



## **TIMBER CREEK DIAMOND PROJECT**

Third Annual Report EL10358

22 April 2004 to 23 April 2005

S.A. Cooper, *Orogenic Exploration Pty Ltd*  
*5 Glengarry Avenue, Burwood, Victoria, 3125*

W.T. Marx, *Tawana Resources NL*  
*530 Little Collins Street, Melbourne, Vic., 3000*

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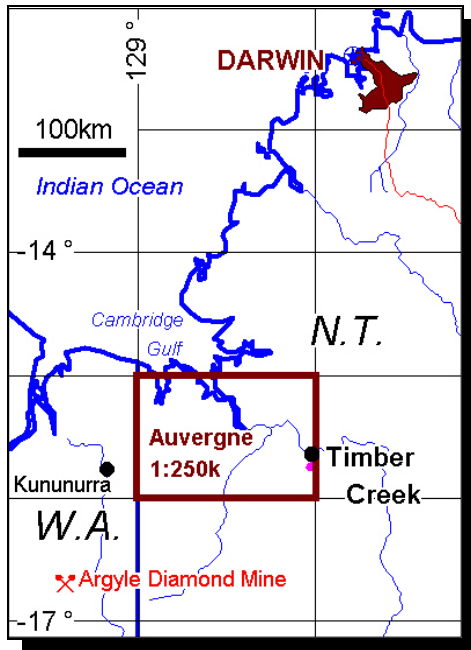
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## 1. INTRODUCTION

The Timber Creek Project is located approximately 370 kilometers SSW of Darwin on the Auvergne (4966) 1:100,000 map sheet. The five known Timber Creek Kimberlites (TC01 to TC05) are sited approximately 10 kilometers south of the small township of Timber Creek (Figure 1). These kimberlites were discovered by De Beers during a sampling program over this area between 1991 and 1993. The Timber Creek project consists of Exploration Licence (EL10358) covering an area of 6.6 square kilometers over the five known Timber Creek kimberlites.



**Figure 1.** Location of Timber Creek Kimberlites.

During the current period, the recovery of diamonds from the crushing Timber Creek 01 Kimberlite stockpile has been completed. Also during the period detailed whole rock geochemistry and petrology has been done, together with some soil geochemistry. Grain microprobe analysis has been received for the heavy mineral samples collected during the previous annual period.

## 2. REGIONAL GEOLOGY

The project area is within the early to mid Proterozoic Victoria River Basin (VRB) overlying the concealed North Australian Craton. The VRB consists of both marine and continental sediments, with a maximum thickness of 3500 metres (Palfreyman, 1984) that has undergone at least three periods of gentle folding and warping (Pontifex & Sweet, 1972).

Surrounding the known kimberlites are shallow dipping sediments of the Bullita Group. This is composed of thinly bedded reddish brown dolomitic siltstones and fine sandstone of the Timber Creek Formation (Sweet, 1972), grading up, and into, grey thin-bedded dolomite and dolomitic siltstone of the Skull Creek Formation (Pontifex & Sweet, 1972). The Bullita Group has formed low rounded hills, sometimes capped by overlying unconformable massive quartz sandstone. This sandstone is the Jasper George Sandstone (Auvergne Group) which also caps the gently sloping plateau of the Newcastle Ranges to the northwest.

The only known igneous intrusions in the project area are the five known kimberlites. All have been classified by De Beers as highly altered hypabyssal facies kimberlites (Berryman et al, 1998). Timber Creek 01 is the largest of these bodies and represents a small pipe on a dyke. An 84t colluvium sample down-slope from Timber Creek 01 produced 1913 diamonds totaling 19.83ct from the -4.75mm fraction (Berryman et al, 1998). Over 100 diamonds, generally small (0.0016 to 0.0023ct) and predominantly brown to yellow in colour, have been recovered from surface loam sampling alone (Berryman, 1995). The age of intrusion is  $179 \pm 2$ Ma (middle Jurassic) based on the dating of recovered kimberlitic zircons (Belousova et al, 2001).

Ground inspection by De Beers led to the discovery of a small kimberlite dyke, Timber Creek 02. Later drilling intersected a thin extension of this dyke. No diamonds have been recovered in this area.

Timber Creek 03 outcrops as a white silicified rock with vague relict igneous textures visible on weathered surfaces (Berryman, 1995). Based on outcrop and chromite distribution from surface loam sampling, this kimberlite was considered relatively small by Stockdale Prospecting Limited. No drilling was completed at the TC-03 site.

Timber Creek TC04 is a series of small en-echelon dykes, or a dyke swarm. The kimberlite outcrops as a goethite-rich breccia and was intercepted in De Beers drill hole 93DH32 core as a 75cm wide dyke and small stringer. One diamond from RAB drill hole 93DH01, and over twenty diamonds from surface loam sampling have been recovered in the TC-04 area (Berryman, 1995). The kimberlite samples were both highly silicified and ferruginised.

The final Timber Creek kimberlite, TC05, does not outcrop, but was intercepted by the single drill hole 93DH33 as a series of thin dykes. No diamonds have been recovered in this area.

### **3. PREVIOUS EL10358 DIAMOND EXPLORATION**

A detailed review of previous historical diamond exploration was completed and a summary presented in the last Annual Report (Cooper & Marx, 2004)

During the dry season of 2002 Tawana Resources NL excavated approximately 5000 tonnes of kimberlite and overburden from the Timber Creek 01 Kimberlite (TC01) with the objective to obtain an average grade and price per carat for the diamonds from TC01. This material was screened (first at 40mm with a hydroscreen, and then at 10mm in the DMS trommel) with the minus 10mm material processed through a Dense Media Separation (DMS) plant and the plus 10mm material stockpiled for later crushing and DMS processing. The minus 1mm material was not processed and went straight to the tailings dam. The 1 to 10 mm DMS plant lights were stockpiled.

The DMS heavy mineral concentrate was milled to remove the large amount of barite from the concentrate and then processed on grease tables and Ultra-Sort X-ray machines to recover diamonds. A total of 12844 diamonds weighing 660 carats were recovered (Bailey, 2003).

In February 2004 the program to crush the stockpiled plus 40mm material with a jaw crusher, and then to process this through a DMS plant commenced. All the DMS trommel oversize (plus 10mm) is to be reduced to minus 8mm with a secondary crusher and re-processed through the DMS plant. All the DMS concentrate is to be milled to reduce the amount of barite and iron oxide in the final concentrate. It had been intended to crush and process the stockpiled plus 10mm material during the dry season of 2003 but due to the lack of sufficient water, and availability of suitable crushers at the time, it was delayed until 2004.

The objective of the program is to recover the diamonds from the stockpiled material and add these diamonds to those recovered from the previous processing so that an accurate grade and diamond value for the TC-01 kimberlite can be established.

A trailer mounted 60cm jaw crusher and a 36cm Gyratory secondary crusher were transported to site from Perth. It was decided to crush Batches 3, 6 and 7 only as these were considered from the results of the previous work to be the most representative of the kimberlite, and contained the least country rock material. All the crushed material was feed into the DMS plant comprising of a vibrating automatic feed hopper with 6t capacity, this feeds by a variable speed conveyor belt into a combined scrubber and trommel fitted with 1mm bottom cut screen and 10mm upper cut screen. The 1.5 to 10mm is then pumped into the DMS plant fitted with a 6 inch FeSi cyclone and rated up to 5 tonnes per hour under optimum feed conditions.

#### **4. CURRENT PERIOD EL10358 EXPLORATION**

##### **4.1 Diamond Recovery**

The concentrate from the crushed stockpiles of the bulk sample of TC-01 kimberlite was treated for diamond recovery during the period using the Diatech Method by Diatech Heavy Mineral Services in Perth. This involved further processing including the use of a mini-DMS, then visual examination.

Processing recovered a further 4543 diamonds, weighing 179 carats, from 1121 tonnes of kimberlite. This brings the total diamond recovery from the TC-01 kimberlite to 17,387 diamonds weighing 839 carats from 3802 tonnes, representing an overall grade of 22 carats per hundred tonnes ("cpht"). The deepest section of the pipe sampled, which was at 8 meters below surface, returned a grade of 25 cpht. An increase in grade is evident with an increase in depth from surface, adding to the potential of this small pipe. This grade is based on +1.5mm fraction recovered. The actual diamond grade of the kimberlite is much higher due to the high concentration of small (less than 1.5mm) diamonds.

The diamonds have been processed to remove surface contaminants and will be valued during the first quarter of 2005.



**Figure 2.** Some of the chromites from sample TS04. Largest is 0.5mm across.

##### **4.2 Exploration Heavy Mineral Samples**

In August 2003, a total of eight heavy mineral samples were collected from four of the known Timber Creek kimberlites to enable comparison of their mineral content. Full details of the samples were provided in the last annual report (Cooper & Marx, 2004). All three Timber Creek 01 Kimberlite samples (TS04 to TS06) provided diamonds and lots of chromite, confirming previous

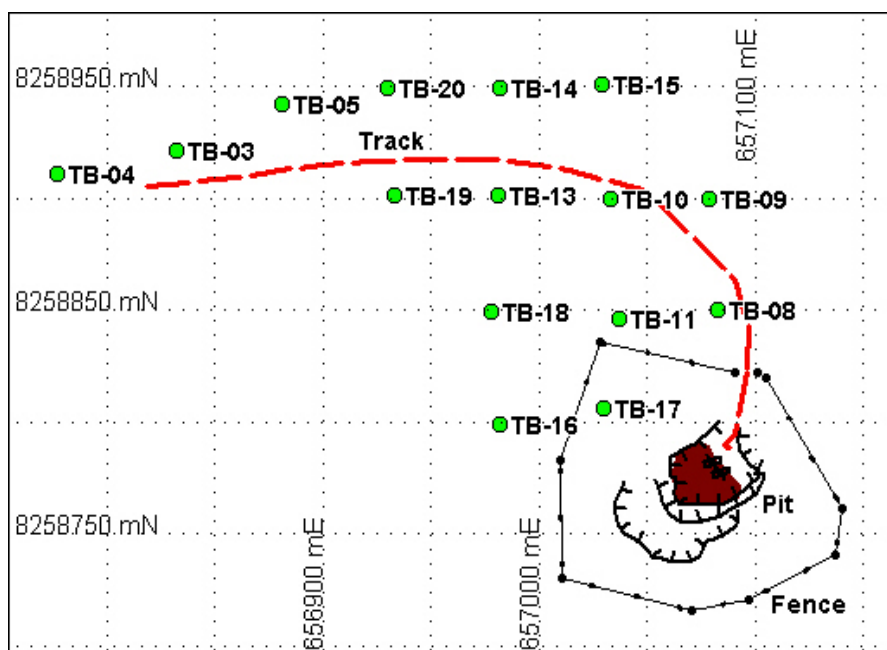
observations by De Beers (Berryman, 1995). The samples from the other three kimberlite areas all provided different amounts of kimberlitic chromite. Sample TS08 from the Timber Creek 04 area also provided one +0.4mm diamond. These mineral counts (detailed in the last Annual report) confirm those provided by Stockdale Prospecting under EL5441 (Berryman, 1995).

A selection of the indicator grains were mounted and sent to Microbeam Services in Melbourne for standard microprobe analyses. Most grains were chromites (149 grains), but there is a small number of other minerals (14 grain) included as a check on their chemistry. Both core and rim analyses were completed for each chromite grain (total 298 analyses), but core only for the other minerals. All the data is provided in the Appendix One.

### 4.3 Soil Geochemical Survey

Twenty two soil samples (TB-01 to TB-22) were collected around the Timber Creek kimberlites. Most samples were near Timber Creek 01 as shown in Figure 2. All were sent to Australian Laboratory Services in Brisbane for analysis by method code ME-MS63 (Diamond Exploration 25 elements). The elements are Al, Ba, Ca, Ce, Co, Cr, Cs, Fe, Hf, K, La, Mg, Mn, Na, Nb, Ni, P, Rb, Sr, Ti, V, W, Y, Zn, and Zr.

All results are provided in the appendices, together with coordinates (in AMG66 datum) for each site. It appears that only samples very close to the kimberlite show any anomalous values. On areas with transported overburden, no anomalous values were detected. This means any soil geochemical survey will need to have close sample spacing, and is best restricted to the hilly areas.



**Figure 3.** Soil geochemical sites down slope from Timber Creek 01 kimberlite (shown in brown).

#### **4.4 Petrology and Geochemical Samples**

In conjunction with the heavy mineral sampling, a number of small samples (TK-01 to TK-09) for petrology and whole rock geochemistry were also collected. The petrology samples were sent to Sydney for examination by consultant petrologist Dr Jane Barron. Her report is provided in Appendix Three. The geochemical samples were sent to Australian Laboratory Services (ALS) in Brisbane for all major oxide analysis by ME-ICP06, plus the trace elements Co, V, Zn, Ni, Cr, Sc, Lu, Cs, Hf, Ta, Pb, Cu, Ga, Rb, Sr, Ba, Nb, Ta, Y, Zr, U, Th, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, and Yb by ME-MS81, and Li & Sc by ME-MS61. The final Certificate of Analysis report is also provided in the Appendix Four. Note that other samples in the ALS report are not from the Northern Territory.

The samples were from various locations, but all were around known kimberlite sites. Sample TK-07 was collected with heavy mineral sample TS04, and TK-08 with sample TS05. TK-09 was from the Timber Creek 01 pit floor center. Coordinates of the samples are provided in the Appendix Four.

#### **4.5 Employment of members of the local community**

Tawana Resources NL has a policy that whenever possible, it will provide employment opportunities to assist the local Myatt community members. Unfortunately the project activities completed during this reporting period required specialised technical skills unable to be currently supplied by the local community.

### **5. EXPENDITURE SUMMARY**

Listed below is the summary of the costs allocated to EL10358 for the period 1 May 2003 to 30 April 2004 (nearest accounting period).

Geological Salaries	\$ 36,376
Field Costs	\$ 66,159
Title Administration	\$ 38,920
Analyses	\$1 2,367
Crushing	\$305,414
Equipment Hire	\$ 93,578
<b>Total</b>	<b>\$ 552,614</b>

### **6. FUTURE WORK PROGRAM**

The diamonds recovered have been cleaned and will be sent to be valued by an Independent Valuer. This will determine the extent of future work on Timber Creek 01 Kimberlite. A detailed ground gravity program will be completed over the pit area to provide both information on the gravity signal of the kimberlite, and to provide a detailed topographic base map on which to plan further work.

Work will be done on the trace element chemistry of the indicator minerals recovered to fully determine the diamond formation conditions within this area. Also areas which are known to contain unexplained indicator minerals will be covered by detailed soil geochemistry to try to locate their source.

The expenditure of this future work program is estimated to be over \$100,000.

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# Appendix 1

### Timber Creek Third Annual Report Microprobe Data

SAMPLE	Mineral	Location	Mount	Sequence	SiO2	TiO2	Na2O	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	Nb2O5	V2O3	NiO	K2O	ZnO	Fe2O3	H2O	SumOxide
TS01	Chromite	Core	OR150104B	3	0.14	0.55	0.00	8.29	13.84	0.11	12.19	0.02	63.34	0.00	0.20	0.18	0.00	0.09	0.00		98.95
TS01	Chromite	Rim	OR150104B	3	0.07	2.06	0.00	12.67	18.44	0.08	10.25	0.01	53.40	0.01	0.17	0.20	0.00	0.01	0.00		97.37
TS01	Chromite	Core	OR150104B	4	0.03	0.54	0.00	16.55	17.50	0.11	11.11	0.00	51.55	0.00	0.24	0.15	0.00	0.08	0.95		98.82
TS01	Chromite	Rim	OR150104B	4	0.08	0.59	0.02	16.53	17.98	0.16	10.60	0.01	51.28	0.04	0.27	0.21	0.01	0.24	0.52		98.52
TS01	Chromite	Core	OR150104B	5	0.09	0.22	0.00	14.29	14.31	0.13	13.02	0.00	56.78	0.03	0.21	0.18	0.00	0.03	0.37		99.65
TS01	Chromite	Rim	OR150104B	5	0.09	0.25	0.00	14.26	14.54	0.06	11.83	0.00	56.92	0.00	0.31	0.17	0.00	0.02	0.00		98.44
TS01	Chromite	Core	OR150104B	6	0.12	0.22	0.01	8.26	13.10	0.12	13.06	0.01	63.60	0.00	0.23	0.12	0.00	0.13	0.25		99.22
TS01	Chromite	Rim	OR150104B	6	0.11	0.31	0.01	7.97	14.93	0.07	11.78	0.00	62.69	0.03	0.13	0.12	0.01	0.05	0.06		98.28
TS01	Chromite	Core	OR150104B	7	0.07	4.42	0.02	16.43	13.19	0.14	16.44	0.02	40.99	0.00	0.05	0.17	0.01	0.07	8.75		100.77
TS01	Chromite	Rim	OR150104B	7	0.12	2.56	0.00	15.00	14.55	0.15	14.01	0.00	49.67	0.00	0.10	0.07	0.01	0.11	2.00		98.36
TS01	Chromite	Core	OR150104B	8	0.03	0.28	0.00	18.21	12.97	0.14	14.37	0.00	51.44	0.04	0.26	0.09	0.00	0.07	2.12		100.04
TS01	Chromite	Rim	OR150104B	8	0.10	2.86	0.01	11.46	16.03	0.14	12.71	0.03	53.54	0.04	0.02	0.25	0.00	0.05	0.76		97.99
TS01	Chromite	Core	OR150104B	9	0.03	0.11	0.01	17.60	13.23	0.12	13.82	0.00	53.84	0.05	0.18	0.10	0.00	0.13	0.01		99.23
TS01	Chromite	Rim	OR150104B	9	0.09	2.80	0.00	11.03	15.73	0.10	12.79	0.00	53.31	0.07	0.09	0.16	0.00	0.04	0.92		97.14
TS01	Chromite	Core	OR150104B	10	0.00	0.09	0.01	32.74	11.79	0.09	16.38	0.00	37.99	0.00	0.19	0.11	0.00	0.17	0.20		99.77
TS01	Chromite	Rim	OR150104B	10	0.04	0.08	0.01	32.55	11.46	0.09	15.33	0.00	38.34	0.00	0.18	0.13	0.00	0.19	0.00		98.39
TS01	Chromite	Core	OR150104B	11	0.10	4.01	0.01	18.32	12.99	0.17	16.17	0.02	38.08	0.00	0.02	0.14	0.01	0.13	8.81		98.98
TS01	Chromite	Rim	OR150104B	11	0.14	3.65	0.01	18.82	12.75	0.17	16.20	0.03	39.33	0.00	0.09	0.13	0.00	0.08	7.36		98.78
TS01	Chromite	Core	OR150104B	12	0.46	5.68	0.03	16.37	14.83	0.19	16.28	0.03	35.12	0.01	0.06	0.06	0.00	0.21	11.08		100.41
TS01	Chromite	Rim	OR150104B	12	0.97	4.33	0.03	15.03	13.65	0.26	16.25	0.04	39.90	0.00	0.09	0.12	0.00	0.71	9.42		100.80
TS01	Chromite	Core	OR150104B	13	0.07	0.03	0.00	17.58	13.88	0.09	13.46	0.01	53.79	0.00	0.27	0.14	0.00	0.13	0.16		99.61
TS01	Chromite	Rim	OR150104B	13	0.05	0.14	0.01	17.19	11.29	0.19	15.03	0.00	52.62	0.05	0.25	0.06	0.01	0.12	2.10		99.11
TS01	Chromite	Core	OR150104B	14	0.08	5.68	0.01	14.84	14.45	0.15	15.94	0.00	37.25	0.00	0.06	0.26	0.00	0.18	11.09		99.98
TS01	Chromite	Rim	OR150104B	14	3.36	3.40	0.05	14.65	19.58	0.13	10.79	0.04	43.68	0.03	0.03	0.03	0.15	1.03	0.00		96.93
TS01	Chromite	Core	OR150104B	15	0.23	3.69	0.03	15.64	16.18	0.18	13.19	0.05	44.04	0.09	0.08	0.15	0.00	0.92	4.05		98.51
TS01	Chromite	Rim	OR150104B	15	0.13	2.81	0.00	13.98	15.79	0.17	12.85	0.04	49.45	0.00	0.06	0.03	0.01	0.21	1.21		96.74
TS01	Chromite	Core	OR150104B	16	0.07	0.39	0.02	16.40	14.29	0.14	12.61	0.01	54.07	0.02	0.20	0.16	0.00	0.06	0.00		98.45
TS01	Chromite	Rim	OR150104B	16	0.11	1.56	0.00	12.28	15.16	0.12	12.51	0.00	55.40	0.06	0.26	0.09	0.00	0.07	0.00		97.62
TS01	Chromite	Core	OR150104B	17	0.08	0.28	0.00	17.22	16.72	0.13	11.45	0.03	52.04	0.02	0.26	0.11	0.01	0.01	0.00		98.36
TS01	Chromite	Rim	OR150104B	17	0.08	0.35	0.01	17.33	14.40	0.13	12.97	0.01	52.08	0.01	0.22	0.14	0.00	0.03	0.19		97.95
TS01	Chromite	Core	OR150104B	18	0.02	0.18	0.00	36.97	12.48	0.08	15.58	0.00	32.91	0.00	0.10	0.11	0.00	0.22	0.00		98.63
TS01	Chromite	Rim	OR150104B	18	0.19	3.49	0.02	16.87	17.95	0.25	12.16	0.05	44.30	0.02	0.06	0.08	0.01	0.36	1.87		97.68
TS01	Chromite	Core	OR150104B	19	0.08	0.51	0.01	13.78	16.67	0.11	10.80	0.00	55.46	0.07	0.24	0.12	0.00	0.01	0.00		97.88

### Timber Creek Third Annual Report Microprobe Data

TS01	Chromite	Rim	OR150104B	19	0.08	0.52	0.00	14.06	15.95	0.09	11.49	0.00	55.85	0.00	0.25	0.16	0.00	0.07	0.00		98.52
TS01	Chromite	Core	OR150104B	20	0.12	2.50	0.03	24.64	12.90	0.15	15.93	0.02	38.61	0.05	0.06	0.20	0.01	0.21	3.50		98.93
TS01	Chromite	Rim	OR150104B	20	0.14	2.52	0.00	12.22	15.77	0.14	12.68	0.04	52.73	0.00	0.08	0.09	0.03	0.15	1.03		97.60
TS01	Chromite	Core	OR150104B	21	0.06	0.08	0.00	25.06	13.25	0.10	14.07	0.00	45.42	0.00	0.20	0.17	0.02	0.15	0.00		98.58
TS01	Chromite	Rim	OR150104B	21	0.10	2.52	0.03	14.00	14.57	0.11	13.78	0.00	51.32	0.03	0.03	0.16	0.00	0.10	1.55		98.30
TS01	Chromite	Core	OR150104B	22	0.05	0.31	0.00	23.87	12.95	0.02	14.70	0.00	45.89	0.01	0.25	0.18	0.00	0.16	0.44		98.84
TS01	Chromite	Rim	OR150104B	22	0.13	2.70	0.03	12.44	14.87	0.15	13.46	0.04	52.89	0.04	0.09	0.17	0.02	0.21	1.31		98.53
TS01	Garnet	Core	OR150104B	23	37.31	0.06	0.02	21.33	29.56	1.52	6.55	1.43	0.02	0.08	0.03	0.04	0.00	0.04	2.24		100.21
TS02	Chromite	Core	OR150104B	24	0.10	0.09	0.00	16.64	14.14	0.07	12.98	0.00	54.15	0.02	0.23	0.10	0.00	0.03	0.00		98.54
TS02	Chromite	Rim	OR150104B	24	0.12	2.22	0.02	10.56	15.25	0.02	12.24	0.01	56.38	0.00	0.14	0.20	0.00	0.11	0.00		97.29
TS02	Chromite	Core	OR150104B	25	1.54	3.47	0.06	14.78	18.96	0.24	10.18	0.12	36.41	0.00	0.05	0.18	0.03	1.66	4.47		92.15
TS02	Chromite	Rim	OR150104B	25	0.30	2.71	0.00	13.24	16.18	0.21	12.61	0.04	49.97	0.04	0.07	0.04	0.01	0.00	0.75		96.16
TS02	Chromite	Core	OR150104B	26	0.07	0.60	0.01	20.03	16.52	0.14	12.29	0.00	46.25	0.10	0.25	0.16	0.01	0.00	2.78		99.19
TS02	Chromite	Rim	OR150104B	26	0.37	4.13	0.00	11.10	17.83	0.18	12.26	0.03	47.98	0.00	0.13	0.14	0.00	0.18	2.92		97.24
TS02	Chromite	Core	OR150104B	27	0.06	0.33	0.01	21.74	15.53	0.17	12.77	0.00	45.96	0.00	0.22	0.20	0.00	0.12	1.98		99.09
TS02	Chromite	Rim	OR150104B	27	0.14	2.11	0.00	11.28	15.46	0.15	12.44	0.00	54.60	0.05	0.12	0.20	0.01	0.03	0.01		96.60
TS02	Chromite	Core	OR150104B	28	0.03	0.04	0.02	22.26	12.65	0.13	14.72	0.00	48.26	0.00	0.15	0.07	0.00	0.06	1.27		99.67
TS02	Chromite	Rim	OR150104B	28	0.08	2.50	0.00	14.70	15.10	0.10	13.45	0.00	51.05	0.00	0.08	0.11	0.00	0.10	0.39		97.68
TS02	Chromite	Core	OR150104B	29	0.05	0.17	0.00	27.26	12.70	0.09	13.80	0.02	44.49	0.00	0.18	0.11	0.00	0.11	0.00		98.98
TS02	Chromite	Rim	OR150104B	29	0.17	2.51	0.00	13.75	15.25	0.13	13.17	0.02	51.73	0.00	0.09	0.20	0.03	0.10	0.34		97.49
TS02	Chromite	Core	OR150104B	30	0.07	0.61	0.00	17.59	13.64	0.11	12.17	0.00	53.44	0.03	0.15	0.11	0.00	0.06	0.00		97.96
TS02	Chromite	Rim	OR150104B	30	0.11	1.98	0.02	11.17	14.65	0.05	13.16	0.00	56.26	0.03	0.15	0.10	0.00	0.07	0.05		97.81
TS02	Chromite	Core	OR150104B	31	0.07	0.05	0.01	18.88	13.79	0.22	13.45	0.02	51.11	0.00	0.21	0.16	0.02	0.06	1.07		99.12
TS02	Chromite	Rim	OR150104B	31	0.13	2.17	0.03	11.40	15.29	0.06	12.51	0.01	55.72	0.02	0.10	0.13	0.00	0.12	0.00		97.67
TS02	Chromite	Core	OR150104B	32	0.09	0.05	0.02	26.73	12.08	0.07	14.08	0.01	44.36	0.03	0.21	0.10	0.00	0.01	0.00		97.85
TS02	Chromite	Rim	OR150104B	32	0.07	0.11	0.01	26.93	11.90	0.15	14.39	0.00	45.01	0.00	0.09	0.14	0.00	0.12	0.00		98.91
TS02	Chromite	Core	OR150104B	33	0.16	2.33	0.00	13.68	15.02	0.11	13.50	0.00	53.01	0.05	0.11	0.14	0.00	0.11	0.05		98.26
TS02	Chromite	Rim	OR150104B	33	0.13	2.25	0.00	10.92	15.06	0.10	12.87	0.01	55.63	0.06	0.11	0.12	0.00	0.03	0.00		97.30
TS02	Chromite	Core	OR150104B	34	0.07	0.03	0.00	17.61	12.89	0.10	14.04	0.00	53.22	0.01	0.18	0.19	0.02	0.08	1.05		99.48
TS02	Chromite	Rim	OR150104B	34	0.11	2.53	0.00	9.75	15.68	0.10	12.61	0.01	56.30	0.03	0.10	0.16	0.01	0.12	0.42		97.95
TS02	Chromite	Core	OR150104B	35	0.08	1.24	0.00	14.24	16.02	0.21	12.30	0.00	51.29	0.01	0.32	0.19	0.02	0.11	3.67		99.71
TS02	Chromite	Rim	OR150104B	35	0.06	1.27	0.00	14.91	17.10	0.13	10.45	0.02	52.71	0.00	0.31	0.14	0.01	0.13	0.00		97.26
TS02	Chromite	Core	OR150104B	36	0.07	0.48	0.00	17.91	12.88	0.09	13.13	0.02	53.69	0.00	0.25	0.08	0.01	0.08	0.00		98.70
TS02	Chromite	Rim	OR150104B	36	0.20	2.07	0.00	12.77	15.41	0.16	12.69	0.01	52.01	0.03	0.20	0.15	0.00	0.08	1.12		96.91
TS02	Chromite	Core	OR150104B	37	0.04	0.64	0.00	27.74	12.87	0.10	15.45	0.01	41.89	0.02	0.20	0.22	0.00	0.10	0.27		99.56
TS02	Chromite	Rim	OR150104B	37	0.82	2.71	0.13	11.74	13.54	0.14	12.96	0.49	49.52	0.01	0.18	0.12	0.54	0.14	4.03		97.06
TS02	Chromite	Core	OR150104B	38	0.07	0.91	0.00	17.81	13.71	0.16	12.51	0.00	52.21	0.02	0.26	0.20	0.00	0.00	0.00		97.87
TS02	Chromite	Rim	OR150104B	38	0.13	2.29	0.00	10.02	15.59	0.10	12.00	0.01	56.56	0.02	0.11	0.15	0.00	0.11	0.00		97.09

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TS02	Chromite	Core	OR150104B	39	0.09	0.43	0.01	20.10	16.18	0.16	12.35	0.00	48.22	0.07	0.28	0.11	0.00	0.15	0.95		99.09
TS02	Chromite	Rim	OR150104B	39	0.10	2.45	0.00	9.96	15.61	0.19	12.56	0.01	55.59	0.05	0.01	0.08	0.01	0.08	0.84		97.56
TS02	Chromite	Core	OR150104B	40	0.09	3.58	0.00	12.79	16.73	0.11	12.64	0.01	47.94	0.01	0.06	0.16	0.00	0.07	2.77		96.98
TS02	Chromite	Rim	OR150104B	40	4.01	2.08	0.00	11.54	16.62	0.15	10.07	0.04	47.28	0.00	0.08	0.11	0.03	0.38	0.00		92.40
TS02	Chromite	Core	OR150104B	41	2.78	4.79	0.04	11.15	18.92	0.23	9.92	0.11	40.12	0.06	0.07	0.07	0.10	0.45	0.00		88.83
TS02	Chromite	Rim	OR150104B	41	1.75	2.35	0.01	11.14	17.08	0.17	12.02	0.02	52.62	0.00	0.13	0.12	0.00	0.10	0.00		97.50
TS02	Chromite	Core	OR150104B	42	0.06	0.17	0.00	16.84	13.81	0.12	12.61	0.00	54.94	0.05	0.18	0.13	0.00	0.07	0.00		98.99
TS02	Chromite	Rim	OR150104B	42	1.96	1.97	0.11	10.07	14.44	0.16	11.35	1.65	51.92	0.00	0.09	0.14	0.73	0.01	1.34		95.95
TS02	Chromite	Core	OR150104B	43	0.06	0.37	0.02	17.48	13.25	0.07	12.34	0.00	53.95	0.00	0.21	0.14	0.03	0.13	0.00		98.06
TS02	Chromite	Rim	OR150104B	43	0.32	2.35	0.02	9.65	15.33	0.17	12.12	0.01	56.57	0.00	0.08	0.16	0.05	0.06	0.00		96.89
TS03	Chromite	Core	OR150104B	94	0.05	0.30	0.01	23.96	12.23	0.09	15.30	0.00	45.81	0.00	0.13	0.13	0.00	0.23	1.58		99.82
TS03	Chromite	Rim	OR150104B	94	0.03	0.27	0.01	24.81	13.14	0.04	14.72	0.01	45.88	0.00	0.12	0.14	0.00	0.26	0.10		99.53
TS03	Chromite	Core	OR150104B	95	0.32	0.17	0.04	35.46	13.22	0.12	14.32	0.02	34.18	0.00	0.08	0.13	0.01	0.11	0.00		98.19
TS03	Chromite	Rim	OR150104B	95	1.27	0.15	0.03	36.41	10.35	0.14	14.85	0.05	35.05	0.00	0.11	0.23	0.00	0.19	0.00		98.82
TS03	Chromite	Core	OR150104B	96	0.01	0.09	0.02	31.77	13.25	0.19	15.11	0.00	38.49	0.09	0.15	0.11	0.00	0.12	0.00		99.40
TS03	Chromite	Rim	OR150104B	96	0.04	0.11	0.02	30.88	13.22	0.09	14.44	0.00	39.48	0.06	0.25	0.04	0.01	0.23	0.00		98.86
TS03	Chromite	Core	OR150104B	97	0.10	3.45	0.00	13.68	16.41	0.20	12.88	0.00	47.04	0.02	0.07	0.14	0.00	0.00	2.93		96.91
TS03	Chromite	Rim	OR150104B	97	0.11	2.55	0.01	10.45	18.12	0.24	10.99	0.02	54.81	0.00	0.08	0.11	0.00	0.11	0.11		97.72
TS03	Chromite	Core	OR150104B	98	0.02	0.05	0.02	34.95	11.98	0.17	16.46	0.02	34.46	0.05	0.13	0.10	0.00	0.22	1.52		100.17
TS03	Chromite	Rim	OR150104B	98	0.32	5.68	0.14	12.53	23.46	0.15	6.80	0.02	31.23	0.00	0.06	0.15	0.02	4.41	13.55		98.51
TS03	Chromite	Core	OR150104B	99	0.03	0.19	0.00	21.37	11.83	0.15	13.33	0.00	50.95	0.00	0.14	0.17	0.01	0.04	0.00		98.22
TS03	Chromite	Rim	OR150104B	99	0.05	0.16	0.02	21.25	11.85	0.08	12.67	0.01	51.02	0.07	0.19	0.05	0.00	0.07	0.00		97.50
TS03	Chromite	Core	OR150104B	100	0.01	0.02	0.01	33.75	12.84	0.09	14.17	0.00	37.55	0.00	0.14	0.16	0.00	0.26	0.00		99.01
TS03	Chromite	Rim	OR150104B	100	0.01	0.02	0.00	34.35	12.96	0.09	13.97	0.00	36.83	0.00	0.16	0.20	0.00	0.16	0.00		98.76
TS03	Chromite	Core	OR150104B	101	0.02	0.05	0.02	31.01	11.99	0.09	15.94	0.00	39.26	0.00	0.19	0.15	0.00	0.12	0.51		99.37
TS03	Chromite	Rim	OR150104B	101	0.06	0.04	0.00	30.88	12.41	0.09	14.71	0.00	39.45	0.06	0.19	0.11	0.01	0.03	0.00		98.04
TS03	Chromite	Core	OR150104B	102	0.92	4.39	0.17	9.53	22.11	0.29	6.29	0.08	36.79	0.04	0.05	0.09	0.06	3.23	7.85		91.89
TS03	Chromite	Rim	OR150104B	102	1.79	3.30	0.07	9.80	21.39	0.36	6.09	0.46	35.93	0.06	0.08	0.05	0.15	1.93	3.77		85.21
TS03	Chromite	Core	OR150104B	103	0.03	0.14	0.00	31.92	12.18	0.11	14.68	0.00	38.69	0.02	0.15	0.15	0.01	0.12	0.00		98.22
TS03	Chromite	Rim	OR150104B	103	0.00	0.14	0.00	31.71	12.28	0.10	14.59	0.00	39.22	0.00	0.13	0.11	0.00	0.11	0.00		98.38
TS03	Chromite	Core	OR150104B	104	0.02	0.05	0.00	36.61	12.05	0.09	15.18	0.00	34.43	0.00	0.13	0.08	0.00	0.20	0.00		98.85
TS03	Chromite	Rim	OR150104B	104	0.02	0.03	0.00	36.98	11.83	0.05	15.02	0.01	34.01	0.02	0.08	0.15	0.00	0.27	0.00		98.47
TS03	Chromite	Core	OR150104B	105	0.03	0.17	0.00	24.24	14.48	0.10	12.82	0.00	45.87	0.00	0.27	0.11	0.00	0.02	0.00		98.12
TS03	Chromite	Rim	OR150104B	105	0.11	2.33	0.02	14.84	16.80	0.13	12.15	0.01	50.51	0.00	0.11	0.26	0.00	0.05	0.41		97.73
TS04	Chromite	Core	OR150104B	44	0.13	0.59	0.01	10.32	15.82	0.15	10.04	0.00	60.00	0.03	0.21	0.08	0.00	0.30	0.00		97.68
TS04	Chromite	Rim	OR150104B	44	0.12	0.59	0.03	10.01	19.15	0.17	7.02	0.00	59.21	0.01	0.14	0.21	0.01	0.57	0.00		97.25
TS04	Chromite	Core	OR150104B	45	0.08	0.13	0.02	17.45	14.07	0.14	11.67	0.01	53.99	0.04	0.26	0.10	0.00	0.17	0.00		98.13
TS04	Chromite	Rim	OR150104B	45	0.06	0.13	0.00	17.83	12.46	0.05	9.94	0.00	55.37	0.00	0.24	0.13	0.00	0.12	0.00		96.31

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TS04	Chromite	Core	OR150104B	46	0.06	0.51	0.00	14.08	16.97	0.07	9.98	0.00	54.13	0.00	0.23	0.13	0.00	0.09	0.00		96.26
TS04	Chromite	Rim	OR150104B	46	0.06	0.50	0.02	12.22	17.28	0.12	9.10	0.00	56.53	0.00	0.28	0.13	0.00	0.55	0.00		96.80
TS04	Chromite	Core	OR150104B	47	0.09	0.07	0.01	16.86	15.28	0.11	10.90	0.00	53.63	0.09	0.12	0.14	0.00	0.09	0.00		97.39
TS04	Chromite	Rim	OR150104B	47	0.08	0.05	0.01	13.32	12.28	0.09	6.84	0.00	61.50	0.05	0.18	0.04	0.00	0.22	0.00		94.65
TS04	Chromite	Core	OR150104B	48	0.05	0.11	0.02	19.80	11.72	0.11	11.88	0.00	53.07	0.00	0.18	0.20	0.00	0.06	0.00		97.21
TS04	Chromite	Rim	OR150104B	48	0.09	0.12	0.00	19.78	11.80	0.10	10.80	0.02	52.86	0.00	0.31	0.14	0.00	0.11	0.00		96.11
TS04	Chromite	Core	OR150104B	49	0.07	0.51	0.00	19.80	14.22	0.17	12.27	0.02	50.82	0.00	0.20	0.18	0.00	0.07	0.00		98.33
TS04	Chromite	Rim	OR150104B	49	0.09	2.26	0.03	10.52	17.60	0.21	6.30	0.00	56.30	0.00	0.32	0.19	0.00	0.18	0.00		94.00
TS04	Chromite	Core	OR150104B	50	0.06	0.23	0.00	14.57	16.14	0.09	10.05	0.01	56.41	0.00	0.20	0.17	0.00	0.00	0.00		97.94
TS04	Chromite	Rim	OR150104B	50	0.10	1.26	0.02	12.25	16.33	0.09	5.03	0.01	57.35	0.04	0.31	0.21	0.01	0.00	0.00		93.01
TS04	Chromite	Core	OR150104B	51	0.07	0.00	0.02	16.82	13.97	0.14	11.66	0.01	54.75	0.00	0.15	0.13	0.00	0.04	0.00		97.77
TS04	Chromite	Rim	OR150104B	51	0.06	0.08	0.00	16.81	14.82	0.09	11.39	0.01	54.20	0.00	0.10	0.12	0.00	0.15	0.00		97.83
TS04	Chromite	Core	OR150104B	52	0.06	0.08	0.03	15.33	11.75	0.03	12.31	0.00	58.16	0.00	0.17	0.16	0.00	0.22	0.00		98.33
TS04	Chromite	Rim	OR150104B	52	0.10	0.11	0.02	15.40	11.70	0.07	9.14	0.01	59.01	0.05	0.24	0.18	0.00	0.11	0.00		96.14
TS04	Chromite	Core	OR150104B	53	0.06	0.36	0.00	10.55	15.60	0.09	10.40	0.01	59.91	0.01	0.31	0.12	0.00	0.06	0.00		97.46
TS04	Chromite	Rim	OR150104B	53	0.07	0.35	0.03	11.01	12.51	0.05	7.29	0.00	62.00	0.00	0.28	0.11	0.00	0.47	0.00		94.17
TS04	Chromite	Core	OR150104B	54	0.05	0.01	0.01	17.25	14.10	0.07	11.84	0.01	54.28	0.00	0.21	0.13	0.01	0.10	0.00		98.07
TS04	Chromite	Rim	OR150104B	54	0.09	1.66	0.04	8.24	20.62	0.22	5.62	0.00	57.80	0.01	0.12	0.06	0.00	1.28	0.00		95.78
TS04	Chromite	Core	OR150104B	55	0.06	0.46	0.01	12.11	15.94	0.03	9.57	0.01	58.46	0.04	0.22	0.08	0.00	0.07	0.00		97.05
TS04	Chromite	Rim	OR150104B	55	0.06	0.48	0.08	12.27	11.89	0.08	7.37	0.01	60.04	0.00	0.25	0.18	0.00	2.26	0.00		94.96
TS04	Chromite	Core	OR150104B	56	0.12	0.69	0.00	8.90	14.09	0.13	10.47	0.00	62.14	0.00	0.19	0.17	0.02	0.17	0.00		97.08
TS04	Chromite	Rim	OR150104B	56	0.17	0.74	0.00	9.00	14.21	0.14	6.93	0.02	62.62	0.03	0.11	0.13	0.01	0.14	0.00		94.25
TS04	Chromite	Core	OR150104B	57	0.11	0.36	0.00	16.69	15.27	0.15	10.51	0.00	54.26	0.03	0.15	0.09	0.00	0.12	0.00		97.76
TS04	Chromite	Rim	OR150104B	57	0.05	0.32	0.00	14.74	14.79	0.06	7.18	0.00	57.28	0.00	0.22	0.10	0.00	0.36	0.00		95.10
TS04	Chromite	Core	OR150104B	58	0.05	0.34	0.00	12.37	14.80	0.17	10.68	0.01	58.60	0.00	0.25	0.12	0.01	0.02	0.00		97.42
TS04	Chromite	Rim	OR150104B	58	0.07	0.60	0.03	11.41	15.30	0.07	6.27	0.00	60.16	0.05	0.30	0.17	0.00	0.18	0.00		94.61
TS04	Chromite	Core	OR150104B	59	0.05	0.32	0.00	14.12	15.88	0.20	10.34	0.00	56.23	0.00	0.25	0.15	0.00	0.06	0.00		97.60
TS04	Chromite	Rim	OR150104B	59	0.06	1.73	0.01	10.31	17.25	0.12	4.72	0.01	58.09	0.07	0.17	0.15	0.01	0.03	0.00		92.72
TS04	Chromite	Core	OR150104B	60	0.08	0.06	0.00	18.76	13.70	0.11	12.21	0.01	52.70	0.02	0.24	0.16	0.00	0.04	0.00		98.08
TS04	Chromite	Rim	OR150104B	60	0.05	0.03	0.01	19.09	13.59	0.08	10.50	0.02	52.85	0.00	0.17	0.19	0.00	0.21	0.00		96.80
TS04	Chromite	Core	OR150104B	61	0.06	0.30	0.00	12.31	12.99	0.16	6.84	0.00	61.40	0.00	0.25	0.13	0.00	0.13	0.00		94.57
TS04	Chromite	Rim	OR150104B	61	0.08	0.31	0.00	12.54	12.69	0.12	6.94	0.01	61.01	0.06	0.31	0.06	0.01	0.11	0.00		94.26
TS04	Chromite	Core	OR150104B	62	0.08	0.20	0.07	9.82	16.30	0.16	7.92	0.00	60.68	0.04	0.23	0.10	0.01	1.84	0.00		97.45
TS04	Chromite	Rim	OR150104B	62	0.06	0.18	0.07	9.55	19.11	0.24	6.49	0.00	59.97	0.00	0.23	0.04	0.00	1.36	0.00		97.29
TS04	Chromite	Core	OR150104B	63	0.09	0.28	0.00	15.90	14.52	0.12	10.56	0.01	55.29	0.01	0.23	0.10	0.01	0.06	0.00		97.17
TS04	Chromite	Rim	OR150104B	63	0.10	0.24	0.02	16.53	13.59	0.06	7.18	0.01	56.68	0.00	0.28	0.09	0.00	0.05	0.00		94.83
TS04	Garnet	Core	OR150104B	64	36.65	0.05	0.02	20.93	33.32	0.81	2.92	3.45	0.06	0.02	0.00	0.01	0.00	0.00	1.87		100.13
TS04	Garnet	Core	OR150104B	65	38.14	0.06	0.01	21.74	22.94	0.46	8.15	5.98	0.04	0.06	0.05	0.04	0.01	0.00	2.62		100.30

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TS05	Chromite	Core	OR150104B	67	0.36	1.73	0.00	15.69	19.16	0.11	7.31	0.02	49.56	0.00	0.08	0.26	0.01	0.20	0.00		94.48
TS05	Chromite	Rim	OR150104B	67	0.19	2.19	0.00	14.94	16.32	0.03	11.45	0.01	52.23	0.00	0.18	0.17	0.02	0.17	0.00		97.88
TS05	Chromite	Core	OR150104B	68	0.04	0.32	0.00	17.50	15.98	0.12	10.34	0.00	52.71	0.00	0.20	0.08	0.01	0.10	0.00		97.41
TS05	Chromite	Rim	OR150104B	68	0.07	0.32	0.00	17.71	15.31	0.12	10.93	0.00	52.70	0.00	0.24	0.11	0.00	0.17	0.00		97.69
TS05	Chromite	Core	OR150104B	69	0.16	1.84	0.02	13.72	16.13	0.00	10.40	0.00	54.57	0.00	0.14	0.15	0.00	0.06	0.00		97.20
TS05	Chromite	Rim	OR150104B	69	0.12	1.85	0.00	13.81	15.77	0.01	10.60	0.00	54.24	0.00	0.14	0.18	0.00	0.10	0.00		96.82
TS05	Chromite	Core	OR150104B	70	0.11	1.59	0.00	9.26	15.60	0.17	6.38	0.01	60.72	0.00	0.14	0.16	0.00	0.13	0.00		94.26
TS05	Chromite	Rim	OR150104B	70	0.13	1.61	0.02	9.12	17.65	0.15	7.12	0.00	59.60	0.03	0.18	0.21	0.01	0.25	0.00		96.07
TS05	Chromite	Core	OR150104B	71	0.09	0.24	0.00	18.66	13.99	0.16	11.01	0.01	53.13	0.00	0.29	0.12	0.00	0.02	0.00		97.70
TS05	Chromite	Rim	OR150104B	71	0.07	0.27	0.00	18.24	13.81	0.15	10.89	0.00	51.90	0.04	0.14	0.16	0.00	0.12	0.00		95.80
TS05	Chromite	Core	OR150104B	72	0.05	0.88	0.04	8.37	17.32	0.06	5.55	0.00	60.91	0.08	0.22	0.01	0.02	1.19	0.00		94.70
TS05	Chromite	Rim	OR150104B	72	0.11	2.36	0.01	4.60	23.82	0.11	4.71	0.01	58.57	0.06	0.33	0.13	0.01	0.36	0.00		95.17
TS05	Chromite	Core	OR150104B	73	0.06	0.74	0.02	13.72	16.28	0.07	10.08	0.02	55.38	0.00	0.39	0.14	0.00	0.36	0.00		97.25
TS05	Chromite	Rim	OR150104B	73	0.10	0.55	0.26	10.32	12.71	0.19	6.88	0.01	57.07	0.06	0.22	0.22	0.00	8.50	0.00		97.07
TS05	Chromite	Core	OR150104B	74	0.03	0.47	0.02	15.73	14.50	0.02	11.26	0.00	55.36	0.06	0.25	0.15	0.00	0.11	0.00		97.96
TS05	Chromite	Rim	OR150104B	74	0.05	0.46	0.00	15.78	14.98	0.10	10.58	0.01	55.35	0.00	0.28	0.14	0.00	0.18	0.00		97.90
TS05	Chromite	Core	OR150104B	75	0.03	0.88	0.06	7.85	18.31	0.16	6.95	0.00	60.57	0.01	0.30	0.09	0.00	2.28	0.00		97.49
TS05	Chromite	Rim	OR150104B	75	0.06	0.87	0.27	7.76	13.66	0.21	7.66	0.02	60.03	0.09	0.23	0.13	0.00	6.89	0.00		97.87
TS05	Chromite	Core	OR150104B	76	0.03	0.29	0.02	16.96	13.73	0.08	11.98	0.00	54.62	0.00	0.20	0.10	0.01	0.09	0.00		98.12
TS05	Chromite	Rim	OR150104B	76	0.03	0.33	0.00	16.74	15.22	0.08	10.19	0.01	53.98	0.02	0.28	0.12	0.00	0.17	0.00		97.19
TS05	Chromite	Core	OR150104B	77	0.07	0.34	0.02	14.88	17.48	0.15	9.20	0.00	54.59	0.00	0.29	0.13	0.01	0.14	0.00		97.31
TS05	Chromite	Rim	OR150104B	77	0.10	0.34	0.01	15.08	16.06	0.06	7.40	0.00	55.99	0.00	0.32	0.14	0.00	0.52	0.00		96.02
TS05	Chromite	Core	OR150104B	78	0.03	1.27	0.07	6.51	18.34	0.21	8.91	0.00	61.23	0.00	0.30	0.08	0.01	1.66	0.78		99.40
TS05	Chromite	Rim	OR150104B	78	0.06	1.18	0.12	6.38	17.55	0.14	6.55	0.02	61.46	0.00	0.26	0.09	0.01	3.29	0.00		97.11
TS05	Chromite	Core	OR150104B	79	0.08	0.13	0.00	14.22	15.01	0.14	9.95	0.00	57.23	0.03	0.27	0.13	0.00	0.36	0.00		97.55
TS05	Chromite	Rim	OR150104B	79	0.14	0.13	0.00	14.51	11.66	0.08	7.58	0.00	57.21	0.00	0.19	0.14	0.00	0.19	0.00		91.83
TS05	Chromite	Core	OR150104B	80	0.07	0.39	0.00	15.44	15.34	0.07	10.81	0.00	54.62	0.00	0.23	0.19	0.00	0.07	0.00		97.22
TS05	Chromite	Rim	OR150104B	80	0.09	0.37	0.00	15.33	17.01	0.13	9.00	0.01	55.30	0.00	0.20	0.11	0.00	0.31	0.00		97.86
TS05	Chromite	Core	OR150104B	81	0.08	0.23	0.03	10.63	16.24	0.11	8.44	0.00	60.16	0.05	0.20	0.10	0.00	0.41	0.00		96.68
TS05	Chromite	Rim	OR150104B	81	0.17	0.21	0.02	9.69	12.36	1.19	9.47	0.03	59.99	0.01	0.13	0.10	0.00	0.81	0.00		94.18
TS05	Chromite	Core	OR150104B	82	0.09	0.25	0.02	14.34	17.26	0.11	8.83	0.01	55.47	0.06	0.27	0.13	0.02	0.18	0.00		97.02
TS05	Chromite	Rim	OR150104B	82	0.10	0.23	0.05	14.23	16.21	0.12	9.54	0.00	55.33	0.00	0.30	0.07	0.00	1.22	0.00		97.40
TS05	Chromite	Core	OR150104B	83	0.02	1.12	0.30	7.29	13.54	0.19	6.48	0.00	60.57	0.00	0.32	0.12	0.01	7.53	0.00		97.49
TS05	Chromite	Rim	OR150104B	83	0.04	1.15	0.14	7.23	17.05	0.13	6.62	0.00	60.13	0.02	0.25	0.11	0.01	4.13	0.00		97.02
TS05	Chromite	Core	OR150104B	84	0.08	0.14	0.00	16.01	14.40	0.05	7.80	0.00	56.50	0.02	0.26	0.08	0.01	0.13	0.00		95.48
TS05	Chromite	Rim	OR150104B	84	0.07	0.11	0.00	15.99	14.53	0.06	6.82	0.00	56.48	0.01	0.24	0.06	0.00	0.13	0.00		94.52
TS05	Chromite	Core	OR150104B	85	0.07	0.58	0.12	8.97	16.68	0.16	7.66	0.01	59.64	0.00	0.27	0.06	0.01	3.43	0.00		97.67
TS05	Chromite	Rim	OR150104B	85	0.13	0.59	0.01	9.10	14.67	0.21	5.76	0.01	59.75	0.00	0.29	0.14	0.00	0.42	0.00		91.08

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TS05	Chromite	Core	OR150104B	86	0.08	0.15	0.02	15.24	15.00	0.15	7.41	0.01	55.91	0.03	0.21	0.09	0.00	0.63	0.00		94.92
TS05	Chromite	Rim	OR150104B	86	0.04	0.15	0.01	15.11	16.20	0.13	8.75	0.00	56.66	0.11	0.18	0.11	0.01	0.29	0.00		97.75
TS05	Garnet	Core	OR150104B	87	38.25	0.06	0.01	21.99	28.16	0.42	9.01	0.82	0.11	0.02	0.04	0.02	0.00	0.07	2.18		101.15
TS05	Garnet	Core	OR150104B	88	37.67	0.04	0.01	22.07	27.40	0.36	9.02	0.90	0.05	0.02	0.03	0.08	0.00	0.00	3.34		101.00
TS05	Tourmaline	Core	OR150104B	89	27.78	0.24	0.06	14.08	0.00	0.04	25.22	0.34	2.44	0.10	0.03	0.61	0.23	0.01	16.54		87.72
TS05	Mica	Core	OR150104B	89	27.78	0.24	0.06	14.08	14.88	0.04	25.22	0.34	2.44	0.10	0.03	0.61	0.23	0.01		3.68	89.75
TS05	Mica	Core	OR150104B	90	14.23	0.16	0.06	6.67	43.66	0.03	11.83	0.19	1.46	0.04	0.00	0.44	0.22	0.04		2.65	81.67
TS05	Unknown	Core	OR150104B	90	14.23	0.16	0.06	6.67	0.00	0.03	11.83	0.19	1.46	0.04	0.00	0.44	0.22	0.04	48.52		83.88
TS05	Mica	Core	OR150104B	91	32.55	2.65	0.08	13.80	9.73	0.15	20.98	0.48	1.77	0.03	0.00	0.50	0.57	0.00		3.72	87.03
TS05	Tourmaline	Core	OR150104B	91	32.55	2.65	0.08	13.80	0.58	0.15	20.98	0.48	1.77	0.03	0.00	0.50	0.57	0.00	10.17		84.32
TS05	Mica	Core	OR150104B	92	11.36	0.14	0.02	5.20	32.51	0.00	9.42	0.30	1.47	0.07	0.03	0.41	0.12	0.00		2.07	63.13
TS05	Unknown	Core	OR150104B	92	11.36	0.14	0.02	5.20	0.00	0.00	9.42	0.30	1.47	0.07	0.03	0.41	0.12	0.00	36.13		64.68
TS06	Chromite	Core	OR150104B	106	0.10	0.70	0.00	14.69	18.32	0.14	8.89	0.01	54.01	0.09	0.28	0.17	0.00	0.11	0.00		97.49
TS06	Chromite	Rim	OR150104B	106	0.08	0.70	0.02	15.15	16.43	0.05	6.12	0.00	55.16	0.01	0.25	0.04	0.00	0.13	0.00		94.13
TS06	Chromite	Core	OR150104B	107	0.08	0.78	0.00	15.13	15.92	0.05	6.24	0.00	54.17	0.01	0.33	0.16	0.00	0.04	0.00		92.89
TS06	Chromite	Rim	OR150104B	107	0.09	0.71	0.00	12.74	17.29	0.18	6.55	0.00	56.48	0.00	0.20	0.11	0.00	0.34	0.00		94.68
TS06	Chromite	Core	OR150104B	108	0.08	0.54	0.00	17.23	17.40	0.08	9.76	0.01	52.32	0.00	0.23	0.08	0.01	0.07	0.00		97.81
TS06	Chromite	Rim	OR150104B	108	0.05	0.57	0.00	17.33	16.17	0.09	7.92	0.00	53.36	0.01	0.25	0.14	0.00	0.16	0.00		96.03
TS06	Chromite	Core	OR150104B	109	0.10	0.36	0.00	18.35	18.61	0.09	10.22	0.00	48.56	0.05	0.26	0.05	0.00	0.16	0.32		97.14
TS06	Chromite	Rim	OR150104B	109	0.13	0.37	0.00	18.38	17.00	0.11	9.08	0.02	49.24	0.04	0.27	0.14	0.00	0.01	0.00		94.79
TS06	Chromite	Core	OR150104B	110	0.08	0.40	0.00	17.16	18.89	0.06	8.29	0.50	49.23	0.05	0.28	0.07	0.00	0.14	0.00		95.14
TS06	Chromite	Rim	OR150104B	110	0.09	0.43	0.00	16.94	19.92	0.07	7.95	0.44	49.19	0.00	0.24	0.18	0.01	0.18	0.00		95.66
TS06	Chromite	Core	OR150104C	1	0.08	1.47	0.01	6.59	16.24	0.04	4.25	0.02	63.61	0.00	0.26	0.13	0.01	0.53	0.00		93.25
TS06	Chromite	Rim	OR150104C	1	0.04	1.47	0.05	6.30	18.65	0.14	5.18	0.01	61.58	0.08	0.31	0.09	0.00	1.56	0.00		95.44
TS06	Chromite	Core	OR150104C	2	0.07	0.13	0.01	22.74	15.06	0.05	9.63	0.28	47.95	0.00	0.16	0.16	0.00	0.15	0.00		96.40
TS06	Chromite	Rim	OR150104C	2	0.05	0.10	0.00	21.96	16.60	0.12	11.16	0.11	46.46	0.00	0.20	0.15	0.00	0.11	0.00		97.03
TS06	Chromite	Core	OR150104C	3	0.12	0.09	0.01	16.28	11.99	0.10	12.19	0.00	57.01	0.00	0.23	0.15	0.01	0.07	0.00		98.25
TS06	Chromite	Rim	OR150104C	3	0.06	0.05	0.02	16.05	12.32	0.05	8.69	0.01	57.71	0.00	0.18	0.01	0.00	0.54	0.00		95.71
TS06	Chromite	Core	OR150104C	4	0.07	0.40	0.01	13.81	11.95	0.06	6.86	0.01	59.56	0.00	0.32	0.12	0.00	0.27	0.00		93.44
TS06	Chromite	Rim	OR150104C	4	0.09	0.37	0.01	13.49	12.86	0.01	6.81	0.02	60.35	0.04	0.25	0.11	0.01	0.17	0.00		94.61
TS06	Chromite	Core	OR150104C	5	0.06	0.09	0.01	17.55	14.88	0.04	10.70	0.00	53.18	0.00	0.22	0.16	0.00	0.21	0.00		97.09
TS06	Chromite	Rim	OR150104C	5	0.07	0.06	0.02	18.35	12.60	0.04	10.80	0.00	54.78	0.00	0.17	0.13	0.00	0.14	0.00		97.15
TS06	Chromite	Core	OR150104C	6	0.09	0.08	0.01	22.31	12.21	0.01	12.35	0.14	49.38	0.00	0.26	0.10	0.01	0.05	0.00		97.00
TS06	Chromite	Rim	OR150104C	6	0.05	0.06	0.00	22.28	13.31	0.15	12.65	0.28	48.46	0.00	0.20	0.11	0.00	0.10	0.00		97.65
TS06	Chromite	Core	OR150104C	7	0.06	0.33	0.00	21.04	13.46	0.09	12.46	0.12	49.67	0.00	0.19	0.17	0.00	0.01	0.00		97.60
TS06	Chromite	Rim	OR150104C	7	0.06	0.35	0.00	21.05	12.45	0.09	12.54	0.23	49.98	0.07	0.25	0.13	0.00	0.03	0.00		97.23
TS06	Chromite	Core	OR150104C	8	0.05	0.06	0.00	17.81	13.87	0.07	11.96	0.00	53.61	0.06	0.21	0.13	0.00	0.07	0.00		97.89
TS06	Chromite	Rim	OR150104C	8	0.06	0.07	0.03	17.94	13.54	0.11	11.36	0.00	53.60	0.00	0.22	0.08	0.01	0.36	0.00		97.38



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TS06	Chromite	Core	OR150104C	9	0.05	0.08	0.02	18.02	14.22	0.09	11.71	0.05	52.96	0.00	0.17	0.07	0.02	0.12	0.00		97.60
TS06	Chromite	Rim	OR150104C	9	0.09	0.05	0.03	17.71	16.72	0.04	9.81	0.19	52.27	0.00	0.20	0.13	0.01	0.10	0.00		97.37
TS06	Chromite	Core	OR150104C	10	0.05	0.10	0.00	20.49	12.70	0.09	9.12	0.25	51.90	0.02	0.12	0.11	0.00	0.05	0.00		95.00
TS06	Chromite	Rim	OR150104C	10	0.08	0.09	0.02	18.19	15.54	0.11	10.06	0.03	52.38	0.00	0.19	0.09	0.01	0.16	0.00		96.95
TS06	Chromite	Core	OR150104C	11	0.08	0.45	0.03	13.27	19.28	0.10	7.99	0.00	54.65	0.00	0.29	0.11	0.00	0.15	0.00		96.38
TS06	Chromite	Rim	OR150104C	11	0.04	0.34	0.19	11.01	15.15	0.21	7.55	0.00	56.81	0.07	0.21	0.08	0.00	5.48	0.00		97.13
TS06	Chromite	Core	OR150104C	12	0.08	1.34	0.03	14.36	15.70	0.12	8.75	0.01	54.25	0.00	0.26	0.14	0.00	0.61	0.00		95.67
TS06	Chromite	Rim	OR150104C	12	0.06	1.32	0.02	14.48	16.09	0.12	9.99	0.02	54.40	0.09	0.25	0.11	0.00	0.21	0.00		97.16
TS06	Chromite	Core	OR150104C	13	0.07	0.09	0.00	18.78	13.74	0.10	10.32	0.00	52.98	0.04	0.25	0.11	0.01	0.16	0.00		96.65
TS06	Chromite	Rim	OR150104C	13	0.04	0.06	0.01	18.42	14.50	0.10	11.77	0.00	52.35	0.07	0.24	0.12	0.01	0.14	0.00		97.82
TS06	Chromite	Core	OR150104C	14	0.04	1.48	0.00	6.78	15.74	0.05	6.20	0.00	63.37	0.00	0.33	0.11	0.01	0.10	0.00		94.21
TS06	Chromite	Rim	OR150104C	14	0.03	1.43	0.02	6.77	15.78	0.02	4.56	0.00	63.37	0.00	0.35	0.09	0.01	0.22	0.00		92.65
TS06	Chromite	Core	OR150104C	15	0.04	0.21	0.01	16.30	12.96	0.07	11.75	0.02	55.59	0.00	0.33	0.13	0.00	0.15	0.00		97.56
TS06	Chromite	Rim	OR150104C	15	0.06	0.21	0.02	15.65	12.78	0.07	11.71	0.02	56.34	0.00	0.31	0.03	0.00	0.58	0.00		97.77
TS07	Chromite	Core	OR150104C	16	0.49	4.23	0.21	11.26	18.05	0.26	7.78	0.01	38.92	0.02	0.01	0.13	0.00	6.42	8.99		96.78
TS07	Chromite	Rim	OR150104C	16	3.30	3.16	0.21	16.42	19.19	0.18	9.64	0.06	36.13	0.00	0.09	0.07	0.05	5.77	2.03		96.31
TS07	Chromite	Core	OR150104C	17	0.11	0.36	0.02	9.77	15.11	0.13	10.03	0.00	60.79	0.01	0.23	0.15	0.00	0.14	0.00		96.85
TS07	Chromite	Rim	OR150104C	17	0.12	0.38	0.01	10.02	13.97	0.31	6.57	0.03	59.89	0.01	0.16	0.06	0.01	0.15	0.00		91.70
TS07	Chromite	Core	OR150104C	18	1.04	3.77	0.33	11.80	17.73	0.32	5.23	0.08	38.10	0.05	0.06	0.07	0.05	9.49	5.12		93.25
TS07	Chromite	Rim	OR150104C	18	0.41	5.01	0.61	6.04	16.52	0.27	0.67	0.05	33.77	0.03	0.11	0.10	0.03	17.40	15.15		96.14
TS07	Chromite	Core	OR150104C	19	0.16	0.13	0.03	10.61	11.05	0.08	13.45	0.01	61.52	0.00	0.16	0.14	0.00	0.16	0.00		97.51
TS07	Chromite	Rim	OR150104C	19	0.14	0.15	0.00	10.30	10.68	0.11	9.46	0.00	63.12	0.00	0.23	0.05	0.00	0.43	0.00		94.67
TS07	Chromite	Core	OR150104C	20	0.09	0.14	0.00	14.36	12.64	0.12	10.61	0.00	58.02	0.01	0.23	0.18	0.00	0.06	0.00		96.45
TS07	Chromite	Rim	OR150104C	20	0.05	0.14	0.01	14.32	11.98	0.05	9.75	0.02	57.96	0.00	0.31	0.16	0.00	0.27	0.00		95.02
TS07	Chromite	Core	OR150104C	21	0.10	0.09	0.02	16.09	14.02	0.07	12.44	0.00	55.37	0.03	0.21	0.14	0.00	0.15	0.00		98.73
TS07	Chromite	Rim	OR150104C	21	0.11	0.10	0.00	15.99	13.28	0.03	9.33	0.00	55.75	0.02	0.25	0.13	0.00	0.07	0.00		95.05
TS07	Chromite	Core	OR150104C	22	0.12	0.38	0.01	10.37	13.29	0.13	12.21	0.00	61.09	0.04	0.22	0.15	0.02	0.11	0.00		98.15
TS07	Chromite	Rim	OR150104C	22	0.13	0.40	0.03	10.29	12.68	0.11	9.47	0.00	61.84	0.00	0.18	0.12	0.01	0.53	0.00		95.80
TS07	Chromite	Core	OR150104C	23	3.94	3.31	0.08	16.35	19.08	0.23	10.54	0.08	40.51	0.02	0.07	0.16	0.22	2.08	0.00		96.68
TS07	Chromite	Rim	OR150104C	23	9.48	2.85	0.22	16.23	17.60	0.19	6.61	0.15	35.58	0.00	0.07	0.07	0.45	6.00	0.00		95.50
TS07	Chromite	Core	OR150104C	24	0.10	0.07	0.01	15.49	10.99	0.11	13.25	0.02	57.22	0.02	0.21	0.12	0.00	0.02	0.00		97.62
TS07	Chromite	Rim	OR150104C	24	0.10	0.03	0.01	15.23	10.03	0.14	13.90	0.00	57.03	0.04	0.32	0.06	0.00	0.38	0.00		97.26
TS07	Chromite	Core	OR150104C	25	0.06	0.11	0.01	17.40	13.93	0.08	11.60	0.00	54.46	0.01	0.29	0.11	0.00	0.00	0.00		98.06
TS07	Chromite	Rim	OR150104C	25	0.11	0.14	0.01	17.65	12.73	0.08	13.02	0.00	53.78	0.02	0.23	0.07	0.00	0.17	0.00		98.02
TS07	Chromite	Core	OR150104C	26	0.13	2.57	0.01	14.59	15.02	0.15	13.28	0.02	50.31	0.00	0.05	0.18	0.01	0.30	0.82		97.43
TS07	Chromite	Rim	OR150104C	26	0.14	1.88	0.03	14.61	12.69	0.25	13.83	0.03	51.71	0.00	0.14	0.11	0.01	1.09	0.88		97.39
TS07	Chromite	Core	OR150104C	27	0.11	0.15	0.00	10.61	11.68	0.12	12.60	0.01	61.38	0.00	0.20	0.12	0.00	0.23	0.00		97.23
TS07	Chromite	Rim	OR150104C	27	0.11	0.15	0.03	10.34	11.04	0.17	12.73	0.00	61.62	0.01	0.13	0.12	0.01	0.51	0.00		96.98

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TS07	Chromite	Core	OR150104C	28	0.08	0.02	0.00	18.39	11.81	0.08	10.69	0.00	54.83	0.04	0.19	0.10	0.00	0.09	0.00		96.34
TS07	Chromite	Rim	OR150104C	28	0.07	0.04	0.01	17.69	14.27	0.03	11.13	0.01	53.15	0.05	0.28	0.14	0.02	0.19	0.00		97.07
TS07	Chromite	Core	OR150104C	29	0.17	0.46	0.00	10.45	14.61	0.12	11.39	0.02	60.05	0.01	0.19	0.09	0.00	0.00	0.00		97.56
TS07	Chromite	Rim	OR150104C	29	0.13	0.42	0.00	10.87	13.97	0.07	9.41	0.02	61.06	0.00	0.22	0.15	0.00	0.14	0.00		96.47
TS07	Chromite	Core	OR150104C	30	0.24	3.62	0.05	13.77	18.30	0.27	10.63	0.03	44.56	0.00	0.04	0.14	0.01	1.35	3.05		96.08
TS07	Chromite	Rim	OR150104C	30	0.42	2.79	0.04	13.99	17.68	0.25	10.75	0.03	46.84	0.05	0.08	0.07	0.06	0.84	0.59		94.48
TS07	Chromite	Core	OR150104C	31	0.08	0.26	0.01	14.81	14.15	0.02	12.49	0.00	56.31	0.00	0.31	0.14	0.01	0.18	0.00		98.79
TS07	Chromite	Rim	OR150104C	31	0.10	0.25	0.00	15.05	14.07	0.07	11.79	0.00	55.38	0.00	0.22	0.11	0.02	0.10	0.00		97.17
TS07	Chromite	Core	OR150104C	32	4.39	4.20	0.08	9.69	25.09	0.17	6.93	0.13	30.93	0.04	0.09	0.11	0.37	0.92	2.00		85.13
TS07	Chromite	Rim	OR150104C	32	0.12	2.43	0.02	17.08	14.36	0.20	14.05	0.01	46.02	0.00	0.12	0.10	0.01	0.15	3.35		98.03
TS08	Garnet	Core	OR150104C	33	35.66	0.01	0.03	20.74	20.64	19.40	1.11	0.26	0.00	0.10	0.00	0.01	0.00	0.01	1.60		99.55
TS08	Chromite	Core	OR150104C	34	0.25	5.03	0.07	5.85	22.40	0.17	7.90	0.02	50.05	0.05	0.23	0.26	0.00	2.25	3.78		98.32
TS08	Chromite	Rim	OR150104C	34	0.22	5.26	0.12	6.05	23.32	0.24	6.30	0.02	51.47	0.07	0.18	0.25	0.00	2.50	0.00		95.99
TS08	Chromite	Core	OR150104C	35	0.14	2.77	0.12	15.11	16.68	0.12	10.93	0.02	46.13	0.00	0.12	0.08	0.00	2.75	3.74		98.71
TS08	Chromite	Rim	OR150104C	35	0.28	2.08	0.02	10.51	15.34	0.22	12.40	0.00	55.57	0.00	0.02	0.13	0.01	0.18	0.03		96.80
TS08	Chromite	Core	OR150104C	36	0.14	0.17	0.00	8.51	16.20	0.15	10.77	0.02	60.88	0.00	0.18	0.06	0.00	0.07	0.45		97.63
TS08	Chromite	Rim	OR150104C	36	0.14	0.19	0.04	9.31	14.81	0.01	7.27	0.01	63.10	0.01	0.27	0.10	0.00	0.22	0.00		95.47
TS08	Chromite	Core	OR150104C	37	0.32	0.70	0.03	12.55	21.38	0.29	7.12	0.01	46.20	0.00	0.22	0.22	0.00	0.86	6.00		95.91
TS08	Chromite	Rim	OR150104C	37	0.29	0.75	0.00	13.03	18.28	0.12	10.17	0.01	48.89	0.07	0.17	0.28	0.01	0.06	5.24		97.37
TS08	Chromite	Core	OR150104C	38	0.22	1.94	0.01	17.59	12.24	0.10	15.28	0.01	47.11	0.00	0.09	0.15	0.03	0.29	3.22		98.29
TS08	Chromite	Rim	OR150104C	38	0.47	1.96	0.02	10.98	16.31	0.21	11.50	0.01	53.22	0.01	0.13	0.09	0.08	0.24	0.18		95.39
TS08	Chromite	Core	OR150104C	39	8.17	3.05	0.06	15.47	18.35	0.17	11.21	0.06	41.37	0.00	0.04	0.17	1.00	0.66	0.00		99.78
TS08	Chromite	Rim	OR150104C	39	8.20	2.22	0.03	15.00	16.29	0.15	9.99	0.04	40.11	0.09	0.04	0.17	1.53	0.36	0.00		94.21
TS08	Chromite	Core	OR150104C	40	0.05	0.20	0.01	14.76	13.61	0.15	12.31	0.00	56.75	0.01	0.14	0.20	0.01	0.09	0.00		98.29
TS08	Chromite	Rim	OR150104C	40	0.07	0.14	0.01	14.22	14.17	0.20	11.77	0.00	56.84	0.00	0.17	0.10	0.00	0.20	0.00		97.90
TS08	Chromite	Core	OR150104C	41	0.07	0.18	0.00	21.33	14.64	0.16	11.83	0.00	49.57	0.01	0.22	0.17	0.01	0.13	0.00		98.33
TS08	Chromite	Rim	OR150104C	41	0.19	2.03	0.02	10.51	15.03	0.09	11.48	0.02	56.48	0.02	0.07	0.10	0.02	0.09	0.00		96.15
TS08	Chromite	Core	OR150104C	42	0.12	2.28	0.11	12.74	16.34	0.18	10.21	0.04	51.78	0.02	0.09	0.08	0.01	3.12	0.86		97.96
TS08	Chromite	Rim	OR150104C	42	0.13	2.16	0.01	9.89	16.67	0.17	10.74	0.02	56.36	0.04	0.09	0.05	0.01	0.82	0.00		97.14
TS08	Chromite	Core	OR150104C	43	0.08	0.06	0.02	14.94	11.58	0.09	8.62	0.01	59.66	0.06	0.23	0.02	0.00	0.00	0.00		95.36
TS08	Chromite	Rim	OR150104C	43	0.08	0.05	0.03	14.24	14.53	0.03	8.73	0.00	57.90	0.07	0.22	0.08	0.00	0.09	0.00		96.05
TS08	Chromite	Core	OR150104C	44	0.03	0.10	0.02	19.94	11.53	0.06	12.79	0.00	53.67	0.00	0.18	0.04	0.00	0.16	0.00		98.50
TS08	Chromite	Rim	OR150104C	44	0.03	0.08	0.03	20.17	9.76	0.12	14.67	0.00	53.87	0.04	0.14	0.07	0.01	0.06	0.00		99.05
TS08	Chromite	Core	OR150104C	45	0.05	0.12	0.00	14.29	13.61	0.16	12.00	0.01	57.42	0.03	0.21	0.12	0.00	0.08	0.00		98.10
TS08	Chromite	Rim	OR150104C	45	0.12	0.09	0.02	14.92	12.30	0.14	10.31	0.00	58.36	0.13	0.19	0.12	0.00	0.12	0.00		96.81
TS08	Chromite	Core	OR150104C	46	0.10	0.19	0.01	15.54	12.31	0.08	12.00	0.00	57.47	0.00	0.23	0.09	0.00	0.05	0.00		98.08
TS08	Chromite	Rim	OR150104C	46	0.08	0.18	0.00	15.30	12.73	0.07	11.47	0.00	57.67	0.08	0.23	0.02	0.01	0.01	0.00		97.85
TS08	Chromite	Core	OR150104C	47	0.13	0.11	0.02	9.41	15.31	0.15	10.05	0.00	62.41	0.07	0.19	0.17	0.00	0.00	0.00		98.01

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TS08	Chromite	Rim	OR150104C	47	0.14	0.09	0.00	9.12	15.83	0.15	9.43	0.02	61.81	0.04	0.16	0.05	0.01	0.09	0.00		96.95
TS08	Chromite	Core	OR150104C	48	0.45	1.70	0.08	12.55	23.02	0.18	5.86	0.03	46.39	0.00	0.25	0.23	0.02	1.73	2.09		94.59
TS08	Chromite	Rim	OR150104C	48	0.48	1.84	0.00	13.00	19.99	0.07	9.37	0.02	47.53	0.00	0.15	0.18	0.02	0.24	2.41		95.28
TS08	Chromite	Core	OR150104C	49	0.09	0.14	0.01	14.38	13.77	0.14	11.74	0.00	57.83	0.00	0.19	0.11	0.02	0.10	0.00		98.50
TS08	Chromite	Rim	OR150104C	49	0.07	0.11	0.00	14.70	13.47	0.17	10.16	0.00	57.66	0.05	0.20	0.14	0.00	0.22	0.00		96.94
TS08	Chromite	Core	OR150104C	50	0.49	0.52	0.04	18.22	21.73	0.26	7.29	0.02	42.49	0.00	0.15	0.24	0.01	0.37	1.60		93.42
TS08	Chromite	Rim	OR150104C	50	0.51	0.50	0.04	18.12	21.72	0.18	7.54	0.03	41.99	0.00	0.13	0.30	0.01	0.32	3.13		94.52
TS08	Chromite	Core	OR150104C	51	0.09	0.19	0.00	14.92	14.58	0.18	11.56	0.02	56.36	0.00	0.17	0.11	0.00	0.04	0.00		98.24
TS08	Chromite	Rim	OR150104C	51	0.06	0.19	0.04	15.04	10.94	0.39	13.49	0.02	56.97	0.00	0.25	0.16	0.01	0.85	0.00		98.41
TS08	Chromite	Core	OR150104C	52	0.15	0.55	0.00	9.48	16.83	0.14	9.98	0.00	59.86	0.01	0.13	0.01	0.01	0.04	0.00		97.20
TS08	Chromite	Rim	OR150104C	52	0.12	0.57	0.01	10.02	15.98	0.19	7.38	0.02	61.17	0.00	0.16	0.14	0.00	0.04	0.00		95.81
TS08	Chromite	Core	OR150104C	53	2.89	3.34	0.03	18.78	19.02	0.23	13.60	0.02	39.17	0.00	0.01	0.20	0.30	0.62	2.03		100.23
TS08	Chromite	Rim	OR150104C	53	0.09	3.61	0.03	18.74	15.68	0.16	13.57	0.04	38.02	0.00	0.07	0.12	0.00	0.96	7.39		98.49

# Appendix 2

### Timber Creek Third Annual Report Soil Geochemical Data

Sample	Easting	Northing	Al	Ba	Ca	Ce	Co	Cr	Cs	Fe	Hf	K	La	Mg	Mn	Na	Nb	Ni	P	Rb	Sr	Ti	V	W	Y	Zn	Zr
	AMG66	AMG66	%	ppm	%	ppm	ppm	ppm	ppm	%	ppm	%	ppm	%	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
			0.01	0.5	0.01	0.01	0.1	1	0.05	0.01	0.1	0.01	0.5	0.01	5	0.01	0.1	0.2	10	0.1	0.2	0.01	1	0.1	0.1	2	0.5
TB-01	656099	8259079	3.14	342	0.13	42.9	5.5	47	2.98	1.37	3.4	2.07	19.5	0.14	274	0.05	5.7	8.2	128	91.4	21.4	0.16	29	1.3	12.9	18	127
TB-02	656200	8259085	3.2	317	0.13	58.4	6.4	52	3.42	1.7	3.1	1.76	24	0.17	427	0.04	3.9	9.3	139	89.3	23.4	0.13	34	1.2	15.6	21	108
TB-03	656832	8258921	4.38	519	0.2	86.3	16	50	5.45	2.45	3.8	1.82	32.4	0.57	1610	0.04	5.3	20	127	115	26.3	0.15	40	1.7	19.8	27	139
TB-04	656777	8258911	3.96	389	0.15	58.1	8	42	4.92	1.79	4.1	1.89	25.4	0.49	540	0.04	5.3	11.8	132	115	24.4	0.15	30	1.6	18.5	27	148
TB-05	656881	8258942	4.64	390	0.2	65.9	8.1	51	6.03	2.1	4.4	1.91	31	0.58	479	0.04	6.3	15.5	149	127	26.1	0.18	39	2	21.5	23	156
TB-06	656624	8259076	3.68	313	0.08	43.8	5.9	48	3.91	1.67	4.1	1.39	21.1	0.23	211	0.04	5.8	11.7	125	75.4	26.1	0.16	31	1.6	14.3	12	152
TB-07	656609	8259102	3.25	292	0.26	52.7	9.4	66	3.38	1.65	3.8	1.62	22.3	0.26	380	0.04	10.6	34.4	181	80.3	30.4	0.18	33	1.4	13.2	13	145
TB-08	657083	8258850	5.98	451	0.21	120	9.6	133	9.1	3.57	6	1.88	56.4	0.53	673	0.04	18.7	65.8	225	212	33.3	0.24	57	6.4	33.9	23	210
TB-09	657079	8258900	3	371	0.12	42.2	5.3	41	3.28	1.22	3.5	1.45	20.3	0.23	477	0.05	6.1	9.6	100	72.5	29.4	0.14	21	1.4	14.2	14	128
TB-10	657033	8258900	3.15	382	0.11	50.2	7	54	3.13	1.58	5.2	1.15	23.6	0.23	722	0.04	10.6	19.7	135	61.7	33.2	0.2	28	1.9	16.6	15	196
TB-11	657037	8258846	3.59	372	0.07	51.2	5.8	34	4.05	1.52	5.5	2.05	24.2	0.28	528	0.05	5.3	10	99	106	29.4	0.15	26	1.6	17.5	16	194
TB-12	656567	8259087	2.78	238	0.1	60.4	10.8	166	2.65	2.03	4.7	1.17	26.1	0.2	455	0.03	24.9	80.1	212	60.6	24.8	0.29	47	2.4	12.9	15	178
TB-13	656981	8258901	3.31	378	0.42	46.7	7.1	54	3.53	1.48	3.5	1.41	23.4	0.33	712	0.04	7.3	16.4	190	77.1	32.7	0.17	29	1.9	15.2	16	127
TB-14	656982	8258949	4.03	409	0.31	47.5	6.2	47	4.83	1.7	4.3	1.36	22.3	0.66	336	0.05	5.9	10	191	82.5	32.6	0.16	30	1.7	16.9	23	156
TB-15	657029	8258951	3.32	367	0.18	42.5	6.3	66	3.88	1.35	4.8	1.37	20	0.47	297	0.04	5.9	11.4	173	71.8	33.2	0.16	22	1.7	15.2	21	180
TB-16	656982	8258799	3.9	433	0.11	54.5	6.7	43	3.97	1.57	5.7	1.36	25.5	0.28	732	0.05	6.6	11.5	155	73.4	36.4	0.18	30	1.9	18.8	20	207
TB-17	657030	8258806	3.73	397	0.23	45	6.1	50	3.97	1.69	4.7	1.39	21.4	0.52	520	0.05	7.9	15.7	195	74	36.6	0.18	28	1.9	15.1	19	173
TB-18	656978	8258849	4.34	320	0.43	57	7.2	47	5.78	1.8	5.3	2.16	27.6	0.63	359	0.04	5.8	12.4	189	154	31.4	0.16	34	1.8	19.7	19	188
TB-19	656933	8258901	2.91	338	0.13	45.3	6.1	41	3.19	1.27	4	1.16	22.7	0.18	460	0.04	6.3	10	119	62.4	30.8	0.16	25	1.6	15.7	12	140
TB-20	656930	8258949	3.47	369	0.18	49.1	6.6	41	4.42	1.47	3.8	1.42	23.2	0.46	477	0.04	4.8	10.5	135	88.2	28.9	0.13	25	1.4	17.3	19	133
TB-21	658388	8259060	3.22	230	0.06	43.7	5.4	57	3.44	2.63	3.1	1.25	16.5	0.17	216	0.03	3.9	9.6	105	76.3	26.2	0.13	45	1.6	12.4	16	111
TB-22	658547	8259001	3.54	302	0.08	54.5	5.5	47	4.17	2.18	4	1.31	24	0.2	198	0.04	5.9	8.8	104	76.6	33.8	0.17	42	1.7	16.9	13	141

# CERTIFICATE OF ANALYSIS



## ALS Chemex

**Batch:** ST38962  
**Sub Batch:** 0

**CONTACT:** MR STEVEN COOPER  
**CLIENT:** OROGENIC EXPLORATION PTY LTD  
**ADDRESS:**  
5 GLENGARRY AVENUE  
BURWOOD VIC 3125

**LABORATORY:** BRISBANE  
**DATE RECEIVED:** 25/08/2003  
**DATE COMPLETED:** 15/09/2003  
**SAMPLE TYPE:** SOIL  
**No. of SAMPLES:** 22

**ORDER No.:** OR080302

**PROJECT:**

### COMMENTS

### NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.  
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

### ISSUING LABORATORY: BRISBANE

**Address**

32 Shand Street  
Stafford QLD 4053  
Australia

**Phone:** 61-7-3243 7222

**Fax:** 61-7-3243 7254

**Email:** shaun.kenny@alschemex.com

Signatory

**Shaun Kenny**  
Minerals Laboratory Manager

### LABORATORIES

#### AUSTRALIA

Brisbane Orange  
Alice Springs Perth  
Cloncurry Townsville  
Kalgoorlie

#### NORTH AMERICA

Vancouver Fairbanks Thunder Bay  
Chihuahua Guadalajara Toronto  
Elko Reno

#### SOUTH AMERICA

Santiago Calama  
Antofagasta Copiapo  
Arequipa Lima

#### AFRICA

Mendoza  
Quito

Mwanza

**Batch:** ST38962  
**Sub Batch:** 0  
**Date of Issue:** 15/09/2003  
**Client:** OROGENIC EXPLORATION PTY LTD  
**Client Reference:**

# CERTIFICATE OF ANALYSIS



SAMPLE	Element	Al	Ba	Ca	Ce	Co	Cr	Cs	Fe	Hf	K	La	Mg
	Unit Method LOR	% ME-MS63 0.01	ppm ME-MS63 0.5	% ME-MS63 0.01	ppm ME-MS63 0.01	ppm ME-MS63 0.1	ppm ME-MS63 1	ppm ME-MS63 0.05	% ME-MS63 0.01	ppm ME-MS63 0.1	% ME-MS63 0.01	ppm ME-MS63 0.5	% ME-MS63 0.01
TB-01		3.14	342	0.13	42.9	5.5	47	2.98	1.37	3.4	2.07	19.5	0.14
TB-02		3.20	317	0.13	58.4	6.4	52	3.42	1.70	3.1	1.76	24.0	0.17
TB-03		4.38	519	0.20	86.3	16.0	50	5.45	2.45	3.8	1.82	32.4	0.57
TB-04		3.96	389	0.15	58.1	8.0	42	4.92	1.79	4.1	1.89	25.4	0.49
TB-05		4.64	390	0.20	65.9	8.1	51	6.03	2.10	4.4	1.91	31.0	0.58
TB-06		3.68	313	0.08	43.8	5.9	48	3.91	1.67	4.1	1.39	21.1	0.23
TB-07		3.25	292	0.26	52.7	9.4	66	3.38	1.65	3.8	1.62	22.3	0.26
TB-08		5.98	451	0.21	120	9.6	133	9.10	3.57	6.0	1.88	56.4	0.53
TB-09		3.00	371	0.12	42.2	5.3	41	3.28	1.22	3.5	1.45	20.3	0.23
TB-10		3.15	382	0.11	50.2	7.0	54	3.13	1.58	5.2	1.15	23.6	0.23
TB-11		3.59	372	0.07	51.2	5.8	34	4.05	1.52	5.5	2.05	24.2	0.28
TB-12		2.78	238	0.10	60.4	10.8	166	2.65	2.03	4.7	1.17	26.1	0.20
TB-13		3.31	378	0.42	46.7	7.1	54	3.53	1.48	3.5	1.41	23.4	0.33
TB-14		4.03	409	0.31	47.5	6.2	47	4.83	1.70	4.3	1.36	22.3	0.66
TB-15		3.32	367	0.18	42.5	6.3	66	3.88	1.35	4.8	1.37	20.0	0.47
TB-16		3.90	433	0.11	54.5	6.7	43	3.97	1.57	5.7	1.36	25.5	0.28
TB-17		3.73	397	0.23	45.0	6.1	50	3.97	1.69	4.7	1.39	21.4	0.52
TB-18		4.34	320	0.43	57.0	7.2	47	5.78	1.80	5.3	2.16	27.6	0.63
TB-19		2.91	338	0.13	45.3	6.1	41	3.19	1.27	4.0	1.16	22.7	0.18
TB-20		3.47	369	0.18	49.1	6.6	41	4.42	1.47	3.8	1.42	23.2	0.46
TB-21		3.22	230	0.06	43.7	5.4	57	3.44	2.63	3.1	1.25	16.5	0.17
TB-22		3.54	302	0.08	54.5	5.5	47	4.17	2.18	4.0	1.31	24.0	0.20

**Batch:** ST38962  
**Sub Batch:** 0  
**Date of Issue:** 15/09/2003  
**Client:** OROGENIC EXPLORATION PTY LTD  
**Client Reference:**

# CERTIFICATE OF ANALYSIS



SAMPLE	Element	Mn	Na	Nb	Ni	P	Rb	Sr	Ti	V	W	Y	Zn
	Unit Method LOR	ppm ME-MS63 5	% ME-MS63 0.01	ppm ME-MS63 0.1	ppm ME-MS63 0.2	ppm ME-MS63 10	ppm ME-MS63 0.1	ppm ME-MS63 0.2	% ME-MS63 0.01	ppm ME-MS63 1	ppm ME-MS63 0.1	ppm ME-MS63 0.1	ppm ME-MS63 2
TB-01		274	0.05	5.7	8.2	128	91.4	21.4	0.16	29	1.3	12.9	18
TB-02		427	0.04	3.9	9.3	139	89.3	23.4	0.13	34	1.2	15.6	21
TB-03		1610	0.04	5.3	20.0	127	115	26.3	0.15	40	1.7	19.8	27
TB-04		540	0.04	5.3	11.8	132	115	24.4	0.15	30	1.6	18.5	27
TB-05		479	0.04	6.3	15.5	149	127	26.1	0.18	39	2.0	21.5	23
TB-06		211	0.04	5.8	11.7	125	75.4	26.1	0.16	31	1.6	14.3	12
TB-07		380	0.04	10.6	34.4	181	80.3	30.4	0.18	33	1.4	13.2	13
TB-08		673	0.04	18.7	65.8	225	212	33.3	0.24	57	6.4	33.9	23
TB-09		477	0.05	6.1	9.6	100	72.5	29.4	0.14	21	1.4	14.2	14
TB-10		722	0.04	10.6	19.7	135	61.7	33.2	0.20	28	1.9	16.6	15
TB-11		528	0.05	5.3	10.0	99	106	29.4	0.15	26	1.6	17.5	16
TB-12		455	0.03	24.9	80.1	212	60.6	24.8	0.29	47	2.4	12.9	15
TB-13		712	0.04	7.3	16.4	190	77.1	32.7	0.17	29	1.9	15.2	16
TB-14		336	0.05	5.9	10.0	191	82.5	32.6	0.16	30	1.7	16.9	23
TB-15		297	0.04	5.9	11.4	173	71.8	33.2	0.16	22	1.7	15.2	21
TB-16		732	0.05	6.6	11.5	155	73.4	36.4	0.18	30	1.9	18.8	20
TB-17		520	0.05	7.9	15.7	195	74.0	36.6	0.18	28	1.9	15.1	19
TB-18		359	0.04	5.8	12.4	189	154	31.4	0.16	34	1.8	19.7	19
TB-19		460	0.04	6.3	10.0	119	62.4	30.8	0.16	25	1.6	15.7	12
TB-20		477	0.04	4.8	10.5	135	88.2	28.9	0.13	25	1.4	17.3	19
TB-21		216	0.03	3.9	9.6	105	76.3	26.2	0.13	45	1.6	12.4	16
TB-22		198	0.04	5.9	8.8	104	76.6	33.8	0.17	42	1.7	16.9	13



**Batch:** ST38962  
**Sub Batch:** 0  
**Date of Issue:** 15/09/2003  
**Client:** OROGENIC EXPLORATION PTY LTD  
**Client Reference:**

# CERTIFICATE OF ANALYSIS



SAMPLE	Element Unit Method LOR	Zr ppm ME-MS63 0.5											
TB-01		127											
TB-02		108											
TB-03		139											
TB-04		148											
TB-05		156											
TB-06		152											
TB-07		145											
TB-08		210											
TB-09		128											
TB-10		196											
TB-11		194											
TB-12		178											
TB-13		127											
TB-14		156											
TB-15		180											
TB-16		207											
TB-17		173											
TB-18		188											
TB-19		140											
TB-20		133											
TB-21		111											
TB-22		141											

# Appendix 3

**DR B.J. BARRON**

**Petrologist**

ABN: 49 121 890 594

**7 Fairview Avenue**

**ST IVES NSW 2075**

**AUSTRALIA**

**Tel/Fax: (02) 9449.5839**

Our ref: 01/98/1338

Your ref: ORO80306

**Petrological examination of nine samples from Timber Creek.**

Report No: 01/98/1338

For: Orogenic Exploration Pty Ltd

**Dr B.J. Barron**  
**Consulting Petrologist**

Sample No. TK-01

Rock Type Quartz-rich silty and very fine sandy claystone with veinlets and patches of calcite, some of which could fill narrow tension fractures.

Hand Specimen A massive, fine grained, pale grey argillic and sandy sample with some small micaceous grains. The rock chip is partly stained by yellow-brown limonitic oxides along some subparallel wispy discontinuous ?veinlets. The sample shows patchy reaction with cold dilute HCl indicating calcite.

Thin Section This sample is a rather well sorted, fine grained quartz-rich clastic sedimentary rock. It has a mainly open framework texture defined by about 40% of angular crystal detritus with a grain size mainly within the range 0.03 mm (silt size) up to 0.13 mm (fine sand size). An average grain size is about 0.08 mm (very fine sand size). This detritus is 'suspended' in an abundant, extremely fine grained argillic rock matrix fraction.

The crystal detritus has the following approximate modal mineralogy: quartz 80%; K-feldspar 10%; plagioclase 5%; muscovite < 5%; and accessory zircon, apatite, tourmaline, rutile and oxides. Also accessory are sparse mafic clasts that are converted to ?chlorite.

Quartz invariably is angular and broken and some grains enclose abundant trails of fluid and dusty solid inclusions. Some K-feldspar grains contain clouds of red-brown hematite dust. Some of these are microcline. Albitised plagioclase cleavage fragments are partly clouded by wispy 'sericite'. Sparse muscovite flakes are unoriented and colourless. Detrital tourmaline mainly is olive green with rare blue grains.

The exceptionally fine grained rock matrix fraction is dominated by low birefringent clay (most likely kaolinite). Also present is moderately abundant wispy ?'sericite' and sparse, extremely fine granular patches of zeolite. The latter are also stained by red-brown hematite dust. Small disseminated granules of hematite once could have been sulphides.

This sample contains discontinuous veinlets and patches of calcite (see reaction with cold dilute HCl). This phase is commonly intergrown with patches of fine granular hematite- stained zeolite. Also present are rims of limonitic oxide dust outlining patches of carbonate. The elongate patches of carbonate are subparallel, and discontinuous branching calcite veinlets appear to fill a series of narrow tension fractures, possibly due to dewatering.

This sample may be identified as a quartz-rich silty and very fine sandy claystone with veinlets and patches of calcite, some of which could fill narrow tension fractures.

Sample No. TK-02

Rock Type Deposit of calcrete that contains a variety of exceptionally altered and oxidised (weathered) lithic and crystal fragments, some of which may be derived from fine grained ?ultramafic igneous material.

Hand Specimen A fine grained, pale brown weakly hematite stained sample that contains moderately abundant, equally fine grained lithic clasts and/or fragments that are mainly less than 4 mm across. The sample reacts with cold dilute HCl indicating abundant calcite.

Thin Section This sample comprises abundant, exceptionally fine grained carbonate (calcite) in which is 'suspended' angular and irregular shaped lithic fragments and fewer crystal fragments. The unsorted lithic fragments account for about 25% of the relevant section area and have a variable size from less than 0.4 mm up to more than 6 mm across.

A variety of lithic fragments is represented. Most abundant are fragments that are now converted to pale yellow-brown fine grained oxidised ?chlorite (and/or serpentine minerals) that lack clear relict textural features. Nevertheless, some of these enclose irregularly disseminated sphene-leucoxene altered

granules and other granules that are converted to red-brown limonitic oxides. These once could have been fine grained volcanic material. These fragments or clasts rarely enclose quite large patches (up to about 4 mm across) that could represent previous large crystal sites that are now converted to granular quartz  $\pm$  carbonate, 'sericite' and hematite. These once could have comprised a mafic phase (???olivine). Other fragments are granular aggregates of secondary quartz enclosing abundant dusty carbonate. This lithic type is cut by a granular quartz vein, also containing abundant dusty carbonate. There is no textural indication of the protolith in this fragment. Still other fragments comprise weakly foliated, very fine grained moderately birefringent layer silicates.

Sparse fine grained angular crystal fragments account for less than 5% of the present section area. Angular chips of quartz predominate and also present are ?oxidised chlorite-altered (mafic) crystal sites, hematite-altered crystal sites and rare carbonated ?organic material (a section through a possible bivalve shell that is only 0.15 mm across).

This sample contains sparse voids or vughs that are coated with water-clear carbonate that lacks the pale brown clouding of ubiquitous carbonate in the host rock. Similar carbonate veinlets and patches are present.

This sample may be described as a deposit of calcrete that contains a variety of exceptionally altered and oxidised (weathered) lithic and crystal fragments, some of which may be derived from fine grained ?ultramafic igneous material.

Sample No.

TK-03

Rock Type

An intensely but partly selectively altered and veined unsorted lithic/(crystal) fragmental breccia most likely of diatrema facies. It contains dominant fragments that retain relict textures of coarsely mafic (?olivine) porphyritic, very fine grained igneous material that once could have contained very abundant groundmass perovskite. The

sample now is converted to assemblages amongst quartz, smectite clay, carbonate and limonitic oxides.

#### Hand Specimen

A fine grained, friable, pale grey sample that contains patches of pale red-brown dusty hematite-staining. Also present are poorly preserved outlines of pale- to mid- grey ?fragments, some of which reach about 3 mm across. The sample reacts strongly with cold dilute HCl indicating abundant calcite.

#### Thin Section

This sample has undergone intense fine grained alteration and veining, and primary mineralogy is not preserved. Nevertheless, partial selective replacement has preserved an unsorted lithic/crystal fragmental relict texture indicating diatreme facies material. Poorly preserved outlines of unsorted volcanic lithic fragments, show that these once could have accounted for at least 65% of the protolith. They have irregular shapes and some reach more than 5 mm across in the present section.

The most distinctive lithic fragments contain outlines of coarse crystal sites (some reach 3 mm across). Some of these retain stout prismatic shapes (up to 3 mm long) that are partly ?magmatically embayed. Other crystal sites retain clear euhedral terminations and once could have comprised ?olivine. These crystal sites now are converted to granular and somewhat fibrous secondary quartz. In some fragments such ?olivine crystal sites account for 40% of the relevant fragment area. They are set in an extremely fine grained ?groundmass fraction that is now converted to wispy pale yellow-green birefringent ?smectite clay that could replace previous chlorite or serpentine minerals. Throughout this fraction are abundant (15% to 20%) of small (granular) oxide crystal sites, most of which are converted to clouded sphene-leucoxene. These once could have been ?perovskite. Also present are sites of opaque to red-brown hematite-altered spinel granules. These oxide granules commonly persist into carbonated domains, suggesting that fine grained primary igneous material formed an abundant protolith. Outlines of some volcanic lithic fragments are marked by abundant dusty hematite that is absent from other lithic fragment sites. Rare lithic fragments now are converted to aggregates of hydrothermal subprismatic quartz that project into voids.

Sparse small crystal fragments are opaque oxides. One fractured opaque oxide fragment that reaches 0.3 mm across most likely is ?chromite. Also present are brown smectite- and hematite- altered mafic crystal sites, and rare small ?zircon crystals in altered lithic fragment sites.

The breccia matrix fraction is heavily carbonated and therefore is poorly defined. The carbonate contains variable proportions of sphene-leucoxene-altered ?perovskite granules indicating abundant very fine grained igneous material in the protolith.

The sample is cut by a network of branching veinlets and clouded carbonate patches that are dominated by calcite (see reaction with cold dilute HCl). Some of these are composite colloform banded carbonate veins with discontinuous central voids. Quartz forms earlier discontinuous veinlets and patches that are less abundant than the carbonate.

This sample may be described as an intensely but partly selectively altered and veined unsorted lithic/(crystal) fragmental breccia most likely of diatreme facies. It contains dominant fragments that retain relict textures of coarsely mafic (?olivine) porphyritic, very fine grained igneous material that once could have contained very abundant groundmass perovskite. The sample now is converted to assemblages amongst quartz, smectite clay, carbonate and limonitic oxides.

Sample No. TK-04

Rock Type Unsorted lithic/crystal fragmental diatreme facies breccia comprising dominant fragments of a mafic-phenocrystic fine grained perovskite-bearing ?ultramafic igneous type. The sample also contains sites of altered mafic crystals and broken sites of ?xenocrystic ?chromite. High- level hydrothermal alteration of the sample is marked by intense quartz- and carbonate- veining with sparse vugs and voids.



Hand Specimen

A fine grained, pale brown limonitic oxide-stained sample that is cut by conspicuous pale grey siliceous patches, some of which enclose voids or vughs into which project small crystals. The sample is also cut by numerous narrow discontinuous pale grey veinlets. The pale brown fine grained fraction reacts strongly with cold with cold dilute HCl indicating abundant calcite.

Thin Section

This sample has undergone intense, partly selective alteration and is cut by conspicuous hydrothermal veins and patches. Nevertheless, there is preserved in some parts of the section, an unsorted lithic/crystal fragmental relict texture dominated by very altered, very fine grained igneous material.

There are poorly preserved outlines of former igneous lithic fragments, but at least some of these are marked by differences in distribution and abundance of ubiquitous oxide granules that are mainly less than 0.05 mm grain size. These are now altered to aggregates of sphene-leucoxene that is stained by hematite dust. The granules (once- ?perovskite) are 'suspended' in a matrix of fine grained secondary carbonate patches and smectite clay that is variously stained by dusty red-brown hematite.

Elsewhere there are preserved subprismatic shaped outlines of once-zoned ?mafic crystal sites, some of which reach 2 mm long. One of these once could have been magmatically corroded and embayed. Elsewhere is a once- mafic crystal site that is subhedral and now marked by almost opaque hematite rims enclosing subradial clusters of hematite. These are now all set in carbonate. This mafic crystal site reaches about 0.15 mm grain size. Also preserved is a broken angular opaque oxide that could comprise chromite. This reaches 0.4 mm grain size. Some large patches of granular and prismatic hydrothermal quartz that reach about 1 cm across, could replace previous coarse crystal sites, possibly of ?olivine macrocrystals. These domains show projection of euhedral terminated quartz into voids. These are partly filled with carbonate.

Elsewhere are patches and veinlets of quartz that are irregular and discontinuous. Still other veins that post-date quartz are carbonate.

Quartz and carbonate most likely post date development of smectite clay that replaces previous ?serpentine minerals ± chlorite.

This sample may be described only tentatively in terms of its primary mineralogy. It could have had a parent of unsorted lithic/crystal fragmental diatreme facies breccia comprising dominant fragments of a mafic-phenocrystic fine grained perovskite-bearing ?ultramafic igneous type. The sample also contains sites of altered mafic crystals and broken sites of ?xenocrystic ?chromite. High level hydrothermal alteration of the sample is marked by intense quartz- and carbonate-veining with sparse vughs and voids.

Sample No. TK-05

Rock Type Fine grained sandy limestone comprising material from two different sources. The fine sandy detrital fraction mainly is derived from a granitic source, whereas the abundant rock matrix mainly is calcite stained by dusty hematite. The sample is cut by abundant subparallel narrow discontinuous carbonate veinlets that lack hematite clouding.

Hand Specimen A fine grained, partly friable red-brown hematite stained sample that shows distinct narrow (< 1 mm across) lensed layers or veins. The sample reacts very strongly with cold dilute HCl indicating abundant calcite.

Thin Section This sample is a fine grained carbonate-rich clastic sediment that incorporates some aggregates of very fine grained clastic sedimentary fragments. The majority of this sample contains a more or less even distribution of mainly angular to irregular detrital grains that account for about 10-15% of the relevant section area. The detritus varies from less than 0.04 mm (silt size) up to about 0.15 mm (fine sand size) with an average grain size of about 0.07 mm (very fine sand size).

This detrital fraction has the following approximate modal mineralogy: quartz 80%; K-feldspar 10%; plagioclase 5%; muscovite < 5%; and accessory apatite, tourmaline, ?amphibole, ?rutile, zircon and oxides.

Quartz occurs as angular chips, some of which are clouded with dusty inclusions. K-feldspar mainly is microcline but rare grains are somewhat graphic inclusions of quartz in K-feldspar indicating a granitic source. Plagioclase cleavage fragments are albite. Also present are sparse unoriented flakes of colourless mica (?muscovite). Accessory grains are clouded apatite, yellow to olive green tourmaline, strongly pleochroic biotite flakes, zircon, ?rutile and oxides.

The recognisable angular detritus is “suspended” in an abundant rock matrix fraction dominated by fine grained calcite that is variously stained with red-brown dusty hematite. Also present are fine grained irregular shaped carbonate-rich patches or fragments that lack the ubiquitous angular detritus. One of these is about 5 mm across and shows poor wavy fine grained layering marked by domains alternately rich and poor in red-brown hematite.

This sample is cut by abundant subparallel narrow branching and discontinuous veinlets of granular calcite. These are generally less than 0.4 mm across and commonly are void centrally. The granular carbonate is clear of the ubiquitous dusty hematite clouding.

This sample may be described as a fine grained sandy limestone comprising material from two different sources. The fine sandy detrital fraction mainly is derived from a granitic source, whereas the abundant rock matrix mainly is calcite stained by dusty hematite. The sample is cut by abundant subparallel narrow discontinuous carbonate veinlets that lack hematite clouding.

<u>Sample No.</u>	TK-06
<u>Rock Type</u>	Weakly grain size- layered, medium/fine grained limy (?dolomitic) sandstone. It is unlikely that this sandstone is reconstituted by explosive introduction of a nearby diatreme.
<u>Hand Specimen</u>	A fine grained, compact pale brown sandy sample with a distinct oxidised red-brown limonitic weathered rind. The sample reacts slowly with cold dilute HCl indicating some calcite. It has a poorly defined grain size layering.

Thin Section

This sample is a rather well sorted quartz-rich clastic sedimentary rock with a distinct grain size layering. In the coarsest layer (more than 1cm thick), the detrital fraction accounts for more than 45% of the relevant section area and grains mainly lie within the size range 0.07 mm (very fine sand size) up to 0.3 mm across (medium sand size). This fraction has an average grain size of about 0.15 mm (fine sand size). Rare grains in this fraction reach 0.55 mm across (coarse sand size).

Detritus in the finer grained fraction accounts for about 35% of the relevant section area and grains vary mainly within the size range 0.05 mm (silt size) up to 0.15 mm (fine sand size) with sparse grains that reach 0.25 mm (upper limit of fine sand size).

The detritus in both the fractions is quite similar comprising some well rounded grains, as well as subrounded to angular grains. The detrital fraction has the following approximate modal mineralogy: quartz 80%; carbonate 10%; K-feldspar 5%; plagioclase 3%; fine grained lithic clasts 2%; and accessory mica flakes, tourmaline, zircon, sphene-altered oxides and rare ?barite.

Quartz grains mainly are angular with subordinate well rounded grains. In the coarse fraction particularly, quartz shows some epitaxial added rims in continuity with the host detrital grains. In some domains epitaxial rims form distinct triple junctions. Grains do not appear to have broken across the epitaxial rims, and therefore the rock most likely is not reconstituted by nearby explosive diatreme intrusion. Detrital carbonate grains are subrounded to quite well rounded and comprise mainly fine grained clouded carbonate. K-feldspar mainly is microcline, and some grains are partly clouded with dusty hematite. Sparse plagioclase cleavage fragments mostly are albite. Rare fine grained lithic clasts comprise cherty quartz and hematite-clouded ?once-glassy acidic volcanic material with some narrow acicular prisms. Accessory small mica flakes mainly are colourless muscovite. Tourmaline comprises grains that are pleochroic dark blue to pale blue and others that are variegated olive green to yellow-brown. Zircon crystals are both subhedral and some broken crystals are present. Also present are rare grains of clouded monazite. This detritus is derived from a granitic source.

The rock matrix fraction invariably is granular carbonate. In the relatively coarse grained layer the carbonate matrix accounts for about 50% to 60%, whereas in the finer grained layer, the detrital fraction is suspended in the rock matrix fraction, where carbonate accounts for about 60% to 70% of this fraction. In the coarser fraction some carbonate is distinctly rhombic and may be dolomite rather than calcite. All carbonate is moderately clouded.

This sample may be described as a weakly grain size layered, medium/fine grained limy (?dolomitic) sandstone. It is unlikely that this sandstone is reconstituted by explosive introduction of a nearby diatreme.

Sample No. TK-07

Rock Type Hydrothermal deposit of quartz and carbonate with accessory small patches of barite and hydrothermal ?apatite, and small relict ?detrital grains of zircon, tourmaline and oxides. Presence of barite and apatite reflect an oxidised fluid containing sulphate and phosphate. Barium indicates association with late fluids from an alkaline igneous source.

Hand Specimen A fine to medium grained, spongy siliceous sample that is mottled pale grey and pale red-brown. The sample is cut by several narrow veinlets that are largely void. The sample reacts very slowly with cold dilute HCl indicating minor calcite.

Thin Section This sample lacks recognisable relict texture and comprises a patchy hydrothermal vein deposit. This deposit has the following approximate modal composition: quartz 65%; carbonate 15%; voids 15%; stained ?smectite clay < 5%; and accessory hydrothermal barite, dusty hematite and small relict zircon crystals.

Quartz forms a dense branching network of weakly colloform banded to subradial grains that mutually impinge to form a granular aggregate. Each mottled equant domain has an average diameter of about 0.3 mm and most quartz grains show strained uneven extinction. The granular quartz encloses

abundant dusty mainly solid inclusions particularly of carbonate. Numerous small fluid inclusions also are present. Some colloform bands and quartz margins are marked by trails of red-brown hematite dust.

Carbonate partly fills voids that are interstitial to the granular quartz. Rare quartz crystals show euhedral terminations into similar voids. At least two generations of carbonate are present. In some voids a coating of fine grained clouded carbonate is adjacent to the host quartz, while more centrally within voids are subradial subprismatic, but very fine grained carbonate crystals and aggregates.

One subradial mottled quartz domain encloses a central core of granular barite that also encloses minute solid and fluid inclusions. The barite patch, which reaches about 0.6 mm across, has a highly irregular boundary against host quartz and is partly replaced by the latter. Also present is an irregular to subhedral patch of hydrothermal apatite that is similarly partly replaced by later hydrothermal quartz.

Some solid inclusions enclosed in this hydrothermal quartz comprise relict heavy detrital grains of yellow-brown to pale yellow pleochroic tourmaline and small rounded zircon grains. These suggest a clastic sedimentary protolith. Elsewhere is a domain of granular quartz that encloses unoriented subprismatic crystals and aggregates of clouded sphene-leucoxene that replaces titanian oxide needles, most of which are less than 0.05 mm long. Still other quartz-rich domains enclose clusters of hematite granules, mainly less than 0.05 mm across, that once could have comprised an oxide or sulphide.

This sample may be identified as a hydrothermal deposit of quartz and carbonate with accessory small patches of barite and hydrothermal apatite, and small relict detrital grains of zircon, tourmaline and oxides. Presence of barite and apatite reflect an oxidised fluid containing sulphate and phosphate. Barium indicates association with late fluids from an alkaline igneous source.

Sample No. TK-08

Rock Type Open-framework breccia that has undergone intense ?hydrothermal silicification with minor development of chlorite and possible sulphide crystal sites. It has undergone intense partly selective oxidation due to near surface weathering,

Hand Specimen A fine grained, strongly oxidised and weathered, somewhat gossanous sample that comprises a spongy intergrown aggregate of pale grey siliceous patches and red-brown limonitic oxides. Red-brown oxides commonly coat abundant voids and partly replace subhedral crystal sites. The sample contains unsorted conspicuous angular pale grey and mid brown-grey ?lithic fragments. The sample lacks calcite since it does not react with cold dilute HCl.

Thin Section This sample is an open framework hydrothermal breccia that has undergone intense silicification ?sulphide mineralisation and intense late oxidation due to near surface weathering.

Sparse recognisable lithic fragments are angular and broken, have an uneven distribution, and vary from less than 1 mm up to about 1 cm across. The lithic fragments account for about 25% of the present section area and altered crystal sites, mainly less than 1.5 mm grain size, account for a further 5% to 7% of the section area. The fragments are set in a spongy matrix of granular fine grained quartz and voids, at least some of which once could have contained sulphides (and/or oxides).

Lithic fragments are intensely altered and virtually no primary mineralogy remains. Some fragments now are aggregates of clouded granular but subradial quartz domains, with an average grain size of about 0.08 mm. This quartz is clouded with dusty solid inclusions (including chlorite) and sphene-leucoxene granules that mark out a poor relict texture of unoriented fine grained prisms. Some small ?apatite prisms remain. Another lithic fragment, that reaches about 5 mm across, is distinctly foliated oxidised chlorite/smectite-bearing ?schist that contains abundant small sphene-leucoxene granules. This lithic type also contains partly void sites of

euohedral ?pyrite crystals and clusters, some of which reach 0.5 mm across. These are largely void centrally and coated with translucent red-brown limonitic oxides  $\pm$  goethite. This lithic type also contains small patches of secondary quartz. Still other lithic fragments also are weakly foliated, very fine grained, intergrown low birefringent clay and smectite clay that is clouded with dusty oxide inclusions.

Very poorly preserved are outlines of subhedral crystal sites, most of which are partly void and partly converted to granular quartz, limonitic oxides  $\pm$  smectite clay.

The abundant rock matrix fraction comprises about 60% of granular secondary quartz forming subradial domains with mottled extinction. These have strongly sutured mutual grain boundaries. The granular quartz mat encloses abundant inclusions of sphene-leucoxene granules and small dusty opaque oxides. Also present are patches of yellow-green partly oxidised chlorite/smectite and translucent red-brown hematite dust. Sparse small prisms that once could have been rutile are now clouded sphene-leucoxene. The abundant quartz-rich domains enclose about 40% of partial voids, some of which clearly once contained subhedral ?pyrite crystals and clusters now partly converted to near opaque to translucent red-brown hematite. At least some voids that are partly coated with limonitic oxides once could have contained an iron-bearing carbonate.

This sample may be described as an open-framework breccia that has undergone intense ?hydrothermal silicification with minor development of chlorite and possible sulphide crystal sites. It has undergone intense partly selective oxidation due to near surface weathering.

Sample No.

TK-09

Rock Type

Intensely but selectively altered, unsorted volcanic (diatreme) breccia with a closed framework texture. It contains abundant completely altered sites of angular lithic fragments and some sites of possible ?olivine xenocrysts. The altered volcanic material overwhelmingly is



microporphyritic and fine grained. It once could have contained abundant ?olivine  $\pm$  ?leucite.

Hand Specimen A fine grained, mid brown partly oxide-stained sample with a distinct greasy feel. The sample contains poor outlines of unoriented lithic  $\pm$  crystal fragments that are pale grey and mottled dark grey.

Thin Section In spite of intense alteration and weathering, the distribution of secondary phases is selective, and clear recognisable relict textures are of an unsorted lithic/crystal fragmental volcanic (diatreme) breccia.

The sample clearly comprises an aggregate of unsorted volcanic lithic fragments and sparse angular xenoliths that vary mainly within the size range 1 mm up to more than 5 mm across in the present section. Volcanic lithic fragments have irregular and deformed boundaries, possibly partly due to hot plastic emplacement, as well as intense alteration to layer silicates. Most of the volcanic lithic fragments retain clear microporphyritic and microlitic relict textures defined by about 35% to 40% of subhedral microphenocryst sites with an average grain size of about 0.06 mm. At least some of these have six-sided cross sections and concentric small dusty inclusions, and once could have been ??leucite. They are now converted to fine grained, moderately birefringent, partly oxidised birefringent layer silicates. Also present are sites that are subprismatic and once could have been pyroxene, while elsewhere are sites that almost certainly once contained olivine. All of these now comprise ??talc and rarely exceed 0.1 mm grain size.

The abundant microphenocryst sites are set throughout a matrix/groundmass also containing abundant degraded ?talc that is clouded by dusty red-brown translucent hematite. Abundant sites of titanian oxide granules (?once perovskite) now are converted to clouded sphene-leucoxene. Sparse coarser grained crystal sites, mainly from 0.3 mm up to 1.3 mm once could have comprised both pyroxene and olivine. These are now converted to aggregates of ?talc, chlorite, sphene-leucoxene granules and dusty hematite. Some altered crystal sites still retain relict textures of reaction coronas, in site of the ubiquitous alteration.

Elsewhere are volcanic lithic fragments that are distinctly texturally different. These contain about 40% of crowded stout prismatic shaped crystal sites (mainly about 0.1 mm grain size) that are converted to almost monomineralic ?talc. These almost certainly once were olivine. The unoriented microphenocrysts, together with the sparse oxide microphenocrysts are set throughout a very fine grained groundmass fraction that is now also altered to clouded ?talc, patchy limonitic oxide dust, sphene-leucoxene granules and fine grained opaque spinels (degraded ?magnetite).

Some relatively coarse grained lithic and ?crystal fragments are enclosed within rims of microporphyritic volcanic material. Some of the lithic fragments are crustal- derived since they retain weakly foliated compositionally layered relict textures of fine grained metasedimentary origin. Other large fragments are intensely altered to fine grained clouded ?talc, and retain angular broken shapes. These once could have been ?olivine ?xenocrysts. Other angular fragments are converted to weakly foliated, almost colourless low birefringent clay. These contain wispy oriented mica flakes, some of which are biotite. Other xenocrysts are opaque oxides (most likely chromite) many of which are converted to hematite. One rounded resorbed ?xenocryst site now is converted to exceptionally fine grained pale green ?talc  $\pm$  chlorite, but this encloses subradial wispy ?reaction needles of previous titanian oxides now converted to sphene-leucoxene.

This sample may be identified as an intensely but selectively altered, unsorted volcanic (diatreme) breccia with a closed framework texture. It contains abundant completely altered sites of angular lithic fragments and some sites of possible ?olivine xenocrysts. The altered volcanic material overwhelmingly is microporphyritic and fine grained. It once could have contained abundant ?olivine  $\pm$  ?leucite.

# Appendix 4

**Timber Creek Third Annual Report Whole Rock Geochemical Data**

Sample	Easting (AMG66)	Northing (AMG66)	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO	BaO	LOI	Co	V	
			%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm
			ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-ICP06	ME-MS81	ME-MS81
			0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.5	5
TK-01	657084	8258753	72.2	8.5	3.4	2.93	3.97	0.05	2.64	0.01	0.34	0.05	0.06	0.01	0.03	5.82	15.7	32	
TK-02	657100	8258770	14.3	3.3	4.91	23.76	16.33	0.03	0.32	0.08	0.89	0.13	0.6	0.01	0.19	35.09	19	45	
TK-03	657104	8258770	40.3	4.77	2.78	21.11	5.78	0.02	1.35	0.17	1.18	0.06	1.1	0.01	0.04	21.28	28.8	82	
TK-04	657089	8258765	68.0	3.84	3.72	8.87	4.34	0.02	0.1	0.15	1.04	0.02	0.88	<0.01	0.01	8.96	59	30	
TK-05	656611	8259103	30.8	3.46	1.37	26.48	7.59	0.12	1.54	0.01	0.18	0.02	0.03	<0.01	0.02	28.36	5.3	15	
TK-06	656633	8259075	76.1	4.33	1.45	3.99	4.17	0.06	2.39	0.01	0.16	0.03	0.04	<0.01	0.09	7.12	5.4	19	
TK-07	657068	8258764	66.0	6.96	7.43	3.68	5.66	0.04	0.61	0.15	1.36	0.03	1.36	<0.01	0.06	6.55	32.3	72	
TK-08	657068	8258763	64.6	5.99	13.25	2.58	3.84	0.02	1.06	0.17	1.86	0.51	1.54	0.01	0.15	4.32	26.4	128	
TK-09	657077	8258768	21.6	9.67	38.04	5.8	8.79	0.06	1.95	0.3	1.9	0.09	1.77	0.01	0.14	9.71	43.8	172	
			Zn	Ni	Cr	Lu	Cs	Hf	Ta	Pb	Cu	Ga	Rb	Sr	Ba	Nb	Y	Zr	
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
			ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	
			5	5	10	0.1	0.1	1	0.5	5	5	1	0.2	0.1	0.5	1	0.5	0.5	
TK-01	657084	8258753	30	234	38	0.3	4.8	6	1	<5	7	14	138	58.8	314	10	14.3	202	
TK-02	657100	8258770	58	402	575	0.5	2.8	7	5.1	<5	10	7	21.9	137	1860	112	37.5	266	
TK-03	657104	8258770	27	365	1080	0.5	2.2	10	7.1	6	10	11	96.2	70.5	402	170	44.9	393	
TK-04	657089	8258765	57	1220	988	0.4	0.5	9	6.1	<5	24	14	6.7	35.9	90.3	150	37.8	321	
TK-05	656611	8259103	14	29	19	0.2	1.7	4	<0.5	<5	<5	8	58.4	34.6	204	5	8.9	139	
TK-06	656633	8259075	13	13	41	0.2	1.8	6	<0.5	6	<5	9	89.3	26.3	849	5	12.9	202	
TK-07	657068	8258764	74	534	1050	0.6	2.4	11	7.7	<5	9	12	36.1	48.6	572	177	45.7	431	
TK-08	657068	8258763	52	471	1140	0.8	2.8	15	10.9	8	12	13	67	62.9	1350	246	70.3	571	
TK-09	657077	8258768	55	968	1930	0.5	3.9	15	10.7	17	6	22	122	94	1280	276	58.2	556	
			U	Th	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Er	Ho	Yb	Li	Sc	
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
			ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS81	ME-MS61	ME-MS61	
			0.5	1	0.5	0.5	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.01	
TK-01	657084	8258753	1.7	13	66.3	105	9.8	32.2	3.9	0.6	2.9	0.4	2.4	1.4	0.5	1.8	37.2	4.37	
TK-02	657100	8258770	4.9	17	21.3	44.1	5.8	25.5	6.2	1.8	6.3	1	6.4	2.9	1.2	3.1	22.3	13.5	
TK-03	657104	8258770	5.2	21	89.8	187	21.9	81.3	13.2	3	10.7	1.5	8.5	3.9	1.7	3.6	34.2	18.5	
TK-04	657089	8258765	4.6	16	126	245	25.4	91.7	12.5	2.7	9.9	1.3	6.6	3.2	1.3	3	92.2	13.2	
TK-05	656611	8259103	1.3	7	13.7	24	2.8	10.6	2	0.3	1.7	0.3	1.6	0.9	0.3	1.2	21.1	2.6	
TK-06	656633	8259075	2.2	8	13.4	25.2	2.9	11.1	2.3	0.5	2	0.4	2.2	1.1	0.4	1.3	32.4	2.64	
TK-07	657068	8258764	5.5	22	46.6	103	12.9	54.4	10.5	2.7	9.2	1.3	8	3.8	1.6	3.6	55.7	16.2	
TK-08	657068	8258763	6.8	23	99.8	195	23	86	16	4.2	15	2.2	12.9	5.7	2.5	5.5	40.8	31.7	
TK-09	657077	8258768	7.2	31	259	525	60.5	220	34.1	6.8	23.7	2.4	11.6	4.8	2	3.9	45	31.9	

# CERTIFICATE OF ANALYSIS



## ALS Chemex

**Batch:** ST38976  
**Sub Batch:** 0

**CONTACT:** MR STEVE COOPER  
**CLIENT:** OROGENIC EXPLORATION PTY LTD  
**ADDRESS:**  
5 GLENGARRY AVENUE  
BURWOOD VIC 3125

**LABORATORY:** BRISBANE  
**DATE RECEIVED:** 01/09/2003  
**DATE COMPLETED:** 27/10/2003  
**SAMPLE TYPE:** ROCK  
**No. of SAMPLES:** 20

**ORDER No.:** OR080307  
**PROJECT:**

### COMMENTS

### NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.  
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

### ISSUING LABORATORY: BRISBANE

**Address**  
32 Shand Street  
Stafford QLD 4053  
Australia

**Phone:** 61-7-3243 7222  
**Fax:** 61-7-3243 7254  
**Email:** shaun.kenny@alschemex.com

Signatory

**Shaun Kenny**  
Minerals Laboratory Manager

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Batch: ST38976

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Date of Issue: 27/10/2003

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SAMPLE	Element	Cu	Ga	Rb	Sr	Ba	Nb	Y	Zr	U	Th	La	Ce
	Unit Method LOR	ppm ME-MS81 5	ppm ME-MS81 1	ppm ME-MS81 0.2	ppm ME-MS81 0.1	ppm ME-MS81 0.5	ppm ME-MS81 1	ppm ME-MS81 0.5	ppm ME-MS81 0.5	ppm ME-MS81 0.5	ppm ME-MS81 1	ppm ME-MS81 0.5	ppm ME-MS81 0.5
TK-01		7	14	138	58.8	314	10	14.3	202	1.7	13	66.3	105
TK-02		10	7	21.9	137	1860	112	37.5	266	4.9	17	21.3	44.1
TK-03		10	11	96.2	70.5	402	170	44.9	393	5.2	21	89.8	187
TK-04		24	14	6.7	35.9	90.3	150	37.8	321	4.6	16	126	245
TK-05		<5	8	58.4	34.6	204	5	8.9	139	1.3	7	13.7	24.0
TK-06		<5	9	89.3	26.3	849	5	12.9	202	2.2	8	13.4	25.2
TK-07		9	12	36.1	48.6	572	177	45.7	431	5.5	22	46.6	103
TK-08		12	13	67.0	62.9	1350	246	70.3	571	6.8	23	99.8	195
TK-09		6	22	122	94.0	1280	276	58.2	556	7.2	31	259	525
OF-1A		<5	20	208	162	468	14	18.4	143	6.0	37	31.0	60.0
OF-1C		<5	23	253	285	1090	14	27.3	295	2.1	10	32.2	63.8
OF-2A		<5	25	264	78.5	217	16	37.3	261	2.0	19	70.9	133
OF-3B		<5	22	285	57.3	205	11	11.9	101	1.3	5	11.9	21.7
ML95-3 17.4M		48	15	75.9	444	1010	87	14.5	116	3.1	13	67.9	112
ML95-3 161.5M		51	16	68.1	473	810	92	14.4	121	3.0	13	69.6	116
SN-230		5	9	41.1	90.5	688	195	12.7	106	1.8	30	141	273
SN-NORTH		6	10	69.9	322	2160	230	19.9	396	5.5	42	168	269
154-SOUTH		35	7	34.7	290	526	84	4.1	31.1	2.3	8	50.1	82.2
FSF-27 11.6M		<5	23	267	60.0	266	20	8.2	289	1.3	10	16.2	31.0
TS-08		11	6	14.5	5.4	176	2	5.7	39.4	<0.5	2	4.3	8.6

**Batch:** ST38976  
**Sub Batch:** 0  
**Date of Issue:** 27/10/2003  
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SAMPLE	Element	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	Cr2O3	TiO2	MnO	P2O5	SrO
	Unit Method LOR	% ME-ICP06 0.1	% ME-ICP06 0.01	% ME-ICP06 0.01	% ME-ICP06 0.01	% ME-ICP06 0.01	% ME-ICP06 0.01	% ME-ICP06 0.01	% ME-ICP06 0.01	% ME-ICP06 0.01	% ME-ICP06 0.01	% ME-ICP06 0.01	% ME-ICP06 0.01
TK-01		72.2	8.50	3.40	2.93	3.97	0.05	2.64	0.01	0.34	0.05	0.06	0.01
TK-02		14.3	3.30	4.91	23.76	16.33	0.03	0.32	0.08	0.89	0.13	0.60	0.01
TK-03		40.3	4.77	2.78	21.11	5.78	0.02	1.35	0.17	1.18	0.06	1.10	0.01
TK-04		68.0	3.84	3.72	8.87	4.34	0.02	0.10	0.15	1.04	0.02	0.88	<0.01
TK-05		30.8	3.46	1.37	26.48	7.59	0.12	1.54	0.01	0.18	0.02	0.03	<0.01
TK-06		76.1	4.33	1.45	3.99	4.17	0.06	2.39	0.01	0.16	0.03	0.04	<0.01
TK-07		66.0	6.96	7.43	3.68	5.66	0.04	0.61	0.15	1.36	0.03	1.36	<0.01
TK-08		64.6	5.99	13.25	2.58	3.84	0.02	1.06	0.17	1.86	0.51	1.54	0.01
TK-09		21.6	9.67	38.04	5.80	8.79	0.06	1.95	0.30	1.90	0.09	1.77	0.01
OF-1A		76.1	12.82	0.74	0.92	0.21	3.23	5.28	0.02	0.14	0.02	0.04	0.02
OF-1C		69.3	13.54	3.60	2.43	0.95	2.82	5.33	0.02	0.52	0.11	0.20	0.03
OF-2A		73.8	12.64	1.38	0.85	0.39	3.82	5.44	0.02	0.28	0.04	0.07	0.01
OF-3B		79.5	11.16	0.08	0.43	0.05	2.80	5.35	0.01	0.11	0.02	0.05	0.01
ML95-3 17.4M		51.1	8.80	6.97	5.01	15.44	1.68	2.45	0.14	0.83	0.11	0.31	0.05
ML95-3 161.5M		50.2	8.48	7.29	4.40	17.24	1.43	2.49	0.17	0.85	0.11	0.31	0.06
SN-230		33.9	2.25	9.45	2.98	34.54	0.02	0.79	0.32	0.58	0.13	0.13	0.01
SN-NORTH		34.8	3.54	10.28	3.50	31.39	0.23	0.58	0.27	0.76	0.19	0.59	0.03
154-SOUTH		39.0	2.46	8.08	3.12	36.68	0.06	0.30	0.23	0.48	0.12	0.23	0.03
FSF-27 11.6M		75.6	13.14	0.67	0.21	0.12	3.99	5.43	0.02	0.30	0.03	0.01	0.01
TS-08		96.1	1.40	1.38	0.04	0.09	0.02	0.21	0.02	0.04	0.04	<0.01	<0.01

**Batch:** ST38976  
**Sub Batch:** 0  
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**Client:** OROGENIC EXPLORATION PTY LTD  
**Client Reference:**

# CERTIFICATE OF ANALYSIS



SAMPLE	Element Unit	BaO %	LOI %	Co ppm	V ppm	Zn ppm	Ni ppm	Cr ppm	Lu ppm	Cs ppm	Hf ppm	Ta ppm	Pb ppm
	Method LOR	ME-ICP06 0.01	ME-ICP06 0.01	ME-MS81 0.5	ME-MS81 5	ME-MS81 5	ME-MS81 5	ME-MS81 10	ME-MS81 0.1	ME-MS81 0.1	ME-MS81 1	ME-MS81 0.5	ME-MS81 5
TK-01		0.03	5.82	15.7	32	30	234	38	0.3	4.8	6	1.0	<5
TK-02		0.19	35.09	19.0	45	58	402	575	0.5	2.8	7	5.1	<5
TK-03		0.04	21.28	28.8	82	27	365	1080	0.5	2.2	10	7.1	6
TK-04		0.01	8.96	59.0	30	57	1220	988	0.4	0.5	9	6.1	<5
TK-05		0.02	28.36	5.3	15	14	29	19	0.2	1.7	4	<0.5	<5
TK-06		0.09	7.12	5.4	19	13	13	41	0.2	1.8	6	<0.5	6
TK-07		0.06	6.55	32.3	72	74	534	1050	0.6	2.4	11	7.7	<5
TK-08		0.15	4.32	26.4	128	52	471	1140	0.8	2.8	15	10.9	8
TK-09		0.14	9.71	43.8	172	55	968	1930	0.5	3.9	15	10.7	17
OF-1A		0.05	0.41	1.5	11	17	5	102	0.4	2.5	5	1.4	42
OF-1C		0.11	0.99	5.8	36	62	10	90	0.4	5.7	9	0.6	32
OF-2A		0.02	1.15	1.2	10	48	7	73	0.6	3.4	9	1.1	32
OF-3B		0.02	0.43	0.7	9	12	<5	95	0.3	5.4	4	0.8	25
ML95-3 17.4M		0.11	6.24	46.4	106	74	539	883	0.2	3.3	3	4.6	11
ML95-3 161.5M		0.09	6.41	53.4	111	77	644	1070	0.2	1.8	3	4.9	11
SN-230		0.07	14.64	57.9	<5	36	1380	2180	0.1	0.6	3	11.1	<5
SN-NORTH		0.23	13.46	67.0	37	45	1140	1800	0.2	1.3	4	14.2	<5
154-SOUTH		0.06	9.07	92.5	42	75	1510	1500	<0.1	0.9	<1	6.0	8
FSF-27 11.6M		0.03	0.38	0.8	14	16	5	87	0.3	2.9	9	1.3	19
TS-08		0.02	0.63	2.5	23	<5	8	144	<0.1	0.8	1	<0.5	<5



**Batch:** ST38976  
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**Client Reference:**

# CERTIFICATE OF ANALYSIS



SAMPLE	Element	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Er	Ho	Yb	Li	Sc
	Unit Method LOR	ppm ME-MS81 0.1	ppm ME-MS81 0.5	ppm ME-MS81 0.1	ppm ME-MS81 0.1	ppm ME-MS81 0.1	ppm ME-MS81 0.1	ppm ME-MS81 0.1	ppm ME-MS81 0.1	ppm ME-MS81 0.1	ppm ME-MS81 0.1	ppm ME-MS61 0.2	ppm ME-MS61 0.01
TK-01		9.8	32.2	3.9	0.6	2.9	0.4	2.4	1.4	0.5	1.8	37.2	4.37
TK-02		5.8	25.5	6.2	1.8	6.3	1.0	6.4	2.9	1.2	3.1	22.3	13.5
TK-03		21.9	81.3	13.2	3.0	10.7	1.5	8.5	3.9	1.7	3.6	34.2	18.5
TK-04		25.4	91.7	12.5	2.7	9.9	1.3	6.6	3.2	1.3	3.0	92.2	13.2
TK-05		2.8	10.6	2.0	0.3	1.7	0.3	1.6	0.9	0.3	1.2	21.1	2.60
TK-06		2.9	11.1	2.3	0.5	2.0	0.4	2.2	1.1	0.4	1.3	32.4	2.64
TK-07		12.9	54.4	10.5	2.7	9.2	1.3	8.0	3.8	1.6	3.6	55.7	16.2
TK-08		23.0	86.0	16.0	4.2	15.0	2.2	12.9	5.7	2.5	5.5	40.8	31.7
TK-09		60.5	220	34.1	6.8	23.7	2.4	11.6	4.8	2.0	3.9	45.0	31.9
OF-1A		6.7	23.5	4.1	0.8	3.1	0.5	3.2	1.9	0.7	2.6	10.2	4.78
OF-1C		7.9	31.5	5.9	1.5	5.1	0.8	4.6	2.4	1.0	2.5	18.5	12.3
OF-2A		15.1	56.9	10.1	1.3	8.2	1.2	7.2	3.5	1.4	3.9	11.2	6.87
OF-3B		2.3	8.1	1.5	0.3	1.4	0.3	1.8	1.3	0.4	1.7	4.5	2.39
ML95-3 17.4M		12.2	41.5	6.1	1.5	4.5	0.6	3.0	1.3	0.6	1.4	20.0	14.7
ML95-3 161.5M		12.0	41.5	5.8	1.5	4.6	0.5	2.8	1.3	0.5	1.3	36.7	14.2
SN-230		30.8	106	13.5	3.0	9.2	1.0	3.6	1.3	0.6	0.8	28.7	13.0
SN-NORTH		27.6	89.9	13.0	3.6	10.3	1.1	4.8	1.6	0.8	1.3	61.4	14.9
154-SOUTH		8.4	27.2	3.0	0.7	2.2	0.2	0.9	0.4	0.2	0.4	7.8	7.69
FSF-27 11.6M		3.3	11.7	1.7	0.5	1.3	0.2	1.4	1.0	0.3	1.6	5.2	7.27
TS-08		1.0	3.9	1.2	0.2	1.0	0.2	1.1	0.5	0.2	0.5	95.6	1.13

**Batch:** ST38976  
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# QUALITY CONTROL REPORT



SAMPLE	Element Unit Method LOR	SiO2 % ME-ICP06 0.1	Al2O3 % ME-ICP06 0.01	Fe2O3 % ME-ICP06 0.01	CaO % ME-ICP06 0.01	MgO % ME-ICP06 0.01	Na2O % ME-ICP06 0.01	K2O % ME-ICP06 0.01	Cr2O3 % ME-ICP06 0.01	TiO2 % ME-ICP06 0.01	MnO % ME-ICP06 0.01	P2O5 % ME-ICP06 0.01	SrO % ME-ICP06 0.01
BLANK	<b>BLANKS</b>												
TK-09 Original Result FSF-27 11.6M Original Result TS-08 Original Result	<b>DUPLICATES</b>												
	If applicable, duplicate results for fire assay golds are shown in the main body of the report.												
	21.6	9.80	38.21	5.76	8.72	0.05	1.93	0.29	1.86	0.09	1.77	0.01	
	21.6	9.67	38.04	5.80	8.79	0.06	1.95	0.30	1.90	0.09	1.77	0.01	
	75.4	13.25	0.74	0.20	0.08	4.04	5.48	0.01	0.29	0.03	0.01	0.01	
	75.6	13.14	0.67	0.21	0.12	3.99	5.43	0.02	0.30	0.03	0.01	0.01	
96.2	1.36	1.39	0.03	0.07	0.01	0.18	0.01	0.03	0.03	<0.01	<0.01		
96.1	1.40	1.38	0.04	0.09	0.02	0.21	0.02	0.04	0.04	<0.01	<0.01		
STANDARD I.D. RESULT OF STANDARD TARGET RANGE	<b>REFERENCE STANDARDS</b>												
	The data that appears on this report are results for the internal standards analysed in conjunction with this batch.												

**Batch:** ST38976  
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# QUALITY CONTROL REPORT



SAMPLE	Element Unit Method	BaO % ME-ICP06	LOI % ME-ICP06	Co ppm ME-MS81	V ppm ME-MS81	Zn ppm ME-MS81	Ni ppm ME-MS81	Cr ppm ME-MS81	Lu ppm ME-MS81	Cs ppm ME-MS81	Hf ppm ME-MS81	Ta ppm ME-MS81	Pb ppm ME-MS81
	LOR	0.01	0.01	0.5	5	5	5	10	0.1	0.1	1	0.5	5
BLANK		<b>BLANKS</b>											
				<0.5	<5	<5	<5	<10	<0.1	<0.1	<1	<0.5	<5
TK-09 Original Result FSF-27 11.6M Original Result TS-08 Original Result		<b>DUPLICATES</b>											
		If applicable, duplicate results for fire assay golds are shown in the main body of the report.											
		0.13	9.65	42.9	164	71	973	1940	0.5	3.8	15	10.4	18
		0.14	9.71	43.8	172	55	968	1930	0.5	3.9	15	10.7	17
		0.03	0.37	0.8	15	20	6	88	0.3	3.0	9	1.3	20
		0.03	0.38	0.8	14	16	5	87	0.3	2.9	9	1.3	19
		0.02	0.66	2.7	23	12	9	153	<0.1	0.8	1	<0.5	<5
0.02	0.63	2.5	23	<5	8	144	<0.1	0.8	1	<0.5	<5		
STANDARD I.D. RESULT OF STANDARD TARGET RANGE		<b>REFERENCE STANDARDS</b>											
		The data that appears on this report are results for the internal standards analysed in conjunction with this batch.											
				46.4	216	156	70	77	1.4	3.6	12	1.6	65

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**Sub Batch:** 0  
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# QUALITY CONTROL REPORT



SAMPLE	Element Unit Method	Cu ppm ME-MS81	Ga ppm ME-MS81	Rb ppm ME-MS81	Sr ppm ME-MS81	Ba ppm ME-MS81	Nb ppm ME-MS81	Y ppm ME-MS81	Zr ppm ME-MS81	U ppm ME-MS81	Th ppm ME-MS81	La ppm ME-MS81	Ce ppm ME-MS81
	LOR	5	1	0.2	0.1	0.5	1	0.5	0.5	0.5	1	0.5	0.5
BLANK		<b>BLANKS</b>											
		<5	<1	<0.2	0.8	0.9	<1	<0.5	0.6	<0.5	<1	<0.5	<0.5
TK-09 Original Result FSF-27 11.6M Original Result TS-08 Original Result		<b>DUPLICATES</b>											
		If applicable, duplicate results for fire assay golds are shown in the main body of the report.											
		5	21	116	90.2	1230	272	56.2	535	7.1	32	252	518
		6	22	122	94.0	1280	276	58.2	556	7.2	31	259	525
		<5	24	271	59.6	263	19	8.5	296	1.3	10	16.0	31.0
		<5	23	267	60.0	266	20	8.2	289	1.3	10	16.2	31.0
		10	6	14.2	5.4	175	2	5.7	41.6	<0.5	2	4.2	8.6
11	6	14.5	5.4	176	2	5.7	39.4	<0.5	2	4.3	8.6		
STANDARD I.D. RESULT OF STANDARD TARGET RANGE		<b>REFERENCE STANDARDS</b>											
		The data that appears on this report are results for the internal standards analysed in conjunction with this batch.											
47	59	34.9	910	1610	19	94.1	404	7.7	29	69.1	135		

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**Sub Batch:** 0  
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# QUALITY CONTROL REPORT



SAMPLE	Element Unit Method	Pr ppm ME-MS81 LOR	Nd ppm ME-MS81	Sm ppm ME-MS81	Eu ppm ME-MS81	Gd ppm ME-MS81	Tb ppm ME-MS81	Dy ppm ME-MS81	Er ppm ME-MS81	Ho ppm ME-MS81	Yb ppm ME-MS81	Li ppm ME-MS61	Sc ppm ME-MS61
BLANK	<b>BLANKS</b>												
	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	0.01
TK-09 Original Result FSF-27 11.6M Original Result TS-08 Original Result	<b>DUPLICATES</b> If applicable, duplicate results for fire assay golds are shown in the main body of the report.												
	60.3	219	33.4	6.6	23.3	2.4	11.1	4.7	2.0	3.8	48.3	33.0	
	60.5	220	34.1	6.8	23.7	2.4	11.6	4.8	2.0	3.9	45.0	31.9	
	3.3	11.8	1.7	0.5	1.3	0.2	1.4	1.0	0.4	1.7	5.0	7.62	
	3.3	11.7	1.7	0.5	1.3	0.2	1.4	1.0	0.3	1.6	5.2	7.27	
	0.9	3.7	1.1	0.2	1.0	0.2	1.1	0.5	0.2	0.5	99.4	1.16	
1.0	3.9	1.2	0.2	1.0	0.2	1.1	0.5	0.2	0.5	95.6	1.13		
STANDARD I.D. RESULT OF STANDARD TARGET RANGE	<b>REFERENCE STANDARDS</b> The data that appears on this report are results for the internal standards analysed in conjunction with this batch.												
	16.6	68.0	14.7	3.5	14.2	2.4	16.3	8.5	3.4	9.1	STSD2 80.2	STSD2 18.7	
												55.0-75.0	13.6-18.4