

Location/Identification

MINFILE Number:	093L 127	National Mineral Inventory Number:	093L15 Ag1
Name(s):	<u>CRONIN</u> CRONIN MINE, BABINE		
Status:	Past Producer	Mining Division:	Omineca
Mining Method	Underground	Electoral District:	Bulkley Valley-Stikine
Regions:	British Columbia	Resource District:	Skeena Stikine Forest District
BCGS Map:	093L096		
NTS Map:	093L15W	UTM Zone:	09 (NAD 83)
Latitude:	54 55 30 N	Northings:	6088630
Longitude:	126 48 56 W	Easting:	639985
Elevation:	1560 metres		
Location Accuracy:	Within 500M		
Comments:	The mine is located on Cronin Creek, on the east side of Mount Cronin, 28 kilometres northeast of Smithers.		

Mineral Occurrence

Commodities:	Silver, Lead, Zinc, Gold, Copper, Cadmium		
Minerals	Significant:	Galena, Boulangerite, Tetrahedrite, Arsenopyrite, Sphalerite, Freibergite, Chalcopyrite, Pyrite	
	Associated:	Quartz	
	Alteration Type:	Silicific'n	
	Mineralization Age:	Unknown	
Deposit	Character:	Vein, Stockwork, Disseminated	
	Classification:	Hydrothermal, Epigenetic	
	Type:	I05: Polymetallic veins Ag-Pb-Zn+/-Au	

Host Rock

Dominant Host Rock:	Plutonic		
Stratigraphic Age	Group	Formation	Igneous/Metamorphic/Other
Jurassic	Bowser Lake	Unnamed/Unknown Formation	-----
Cretaceous-Tertiary	-----	-----	Unnamed/Unknown Informal
Isotopic Age	Dating Method	Material Dated	
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Lithology:	Rhyolite Porphyry, Argillite, Sandstone, Intraformational Pebble Conglomerate, Ash Tuff, Grit, Mudstone		

Geological Setting

Tectonic Belt:	Intermontane	Physiographic Area:	Nechako Plateau
Terrane:	Stikine		
Metamorphic Type:	Regional		

Inventory

Ore Zone: CRONIN
Category: Inferred
Quantity: 117,923 tonnes

Year: 1972
Report On: Y
NI 43-101: N

Commodity	Grade
Silver	428.5000 grams per tonne
Gold	0.3400 grams per tonne
Cadmium	0.1000 per cent
Lead	7.1100 per cent
Zinc	8.1200 per cent

Comments:

Reference: Statement of Material Facts May 6, 1974 - Hallmark Resources Ltd.

Ore Zone: CRONIN
Category: Indicated
Quantity: 42,408 tonnes

Year: 1972
Report On: Y
NI 43-101: N

Commodity	Grade
Silver	428.5000 grams per tonne
Gold	0.3400 grams per tonne
Cadmium	0.1000 per cent
Lead	7.1100 per cent
Zinc	8.1200 per cent

Comments: Subject to dilution of up to 20 per cent. There is an additional inferred reserve of 117,923 tonnes at the same grade.

Reference: Statement of Material Facts May 6, 1974 - Hallmark Resources Ltd.

Summary Production

		Metric	Imperial
	Mined:	25,838 tonnes	28,481 tons
	Milled:	24,386 tonnes	26,880 tons
Recovery	Silver	8,169,918 grams	262,669 ounces
	Gold	8,772 grams	282 ounces
	Zinc	1,517,881 kilograms	3,346,355 pounds
	Lead	1,367,178 kilograms	3,014,112 pounds
	Cadmium	18,012 kilograms	39,710 pounds
	Copper	10,394 kilograms	22,915 pounds

Capsule Geology

The Cronin mine is located 27 kilometres north east of Smithers, on the ridge separating Cronin Creek from Haystack Creek.

The Cronin occurrence was first discovered by prospectors in 1905. In 1908, it was purchased by James Cronin and about 1200 metres of lateral working were completed by 1925. In 1928, Babine Bonanza Metals Limited was formed with control of the property, little work was done. During the 1940s, 1950s and 1960s the property was owned by New Cronin Babine Mines Limited. A 45.3-tonne-per-day mill was operated sporadically after 1952. In 1972, the leases were optioned by Hallmark Resources Limited and a program of bulldozer stripping was completed. Coa Metals Limited completed topographic and underground surveys, ten surface diamond-drill holes (1530 metres) and structural mapping on the property in 1975.

The geology at the Cronin mine is very complex, however three major rock types host the mineralized structures: the Middle to Upper Jurassic Bowser Lake Group (Ashman Formation), and two Late Cretaceous to Tertiary rhyolitic sub-volcanic intrusives. The Bowser Lake Group is in fault contact with Lower-Upper Cretaceous volcanic rocks of the Kasalka Group immediately west of the showings.

The sedimentary unit is comprised of a bedded clastic sequence of argillite, grits and minor pebble conglomerate. Sericite schist has developed at the

contact with rhyolite. Sedimentary structures include graded bedding, crossbedding and slump structures. Tight folds were observed in the argillites and overturned beds indicate intense folding. Locally, the argillite is graphitic and hosts moderate to intense quartz veining, 1 to 4 millimetres in width, with minor galena. Interbedded mudstone, sandstone, intraformational pebble conglomerate and ash tuffs are also part of the sedimentary unit.

A grey, massive, medium to fine-grained rhyolite porphyry is the most prominent part of the intrusive complex. It is comprised of an aphanitic groundmass of quartz, sericite, calcite, zoisite, and chlorite with laths of albite. No appreciable chill margin was mapped at the contact with the sedimentary unit. A quartz stockwork exists within the rhyolite porphyry and this has been intruded by another porphyry which has in turn been cut by a second phase of quartz veining. The quartz veins average 4 to 20 millimetres in width and host sphalerite and galena.

Silicification adjacent to the quartz veining is the only alteration associated with this unit other than low grade regional metamorphism.

An altered, white to pale yellow rhyolitic stock intrudes the porphyry. Pyrite, sphalerite, and galena occur along fractures within the stock rather than in a quartz stockwork. A set of post-mineral, quartz diorite and dioritic lamprophyre dikes crosscut the host rocks.

The main exploration targets at Cronin are massive sulphide and quartz veins that contain argentiferous galena and sphalerite with minor pyrite and chalcopyrite. Boulangerite, freibergite and arsenopyrite have also been identified.

Sulphide mineralization occurs in quartz stockworks, quartz infilling in faults, along fractures or as disseminations in the intrusive. The mineralized veins are results of two sinuous faults which strike northeasterly and dip moderately westward. The quartz veins exposed in the workings range in width from 0.3 to 1.0 metres, striking northeast and dipping 45 to 65 degrees to the northwest. Mineralization occurs as pods up to 40 metres long by 6 metres wide within the main fault system. There is a distinct zoning of minerals within the pods; galena, boulangerite and tetrahedrite are concentrated near the fault plane with the sphalerite spread out into the altered and brecciated wallrock. Pyrite and chalcopyrite occur erratically throughout the vein system.

In 1944, the Cronin mine was owned and operated by Babine Bonanza Mining and Milling Company. Work at this time was concentrated on the No. 1 and 2 veins with a number of shafts, tunnels, drifts and raises being worked on each. Minor work was performed on the Homestake vein, Vein A and Wardell showing. Probable ore grades indicated at this time were 38 230 tonnes at 0.69 grams per tonne gold, 548.8 grams per tonnes silver, 8 per cent lead and 8 per cent zinc (Property File Rimfire Galloway, 1937). Other areas of interest on the property include the Pal and Eagle veins, 400 metres to the southeast of the Wardell zone with assays of 11.3 and 20.0 grams per tonne gold and the Northeast zone, on a soil anomaly 600 metres north-east of the mine (Trenholme, 1976).

Indicated reserves at Cronin are 42,408 tonnes grading 428.5 grams per tonne silver, 0.34 gram per tonne gold, 7.11 per cent lead, 8.12 per cent zinc and 0.1 per cent cadmium subject to dilution of up to 20 per cent. There is an additional inferred reserve of 117,923 tonnes at the same grade (Statement of Material Facts May 6, 1974 - Hallmark Resources Ltd.).

Production from 1917 to 1974 totalled 25,838 tonnes yielding 8,169,918 grams of silver, 8,772 grams of gold, 18,012 kilograms of cadmium, 10,394 kilograms of copper, 1,367,178 kilograms of lead and 1,517,881 kilograms of zinc.

WORK HISTORY

The showings were reported staked by M.J. Brewer in 1906 and acquired by James Cronin in 1909. Mr. Cronin retained a controlling interest in Babine Bonanza Mining and Milling Company, Limited, which was incorporated in 1909 with head office in Spokane.

The underground workings totalled about 122 metres when work ceased in 1910. Six claims, the Homestake, Bonanza, Eureka, Lucky Strike, Babine Chief, and Buckley Pioneer (Lots 1859-1864 respectively) were Crown-granted to the company in 1911. The mine reopened in 1914 and development work was carried on each summer until 1923. The workings at that time comprised about 1.2 kilometres of drifts, crosscuts, and raises, in 5 adit levels over a vertical distance of about 137 metres. A shipment of 71.7 of hand sorted ore was made in 1917.

The property was optioned and reopened in 1928 by Vancouver interests who in 1929 incorporated Babine Bonanza Metals, Limited. The company name was changed to Babine Metals Limited in 1930 and to Mid-Continent Goldfields Limited in 1931. Further work was done in drifts, crosscuts, and raises. A shipment of 27.2 of hand sorted ore was made in 1929. The mine closed in 1931.

Cronin Babine Mines Limited, incorporated in 1948, optioned the property and during the year carried out diamond drilling totalling 387 metres in 5 surface holes and 407 metres in 11 underground holes. Nothing further was reported until 1951 when the workings were reopened and mill construction began. The 46.3 tonne per day mill operated from July to November 1952 when work ceased due to low metal prices. The company name was changed in 1956 to New Cronin Babine Mines Limited. Work resumed during the year and the mill operated part time until October 1957 when the mine closed.

Lessee Paul Kindrat carried out small scale mining and milling operations each summer, beginning in 1962. In 1966, Kindrat Mines Ltd. was incorporated to continue the operation. The option held by New Cronin to purchase 8 Crown-granted claims from Babine Bonanza Mining and Milling was acquired by Kindrat Mines Ltd. in August 1969; the company also acquired a lease on the mill. Babine Bonanza Mining and Milling

Company, Limited, was dissolved in 1972. New Cronin Babine Mines Limited underwent a name change in 1973 to Sproatt Silver Mines Ltd.

H.J. Wilson and associates, by an April 1972 option agreement, acquired all the shares of Kindrat Mines from Paul and Alice Kindrat, of Smithers. Kindrat Mines at that time owned a 19/20 interest in 8 Crown grants (Lots 7417, 7418, 1859A-1864A); the remaining 1/20 interest was held by Sproatt Silver. Wilson and associates in August 1972 incorporated Hallmark Resources Ltd. to acquire Kindrat Mines and in addition 26 located claims in the View, Del, etc. groups.

Reserves as of November 6, 1972 were estimated by J.A. Mitchell as 42,404 tonnes indicated, and 117910 tonnes inferred. This material is subject to dilution of up to 20 per cent. The average grade expected is about 0.34 grams per tonne gold, 428.57 grams per tonne silver, 7.11 per cent lead, 8.12 per cent zinc, 0.1 per cent cadmium (Hallmark Resources Statement of Material Facts, May 6, 1974).

Exploration and development work during 1972—73 included some 245 feet of drifting and raising, geological mapping, and a geochemical soil survey. Development work to 1973 totals about 1158 metres of drifts and crosscuts and 366 metres of raises in adits at elevations of 1455, 1516, 1524, and 1577 metres. During 1974 drifting (about 49 meters) and stope preparation were carried out on No. 2 vein. The mill operated during 1974 from July 10 to September 12.

Hallmark Resources in 1974 acquired an option to purchase from Sproatt Silver its 1/20 interest in the property. Congdon and Carey Ltd., of Denver, optioned the property in 1975 and carried out 1,530 metres of diamond drilling in 10 holes before dropping the option. Hallmark during 1977-78 carried out drifting and raising on #1 level and sampling. This work indicated an additional reserve of more than 18,000 tonnes grading 428.57 grams per tonne silver, 7 per cent lead, 8 per cent zinc (Northern Miner, Dec. 29, 1977). In the period 1979-85 Hallmark negotiated with a number of interests and Companies for financing of a joint venture to achieve production, but without success.

In 1983, Goldsil Mining & Milling Inc. optioned the property. Extensive underground sampling and some surface diamond drilling; 14 holes totaling 482 meters. This work confirmed and was reported to have improved the resource.

Barnes Resources Ltd in July 1986 was granted an option to earn a 50 per cent interest in the property.

In 1987, Southern Gold Resources Ltd. acquires an option on the property and collected 49 rock and 1233 soil samples. The also conducted 65 kilometers of VLF ground electromagnetic and ground magnetic surveying. In 1988, Southern Gold Resources Ltd. conducted 14.7 kilometers of HLEM ground electromagnetic magnetic surveying over the mine.

In 1998, all Crown granted claims were forfeited and ownership reverted to the Crown.

In 2001 a work program carried out on the Cronin property by Discovery Consultants. This consisted of sampling the felsic rocks to determine an age date. Samples were collected from both the rhyolite porphyry and the rhyolite. One five-gallon pail of rhyolite was collected and submitted for U-Pb age dating to Dr. Larry Heaman at the University of Alberta in Edmonton, Alberta. Three zircon fractions were produced from the crushed rhyolite from which an age date of 5 1.1 million years was derived. This date corresponds to the Eocene.

In 2006 New mineral tenures were staked by Randy Marko and held in good standing until present (2014).

In 2012, Work by Randy Marko occurred in the #1 adit (caved) area. Several of the mineralized veins were exposed in previous trenches and were sampled. In 2013, further prospecting and sampling occurred.

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Date Coded:	1985/07/24	Coded By:	BC Geological Survey (BCGS)	Field Check:	N
Date Revised:	2015/04/14	Revised By:	Garry J. Payie (GJP)	Field Check:	N