

Location/Identification

MINFILE Number:	082GSW025	National Mineral Inventory Number:	082G5 Pb1
Name(s):	ST. EUGENE (L.666) ST. EUGENE MINE, SILVER FOX, MOYIE (L.669), LAKE SHORE (L.756), QUEEN OF THE HILLS (L.668), PETER (L.665)		
Status:	Past Producer	Mining Division:	Fort Steele
Mining Method	Underground	Electoral District:	Kootenay East
Regions:	British Columbia	Resource District:	Rocky Mountain Natural Resource District
BCGS Map:	082G021		
NTS Map:	082G05W	UTM Zone:	11 (NAD 83)
Latitude:	49 17 07 N	Northing:	5459832
Longitude:	115 49 36 W	Easting:	585328
Elevation:	1100 metres		
Location Accuracy:	Within 100M		
Comments:	Location identifies old workings and the millsite.		

Mineral Occurrence

Commodities:	Silver, Lead, Zinc, Gold		
Minerals	Significant:	Galena, Sphalerite, Pyrite, Pyrrhotite, Magnetite, Chalcopyrite	
	Associated:	Quartz, Calcite, Garnet, Actinolite	
	Associated Comments:	Gangue is restricted.	
	Alteration:	Silica	
	Alteration Comments:	Quartzites show some evidence of silicification locally.	
	Alteration Type:	Silicific'n	
	Mineralization Age:	Unknown	
Deposit	Character:	Vein	
	Classification:	Hydrothermal, Epigenetic	
	Type:	I05: Polymetallic veins Ag-Pb-Zn+/-Au	
	Shape:	Tabular	Modifier: Faulted
			Strike/Dip: 090/70S
	Comments:	Moyie anticline dominates structure south of Moyie fault. It is an upright northeast plunging fold.	

Host Rock

Dominant Host Rock:	Sedimentary		
Stratigraphic Age	Group	Formation	Igneous/Metamorphic/Other
Helikian	Purcell	Middle Aldridge	-----
Isotopic Age	Dating Method	Material Dated	
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Lithology:	Quartzite, Argillite, Turbidite		

Geological Setting

Tectonic Belt:	Omineca	Physiographic Area:	Purcell Mountains
Terrane:	Ancestral North America		

Inventory

No inventory data

Summary Production

		Metric		Imperial	
	Mined:	1,475,266	tonnes	1,626,202	tons
	Milled:	1,460,977	tonnes	1,610,451	tons
Recovery	Silver	182,690,658	grams	5,873,641	ounces
	Gold	78,846	grams	2,535	ounces
	Lead	113,034,479	kilograms	249,198,369	pounds
	Zinc	14,482,913	kilograms	31,929,358	pounds

Capsule Geology

The St. Eugene mine is located 1.5 kilometres southeast of Moyie, east of Moyie Lake.

The deposit is hosted by quartzites and argillites of the Helikian Middle Aldridge Formation (Purcell Supergroup) and is contained within an east-west fracture zone, dipping 70 degrees south, which strikes across the axial plane of a large regional northeast plunging anticline. The St. Eugene mine is on the eastern limb of the anticline and the Aurora showing (082GSW023) is on the western limb across Moyie Lake.

The deposit consists of two important veins and a system of connecting veins which meet the main vein system at a low angle. Most of the ores occurred at or near such junctions in the form of irregular lenses. Very little displacement was noted along the vein as a whole and they are probably tensional fractures along the crest of a plunging anticline. It was reported that the sulphides (mainly pyrite, pyrhotite and sphalerite) were slightly more abundant near the margins of the orebodies and that sphalerite showed no increase with depth. At the 305-metre level, the two main veins/fissures are 183 metres apart and converge downwards and towards the west.

The St. Eugene Vein System is comprised of several cross-cutting veins which transect the upper part of the Middle Aldridge, becoming less pronounced up into the Upper Aldridge. The northwest-striking, steeply south dipping veins extend from the Aurora/Guindon on the west side of the lower Moyie Lake southeast about 5 kilometres, over a vertical range of at least 1200 metres. It is primarily a lead-zinc-silver system with a variety of trace elements including copper, gold, arsenic, antimony, and mercury. The mine produced primarily lead and silver with the sphalerite discarded for most of the production history. Most of the tonnage was contained within the north and south veins, particularly where the south vein converged on the north vein and cross structures (linking shears) yielded significant production as well. The best developed veins and mineralization were confined to two intervals of quartzite-dominated stratigraphy designated the Lakeshore and Moyie zones.

Production from 1899 to 1929 totalled 1.475 million tonnes resulting in 182,690,658 grams of silver, 78,846 grams of gold, 113,034,479 kilograms of lead, and 14,482,913 kilograms of zinc (BC METAL MM00544).

WORK HISTORY

The St. Eugene mine area has a long and varied history. Mining of the vein system was earliest from the late 1890's through to 1916. Production totalled 1.47 million tonnes of about 7.7 per cent lead, 124 grams per tonne silver, 1 per cent zinc, and 0.05 gram per tonne gold. Small tonnages were extracted from extensions on the west side of the lake (Aurora (082GSW023)) and Guindon (082GSW027)) and to southeast at the Society Girl (082GSW030). The operators of the day did exploration underground and later in the 1930s, 1940s, and 1960s more mapping and drilling was done but records are poor to non-existent.

Early exploration at the St. Eugene is generally described but specific results are lacking. The deposit was recorded in 1893 by James Cronin, who was told of the ore by the Ktunaxa (Kootenai) people. St. Eugene Consolidated Mining Company conducted early development and in 1905 the mine was taken over by the Consolidated Mining and Smelting Company. During mining, levels were extended, and a few holes drilled from surface.

Later in the 1930s and 1940s several reviews were conducted of the property and some dewatering of workings took place. In 1947, Saint Eugene Mining completed a program of geological mapping and a 10-line-kilometre ground magnetic survey on the area as the Moyie property. In 1964 and 1965 exploration consisting of mapping, soil geochemistry, trenching on the upper St. Eugene area and across the lake at the Aurora. Two drill holes were done on the upper St. Eugene Baltimore claim. During the 1960s Cominco Ltd. drilled three deeper holes along the east shore of the lower lake apparently to test the ground south of the St. Eugene for parallel veins but also to try to intersect the St. Eugene system at depth which was not accomplished. In 1988, after completion of the d-8-c well hole by Duncan Oil and Gas at the south end of the lower Moyie Lake, the cuttings from 3

metre intervals were sampled and analyzed. This identified some anomalous lead-zinc intervals and a deeper anomalous copper zone. In 1990, Cominco completed a 16.5-line-kilometre ground electromagnetic survey on the area. (Assessment Report 20705). Also in 1990, Noranda completed a one-year program of mapping and soil geochemistry on the Beach property, 4 kilometres to the north, in response to anomalous copper in an RGS sample (Assessment Report 20483).

In 2006, Saint Eugene Mining completed 697 line-kilometres of airborne combined magnetic and electromagnetic surveys on the area (Assessment Report 28450). In 2011 and 2013, Kootenay Silver completed programs of geological mapping, rock sampling, a 500 line-kilometre airborne magnetic survey and a 500 line-kilometre seismic survey on the area as the Silver Fox property.

In 2014, Kootenay Silver conducted more detailed geological mapping on its Silver Fox claim block (Assessment Report 35034). Work was focused on three principal areas, two of these being to the south around Ward and Gilnockie creeks, with the third being at the St. Eugene mine.

In 2018, a program consisting of geological mapping/prospecting and pXRF soil sampling was completed along the basal member of the Middle Creston Formation for approximately 17 kilometres from Barkshanty Creek south to the headwaters of Tepee Creek (Assessment Report 38925). The Silver Fox claim group of Kootenay Silver Inc. covered the area from Moyie Lake southeast to the U.S. border, some 30 kilometres. The Barkshanty geological work area covered Society Girl (082GSW030) and Golden Burp (082GSW085) with St. Eugene (082GSW025) and North Zone (082GSW086) being a little further west though part of the Silver Fox property. The area is transected by several important base metal-bearing structures (St. Eugene (082GSW025), North Break, Old Yeller (082GSW111), etc.) but much of the area is masked by overburden. New copper mineralization was documented in various localities of the "Barkshanty" map area, and two holes were drilled on the property just over 3 kilometres east-southeast of the village of Moyie. The first hole was abandoned at 135 meters due to a rig breakdown. A second shallower hole was drilled from the same location and ended at 500 meters depth. The purpose of the program was to test the basal member of the Middle Creston Formation for stratabound copper-silver mineralization.

In 2021, Kootenay Resources Inc. contracted Salt Spring Imaging, Ltd. to record and analyse magnetotelluric data on the Moyie anticline (Assessment Report 40348).

Refer to Tepee Copper (082GSW088) for related geological and work history information on the Silver Fox property, which (more recently) includes the area of the St. Eugene past producing mine.

Bibliography

EMPR AR 1893-1066; 1894-748; 1895-673; 1896-517,521; 1897-569,523; 1898-993,1010,1034; 1899-593,660; *1900-791,799,946; 1901-1006; 1902-131; 1903-93; *1904-104; 1905-24; 1906-132; 1907-163; *1909-88,154,272; 1910-90,243; 1911-121; 1912-131,322; 1913-121, 419; 1914-237,509; 1915-444; 1916-191; 1917-150; 1918-150,176,179, 188,390; 1919-115,148; 1920-116,140; 1923-301; 1924-186; 1925-226; 1927-266; 1928-281; 1929-295; 1937-E52; 1940-A82; 1947-A175; 1962-85; *1963-81; 1965-199; 1966-241

EMPR ASS RPT 1, 41, 1174, 20705, 28450, 32629, 34631, 34695, 35034, 38925, 40348

EMPR BC METAL MM00544

EMPR BULL *20, p. 17, Part II

EMPR FIELDWORK *1980, pp. 9-13; 1983, p. 24

EMPR OF *1988-14; 1998-10

EMPR PF (Crowsnest Pass Website (Apr.1999): St. Eugene Mine, 2 p.)

GSC EC GEOL 8

GSC MAP 1960-11

GSC MEM *76, p. 118; 207

Falconbridge File

Placer Dome File

EMPR PFD 650026, 650049, 650050, 650051, 650052, 650053, 650048, 650054, 650055, 650056, 650057, 650058, 650059, 650062, 650060, 650046, 650061, 650044, 650045, 650047, 650032, 1885, 3527, 3528, 3529, 3530, 885651, 885653, 885658, 885654, 885655, 823071, 822715, 822697, 822698, 822699, 822700, 822701, 822707, 822708, 822712, 822723, 822729, 822730, 600085, 802639, 861261, 861262, 504578, 896433, 650383

Date Coded:	1985/07/24	Coded By:	BC Geological Survey (BCGS)	Field Check:	Y
Date Revised:	2023/06/06	Revised By:	Garry J. Payie (GJP)	Field Check:	Y