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CERTIFICATE OF ANALYSIS FOR

RHYODACITE BLANK
OREAS 21P BATCH 2
AND
OREAS 21C BATCH 1

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REPORT 21B

INTRODUCTION

OREAS geochemical reference materials are intended to provide a low cost method of evaluating and improving the quality of precious metal analysis of geological samples. To the analyst they provide an effective means of calibrating analytical equipment, assessing new techniques and routinely monitoring in-house procedures. To the explorationist they provide an important control in geochemical data sets related to exploration from the grass roots level through to prospect evaluation.

As a rule only source materials exhibiting an exceptional level of homogeneity of the element(s) of interest are used in the preparation of standards. This has enabled Ore Research & Exploration to produce a range of gold standards exhibiting homogeneity that matches or exceeds that of currently available international reference materials. In many instances standards produced from a single source are sufficiently homogeneous to produce relatively coarse-grained standards designed to simulate drill cuttings. These have a grain size of minus 3mm and are designated with a "C" suffix to the standard identification number. These standards are packaged in 1kg units following homogenisation and are intended for submission to analytical laboratories in units of this size. They offer the added advantages of providing a check on both sample preparation and analytical procedures while acting as a transparent standard to the assay laboratory. The more conventional pulped standards have a grain size of minus 75 microns and a higher degree of homogeneity. These standards are distinguished by a "P" suffix to the standard identification number.

SOURCE MATERIALS

The reference standards OREAS 21P Batch 2 and OREAS 21C Batch 1 have been prepared from a blend of fresh hypersthene rhyodacite. The rhyodacite comprises part of the Upper Devonian Mount Dandenong Volcanics Group in central Victoria and is referred to as the Ferny Creek rhyodacite. It is characterised by extremely low background gold, platinum and palladium contents of less than 5 parts per billion each.

The major and trace element composition of this standard is given in Table 1. The constituents SiO_2 to Zr are the means of duplicate XRF analyses determined at the University of Melbourne

using a low dilution borate fusion method, while the remaining constituents As to Zn are means of at least ten replicate analyses determined via INAA at Becquerel Laboratories.

COMMINUTION AND HOMOGENISATION PROCEDURES

Approximately 400kg of the Ferny Creek rhyodacite was prepared in the following manner:

a) *primary crushing in a large (36x51cm) jaw crusher*
b) *drying overnight at 90°C*
c) *secondary crushing in a small (10x20cm) jaw crusher to an approximate grain size of -3mm*

The resultant -3mm material constitutes OREAS 21C Batch 1. The corresponding pulp standard OREAS 21P Batch 2 was prepared from 50kg of this material in the following manner:

a) *packaging into 2kg lots and drying overnight at 90°C*
b) *pulverisation of each 2kg lot for 15 minutes in an upgraded Labtech LM5 planetary puck and bowl-type vibratory mill*
c) *screening to minus 75 microns in a Kason sieving machine*
d) *homogenisation for four hours in a tumble blender loaded with 19mm carbon steel mixing balls*
e) *collection into 25 litre plastic drums*
f) *packaging into 1kg lots*

By loading the LM5 mill to only 40% of its bowl capacity and employing a 15 minute pulverisation, a very fine grind was achieved. The oversize fraction remaining after the screening process was reground and screened until less than 0.2% of +75 micron material remained. This residual oversize fraction was retained and stored separately.

ANALYSIS OF OREAS 21P BATCH 2

Three laboratories participated in the analytical program and are listed in Appendix I.

To ensure anonymity these laboratories have been randomly designated the letter codes A through C. Laboratories A and B used a lead fire assay collection on 50g charges with ICP-mass spectrometry and carbon rod atomic absorption spectrometry finishes, respectively. Laboratory C used instrumental neutron activation analysis on 30g charges. Examination of the results (Table 2) indicates that the parcel of Ferny Creek rhyodacite is uniformly impoverished in the precious metals gold, platinum and palladium making it an ideal natural blank for monitoring contamination levels in routine assay work.

CONCLUSIONS

A barren hypersthene rhyodacite was prepared as a standard blank in chip (-3mm) and pulp (-75μ) form. The following concentrations are recommended:

OREAS 21P Batch 2	Au < 5ppb, Pt < 5ppb, Pd < 5ppb
OREAS 21C Batch 1	Au < 5ppb, Pt < 5ppb, Pd < 5ppb

APPENDIX I

List of Participating Laboratories:-

Becquerel Laboratories, Lucas Heights, NSW

Classic Laboratories, Thebarton, SA

Genalysis Laboratory Services, Maddington, WA

Table 1. Approximate major and trace element composition of gold ore standard OREAS 21 (P and C). SiO2 to Total as weight percent; rest in ppm; negative sign indicates "less than".

Constituent		Constituent	
SiO2	62.10	As	-2
TiO2	0.88	Ba	1400
Al2O3	15.48	Br	-2
Fe2O3	6.27	Ce	78
MnO	0.09	Co	21
MgO	2.42	Cr	70
CaO	4.10	Cs	8
Na2O	2.52	Eu	2
K2O	2.41	Hf	7
P2O5	0.22	La	45
H2O+	2.64	Rb	108
Total	99.13	Sb	1
		Sc	16
		Sm	8
Nb	15	Th	14
Pb	18	W	-2
S	768	Yb	3.00
Sr	375	Zn	170
V	116		
Y	36		
Zr	243		

Table 2. Analytical results for Pt, Pd and Au in OREAS 21P Batch 2 (INAA - instrumental neutron activation analysis; FA*AAS - fire assay/atomic absorption spectrometry; FA*MS - fire assay/mass spectrometry).

Sample No.	Lab A FA*MS			Lab B FA*AAS			Lab C INAA
	Pt	Pd	Au	Pt	Pd	Au	Au
1	1	2	5	<5	3	3	<4
2	1	1	1	<5	2	8	<3
3	2	3	3	<5	4	2	<4
4	1	2	1	<5	1	3	<4
5	3	2	1	<5	2	1	<4
6							<3
7							<3
8							<3
9							<3
10							<3
11							<4
12							<4
13							<5
14							<4
15							<4
16							<4
17							<4
18							<5
19							<4
20							<5