

Location/Identification

MINFILE Number:	082ESE020	National Mineral Inventory Number:	082E2 Cu2
Name(s):	PHOENIX (KNOB HILL)		
	PHOENIX MINE, KNOB HILL (L.590), KNOB HILL-IRONSIDES, GRANBY PHOENIX, OLD IRONSIDES (L.589), AETNA (L.978), VICTORIA (L.933), PHOENIX (L.894), IDAHO (L.981), BROOKLYN (L.796), STEMWINDER (L.588), GOLD DROP (L.899), SNOWSHOE (L.891), RAWHIDE (L.892)		
Status:	Past Producer	Mining Division:	Greenwood
Mining Method	Underground, Open Pit	Electoral District:	Boundary-Similkameen
Regions:		Resource District:	Selkirk Natural Resource District
BCGS Map:	082E007		
NTS Map:	082E02E	UTM Zone:	11 (NAD 83)
Latitude:	49 05 27 N	Northing:	5438785
Longitude:	118 35 58 W	Easting:	383228
Elevation:	1315 metres		
Location Accuracy:	Within 500M		
Comments:	Several important mines were developed around the old town of Phoenix. The main Phoenix mine is centred on the claim of the same name, located six kilometres east of Greenwood at the elevation of 1370 metres. Access to Phoenix is paved road east from Greenwood and by an all weather gravel road west from the Grand Forks section of Highway 3. The Knob Hill claim covers part of the Phoenix pit. Location of old shaft and glory hole is on GSC Map 16A. Production includes Old Ironsides (082ESE021), Aetna (082ESE022) and Victoria (082ESE023). Other associated claims include Brooklyn, Stemwinder, Gilt Edge, Red Rock, Bald Eagle, Grey Eagle, War Eagle, Curlew, Snowshoe, Rawhide, Monarch, Gold Drop, Bank of England and Yellow Jacket (082ESE013-019 and 082ESE024-030, respectively). See also Phoenix Tailings (082ESE262).		

Mineral Occurrence

Commodities:	Copper, Gold, Silver, Lead, Iron		
Minerals	Significant:	Chalcopyrite, Pyrite, Magnetite, Gold, Silver	
	Associated:	Quartz, Chlorite, Calcite, Epidote, Garnet, Amphibole, Specularite, Hematite	
	Mineralization Age:	Jurassic-Cretaceous	
Deposit	Character:	Massive, Disseminated	
	Classification:	Skarn, Replacement, Hydrothermal	
	Type:	K01: Cu skarn, K04: Au skarn, K03: Fe skarn, T01: Tailings	

Host Rock

Dominant Host Rock:	Sedimentary		
Stratigraphic Age	Group	Formation	Igneous/Metamorphic/Other
Triassic	Brooklyn	Unnamed/Unknown Formation	-----
Isotopic Age	Dating Method	Material Dated	
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Lithology:	Limestone, Chert Pebble Conglomerate, Sharpstone Conglomerate, Argillite, Chert, Greenstone, Quartzite		

Geological Setting

Tectonic Belt:	Omineca	Physiographic Area:	Okanagan Highland
Terrane:	Quesnel		

Inventory

No inventory data

Summary Production

		Metric		Imperial	
	Mined:	21,552,283	tonnes	23,757,325	tons
	Milled:	13,055,128	tonnes	14,390,815	tons
Recovery	Silver	183,035,743	grams	5,884,736	ounces
	Gold	28,340,619	grams	911,172	ounces
	Copper	235,692,705	kilograms	519,613,469	pounds
	Lead	530	kilograms	1,168	pounds

Capsule Geology

Several important mines were developed around the old town of Phoenix. The main Phoenix mine, centred on the claim (Lot 894) of the same name, is located six kilometres east of Greenwood at the elevation of 1370 metres. Access to Phoenix is by paved road east from Greenwood or by an all weather gravel road west from the Grand Forks section of Highway 3.

The first claims in the Phoenix area were staked by Henry White (Knob Hill (Lot 590)) and Matthew Hatter (Old Ironsides (Lot 589) (082ESE021)) on July 15th, 1891. The claims were Crown granted in 1896. In 1896, J.F.C. Miner, a rubber footwear manufacturer from Granby, Quebec, together with mining promoter J.P. Graves and A.L. Little of Spokane, Washington, formed the Miner-Graves Syndicate. In 1899, they incorporated The Granby Consolidated Mining and Smelting Company, Limited and, in 1901, consolidated under The Granby Consolidated Mining, Smelting and Power Company, Limited. The Canadian Pacific Railway extended a branch line to Phoenix and underground mining of copper and gold ores began using a combination of square set and room and pillar stopes serviced by numerous shafts and adits. Later, open pit mining methods were developed and the Old Ironsides mine became one of the first open pit mines in Canada. In 1900, the City of Phoenix was incorporated, construction of the British Columbia Copper Co.'s smelter at Greenwood was largely completed, and the Granby smelter at Grand Forks was 'blown in' in the fall of the year.

In the early days most of the ore feeding the smelter at Grand Forks came from the Old Ironsides mine; however, 8 different mineralized zones contributed to production from the Granby property. Ore was also produced in the mining camp by the Consolidated Mining and Smelting Company, primarily from the Snowshoe mine (082ESE025). Production rates from the camp varied markedly but attained as much as 3000 tons per day at this time. In 1919, the Granby mine and smelter closed owing to a number of factors at the end of World War I, including low copper prices, decreasing ore grades and a shortage of coking coal for the smelter furnaces.

W.E. McArthur leased the property in 1936 and began recovering ore from the old workings; he subsequently purchased the property from Granby and intermittent exploration and development work continued until 1946. Attwood Copper Mines Limited optioned the property in 1951 and conducted geological mapping, geophysical and geochemical surveys and diamond drilling until 1953.

In 1955, the Granby company re-purchased the property and began an evaluation with intent of developing an open pit, trackless mining operation. A subsidiary company, Phoenix Copper Company Limited, was incorporated in June 1956. Open pit production began in 1959 from the general area of the underground mine at a rate of 900 tons per day which was increased to 2000 tons per day in 1961 and to 3000 tons per day in 1972. By 1964, 4 open pits, the Old Ironsides, Idaho (082ESE013), Snowshoe and Stemwinder (082ESE014) were in operation. By 1973, declining production was supplemented by stockpiled low grade copper ore. Mill feed was also augmented by ore trucked from the Lone Star mine, 20 kilometres to the south in Washington State. An unsuccessful attempt was also made to mill ore from the Oro Denoro mine (082ESE063). Granby terminated mining operations at Phoenix in 1974 and later dismantled and moved the mill. Subsequently the property was purchased by Noranda mines Ltd.

No significant work was done on the property until 1981 when Noranda optioned the Phoenix property to Kettle River Resources Ltd., who carried out an exploration program focused on the precious metal potential of the property. A drilling program discovered the Sylvester K zone (082ESE046) in 1983. Noranda elected to participate in exploration during 1984 through 1985 and continued drilling Sylvester K and other anomalies found during the course of previous geological, geophysical and geochemical surveys. In 1987 Skylark Resources Ltd. attempted to mine the Sylvester K deposit but abandoned the operation after unsuccessfully processing only a few tons of the ore. During 1989 through 1990 Kettle River Resources Ltd. acquired outright ownership of the property from Noranda. Battle Mountain (Canada) Inc. optioned the property from Kettle River Resources Ltd. and conducted a program of reconnaissance mapping and sampling during the early in 1990. This work was subsequently expanded to a larger program including establishment of a survey-controlled grid over the southwestern part of the property around the Phoenix workings, with cut and flagged cross lines at 100 metre intervals. A magnetometre survey and a geochemical soil survey over the entire grid was followed by detailed geological mapping of a portion of the grid at the scale of 1:1000. Drilling programs were completed during 1991 and 1992 with no encouraging

results.

Mining in the Phoenix area was from four principal ore bodies underlying (1) the Old Ironsides (082ESE021), Knob Hill (082ESE020) and Victoria (082ESE023) claims; (2) the Gold Drop (082ESE028), Rawhide (082ESE026) and Snowshoe (082ESE025) claims; (3) the Brooklyn and Idaho (082ESE013) claims; and (4) the Stemwinder (082ESE014) claim. Other claims associated with the Phoenix Mine are Aetna (082ESE022), Curlew (082ESE024), Monarch (082ESE027), Gilt Edge (082ESE015), Red Rock (082ESE016), Bald Eagle (082ESE017), Grey Eagle (082ESE018), War Eagle (082ESE019), Bank of England (082ESE029) and Yellow Jacket (082ESE030).

Total production, between 1900 and 1978, from the Phoenix Mine was 21,552,284 tonnes of ore containing 28,341 kilograms of gold, 183,036 kilograms of silver and 235,693 tonnes of copper. In addition to this production, 12 tonnes of ore was shipped from the Gold Drop mine in 1900; plus 855,634 tonnes of ore from the Rawhide mine between 1904 and 1916; plus 545,129 tonnes from Snowshoe between 1900 and 1911; and 292,834 tonnes from the Brooklyn, Idaho and Stemwinder operations between 1900 and 1960.

The first period of production, from 1900 to 1919, was largely by underground mining on the Knob Hill, Ironsides, Gold Drop, Monarch, Victoria, Snowshoe and Curlew claims. Systematic development, consisting of an extensive system of tunnels and stopes, began in 1895 and comprised three adit levels on the Old Ironsides and Knob Hill claims, at elevations of 1440 metres, 1414 metres and 1386 metres. To the east, five levels, serviced in part by the Victoria shaft, were developed on the Victoria and Aetna claims at elevations of 1451 metres, 1356 metres, 1334 metres, 1315 metres and 1305 metres. At the close of the first period of operations in June 1919, a total of 12,434,620 tonnes of ore had been mined from stoped areas, exceeding 48,000 square metres in lateral extent, accessed by a 37-kilometre long network of interconnected tunnels.

Intermittent mining took place by W.E. McArthur from 1920 to 1942, mainly from the Old Ironsides claim. This period produced 47,107 tonnes of ore.

Renewed operations by the Granby company in 1959 began excavations which, by the final close of mining activity in 1976, resulted in removal of almost the entire old underground workings. This created a large elliptical 425 by 800-metre open pit. Mining took place largely on the Knob Hill, Old Ironsides, Aetna, Victoria, Brooklyn, Idaho, Stemwinder, Snowshoe and Rawhide claims. From 1959 to 1978, 9,070,560 tonnes of residual low grade ore was extracted.

The geology of the Phoenix area is complex. The mine is underlain by an intricately folded, faulted, metamorphosed and mineralized sequence of Paleozoic and Mesozoic volcanic and sedimentary rocks that are overlain in turn by Eocene volcanic and epiclastic rocks. Paleozoic rocks at Phoenix include the Knob Hill Group, consisting mostly of chert, cherty argillite, greenstone and a minor amount of limestone. Scanty fossil evidence indicates that the Knob Hill rocks may be as old as Devonian, although some geologists suggest a Permo-Carboniferous age. These rocks are unconformably overlain by Brooklyn limestone, sharpstone conglomerate, argillite and the Eholt volcanics believed to be Middle-Upper Triassic age. Small microdiorite intrusions together with possibly coeval andesites of the Eholt Formation, overlie and intrude Brooklyn limestone and sharpstone conglomerate units. North-trending fold axes and a series of north-dipping thrusts, associated with serpentinite slices, have been identified within the pre-Tertiary assemblages. Locally, sedimentary rocks of the Eocene Kettle River Formation unconformably overlie the older rocks. These are feldspathic sandstones and conglomerates containing interbeds of rhyolite ash and minor carbonaceous seams. Overlying and intruding these beds are pulaskite and augite porphyry dikes and sills, and trachyte and mafic phonolite volcanics of the Eocene Marron Formation.

The ores of the Phoenix area are almost exclusively the result of limestone alteration. The extensive deposits of low grade copper ore, which have given rise to the mining industry at Phoenix, occur in mineralized areas of the Brooklyn limestone, which have all the characteristics of metasomatic replacements. These replacements are composed essentially of chlorite-epidote skarn rocks with variable amounts of garnet, calcite and quartz, accompanied by blebs and disseminations of pyrite, chalcopyrite, magnetite and specularite. The skarn and copper minerals are localized in a band of impure limestone above a well-defined footwall argillite. The thickness of mineralization varies from a maximum of 60 metres to less than 1 metre at the limits of mining. The ore beds are generally inclined downward to the east, but dips vary and a series of north-south faults have produced irregularities.

The main ore body outcrops on the Knob Hill and Old Ironsides claims, on the south side of a ravine that is the headwater area of Twin Creek. In its downward and eastward extension the ore body passes onto the Victoria and Aetna claims. The mountain in this area is divided by a 'great' pulaskite porphyry dike which is traceable southerly for 1200 metres from the Victoria claim through the Aetna and War Eagle claims. The dike is relatively fresh, has not been cross-fissured by any subsequent geological events, and continues at depth for at least a few hundred metres, as proven by diamond drilling. The main body of ore, on the Knob Hill, Ironsides and other westerly claims, is composite in character and consists of two lenses which coalesce about their central portions. The western lens is at least 750 metres long, from 12 to 38 metres thick, and from 112 to over 275 metres wide. The eastern lens is apparently not so long, but approaches the magnitude of the former in width and thickness. The combined thickness of the two at their point of junction is about 57 metres. In its southern extension this composite ore body appears to break up into subordinate ribs and wedges of ore separated by complementary ribs of almost barren gangue rock. A similar condition also appears to occur to the east of the main ore body and the 'great' dike, where a rather flat lying zone, consisting in part of pay ore, has been found on about the same level as No. 3 tunnel. The general strike of the outcrop of the ore body is 010 degrees with dips to the east ranging from 45 to 60 degrees. The dip flattens with depth and on the lower levels averages from 15 to 30 degrees. A downfaulted block of Tertiary rock, viewed in the 1000-metre long Victoria to Gold Drop tunnel (elevation 1450 metres), separates the east side of the Phoenix pit from an eastern extension of the Old Ironsides - Knob Hill skarn zone.

The Gold Drop mine (082ESE028) develops only part of an extensive and practically continuous ore body, which outcrops on the Gold Drop claim, swings down and across the Rawhide and Curlew, and terminates on the Snowshoe claim. The whole, when broadly viewed, has, on a horizontal plan, the form of a compressed crescent with northward trending horns, broken by the occurrence of the detached Gold Drop No. 1 ore body and the north Snowshoe body. The ore body rests on a floor of sharpstone beds and in the Gold Drop proper there is an entire absence of Brooklyn limestone and Tertiary intrusives. The ore body of the Gold Drop proper is developed in the southeast part of the Gold Drop claim, and the northeast part of the Monarch claim (082ESE027). The strike varies from 013 degrees to 032 degrees, with an easterly dip, which averages about 40 degrees, but flattens to about 25 degrees below the level of the Monarch drift.

The known length of the ore body along the strike of the Monarch drift is over 320 metres, and its width to the boundary of the claim is about 96 metres. The thickness probably averages about 9 metres, the diamond drill logs showing a range from 2 to 17 metres.

The Rawhide mine (082ESE026) develops the continuation of the Gold Drop-Monarch ore body. The mine workings, underlying about three hectares on the western part of the Rawhide claim, consist of several large stopes and glory holes accessed by approximately 1400 metres of tunnelling on seven levels. The ore body, which attains a maximum thickness of 23 metres near the northwest boundary of the claim, rests on Brooklyn sharpstone conglomerate beds dipping 13 to 25 degrees north and northeast.

The Snowshoe mine (082ESE025) consists of two main mineralized zones worked to a depth of about 65 metres. Development to the end of operations in 1911 included several open cuts, glory holes, two shafts and a series of stopes accessed by 3000 metres of tunnelling. Surface excavations, including a 70 by 120-metre pit, completed between 1957 and 1964, resulted in the production of about 270,000 tonnes of low grade ore from the southern part of the claim.

The south ore body (Snowshoe mine) is a continuation of the one developed in the Curlew, Rawhide, and Gold Drop mines. It is broadly considered as one ore body, though bands, wedges, and ribs of slightly mineralized gangue rock break its continuity. These were removed or left in stopes depending on their size and structure. Along the Snowshoe-Curlew boundary the footwall dips north at about 40 degrees. To the west, it has a curving strike to the north with easterly dips ranging from 30 to 65 degrees. North of the main shaft at the first cross-cut, the strike is northeasterly with southeast dips from 40 to 50 degrees. In its downward extension, the ore body apparently swings to the northeast, which brings it adjacent to, or in contact with, the north ore body. The north and south axis of the ore body is about 180 metres and the east and west axis is about 80 metres long. The thickness of the ore according to the cross sections varies from 8 to 11 metres with occasional local swells giving a greater thickness over small areas.

The footwall rocks are sharpstone conglomerate beds, tuffs, and red and grey argillites, with local patches of quartzose crystalline limestone. The hanging wall consists of the garnet and epidote rocks of the mineralized zone into which the ore either insensibly fades, or from which it is separated by a gouge filled fissure (slip). The ore body in depth terminates abruptly against the quartzose rocks of the Knob Hill group, on the plane of a presumably pre-mineral fault or contact plane, which dips west at from 15 to 38 degrees. The ore body throughout is cut by numerous fissures, which in places have a marked influence on the character of the ore, and which were the main channels of circulation of the ore bearing solutions. Many of these have been filled during the closing stages of deposition with quartz, calcite, chalcopyrite, and pyrite in banded arrangement.

The north ore body was probably at one time connected surficially with both the South Snowshoe and Gold Drop No. 1 bodies, but has been separated by subsequent erosion. From the mine plans and sections, the main part of the north ore body has a length north and south of 110 metres on the surface, a width ranging from 34 to 46 metres, and is from 2 to 17 metres thick, the average being about 11 metres. The dip of the footwall varies from 18 to 56 degrees east. A fault dipping west at 12 degrees cuts the ore off. To the north this fault steepens to 47 degrees and with a displacement of about 12 metres brings the lower part of the ore body to surface. The ore at this point lies on an augite porphyry dike which has been intruded along the footwall. In its northern extension, the strike of the ore body swings to the northeast and the sharpstone footwall gives place to the quartzose rocks of the Knob Hill group. The dip is to the southeast from 22 to 65 degrees, averaging about 45 degrees. The ore in this portion of the body was of higher grade than the average mined in the camp, particularly in the copper content.

The Brooklyn and Idaho mines (082ESE013) are situated on a mineralized zone crossing the valley of Twin Creek, about 700 metres northwest of the Phoenix pit. The zone is an elongated pear shaped form, broad and shallow at the south, narrowing and becoming steeper to the north until it is enclosed by almost vertical walls of limestone, as exposed by the Brooklyn 'glory hole'. The sharpstone beds lie to the east and the limestone to the west. The floor is mainly limestone with some sharpstone conglomerate in the southern part. The length is about 564 metres, and the width varies from about 122 metres in the south to less than 15 metres in the extreme north.

The Brooklyn mine, at the north end of the mineralized zone, was developed from two glory holes at surface and a number of underground stopes serviced by a 130-metre inclined shaft with working levels at 24, 46, 76, 91, and 106 metres. The total recorded ore production is 258,290 tonnes, which includes the two main periods of operation from 1900 to 1908 and 1937 to 1940.

The Idaho mine, at the south end of the mineralized zone, includes an inclined shaft and two levels, the deepest of which connects with the 76-metre level of the Brooklyn mine. A total of approximately 2300 metres of tunnelling was completed at the Brooklyn and Idaho mines by the first closing of operations in 1908. In the period 1963 to 1964, open pit excavations in a 75 by 150-metre area near the Idaho shaft yielded an additional 130,000

tonnes of ore. Subsequently the area became the main tailings pond for the Phoenix mine.

The Stemwinder mine (082ESE014) is 300 metres east of the Brooklyn and Idaho workings and 500 metres north of the Phoenix pit. Production from the Stemwinder began with a trial shipment of 4.5 tonnes of ore in 1895, seven years after the claim was first located by prospectors. Intermittent production between 1900 and 1949 yielded 32,014 tonnes of ore from workings consisting of an open stope and glory hole connected to 450 metres of tunnelling on two levels, at 32 and 61 metres depth, serviced by an inclined shaft and two portals. These workings were the focus of later excavations, in the period 1964 to 1967, which produced a 55 by 146-metre open pit from which 73,322 tonnes of ore was supplied to the Phoenix mill. A total of 718,475 tonnes of waste rock from this operation aided in the construction of a tailings pond and water reclamation site in the vicinity of the Idaho workings.

The most widespread rock around the Brooklyn and Stemwinder is a peculiar aggregate of subangular to subrounded fragments of white, red, and green chert; various types of volcanic and coarse grained granitic rocks; and occasionally, finely crystalline limestone. The rock may be called chert breccia. It is one type of cherty material comprising the sharpstone unit.

Two northerly trending, curved, lenticular bodies of another peculiar rock, which will be referred to as limestone breccia, occur near and in the Stemwinder mine. It consists of subangular fragments of greyish white finely crystalline limestone ranging in size from one to several centimetres, together with a few smaller fragments of chert, set in a fine grained matrix of carbonate, chlorite, quartz, and clay minerals. Where faults are absent, the contact with the chert breccia is abrupt rather than gradational. Westward, near the Brooklyn mine, the chert breccia is in sharp contact along a northerly trending line with finely crystalline, thin bedded, siliceous or argillaceous limestone. The distinct and regular bedding of the latter strikes north and dips 75 to 80 degrees eastward. Although the bedded limestone is more than 300 metres thick on the north side of Twin Creek, it appears to be absent a short distance to the south, on the opposite side of the drift filled valley bottom.

In the old part of the Stemwinder mine, faults are the most conspicuous feature. Two important fault sets strike variably west of north. Faults of one set dip moderately to steeply east, and faults of the other set dip 25 to 40 degrees westward. Faults of a third set appear to cut those of the other two sets. The third set strikes northeasterly and dips moderately or steeply to the northwest or to the southeast. They are characterized by much gouge and by fluting that is close to horizontal. Although on the surface the limestone breccia appears to be fairly continuous, in the workings it is found to be cut into isolated blocks by the numerous faults. The blocks, ranging in size from a metre to several metres, are in fault contact with chert breccia on all sides. On No. 1 level the segmentation occurs in a northerly trending belt roughly 60 metres wide. This belt is bounded on the west, almost directly below the glory hole, by a fault, beyond which the rock is all chert breccia.

All of the ore in the old part of the Stemwinder mine occurs in this belt. The ore bodies are fault blocks of limestone breccia which have been partly recrystallized as coarse grained grey calcite containing irregular veinlets and larger masses of chalcopyrite and pyrite. Usually the mineralization ends at the faults bounding the limestone breccia blocks, but in a few places the chert breccia, for a few feet beyond such a fault, is brecciated and moderately well mineralized. The ore is striking different to that of the Brooklyn mine. It contains no garnet or other lime silicate gangue minerals, no specularite, and no quartz. However, it is similar to the Brooklyn ore in its virtual restriction to carbonate rocks and in its relation to faults which may well be pre-ore in age. The orebody mined in the Stemwinder glory hole was a block of mineralized limestone breccia bounded on both sides and below by faults. The lower bounding fault dips 25 degrees westward and contains a thin sheet of pulaskite porphyry. The intensity of the mineralization of the limestone breccia shows a marked increase near this fault.

In summary, the Phoenix ore body appears to be localized by the fault system, the footwall argillite and impurity of the overlying limestone. No igneous source rocks are known, nevertheless, it is assumed that deep seated granitic rocks under the mine area produced the mineralizing solutions which were then channelled by faults to favourable facies sites in the Brooklyn limestone for replacement and deposition.

Ore reserves of the Phoenix mine as of December 31, 1974 were as follows: 874,000 tonnes of ore grading 0.807 per cent copper; 2,555,468 tonnes of marginal ore (stockpile) grading 0.40 per cent copper; and 2,163,907 tonnes of waste (Geology, Exploration and Mining, 1974, page 35). Ore produced from this date to the end of operations on October 4, 1978, totalled 3,022,104 tonnes (Mining in B.C., 1975-1980, Vol. 1, page 10).

In 1985, Kettle River Resources Ltd. and Noranda Explorations Company Limited began a program to evaluate grade and recovery methods on 4,145,835 tonnes of tailings from past production of the Phoenix pit. The Phoenix Tailings (082ESE262) are located about 3.5 kilometres northeast of the mine.

In 1995, with support from the Explore B.C. Program, Kettle River Resources Ltd. carried out a limited program of sonic drilling and sampling of the Phoenix mine tailings to assess their gold content and determine the economics of re-processing. In all, 42 metres of drilling was done in two holes which were fully sampled. The gold content was found to be 20 per cent lower than previously reported. Metallurgical studies on the sampled material determined that re-grinding and cleaner flotation would produce a concentrate grading approximately 18 per cent copper and 207 grams per tonne gold (Explore B.C. Program 95/96 - M46).

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Date Coded:	1985/07/24	Coded By:	BC Geological Survey (BCGS)	Field Check:	Y
Date Revised:	2020/07/22	Revised By:	Karl A. Flower (KAF)	Field Check:	Y