Occurrence Details

Occurrence Number: 115I 118
Occurrence Name: Carmacks Copper Zone 11
Occurrence Type: Hard-rock
Status: Prospect
Date printed: 4/28/2025 7:55:39 PM

General Information

Secondary Commodities: copper, gold, silver
Aliases: Carmacks Cu Zone 11
Deposit Type(s): Porphyry Alkalic Cu-Au
Location(s): 62°19'26.4" N - -136°44'9.6" W
NTS Mapsheet(s): 115I07
Location Comments: Location from georeferenced maps and google earth
Hand Samples Available: No
Last Reviewed:

Capsule

Work History

The Carmacks Copper property (aka Williams Creek property) was originally staked as Boy cl 1-150 (Y51099) in Mar/70 by A. Arsenault & G. Wing and optioned in July by Dawson Range Joint Venture (Straus Exploration Inc, Great Plains Development Corporation, Marietta Resources International Ltd, Molybdenum Corporation of America and Trojan Consolidated Mines Ltd).

The main showing (No. 1 zone) was found by prospecting in Aug/70 and explored with bulldozer trenching and 2 x-ray holes (31.4 m) in 1970; soil sampling, I.P., EM and magnetometer surveying, bulldozer trenching, road construction and drilling of 25 holes (5 583 m) in 1971; bulldozer trenching and drilling of 8 holes for 1 468 m in 1972; and a legal survey in 1974. Great Plains dropped its interest in 1971. The Trojan interest was transferred to BX Development Ltd in late 1972.

In 1982, the property was purchased by Archer, Cathro and Associates (1981) Ltd which conducted bulldozer trenching in 1987 and optioned the property to Western Copper Holdings Ltd in Aug/89. Western Copper began baseline environmental studies and farmed out a 50% interest to Thermal Exploration Ltd. The joint venture added W cl 1-49 (YB26708) in Sep/89, and shipped 2 composite bulk samples totaling 2 700 kg for metallurgical testing, and drilled 3 holes (321.6 m) in 1990. A major exploration program in 1991 included drilling 35 holes (3 532 m); excavating twenty-two trenches (1 856 m); one hectare of stripping at the south end of the No. 1 Zone; 83.7 km of VLF-EM and magnetometer surveying; and baseline environmental studies commenced.

WC cl 1-76 (YB36689) and War cl 38-50 (YB36765) were tied on to the northwest in Feb/92, joining the Williams Creek property to the Stu property (Minfile Occurrence #115I 011). W cl 87-99 (YB36925) were added to the south side of the property in Jul/92. The 1992 exploration program included 6.5 km of trenching, diamond drilling of 11 holes (1164 m), percussion drilling of 11 holes, baseline environmental studies and numerous engineering, geotechnical and metallurgical studies. A 300 tonne test heap leach (grading 1.36% copper) and pilot plant was operated from September to Dec/93. Numerous surviving Dun, AC , W, X, and War claims were transferred to Western Copper Holdings Ltd in Apr/93.

In Sep/93 Western Copper Holdings contracted Kilborn Engineering Pacific Ltd to carry out a mining feasibility study of the Williams Creek property. In 1994 Western Copper began the permitting process and held preliminary economic development discussions with both the Yukon Territorial Government and the Little Salmon Carmacks First Nations. In Sep/94 Kilborn Engineering returned a positive feasibility study and Western Copper announced their intentions to place the property into production.

In Apr/95 Western Copper Holdings and Thermal Exploration announced their intention to amalgamate with Western Copper as the continuing entity. In Sep/95 Prime Equities International reached an agreement with Teck to acquire a controlling interest in Western Copper and the Williams Creek property. Prime announced that once the transaction closed it would take an active role in the management of Western Copper and assist it in raising capital to bring the Williams Creek property into production. That year, the company drilled 10 geotechnical holes for 185 m. In 1996, the company drilled 18 geotechnical and monitoring holes totaling 920 m.

Western Copper Holdings continued geotechnical and engineering studies under the review process of the Canadian Environmental Assessment Act from 1996-1998. During 1997 the company also cleared the access road, leach pad and plant site and contracted Kilborn Engineering Pacific Ltd to carry out run-of-mine bulk sampling of the No. 1 zone 1 deposit. Leaching and decommissioning test work was then carried out by Beattie Consulting Ltd to provide a basis for predicting copper recovery and neutralization requirements.

Western Copper Holdings changed its name to Western Silver Corporation in March 2003. In May/2006, Glamis Gold Ltd bought out Western Silver and spun off the property to a new company, Western Copper Corporation. In 2006 Western Copper drilled 34 diamond drill holes (7 100 m), 61 rotary air blast holes (1 201 m) and re-initiated environmental baseline studies.

Western Copper released an independent feasibility study in Apr/2007 which proposed an open-pit mine with acid heap leach and solvent extraction and electrowinning. Production was projected at 1.73 million tonnes of ore per year over a six-year mine life. The company's 2007 exploration program consisted of 17 830 m of diamond drilling in 123 holes, 846 m of geotechnical drilling in 34 holes, 31.7 line kilometres of induced polarization surveys and surveying of all drill hole locations including all the historical drill holes, geotechnical holes and rotary air blast holes.

In Nov/2007 Western Copper released an updated resource estimate for zones 1, 4 and 7 of the Carmacks Copper Project. Using a 0.25% total copper cut-off grade Wardrop Engineering Inc calculated that the project hosts an Oxide Resource Estimate of 11 980 00 tonnes in the Measured and Indicated categories containing 1.06 % total copper, 0.86 % oxide copper, 0.46 g/t gold and 4.6 g/t silver. The Sulphide Resource Estimate equals 4 340 000 tonne in the measured and indicated categories containing 0.75% total copper, 0.03 % oxide copper, 0.21 g/t gold and 2.3 g/t silver.

The Carmacks Copper Project received its Yukon Environmental and Socio-economic Assessment Board (YESAB) final Screening Report in Jul/2008 which recommended approval of the project subject to terms and conditions of the mitigative factors outlined in the report. In Sep/2008 the Yukon Government issued a Decision Document agreeing with the recommendations of the Yukon Environmental and Socio-economic Assessment Board that the Carmacks Copper Project proceed, signalling the completion of assessment process under the Yukon Environmental and Socio-economic Assessment Act. Geotechnical drilling, engineering studies and water sampling were conducted in 2008 in preparation for mine development. In Dec/2008 the company submitted an updated Water Use License application to the Yukon Water Board. In addition the company filed updated Quartz Mining License application with the Yukon Government's Department of Energy, Mines and Resources. In 2008, the company drilled 9 geotechnical and water monitoring holes for 1 897 m.

In Apr/2009 Western Copper received a Quartz Mining License from the Yukon Government for the Carmacks Copper Project. This license permits the company to build the Carmacks

Copper Mine and establishes many of the terms and conditions under which the mine will operate.

In May, 2010, the company was notified by the Yukon Water Board that the Water Use License application had been denied.

In Oct/2011 Western Copper Corp changed name to Western Copper and Gold Corporation and spun out Copper North Mining Corp, which retained the Carmacks Copper property.

In 2014, the company completed trenching and 1 082 m of diamond drilling in 15 holes. In 2015, they completed ground magnetic surveying, trenching and 3 270 m of diamond drilling in 34 diamond drill holes. In 2016, they completed soil sampling, trenching and initiated a PEA. In 2017 they completed 4 000 m of diamond drilling in 32 diamond drill holes.

In 2016, the company completed a Preliminary Economic Study for the site. The study was performed by JDS Energy and Mining Ltd.

The No. 11 Zone was originally discovered by soil sampling and trenching in 1972.

Carmacks Copper is one of several metamorphosed copper deposits which occur along the boundary between the Yukon Tanana and Northern Stikine terranes. The Carmacks Copper property hosts 15 similar occurrences and the large Carmacks-Minto belt hosts others which resemble Carmacks Copper including Stu (Minfile Occurrence #115I 011), Def (Minfile Occurrence #115I 021) and Minto (Minfile Occurrence #115I 022). A study by N. Kovacs, et. al. (2016) on the Carmacks Copper deposit provides new insight into the paragenesis of these occurrences. According to Kovacs, et. al., Carmacks Copper and the associated occurrences are hosted in compositionally heterogeneous, foliated and folded, and variably migmatitic metamorphic rocks, which occur as elongate, NNW-trending inliers in Early Jurassic granitoids of the Granite Mountain batholith. Hypogene copper mineralization is restricted to metamorphic host rocks, and occurs both as foliation-parallel chalcopyrite-dominant stringers in schistose rocks, and as net-textured bornite-chalcopyrite-dominant sulphides in the migmatitic rocks prevalent along the eastern margin of the metamorphic inlier. The latter style of mineralization is interpreted to form from a sulphide melt phase generated during partial melting of a previously mineralized protolith, during emplacement of the Granite Mountain batholith.

The Carmacks Copper No. 1 zone deposit extends over a 700 m strike length and at least 450 m down dip. At its south end the No. 1 zone appears to splay into the No. 7 and 7A zones and is pulled apart, or fault offset into No. 4 zone. The deposit is open at depth and is oxidized to approximately 230 m in depth. The copper mineralization in the oxidized portion of the deposit is predominantly malachite, tennorite and azurite.

In the northern half of the No. 1 zone, copper grades are higher in the footwall relative to the hanging wall. Oxide copper grades increases with depth in both the footwall and hanging wall. Gold values are higher in the northern half of the zone. They average 0.75 g/t compared with 0.27 g/t in the south half. There is no apparent increase in values with depth and the highest grade gold values are not associated with the highest copper values. This lack of increase in gold values with depth suggests that gold distribution reflects primary distribution rather than a secondary distribution, such as the oxide copper values. There is no association of copper or gold values with rock type, mafic mineral content or grain size. The majority of gold occurs in a higher grade zone located between sections 1700 N and section 1200 N.

The general lack or very low quartz content and high mafic content suggest a volcanic origin for the gneiss. An andesitic to basaltic pyroclastic volcanic, probably tuffaceous, agglomerate of breccia precursor rock with some sedimentary re-working is considered most likely. Post mineralization aplite and pegmatites are common. They range in thickness from a few centimetres up to three meters. Quartz vein are uncommon and average two to five centimetres in thickness. Thin mafic dykes that were feeders for Carmacks Group volcanics are also uncommon. The only copper mineralization in these dykes and veins is non-sulphide secondary copper in aplite and pegmatite.

The character of the No. 1 zone changes along strike leading to a division into northern and southern halves. The northern half is more regular in thickness, dip angle, width and downdip characteristics. It pinches out to the north. The southern half splays into irregular intercalations and appears to terminate against sub-parallel faults down dip. The south end appears to splay into the No. 7, 7A zones and is pulled apart or fault offset into the No. 4 zone. The copper-gold mineralization in N0. 7 and 7A zones are similar to zone 1, with the exception that in some locations the depth of oxidation is shallower.

The No. 11 zone contains is covered by overburden and was discovered by soil sampling and subsequent trenching. The zone measures 100 m long as defined by trenching. Mineralization occurs as minor malachite, similar to zones 9 and 10. No sulphide minerals were observed in the trenches.

The 2016 PEA was completed by JDS Mining and Energy Inc. and included an updated resource calculation on zones 1, 4, 7, 7A, 13, 14 and 2000S. The update resource was divided between Oxide-Transition mineralization and Sulphide mineralization. The Oxide-Transition mineralization contained a Measured and Indicated resource of 15 690 000 tonnes with 0.94% total Cu, 0.74% weak acid soluble Cu, 0.38 g/t Au and 3.97 g/t Ag. The Oxide-Transition mineralization Inferred resource was 913 000 tonnes with 0.45% total Cu, 0.3% weak acid soluble Cu, 0.12 g/t Au and 1.9 g/t Ag. The Sulphide mineralization contained a Measured and Indicated resource of 8 068 000 tonnes with 0.68% total Cu, 0.05% weak acid soluble Cu, 0.18 g/t Au and 2.33 g/t Ag. The Sulphide mineralization Inferred resource was 8 407 000 tonnes with 0.63% total Cu, 0.3% weak acid soluble Cu, 0.15 g/t Au and 1.99 g/t Ag.

Work History

Date	Work Type	Comment
12/13/1972	Airphotography	
12/13/1972	Geochemistry	
12/13/1972	Geology	
12/13/1972	Other	
12/13/1972	Geochemistry	
12/13/1972	Trenching	

Assessment Reports that overlap occurrence

Report Number	Year	Title	Worktypes	Holes Drilled	Meters Drilled
094984	2007	Assessment Report on the WS TOTAL Claims Target Evaluation Program	Gamma-Ray Spectrometry - Airborne Geophysics, Magnetic - Airborne Geophysics, Rock - Geochemistry, Soil - Geochemistry, Bedrock Mapping - Geology, Prospecting - Other		
093083	1992	Biophysical Assessment Report of Williams Creek	Silt - Geochemistry, Water - Geochemistry, Data Compilation - Pre-existing Data, Biophysical Mapping - Studies, Environmental Assessment/Impact - Studies, Heritage/Archeological - Studies		
060114	1972	Report on 1972 Geochemical Diamond Drilling and Trenching Program-WILLIAMS CREEK Property	Interpretation - Airphotography, Diamond - Drilling, Drill Core - Geochemistry, Soil - Geochemistry, Detailed Bedrock Mapping - Geology, Line Cutting - Other, Mechanical - Trenching	8	1530.71