"MAGSAM 2000" - MAGNETIC SAMPLER

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This Rare Earth Magnetic sampler is housed in a stainless steel casing to provide a robust and convenient sampling method. The long shaft and retracting magnetic plunger result in a clean sample that does not contaminate the following sample. The magnetic lag fraction can be easily deposited into a conventional kraft soil sample packet. Magnetic lags represent a standard geochemical method, commonly used in stream sediment sampling programs with potential applications to regional soil/MAGLAG sampling.

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MAGSAM - Magnetic Sampler. Dimensions - 20 cm long X 3 cm diameter barrel. Strength of internal rare earth magnet - 2000 gauss.

Major Advantages Include:

- **Compact size and increased field strength compared with conventional magnets.**
- **Samples a common medium (maghemite and associated Fe hydroxides) across a changing regolith terrain.**
- **Potentially increases anomaly size and decreases geochemical "noise" affording confidence in a much wider sample spacing, i.e 1 to 2 samples/km^2.**
- **Potential applications to partial digestion techniques analysing for Au & PGE plus a multielement suite.**
- **Small sample size required - 10 to 20 gm (even for low level Au analyses) helping to minimise freight costs and potential customs/quarantine problems for overseas jobs.**
- **Can be used underwater in stream sediment sampling programs.**
- **Relatively low cost - $280 plus GST.**

Various geochemical orientation programs undertaken in Australia, Africa and in tropical areas such as Fiji and the Philippines confirm the effectiveness of sampling and analysing the ferruginous magnetic fraction as an exploration method to locate gold, PGM and base metal mineralisation. Standard mixed acid and Aqua Regia digests as well as innovative partial digests have been applied to the samples collected by the "MAGSAM 2000".

A mini Aqua Regia digest, using only a 4 gm sample mass, represents a cost effective method of analyzing for up to 17 to 18 elements including the precious metals (Au plus the PGEs) plus a multi-element suite for approximately Aud$15 per sample. The technique has proved to be very effective in exploring for gold in areas of relatively shallow cover such as the Central Victorian Goldfields where Au values up to 6380 ppb have been achieved in MAGLAG samples. Similarly, exploration for PGM in the East Kimberley has returned maximum values of 994 ppb Au, 1020 ppb Pt, 820 ppb Pd, 52 ppb Ir, 114 ppb Os, 0.83% Cu, 0.63% Ni & 0.053% Co. MAGLAG Pt values up to 1370 ppb have been achieved in soils covering the Platreef PGM mineralisation in the Bushveld Complex, South Africa.

Partial concentrated HCl (Cc) and Micro Cyanide Leach (MCL) digests developed by Ultra Trace Laboratories in Perth only require small sample masses and have the advantage of low detection limits (ie 10 ppt for Au & Pd using the MCL digest). Both of these digests have proved to be very effective in areas of deep cover typified by the regolith mantling the Archaean Yilgarn Province of Western Australia. An example is provided by the Kirgella Gift prospect, east of Kalgoorlie, where shear – hosted epigenetic gold mineralisation has been found below several metres of transported sands bordering the Lake Rebecca playa lake system. The concentrated HCl digest has the advantage of analysing for Au plus a multi-element trace element suite at ppb levels and can be used to potentially vector into both gold and base metal mineralisation.

PGM Case History - Panton Sill PGE/Chromitite Deposit, NE Kimberley, Western Australia.

Target: PGE mineralized chromitite horizons occur within a layered mafic/ultramafic sill-like intrusive comprising basal mesocumulate to orthocumulate peridotite (harzburgite and lherzolite) and dunite overlain by gabbronorite and anorthosite. Several PGE mineralized chromitite horizons, up to 1.2 m thick, occur within the peridotitic unit that has been folded around a syncline. An indicated resource of 2M tones at 6.02 g/t combined Pt, Pd & minor Au has been outlined within the chromitite horizons over a strike length of 1500 m. The deposit remains open along strike and at depth.

Regolith: The area is typified by relatively rugged topography with an incised creek system mainly draining along the axis of the syncline. Although relatively fresh rock outcrops, hillside scree and colluvial soils can potentially mask the chromitite horizons.

Geochemistry:
An orientation MAGLAG sampling programme was conducted on two traverses straddling the PGE mineralized chromitiferous horizons.

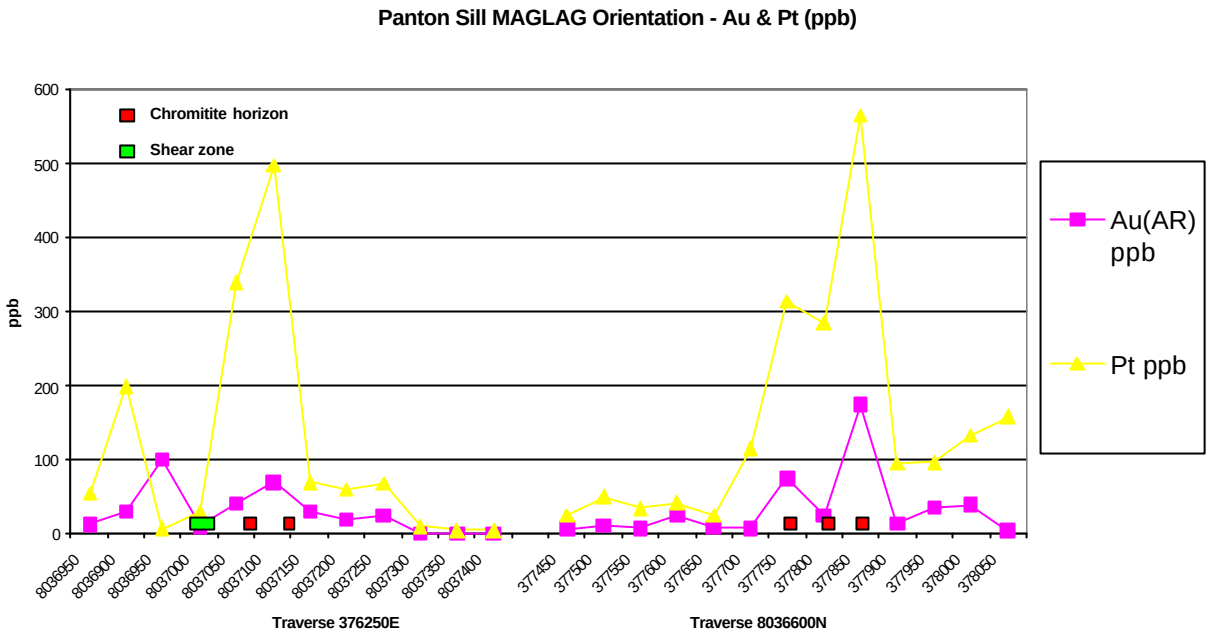
The MAGLAG samples (4 g) were analysed for a multi-element suite after using a Mini Aqua Regia digest and ICP – MS/OES finish. The MAGLAG samples have proved to be highly effective in defining the main PGE mineralized chromitiferous and sulphidic horizons in the Panton Sill and are comparable with the results achieved over the Melon Patch layered mafic/ultramafic intrusive 20 km to the north of the Panton Sill. Anomalous Pt, Au & Ni values (**Figures 1 & 2**) with support from pathfinder elements such as As, Bi & Te (not shown) correspond with the PGE – rich chromitite horizons.
The MAGLAG samples can also provide a useful additional guide to lithologies such as the peridotitic host to the PGE chromite horizons by using V, Cu, Cr and Ni values as well as Mg/Ca and Fe/Mn ratios. For example, **Figure 2** shows that V has been depleted over the ultramafic host to the chromitite horizons.

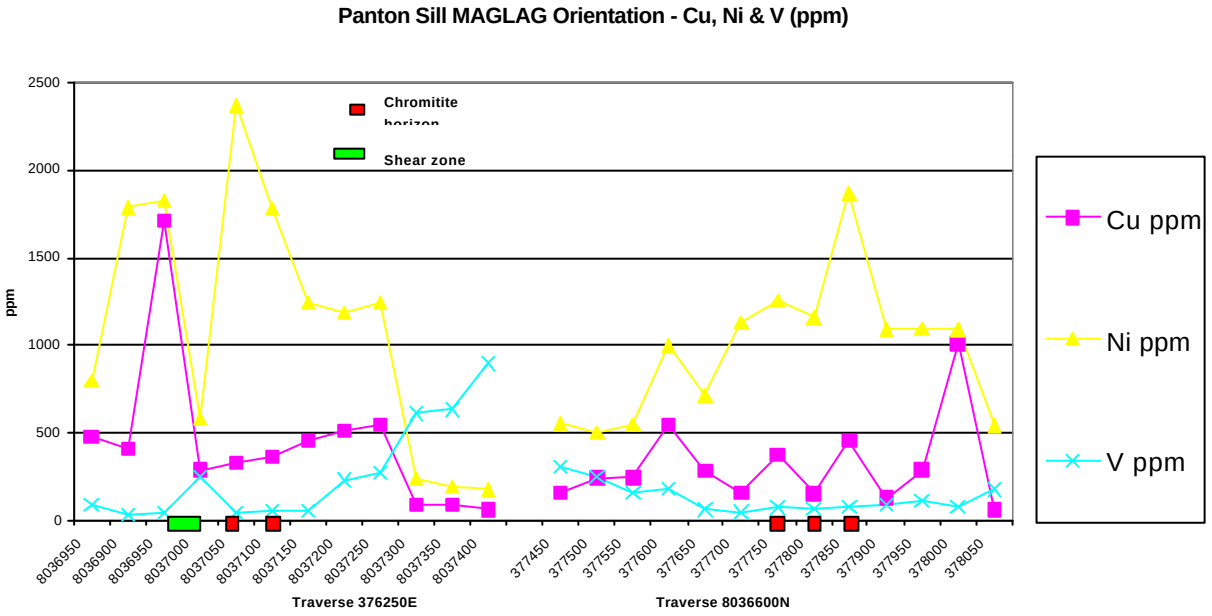
Platinum & Au - Orientation traverses gave a very good response for Pt with the main PGE mineralised chromitite horizons on Traverse 375250mE associated with a 100 m - wide apical anomaly. An anomalous "shoulder" indicates that the footwall peridotitic ultramafics are also anomalous in Pt. A single peak that corresponds with anomalous Ni, As, Cu, Bi & Te may indicate an additional upper, possibly sulfide PGE horizon on this traverse. The Pt dispersion gives a similar result on the E – W traverse (8036600mN) with a 200 m – wide Pt anomaly associated with outcropping chromitite horizons. Anomalous Au values support the anomalous Pt geochemistry (**Figure 1**).

Nickel, Cu & V - The peridotitic host to the chromitite horizons is broadly anomalous in Ni on both orientation traverses. A dip in the MAGLAG Ni values corresponds with a shear zone on Traverse 376250mE. Anomalous Ni values also enhance the potential for Ni mineralisation in the basal portions of the ultramafic host to the chromitite horizons. Copper is not particularly enriched over the PGE - rich chromite seams but would appear to exhibit a relationship with Ni as a potential guide to nickel sulfide mineralisation. Vanadium is depleted over the ultramafic lithologies but potentially highlights the gabbroic units in the layered mafic/ultramafic sill (**Figure 2).**

Conclusions:
The MAGLAG samples have successfully defined the PGE mineralized chromite horizons on both orientation traverses as anomalous Pt, Au & Ni values with support from pathfinder elements such as As, Bi & Te. The potential for dispersion or masking of the anomalies on the hillside scree slopes does not appear to be a major factor in interpreting the MAGLAG geochemical data. A potential PGE sulfide horizon is also apparent on Traverse 376250mE and is associated with anomalous Pt, Ni, Cu, As, Bi and Te values. The MAGLAG samples can also provide a useful

additional guide to the ultramafic lithologies hosting the PGE chromitite horizons by using V, Cu, Cr and Ni values as well as Mg/Ca and Fe/Mn ratios.





Figures 1 & 2 Orientation MAGLAG profiles for Au, Pt, Cu, Ni & V across the Panton Sill.

Geochemical 3D images for Au, total PGE and Ni for the MAGLAG programme completed over the Panton Sill are shown in **Figure 3.** The northern PGE – Ni anomaly is probably associated with Ni – Cu sulphides that were previously unknown.

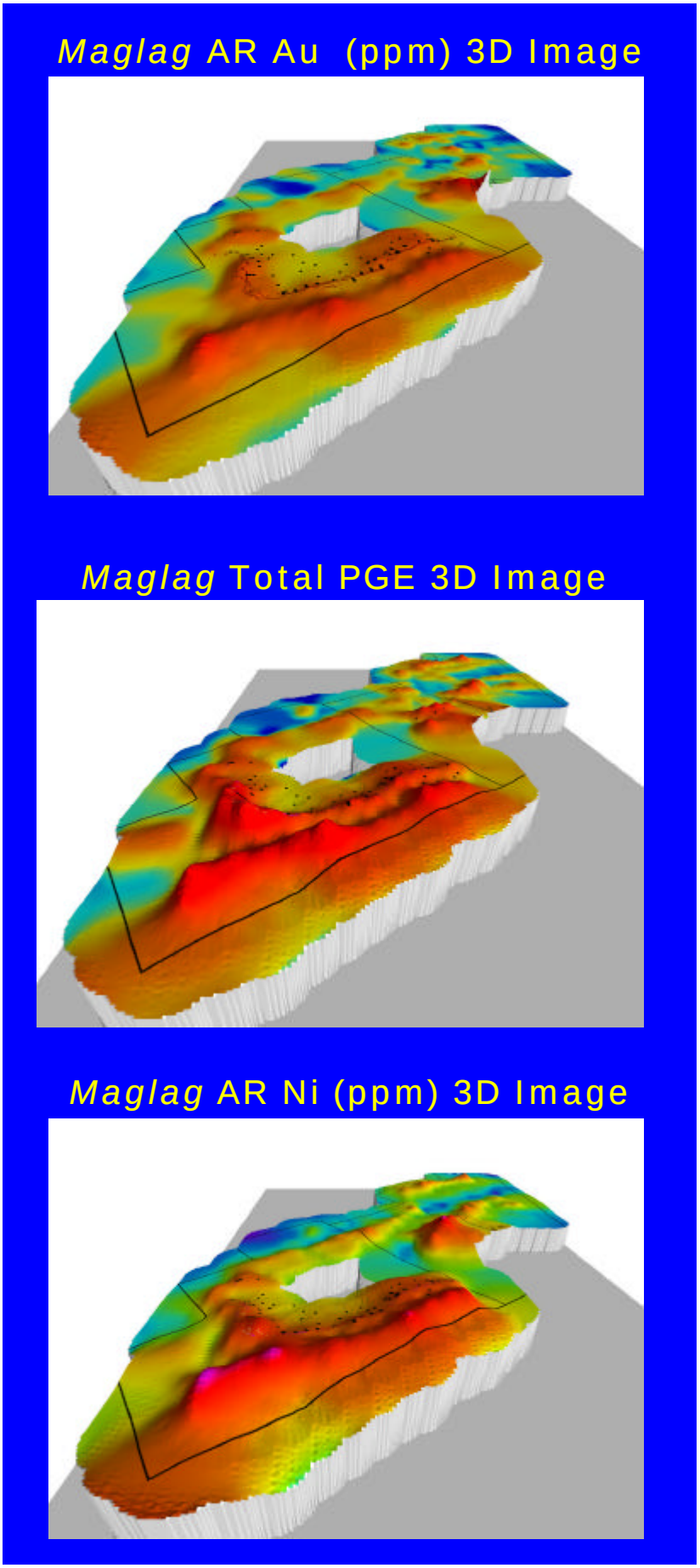


Figure 3 MAGLAG geochemical images for Au, total PGE and Ni values - Panton Sill