Electronic Supplementary Material (ESI) for Analyst

A New Quantitative Method for Gunshot Residue Analysis by Ion Beam Analysis: Supporting Information

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Background Subtraction Protocol

	Sample stub																
Element	OG3	OG4	OG6	OG8	OG16	OG18	OG19	OG21	OG28	OG40	OG45	SP1	SP2	SP3	SP4	SP5	Worst
P	873	1211	1652	813	689	1578	1224	972	906	519	592	3938	4195	-	-	-	4195
S	3515	5120	7109	3760	2868	7145	5258	4069	4025	2938	2423	1891	364	3274	3627	4543	7145
Cl	73	163	129	65	-	162	149	83	-	392	-	502	198	-	-	651	651
K	42	85	442	119	42	103	70	42	52	113	105	237	142	-	158	-	442
Ca	-	-	-	-	-	-	-	-	-	-	-	-	-	113	-	-	113
Cu	105	183	1064	322	77	178	27	65	78	568	210	262	-	-	130	-	1064
Zn	-	-	47	76	-	-	-	-	-	-	-	-	-	-	-	-	76
Ba	81	-	580	116	-	-	-	-	-	-	-	-	-	-	-	-	580
Pb	-	-	1523	214	-	-	-	-	-	-	-	-	-	-	-	-	1523

Figure S1: Extracted concentration results from blank spots on the carbon tabs. Red highlights indicate the highest concentration found which are compiled into a 'Worst case scenario' stub detailed on the far right. Units are mg/kg.

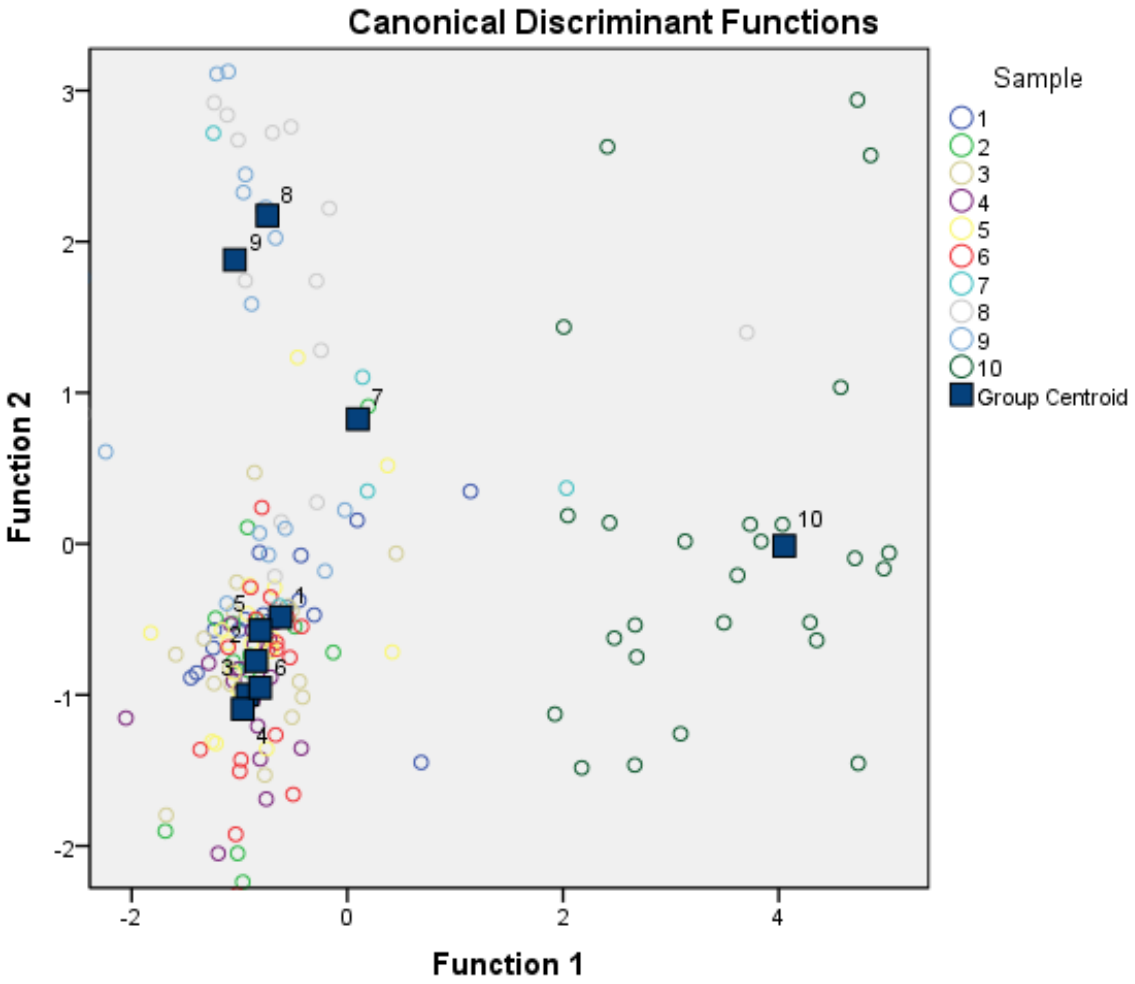

Figure S2: Non-background subtracted CDFA plot

Box Plots Illustrating Elemental Concentrations of Samples Collected From Hands

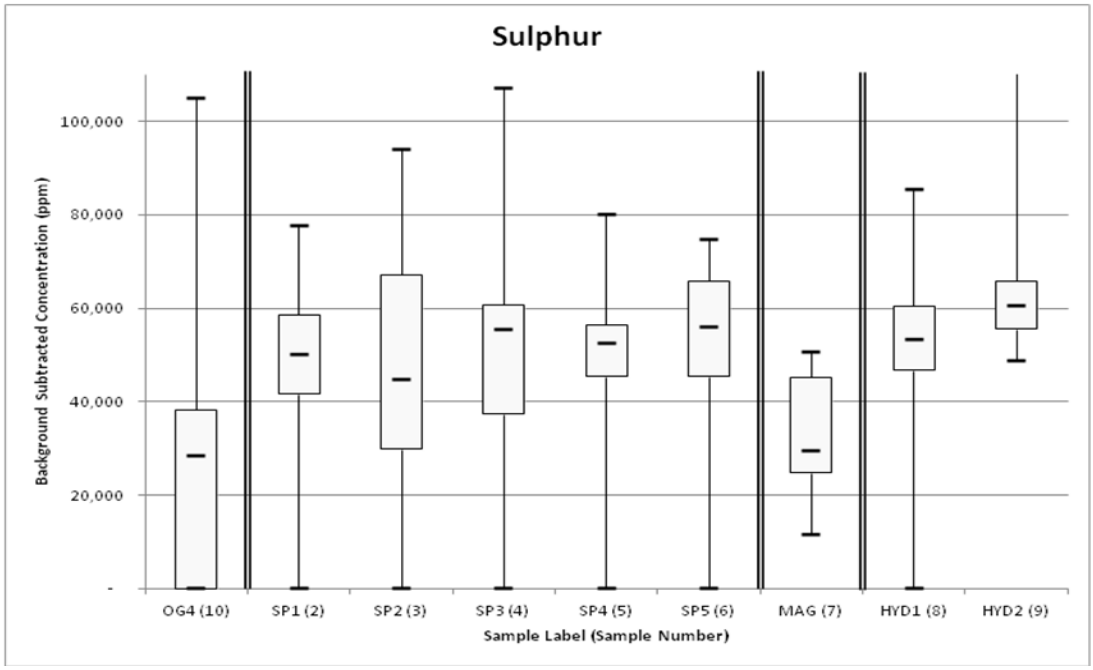

Figure S3: Box plots representing the background subtracted concentrations of Sulphur in the samples studied. The HYD2 (9) sample has an outlier at 433,503.7 ppm.

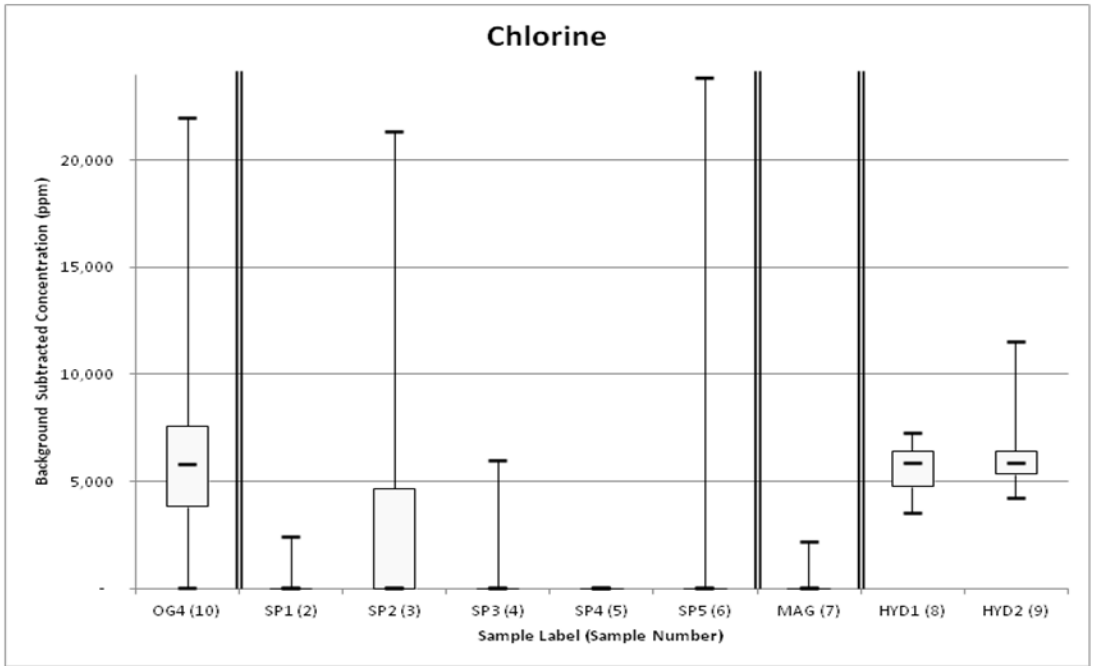

Figure S4: Box plots representing the background subtracted concentrations of Chlorine in the samples studied. Cl was only intermittently detected in the SP samples but consistently in OG4 (10) and the HYD samples (8 & 9).

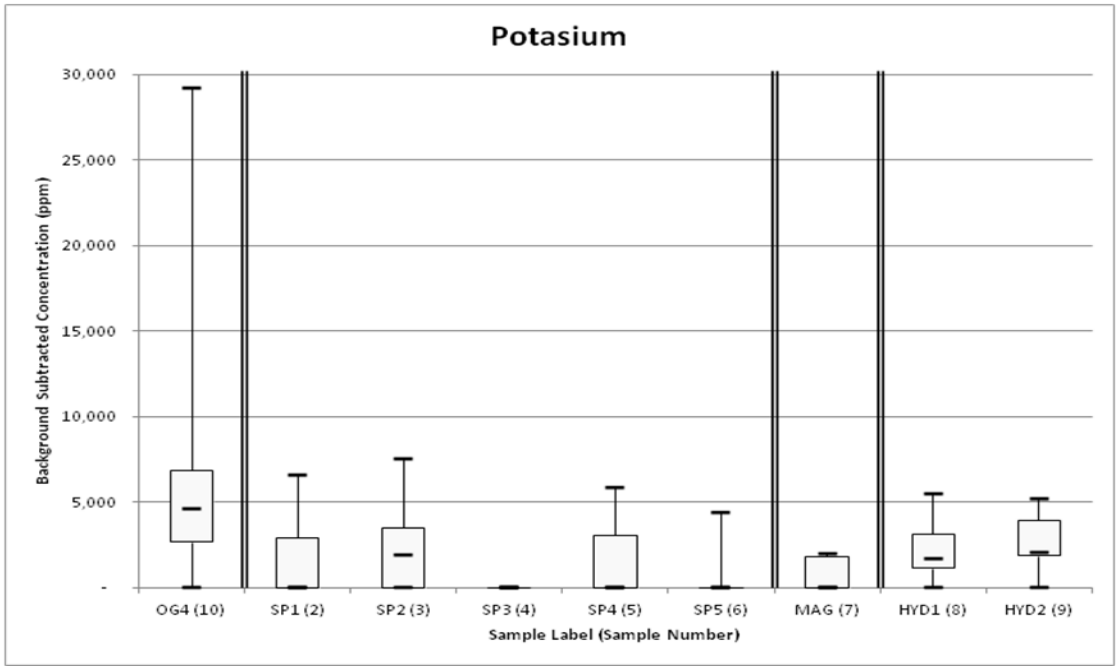

Figure S5: Box plots representing the background subtracted concentrations of Potassium in the samples studied.

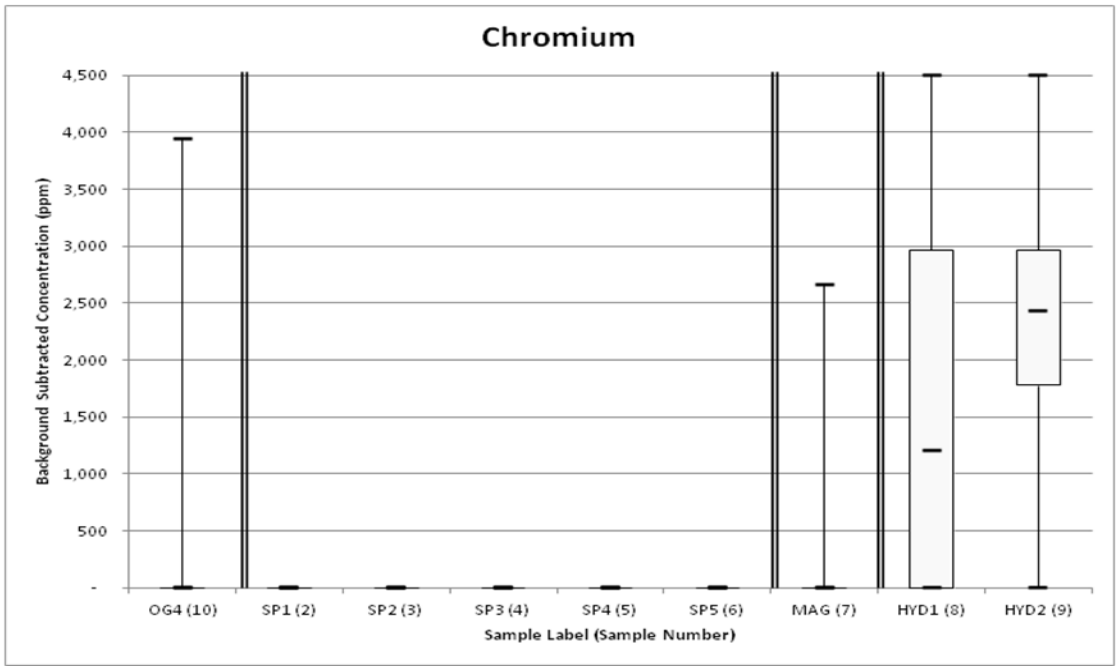

Figure S6: Box plots representing the background subtracted concentrations of Chromium in the samples studied.

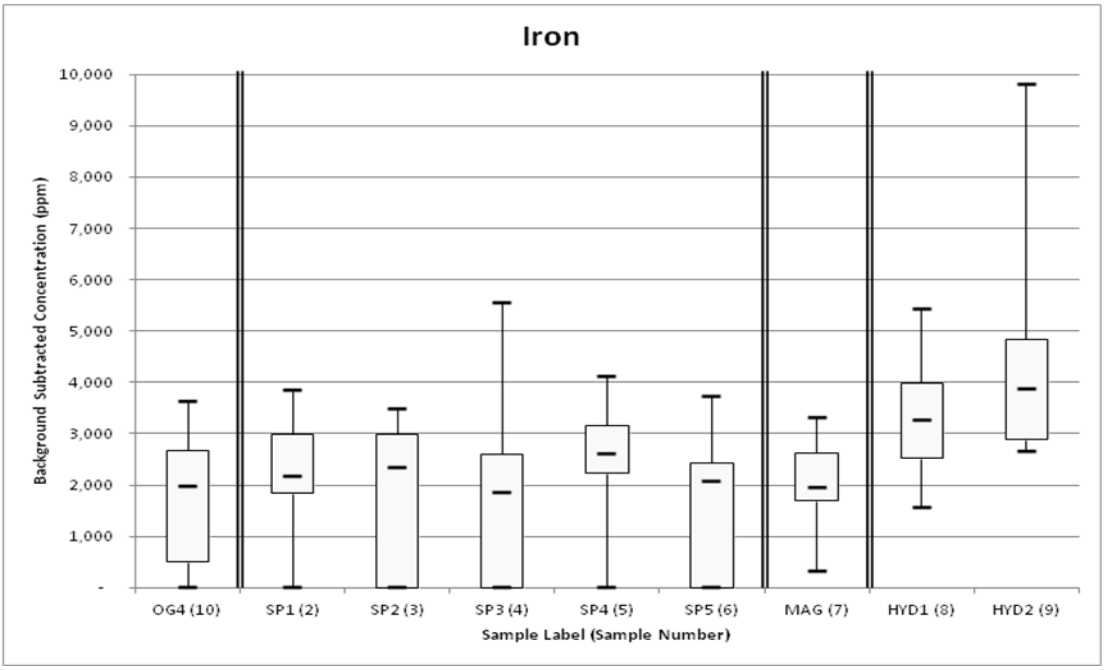

Figure S7: Box plots representing the background subtracted concentrations of Iron in the samples studied.

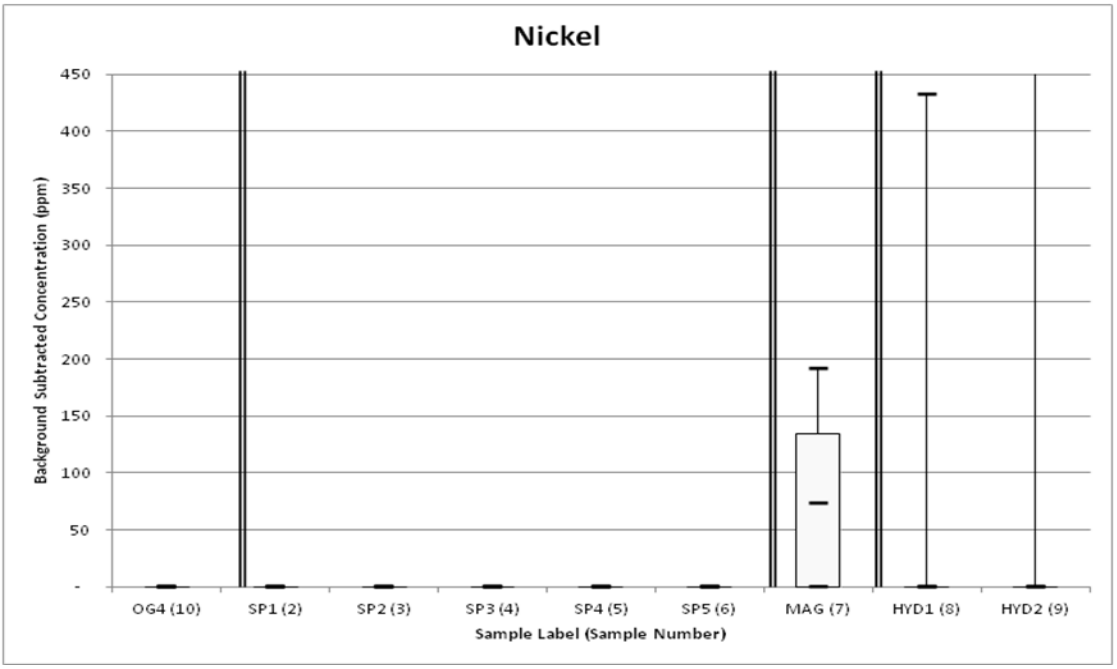

Figure S8: Box plots representing the background subtracted concentrations of Nickel in the samples studied. The HYD2 (9) sample has an outlier at 7,940.3 ppm.

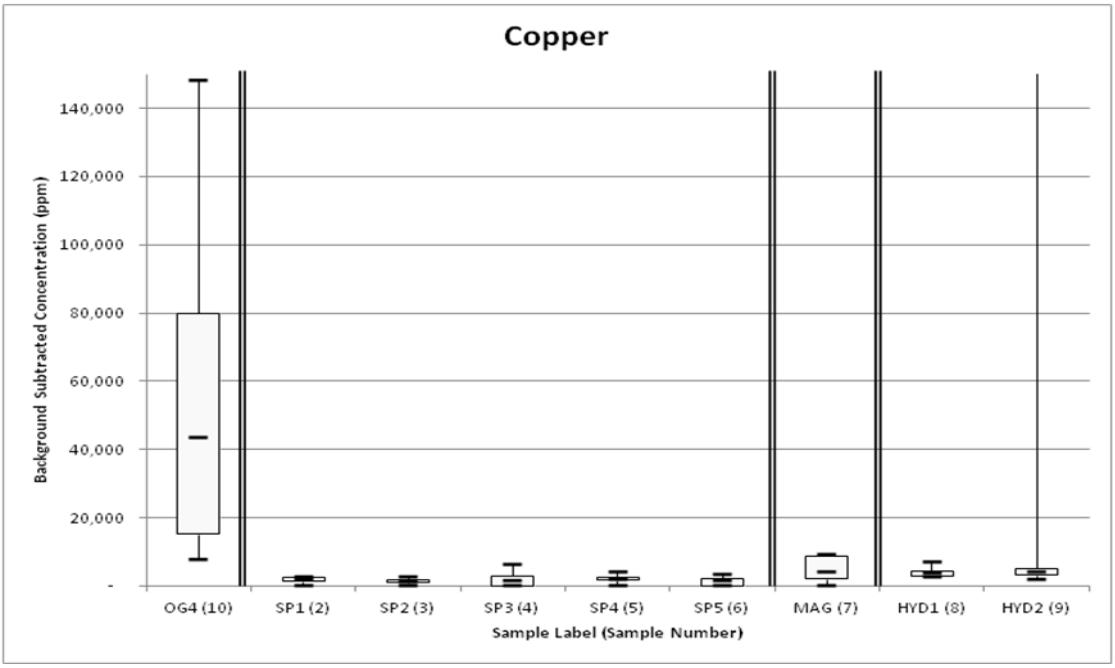

Figure S9: Box plots representing the background subtracted concentrations of Copper in the samples studied. The HYD2 (9) sample has an outlier at 250,278.9 ppm. This figure showcases the large difference in copper concentration between cartridge case samples and hand samples.

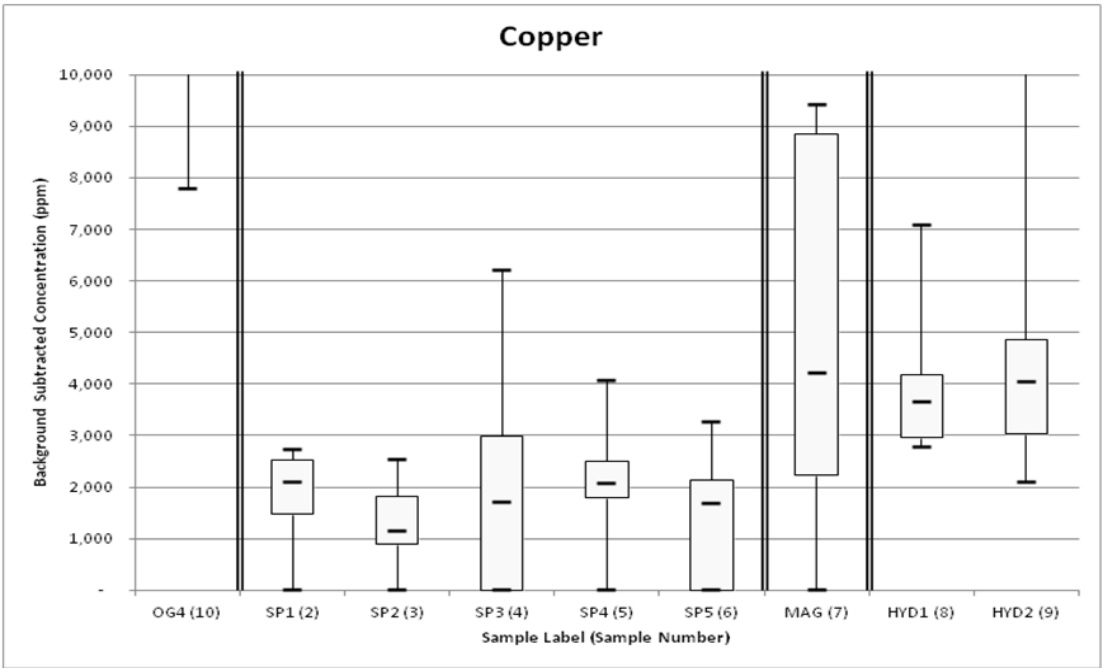

Figure S10: Box plots representing the background subtracted concentrations of Copper in the samples studied. This figure showcases the differences in copper concentration between the hand samples.

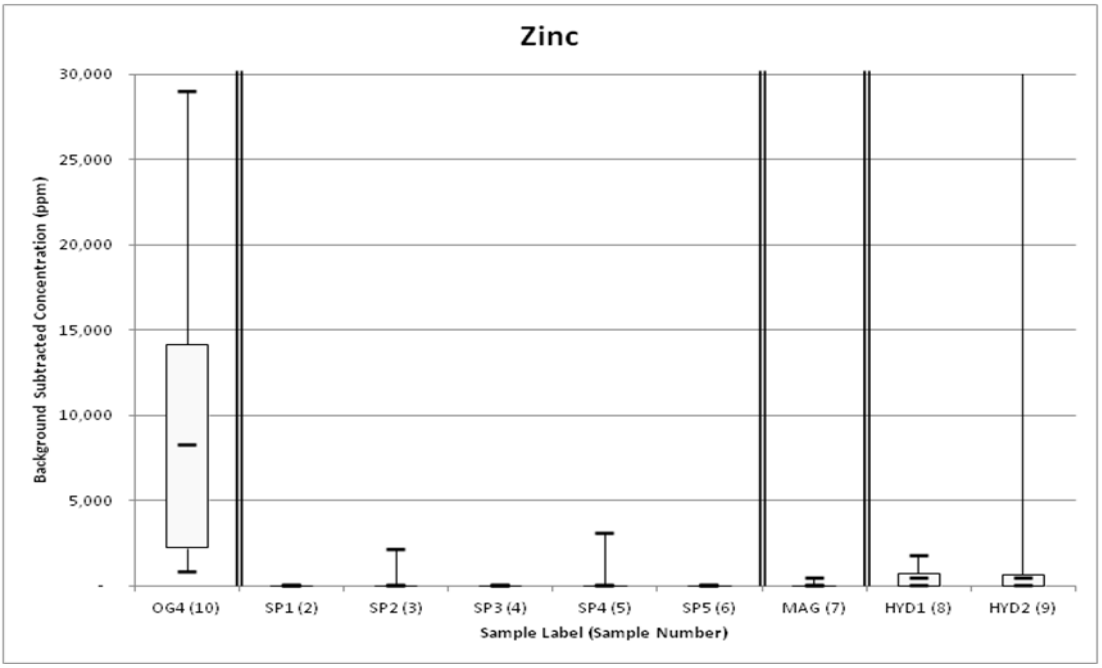

Figure S11: Box plots representing the background subtracted concentrations of Zinc in the samples studied. The HYD2 (9) sample has an outlier at 227,764.1 ppm.

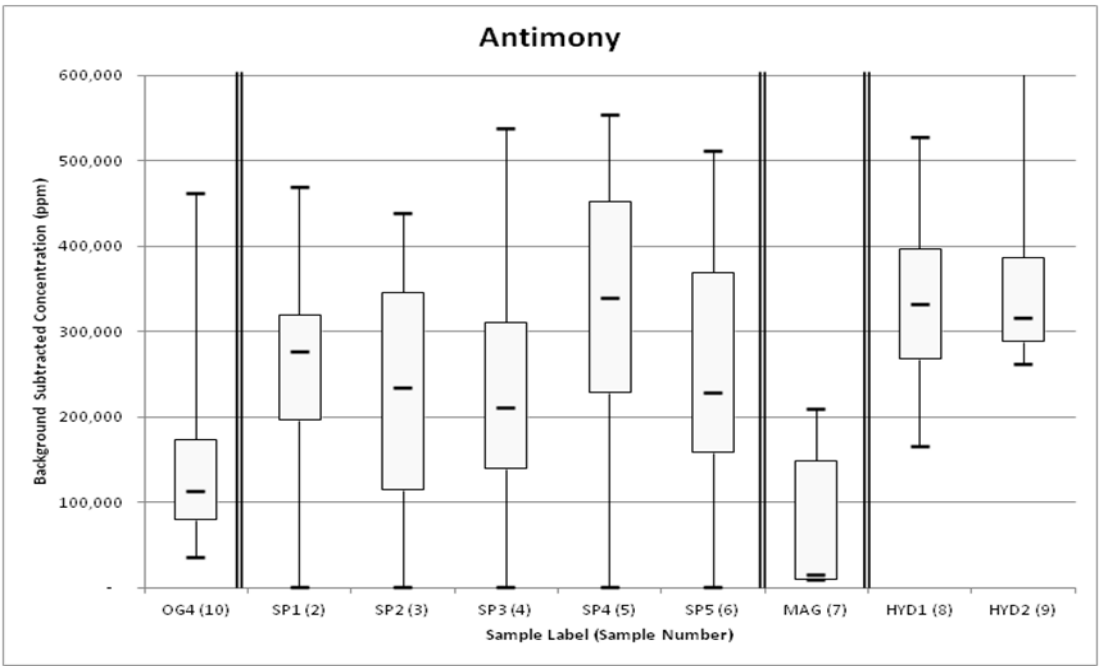

Figure S12: Box plots representing the background subtracted concentrations of Antimony in the samples studied. The HYD2 (9) sample has an outlier at 1,330,323.6 ppm.

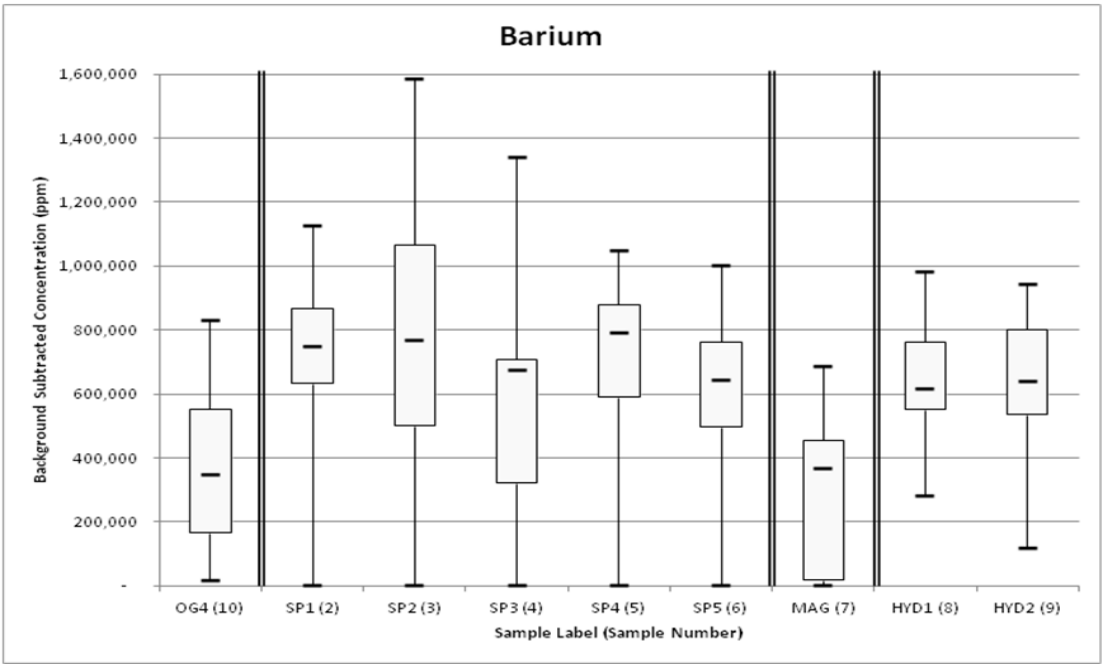

Figure S13: Box plots representing the background subtracted concentrations of Barium in the samples studied.

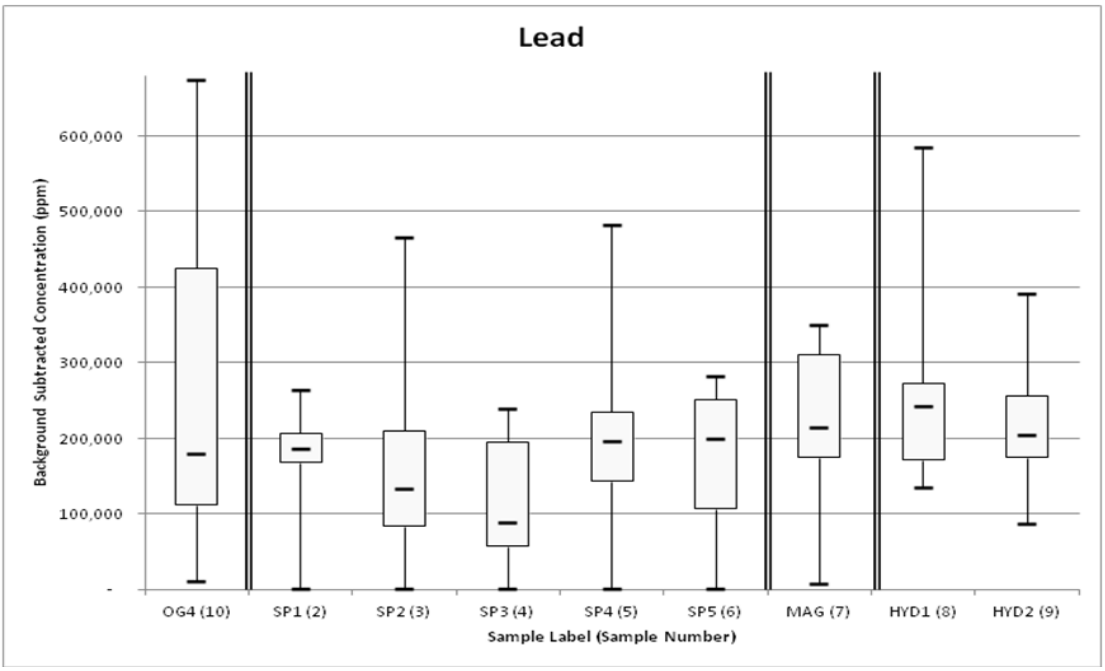

Figure S14: Box plots representing the background subtracted concentrations of Lead in the samples studied.

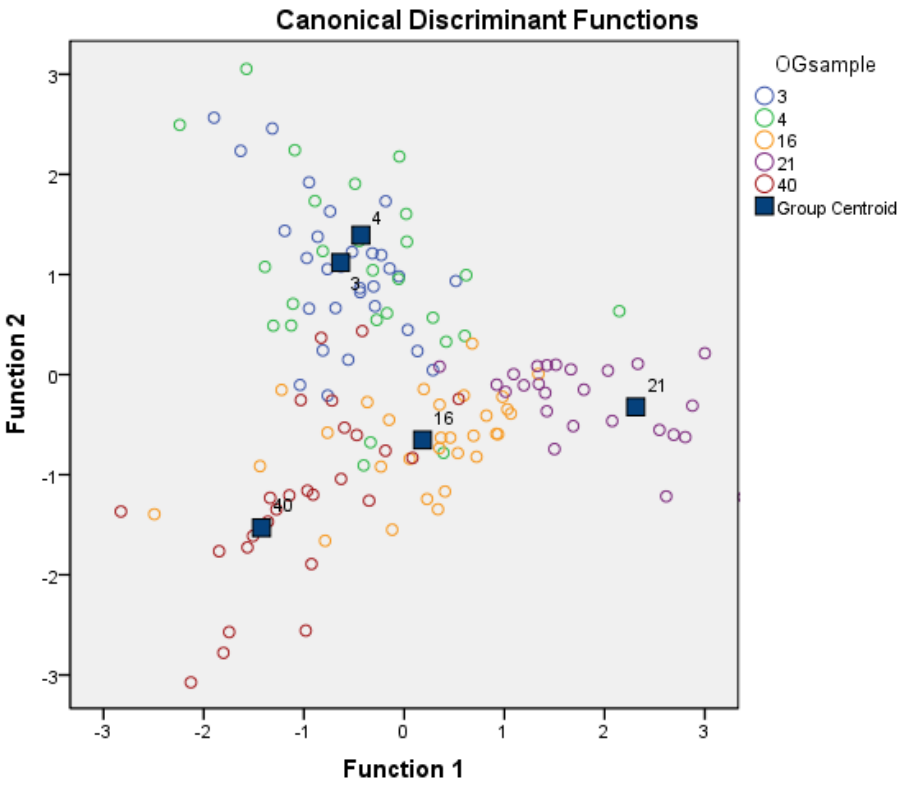

Figure S15: Figure 15: Multivariate CDFA plot of characteristic GSR particles collected from cartridge cases

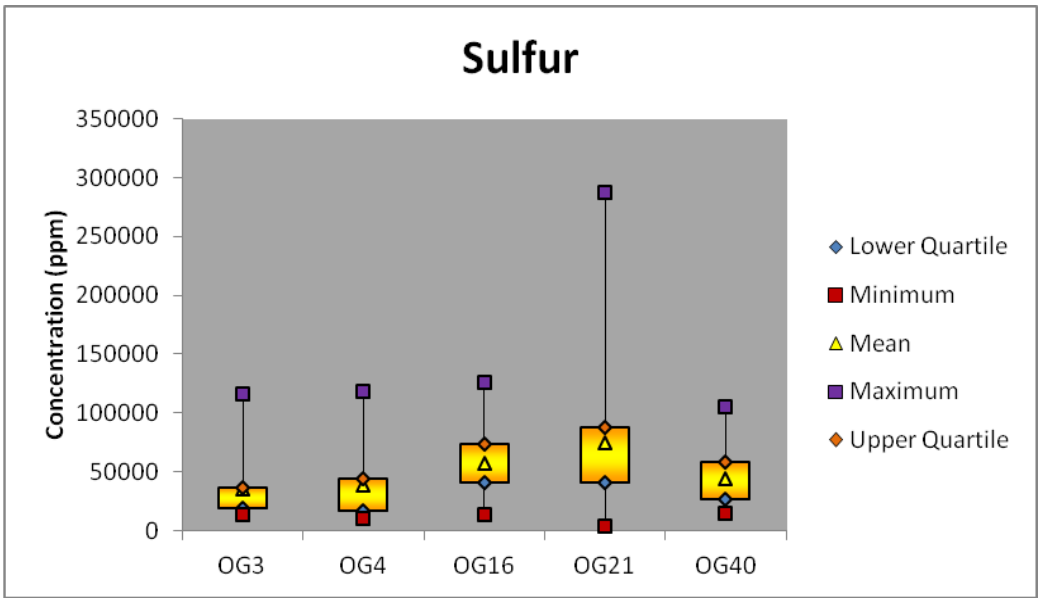

Figure S16: Box plots representing the background subtracted concentrations of S in the cartridge case samples.

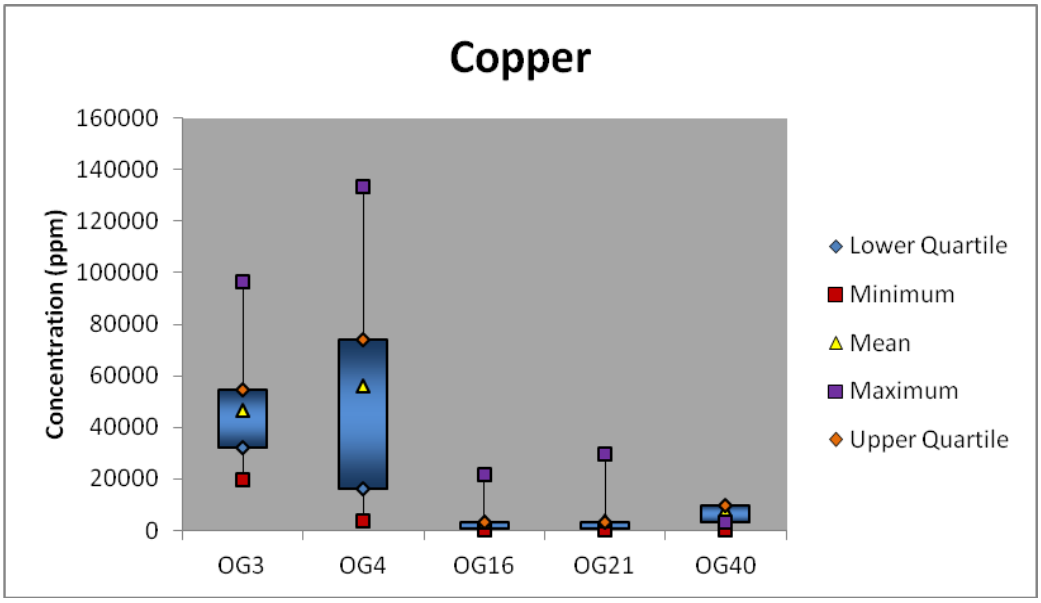

Figure S17: Box plots representing the background subtracted concentrations of Cu in the cartridge case samples.

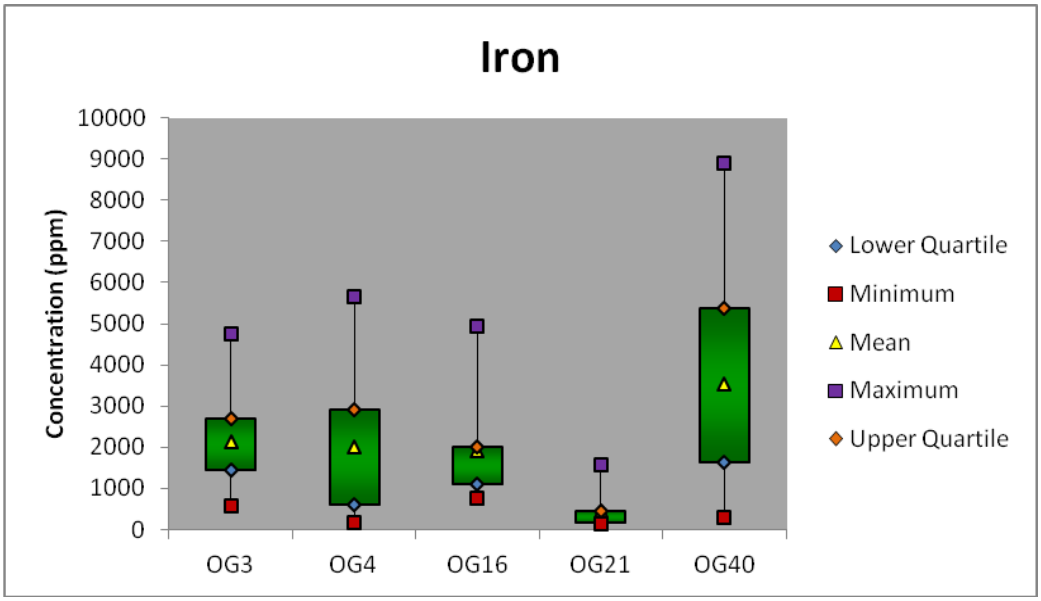

Figure S18: Box plots representing the background subtracted concentrations of Fe in the cartridge case samples.