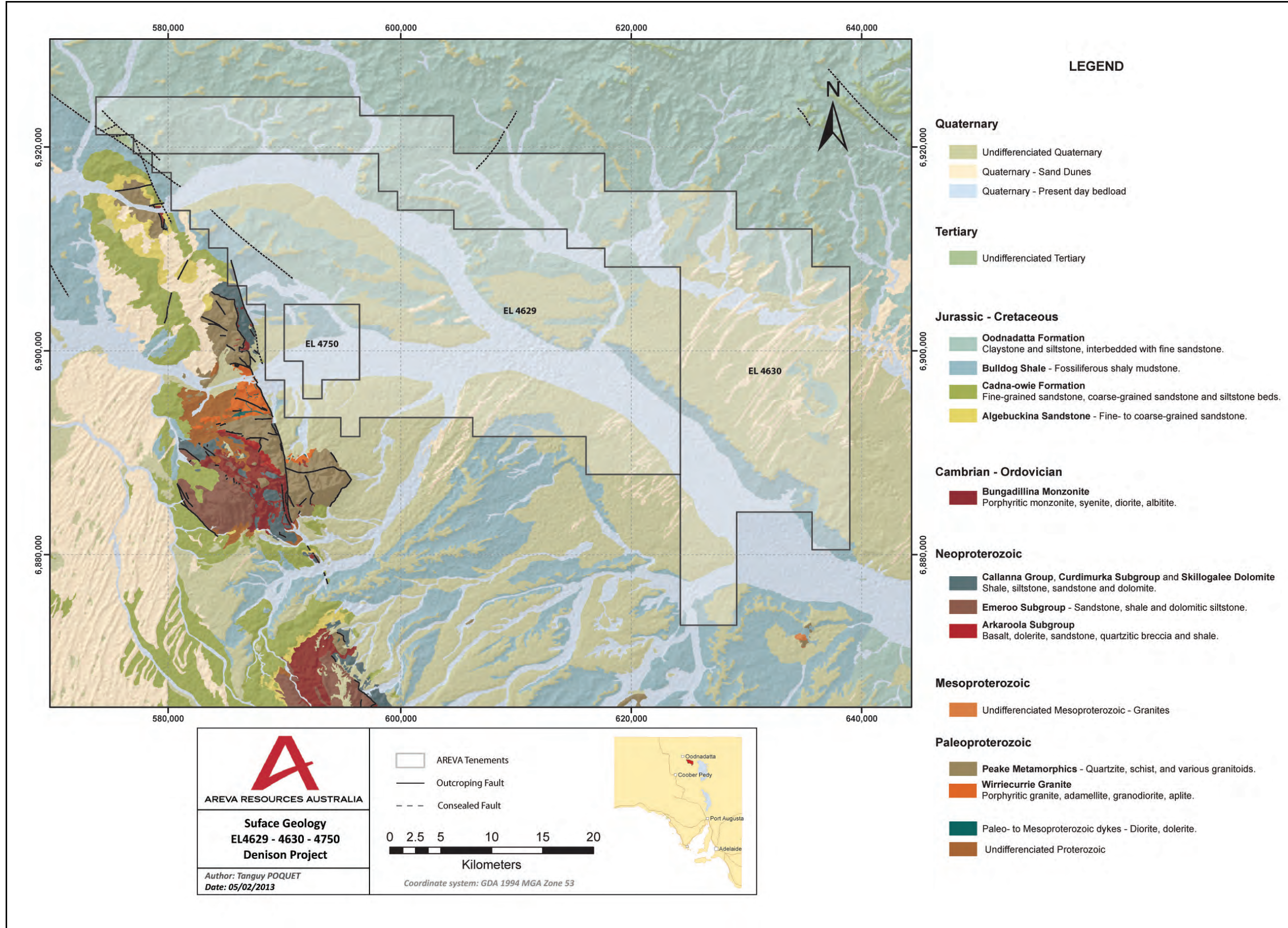


Figure 3: Denison Range Project – 1 :250,000 scale surficial geology

2. GEOLOGY

2.1. REGIONAL GEOLOGY

The Peake and Denison Ranges occur as complex structural, northerly trending Precambrian Inliers between the Permian Arckaringa and Pedirka Basins to the west and north-east respectively. The Peake Metamorphics of Lower Proterozoic age are the oldest rocks exposed and consist of interlayered slates, phyllites, schists, gneisses, migmatites and quartzites in a sequence which was metamorphosed to greenschist to amphibolite grade following syntectonic granite intrusion about 1555-1530 Ma. Further deformation and probable greenschist facies metamorphism occurred about 1050 Ma.

Overlying the Peake Metamorphics are the Upper Proterozoic Adelaidean Sediments which were deposited in a subsiding fault-bounded trough, the northern extension of the Adelaide Geosyncline. The Adelaidean Sediments consist of a basal conglomerate overlain by dolomite and volcanics, followed by a thick sedimentary sequence of shales, sandstones, siltstones and glacial tillites. The contact between the Peake Series and the Adelaidean Sediments is marked by faulting and frequently the emplacement of basic dykes.

Extensive continental sedimentation in the Great Artesian Basin commenced during the Jurassic and is represented by Algebuckina Sandstone which outcrops at the margins of the Inliers. Algebuckina Sandstone is disconformably overlain by the Lower Cretaceous Cadna-owie Formation which marks the start of widespread marine transgression. Conformably overlying the Cadna-owie Formation is the Cretaceous marine Bulldog Shale. The Mesozoic Eromanga Basin is an intracratonic sag basin that overlies Precambrian basement and Neoproterozoic to late Palaeozoic sedimentary basins and, in turn, is overlain by Cenozoic sedimentary basins.

The Peake and Denison Inliers reflect a complex tectonic history. The Precambrian sediments show evidence of extensive folding and faulting with the dominant structural feature being a series of NNW trending faults with extensively faulted anticlines and well preserved synclines. There has been a major wrench thrust and reverse faulting in the area which probably occurred at the same time as in the Flinders Ranges in the early Palaeozoic. Regional scale airborne magnetic and gravity maps show several large scale coincident features which appear to reflect basement structures.

Sas *et al.* (1981) recognised at least six deformational periods ranging in age from Middle Proterozoic to Quaternary;

1. Foliation parallel to the layering of units of the Peake Metamorphics
2. Recognition of a second tectonic phase from geochronological dating. There is no faulting or folding which is attributable to this period.
3. The Delamerian Orogeny, resulting in cross-folding and faulting of the Adelaidean sediments, and widespread diapirism.
4. Episode of faulting which coincided with Permian Sedimentation.

5. Tertiary (late Miocene) tectonic phase where huge fault blocks were uplifted to form the Peake and Denison Ranges. Jurassic and Cretaceous sediments and Tertiary silcretes were strongly upturned adjacent to the ranges.
6. Quaternary (Pleistocene) phase which renewed fault movements and disrupted lower Pleistocene sediments.

2.2. STRATIGRAPHY

The sedimentary sequence for the Denison Range Project is represented by the following three formations (Figure 4):

Bulldog Shale (Upper Cretaceous)

The Bulldog Shale is predominantly a medium to dark grey, clayey and silty mudstone with thin interbedded coarse silt and very fine sand layers which is bioturbated and fossiliferous. The Bulldog Shale is the most widely distributed and lithologically uniform Mesozoic unit in the Western Great Artesian Basin. It was deposited in a near shore to open marine environment. The thickness varies due to erosion but can reach up to 200+ metres thick. The Bulldog Shale conformably overlies the Cadna-owie Formation.

Cadna-owie Formation (Lower Cretaceous)

The formation consists of mainly silty and clayey, very fine to medium quartz sandstone with thin interbeds of claystone and siltstone, and irregular bands of pebbly medium to very coarse grained sandstone. Calcareous beds (rarely lignitic) occur occasionally within this formation and a carbonaceous horizon commonly marks the transition from the overlying Bulldog Shale and occasionally into the underlying Algebuckina Sandstone. It has a similar distribution as the Algebuckina Sandstone, and was deposited in a shallow-water marine to fluvial-deltaic environment. Thicknesses range from 5 to 65 metres. The Cadna-owie Formation disconformably overlies the Algebuckina Sandstone.

Algebuckina Sandstone (Jurassic)

The Algebuckina Sandstone mostly comprises fine to coarse grained and locally pebbly, quartz sandstone. The sandstone has variable clay content with minor interbedded micaceous claystone which typically becomes coarser with depth. Pebbly and conglomeratic layers can occur throughout the unit. The sandstone is exposed around the flanks and outliers on the Peake and Denison Ranges and can be poorly developed where it overlies basement saprolitic lithologies at relatively shallow depths (30-65m). Surface outcrops with an abundance of kaolinitic clay and absence of feldspars indicate an intense weathering during the deposition under an oxidising arid terrestrial condition. Thicknesses range from 20 to more than 70 metres north and northeast of the Denison Inlier. Occasionally the basal part of the Algebuckina Sandstone is host to black organic rich layers.

Basement

Basement has been described as quartzite and quartz-feldspar-biotite gneiss of the Palaeoproterozoic Peake Series and has been reached at depths of 80 to 150+ metres. Saprolitic clay-sericite altered schist and granite are also recorded. Based on regional geophysics and drill data the basement east of the ranges varies from 130m (drilling by Areva) in the westernmost part of the tenement and appears to be eastward-dipping with depths reaching 300-350m (based on water bore depths). The sedimentary sequence to the east of the Denison Inlier appears to be thicker with the Bulldog Shale increasing in thickness to the north-east.

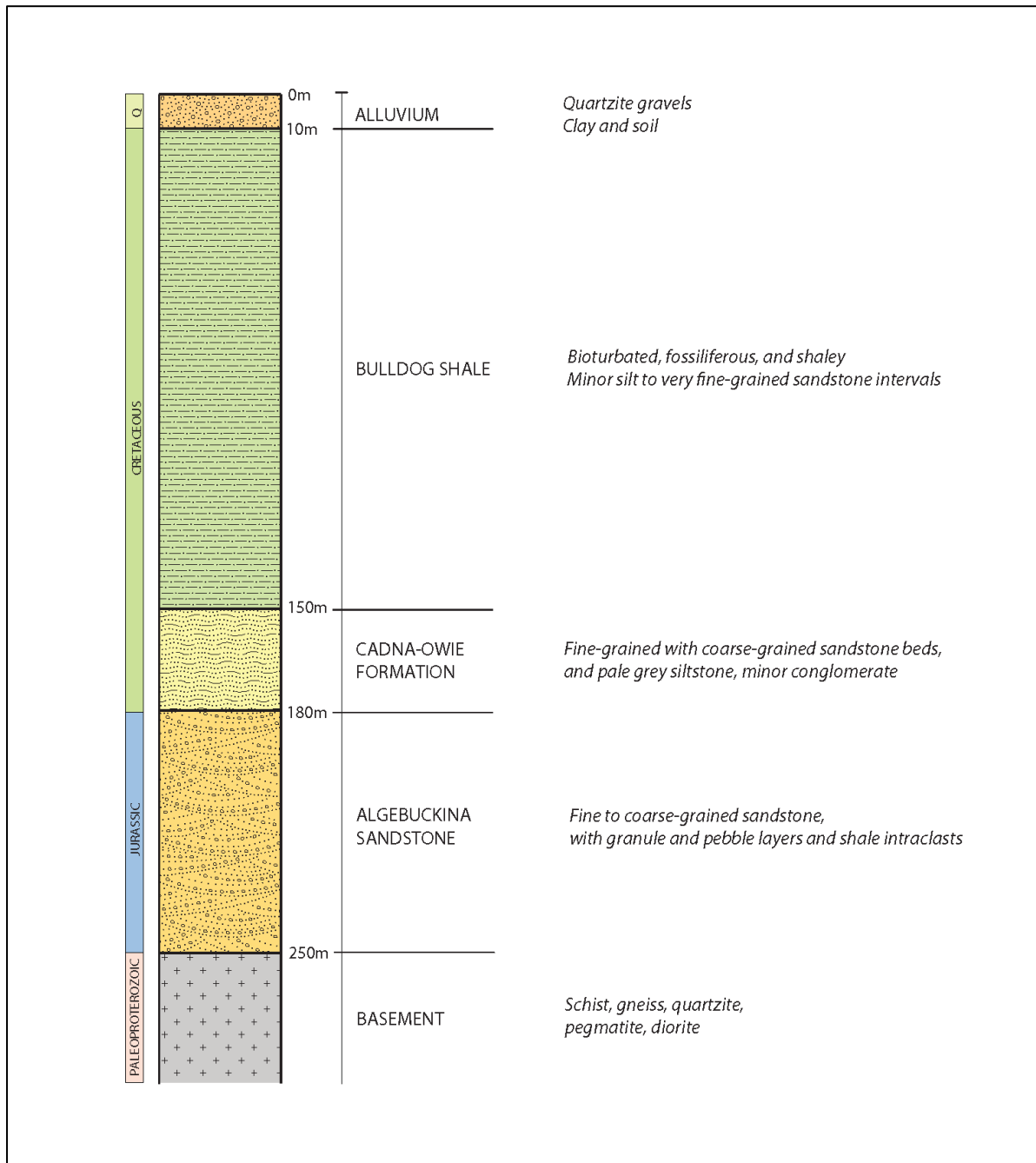


Figure 4: Denison Range Project – Schematic stratigraphic column

3. WORK COMPLETED DURING REPORTING PERIOD

3.1. ROTARY MUD DRILLING

The 2012 drilling program was the second to be performed by Areva over the Project area. The initial drilling program (2011) was designed as a first pass to assess stratigraphy, oxidation state and the nature of potential sandstone uranium traps. Results of this first drilling program showed the potential of the Cretaceous-Jurassic Formations to be targets for sandstone-hosted uranium mineralisation due to thick sequences of reduced, porous sandstones within proximity to the supposedly enriched basement rocks. The results of this first program failed to identify the supposed redox front, leading to a 2012 program with a main focus on identifying a redox boundary closer to the enriched basement.

The mound springs at the edge of the Inliers are of considerable environmental and cultural significance and in order to drill within 5km of these springs additional stringent environmental conditions need to be met which includes further approval processes. Due to this, the 2011 program was designed to avoid the 5km buffer to make the approval process more straight forward. Since the 2011 results showed no oxidation within the sediments, the 2012 program was located closer to the range front whereby oxidised recharge fluids from the range front could enter the system.

Between the 18th October 2012 and the 28th October 2012, Thompson Drilling Company Pty Ltd successfully drilled four rotary mud holes for a total of 862 metres within EL4629 and 4750 (Figure 2, Table 3). Drillholes were vertical with an average depth of 215m and a maximum of 266m. Drill holes were terminated when Precambrian basement was intersected. A larger program was initially planned, however as it became apparent that the target sandstones were in a reducing environment the program was terminated after four holes.

Down-hole geophysical probing was performed at the completion of drilling by Borehole Wireline Pty Ltd in order to record information about gamma radiation and electrical characteristics of the sedimentary formations. Several types of geophysical measurements were carried out for each hole as summarised in Table 4. Down-hole tool specifications are given in Appendix A.

Drill cutting samples were collected systematically every two metres and complete chip tray sections were taken for all holes. Cutting samples of complete holes DR_0012_2, DR_0013_1, DR_0014_1 and DR_0015_1 were sampled for DMITRE's core storage facility (yet to be submitted).

Table 3 : Denison Range Project – 2012 Collar information

TENEMENT NUMBER	DRILL HOLE NUMBER	DATE DRILLED		HOLE DEPTH (m)	EASTING	NORTHING	ZONE	DATUM
		START	END					
EL4750	DR_0012_1 *Hole abandoned due to drilling problems	18/10/2012	19/10/2012	144	591,970	6,896,220	53	GDA94
EL4750	DR_0012_2	20/10/2012	21/10/2012	198	591,973	6,896,220	53	GDA94
EL4629	DR_0013_1	22/10/2012	23/10/2012	144	589,169	6,899,647	53	GDA94
EL4629	DR_0014_1	23/10/2012	25/10/2012	254	586,936	6,907,011	53	GDA94
EL4629	DR_0015_1	26/10/2012	28/10/2012	266	582,236	6,914,121	53	GDA94

Table 4: Denison Range Project - Detail of down-hole geophysical survey runs for each drill hole

	RUN	1				2					
	MEASUREMENT	GAMMA	CALIPER	INDUCTION		GAMMA	SP	RESISTIVITY		DEVIATION	
				SHALLO W	DEEP			SHALLOW	DEEP	INCLINATION	AZIMUTH
	SPEED (m/min)	5				5	7.5	5		5	
	STEP (cm)	10				10					
TENEMENT	DRILLHOLE										
EL4750	DR_0012_1	×		×		×	×	×		×	×
EL4629	DR_0012_2	✓		✓		✓	✓	✓		✓	✓
EL4629	DR_0013_1	✓		✓		✓	✓	✓		✓	✓
EL4629	DR_0014_1	✓		✓		✓	✓	✓		✓	✓
EL4629	DR_0015_1	✓		✓		✓	✓	✓		✓	✓

3.2. DRILLING RESULTS

3.2.1. Mineralisation

No significant anomalous radioactivity was identified within either the Algebuckina Sandstone or Cadna-owie Formation.

Weak anomalism observed in 2011 appeared to be related to redox contrasts and discontinuities between lithologies (i.e. at the contact between porous oxidised sands and overlying/underlying reduced clays and silts).

Table 5 details the findings from the 2012 drilling program.

Table 5: Denison Range Project - 2012 Grade Thickness results

HOLE ID	GRADE THICKNESS CUT-OFFS				MAX eUppm	DEPTH m
	25 ppm cut off	50 ppm cut off	100 ppm cut off	150 ppm cut off		
	m.‰ Ueq	m.‰ Ueq	m.‰ Ueq	m.‰ Ueq		
DR_0012_2	0	0	0	0	40	195.6
DR_0013_1	0	0	0	0	24	130.3
DR_0014_1	0	0	0	0	17	212.7
DR_0015_1	0	0	0	0	32	259.3

3.2.2. Redox Potential

Except for slightly oxidised layers within the Cadna-owie, all intersections were in a reducing environment.

The sand units intersected during the 2012 drilling campaign were predominately reduced with pyrite and very occasional organic matter. Occasional oxidised sand grains were identified, mostly within the Cadna-owie Formation however the predominant redox condition was reduced.

Initially, oxidised Algebuckina Sandstone and Cadna-Owie Formation outcropping around the flanks of the ranges indicated the potential for a redox boundary in closer proximity to the range front. The poor exposure of the sandstone sequences to the east of the Inliers result in only minor oxidation occurring in these areas. It would thus appear the sandstone sequence is almost entirely reduced on the eastern margin of the Inliers.

3.3. ENVIRONMENTAL REHABILITATION

Exploration activities, mitigation and rehabilitation methods were conducted in line with DMITRE's *Statement of Environmental Objectives and Environmental Guidelines for Mineral Exploration Activities in South Australia* (DMITRE Information Sheet M33) and *Mineral Exploration Drillholes – General Specifications for Constructing and Backfilling* (DMITRE Information Sheet M21), as well as conditions of the Program for Environment Protection and Rehabilitation Approval (reference: E-PEPR 2012-125). Furthermore, Areva complied with internal safety and environmental procedures and policies as well as ISO14001, OSHA18001 and AS4801 certification requirements.

An exploration rehabilitation/compliance report was submitted to DMITRE in January 2013 which details drillhole decommissioning and rehabilitation methods and results.

4. CONCLUSION

The target for the 2012 exploration program was to define a redox boundary within the Mesozoic sediments between the basement rocks of the Denison Inlier and the drillholes performed in 2011. Significant areas of cultural heritage and environmental sensitivity were identified and drillholes were located as proximal as possible to the Range front.

Unfortunately, results from the 2012 drilling program were disappointing with an absence of a reducing-oxidising front proximal to the range front. Artesian water flow directions appear to occur from the north east and south west and mound springs are located along fractures whereby pressurised artesian fluids can escape. Recharge fluids from the range front are considered to be of minimal influence into the basin and therefore not sufficient enough to penetrate further into the basin. Springs fringing the Inliers may be attributed to shallow truncation of the basal Mesozoic sandstone aquifers in the area and may indicate fault interruptions to the sandstone. This lack of a redox front may also be due to the down-faulting along the eastern flank of the Peake and Denison Range.

The lack of significant groundwater recharge from the ranges and lack of redox contrast significantly reduced the likelihood of finding mineralisation within the Mesozoic sediments of the Denison Range Project.

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Sas, Z and Gates, A.H., 1981. Report on Mount Kingston Prospect EL 491, South Australia (Pacific Exploration Consultants Pty Ltd). *South Australia. Department of Mines and Energy. Open File Envelope, 3562.*

Teluk, J.A., 1974. Completion report. EL22 Lagoon Hill area, South Australia. *South Australia. Department of Mines and Energy. Open file Envelope, 2182.*

APPENDIX A

GEOVISTA PROBE DETAILS

Natural Gamma Sonde

The Geovista digital Natural Gamma Ray Sonde can be used on its own or in combination with other Geovista sondes for correlation purposes. The spectral gamma version can operate in both spectral and in 5 window mode

Specifications:

Gross Gamma Sonde

Weight:	3.5kg
Length / Diam.	0.7m / 38mm or 28mm
Detector (NaI)	50mm x 25mm (38mm sonde only)
Max. Press. /Temp.	20MPa / 80°C

Spectral Gamma Sonde

Weight:	6.30kg
Length / Diam.	0.9m / 60mm
Detector (NaI)	150mm x 38 mm
Max. Press. /Temp.	20MPa / 80°C
No. of Channels	256
Energy Range	100keV to 2.8MeV
Resolution	10% @ 137Cs



Caliper Sonde

The GeoVista Two-Arm caliper probe can be used on its own, in combination with other GeoVista sondes, or with a second caliper sonde to provide a low cost Four-Arm caliper.

Alternatively a single Four-Arm caliper with independent arms is available for larger boreholes.

The addition of a Geovista Verticality sonde would yield a Borehole Geometry Log.

Specifications:

	2-Arm	4-Arm
Weight	5.5 kg	18.0kg
Length	1.15	1.18m
Diameter	38mm	80mm
Accuracy	±5mm	±5mm
Max. Pressure	20MPa	20MPa
Max. Temp.	80°C	80°C
Range	45 – 600 mm	85 to 1000mm



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EM Induction Sonde

Provides logs in low conductivity mud, air-filled and plastic lined boreholes. Performance is best in higher conductivity formations. The Dual Induction configuration allows for a deep and medium penetration differentiating between invaded and uninvaded zones. Probes can be used on their own or in combination with other Geovista sondes.

Specifications:

	Single Induction	Dual Induction
Weight:	6.5 kg	7.5 kg
Length	1.83 m	1.85 m
Diameter	43 mm	43 mm
TX-RX Spacings	39"	24" & 32"
Operating frequency	39 kHz	25 kHz
Conductivity Range	3 to 3000 mmho	3 to 3000 mmho
Max. Pressure	20MPa	20MPa
Max. Temperature	80°C	80°C

Induced Polarisation Sonde

The Geovista IP sonde measures apparent formation chargeability to detect the presence of disseminated ore bodies. In addition, an SP curve can also be recorded to help locate massive ore bodies.

Specifications:

Length / Weight / Ø:	1.8 m / 7.0 kg / 42 mm
Method of measurement:	Time Domain with 220 ms cycle time
Electrode spacing:	40 cm spacing, in Wenner array configuration
Max. Temp.:	80° C
Max. Press.:	20M Pa

Magnetic Susceptibility Sonde

This is a two coil EM induction sonde designed to measure formation conductivity and magnetic susceptibility.

Specifications:

Length / Weight / Ø:	2.0 m / 6.5 kg / 36 mm
TX to RX spacing:	85 cm
Apparent Susceptibility range:	0 to 7000 mS/m
Apparent Conductivity range:	0 to 90 x 10 ⁻³ SI units
Max. Temp.:	50°C
Max. Press.:	10M Pa



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Normal Resistivity Sonde

The Geovista digital Normal Resistivity Sonde can be used on its own or in combination with other Geovista sondes for efficient logging and correlation purposes. The SP can be recorded with the sonde either powered on or off, using the 16" electrode and a surface fish.

Specifications:

Weight	8kg
Length	2.27m
Diameter	42mm
64"N & 16"N Resistivity Range	1 to 10,000 Ohmm
SPR	1 to 10,000 Ohm
SP Range	-2.5V to +2.5V
Current return	Cable armour
Measure return	Bridle electrode
Max. Pressure	20MPa
Max. Temperature	80°C

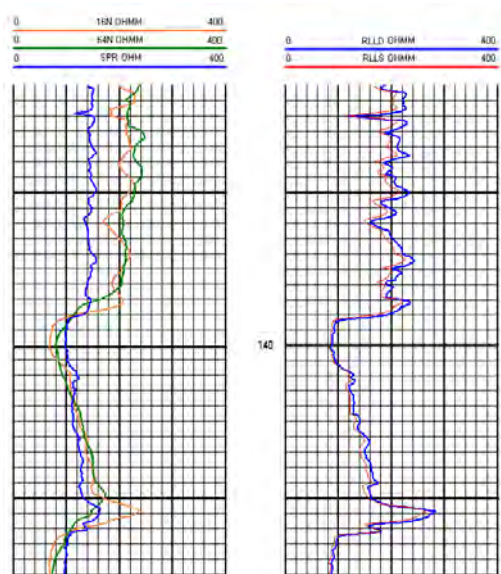
Dual Guard Focused Resistivity Sonde

Provides a Medium and a Deep LL3 focussed resistivity log with finer vertical resolution than the traditional Normal Resistivity sonde.

Performance is also better in higher conductivity mud and higher resistivity formations. This probe can be used on its own or in combination with other Geovista sondes.

Specifications:

Weight	8.0 kg
Length	2.37m
Diameter	38 mm
LLD & LLS Resistivity Range	1 to 10,000 Ohmm
SP Range	-2.5V to +2.5V
Max. Pressure	20MPa
Max. Temperature	80°C



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Verticality Sonde

The Geovista digital Verticality probe can be used in open boreholes or in non-magnetic casing. It can be run on its own or in combination with other Geovista sondes for correlation purposes or to save run time.

Specifications:

Weight / Length/ Ø:	3.5 kg / 0.60 m / 38 mm
Inclination Accuracy:	±0.4° (<i>Higher accuracy sensor available</i>)
Range:	0 to 180°
Azimuth Accuracy:	±2.0°
Range:	0 to 360°
Max. Pressure	20MPa
Max. Temperature	80°C

Inclinometer Sonde

The Geovista inclinometer probe measures borehole inclination only. It can be used on its own or in combination with other Geovista sondes.

Specifications:

Weight / Length/ Ø:	3.5 kg / 0.60 m / 38 mm
Inclination Accuracy:	±0.5°
Range:	0 to 30° (<i>Extended Range avail-</i>
Max. Pressure	20MPa
Max. Temperature	80°C

Casing Collar Locator (CCL)

The Geovista CCL sonde is used to locate casing joints in a borehole. The probe can be used on its own or in combination with other Geovista sondes for correlation purposes in cased holes.

Specifications:

Weight / Length /	3.9kg / 0.65m / 38mm
Detector	1" Coils and magnets assembly
Max. Press. / Temp.	20MPa / 80°C

Quartz Pressure Gauge (QPG)

The Geovista QPG probe is used to log pressure variations in the borehole fluid column. The probe can be used on its own or in combination with other Geovista sondes.

Specifications:

Weight / Length /	4.0kg / 0.73m / 38mm
Accuracy / Resolution:	± 1 dBar / ± 0.1 dBar
Max. Press. / Temp.	20MPa / 80°C



Geovista reserve the right to change the prod-

APPENDIX B

DRILLHOLE LOGS EL4629



GEOLOGICAL LOG

Scale: 1/200

AFMECO Mining and Exploration Pty Ltd

State: South Australia

Project: DENISON RANGE

Tenement: EL 4236

Drilled depth: 144 m

Logged depth: 143.99 m

Azimuth: 0 °

Dip: -90 °

Hole ID:

DR_0013_1

System:

X: 0589169

Y: 6899647

Z: 57

DRILLING

Start: 22/10/12 End: 23/10/12

Drilling company: Thompson Drilling

Drill rig: BOURNE 1250

Drilling diameter		from	to	DrillType
228.60	mm	0	32	RM
133.35	mm		144	RM
	mm			

Casing Type: PVC

Casing diameter		from	to (m)
Internal	External		
161	mm	0	30
	mm		
	mm		

Drilling fluid: Polymer Mix
density : 1.26 viscosity : 49 S
salinity: 2.49 ppk resistivity: 210 ohm*m

Fluid Loss: from: XX m to: XX m

Fluid level: 0 m

Conditions of hole abandonment:

Grouting from Top to Bottom

LOGGING

Date: 23/10/12

Logging company: Borehole Wireline

Recorder: DJQ

Time since end of drilling (min): 15

Acquisition systems: Geovista

Stack	Probe type	LOG1	LOG2	Record	Serie	Run	Dir	S.(m/mn)	Step (cm)	Top (m)	Bottom
1	NGRS	GRO 3346	eUppm GRO 3346	NGAM	3346	1	up	5	1	5	143.95
1	DLL3	RLLD	RLLS	RLLD - RLLS	3279	1	up	5	1	5	143.95
1	SP	SP		SP	3550	1	down	7.5	1	0	140.60
1	VERT	AZIM	INCL	AZIM - INCL	3333	1	up	5	1	5	143.95
2	NGRS	GRO 3161	eUppm GRO 3161	NGAM	3161	2	up	5	1	0	143.99
2	CALX	CAL		CAL	3064	2	up	5	1	0	143.99
2	DILS	INDD	INDS	ILS - ILD	3601	2	up	5	15	0	143.99

GEOLOGIST: R.WILSON

Remarks: Bad samples from 90 to 110m.

LITHOLOGIES LEGEND

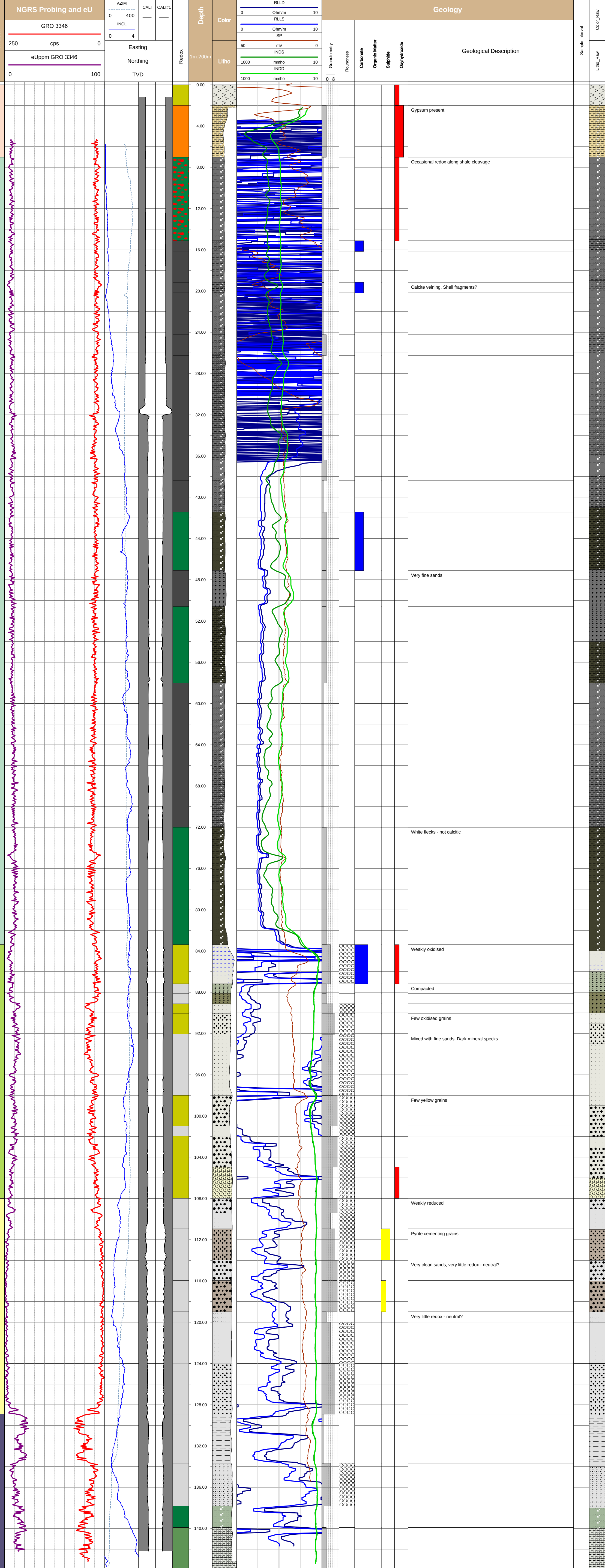
	Clay		Medium Grained Sandstone
	Silt		Gypsum
	Clay and Silt		
	Sand and Silt		
	F Grained Sand		
	M Grained Sand		
	C Grained Sand		
	Very C Grained Sand		
	Calic Sandstone		
	Fine grained Sandstone		

COLORS LEGEND

	Grayish orange		Greenish gray
	Grayish yellow		
	Very light gray		
	Medium dark gray		
	Light brownish gray		
	Yellowish gray		
	Olive gray		
	Olive black		
	Light greenish gray		
	Greenish gray		

REDOX LEGEND

	Reduced black +++
	Reduced light grey +
	Reduced green ++
	Reduced light green +
	Redox green with red patches
	Oxidised yellow +
	Oxidised ore ++





GEOLOGICAL LOG

Scale: 1/200

State: South Australia
Project: DENISON RANGE
Tenement: EL4629

Drilled depth: 254 m
Logged depth: 247.75 m
Azimuth: 0 °
Dip: -90 °

Hole ID:
DR_0014_1

System: 0586936
X: 6907011
Y:
Z: 80

DRILLING

Start: 23/10/12 End: 25/10/12

Drilling company: Thompson Drilling

Drill rig: BOURNE 1250

Drilling diameter		from	to	DrillType
228.6	mm	0	32	RM
133.35	mm	32	254	RM

Casing Type: PVC

Casing diameter		from	to	(m)
Internal	External			
161	mm	177	mm	0
	mm		mm	31

Drilling fluid: Polymer Mix
density : 1.35 viscosity : 51 S
salinity: 2.68ppk resistivity: 170 ohm*m

Fluid Loss: from: XX m to: XX m

Fluid level: 1 m

Conditions of hole abandonment:
Grouting from Top to Bottom

LOGGING

Date: 25/10/12

Logging company: Borehole Wireline

Recorder: DJQ

Time since end of drilling (min): 15

Acquisition systems: Geovista

Stack	Probe type	LOG1	LOG2	Record	Serie	Run	Dir	S.(m/mn)	Step (cm)	Top (m)	Bottom
1	NGRS	GRO 3346	eUppm GRO 3346	NGAM	3346	1	up	5	1	5	247.75
1	DLL3	RLLD	RLLS	RLLD - RLLS	3279	1	up	5	1	5	247.75
1	SP	SP		SP	3550	1	down	7.5	1	0	244.93
1	VERT	AZIM	INCL	AZIM - INCL	3333	1	up	5	1	5	247.75
2	NGRS	GRO 3161	eUppm GRO 3161	NGAM	3161	2	up	5	1	0	246.33
2	CALX	CAL		CAL	3064	2	up	5	1	0	246.33
2	DILS	INDD	INDS	ILS - ILD	3601	2	up	5	1	0	246.33

GEOLOGIST: G. KERN

Remarks: Probe stuck at 245.46m run up with DLL3-VERT-NGRS.

LITHOLOGIES LEGEND

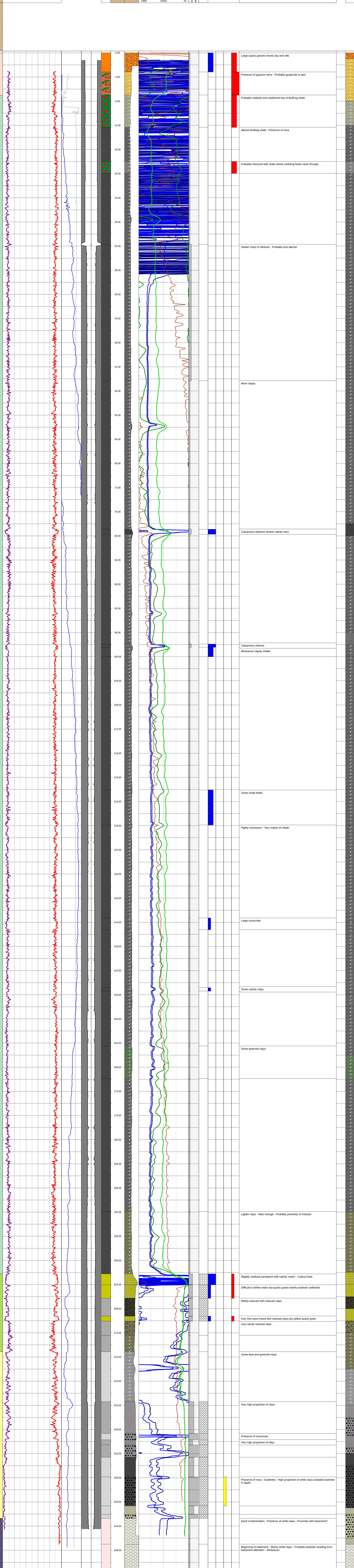
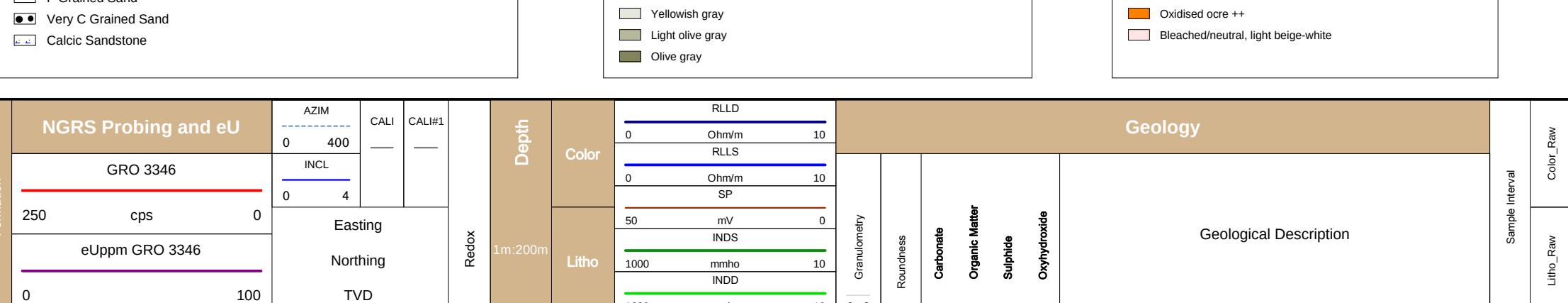
☐ Clay
☐ Clay and Sand
☐ Gravel-rich clay
☐ Silt
☐ Clay and Silt
☐ Very F Grained Sand
☐ F Grained Sand
☐ Very C Grained Sand
☐ Calic Sandstone

COLORS LEGEND

☐ Light brown	☐ Olive black
☐ Dark yellowish orange	☐ Dark greenish gray
☐ Moderate olive brown	☐ Light bluish white
☐ Medium light gray	
☐ Medium gray	
☐ Medium dark gray	
☐ Dark gray	
☐ Dark gray	
☐ Yellowish gray	
☐ Light olive gray	
☐ Olive gray	

REDOX LEGEND

☐ Reduced black +++
☐ Reduced gray ++
☐ Reduced light gray +
☐ Reduced light green +
☐ Redox green with red patches
☐ Redox brown with green patches
☐ Oxidised yellow +
☐ Oxidised ore ++
☐ Bleached/neutral, light beige-white





GEOLOGICAL LOG

Scale: 1/200

AFMECO Mining and Exploration Pty Ltd

State: South Australia
Project: DENISON
Tenement: EL 4629

Drilled depth: 266 m
Logged depth: 266.57 m
Azimuth: 0 °
Dip: -90 °

Hole ID: DR_0015_1

System: 0582236
X: 6914121
Y:
Z: 63

DRILLING

Start: 26/10/12 End: 28/10/12
Drilling company: Thompson Drilling

Drill rig: BOURNE 1250

Drilling diameter		from	to	DrillType
228.6	mm	0	32	RM
133.35	mm	32	266	RM
	mm			

Casing Type: PVC

Casing diameter		from	to	(m)
Internal	External			
161	mm	177	mm	0
	mm		mm	30
	mm		mm	

Drilling fluid: Polymer Mix
density : 1.45 viscosity : 137 S
salinity: 120 ppk resistivity: 359.7ohm*m
Fluid Loss: from: XX m to: XX m
Fluid level: 0 m
Conditions of hole abandonment:
Grouting from Bottom to Top

LOGGING

Date: 28/10/12

Logging company: Borehole Wireline

Recorder: DJQ

Time since end of drilling (min): 15

Acquisition systems: Geovista

Stack	Probe type	LOG1	LOG2	Record	Serie	Run	Dir	S.(m/mn)	Step (cm)	Top (m)	Bottom
1	NGRS	GRO 3346	eUppm GRO 3346	NGAM	3346	1	up	5	1	5	266.25
1	DLL3	RLLD	RLLS	RLLD - RLLS	3279	1	up	5	1	5	266.25
1	SP	SP	SP	SP	3550	1	down	7.5	1	0	262.70
1	VERT	AZIM	INCL	AZIM - INCL	3333	1	up	5	1	5	266.25
2	NGRS	GRO 3161	eUppm GRO 3161	NGAM	3161	2	up	5	1	0	266.57
2	CALX	CAL	CAL	CAL	3064	2	up	5	1	0	266.57
2	DILS	INDD	INDS	ILS - ILD	3601	2	up	5	1	0	266.57

GEOLOGIST: R. WILSON

Remarks:

LITHOLOGIES LEGEND

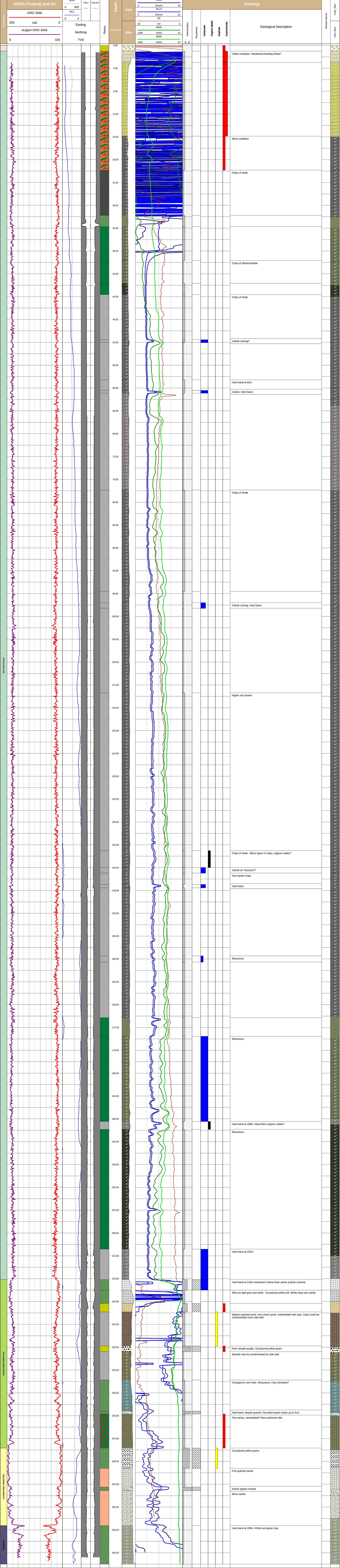
☐ Silt
☐ Clay and Silt
☐ Sand and Silt
☐ Sands, Silt and Clay
☐ C Grained Sand
☐ Very C Grained Sand
☐ Gravel
☐ Calcic Sandstone
☐ Fine grained Sandstone
☐ Gypsum

COLORS LEGEND

☐ Grayish orange	☐ Dark greenish gray
☐ Grayish yellow	☐ Greenish black
☐ Dusky yellow	☐ Medium bluish gray
☐ Very light gray	
☐ Medium gray	
☐ Medium dark gray	
☐ Brownish gray	
☐ Yellowish gray	
☐ Olive gray	
☐ Greenish gray	

REDOX LEGEND

☐ Reduced black +++
☐ Reduced gray ++
☐ Reduced green ++
☐ Reduced light green +
☐ Redox green with red patches
☐ Redox brown with green patches
☐ Oxidised yellow +
☐ Bleached/neutral beige



APPENDIX C

DRILLHOLE LOGS EL4750



GEOLOGICAL LOG

Scale: 1/200

AFMECO Mining and Exploration Pty Ltd

State: South Australia
Project: DENISON RANGE
Tenement: EL4750

Drilled depth: 198 m
Logged depth: 197.88 m
Azimuth: 0 °
Dip: -90 °

Hole ID:
DR_0012_2

System: UTM_GDA94_Z53
X: 0591973
Y: 6896220
Z: 46

DRILLING

Start: 20/10/12 End: 21/10/12

Drilling company: Thompson Drilling

Drill rig: BOURNE 1250

Drilling diameter from		to	DrillType
228.6	mm	0	30 RM
133.35	mm	30	198 RM

Casing Type: PVC

Casing diameter		from	to (m)
Internal	External		
161	177	0	29
mm	mm		
mm	mm		

Drilling fluid: Polymer Mix
density : 1.47 viscosity : 62 S
salinity: 1.60 ppk resistivity: 380 ohm*m

Fluid Loss: from: XX m to: XX m

Fluid level: 0 m

Conditions of hole abandonment:

Grouting from Top to Bottom

LOGGING

Date: 21/10/12

Logging company: Borehole Wireline

Recorder: DJQ

Time since end of drilling (min): 15

Acquisition systems: Geovista

Stack	Probe type	LOG1	LOG2	Record	Serie	Run	Dir	S.(m/mn)	Step (cm)	Top (m)	Bottom
1	NGRS	GRO 3346	eUppm GRO 3346	NGAM	3346	1	up	5	1	5	197.88
1	DLL3	RLLD	RLLS	RLLD - RLLS	3279	1	up	5	1	5	197.88
1	SP	SP		SP	5534	1	down	7.5	1	0	194.69
1	VERT	AZIM	INCL	AZIM - INCL	3333	1	up	5	1	5	197.88
2	NGRS	GRO 3161	eUppm GRO 3161	NGAM	3161	2	up	5	1	0	197.60
2	CALX	CAL		CAL	3064	2	up	5	1	0	197.60
2	DILS	INDD	INDS	ILS - ILD	3601	2	up	5	1	0	197.60

GEOLOGIST: G. KERN

Remarks: Logged through rig. Hole sampled for DMITRE.

LITHOLOGIES LEGEND

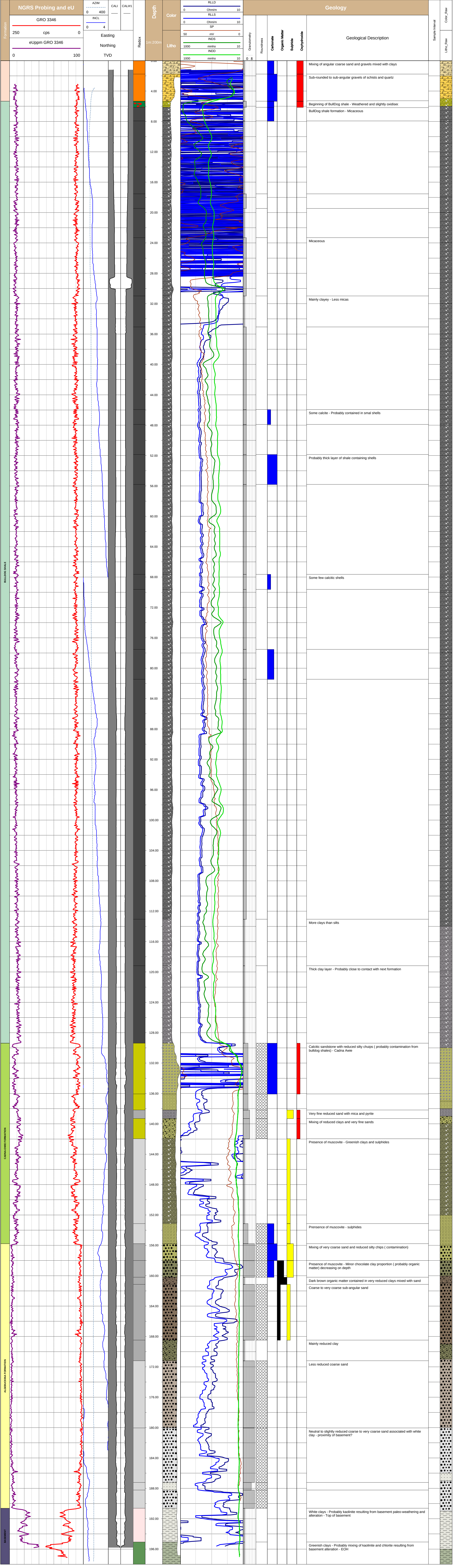
	Clay
	Clay and Sand
	Gravel-rich clay
	Clay and Silt
	Very F Grained Sand
	M Grained Sand
	Very C Grained Sand
	Calic Sandstone
	Fine grained Sandstone

COLORS LEGEND

	Grayish orange		Olive gray
	Dark yellowish orange		Greenish gray
	Light olive gray		
	Moderate olive brown		
	Very light gray		
	Medium gray		
	Medium dark gray		
	Light brownish gray		
	Brownish gray		
	Yellowish gray		

REDOX LEGEND

	Reduced black +++
	Reduced grey ++
	Reduced light grey +
	Reduced light green +
	Redox green with red patches
	Oxidised yellow +
	Oxidised ocre ++
	Bleached/neutral, light beige-white



APPENDIX D

GEOLOGICAL CROSS-SECTIONS





Mckenzie, Todd (DMITRE)

From: WILSON Rachael (AREVA) [rachael.wilson@areva.com]
Sent: Monday, 22 July 2013 3:04 PM
To: DMITRE:Exploration
Cc: CHEMILLAC Remy (AREVA)
Subject: Final Technical Report

Dear Nella,

Areva Resources Australia would like to inform you that no work has been conducted from the date of the last annual technical report to the date of full surrender (12/06/2013) for the following tenements:

- EL4750 (last report 12/12/2012)
- EL4629 (last report 12/12/2012)
- EL4630 (last report 12/12/2012)
- EL4647 (last report 17/01/2013)
- EL4531 (last report 11/07/2012)

If you require anything further, please feel free to contact me.

Kind Regards,

Rachael Wilson

Project Geologist

AREVA Resources Australia Pty Ltd

68 Greenhill Road | Wayville | SA 5034 | Australia

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