CDN Resource Laboratories Ltd.

#2, 20148 – 102nd Ave, Langley, B.C., Canada, V1M 4B4, 604-882-8422, Fax: 604-882-8466 (www.cdnlabs.com)

REFERENCE MATERIAL: CDN-ME-2301

Recommended values and the "Between Lab" Two Standard Deviations

Gold	**1.329 gpt**	**±**	**0.101 gpt**	**30 g FA, AA or ICP Finish**	**Certified value**
Silver	**318 ppm**	**±**	**14 ppm**	**FA, Gravimetric Finish**	**Certified value**
Silver	**329 ppm**	**±**	**15 ppm**	**4 Acid digestion / ICP Finish**	**Certified value**
Copper	**0.271 %**	**±**	**0.010 %**	**4 Acid digestion / ICP Finish**	**Certified value**
Lead	**2.57 %**	**±**	**0.12 %**	**4 Acid digestion / ICP Finish**	**Certified value**
Zinc	**4.41 %**	**±**	**0.09 %**	**4 Acid digestion / ICP Finish**	**Certified value**

Note 1: Standards with an RSD of near or less than 5% are certified; RSD's of between 5% and 15% are Provisional; RSD's over 15% are Indicated. Provisional and Indicated values cannot be used to monitor accuracy with a high degree of certainty.

PREPARED BY: CDN Resource Laboratories Ltd.
CERTIFIED BY: Ali Alizadeh, MSc, MBA, P Geo
INDEPENDENT GEOCHEMIST: Dr. Barry Smee., Ph.D., P. Geo.
DATE OF CERTIFICATION: September 14th, 2023

ORIGIN OF REFERENCE MATERIAL:

Standard CDN-ME-2301 was prepared from the ore provided by Hecla Mining's Greens Creek deposit blended with granitic rock. The Greens Creek deposit is a polymetallic, stratiform, massive sulfide deposit. The host rock consists of predominantly marine sedimentary, and mafic to ultramafic volcanic and plutonic rocks, which have been subjected to multiple periods of deformation. Mineralization occurs discontinuously along the contact between a structural hanging wall of quartz mica carbonate phyllites, and a structural footwall of graphitic and calcareous argillite. Ore lithologies fall into two broad groups: massive ores with over 50% sulfides and white ores with less than 50% sulfides. The massive ores are further subdivided as either base-metal or pyrite dominant. Massive ores vary greatly in precious-metal grade from uneconomic to bonanza Au (>.5 opt) and Ag (>100 opt). White ores are subdivided into three groups by the dominant gangue mineralogy: white carbonate, white siliceous, and white baritic ore. These ores tend to be base-metal poor and precious-metal rich. Major sulfide minerals are pyrite, sphalerite, galena, and tetrahedrite/tennanite.

METHOD OF PREPARATION:

Reject ore material was dried, crushed, pulverized, and then passed through a 270-mesh screen. The +270 material was discarded. The -270 material was mixed for 5 days in a double-cone mixer. Splits were taken and sent to 15 commercial laboratories for round robin assaying.

Assay Procedures:

Au: 30 gr. fire assay pre-concentration, AA or ICP finish.
Ag: Fire assay pre-concentration, gravimetric finish.
Ag, Cu, Pb, Zn, Fe: 4-acid digestion, AA or ICP finish.

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 database. 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.

Quality Assurance and Quality Control Procedures:

Screening Test: After completion of homogenization, three samples, 300g each of homogenized material was randomly collected and was re-screened by a testing sieve. Over size material of this standard and based on CDN's screening test was ~%1.0.

Homogeneity Test:

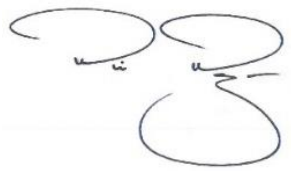
15 samples were selected selectively throughout the batch and were sent to an independent assay Laboratories for Homogeneity testing following directions of Annex B, Homogeneity and Stability of proficiency test items, ISO 13528:2015 Guidelines.

Assay results went through a statistical work-up by checking the mean, standard deviation, and %RSD. Based on performed statistical works outlined by ISO 13528; CDN-ME-2301 is statistically homogenized (Appendix III).

LEGAL NOTICE:

This certificate and the reference material described in it have been prepared with due care and attention. However, CDN Resource Laboratories Ltd. nor Barry Smee accept any liability for any decisions or actions taken following the use of the reference material. Our liability is limited solely to the cost of the reference material.

Certified by



Ali Alizadeh, MSc, MBA, P.Geo.

Geochemist

Dr. Barry Smee, PhD, P. Geo.

APPENDIX I:
Whole rock analysis and 30 element ICP analysis (4-acid digestion) were also conducted on 3 samples.

APPROXIMATE CHEMICAL COMPOSITION (by whole rock analysis):

Analyte	Percent	Analyte	Percent
SiO_2	19.3	**Na_2O**	0.9
Al_2O_3	5.6	**MgO**	4.1
Fe_2O_3	9.8	**K2O**	0.7
CaO	7.1	**TiO_2**	0.2
MnO	0.2	**LOI**	7.4
Total S	10.4	**Total C**	2.4

Participating Laboratories: (not in same order as table of assays)

Activation Labs, Ancaster, Ontario, Canada	Bureau Veritas, Perth, Australia
Activation Labs, Thunder Bay, Ontario, Canada	Bureau Veritas, Vancouver, BC, Canada
ALS, Brisbane, Australia	Certimin S.A., Lima, Peru
ALS, Perth, Australia	MS Analytical, Langley, BC, Canada
ALS Lima, Peru	SGS Lakefield, ON, Canada
ALS, Loughrea, Ireland	SGS, Vancouver, BC, Canada
ALS Reno, NV, USA	Skyline Asseyers, Tucson, Arizona, USA
ALS Canada, North Vancouver, BC, Canada	

APPENDIX II: Results from round-robin assaying:

Sample	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
	Au (g/t) by Fire Assay, 30g sample size and Instrumental finish														
ME-2301	1.31	1.29	NSS	1.325	1.420	1.325	1.300	1.395	1.31	1.389	1.272	1.442	1.354	1.42	1.35
	1.34	1.27	1.335	1.285	1.310	1.325	1.310	1.270	1.36	1.379	1.241	1.407	1.416	1.37	1.28
	1.26	1.30	1.270	1.340	1.375	1.200	1.330	1.360	1.36	1.485	1.217	1.379	1.344	1.41	1.32
	1.35	1.36	1.320	1.395	1.300	1.310	1.295	1.295	1.35	1.464	1.285	1.456	1.392	1.21	1.23
	1.42	1.34	1.310	1.375	1.300	1.280	1.330	1.375	1.38	1.500	1.288	1.473	1.352	1.34	1.30
	1.35	1.35	1.350	1.275	1.315	1.285	1.240	1.400	1.29	1.289	1.221	1.434	1.346	1.35	1.26
	1.27	1.32	1.315	1.305	1.310	1.235	1.310	1.295	1.29	1.307	1.277	1.393	1.326	1.34	1.32
	1.33	1.28	1.340	1.405	1.295	1.375	1.380	1.280	1.29	1.348	1.271	1.446	1.309	1.34	1.28
	1.31	1.34	1.290	1.340	1.400	1.310	1.315	1.330	1.34	1.310	1.222	1.403	1.282	1.35	1.33
	1.34	1.25	1.380	1.370	1.320	1.315	1.405	1.345	1.40	1.411	1.245	1.435	1.349	1.27	1.28
Mean	1.33	1.31	1.323	1.342	1.335	1.296	1.322	1.335	1.34	1.388	1.254	1.427	1.347	1.34	1.30
Std. Devn.	0.05	0.04	0.03	0.04	0.05	0.05	0.05	0.05	0.04	0.08	0.03	0.03	0.04	0.06	0.04
% RSD	3.40	2.86	2.47	3.34	3.44	3.81	3.44	3.59	2.99	5.50	2.22	2.10	2.82	4.60	2.78
	Ag (g/t) by Fire Assay, 30g sample size and Gravimetric finish														
ME-2301	323	353	312	314	313	311	325	311	311	310	321	324	346	341	324
	322	325	315	317	315	309	328	309	322	315	328	319	343	336	321
	388	330	315	313	313	308	326	317	319	320	326	325	337	325	301
	312	368	315	313	312	307	323	311	320	315	326	324	347	329	297
	313	376	315	314	312	310	327	316	312	311	321	311	337	327	318
	330	358	313	314	309	315	324	322	323	311	321	332	349	329	334
	319	333	313	328	315	312	323	308	315	305	327	326	346	321	332
	320	370	312	315	310	309	324	NSS	312	313	322	334	349	343	316
	318	363	317	315	311	310	325	307	315	318	320	324	353	327	313
	321	358	310	312	316	315	325	307	306	314	327	337	333	329	315
Mean	327	353	314	316	313	311	325	312	316	313	324	326	344	331	317
Std. Devn.	22.16	17.96	2.06	4.60	2.27	2.72	1.63	5.220	5.44	4.26	3.14	7.50	6.39	7.06	11.82
% RSD	6.79	5.08	0.66	1.46	0.73	0.87	0.50	1.673	1.72	1.36	0.97	2.30	1.86	2.13	3.73
	Ag (g/t) by 4 Acid digestion /Instrumental finish														
ME-2301	327	332	328	313	338	336	334	330	337	340	329	318	> 150.0	300	311
	325	331	331	323	335	336	335	326	358	342	328	323	> 150.0	300	316
	328	341	330	328	334	336	343	320	354	335	325	334	> 150.0	300	314
	328	331	329	324	338	338	327	321	350	334	327	320	> 150.0	300	313
	320	332	330	321	333	334	336	323	344	331	323	325	> 150.0	300	314
	324	321	333	331	328	332	342	322	348	334	322	319	> 150.0	300	309
	331	329	329	325	335	333	340	323	338	334	329	318	> 150.0	300	320
	321	329	331	326	329	346	333	322	343	335	321	321	> 150.0	300	309
	336	335	329	325	339	340	331	326	342	335	328	324	> 150.0	300	314
	331	321	330	328	337	342	336	322	349	334	326	328	> 150.0	300	315
Mean	327	330	330	324	335	337	336	324	346	335	326	323		300	314
Std. Devn.	4.86	5.96	1.41	4.90	3.75	4.32	4.95	2.991	6.75	3.20	2.94	5.06		0.00	3.31
% RSD	1.49	1.80	0.43	1.51	1.12	1.28	1.47	0.924	1.95	0.96	0.90	1.57		0.00	1.06

Cu (%) by 4 Acid digestion Instrumental finish															
ME-2301	0.269	0.262	0.270	0.269	0.275	0.269	0.278	0.277	0.261	0.278	0.257	0.266	0.271	0.28	0.263
	0.268	0.265	0.270	0.273	0.273	0.270	0.278	0.274	0.271	0.281	0.253	0.264	0.273	0.27	0.264
	0.265	0.263	0.270	0.272	0.275	0.265	0.281	0.272	0.268	0.277	0.254	0.268	0.275	0.27	0.264
	0.270	0.268	0.266	0.274	0.275	0.270	0.275	0.273	0.268	0.275	0.252	0.264	0.273	0.27	0.263
	0.269	0.261	0.269	0.273	0.275	0.268	0.277	0.276	0.269	0.274	0.254	0.268	0.273	0.27	0.263
	0.266	0.261	0.266	0.275	0.271	0.268	0.278	0.274	0.270	0.274	0.258	0.261	0.272	0.28	0.261
	0.274	0.267	0.270	0.271	0.275	0.270	0.279	0.276	0.261	0.274	0.252	0.266	0.270	0.28	0.265
	0.269	0.268	0.273	0.271	0.274	0.272	0.277	0.276	0.267	0.278	0.253	0.266	0.271	0.27	0.262
	0.276	0.267	0.270	0.270	0.277	0.272	0.277	0.274	0.268	0.275	0.258	0.268	0.271	0.28	0.262
	0.271	0.258	0.267	0.273	0.274	0.271	0.278	0.275	0.264	0.276	0.257	0.271	0.271	0.28	0.265
Mean	0.270	0.264	0.269	0.272	0.274	0.270	0.278	0.275	0.267	0.276	0.255	0.266	0.272	0.28	0.263
Std. Devn.	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.002	0.002	0.003	0.002	0.005	0.001
% RSD	1.237	1.324	0.811	0.681	0.575	0.787	0.558	0.570	1.323	0.833	0.958	1.045	0.574	1.917	0.500
Pb (%) by 4 Acid digestion Instrumental finish															
ME-2301	2.61	2.91	2.51	2.54	2.56	2.57	2.67	2.57	2.37	2.61	2.57	2.44	1.82	2.33	2.68
	2.63	2.91	2.51	2.56	2.55	2.56	2.61	2.54	2.52	2.63	2.61	2.42	1.89	2.09	2.65
	2.64	2.95	2.51	2.57	2.55	2.55	2.65	2.54	2.38	2.56	2.59	2.51	1.82	1.98	2.62
	2.60	2.95	2.50	2.56	2.55	2.58	2.69	2.51	2.49	2.58	2.59	2.31	1.82	2.17	2.62
	2.62	2.89	2.53	2.56	2.56	2.56	2.68	2.57	2.28	2.58	2.63	2.45	1.84	2.40	2.63
	2.60	2.88	2.52	2.55	2.52	2.54	2.66	2.51	2.35	2.54	2.62	2.46	1.90	2.18	2.62
	2.64	2.91	2.52	2.58	2.58	2.56	2.70	2.55	2.49	2.55	2.62	2.43	1.83	2.36	2.59
	2.60	2.94	2.53	2.54	2.55	2.60	2.69	2.54	2.55	2.52	2.67	2.45	1.90	2.29	2.66
	2.65	2.95	2.53	2.53	2.57	2.59	2.67	2.54	2.46	2.53	2.61	2.52	1.90	2.16	2.64
	2.62	2.90	2.51	2.56	2.55	2.58	2.67	2.55	2.49	2.52	2.62	2.47	1.83	2.29	2.62
Mean	2.62	2.92	2.52	2.56	2.55	2.57	2.67	2.54	2.44	2.56	2.61	2.45	1.86	2.23	2.63
Std. Devn.	0.02	0.03	0.01	0.02	0.02	0.02	0.03	0.02	0.09	0.04	0.03	0.06	0.04	0.13	0.03
% RSD	0.71	0.91	0.42	0.59	0.62	0.72	0.96	0.80	3.58	1.47	1.04	2.35	2.01	5.91	0.96
Zn (%) by 4 Acid digestion Instrumental finish															
ME-2301	4.44	4.34	4.41	4.37	4.39	4.37	4.41	4.42	4.38	4.64	4.53	4.32	4.60	4.55	4.44
	4.47	4.37	4.41	4.40	4.39	4.38	4.35	4.38	4.48	4.66	4.54	4.28	4.54	4.52	4.43
	4.47	4.35	4.43	4.41	4.44	4.34	4.38	4.37	4.48	4.62	4.48	4.36	4.58	4.55	4.37
	4.41	4.38	4.39	4.46	4.39	4.40	4.35	4.37	4.43	4.58	4.51	4.36	4.54	4.45	4.40
	4.44	4.29	4.42	4.42	4.41	4.37	4.38	4.41	4.42	4.61	4.48	4.39	4.58	4.49	4.39
	4.42	4.31	4.40	4.45	4.36	4.36	4.40	4.40	4.50	4.58	4.48	4.34	4.63	4.51	4.32
	4.45	4.34	4.43	4.39	4.40	4.38	4.42	4.42	4.42	4.59	4.50	4.38	4.62	4.50	4.32
	4.42	4.36	4.44	4.39	4.42	4.40	4.41	4.42	4.47	4.61	4.50	4.37	4.63	4.53	4.35
	4.47	4.35	4.42	4.39	4.42	4.42	4.38	4.41	4.40	4.57	4.53	4.35	4.63	4.52	4.36
	4.44	4.28	4.39	4.43	4.37	4.40	4.42	4.41	4.39	4.60	4.46	4.41	4.56	4.54	4.34
Mean	4.44	4.34	4.41	4.41	4.40	4.38	4.39	4.40	4.44	4.61	4.50	4.36	4.59	4.52	4.37
Std. Devn.	0.02	0.03	0.02	0.03	0.02	0.02	0.03	0.02	0.04	0.03	0.03	0.04	0.04	0.03	0.04
% RSD	0.50	0.77	0.39	0.65	0.55	0.54	0.60	0.46	0.96	0.62	0.59	0.85	0.79	0.68	0.97

Notes:

Ag results assayed by fire assay, with gravimetric finish from Labs 2 and 13 were removed for failing the t test.
Ag results assayed by 4 Acid digestion with ICP finish from Lab 14 were removed for failing the t test.
Cu results assayed by 4 Acid digestion with ICP finish from Lab 11 were removed for failing the t test.
Pb results assayed by 4 Acid digestion with instrumental finish from Labs 2, 13 and 14 were removed for failing the t test.
Zn results assayed by 4 Acid digestion with instrumental finish from Lab 10 and 13 were removed for failing the t test.

APPENDIX III: QAQC

Table below illustrates percentages of over size (+275 mesh) material in CDN-ME-2301

Standard	Study Date	Total weight Screened (g)	Total weight Over size (g)	Percentage
ME-2301	May 12 2023	300	3	1.0%
	May 12 2023	300	2.5	0.8%
	May 12 2023	300	3	1.0%

Table below shows homogeneity test results of CDN-ME-2301

	Au Original	Au Repeat	Between Sample Variance Wt	Sample Avg. Xt	Stdev of Sample Avg	Within-Sample Std.
ME-2301	1.345	1.345	0.000	1.345	0.000	0.000
	1.359	1.427	0.068	1.393	0.002	0.005
	1.320	1.382	0.062	1.351	0.000	0.004
	1.331	1.305	0.026	1.318	0.001	0.001
	1.307	1.353	0.046	1.330	0.001	0.002
	1.375	1.260	0.115	1.318	0.001	0.013
	1.372	1.357	0.015	1.365	0.000	0.000
	1.425	1.278	0.147	1.352	0.000	0.022
	1.438	1.286	0.152	1.362	0.000	0.023
	1.337	1.359	0.022	1.348	0.000	0.000
	1.396	1.261	0.135	1.329	0.001	0.018
	1.372	1.351	0.021	1.362	0.000	0.000
	1.316	1.458	0.142	1.387	0.001	0.020
	1.373	1.361	0.012	1.367	0.000	0.000
	1.418	1.329	0.089	1.374	0.000	0.008
Statistics			**Gavg**	**SX**	**SS**	
Mean	1.366	1.341	**1.353**	**0.062**	**0.038**	
SD	0.0406	0.0569	**C**	**C SQRT**		
RSD	2.976	4.247	**0.0037**	**0.06**		
Proof of Homogeneity	Based on Statistical procedures outlined in Annex B, ISO 13528:2015 guidelines, If "SS is < square root of C" Standard is considered homogeneous. **ME-2301 is statistically homogenous**					

APPENDIX IV: General Notes

Intended Use

This Certified Reference Material, fit for use as a control sample in routine assay laboratory quality control when inserted within runs of test samples and measured in parallel to test samples. This material can also be used for method development, use as independent calibration verification check standard or for validation of accuracy in a method validation exercise.

This CRM can also be used to assess inter-laboratory or instrument bias and establish within-laboratory precision and within-laboratory reproducibility. The certified concentrations and expanded uncertainty for this material are property values based on an inter-laboratory measurement campaign and reflect consensus results from the laboratories that took part in the exercise.

Handling

Do not use if the seal is broken or there are any signs of contamination.

The material is packaged in either Tin Tie envelopes, foil envelopes or jars that must be shaken before use.

Storage information

The material should be stored in a dry place, in such a way that it does not compromise the integrity of the CRM. The material should be stored in conditions which will ensure it does not absorb moisture.

Certificate is not valid if re-packaged by a third party.

Metrological Traceability

The values quoted herein are based on the consensus values derived from statistical analysis of the data from an inter-laboratory measurement program. Traceability to SI units is via the standards used by the individual laboratories all of which are accredited to the ISO17025 general requirements for the competence of testing and calibration laboratories and who have maintained measurement traceability during the analytical process.

Period of Validity

The certified values are valid for this product, while still sealed in its original packaging, until notification to the contrary. The stability of the material will be subject to continuous testing for every five years of the duration of the inventory. Should product stability become an issue, all customers will be notified and notification to that effect will be placed on the http://www.cdnlabs.com/ website.

Minimum Sample Size

Most of the laboratory's reporting used a 0.5g sample size for the ICP and a 30g sample size for the fire assay. Our certified gold values are based on 30 g Fire Assay determinations. For optimal results, we strongly recommend you assay our standards with similar methods using "at least" 30 g of material. Using a smaller sample weight may result in erratic values. These are the recommended minimum sample sizes for the use of this material.