Geochemical analyses of soils for Molycorp project

Measurements listed in the following chart will be conducted for all soil samples collected for microbial analysis, totaling approximately 25 samples per trench.
General solids characterization will include 400-500 samples total, requiring only cations/metals analysis, XRF, XRD and microprobe analysis and can be split from ground samples prepared for XRF.

Field-based measurements	**Lab-based measurements**					
	Various analyses	Nitrogen analysis	Cations/metals analysis by ICP-OES and ICP-MS			TOC analysis
Soil slurry measurements will be taken at site. Eh, pH and conductivity should be taken at time of sampling.	**250 g in Ziploc bag, sample kept < 4 degrees C with ice packs. Ice is not recommended as melt water can contaminate samples.**	**Same bag listed in previous column, but should be frozen upon receipt at lab if immediate analysis not possible.**	**To prevent contamination, use only stainless steel or plastic tools to collect, store and prepare samples.**	----	**Samples for cation analysis can be split from samples that were dried and ground for XRF.**	**Store in glass bottle with Teflon liners. Can not use low-density polypropylene. See bottom of page.**
Eh / oxidation-reduction potential	alkalinity	nitrate	aluminum	iron	silver	organic carbon
pH / temperature of soil slurry	pH	nitrite	antimony	lead	sodium	
specific conductivity	specific conductivity	ammonia	arsenic	lithium	strontium	
temperature	Br	total Kjeldahl nitrogen	barium	magnesium	sulfur ?? (total)	
	Cl		beryllium	manganese	thallium	
	F		boron	mercury	thorium	
	phosphate		cadmium	molybdenum	tin	
	sulfate		calcium	nickel	titanium	
			chromium	potassium	uranium	
			cobalt	selenium	vanadium	
			copper	silica	zinc	

Specific conductivity - Ability of a solution to conduct an electric current. Dependent on the nature and number of ionic species in that solution. Correlates with the concentration of dissolved minerals.

Alkalinity - Amount of carbonates (CO_3^{2-}) and bicarbonates (HCO_3^-) of Ca, Mg and Na in natural waters.

Organic nitrogen = total Kjeldahl nitrogen - (nitrates + nitrites + ammonia)

For organic carbon < 10 mg/L, collect samples in glass vial with Teflon liners (Fisher Scientific part number specified by Mike Pullin) washed by Mike Pullin's laboratory. Can not use low-density polypropylene for storage!!! Will contaminate samples. High-density polypropylene is OK. Expect to filter to 0.45 um with glass filters specified by Mike Pullin, probably using a surfactant.