

Yukon Molybdenum Potential

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NICK (106D 092)
Stratiform polymetallic massive sulphide occurs at the contact between Road River Group mudstone and overlying Earn Group chert. Samples returned up to 0.395% Mo, 5.8% Ni & 1.56% Zn.



CASINO DEPOSIT (115J 028)
Cu-Au-Mo mineralisation is centred on an altered breccia pipe associated with the Late Cretaceous (74-72 Ma) felsic Patton porphyry of the Prospector Mountain suite (LKP). Supergene and hypogene resources are present (see Table 1).

CASH DEPOSIT (115I 037)
Cu-Mo-Au mineralisation (Table 1) is associated with Late Cretaceous (75Ma) feldspar porphyry plugs and dykes of the Prospector Mountain suite (LKP).

WHITEHORSE COPPER (105D 053)
Best known for Cu mineralisation in 28 skarn deposits that stretch for 32 km along the western margin of the mid-Cretaceous Whitehorse Batholith, part of the Whitehorse Suite (mKW). However, Mo is abundant at the northern & southern ends of the belt where the pluton dips shallowly, e.g. Cowley Park (Table 1), Sue & War Eagle deposits.

TAD (115I 031)
Mo mineralisation occurs as disseminations & in quartz veins within the Coffee Creek phase of the mid-Cretaceous Dawson Range Batholith (mKW). Zn-Au mineralisation occurs nearby & is associated with Late Cretaceous quartz-feldspar-biotite porphyry (LKP) that cuts the quartz monzonite.

KLOT/PATT (115J 002)
Molybdenite & chalcopyrite mineralisation occurs on fractures & as disseminations in Tertiary miarolitic alaskite of the Nisling Range Suite (ETN).

POW (105D 050)
Molybdoscheelite occurs in garnet-diopside-apatite skarn developed along the contact between Triassic Lewes River limestone (uTAK) & hornblende granodiorite of the mid-Cretaceous Cap Creek pluton, part of the Whitehorse Suite (mKW).

CORK (115G 015)
Cu-Mo mineralisation occurs in quartz veins and on fractures cutting Tertiary (26 Ma) feldspar porphyry sills and/or dykes of the Tkope Suite (OT).

ITTLEMIT (115H 041)
Molybdenite occurs as disseminations & in quartz veins in Early Tertiary Nisling Range Suite granodiorite (ETN). Cu-Mo-bearing skarn occurs in proximal Nisling Terrane rocks, e.g. Giltana prospect.

LIME (105D 004)
Pockets and rosettes of molybdenum occur in a 750 x 150 m stockwork at the top of a quartz monzonite stock (?Late Cretaceous) that intrudes Cache Creek terrane oceanic rocks. Best reported result is 0.756% MoS₂ over 1.5 m in a trench.

HOIDAHL, SEDGWICK (117A 021,024)
Mo (Cu,W, Au,As,U) mineralisation is associated with Devonian biotite-quartz monzonite stocks of the Old Crow Suite (MLDO). Molybdenite occurs on fractures & in narrow quartz veins within the intrusive rocks & as Mo-bearing skarn in proximal Cambrian Slats Creek strata. A quartz vein sample returned 1.94% MoS₂.

Legend

Plutons

- Cenozoic
- Mesozoic
- Paleozoic

Black Shales

- Dev.-Miss. Earn Gp
- Cam.-Dev. Road River Gp

Mo MINFILE occurrences

- Porphyry
- Vein/Breccia
- Skarn
- Mo silt geochemistry (GSC) values > 99th percentile, divided by terrane

Mo silt geochemistry (GSC) values > 99th percentile, divided by terrane

- Insular: > 8 ppm
- Yukon-Tanana: > 7 ppm
- Intermontane: > 10 ppm
- Cassiar Platform: > 13 ppm
- Selwyn Basin: > 25 ppm
- N. Amer. Platform: > 39 ppm
- Richardson Trough: > 6 ppm



TWO BUTTES (105M 038)
Molybdenite occurs within quartz veinlets and stockworks within a 600 x 300 m area at the top of the mid-Cretaceous Two Buttes monzogranite stock. Scheelite-bearing skarn occurs on the pluton margins.

STORMY (105F 011)
Mo ± W mineralisation (Table 1) is densely disseminated in mid-Cretaceous diorite of the Cassiar Suite (mKC) & within garnet-diopside skarn developed in proximal Lower Cambrian Rossella limestone (ICR).

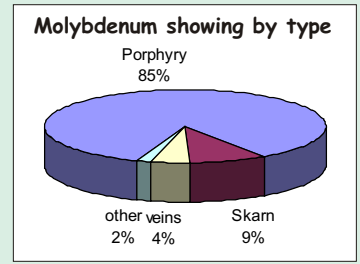
RED MOUNTAIN (105C 009)
Molybdenite (Table 1) occurs in quartz stockworks in a multi-stage Late Cretaceous quartz monzonite stock of the Prospector Mountain Suite (LKP).

Devono-Mississippian Shale
Elevated levels of Mo (± Ni, Zn, V, U, Sn, Sb, Hg, Cu, Ba, Ag, Au) occur in Devono-Mississippian shales of the Road River & Earn Groups. Stream sediments draining these units contain up to 1240 ppm Mo.



LOGTUNG DEPOSIT (105B 039)
Scheelite- & molybdenite-bearing quartz stockworks occur in a high level ?mid-Cretaceous felsic intrusive of the Cassiar Suite (mKC). Resource estimates are given in Table 1.

TUNA (105H 082)
Mo (± W, Cu, Au, Ag, Sb, Bi, As) occurs in veins, breccia & stockworks in altered mid-Cretaceous granodiorite of the Selwyn Suite (mKS). In addition, disseminated Mo mineralisation occurs in the megacrystic core of the pluton, in aplite porphyry dykes & in tourmaline breccia & stockworks.



Tonnes & Grade

Deposit	tonnes (x 10 ⁶)	% MoS ₂	% Mo
Casino	675	--	0.02
Logtung	229	0.05	
Red Mountain	187.3	0.167	
Cash	36.3		0.018
Stormy	0.0134	0.73	
Cowley Park	0.884	0.066	

Table 1: Resources for Yukon molybdenum-bearing deposits.

Geology of Deposits

Most significant molybdenum mineralisation in the Yukon is related to porphyritic rocks associated with the following intrusive suites:

- Devonian Old Crow Suite
- mid-Cretaceous Whitehorse Suite
- mid-Cretaceous Cassiar Suite
- mid-Cretaceous Selwyn Suite
- Late Cretaceous Prospector Mountain Suite
- Early Tertiary Nisling Range Suite
- Oligocene Tkope Suite

Mo mineralisation occurs largely in quartz vein stockworks & as disseminations in the tops of Mo-bearing intrusions, e.g. Casino, Tad, Patt, Two Buttes, Red Mountain, Logtung & Tuna.

Mo-bearing skarns developed in calcareous strata adjacent to the intrusive rocks are also significant, e.g. Whitehorse Copper, Pow & Stormy.

Regional Geochemistry

Regional silt sample data (GSC) for Mo is displayed with respect to underlying terrane in the Yukon map to the left. In general, there is a good correlation between Mo values in the regional geochemical survey and areas known to host significant porphyry, skarn &/or vein molybdenum mineralisation. Exceptions to this occur in the Selwyn Basin and North American Platform where high Mo values were also returned by silts derived from Devono-Mississippian black shales and cherts of the Road River and Earn Groups. There appears to be at least one horizon within the sedimentary package that is locally highly enriched in metals (Mo ± Ni, Zn, V, U, Sn, Sb, Hg, Cu, Ba, Ag, Au). Evidence of this is seen at the Nick prospect where there is a narrow bitumen-bearing horizon that contains vaesite, pyrite & sphalerite & elevated levels of Mo, Pt, Pd, Ag, Au, Re & Se.

Exploration Models

Molybdenum deposit models useful for exploration in the Yukon include:

- 1) **Disseminated & stockwork Mo mineralisation** developed in Devonian, Cretaceous & Tertiary intrusive rocks. Associated elements include W & Cu. E.g. Hoidahl, Logtung & Klot/Patt.
- 2) **Molybdenite-bearing skarn deposits** developed in Paleozoic & Mesozoic carbonate rocks at or near contacts with felsic Devonian, Cretaceous and Tertiary intrusions. Associated elements include W & Cu. Examples: Whitehorse Copper & Pow.
- 3) **Molybdenite-bearing veins & stockworks** in hornfelsed sedimentary rocks proximal to Cretaceous & Tertiary intrusions. Associated elements include Cu, Co, Zn, W, As, Pb. Examples: Bloom & St Elias.
- 4) **Mo-bearing black shales** in areas underlain by Cambrian-Devonian Road River Group and Devonian-Mississippian Earn Group in the Selwyn Basin and North American Platform. High values of Mo (& other metals) occur in regional silt samples (GSC) from creeks draining these areas.

Further Reading

- © Hart CJR, Goldfarb RJ, Lewis LL and Mair JL (2004) The Northern Cordilleran mid-Cretaceous Plutonic Province: Illmenite/magnetite-series granitoids and intrusion-related mineralisation. Resource Geology 54:3:253-280.
- © Sinclair WD (1987) Molybdenum, tungsten and tin deposits and associated granitoid intrusions in the northern Canadian Cordillera and adjacent parts of Alaska. In: Morin JA (ed.) Mineral Deposits of Northern Cordillera Symposium, CIMM, Special volume 37, pp. 216-233.
- © Schroeter TG (ed. 1995) Porphyry Deposits of the Northwestern Cordillera of North America. CIMM Special volume 46, 888p.

Mo MINFILE Occurrences

MINFILE #	Names	Status	Major	Minor	MINFILE #	Names	Status	Major	Minor	MINFILE #	Names	Status	Major	Minor
Porphry														
105A 020	MURRAY	Showing	Au, Mo	W	115G 015	CORK	DP	Mo, Cu		115J 044	BID	Showing		Mo, Cu
105A 046	TAFFIE	Anomaly		Mo	115G 069	TALBOT	Showing		Cu	115J 045	VINA	Showing		Mo, Cu
105B 010	TROY	Anomaly	Cu		115G 070	RAFT	DP		Mo, Cu, W	115J 048	HANNA	Anomaly	Cu	
105B 039	LOGTUNG	Deposit	W, Mo	Be	115G 071	ROCKSLIDE	DP		Mo, W, Cu	115J 064	LYON	Anomaly		
105B 087	MCPRES	Prospect	Mo, Cu	Ag	115G 072	NORTH STAR	Unknown			115J 072	SCROGGIE	Showing		Mo, Cu
105B 103	THRALL	Showing	Ag, Mo	Cu	115G 073	BED	Anomaly			115J 089	PATTISON	DP	Cu, Mo	
105B 108	REGIONAL	Anomaly	Mo	W, Sn	115G 074	ALASKITE	Anomaly		Mo, Cu	115J 090	INDIANA	DP	Cu, Mo	
105C 009	RED MTN	Deposit	Cu, Mo, Ag, W		115G 075	TYRRELL	Anomaly		unknown	115J 091	AMOCO	Showing	Cu, Mo	
105D 004	LIME	DP	Mo	Cu	115G 076	DWARF	Showing		Cu, Mo	115J 101	ANA	DP	Cu, Au	Mo
105D 010	CARCROSS	DP		Cu, Mo	115G 079	RHYOLITE	DP	Cu, Mo		115K 081	WRANGELL	Anomaly		
105D 015	FINGER	Showing	Au, Zn, Pb, Ag	Cu	115H 003	NIPPON	Showing			115K 082	TRUDI	DP	Cu, Mo	
105D 016	LATREILLE	Showing	Ag, Mo, Au, Cu		115H 007	SNIFE	Showing	Cu		115N 021	ARIES	Showing	Cu	Au
105D 023	FAWLEY	DP	Au, Cu	Ag	115H 014	LION	DP	U		115N 026	LADUE	Showing	Cu, Mo	
105D 041	ALLIGATOR	Showing		Cu, Mo	115H 021	SATO	Showing	Cu		115N 029	PAX	Anomaly		Cu, Mo
105D 044	ARK	Showing		Cu, Mo	115H 025	KATHY	Unknown		Mo, Cu	115O 020	APOLLO	Anomaly		Cu, Mo
105D 058	KOOKATSOON	DP		Cu, Mo	115H 027	POPLAR	Anomaly			115O 085	MCMICHAEL	Showing	Cu	
105D 059	DUGDALE	DP		Cu, Au, Mo	115H 028	STEVENS	Anomaly			115P 032	MOZI	Anomaly		
105D 080	IMP	Anomaly		Cu	115H 029	OCCIDENT	Anomaly			116B 002	BENSON	Anomaly		Mo
105D 081	STONY	Showing		Mo	115H 032	KIRI	Anomaly			116B 055	FIREWEED	Anomaly		
105D 100	INCO	Showing	Au, Ag	Cu	115H 033	BUFF	Showing		Mo	116C 134	PLUTO	DP	Mo	
105D 104	SUITS	DP	Mo, Cu	Au	115H 036	BILQUIST	Unknown			116C 143	SWEDE	Unknown	Mo	
105D 135	WEST ARM	Anomaly	U	Mo	115H 038	TAHTE	Showing	Mo, Cu	gypsum, F, Au	117A 021	HOIDAHL	Showing	Mo, W	Au
105D 167	BOVE	Anomaly	Mo		115H 041	ITTLEMIT	Showing	Cu, Mo		117A 024	SEDGWICK	Showing	Cu, Mo, W	Au
105D 180	SILVER QUEEN	DP	Ag	Au, Cu, Pb	115I 023	PAL	DP	Cu	Ag, Au	Skarn				
105D 190	WARD	Showing	Au, Ag, Cu	Pb + Zn	115I 026	PELLY	DP	Cu	Mo	105B 090	SWIFT	Unknown	Mo	
105E 002	TUV	Prospect	Cu	F, Pb, Mo, W	115I 029	DELTA	Anomaly		Au	105B 093	RALFS	Unknown		
105E 024	HIG	Showing	Mo	Cu	115I 031	TAD	DP	Au, Pb, Zn	Mo, Cu, Ag	105B 097	URP	Showing	W, Mo, Cu	F, Pb, Ag, Zn
105E 024	HIG	Showing	Mo	Cu	115I 032	PHELPS	Prospect	Cu	Ag, Mo, Au	105C 035	ENGLISHMAN	Showing		Mo, U, Pb
105E 025	LORI	Showing	Mo	Cu	115I 037	CASH	Deposit	Mo, Cu	Au, Zn, Pb, Sb, Ag	105D 050	POW	Showing	Cu	Mo, Ag, Pb, Cu, Au, W
105E 027	BACON	Showing	Cu	Au	115I 038	KLAZAN	DP	Mo, Cu	Au, Ag	105D 053	WHITEHORSE Cu	PP	Cu, Au, Ag	Ag, Au, Mo
105F 004	GOPHER	Prospect	Pb, Mo, Ag	Au, Zn	115I 039	COM	Anomaly	Cu	F, W	105D 125	FOOT	DP	Cu, Au	Mo
105F 011	STORMY	Deposit	Mo, W		115I 042	REVENUE	DP	Cu, Au	W, Ag, Mo	105F 001	MOLLY	DP	Mo	U
105F 079	MURPHY	Showing	U	W, Cu	115I 045	NEWKIRK	Showing	Cu, Mo	Zn	105H 040	CREE	Showing	Mo	
105H 044	RENA	Showing	W, Mo		115I 047	TRITOP	Anomaly		Au, Mo, Cu	105H 052	DODGE	Showing	Mo, W	
105H 053	TILLEI	Showing	Mo, W	Pb, Zn	115I 048	EDGAR	Anomaly		Cu, Mo	105H 088	BILLINGS	Showing	Mo, W	
105H 082	TUNA	Showing	W, Mo	As, Sb, Bi, Au, Ag, Cu	115I 050	GRANGER	DP	Au	Ag, Cu, Mo	105J 035	SASK	Showing	Cu, Mo	Pb, Ag, Au, Zn
105H 082	TUNA	Showing	W, Mo	As, Sb, Bi, Au, Ag, Cu	115I 066	CYPRUS	DP	Cu, Au	Mo	115J 052	TONI TIGER	Showing	Mo, Ag, W, Cu	
105H 097	TUS	Showing	Mo	W	115I 070	MALONEY	DP	Cu, Mo	W, Au, Ag	115G 068	BROOKS	Showing		Mo
105J 006	TAC	Anomaly	Mo, Cu		115I 074	COMANCHE	DP	Cu		115H 015	MORaine	Prospect	Ag, Au, Cu, W	Co, Au, Ag
105L 055	HODDER	Showing	Mo		115I 076	TUF	Showing	Cu		115H 016	GILTANA	DP	Cu, Mo	
105M 038	TWO BUTTES	DP	W		115I 081	KERR	DP	Cu, Mo		116B 060	MULTIPLY	Showing	Cu, Mo	
105O 003	JEFF	Unknown	Mo		115I 087	KOOK	Anomaly		Mo, Cu	Vein				
105O 008	KEELE	Showing	Mo		115I 093	GOULTER	DP	Ag, Au	Zn, Pb	105B 135	GOLDEX	Anomaly	Cu, Mo, Zn	
105O 030	GRIZZ	Showing	Mo, W, Ag, Au		115I 094	GIANT	DP	Cu, Au	Ag	105C 030	MUSKRAT	Anomaly	Mo	
105O 031	VAN ANGEREN	Showing	Mo		115I 102	LUMBY	Anomaly		Cu, Mo	105G 018	GRASS	Showing	Mo, W	
105O 056	GOLD	Unknown	Au	Cu, Mo, Ag, W, Sb	115I 107	NUCLEUS	Deposit	Cu, Au	Mo, Ag, W, Cu	105N 012	BLOOM	Showing	Mo, Pb, Cu	
106C 001	KOHSE	Prospect	Cu		115I 108	TOOT	Showing	Cu		105N 031	THUNDERHEAD	Anomaly	Cu	Au, Ag
115A 002	DALTON	DP			115J 002	KLOT	Showing		Mo, Cu	115G 029	ST. ELIAS	Showing	Mo	
115A 012	CAVE	Prospect	Cu	Ag	115J 003	MIM	Showing			Shale-hosted Ni-Zn-Mo-PGE				
115A 024	DEVILHOLE	Showing	Cu, Mo	Pb	115J 004	SOMME	Anomaly			106D 092	NICK	Prospect	Ni	Mo,Zn,Se,Ag,Re,Pt,Pd,Au
115A 043	SOUTHER	Showing	Mo, Cu	Zn, Pb, Ag	115J 015	CROCK	Unknown		Cu	DP = drilled prospect PP = past producer				
115A 045	TATSHENSHINI	Showing	Cu	Mo	115J 017	COCKFIELD	Showing	Mo, Cu						
115F 030	SHARPE	Showing	Ag, Au	Cu, Au, Mo, Ag	115J 025	PEG	Anomaly							
115F 031	GALLOPING	Showing		Mo	115J 028	CASINO	Deposit	Cu, Mo, Au						
115F 032	ICE FIELD	Anomaly		Cu, Mo	115J 029	HOLE	Anomaly	Mo, Cu						
115F 034	GARLIC	Prospect	Au	Cu, Mo	115J 031	CLEVELAND	Anomaly	Cu	Mo					
115F 047	EPIC	Showing		Cu, Mo	115J 032	RONGE	Anomaly							
115F 087	CANYON MTN	Showing	Au	Cu	115J 034	GEP	Anomaly	Cu	Mo					
115G 004	MULLER	Anomaly		Mo	115J 035	AZTEC	Anomaly	Cu	Mo					
115G 014	AMP	Anomaly		Cu	115J 036	ZAPPA	DP	Au, Cu	Mo					
					115J 040	BOREAL	Showing	Cu, Mo, Ag						