## Location/Identification

**MINFILE Number:** 104N 011
**National Mineral Inventory Number:** 104N12 Ag1
**Name(s):** **ATLIN RUFFNER**
SILVER FOX, MOUNT VAUGHAN, BIG CANYON, CHEROKEE, SILVER BARBER, TWIN MOOSE, CRATER CREEK, CRANBERRY (L. 4637), PORTAL (L. 4638), WILLOW FR. (L. 4644), TED FR. (L. 4645)
**Status:** Past Producer
**Mining Division:** Atlin
**Mining Method** Underground
**Electoral District:** Stikine
**Regions:** British Columbia
**Resource District:** Skeena Stikine Natural Resource District
**BCGS Map:** 104N073
**NTS Map:** 104N12E
**UTM Zone:** 08 (NAD 83)
**Latitude:** 59 44 09 N
**Northing:** 6622918
**Longitude:** 133 31 18 W
**Easting:** 583110
**Elevation:** 1151 metres
**Location Accuracy:** Within 500M
**Comments:** The mine is located 23 kilometres northeast of the community of Atlin, on Crater Creek, which drains west into Fourth of July Creek.

## Mineral Occurrence

**Commodities:** Silver, Lead, Zinc, Gold, Copper, Cadmium, Molybdenum, Tin, Tungsten

**Minerals**
**Significant:** Galena, Sphalerite, Chalcopyrite, Pyrargyrite, Tetrahedrite, Molybdenite, Scheelite, Cassiterite
**Associated:** Quartz, Calcite, Pyrrhotite, Pyrite, Ankerite, Arsenopyrite
**Alteration:** Ankerite
**Alteration Type:** Oxidation
**Mineralization Age:** Unknown

**Deposit**
**Character:** Vein, Shear
**Classification:** Hydrothermal, Epigenetic
**Type:** I05: Polymetallic veins Ag-Pb-Zn+/-Au
**Strike/Dip:** 070/85N
**Comments:** Lamprophyre dikes' attitude. Dip is 85NW.

## Host Rock

**Dominant Host Rock:** Plutonic

| Stratigraphic Age | Group | Formation | Igneous/Metamorphic/Other |
|---|---|---|---|
| Middle Jurassic | ------ | ------ | Fourth of July Creek Batholith |

| Isotopic Age | Dating Method | Material Dated |
|---|---|---|
| 171 +/- 5 Ma | Zircon | Zircon |

**Lithology:** Pyroxene Lamprophyre Dike, Granite, Feldspar Porphyritic Quartz Syenite
**Comments:** Mineralization occurs in vein/shear zones in lamprophyre dikes hosted in the Fourth of July Creek batholith. Age date from Fieldwork 1990.

## Geological Setting

**Tectonic Belt:** Intermontane
**Physiographic Area:** Teslin Plateau
**Terrane:** Plutonic Rocks, Cache Creek

## Inventory

**Ore Zone:** ATLIN RUFFNER **Year:** 1988

**Category:** Unclassified **Report On:** Y

**Quantity:** 113,638 tonnes **NI 43-101:** N

| Commodity | Grade |
|---|---|
| Silver | 600.0000 grams per tonne |
| Lead | 5.0000 per cent |

**Comments:** Reserves from the two zones from which underground development and production has taken place.

**Reference:** Assessment Report 18646.

## *Summary Production*

| | | Metric | | Imperial | |
|---|---|---|---|---|---|
| **Mined:** | | 3,395 | tonnes | 3,742 | tons |
| **Milled:** | | 3,535 | tonnes | 3,896 | tons |
| **Recovery** | Silver | 2,079,217 | grams | 66,848 | ounces |
| | Gold | 3,439 | grams | 111 | ounces |
| | Lead | 138,493 | kilograms | 305,325 | pounds |
| | Zinc | 13,540 | kilograms | 29,851 | pounds |
| | Copper | 920 | kilograms | 2,028 | pounds |
| | Cadmium | 15 | kilograms | 33 | pounds |

## *Capsule Geology*

The Atlin Ruffner mine, composed primarily of the Ruffner and Big Canyon claim groups, is located on Crater Creek which drains west into the Fourth of July Creek. The mine is about 23 kilometres northeast of the community of Atlin. The mine has been an intermittent producer from 1916 to 1981, being operated by numerous companies.

The occurrence lies completely within the Middle Jurassic Fourth of July Creek batholith (Three Sisters Plutonic Suite) which covers about 780 square kilometres northeast of Atlin. It is composed of both monzonitic and quartz dioritic phases and in the area of the Atlin Ruffner mine is composed of feldspar porphyritic quartz syenite to granite. The batholith has intruded into Carboniferous-Jurassic Cache Creek Complex rocks.

Mineralization on the property is associated with dark green, pyroxene-bearing lamprophyre dikes which strike 070 degrees and dip 85 degrees to the northwest. The dikes are abundant, parallel, and from 2 to 10 metres thick. They follow older fracture zones and have been the host for younger fracturing, shearing, and veining. The dikes are not commonly seen outside the batholith and have also been crosscut by the younger, Late Cretaceous Surprise Lake batholith. These relationships suggest that the mafic dikes may be in part coeval with the Jurassic Fourth of July Creek batholith and represent a residual, differentiated mafic portion of the same parent magma emplaced only slightly after the main body.

Possibly because of their brittle more competent nature, the dikes host later shearing, veining, and fracturing. Four of these dikes are replaced by ankerite-quartz-calcite veining and shear zones. They are heavily mineralized with galena, sphalerite and arsenopyrite with lesser pyrite and chalcopyrite. Mineralization is lensy and not laterally continuous. Ore has been produced from these structures from 1916 to 1981 with an average grade of 0.42 grams per tonne gold, 267 grams per tonne silver and 5 per cent combined lead-zinc. Mineralization occurs in four major zones (Assessment Report 18646).

The dikes usually host the mineralization, and clearly predate the mineralization, as in many cases brecciated dike rock fragments are found in the quartz-carbonate-sulphide assemblages that constitute the ore. Mineralization includes varying amounts of sphalerite, galena, arsenopyrite, pyrite, pyrrhotite, chalcopyrite, pyrargyrite (with trace amounts of tetrahedrite, molybdenite, scheelite, and cassiterite) in a quartz-calcite gangue. Across the mineralized veins/shears, which typically are 1 to 2 metres in width, there is a crude segregation of sulphide mineralogy, from sphalerite-rich hangingwall, through a galena-rich core, to an arsenopyrite-rich footwall. High-grade silver values are commonly associated with galena-rich zones, and gold values with arsenopyrite-rich zones. Four major vein/shear systems have been identified to date, with underground development and production having taken place on two of them.

In 1988, unclassified reserves from the two zones from which underground development and production has taken place are 113,638 tonnes grading 600 grams per tonne silver and 5.0 per cent lead (Assessment Report 18646).

In 1918, M.J. Ruffner optioned and staked the Atlin Ruffner Crown grants. Surface prospecting revealed four vein zones on the property with the

bulk of all subsequent work being performed on the No. 2 and No. 4 veins. Underground work began in 1921 on the No. 4 vein at the 4975-level and later drifting was done on the No. 2 vein at the 4300-level. Small shipments of sorted lead-silver ore were made in 1923 and 1927.

After Ruffner's death, the C.V. Bob Group acquired control in 1928 and continued to develop the underground workings, driving the 3900-level crosscut for a length of about 807 metres. This crosscut intersected the No. 2 vein at 442 metres and continued toward the No. 4 vein for another 365 metres. Diamond drilling of four holes from the end of this level intersected the No. 4 vein but recoveries were poor. Work on the 4100- and 4300-levels was also accomplished by this group but failed to provide sufficient encouragement to warrant further work and they dropped their option in 1934. Bobjo Mines Ltd. acquired the property in 1934 and continued underground exploration on the 5150 (4E drift) and 4300 (2X drift) levels, advancing them 195 and 176 metres, respectively.

In 1951, Atlin Ruffner Mines reopened the workings and produced a shipment of 44 tons of ore grossing 280 grams of gold, 166,183 grams of silver, 16,419 kilograms of lead, and 2644 kilograms of zinc. Their surface work included bulldozer trenching and drilling of about 1219 metres of AX core on the Vulcan and Big Canyon veins, which lie to the south.

Interprovincial Silver Mines Ltd. optioned the Vulcan Property in 1966 and drilled 2779 metres of AX core on the veins that parallel the mineralized structures on the Atlin-Ruffner claims. The company optioned the Atlin-Ruffner claims in 1967 and work that year included construction of 16 kilometres of access roads.

In 1979-82, strike extensions of two vein systems were discovered when Cyclone Development Ltd. completed a nine-hole diamond drilling program 1000 metres east of the Big Canyon veins. Drill results from both veins were reported as uneconomic. Homestake Mineral Development Co. Ltd. acquired the property in early 1988, and through the 1988 exploration season completed programs of airborne and ground geophysics, detailed and reconnaissance-scale geological mapping, lithogeochemical sampling, soil geochemical sampling, and trenching over various portions of the property. The results of the airborne geophysical (total field magnetics, calculated vertical gradient magnetics, VLF-EM) surveys over the property were inconclusive. None of these geophysical techniques definitively identified the areas of known mineralization, nor were any new targets identified as a result of the survey. Most variations observed in both the magnetic and electromagnetic fields are thought to be attributable to topography and/or variations in the depth of overburden cover. Approximately 240 line-kilometres of grid controlled geological mapping was completed on the property, during the course of which 531 rock samples were collected and analyzed for gold and a suite of thirty additional elements. A soils geochemical survey was completed over a portion of the property (Number 6 Vein Grid), in an effort to delineate the strike extensions of the Big Canyon Numbers 1 and 2, and Numbers 6 and 7 Veins. Ground geophysical surveys were completed over portions of the grid, in an attempt to delineate strike extensions of the Numbers 6 and 7 Veins. Neither total field magnetics, horizontal loop electromagnetics, or radiometrics were successful in defining a geophysical signature for the vein systems. Nine diamond-drill holes, completed by Cyclone Development Ltd. in 1981 on the Number 6 and 7 Vein systems, were logged and sampled in detail. Recovery through the mineralized sections appears to have been extremely poor, and as such the analytical results were equally as poor. No economic intersections from any of the nine holes were returned. A small trenching program was completed over four target areas of the property. Two trenches exposed significant quantities of mineralization, from which elevated precious and base metal values were returned.

In 1996-97, Pacific Harbour Resources Inc. completed an extensive grid geochemical survey, and VLF and induced polarization geophysical surveys on 28 Atlin Ruffner Crown grants.

In late 2006, Saturn Minerals Inc. optioned the Wheelbarrow property and became the operator. During the early summer of 2007, Saturn Minerals conducted prospecting and rock sampling programs accompanied by lithological and structural observations. A total of 420 samples (including 98 chip samples taken from hand-trenched mineralized zones) were collected and analyzed. The rock sampling program was designed to test the character and grade of mineralization in several known showings and sites, as well as to prospect for extensions of the known zones and for completely new zones. The purpose of this extensive sampling program was also to select targets for subsequent mechanical trenching and, eventually, diamond drilling programs, both of which took place later on during the same field season. During mid- to late- summer 2007, Saturn conducted complementary soil, trenching and drilling programs. The soil sampling resulted in 74 soil samples taken in four distinct areas of the property. Excavator trenching resulted in 16 trenches and test pits totalling 315 metres in length. Approximately 150 rock samples from the trenches were sent for analysis. Nine diamond-drill holes were drilled to test the southern Big Canyon mineralized structure. The total length of the drillholes was 607.68 metres; 255 core samples were sent for analysis.

Global Drilling Solutions Inc. acquired the majority of the claims comprising the current Ruby Creek Project in the spring of 2016 from Adanac Moly Corporation. For the 2016 field season Global chose to target gold vein deposits structurally controlled by faulting within existing placer creeks with the main focus on Boulder Creek. In 2017, Global conducted geochemical sampling, drilling and ground geophysics on the Ruby Creek property. In 2018, Global carried out further geochemical sampling and drilling on this property. It's mentioned that the Ruby Creek property remains of high interest for not only gold/molybdenum but also for silver and copper based on the exploration work during 2017/2018 (Assessment Report 38256).

In 2020, Stuhini Exploration conducted mapping, prospection, ground geophysics and geochemical sampling on the Ruby Creek property. In 2021, an airborne SkyTEM survey was conducted by Stuhini on the Ruby Creek property, which revealed a number of regional trends across the property.

## *Bibliography*

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|---|---|---|---|---|---|
| **Date Coded:** | 1985/07/24 | **Coded By:** | BC Geological Survey (BCGS) | **Field Check:** | N |
| **Date Revised:** | 2021/10/15 | **Revised By:** | George Owsiacki (GO) | **Field Check:** | N |