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*Canadian Malartic Corporation*

Report on Prospecting in Claim 4273192  
on the Federal Mine Property  
Teck Township  
Larder Lake Mining Division

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**Christopher Clarke M.Sc., P.Ge**

*November 18, 2016*

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## **Introduction**

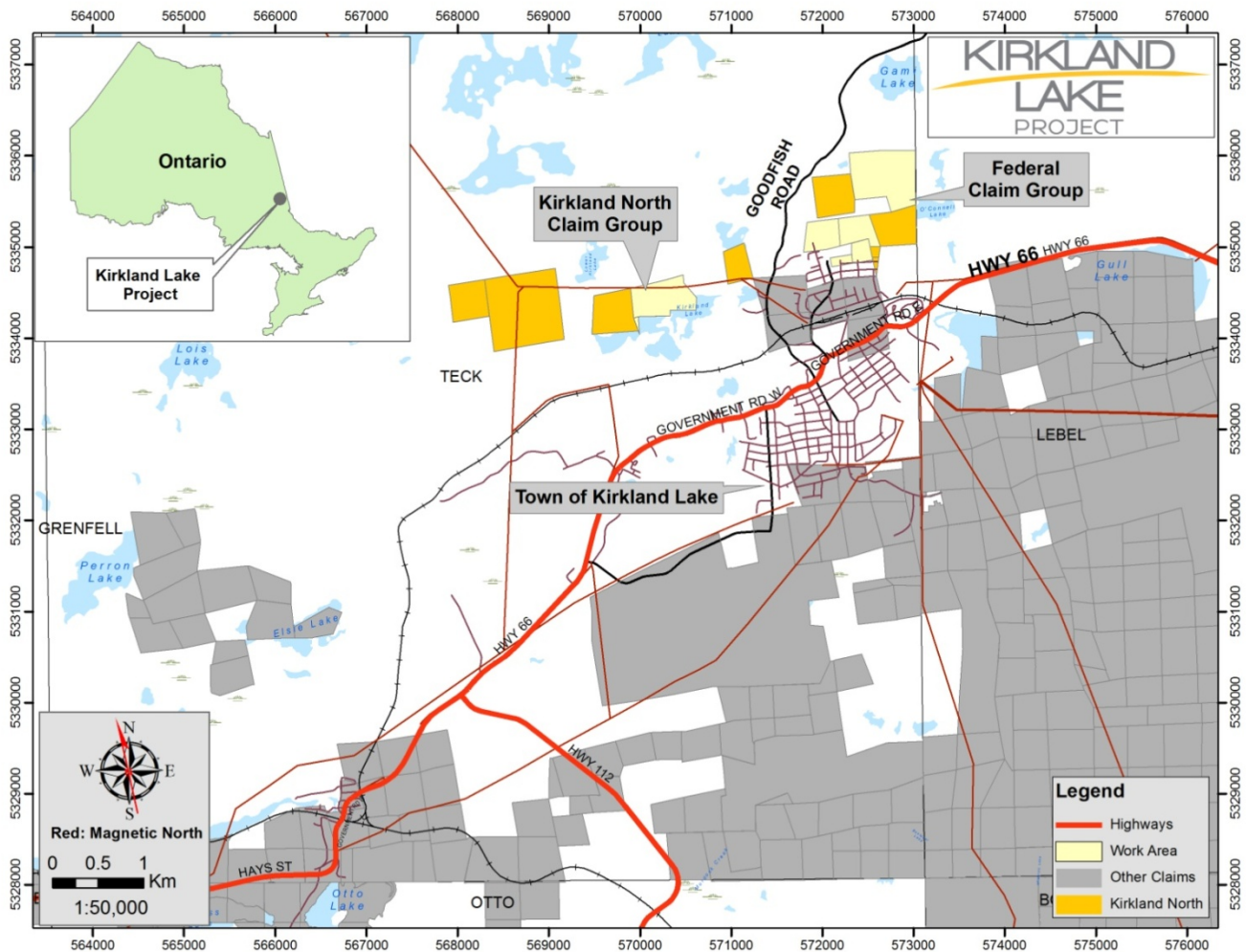
This report is written for submission to the Ministry of Northern Development and Mines to fulfill the assessment work requirements for part of the historic Federal Mine property. This report summarizes the activities completed in the period of November 18, 2016 on the unpatented mining claim 4273192. This report was prepared by Canadian Malartic Corporation (CMC) geologist Christopher A. L. Clarke, P.Geo under supervision from Mark Masson, P.Geo.

## **Summary**

The claim 4273192 in Teck Township is associated with the historic Federal Mine property, whose shaft is located on claim 1222223. The claim is held by Canadian Malartic Corporation and is contiguous with other claims on the Federal Mine property which Canadian Malartic also holds. Claim 4273192 was staked on May 6, 2015. Workers for Canadian Malartic conducted a prospecting and sampling program to fulfill the work requirements of the claim. Historically, the Federal Mine property has been the focus of extensive exploration both above and below ground.

## **Property Descriptions and Access**

Claim 4273192 is situated along the north-eastern edge of the Town of Kirkland Lake in Teck Township, District of Timiskaming, Larder Lake Mining Division, Ontario, Canada (Figure 1) and is roughly 0.7 hectares in size. The claim 4273192 can be accessed via Wishman Street, Federal Street, Grierson Road or Foss Avenue and is within a residential neighbourhood in Kirkland Lake. The surface right owner is the Town of Kirkland Lake (SRO claim #6527).



**Figure 1: Location of Teck Township relative to the Province of Ontario and Canadian Malartic Claims (shaded grey); the orange/pale orange claims represent the Kirkland North/Federal claim group of which claim 4273192 is a part of.**

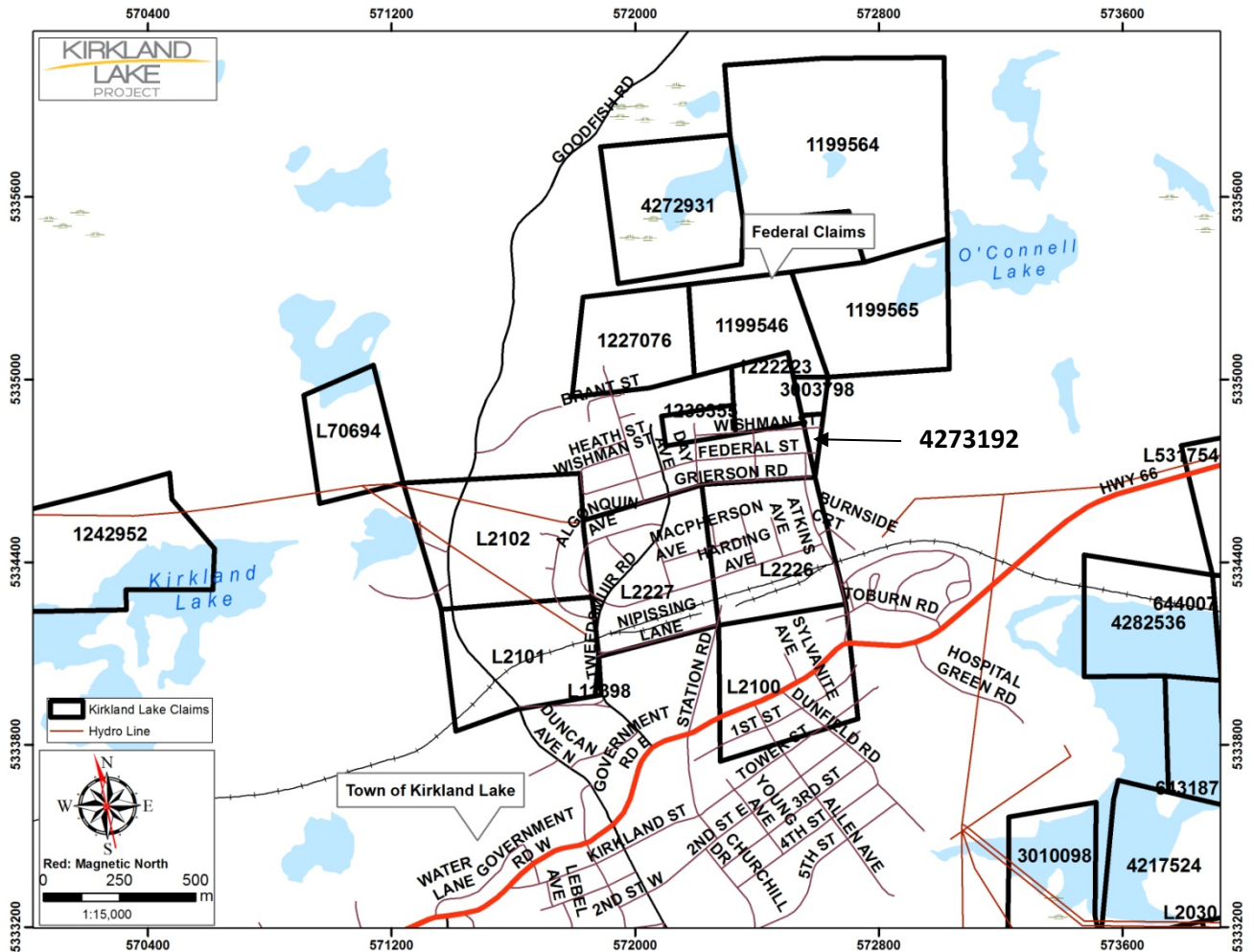


Figure 2: A 1:15,000 scale map showing MNDM listed mining claims for Teck Township in the area of the Municipality of Kirkland Lake.

## History

Claim 4273192 was staked on May 6, 2015. The most recent work conducted on the claim was reported in assessment file 42A01NE2038 which was filed in 2000 (including claim 1222221). The property has been part of previous claims and an active Mine. The claims to the north: 4272931 & 1199564 were reported by Canadian Malartic Corporation in 2015-2016 and consisted of prospecting and geochemical sampling. Work was also conducted by Vault Minerals in 2006 and published in 2013 under assessment files AFRI# 20000001685 and 20000001686. The Vault Minerals work was designed to

assess the Kirkland Basin and Federal Kirkland historic properties. Vault Minerals was 100% acquired by Queenston Mining Inc. which in turn was 100% acquired by Osisko Mining Ltd and was then acquired by a 50-50% agreement between Agnico Eagle and Yamana Gold who formed the Osisko properties into the Canadian Malartic Corporation. Vault Minerals conducted a mapping and sampling program on their claims on the Federal Mine property.

Historically, The Federal Mine property has had extensive and near continuous work conducted on it, most notably a 745 ft shaft which is currently capped in the northeast corner of claim #1222223. The underground workings consist of four levels situated at 200, 400, 500 and 700 feet below surface with pervasive drifting. Another notable period in the Federal Mine property was in 1986 and 1987, when a drill program was initiated by Goldhunter Explorations Inc. The drill program consisted of 27 diamond drill holes primarily targeting the mine workings on claim #1222223 and 1227076.

The historic drilling and stripping programs listed by Goldhunter Explorations Inc. or other assessment files appears to have been concentrated in claim 1222223. Only limited prospecting and mapping appears to have been reported on the claim area.

## **Property Geology**

The claim 4273192 is situated within the prolific Kirkland Lake gold camp which is part of the Abitibi Greenstone belt in the Superior Province. The Abitibi Greenstone belt is Archean in age and is composed of greenschist facies volcanic and sedimentary rocks with localized syn-post tectonic intrusions of granitic to dioritic dykes to batholiths. The Abitibi Greenstone belt forms an east plunging synclinorium between the Abitibi batholith, northeast of Timmins and the Round Lake batholith, south of Kirkland Lake. Mesozoic aged kimberlitic dykes are also present in the Kirkland Lake Camp but are rare in occurrence. The Kirkland Lake Camp hosts Keewatin (2750-2700 Ma) and Timiskaming (2690-

2670 Ma) aged assemblages associated with the Abitibi Greenstone belt. The Keewatin assemblages within the Kirkland Lake Camp are composed of the greenschist facies volcano-sedimentary lithologies of the: Pacaud, Deloro, Stoughton-Roquemaure, Kidd-Munro, Tisdale, Kinojevis, and Blake River groups. The Timiskaming assemblage within the Kirkland Lake camp is the Timiskaming group, noted for its non-marine, variably metamorphosed, pyroclastic and clastic-sedimentary (conglomerate) lithological units. Timiskaming group meta-sedimentary rocks form along the north facing side of the Larder Lake-Cadillac Deformation Zone (LLCDZ), a major east-west structural control associated with chemical alteration and sulphide mineralization. The LLCDZ length coincides with a folded and deformed sinuous belt of sedimentary rocks of Timiskaming age.

Claim 1239355 largely hosts intrusive volcanic units which are generally described as augite syenites, porphyries, trachytes and lamprophyres; Timiskaming meta-sediments (conglomerate-wacke) are also present as small slivers (Figure 3). The inferred contact from Ontario Geological Survey maps is striking northeast, through the centre of the Federal property. Both map units host various degrees of structural deformation from brittle (faults) to ductile (foliation/shearing); notably the north-south Sylvanite fault passes through the centre of the claim 1227076.

To the North of the claims are a series of Keewatin aged basic volcanics (greenstone) of the Kinojevis Group. To the south are a series of Timiskaming meta-sedimentary units and felsic-intermediate intrusives (syenite-diorite).



## General Description of Local Rock Units

### *Meta-Sediment: Greywacke*

**Grain Size:** Fine grained (fine sand sized grains)

**Texture:** massive with conchoidal breaks

**Alteration:** Generally fresh with weak to moderate carbonate (ankerite?) alteration

**Mineralization:** <1-1mm anhedral pyrite disseminated within matrix

**Magnetism:** non-magnetic

**Veining:** There are <1% abundant, <1-3mm thick, milky quartz-carbonate stringers

### *Mafic Syenite*

**Grain Size:** Fine-medium grained (euhedral grains) with 2-3mm augite grains

**Texture:** massive

**Alteration:** Generally fresh with weak to moderate carbonate (calcite/ankerite) alteration

**Mineralization:** non-visible

**Magnetism:** weak to moderate

**Veining:** There are <1% abundant, <1-3mm thick, milky quartz-carbonate stringers

### *Conglomerate*

**Grain size:** Polymict pebble to cobble sized clasts matrix supported in a sand-sized matrix

**Texture:** moderately sorted relatively sharp grades into greywacke unit

**Alteration:** bleached white-pink weathering colour, weak patches of red hematite alteration along joints

**Mineralization:** non-visible

**Magnetism:** non-magnetic

**Veining:** isolated, sub-planar stringers of <2mm thick quartz-carbonate which are <<1% abundant.

### *Mafic Volcanic*

**Grain size:** Aphanitic

**Texture:** Massive

**Alteration:** 1-2mm rounded blebs of green chlorite alteration

**Mineralization:** non-visible

**Magnetism:** non-weak magnetic

**Veining:** isolated, sub-planar stringers of <2mm thick quartz-carbonate which are <<1% abundant.

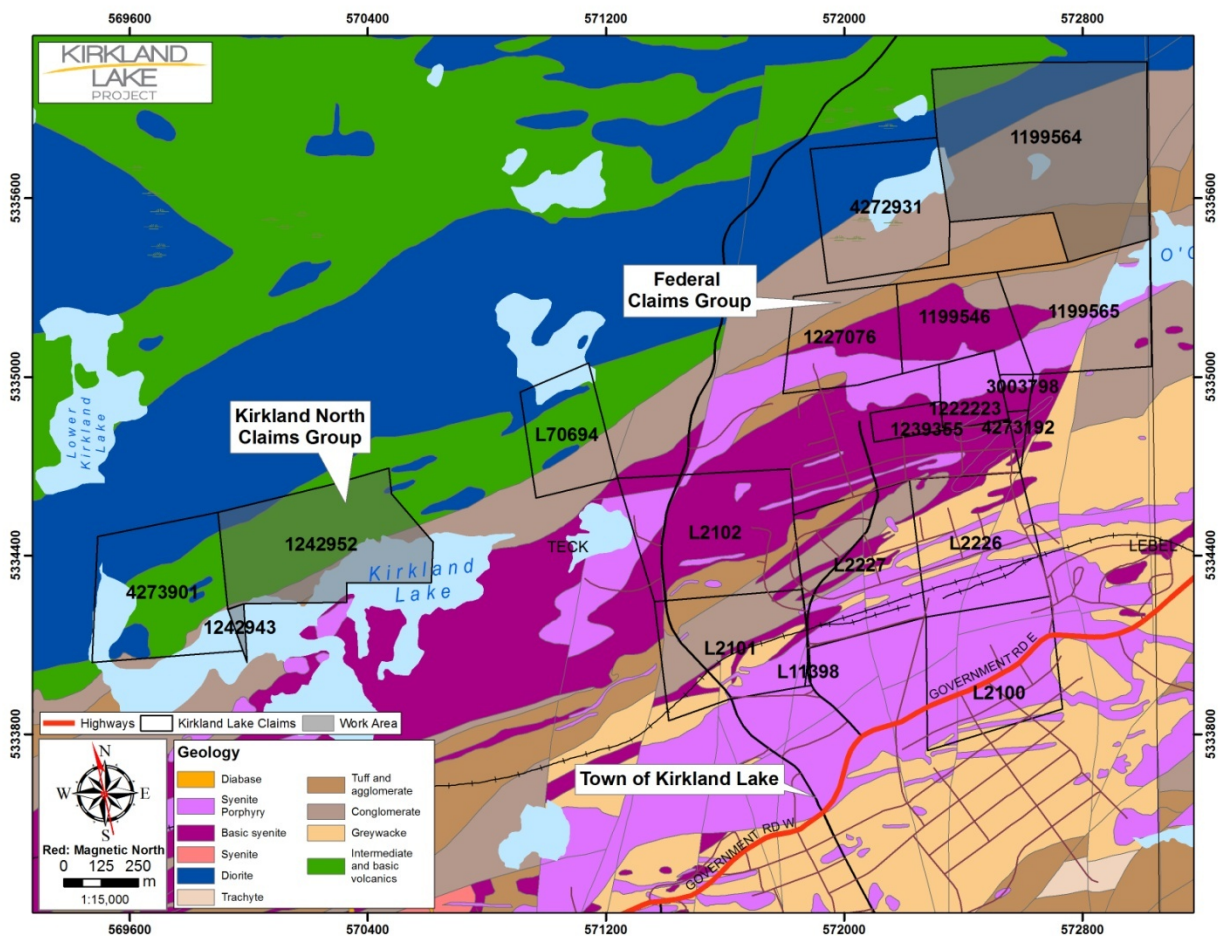


Figure 3: Local Geology in the Claim area north of Kirkland Lake. The map shows the bands of Timiskaming meta-sediments intruded with felsic-intermediate intrusives and Keewatin volcanics in contact to the north of the Timiskaming sediments.

## **Description of Recent Work**

The work conducted was prospecting, sampling and limited mapping. The goal of the work was to gain an understanding of the geology of the claim, identify historic trenches and pits, map outcrops, gather samples for gold and major-trace element abundances, and recording the locations using a GPS. The entirety of the claim 4273192 was composed of residential housing and associated modification of the landscape (lawns, paved drive ways, roads, etc). Work was restricted to front and back yards and dependent on the co-operation/permission of home-owners in allowing access to their lots. One notable outcrop and three lesser outcrops were observed. The notable outcrop was located in the backyard of 6 Wishman Street and was a 5x10m mound of outcrop 1-1.5m high and composed of greywacke with several beds of conglomerate; the outcrop had been modified into a fire pit by the homeowner so no sampling was performed. The three lesser outcrops were each: greywacke, mafic volcanics and Kirkland Lake style 'mafic syenite'; the greywacke and syenite outcrops were polished and flat while the mafic volcanic outcrop was a 2m in diameter and 1m high plug with numerous BQ sized drill holes within it. No significant piece of the lesser outcrops could be adequately broken off for sampling.

## **Conclusions and Recommendations**

The density of housing and the effects of human habitation on the landscape make any worthwhile surface prospecting efforts redundant for this claim. It is recommended any further work be limited to drilling or subsurface work if and when the geological/economic case for said work can be justified.

Respectfully Submitted,  
Christopher A. L. Clarke

## Data

*The work was carried out as follows:*

**Field:**

Prospecting      November 18, 2016

**Office:**

Report            November 21, 2016

*Persons who carried out the work:*

**Prospecting:**

Christopher A.L. Clarke      Larder Lake, On

Leah Zapotochny              Kirkland Lake, On

**Report:**

Christopher A.L. Clarke

*Sample List (UTM zone 17 NAD 83)*

*No Samples were taken*

Waypoint	Northing	Easting	Rock Type

**November 18, 2016 – 1 Day Prospecting**

Workers: Christopher Clarke and Leah Zapotochny

Weather: Overcast, cool

We drove to the claim and parked the truck at the eastern end of the claim on Federal Street. We then walked down the south side of Foss Avenue looking for any outcrop in front lawns and also knocked on doors to obtain permission from the residents to observe their backyards for outcrop. Most residents gave permission or were not at home in which case we moved onto the next lot. We arrived at the south end of the claim and attempted to locate the claim post in a homeowner's lot but could not locate it. At this point we walked north along Foss Avenue past Federal street and located two outcrops: one (mafic syenite) in the driveway of 19 Foss Ave and the other (mafic volcanic) in the backyard of 21 Foss Ave. After noting these outcrops we returned to Foss Ave until we reached Wishman St and headed east to the claim boundary. An outcrop of altered greywacke, 50cm in diameter, was observed in the front yard of 4 Wishman St. At this point we moved to 6 Wishman St where we inferred the location of the northwest corner of the claim would be located, namely in the backyard of this address. After obtaining entry into the backyard from the homeowner we located a large outcrop of greyacke and conglomerate at the northern edge of the lot. The outcrop had been modified into a porch/firepit and as such we limited ourselves to non-invasive observations. After recording our observations we returned to the truck and left the claim.

Prospecting Diary for Christopher Clarke, B.Sc, M.Sc, P.Geo

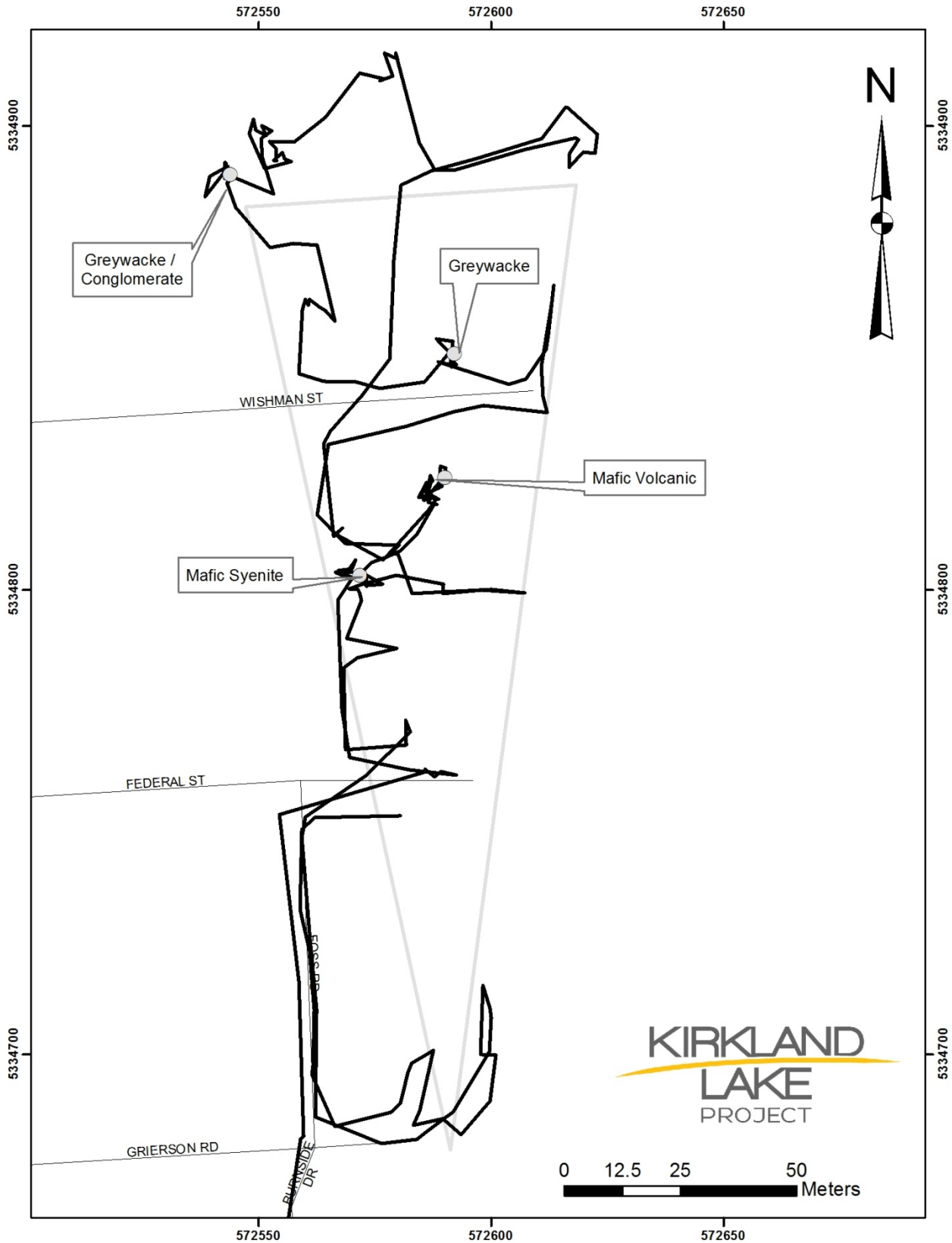


Figure 4: Map showing the GPS tracks and waypoints for the worker's traverses on November 18, 2016 for claim 4273192.





Figure 5: A 1:1,000 scale satellite map showing access and traverse tracks for claim 4273192.