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East Laverton Project: Litho-Structural Analysis and Targeting

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Purpose and Products

St George has completed substantial exploration for nickel sulphide-type mineralisation in the project area. From this work, it was recognised that the extent of the preserved greenstone belt may be greater than had previously been recognised. CSA Global and Outcrop Exploration were therefore commissioned to:

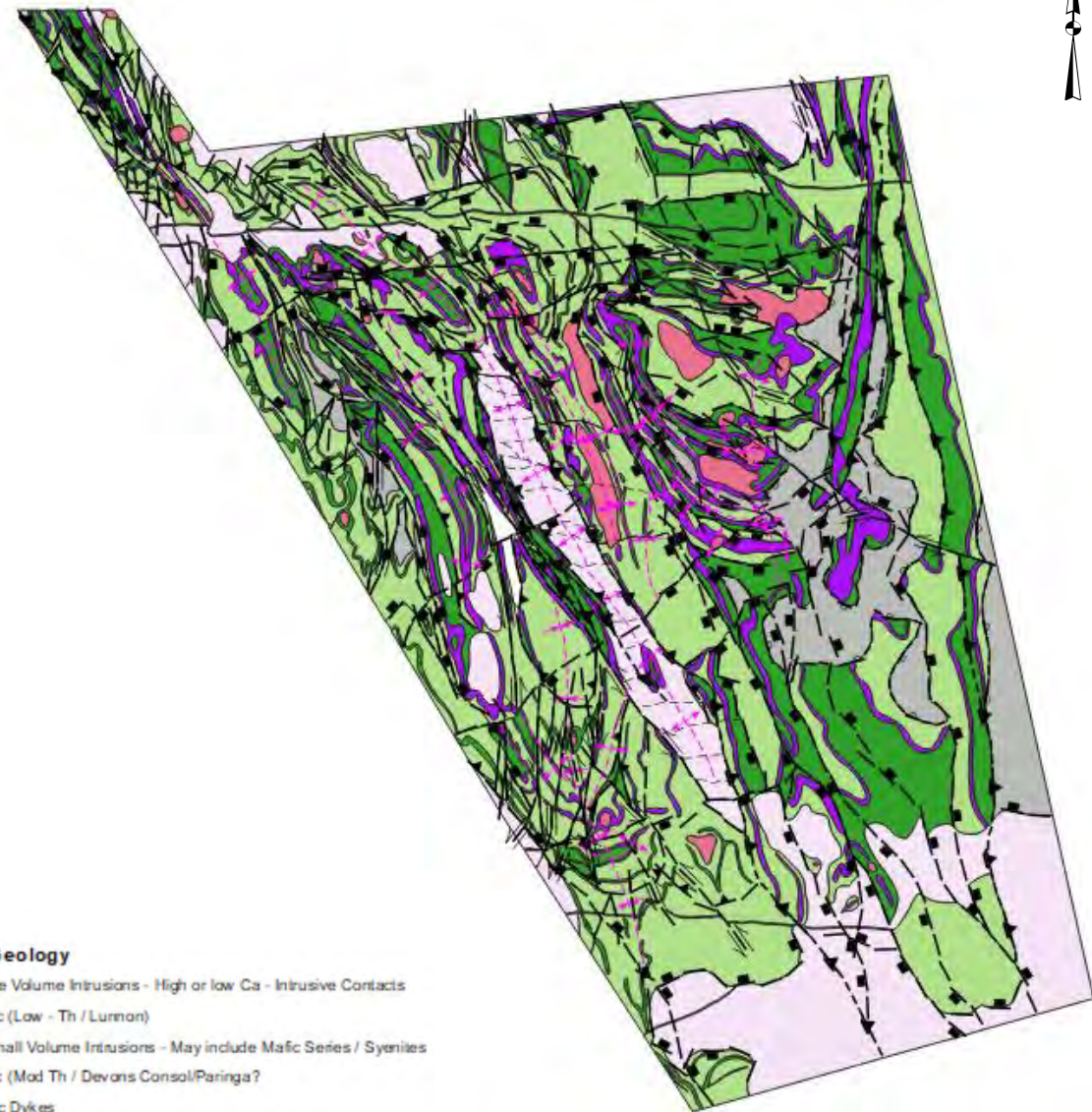
- Compile as much open file data as possible to constrain lithology/stratigraphy and complete a geochemical model as suitable.
- Complete a litho-structural review of the East Laverton Project/Greenstone belt to:
 - Assess the extent of preserved greenstone; and
 - Interpret the structural history of the greenstone belt to provide a framework for potential magmatic hydrothermal mineralising events.

Products for delivery include: a compiled and concatenated database product, interpreted structural and litho-structural GIS products, a high-level target assessment – summarised in a powerpoint format report.



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Litho-Structural Interpretation

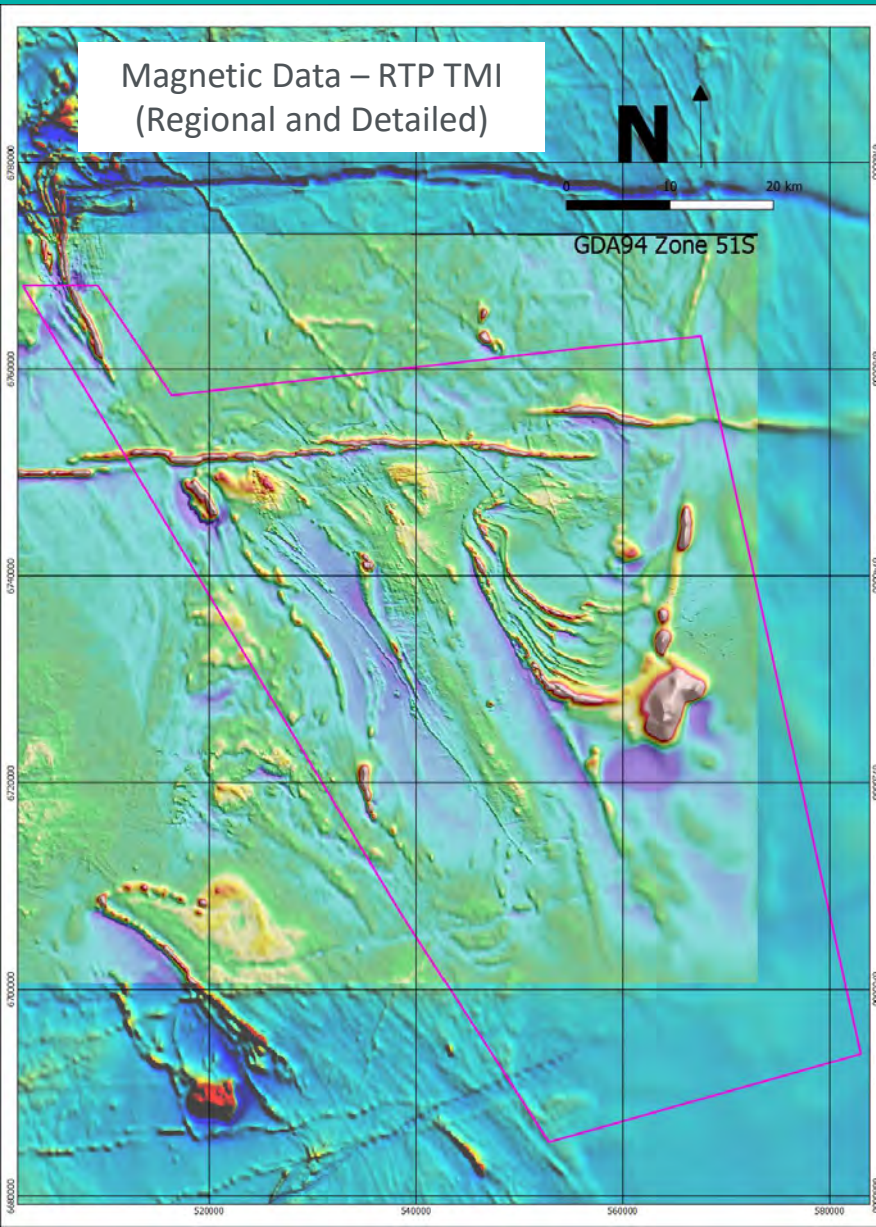


Legend

Interpreted Geology

- Early Large Volume Intrusions - High or low Ca - Intrusive Contacts
- Early Mafic (Low - Th / Lurnon)
- Internal Small Volume Intrusions - May include Mafic Series / Syenites
- Mid - Mafic (Mod Th / Devons Consol/Paringa?)
- Proterozoic Dykes
- Sediments - Dominantly Early extension related - Black Shale through Conglomerate
- Sediments - Dominantly Early extension related - More Likely Conglomerate
- Sediments - dominantly Early extension related - More likely Conglomerate
- Ultramafic - Komatiite +/- Tholeiite

Litho-Structural Interpretation – Available data

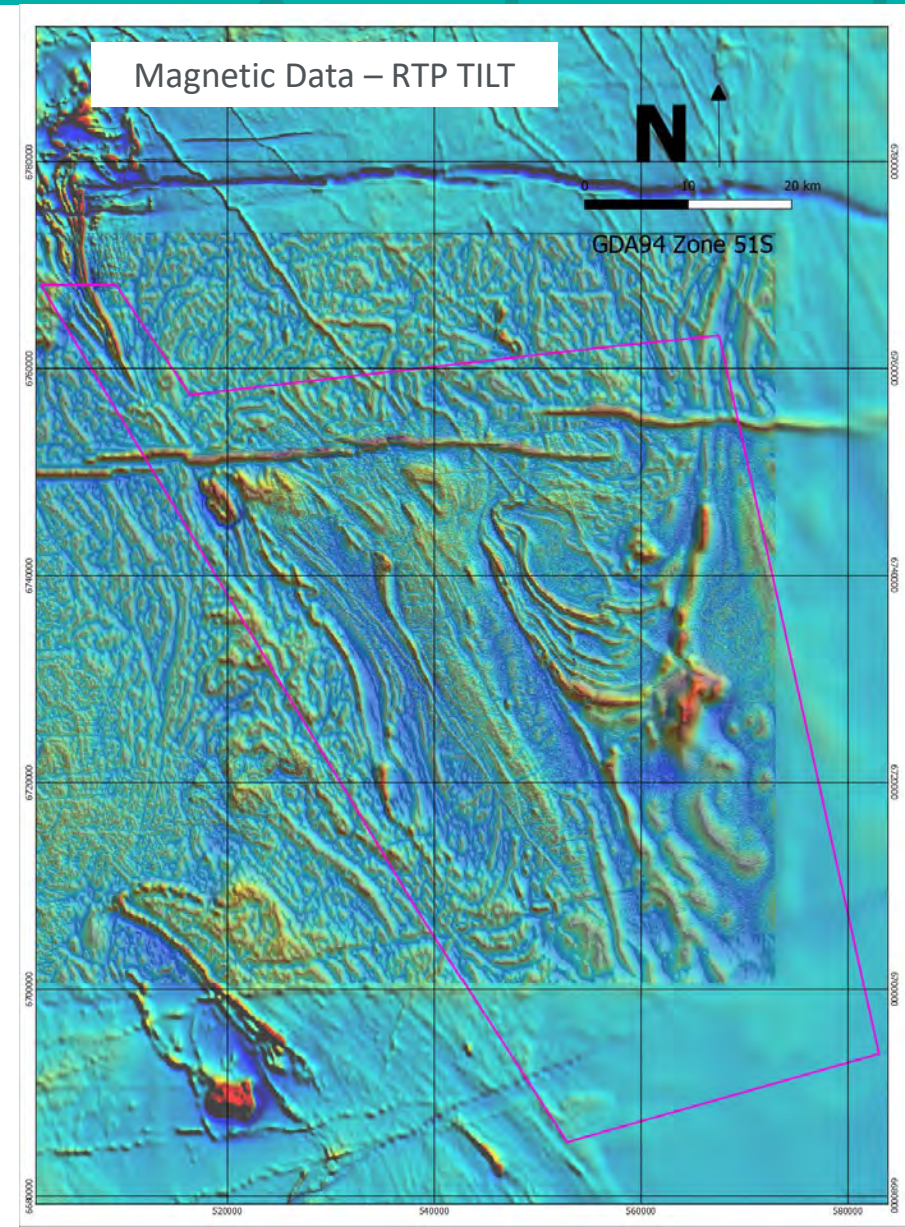


The principal dataset used was regional aeromagnetic data.

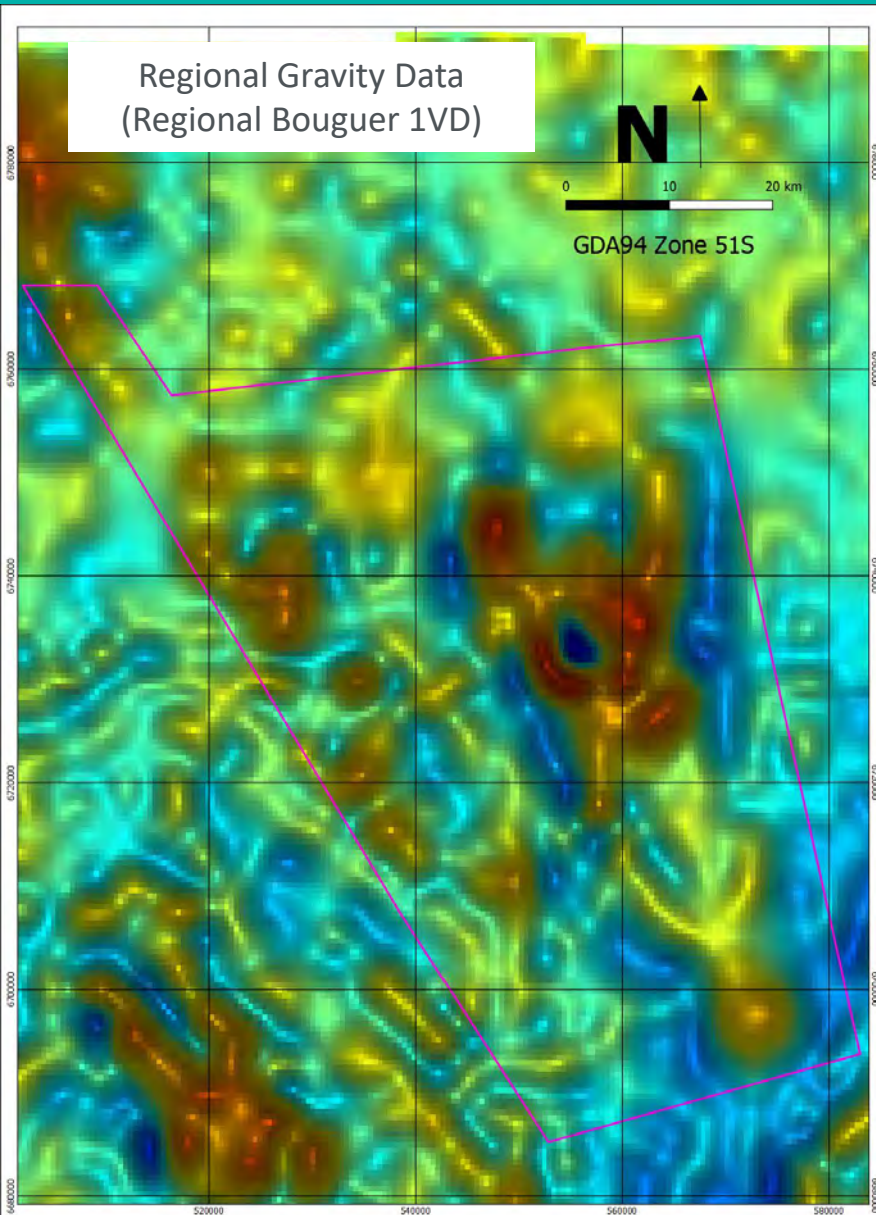
This comprises a background of regional 400 m line spaced data (public) and more detailed 50 m line spaced data collected by SGQ.

Various signal filters and enhancements were used:

- RTP-TMI and 1VD for lithology
- Tilt and 1VD for structure



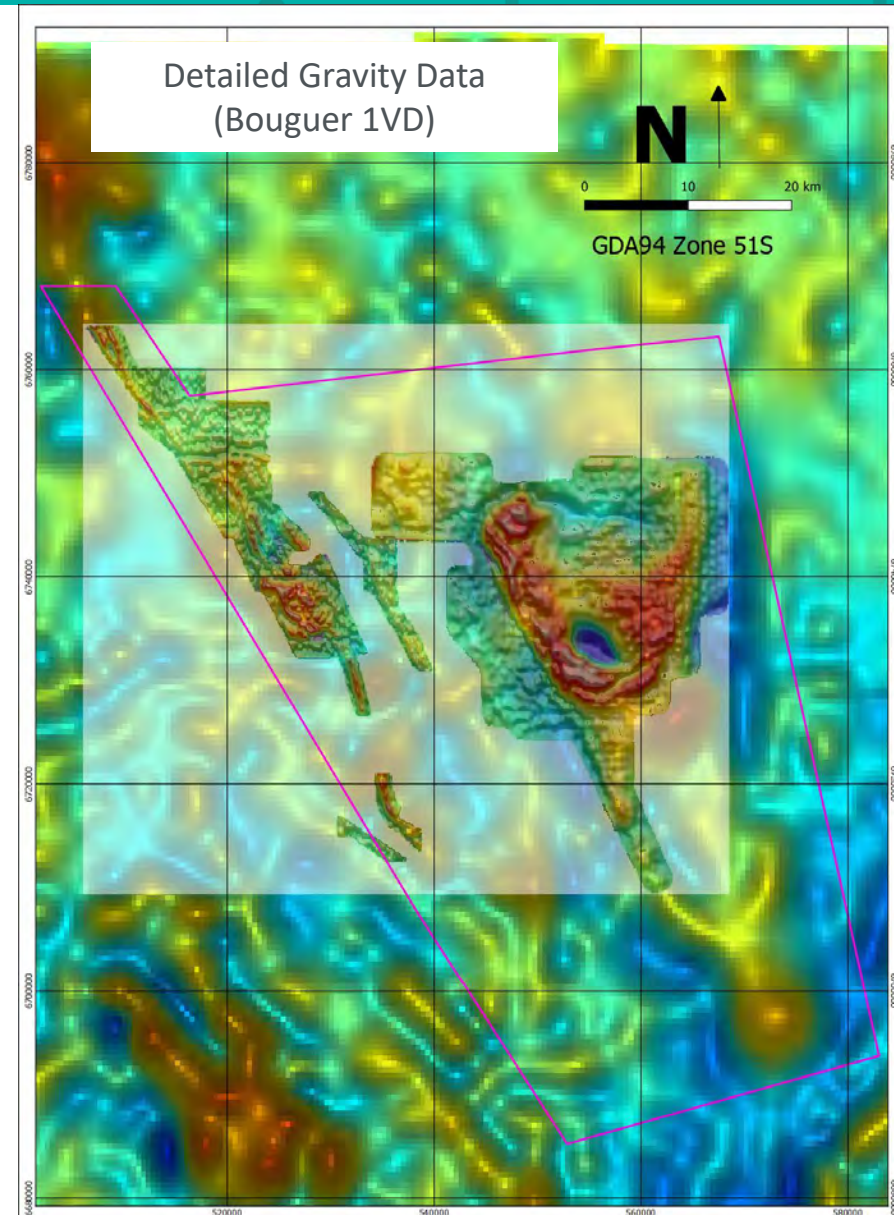
Litho-Structural Interpretation – Available data



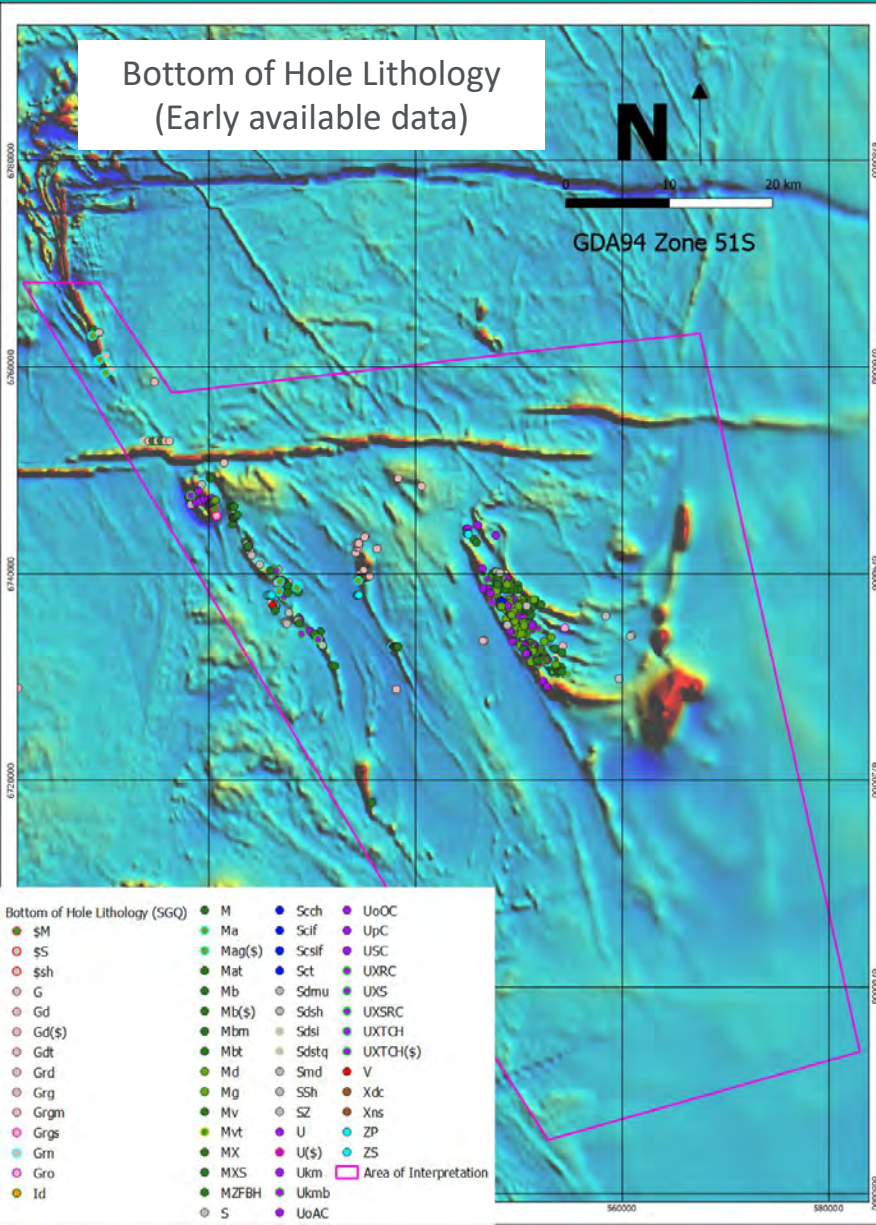
The secondary data used is gravity.

Regional gravity data is coarse but provides a baseline for higher density greenstone outlines.

Detailed company gravity provides insight into the architecture and extent of major greenstones.



Litho-Structural Interpretation – Available data



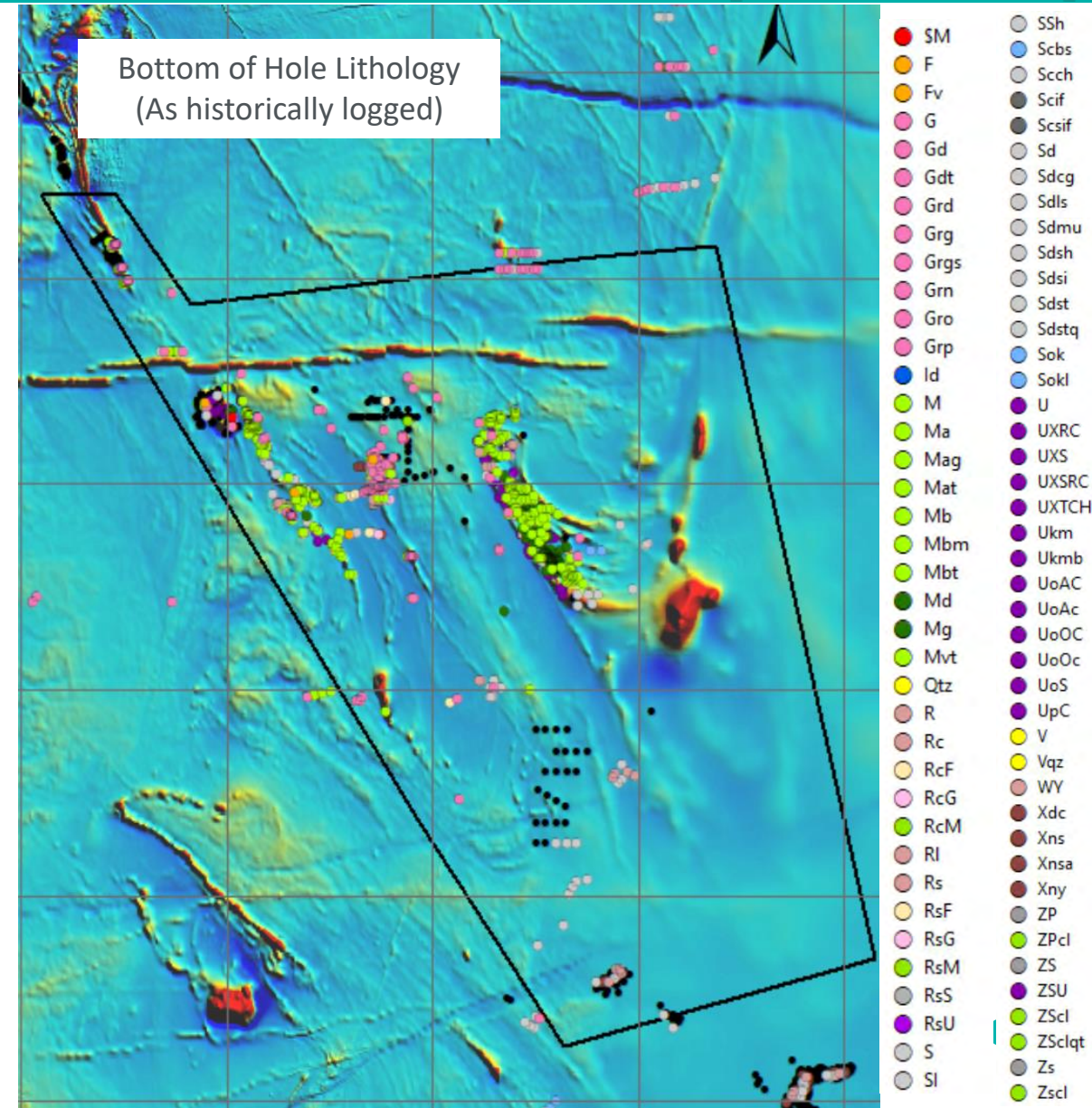
Initial lithological constraints and 'getting an eye in' was provided by BOH lithology derived from SGQ database.

Provided a reasonable baseline for the magnetic and gravity signature of major units.

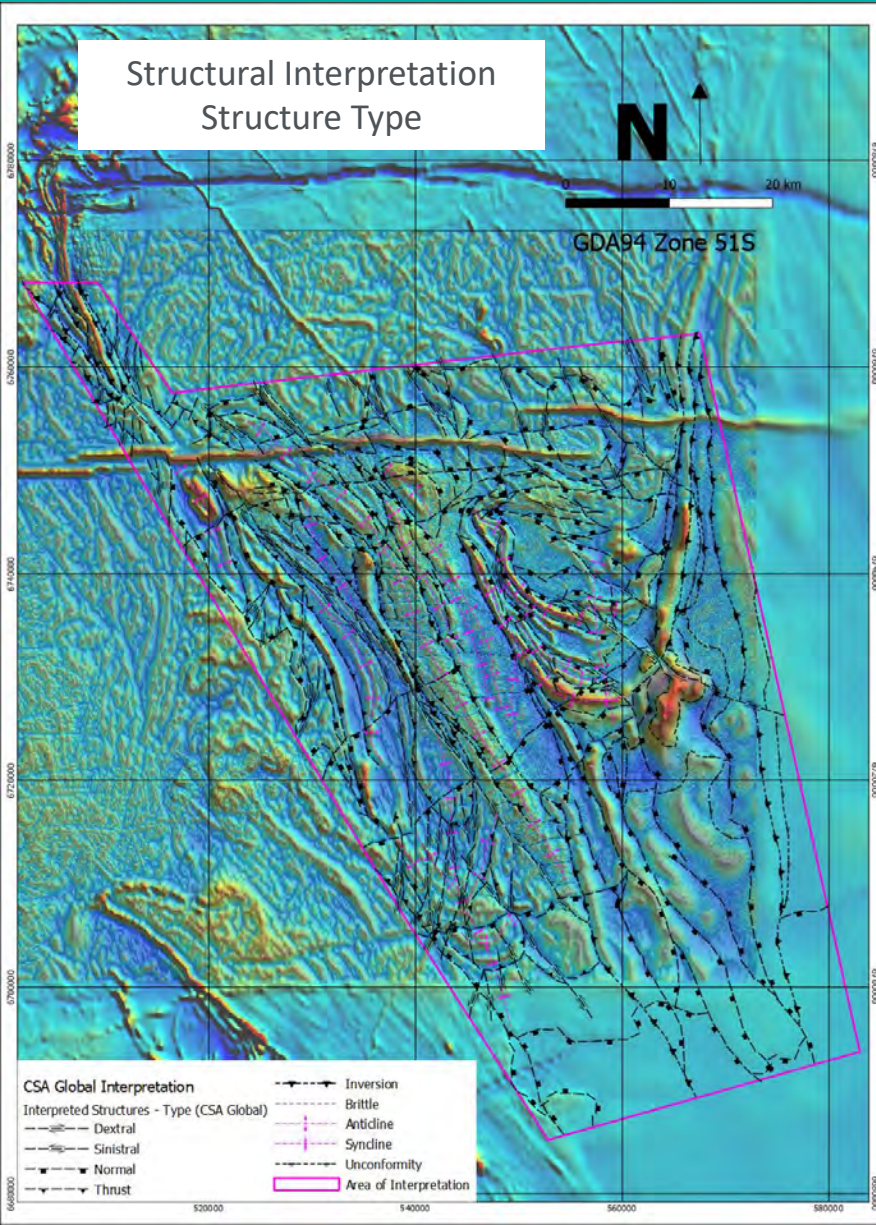
Doesn't necessarily provide good insight into metamorphic grade.

Dominated by mafic and ultramafic stratigraphy due to prior exploration focus.

BOH sediments provided confidence in 'Late Basins'



Litho-Structural Interpretation – Structural Review



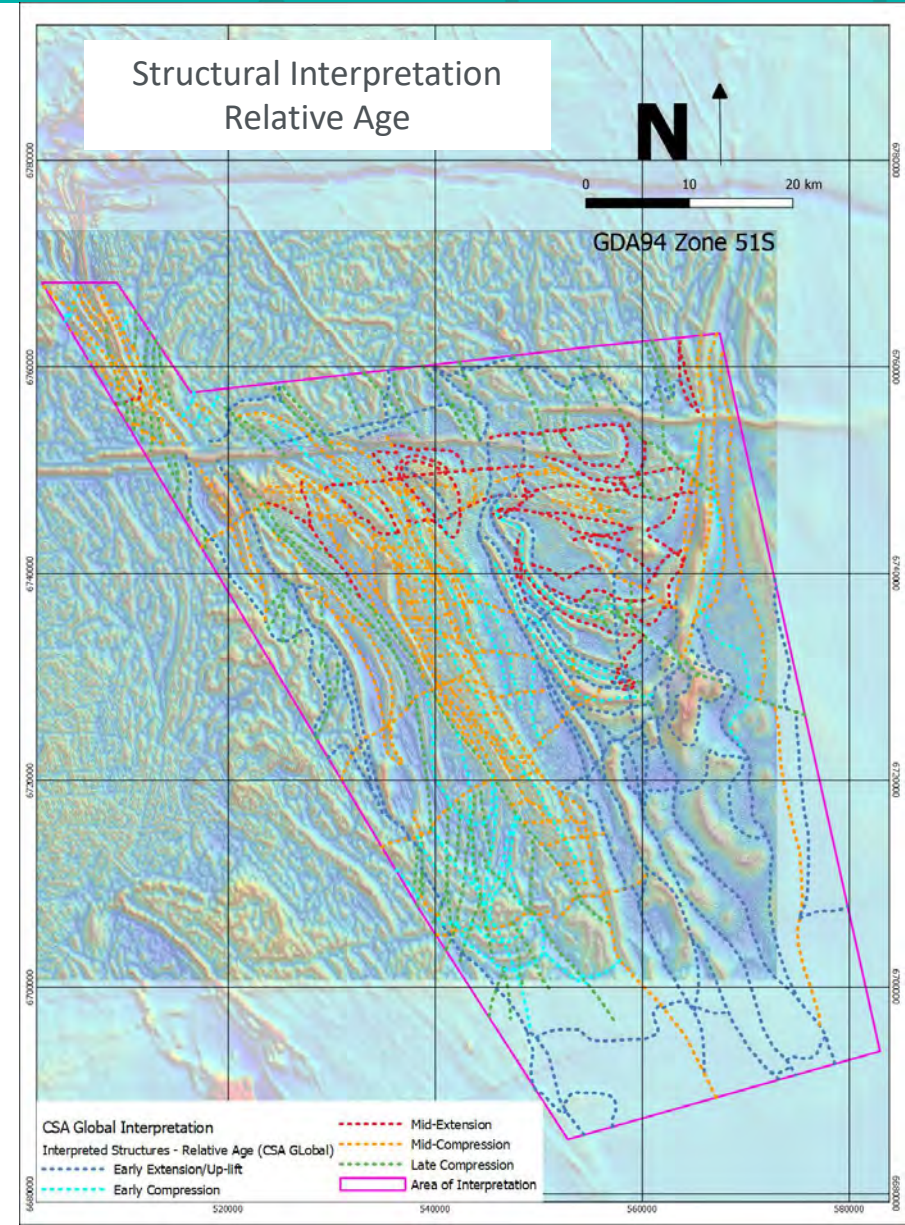
A structural interpretation was completed with consideration for a number of factors:

- Generally accepted tectonic evolution of the Eastern Goldfields
- Type and orientation of structures
- Endeavour to maintain consistent cross-cutting relationships (based on relative age).

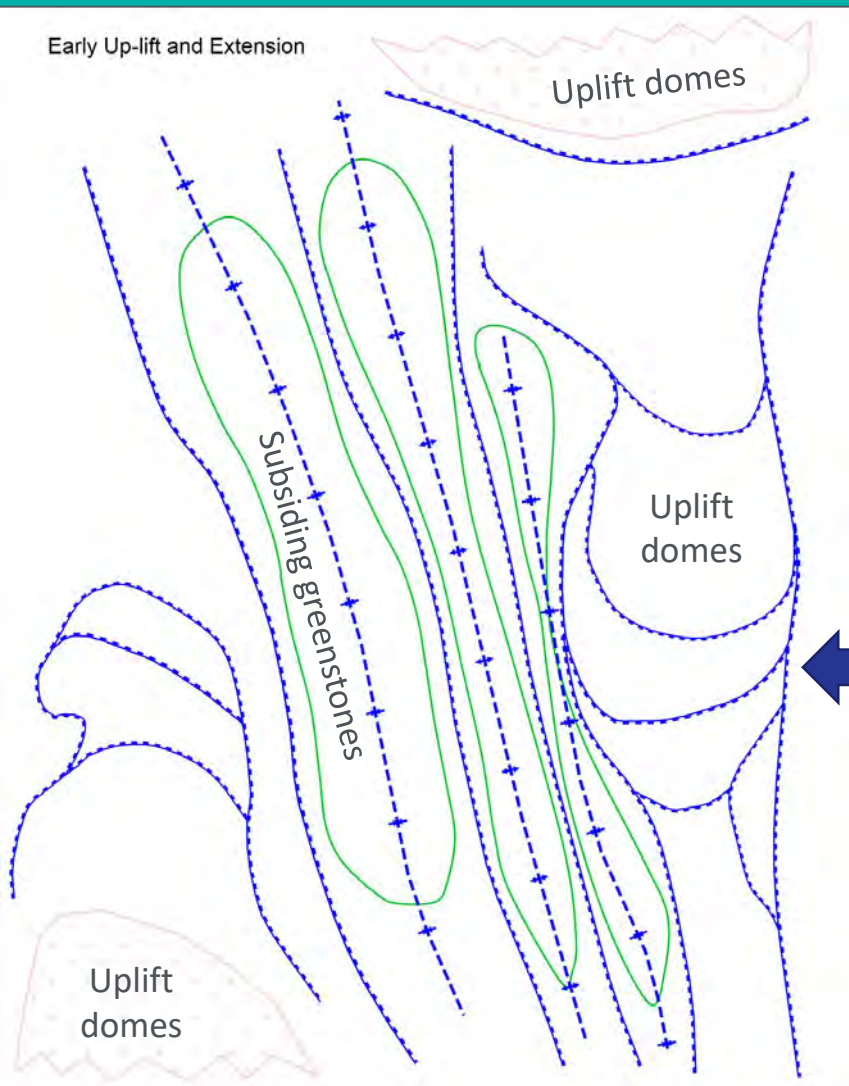
Data set contains three factors:

- Structure type (with dip)
- Relative age
- Confidence in structure.

Designed to provide user with increased understanding of the outcomes.



Litho-Structural Interpretation – Structural Evolution



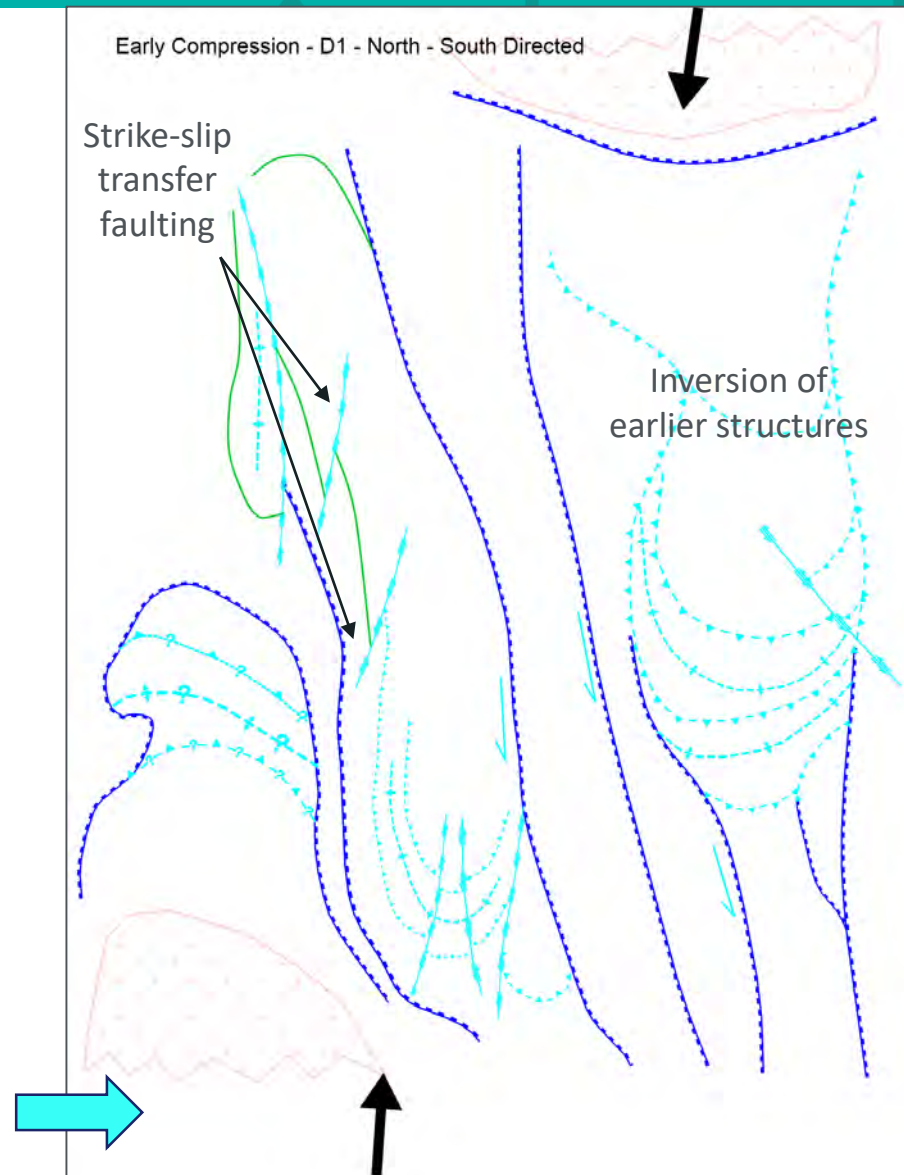
A series of cartoons, not to scale and illustrative only, were developed to demonstrate the inferred structural development of the greenstone belt.

Early Extension

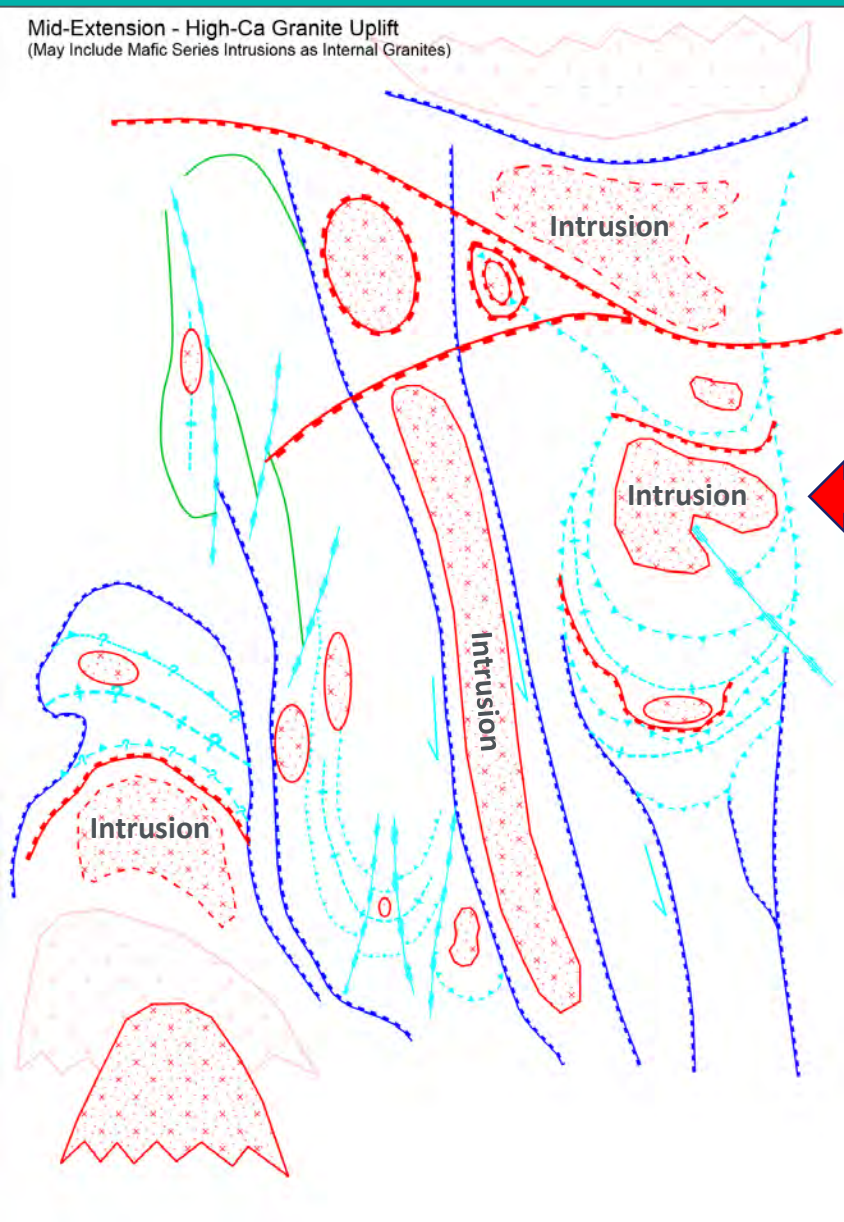
- Sagduction – gravity inversion resulting in uplift of 'granitic' basement and down-drop of greenstones, creating preliminary basin architecture and dome related extension architecture

Early Compression

- D1 N-S directed regional stress, inverting early generally E-W structures and folding greenstone stratigraphy

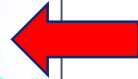


Litho-Structural Interpretation – Structural Evolution



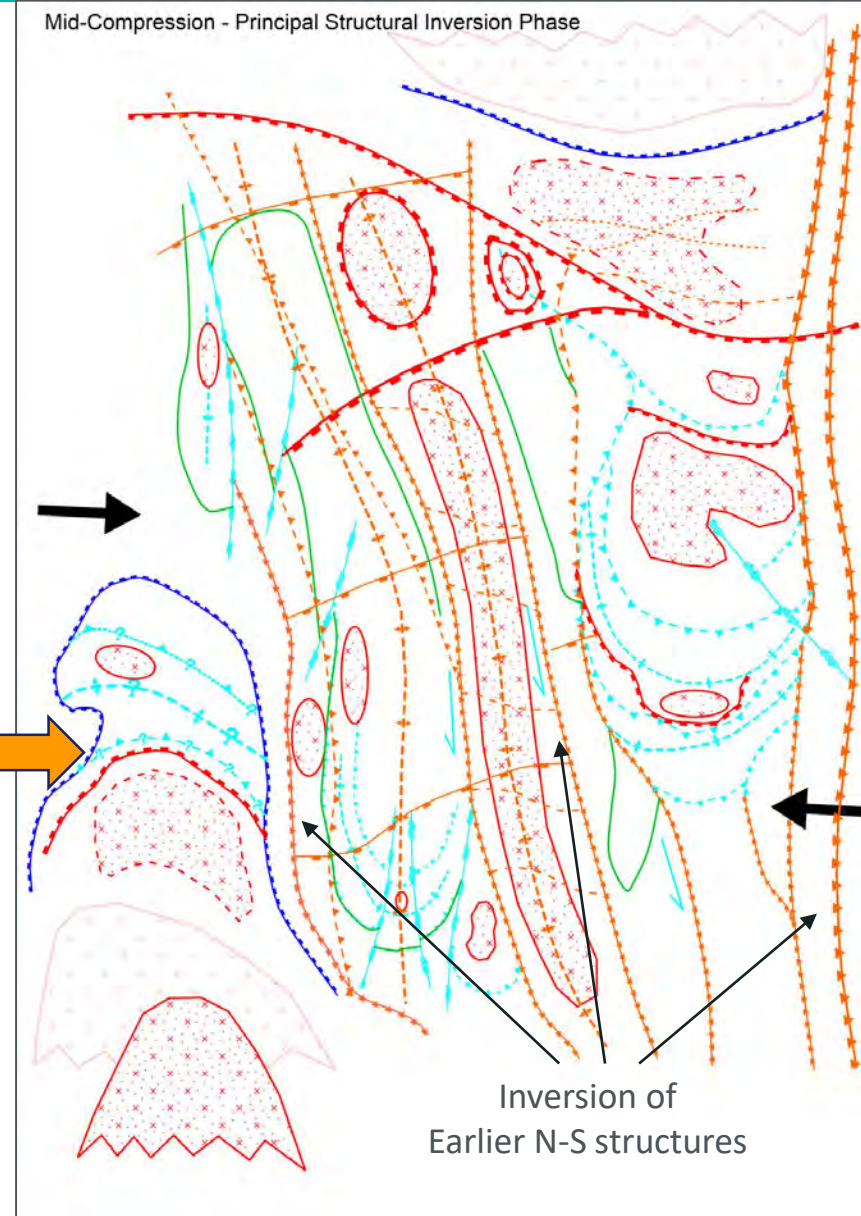
Mid-Extension

- Intrusion of large scale batholiths (high-Ca series) driving domal uplift and generally east-vergent extension. Smaller volume intrusions may be mafic and/or syenite series, generally proximal to early extensional structures.



Mid-Compression

- Generally E-W directed far-field compression resulting in major inversion of early structures, with folding

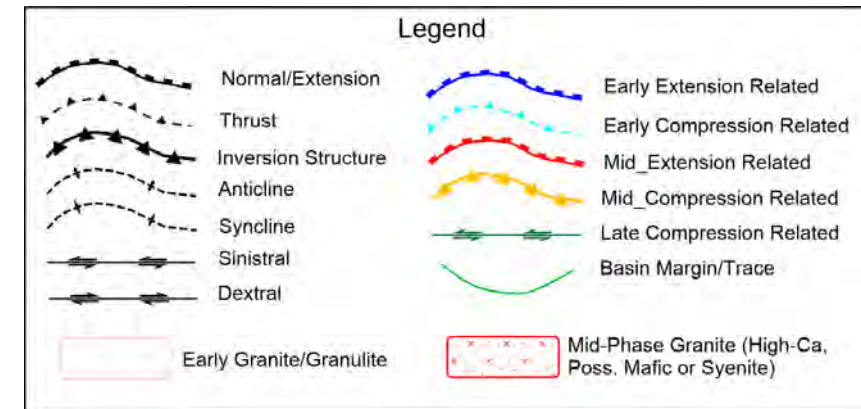


Litho-Structural Interpretation – Structural Evolution

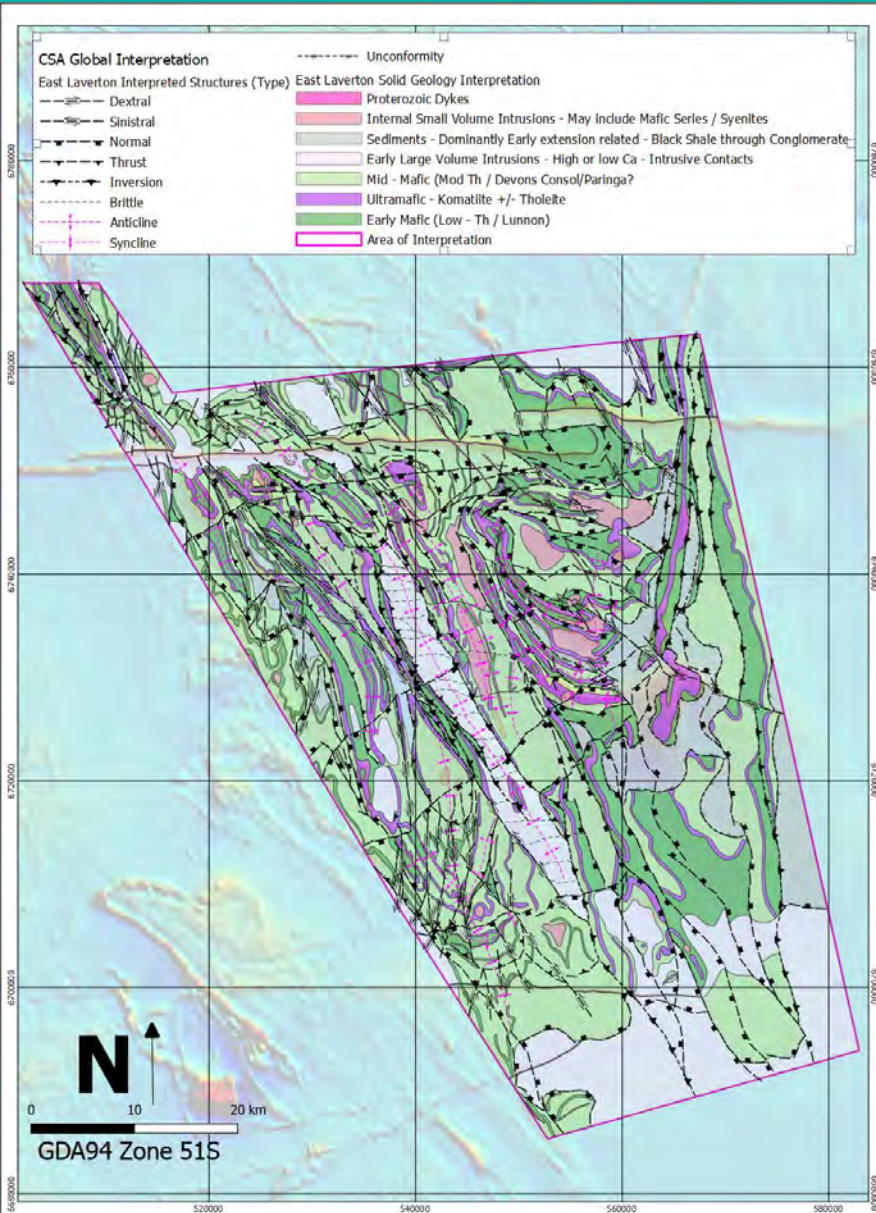


Late-Compression

- Probably related to rotation of the far-field stress field to NW-SE driving compression into sinistral dominant transpression.
- Major offset along the Stella Range fault zone and subsidiary complimentary structures causing dissection of the main basin and reactivation of a number of earlier structures.
- Arguably gold mineralisation timing relevant.

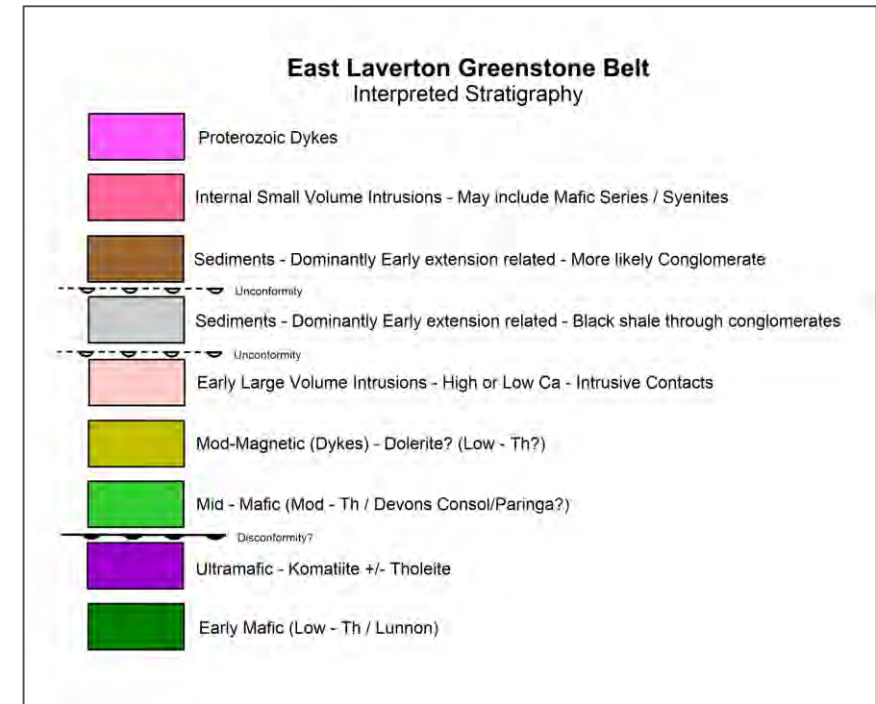


Litho-Structural Interpretation – Solid Geology

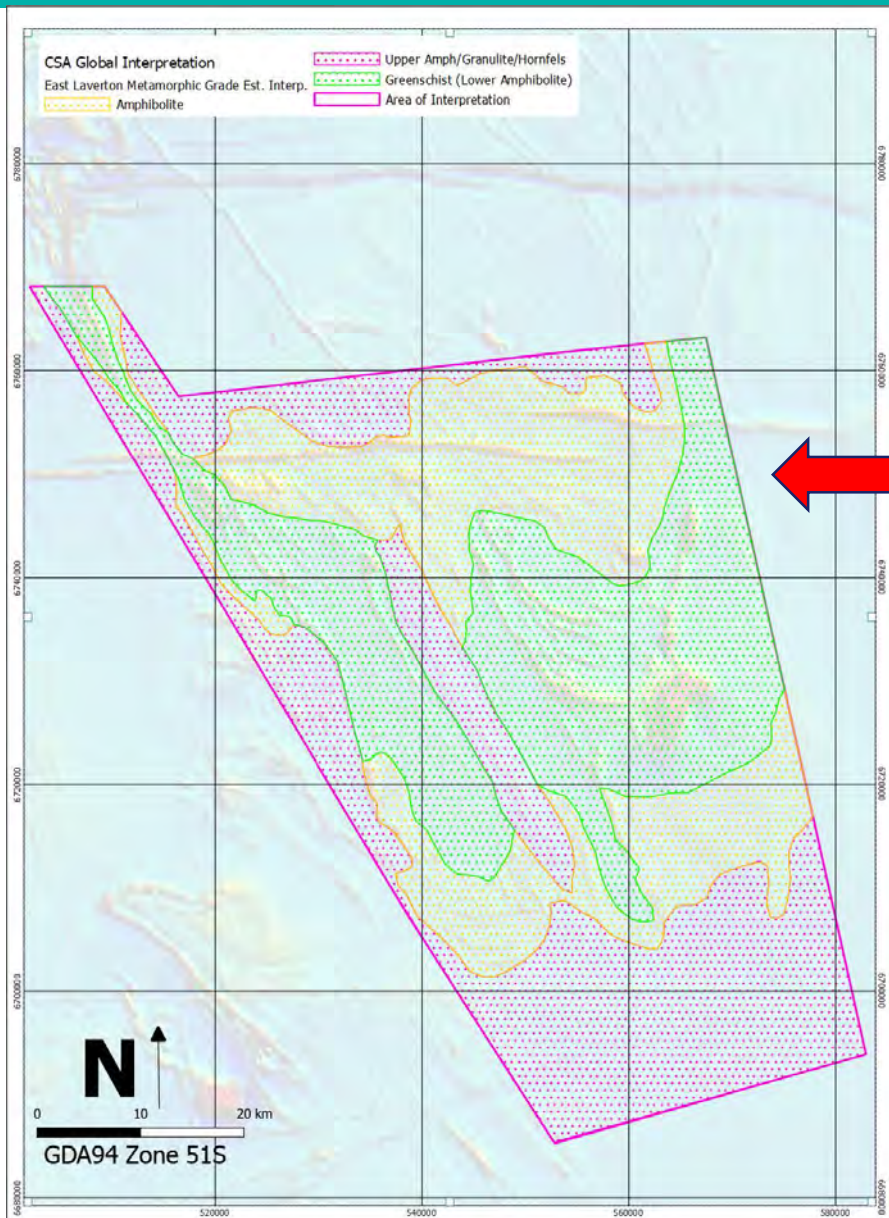


A solid geology interpretation (left) was completed based on the same data used for the structural interpretation. Available bottom of hole geology from drilling was used to calibrate the interpretation.

Right: is an interpreted stratigraphic column based on a generalised stratigraphic sequence of the Eastern Goldfields province and events that are relatively common to major global Archaean greenstone belts.

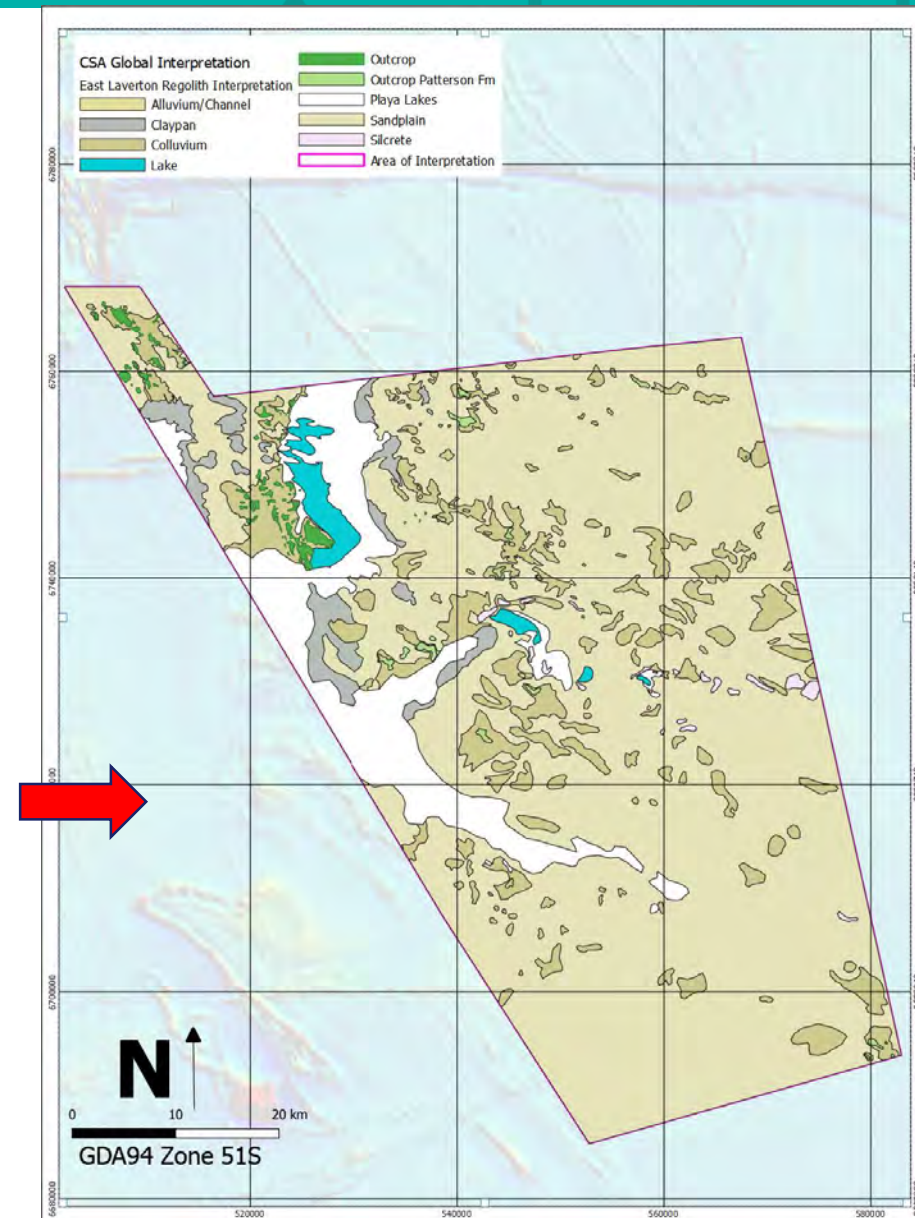


Metamorphic Grade and Regolith Interpretation



Metamorphic Grade: The interpretation suggests wide-spread greenstone. However, based in part on the BOH geology, but also the magnetic signature, it is considered that the area of true greenstone is limited. Instead, a large area of amphibolite to granulite level metamorphism is interpreted as indicated in the map to the left.

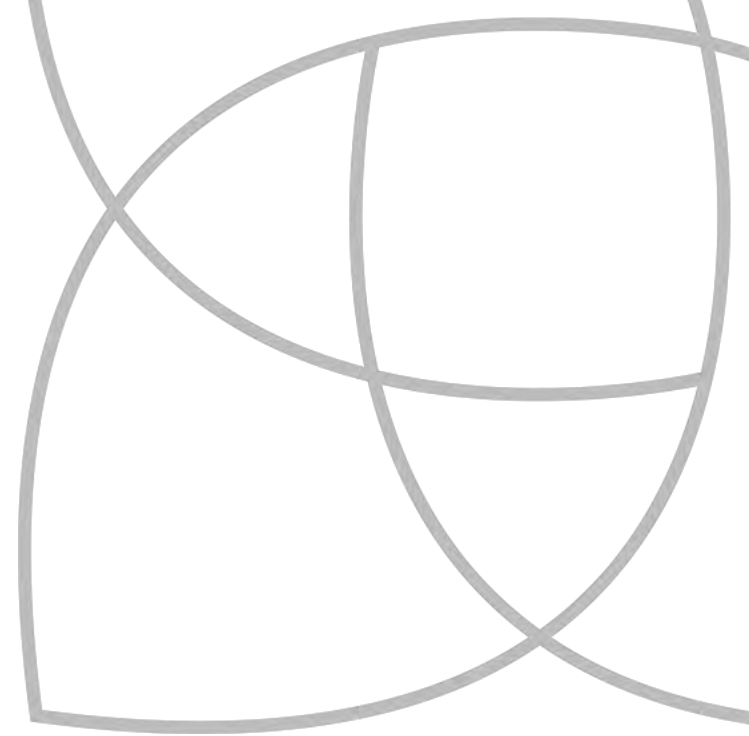
Regolith Interpretation: As part of the process of being able to place surface geochemistry in context, a regional level regolith interpretation was completed using a combination of data, including radiometrics, ASTER, and Landsat.





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Geochemical Datasets



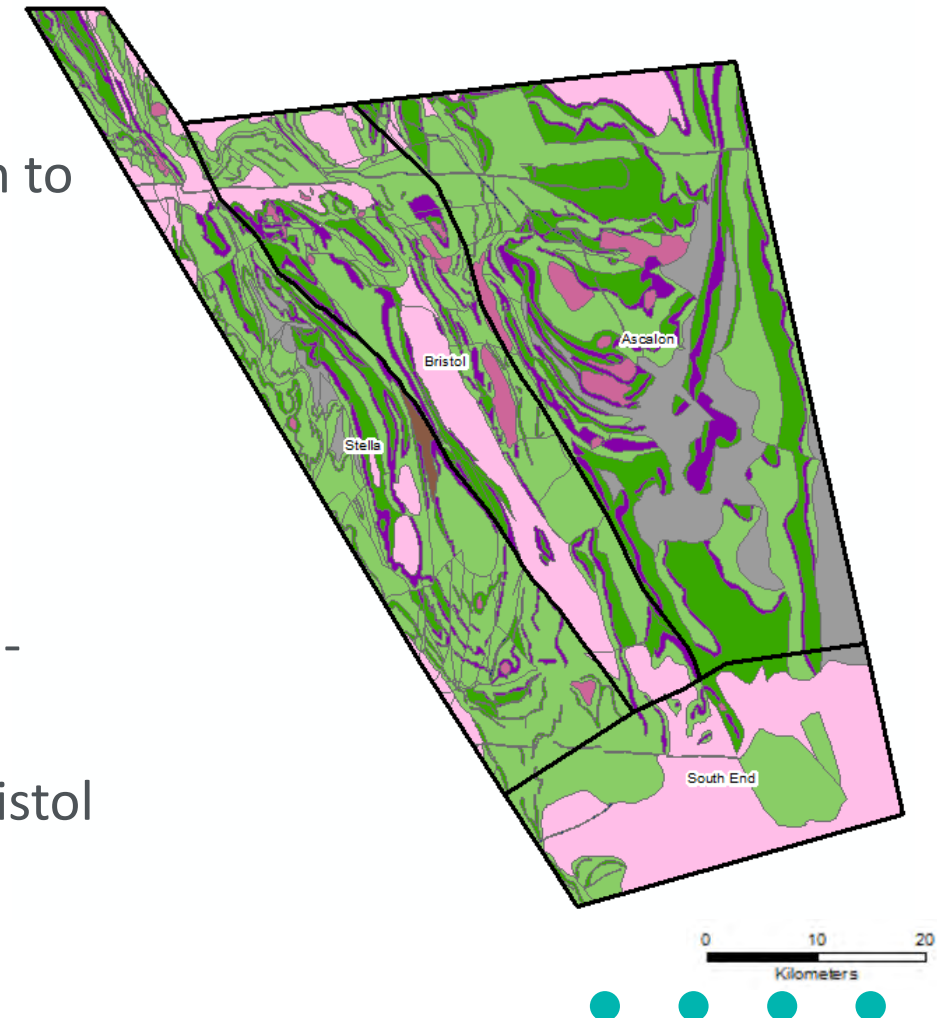
Geochemical Data Assessment

Using the surface and drill datasets, geochemical relationships and abundances were utilised to determine the presence of a magmatic hydrothermal signature.

Due to the sparse and inconsistent dataset, a holistic approach to the data was used.

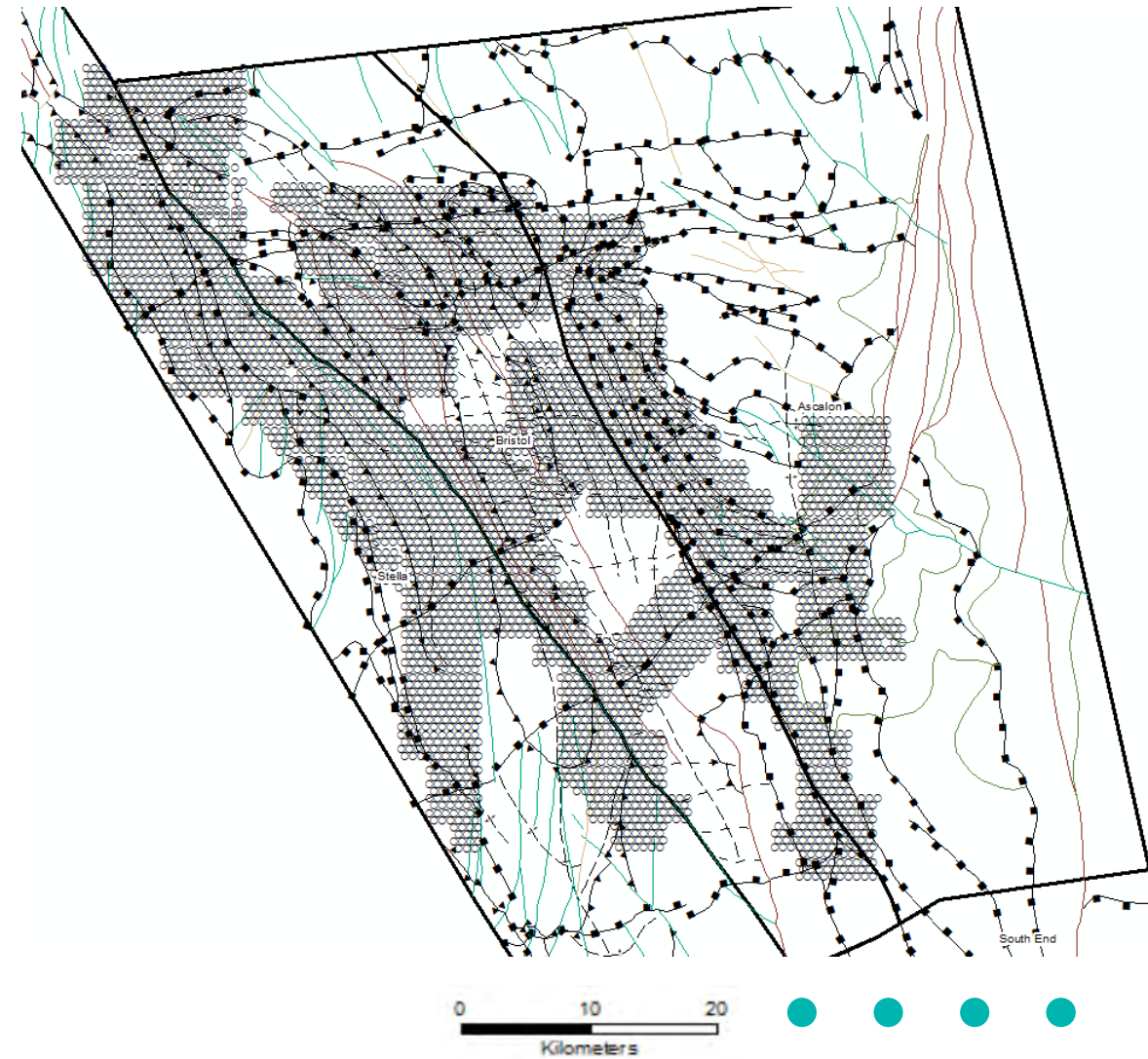
The key datasets include:

- Surface samples – including all types of soil sampling, auger, vacuum drilling and the top 5 m of drilling (generally 1st composite sample).
- Desurveyed drill data with lithology attributed by midpoint.
- The data was divided into 3 mains domains: Stella, Bristol and Ascalon (see figure to right).



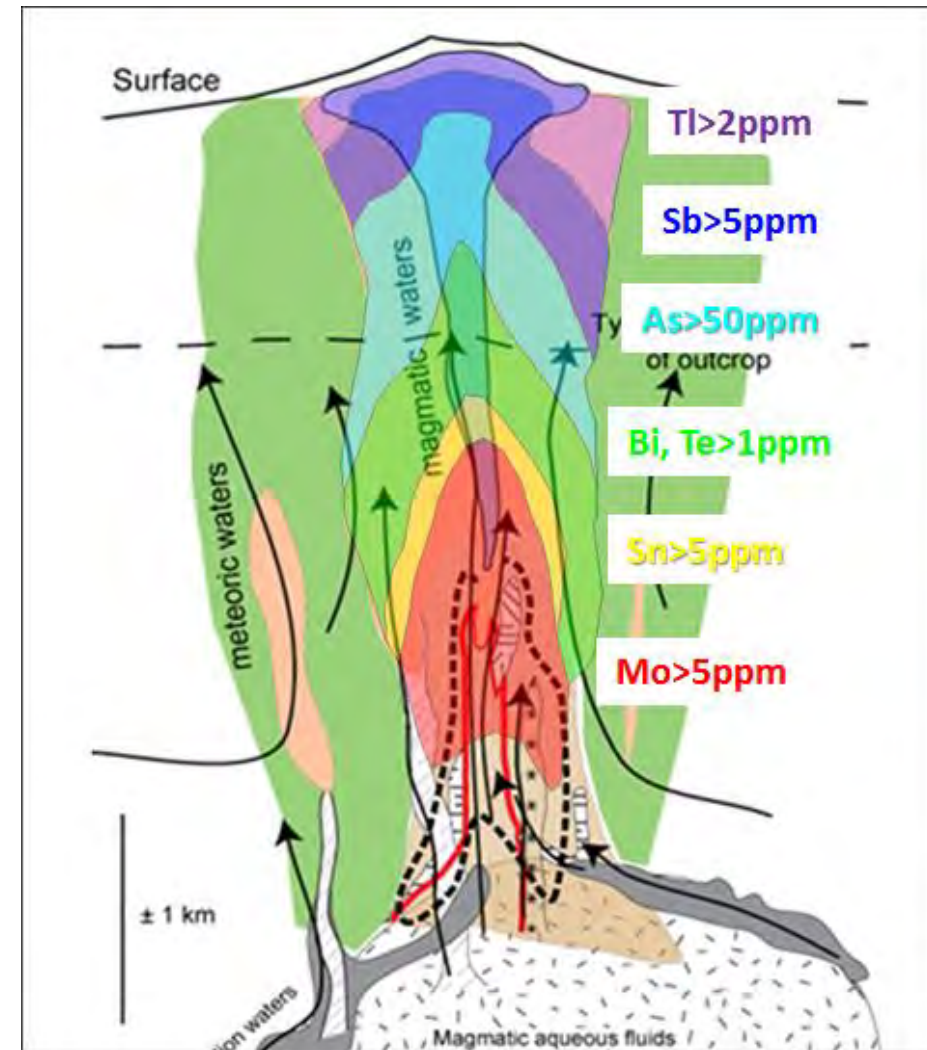
MMI Dataset

- Largest dataset within the AOI.
- Full multi-element analyses not completed on each sample.
 - Cu, Ce and Pd were the most sampled elements.



Background for Element Anomalism

- Due to a lack of coherent and consistent data, element anomalism (individual and associated) was used to determine if there is a magmatic hydrothermal signature.
- Geochemical assessment was based on the theory that is represented in a diagram by Scott Halley (right). The figure represents a temperature gradient for pathfinder elements. *“Mo-Se-Sn-Te-Bi-As-Sb substitute into the lattice of pyrite and are precipitated in sulfidic alteration sequentially down-temperature in any kind of hydrothermal system, regardless of the type of system. The zoning pattern primarily reflects a temperature gradient.”*
- 10x crustal background values for key pathfinder elements were used throughout the interpretation.

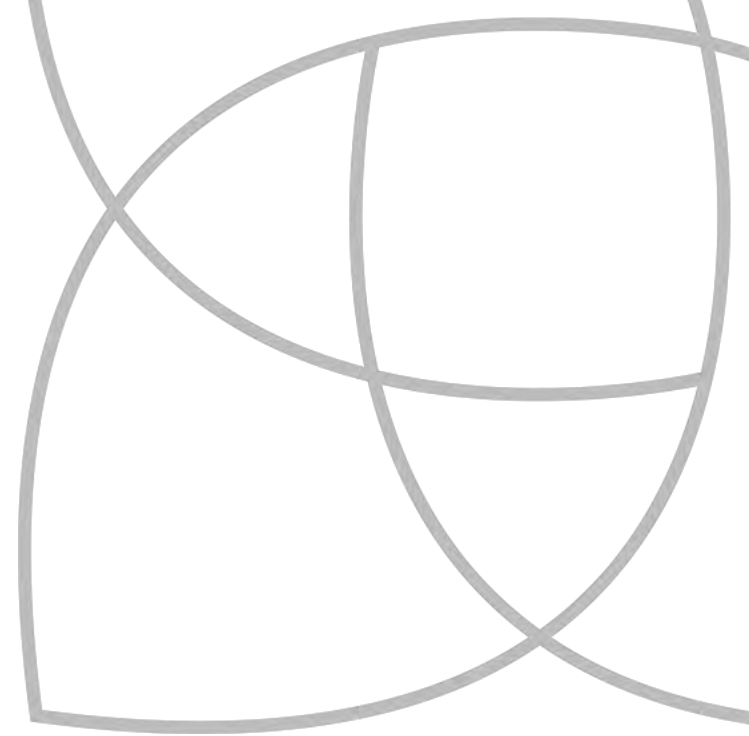


Taken from S. Halley Raglan Lecture, 2019.
(Presentation available on Mineral Mapping website)



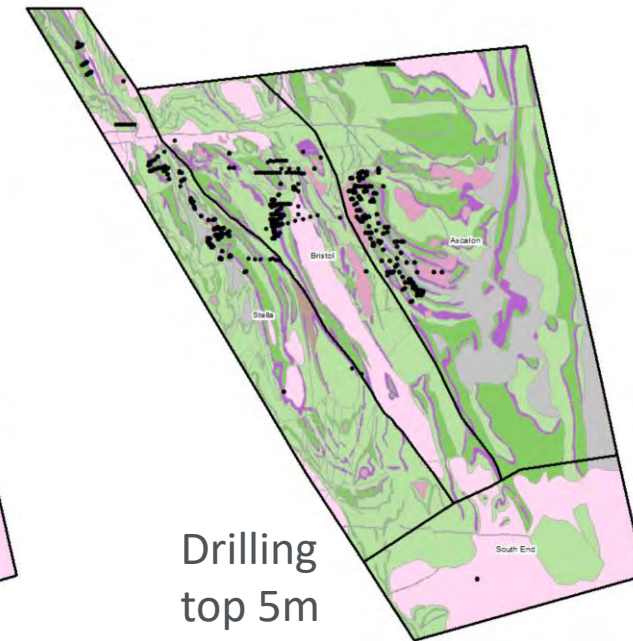
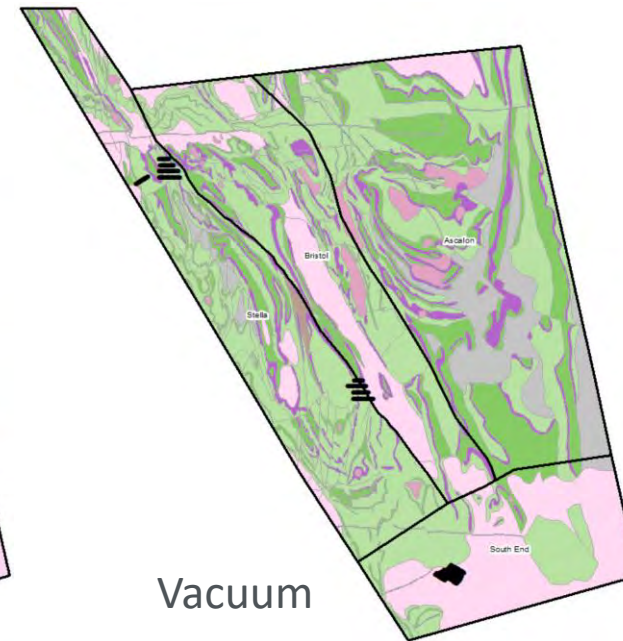
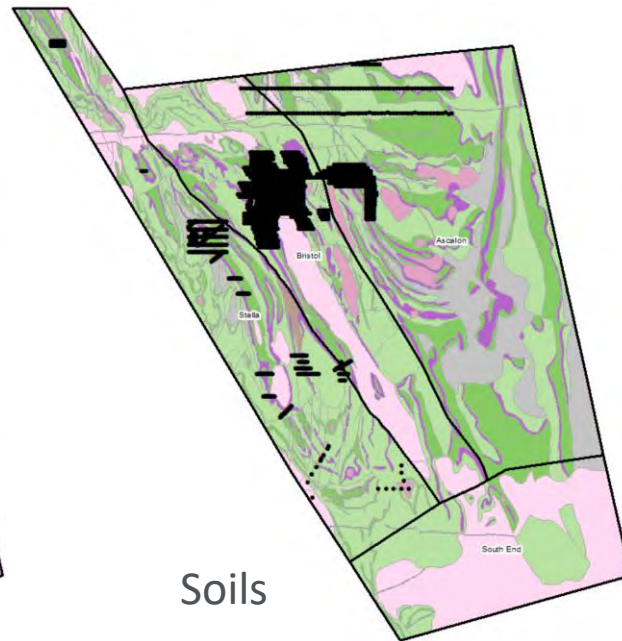
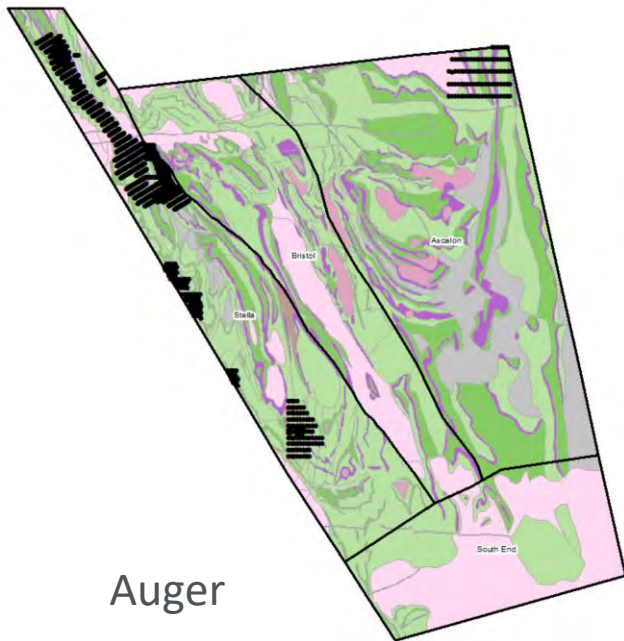
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Surface Sampling Datasets



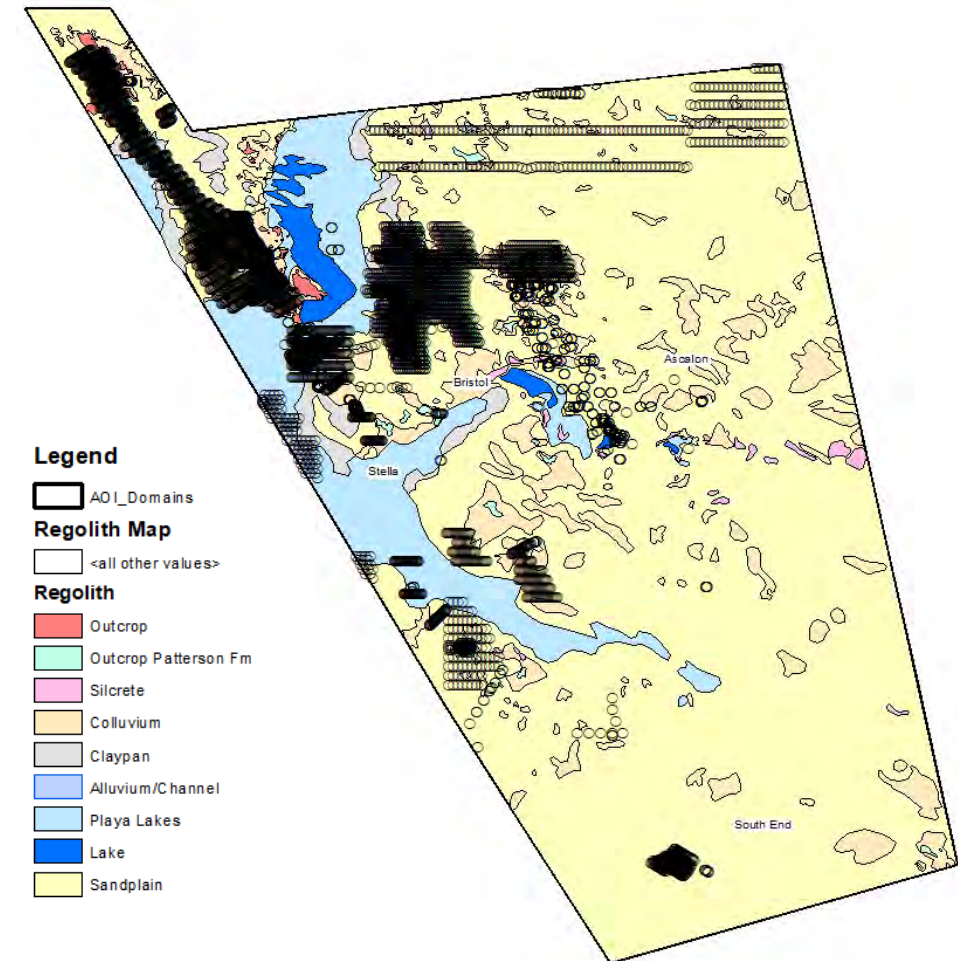
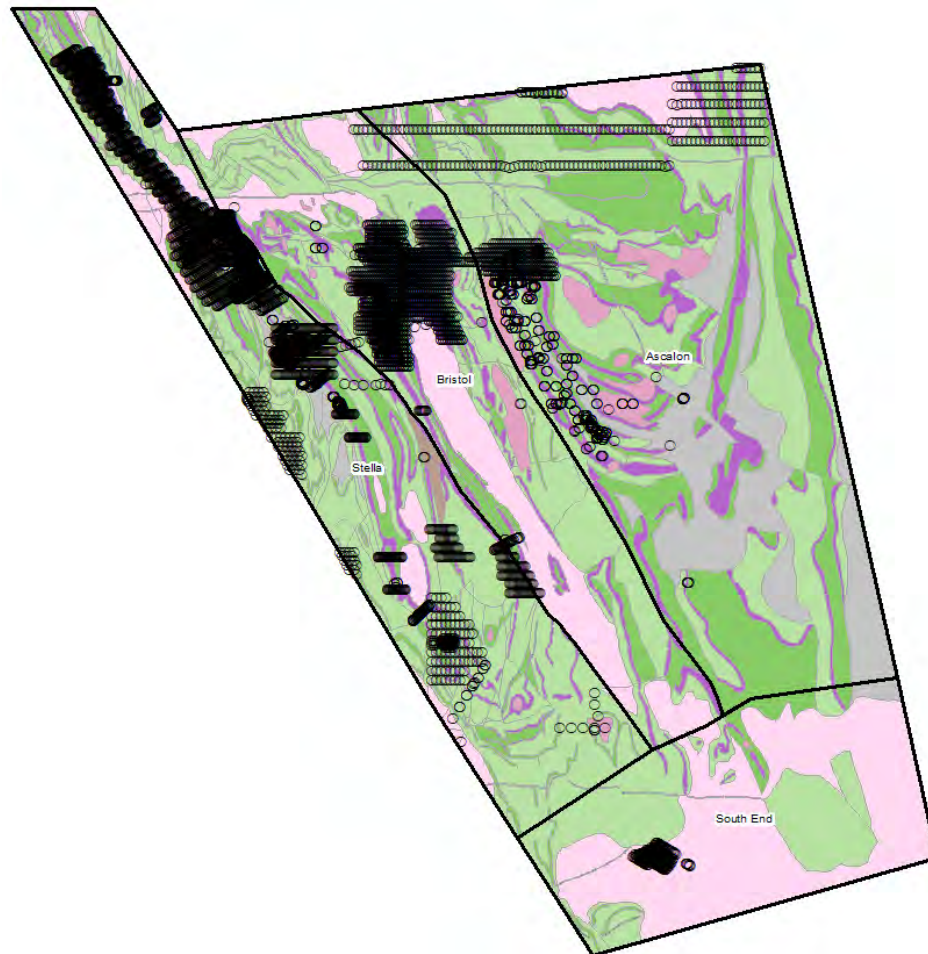
Auger, Soil, Vacuum, Drilling (Top 5 m) Datasets

- Below is the spatial distribution for each individual dataset that has been combined.



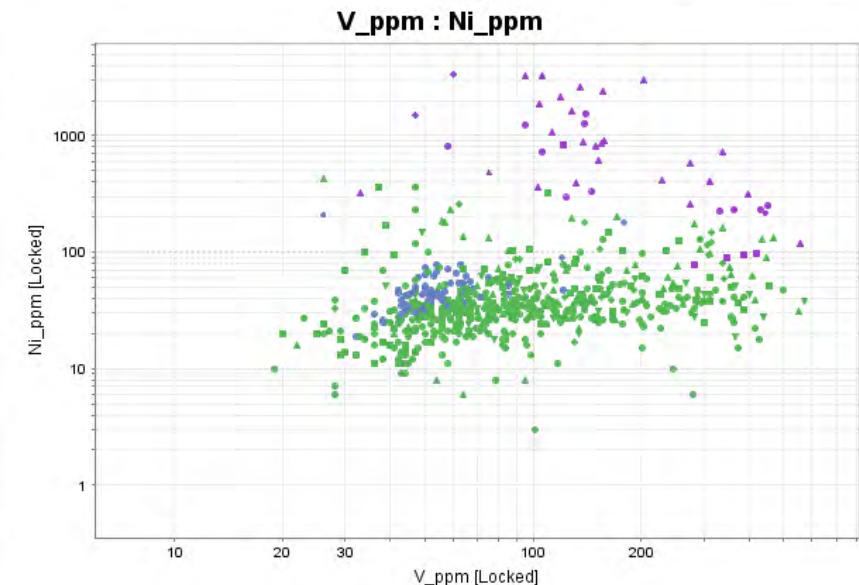
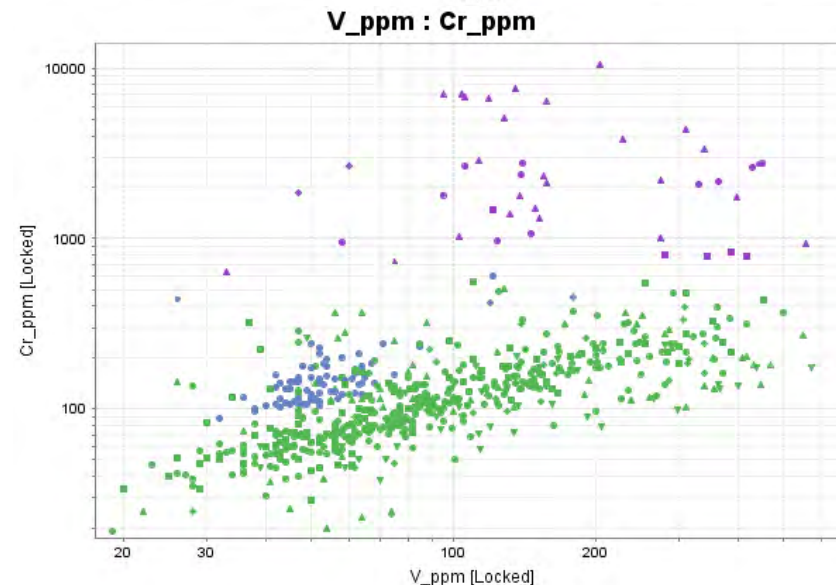
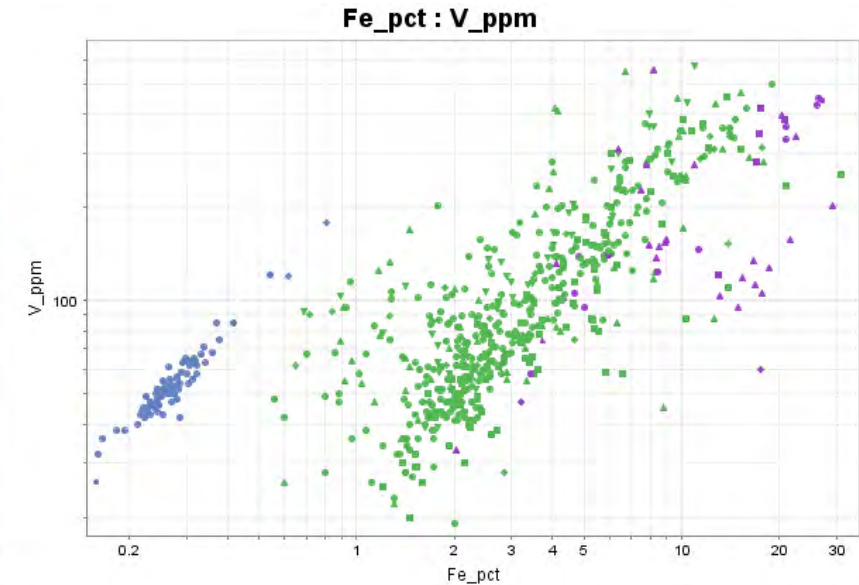
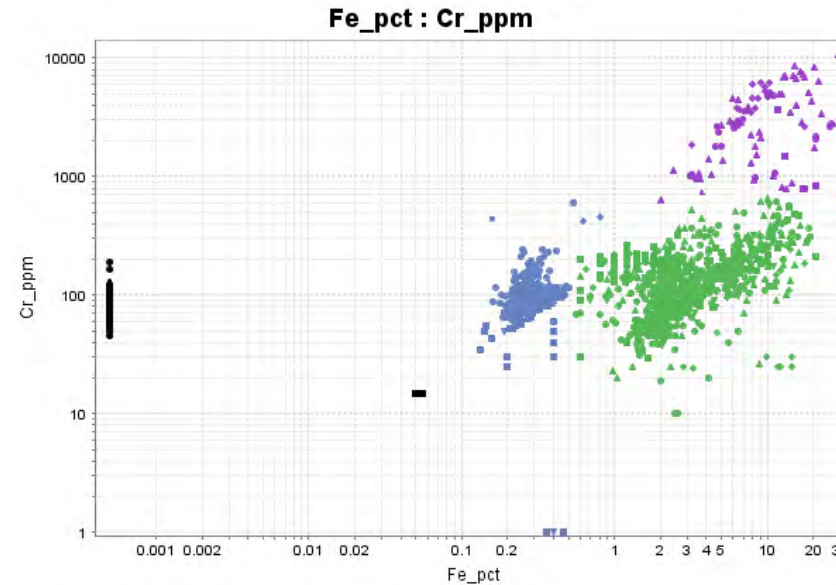
Surface Soils/Auger/Vac and Top 5m of Drilling

The data was combined and attributed based on regolith regime, which resulted in reasonable coverage throughout the AOI.



Lithology Classification Based on 'Soil' Dataset

- Data from both Colluvium and Sandplain regimes.
- Intermediate, mafic and ultramafic lithologies can be resolved.

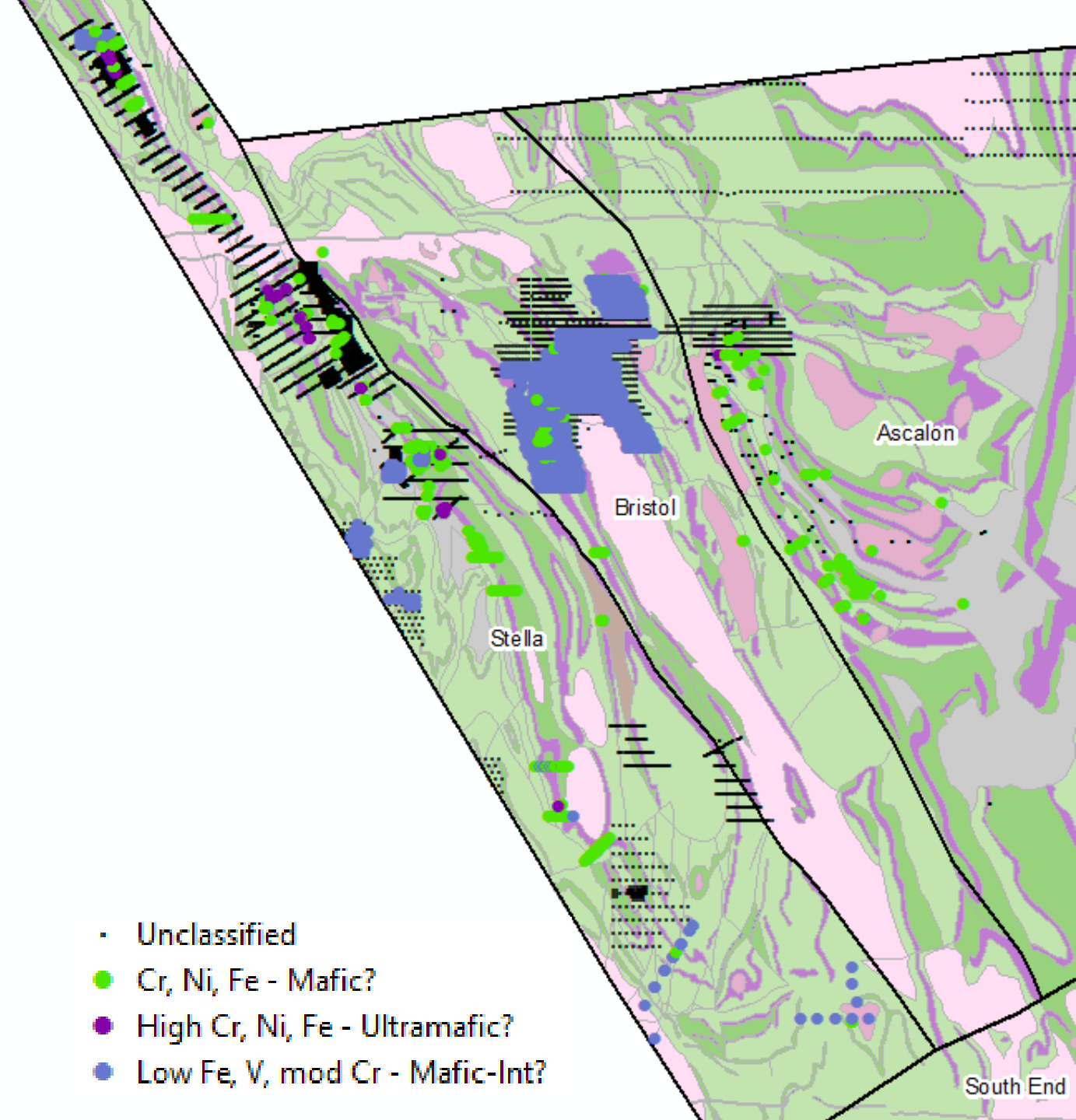


Lithology Classification

- Unclassified
- Cr, Ni, Fe - Mafic?
- Low Fe, V, mod Cr - Mafic-Int?
- High Cr, Ni, Fe - Ultramafic?

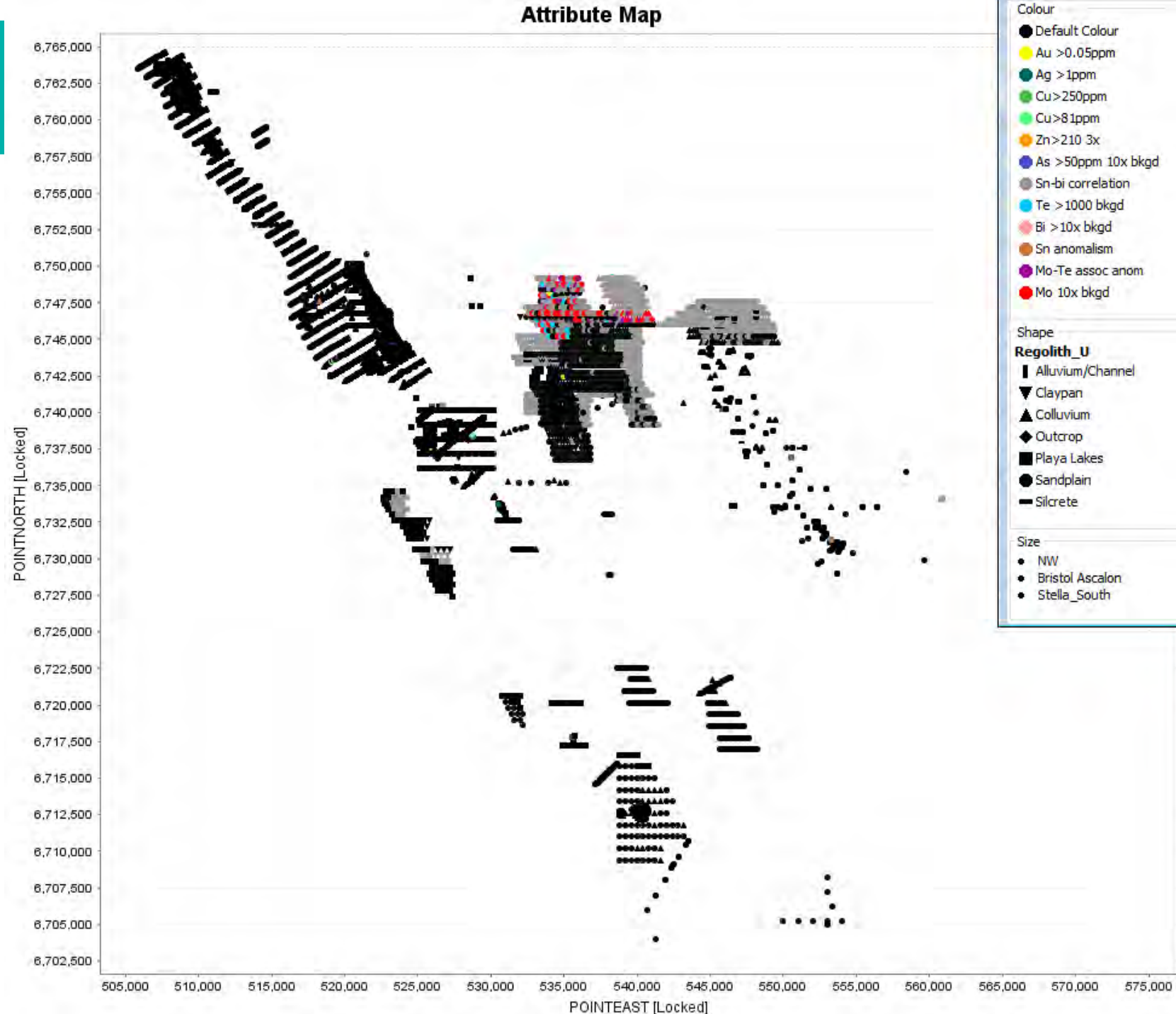
Soil Lithology Distribution

- Lithology interpretation of soil data supports the geological and structural interpretation.



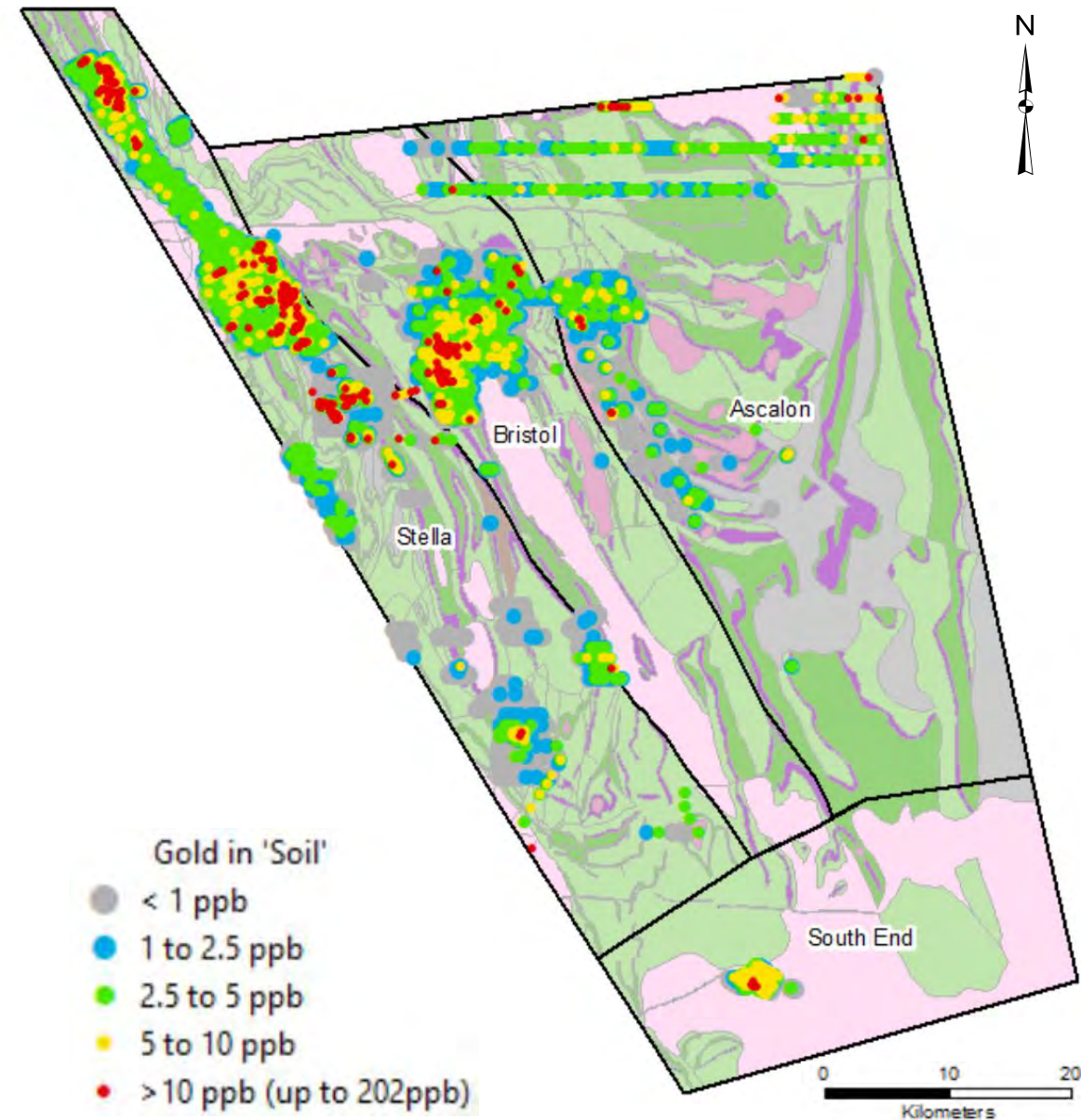
Soil Anomalism

- Data interrogated independently by regime.
- Sandplain and Colluvium have similar anomalism levels.
- Sn-Bi is a key correlation, together with individual points of anomalous Te and Mo in the Bristol area.



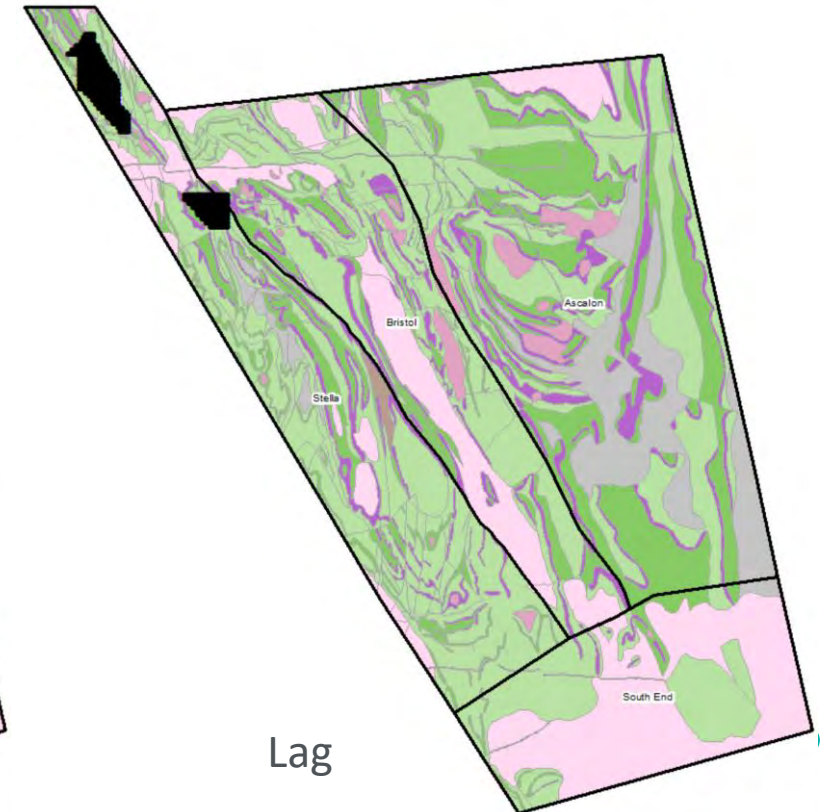
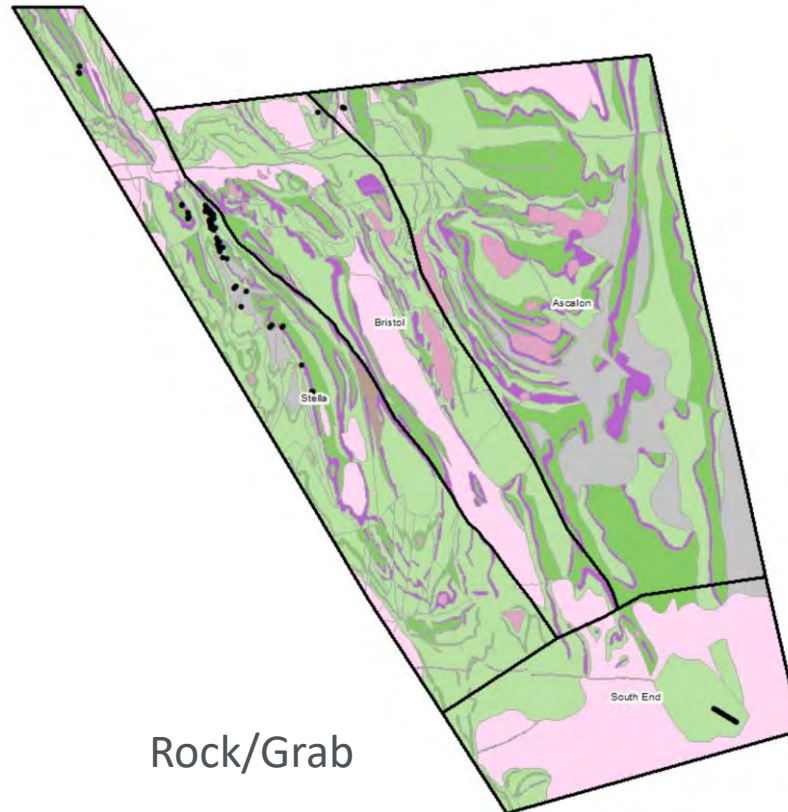
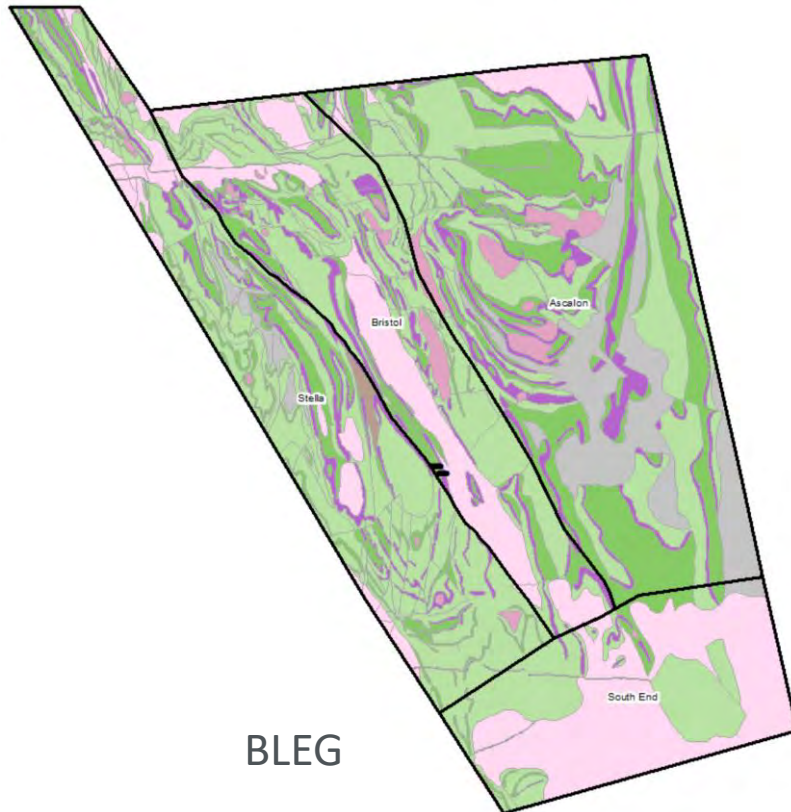
Soil Anomalism

- Gold anomalism does not correlate with multi-element anomalism.
- Clusters of gold assays with $>10\times$ crustal background are evident (crustal background $\sim 10\text{ppb}$).



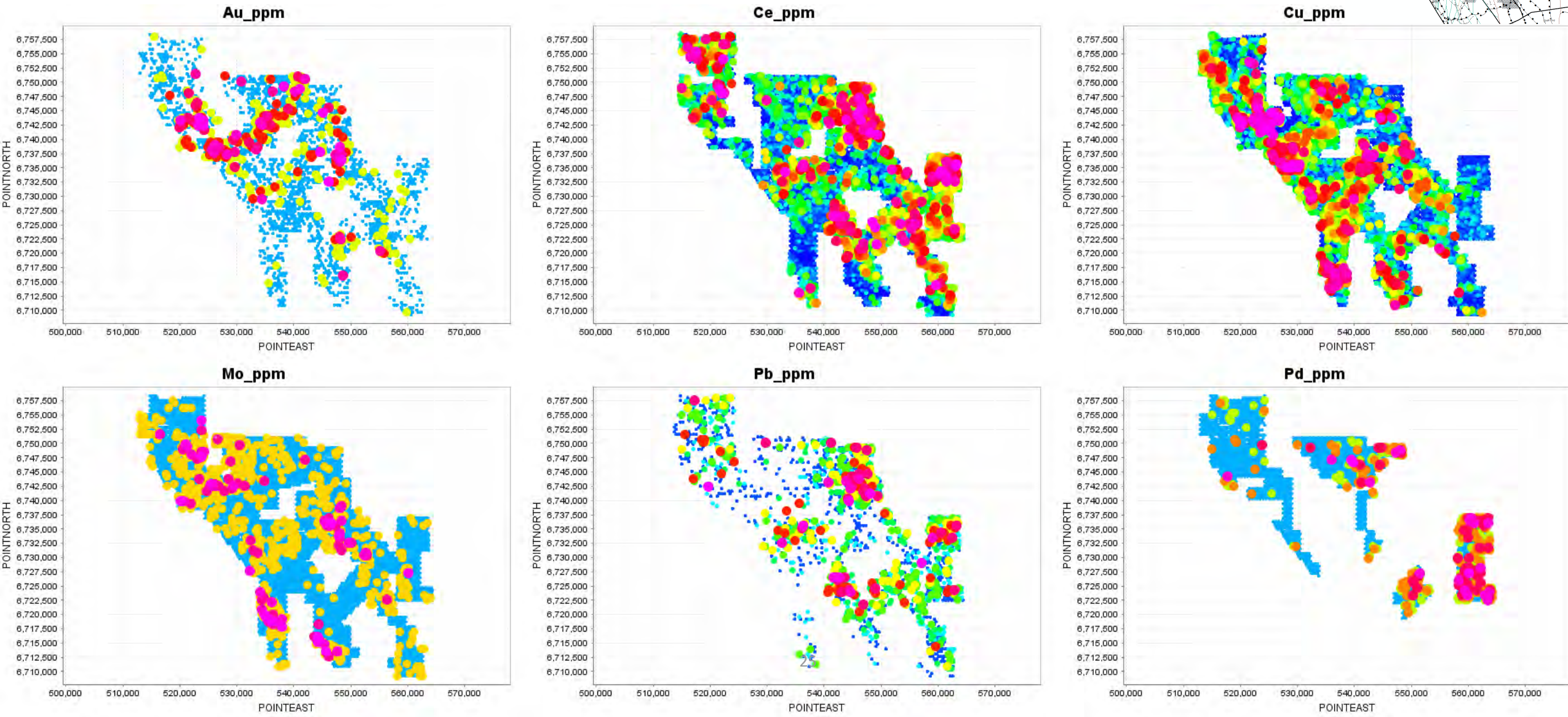
Additional Surface Datasets

- Compilation of BLEG, Rock/Grab and Lag sampling was completed within the AOI.
- Data coverage is sparse.
- Note the lag data focus is in the northwest corner.



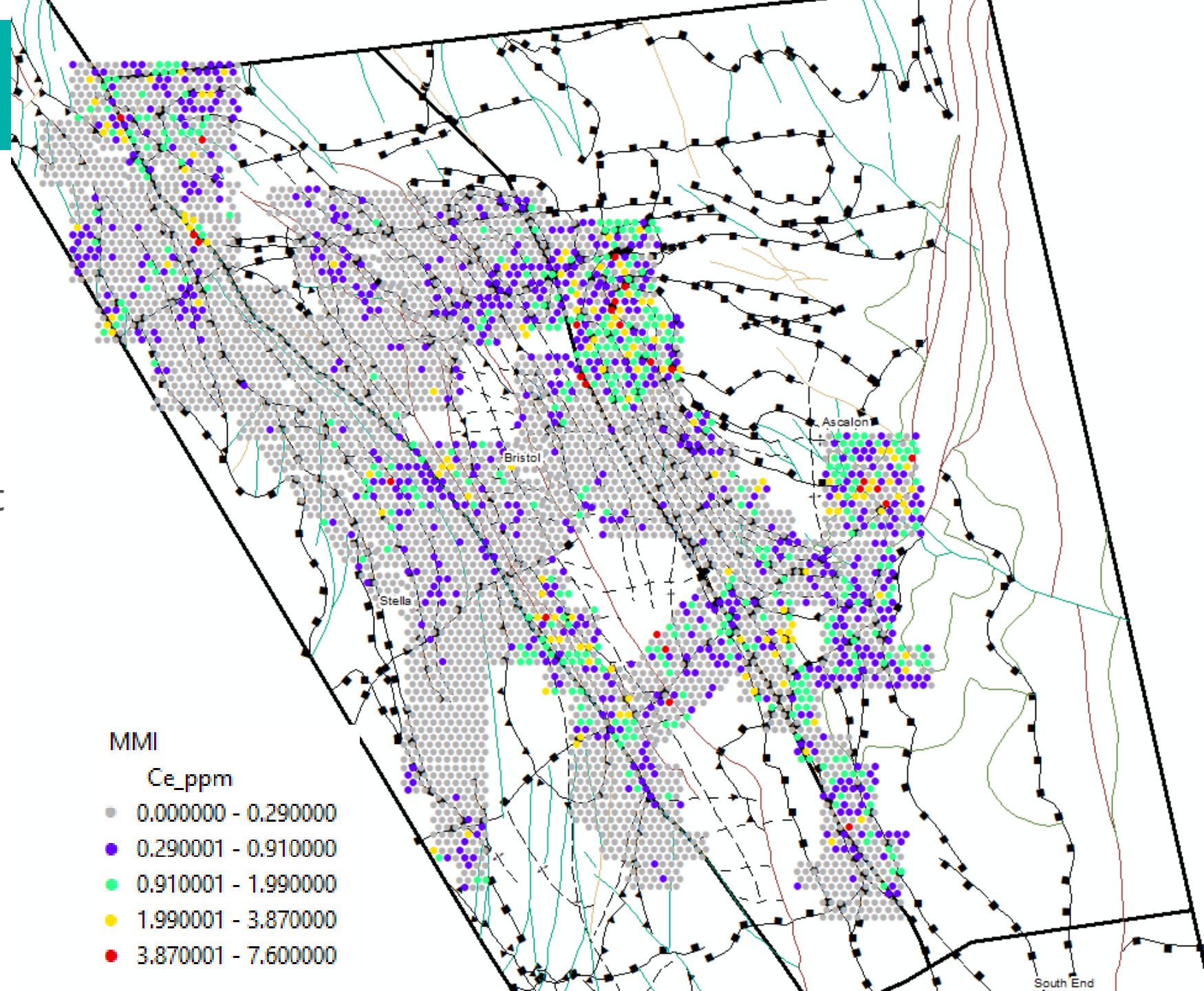
Quick Note on the MMI

- Data collected for magmatic nickel (based on a SGS laboratories method); Ce, Cu and Pd are key datasets.



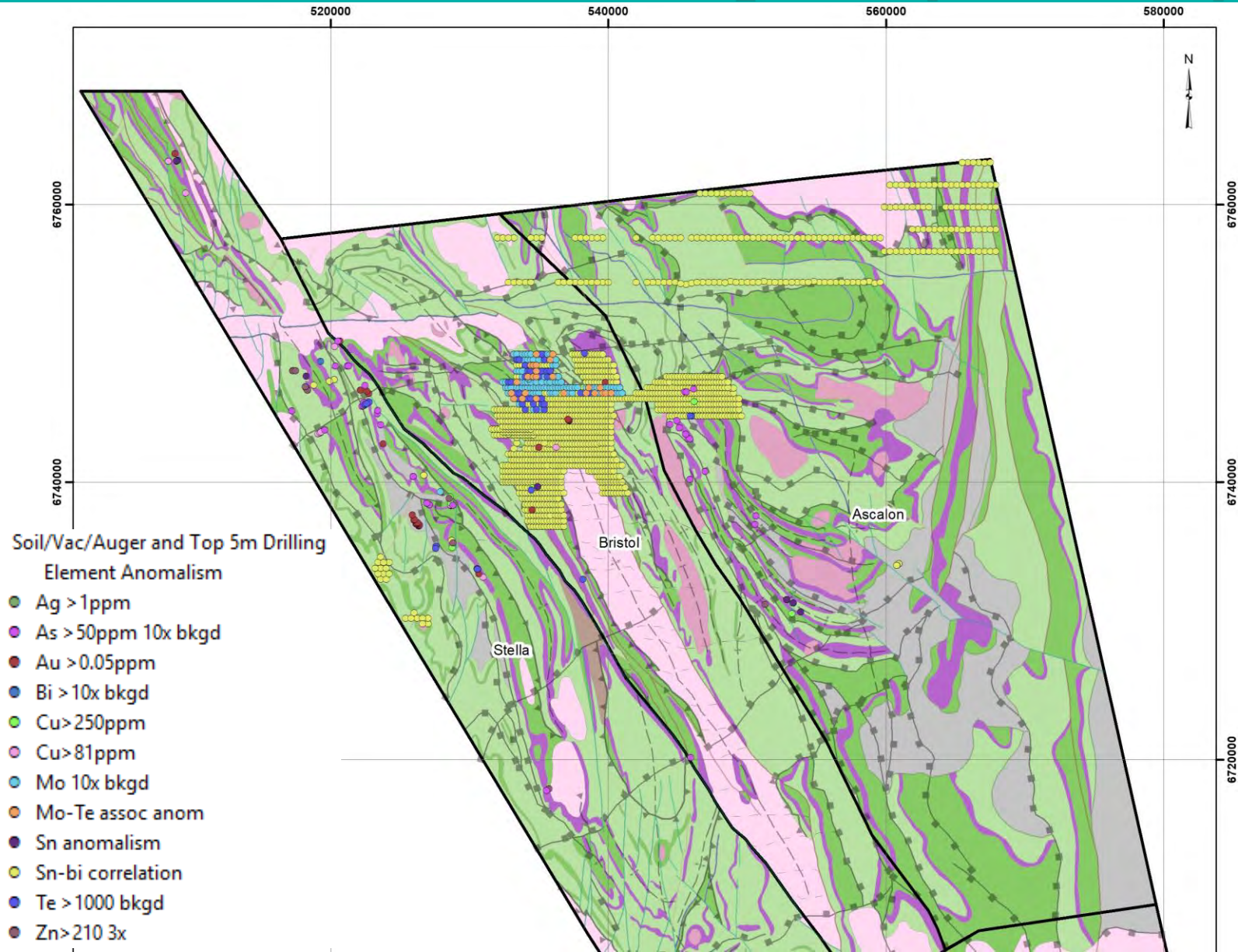
Cerium Data

- Ce has been interpreted to be picked up from the substrate during thermal erosion.
- Nb data is missing but theoretically this could be used to map out ultramafic lithologies.



Surface Geochemistry Anomalism

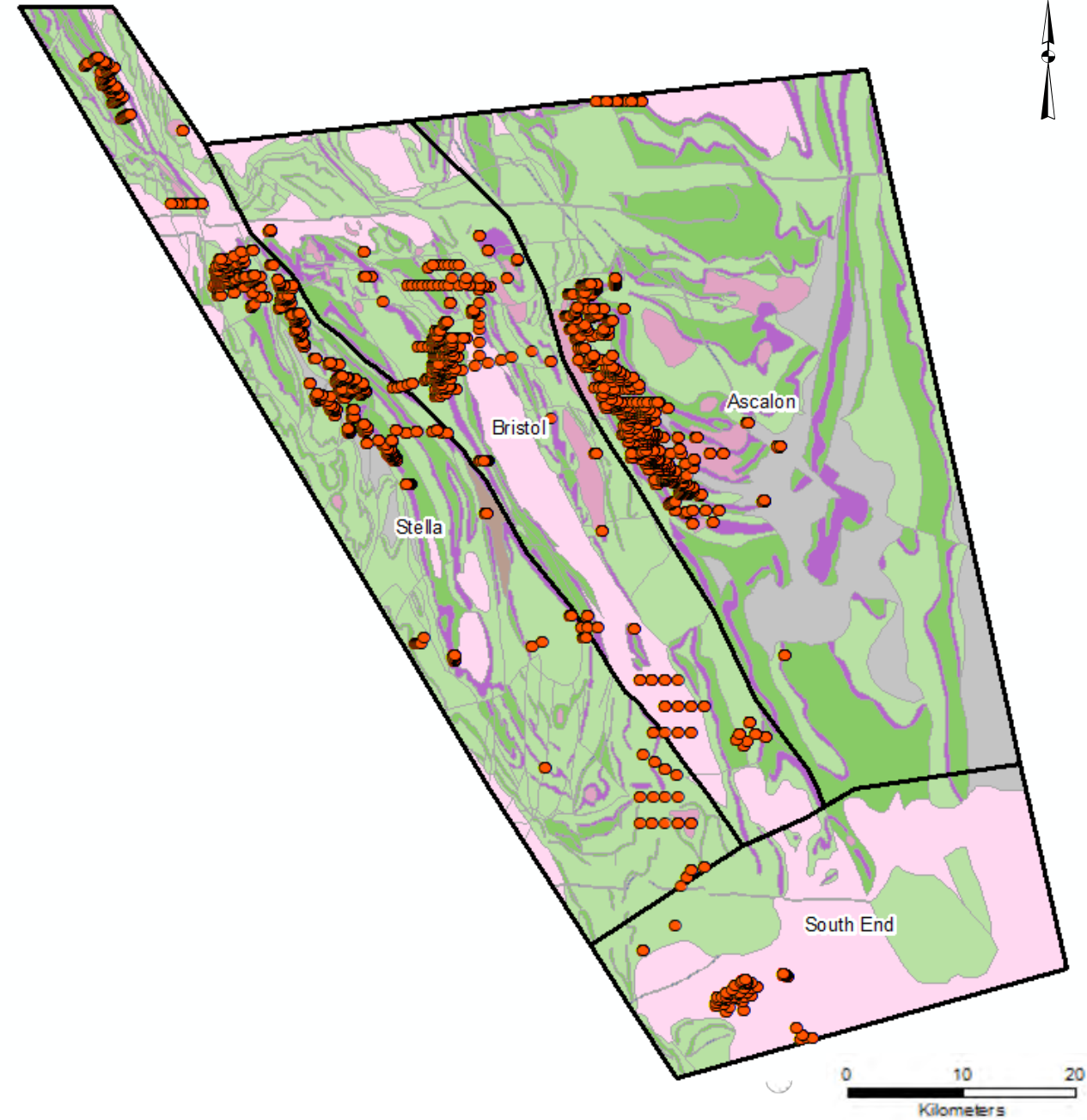
- Yellow points identify a strong Sn-Bi correlation, which correlates to ENE structure (visible on regional gravity).
- Note the associated Mo-Te anomalism (orange) and isolated Mo and Te anomalism in the northern end of the Bristol zone. This coincides with the Sn-Bi correlation
- Sporadic anomalism is present throughout the Stella Domain.



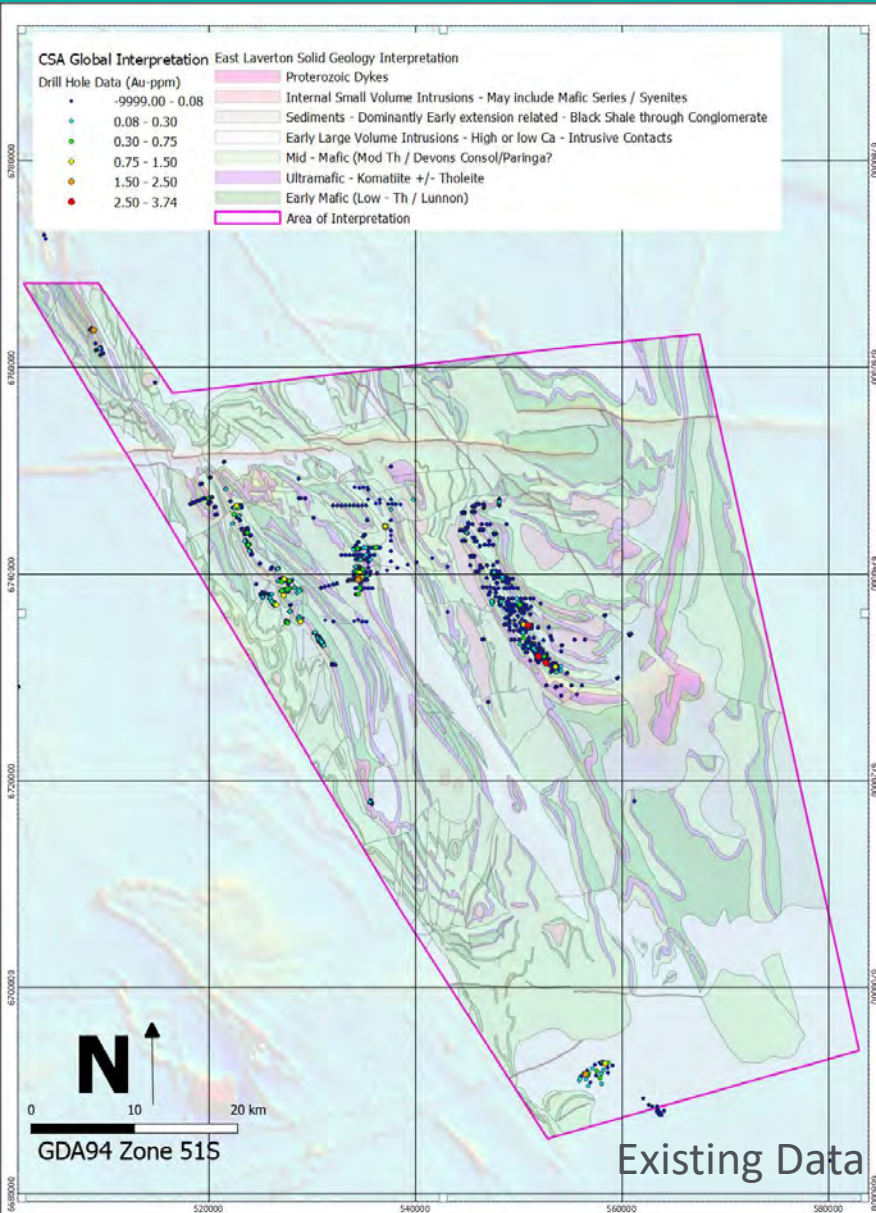


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Drill hole Dataset

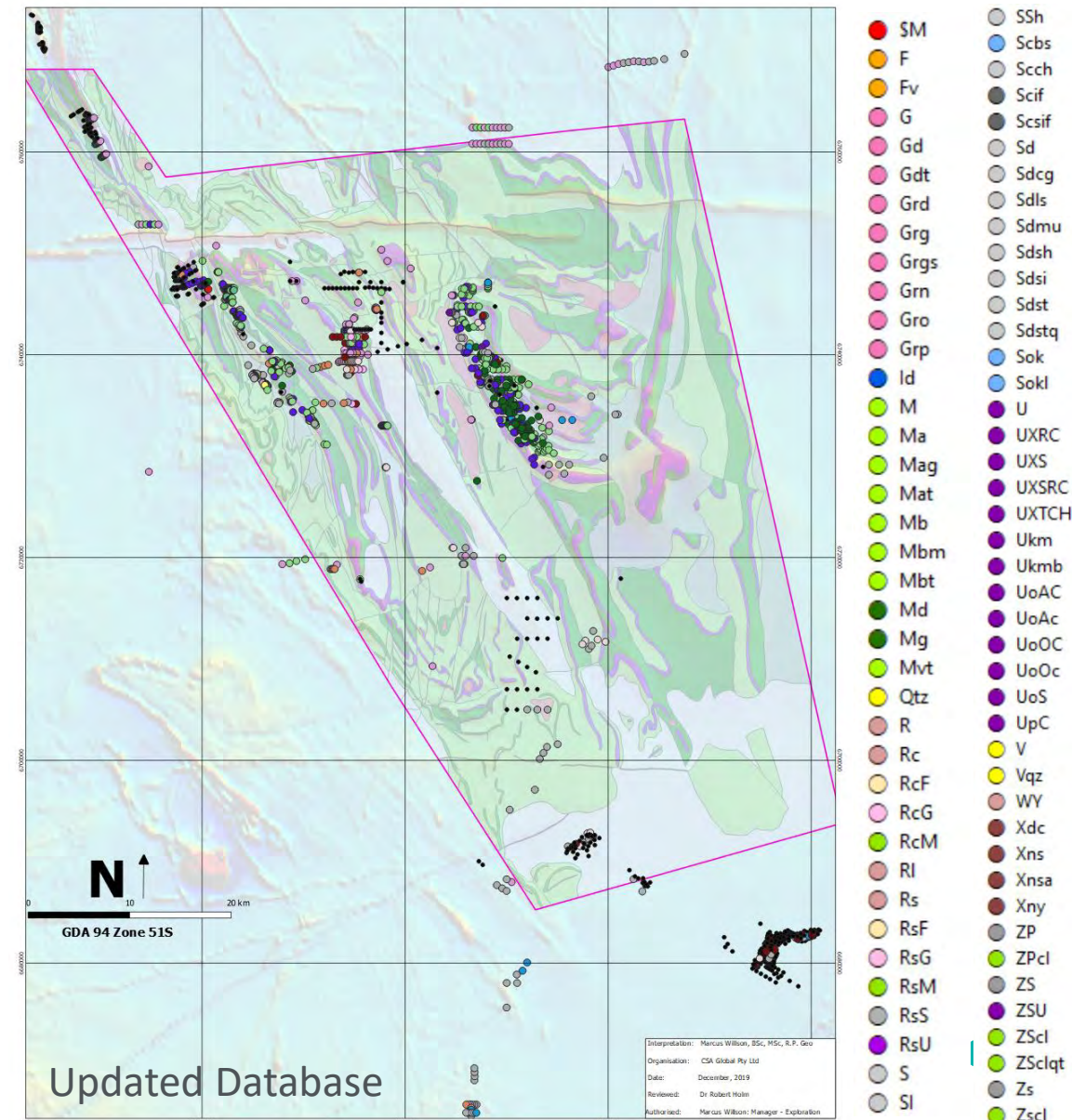


Drill Hole Geochemistry



Over 50,000 lith corrections and additions were made to the database.

Missing assays were also added where possible.



Drill hole Dataset

- Assay data was desurveyed based on the midpoint and lithology data was attributed to each point.
- The logged lithology and regolith fields were attributed.
- Data work flow:
 - Data subdivided by domain;
 - Fresh samples separated from regolith and transported material based on chemistry;
 - Data attributed by logged lithology and validated;
 - Lithogeochemical classification completed where possible;
 - Alteration defined; and
 - Anomalous areas identified, predominantly based on individual element anomalism.

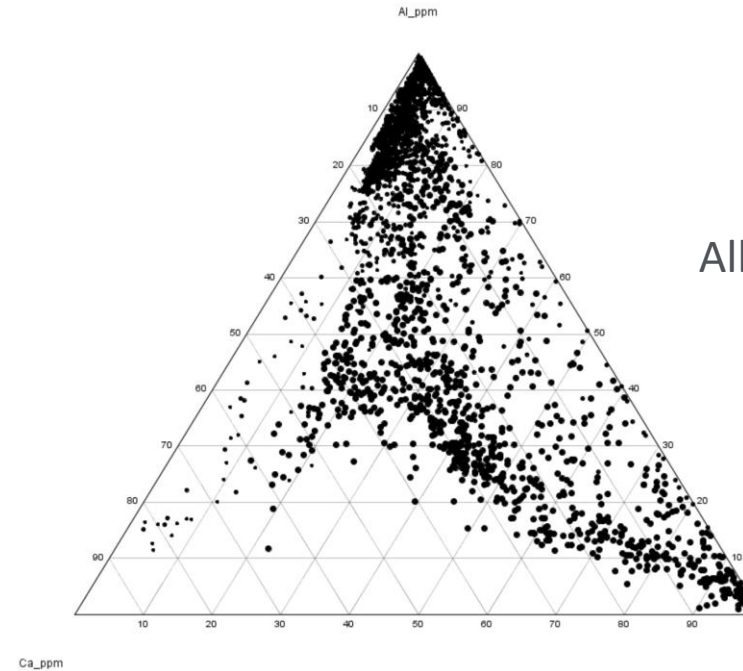
NB: Only samples interpreted as “fresh” were interpreted for lithology, alteration and anomalism.

South End Domain

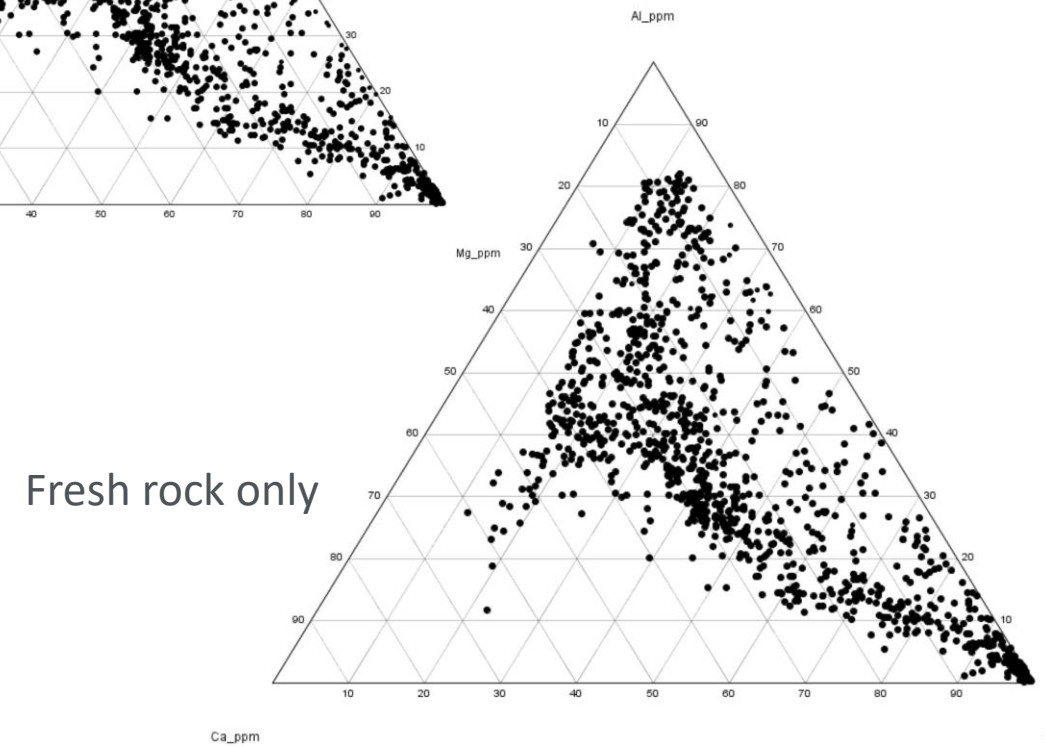
- The data was not interpreted due to its distance from St. George landholdings and the main cluster of data is held by “Narnoo Mining” and operated by Vimy Resources (ASX:VMY).
- Focus is on Uranium – Mulga Rocks Deposit (estimated first production 2023).
- Misty Moss Pty Ltd has application pending around Mulga Rocks; Narnoo Mining objecting in Warden’s court, large land holding.
- Rio Tinto Exploration has large land holding in SE corner of tenement.
- Key dataset over Mulga Rock (Emperor):
 - A-File reports on “Narnoo Project” testing concept of polymetallic/gold mineralisation along margin of Officer Basin (First noted in A050695).

Removing Weathered and Transported Material – Bristol Example

- Based on logging; transported and regolith material was attributed.
- The data was subsequently assessed geochemically to determine weathered material:
 - Data with high Al, low Ca, low Mg is interpreted to be weathered.
- Only fresh material was interpreted in this review.



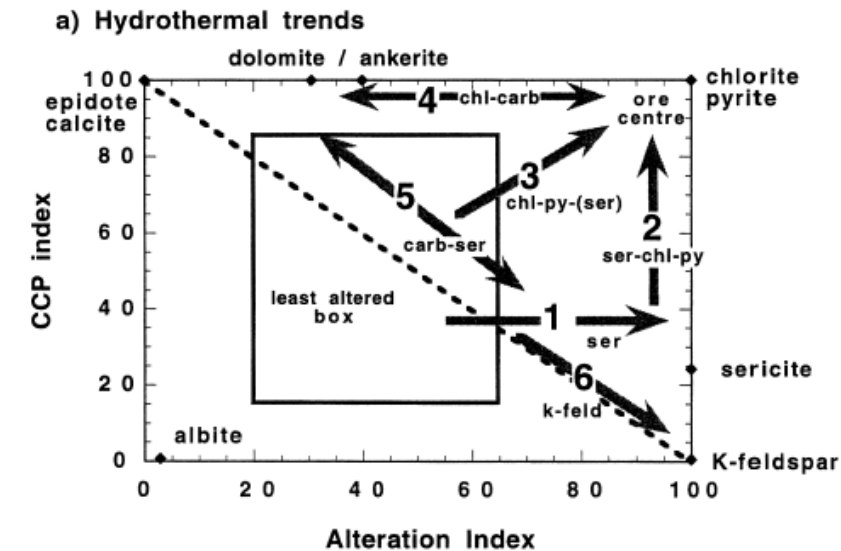
All data



Fresh rock only

Classifying Alteration

- Alteration was classified based on a mix of Al, Na, K, Ca and Mg ternary diagrams.
- The Alteration Box Plot (Large *et al*, 2001) was considered in classification of the alteration to assess potential trends related to VMS style mineralisation.
 - The box plot is predominantly used in more andesitic to rhyolite compositions but can be used here by noting trends towards biotite alteration (K-feldspar corner) where an abundance of K is more likely a result of biotite than K-feldspar in mafic lithologies.



Hydrothermal trends shown in Figure 8a

Trend 1: Weak sericite alteration at the margins of a hydrothermal system in felsic volcanic host rocks (both hanging wall and marginal footwall to ore)

Trend 2: Intense sericite-chlorite \pm pyrite alteration typical of the proximal footwall alteration system to a VHMS deposit, within both felsic and mafic volcanics.

Trend 3: Chlorite \pm sericite \pm pyrite alteration typical of chlorite-dominated footwall alteration either in felsic or mafic volcanics.

Trend 4: Chlorite-carbonate alteration typically developed immediately adjacent to massive sulfide lenses in a footwall position in either felsic or mafic host rocks (e.g., Hellyer, Hercules).

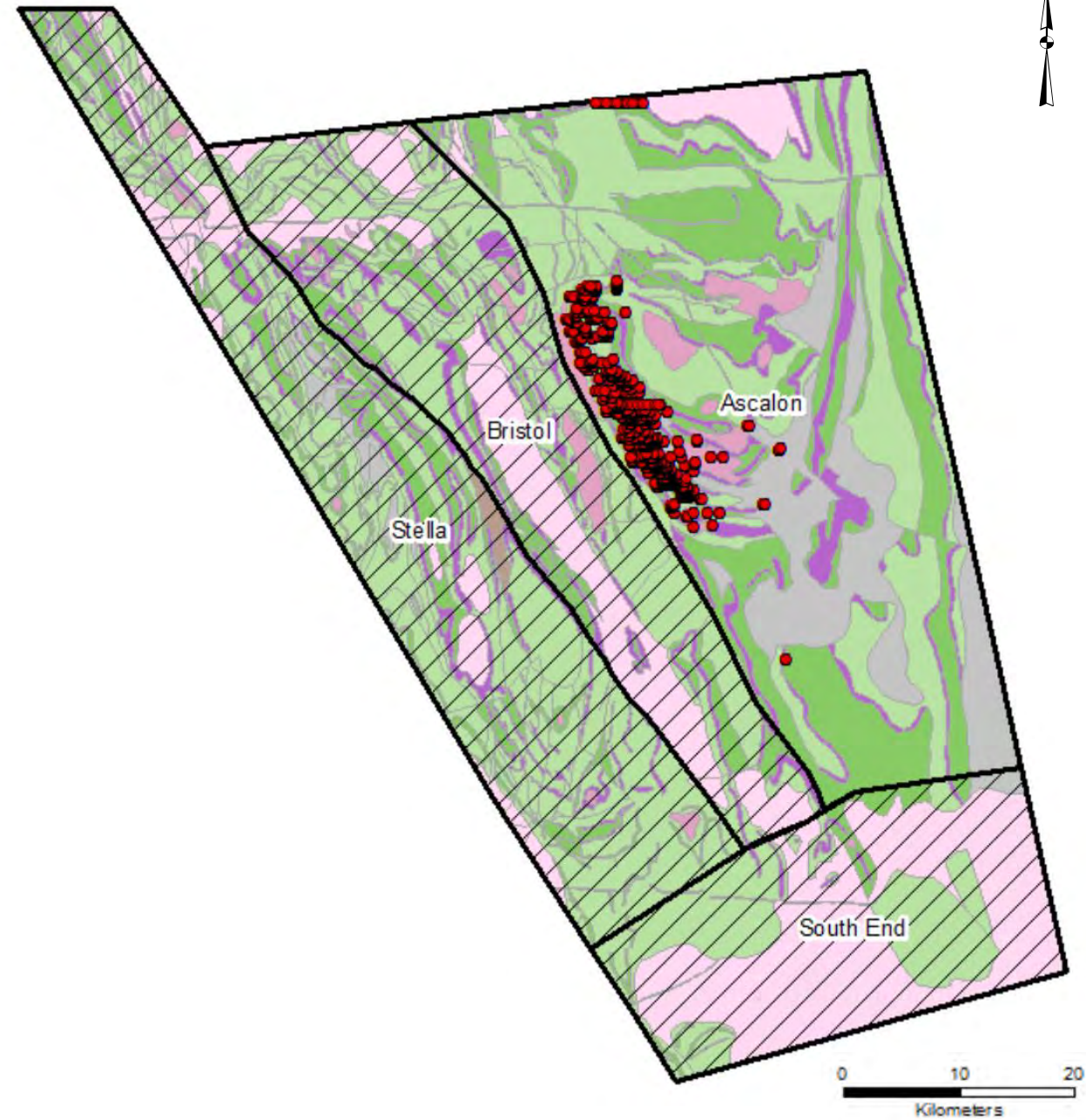
Trend 5: Sericite-carbonate alteration—immediate hanging wall to massive sulfide or along the favorable stratigraphic host unit, (e.g., Rosebery, Hercules, Hellyer).

Trend 6: K feldspar-sericite—an uncommon trend developed locally within felsic footwall volcanics (e.g., Thalanga; Paulick et al., 2001).

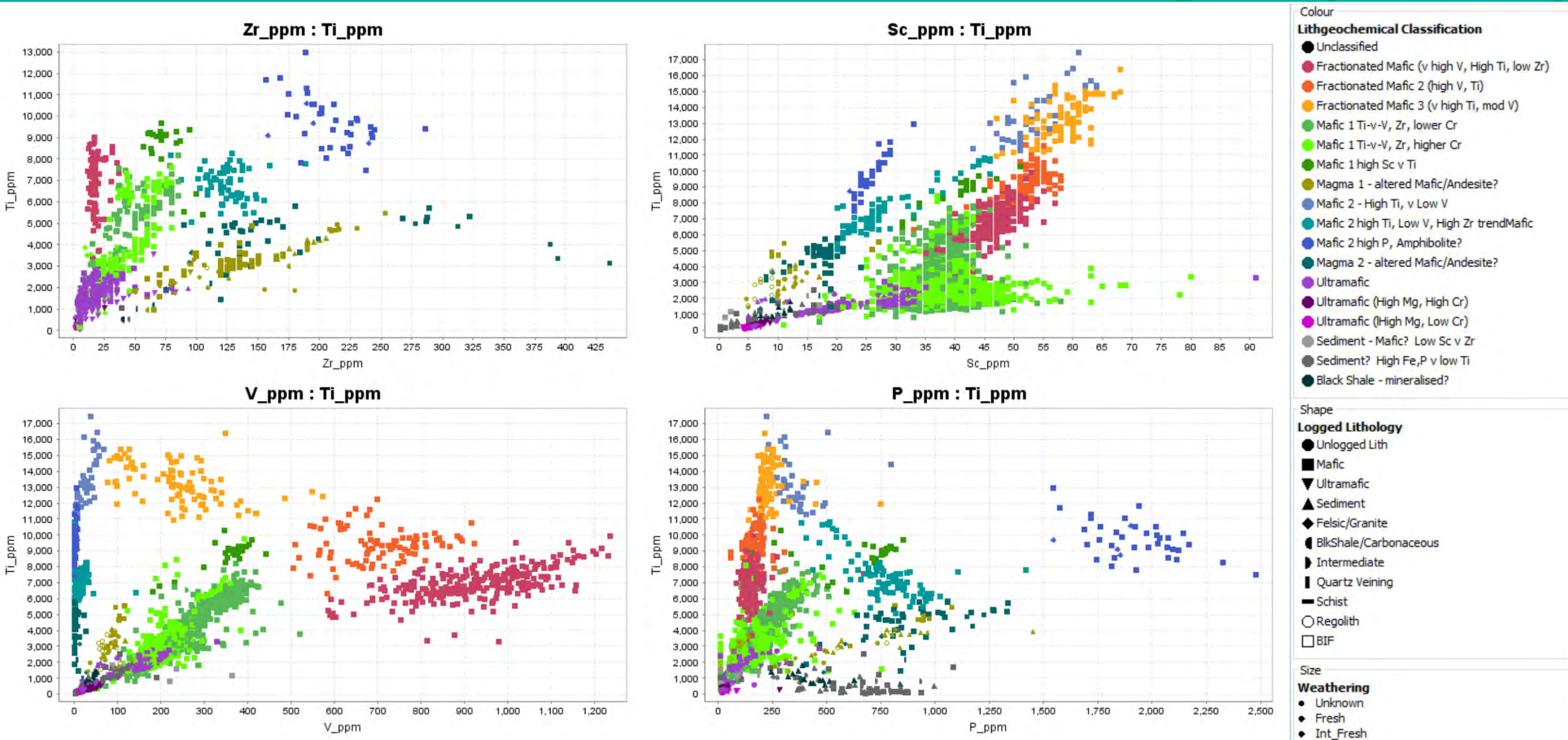


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Ascalon Domain

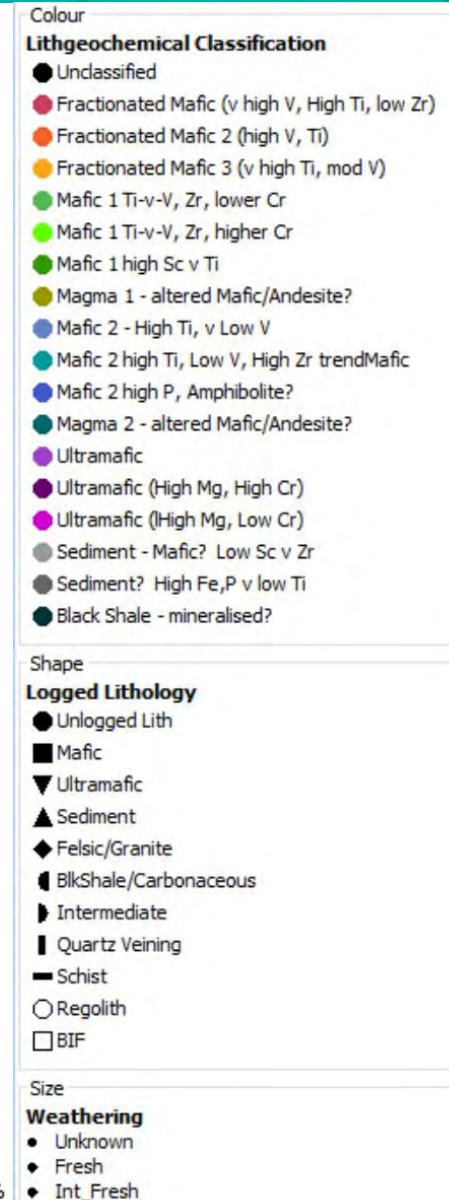
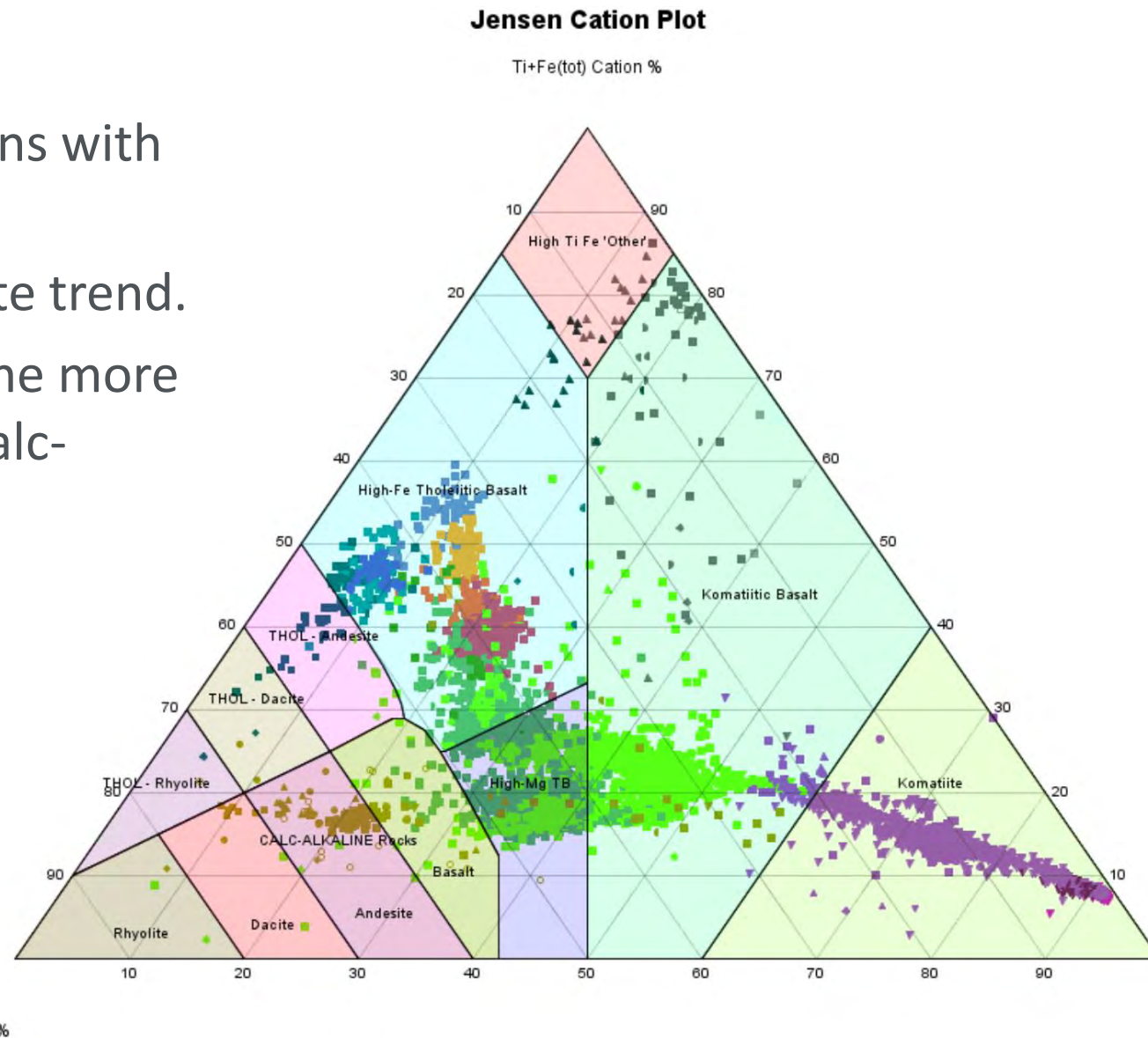


Ascalon – Lithological Classification – 2 Magma Series Present



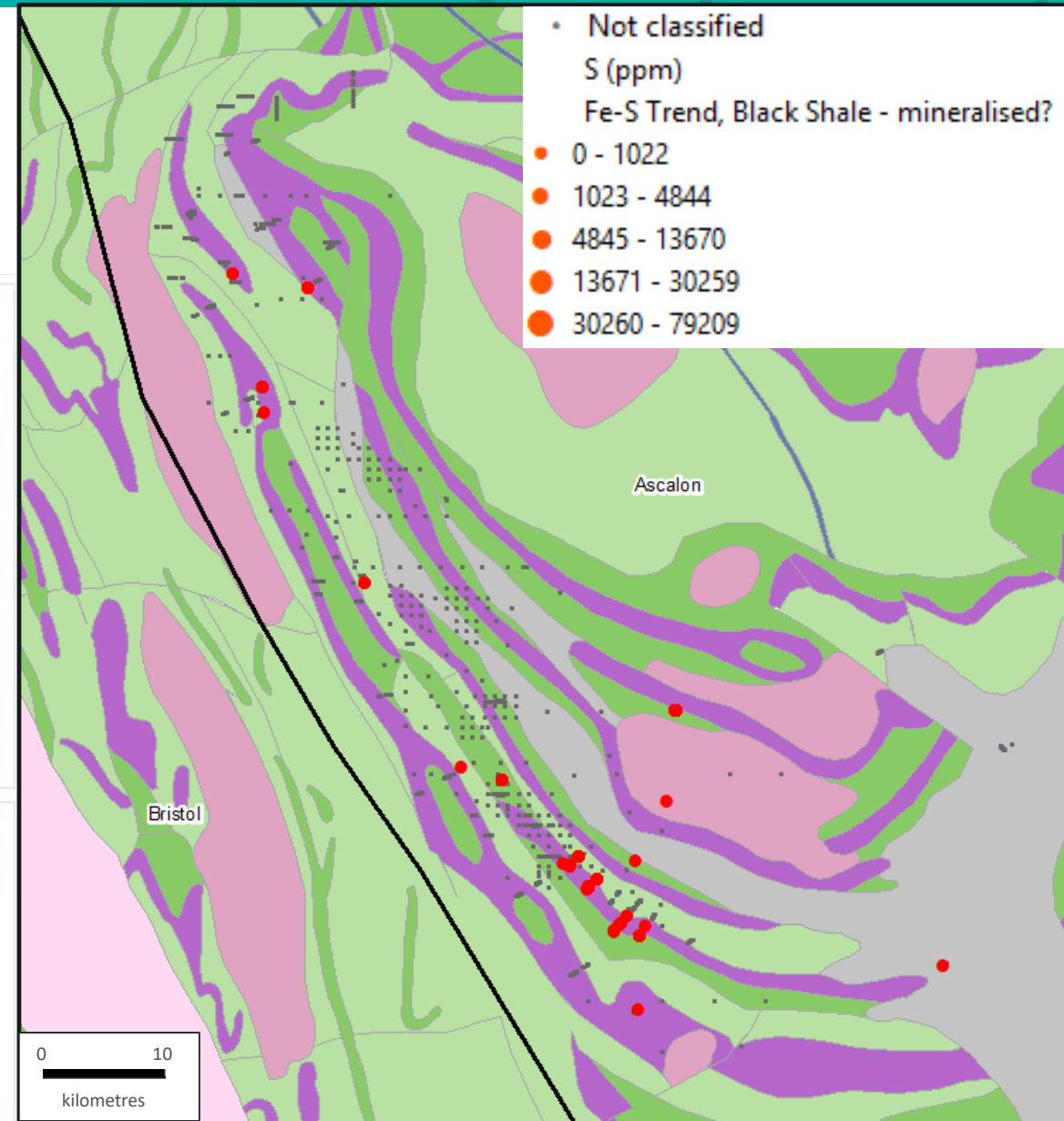
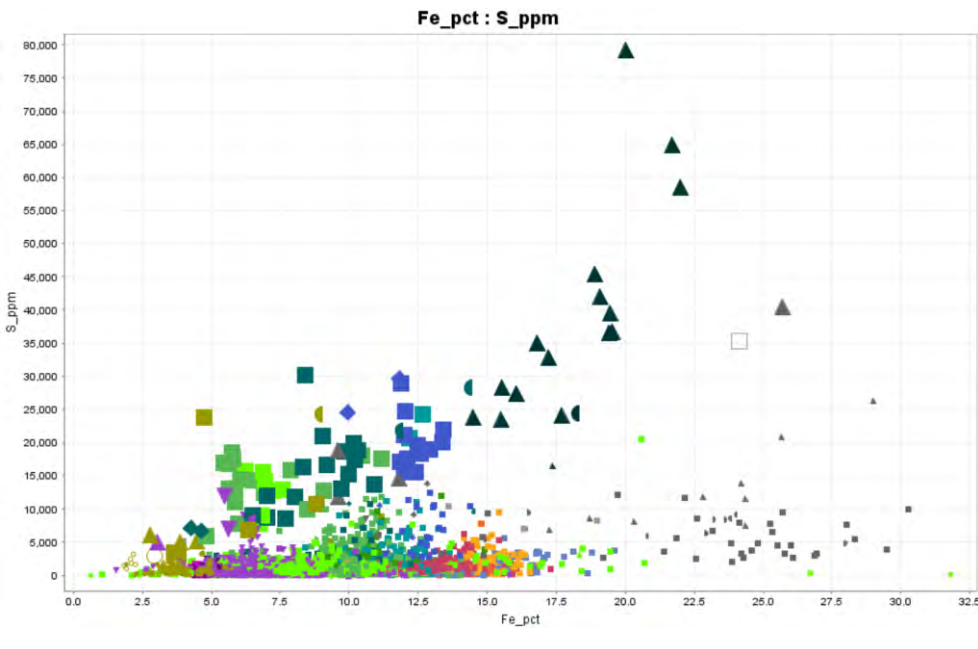
Ascalon: Lithogeochemical Classification – All Samples

- Note:
 - Sediment populations with high Ti, Fe.
 - Fractionated ilmenite trend.
- Two magma series: one more tholeiitic, the other calc-alkaline.

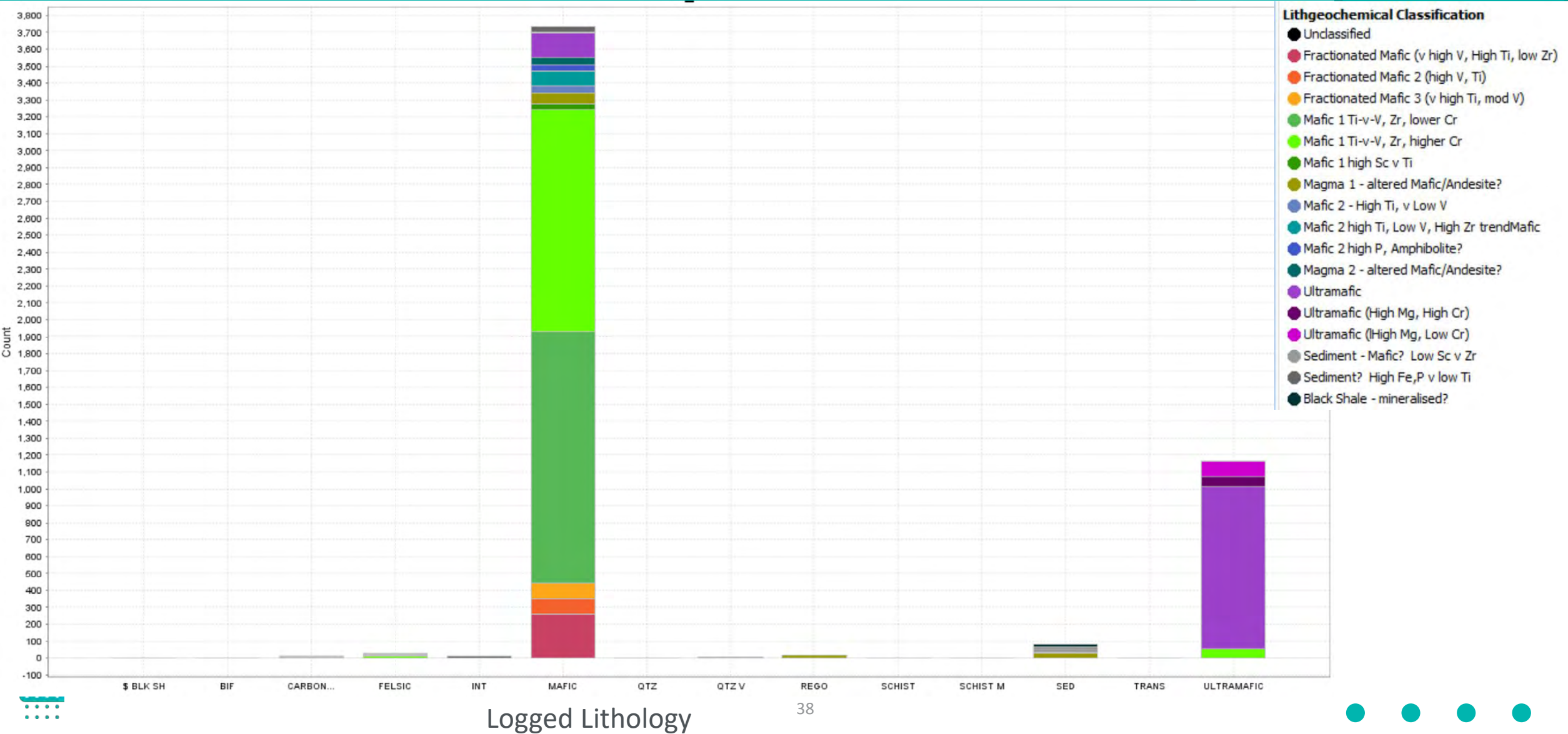


Fe-S to Determine Mineralised Sediments

- Fe-S trend coloured by lithology shows the samples logged as sediment and classed as sediment have a high Fe-S ratio.
- The distribution of these sediments shows a greater stratigraphic thickness in the southern area.

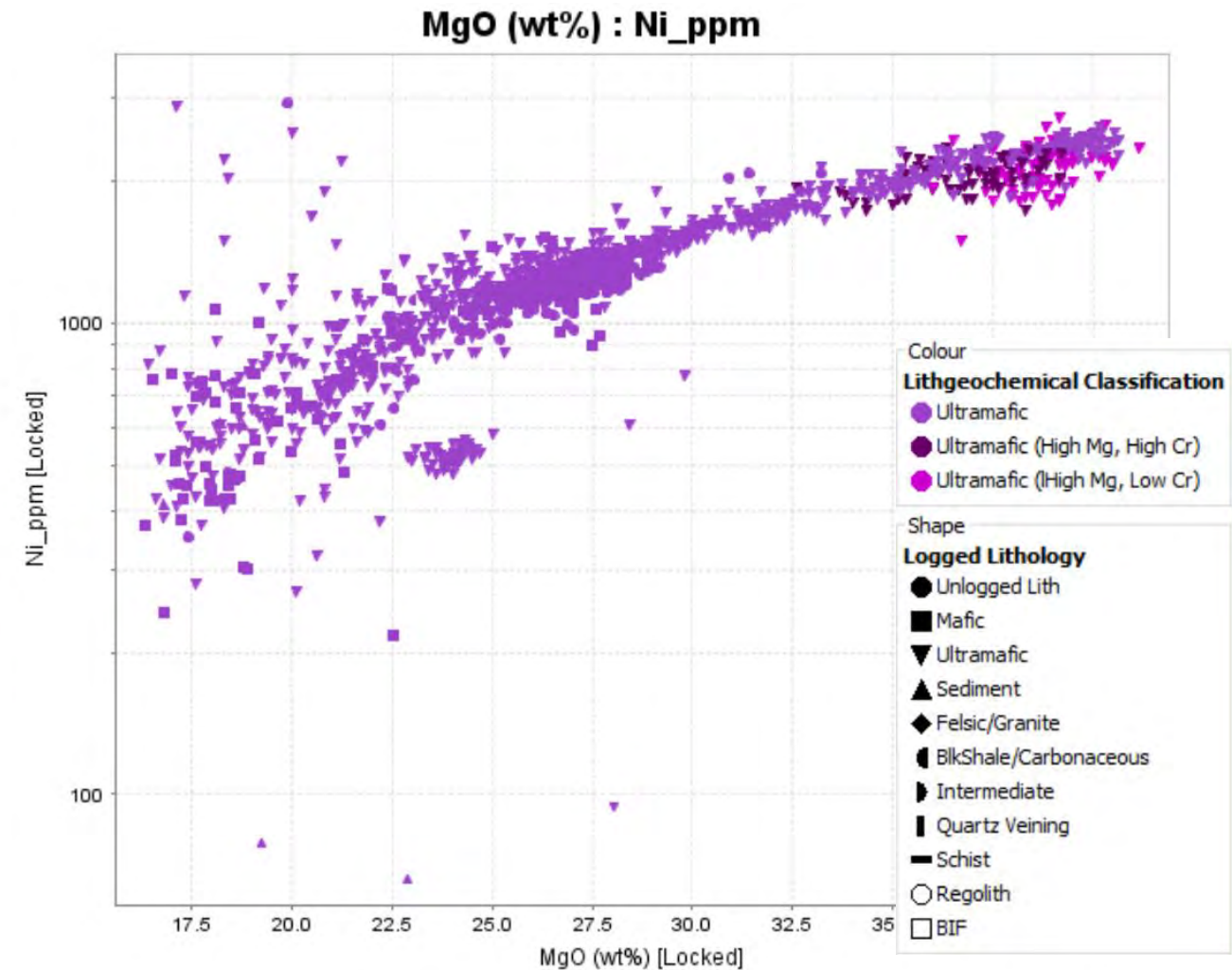
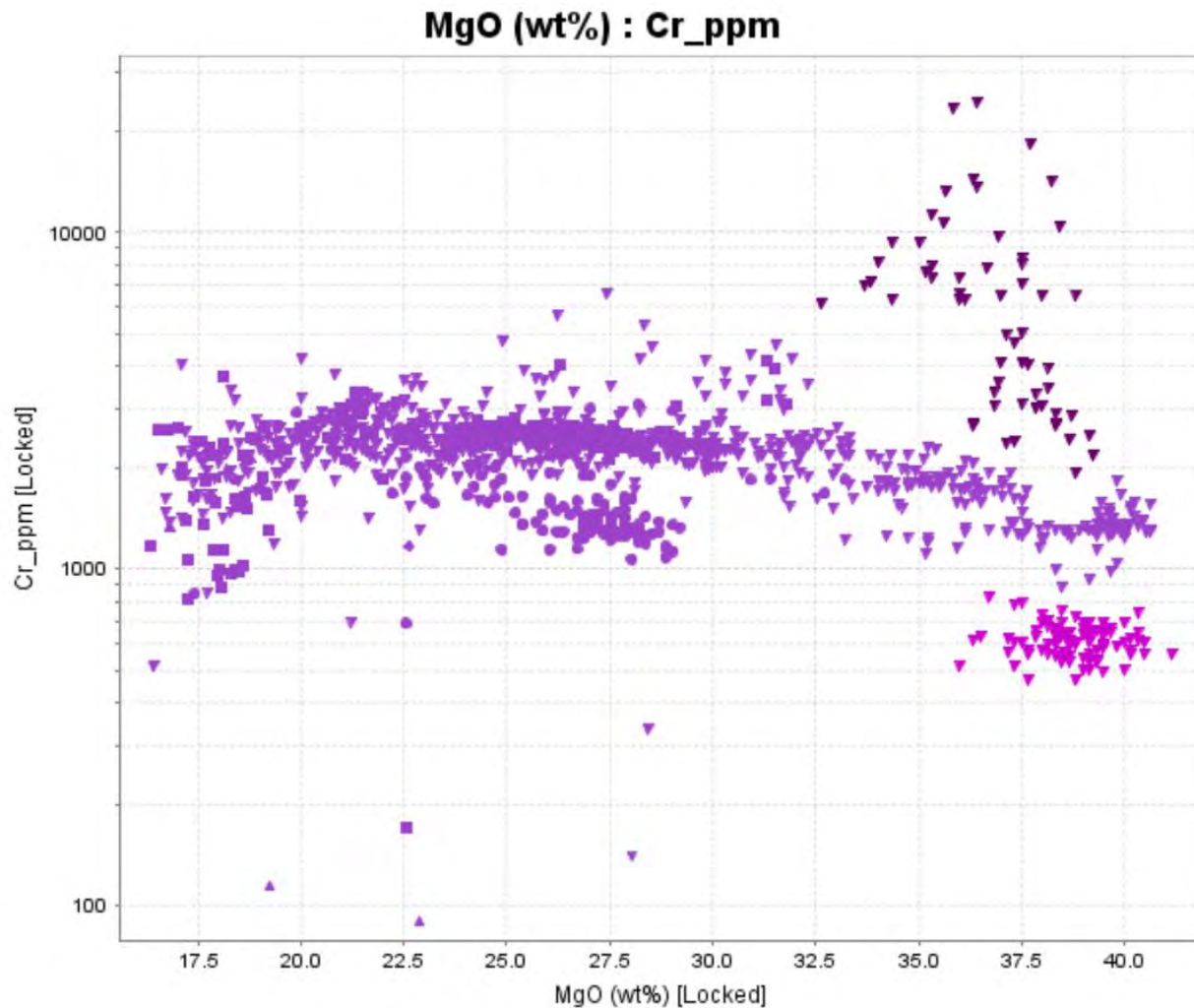
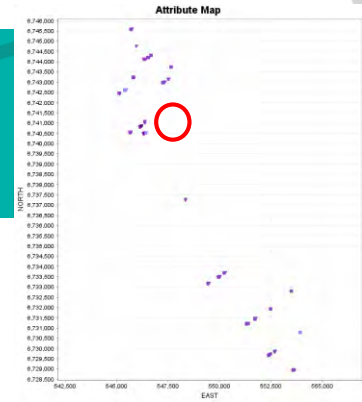


Ascalon - Lithogeochemical Classification Compared to Logged Lithology



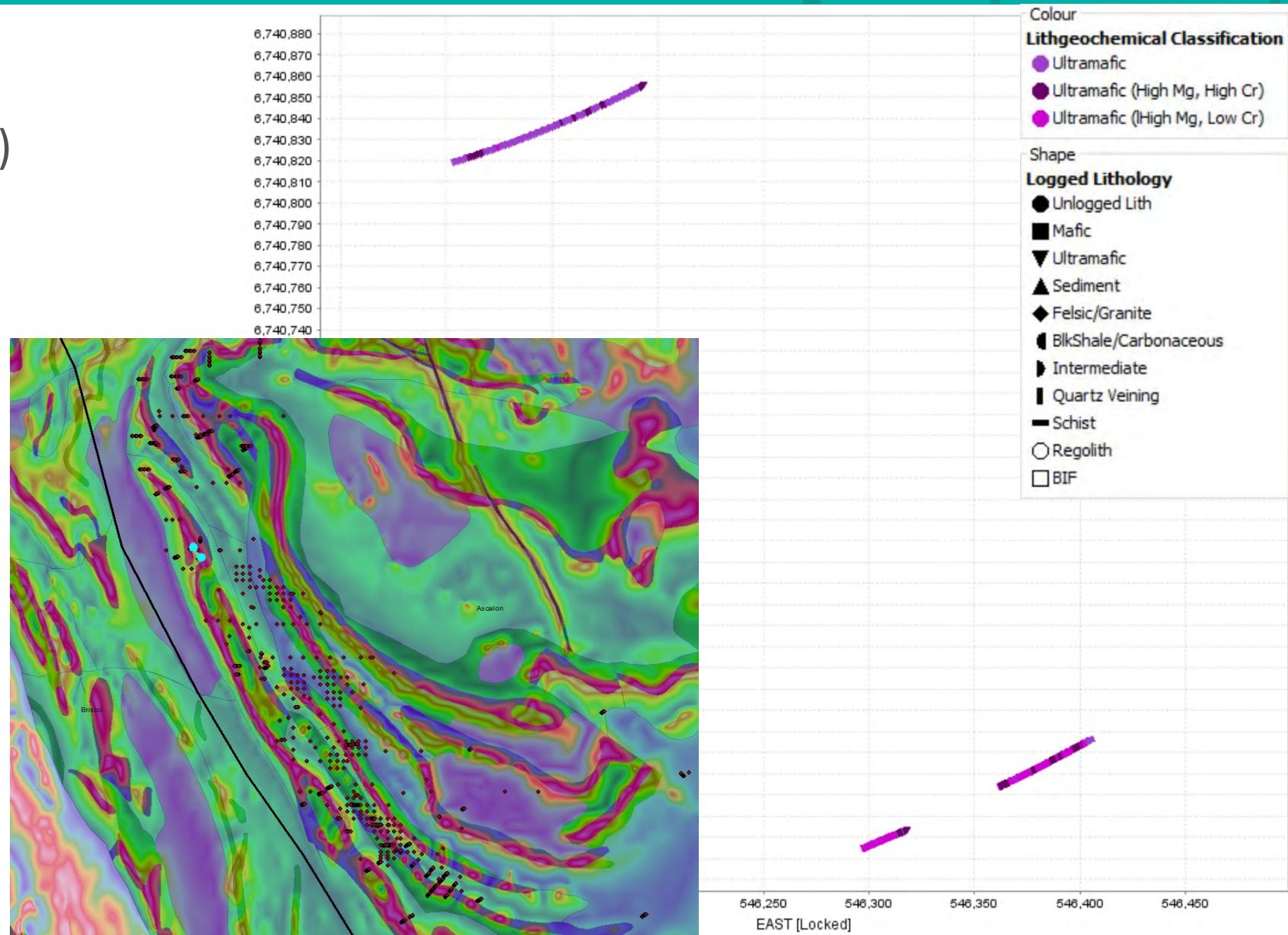
Note on Ultramafics: Layered intrusion?

Very high and low Cr populations identified (up to 2.5% Cr).



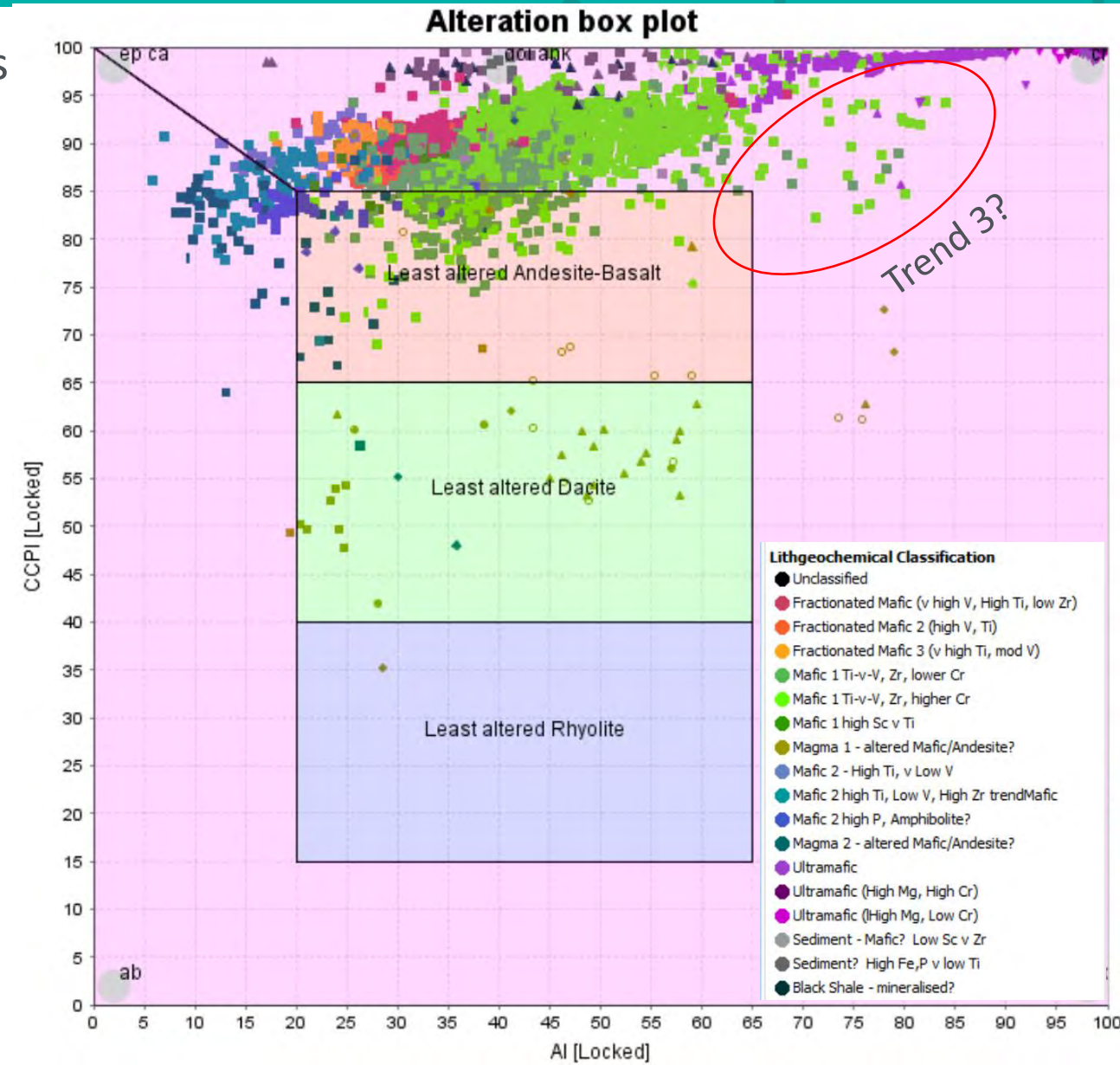
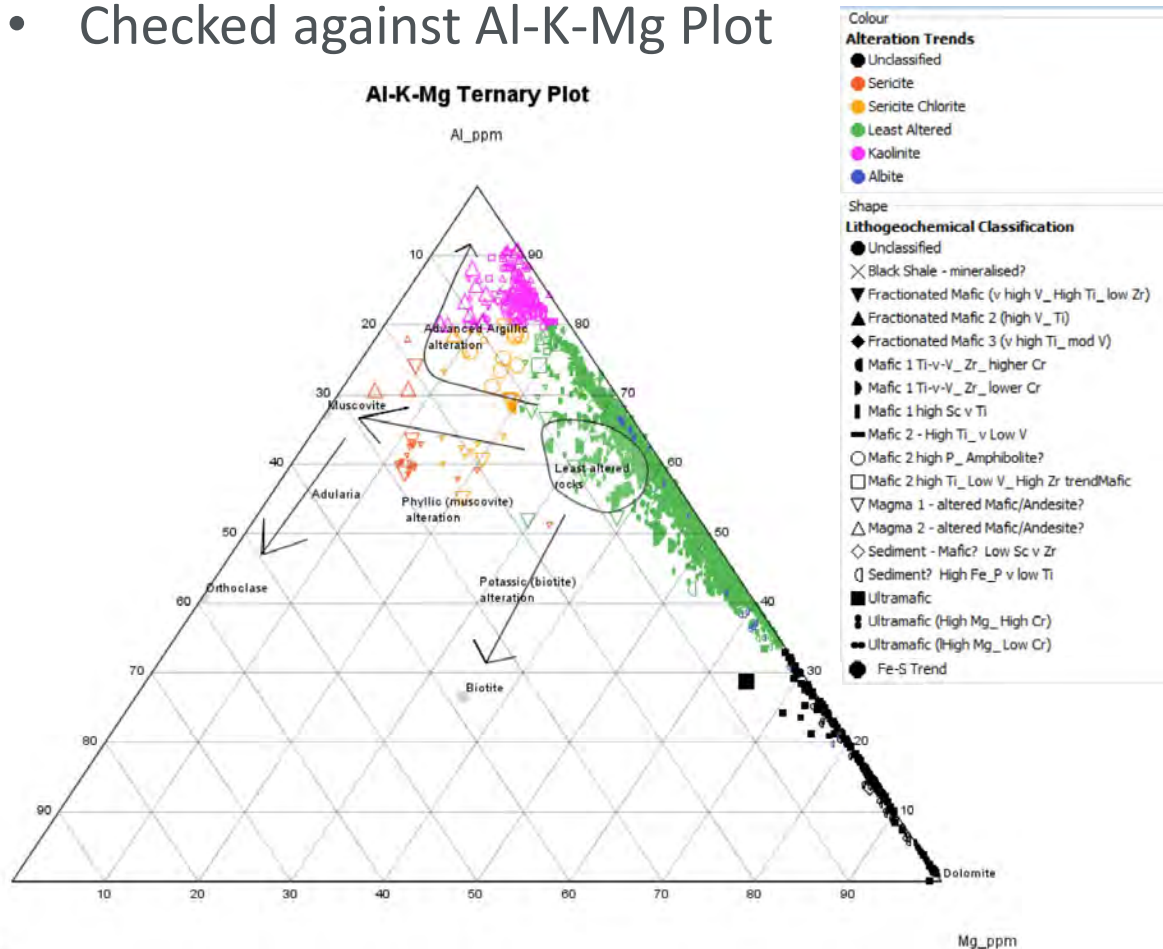
Similarity to the Intrusives in the Yamarna/West Musgraves?

- Two holes at the Athena Prospect (DRAC4, ATHDD001) have unique chemistry.
- Alternating bands of high Cr (up to 2.5%) and low Cr.
- Corresponding S, Cu, Pt, Pd values are low.



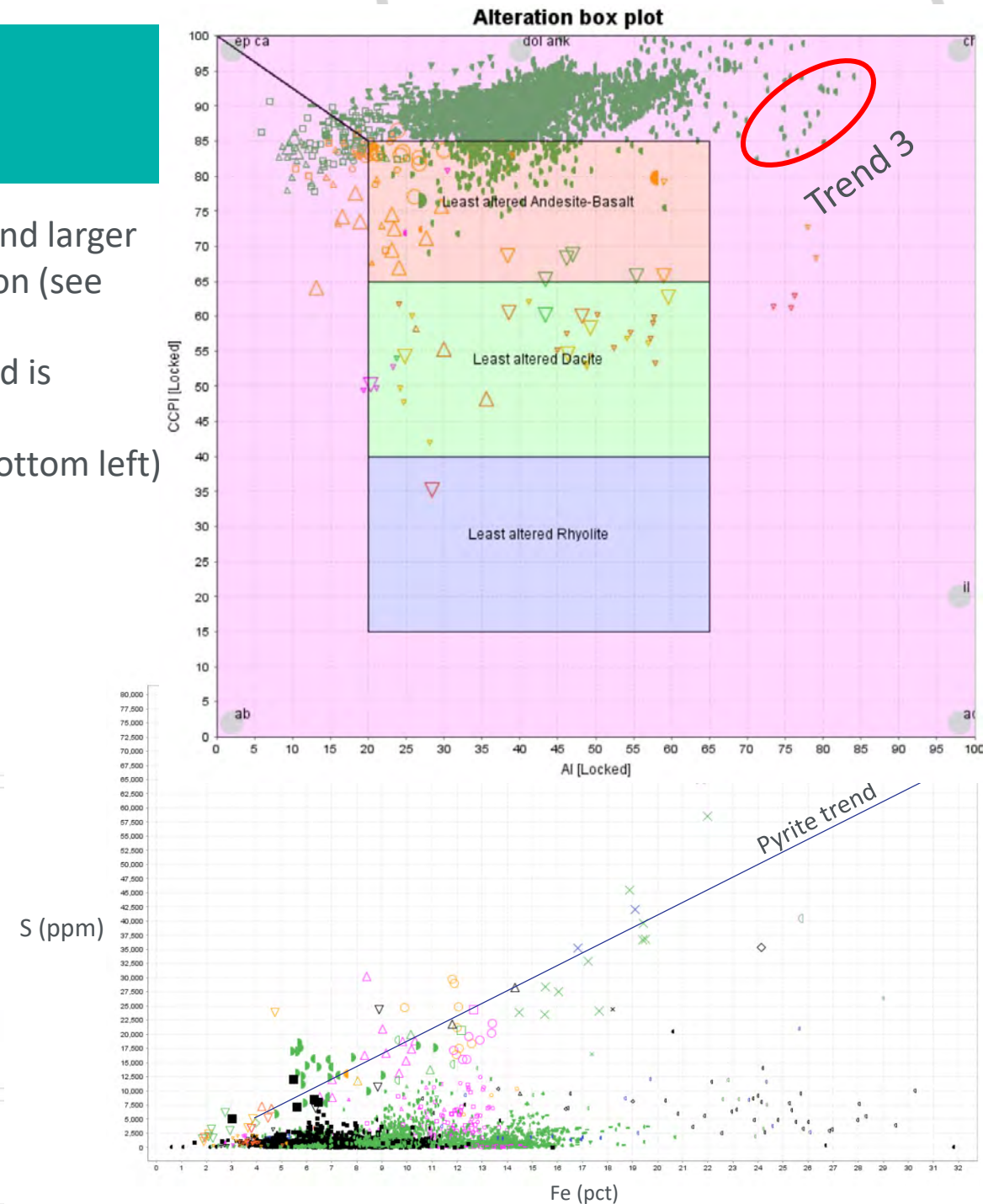
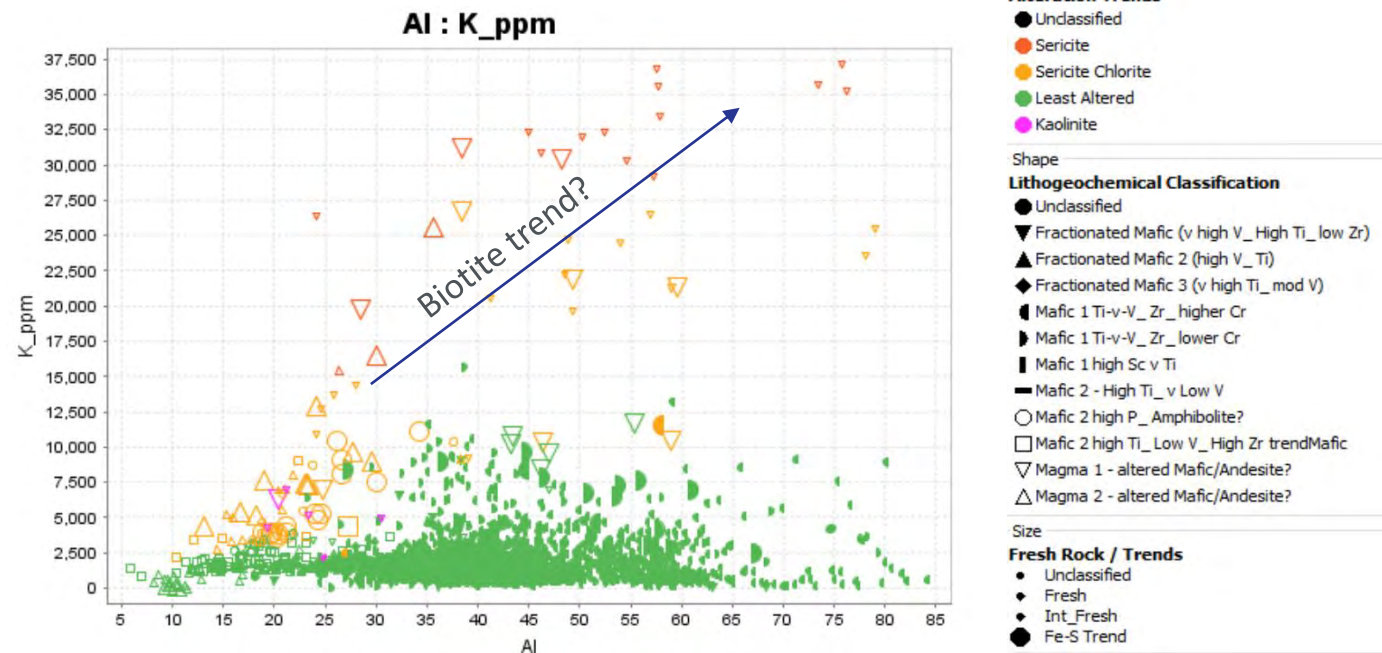
Ascalon - Alteration Box Plot

- Based on work by Large *et al* (2016), lithologies classed as 'mafic' plot in Trend 3 (Chlorite-Pyrite±Sericite).
- Checked against Al-K-Mg Plot



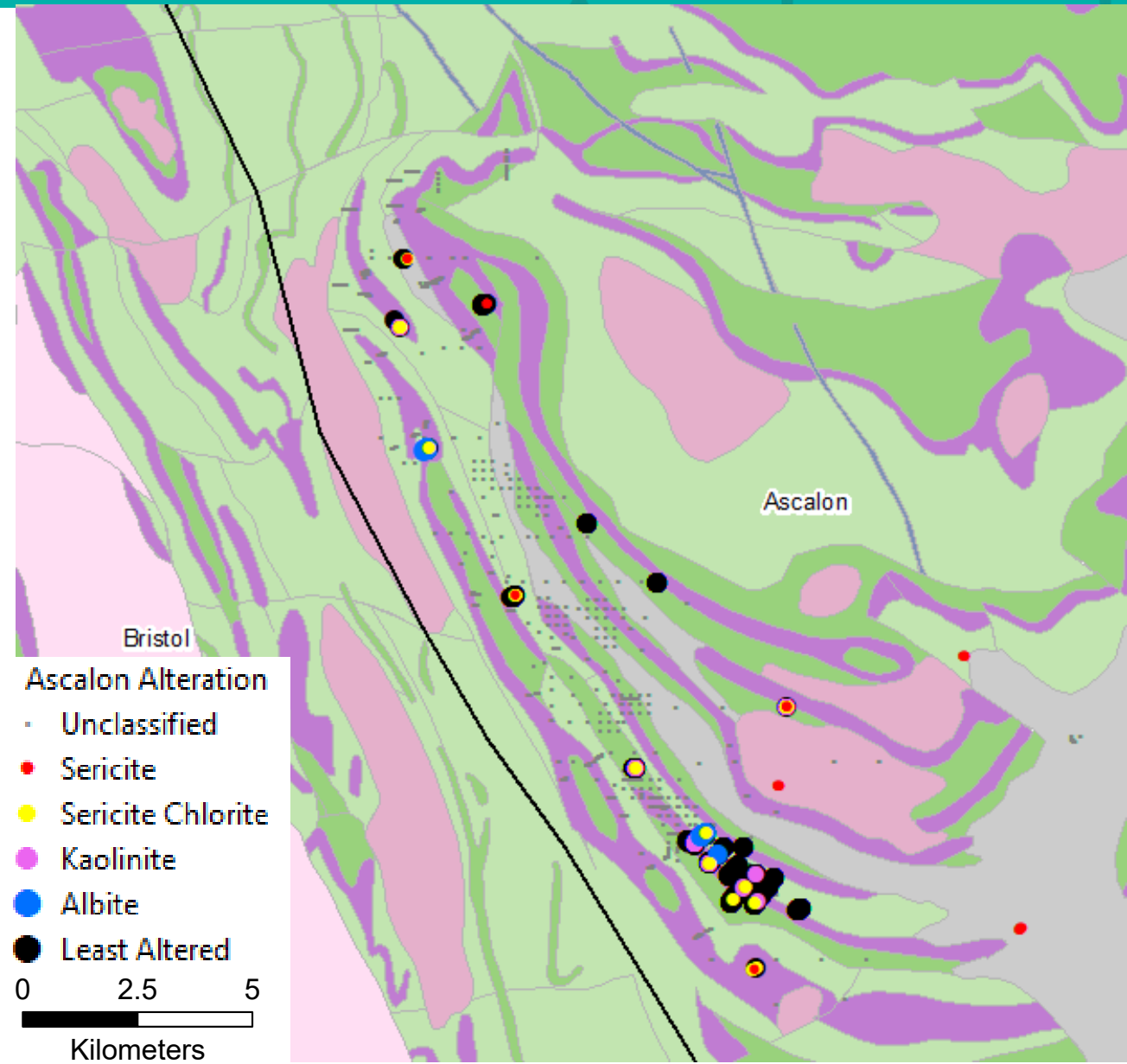
Alteration Associations

- Alteration is often associated with pyrite (Fe-S trend bottom right, and larger symbols on box plot) and Magma 1 altered mafic/andesite population (see hollow triangles).
- The Fe-S trend towards rhyolite composition is a trend towards K and is interpreted to be the result of biotite alteration.
 - Note: Plot of AI indices (Ishikawa Alteration Index) against K (bottom left)
- Mafic 1 (high and low Cr populations) are associated with Trend 3.
- Note the progression of alteration from proximal to distal on left.
- Albite alteration is only present in sedimentary units.



Alteration – Spatial Relationships

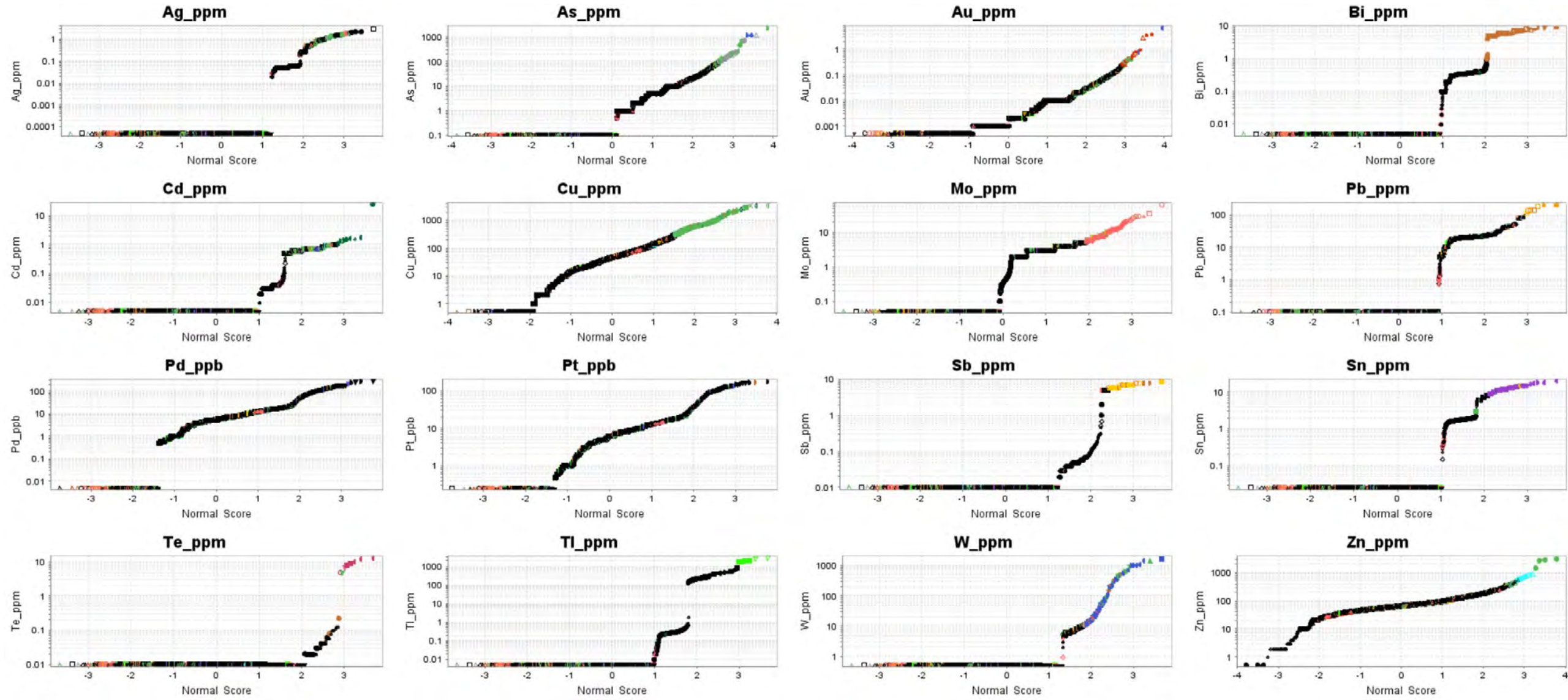
- Clusters of alteration in southern area are associated with a Ti-V fractionated unit.
- Lack of alteration does not equal no alteration – dataset is incomplete to interpret across all holes.



Ascalon - Element Anomalism

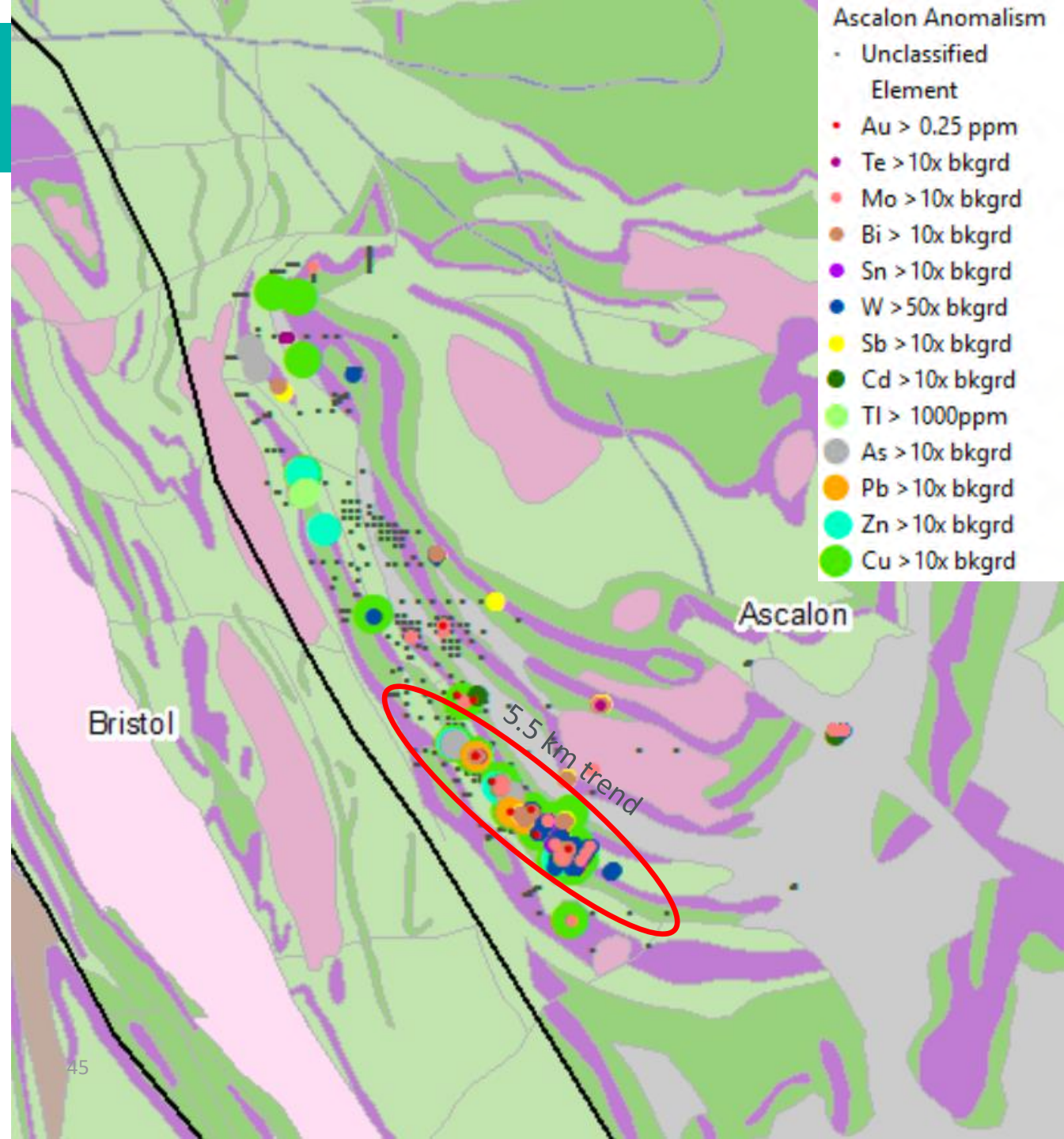
- Lack of association of anomalism due to multiple generations of data.

Element Anomalism



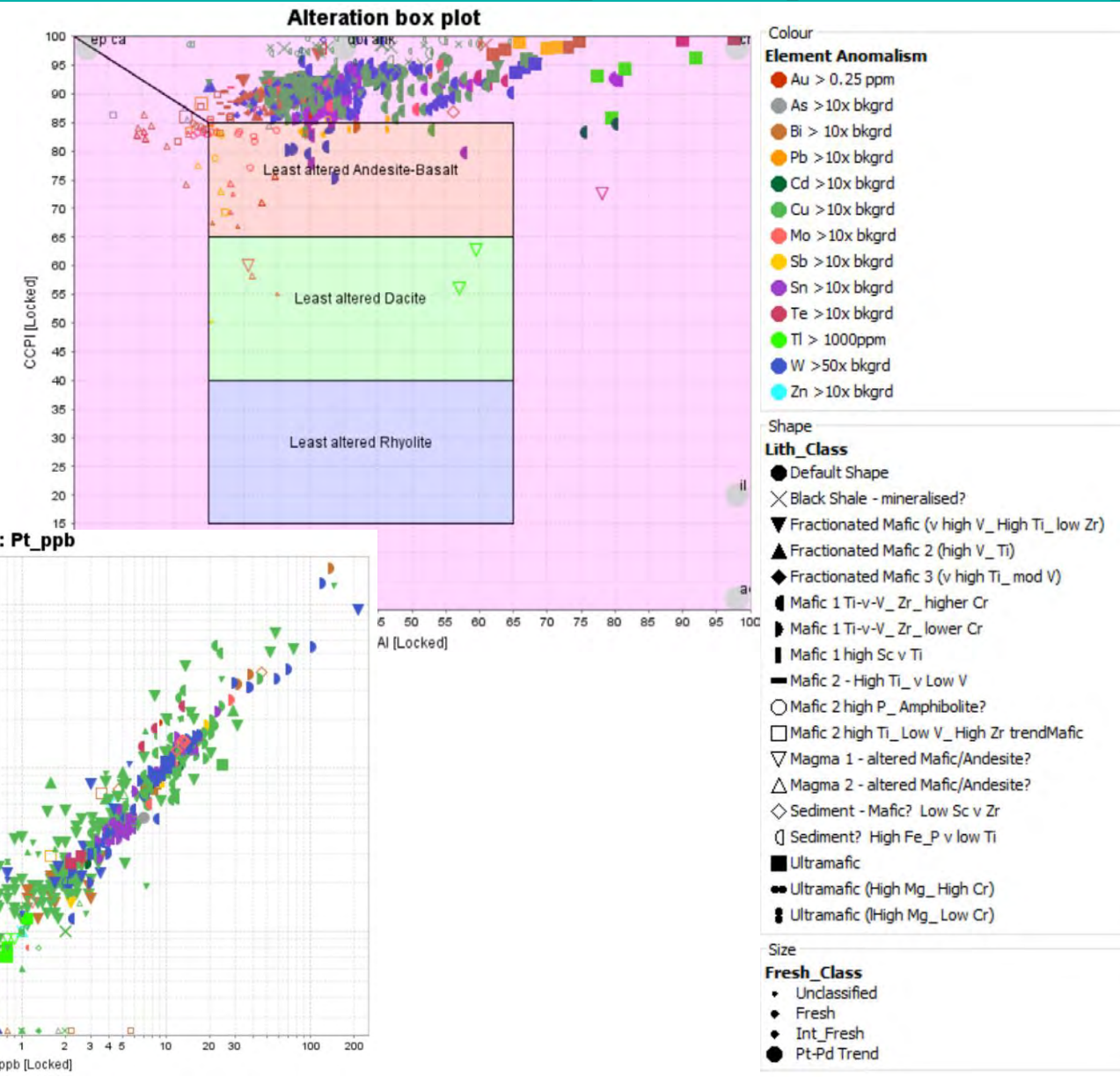
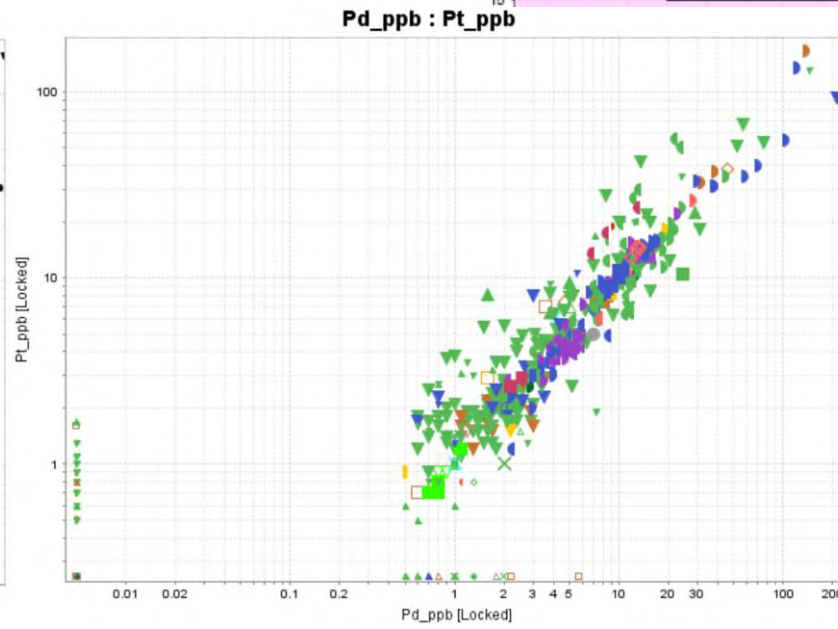
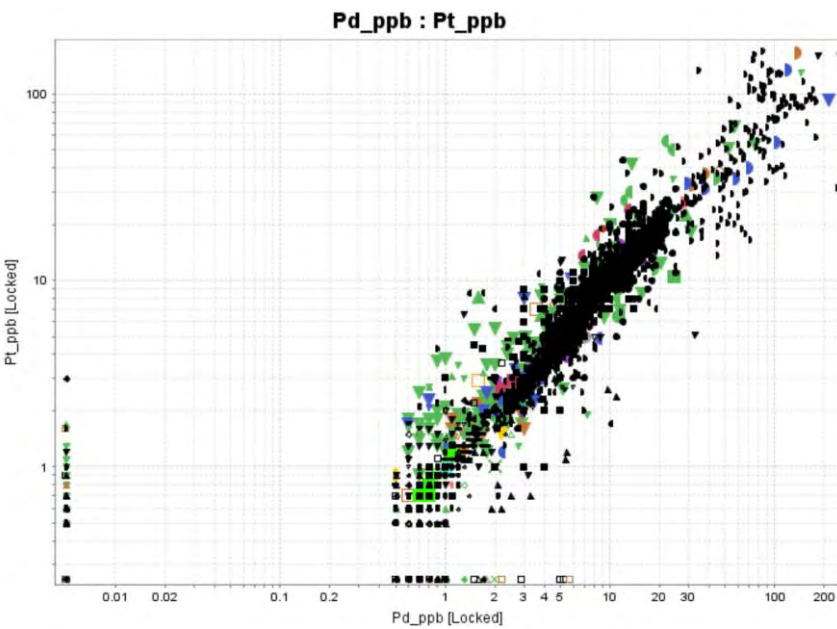
Elemental Anomalism

- Approximately 5.5 km trend of anomalism that includes:
 - As, Bi, Cd, Cu, Mo, Pb, Sb, Sn, W and Zn;
 - 2 points with Au: 2.88g/t and 3.74 g/t; and
 - Coincides with zone of alteration and fractionated mafic lithologies.
- Gold anomalism is focused in the southern end but little correlation to other elements is present.



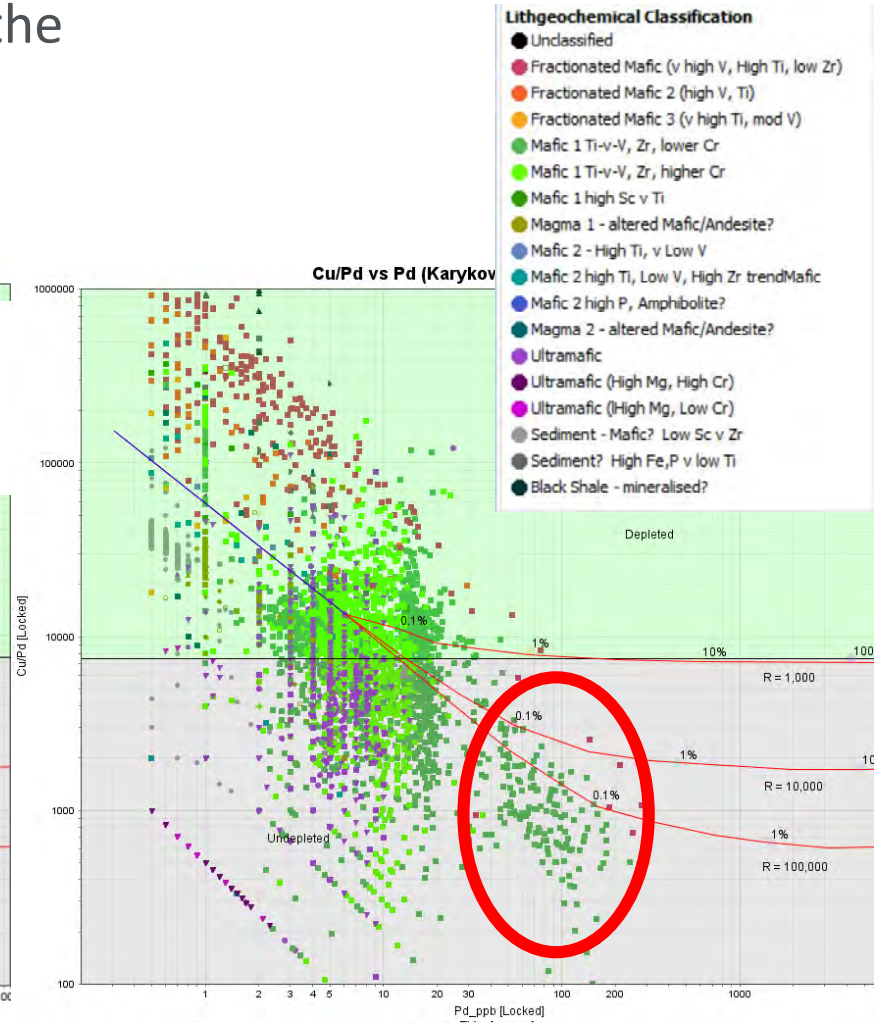
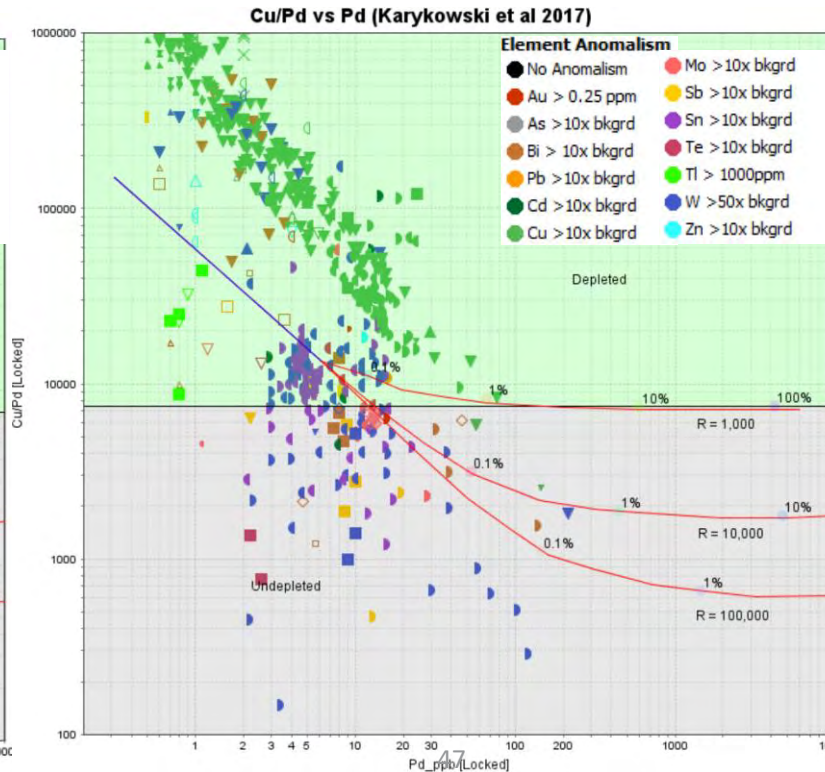
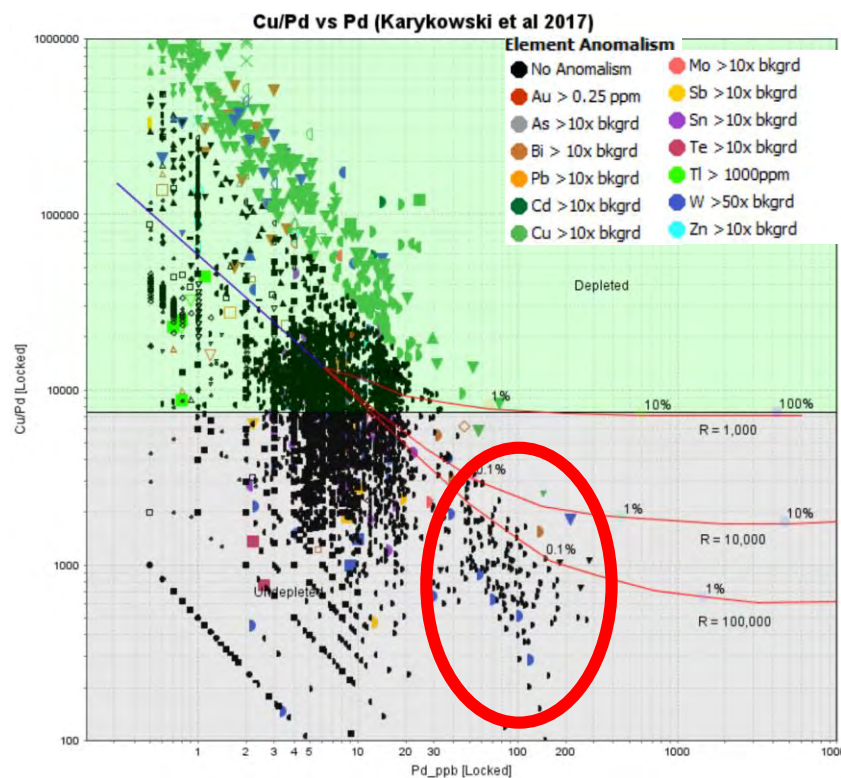
Ascalon: Note on Pd/Pt Relationships and Element Anomalism

- Strong Pd/Pt correlation in data.
- Samples with element anomalism plot within Pd/Pt trend.
- The cluster of data points around 10-30 ppb Pd and Pt are associated with the 5.5 km trend. Is this a potential vector for targeting?



Note on Potential 'Intrusion' Fertility

- Anomalism follows the R factor 100,000 trend from Karykowski et al (2017).
- This population is associated with the Magma 1 series from the lithogeochemical classification.



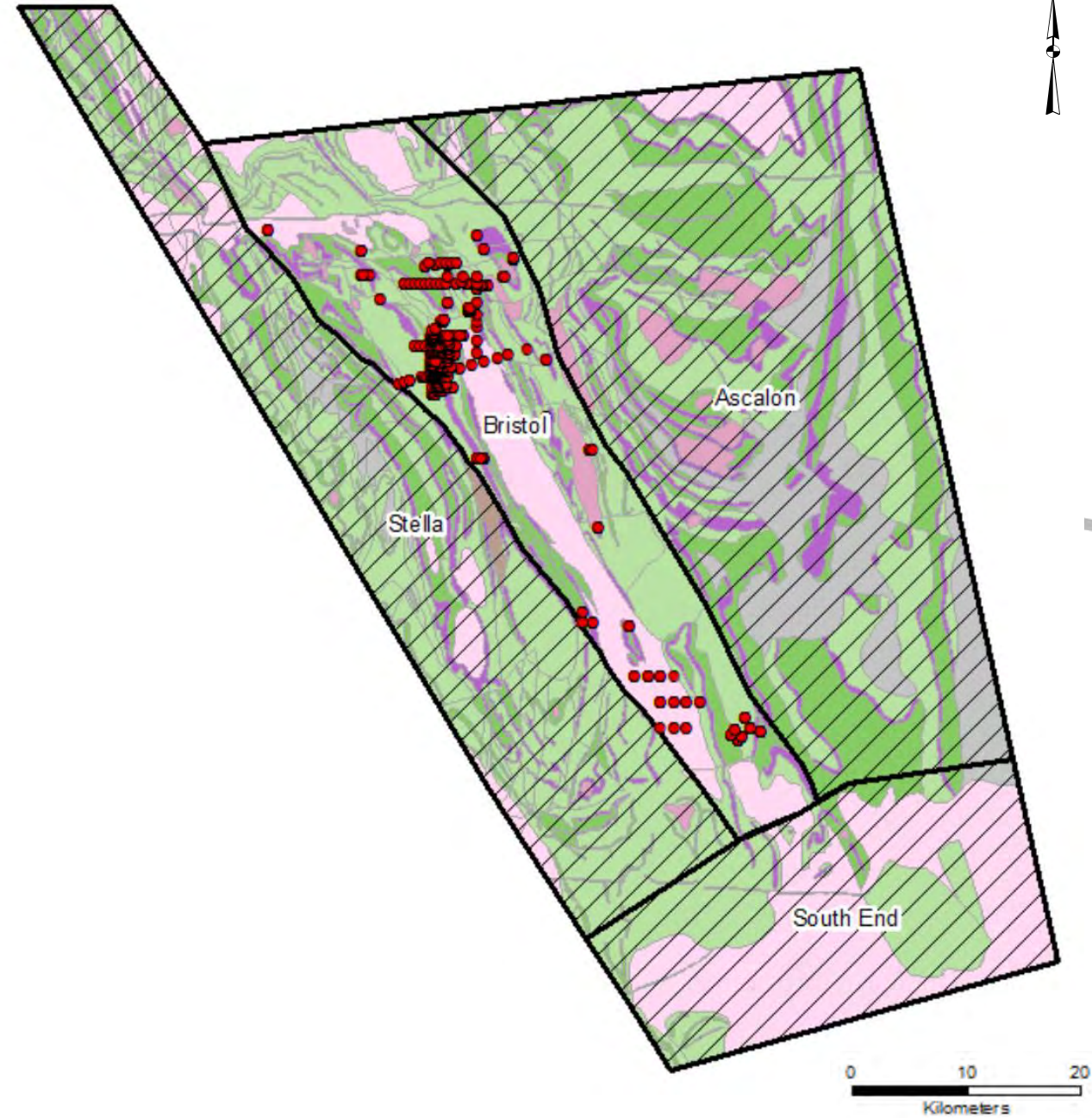
Ascalon Summary

- Two magma populations, one more tholeiitic, the other calc-alkaline.
- Potential layered intrusion present with Cr up to 2.5%.
- Alteration of mafic lithologies clusters in southern portion of dataset.
- A ~5.5 km trend of anomalism is associated with alteration and fractionated mafics.
 - Anomalous elements include: As, Bi, Cd, Cu, Mo, Pb, Sb, Sn, W and Zn.
- Strong Pt-Pd trend present with associated anomalous elements.
- Pd/Cu ratios suggest a strong R factor correlation with “Mafic 1”.

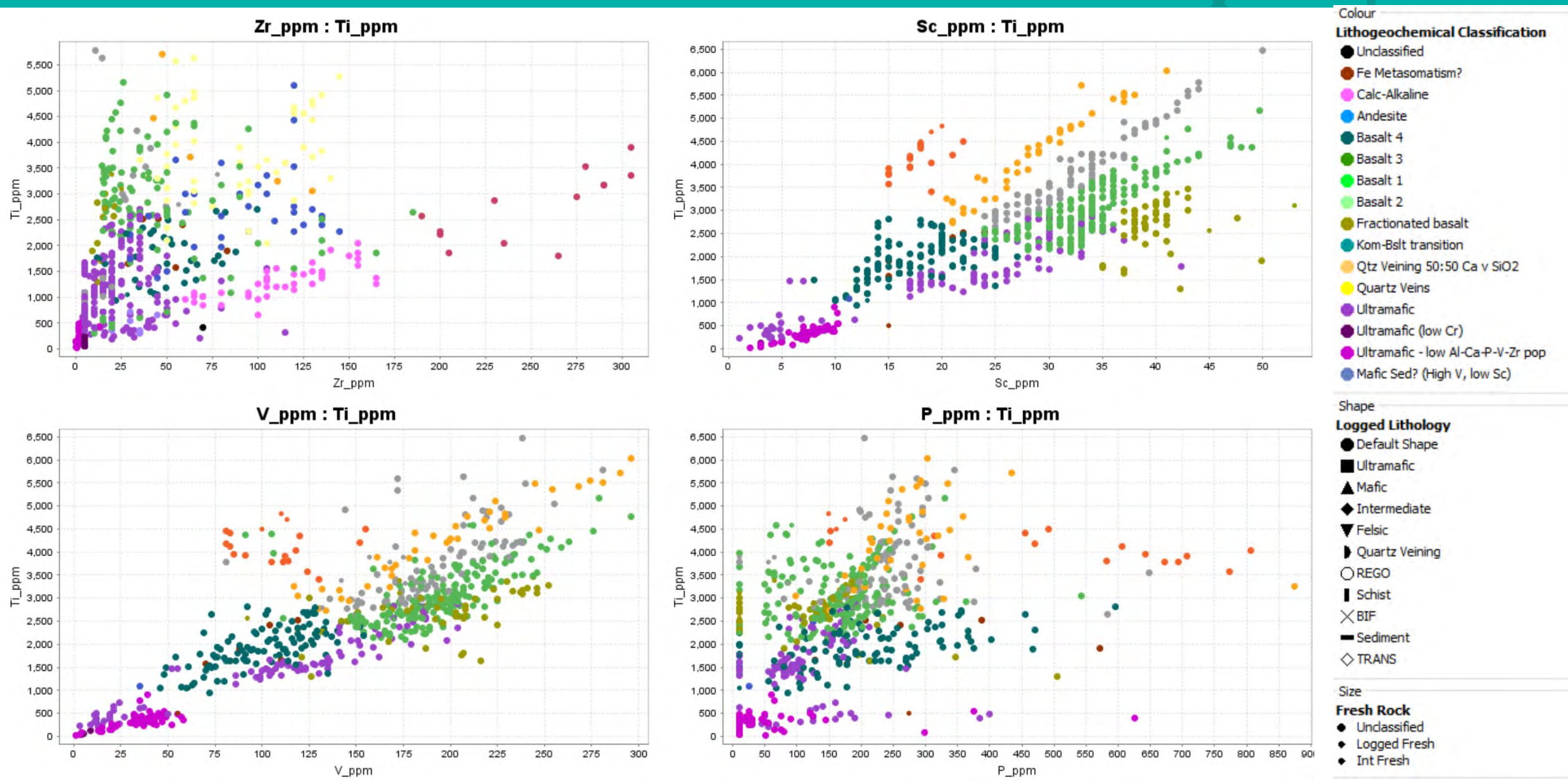


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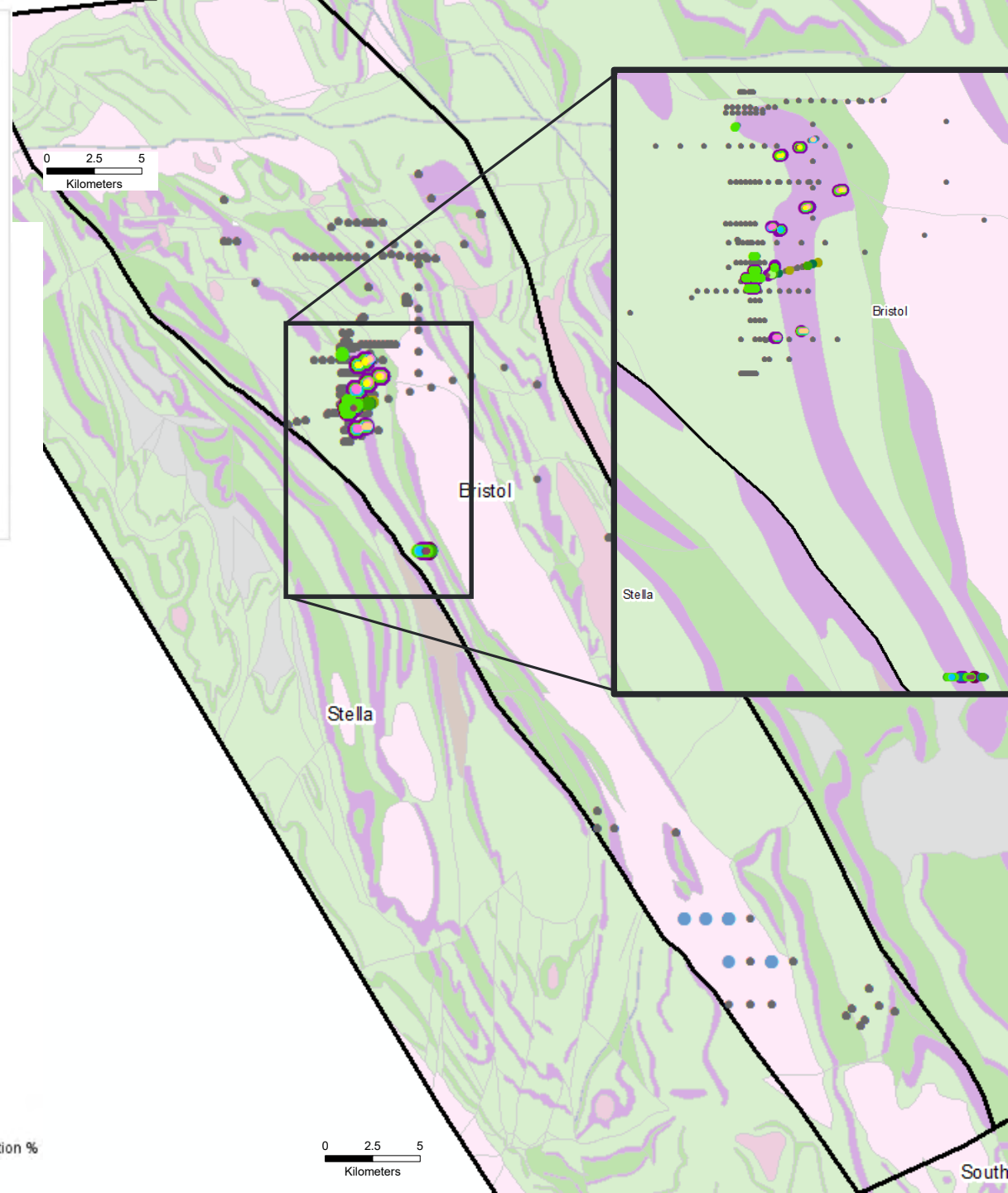
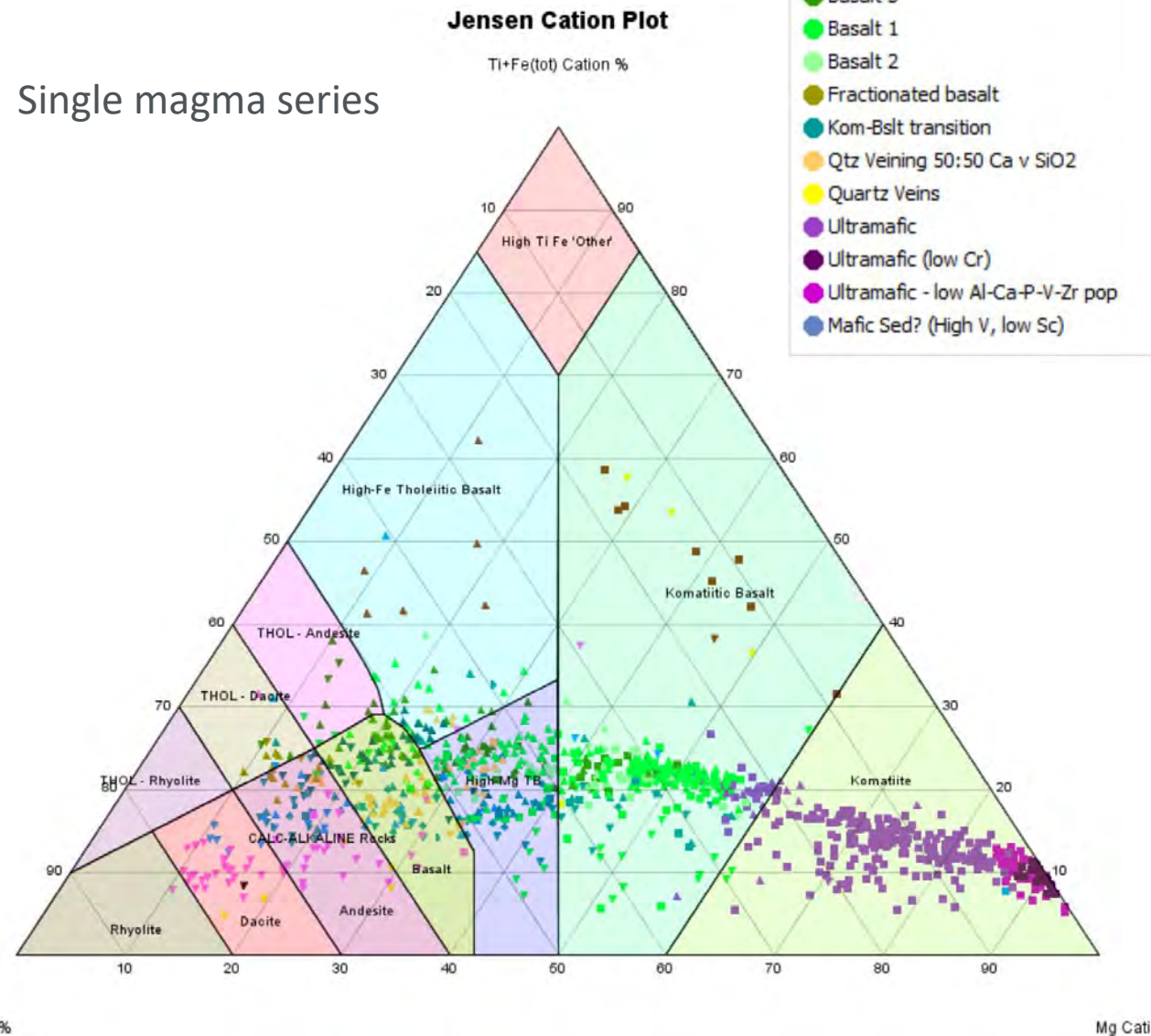
Bristol Domain



Bristol – Lithogeochemical classification – One Magma Series



Spatial Distribution

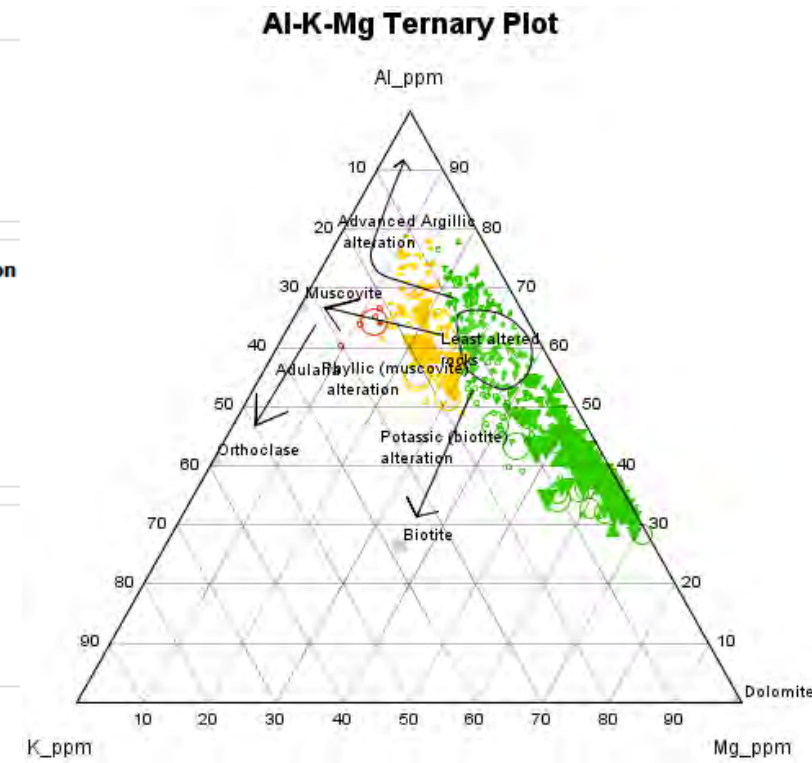
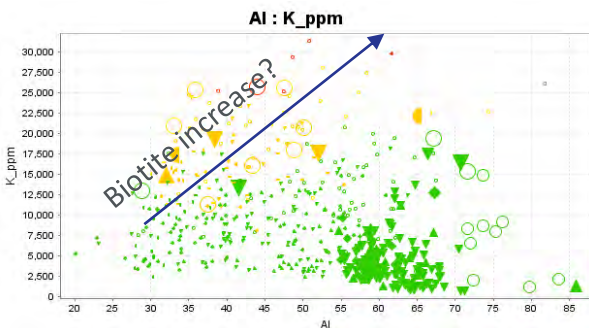
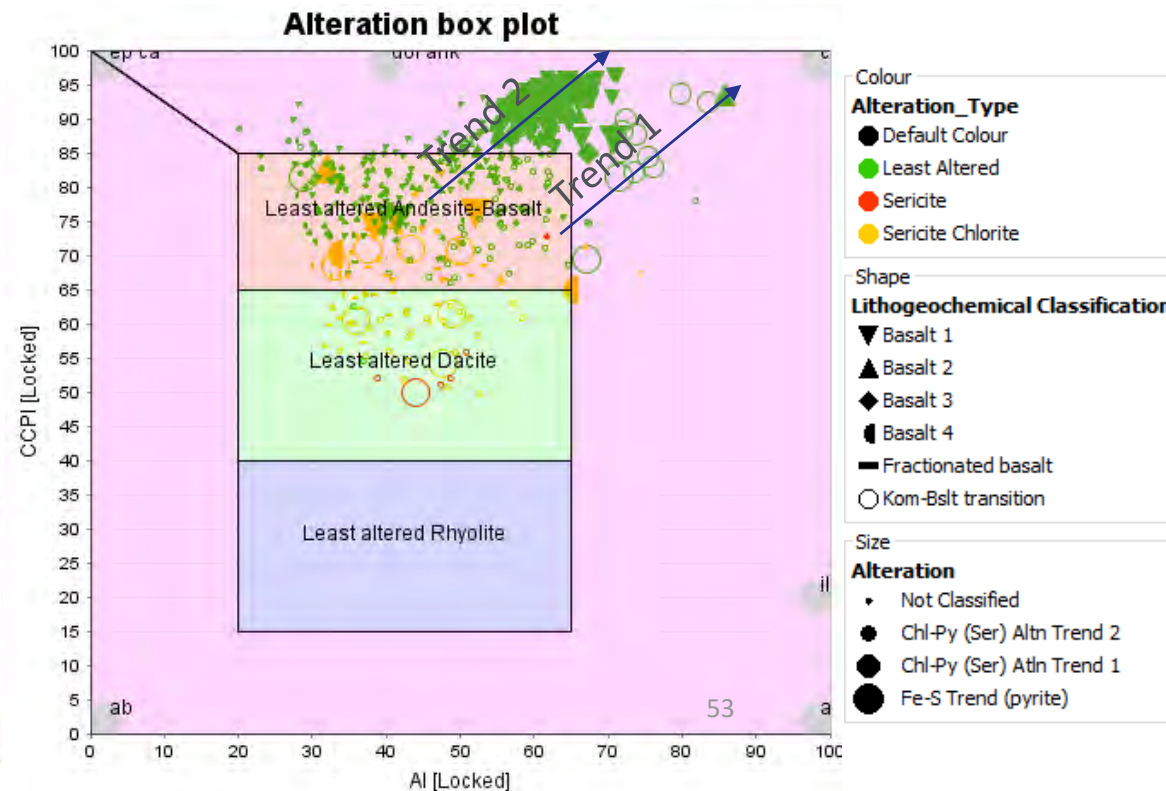
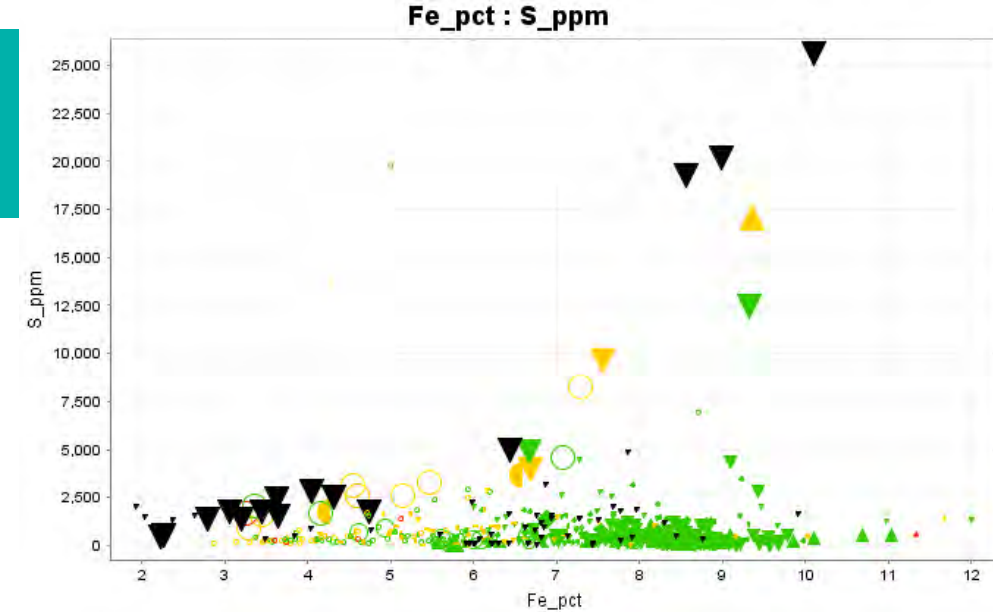


Logged Lithology



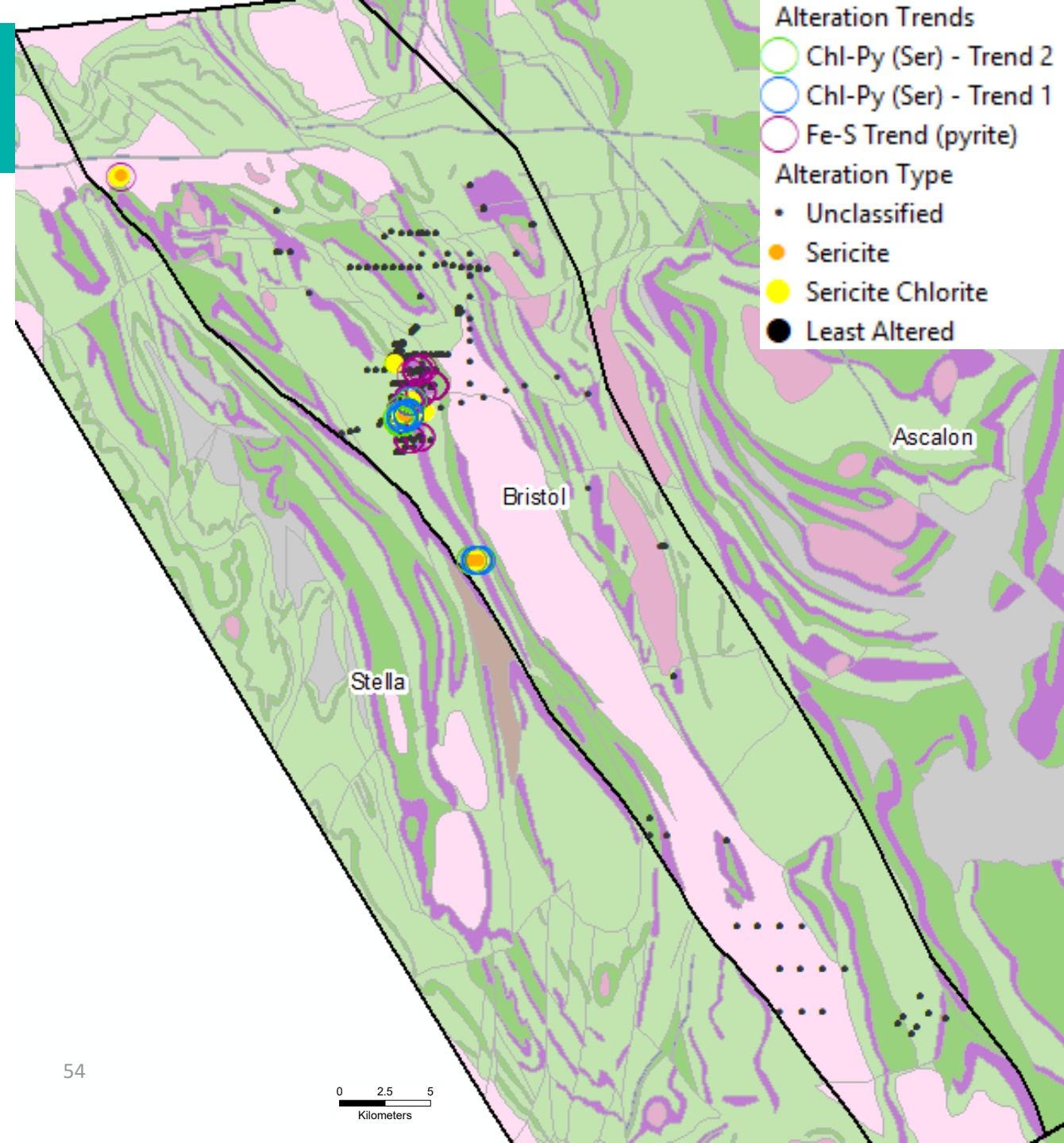
Alteration: Mafic Units

- Only mafic lithologies have been interpreted due to a lack of data for the remaining lithogeochemical groups.
- Note the Fe-S/Sericite and Sericite-Chlorite trends/population and relationship of Ishikawa Alteration Index (AI) vs K – interpreted as biotite alteration.

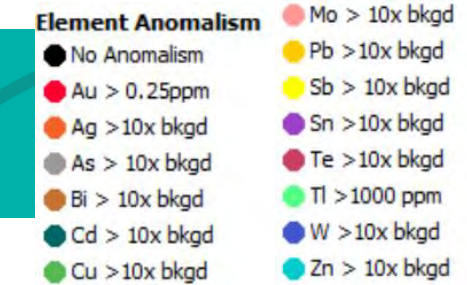


Bristol – Alteration Distribution

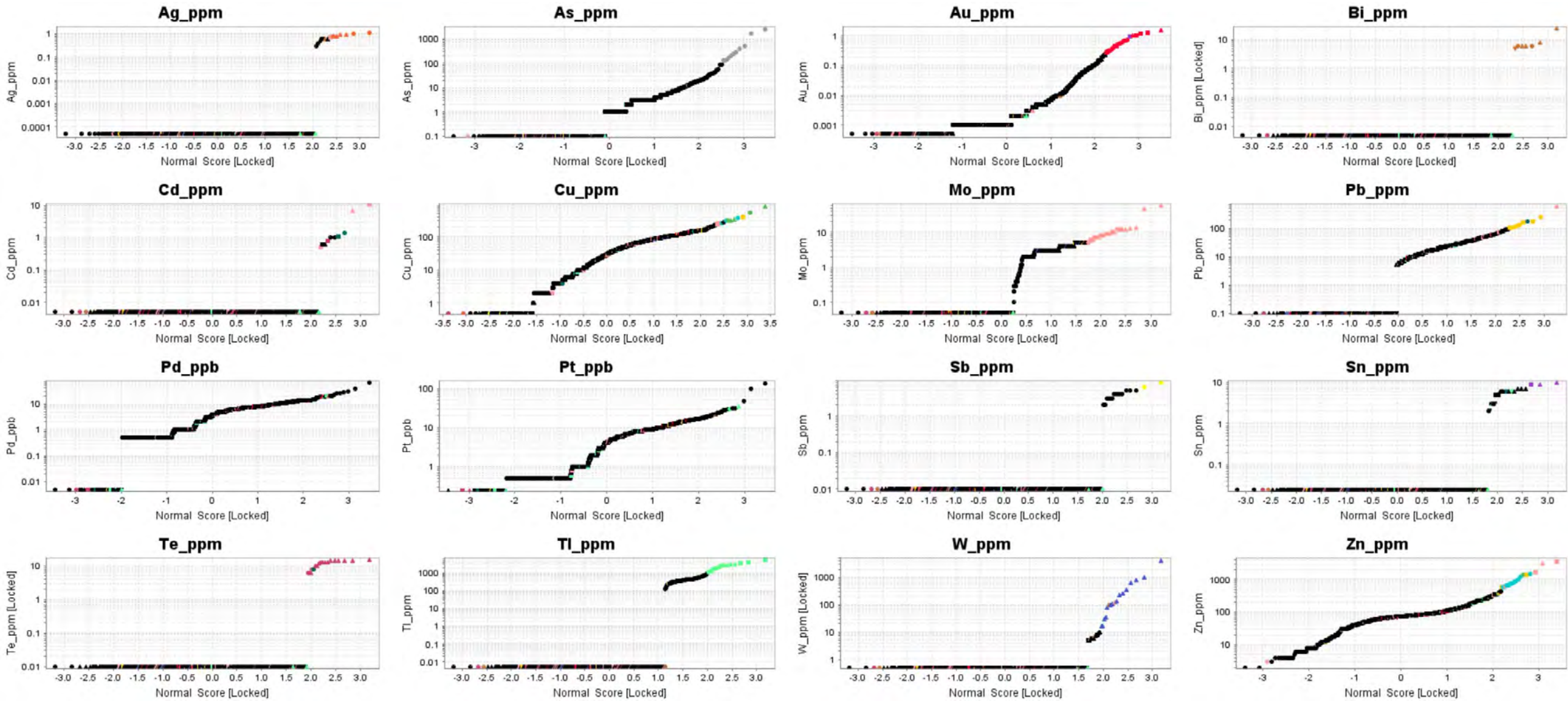
- 1.5 km long alteration zone associated with chlorite-pyrite and increasing sericite, with another alteration zone associated with same interpreted stratigraphic horizon ~7 km to the south with little to no drilling in between.
- Isolated alteration population with limited data in northwest of Bristol Domain.
- All alteration data is associated with interpreted mafic lithologies.



Bristol – Element Anomalism

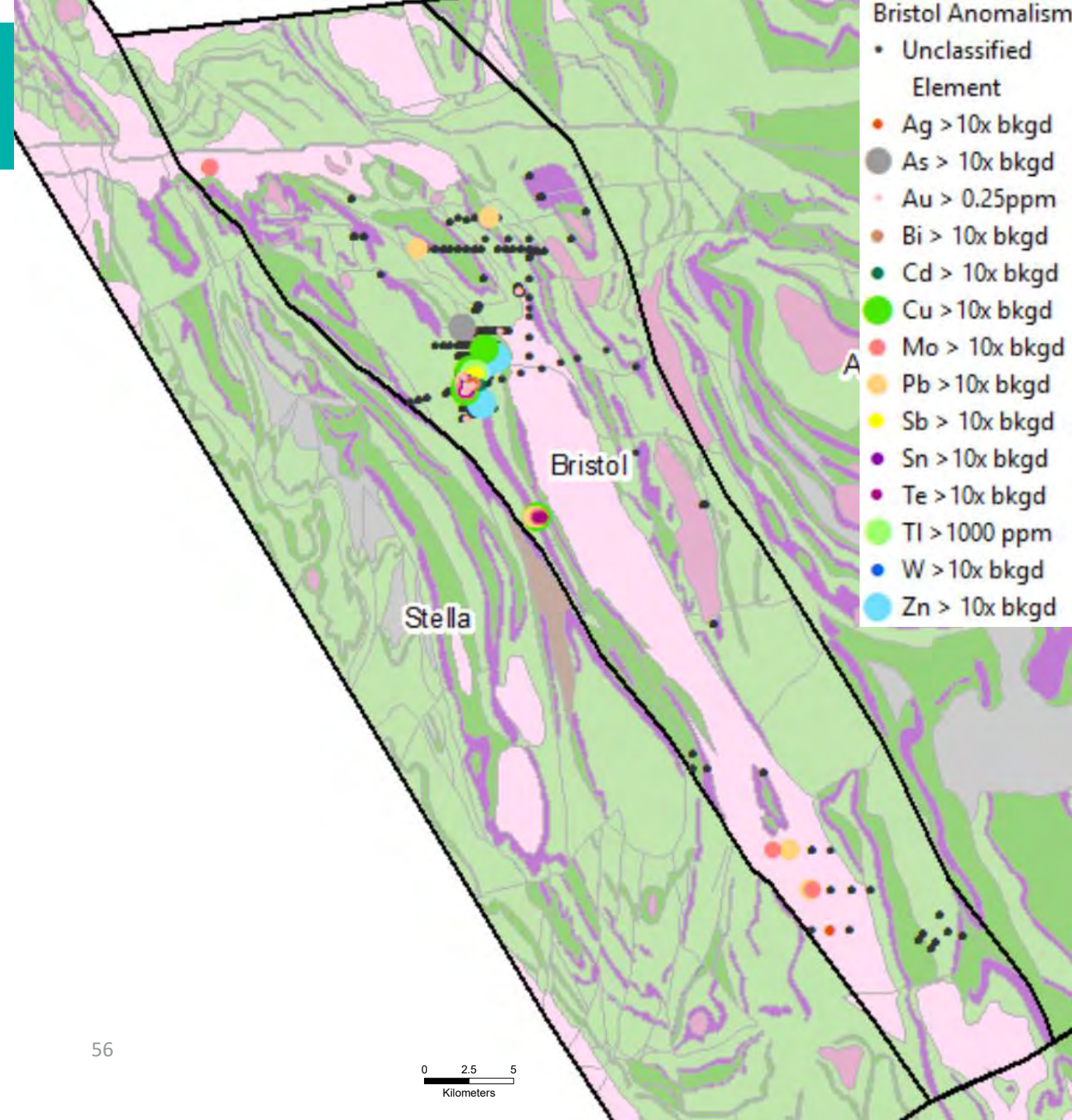


- Lack of association of anomalism due to multiple generations of data.



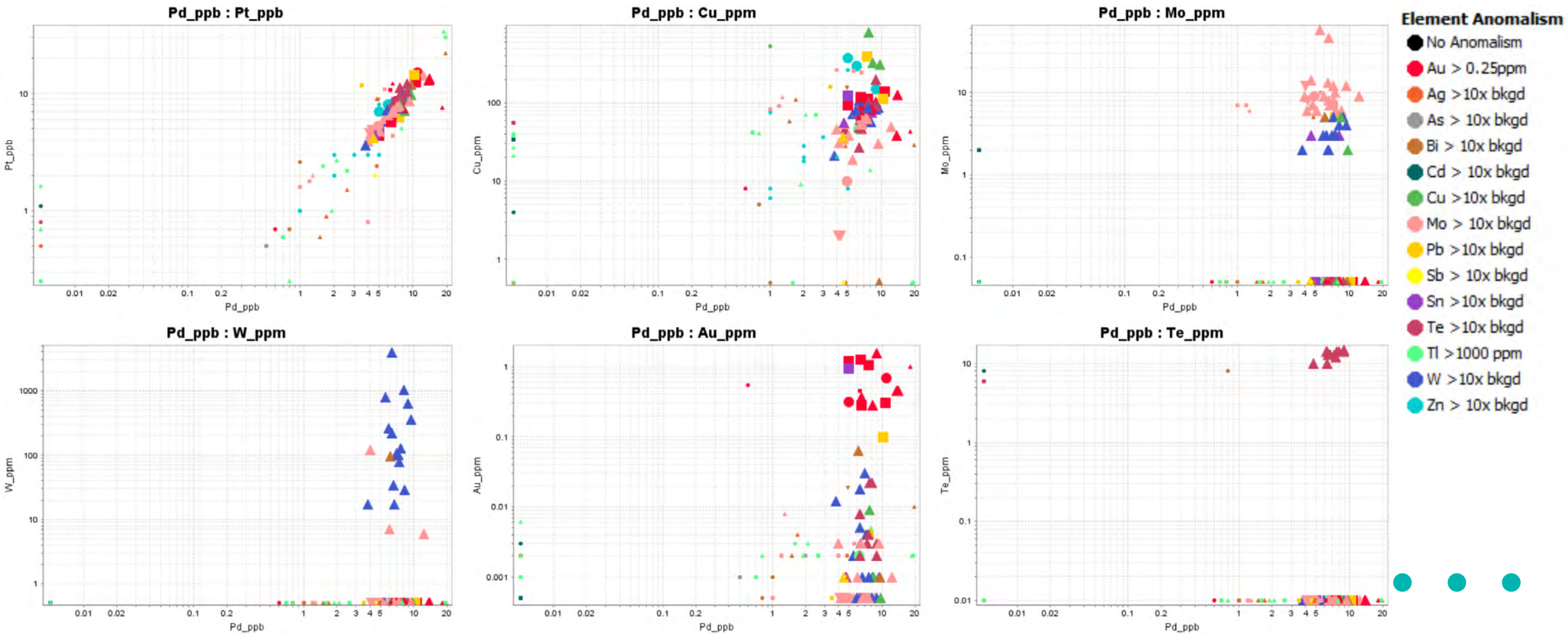
Element Anomalism

- Approximately 1.5 km trend of anomalism that includes:
 - Ag, Bi, Cd, Cu, Mo, Pb, Sb, Sn, Te, Tl, W and Zn.
 - Coincides with zone of alteration and fractionated mafic lithologies.
- ~6 km to south of main trend are two isolated drill holes with Bi, Cd, Mo, Pb and Te anomalism.
- No drill data exists between these two areas.



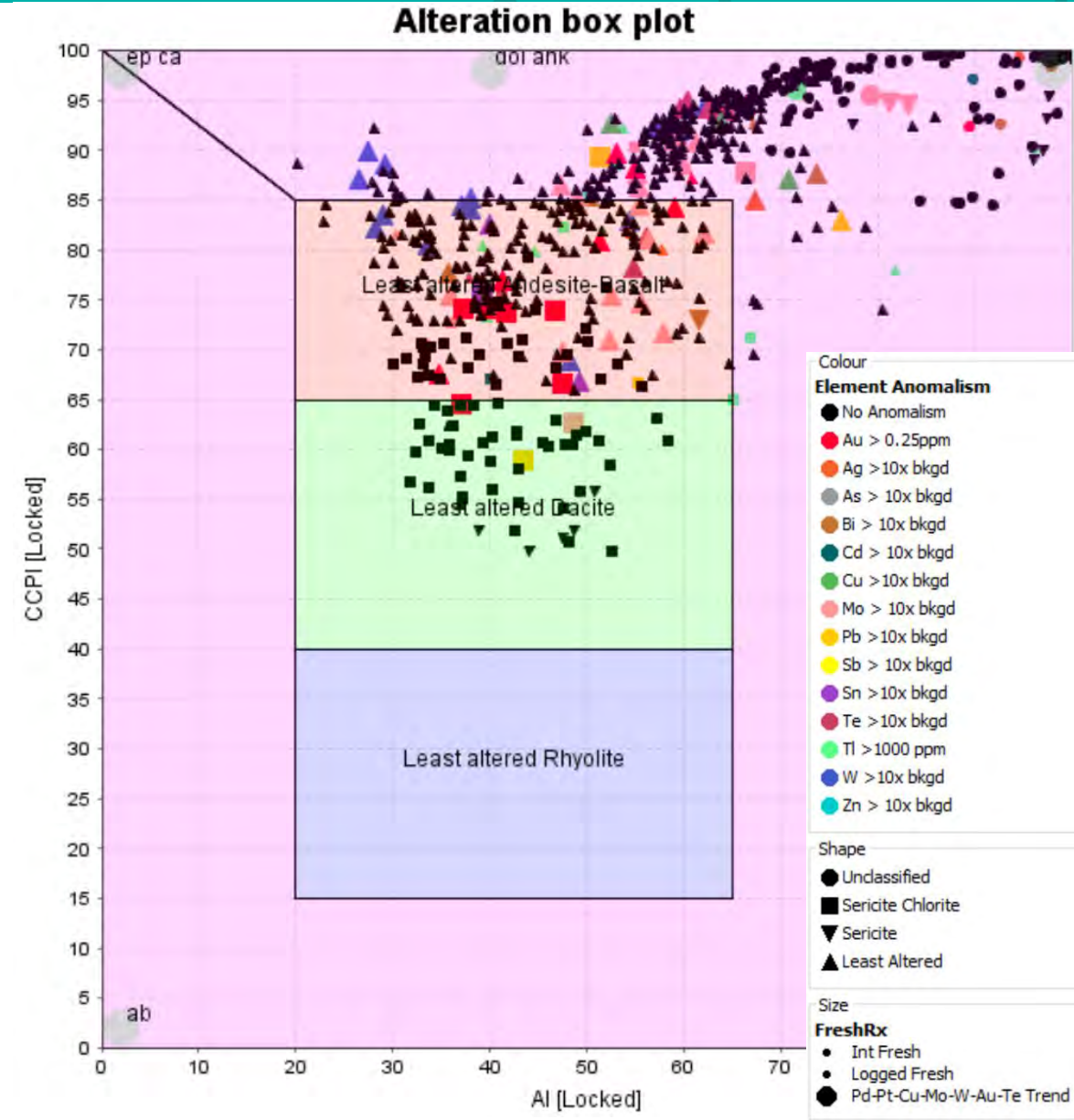
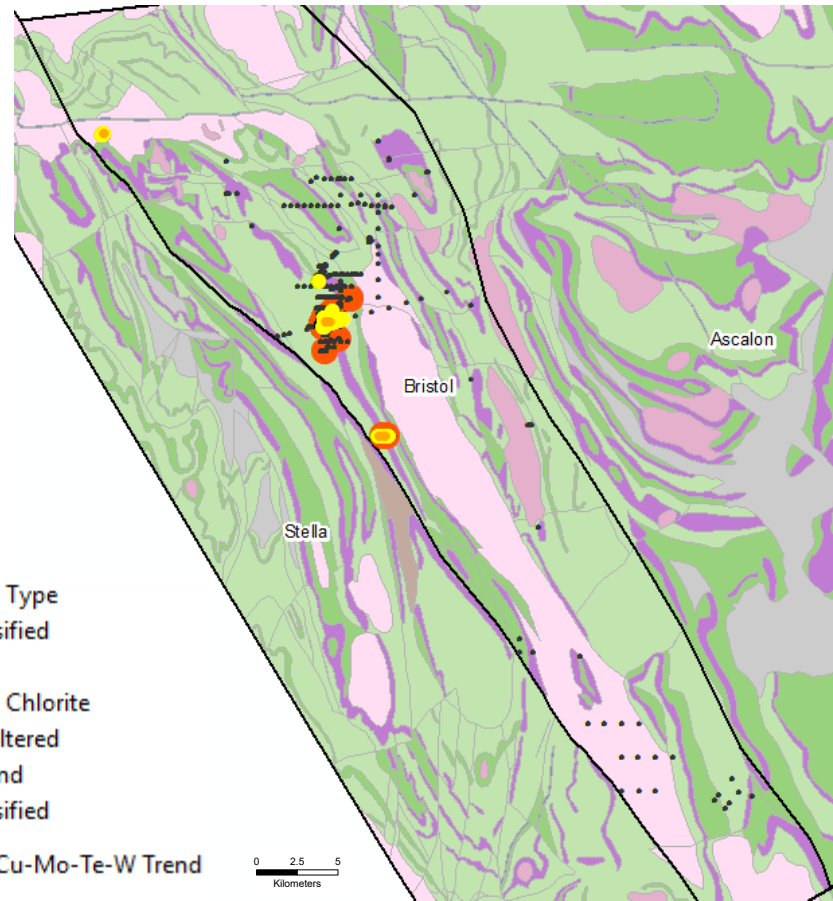
Bristol: Pd-Pt-Cu-Mo-Te-W Trend?

- Cluster of anomalism and positive Pd/Pt correlation is associated with positive correlation of Pd with Cu-Mo, and lesser W, Au and likely Te.



Bristol: Pd-Pt-Cu-Mo-Te-W Trend on Alteration Box Plot

Pd-Pt trend is associated with Chlorite-Sericite alteration, which correlates with a positive trend on the Alteration Box Plot suggesting footwall alteration (Slide 37).



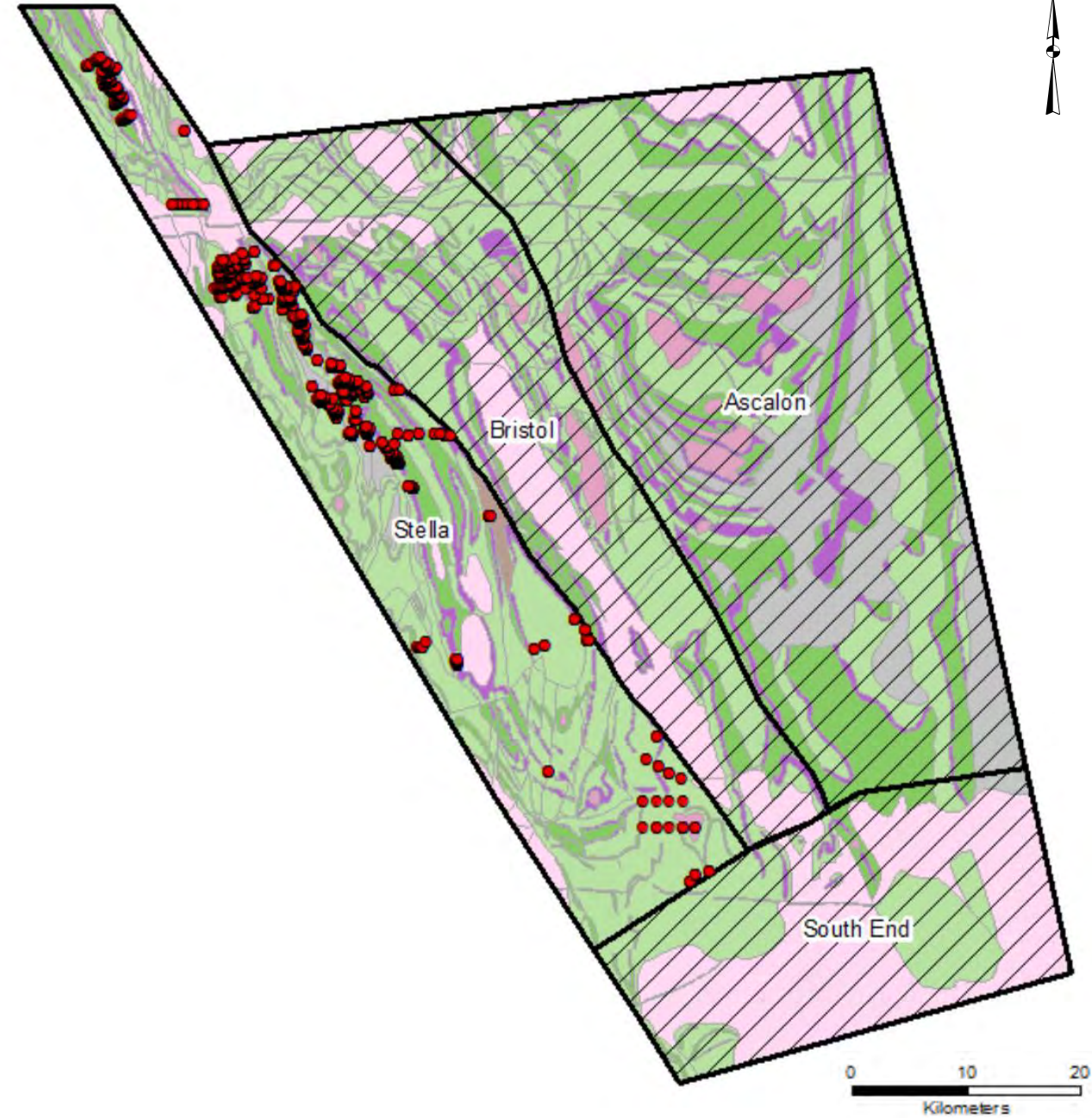
Bristol Summary

- One magma series from ultramafic through to calc-alkaline composition.
- Alteration of mafic lithologies clusters along a 1.5 km strike length, which is associated with a Fe-S (pyrite) and Chlorite-Sericite trend and strong element anomalism.
 - Element anomalism includes: Ag, Bi, Cd, Cu, Mo, Pb, Sb, Sn, Te, Tl, W and Zn.
 - A strong Pd-Pt-Cu-Mo-Te-W correlation is present in this zone.
- Two additional populations of data have strong alteration and element anomalism, one south of the main cluster and the other to the northwest. Both anomalies have limited drilling and are considered untested.



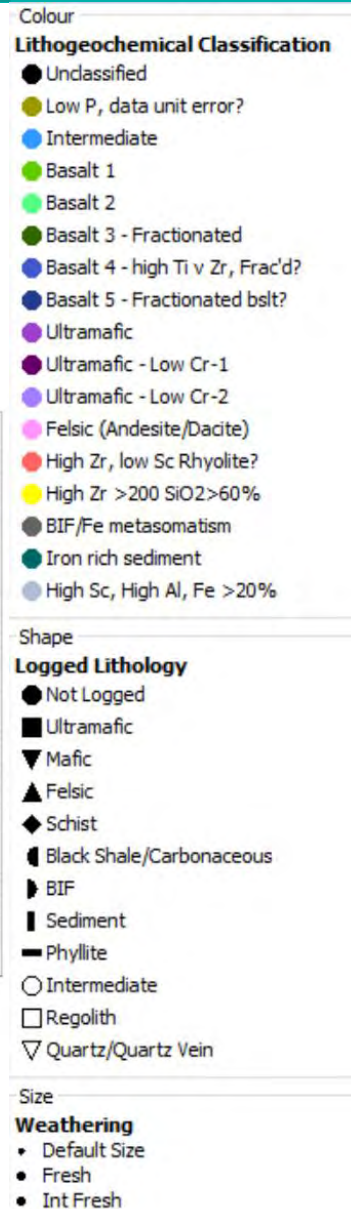
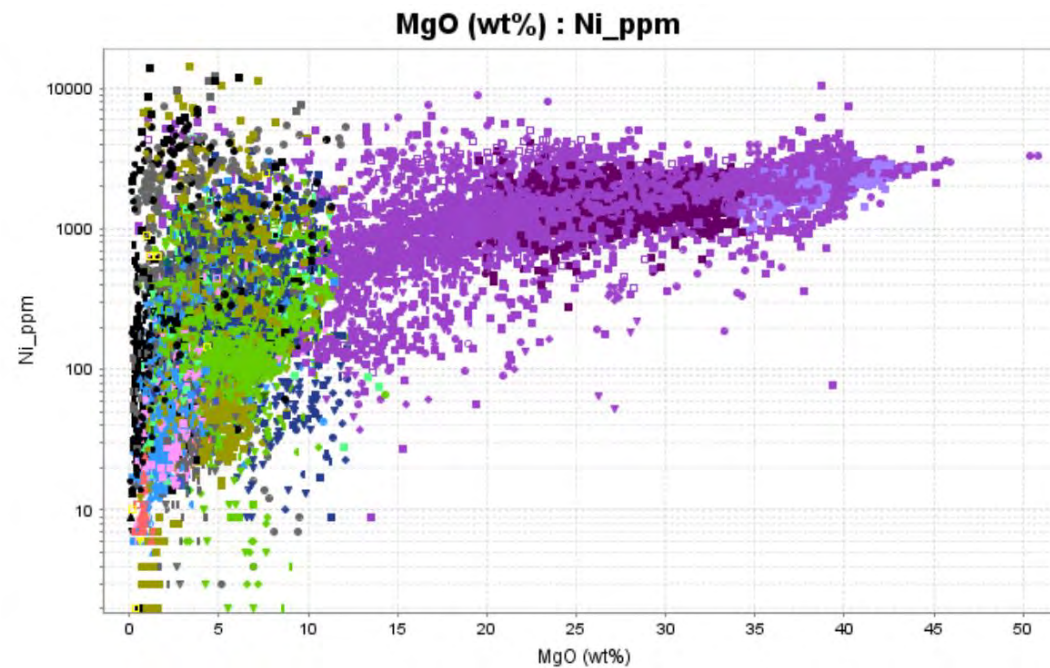
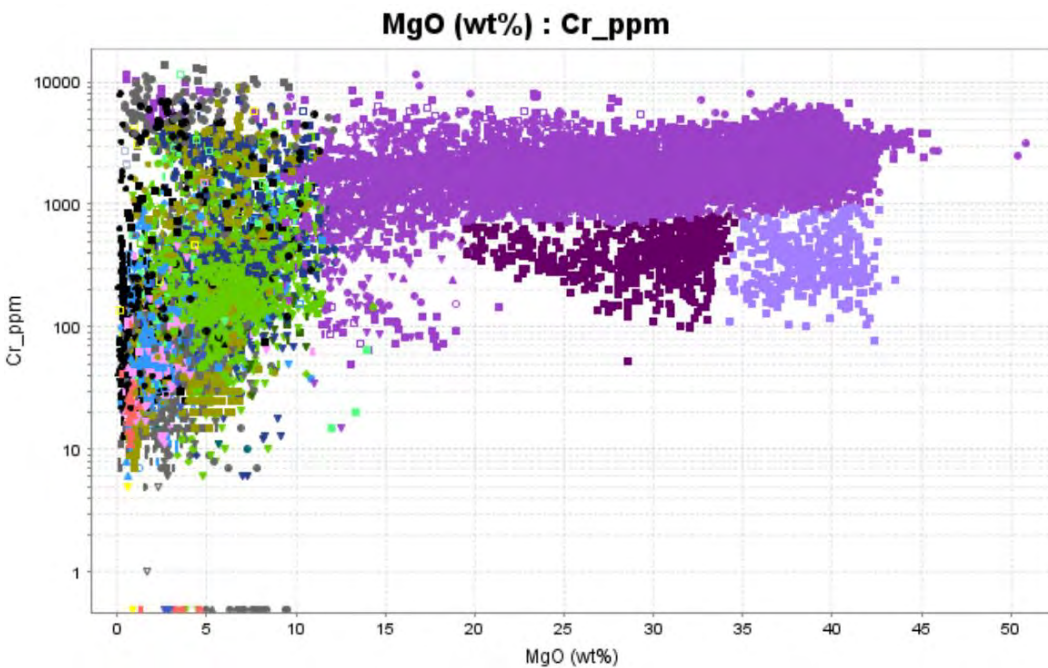
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Stella Domain

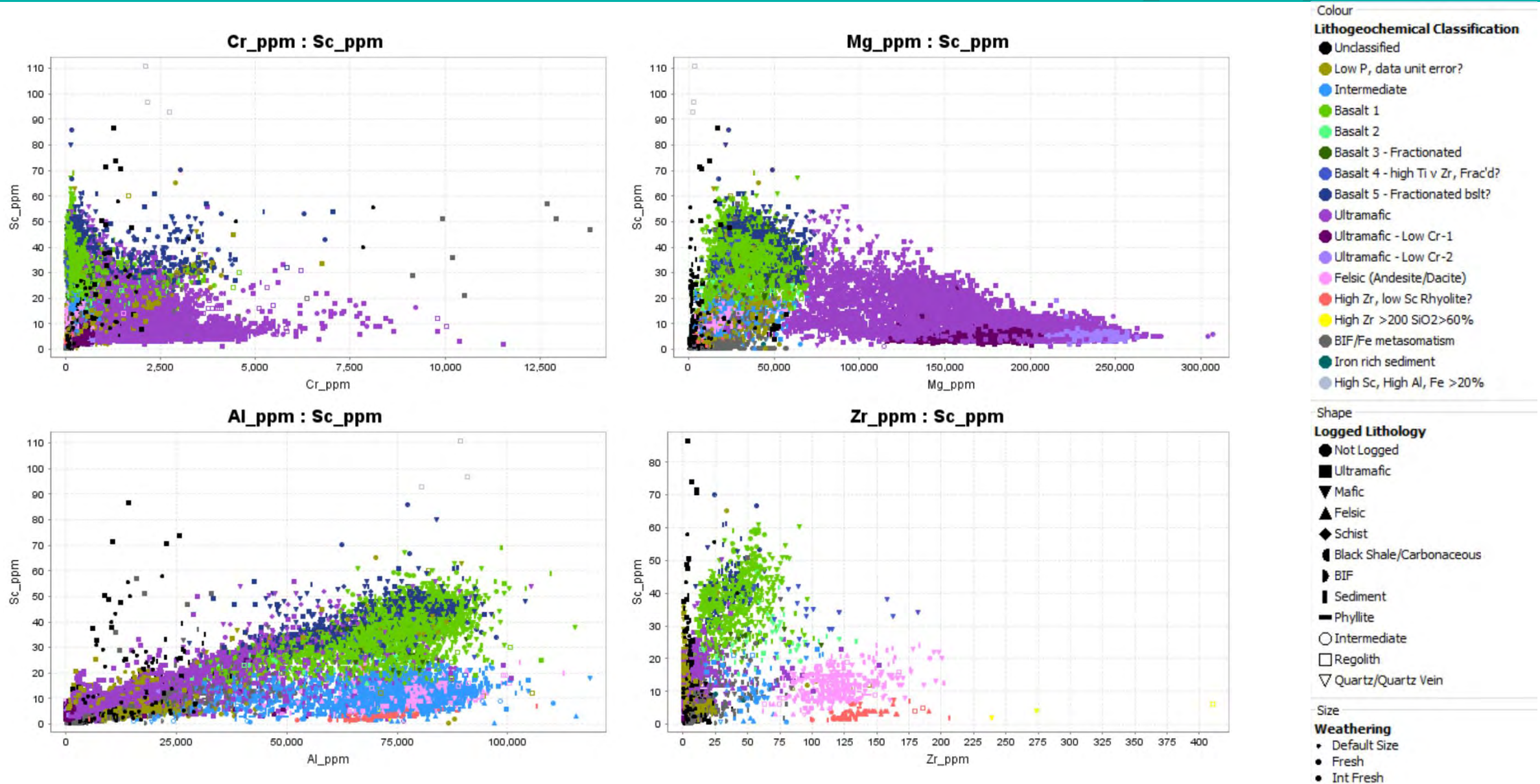


Stella: Lithological Classification - Ultramafics

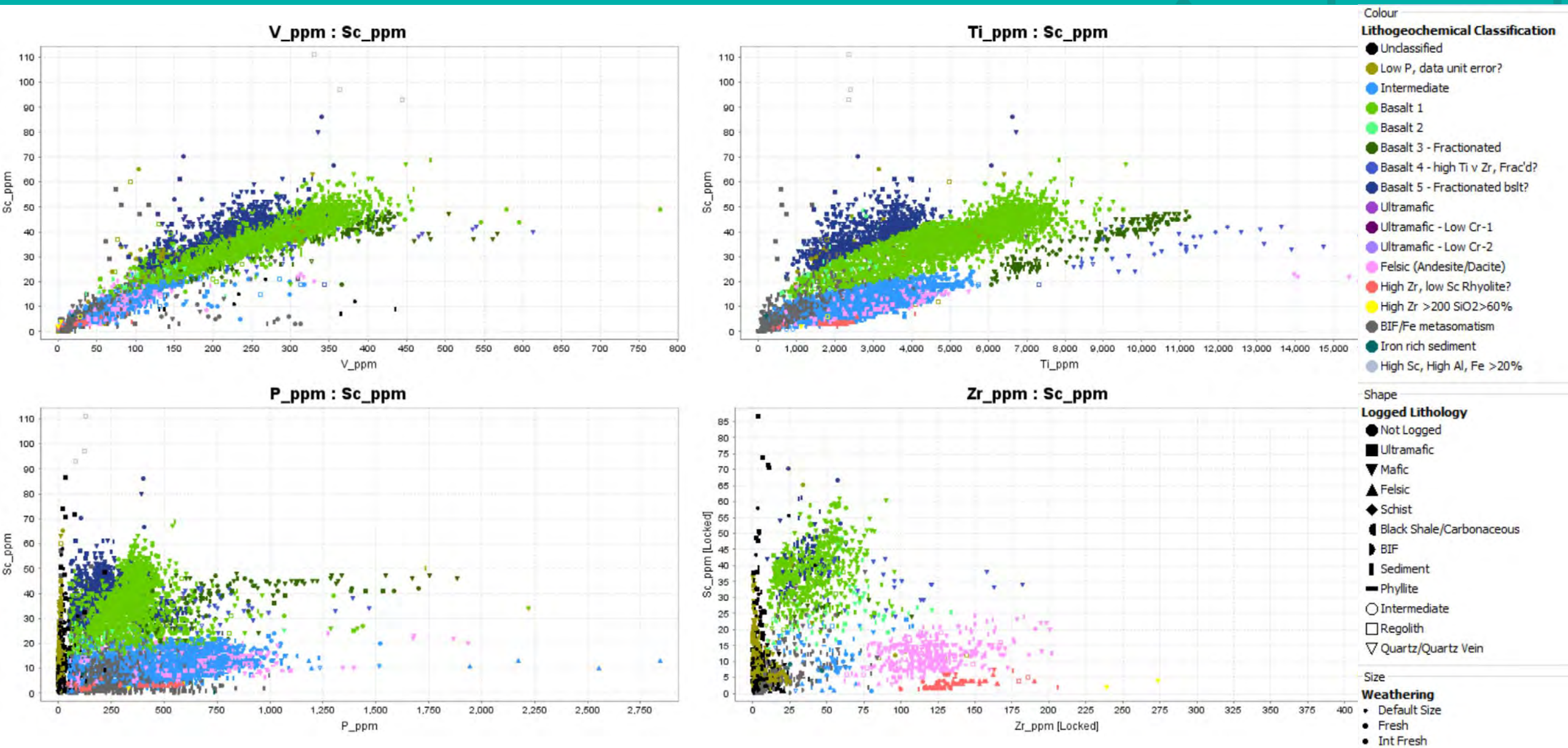
- Cr and Ni against MgO is used to determine ultramafic populations, and verified against Sc relationships.



Confirmation of Ultramafic Lithologies

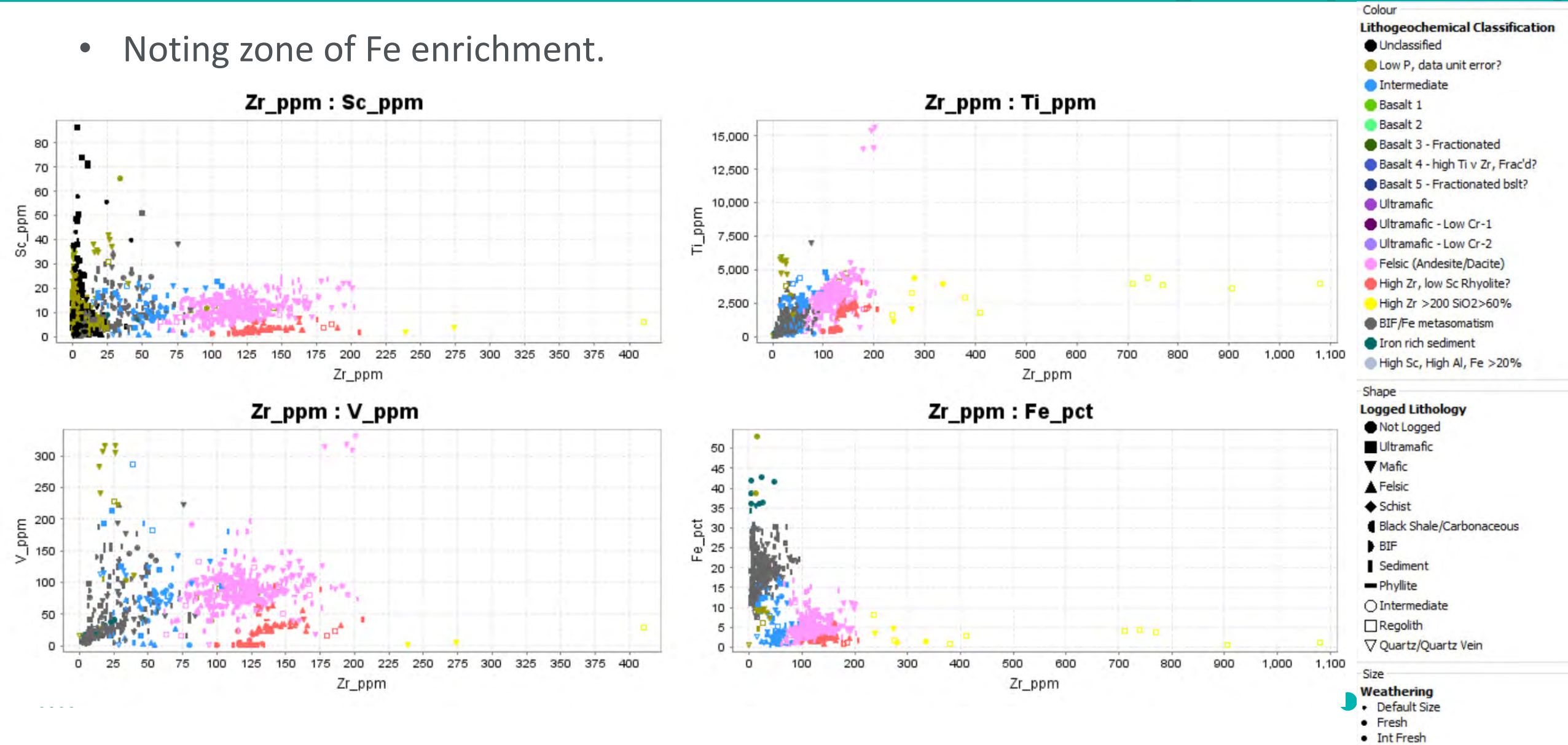


Classifying Mafic Units (Ultramafics Not Visible)

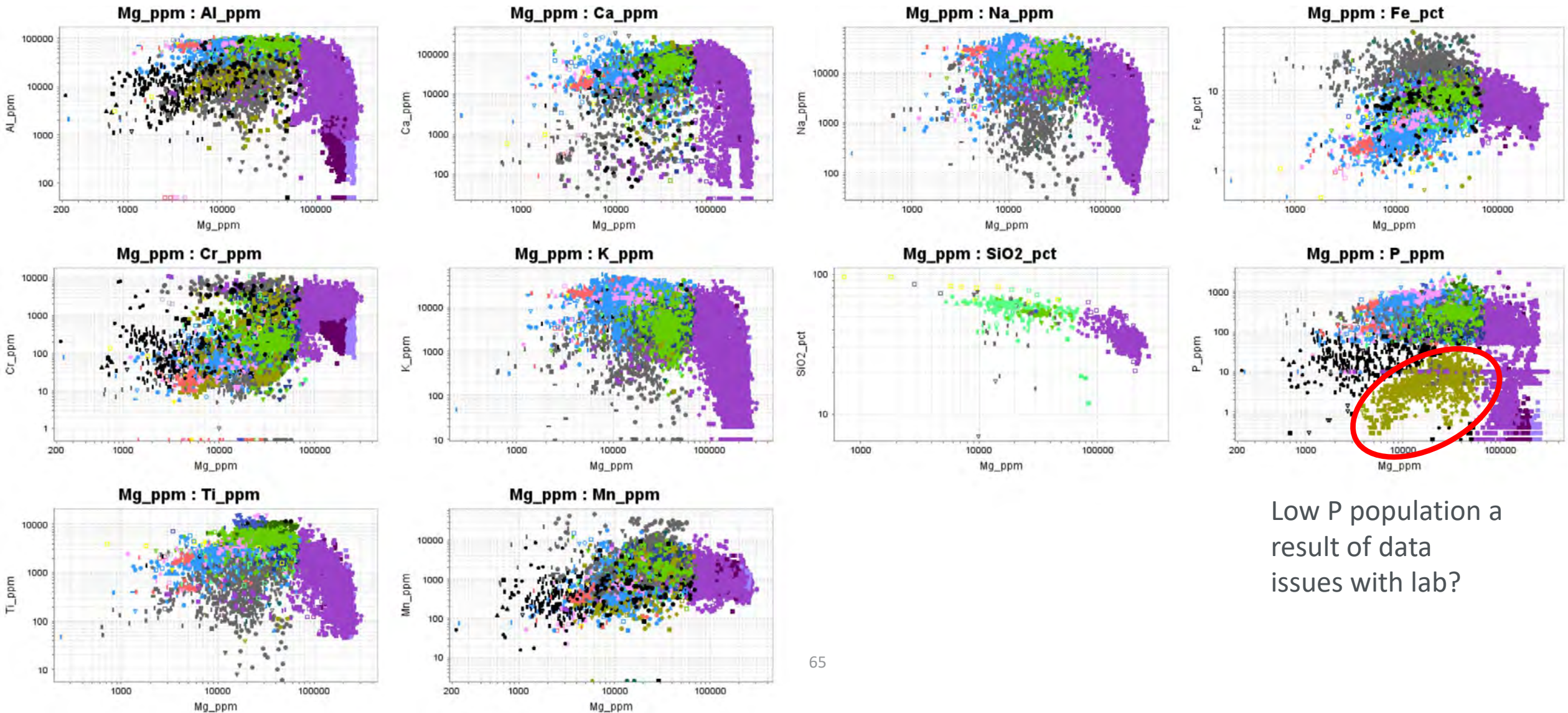


Separating Calc-Alkaline Units

- Noting zone of Fe enrichment.

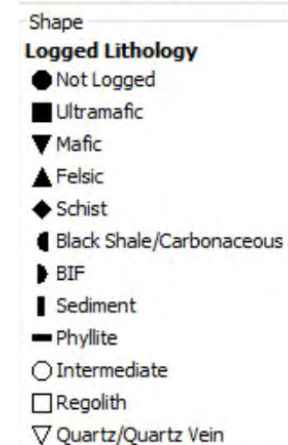
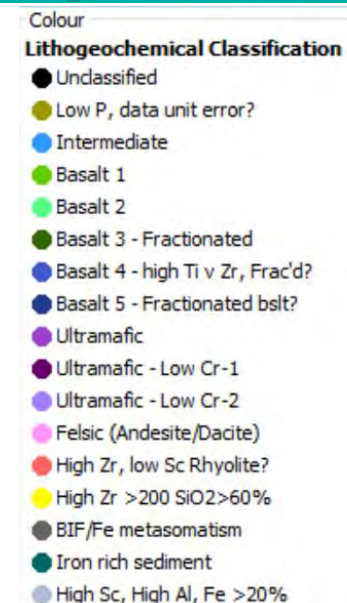
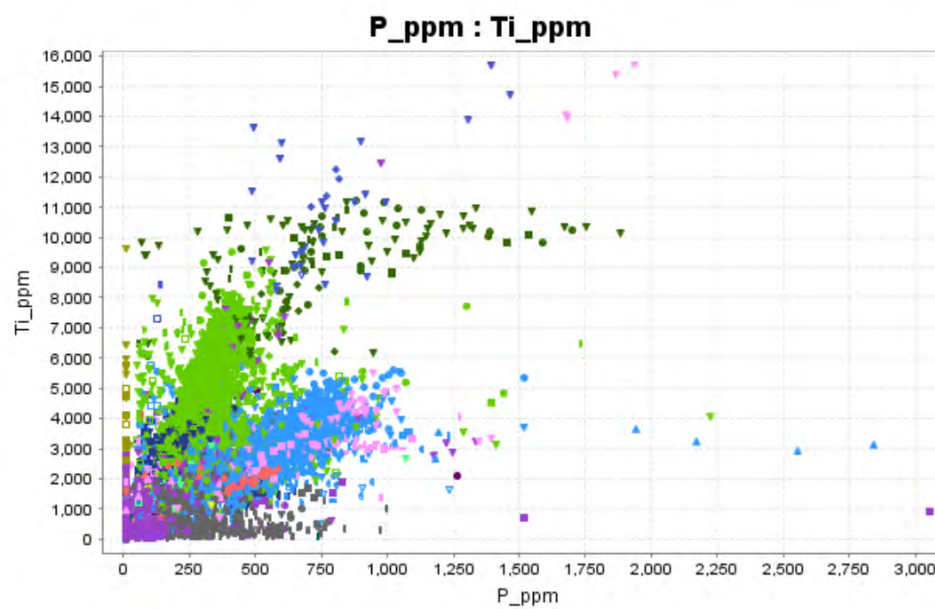
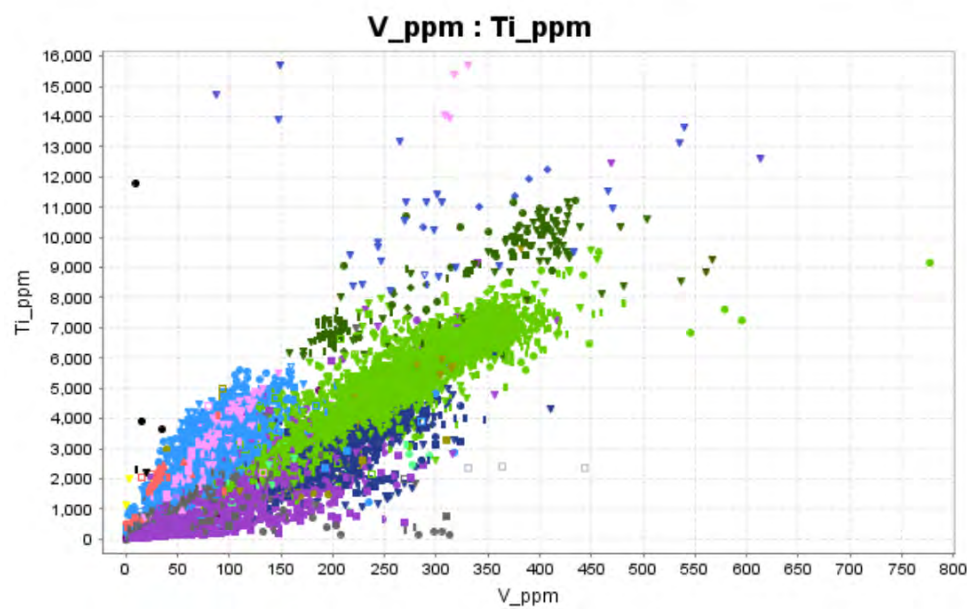
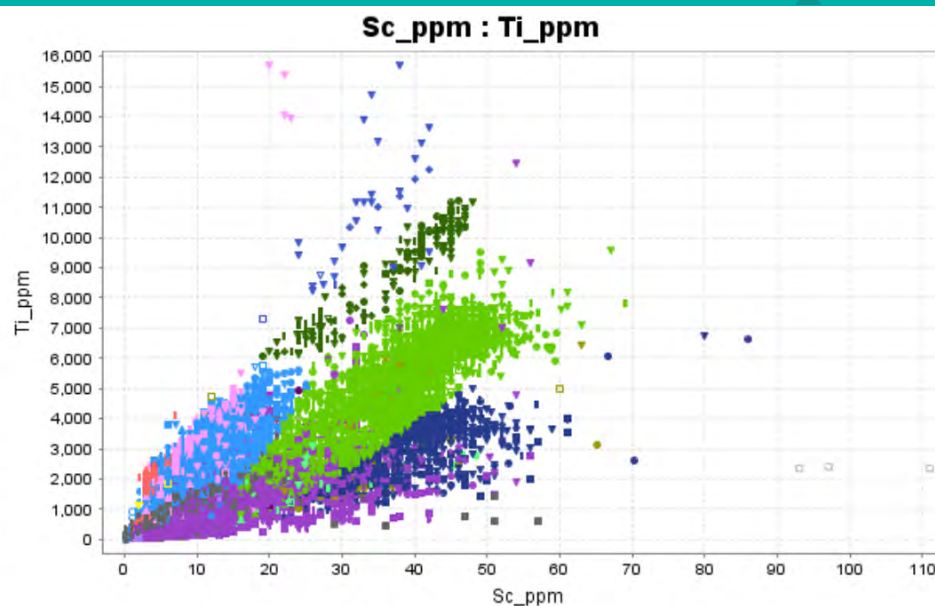
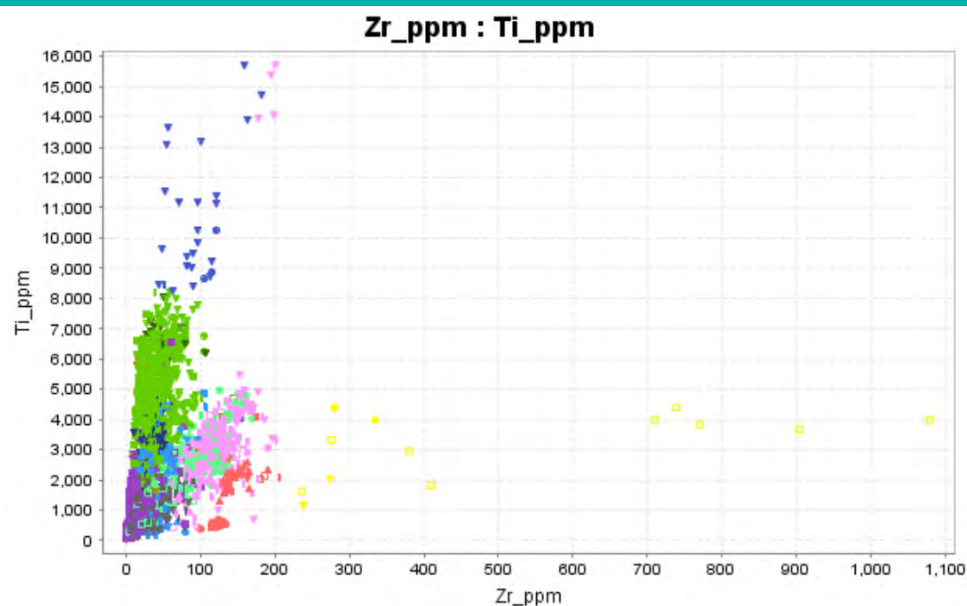


Low P Population – Data Conversion Error?

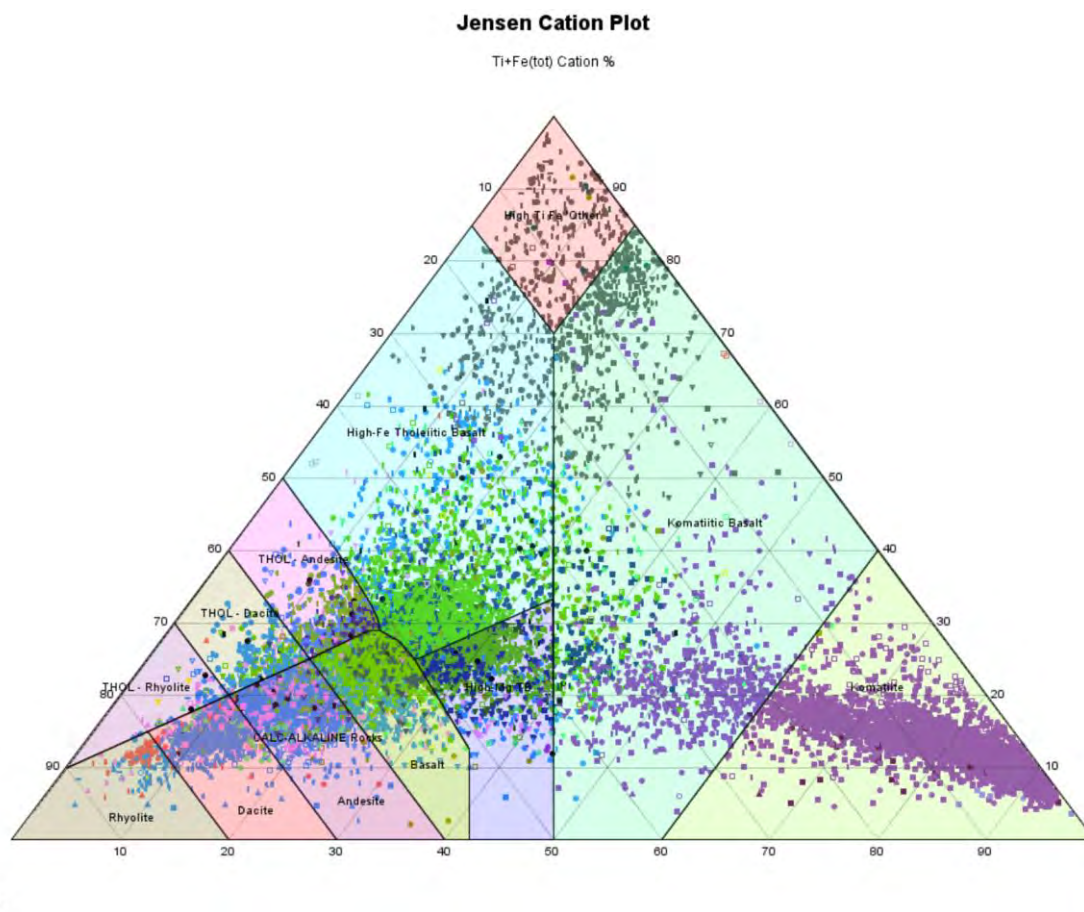
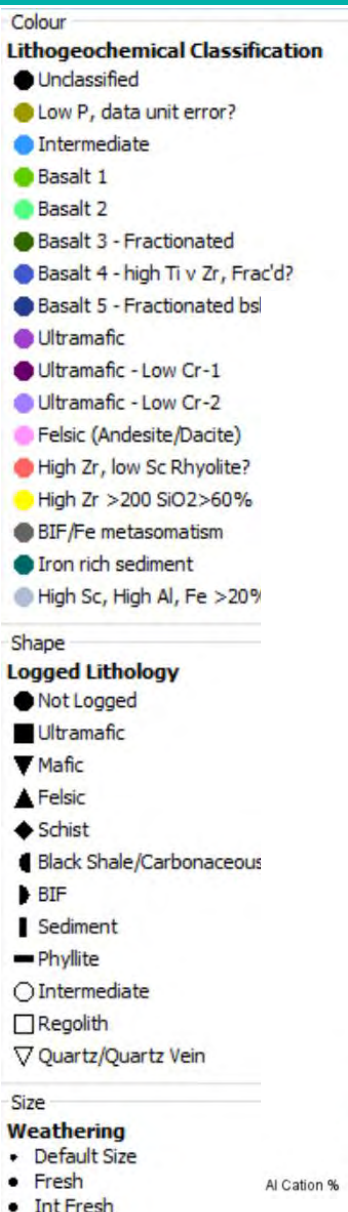


Low P population a
result of data
issues with lab?

Stella – Lithological Classification Summary

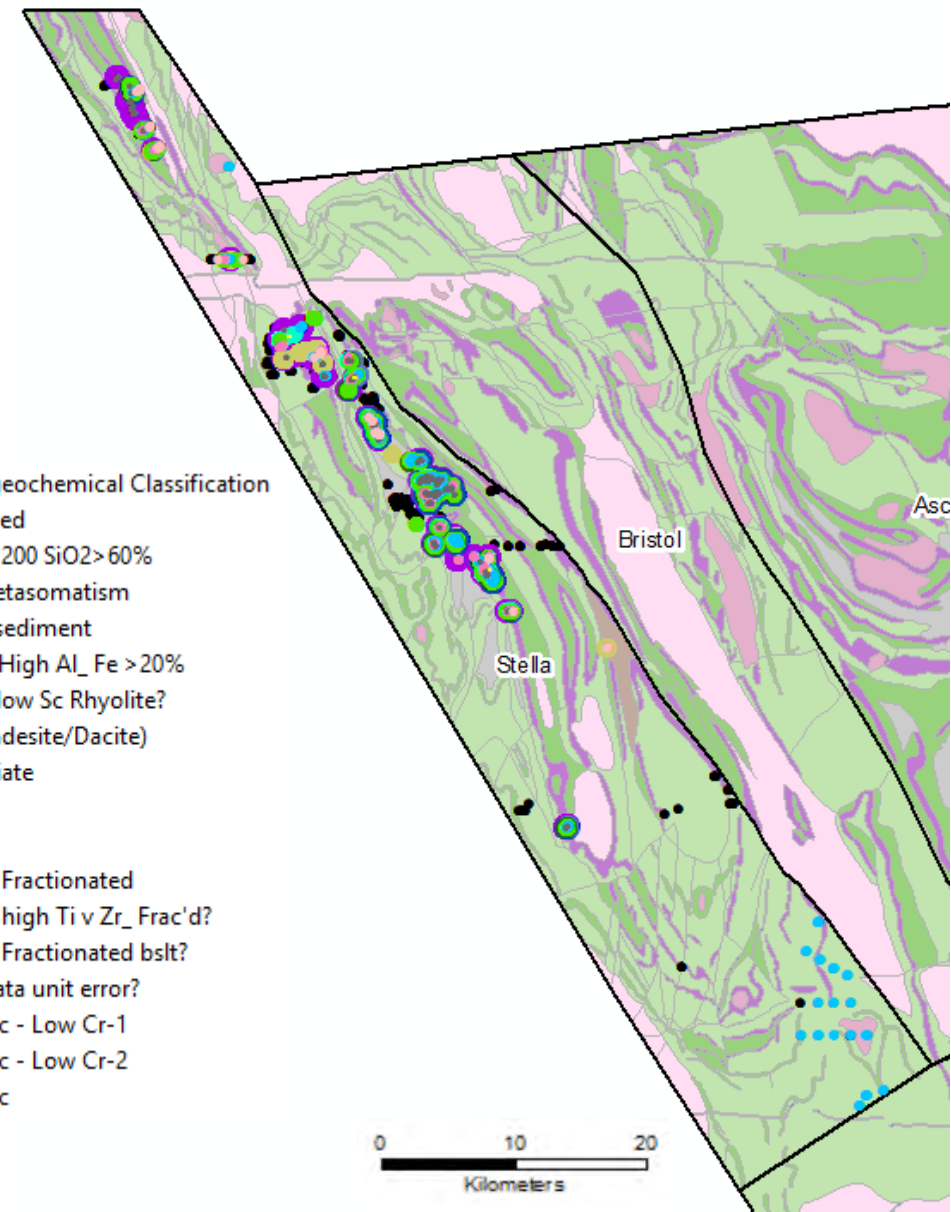


Stella – Jensen Cation Plot and Spatial Distribution of Lithologies



Stella Lithogeochemical Classification

- Unclassified
- High Zr >200 SiO₂>60%
- BIF/Fe metasomatism
- Iron rich sediment
- High Sc_ High Al_ Fe >20%
- High Zr_ low Sc Rhyolite?
- Felsic (Andesite/Dacite)
- Intermediate
- Basalt 1
- Basalt 2
- Basalt 3 - Fractionated
- Basalt 4 - high Ti v Zr_ Frac'd?
- Basalt 5 - Fractionated basalt?
- Low P_ data unit error?
- Ultramafic - Low Cr-1
- Ultramafic - Low Cr-2
- Ultramafic

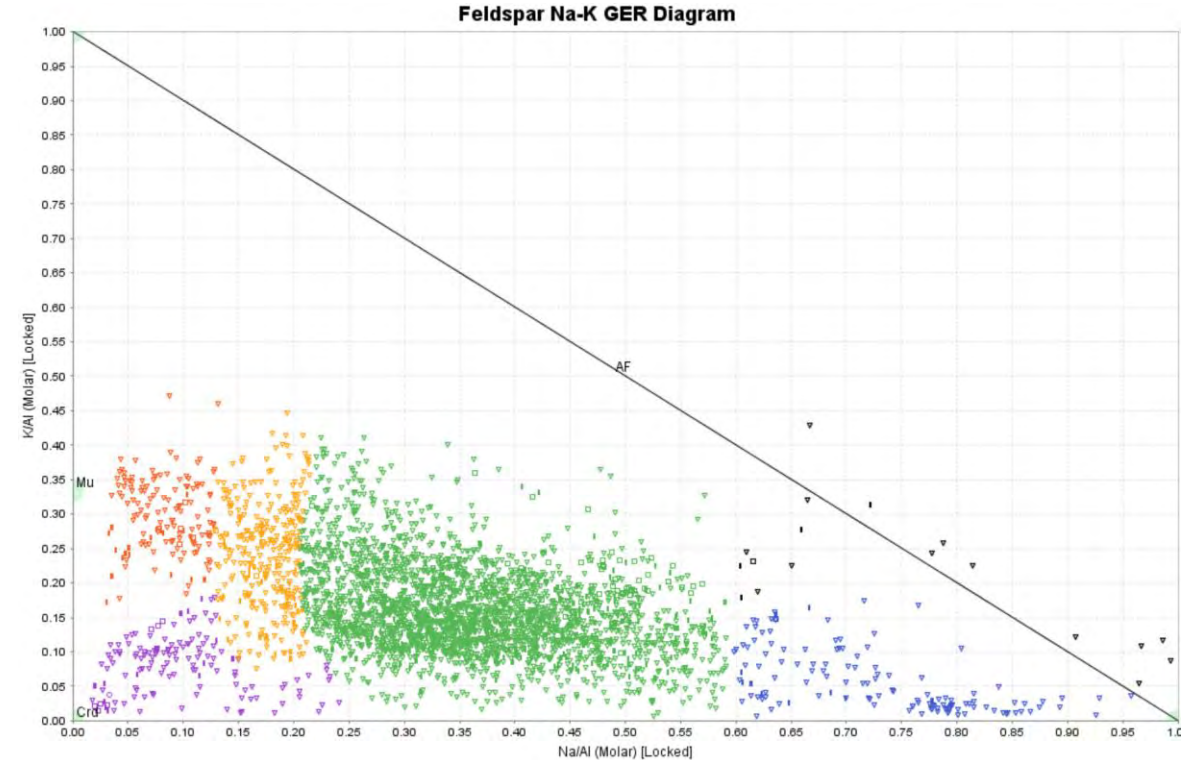
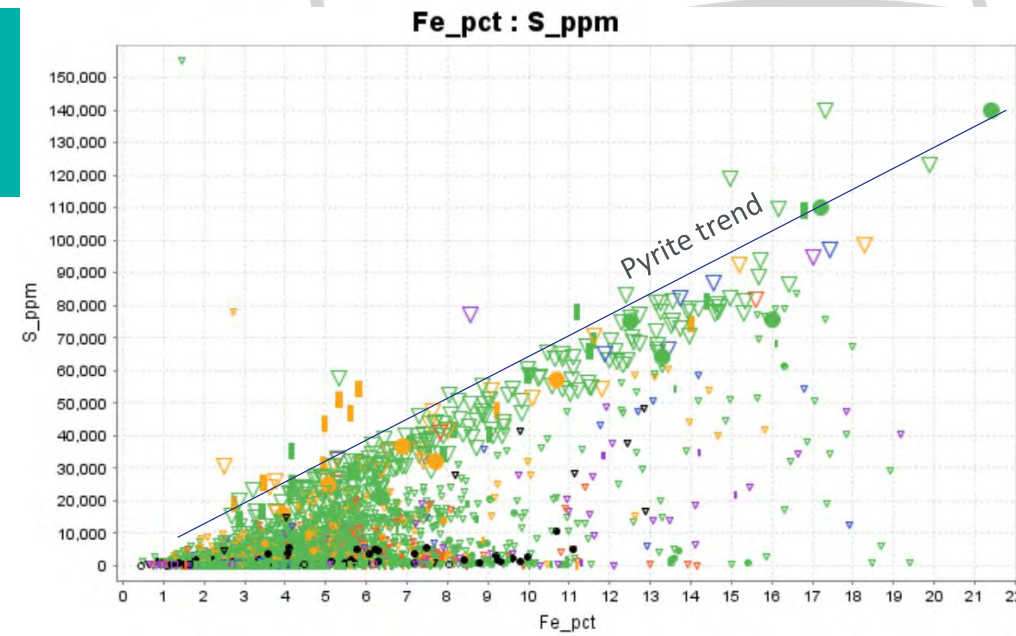
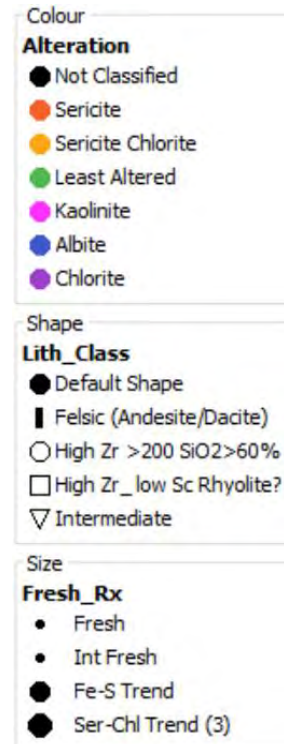
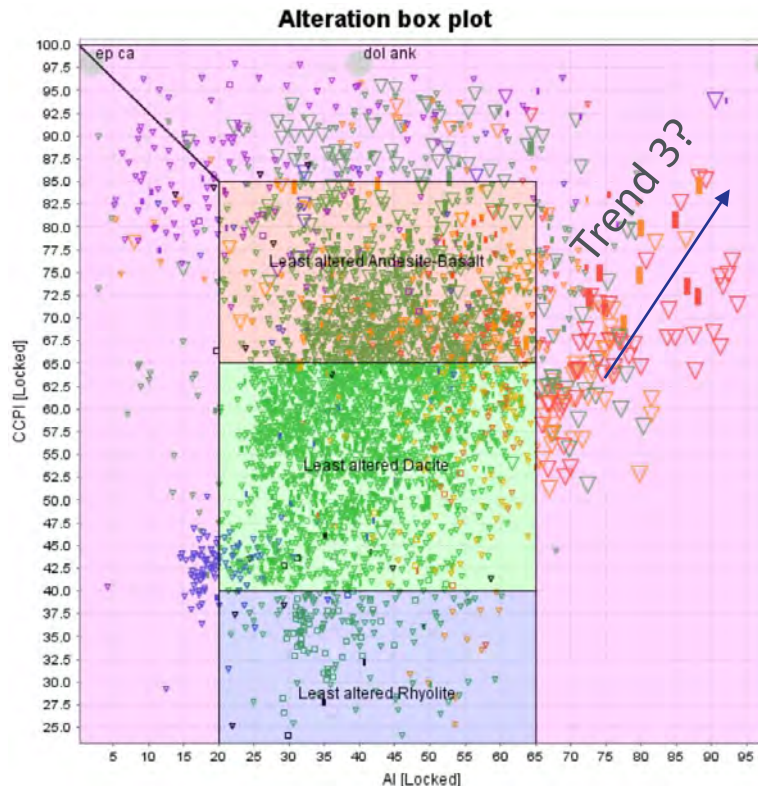


Technical Classification



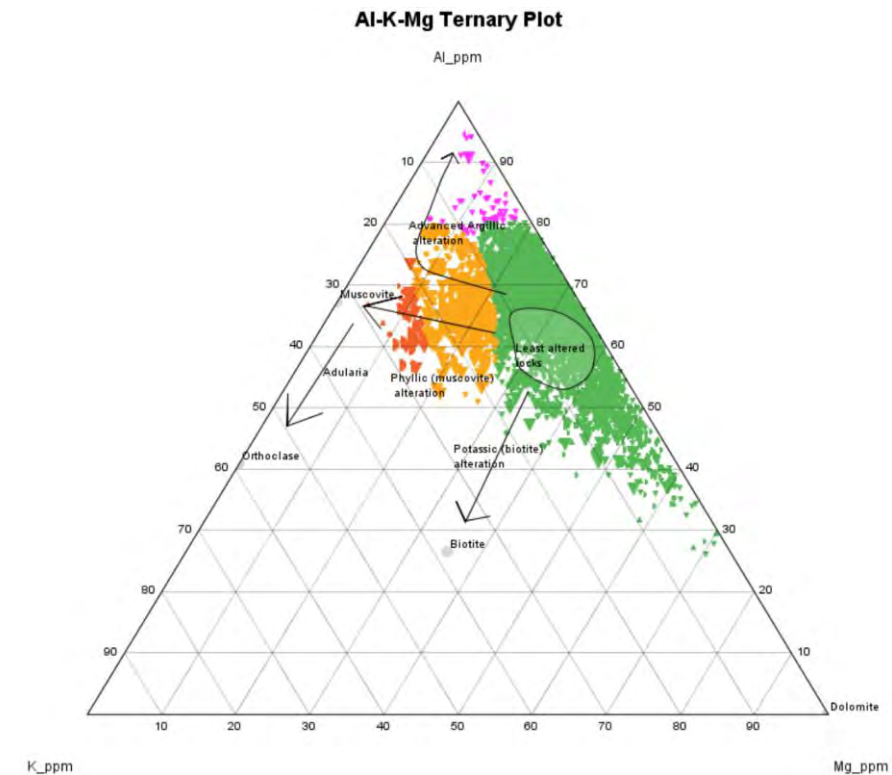
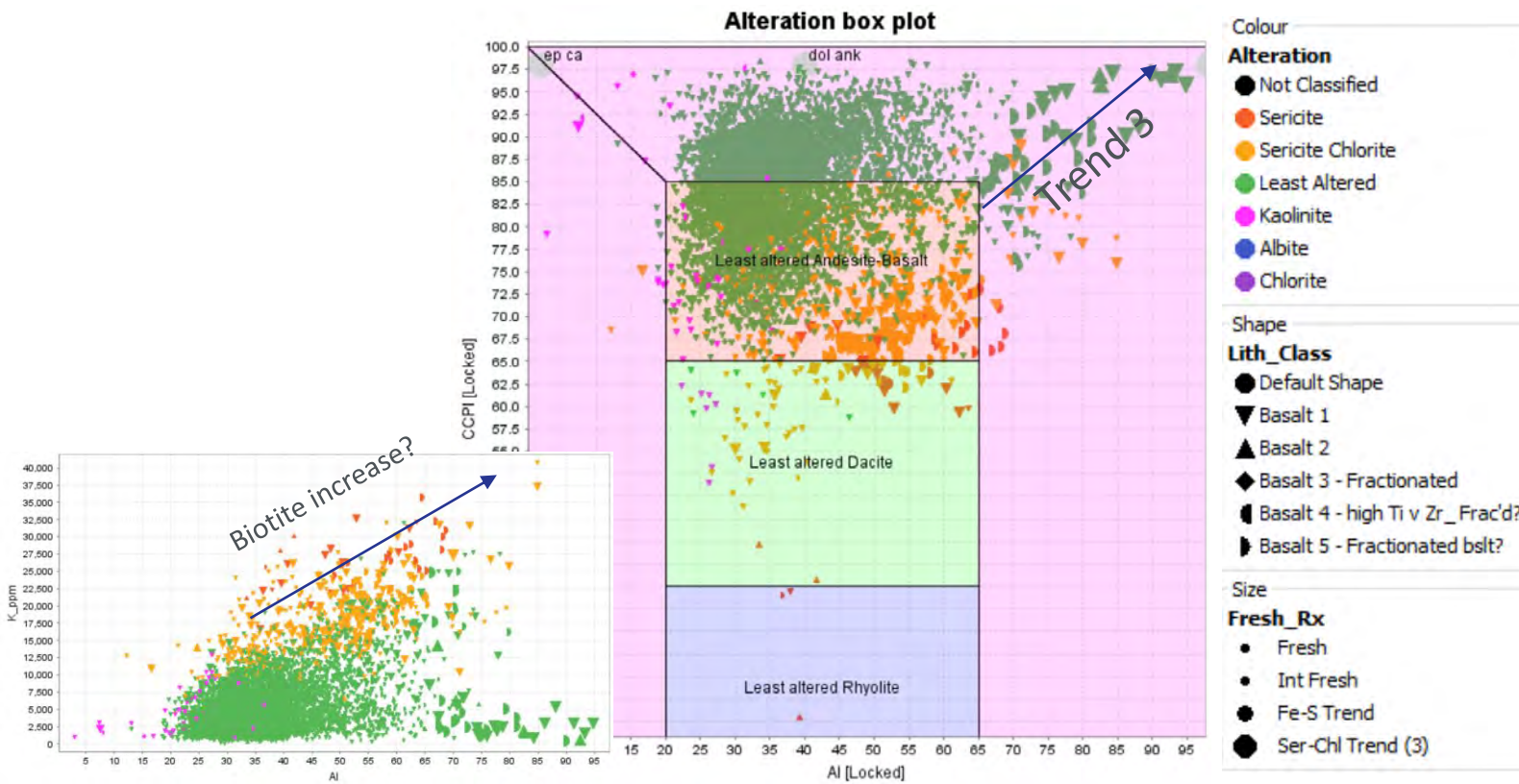
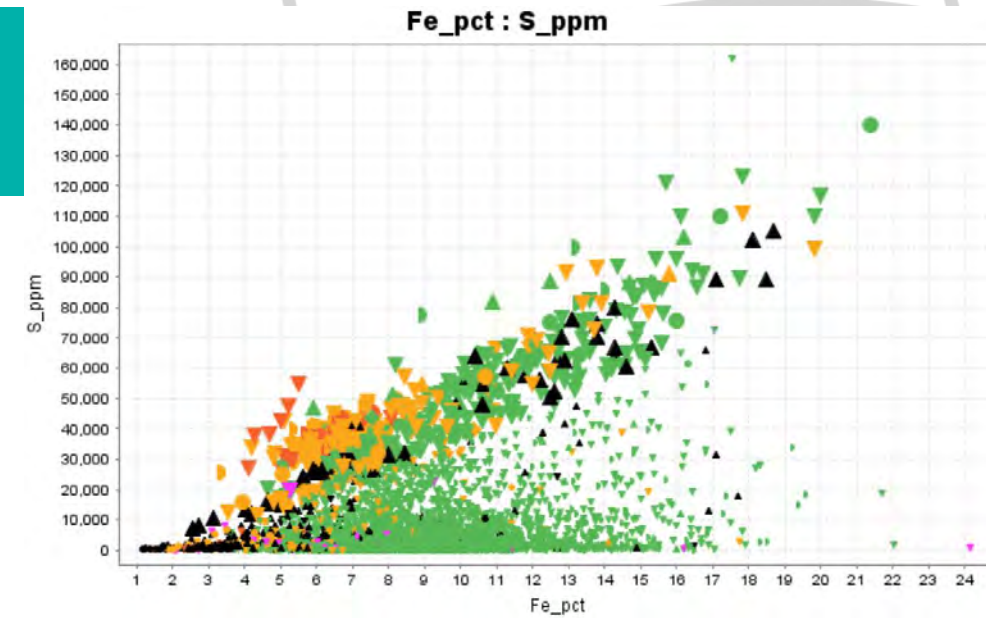
Alteration: Intermediate to Felsic Units

- Alteration in box plot shows a positive trend in the chlorite-sericite and pyrite space.
- The Feldspar Na-K diagram supports the alteration distribution.



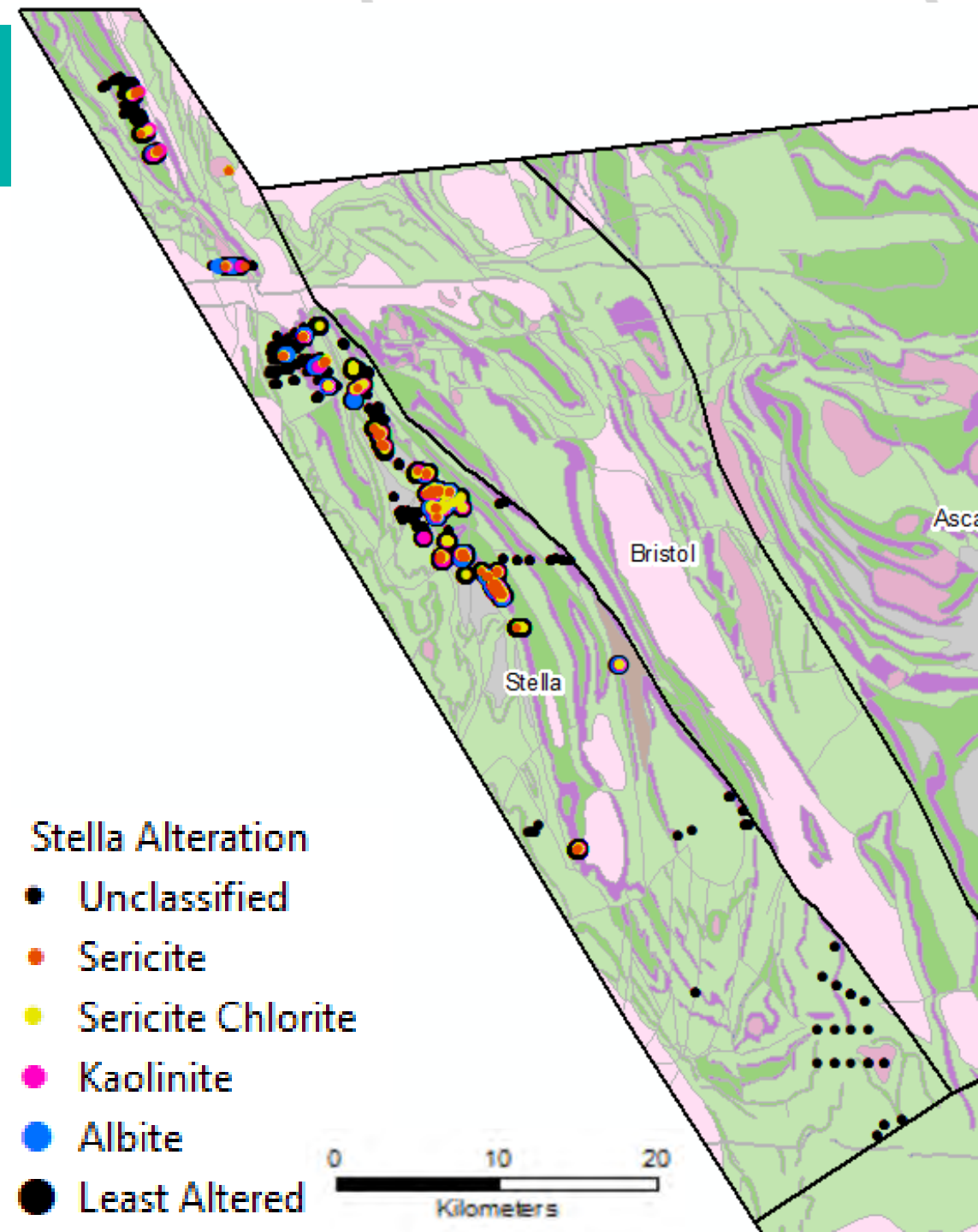
Alteration: Mafic Units

- Mafic lithologies plot slightly separate to the intermediate to calc-alkaline units.
- Note the Fe-S/Sericite and Sericite-Chlorite trends/population and relationship to K – interpreted as biotite alteration.



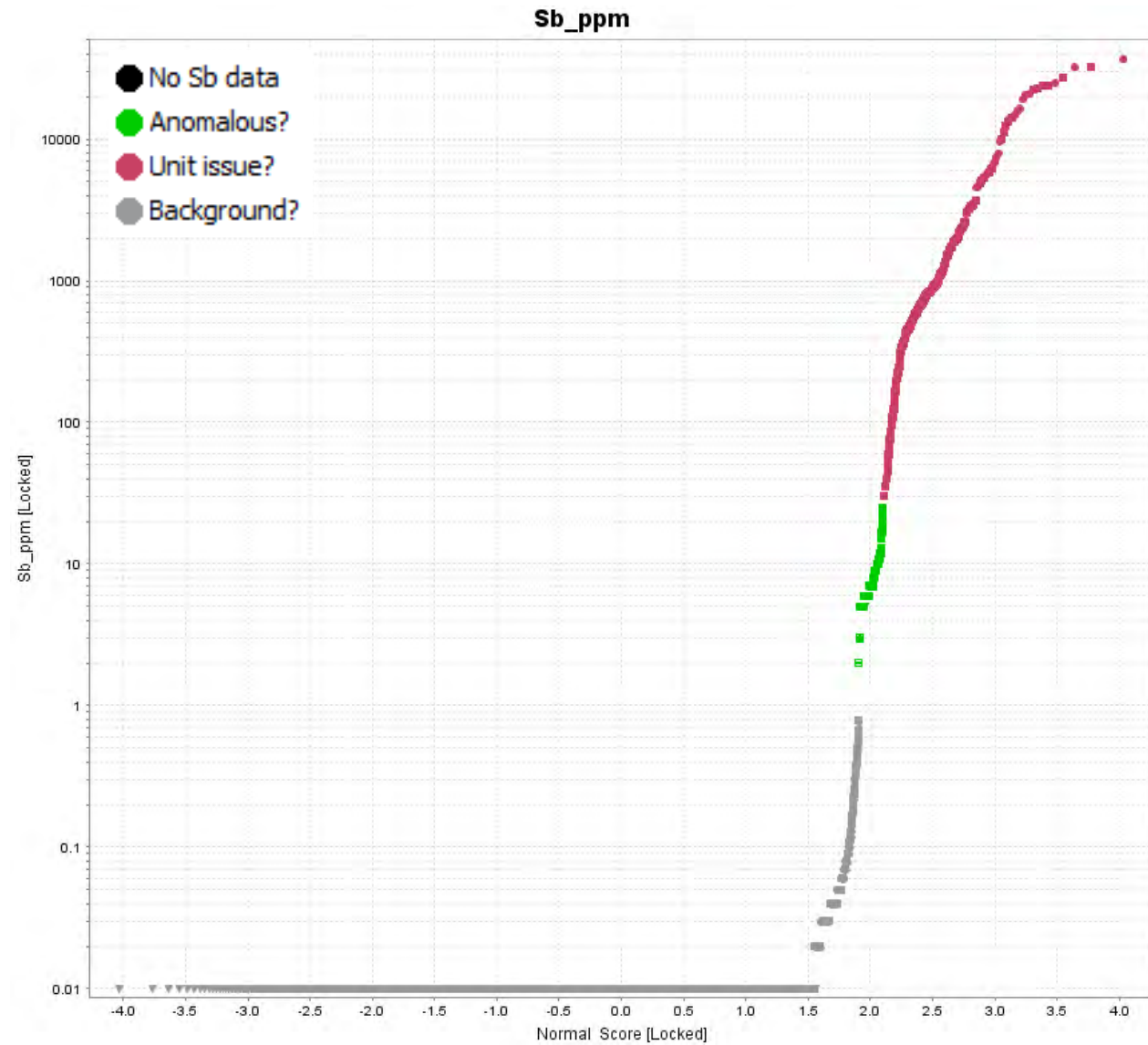
Stella: Alteration Distribution

- Alteration classified based according to each lithology.
- Map shows the spatial distribution of all classified alteration.
- Central trend extends for over 22 km and likely extends along strike to south to area of isolated drilling (Aphrodite).
- Area north of the E-W dolerite also has significant alteration.



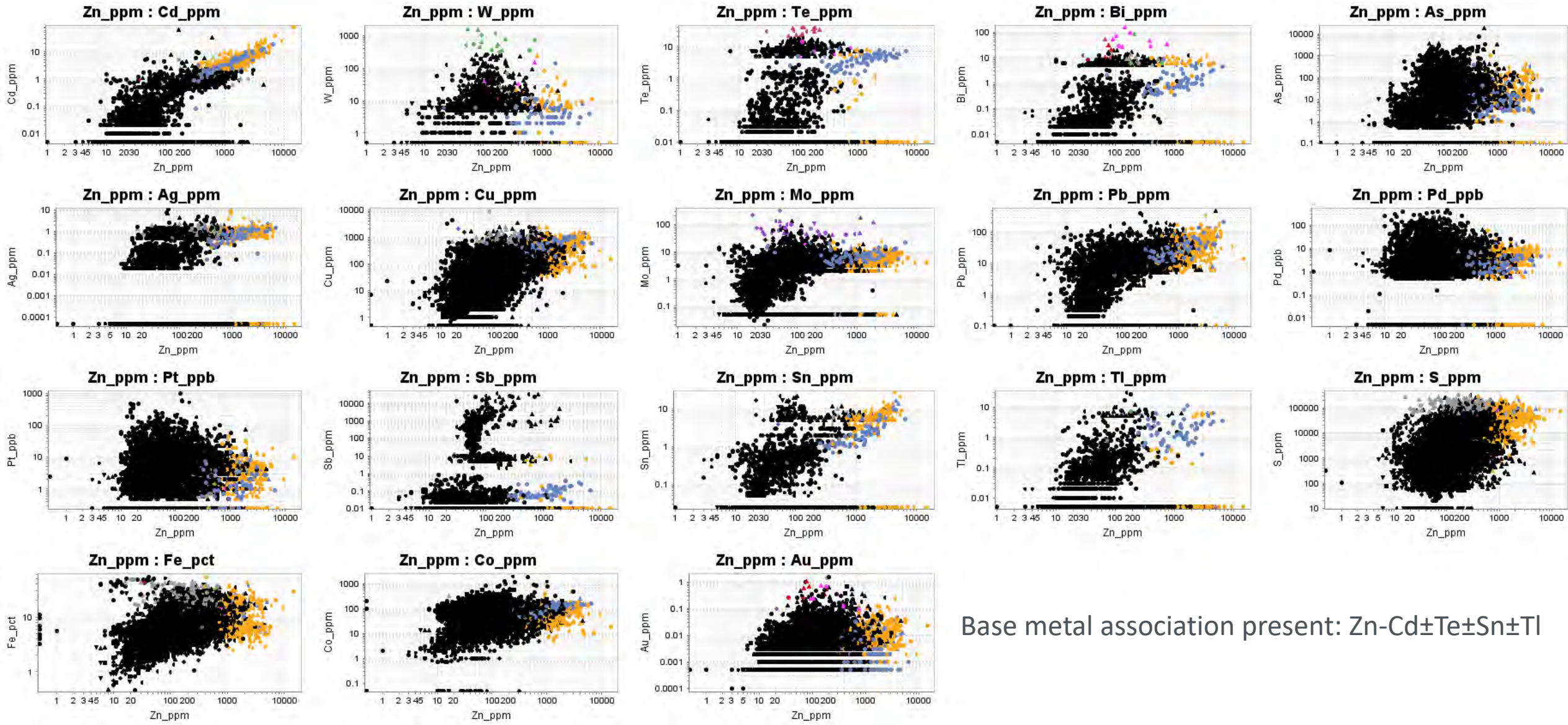
Stella: Element Anomalism - Sb Issue

- Holes: DDD001, DDD002, DDD003 and WB01 have Sb values greater than 1%.
- This is likely a ppb to ppm issue and requires validation from the laboratory certificates.
- Holes were drilled in 2013, 2014.
- Sb data will not be plotted at this time.



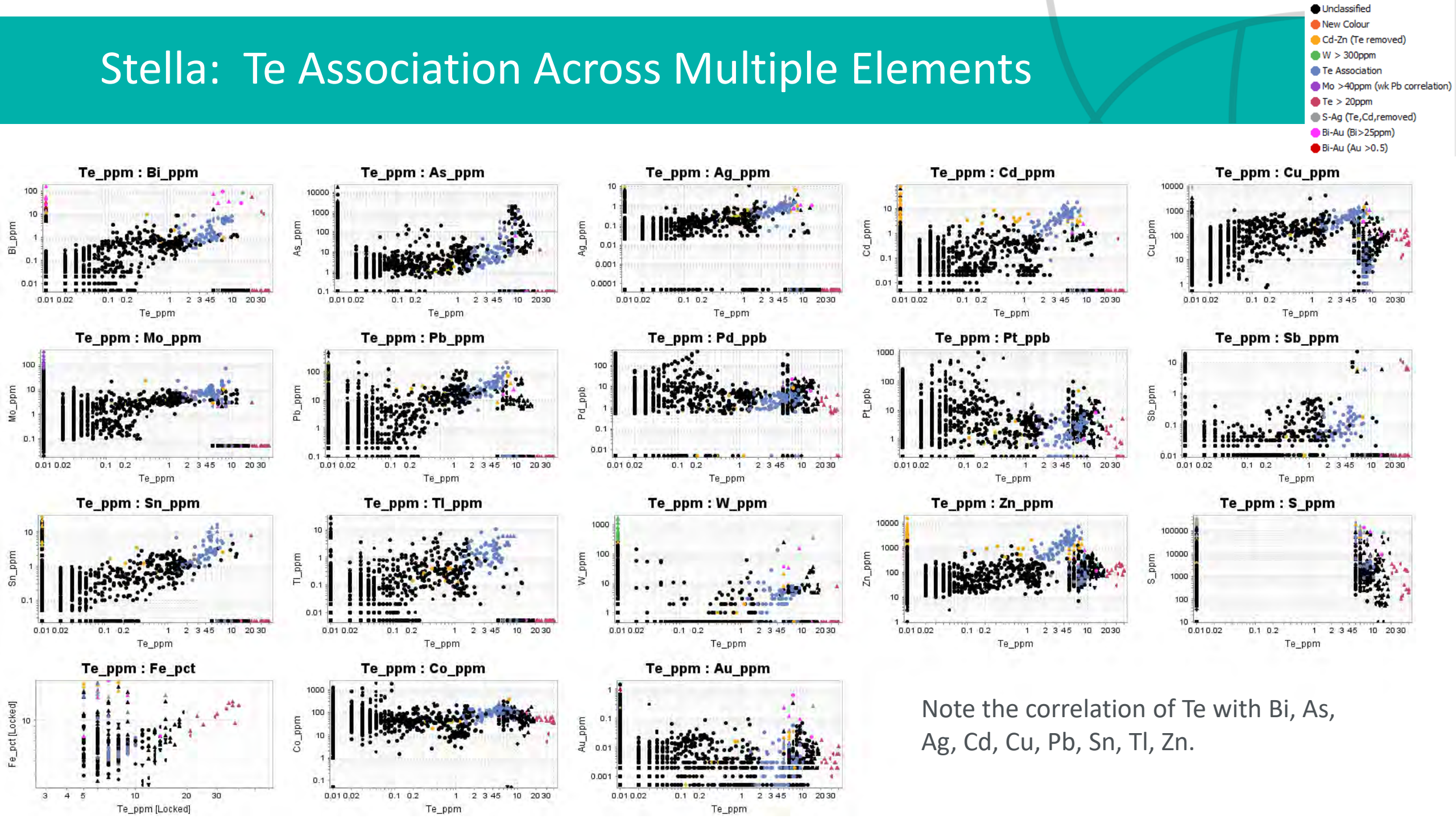
Stella: Element Anomalism – Zn-Cd-Te Association

- Unclassified
- New Colour
- Cd-Zn (Te removed)
- W > 300ppm
- Te Association
- Mo > 40ppm (wk Pb correlation)
- Te > 20ppm
- S-Ag (Te,Cd,removed)
- Bi-Au (Bi>25ppm)
- Bi-Au (Au > 0.5)

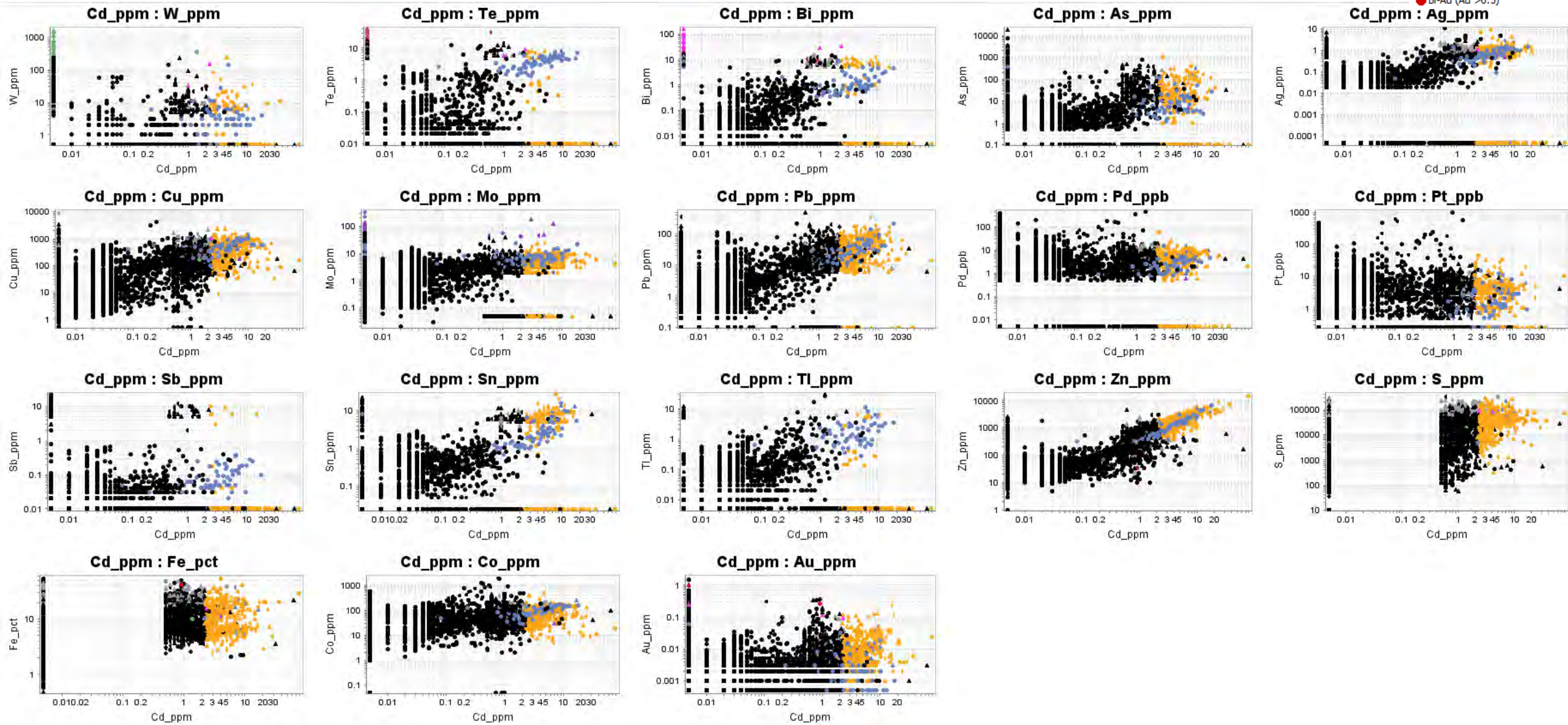


Base metal association present: Zn-Cd±Te±Sn±Tl

Stella: Te Association Across Multiple Elements

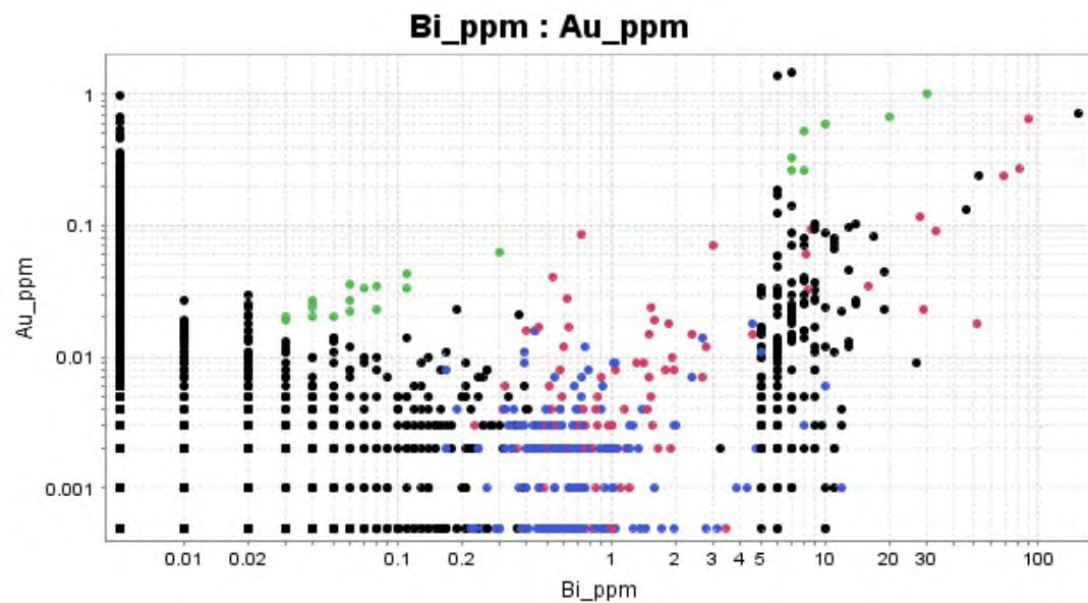
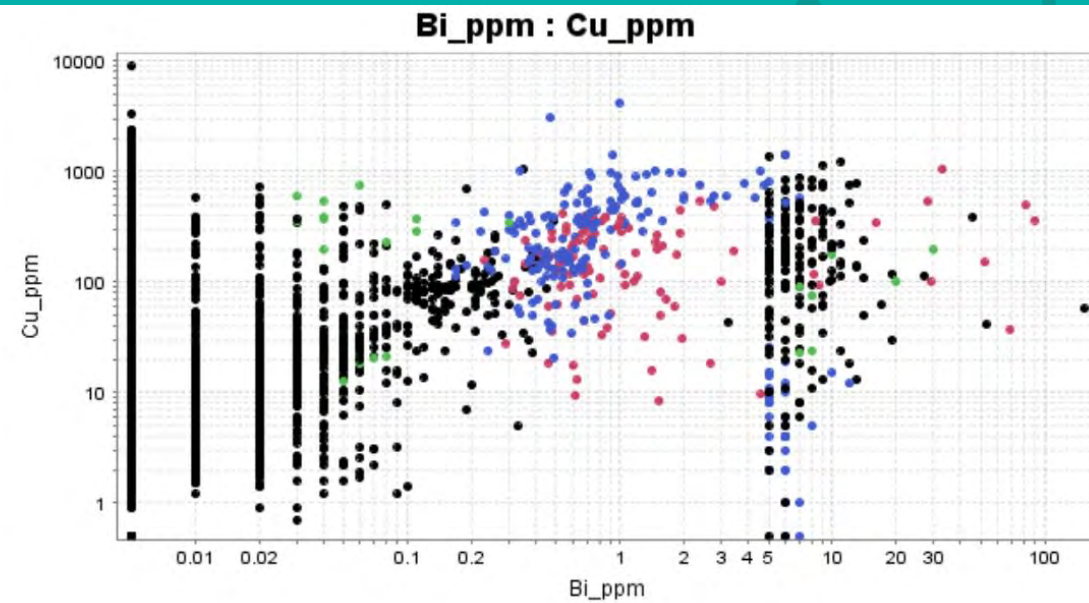
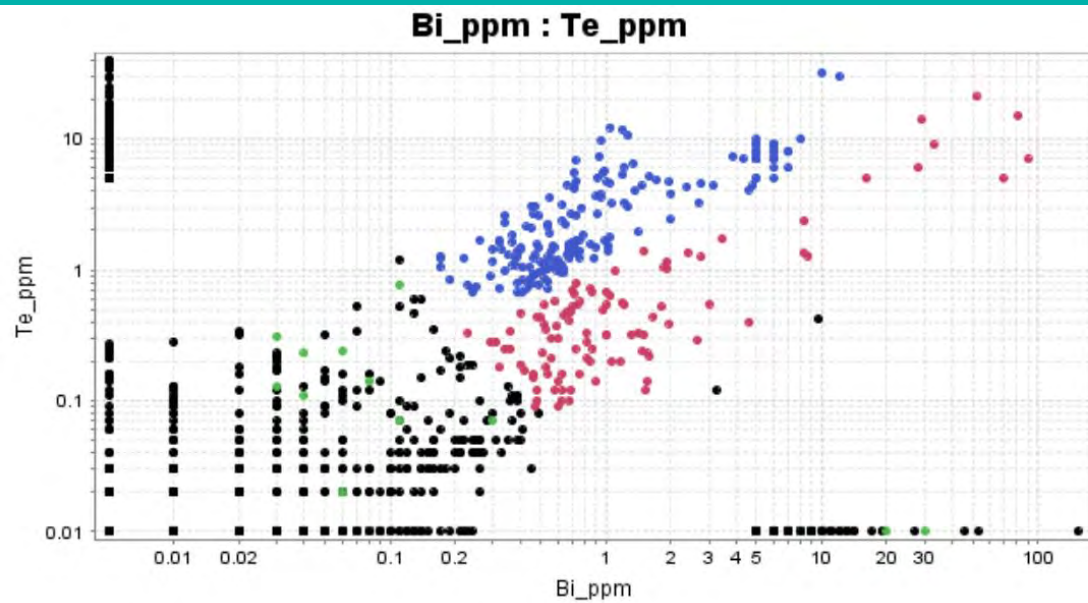


Stella: Cd Association is Similar to Te Association



Bi Association with Te, Cu and Au

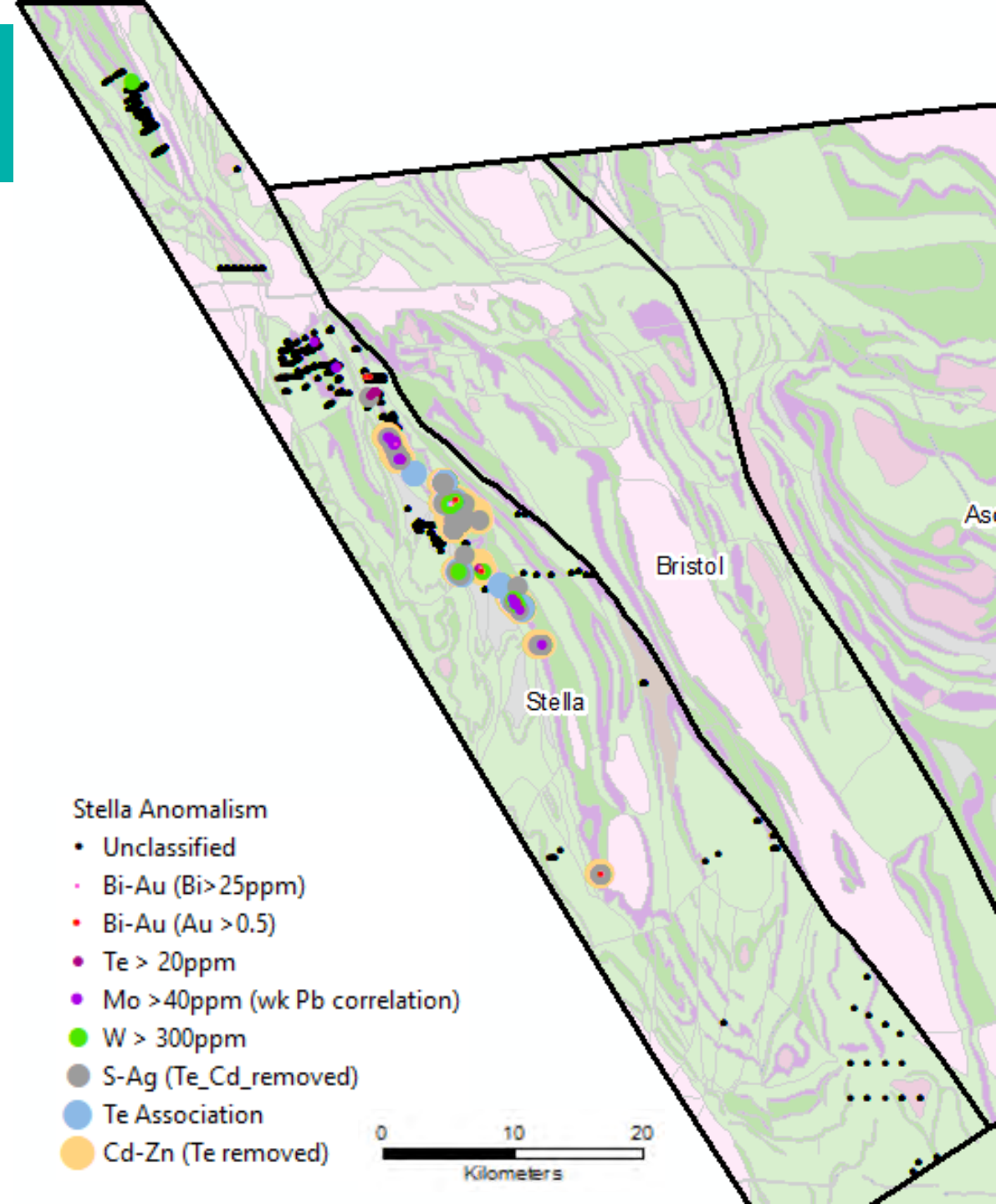
- No Association
- Bi-Au trend
- Bi-Te high trend
- Bi-Te low trend



- Strong Bi-Te-Cu correlation with subtle correlation with Au.
- Division in data is due to different historic datasets.

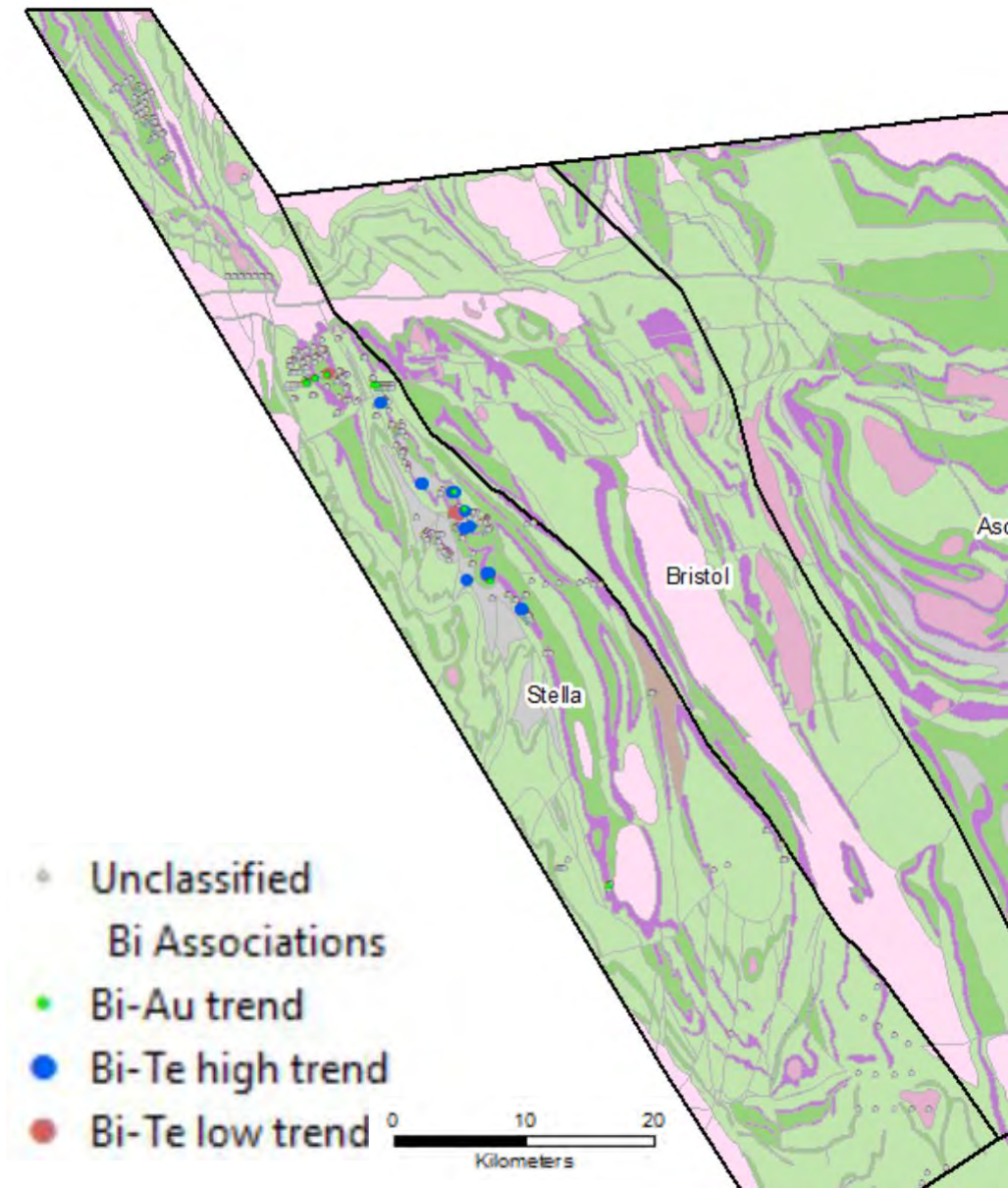
Stella: Anomalism Distribution

- Approximately 15 km Cd-Zn-Te trend with associated Ag, S, Mo, Te and pockets of Bi-Au anomalism.
- This trend extends along the same horizon as the alteration trend.
- Anomalism is predominantly associated with mafic to intermediate lithologies.
- The lack of drilling between this area and Aphrodite also has potential to be anomalous, which could comprise up to 30 km of along strike anomalism that can be associated with a hydrothermal system.



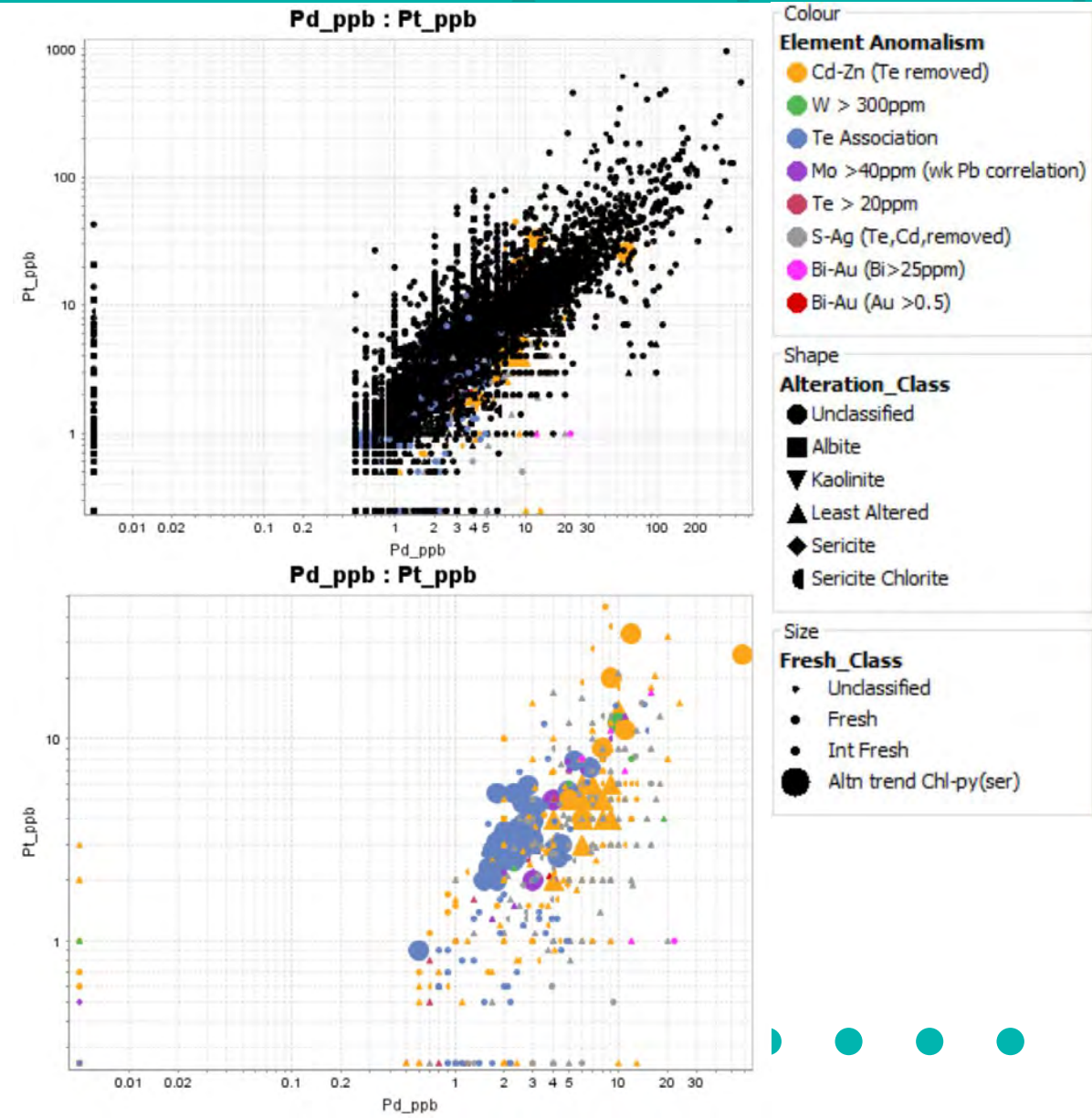
Stella: Bi-Te-Cu Association (Lesser Au)

- Anomalism is present along one structural horizon.
- The Bi-Au trend, through sporadic, extends from Aphrodite in the south up to Cambridge.
- There is a lack of multi-element data in area so results along this trend mainly occur where Bi-Te were analysed.



Stella: Pd-Pt Relationship

- Similar to the Ascalon and Bristol Domains, the positive correlation of Pd/Pt is associated with the elemental anomalism.
- The data clusters at lower values than in Ascalon and Bristol but it is still almost a 1:1 relationship.



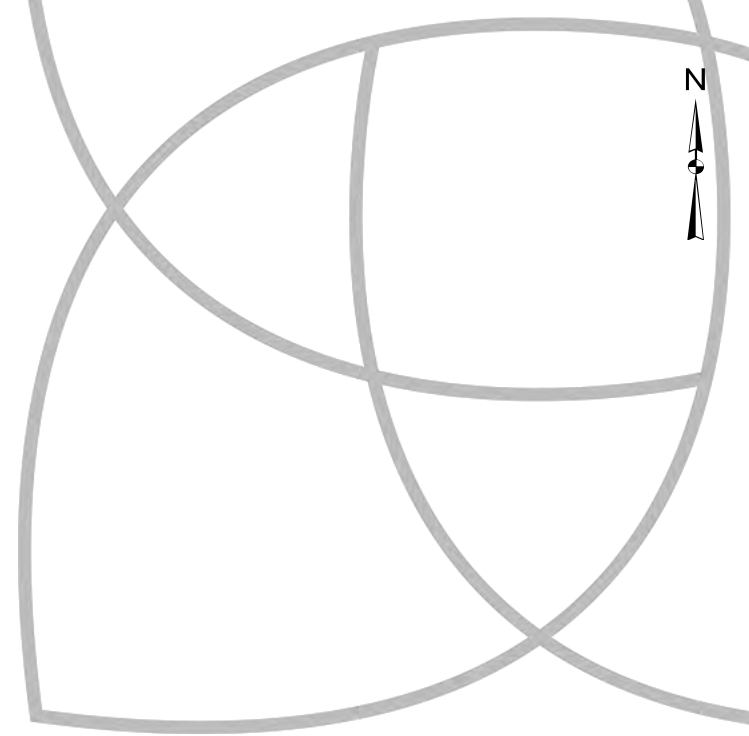
Stella Summary

- Largest dataset.
- One magma series from ultramafic through to felsic compositions.
- Alteration of mafic and intermediate-calc-alkaline rocks indicate a 20 km+ long zone which is associated with a strong Cd-Zn-Te trend.
 - Additional element anomalism includes: Sn, Tl \pm Mo, Ag, Pb.
 - Anomalous zones of Bi-Te-Cu associated with Au present in this zone.
 - Strong Pd-Pt correlation (1:1 to 1:2) with up to 965 ppb Pt and 440 ppb Pd.
- Alteration and anomalism shows a stratigraphic correlation with similar anomalism to south .



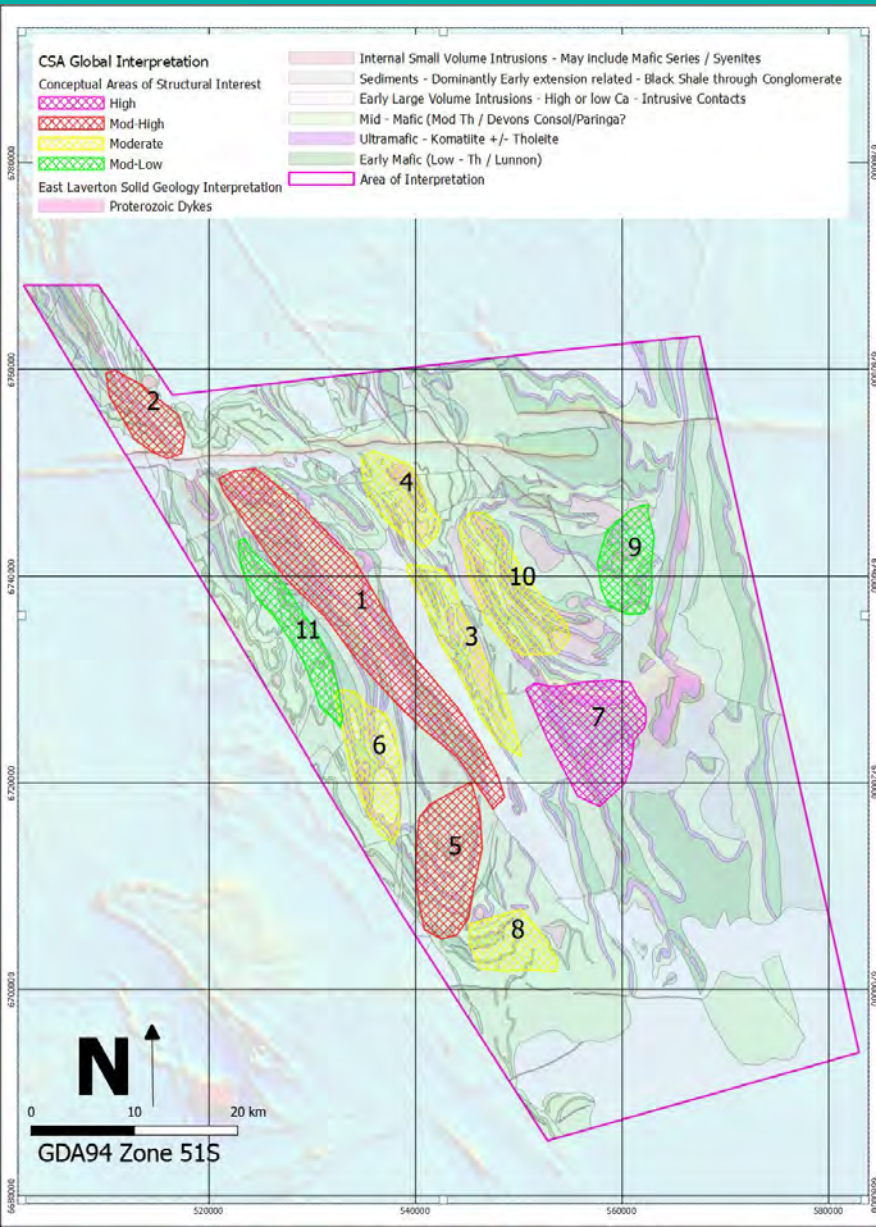
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Targets



0 10 20
Kilometers

Targeting: Structural / Conceptual



Prior to availability of surface and drilling geochemical data, a review of the litho-structural interpretation was completed to assess areas that are considered to demonstrate structural/architectural features of potential interest in the context of Archaean greenstone exploration models.

At left are the areas considered priorities with a summary to the right of the reasoning behind the areas.

Area ID	Priority	Confidence	Comment
1	MH	M	Trend of the most significant inversion with later major strike slip movement. Significant structural complexity with thrusts, transcurrent and brittle structures generally HW deep seated structures. Potential late basin. More likely synclinal however.
2	MH	M	Confluence of multiple structures at marked change in compression with small volume granite interpreted, all associated with major deep through going structure.
3	M	M	HW to major, deep seated inversion structure with moderate structural complexity, with anticlinal stratigraphy.
4	M	M	Area of interpreted late domal up-lift and extension HW to major inversion structure. Potential for intrusions to be mafic series
5	MH	M	Thrusts with multiple transcurrent structures tapping into major inversion structure. Small volume intrusions evident. Folded stratigraphy provides potential anticlinal traps.
6	M	L	Possible Tarmoola/Gwalia setting for steeply plunging mineralisation at edge of belt and associated with late intrusions (Mafic series?). Likely more local complexity than interp indicates.
7	H	M	Similar structural and stratigraphic position to Kanowna Belle/Red Hill in Kalgoorlie. Early extension structures inverted with strike changes and small volume intrusion (Mafic Series?) and late basin like sediments.
8	M	L	Basin marginal thrusts with D1 folding and some transcurrent faulting with small volume intrusion interpreted. Further from inversion structure and has less complexity.
9	ML	L	Similar architecture setting to Lancefield in Laverton. Mafic/ultramafic stratigraphy intruded by small volumen intrusion (potentially best chance at Syenite series), with NW brittle faults connecting to major inversion structures.
10	M	M	Structural complexity related to interaction of early extension, D1 and then later compression, larger volume internal granite (similar to Liberty in Kalgoorlie). Potentially more complexity than interpretation indicates.
11	ML	L	Basin in FW to major normal fault that may have inversion on it.

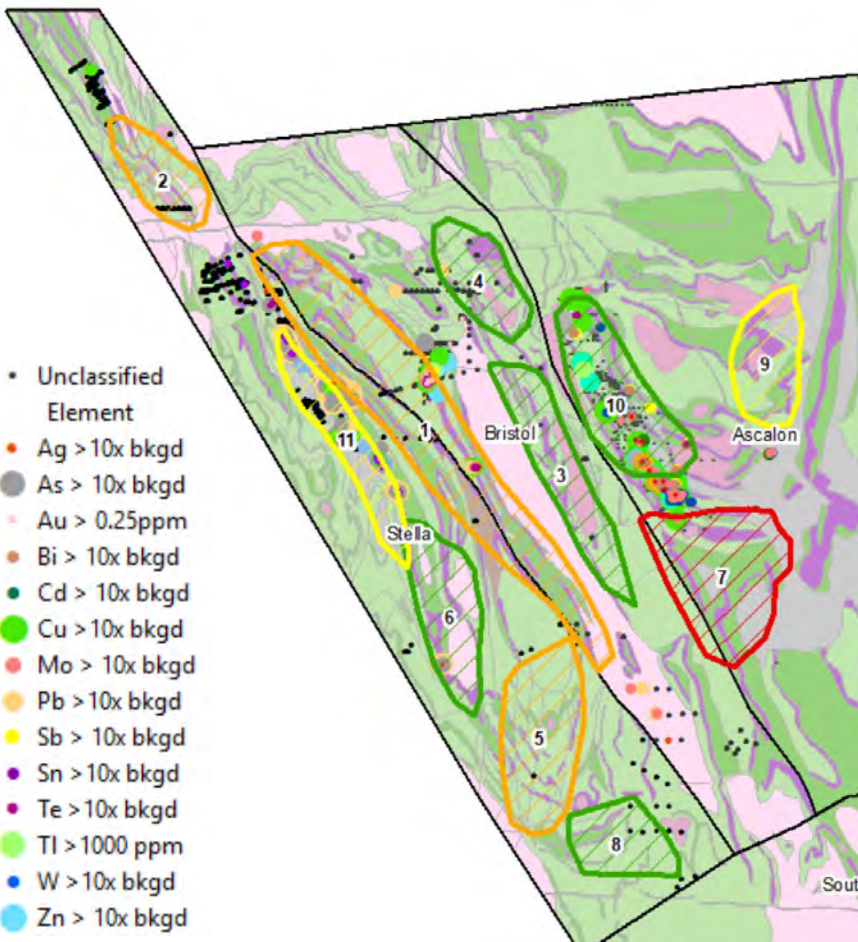
Structural/Conceptual Targets Over Alteration and Anomalism (Drill Data)

Structural Targets

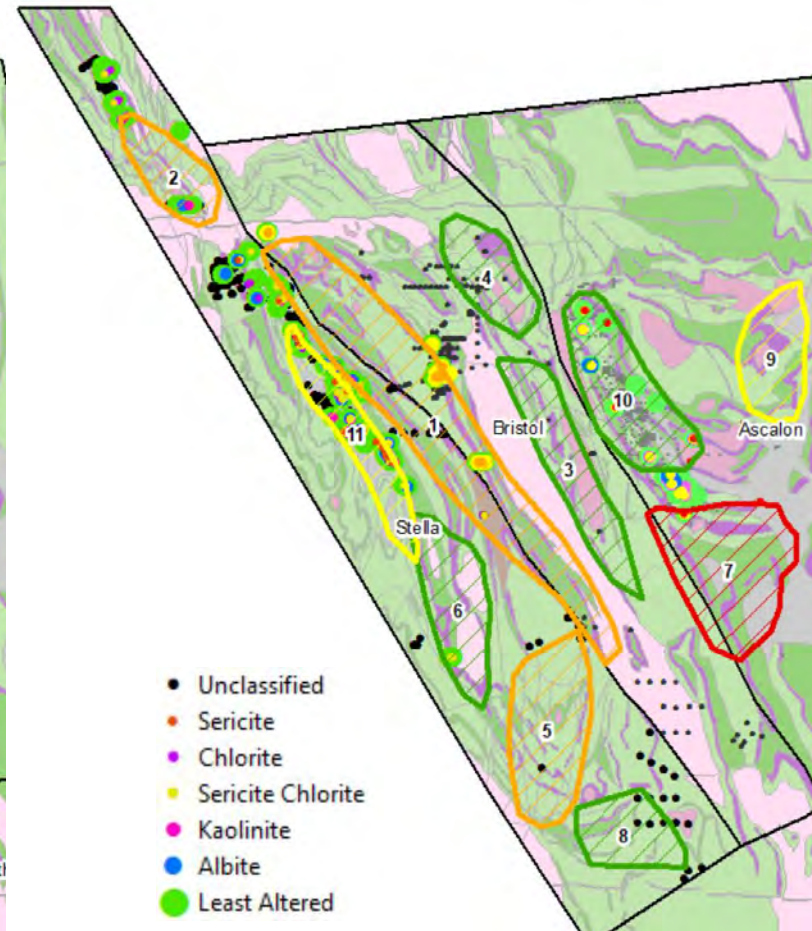
Priority

- High
- Medium
- Medium-High
- Medium-Low

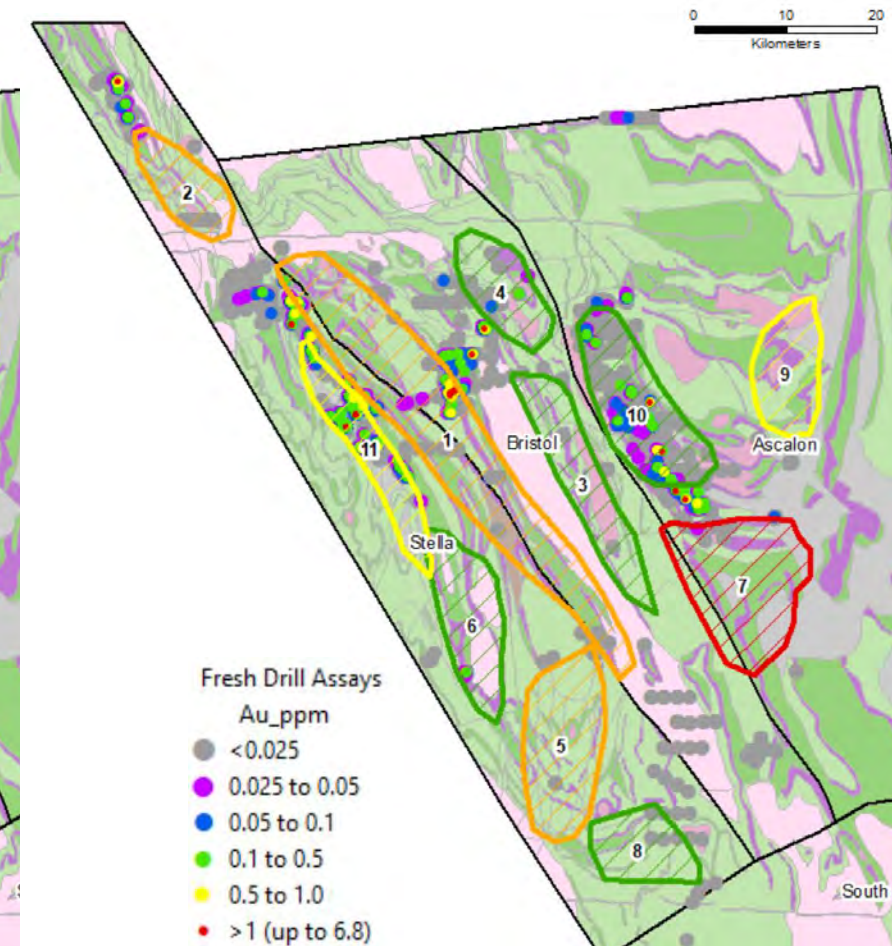
Pathfinder Anomalism



Alteration



Gold Anomalism



Targeting: Gold



A combination of surface geochemistry and maximum gold in hole was used to determine the target areas. Targets were based on surface anomalism and drilling results. If drilling had been completed, the effectiveness of this was considered.

Broadly, targets coincide within the areas of structural interest.

Target ID	Anomalism Level	Priority	Comment
1	MH	MH	Coherent low to moderate level anomaly over close to 3km of strike associated with thrust/inversion cut by sinistral transform. M/UM contact may be target. Travers of drill holes are unlikely to have test target.
2	ML	ML	Intersection of inversion and generally E-W series normal fault, with FW of interpreted granite. Small anomaly but data poor in interesting structural position.
3	H	H	Approx 4km long trend of moderate to strong gold anomalism associated with the intersection of E-W normal fault and structurally modified anticline. Point drilling appears to be poorly located so as to not test the anomalism/structure.
4	L	L	Intersection of domal up-lift with inversion structures. Possible small internal granite intruding ultramafic unit with low level anomalism on margins and in E-W normal fault. Drilling may have tested but >1g/t intersected
5	L	L	Single point low level anomaly on major inversion where mag suggest potential small volume intrusion. No drilling
6	L	L	Single point anomaly at intersection between thrust and E-W fault, adjacent to dome. No drilling
7	L	L	Trend of low level anomalism along axial trace of up-lifted dome. No Drilling
8	L	L	Small cluster of slightly anomalous samples at intersection of mid-comp related brittle cross cutting structure and thruses adjacent to anticline. No drilling
9	ML	ML	4km area of low to mod level anomalism at the apex of early dome related architecture, likely change in stress field. No drilling
10	MH	M	E-W trend of generally low level anomalism but significant peak hit associated with brittle structure. While are interpreted as intrusive, may be thrust up, metamorphosed mafic - potentially retrograde target. No drilling.
11	L	L	Coherent area of very low level anomalism where part of the basin has been thrust over the marginal contact. Interpreted small volume intrusions, with transcurrent compensation faults. Possible Tarmoola like target. Drilling results disappointing
12	L	L	Major early bend in eastern dome, with generally E-W dome between early normal faults. No drilling
13	L	ML	Corner of major dome structures and complex interaction of later normal structures. No drilling
14	L	ML	Coherent area of low level anomalism at intersection of major inversion and E-W normal fault in area of anticline. No drilling
15	L	L	Relative coherent but very low level anomalism at intersection of major early normal faults in a generally 'Kanowna Belle' type structural position relatively to eastern dome. No drilling
16	M	M	Area of very coherent but low level anomalism that incorporates targets 4,5 and 6 in area of intersection of major inversion faults with major early normal faulting corridor at area of flexure. Limited point drilling. Needs regolith interrogation.
17	L	L	Relatively coherent area of low to very low anomalism at intersection of dome related flexure and major E-W normal corridor. No drilling
18	H	H	Early anticlinal fold with transcurrent compensation faulting with a series of drill holes that have returned >2.5g/t along anticline flanks and associated early normal (poss inverted) faults. Best anomalism near compensation faults. Needs coherent test.
19	M	M	Small pattern of almost random drilling that returned > .75g.t Au adjacent to sinistral compensation fault proximal to interpreted small volume intrusion.

Gold Targets Over Alteration (Drill Data)

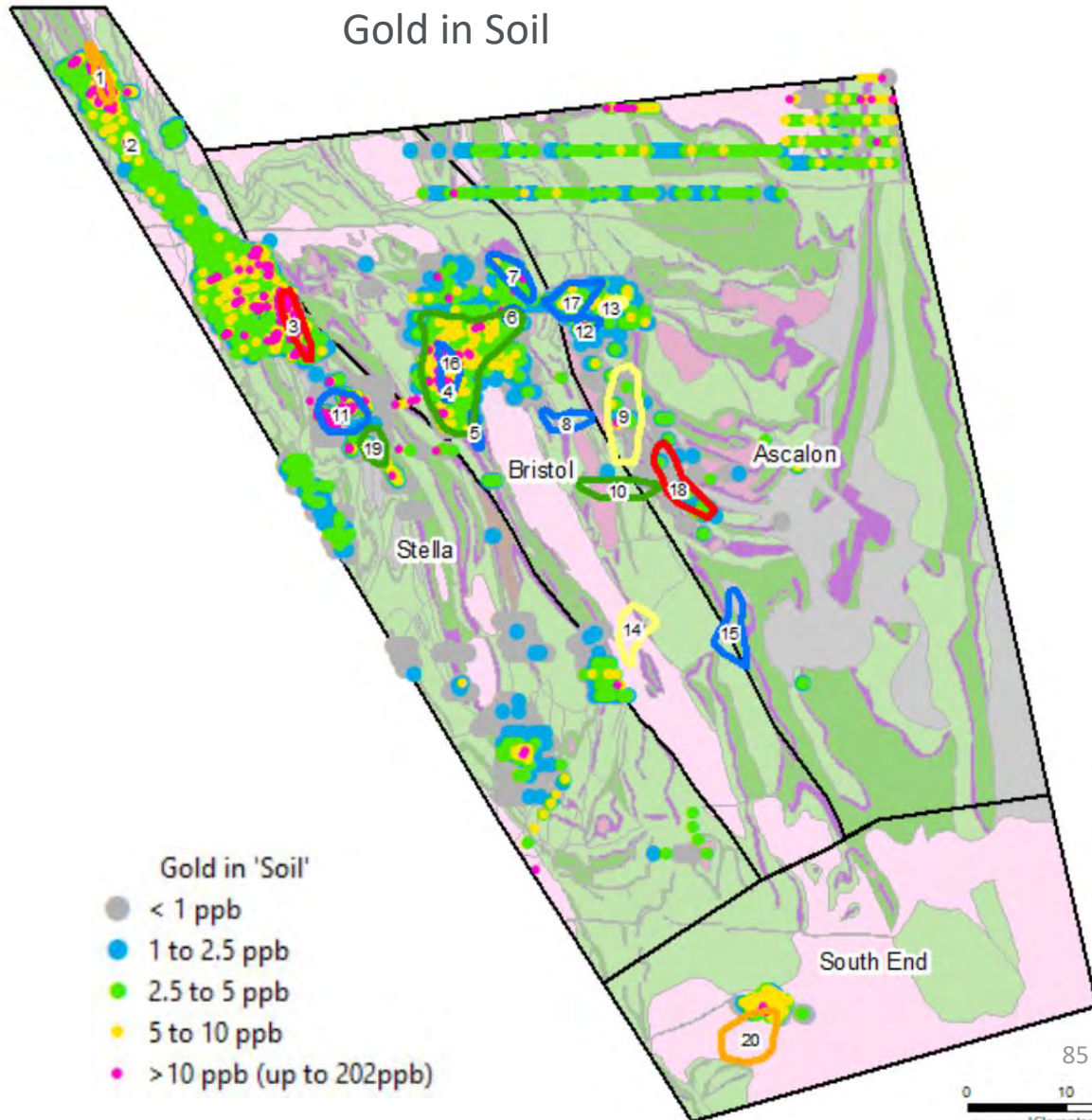
Gold Targets
Priority

- High
- Low
- Moderate
- Moderate-High
- Moderate-Low



Gold in 'Soil'

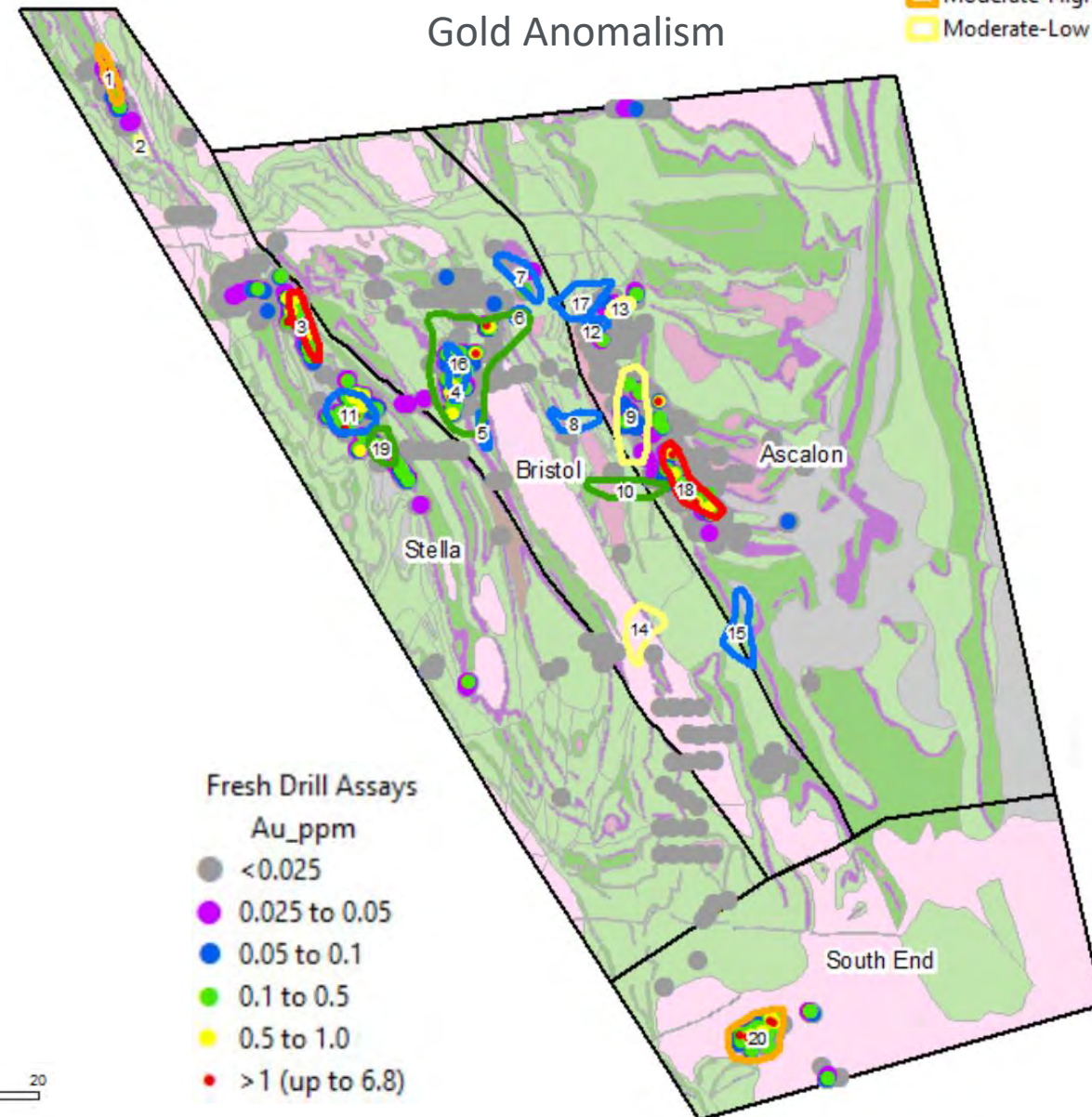
- < 1 ppb
- 1 to 2.5 ppb
- 2.5 to 5 ppb
- 5 to 10 ppb
- > 10 ppb (up to 202ppb)



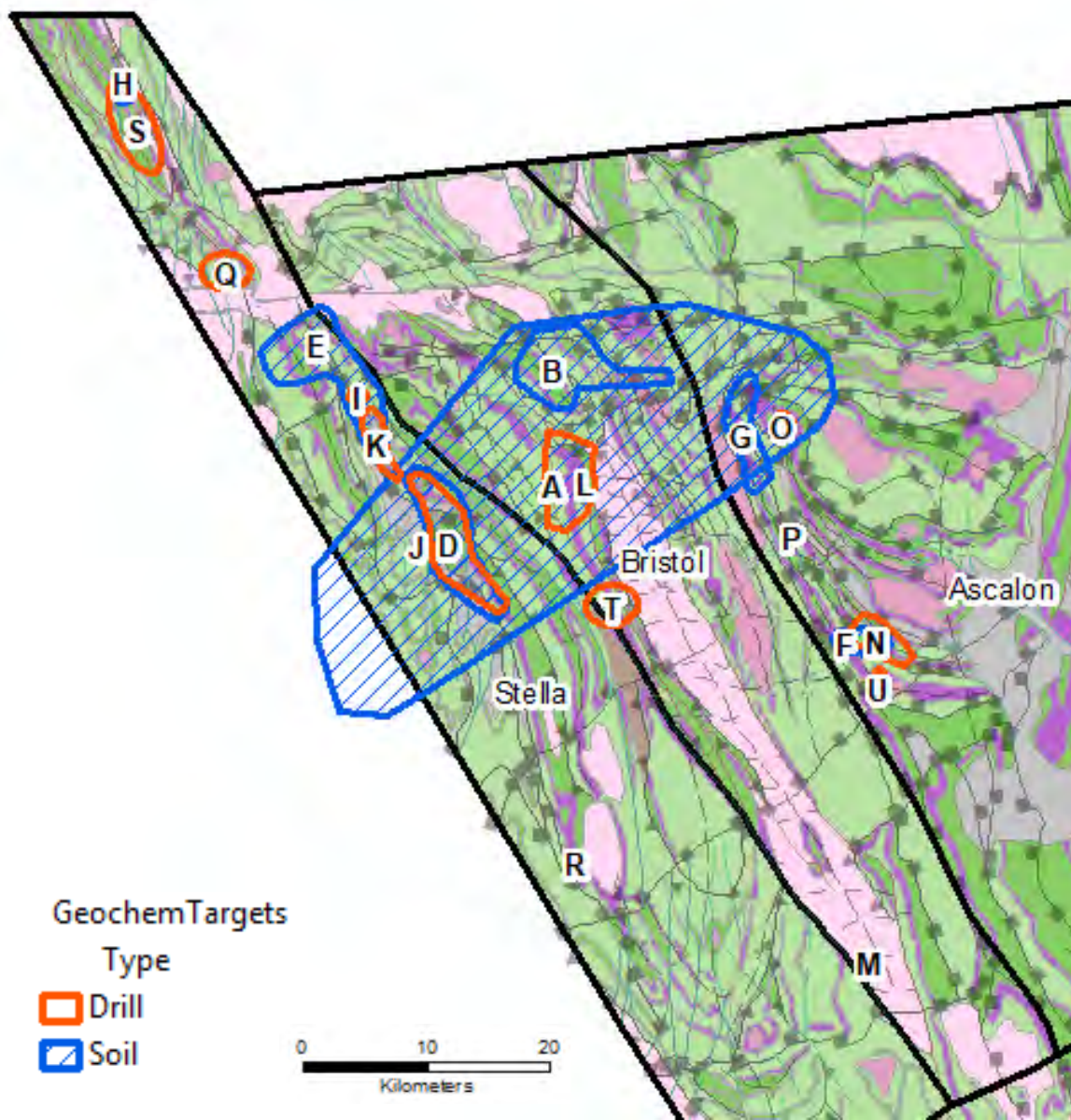
Fresh Drill Assays

Au_ppm

- < 0.025
- 0.025 to 0.05
- 0.05 to 0.1
- 0.1 to 0.5
- 0.5 to 1.0
- > 1 (up to 6.8)



Geochemical Targets

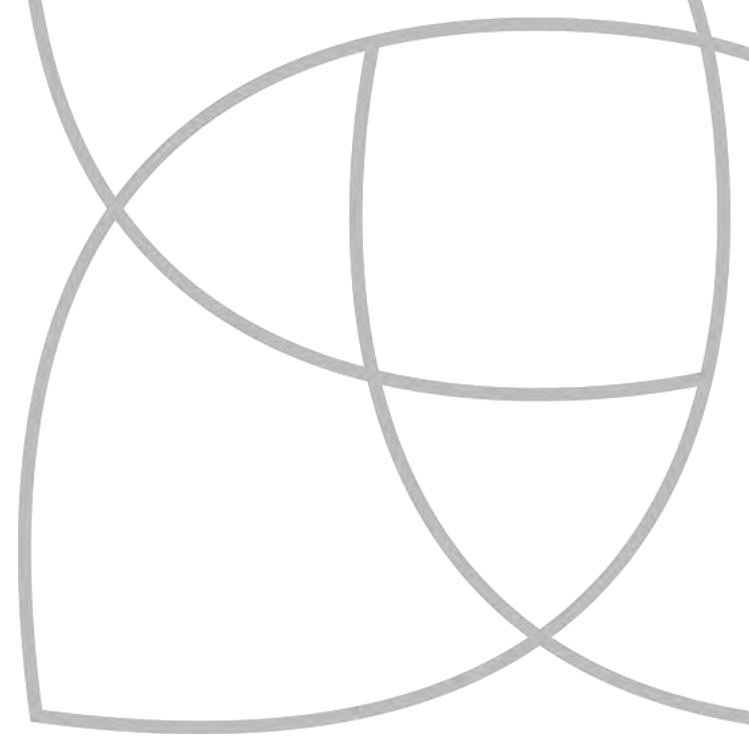


Id	Type	Priority	Comment
A	Soil	low	Low level Sn-Bi correlation
B	Soil	High	Mo-Te anomalous area
C	Soil	Moderate	Bi, Cu anomalism
D	Soil	High	Multi-element anomalism - As, Cu, Mo, Te, Zn, Au
E	Soil	High	Multi-element anomalism - As, Sn-Bi, Te, Mo, Zn
F	Soil	Moderate	Sn, Cu anomalism
G	Soil	Moderate	As trend with isolated Te, Cu anomalism
H	Soil	Moderate	Sn, Cu, Au anomalism
I	Drill	High	Te anomaly 100X background, W, Mo associated
J	Drill	High	Te, Mo, Sb (significant anomalism in N end), Sn, W anomalous
K	Drill	High	Multi-element anomalism
L	Drill	High	Multi-element anomalism and alteration
M	Drill	Low	Te anomalism
N	Drill	High	Multi-element anomalism, alteration with fractionated dolerite
O	Drill	Mod-Low	Alteration and Te anomalism
P	Drill	Mod-Low	Alteration and Te anomalism
Q	Drill	Moderate	Associated alteration and anomalism
R	Drill	Moderate	Associated alteration and anomalism
S	Drill	Low	Associated alteration with spotty anomalism
T	Drill	Moderate	Zone of anomalism
U	Drill	Moderate	Zone of anomalism



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Summary & Recommendations



Summary

- The East Laverton Project can be subdivided into 3 main domains with distinct mafic-ultramafic greenstone packages.
- Hydrothermal alteration signatures are interpreted based on historic datasets, even though not all datasets have full multi-element suites and do not correlate in a given sample.
- Element anomalism is widespread in the area when assessing for abundances 10x crustal background and looking for 'nearology' associations with a distinct base metal signature present in Stella and Bristol. Gold anomalism is widespread but based on data available cannot link to fresh rock source.
- The targets identified are based on the structural/conceptual interpretation, gold deposit model signatures and geochemical data; these overlap in numerous areas.
- The litho-structural interpretation has interpreted significant greenstone sequences within the AOI that are untested for hydrothermal mineralisation.
- Potential layered intrusion in the Ascalon Domain – Mt. Venn similarities?

Recommendations/Further Work

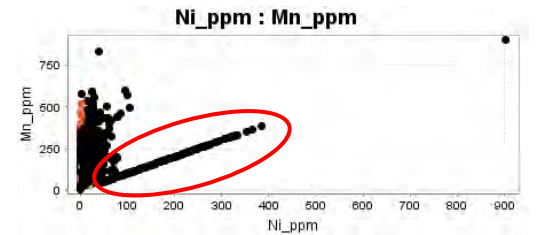
- Further evaluation of drill data could refine alteration and lithology interpretation.
- If MMI samples/pulps are still available, reanalysis could yield a large dataset for interpretation.
- Analysis of weathered/regolith dataset could yield further targets due to the shallow nature of drilling in areas.
- Some targets have detailed surface and/or drill geochemistry. Further work could be done to advance these targets to focus further work (ie: lag multi-element data in NW tip/corner of Stella Domain).
- The relationship of Pd/Pt throughout the area with numerous associated pathfinder element anomalism could be used as targeting tool to vector a towards hydrothermal system or 'unique' layered intrusion.
- Merged gravity file and subsequent derivative to better identify prospective structures.

Database Issues

The following issues are present in the database and could not be rectified during valuation:

Surface database:

1. Sample ID's NS636_AR_a72950 to NS816_AR_a72950 inclusive have the same values for Mn and Ni. This cannot be reconciled from the historic data.



Drill database:

1. Hole ASCR007 had dips recorded as positive. This was fixed post lithogeochem analysis as it became apparent during the interpretation. Due to the time to rectify this one hole, the data was left incorrect in the interpretation but validated in the database.
2. In the Stella domain, a large population of data has very low P values, this data is identical to what was originally in the database prior to this work commencing.

Phosphorus Data Query – refer back to Slide 62

- This population of data has very low P and is likely a result of a unit issue (values <20 ppm).
- This data was originally in the database prior to the work completed by CSA Global.
- The data is from a large group of drill holes and covers a large area.
- The list of drill holes associated with the population of data are listed to the right.
- If this data is correct, three of these holes (CAMRC003, CAMRC004 and DDRC023) are in the Cd-Zn-Te anomalous zone and this *might* reflect an alteration or prospective lithology.

