Location/Identification

MINFILE Number: 092ISE027
National Mineral Inventory Number: 092I7 W1
Name(s): **LUCKY MIKE**
LAST CHANCE, CAM, MAC 3, GRACE

Status: Past Producer
Mining Method Open Pit
Regions: British Columbia
BCGS Map: 092I037
NTS Map: 092I07E
Latitude: 50 18 02 N
Longitude: 120 41 31 W
Elevation: 1603 metres
Location Accuracy: Within 500M

Mining Division: Nicola
Electoral District: Fraser-Nicola
Resource District: Cascades Natural Resource District

UTM Zone: 10 (NAD 83)
Northing: 5574597
Easting: 664370

Mineral Occurrence

Commodities: Tungsten, Silver, Copper, Zinc, Lead, Gold

Minerals
Significant: Scheelite, Pyrite, Pyrrhotite, Chalcopyrite, Galena, Sphalerite
Associated: Garnet, Epidote, Calcite
Associated Comments: Skarn
Alteration: Garnet, Epidote, Calcite, Magnetite, Hornblende, Chlorite, Hematite
Alteration Comments: Skarn
Alteration Type: Skarn, Carbonate
Mineralization Age: Unknown

Deposit
Character: Disseminated, Stockwork
Classification: Skarn
Type: K05: W skarn, I05: Polymetallic veins Ag-Pb-Zn+/-Au
Shape: Irregular **Modifier:** Fractured
Dimension: 110x0x0 metres
Comments: Main skarn unit; northeast strike.

Host Rock

Dominant Host Rock: Volcanic

Stratigraphic Age	Group	Formation	Igneous/Metamorphic/Other
Upper Triassic	Nicola	Undefined Formation	------

Isotopic Age	Dating Method	Material Dated
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Lithology: Skarn, Lithic Tuff, Tuff, Limy Volcanic Rock, Limestone, Andesitic Breccia, Intermediate Crystal Lithic Tuff, Crystal Lithic Tuff, Felsic Crystal Lithic Tuff

Geological Setting

Tectonic Belt: Intermontane
Physiographic Area: Thompson Plateau
Terrane: Quesnel

Inventory

Ore Zone: DRILLHOLE
Year: 2014
Category: Assay/analysis
Report On: N
NI 43-101: N

Sample Type: Drill Core

Commodity	Grade
Tungsten	0.17 per cent

Comments: Drilling on the Luck Mike occurrence yielded intercepts including 0.15 per cent tungsten over 20 metres in hole LM-2, 0.17 per cent copper, 26.4 grams per tonne silver and 0.12 per cent tungsten over 9 metres in hole LM-3 and 0.17 per cent tungsten over 23.9 metres in hole LM-4, while another drill hole (LM-7) located several hundred metres north of the previous holes yielded 0.22 per cent zinc over 42.08 metres, including 0.2 per cent copper, 0.08 per cent tungsten with 8.6 grams per tonne silver over 24.83 metres

Reference: Assessment Report 35480

Ore Zone: TRENCH
Year: 2011
Category: Assay/analysis
Report On: N
NI 43-101: N

Sample Type: Chip

Commodity	Grade
Silver	82.5 grams per tonne
Copper	3.537 per cent
Tungsten	0.41 per cent

Comments: a 1.0 metre chip sample (80964)

Reference: Turner, J.A. (2012-09-17): Technical Report NI 43-101 for the Lucky Mike Copper-Tungsten Property

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Ore Zone: DRILLHOLE
Year: 1993
Category: Assay/analysis
Report On: N
NI 43-101: N

Sample Type: Drill Core

Commodity	Grade
Silver	8.7 grams per tonne
Gold	0.26 grams per tonne
Copper	0.25 per cent

Comments: 0.25 per cent copper, 8.7 grams per tonne silver and 0.26 gram per tonne gold over 2.5 metres and 5.41 per cent copper, 160.4 grams per tonne silver and 0.60 gram per tonne gold over 0.24 metre in hole 93-7 located on a magnetic anomaly

Reference: Turner, J.A. (2013-03-14): Technical Report NI 43-101 for the Lucky Mike Copper-Tungsten Property

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Ore Zone: DRILLHOLE
Year: 1988
Category: Assay/analysis
Report On:
NI 43-101: N

Sample Type: Drill Core

Commodity	Grade
Silver	38.3900 grams per tonne
Copper	0.1800 per cent
Tungsten	0.1520 per cent

Comments: Tungsten assay across 14.1 metres of mineralized skarn. Copper and silver assays are across 3.6 metres of mineralized skarn.

Reference: Assessment Report 18583.

Ore Zone: TOTAL
Year: 1973
Category: Indicated
Report On: Y
Quantity: 317,485 tonnes
NI 43-101: N

Commodity	Grade
Silver	20.5000 grams per tonne
Copper	0.5600 per cent
Tungsten	0.2300 per cent

Comments: Estimated geologic reserves.
Reference: Assessment Report 24600, page iii.

Ore Zone: TRENCH
Year: 1943
Category: Assay/analysis
Report On: N
NI 43-101: N

Sample Type: Chip

Commodity	Grade
Tungsten	0.25 per cent

Comments: tungsten tri-oxide over a width of 10.2 metres
Reference: (Turner, J.A. (2012-09-17): Technical Report NI 43-101 for the Lucky Mike Copper-Tungsten Property

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Ore Zone: DRILLHOLE
Year: 1943
Category: Assay/analysis
Report On: N
NI 43-101: N

Sample Type: Drill Core

Commodity	Grade
Tungsten	0.312 per cent

Comments: tungsten tri-oxide in eight holes over an average width of 7.5 metres
Reference: Turner, J.A. (2012-09-17): Technical Report NI 43-101 for the Lucky Mike Copper-Tungsten Property

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Summary Production

		Metric	Imperial
Mined:		24 tonnes	26 tons
Milled:		0 tonnes	0 tons
Recovery	Silver	4,262 grams	137 ounces
	Gold	62 grams	2 ounces
	Copper	876 kilograms	1,931 pounds
	Lead	795 kilograms	1,753 pounds

Capsule Geology

The Lucky Mike (Last Chance) occurrence is located at an elevation of approximately 1590 metres on the north slope of Swakum Mountain and approximately 2 kilometres north-northwest of Dartt Lake.

The area around Swakum Mountain consists of folded Upper Triassic Nicola Group volcanic rocks with interbedded sedimentary units. These rocks are intruded by large north-trending felsic to intermediate intrusions (batholiths) east and west of the mountain. Nicola Group rocks on the mountain strike north to northeast with generally steep dips. For a large part they consist of andesitic flows and tuffs, agglomerates, and occasional basalts and

rhyolites. A break occurs in the volcanic stratigraphy and is comprised of a mixed volcanic-sedimentary unit consisting of a thick sequence of felsic volcanic flows, lithic and crystal tuffs, limy sediments and a prominent limestone. This unit has a northeast strike and crosses the mountain for a 2.5-kilometre strike length. The unit has been historically used as a marker horizon in interpreting a large, asymmetrical, south-plunging anticline with its north-trending axis near Swakum Mountain summit. Narrow quartz porphyry dikes locally intrude the Nicola Group sequence. To the east of this marker unit are a thick, unconformable wedge of immature sediments, predominantly coarse polymictic conglomerates (fan-type) and grits with minor cherty units. Most of the old workings on the mountain occur in close proximity to or within this volcanic-sedimentary unit. The Swakum Mountain deposits consist of polymetallic skarn-type mineralization, lead-zinc-silver bearing quartz veins and replacements, and polymetallic quartz veins.

On the Lucky Mike property, polymetallic skarn mineralization is associated with altered sections of the marker horizon unit of the Upper Triassic Nicola Group. Limy volcanics, tuffs and limestone of this marker unit have been in part, converted to garnet-epidote-calcite skarn with associated copper, tungsten, silver and minor gold and zinc mineralization. Recent drilling has indicated that tungsten mineralization is widespread in the garnet skarn while copper-zinc- gold-silver values tend to be restricted to late crosscutting structures.

The main skarn unit is 110 metres long with a northeast strike. It occurs at the contact between epidotized andesitic breccias and intermediate to felsic crystal-lithic tuffs within a lens of limy volcanic rocks, lithic tuffs and limestone (skarn protoliths). The skarn is bimodal in mineralogy, consisting of interfingering garnet skarn (andradite garnet, magnetite, epidote, hornblende, chlorite and calcite) and carbonate skarn (coarse calcite, epidote, hornblende, chlorite, minor magnetite or hematite) possibly reflecting original compositional variation (protolith-coarse, highly carbonated lithic tuffs[?]). Numerous late, fairly wide, east-dipping (30-50 degrees) fracture zones cut the skarn with local displacements. A major fault zone is evident in the hangingwall lithic tuffs.

The skarn geometry is complex, with the marble line (skarn edge) having a tooth-like cross section. Locally wide near to surface (up to 25 metres true width), the skarn tapers to depth with narrow 1- to 2-metre wide ‘roots’ 50 metres below surface. Tungsten mineralization is confined to the bimodal skarn with fine to coarse disseminated scheelite. A drillhole (LS-1-88) intersection across 14.1 metres of skarn mineralization assayed 0.152 per cent tungsten (Assessment Report 18583). Copper mineralization with silver and local zinc values appears to be structurally controlled and located along shallow east-dipping fault zones within the skarn and in the footwall epidotized volcanics. The structures are late (post-skarn). They are wider in the skarn than in the volcanics but yield lower copper and silver values than in the volcanics below. Sulphides consist of chalcopyrite, pyrrhotite and pyrite. Galena and sphalerite are also reported. A diamond drill hole (LS-1-88) intersection across 3.6 metres of skarn mineralization assayed 0.18 per cent copper and 38.39 grams per tonne silver, whereas another drillhole (LS-4-88) yielded 0.72 per cent copper over 4.9 metres, including 2.35 per cent copper and 64.0 grams per tonne silver over 1.06 metres from the footwall of a fault zone (Assessment Report 18583). Tungsten values occur with the copper and silver where the structures cut through the skarn. Tungsten mineralization in the skarn body appears to be early (prograde[?]) whereas copper, silver, zinc and gold mineralization is late (retrograde[?]) associated with fracturing.

Diamond drilling has tested the skarn for a 110-metre strike length and at a variety of elevations 40 to 80 metres below the old surface workings. Based on present and past drilling, the indicated reserve of skarn available for tungsten mineralization is less than 90 710 tonnes (Assessment Report 18583).

Geological reserves at the Lucky Mike skarn copper-tungsten deposit are estimated at 317 485 tonnes grading 0.56 per cent copper, 0.30 per cent tungsten trioxide (0.23 per cent tungsten) and 20.5 grams per tonne silver (Assessment Report 24600, page iii).

Approximately 210 metres southwest of the workings a limy tuff with zones of skarn hosting disseminated chalcopyrite is reported. The zone is 3 to 4.5 metres wide, strikes north 10 degrees west and dips 20 degrees southwest. Similar mineralization is reported to have been intersected by drilling approximately 60 metres along strike from the surface exposure.

Another zone of mineralization, referred to as the Grace occurrence, is reported approximately 400 metres north of the Lucky Mike (Last Chance) workings. A historical shaft or adit is reported on the occurrence.

Work History

The Swakum Mountain area has been explored since the early 1900s, with numerous small shafts and pits being developed during this time. The Lucky Mike (Last Chance) occurrence was originally discovered in 1916 by Oscar Schmidt and later that year Northwestern Mines Ltd. sank an inclined shaft on the north end of the mineralized zone.

Minor production occurred in 1917 and 1927 , with a total of 24 tonnes being milled yielding 4.262 kilograms of silver, 62 grams of gold, 876 kilograms of copper and 795 kilograms lead.

In 1942 and 1943, the area was re-staked and explored as a scheelite prospect by W.B. Milner, and the Strategic Metals Committee completed programs of trenching and 14 diamond drill holes over a strike length of 100 metres. Surface sampling of trenches is reported to have yielded values ranging from 0.1 to 1 per cent tungsten trioxide, including 0.25 per cent tungsten trioxide over a width of 10.2 metres, whereas diamond drilling is reported to have averaged 0.312 per cent tungsten trioxide in eight holes over an average width of 7.5 metres (Turner, J.A. (2012-09-17): Technical Report NI 43-101 for the Lucky Mike Copper-Tungsten Property).

In 1948, the mineralized zone was described, by W.E. Cockfield, as having an exposed length of approximately 105 metres with both ends concealed by overburden and a width ranging from 7.5 to 22.5 metres with an averaged of 12.0 metres.

In 1956, Jackson Mines Ltd. completed a program of geological mapping, hand trenching and sampling on the area as the Mac claims. A chip sample of mineralized garnetite and andesite from the back of the winze yielded 1.05 per cent copper over 3 metres, whereas a 4.5-metre sample of drillcore from DDH no. 10 yielded 0.47 per cent copper (Assessment Report 136).

During 1958 through 1965, Torwest Resources Ltd. conducted programs of trenching, geochemical sampling, geological mapping and geophysical surveys on the area. At least 23 drillholes over a strike length of 150 metres are reported to have been completed during this time. Chip sampling of the Last Chance workings yielded 1.20 per cent copper and 6.8 grams per tonne silver over 4.05 metres, whereas a chip sample taken 30 metres south of the previous sample yielded 2.70 per cent copper and 65.0 grams per tonne silver over 2.64 metres (Property File 800512).

In 1972, Adar Resources completed a 7.6 line-kilometre ground magnetic survey on the area immediately north and east of the occurrence as the LO claims. Random sampling of the shaft is reported to have yielded 1.68 per cent copper, 25 grams per tonne silver, 0.14 per cent lead and 0.17 per cent tungsten (Assessment Report 25744). The following year, Adar Resources completed a program of diamond drilling, totalling 150 metres, percussion drilling, totalling 144 metres, soil sampling and ground magnetic and electromagnetic surveys on the Amigo, Lo and Old Alameada claims. Also at this time, American Smelting and Refining Co. completed a soil sampling program on the area north of the occurrence as the WAK claims.

In 1976, Cominco Ltd. completed a 25.0 line-kilometre ground magnetic and induced polarization survey on the area immediately north of the occurrence as the Helmer 1-4 claims. In 1978, a 7.2 line-kilometre induced polarization survey was completed on the Helmer claims. In 1981, two percussion drill holes, totalling 144 metres, were completed on the claims. In 1979, the area immediately south of the occurrence was prospected by L. Trenholme as the Dartt 1-2 claims.

In 1985 and 1986, Pacific Northwest Geotech Ltd. completed programs of soil sampling on the area immediately west of the occurrence as the Irene claim. In 1987, Lacana completed a program of geological mapping, geochemical sampling and geophysical surveys on the area. In 1988, International Corona Corp. completed a program of trenching and 11 diamond drill holes, totalling 800.1 metres, and an airborne geophysical survey on the area as the Petrie property.

In 1993, Hera Resources completed four drillholes, totalling 568.2 metres, on geophysical targets in the Lucky Mike occurrence area.

In 1998, Ahura Mining Ltd. prospected and sampled the area immediately south of the occurrence as the How 1-10 claims. The following year, a program of geological mapping, rock sampling and a 27.2 line-kilometre ground electromagnetic survey was completed on the claims. In 2000, Ahura Mining completed a program of geological mapping and geochemical (rock and soil) sampling on the How property.

In 2011, Plate Resources Inc. completed a 576 line-kilometre airborne geophysical survey and a limited amount of geological mapping and sampling on the area. Four grab samples (156672 to 156675) from historical trenches yielded values from 0.01 to greater than 1.00 per cent copper, 0.068 to 0.494 per cent tungsten, trace to greater than 100 grams per tonne silver and trace to 0.478 gram per tonne gold, whereas a 1.0-metre chip sample (80964) assayed 3.537 per cent copper, 82.5 grams per tonne silver and 0.41 per cent tungsten (Turner, J.A. (2012-09-17): Technical Report NI 43-101 for the Lucky Mike Copper-Tungsten Property).

In 2010 and 2012, Pan Andean Minerals Corp. completed programs of soil sampling on the area immediately east of the occurrence as the Dartt Lake claims.

In 2013, Plate Resources Inc. completed a program of geological mapping, geochemical (rock and soil) sampling and an induced polarization survey on the area.

In 2014, Arc Pacific Resources Corp., on the behalf of Plate Resources Inc., Korea Resources Corp. and Nexgeo Inc., completed 16 diamond drill holes, totalling 3004.0 metres, on the Lucky Mike property. Drilling on the Luck Mike occurrence yielded intercepts including 0.15 per cent tungsten over 20 metres in hole LM-2, 0.17 per cent copper, 26.4 grams per tonne silver and 0.12 per cent tungsten over 9 metres in hole LM-3 and 0.17 per cent tungsten over 23.9 metres in hole LM-4, whereas another drillhole (LM-7), located several hundred metres north of the previous holes, yielded 0.22 per cent zinc over 42.08 metres, including 0.2 per cent copper and 0.08 per cent tungsten with 8.6 grams per tonne silver over 24.83 metres (Assessment Report 35480).

In 2015, Arc Pacific Resources Corp., on the behalf of Plate Resources Inc., completed a program of geological mapping, a 50 line-kilometre induced polarization survey and 17 diamond drill holes, totalling 4827.7 metres, on the Lucky Mike property.

In 2016, Arc Pacific Resources Corp. completed eight diamond drill holes, totalling 4032.8 metres, and an induced polarization survey on the Lucky Mike property.

Bibliography

EMPR AR 1917-233,450; 1918-239; 1924-136; 1925-183; 1927-213;
1934-D24; 1935-D14; 1938-A33; 1958-28; *1959-36
EMPR ASS RPT *136, 3936, 4223, 4409, 6119, 7016, 8053, 9880, 14117, 15075, *18583, *24600, *25744, 26068, 26468, 32569, 33333, 33980, 34441, *35480, 36240, 36770
EMPR BULL 10, p. 107; 69
EMPR EXPL 1976-E95; 1978-E163; 1989-119-134
EMPR GEM 1971-294; 1972-180
EMPR MAP 47
EMPR OF 1991-17; 1998-10
EMPR PF (*Report by M.S. Hedley, 1943; Geological notes)
EMR MP CORPFILE (Torwest Resources Ltd.; Adar Resources Ltd.;
Brendon Resources Ltd.)
GSC MAP 44-20A; 886A; 887A; 1386A; 5212G
GSC MEM *137, p. 143; 249, p. 60
GSC OF *980
*Turner, J.A. (2012-09-17): Technical Report NI 43-101 for the Lucky Mike Copper-Tungsten Property
Turner, J.A. (2013-03-14): Technical Report NI 43-101 for the Lucky Mike Copper-Tungsten Property

EMPR PFD 650168, 650171, 9979, 10417, 10418, 10419, 10420, 826931, 800506, 800507, 800510, 800511, *800512, 800513, 800514, 800515, 800516, 800522, 800523, 800524, 800525, 800526, 800527, 800528, 800529, 800530, 800531, 800532, 800533, 800534, 600239, 896710, 896743

Date Coded:	1985/07/24	**Coded By:**	BC Geological Survey (BCGS)	**Field Check:**	N
Date Revised:	2021/07/15	**Revised By:**	Karl A. Flower (KAF)	**Field Check:**	N