ILUKA RESOURCES LIMITED

TECHNICAL REPORT

ILUKA-TR-T18267

EL5251 Florieton
Annual and Final Report

23/05/2013 – 20/12/2013

BY
Paul Smith

Date: 15 November 2013

AUTHOR KEYWORDS: Exploration, Murray Basin, Florieton, Heavy Minerals, Loxton Sand, Parilla Sand, Loxton-Parilla Sand, Blanchetown Clay, Geera Clay

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EXECUTIVE SUMMARY

The following report covers all work completed by Iluka Resources on Exploration Licence EL5251 from the 23rd May 2012 to the 20th December 2013. EL5251 is located in eastern South Australia approximately 95 kilometres north west of Renmark.

Two drilling campaigns were completed during June and September 2013. A total of 34 holes were drilled for an advance of 2089m during the reporting period.

No significant mineralisation was intersected with drillholes failing to intersect significantly thick sequences of marine sands.

A data review of the 2013 drilling has determined that the Loxton Sands are either not preserved or the Pliocence coast line did not extend this far west in the Murravian Gulf within EL5251.

1. INTRODUCTION

The following report is submitted to fulfil the annual reporting requirements for Exploration Licence (EL)5251. It covers the work undertaken by Iluka Resources Ltd over the reporting period from 23rd May 2013 to the 20th December 2013.

1.1 Tenure

The EL5251 licence area was granted to Iluka Resources Ltd on 23rd May 2013, for a period of two years over an area totalling 235 square kilometres. A full surrender of the tenement was undertaken on the 20th December 2013.

1.2 Location

EL5251 is located on the north-west margin of the Murray Basin, 50km west of Burra in eastern SA. The tenement (in two parts) is located immediately adjacent to the east of Iluka tenement EL4864 Newikie Creek and 40km west of Iluka tenement EL5251 Parcoola. Access to the tenement is via the Goyder Hwy and the Eastern Rd. Unsealed private roads and tracks provide access to the drill targets. Table 1 shows the Map sheets and current coordinate extent of the license boundary.

Table 1: Map sheets enclosing EL5251 and coordinates of the tenement boundary.

Map Sheets			
1:250,000		***1:100,000***	
Chowilla	SI5406	Caroona	6731
Burra	SI5405	Florieton	6730
		Murkaby	6831
		Koomooloo	6830
Geographic Coordinates (MGA Zone 54, GDA94)			

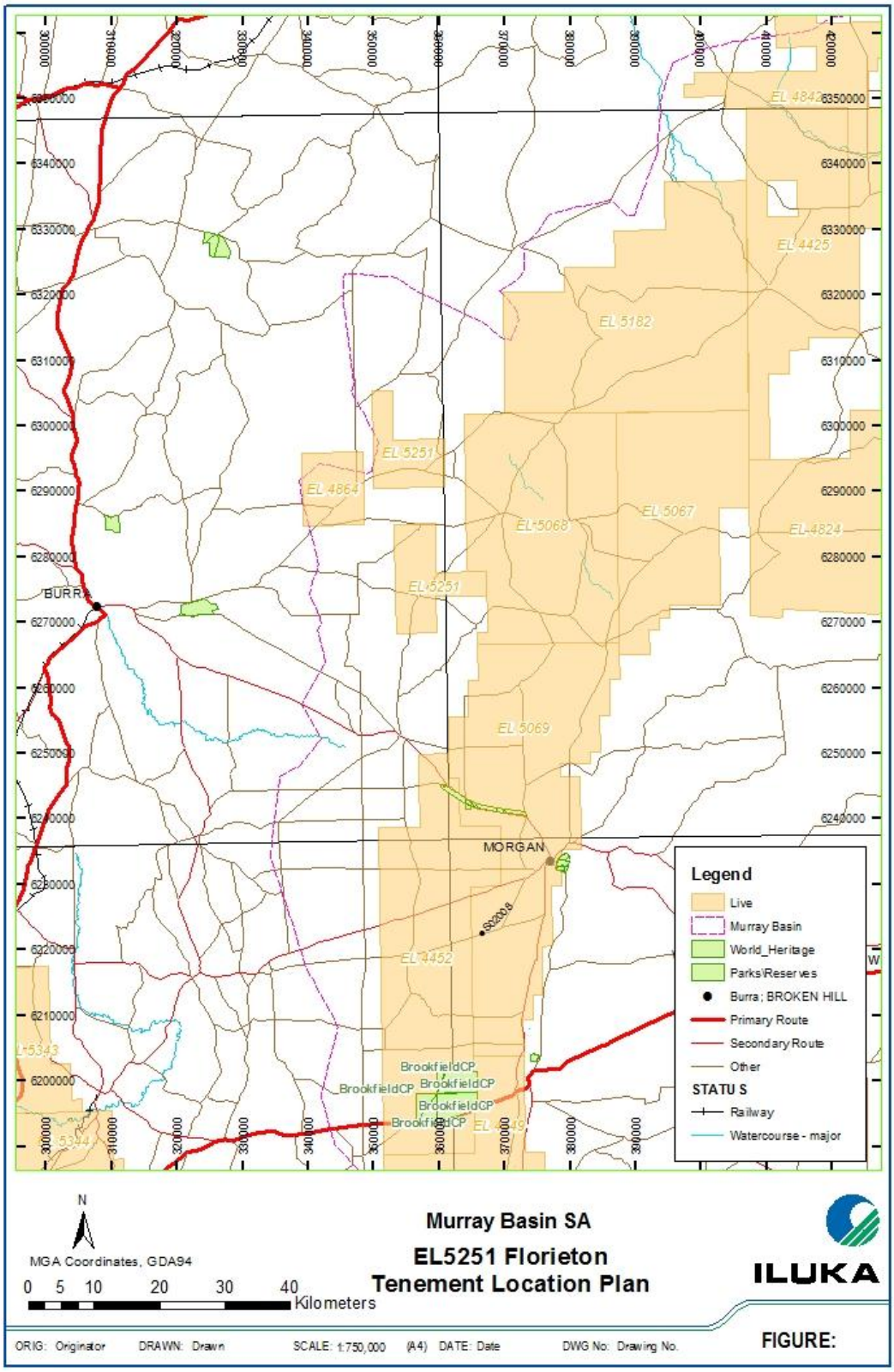


Figure 1: EL5251 Tenement Location Plan

1.3 Iluka's Exploration History and Rationale

Iluka Resources exploration rationale in the Murray Basin has been to target the mineralised Loxton-Parilla Sand (LPS) sediments deposited during the Pliocene marine regression, concentrating on higher grade, coarse-grained strands in regions of favourable mineral assemblage. The exploration for heavy mineral sand deposits has been performed using two techniques as described below;

The first technique utilises filtered airborne magnetics as a first pass coverage of the licence to delineate direct drill targets from magnetic anomalies. The magnetic information is derived from both airborne magnetic surveys commissioned by Iluka Resources, and state government based magnetic data.

The second technique involves the planning of drilling traverses based on previous drilling data, regional structural contour maps, detailed digital terrain models, and the utilisation of airborne magnetics. Drilling traverses usually commence with wide-spaced holes to investigate the broad geological setting, and then infilling to close-spaced drilling as required by geology and mineral intersections.

2. GEOLOGY

2.1 Regional Geology

The Murray Basin has been described as a shallow, intracratonic Cainozoic basin covering an area of 300,000 km^2 in south eastern South Australia, south-western New South Wales and north-western Victoria (Brown & Stephenson, 1991). The Murray Basin is flanked by low mountain ranges of Proterozoic and Palaeozoic rocks.

Much of the sedimentary sequence within the basin is the result of repeated marine incursions from the southwest, with the latest transgressive-regressive event resulting in deposition of the Late Miocene to Late Pliocene Loxton-Parilla Sand (LPS). These sediments were deposited in shallow-marine, littoral and fluvial conditions and comprise fine to coarse-grained, generally well-sorted sand, with minor clay, silt and gravel and host the Murray Basin mineral sand deposits (Brown & Stephenson, 1991).

Overlying the LPS in the northern and eastern Murray Basin is the Shepparton Formation. This deposit style consists of mixed fluvial channel and floodplain deposits, including some aeolian sediments. The lithology of the Shepparton Formation varies between gravel and clay. The source material varies between regions, leading to the subdivision of the unit based on geomorphic forms and soils, but all are consistent with Riverine Plain sedimentation (Brown & Stephenson, 1991).

A unit of greenish grey Blanchetown Clay disconformably overlies the Parilla Sand in many parts of the basin. The unconformity is often marked by a weathering profile that is locally siliceous or lateritic and termed the Karoonda Surface (Brown & Stephenson, 1991). The Blanchetown Clay is a fluvio-lacustrine deposit with most sedimentation taking place in a large freshwater lake. Within South Australia, the unit was deposited together with the Bungunnia Limestone (Douglas and Ferguson, 1988).

Disconformably overlying the Blanchetown Clays is the Quaternary Woorinen Formation. This formation is described as consisting of "red-brown siliceous silty sand, red calcareous silty clay and sandy clay" (Brown & Stephenson, 1991). It is generally 2-3m thick, but contains east-west longitudinal dunes that can locally be considerably thicker. The Woorinen Formation was deposited in an aeolian environment. Other aeolian landforms have been identified on the basin, particularly the Lowan/Molineaux Sands occurring in the western part of the Murray Basin. These Dune Fields occur as three tongues otherwise known as the Sunset Desert, Big Desert and Little Desert. The dune patterns and types are different from the tear shaped east-west dunes of the Woorinen Formation (Douglas and Ferguson, 1988).

Disconformably overlying the Blanchetown clay on the western and north western basin margins is the Pooraka Formation. This formation generally forms "low to high-angle alluvial and colluvial fans adjacent to basin margins" (Brown and Stephenson, 1991) and ranges from 1 to 5m in thickness. As the material within the Pooraka formation is sourced from the surrounding Curnamona Province and Adelaidean sediments it is classified as a composite morphotectonic unit.

2.2 Local Geology

Along the north western margin off the Murray Basin, Murray Basin sediments on-lap a succession of metasediments, volcanic and granite rocks of Neoproterozoic to Early Palaeozoic age of the Adelaide Geosyncline. Towards the end of late Cambrian times, folding metamorphism and emplacement of granite during the Delamerian Orogeny affected both the Cambrian and Precambrian rocks of the Adelaide Geosyncline west of the Torrens Hinge Zone. This zone is known as the Delamerian fold belt. Aeromagnetic images of the northern Murray Basin display a large arcuate zone of curvilinear magnetic high anomalies stretching from south of the Broken Hill Block to the southwest towards the eastern Mount Loft Ranges (Rankin et. al. 1991). It is likely that this structurally complex region was active during the deposition of the Murray Basin sediments. If the faults were active during the deposition of the Loxton-Parilla Sand (LPS), there is the potential for localised stacked sequences as a result of minor marine transgressions or still stand positions.

Exploration for heavy mineral sand within the Murray Basin is focused on intersecting the littoral marine sediments of the Pliocene aged Loxton-Parilla Sand, in particular sediment of relict strandlines that commonly host placer deposits of heavy mineral sand. This beach facies unit is very well developed, with well defined foreshore - surfzone - lowershore regressive sequence. The best heavy mineral accumulations manifest themselves within the foreshore within this unit. Unlike in the majority of the rest of the Murray Basin, on the northern margin of the Murray Basin the LPS may be separated into its separate components based on their mode of deposition. The Parilla Sand (PS) is the fluvial to fluvio-lacustrine portion of the LPS and the Loxton Sand (LS) is shallow marine to littoral portion of the LPS. In the tenement it is anticipated that the Loxton Sand as distinct form the LPS will be the target horizon for the program.

The diverse range of lithologies comprising the geosyncline includes many medium- to high-grade metamorphic and intrusive units that are unstable at surface conditions and therefore friable and readily eroded. These rocks could have made a significant contribution to the sediment load within the Murravian Gulf, including available heavy minerals.

3. EXPLORATION METHODS

3.1 Drilling

All drilling was carried out with a Wallis Drilling Pty Ltd owned and operated reverse circulation air core drill rig. Drill hole collars were surveyed by RTK DGPS and GPS to an accuracy of ±1m and ±10m respectively and are included with the report as an electronic file (see EL5251_201311_F_03_location.txt). Rods were NQ in size giving approximately 10cm diameter holes.

Drilling was conducted at 1.5m sampling throughout the entire hole.

A 1 to 2 kg split was taken by rotary splitter for logging and laboratory analysis. A subsample was taken from each sample for logging and panning. The logging procedure involved using wet panning to remove the clay fraction from the sample and then hydraulic separation to estimate the percentage of heavy mineral.

For approximately one in six drillholes, an additional sample was collected for the Department of Manufacturing, Innovation, Trade, Resources and Energy (DMITRE) core library. These samples were collected following guidelines listed within the M41 Earth Resources Information Sheet and were dispatched to PIRSA in late 2012.

The ease with which clay and silt was liberated from the sample was logged on a scale of very easy to impossible (see EL5251_201311_F_02_Logging_Codes.pdf) and the percentage of clay and silt ("Slimes") was also recorded. The presence and type of cemented fragments was recorded with an estimate of percentage ("Rock").

The ease with which the drill penetrated the ground was recorded on a scale of 1 to 5 ("Hardness"). Colour, dominant grainsize, max grainsize and sorting were also recorded. All geology logs are digitally included with this report (see EL5251_201311_F_04_lithology.txt).

3.2 Heavy Mineral Determination

Five hundred and forty three samples collected were assayed for heavy mineral (HM) content at Iluka's laboratory in Hamilton using the Method I procedure. Upon receipt, samples were dried, weighed, attritioned, then wet screened to remove the slime (-53µm) fraction. The samples were again dried, weighed, and screened to remove the fraction greater than 2 mm (oversize) and were further screened at 710 microns and the remaining subsample of the -710um +53 µm fraction underwent HM separation using LST (a solution of lithium polytungstate) at a specific

gravity of 2.85. The weights were then used to calculate percent slimes, percent oversize and percent HM for the entire sample.

Final assay results are included in the attached digital file (EL5251_201311_F_05_geochemistry.txt).

3.3 QAQC

Field standards, duplicate samples and twin hole drill holes are routinely collected during Iluka drill programmes. The drilling completed on EL5251 was grassroots exploration. Therefore, only field standards were submitted for QAQC. Standards were submitted following the standard Iluka protocol with approximately one standard submitted for every 40 samples assayed. QAQC details are submitted in digital form in EL5251_201311_F_07_qaqc.txt.

4. EXPLORATION WORK COMPLETED

A total of 34 holes were drilled across EL5251 in two separate drilling programmes in June/July 2013 and September/October 2013 for an advance of 2089m.

The June/July programme consisted of drilling along two traverses with one in an east-west orientation (ST069) and the other in a north-south orientation (ST070).

The second programme was part of a larger programme of work on the newly acquired neighbouring Delamerian Tenements EL4425, EL4449, EL4452, EL4842, EL4871, EL4872, EL5067, EL5068, EL5069 and EL5182. Two holes were drilled on the south eastern area of EL5251 along ST074 as part of this programme.

Geological cross sections and drill hole location plans are included in EL5251_201311_F_08_Sections.pdf and EL5251_201311_F_09_Plans.pdf (Fig 2) respectively.

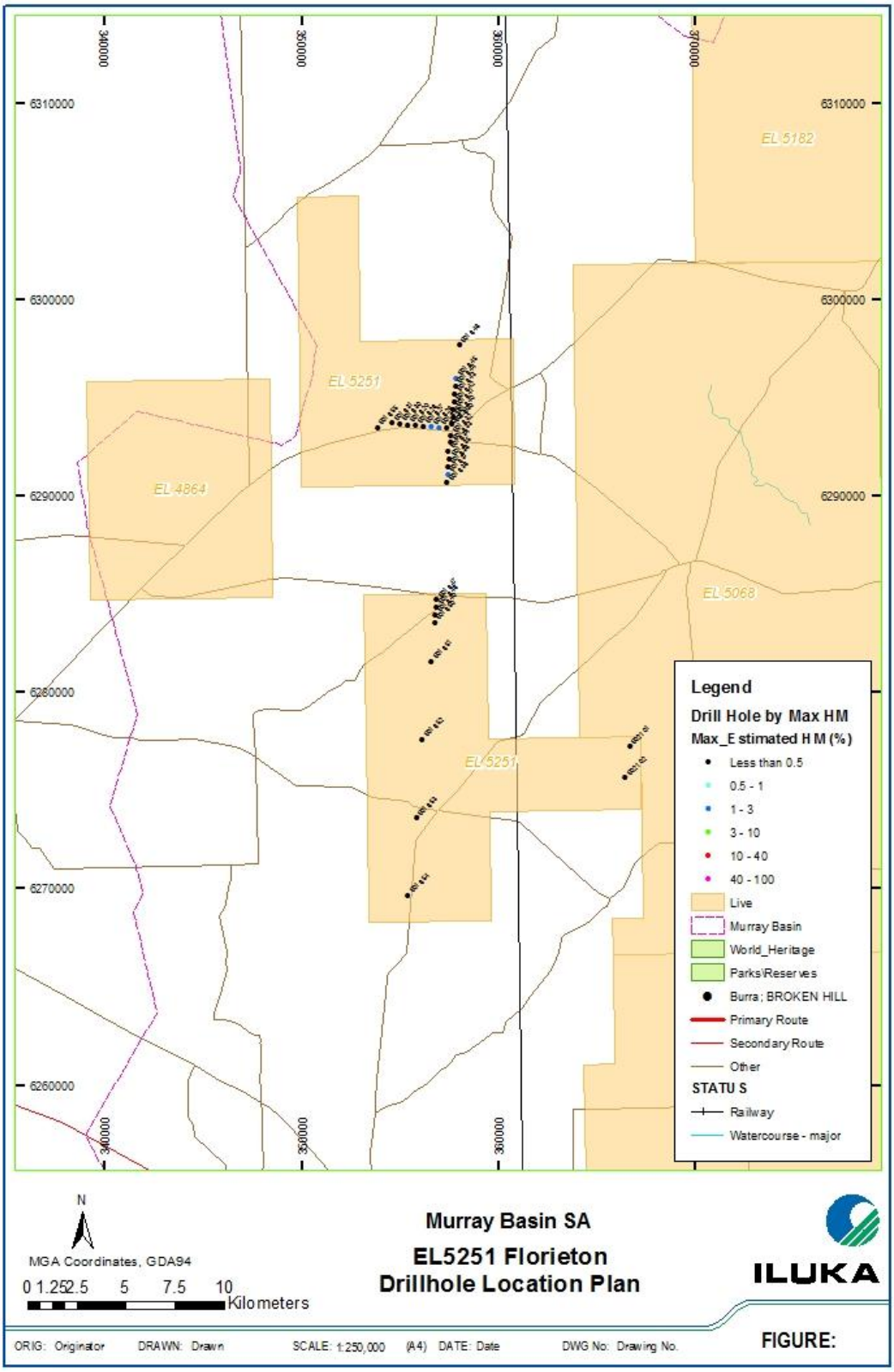


Figure 2: EL5251 Drill Hole Location Plan

4.1 Traverse ST069

A total of 9 holes were drilled along ST069 in an easterly direction with the aim of determining the maximum extent of Murray Basin marine sediments along this small portion of the western basin margin.

Drillholes along ST069 (S01824-S01831, S01855) intersected from surface; up to 45m of colluvial silts of the Pooraka Formation and Lacustrine clays; up 12m of calcareous sandstones and sands terminating in dark grey fossiliferous marl (Winambool Formation). Drillhole S01825 intersected 9m @ 0.9% HM / 40.5m within lacustrine clays and clayey sands. Drillhole S01826 intersected 3m @ 1% HM / 46.5m within clayey sands and clays.

The calcareous sandstone (possibly Morgan Limestone) intersected within all drillholes was heavily cemented with grainsizes of the sands medium to very coarse grained, sub-rounded and moderately to poorly sorted. No significant mineralisation was intersected within drillholes along ST069

4.2 Traverse ST070

Drillholes along ST079 (S01832-S01846) typically intersected from surface between 45m and 65m of colluvial silts/clays (Pooraka Formation), lacustrine clays (Quaternary Clays) and fluvial sands and clays; up 9m of calcareous sandstones and sands terminating in dark grey fossiliferous marl (Winambool Formation). Drillhole S01837 intersected minor HM of 6m @ 1% HM / 45m fine-medium grained fluvial clayey sand with slimes of over 30%. Drillhole S01845 intersected 2m @ 1% HM / 33m in very fine grained clayey sand with slimes values of over 30%.

Coarse to very-coarse grained poorly sorted marine sands were intersected in drillholes S01838, S01847-53 at depths from 45m to 61.5m, however, no significant mineralisation was intersected.

4.3 Traverse ST074

Two holes (S02101-02) were drilled along ST074 and intersected from surface 3-6m of Pooraka Formation; 25.5-30m of Blanchetown Clay; 3-6m of fluvial sands and clays terminating in the dark grey marl of the Winnambool Formation. No marine sands were intersected within the drillholes S02101 and S02102.

5. CONCLUSION

Two drilling campaigns were completed during June and September 2013. A total of 34 holes were drilled for an advance of 2089m during the reporting period.

No significant mineralisation was intersected with drillholes failing to intersect significantly thick sequences of marine sands.

A data review of the 2013 drilling has determined that the Loxton Sands are either not preserved or the Pliocence coast line did not extend this far east in the Murravian Gulf within EL5251.

6. REFERENCES

Brown, C.M. and Stephenson, A.E., 1991. *Geology of the Murray Basin Southeastern Australia,* Bureau of Mineral Resources, Geology and Geophysics Bulletin 235

Douglas, J.G & Ferguson, J.A (Eds), 1988: *Chapter 8 – Tertiary* by C. Abele et al, in Geology of Victoria, Victorian Division Geological Society of Australia Incorporated, Melbourne, pp 265-272.

Rankin, L.R., Clough, B.J. and Gatehouse, C.G., 1991. *Mafic Suites in Nasement Beneath the Murray Basin: New Data for the Early Palaeozoic History of the Tasman Orogenic Province.* PIRSA report book no 91/44 (DME 281/89)

353750mE

354000mE

354250mE

354500mE

354750mE

355000mE

200m

100m

S01855

63m

S01831

66m

S01830

58m

ILUKA	Iluka Resources Ltd. 159 Burgins Rd Hamilton, Vic 3300	Estimated HM% 0 to 0.5 0.5 to 1 1 to 3 3 to 10 10 to 40 >= 40 Grainsize Sorting VG G M P VP	X Scale = 1 : 4000 Y Scale = 1 : 1000 0 50 100m	Date 15-Nov-2013 Plot File: ST069A	Sheet 1 of 1	LHS: Lithology RHS: Actual HM% RHS: Actual Slimes RHS: Dominant Grainsize Hatch: Sorting	EL5251 Florieton Geological Cross Section ST069A

355000mE
355250mE
6293500mN
355500mE
355750mE
356000mE
356250mE
356500mE
200m
100m
S01829
54m
S01828
84m
S01827
66m

ILUKA	Iluka Resources Ltd. 159 Burgins Rd Hamilton, Vic 3300	Estimated HM% 0 to 0.5 0.5 to 1 1 to 3 3 to 10 10 to 40 >= 40 Grainsize Sorting VG G M P VP	X Scale = 1 : 4000 Y Scale = 1 : 1000 Date 15-Nov-2013 Sheet 1 of 1 Plot File: ST069B 0 50 100m	LHS: Lithology RHS: Actual HM% RHS: Actual Slimes RHS: Dominant Grainsize Hatch: Sorting	EL5251 Florieton Geological Cross Section ST069C

356500mE

356750mE

357000mE

357250mE

357500mE

357750mE

200m

200m

100m

100m

S01826

66m

S01825

49m

S01824

51m

S01839

46m

ILUKA	Iluka Resources Ltd. 159 Burgins Rd Hamilton, Vic 3300	Estimated HM% 0 to 0.5 0.5 to 1 1 to 3 3 to 10 10 to 40 >= 40 Grainsize Sorting VG G M P VP	X Scale = 1 : 4000 Y Scale = 1 : 1000 0 50 100m	Date 15-Nov-2013 Plot File: ST069C	Sheet 1 of 1	LHS: Lithology RHS: Actual HM% RHS: Actual Slimes RHS: Dominant Grainsize Hatch: Sorting	EL5251 Florieton Geological Cross Section ST069C

6298250mN

358000mE

6298000mN

6297750mN

6297500mN

6297250mN

6297000mN

200m

200m

100m

100m

S01846

81m

Iluka Resources Ltd. 159 Burgins Rd Hamilton, Vic 3300	Estimated HM% 0 to 0.5 0.5 to 1 1 to 3 3 to 10 10 to 40 >= 40 Grainsize Sorting VG G M P VP	X Scale = 1 : 4000 Y Scale = 1 : 1000 Date 15-Nov-2013 Sheet 1 of 1 Plot File: ST070A 0 50 100m
LHS: Lithology RHS: Actual HM% RHS: Actual Slimes RHS: Dominant Grainsize Hatch: Sorting	EL5251 Florieton Geological Cross Section ST070A	

6296250mN
6296000mN
6295750mN
6295500mN
6295250mN
357750mE
6295000mN

200m

100m

S01845

63m

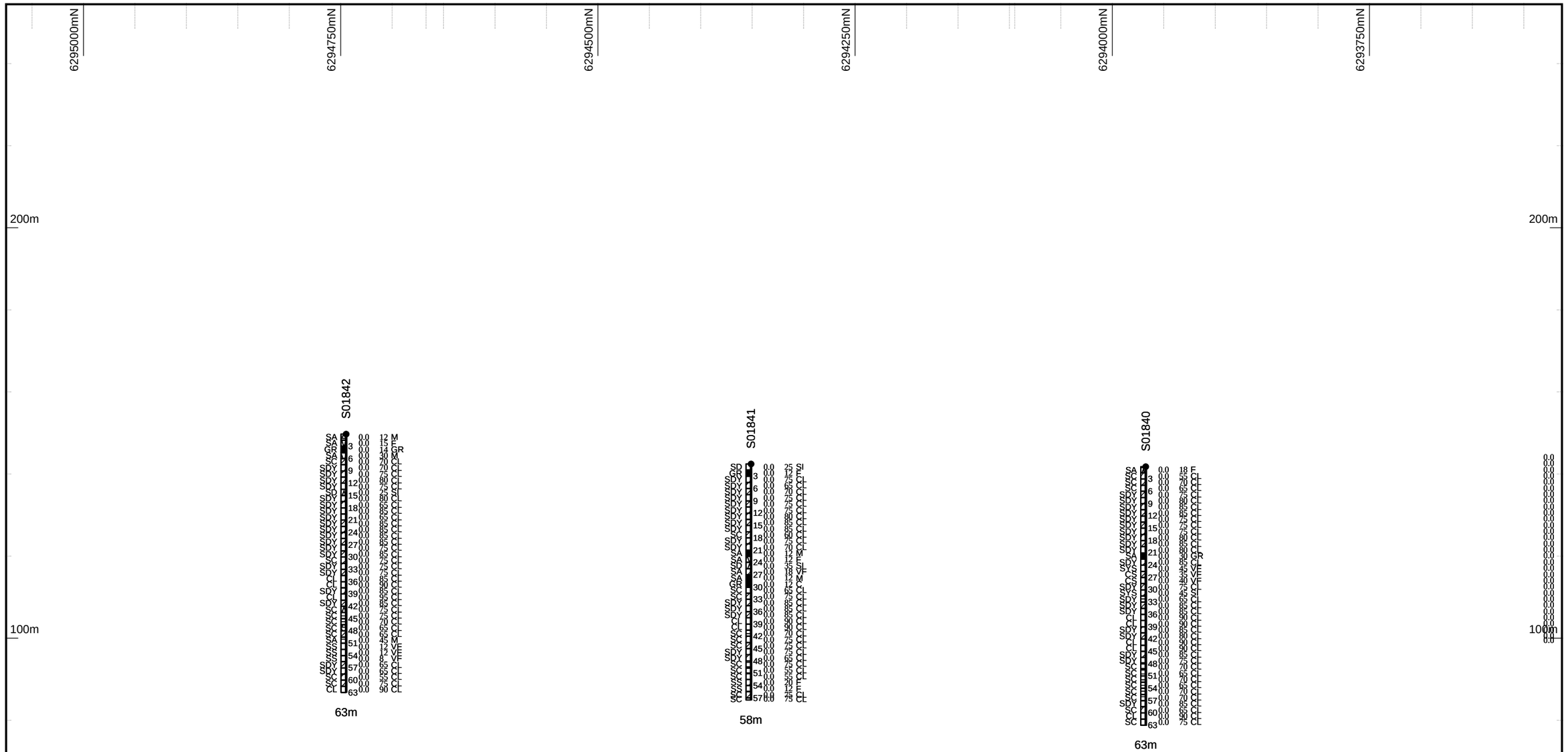
S01844

16m

S01843

63m

ILUKA	Iluka Resources Ltd. 159 Burgins Rd Hamilton, Vic 3300	Estimated HM% 0 to 0.5 0.5 to 1 1 to 3 3 to 10 10 to 40 >= 40 Grainsize Sorting VG G M P VP	X Scale = 1 : 4000 Y Scale = 1 : 1000 0 50 100m	Date 15-Nov-2013 Plot File: ST070B	Sheet 1 of 1	LHS: Lithology RHS: Actual HM% RHS: Actual Slimes RHS: Dominant Grainsize Hatch: Sorting	EL5251 Florieton Geological Cross Section ST070B



ILUKA

Iluka Resources Ltd.
159 Burgins Rd
Hamilton, Vic
3300

Estimated HM%
- 0 to 0.5
- 0.5 to 1
- 1 to 3
- 3 to 10
- 10 to 40
- >= 40

Grainsize Sorting
- VG
- G
- M
- P
- VP

X Scale = 1 : 4000
Y Scale = 1 : 1000

Date: 15-Nov-2013

Sheet: 1 of 1

Plot File: ST070C

0 50 100m

LHS: Lithology
RHS: Actual HM%
RHS: Actual Slimes
RHS: Dominant Grainsize
Hatch: Sorting

EL5251 Florieton
Geological Cross Section
ST070C

6293750mN

6293500mN

6293250mN

6293000mN

6292750mN

6292500mN

357500mE

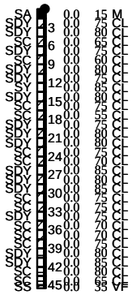
200m

200m

100m

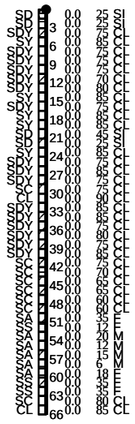
100m

S01839



46m

S01832



66m

S01833

81m

ILUKA

Iluka Resources Ltd.
159 Burgins Rd
Hamilton, Vic
3300

Estimated HM%
0 to 0.5
0.5 to 1
1 to 3
3 to 10
10 to 40
>= 40

Grainsize Sorting
VG
G
M
P
VP

X Scale = 1 : 4000
Y Scale = 1 : 1000

Date
15-Nov-2013

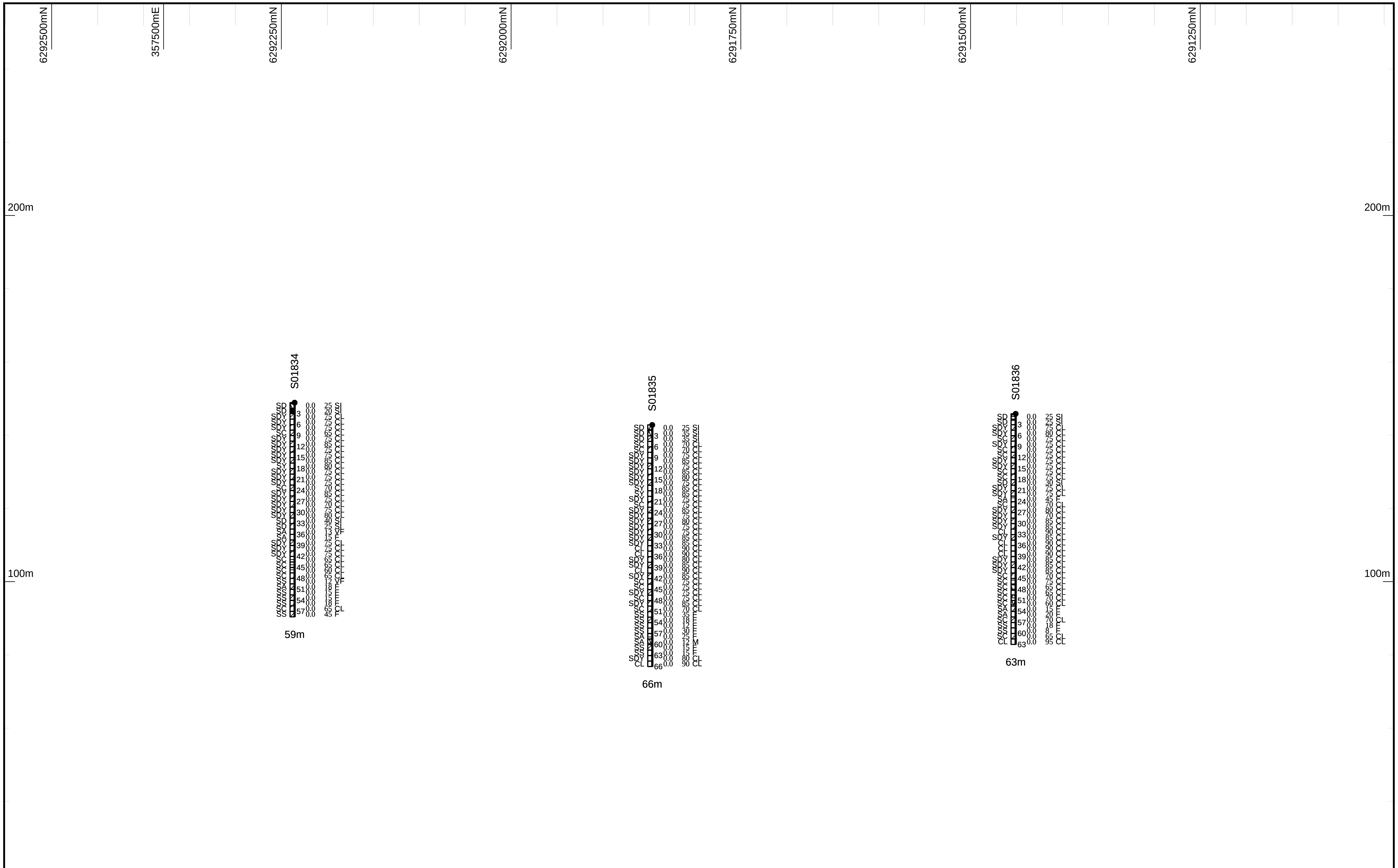
Sheet
1 of 1

Plot File: ST070D

0 50 100m

LHS: Lithology
RHS: Actual HM%
RHS: Actual Slimes
RHS: Dominant Grainsize
Hatch: Sorting

EL5251 Florieton
Geological Cross Section
ST070D



ILUKA

Iluka Resources Ltd.
159 Burgins Rd
Hamilton, Vic
3300

Estimated HM%	Grainsize Sorting
0 to 0.5	VG
0.5 to 1	G
1 to 3	M
3 to 10	P
10 to 40	VP
>= 40	

X Scale = 1 : 4000
Y Scale = 1 : 1000

Date: 15-Nov-2013

Sheet: 1 of 1

Plot File: ST070E

0 50 100m

LHS: Lithology
RHS: Actual HM%
RHS: Actual Slimes
RHS: Dominant Grainsize
Hatch: Sorting

EL5251 Florieton
Geological Cross Section
ST070E

6291250mN

6291000mN

6290750mN

6290500mN

6290250mN

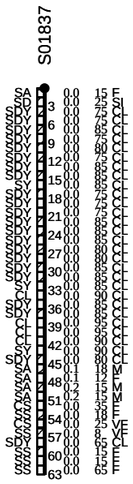
6290000mN

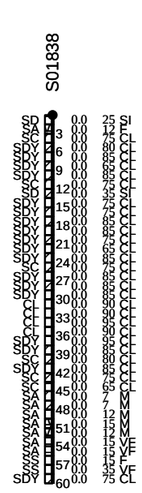
200m

200m

100m

100m





ILUKA

Iluka Resources Ltd.
159 Burgins Rd
Hamilton, Vic
3300

Estimated HM%
- 0 to 0.5
- 0.5 to 1
- 1 to 3
- 3 to 10
- 10 to 40
- >= 40

Grainsize Sorting
- VG
- G
- M
- P
- VP

X Scale = 1 : 4000
Y Scale = 1 : 1000

Date
15-Nov-2013

Sheet
1 of 1

Plot File: ST070F

0 50 100m

LHS: Lithology
RHS: Actual HM%
RHS: Actual Slimes
RHS: Dominant Grainsize
Hatch: Sorting

EL5251 Florieton
Geological Cross Section
ST070F

6285000mN

6284750mN

6284500mN

6284250mN

6284000mN

356750mE

6283750mN

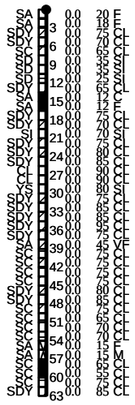
200m

200m

100m

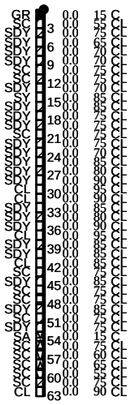
100m

S01847



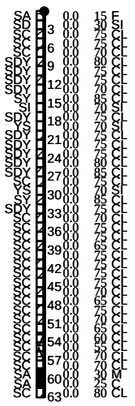
63m

S01848



63m

S01849



63m

ILUKA

Iluka Resources Ltd.
159 Burgins Rd
Hamilton, Vic
3300

Estimated HM%
0 to 0.5
0.5 to 1
1 to 3
3 to 10
10 to 40
>= 40

Grainsize Sorting
VG
G
M
P
VP

X Scale = 1 : 4000
Y Scale = 1 : 1000

Date
15-Nov-2013

Sheet
1 of 1

Plot File: ST070G

0 50 100m

LHS: Lithology
RHS: Actual HM%
RHS: Actual Slimes
RHS: Dominant Grainsize
Hatch: Sorting

EL5251 Florieton
Geological Cross Section
ST070G

356750mE

6283750mN

6283500mN

6283250mN

6283000mN

6282750mN

6282500mN

200m

200m

100m

100m

S01850

66m

SA	1	0.0	20	F	
SC	2	0.0	55	CC	
SDY	3	0.0	70	CC	
SDY	4	0.0	70	CC	
SC	5	0.0	70	CC	
SDY	6	0.0	70	CC	
SDY	7	0.0	70	CC	
SDY	8	0.0	75	CC	
SC	9	0.0	70	CC	
SC	10	0.0	70	CC	
SC	11	0.0	60	CC	
SC	12	0.0	70	CC	
SC	13	0.0	70	CC	
SC	14	0.0	60	CC	
SC	15	0.0	60	CC	
SC	16	0.0	70	CC	
SC	17	0.0	70	CC	
SC	18	0.0	70	CC	
SDY	19	0.0	65	CC	
SDY	20	0.0	80	CC	
SC	21	0.0	70	CC	
SC	22	0.0	70	CC	
SDY	23	0.0	65	CC	
SDY	24	0.0	65	CC	
SDY	25	0.0	80	CC	
SDY	26	0.0	80	CC	
SDY	27	0.0	80	CC	
SDY	28	0.0	80	CC	
SDY	29	0.0	85	CC	
SDY	30	0.0	85	CC	
SDY	31	0.0	85	CC	
SDY	32	0.0	85	CC	
SDY	33	0.0	85	CC	
SC	34	0.0	65	CC	
SC	35	0.0	70	CC	
SA	36	0.0	15	M	
SA	37	0.0	5	M	
SA	38	0.0	5	M	
SA	39	0.0	5	M	
SA	40	0.0	5	M	
SA	41	0.0	5	M	
SA	42	0.0	5	M	
SA	43	0.0	40	M	
SC	44	0.0	70	CC	
SC	45	0.0	65	CC	
SDY	46	0.0	85	CC	
SC	47	0.0	80	CC	
SDY	48	0.0	80	CC	
SC	49	0.0	70	CC	
SC	50	0.0	70	CC	
SC	51	0.0	60	CC	
SC	52	0.0	70	CC	
SA	53	0.0	10	M	
SA	54	0.0	15	M	
SA	55	0.0	25	M	
SA	56	0.0	12	M	
SA	57	0.0	12	M	
SA	58	0.0	12	M	
SC	59	0.0	70	CC	
SC	60	0.0	65	CC	
SC	61	0.0	65	CC	
SC	62	0.0	70	CC	
SC	63	0.0	90	CC	
CL	64	0.0	85	CL	
CL	65	0.0	85	CL	
CL	66	0.0	85	CL	

ILUKA

Iluka Resources Ltd.
159 Burgins Rd
Hamilton, Vic
3300

Estimated HM%
- 0 to 0.5
- 0.5 to 1
- 1 to 3
- 3 to 10
- 10 to 40
- >= 40

Grainsize Sorting
- VG
- G
- M
- P
- VP

X Scale = 1 : 4000
Y Scale = 1 : 1000

Date
15-Nov-2013

Sheet
1 of 1

Plot File: ST070H

0 50 100m

LHS: Lithology
RHS: Actual HM%
RHS: Actual Slimes
RHS: Dominant Grainsize
Hatch: Sorting

EL5251 Florieton
Geological Cross Section
ST070H

6282000mN
6281750mN
6281500mN
6281250mN
6281000mN
356500mE
6280750mN

200m
100m
0m

S01851

SC	1	0.0	45	VF
SDY	3	0.0	65	CL
SC		0.0	70	CL
SC		0.0	65	CL
SDY	6	0.0	75	CL
SDY		0.0	75	CL
SDY	9	0.0	60	CL
SC		0.0	45	CL
SC	12	0.0	75	CL
SA		0.0	45	M
SA	15	0.0	12	M
SA		0.0	8	M
SC	18	0.0	55	CL
SDY		0.0	75	CL
SC	21	0.0	75	CL
SC		0.0	60	CL
SC	24	0.0	65	CL
SDY		0.0	75	CL
SDY	27	0.0	60	CL
SDY		0.0	60	CL
SDY	30	0.0	60	CL
SDY		0.0	60	CL
SDY	33	0.0	65	CL
SDY		0.0	70	CL
SDY	36	0.0	75	CL
SC		0.0	75	CL
SDY	39	0.0	65	CL
SC		0.0	70	CL
SC	42	0.0	65	CL
SC		0.0	65	CL
SC	45	0.0	75	CL
SDY		0.0	75	CL
SC	48	0.0	75	CL
SC		0.0	75	CL
SC	51	0.0	75	CL
SC		0.0	75	CL
SC	54	0.0	75	CL
SC		0.0	65	CL
SC	57	0.0	60	CL
SC		0.0	70	CL
SC	60	0.0	75	CL
SC		0.0	70	CL
SC	63	0.0	70	CL
SC		0.0	65	CL
SC	66	0.0	65	CL
SA		0.0	15	M
SA	69	0.0	35	M
SC		0.0	75	CL
SC	72	0.0	75	CL

72m

ILUKA

Iluka Resources Ltd.
159 Burgins Rd
Hamilton, Vic
3300

Estimated HM%
- 0 to 0.5
- 0.5 to 1
- 1 to 3
- 3 to 10
- 10 to 40
- >= 40

Grainsize Sorting
- VG
- G
- M
- P
- VP

X Scale = 1 : 4000
Y Scale = 1 : 1000

Date
15-Nov-2013

Sheet
1 of 1

Plot File: ST070I

0 50 100m

LHS: Lithology
RHS: Actual HM%
RHS: Actual Slimes
RHS: Dominant Grainsize
Hatch: Sorting

EL5251 Florieton
Geological Cross Section
ST070I

6278250mN

356250mE

6278000mN

6277750mN

6277500mN

6277250mN

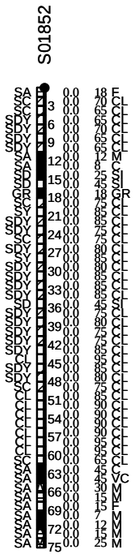
6277000mN

200m

200m

100m

100m



0m

0m

ILUKA

Iluka Resources Ltd.
159 Burgins Rd
Hamilton, Vic
3300

Estimated HM%
- 0 to 0.5
- 0.5 to 1
- 1 to 3
- 3 to 10
- 10 to 40
- >= 40

Grainsize Sorting
- VG
- G
- M
- P
- VP

X Scale = 1 : 4000
Y Scale = 1 : 1000

Date
15-Nov-2013

Sheet
1 of 1

Plot File: ST070J

0 50 100m

LHS: Lithology
RHS: Actual HM%
RHS: Actual Slimes
RHS: Dominant Grainsize
Hatch: Sorting

EL5251 Florieton
Geological Cross Section
ST070J

6274250mN
6274000mN
6273750mN
6273500mN
6273250mN
6273000mN

200m

100m

S01853

SD	1	0.0	25	SI
SDY	2	0.0	65	CL
SDY	3	0.0	65	CL
SDY	4	0.0	55	CL
SY	5	0.0	55	CL
SDY	6	0.0	60	CL
SDY	7	0.0	70	CL
SDY	8	0.0	70	CL
SDY	9	0.0	75	CL
SDY	10	0.0	70	CL
SDY	11	0.0	70	CL
SDY	12	0.0	75	CL
SDY	13	0.0	70	CL
SDY	14	0.0	80	CL
SDY	15	0.0	70	CL
SDY	16	0.0	75	CL
SDY	17	0.0	70	CL
SDY	18	0.0	75	CL
SC	19	0.0	70	CL
SDY	20	0.0	80	CL
SY	21	0.0	85	CL
SY	22	0.0	80	CL
SDY	23	0.0	85	CL
SDY	24	0.0	75	CL
SY	25	0.0	85	CL
SDY	26	0.0	80	CL
SDY	27	0.0	85	CL
SDY	28	0.0	85	CL
SDY	29	0.0	85	CL
SDY	30	0.0	80	CL
SDY	31	0.0	85	CL
SDY	32	0.0	85	CL
SDY	33	0.0	85	CL
SDY	34	0.0	85	CL
SDY	35	0.0	85	CL
SDY	36	0.0	80	CL
SDY	37	0.0	85	CL
SDY	38	0.0	85	CL
SDY	39	0.0	85	CL
CL	40	0.0	90	CL
CL	41	0.0	90	CL
YS	42	0.0	80	SI
SDY	43	0.0	85	CL
SDY	44	0.0	80	CL
SDY	45	0.0	85	CL
SDY	46	0.0	80	CL
SDY	47	0.0	85	CL
CL	48	0.0	90	CL
CL	49	0.0	90	CL
CL	50	0.0	90	CL
CL	51	0.0	90	CL
CL	52	0.0	90	CL
CL	53	0.0	90	CL
CL	54	0.0	90	CL
CL	55	0.0	90	CL
SC	56	0.0	75	CL
SC	57	0.0	60	CL
SA	58	0.0	20	M
SA	59	0.0	5	M
SA	60	0.0	5	C
SA	61	0.0	5	M
SA	62	0.0	5	M
SA	63	0.0	5	M
SA	64	0.0	5	M
SA	65	0.0	5	M
SA	66	0.0	5	M
SA	67	0.0	5	M
SA	68	0.0	18	F
CL	69	0.0	90	CL
CL	70	0.0	90	CL
CL	71	0.0	90	CL
CL	72	0.0	85	CL

72m

0m

ILUKA

Iluka Resources Ltd.
159 Burgins Rd
Hamilton, Vic
3300

Estimated HM%
- 0 to 0.5
- 0.5 to 1
- 1 to 3
- 3 to 10
- 10 to 40
- >= 40

Grainsize Sorting
- VG
- G
- M
- P
- VP

X Scale = 1 : 4000
Y Scale = 1 : 1000

Date
15-Nov-2013

Sheet
1 of 1

Plot File: ST070K

0 50 100m

LHS: Lithology
RHS: Actual HM%
RHS: Actual Slimes
RHS: Dominant Grainsize
Hatch: Sorting

EL5251 Florieton
Geological Cross Section
ST070K

6270000mN
6269750mN
6269500mN
355500mE
6269250mN
6269000mN
6268750mN

200m
100m
0m

S01854

66m

Estimated HM%	Grainsize Sorting
0 to 0.5	VG
0.5 to 1	G
1 to 3	M
3 to 10	P
10 to 40	VP
>= 40	

ILUKA

Iluka Resources Ltd.
159 Burgins Rd
Hamilton, Vic
3300

X Scale = 1 : 4000
Y Scale = 1 : 1000

Date
15-Nov-2013

Sheet
1 of 1

Plot File: ST070L

0 50 100m

LHS: Lithology
RHS: Actual HM%
RHS: Actual Slimes
RHS: Dominant Grainsize
Hatch: Sorting

EL5251 Florieton
Geological Cross Section
ST070L

Metadata used in Iluka Resources Ltd Surface Location Files

Name	Type*	Size	Decimals	Description
HOLE_ID	C	10	0	Hole Name
LATITUDE	N	12	6	Latitude
LONGITUDE	N	12	6	Longitude
RL	N	7	2	AHDRL Elevation
DATUM	C	5	0	Datum Name
SURV_METH	C	10	0	Survey Method
SURV_COMP	C	10	0	Survey Company
SURV_NAM	C	10	0	Surveyor Name
PEG_VAR	C	1	0	Variation from Peg
UTM_NORTH	N	12	2	Northing MGA (GDA94) datum
UTM_EAST	N	12	2	Easting MGA (GDA94) datum
UTM_GRIDID	C	10	0	Universal Transverse Mercator Grid Name
LOCAL_E	N	12	2	Local Grid Easting
LOCAL_N	N	12	2	Local Grid Northing
LOCAL_GRID	C	20	0	Local Grid Name
DRILL_TYPE	C	5	0	Drilling Method
HOLE_SIZE	C	3	0	Hole Diameter
AZIMUTH	N	1	0	Azimuth of Drill String
DIP	N	3	0	Dip of Drill String
SAMP_SPLIT	C	5	0	Percentage of Sample Taken
TWIN	C	1	0	Twin Hole
TWIN OF	C	10	0	Twin Hole Original
TD	N	6	1	Depth of Hole
TENURE_REF	C	10	0	Exploration Licence
STATE	C	5	0	State
COMPANY	C	10	0	Exploration Company
PROJECT	C	30	0	Regional Project Area
DEPOSIT	C	30	0	Deposit
GRID_LINE	C	12	0	Grid Line Name
TRAVERSE	C	20	0	Traverse Name
ANOMALY	C	20	0	Anomaly Name
PEG_ID	C	12	0	Peg Name
PAN	C	1	0	Confirmation of Panning
LOGGER	C	15	0	Logger Name
DRILL_CO	C	10	0	Drilling Company
DRILL_RIG	C	10	0	Drilling Rig
DATE	C	10	0	Date
COMMENTS	C	30	0	Comments
VIS_VAL	C	1	0	Visual Validation of Data

***** C = Character
N=Numeric

Metadata used in Iluka Resources Ltd Lithological Logging Files

Name	Type	Size	Decimals	Description
HOLE_ID	C	10	0	Hole Name
PROJECT	C	30	0	Regional Project Area
FROM	N	5	1	Depth From
TO	N	5	1	Depth To
SAMPLE_ID	C	10	0	Sample Name
AS	C	3	0	Assay
SAMP_QUAL	C	1	0	Quality of Sample
WATER	C	1	0	Sample Moisture
E_SL	N	3	0	Estimated Slimes Percentage
WA	C	2	0	Washability of Sample
CO1	C	3	0	Primary Sample Colour
LI1	C	3	0	Primary Lithology
DGS1	C	2	0	Primary Dominant Grain Size
CGS1	C	2	0	Primary Maximum Grain Size
SO1	C	2	0	Primary Sorting
LINK	C	2	0	Link to Second Lithology
CO2	C	3	0	Secondary Colour
LI2	C	3	0	Secondary Lithology
E_LI2	N	3	0	Percentage of Secondary Lithology
DGS2	C	2	0	Secondary Dominant Grain Size
CGS2	C	2	0	Secondary Maximum Grain Size
SO2	C	2	0	Secondary Sorting
IND	C	4	0	Induration
E_IND	N	3	0	Percentage of Induration in Sample
H	N	1	0	Hardness of Induration
E_HM	N	5	1	Estimated HM percentage
HMGS	C	2	0	HM Grain Size
QU	C	3	0	Qualifiers
COMMENTS	C	30	0	Comments
FM	C	3	0	Formation

Metadata used in Iluka Resources Ltd Assay Files

Name	Type	Size	Decimals	Description
HOLE_ID	C	10	0	Hole Name
FROM	N	5	1	Depth From
TO	N	5	1	Depth To
SAMPLE_ID	C	10	0	Sample Name
OS	N	5	2	Oversize Percentage
SANDC	N	5	2	Coarse Sand Percentage
SAND	N	5	2	Sand Percentage
SLIMES	N	5	2	Slimes Percentage
HM	N	5	2	HM Percentage

CODES

CODE	ASSAY
Y	YES - HM ASSAY
N	NO - HM ASSAY
M	MULTI ELEMENT
D	DUPLICATE
3P	STANDARD
E3	STANDARD
HG1	STANDARD
HG2	STANDARD
HG3	STANDARD
HG4	STANDARD

CODE	GRAINSIZE
CL	CLAY
GR	GRIT
PB	PEBBLE
SI	SILT
VF	VERY FINE
F	FINE
M	MEDIUM
C	COARSE
VC	VERY COARSE

CODE	SURVEY COMPANY
PDS	Peter Danson
ILUKA	Iluka

CODE	SURVEY METHOD
GPS	GPS
DGPS RTK	DGPS RTK
OTHER	OTHER

CODE	WATER
D	DRY
M	MOIST
W	WET
I	INJECTED

CODE	COMPANY
ILU	ILUKA RESOURCES LTD

CODE	DRILLING COMPANY
WALLIS	WALLIS DRILLING LTD
ILUKA	ILUKA RESOURCES LTD

CODE	DRILL RIG
CUSTOM	CUSTOM
MANTIS1	MANTIS1
MANTIS2	MANTIS2
MANTIS3	MANTIS3
DELTA15	DELTA15
DELTA28	DELTA28
WALLD29	DELTA29
WALLIS D30	DELTA30
DELTA32	DELTA32
DELTA5	DELTA5
DELTA7	DELTA7
WARMAN	WARMAN

CODE	DRILL TYPE
RCAC	REVERSE CIRCULATION AIR CORE
AU	AUGER
RAB	ROTARY AIR BLAST
DIAMOND	DIAMOND
RC	REVERSE CIRCULATION

CODE	FORMATION
TFS	TOP OF FORESHORE
TLS	TOP OF LOWERSHORE
TSZ	TOP OF SURFZONE
TLI	TOP OF LIMESTONE
DU	DUNAL
WT	TOP OF WATER TABLE

CODE	INDURATION HARDNESS
1	VERY SOFT
2	SOFT
3	MEDIUM
4	HARD
5	VERY HARD

CODE	HM GRAINSIZE
F	FINE
VF	VERY FINE
FM	FINE-MEDIUM
M	MEDIUM
MC	MEDIUM-COARSE
C	COARSE
VC	VERY COARSE

CODE	HOLE SIZE
BQ	60mm
NQ	75.8mm

CODE	INDURATION
FE	FERRUGINOUS INDURATION
SI	SILICEOUS INDURATION
CC	CALCAREOUS INDURATION
PY	PYRITIC INDURATION

CODE	LITHOLOGY
BA	BASALT
CA	CALCRETE
CL	CLAY
CT	CLAY STONE
YS	CLAY-SILT
CS	CLAYEY SAND
CO	COAL
CG	CONGLOMERATE
DO	DOLOMITE
GA	GRANITE
GR	GRAVEL
GY	GYPSUM
HM	HEAVY MINERAL
IC	INDURATED CLAY
IR	IRONSTONE
LA	LATERITE
LI	LIMESTONE
LS	LOMESAND
LC	LOST CORE
MU	MUDSTONE
PY	PYRITE
QU	QUARTZ
RK	ROCK UNKNOWN
SA	SAND
SS	SANDSTONE
SC	SANDY CLAY
SAP	SAPROLITE
ST	SCHIST
SH	SHALE
SE	SILCRETE
SI	SILT
SIS	SILTSTONE
SD	SILTY-SAND
SY	SILTY-CLAY
SYS	SILTY-CLAY-SAND
SDY	SILTY-SANDY-CLAY
SL	SLATE
SLM	SLIME
SO	SOIL

CODE	LINK
TO	TO
AN	AND

CODE	PEG VARIATION
Y	YES
N	NO
P	PICK-UP

CODE	QUALIFIER
AT	ABUNDANT BLACK TRASH
CB	CARBONACEOUS
CT	COMMON BLACK TRASH
FE	FERRUGINOUS

LA	LATERITIC
MI	MICACEOUS
MO	MOTTLED
MT	MINOR BLACK TRASH
OX	OXIDISED
PY	PYRITIC
WE	WEATHERED
SI	SILICEOUS
CC	CALCAREOUS
CE	CARBONATE
GY	GYPSUM
OR	ORGANIC
ALF	ABUNDANT LATERITIC FINES
CLF	COMMON LATERITIC FINES
MLF	MINOR LATERITIC FINES
BM	BASEMENT
TL	TAILINGS
SL	SLIMES
CV	CAVEN

CODE	SAMPLE QUALITY
G	GOOD
M	MODERATE
P	POOR

CODE	SAMPLE SPLIT
25_75	25% SAMPLE SPLIT
50_50	50% SAMPLE SPLIT
100	100% SAMPLE SPLIT

CODE	SORTING
G	GOOD
M	MODERATE
P	POOR
VG	VERY GOOD
VP	VERY POOR

CODE	WASHABILITY
IM	IMPOSSIBLE
M	MODERATE
MD	MODERATELY DIFFICULT
ME	MODERATELY EASY
VD	VERY DIFFICULT
VE	VERY EASY

CODE	COLOUR
BK	BLACK
BL	BLUE
BR	BROWN
BB	BROWN-BLACK
BC	BROWN-CREAM
BO	BROWN-ORANGE
BW	BROWN-WHITE
BY	BROWN-YELLOW
BU	BUFF
CR	CREAM
CO	CREAM-ORANGE
RC	CREAM-RED
DBK	DARK BLACK
DBL	DARK BLUE
DBR	DARK BROWN
DBB	DARK BROWN-BLACK
DBC	DARK BROWN-CREAM
DBO	DARK BROWN-ORANGE
DBW	DARK BROWN-WHITE
DBY	DARK BROWN-YELLOW
DBU	DARK BUFF
DCR	DARK CREAM
DCO	DARK CREAM-ORANGE
DRC	DARK CREAM-RED
DGN	DARK GREEN
DNB	DARK GREEN-BROWN
DNY	DARK GREEN-YELLOW
DGR	DARK GREY
DGK	DARK GREY-BLACK
DGB	DARK GREY-BROWN
DGC	DARK GREY-CREAM
DGG	DARK GREY-GREEN
DGO	DARK GREY-ORANGE
DGP	DARK GREY-PINK
DGD	DARK GREY-RED
DGW	DARK GREY-WHITE
DGY	DARK GREY-YELLOW
DMU	DARK MUSTARD
DOR	DARK ORANGE

DOB	DARK ORANGE-BROWN
DOW	DARK ORANGE-WHITE
DOY	DARK ORANGE-YELLOW
DPI	DARK PINK
DPB	DARK PINK BROWN
DPC	DARK PINK-CREAM
DPO	DARK PINK-ORANGE
DPW	DARK PINK-WHITE
DPU	DARK PURPLE
DRE	DARK RED
DRK	DARK RED-BLACK
DRB	DARK RED-BROWN
DRO	DARK RED-ORANGE
DRP	DARK RED-PINK
DRW	DARK RED-WHITE
DRY	DARK RED-YELLOW
DWH	DARK WHITE
DWC	DARK WHITE-CREAM
DYE	DARK YELLOW
DYB	DARK YELLOW-BROWN
DYG	DARK YELLOW-GREEN
DYW	DARK YELLOW-WHITE
GN	GREEN
NB	GREEN-BROWN
NY	GREEN-YELLOW
GR	GREY
GK	GREY-BLACK
GB	GREY-BROWN
GC	GREY-CREAM
GG	GREY-GREEN
GO	GREY-ORANGE
GP	GREY-PINK
GD	GREY-RED
GW	GREY-WHITE
GY	GREY-YELLOW
KH	KHARKI
LBK	LIGHT BLACK
LBL	LIGHT BLUE
LBR	LIGHT BROWN
LBB	LIGHT BROWN-BLACK
LBC	LIGHT BROWN-CREAM
LBO	LIGHT BROWN-ORANGE
LBW	LIGHT BROWN-WHITE
LBY	LIGHT BROWN-YELLOW
LBU	LIGHT BUFF
LCR	LIGHT CREAM

LCO	LIGHT CREAM-ORANGE
LRC	LIGHT CREAM-RED
LGN	LIGHT GREEN
LNB	LIGHT GREEN-BROWN
LNY	LIGHT GREEN-YELLOW
LGR	LIGHT GREY
LGK	LIGHT GREY-BLACK
LGB	LIGHT GREY-BROWN
LGC	LIGHT GREY-CREAM
LGG	LIGHT GREY-GREEN
LGO	LIGHT GREY-ORANGE
LGP	LIGHT GREY-PINK
LGD	LIGHT GREY-RED
LGW	LIGHT GREY-WHITE
LGY	LIGHT GREY-YELLOW
LMU	LIGHT MUSTARD
LOR	LIGHT ORANGE
LOB	LIGHT ORANGE-BROWN
LOW	LIGHT ORANGE-WHITE
LOY	LIGHT ORANGE-YELLOW
LPI	LIGHT PINK
LPB	LIGHT PINK BROWN
LPC	LIGHT PINK-CREAM
LPO	LIGHT PINK-ORANGE
LPW	LIGHT PINK-WHITE
LPU	LIGHT PURPLE
LRE	LIGHT RED
LRK	LIGHT RED-BLACK
LRB	LIGHT RED-BROWN
LRO	LIGHT RED-ORANGE
LRP	LIGHT RED-PINK
LRW	LIGHT RED-WHITE
LRY	LIGHT RED-YELLOW
LWH	LIGHT WHITE
LWC	LIGHT WHITE-CREAM
LYE	LIGHT YELLOW
LYB	LIGHT YELLOW-BROWN
LYG	LIGHT YELLOW-GREEN
LYW	LIGHT YELLOW-WHITE
MU	MUSTARD
OR	ORANGE
OB	ORANGE-BROWN
OW	ORANGE-WHITE
OY	ORANGE-YELLOW
PI	PINK
PB	PINK BROWN

PC	PINK-CREAM
PO	PINK-ORANGE
PW	PINK-WHITE
PU	PURPLE
RE	RED
RK	RED-BLACK
RB	RED-BROWN
RO	RED-ORANGE
RP	RED-PINK
RW	RED-WHITE

RY	RED-YELLOW
WH	WHITE
WC	WHITE-CREAM
YE	YELLOW
YB	YELLOW-BROWN
YG	YELLOW-GREEN
YO	YELLOW-ORANGE
YR	YELLOW-RED
YW	YELLOW-WHITE