Occurrence Details

Occurrence Number: 115I 021
Occurrence Name: Minto Main
Occurrence Type: Hard-rock
Status: Deposit
Date printed: 4/28/2025 1:38:50 PM

General Information

Primary Commodities: copper, gold, silver
Secondary Commodities: lead, zinc
Aliases: Minto Property
Deposit Type(s): Porphyry Alkalic Cu-Au
Location(s): 62°36'33" N - -137°14'18" W
NTS Mapsheet(s): 115I11
Location Comments: .5 Kilometres
Hand Samples Available: Yes
Last Reviewed:

Capsule

Work History

Staked as the Minto cl 1-16 (Y61620), cl 17-60 (Y61904), 61-64 (Y61950) and 65-94 (Y62296) in August and Sep/71 by the Dawson Syndicate (Silver Standard Mines Ltd and Asarco, (American Smelting and Refining Company)) on a target located by a regional stream sediment geochemical program in 1970. Explored by soil sampling, IP surveys, hand pitting and 7 diamond drill holes (1 158 m) in 1971, and detailed mapping, airstrip construction, extensive bulldozer trenching and 12 diamond drill holes (1 871 m) on four adjoining zones (1, 19, 21 and 52) in 1972.

The discovery by United Keno Explorations in June 1973 of mineralization on the adjoining DEF claims to the north led the joint venture to diamond drill an additional 62 holes (7 887 m) in 1973 on the northern boundary of the property (North zone). The joint venture staked fractional claims Minto cl 94-95 (Y77310) and 96-97 (Y78024) in October and Nov/73. A winter road was constructed in early 1974 from Yukon Crossing to the bush airstrip (in a joint venture with United Keno Explorations) and a further 58 diamond drill holes (11 228 m) were drilled later in the year. Surficial studies, including overburden drilling, were conducted as part of a joint feasibility study by Dawson Syndicate and United Keno Explorations in 1975-76.

In Apr/77 United Keno Hill Mines announced the results of the joint feasibility study. The study reported Main zone reserves of 6 550 748 tonnes grading 1.86% copper, 0.51 g/t gold and 6.86 g/t silver. A portion of the reserve is located on the DEF claims. United Keno Mines reported that their portion of the reserve was approximately 2 678 903 tonnes of approximately the same grade (United Keno Hill Mines Ltd, Annual Meeting April 6, 1977). These reserve figures are not National Instrument 43-101 compliant and must be considered historic reserves.

In 1984, Silver Standard changed its name to Consolidated Silver Standard Mines Ltd and transferred its interest to a subsidiary, Western Copper Holdings Ltd, which in turn transferred the interest in most claims to Teck Corp in October 1989. Teck performed linecutting and a magnetometer/VLF-EM survey in 1991.

In April 1993, Teck and Asarco sold their interests in the Minto claims to Minto Explorations Inc, a new company specifically incorporated for the acquisition of the Minto and DEF claims (Minfile Occurrence #115I 022). Minto then consolidated the Minto and DEF claims into the Minto Property. During 1993 Minto Explorations carried out an airborne radiometric survey and drilled 8 diamond drill holes (984 m) for infilling and metallurgical studies.

In 1994 exploration targets outside of existing reserves were tested with 16 diamond drill holes totaling 2 084 m. Minto also performed engineering and geotechnical studies including overburden and waste characterization, tests on tailings solids and tailings effluent, and standard acid-base accounting. Minto also calculated an initial in-situ geological reserve for the property. Using a cut-off grade of 0.5% copper the company reported 8 818 000 tonnes grading 1.72% copper, 0.48 g/t gold and 7.5 g/t silver. These figures are pre NI 43-101 compliant thus must be considered historical reserves. This estimate was used until Sherwood Mining completed a new NI 43-101 resource estimate in Jun/2005 and Minto did not break out the portion of the reserve located on DEF claims. In late 1994 Minto announced that it was conducting a feasibility study and beginning the process to acquire various environmental permits required for mining and production.

In 1995 Minto drilled 5 diamond drill holes (425 m) to test 4 aeromagnetic anomalies identified by reinterpreting 1993 magnetic data. In addition the company drilled 1 condemnation hole (147 m) north of the proposed mill location. The company continued to direct most of its efforts toward engineering, geotechnical and environmental studies in support of permit applications.

In Jan/96 Minto completed a feasibility study and in May/96 arranged project funding. In Jul/1996 Minto announced that it had completed a joint venture with Asarco Inc to bring the project into production. Asarco acquired a 70% interest in the project by providing up to US $25 million for development of the mine. Minto Explorations Ltd retained a 30% interest and remained the operator of the project.

During the summer of 1996 Minto upgraded 17 km of access road to the property and installed a 40 m single span bridge over Big Creek. The final 12.8 km of access road were upgraded in 1997 along with other roads near the mine site. As well, two grinding mills were moved to the site. Geotechnical programs were completed in 1996 as well as some diamond drilling at the margins of the orebody. Minto continued working through various environmental reviews and mine permitting hearings.

On April 8, 1997 a final screening report on the Environmental Assessment of the proposed mining project was released by DIAND, a camp water well was installed and the mill site was excavated. In 1998, a Type A water use licence was issued, the mill foundations were poured, the access road was completed, the concentrator design and Phase 1 open pit plan were completed, a camp was installed .nd the proposed tailings dam site was grouted.

In 1999, the company received the Mine Production Licence and drilled 5 geotechnical holes (957 m).

In October 2004, Minto Exploration reached an agreement with Asarco and Falconbridge to engage Roman Friedrich and Company Ltd to solicit bids for the sale of all shares of the company. In order to facilitate the takeover bid process Falconbridge agreed not to exercise its DEF claim repurchase right, in exchange for Minto purchasing the right for a cash amount equivalent to 42.5% of the total of any takeover consideration.

In March 2005, Sherwood Mining Corporation agreed to make a take over offer for Minto Exploration Ltd, of which Minto Explorations' Board of Directors unanimously recommended approval. Subsequently in Jun/2005 Sherwood announced that more than 90% of Minto Explorations shares were tendered, resulting in the minimum conditions of the offer being met and Sherwood taking up and paying for the Minto shares deposited under the offer and successfully consolidating the ownership of the Minto project.

In late Jul/2005 the company announced the results of an independent, National Instrument 43-101 resource estimate of the project. Using a 0.5% copper cut-off the company reported a resource estimate of 8 340 000 tonnes grading 1.83% copper, 0.55 g/t gold and 7.95 g/t silver in the measured and indicated categories, with a further 700 000 tonnes grading 1.41% copper, 0.45 g/t gold and 6.0 g/t silver in the inferred category. This resource estimate represents an approximately 10% gain in contained copper and gold over the resource estimate made in 1994 and used in Sherwood Mining's initial feasibility study.

Diamond drilling of the property in 2005 was designed to independently confirm the resource, upgrade the inferred resource within the proposed pit and expand the overall resource; Sherwood drilled 6 772 m in 57 holes. In September 2005, Sherwood Mining changed its name to Sherwood Copper Corporation and received a 10-year extension of its Type A water licence.

Sherwood received an extension of its quartz mining licence in 2006, which moved the expiry date to June 30, 2016. Sherwood drilled 119 diamond drill holes for a total of 24 252 m in 2006. Drilling included infill holes in the resource area and exploratory drilling to the west and north of the proposed pit, as well as at Area 2, located 300 m southeast of the open pit. The company also commenced building the mill and began pre-stripping the Main zone (deposit).

Exploration in 2007 consisted of 91 exploration and 10 geotech/metallurgical diamond drill holes totalling 23 292 m. Significant new copper-gold mineralization was discovered at the Area 118, Copper Keel, Airstrip and Ridgetop zones and in the gap between the Minto Main and Area 2 zones. In Feb/2007 the company released a resources estimate for the Area 2 deposit. The measured and indicated resources for Area 2 comprises 7.6 million tonnes at an average grade of 1.26% copper and 0.48% gold using a 0.5% copper cut-off grade. This estimate incorporated the results of 92 drill holes with the resource remaining open to further expansion.

Sherwood completed the mill construction and pre-stripping of the Main zone and the first copper-gold concentrates were produced on May 1, 2007. The company immediately began work to expand the mill to handle 2 400 tonnes per day (tpd). Sherwood Copper delivered its first load of concentrates to the port of Skagway, Alaska on July 16, 2007. On Oct 1, 2007 the company declared it had reached commercial production.

In Mar/2008 Sherwood Copper signed a Memoranda of Understanding with Firestone Ventures Inc whereby Sherwood's wholly owned subsidiary, Minto Explorations Ltd, would receive an equity interest in a new public company; Northern Tiger Resources Inc, created by Firestone in exchange for contributing four groups of mineral claims in the Minto region, access to Minto Explorations extensive Yukon exploration database and participation in a regional alliance. The four claim groups lay outside of, but in close proximity to the Minto mine property. In addition Minto Exploration would retain back-in rights to acquire a 65% interest in any Northern Tiger projects located within a 50 km radius that are found to have mineralization amenable to processing at the existing Minto Mine facilities.

Exploration in 2008 consisted of 118 diamond drill holes (23 840 m) directed towards expanding the known resources at Area 2, Area 118 and Ridgetop deposits and increasing the confidence in those mineral resources in support of a pre-feasibility study for expanded mining and milling rates. On the production side Sherwood Copper announced in Apr/2008 that the Phase 2 mill expansion was complete and that the mill had essentially achieved and several times exceeded its design capacity of 2 400 tonnes per day.

In Sep/2008 Sherwood Copper announced that it had entered into a Letter of Agreement with Capstone Mining Corporation. Sherwood Copper shareholders were offered 1.566 shares of Capstone Mining for every share of Sherwood Copper. The merger was completed on November 24, 2008. On November 25, 2008 Capstone Mining and Yukon Energy announced that the Minto Mine was officially connected to Yukon Energy's electrical grid thus eliminating the need to produce electricity by diesel generator.

Exploration in 2009 consisted of 201 diamond drill holes (31 479 m) directed towards infill drilling on the Ridgetop and Area 2 deposits and testing other targets located on the property. The results from this drilling led to the calculation of new mineral resource figures for the mine and led to the discovery of the Minto North (Minfile Occurrence #115I 022) and Minto East zones. The company also carried out a Dipole-Dipole Induced Polarization and a Titan-24 DC Induced Polarization and magnetotelluric (Mt) geophysical survey on the property.

In Mar/2009 the company announced the completion of the Phase 3 mill expansion increasing throughput to 3 200 tpd. The company continued planning for a Phase 4 expansion to allow for 4 000 to 5 000 tpd throughput. In Jun/2009 the company released a new resource calculation for various deposits located within the mine property.

In Dec/2009 Capstone Mining released the results of a pre-feasibility study for the Phase 4 expansion of the mine. The study forecasted total production of approximately 166 million kgs of copper in concentrate produced over a 8 year mine life commencing in January 2010 and considered the possibility of developing a 1 000 to 2 000 tpd underground mine to provide higher grade feed relatively earlier in the mine life. As of Dec 15, 2009 the Minto mine held proven and probable reserves of 10 893 000 tonnes grading 1.64% copper, 5.36 g/t silver and 0.59 g/t gold. (details of the reserves and resources can be found in the Reserves section of the database).

In 2011, the mine processed circa 1,258,308 tonnes of ore at a grade of 1.61% Cu, 0.68 g/t Au and 5.9 g/t of Ag (Capstone, 2012). Mineral extraction of the Minto Main resource was completed as of April 2011.

The company completed a Phase VI Preliminary Feasibility Study in January, 2012. It built on the SRK 2010 Phase V report by including a new mineral resource/reserve estimates for Minto Main; Minto South Deposit ("MSD", an amalgamation of the deposits formerly called Area 2/118, Copper Keel and Wildfire) and Minto East. The report also includes new life-of-mine plan that incorporates additional underground mineral reserves from the Copper Keel and Wildfire deposits; updated cost and economic analysis estimates; processing plant capacity improvements; and exploration upside opportunities with recent discoveries at Fireweed A and Fireweed B plus Inferno. There were no modifications to the Minto North and Ridgetop deposit models, however, pit designs or reserves have been slightly adjusted due to the new NSR parameters.

Exploration from 2012 through 2019 was predominantly focused on delineation core drilling and related activities.

In early 2013, the company began construction on an underground access ramp to "Area 118 underground". This work was halted in the fall of that year.

In July, 2013 Capstone submitted an operating plan for all remaining mineral reserves as identified in the 2012 Phase V/VI Pre-Feasibility Study (PFS) to the Yukon Environmental and Socioeconomic Assessment Board (YESAB) for environmental assessment.

In 2014, Capstone completed mining of the Area 2 pit and moved operations to mining the M-Zone and Area 118 open pit then underground on Area 118.

In 2015, operations focused on underground mining in Area 118, as well as stockpiles, while awaiting issuance of the Water Use Licence (WUL) for open pit mining of the Minto North deposit. The WUL was granted in early August and stripping began later that year. Ore began to be extracted in December.

In 2016, mill throughput, head grades and recoveries exceeded expectations, roughly doubling production of copper, gold and silver from 2015. The increase in recoveries resulted from a greater proportion of sulphide ore, rather than oxide ore, in the mill feed. At the end of 2016, Capstone reported it had an approximate 3-year mine life remaining.

In February 2018, Capstone entered into a Purchase and Sale Agreement with Pembridge Resources plc (Pembridge) for potential acquisition of the mine. However, Pembridge was subsequently not able to fulfill the terms within the period of exclusivity. Capstone switched from open pit mining to underground development of the Minto East deposit in June of that year. In May, milling was reduced to operating on a two-week on, two-week off basis. Underground mining ceased on October 11, milling operations stopped on October 19, and the mine was placed on care and maintenance.

On June 3, 2019 Pembridge and Captsone renegotiated the terms of a definitive "Share purchase Agreement" (SPA) and closed the acquisition of Minto Explorations Ltd by Pembridge. In October, Pembridge restarted mining and milling operations on a 2 week on- 2 week off basis.

CAPSULE GEOLOGY

The geological setting, mineralogy and deposit styles is modified from Kovaks, 2018 and Schulze, 2019.

The Minto property is located within the Minto Copper belt, a 42 km long, NW-trending series of copper-gold deposits and occurrences in central Yukon. The deposits are hosted within deformed and metamorphosed inliers engulfed by the intrusions of the Late Triassic to Early Jurassic Minto pluton (204-195 Ma).

The Minto pluton consists of medium to coarse-grained granite, biotite-hornblende granite to granodiorite and quartz monzonite. The pluton is bounded by mafic to intermediate volcanic rocks of the Late Cretaceous Carmacks Group to the south and variably deformed and metamorphosed greenschist and amphibolite facies, augite phyric basalt, volcaniclastic rocks, and hornblende gabbro of the Late Triassic Povoas Formation, to the east.

Four major deposits have been delineated and/or undergone mineral extraction: the Minto Main, Minto East, Minto North and Minto South deposits. The Minto South deposit contains the Area 2, Area 118, Copper Keel and Wildfire resource sub-domains.

Hypogene copper sulphide mineralization is hosted within Late Triassic variably deformed, metamorphosed, and migmatized rocks that are engulfed by the undeformed and unmineralized felsic intrusive phases of the Minto pluton.

The primary hypogene minerals are chalcopyrite, bornite, chalcocite, and minor pyrite. Copper sulphide minerals occur mainly as disseminated grains, foliaform stringers, and net-textured domains. Sulphide mineral content tends to increase with ductile deformation. Native gold, electrum, and gold telluride mainly occur as inclusions in bornite. Coarse free gold is locally found along late chloritic fractures, likely resulting from secondary enrichment from a hydrothermal event. Hypogene sulphide mineralization is almost always associated with biotite alteration and magnetite.

A crude zonation occurs from west to east at the Minto Main deposit, with bornite predominating in the west, transitioning to a thicker, lower grade chalcopyrite-bearing zone in the east. Both the Minto North and Minto East deposits show a similar zonation.

At the Area 2, Area 118 and Copper Keel resource subdomains of the Minto South deposit, ductile deformation appears to be more developed and mineralization is characterized by disseminated grains and minor foliaform stringers. The assemblage consists mainly of chalcopyrite-bornite-magnetite and minor pyrite. Mineralization is more homogenous and consistent than at the Minto Main and Minto North deposits, where mineralization is dominated by net-textured domains of bornite-chalcopyrite. At both the Ridgetop deposit and the Wildfire resource sub-domain, mineralization is subdivided into a near surface horizon of supergene mineralization, and a lower zone of sulphide mineralization. The lower zone comprises chalcopyrite-bornite - magnetite ± pyrite.

Copper oxide mineralization resulting from supergene alteration processes represents either the erosional remnants of foliated horizons above the deposits, or the vertical remobilization of copper along late brittle faults and fracture zones from underlying copper sulphide zones. The oxide mineral assemblage consists of chalcocite, malachite, minor chrysocolla and azurite and rare native copper.

Mineralization occurs as fracture-fill and joint coatings and, to a lesser extent, interstitially to rock-forming silicate minerals. Oxidation is also manifested as pervasive limonite, earthy hematite and clay alteration of feldspars. Oxidation is related directly to the depth of the water table, mainly less than 30 metres and is minimal at the Minto Main zone, due to its depth.

Both brittle and ductile deformation occur in the Minto Mine vicinity. Amphibolite facies ductile deformation affected the metamorphic rocks and it is evident by the alignment of hornblende and biotite grains forming foliation, and by the segregation of quartz and feldspar grains forming gneissic texture in areas of higher strain. Deformation zones occur as sub-horizontal horizons traceable for more than 1,000 metres and are commonly stacked in parallel to sub-parallel sequences. The felsic intrusive rocks are generally undeformed, although moderate to strong foliation is locally developed near the contact with the metamorphic inliers.

The predominant alteration assemblage associated with hypogene copper mineralization in the Minto mine area is a pervasive, potassic alteration, characterized by elevated biotite and magnetite content, within the horizontal mineralized zones, present in all Minto deposits. The late, post-mineralization alteration assemblage includes replacement of mafic minerals by chlorite, epidote and sericite in both ore and waste rock. Pervasive silicification tends to coincide with areas of higher grade mineralization.

The Minto deposit has been modified by deformation, amphibolite facies metamorphism, and localized metamorphic anatexis. Since its discovery, several hypotheses have been presented to explain the genesis of the deposit, including: copper mineralization in digested Triassic volcanic rocks, metasedimentary red-bed copper, deformed and metamorphosed porphyry copper-gold, iron oxide copper gold (IOCG), deep 'aborted' porphyry Cu-Au that formed during the early stage of porphyry Cu-Au mineralization, and shear-hosted hydrothermal mineralization generated in the ductile root zones of porphyry systems.

Recent studies of the setting and mineralization of the Minto deposits by Kovacs (2018) have resulted in the plausibility that mineralization may be hosted by 215-212 Ma Late-Triassic Povoas Formation volcanic rocks subsequently engulfed into the 198 Ma Minto pluton. The Carmacks Copper deposit is located 42 km southeast of the Minto mine. The Minto and Carmacks Copper deposits are metallogenically related, given their spatial relation and deformed, metamorphosed, and partially oxidized nature. Kovacs integrated the two deposits into a single genetic model and proposed that the Minto deposit is the more highly migmatized analogue of the Carmacks Copper deposit. The same study also concluded that the two deposits together represent Late Triassic porphyry deposits hosted within Late Triassic volcanic rocks of the Stikine terrane (Stikinia) that have undergone amphibolite facies metamorphism, deformation, and partial melting (anatexis).

All deposits at the Minto Mine property share the same style of mineralization, comprising copper sulphide mineralization associated with sub-horizontal and subparallel deformed and metamorphosed migmatitic host rocks engulfed within the undeformed and unmineralized intrusive phases of the Minto pluton. The host rock at the Minto mine is interpreted to be a migmatite formed from the partial melting of the Late Triassic volcanic rocks of the Povoas Formation, Stikinia, during the emplacement of the Minto pluton in the Early Jurassic (Kovacs, 2018).

Work History

Date	Work Type	Comment
12/31/2009	Drilling	Two hundred and one holes, 31,479 m.
12/31/2009	Studies	Phase 4 expansion study.
12/31/2008	Drilling	One hundred and eighteen holes, 23,840 m. Collared on Area 2, Area 118, Airstrip, Copper Keel and Ridgetop zones.
12/31/2008	Ground Geophysics	Dipole-Diploe Induced Polarization survey and Titan-24 DC Induced Polariztion survey.
12/31/2007	Studies	Updated figures.
12/31/2007	Drilling	One hundred and one holes, 23,618 m. Exploration and Geotech/metallurgical.
12/31/2007	Other	First ore shipment. Mine reaches commercial production Oct 1, 2007.
12/31/2006	Drilling	One hundred and nineteen holes, 24,252 m. Seventy-nine holes for 18 376 m were in area 2.

12/31/2006	Development, Surface	Also stripped over burden.
12/31/2005	Studies	First estimate to meet NI 43-101 standards.
12/31/2005	Drilling	Fifty-seven holes, 6,772 m. Nine of the holes were geotechnical holes.
12/31/1997	Development, Surface	Final 12.8 km of access road upgraded. Two grinding mills were moved to the site.
12/31/1996	Development, Surface	Constructed 17 kms of road and bridge over Big Creek.
12/31/1995	Drilling	Five holes, 425 m. Assessment Report #093390.
12/31/1995	Studies	
12/31/1994	Drilling	Sixteen holes, 2,084 m.
12/31/1994	Studies	Company began process to bring deposit into production.
12/31/1993	Airborne Geophysics	
12/31/1991	Ground Geophysics	Also VLF-EM survey.
12/31/1976	Studies	Non-compliant.
12/31/1976	Drilling	
12/31/1975	Drilling	
12/31/1974	Drilling	Fifty-eight holes, 11,228 m.
12/31/1974	Development, Surface	Road contruction to Yukon Crossing.
12/31/1973	Drilling	Sixty-two holes, 7,887 m.
12/31/1972	Development, Surface	
12/31/1972	Drilling	Twelve holes, 1,871 m.
12/31/1972	Geology	
12/31/1972	Trenching	
12/31/1971	Drilling	Seven holes, 1,158.24 m.
12/31/1971	Ground Geophysics	
12/31/1971	Trenching	
12/13/2002	Pre-existing Data	
12/13/2002	Geochemistry	
12/13/2002	Other	
12/13/2001	Drilling	5 holes for 551 m. Confirmation holes in the center of the deposit.
12/13/1999	Drilling	5 geotechnical holes for 957 m
12/13/1998	Development, Surface	Mill foundation concrete was poured, camp construction began, tailings dam area was grouted.
12/13/1998	Development, Surface	
12/13/1997	Development, Surface	mils site and camp were excavated
12/13/1993	Drilling	Eight holes, 984 m. Infill drilling and for metallurgical studies.
12/13/1971	Geochemistry	
12/13/1970	Geochemistry	Regional program.
1/1/2012	Studies	Updated feasibility study.

Assessment Reports that overlap occurrence

Report Number	Year	Title	Worktypes	Holes Drilled	Meters Drilled
094896	2007	Report on Geophysical Gradient IP Survey and Geological Diamond Drilling at the Minto Property on DEF and MINTO Quartz Mining Claims	Diamond - Drilling, IP - Ground Geophysics, Line Cutting - Other	4	665
093012	1991	1991 Mag-VLF Survey Assessment Report-MINTO Project	EM - Ground Geophysics, Magnetics - Ground Geophysics		
091338	1974	[1974 Geological Diamond Drill Logs at the MINTO Property]	Diamond - Drilling, Drill Core - Geochemistry	9	1775.76
061139	1974	Report on the ROD and AL Claims Group	Soil - Geochemistry, Bedrock Mapping - Geology		
091337	1974	Assessment Report on the Dark 47 to 54 Inclusive and DARK 61 and 63 Claims Group	Data Compilation - Pre-existing Data		
061095	1974	Geophysical Report of the Ground Magnetometer Survey on the DARK Mineral Claims	Magnetics - Ground Geophysics, Line Cutting - Other		

092011	1973	Geological Report on the DARK 47 to 54 Inclusive and DARK 61 and 53 Claim Group	Data Compilation - Pre-existing Data		
061161	1973	Geological Report on the DARK 47 to 54 Inclusive and DARK 61 and 53 Claim Group	Data Compilation - Pre-existing Data		
091335	1972	1972 Assessment Report on the MINTO CREEK Project	Air Strip - Development, Surface, All Weather Road - Development, Surface, Diamond - Drilling, Drill Core - Geochemistry, Rock - Geochemistry, Soil - Geochemistry, Water - Geochemistry, Bedrock Mapping - Geology, Line Cutting - Other, Prospecting - Other, Surveying - Other, Process/Interpret - Pre-existing Data, Mechanical - Trenching	13	1868.12

Related References

Number	Title	Page(s)	Reference Type	Document Type
ARMC006651	News Release - Silver Standard Mines		Property File Collection	News Release
ARMC006652	Correspondence Re: Silver Standard-Asarco-Minto drill project		Property File Collection	Miscellaneous Company Documents
ARMC006653	Notes - Silver Standard for 3 areas		Property File Collection	Miscellaneous Company Documents
ARMC006654	Notes - Silver Standard - Asarco - Drilled assays		Property File Collection	Miscellaneous Company Documents
ARMC006655	Drill plan map - Silver Standard Asarco - Minto project		Property File Collection	Geoscience Map (General)
ARMC006656	Drill hole map showing 3 areas - Silver Standard		Property File Collection	Geoscience Map (General)
ARMC006657	Report - Minto and Yukon River projects		Property File Collection	Report
ARMC006773	Press release - Minto and Yukon River projects - June 1 - August 31, 1974		Property File Collection	News Release
2010-19	Report on a Quantec Titan-24 geophysical survey over the Minto Mine, central Yukon		Yukon Geological Survey	Open File (Geophysical)
YEG2003_21	Early Jurassic porphyry(?) copper (-gold) deposits at Minto and Williams Creek, Carmacks Copper Belt, western Yukon		Yukon Geological Survey	Annual Report Paper
YEG2008_14	High-grade hydrothermal copper-gold mineralization in foliated granitoids at the Minto mine, central Yukon		Yukon Geological Survey	Annual Report Paper
ARMC016619	Geology map - 115I/11 - Dark Creek		Property File Collection	Geoscience Map (Geological - Bedrock)
ARMC011174	Sample location map - Minto		Property File Collection	Geoscience Map (General)
ARMC020317	Summary report - Williams Creek copper deposit - Carmacks area, Yukon Territory		Property File Collection	Report
ARMC020318	Report on Braeburn coal area, Carmacks North coal area, Carmacks South coal area, Kotaneelee coal area, Lone Pine Mountain coal occurrence, Porter's coal, Guder's coal, Whitehorse coal area, and Bush Mountain coal area - File 164		Property File Collection	Report

Resource/Reserve

Year	Zone	Type	Commodity	Grade	Tonnage	Amount	Reported Amount	43-101 Compliant	Cut-off
2019	Stockpiles (Undetermined)	Measured	gold	.25 g/t	412,000	103000	Yes	Yes	Unknown
2019	Stockpiles (Undetermined)	Measured	silver	3.05 g/t	412,000	1256600	Yes	Yes	Unknown
2019	Stockpiles (Undetermined)	Measured	copper	1.12 %	412,000	5000000	Yes	Yes	Unknown

Drill core at YGS core library

Number	Property	Year Drilled	Core Size	Photos	Data
08SWC278	Minto	2008		26	8
06SWC125	Minto	2006		22	9

2001-08	Minto	2001	HQ	20	2
2001-09	Minto	2001	HQ	16	2
2001-12	Minto	2001	HQ	18	2
2001-13	Minto	2001	HQ	22	2
2001-14	Minto	2001	HQ-NQ	12	3
99-02	Minto	1999		4	0
99-06	Minto	1999		22	3
96-01	Minto	1996	HQ-NQ	12	1
96-02	Minto	1996	NQ	0	1
96-03	Minto	1996	NQ	0	1
96-04	Minto	1996	NQ	0	1
94-06	Minto	1994	HQ	2	2
94-17	Minto	1994	HQ	13	2
93-A	Minto	1993	HQ	16	2
93-B	Minto	1993	HQ	26	2
93-C	Minto	1993	HQ	14	2
93-D	Minto	1993	HQ	16	2
93-E	Minto	1993	HQ	0	2
93-F	Minto	1993	HQ	0	2
93-G	Minto	1993	HQ	0	2
93-H	Minto	1993	HQ	0	2
1973	Minto	1972	NQ	0	1