

HyLogger – Providing New Insights to IOCG Deposits

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Introduction

Developed by CSIRO, HyLogger™ is a hyperspectral spectroradiometer mounted over a robotic table enabling thousands of metres of diamond drill core to be measured for their spectral response between 400nm and 2500nm at a rate of approximately 75 metres per hour. Three instruments are installed on the support frame: a hyperspectral spectroradiometer recording a full wavelength spectrum every 1cm; a high resolution linescan camera recording a continuous 3 band image at 0.1mm resolution; and a laser profilometer measuring the height of the upper surface of the core at 0.2mm resolution. Interpreting the data generated at a rate of 3 Gigabytes per day requires specialized software, available as a core-logging version of “The Spectral Geologist”, TSG, package. It is now realistic to examine semi-statistical distributions of minerals downhole. Linked with assay data, the geologist has a powerful new tool for understanding drilling results in the context of deposit paragenesis. The analysis / illustrations in this presentation came from the TSG package (see: www.thespectralgeologist.com)

HyLogger(TM) is a trademark of CSIRO

HyLogger Core Scanner

Continuous core/chip scanning

0.8 cm spatial
res of spectra

0.1 mm spatial
res of image

60m scanned / hour

Up to 1000m per day

3 Gbytes data per day





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HyLogged Holes



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Gawler Craton

Stuart Shelf

- Emmie Bluff
- Beda Arm
- Bopeechee
- Cocky Swamp
- Engenina
- Murdie Murdie Island
- Red Lake 8 SAR8
- Torrens TD2

Moonta/Wallaroo

- Mald 1
- DDH 203
- DDH 93
- DDH 178
- DD85WE1
- KGD01



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Ancillary Information

Original geologist's logs held on open file

Assays:

- Cu
- Zn
- Au
- Pb
- Ba
- U₃O₈
- Magnetic Susceptibility
- Specific Gravity

Lithology and alteration

Geological Setting

Proterozoic iron oxide deposit

Cu-U-Au-REE assemblage

Upper Prot. Overlying Pandurra Fm – arenaceous seds

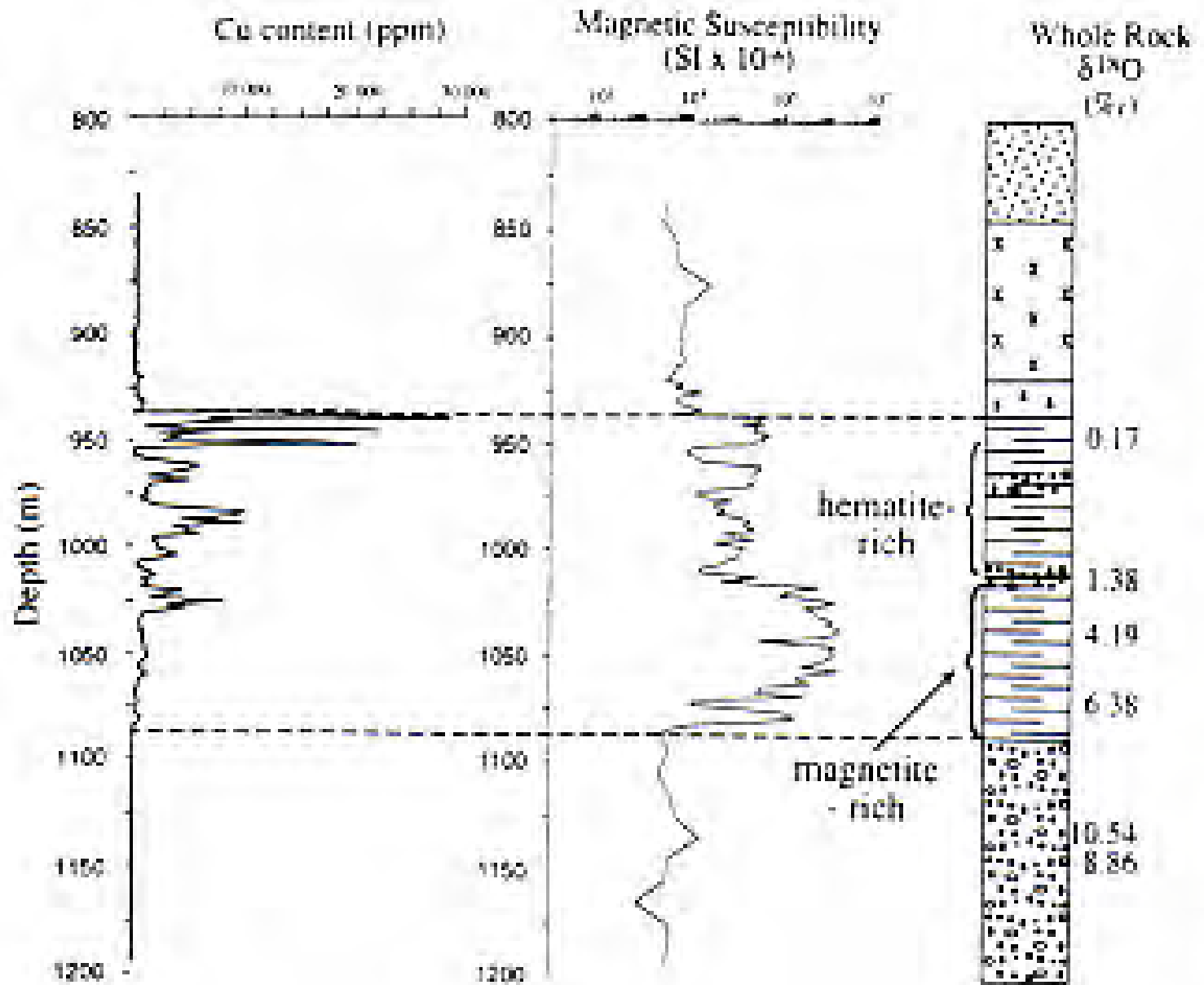
Mid Prot. Silicified reverse fault zone

Mid Prot. Fe-oxide rich, fine-grained, laminated sed. Deposits containing siliclastic lenses – interpreted as equiv. Wandearah Metasiltstone

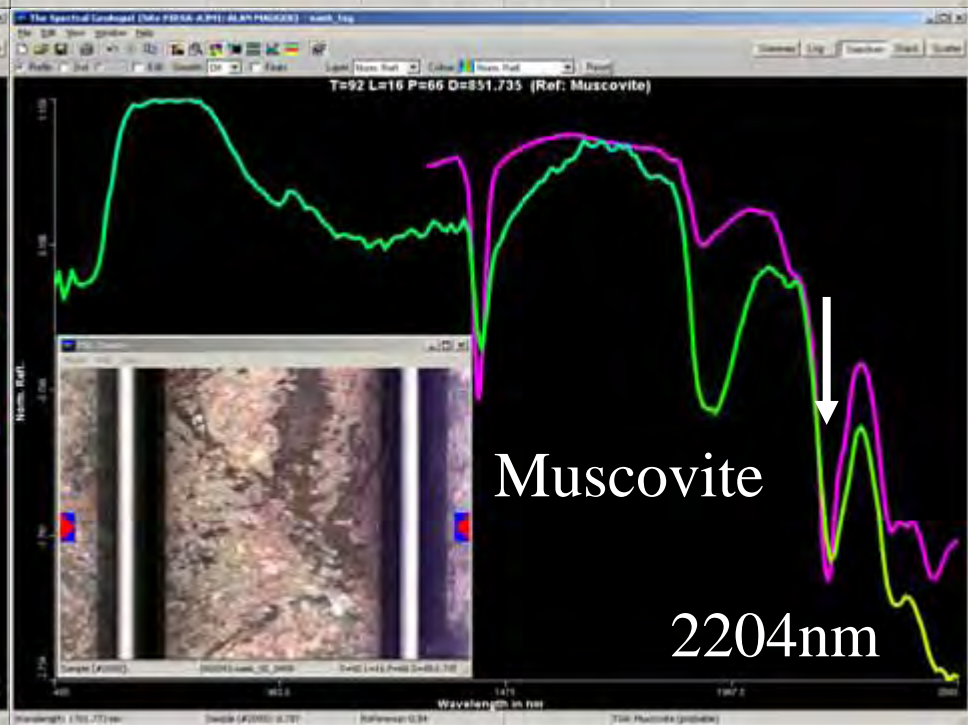
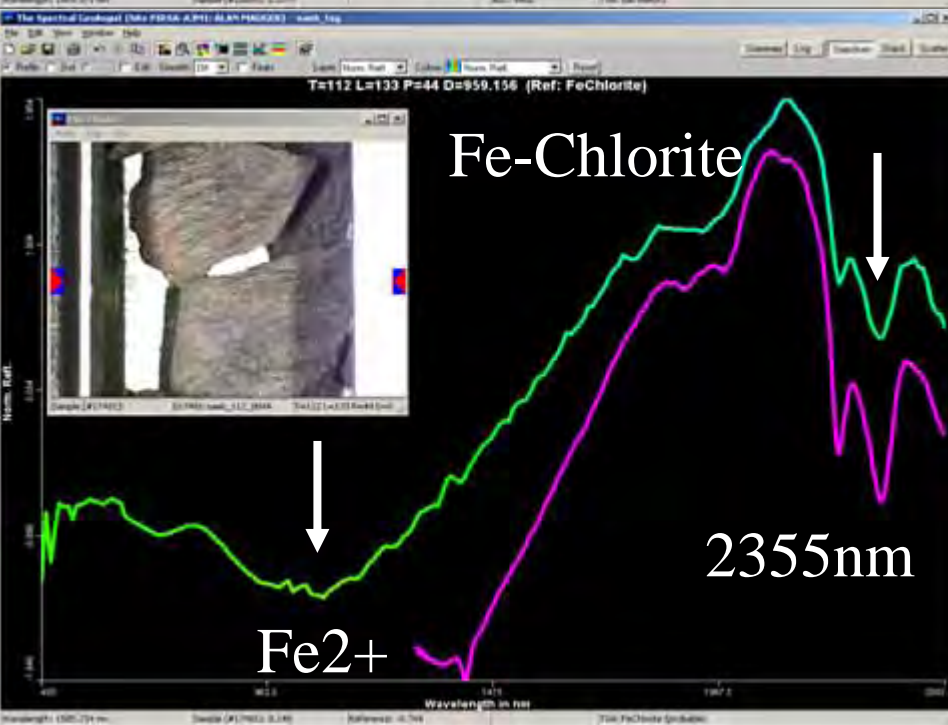
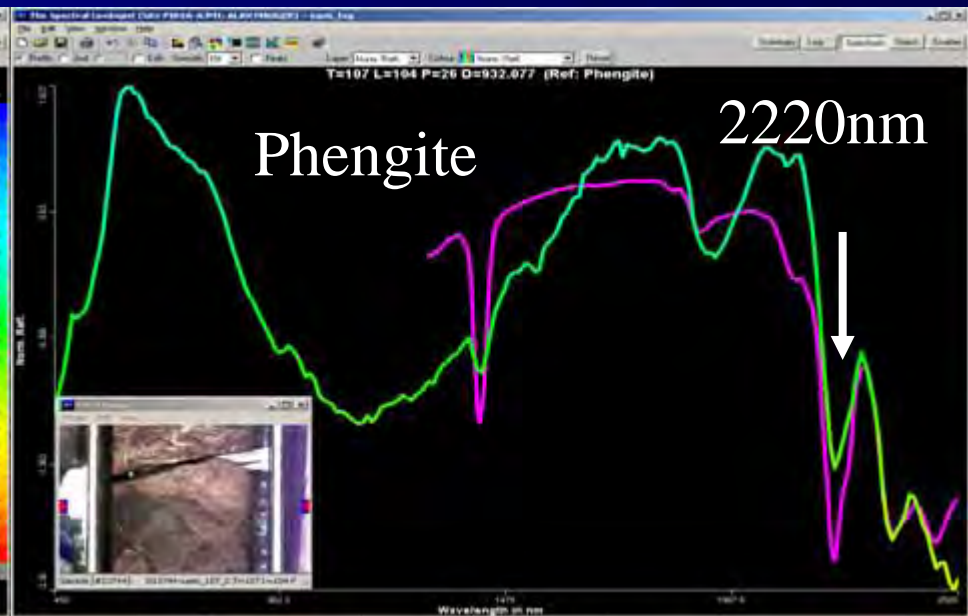
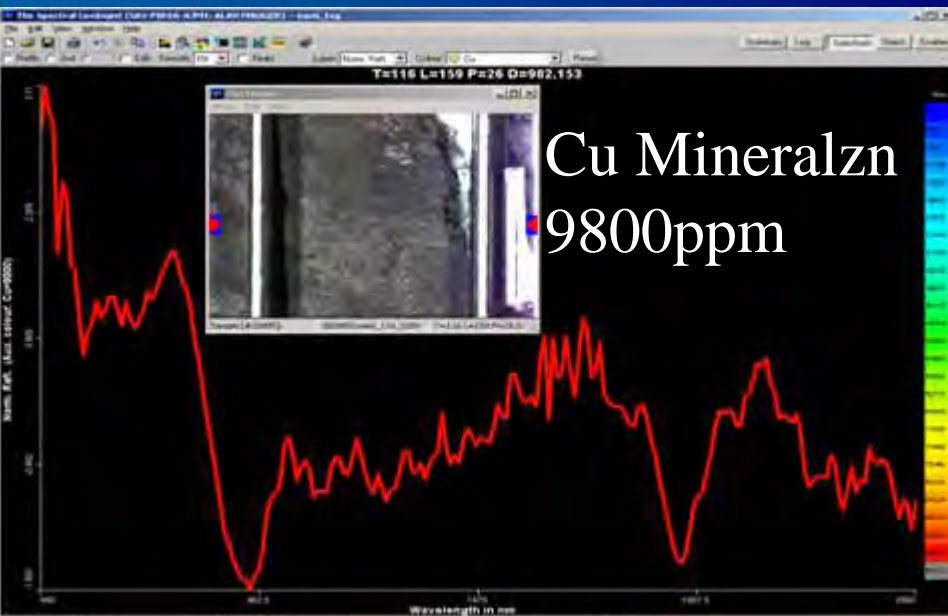
Mid Prot. Coarse grained arkosic unit – basal unit Wandearah Metasiltstone

Lower Prot. Metagranite – interpreted as equiv. Lincoln Complex

SAE 6



Emmie Bluff SAE6



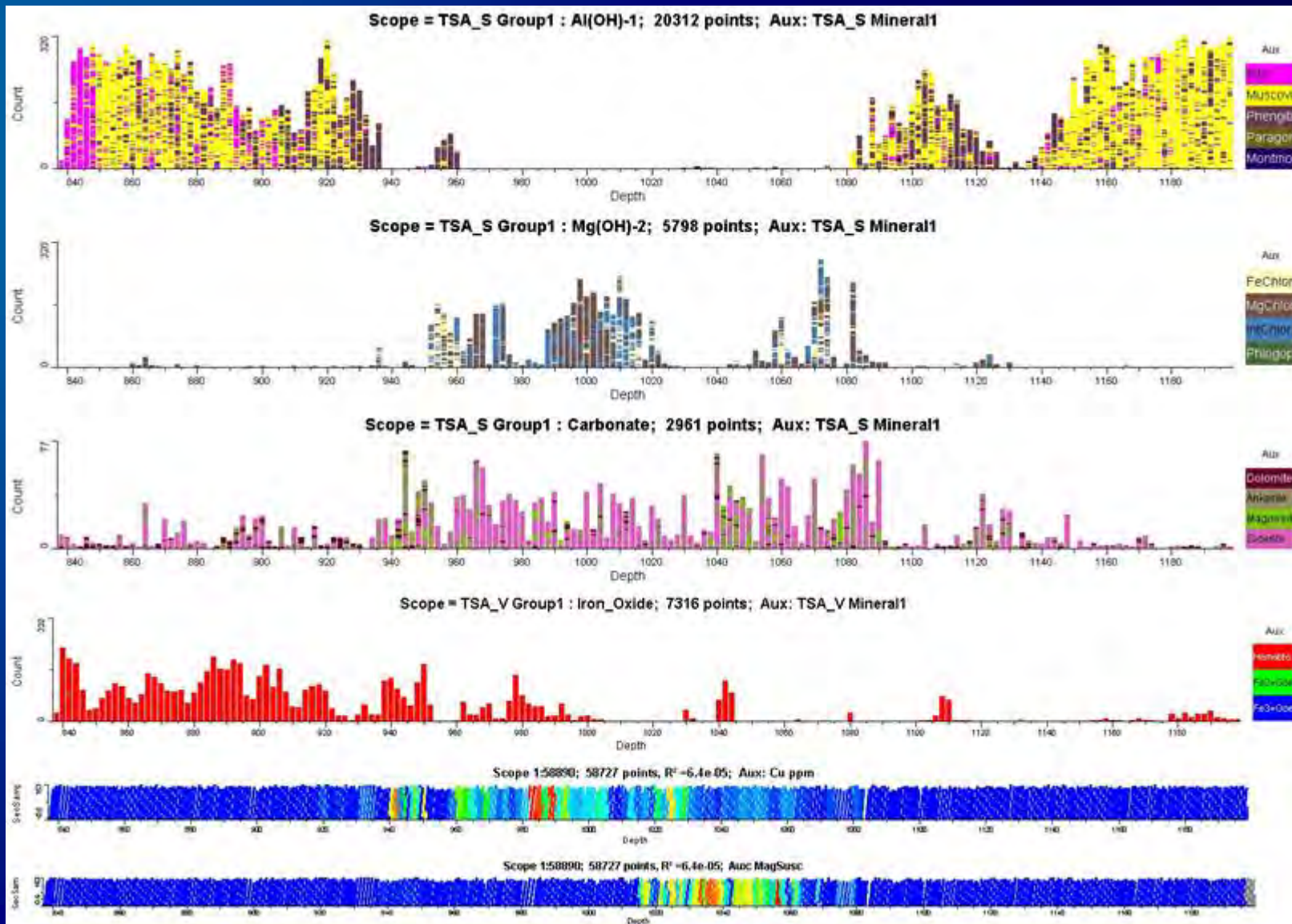
Results

SAE 6 – Type hole

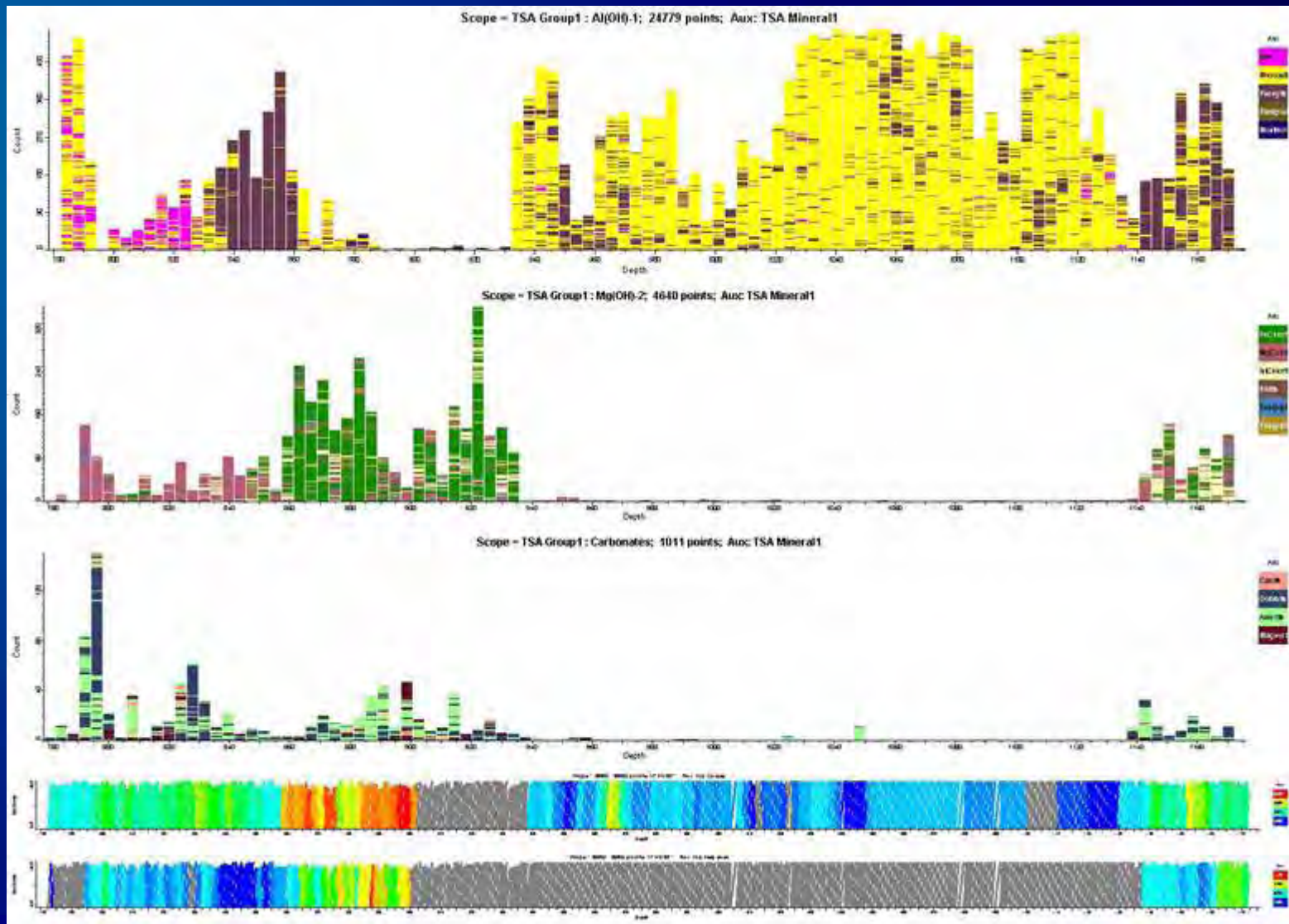
Although material dark giving noisy signal
and apparent low on “SWIR Visible”
minerals-

Patterns appear in the spectra which can be
correlated with mineralization model

Emmie Bluff SAE6



Emmie Bluff SAE4

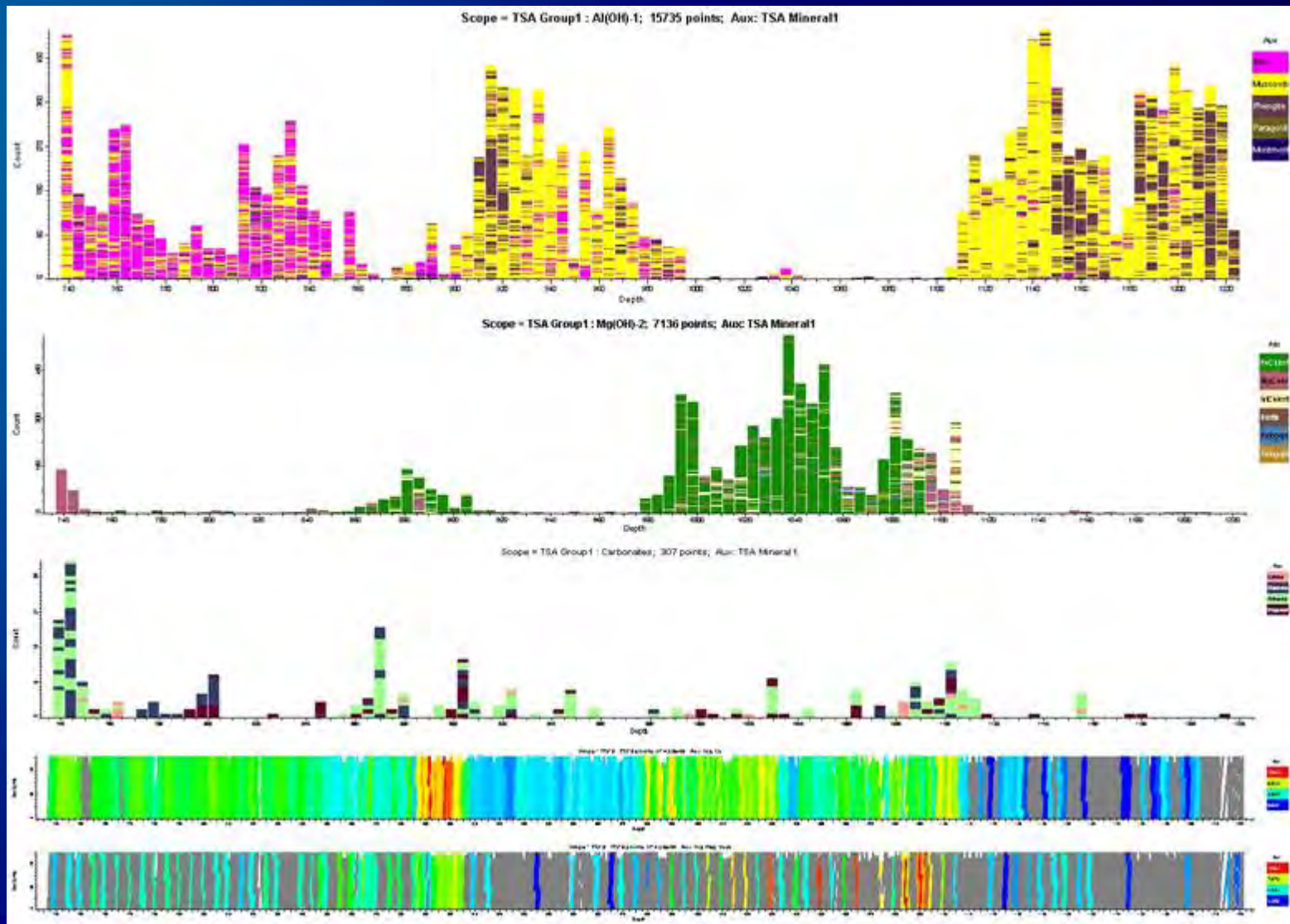


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Emmie Bluff SAE3

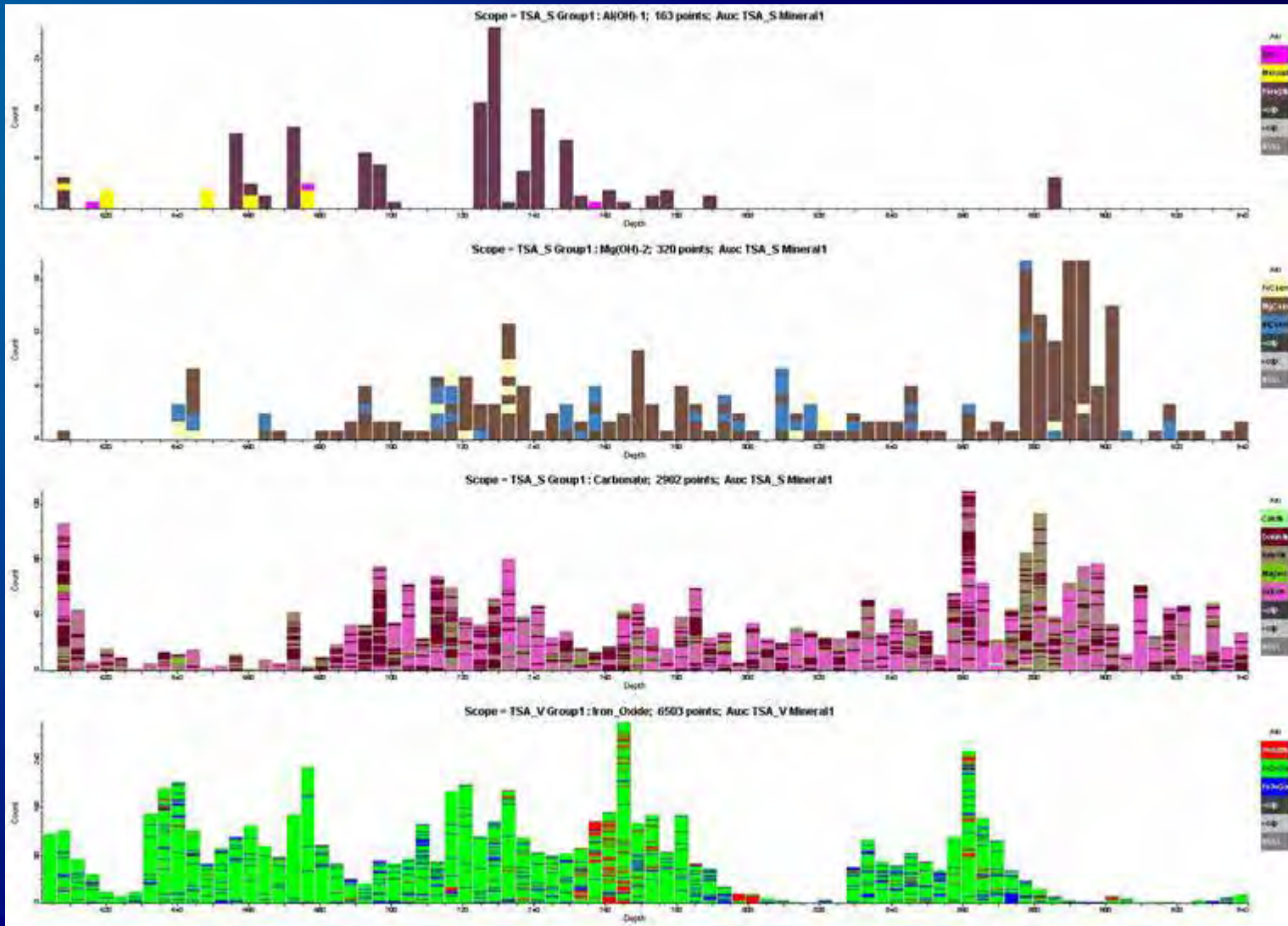


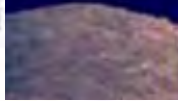
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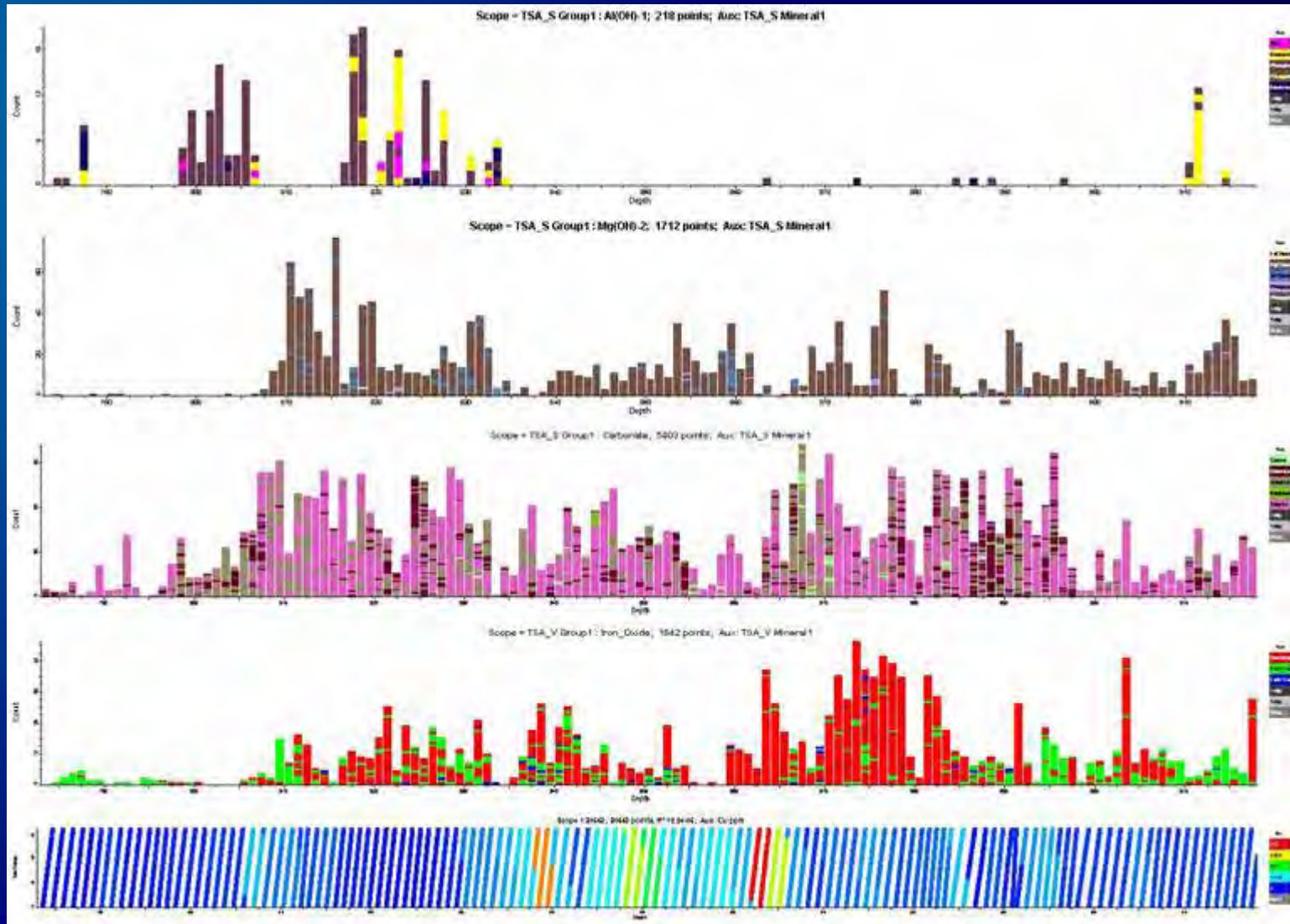
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Bopeechee





Murdie Murdie Island

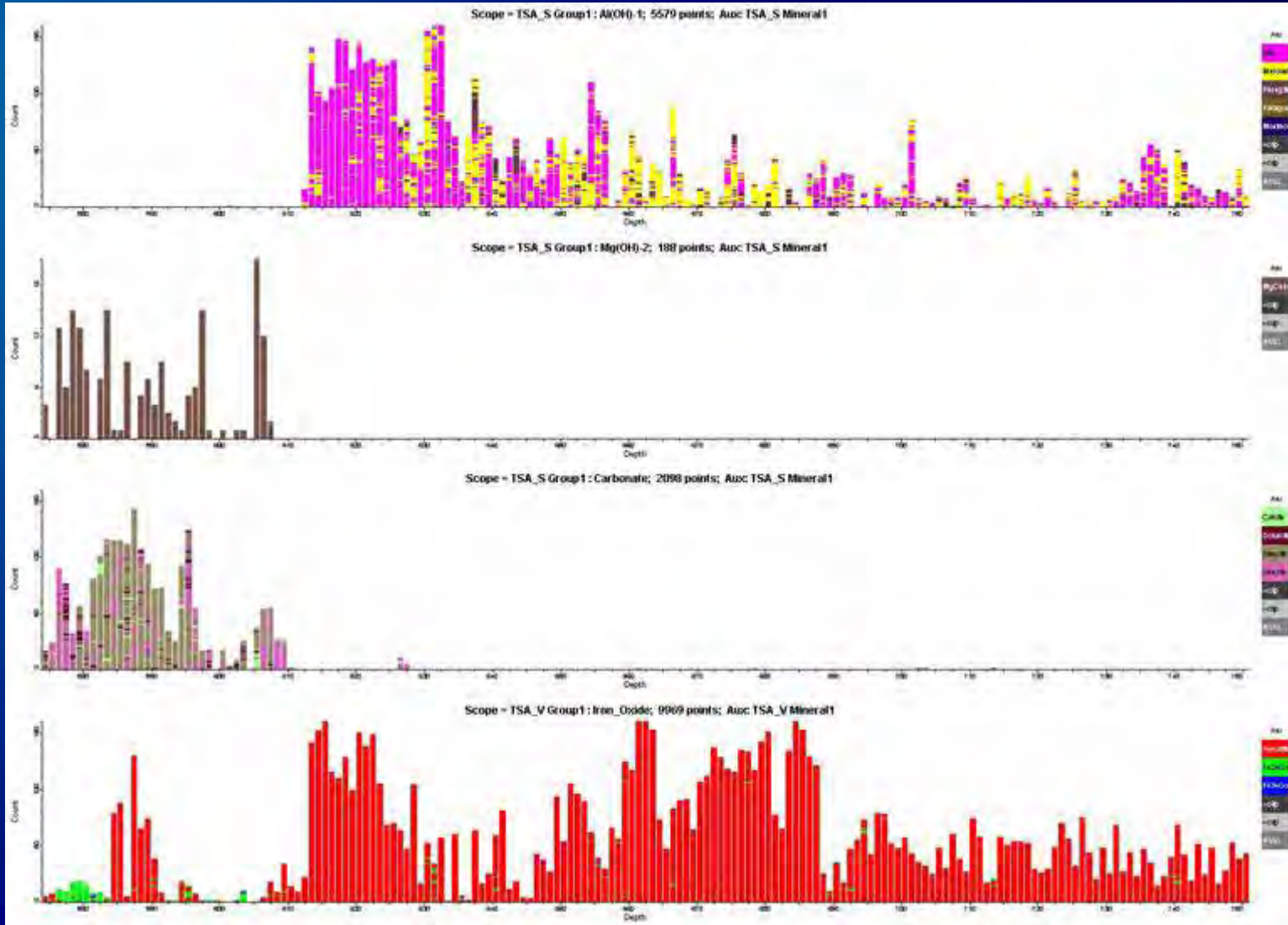


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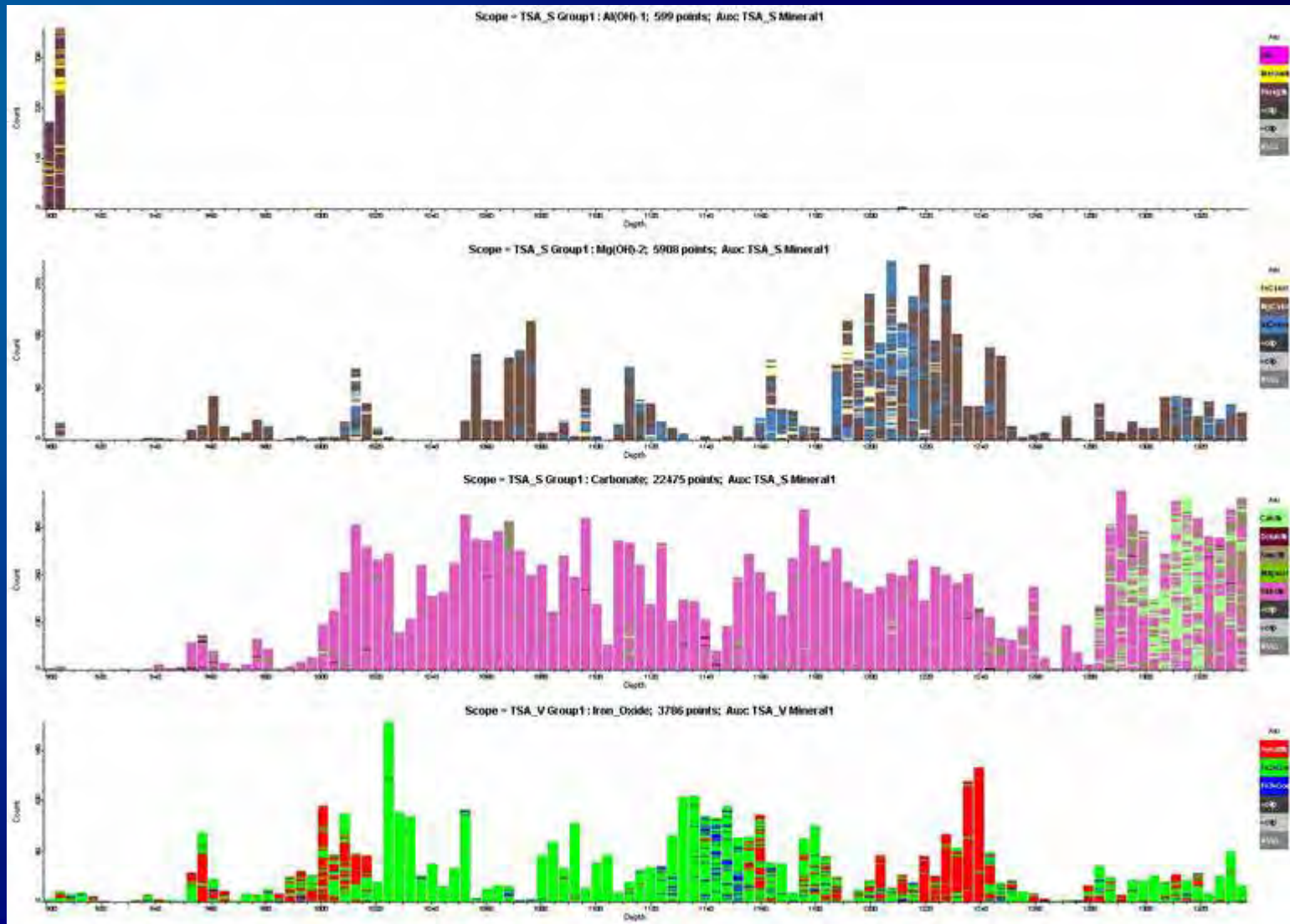
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Beda Arm

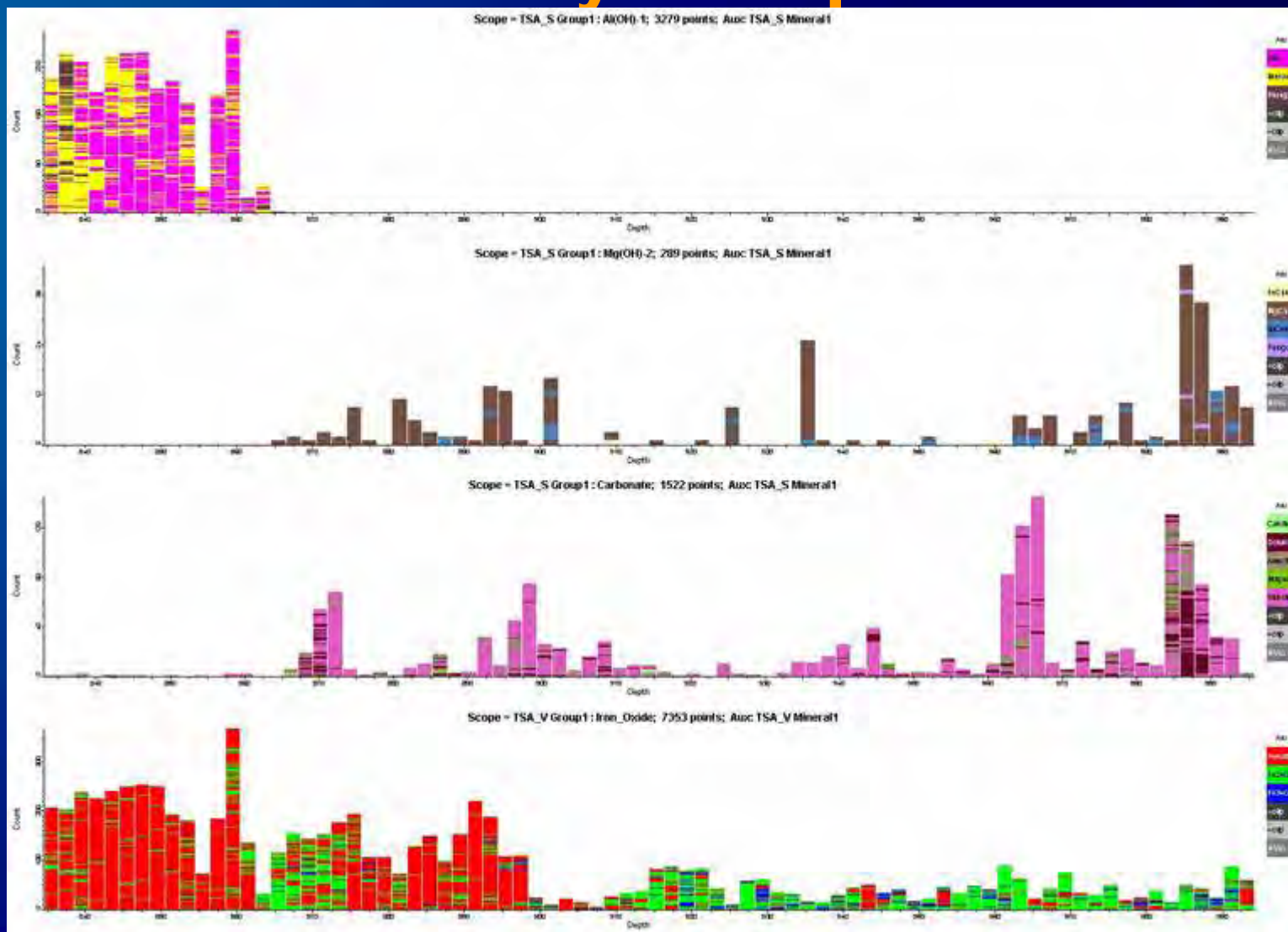


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Red Lake 8 – SAR8



Cocky Swamp

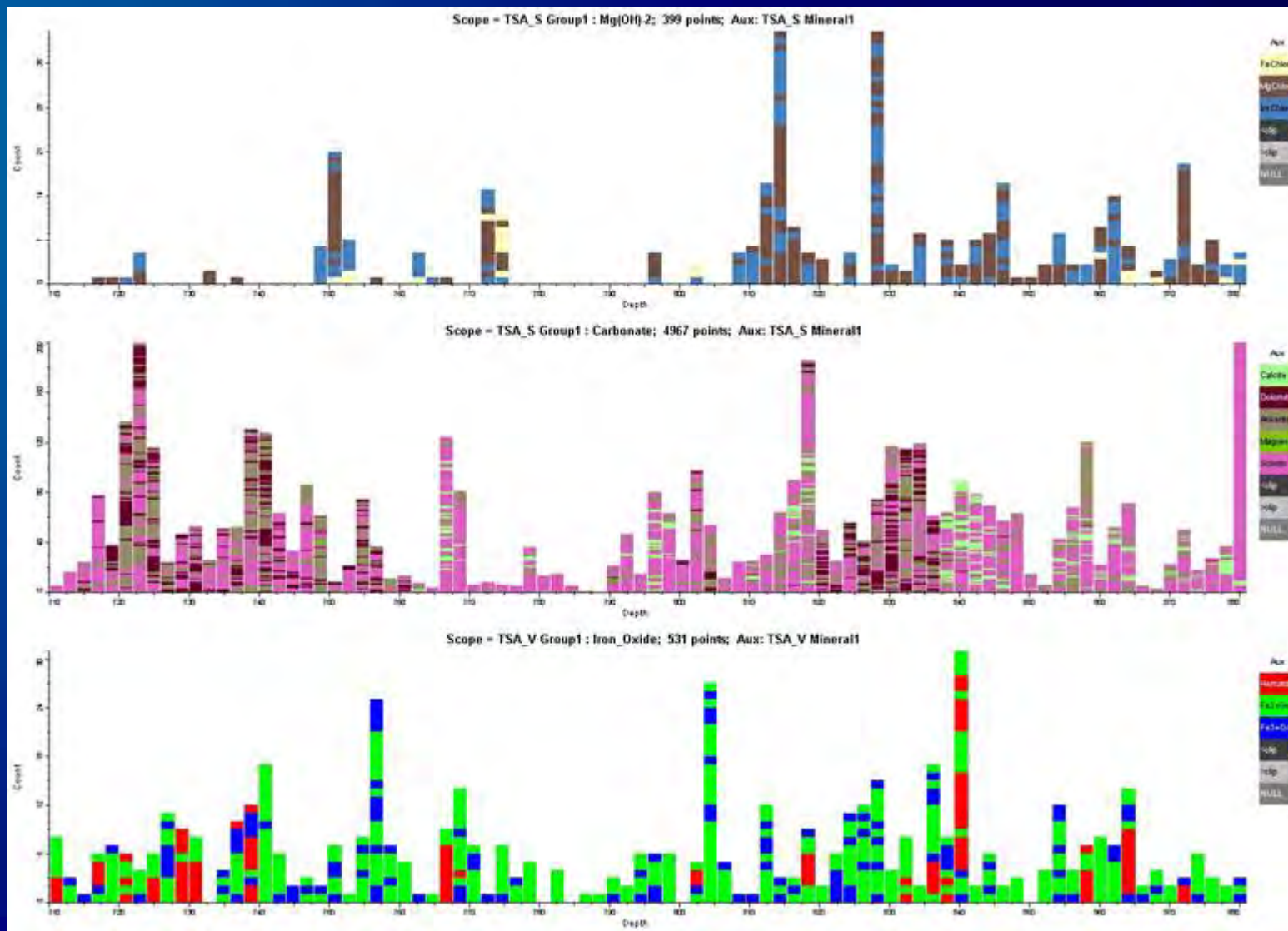


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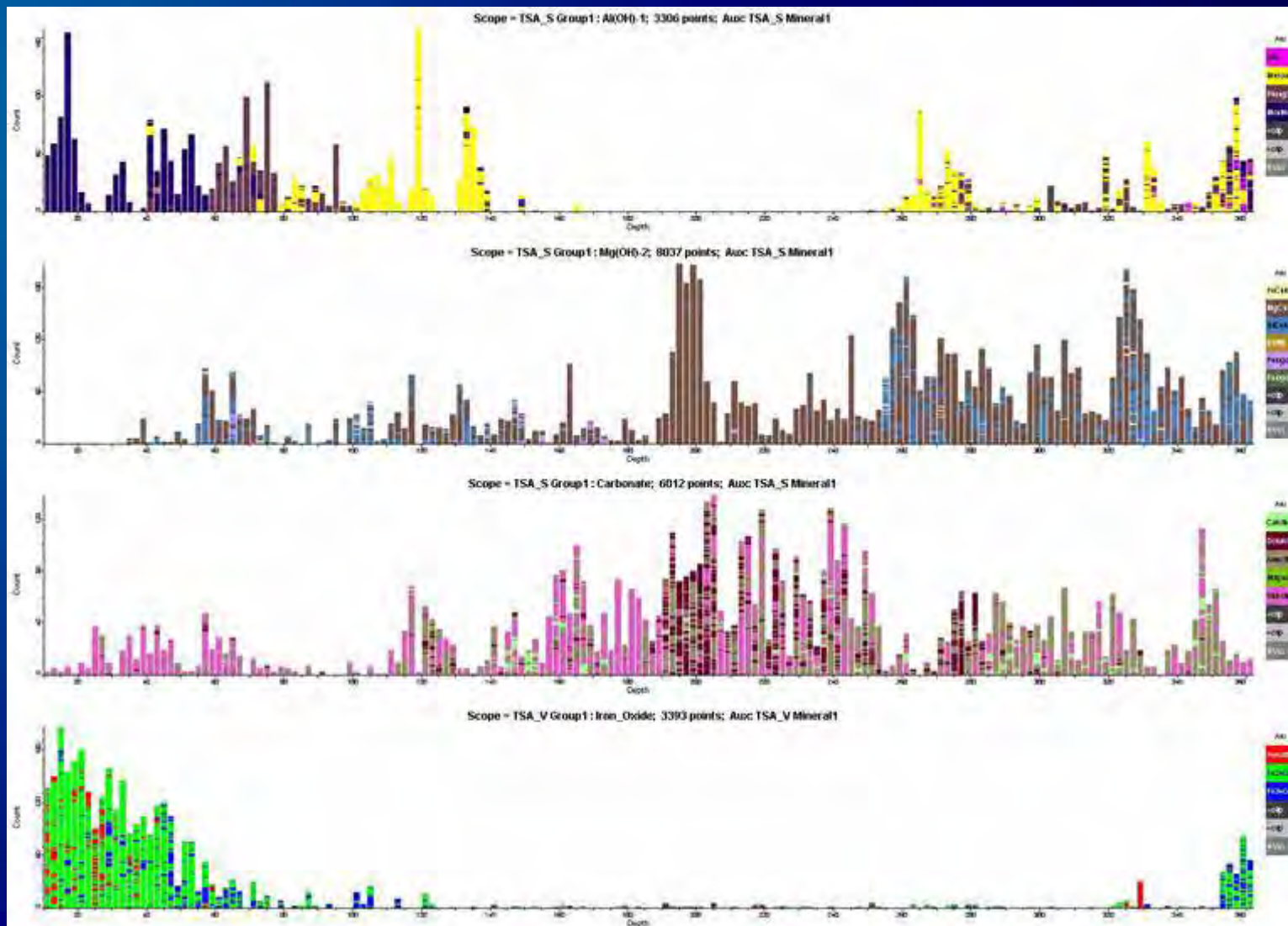


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Torrens TD2



MALD 1

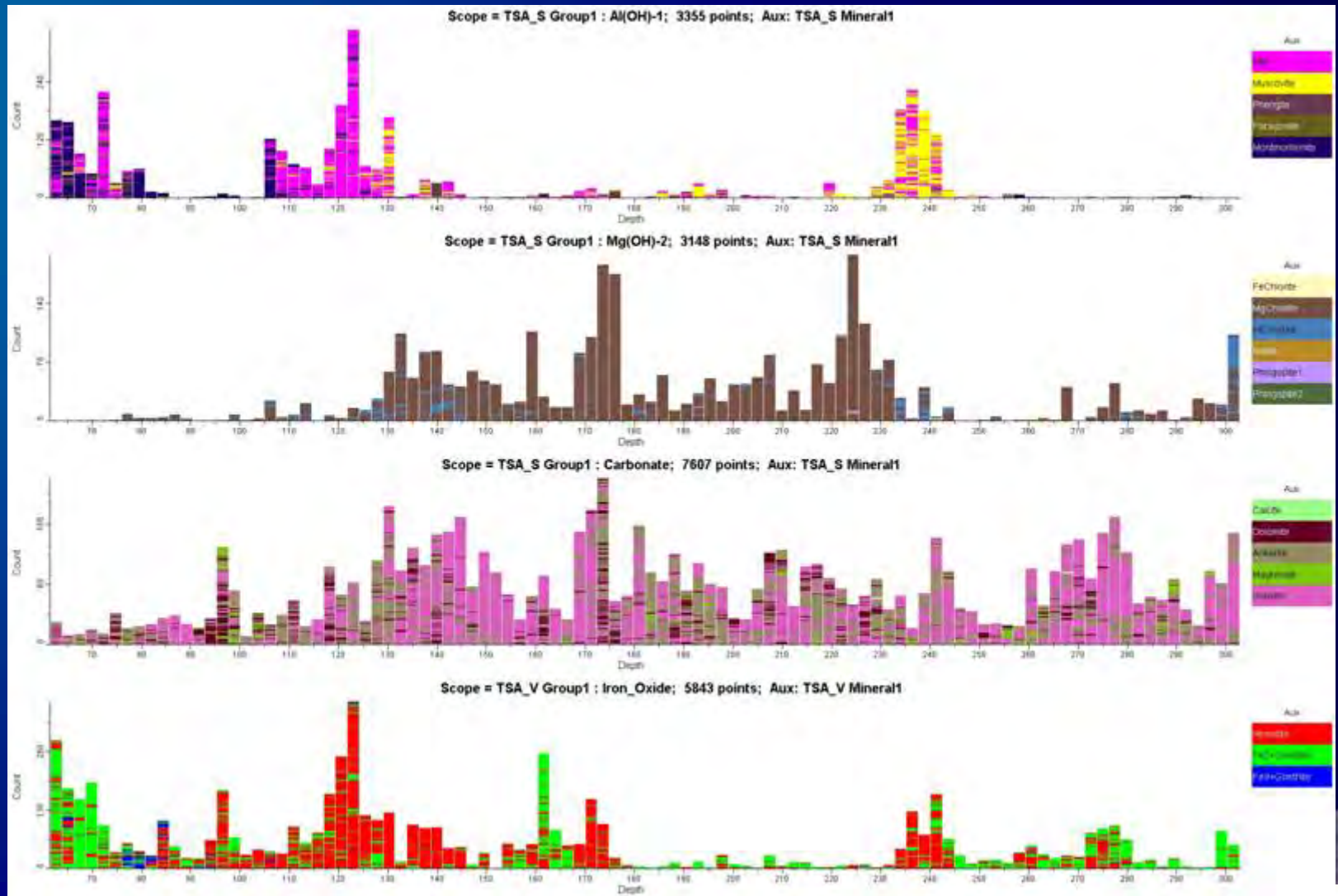


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North Broken Hill DH203



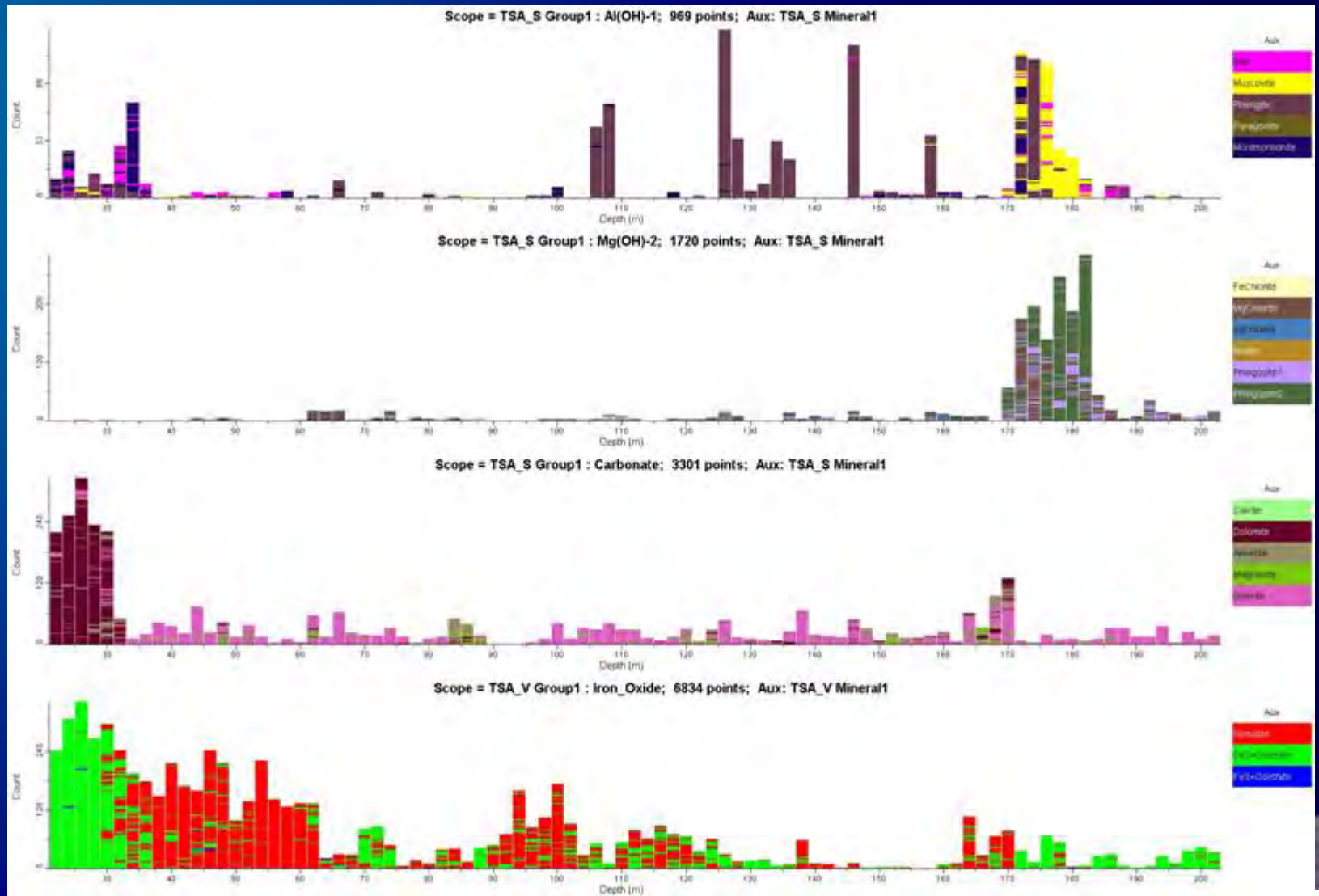
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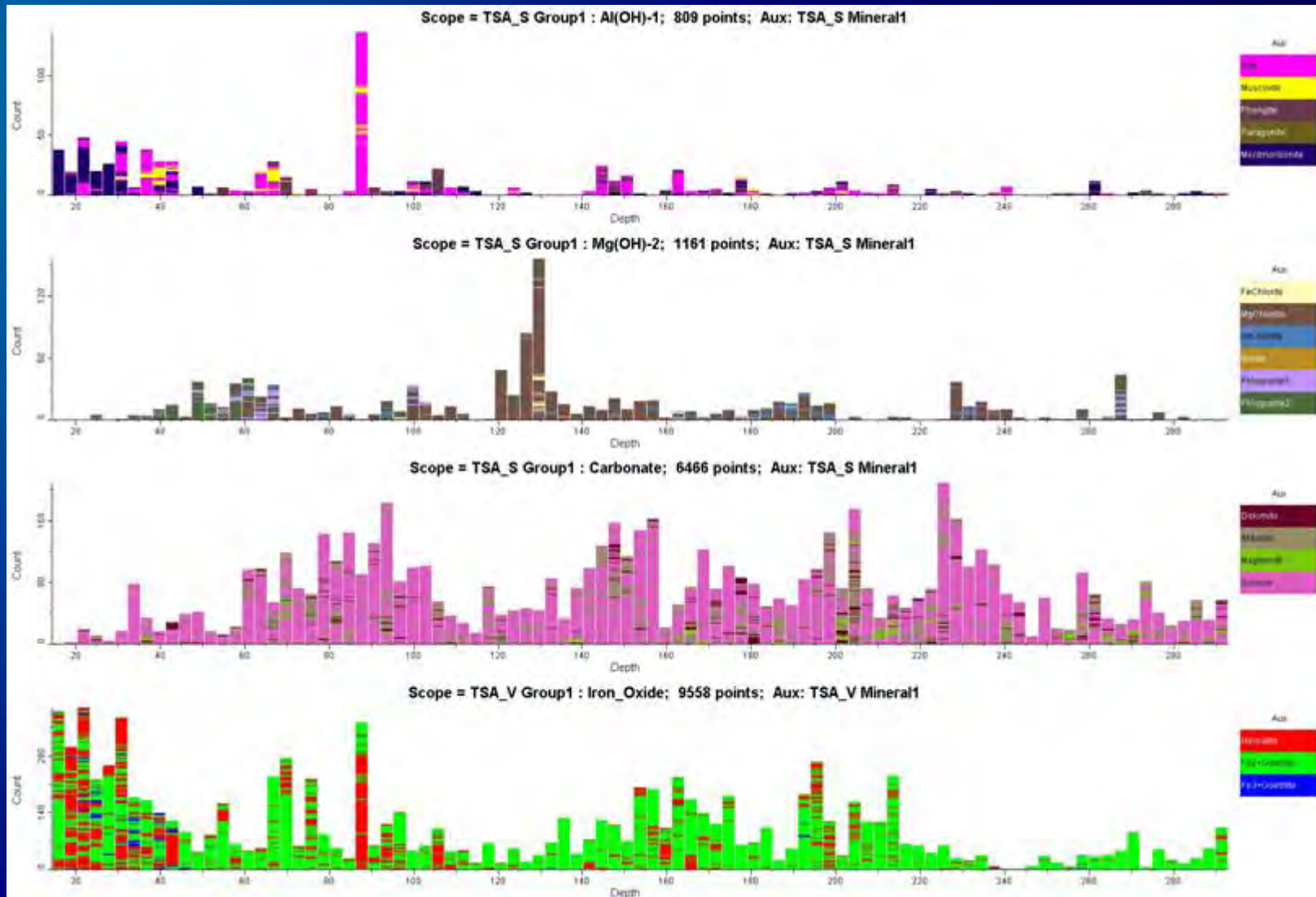
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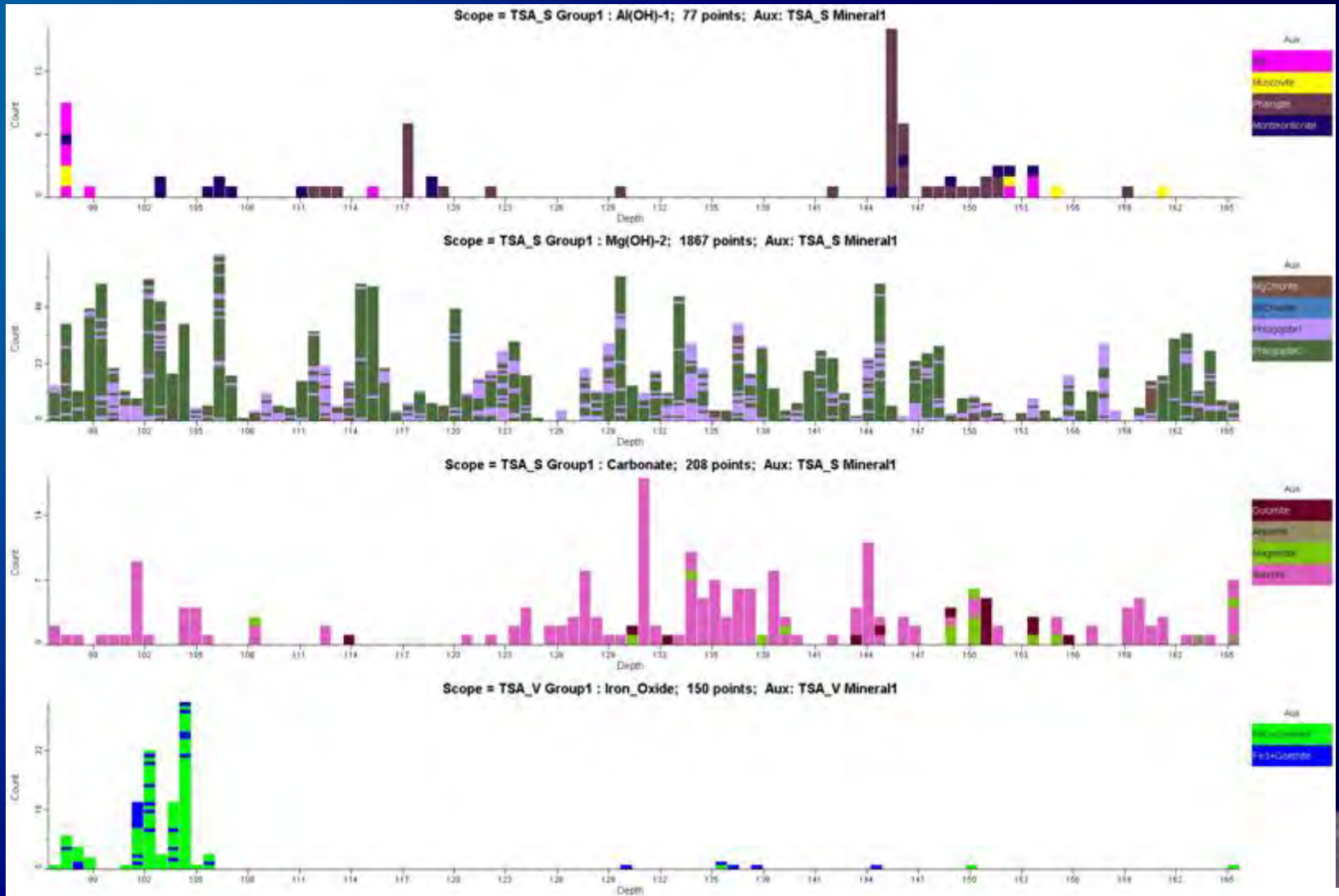
Yorke Peninsula DDH178



Weetulta DDH93



King George KGD01



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Results

Muscovite (Sericite) distal to ore

Phengite increases towards ore zone

Al(OH) minerals absent in ore zone

Chlorites present in ore zone – Fe/Mg-Chlorite

Acknowledgements

AMIRA Project P685 “Automated Mineralogical Logging of Drill Core, Chips and Powders”

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