

Mineral Alteration Mapping Using HyLogger: Barns Au Prospect

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gawler craton
state of play 2004



Effective means of exploring through cover

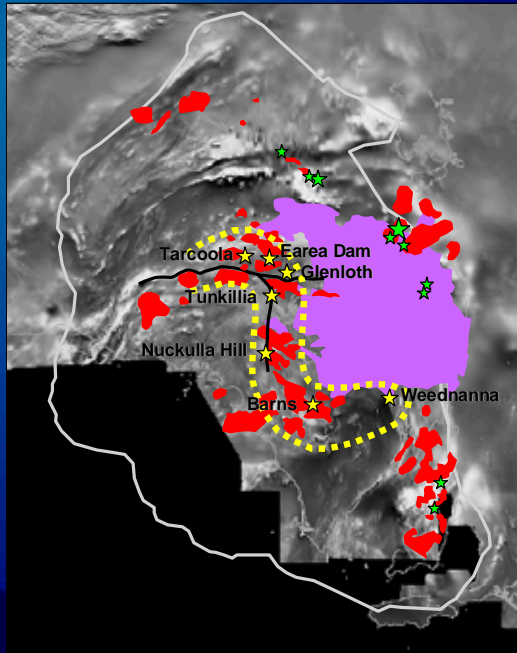
Geochemical

Geophysical

- Properties of the Cover
- Properties of the Target

CRCLEME

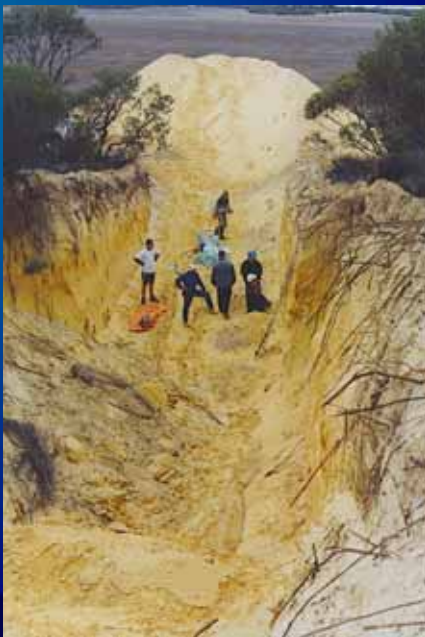
Central Gawler Gold Province



KEY PROSPECTS & FEATURES

- ★ Au Prospect
- ★ Cu-Au Prospect
- Gawler Range Volcanics (~1590 Ma)
- Hiltaba Suite granitoids and mafic intrusions (~1590-1580 Ma)
- Shear Zone
- ⋯ Central Gawler Au Province (?1590 -1580)

BARNS Au Prospect - Dune Sampling



HyLogger Campaign 2003-04

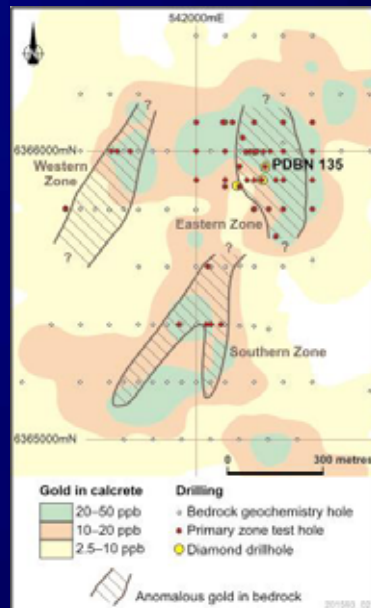
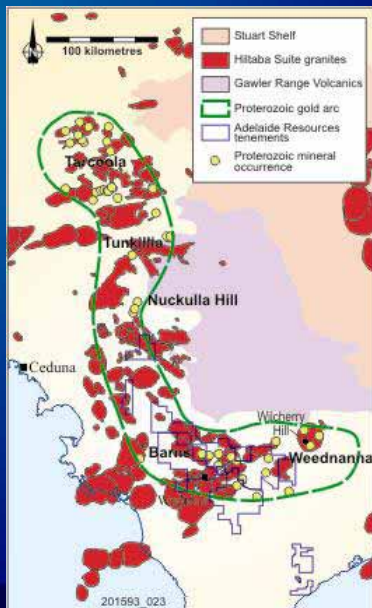


- 29 September 2003 – 25 January 2004
- 52,000m of SA core were scanned
- Central Gawler Gold: Tunkillia, Barns, Tarcoola, Weednanna, Nuckulla Hill, Meninnee Dam, Gibraltar

Scanning rate: 500 to 1,000m per day; ave. around 800m per day

Output: Spectral log at 1cm intervals in VIS – SWIR (416-2500nm)
Linescan image of the drill core

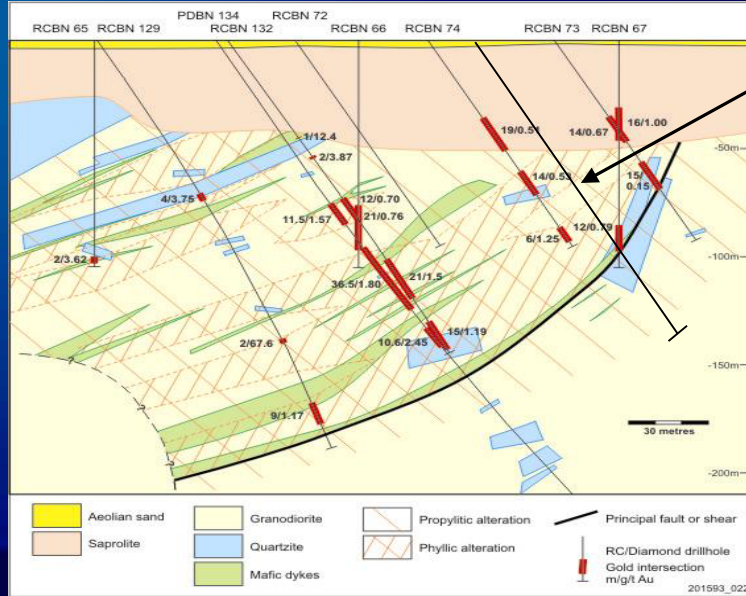
Barns Au Prospect - Location



Barns Au Prospect - Section

West

East



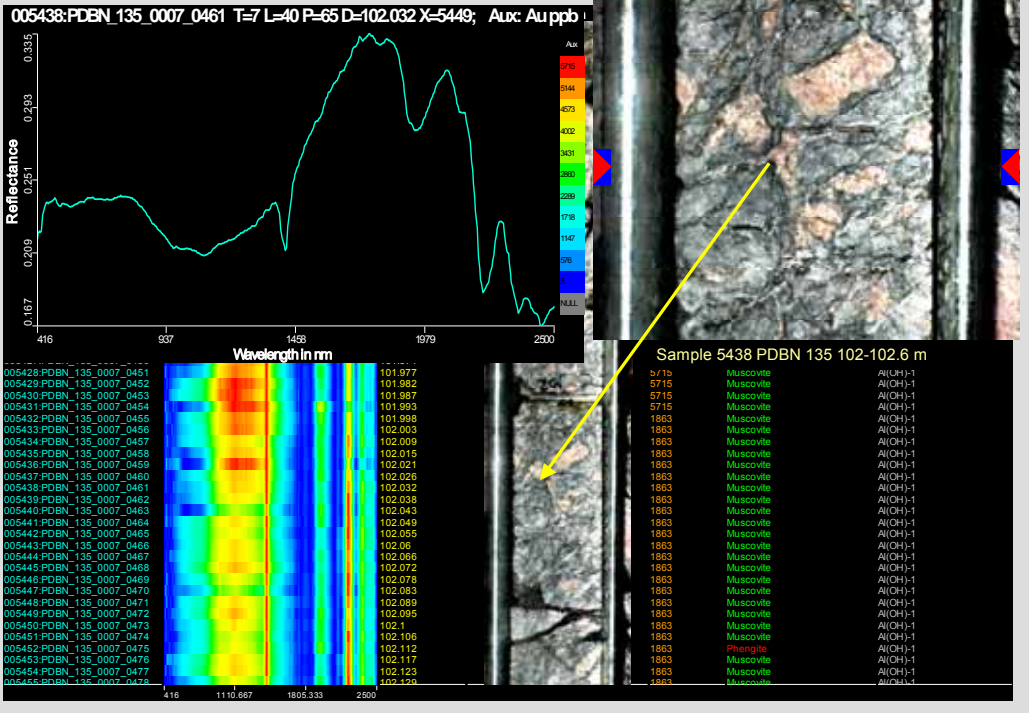
Projection of PDBN 135

Barns Au Prospect: Hole PDBN 135 99.49-104.1m

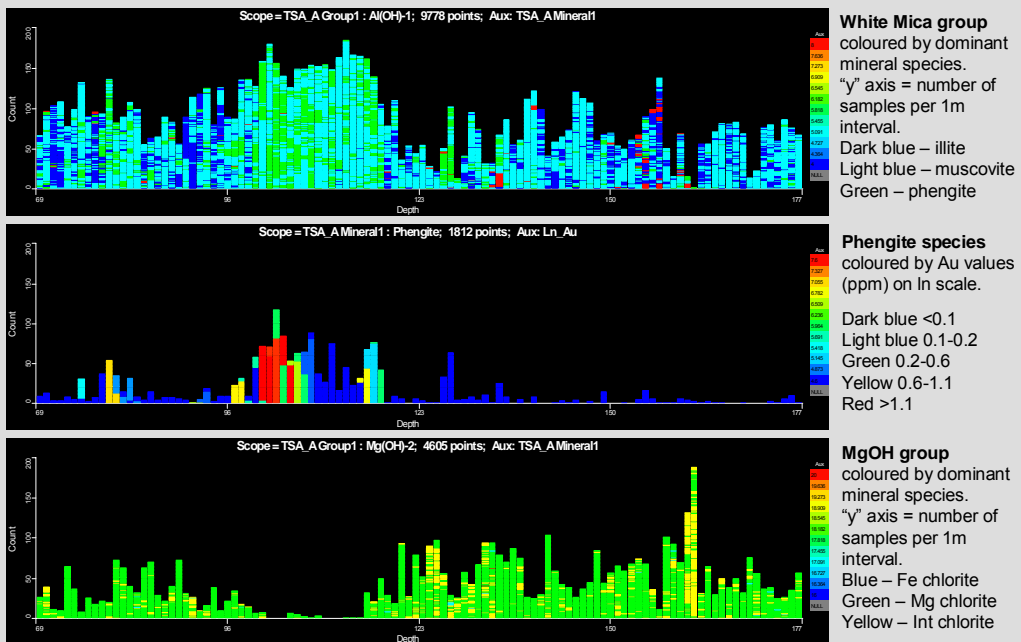


- Reconstructed core tray from linescan digital data modified by core log database entries.
- Red overlays show unfilled portions of the core tray excluded from processing in The Spectral Geologist (TSG)

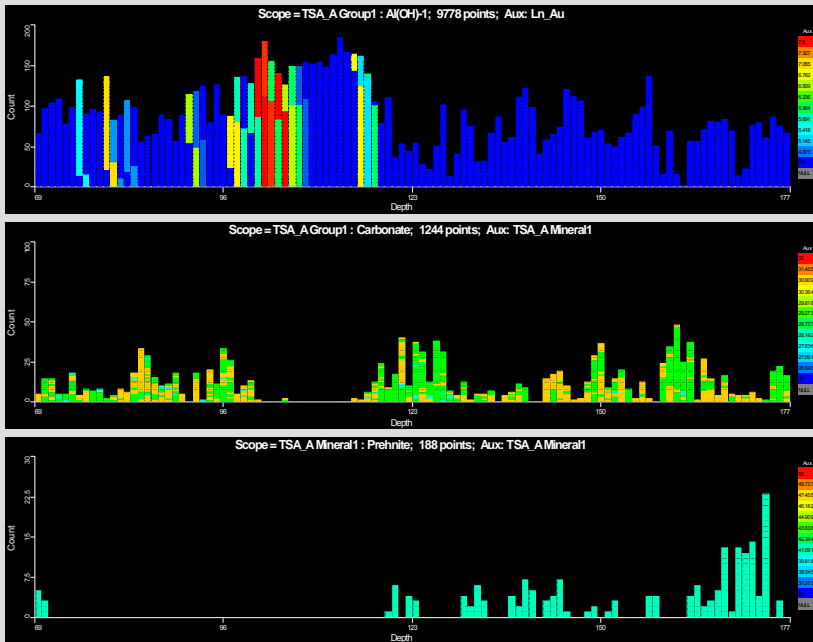
BARNS Au Prospect: Hole PDBN 135



BARNS Au Prospect: Hole PDBN 135



BARNS Au Prospect: Hole PDBN 135



White Mica group
coloured by Au values (ppm) on ln scale.

- Dark blue <0.1
- Light blue 0.1-0.2
- Green 0.2-0.6
- Yellow 0.6-1.1
- Red >1.1

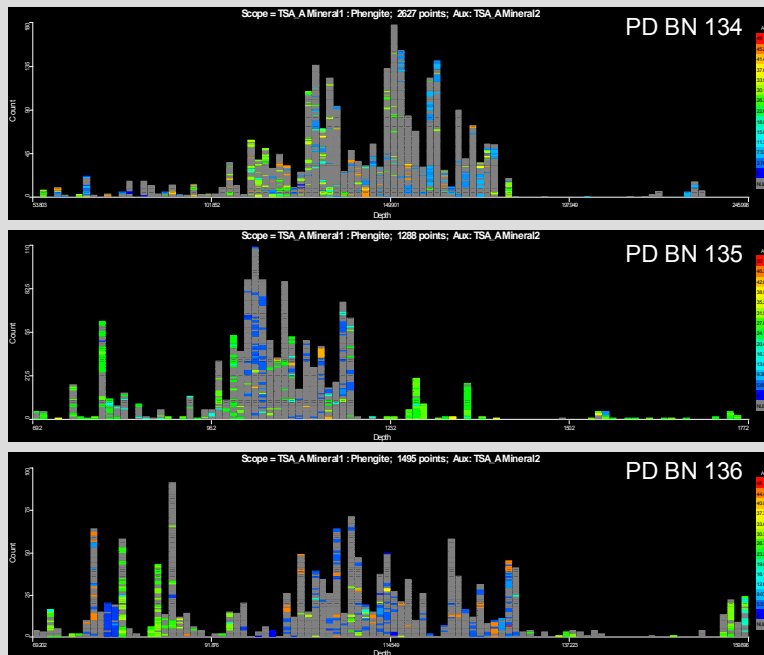
Carbonate species
coloured by dominant mineral species.

- "y" axis = number of samples per 1m interval.
- Light blue – dolomite
- Green – siderite
- Orange – ankerite

Prehnite

- "y" axis = number of samples per 1m interval.

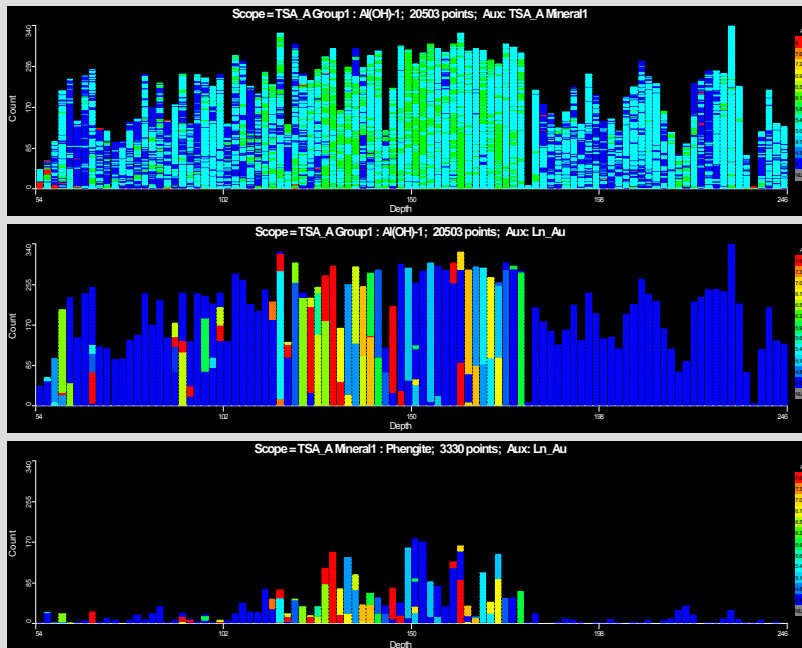
Barns Au Prospect - Phengite Distribution



Phengite Species
histograms coloured by other minerals present in the spectra as identified by TSA

- Grey – phengite only
- Blue – muscovite
- Green – carbonate
- Yellow - prehnite
- Orange – tourmaline

BARNS Au Prospect: Hole PDBN 134

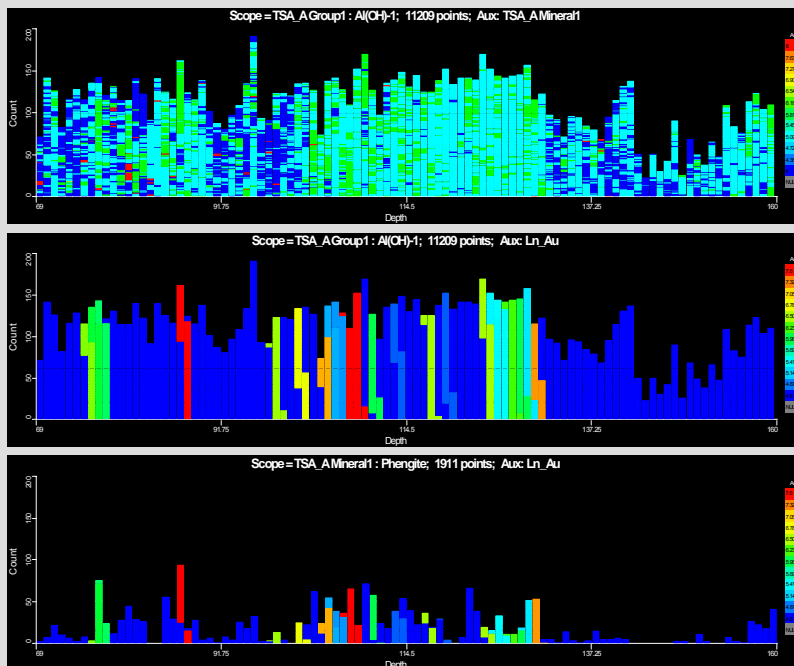


White Mica group
coloured by dominant mineral species.
"y" axis = number of samples per 1m interval.
Dark blue – illite
Light blue – muscovite
Green – phengite

White Mica group
coloured by Au values (ppm) on ln scale.
Dark blue <0.1
Light blue 0.1-0.2
Green 0.2-0.6
Yellow 0.6-1.1
Red >1.1

Phengite species
coloured by Au values (ppm) on ln scale.
Dark blue <0.1
Light blue 0.1-0.2
Green 0.2-0.6
Yellow 0.6-1.1
Red >1.1

BARNS Au Prospect: Hole PDBN 136



White Mica group
coloured by dominant mineral species.
"y" axis = number of samples per 1m interval.
Dark blue – illite
Light blue – muscovite
Green – phengite

White Mica group
coloured by Au values (ppm) on ln scale.
Dark blue <0.1
Light blue 0.1-0.2
Green 0.2-0.6
Yellow 0.6-1.1
Red >1.1

Phengite species
coloured by Au values (ppm) on ln scale.
Dark blue <0.1
Light blue 0.1-0.2
Green 0.2-0.6
Yellow 0.6-1.1
Red >1.1

Barns Gold Prospect: Hole RCBN 126

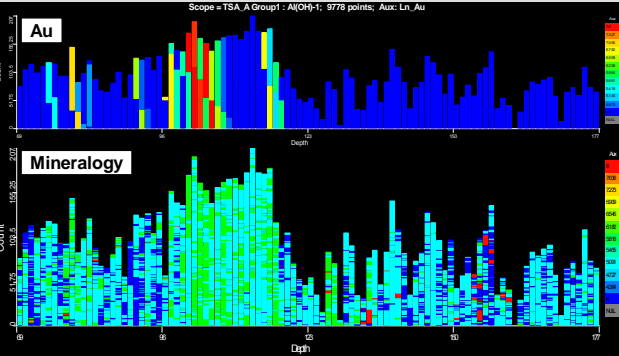


Index	Deriv1	Depth	Linescan	Au ppb	TSA_A Mineral1	TSA_A Mineral2
000067.RCBN-126_0001_0067		34.392		5	illite	YellowMarker
000068.RCBN-126_0001_0068		34.908		5	IsaWhite	Montmorillonite
000069.RCBN-126_0001_0069		35.426		20	Montmorillonite	IsaYellow
000070.RCBN-126_0001_0070		35.943		20	illite	NULL
000071.RCBN-126_0001_0071		36.461		20	illite	YellowMarker
000072.RCBN-126_0001_0072		36.978		20	YellowMarker	illite
000073.RCBN-126_0001_0073		37.495		5	illite	NULL
000074.RCBN-126_0001_0074		38.012		5	Aspectral	NULL
000075.RCBN-126_0001_0075		38.529		1280	YellowMarker	illite
000076.RCBN-126_0001_0076		39.047		20	IsaWhite	illite
000077.RCBN-126_0001_0077		39.564		20	illite	YellowMarker
000078.RCBN-126_0001_0078		40.082		1280	illite	WhiteMarker
000079.RCBN-126_0001_0079		40.600		1280	illite	WhiteMarker
000080.RCBN-126_0001_0080		41.117		5	WhiteMarker	NULL
000081.RCBN-126_0001_0081		42.323		20	Montmorillonite	IsaWhite
000082.RCBN-126_0001_0082		42.841		20	illite	NULL
000083.RCBN-126_0001_0083		43.358		20	illite	NULL
000084.RCBN-126_0001_0084		43.8		20	illite	YellowMarker
000085.RCBN-126_0001_0085		44.282		660	illite	IsaWhite
000086.RCBN-126_0001_0086		44.785		660	Montmorillonite	NULL
000087.RCBN-126_0001_0087		45.277		4800	Montmorillonite	Phengite
000088.RCBN-126_0001_0088		45.769		4500	WhiteMarker	illite
000089.RCBN-126_0001_0089		46.262		3130	Muscovite	IsaWhite
000090.RCBN-126_0001_0090		46.754		3130	illite	IsaWhite
000091.RCBN-126_0001_0091		47.246		1800	illite	illite
000092.RCBN-126_0001_0092		47.738		1800	IsaWhite	illite
000093.RCBN-126_0001_0093		48.231		1280	Muscovite	IsaYellow
000094.RCBN-126_0001_0094		48.723		1280	Muscovite	NULL
000095.RCBN-126_0001_0095		49.215		1280	illite	WhiteMarker
000096.RCBN-126_0001_0096		49.708		620	IsaWhite	YellowMarker
000097.RCBN-126_0001_0097		50.2		220	Muscovite	NULL
000098.RCBN-126_0001_0098		50.692		220	Muscovite	NULL
000099.RCBN-126_0001_0099		51.185		180	Muscovite	WhiteMarker
000100.RCBN-126_0001_0100		51.677		180	WhiteMarker	IsaYellow
000101.RCBN-126_0001_0101		52.169		780	Phengite	IsaWhite
000102.RCBN-126_0001_0102		52.661		780	Muscovite	NULL
000103.RCBN-126_0001_0103		53.154		560	Muscovite	WhiteMarker
000104.RCBN-126_0001_0104		53.646		560	IsaWhite	illite
000105.RCBN-126_0001_0105		54.139		2400	Muscovite	NULL
000106.RCBN-126_0001_0106		54.631		2400	Muscovite	NULL
000107.RCBN-126_0001_0107		55.123		1650	Aspectral	NULL
000108.RCBN-126_0001_0108		55.615		1650	WhiteMarker	IsaYellow
000109.RCBN-126_0001_0109		56.108		2630	Muscovite	IsaWhite
000110.RCBN-126_0001_0110		56.6		2630	Muscovite	Siderite
000111.RCBN-126_0001_0111		57.092		4520	Muscovite	NULL
000112.RCBN-126_0001_0112		57.585		4520	WhiteMarker	Muscovite
000113.RCBN-126_0001_0113		58.077		3685	Muscovite	Siderite
000114.RCBN-126_0001_0114		58.569		3685	Muscovite	Siderite
000115.RCBN-126_0001_0115		59.062		1800	Muscovite	IsaWhite
000116.RCBN-126_0001_0116		59.554		1800	Muscovite	Muscovite
000117.RCBN-126_0001_0117		60.046		7300	MgChlorite	illite
000118.RCBN-126_0001_0118		60.539		7300	MgChlorite	illite
000119.RCBN-126_0001_0119		61.031		1650	Muscovite	IsaWhite
000120.RCBN-126_0001_0120		61.523		1650	YellowMarker	NULL
000121.RCBN-126_0001_0121		62.015		3085	Muscovite	NULL

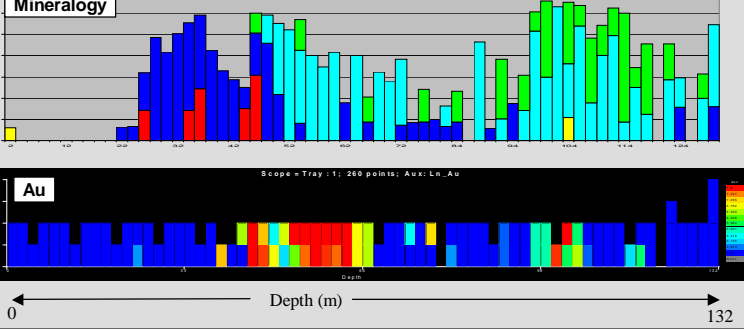
Barns Au Prospect: Holes PDBN 135 and RCBN 126

- Mineralogy**
- Montmorillonite
 - Phengite
 - Muscovite
 - Illite
 - Paragonite

PDBN 135 (69-177m)

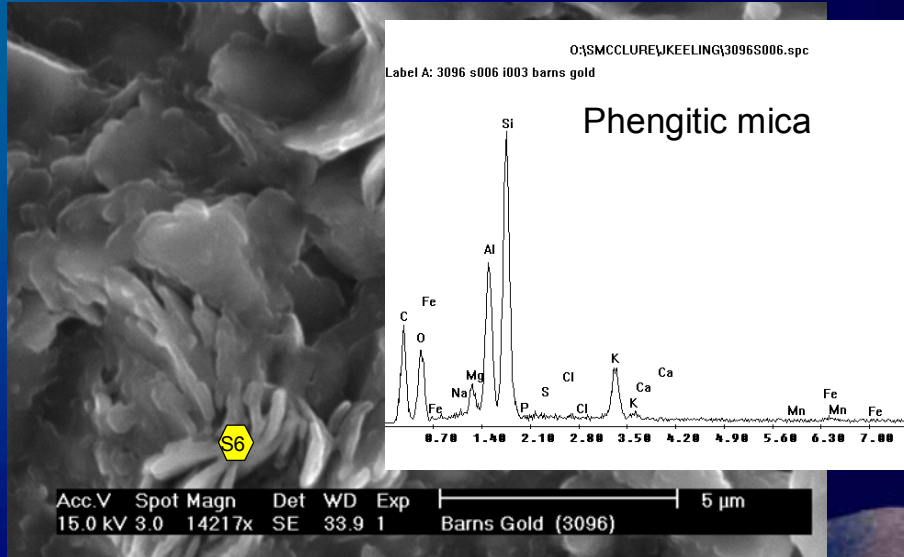


RCBN 126 (0-132m)



- Au ppm**
- >1.1
 - 0.6 – 1.1
 - 0.2 – 0.6
 - 0.1 – 0.2
 - <0.1

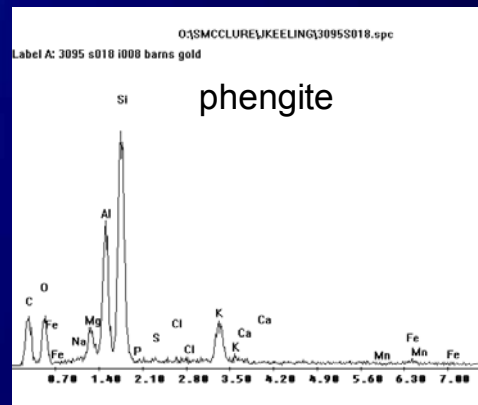
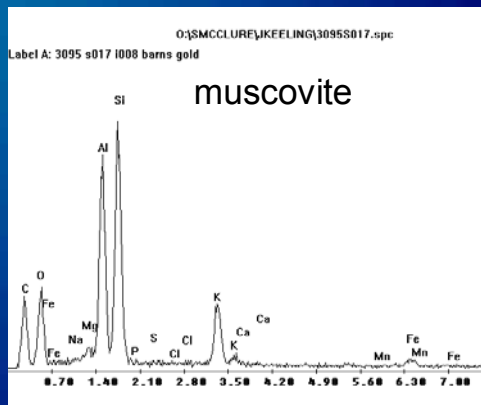
RCBN 126 (104-106m) Sericite alteration



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Barns Au prospect Compositional variation in white micas



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Summary

- At Barns, anomalous Au is associated with:
 - Increased white mica (sericite) content
 - Lower levels of chlorite
- Higher gold values often report in zones of increased phengitic mica
- Chlorite is dominantly Mg-rich and shows a negative correlation with Au.
- White mica/illite persists into the lower saprolite

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Conclusions

- Spectral logging provides a rapid and objective means of mapping certain alteration mineralogy
- Potential to map alteration into the weathered zone
- Provides additional evidence for the association of Au and specific alteration mineralogy
- Potential to build vectors to ore and to model targets for geophysical testing

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