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Investigating non-disclosing precious metal components in the UG2 reef

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2011-03-17
http://hdl.handle.net/10539/9161

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APPENDIX 1

1.1 Summary data for the calibration process during the analysis of the UG2 tailings composite sample.

Table 1A Details of the calibration program FTAILS, concentration expressed in mg l^{-1}

	STD 0	STD1 Low QC Std	STD 2	STD 3	STD 4 High QC Std	STD 5
Cr_2O_3	0	50	100	200	300	400
FeO	0	50	100	150	200	250
CaO	0	1	5	10	20	40
SiO_2	0	50	60	70	80	90
MgO	0	40	60	80	100	120
Al_2O_3	0	25	50	100	150	200
S	0	0.01	0.03	0.05	0.10	0.20
P	0	0.01	0.03	0.05	0.10	0.20
Mn	0	1.0	1.5	2.0	4.0	8.0
Ti	0	3	6	10	20	40
Ni	0	0.5	1.0	2.0	4.0	8.0
Co	0	0.1	0.5	1.0	2.0	4.0
B/Y	5	5	5	5	5	5

Table 1B Details for the calibration program FTAILS, concentration expressed in wt. %

	STD 0	STD1 Low QC Std	STD 2	STD 3	STD 4 High QC Std	STD 5
Cr_2O_3	0	7.307	14.61	29.23	43.84	58.46
FeO	0	6.433	12.87	19.30	25.73	32.16
CaO	0	0.139	0.700	1.40	2.798	5.597
SiO_2	0	10.70	12.83	14.97	17.11	19.25
MgO	0	6.633	9.949	13.26	16.58	19.90
Al_2O_3	0	4.724	9.448	18.90	28.34	37.79
S	0	0.001	0.003	0.005	0.010	0.020
P	0	0.001	0.003	0.005	0.010	0.020
Mn	0	0.100	0.150	0.200	0.400	0.800
Ti	0	0.300	0.600	1.000	2.000	4.000
Ni	0	0.050	0.100	0.200	0.400	0.800
Co	0	0.010	0.050	0.100	0.200	0.400

B/Y – Boron and Yttrium were selected as Internal Standards

Matrix – The standards were matrix matched with 4 g Na_2O_2 and 4 mls of conc. Nitric acid.

1.2 An example of the regression statistics performed for the calibration program: FTails using the software MS-Excel 97.

Table 1C Summary sheet of regression statistics 1

1.2	VARIAN VISTA-PRO Ni 231.604 Range: % 0 0.080 0.160 0.200 0.400 0.800	VARIAN VISTA-PRO Mg 279.800 Range: % 0 6.330 9.949 13.26 16.58 26.53
1.2.1	Number of standards = n = 6	Number of standards = n = 6
1.2.2	The blank is included as a standard.	The blank is included as a standard.
1.2.3	r = 0.9999 r^2 = 0.9997 The values of r and r^2 point to almost positive linearity	r = 0.9996 r^2 = 0.9993 The values of r and r^2 point to almost positive linearity
1.2.4	The ANOVA manipulation gave: F_{calc} = 14800,74 $F_{crit} = F_{1,4,0.05}$ = 2.73E-8 These F-values point to significant linearity since $F_{calc} > F_{crit}$	The ANOVA manipulation gave: F_{calc} = 5952.67 $F_{crit} = F_{1,4,0.05}$ = 1.69E-07 These F-values point to linearity since $F_{calc} > F_{crit}$
1.2.5	Regression parameters: Slope = b = 1342.91 Intercept = a = 28.33 Regression line: y = bx + a y = 1342.91x + 28.33	Regression parameters: Slope = b = 1381.82 Intercept = a = 449.26 Regression line: y = bx + a y = 1381.82x + 449.26
1.2.6	Calibration Uncertainties: Random calibration uncertainty = Sy/x = 7.18 Uncertainty in the slope - Sb = 4.21 Uncertainty in the intercept – Sa = 11.04 Sb < Sy/x indicating good precision Sa > Sb range is acceptable	Calibration Uncertainties: Random calibration uncertainty = sy/x = 364.41 Uncertainty in the slope – sb = 17.91 Uncertainty in the intercept – sa = 263.00 Sb < Sy/x indicating good precision Sa > Sb range is acceptable

- LOD:

  $y_{LOD,}$ the signal representing the LOD, can be determined from the equation

  $y_{LOD} = a + 3\, s_{x/y.}$

  x_{LOD} can be determined from the equation $y_{LOD} = b\, x_{LOD} + a$

Pt 265.954	Pd 340.355
y_{LOD} = 49.89	y_{LOD} = 0.00687063
x_{LOD} = 0.016 %	x_{LOD} = 1.05 ppm

- LOQ:

  $y_{LOQ,}$ the signal representing the LOQ, can be determined from the equation

  $y_{LOQ} = a + 10\, s_{x/y.}$

  x_{LOQ} can be determined from the equation $y_{LOQ} = b\, x_{LOQ} + a$

y_{LOQ} = 100.18	y_{LOQ} = 0.01965796
x_{LOQ} = 0.054 %	x_{LOQ} = 3.5 ppm

- Sensitivity

The method is analytically sensitive if $b \neq 0$

The analytical sensitivity of the method appears to be satisfactory.

Table 1D Summary sheet of regression statistics 2

Nickel 231.604

X	y
0.000	31.9061
0.080	137.031
0.160	242.3
0.200	299.815
0.400	553.14
0.800	1108.16

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.9999
R Square	0.9997
Adjusted R Square	0.9997
Standard Error	7.1854
Observations	6

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	764160.66	764160.66	14800.74	2.74E-08
Residual	4	206.52	51.63		
Total	5	764367.18			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	28.33	4.21	6.73	0.00	16.65	40.01	16.65	40.01
X Variable 1	1342.91	11.04	121.66	0.00	1312.26	1373.55	1312.26	1373.55

YLOD = bXLOD + a

YLOD = 49.89

YLOD = bXLOD + a

XLOD = 0.016

YLOQ = a + 10Sy/x

YLOQ = 100.18

YLOQ = bXLOQ + a

XLOQ = 0.054

1.3 Particle size distribution data for the chromite sample (RCCs).

Figure 3.A Graphical presentation of the particle size analysis: Volume frequency versus diameter.

1.4 Base metal (BM) and PGE analyses for the sample: UG 2 HG FT composite.

Table 1E Reproducibility data obtained for base metal analysis of SARM 64

Table 1F Reproducibility data obtained for base metal analysis of UG 2 HG FT composite sample

Table 1G Reproducibility data obtained for PGE analysis of SARM 64

Table 1H Reproducibility data obtained for PGE analysis of UG 2 HG FT composite sample