

# CDN Resource Laboratories Ltd.

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## REFERENCE MATERIAL: CDN-PGMS-23

Recommended values and the "Between Lab" Two Standard Deviations

<i>Gold</i>	<i>0.496 g/t ± 0.058 g/t</i>	<i>Certified value</i>	<i>30g FA / ICP or AA</i>
<i>Platinum</i>	<i>0.456 g/t ± 0.040 g/t</i>	<i>Certified value</i>	<i>30g FA / ICP or AA</i>
<i>Palladium</i>	<i>2.032 g/t ± 0.166 g/t</i>	<i>Certified value</i>	<i>30g FA / ICP or AA</i>

**PREPARED BY:** CDN Resource Laboratories Ltd.

**CERTIFIED BY:** Duncan Sanderson, B.Sc., Licensed Assayer of British Columbia

**INDEPENDENT GEOCHEMIST:** Dr. Barry Smee., Ph.D., P. Geo.

**DATE OF CERTIFICATION:** May 7, 2012

### **METHOD OF PREPARATION:**

The ore was supplied by Stillwater Mining Corporation from the Stillwater Complex in Montana.

The mineralogy of the Stillwater Pt/Pd ore consists of up to 1 % sulphides comprising chalcopyrite, pentlandite, pyrrhotite, ± pyrite hosted by a chromite-rich ultramafic layer. The main platinum-bearing minerals are Braggite (Pt,Pd,Ni)S, Cooperite (Pt, Pd, Ni)S as well as Isoferroplatinum (PtFe<sub>3</sub>) and Moncheite (Pt,Pd)(Te,Bi)<sub>2</sub>. The majority of the palladium is hosted as solid solution within the pentlandite ((Fe,Ni)<sub>9</sub>S<sub>8</sub>); less than 15 % as Vysotskite (Pd,Ni,Pt)S, Braggite, Cooperite and Moncheite.

This standard was prepared by combining 266 kg of the Stillwater ore (screened to -325) with 3 kg of a gold ore concentrate (screened to -325) and 532 kg of a blank granitic ore (screened to -270). The material was mixed for 5 days in a double-cone mixer. Splits were sent to 15 laboratories for round robin assaying.

**Approximate chemical composition (by whole rock analysis) is as follows:**

	Percent			Percent
SiO <sub>2</sub>	60.3		MgO	4.7
Al <sub>2</sub> O <sub>3</sub>	15.8		K <sub>2</sub> O	0.7
Fe <sub>2</sub> O <sub>3</sub>	6.4		TiO <sub>2</sub>	0.4
CaO	6.8		LOI	1.9
Na <sub>2</sub> O	2.4		S	0.1

### **Statistical Procedures:**

The final limits were calculated after first determining if all data was compatible within a spread normally expected for similar analytical methods done by reputable laboratories. Data from any one laboratory was removed from further calculations when the mean of all analyses from that laboratory failed a t test of the global means of the other laboratories. The means and standard deviations were calculated using all remaining data. Any analysis that fell outside of the mean ±2 standard deviations was removed from the ensuing data base. The mean and standard deviations were again calculated using the remaining data. This method is different from that used by Government agencies in that the actual "between-laboratory" standard deviation is used in the calculations. This produces upper and lower limits that reflect actual individual analyses rather than a grouped set of analyses. The limits can therefore be used to monitor accuracy from individual analyses, unlike the Confidence Limits published on other standards.

**Results from round-robin assaying are presented on the following page:**

**REFERENCE MATERIAL: CDN-PGMS-23**

**Assay Procedure: 30g fire assay, AA or ICP finish.**

	Lab 1	Lab 2	Lab 3	Lab 4	Lab 5	Lab 6	Lab 7	Lab 8	Lab 9	Lab 10	Lab 11	Lab 12	Lab 13	Lab 14	Lab 15
SAMPLE	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t
PGMS-23-1	0.505	0.445	0.556	0.519	0.46	0.515	0.48	0.480	0.491	0.550	0.493	0.497	0.537	0.51	0.47
PGMS-23-2	0.482	0.500	0.548	0.510	0.46	0.477	0.52	0.520	0.508	0.546	0.438	0.476	0.501	0.54	0.49
PGMS-23-3	0.510	0.480	0.542	0.497	0.53	0.438	0.50	0.481	0.473	0.531	0.455	0.484	0.535	0.53	0.47
PGMS-23-4	0.496	0.462	0.511	0.464	0.47	0.526	0.53	0.522	0.485	0.509	0.506	0.476	0.593	0.53	0.49
PGMS-23-5	0.492	0.496	0.502	0.478	0.49	0.506	0.49	0.506	0.467	0.540	0.460	0.502	0.464	0.54	0.50
PGMS-23-6	0.498	0.532	0.550	0.461	0.45	0.471	0.54	0.478	0.468	0.531	0.459	0.527	0.523	0.51	0.47
PGMS-23-7	0.464	0.504	0.562	0.477	0.49	0.441	0.47	0.567	0.454	0.509	0.458	0.511	0.572	0.53	0.49
PGMS-23-8	0.469	0.465	0.546	0.484	0.45	0.440	0.50	0.517	0.479	0.508	0.477	0.502	0.533	0.53	0.46
PGMS-23-9	0.489	0.488	0.526	0.478	0.52	0.429	0.50	0.495	0.465	0.550	0.438	0.547	0.526	0.49	0.46
PGMS-23-10	0.447	0.454	0.512	0.500	0.53	0.505	0.49	0.462	0.486	0.526	0.516	0.484	0.527	0.53	0.49
Mean	0.485	0.483	0.536	0.487	0.485	0.475	0.502	0.503	0.478	0.530	0.470	0.501	0.531	0.524	0.479
Std. Dev'n	0.0198	0.0266	0.0211	0.0191	0.0321	0.0364	0.0220	0.0304	0.0155	0.0168	0.0271	0.0229	0.0351	0.0158	0.0145
%RSD	4.08	5.52	3.94	3.93	6.61	7.67	4.38	6.05	3.25	3.17	5.77	4.58	6.60	3.01	3.03
	Pt g/t	Pt g/t	Pt g/t	Pt g/t	Pt g/t	Pt g/t	Pt g/t	Pt g/t	Pt g/t	Pt g/t	Pt g/t	Pt g/t	Pt g/t	Pt g/t	Pt g/t
PGMS-23-1	0.435	0.476	0.47	0.493	0.46	0.486	0.47	0.426	0.462	0.459	0.434	0.433	0.459	0.44	0.440
PGMS-23-2	0.452	0.455	0.45	0.469	0.44	0.471	0.46	0.469	0.441	0.459	0.415	0.433	0.463	0.48	0.466
PGMS-23-3	0.453	0.475	0.47	0.452	0.47	0.407	0.45	0.426	0.469	0.501	0.405	0.445	0.452	0.52	0.437
PGMS-23-4	0.446	0.463	0.47	0.454	0.48	0.448	0.47	0.438	0.453	0.471	0.433	0.425	0.448	0.48	0.444
PGMS-23-5	0.420	0.457	0.43	0.468	0.48	0.454	0.48	0.453	0.458	0.461	0.440	0.437	0.458	0.47	0.436
PGMS-23-6	0.426	0.454	0.51	0.459	0.47	0.452	0.44	0.470	0.445	0.524	0.421	0.439	0.500	0.47	0.439
PGMS-23-7	0.415	0.451	0.48	0.493	0.46	0.433	0.45	0.459	0.457	0.470	0.420	0.471	0.454	0.51	0.437
PGMS-23-8	0.439	0.500	0.47	0.478	0.48	0.481	0.44	0.425	0.449	0.495	0.396	0.464	0.454	0.43	0.457
PGMS-23-9	0.428	0.461	0.48	0.472	0.48	0.481	0.45	0.438	0.473	0.473	0.431	0.456	0.457	0.44	0.429
PGMS-23-10	0.429	0.456	0.49	0.462	0.50	0.463	0.49	0.422	0.451	0.460	0.415	0.431	0.477	0.43	0.427
Mean	0.434	0.465	0.472	0.470	0.472	0.458	0.460	0.443	0.456	0.477	0.421	0.443	0.462	0.467	0.441
Std. Dev'n	0.0131	0.0150	0.0215	0.0145	0.0162	0.0245	0.0170	0.0187	0.0102	0.0221	0.0139	0.0153	0.0154	0.0320	0.0120
%RSD	3.01	3.23	4.55	3.09	3.43	5.36	3.69	4.23	2.23	4.63	3.29	3.46	3.34	6.85	2.72
	Pd g/t	Pd g/t	Pd g/t	Pd g/t	Pd g/t	Pd g/t	Pd g/t	Pd g/t	Pd g/t	Pd g/t	Pd g/t	Pd g/t	Pd g/t	Pd g/t	Pd g/t
PGMS-23-1	2.00	1.98	2.13	2.09	2.12	2.04	2.04	1.89	2.07	2.10	1.90	1.91	2.11	2.21	2.04
PGMS-23-2	2.01	1.92	2.13	2.01	2.15	2.00	2.10	1.92	2.01	2.08	1.83	1.93	2.12	2.24	2.03
PGMS-23-3	1.97	2.01	2.10	2.01	2.15	1.78	2.04	1.91	2.08	2.09	1.79	1.96	2.08	2.18	2.06
PGMS-23-4	2.03	1.99	2.06	2.02	2.12	2.02	2.08	1.93	1.97	2.11	2.00	1.97	2.13	2.22	2.00
PGMS-23-5	1.99	1.97	2.07	2.03	2.15	2.01	2.05	1.90	2.06	2.09	1.92	1.98	2.06	2.18	2.05
PGMS-23-6	1.99	1.97	2.14	2.03	2.07	1.88	2.04	1.90	1.99	2.14	1.82	2.03	2.10	2.19	1.99
PGMS-23-7	1.92	1.98	2.11	2.04	2.11	1.85	2.03	1.96	1.97	2.08	1.87	1.97	2.12	2.18	2.04
PGMS-23-8	1.93	2.00	2.12	2.05	2.16	2.01	2.05	1.90	1.97	2.10	1.86	1.93	2.14	2.20	2.07
PGMS-23-9	1.99	1.92	2.12	2.04	2.10	1.98	2.02	1.93	2.04	2.21	1.88	2.00	2.08	2.10	2.03
PGMS-23-10	1.94	2.00	2.16	2.04	2.12	2.05	2.05	1.87	2.07	2.08	1.95	1.94	2.13	2.05	2.04
Mean	1.97	1.97	2.11	2.04	2.13	1.96	2.05	1.91	2.02	2.11	1.88	1.96	2.11	2.18	2.04
Std. Dev'n	0.0378	0.0313	0.0306	0.0218	0.0280	0.0918	0.0236	0.0243	0.0460	0.0402	0.0617	0.0361	0.0263	0.0574	0.0228
%RSD	1.91	1.59	1.45	1.07	1.32	4.68	1.15	1.27	2.27	1.91	3.28	1.84	1.25	2.64	1.12

**REFERENCE MATERIAL: CDN-PGMS-23**

**Participating Laboratories:**

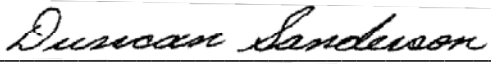
(not in same order as listed in table of results)

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Certified by

  
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Duncan Sanderson, Certified Assayer of B.C.

Geochemist

  
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Barry Smee, Ph.D., P. Geo.