GeoDiscovery Group

Minerals exploration, discovery and management

EL 10140 LITCHFIELD PROJECT NORTHERN TERRITORY
ANNUAL REPORT FOR THE PERIOD ENDING 13 FEBRUARY 2004

For Discovery Nickel Limited

by Peter Gregory
Consultant Geologist
GeoDiscovery Group

March 2004

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SUMMARY

This report summarises all work conducted in EL 10140 for the period ended 13 February 2004.

The tenement area lies in the western parts of the Pine Creek Inlier (Litchfield Province) and is considered to have good potential for magmatic Cu-Ni mineralisation related to the Wangi Basics. The Litchfield Province is the continuation of the prospective Halls Creek Province of the Kimberleys, a known significant magmatic Cu-Ni province.

Work conducted includes, a comprehensive open file review, published literature review, interpretation of aeromagnetic, gravity and landsat data and a GIS study.

This work confirmed the prospectivity of the tenement area for magmatic Cu-Ni mineralization related to the Wangi Basics. In particular the Sandy Creek Mafic Complex of gabbros, troctolite and anorthosite shows anomalous base metals and PGE geochemistry over a large magnetic high. No drilling or EM have been conducted over the main part of the complex. A program of airborne EM is planned to cover the known mafic/ultramafic intrusions and the broad structural corridors that contain them.

1. INTRODUCTION

EL 10140 is one of several tenements (and tenement applications) forming the Litchfield Project and is located approximately 40km south southwest of Daly River in the Northern Territory (**Figure 1**). The tenement area encompasses parts of the Moyle and Wingate Mountains 1:100 000 sheets.

EL 10140 was originally granted to Corporate Developments, but is now under an option to Falconbridge (Australia) Pty Limited. On 15 October 2003, Falconbridge's option was transferred to Discovery Nickel Limited pursuant to a Heads of Agreement. The agreement also included other Falconbridge tenements/tenement applications comprising the Litchfield Project.

Falconbridge (Australia) Pty Limited and its consultants (e.g., White, 2001) identified the Litchfield Block in the Northern Territory as a prospective belt for magmatic Cu-Ni sulfide mineralization related to mafic/ultramafic intrusives. The Litchfield Project area is defined as the area 100-300 km SSW of Darwin, containing mapped exposures of Proterozoic Wangi Basics. These potential host rocks occur on major NNE-SSW trending structures, (and fault splays associated with those main structures) that extend to the SSE towards the Halls Creek Block in WA (**Figure 2**).

Various magnetic/gravity images and regional geological maps indicate that the NNE-trending structures and associated (nickel-bearing) ultramafic and mafic intrusives in the Halls Creek Block continue to the NNE into the Litchfield area of the NT. The Halls Creek Block is considered to be highly prospective for Ni sulfide mineralisation and contains some defined (sub-economic) Ni-PGE resources (e.g. Sally Malay). The Argyle diamond mine also occurs along the Halls Creek Fault and therefore the Litchfield area is also prospective for diamonds.

Unlike the Halls Creek area, the Litchfield Block has not been widely explored for Cu-Ni sulfide mineralisation, and no Cu-Ni-PGE resources have been discovered to date.

This report summarises the work carried out in the general tenement area for the period ended 13 February 2004.

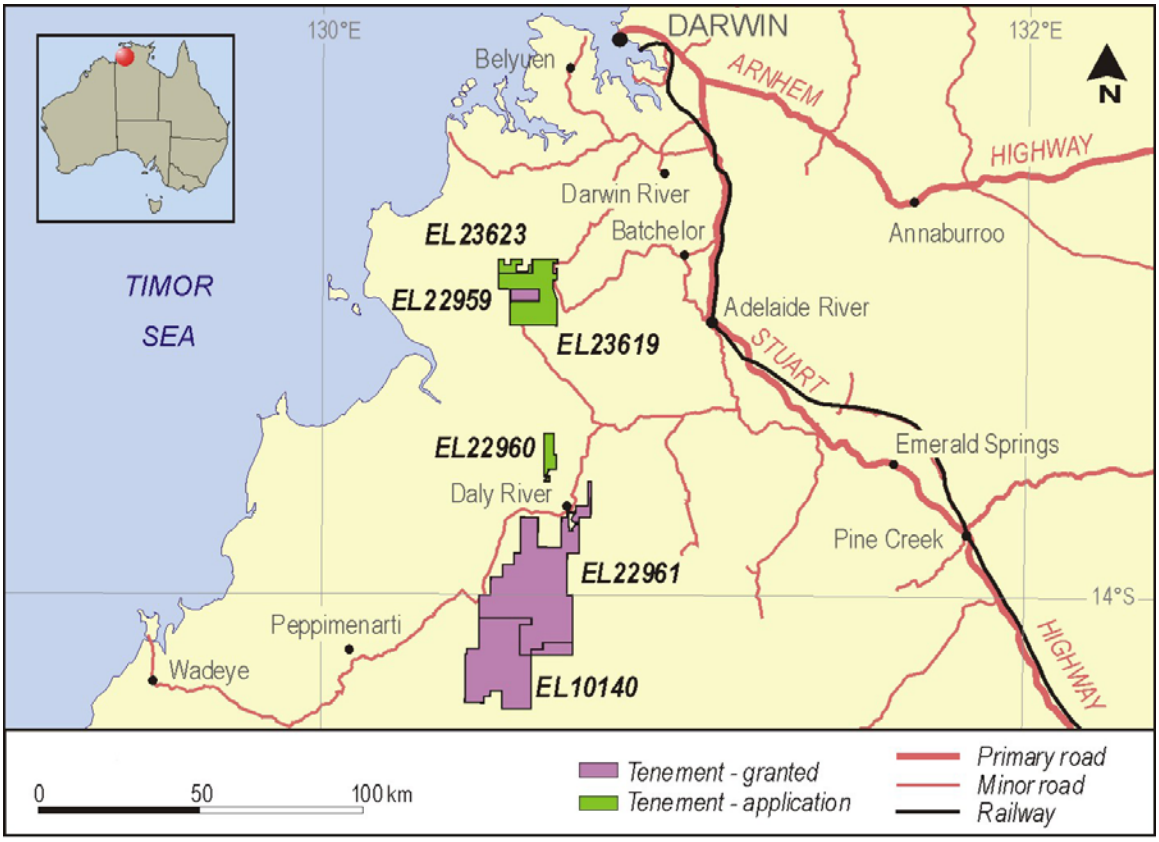

Figure 1. Litchfield project location.

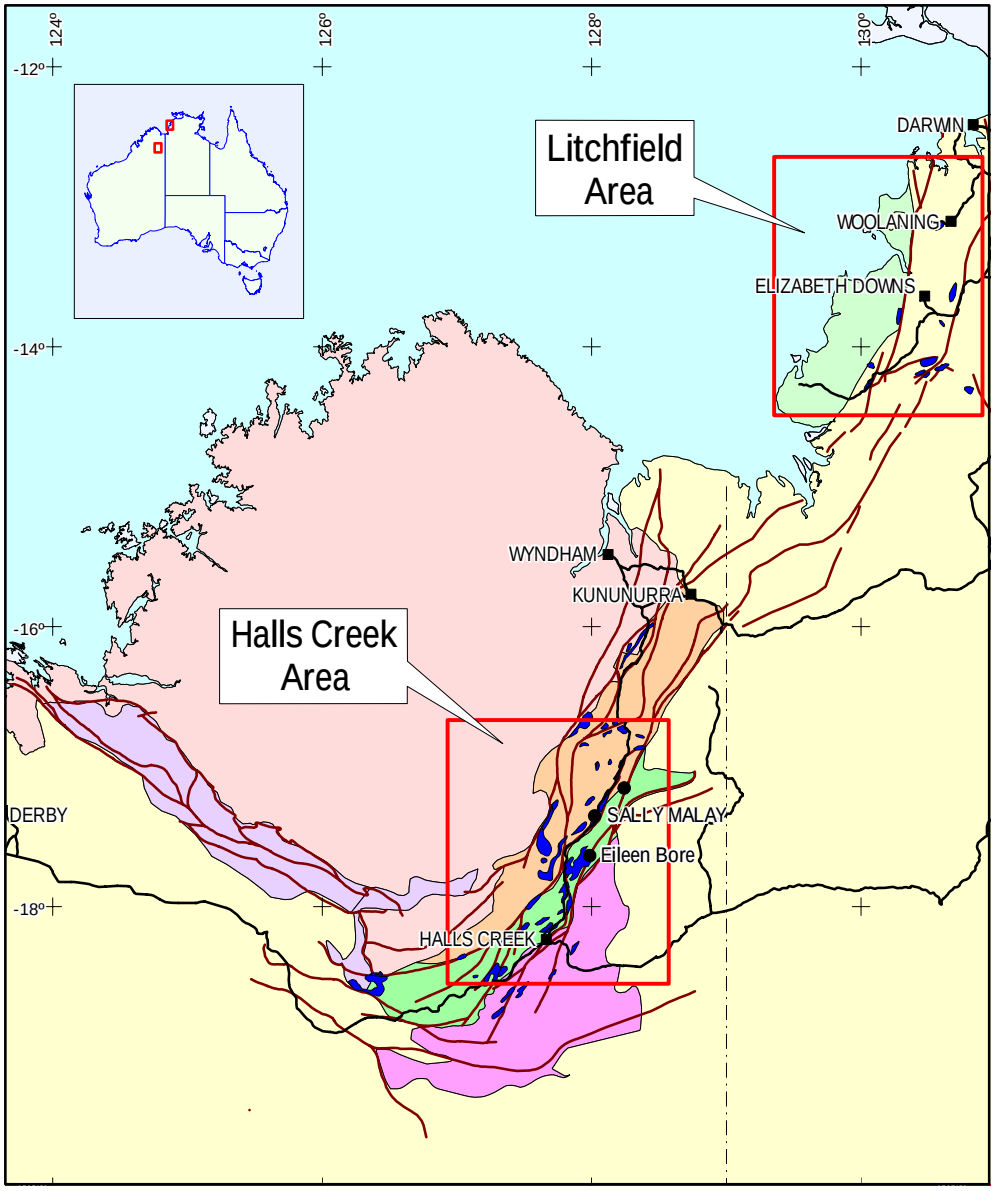

Figure 2. Location of Litchfield Area with respect to the prospective Halls Creek Area

2. TENEMENT INFORMATION

EL 10140 of 154 sub-blocks was granted to Corporate Developments on 14 February 2003 for a period of six years. Subsequently, Falconbridge obtained an option agreement over the tenement in order to undertake exploration work. This option agreement was transferred to Discovery Nickel Limited under a Terms Of Agreement dated 15 October 2003 that covered all of Falconbridge's tenements on the Litchfield Project. Tenement details are given in **Table 1**.

Table 1. Tenement Details

EL	Sub-blocks	Grant Date	Expiry Date	Expenditure Commitment Yr 1
10140	154	14.02.03	13.02.09	$20000

3. REGIONAL GEOLOGY

The Litchfield Province is part of the western Pine Creek Inlier and southern extensions and is correlated with the Halls Creek Mobile Belt of the Kimberleys which contains numerous significant magmatic nickel occurrences and deposits such as Sally Malay. The Province contains Proterozoic to Quaternary geological units, including Proterozoic meta-mafic and meta-ultramafic units referred to as the Wangi Basics(**Figure 3**). These mafic and ultramafic rocks are considered to be a likely host for Cu-Ni sulfide mineralization similar to that in the Halls Creek area.

In the tenement area, inliers of Halls Creek Group equivalent metasediments (Myra Falls Metamorphics and Nourlangie Schist), younger Palaeoproterozoic sediments of the Tolmer Group and Palaeoproterozoic granite (Mount Litchfield Granite) are represented together with one large body of mafic-ultramafic intrusive (Sandy Creek Mafic Complex) and one smaller one (Moyle) along northeast and east northeast structures (Needham and De Ross, 1990, Ahmad, 1998). These may be splays related to a major north northeast structure which cuts through the centre of the tenement. Cretaceous and younger cover is locally developed over these rocks.

Deformation and metamorphism during the Nimbuwah Event (Needham, et al., 1988) is to upper amphibolite facies and is dated at 1870-1855 Ma. Rocks in the Litchfield Province are at least ~1885 Ma in age (Page et al., 1980).

The Proterozoic Wangi Basic rocks contain a range of largely mafic to ultramafic rocks including gabbro, felsic gabbro, dolerite, basalt, anorthosite, diorite, periodotite, pyroxenite, hatrzbergite and troctolite. These rocks have undergone a single episode of high greenschist to low-amphibolite facies metamorphism. They are considered to be mainly intrusive however minor extrusive varieties have been noted due to presence of interpreted pillow lava structures. In the general region, the Wangi Basics have been dated as ~1850-1840 Ma (Page et al. 1984) and have intruded the older rocks of the Hermit Creek Metamorphics (~2400 Ma) and also the Finnis River Group (~1880 Ma).. The Wangi Basics are considered to be slightly older than the Mount Litchfield Granites (~1850-1840 Ma) that are widespread in the Litchfield area. The Wangi Basics have also been correlated with the Zamu Dolerite in the Pine Creek area (Needham et al., 1980) and the Golden Dyke Metadolerites (Maddocks 1985).

Based on a small number of analyses, Maddocks (1985) concluded that the Daly River Metadolerites (Wangi Basics) are probably oceanic tholeiitic basalts. Maddocks suggests

that these “Si-rich” mafic rocks (relative to the other basalts in the Pine Creek Geosyncline) are related to the Golden Dyke Metadolerites (exposed further to the northeast), and were derived from the progressive differentiation of a single basic magma.

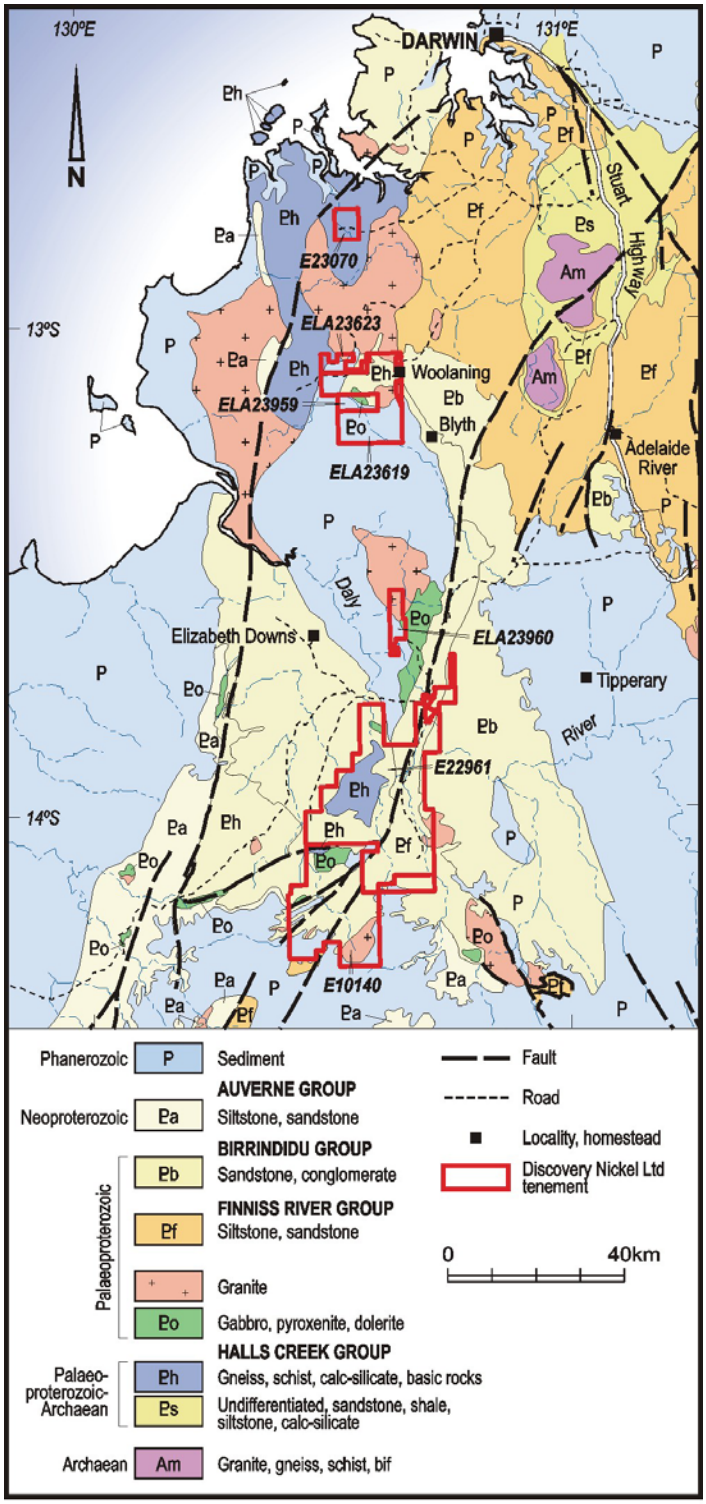

Figure 3. Litchfield Project Regional Geology

4. PREVIOUS EXPLORATION

The Litchfield area has received a large amount of diversified regional-scale (greenfields) exploration work over the past forty years. A large proportion of the previous work was for uranium and diamonds, using regional stream geochemistry, aeromagnetics and radiometrics as the main exploration tools. Only a very small proportion of the previous work was dedicated towards Ni-sulfide exploration. The base metal exploration efforts have been mainly for Cu and Zn within the Proterozoic submarine volcanics, (e.g. along strike of the Daly River Copper Mine). In many cases, no Ni analyses were conducted in many of the previous geochemical surveys.

Specific searches were conducted for the known intrusives in the tenement, the large Sandy Creek Mafic Complex and the smaller Moyle intrusive.

4.1 Open File Data Sandy Creek Mafic Complex

The Sandy Creek Mafic Complex is the largest area of Wangi Basics exposed in the Litchfield Block. The complex shows a number of different mafic and ultramafic rocks including felsic gabbro, mafic gabbro and troctolite, and also minor anorthosite. The complex is approximately 10 km across and is proximal to the Henschke Fault, an E-W cross fault between the major SSW-trending Giants Reef and Tom Turners Faults (**Figure 3).**

Planet Management and Research Pty Ltd held licence 2343 (CR1969/42) over the Sandy Creek Mafic Complex during the late 1960s, and explored the area for Ni-Cu. Planet carried out some geochemical sampling and ground magnetic work and identified three target areas. Follow-up work was recommended but never carried out.

Suttons Motors in JV with Mobil Energy conducted a regional exploration program during the late 1970s and early 1980s (ELs 1965 and 3023), mainly for stratabound uranium mineralisation. Exploration was also directed towards base metals in places. Work consisted of geological mapping, stream sediment sampling, airborne radiometrics and magnetics. Target areas were followed up with ground geophysics, geochemistry and drilling. The aeromagnetic and stream sediment Ni data highlighted the Sandy Creek Mafic Complex. The area was mapped and rock chip sampled, and ~20 samples were submitted for petrologic analyses. Mobil concluded that the complex had limited potential for Ni, Pt and Cr due to the absence of the following features:
a basal ultramafic unit, compositional layering and compositional trends, cumulate textures, “true” anorthosites, and chromite bands. Mobil suggests that the Cu-Ni anomaly discovered earlier by Planet is in an area of alluvium-soil cover (SW end of complex) is associated with a reversely-polarised magnetic anomaly.

Geopeko entered a JV with Mobil in 1983 and reviewed the area for Ni-Cu. They also concluded that there was little Ni-PGE-Cr potential compared with the Halls Creek area, and therefore the area was not followed up. GEM Minerals also entered a JV with Mobil

in the mid 1980s and carried out regional stream sediment sampling for diamonds. No significant results were obtained.

Carpentaria Gold (MIM) then held the area under EL 4650 until 1990. They carried out exploration mainly for Gold and discovered a number of small prospects around the margins of the mafic complex (Terry's, Specky Creek, Bubbles Prospects). Carpentaria carried out regional stream sediment surveys, and detailed work (mainly at Terrys Prospect) including soils, costeaning, ground magnetics, IP and significant drilling.

In 1989, Eupene Exploration Enterprises published a document on PGE Metals in the Northern Teritiory for the NT Geological Survey. The document outlines the geology over the Sandy Creek Mafic Complex and quotes some anomalous geochemical results (maximum 50 ppb Pt from microtroctolite and anomalous Ni, Cu). Although the complex lacks distinct compositional layering, the authors believe that the identification of different compositional zones suggests that the complex has some potential for PGE mineralisation and is worthy of further investigations.

Corporate Developments then held the area from 1991 to 1997 (EL 7580 - Wingate) and followed up the main Au prospects identified by Carpentaria. This company carried out mapping, ground geophysics, soils and auger sampling. They tested parts of the reversely polarised aeromagnetic anomaly noted by Planet with soil sampling and IP. The results indicated anomalous Ni geochemistry and a weak sulfide (IP) response. Corporate Developments did not further test this target, and currently hold a new application over the area.

In 1995, Playford Resources held the ground on the western side of the complex (EL 8569), adjacent to ground held by Corporate Developments. Playford carried out minor stream sampling for gold. Their tenement covered part of the reversely polarised aeromagnetic anomaly on the SW side of the complex. Gold assays were insignificant and no further work was carried out.

In summary, the Sandy Creek Mafic Complex shows some prospectivity for Ni-sulfide mineralisation (i.e. anomalous stream/soil Ni geochemistry and weak IP responses). The complex covers a relatively large area to explore (10 km across) and occurs in a favourable structural (possibly dilational) setting. Previous work has not included any EM or drilling.

4.2 Open File Data Moyle Intrusive

The Molye area occurs approximately 10 km to the SW of the Sandy Creek Mafic Complex along SW fault splays associated with the Giants Reef and Henschke Faults (**Figure 3**). Relatively small areas of Wangi Basics (largely basalt and gabbro) occur along the faults. The area between the Sandy Creek Mafic Complex and the Moyle exposures is largely covered, but also includes other Proterozoic units.

As with the Sandy Creek Mafic Complex, the Moyle area was also covered by regional efforts undertaken by Mobil/Suttons and Carpentaria during the 1980s. Mobil carried out some drilling in the area intersecting basalt with up to 1% pyrite (holes CPD5, 6, 7).

More detailed exploration was carried out by RGC in the early 1990s (EL 6918), with exploration directed towards locating VHMS mineralisation associated with the Proterozoic submarine Berinka Volcanics. The RGC program included regional stream sediment sampling, rock chip sampling, regional airborne EM (Input), regional gravity (4 x 4 km), and several ground geophysical techniques. RGC were focused towards classic VHMS targets and did not assay any geochemical samples for Ni.

In the mid 1990s, CRA took up this area after assessing the RGC data. CRA were also directed towards locating VHMS mineralisation. After assessing RGCs data, CRA identified 4 conceptual VHMS targets and then flew these areas with 75 Hz Geotem. One prospect was also flown with Dighem. CRA identified two conductors associated with magnetic targets and drill tested these with RC and diamond drilling (7 holes). The diamond holes intersected magnetic basalts with traces of pyrite, pyrrhotite and chalcopyrite. Assays for Ni are insignificant, however, none of the diamond drill core was sampled (only overlying oxidised sequence). The CRA work was immediately to the south of the Sandy Creek Mafic Complex and the Complex was not tested with EM or drillling.

In summary, this area has had a considerable amount of previous exploration. It is considered to have some prospectivity due to its proximity to the Sandy Creek Mafic Complex, however, airborne EM (75 Hz GEOTEM) has been flown over much of the area, and the two best conductors have been tested by drilling. Only minor to trace pyrrhotite-chalcopyrite mineralisation was seen in these holes .

5. EXPLORATION COMPLETED

Work completed has been office based and involved review and compilation of open file reports, review of published literature, regional aeromagnetic, landsat TM and gravity data, a GIS review and planning for the field season.

These confirm the potential of the region for Cu-Ni and the possibilities of covered mafic intrusives along major structures and associated splays.

6. EXPENDITURE

Expenditure for the tenement for the twelve months is listed in **Table 2**.

Table 2. Expenditure Details

Salaries	5, 808
Consultants - legal	6, 519
Consultants - project	144
Property maintenance	894
Option payments	10, 000
Administration and overheads	3, 505
TOTAL	**$26, 869**

A budget of approximately $50, 000 is proposed for expenditure in the second year of tenure dependent on results**.**

7. CONCLUSIONS AND RECOMMENDATIONS

The tenement is located in an interesting structural position as a continuation of the prospective Halls Creek Province. The Cu-Ni potential is high and has not been downgraded by the diversity of previous exploration. Whole rock geochemistry of the outcropping mafic/ultramafics (and core where available) is recommended to establish degree of crustal contamination and sulphur saturation of these rocks. Airborne EM in structural corridors that contain the known mafic/ultramafic intrusives would be the best approach to define targets for drilling. Soil sampling may be appropriate across defined targets (dependent on cover) to better quantify any conductive response prior to ground EM and any drill testing.

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