Occurrence Details

Occurrence Number: 106D 062
Occurrence Name: Gnuckle
Occurrence Type: Hard-rock
Status: Showing
Date printed: 12/16/2025 3:21:08 PM

General Information

Secondary Commodities: silver, uranium
Aliases: Rio, Tva
Deposit Type(s): Iron Oxide Breccias & Veins (Wernecke Breccias)
Location(s): 64°56'36" N - -134°15'47" W
NTS Mapsheet(s): 106D16
Location Comments: .5 Kilometres
Hand Samples Available: Yes
Last Reviewed:

Capsule

Work History

Copper mineralization was discovered here by Cyprus Exploration Corporation Ltd in 1968. Uranium was first recognized by a joint venture between Wernecke Joint Venture (Chevron Canada Ltd & AquitaineCompany of Canada Ltd) & Eldorado Nuclear Ltd, which staked the Gnuckles cl 1-8 (YA5935) in Jul/76 and performed radiometric and geochem surveys and mapping. Eldorado dropped its interest late in the year.
In the summer of 1992 a joint venture group consisting of Pamicon Developments Ltd, Equity Engineering Ltd and Westmin Resources Ltd carried out an preliminary exploration program on Ursus cl 1-14 (YB28574 - Minfile #106D 052) located 2 km to the south. Based on the results of this program the joint venture group staked TVA 1-4 cl (YB29130) 1.5 km to the south in Oct/92. Following completion of a joint exploration program on the Ursus and TVA claims in Jun/93, the joint venture group staked 10 additional TVA claims (YB22511) in Aug/93. The following month Newmont Exploration Ltd conducted an airborne geophysical survey over the area using proprietary company equipment. In Oct/93 the joint venture group added TVA cl 15-22 (YB42309) and Ursus cl 15-18 (YB42305) to its holdings.
In Jan/94 Pamicon and Equity transferred 100% interest in the TVA and Ursus claims to Westmin, which then formed the Fairchild Joint Venture with Newmont. In the summer of 1994 the Fairchild Joint Venture contracted Pamicon and Equity to carry out a program consisting of geological mapping, prospecting and soil sampling on the TVA and Ursus claim groups. In Mar/95 the joint venture added TVA cl 23-38 (YB43923) to its holdings and in Aug/95 drilled 1 diamond drill hole on TVA cl 6.
Westmin Resources was purchased by Boliden Ltd in Mar/98 and changed its name to Boliden Westmin Ltd. By the end of 2002 all of the TVA claims except for TVA cl 1-4 (YB29130) had expired. In Jul/2004 Breakwater Resources Ltd purchased all outstanding shares of Boliden Westmin (Canada) Ltd from parent company Boliden Ltd. Breakwater transferred control of all surviving claims located in the Wernecke Mountains, Yukon (including the 4 surviving TVA claims) to its wholly owned subsidiary NVI Mining Ltd.
In Jan/2006 Fronteer Development Group (80%) and Rimfire Minerals Corporation (20%) signed an agreement with Newmont Exploration Canada and NVI Mining Ltd to purchase all claims and exploration data relating to 700 mineral claims owned by the Fairchild Joint Venture in the Wernecke Mountains, Yukon. Fronteer Development was appointed operator of the project. In the summer of 2006 Fronteer Development flew a airborne gravity survey over their entire claim holdings. In Jun/07 Fronteer Development staked TVA cl 5-43 (YC56076) overtop the previously expired TVA claims. The company drilled 5 diamond drill holes (855m) on the TVA claims later in the year.

Capsule Geology

The region is underlain by a metamorphosed and altered sequence of Early Proterozoic Wernecke Supergroup clastic and carbonate rocks (Fairchild Lake Group, Quartet Group and Gillespie Lake Group, from oldest to youngest) that are intruded by Early to Middle Proterozoic mafic sills and dykes, and cut by Middle Proterozoic Wernecke Breccia. To the east, Wernecke Supergroup rocks are unconformably overlain by Middle Proterozoic Pinguicula Group rocks. According to Thorkelson (2000), Wernecke Breccia development is best modeled as a set of hydrothermal and/or phreatic breccias; brecciation being caused by explosive expansion of volatile-rich fluids. Hunt (2005) attributed Wernecke Breccia formation to periodic over-pressuring of dominantly basinal fluids, which lead to repeated brecciation of host strata and mineral precipitation.
The Wernecke JV reported that brannerite occurs in quartz veins cutting strongly silicified argillite of the Quartet Group near a breccia body. Minor chalcopyrite occurs in veinlets within and peripheral to the breccia. Soil sampling over the breccia returned an average of 410 ppm Cu and 9 ppm Mo.
The claims are located along a regional northwest-southeast trending fault or shear zone that is host to Wernecke breccia zones on the Cleveland, Slats, Ursus/TVA and other claim groups. This zone is interpreted to be an early regional transpressional thrust fault that was intruded by volatile rich diorite dykes and Wernecke Breccia. The regional structure has been cut by subsequent extensional faults along Ursus and Mica Creeks.
The 1993 work program consisted of preliminary examination of the claims. Several previously reported copper and uranium showings were relocated and assays confirmed previously reported anomalous copper values. Further work uncovered numerous other mineralized zones with anomalous copper and gold mineralization. The mineralization was generally located in or near the diorite dykes, hematite breccias or near alteration zones associated with the two units.
Two of the 2007 drill holes (hole UT07-11 & 12) intersected copper-gold mineralization at the Hem zone located approximately 1 km south of the original occurrence location. Hole 11 returned 0.69% copper and 0.17 g/t gold over 9.33 m and hole 12 returned 0.36% copper and 0.18 g/t gold over 8.37 m. Both holes appear to have been collared in Upper Fairchild Lake rocks located near a Wernecke Breccia body. A third hole tested for mineralization at the newly discovered Rio zone located approximately 2 km south of the original occurrence. The Rio zone identifies an area of high uranium mineralization measuring at least 15m by 150m and hosting values between 0.08% and 0.60% uranium oxide (U3O8). Hole UT07-08 returned trace copper and 0.159 g/t gold over 5.72m.

References

ARCHER, A.R., AND SCHMIDT, U., 15 Oct/77. Mineralized Breccias of Early Proterozoic Age, Bonnet Plume River District, Y.T. Paper presented at the 2nd Annual Canadian Institute of Mining and Metallurgy District 6 Meeting, Victoria.

ELDORADO NUCLEAR LTD, 1976. Assessment Report *#061620 by C.J. Riley and D.F. Schutz.

ELDORADO NUCLEAR LTD, 1976. Assessment Report *#090159 by C.J. Riley.

FRONTEER DEVELOPMENT GROUP. News Release, 5 Jul/2007, Project Summary Dec/2007, 17 Jan/2008.

FRONTEER DEVELOPMENT GROUP. Nov/2008. Web Site: www.fronteergroup.com.

GORDEY, S.P. AND MAKEPEACE, A.J., 2003. Yukon Digital Geology, version 2.0, S.P. Gordey and A.J. Makepeace (comp); Geological Survey of Canada, Open File 1749 and Yukon

Geological Survey, Open File 2003-9 (D).

HUNT, J., 2005. The geology and genesis of iron oxide-copper-gold mineralization associated with Wernecke Breccia, Yukon Canada, PhD thesis, James Cook University, Australia, 2 volumes, 120 p.

MINERAL INDUSTRY REPORT 1976, p. 125-126.

PAMICON DEVELOPMENTS LTD, Feb/94. Assessment Report #093170 by M.A. Stammers.

PAMICON DEVELOPMENTS LTD, Feb/95. Assessment Report #093267 by M.A. Stammers and H.M. Klatt.

PAMICON DEVELOPMENTS LTD, Nov/95. Assessment Report #093437 by M.A. Stammers.

THORKELSON, D.J., AND WALLACE, C.A., 1993a. Development of Wernecke Breccia in Slats Creek (106D/16) map area, Wernecke Mountains, Yukon. In: Yukon Exploration and Geology 1992, Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, p. 77-87.

THORKELSON, D.J. AND WALLACE, C.A., 1998. Geological Map of Slats Creek map area, Wernecke Mountains, Yukon (106D/16). Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, Geoscience Map 1998-9, 1:50,000 scale.

THORKELSON, D.J. AND WALLACE, C.A., 2000. Geology and mineral occurrences of the Slats Creek, Fairchild Lake and "Dolores Creek" areas, Wernecke Mountains, Yukon (106D/16, 106C/13, 106C/14). Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, Bulletin 10, 73 p.

YUKON EXPLORATION & GEOLOGY 1995, p. 12, 16; 2007, p. 32-33, 40, 42.

Work History

Date	Work Type	Comment
12/31/2007	Drilling	Five holes, 855 m.
12/31/1994	Geology	
12/31/1994	Geochemistry	
12/31/1994	Other	
12/31/1993	Ground Geophysics	Also magnetic survey.
12/31/1992	Geochemistry	
12/31/1992	Geology	
12/31/1992	Geochemistry	
12/31/1976	Ground Geophysics	
12/31/1976	Geochemistry	
12/13/2006	Airborne Geophysics	Survey flown over entire claim holdings.

Assessment Reports that overlap occurrence

Report Number	Year	Title	Worktypes	Holes Drilled	Meters Drilled
095646	2007	2007 Geological, Geochemical and Geophysical Report on the Werneckes Project	Diamond - Drilling, Rock - Geochemistry, Silt - Geochemistry, Soil - Geochemistry, Detailed Bedrock Mapping - Geology, Regional Bedrock Mapping - Geology, Magnetics - Ground Geophysics, Scintillometer - Ground Geophysics, Prospecting - Other, Backhoe - Trenching, Hand - Trenching, Handblast - Trenching	28	6537.96
094956	2006	2006 Geological, Geochemical and Geophysical Report on the Werneckes Project	Reverse Circulation - Airborne Geophysics, Rock - Geochemistry, Soil - Geochemistry, Bedrock Mapping - Geology, Scintillometer - Ground Geophysics, Prospecting - Other		
093267	1994	Geological and Geochemical Assessment on the Ursus 1-18 and TVA 1-22 Claims	Gamma-Ray Spectrometry - Airborne Geophysics, Magnetic - Airborne Geophysics, Rock - Geochemistry, Bedrock Mapping - Geology, Prospecting - Other		
090818	1979	Assessment Report on the Ursus 1-24, Ursus 25-66 Mineral Claims	Rock - Geochemistry, Bedrock Mapping - Geology, Prospecting - Other, Hand - Trenching		
061620	1976	Report on Geology, Radiometrics, and Geochemistry on the Gnuckle Claims 1-8	Soil - Geochemistry, Bedrock Mapping - Geology, Gamma-ray Spectrometry - Ground Geophysics		
090159	1976	Report on Geology, Radiometrics, and Geochemistry on the Gnuckle Claims 1-8	Rock - Geochemistry, Soil - Geochemistry, Bedrock Mapping - Geology, Gamma-ray Spectrometry - Ground Geophysics		

Related References

Number	Title	Page(s)	Reference Type	Document Type
ARMC007821	Map - Reef Project		Property File Collection	Geochemical Map