



# Geochemical Exploration through Thick Glacial Cover: a Case History from Kwanika, North-Central BC.

by

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Roundup 2010



**Heberlein Geoconsulting**  
*Extracting value from geochemistry*



# The Challenge

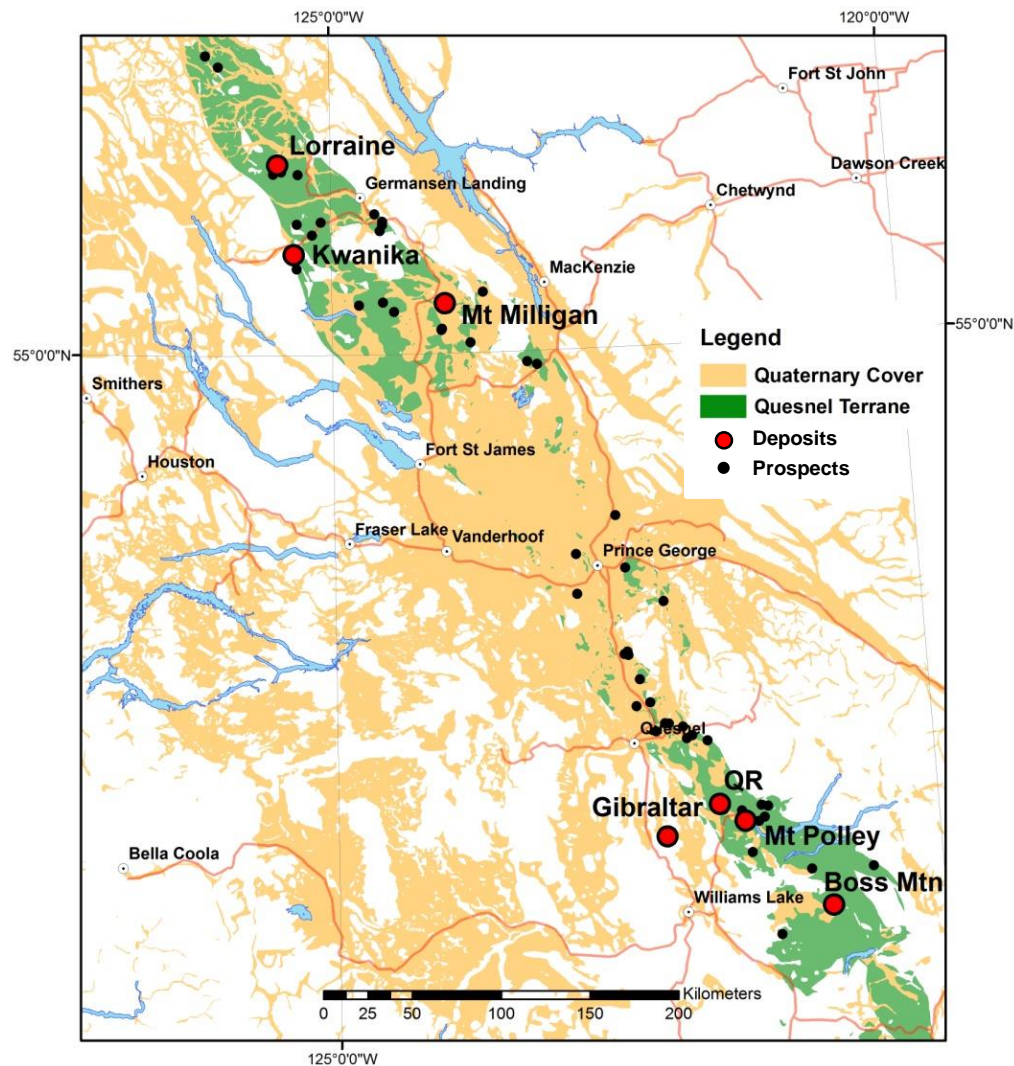


*Nechako River*





# The Challenge



# Why this study?



- A clear need to develop geochemical exploration techniques to see through cover.
- There is a poor understanding of 'Deep Penetrating' Geochemical methods.
- Influenced by laboratories who promote their own often proprietary methods.
- Relative effectiveness of these methods is poorly understood.



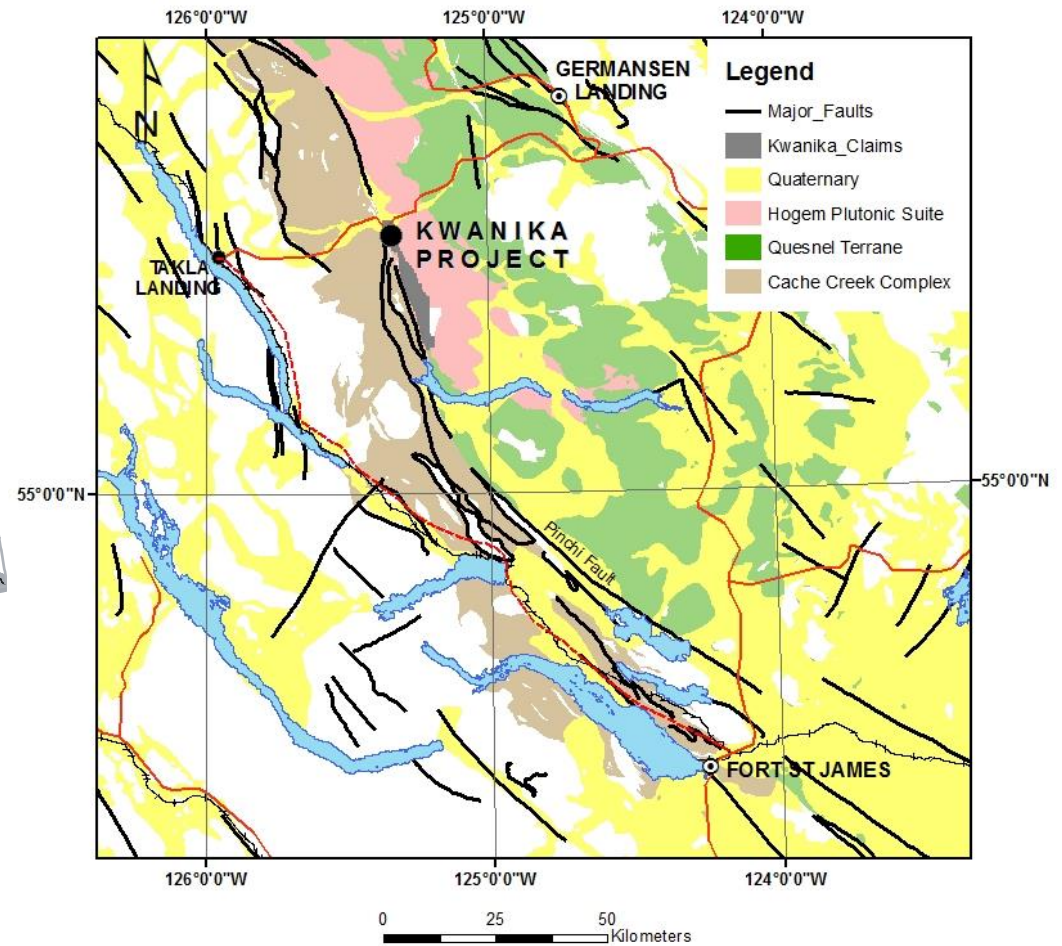
# Questions



- Can soil geochemistry see through glaciofluvial cover?
- Does conventional soil sampling work in this environment?
- Is there any benefit to using laboratory specific methods over 'generic' techniques?
- What is the optimum combination of sample medium and geochemical extraction?



# Location Map/Regional Setting



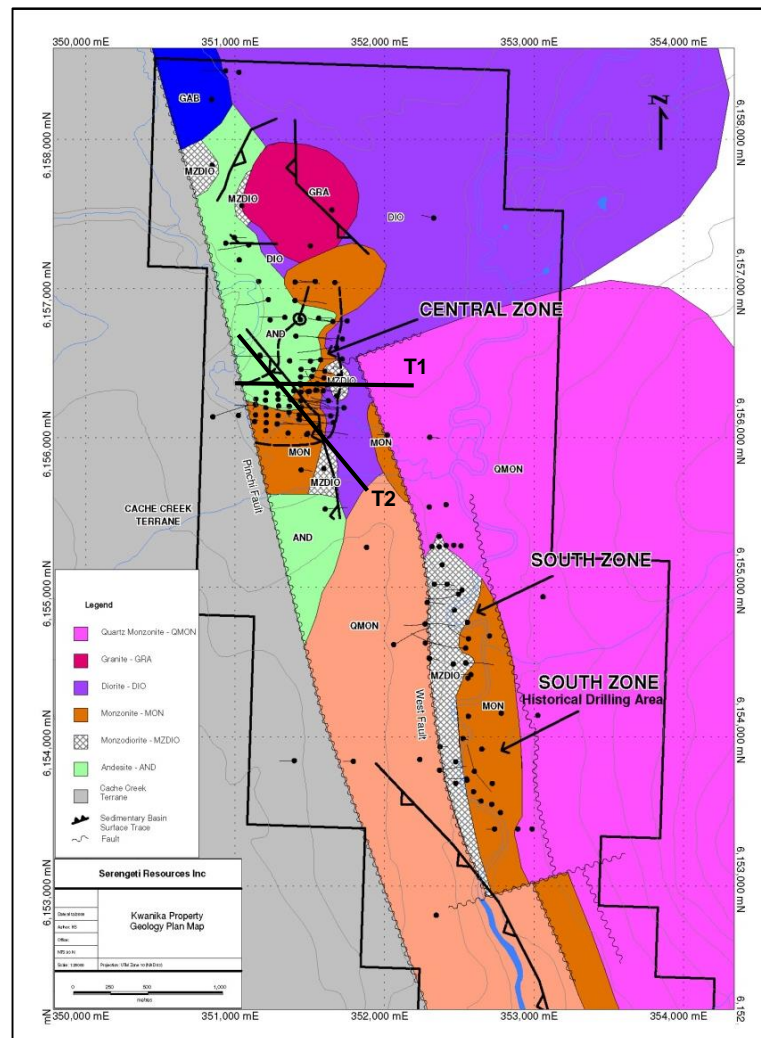


# Property Geology and Targets



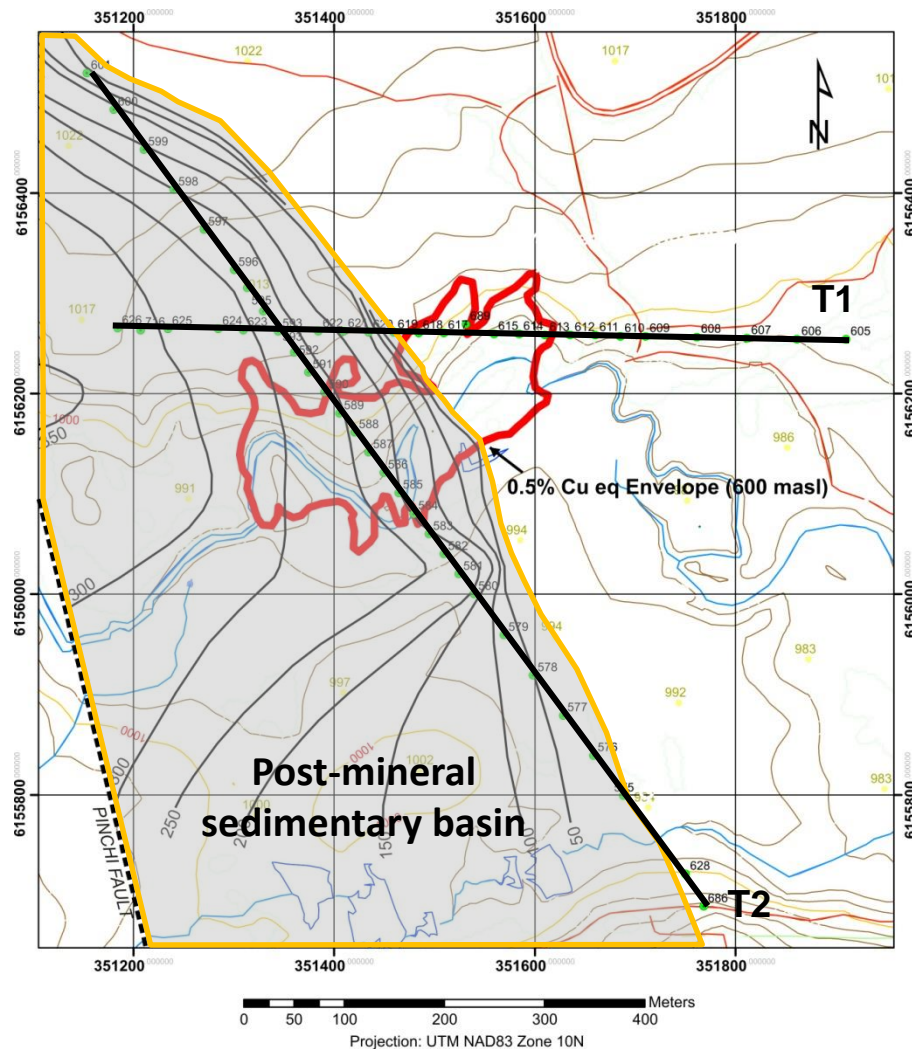
## LEGEND

-  Gabbro
-  Diorite
-  Granite
-  Quartz Monzonite
-  Monzonite
-  Monzodiorite
-  Andesite
-  Cache Creek Terrane



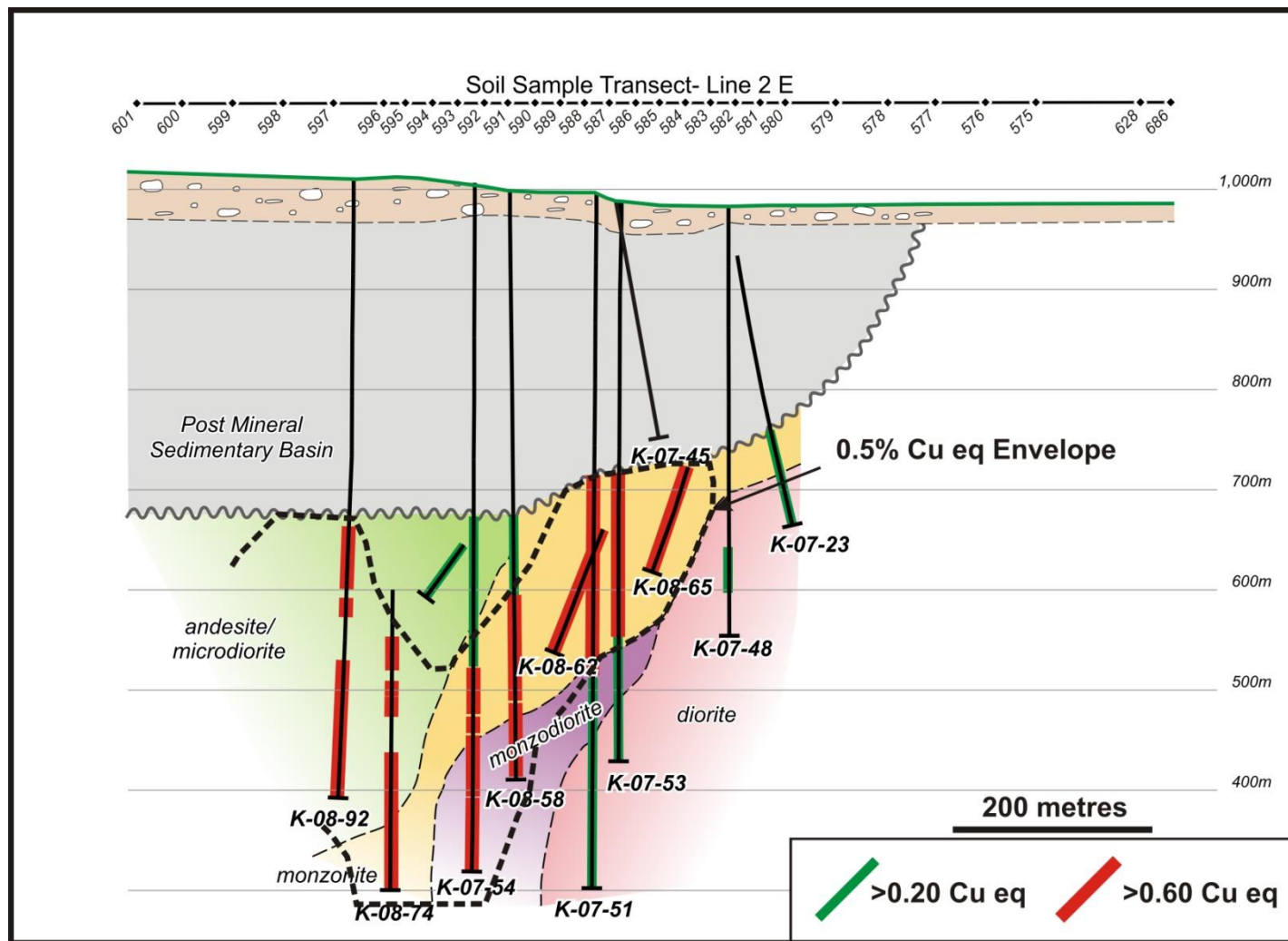
Courtesy of Serengeti Resources Inc.

# Survey Area





# Cross Section of Transect 2



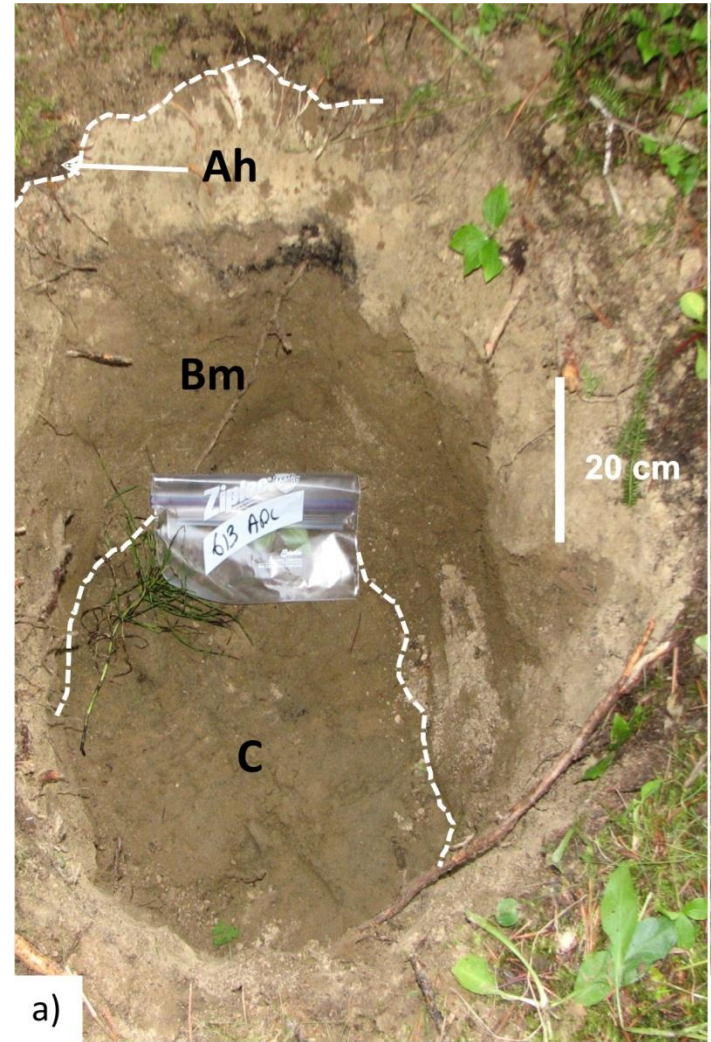
Courtesy of Serengeti Resources Inc.

# Surficial Environment



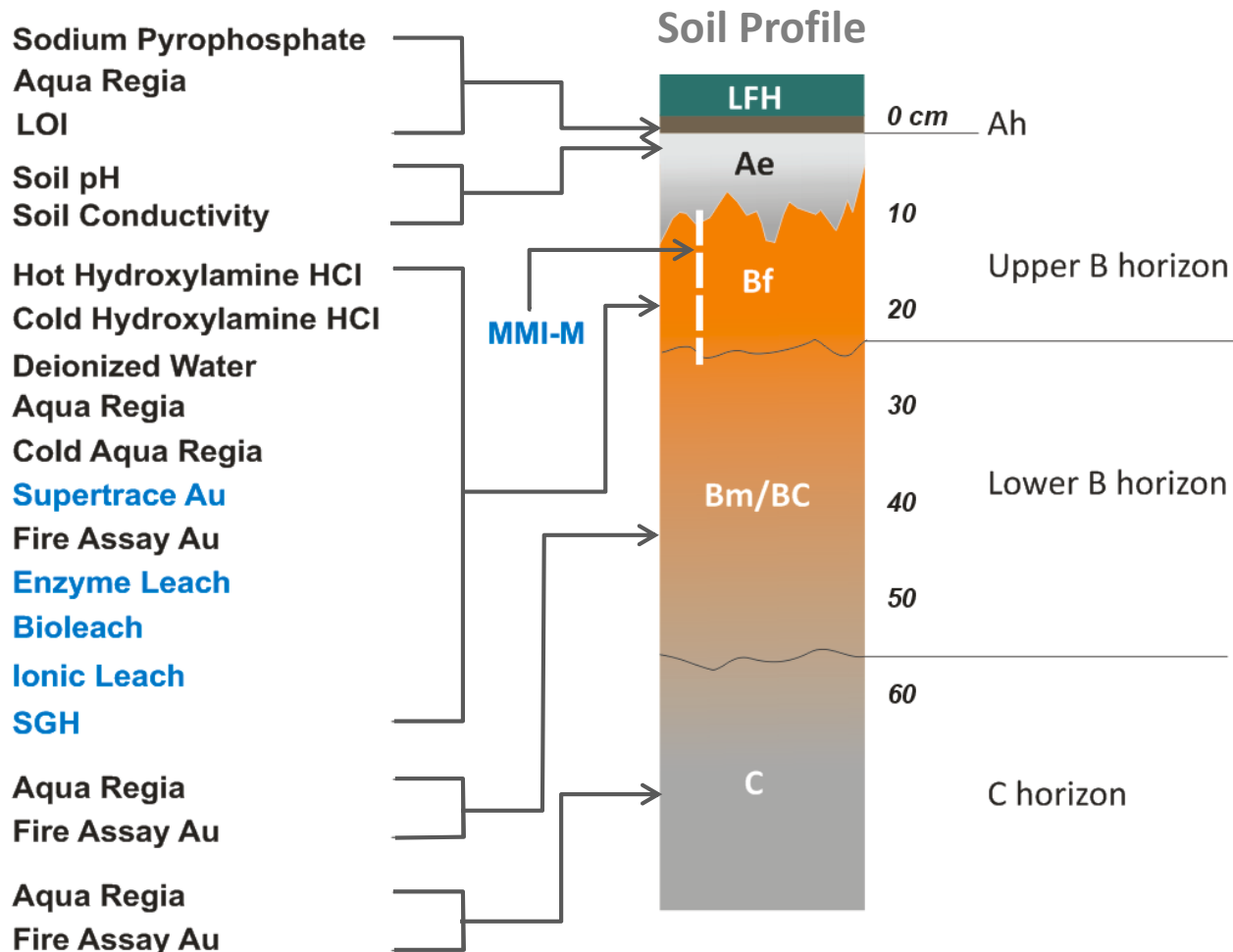


# Soil Profiles





# Sampling and analyses

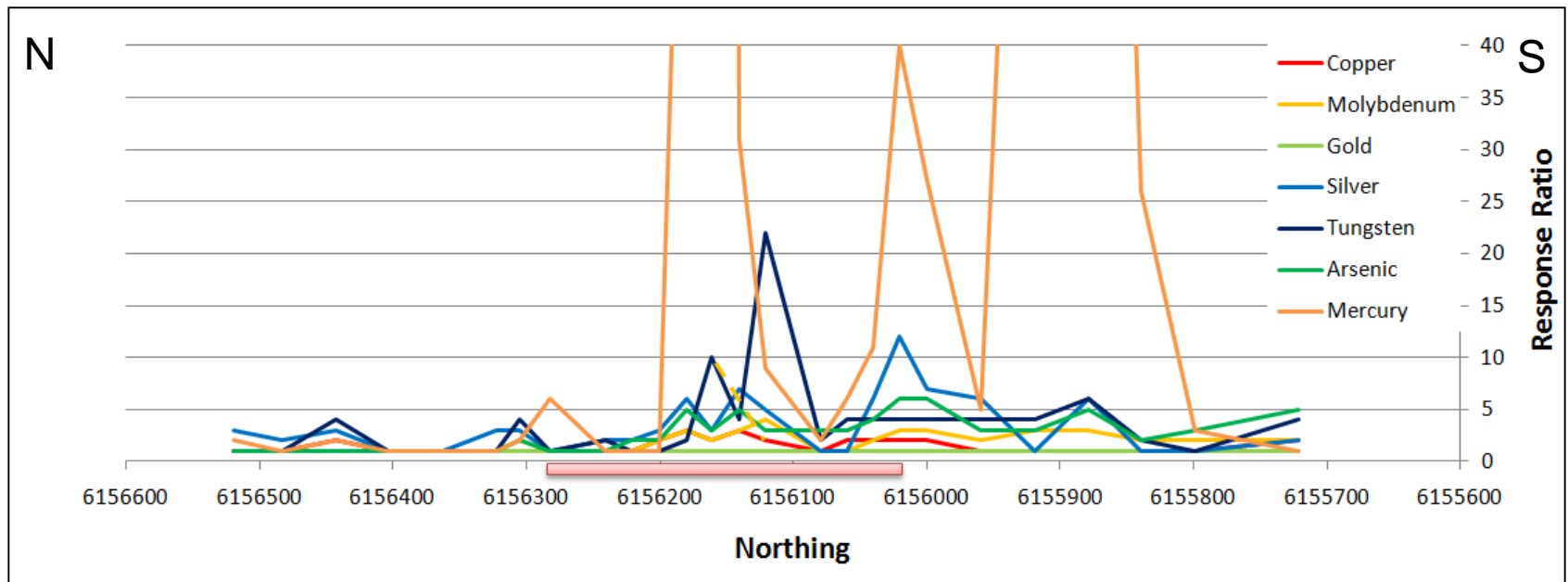


Laboratory specific methods

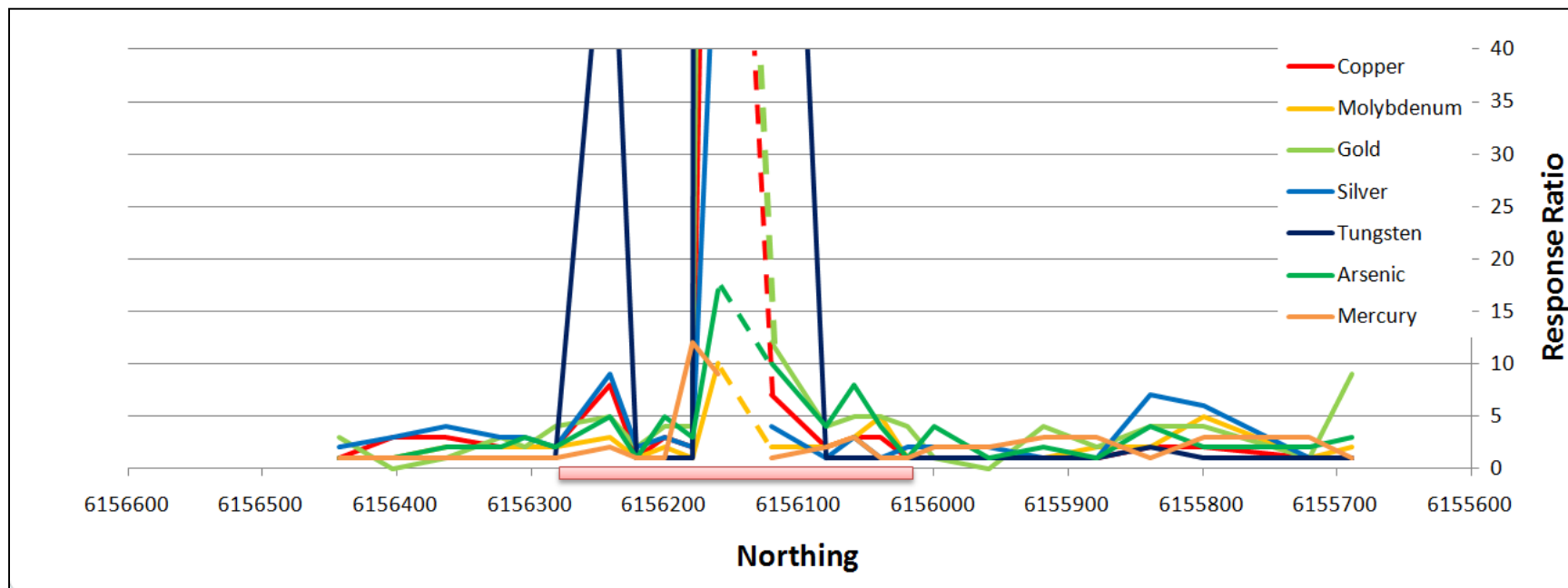
# Upper B horizon – Aqua Regia



## Conventional Soil Sampling

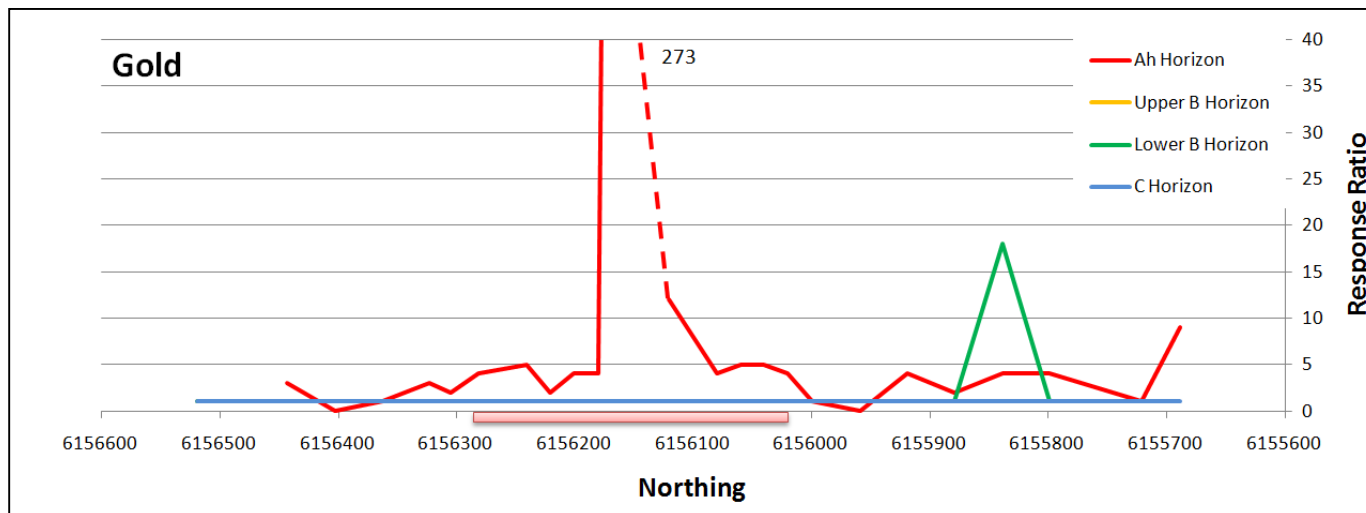
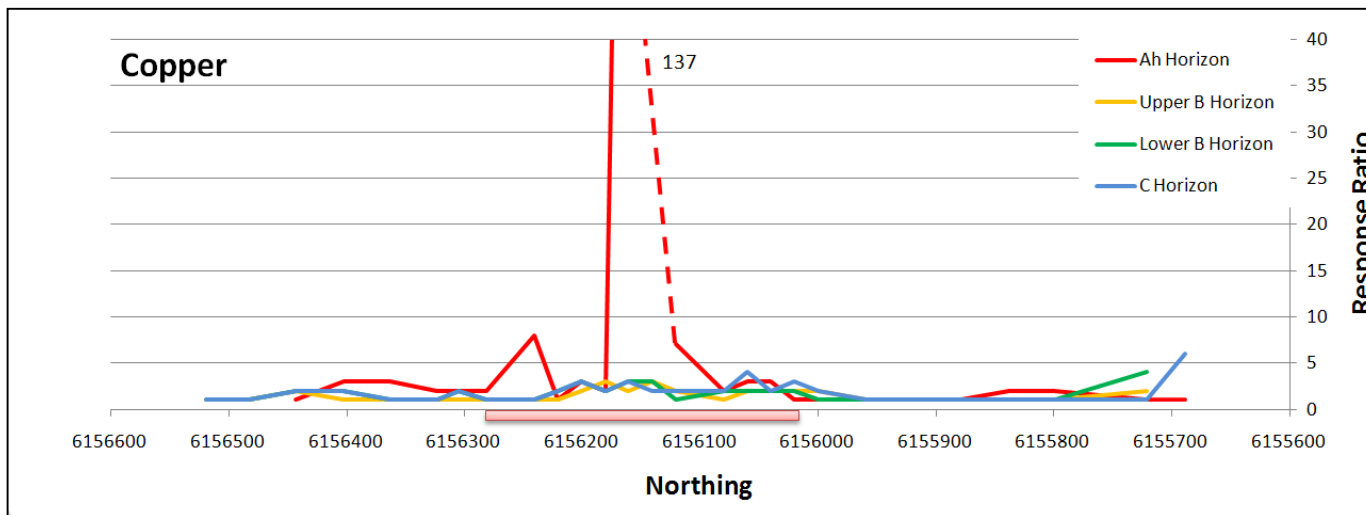


# Ah Horizon – Aqua Regia

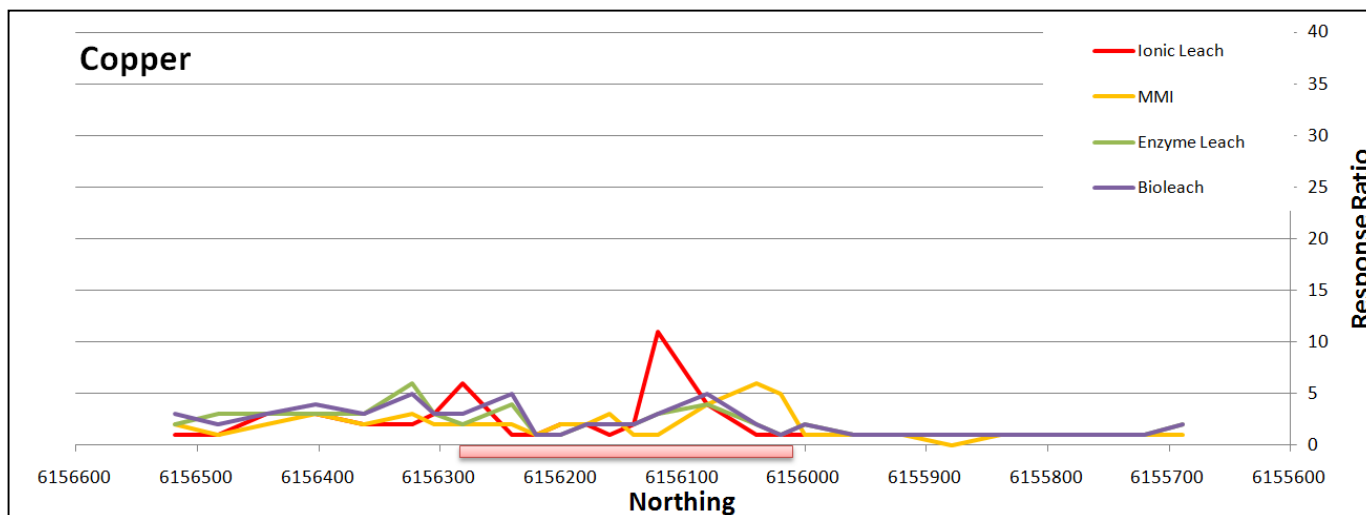
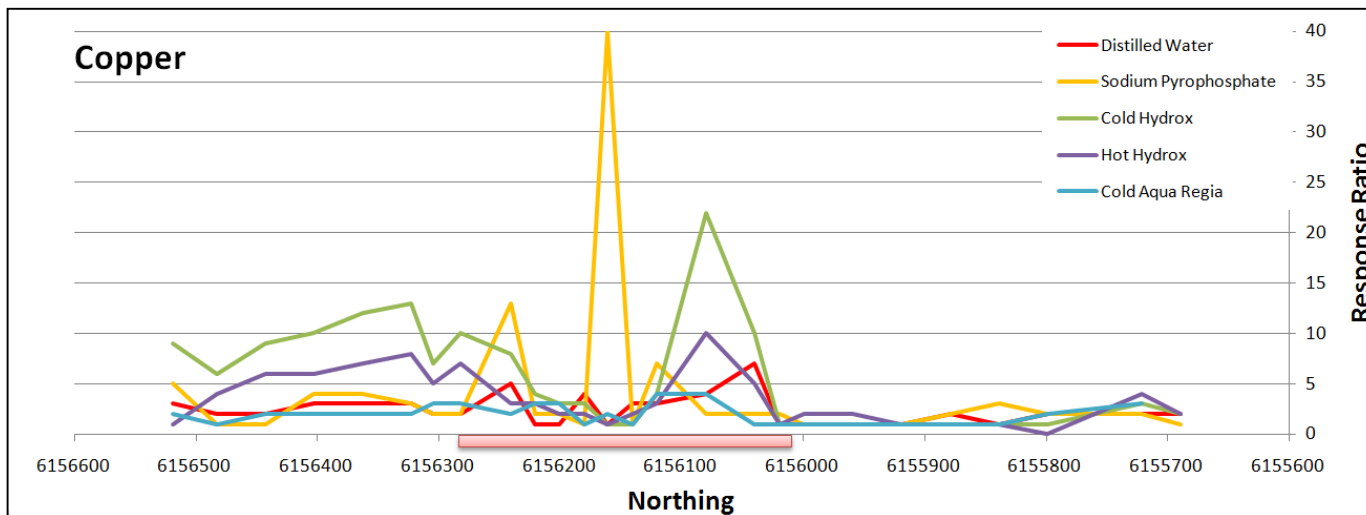




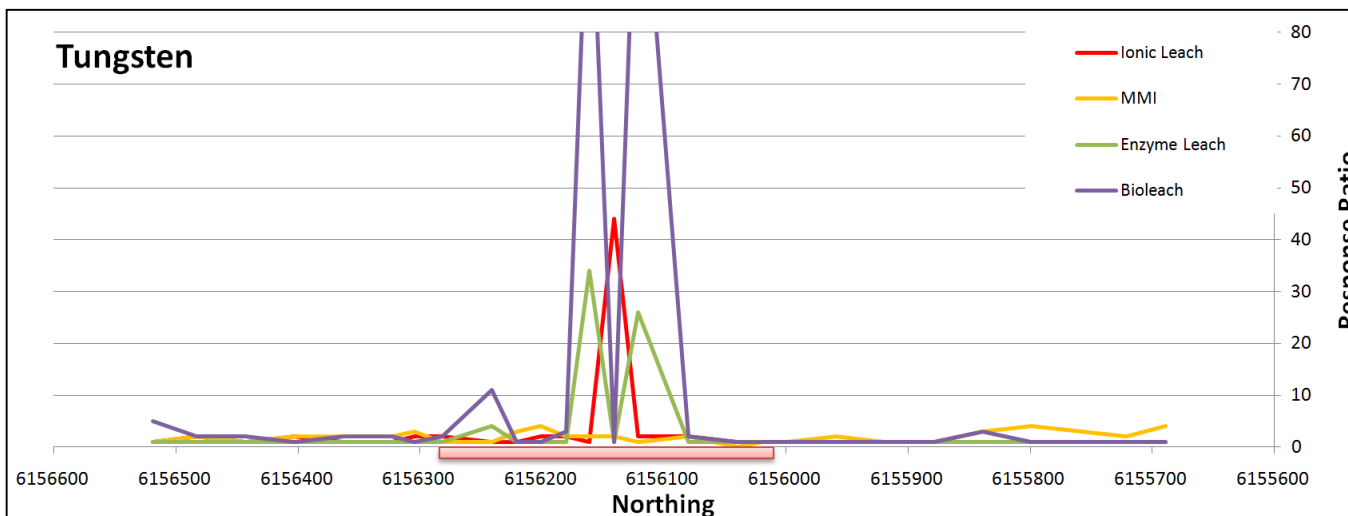
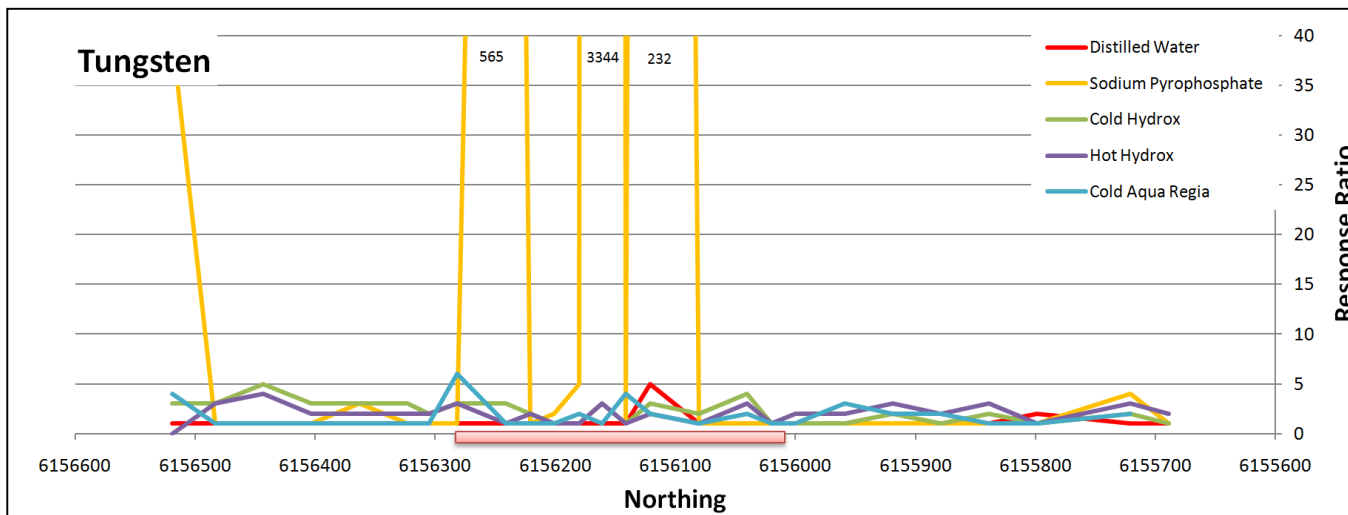
# Ah Horizon – Aqua Regia



# Selective and Partial Extraction results – Copper



# Selective and Partial Extraction results – Tungsten





# Comparison of methods



Horizon	Extraction	Cu	Au	Pb	Zn	Bi	Ag	Mo	Hg	W	U	As	Sb	Ca	Fe	Mn	Score	Relative Score
Ah	Aqua Regia	4	4			2	4	3	3	4	2	4	2	3		2	36	26
Upper B	Ionic Leach	3	3	1	2	2	2		1	4	1	1	2	2		2	28	18
Ah	Sodium Pyrophosphate	4	1		1	1	3	2		4	3	2		2		1	24	14
C	Aqua Regia					2	2	2	4			3	1	1	1		16	6
Upper B	Cold Hydroxylamine HCl	4		2			1					1		4		3	15	5
Upper B	Cold Aqua Regia				3		2		1			3	2	2		1	14	4
<b>Upper B</b>	<b>Aqua Regia*</b>	1							3	4			1	1			10	0
Other	MMI-M	2	2			3	1	2									10	0
Upper B	BioLeach					1				4						3	8	-2
Upper B	Distilled Water	1			1				1			1		1		2	7	-3
Upper B	Hot Hydroxylamine HCl	2												2		3	7	-3
Upper B	Enzyme Leach									4						2	6	-4
Lower B	Aqua Regia								3	1							4	-6

Score
4
3
2
1

**Very Strong**  
**Strong**  
**Moderate**  
**Weak**

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# Conclusions

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- Yes. Soil Geochemistry can be used.
- No. Conventional soil sampling is ineffective.
- No. There is no advantage to using lab specific methods in this environment.
- Best response occurs in the Ah horizon.
- Aqua regia is the best performing digestion.
- Tungsten is a potentially useful pathfinder.

# Acknowledgements



**ALS Laboratory Group**  
ANALYTICAL CHEMISTRY & TESTING SERVICES



SERENGETI  
RESOURCES INC.

TSX-V:SIR



WHEN YOU NEED TO BE SURE

