# Wollogorang Project: Review of 2018 exploration program

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## Background

In April 2018, Northern Cobalt ('N27' or 'the Company') announced a resource upgrade for the Stanton Cobalt Deposit from the results of drilling in late 2017. The new total Mineral Resource Estimate, prepared in accordance with the JORC Code, is 942 000 t at 0.13% Co, 0.06% Ni and 0.12% Cu (the previous Mineral Resource Estimate of 500 000 t at 0.17% Co, 0.09% Ni and 0.17% Cu was reported by N27 in its prospectus in September 2017). Importantly, the contained cobalt within the resource increased and has been largely moved from inferred to indicated status indicating a greater degree of confidence.

## Introduction

The Wollogorang Project is located close to the NT–QLD border in the Gulf of Carpentaria (**Figure 1**). N27 listed on the Australian Stock Exchange (ASX) in October 2017 and immediately commenced drilling at the Stanton Cobalt Deposit, completing 70 reverse circulation (RC) and 10 diamond core holes. The aim was to upgrade the existing inferred Mineral Resource, as well as obtain material for metallurgical and scoping studies. A further 57 RC holes were drilled on existing regional prospects previously defined by CRA, for a combined total of 11 856 m drilled between October and early December 2017.

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During this period, the Company also completed a new aeromagnetic and radiometric survey totalling 3685 line-km of high-resolution magnetic and radiometric data at 25 m flight line spacing covering the Stanton Cobalt Deposit and surrounding cobalt prospects. This new magnetic data, together with historical soils and lag geochemical data, formed the basis for the 2018 exploration program. This paper provides a review of the Company's 2018 exploration program on the Wollogorang project.

## Geology

The project area is located within the Wearyan Shelf tectonic element of the southeastern Palaeo– to Mesoproterozoic McArthur Basin, a 5–12 km thick platform cover sequence of mostly unmetamorphosed sedimentary and lesser volcanic rocks deposited on the North Australian Craton, containing dolostone, sandstone and shale units with minor felsic and mafic volcanics (Rawlings 1999, Goulevitch 2002).

The main geological units of interest in the project area are the Gold Creek Volcanics (interlayered basalt lavas and sedimentary rocks) and the Wollogorang Formation (carbonaceous shales and dolomite). To the west of Stanton, these formations are overlain by the flat-lying 250 m thick Pungalina Member (Echo Sandstone) and the Karns Dolostone (**Figure 2**). The Stanton Cobalt Deposit and copper mineralisation at the *Gregjo* and *Running Creek* prospects are all hosted within the Gold Creek Volcanics.

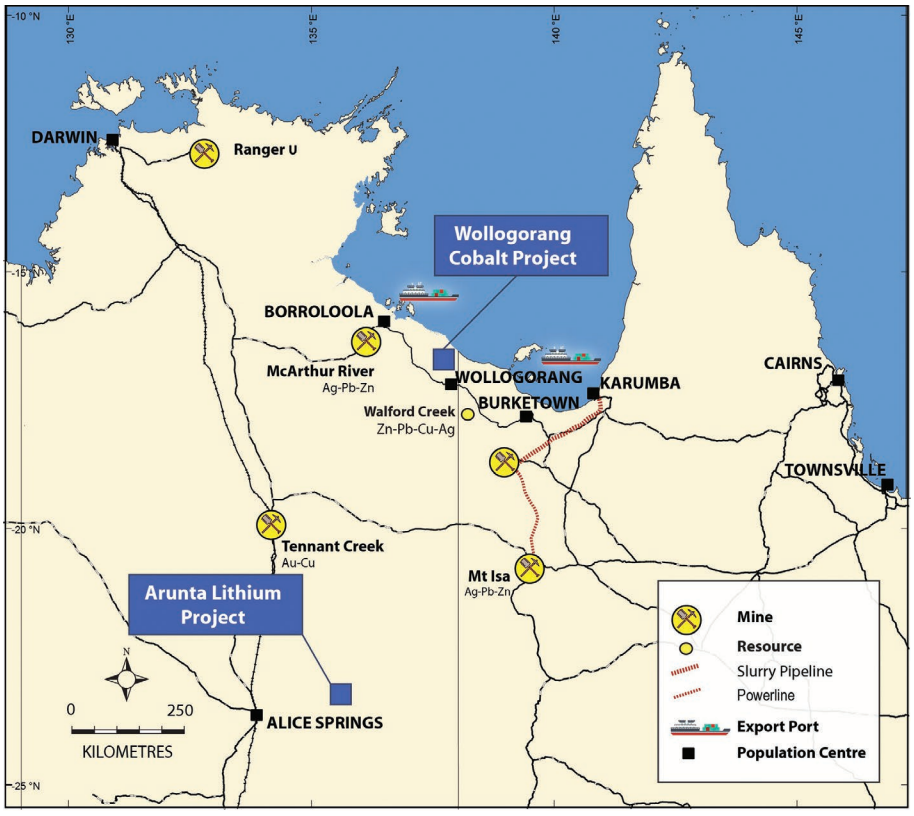



**Figure 1**. Regional location and projects.

## 2018 Exploration Highlights

- Completed 1203 aircore (AC) and rotary air blast (RAB) drillholes across the project area.
- Significant drillhole intersections at Running Creek Prospect include:
  - 55 m at 0.78% Cu from 0 m (18RAB102), including 33 m at 1.08% Cu from 11 m, and 13 m at 2.01% Cu from 11 m
  - 27 m at 0.67% Cu from 3 m (18RAB095)
  - 19 m at 0.78% Cu from 10 m (18RAB096)
  - 4 m at 1.5% Cu from 8 m (18RAB094).
- Significant intersections for the Gregjo Prospect include:
  - 7 m at 1.26% Cu from 5–12 m (18RAB013)
  - 20 m at 0.72% Cu from 1 m (18RAB020), including 1 m at 1.4% Cu and 3 m at 1.67% Cu
  - 11 m at 0.65% Cu from 16 m (18RAB031), including 1 m at 1.97% Cu
  - 3 m at 1.57% Cu from 13 m (18RAB051).
- Completed additional heli-borne aeromagnetic and radiometric survey covering eastern half of project area.
- Completed induced polarisation surveys at Gregjo and Running Creek prospects.

## Drilling

The objective of the 2018 drilling program was to continue the exploration program undertaken since listing on the ASX to outline areas with cobalt and copper potential, with a focus on the region surrounding the Stanton Cobalt Deposit. The Company completed 14 395.4 m of drilling during 2018, comprising 977 AC holes for 6431.9 m and 225 RAB holes for 7964.5 m (see **Table 1** for a summary of N27's 2018 drilling).

**Table 1**. Summary of 2018 drilling.

| Location | AC drilling | | RAB drilling | |
|---|---|---|---|---|
| | holes | metres | holes | metres |
| Regional | 944 | 6074.9 | 95 | 3279.5 |
| Gregjo | 33 | 357 | 86 | 2737.5 |
| Running Creek | | | 44 | 1947.5 |
| **Total** | **977** | **6431.9** | **225** | **7964.5** |

The 2018 drilling program was completed using an AC/RAB system mounted on a 6WD Toyota to gain access to sites without the need to clear tracks (**Figure 3**). Initial drilling was shallow AC with 944 regional holes completed

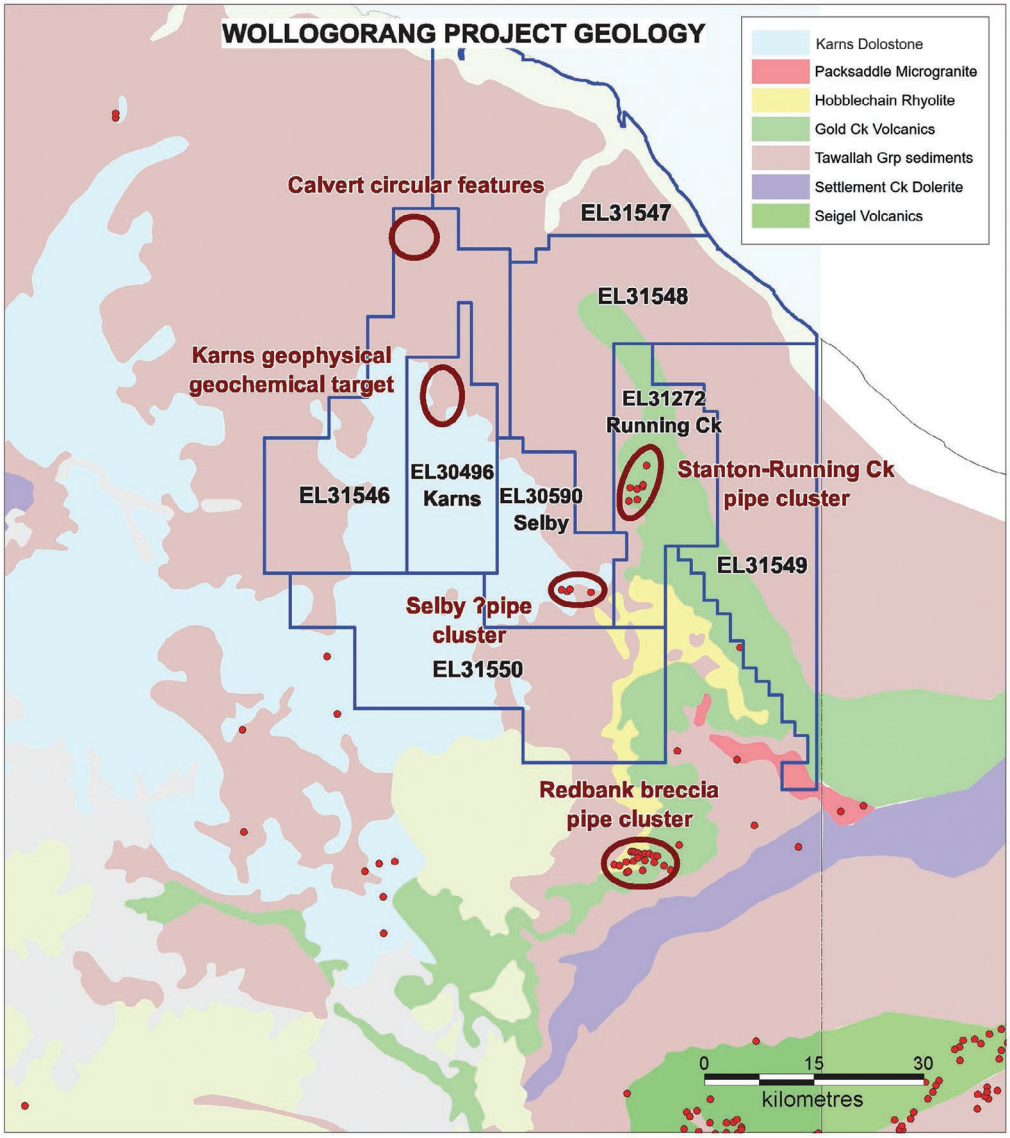



**Figure 2**. Regional geology of the Wollogorang Project area showing current and historical prospects, and known pipe clusters.

**Figure 3**. AC/RAB rig at Wollogorang Project.

over magnetic lows. A total of 75 magnetic targets were tested of which 21 returned cobalt assays >100 ppm (**Figure 4**). A review of historical surface sampling at the Stanton Cobalt Deposit showed that lag sampling reported an average cobalt content of 147 ppm Co at surface, hence holes reporting >100 ppm Co were targeted by follow-up deeper RAB drilling.

In late 2018, a further 95 regional RAB holes were completed over these 21 target areas for 3279.5 m (average depth 34.5 m). Samples are currently awaiting assaying by pXRF.

### *Gregjo Prospect*

The Gregjo Prospect is located ~3.4 km south of the Stanton Cobalt Deposit. Initially, CRA discovered surficial copper mineralisation within a flat-lying siltstone (**Figure 5**).

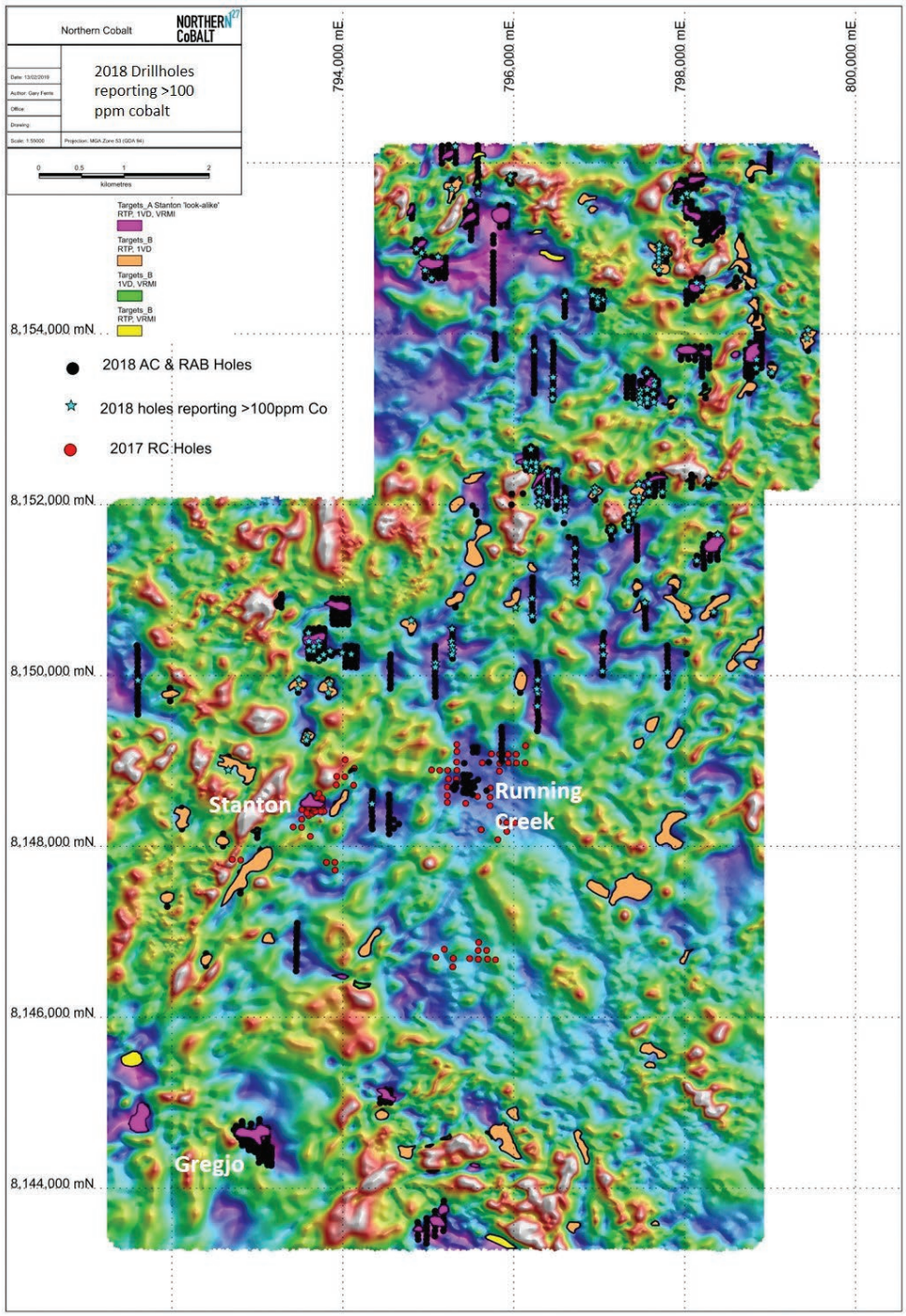



**Figure 4**. 2018 program drillholes reporting >100 ppm Co (background TMI–RTP image with N27 target areas).

CRA completed 6 RC holes totalling 146 m, with the best intersection reported being 12 m at 0.32% Cu from surface in hole PD92RC28 (Palmer 1993).

N27 completed 33 shallow AC holes, totalling 357 m (average depth 10.8 m). Best pXRF results include 12 m at 0.2% Cu from 0–12 m (18AC943), 7 m at 0.24% Cu from 1–8 m (18AC939), and 6 m at 0.28% Cu from 7–13 m (18AC944).

The Company drilled a further 86 RAB holes for 2737.5 m (average depth 31.8 m) to test for deeper mineralisation at Gregjo. Best laboratory results were:

- 7 m at 1.23% Cu from 1 m (18RAB103), including 1 m at 4.24% Cu
- 15 m at 0.53% Cu from 5 m (18RAB009), including 4 m at 1.08% Cu
- 20 m at 0.72% Cu from 1 m (18RAB020), including 1 m at 1.4% Cu and 3 m at 1.67% Cu
- 11 m at 0.65% Cu from 16 m (18RAB031), including 1 m at 1.97% Cu
- 3 m at 1.57% Cu from 13 m (18RAB051), including 1 m at 0.78% Cu.

Copper mineralisation appears to be spatially associated with at least two structures within the Gregjo Fault. Higher grade copper occurs adjacent to and within the interpreted fault structures that are steeply dipping. Vertical RAB drilling has difficulty intersecting these zones but once the lateral extent of mineralisation is defined, deeper angled RC drillholes will be used to target high-grade mineralisation in conjunction with results from the recently completed IP survey.

Lower grade mineralisation extends laterally from the fault structures within shallow dipping, pyritic sandstone and siltstones (**Figure 6**). This style of mineralisation has many similarities with Aeon Metals' Walford Creek Cu-Co deposit, ~90 km to the southeast.

**Figure 5**. Surface copper mineralisation at Gregjo Prospect.

***Running Creek Prospect***

The Running Creek Prospect is located ~1.8 km east–northeast of the Stanton Deposit. Copper mineralisation was discovered at Running Creek in the 1950s with reports of malachite and azurite ore (~30–40 tonnes) mined by hand from a 10 m deep shaft and a small 3 m-deep pit (Randell 2012).

Exploration by CRA in the 1990s as part of the Running Creek joint venture included various airborne and ground geophysical surveys, detailed lag sampling and geological mapping and drilling. The best drillhole intersections reported from Running Creek were:

- 13.4 m at 1.2% Cu from 32.1 m in hole DD94RC63 (Palmer *et al* 1995)
- 29 m at 0.74% Cu from 0 m in hole PD95RC236, including 7 m at 1.77% Cu from 22–29 m
- 23 m at 1.66% Cu from 10 m in hole PD95RC247, including 6 m at 3.92% Cu from 14–20 m; and 3 m at 2.22% Cu from 26–29 m (Menzies *et al* 1996).

Minor cobalt was reported from 2 drillholes including 1 m at 0.12% Co from 18–19 m (PD94RC41) and 5 m at 0.11% Co from 70–75 m (PD94RC83, Palmer *et al* 1995).

N27 completed 44 RAB holes at Running Creek (**Figure 7**) for 1947.5 m (average depth 44.2 m) with the best copper intersections reported including:

- 55 m at 0.78% Cu from 0 m (18RAB102), including 33 m at 1.08% Cu from 11 m, and 13 m at 2.01% Cu from 11 m
- 27 m at 0.67% Cu from 3 m (18RAB095)
- 19 m at 0.78% Cu from 10 m (18RAB096)
- 4 m at 1.5% Cu from 8 m (18RAB094)

The Running Creek prospect also contains anomalous cobalt with the best intersections reported including 6 m at 0.11% Co from 29–35 m (18RAB100) and 5 m at 0.16% Co from 20–25 m (18RAB123). Drillhole 18RAB102, with 55 m of copper mineralisation from surface, also showed anomalous cobalt with 22 m at 380 ppm Co from 22 m; this hole ended in mineralisation with the last metre assaying 450 ppm Co and 0.37% Cu.

Mineralisation at the Running Creek Prospect appears to be associated with northeast-trending structures. The prospect area was originally identified by CRA in the 1990s as a group of small, individual copper and cobalt mineralised systems with limited extent. Reinterpretation by Northern Cobalt of the main controls of mineralisation along northeast-trending structures has linked the individual mineral systems and led to the significant copper intersection in drillhole 18RAB102 as well as cobalt intersections throughout the project area (**Figure 8**).

**Magnetic Survey**

Based on the success of the 2017 helicopter airborne magnetic and radiometric survey over the Stanton Cobalt Deposit and surrounding prospects, N27 completed a high resolution aeromagnetic and radiometric survey over the

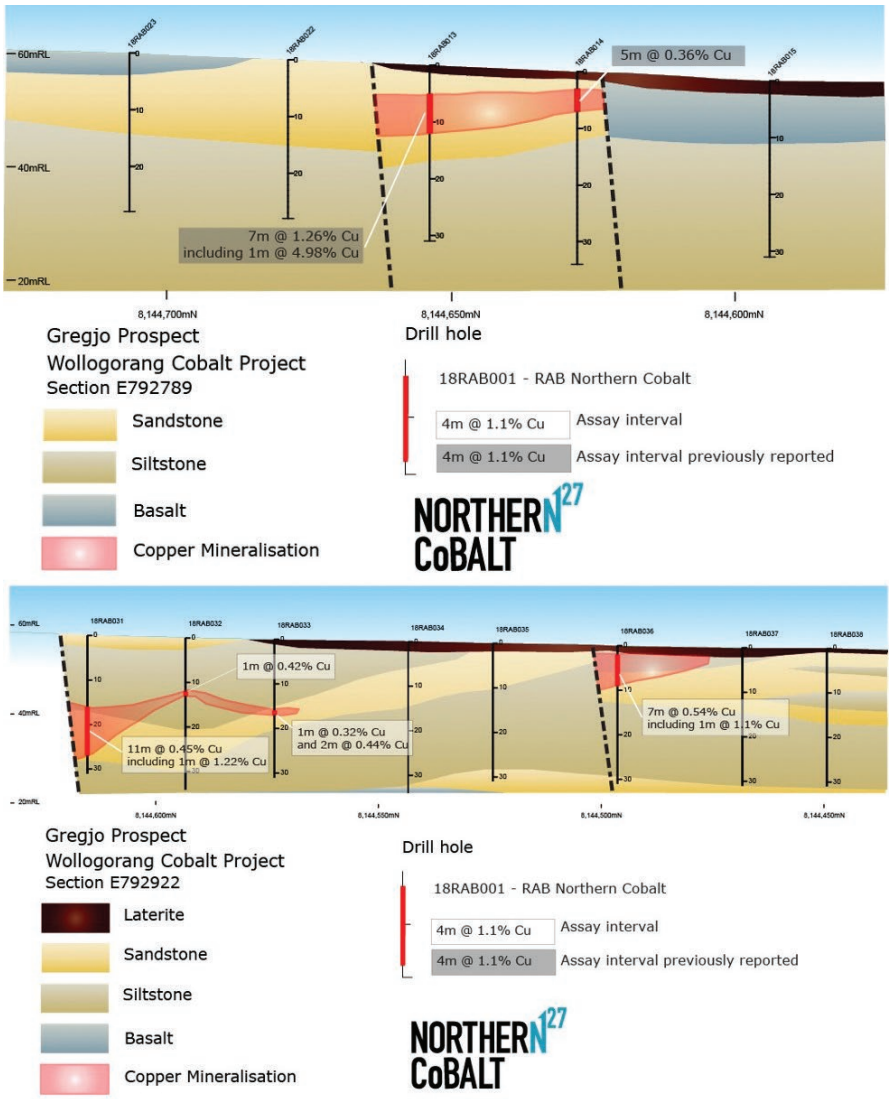



**Figure 6**. Cross sections at Gregjo Prospect. Profile lines are shown on **Figure 10**.

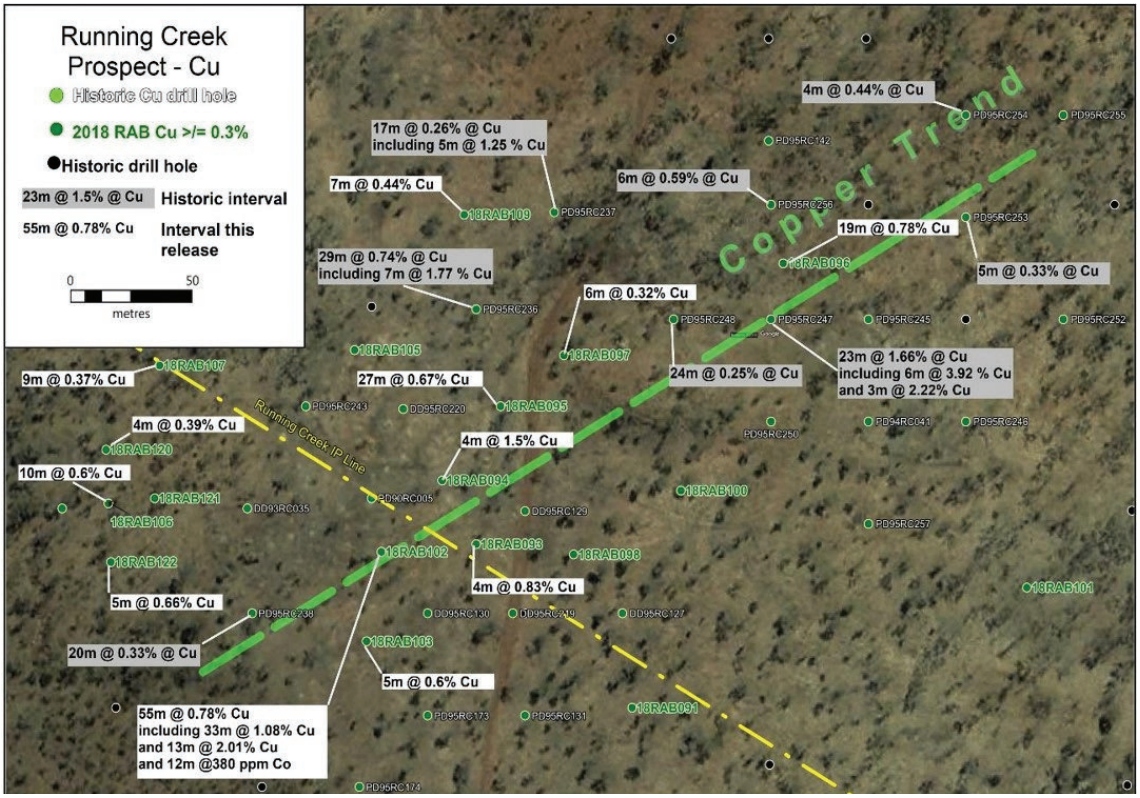



**Figure 7**. Google Earth image showing drillhole results from Running Creek Prospect, highlighting interpreted copper trend.

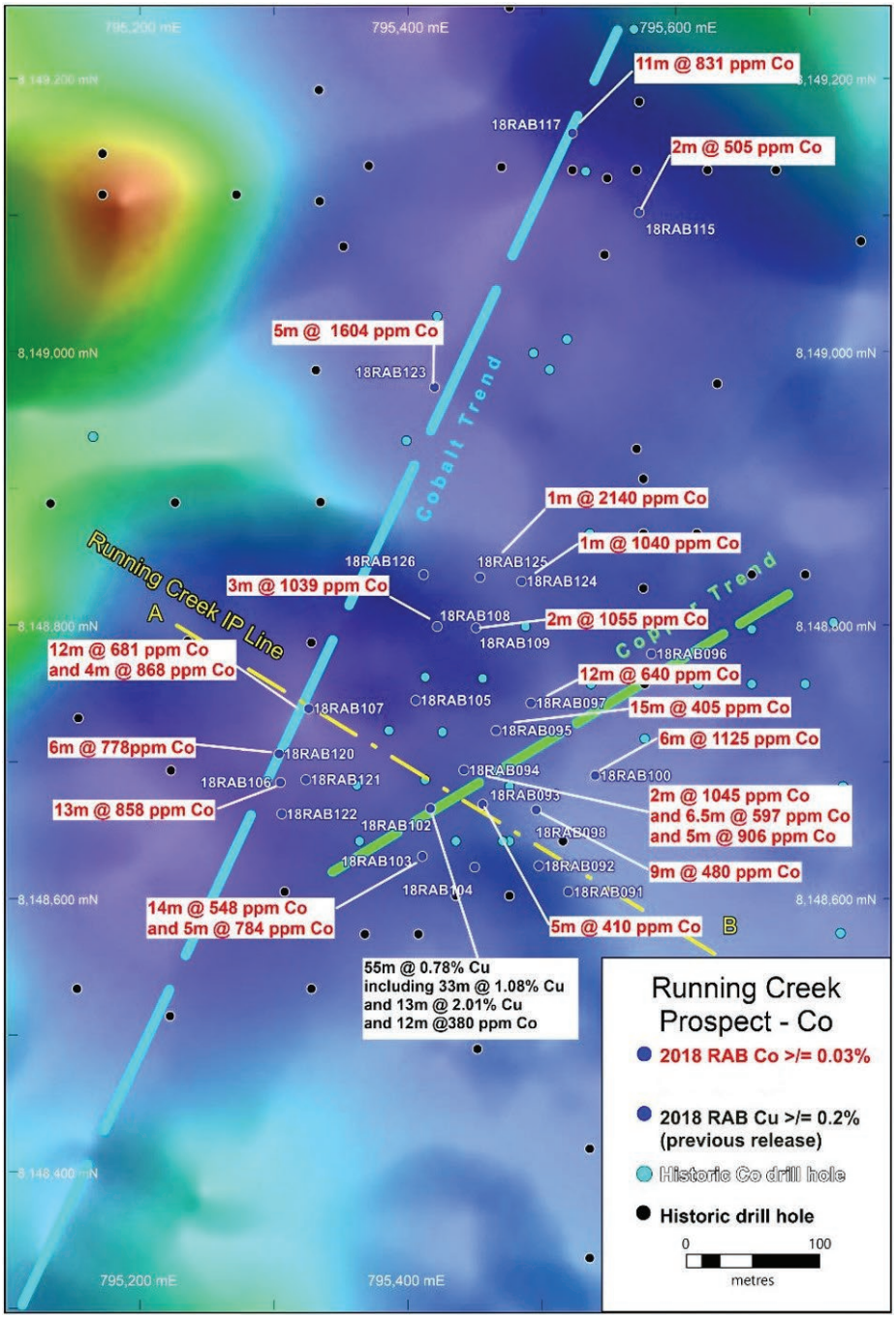



**Figure 8**. TMI–RTP image showing significant cobalt results from Running Creek Prospect.

Wollogorang Project at a flight line spacing of 75 m. The new 2018 survey (Area 2) covers ~1720 km$^2$ and expands the 2017 heli-borne survey by almost twenty-fold (**Figure 9**). This newly acquired data was partly co-funded by a grant of $100 000 awarded by the NT government and will be used to assist in further exploration in 2019.

### Induced Polarisation (IP) Survey

N27 completed Dipole-Dipole IP surveys at the Gregjo and Running Creek prospects, which returned highly encouraging results in both areas. Mineralisation at the Gregjo Prospect is associated with a northwest-trending structure (**Figure 10**). The Gregjo Prospect was originally identified by CRA in the 1990s as a surface geochemical anomaly of limited extent with minor copper mineralisation. Reinterpretation of the main controls of mineralisation along northwest-trending structures and subsequent drill testing by N27 in 2018 has identified the copper source of the surface geochemical anomaly.

The results of the IP survey at Gregjo identified a large chargeable feature beneath the currently identified mineralisation (**Figure 11**). The Company interprets this feature to represent an extension of high-grade oxide copper mineralisation identified at surface to primary mineralisation at depth. **Figure 11** shows the anomaly in sections 1, 2 and 4, it but appears to be missing from section 3, possibly due to unfavourable host rocks at this location or being offset by a cross cutting fault. The distance between sections 1 and 4 exceeds 800 m of strike.

Results from the IP survey at Running Creek Prospect has also identified a large chargeable feature beneath the currently identified mineralisation (**Figure 12**). N27 interprets this feature similarly to that at Gregjo as

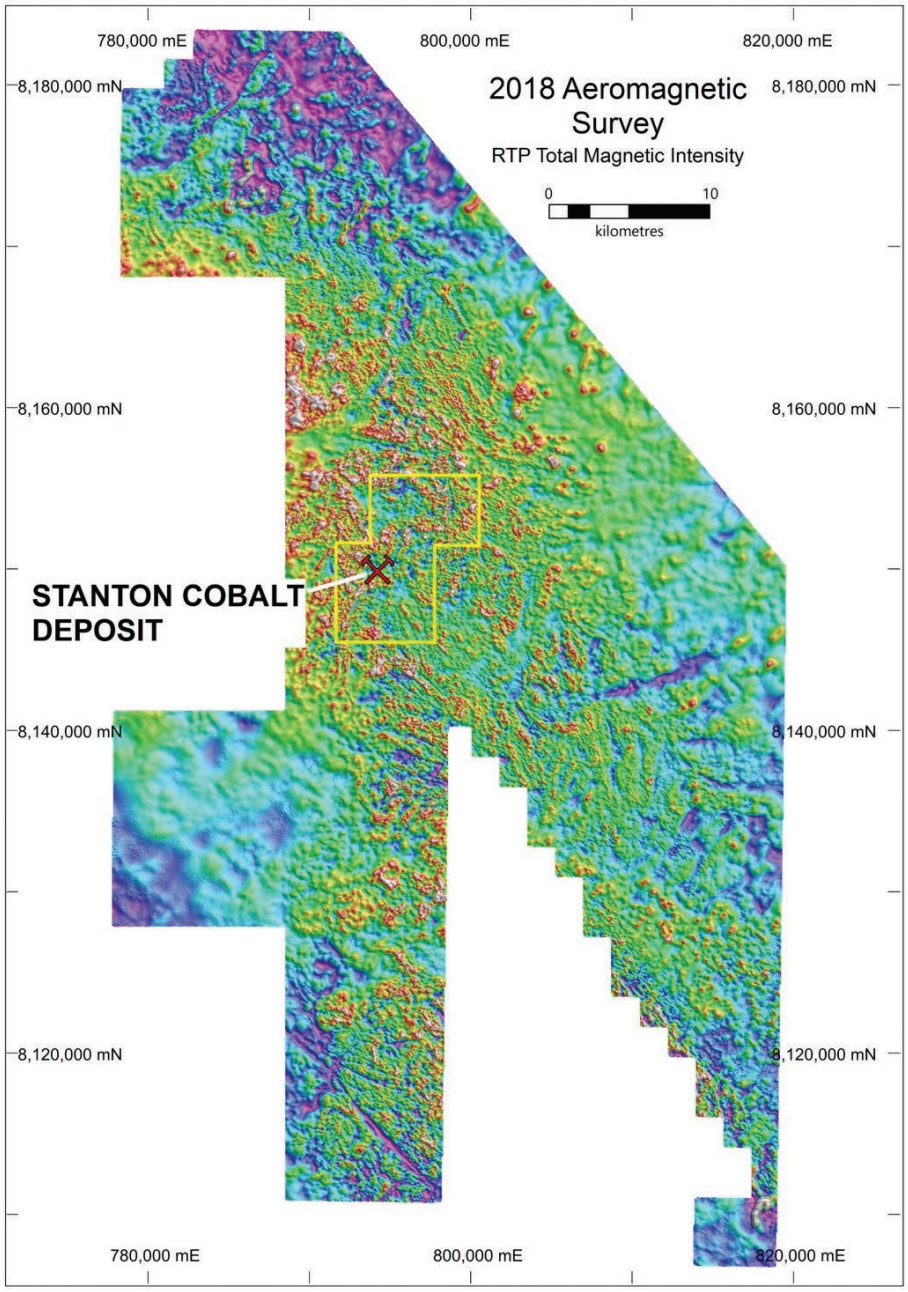



**Figure 9**. Newly acquired heli-mag data over Wollogorang Project area. Yellow box shows area of 2017 heli-mag survey.

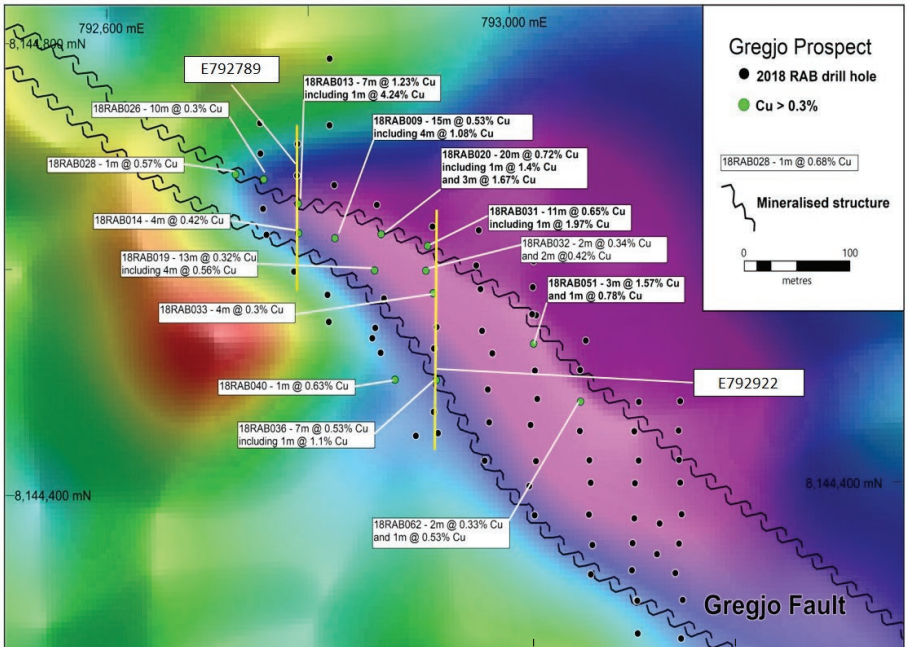
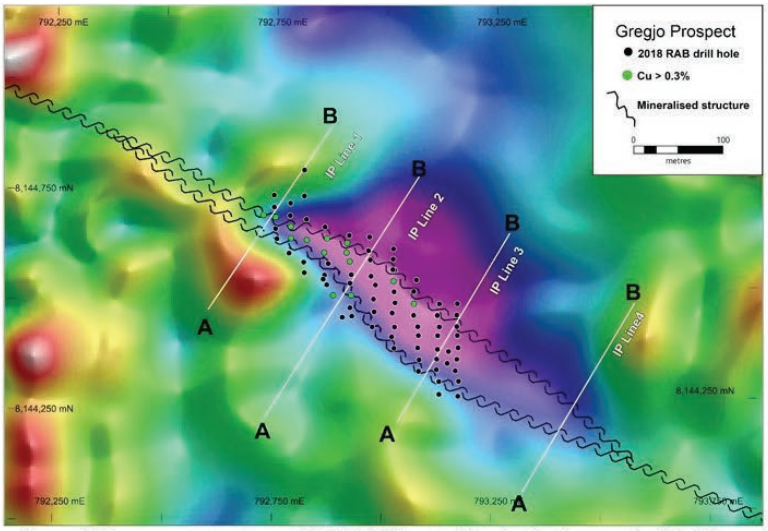



**Figure 10**. TMI–RTP image of Gregjo Prospect highlighting significant structure. Cross-sections related to northwest-trending section lines (yellow) are shown in **Figure 6**.




Plan of IP survey traverses and RAB drilling at Gregjo (background – TMI image)

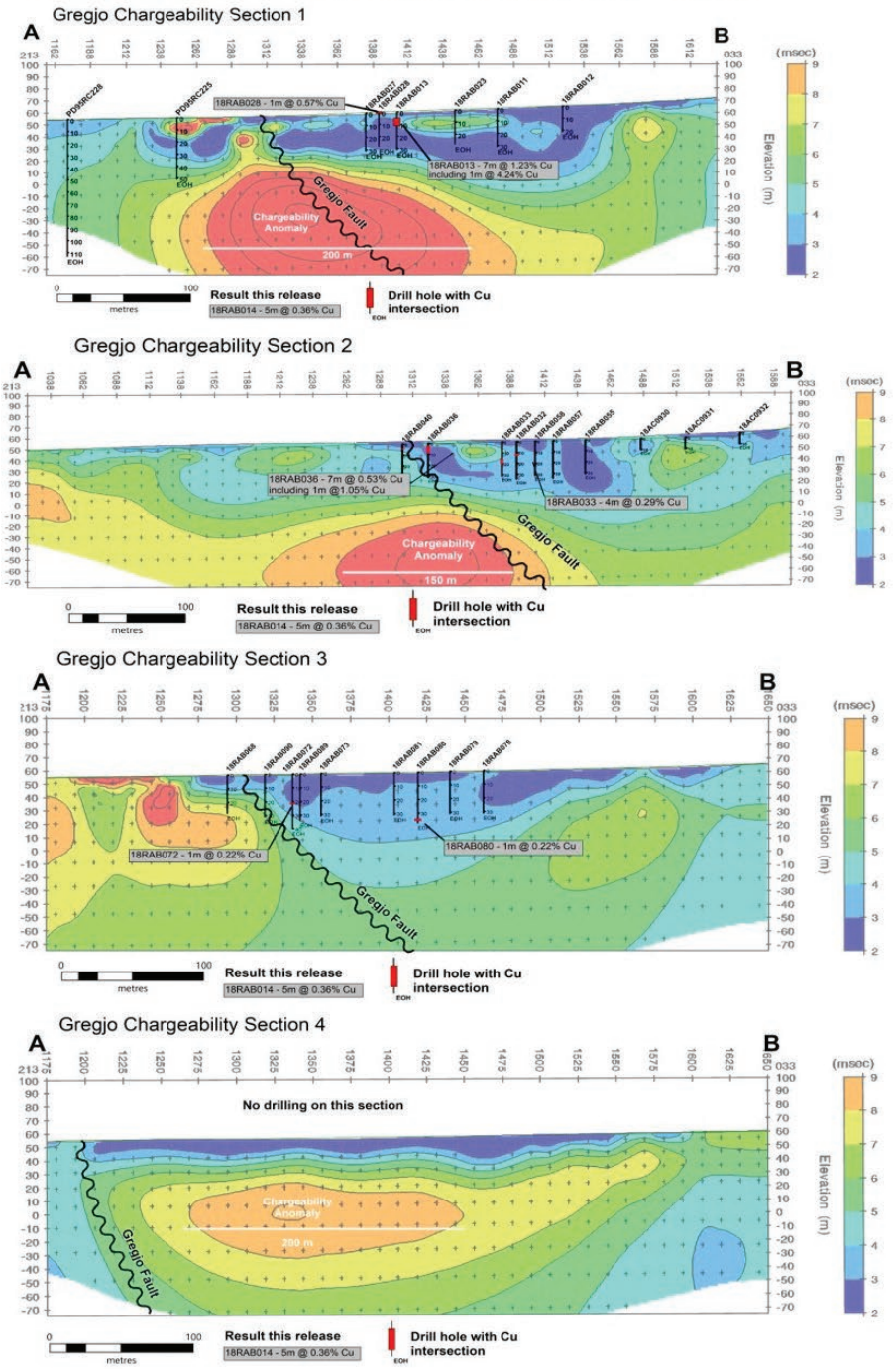



**Figure 11**. Induced polarisation chargeability plan view and sections 1–4 at Gregjo Prospect.

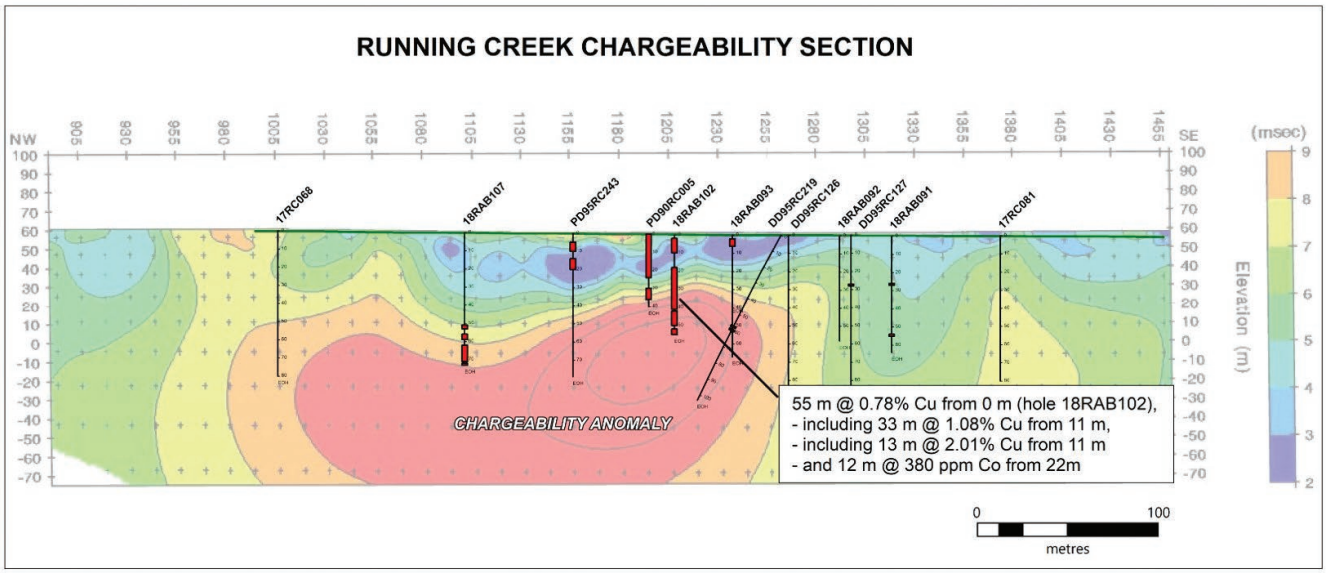



**Figure 12**. Induced polarisation chargeability section at Running Creek Prospect (see **Figure 8** for line location).

representing an extension of high-grade copper-cobalt mineralisation at depth; this feature will be tested by further drilling in 2019.

## Exploration Program for 2019

Following the successful exploration results for 2018, the Company is planning drilling programs at the Running Creek and Gregjo prospects to follow-up on drilling results and targets outlined by the IP surveys. The Company is awaiting pXRF results for samples from the RAB drilling to the northeast of Stanton and Running Creek; this data will be integrated with available geochemical and geophysical data to assist in future exploration in this region. The Company will continue to assess the newly acquired magnetic and radiometric data by incorporating data from the 2018 drilling programs.

## References

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## ASX Announcements used in this abstract

- 9 April 2018: Stanton resource upgrade increases contained cobalt
- 30 May 2018: Regional cobalt targets identified on Wollogorang Project
- 28 August 2018: Copper discovered at first drill target
- 19 September 2018: Copper discovery grows at Gregjo Prospect
- 9 October 2018: Copper intersection confirms new model at Running Creek
- 19 October 2018: Cobalt system developing at Running Creek
- 14 December 2018: Cobalt and copper system confirmed at Running Creek
- 22 January 2019: Geophysics highlight potential at Gregjo
- 25 January 2019: Quarterly Activities and Cashflow Report 31 December 2018