

PRINCE GEORGE REGION

TAKLA SILVER (Lustdust)

Property name: TAKLA SILVER (LUSTDUST)
Map number (see Appendix C): 49
Mine drainage sample numbers: LB00-3401 to 3403
MINFILE number: 093N 009

Date: September 25, 2000

Persons present: Ken MacDonald (Mining Division, Prince George) and L. Barazzuol (Mining Division, Victoria).

Weather: warm and sunny, slightly overcast

Regional Office: Prince George

NTS map sheet: 093N11W

Location: situated on a ridge west of the divide between Silver and West Kwanika creeks, approximately 35 kilometres east-northeast of Takla Landing

Access: The main camp is approximately 180 km northwest of Fort St. James, or 77 km west of Germansen Landing on Germansen Lake Road. Bralorne-Takla adits are about 3 km west of the camp.

UTM coordinates: n/a

Type of deposit: Polymetallic manto Ag-Pb-Zn

Commodities mined: Silver, Zinc, Lead, Gold, Antimony, Copper

Years mined (open/closed): unknown

Mine Workings Inspected:

Mine workings inspected include 2 backfilled adits and a waste rock dump.

Two collapsed/backfilled portals adjacent to each other were previously draining water (K. MacDonald). No culverts were in place. Only the north adit was draining at the time and was sampled.

The access road was built on top of the waste rock dump, west of the portals. The waste rock fizzes vigorously as the dump contains marble. The volume of the dump is ~800 m³. The slope of the dump face is about 27 degrees. There was minor visible oxidation in the limestone and altered argillite members. Secondary minerals included limonite or goethite. No visible mineralization was observed. The edge of the dump was fractured and slumped. A high percentage (~75%) of the dump was comprised of fines and sediments.

Mine Drainage:

The drainage from the northern portal flowed east under the road, surfaced on the other side and then flowed down the waste rock dump into the surrounding forest.



Photo 57. Backfilled portal at Takla Silver mine site.

Observations & Analytical Results:

The drainage from the northern portal flowed at ~5-8 L/min. The field pH=5.0. The water was odourless with no visible oxidants or salts. Bright and dark green moss was prolific in the drainage paths. The drainage was sampled.

Water quality analyses are as follows: pH=7.76, [SO₄]=55 ppm, H=228 ppm. Metals above the water quality guidelines for aquatic life are Sb, As, Fe and Zn.

- Sb is dissolved in the drainage and is 1 order of magnitude higher than the guidelines.
- As is colloidal in the drainage and is 1 order of magnitude greater than the guidelines.
- Fe in the drainage is colloidal and is 0.05 ppm above the water quality guidelines.
- Zn is of the same magnitude as the water quality guidelines. Only the dissolved fraction is in excess, by 0.25 ppm.

See Appendix B for the geochemical data set.

Additional Comments:

Although carbonate horizons could provide potential buffering capacity to the system, it appears acid generation is not active at this locale (slightly acidic field pH, neutral lab pH, low sulphate). However, metal leaching is a concern, especially the dissolved Sb and Zn in the drainage. The high concentration of Sb is probably related to the disseminations of lead antimonides in the siliceous and carbonaceous horizons (MINFILE).

The property currently has an MX permit. The exploration site is at a higher elevation than the workings described in this report.

References: See MINFILE

BRALORNE-TAKLA

Property name: BRALORNE-TAKLA

Map number (see Appendix C): 50

Mine drainage sample numbers: LB00-3501 to 3504

MINFILE number: 093N 008

Date: September 25, 2000

Persons present: Ken MacDonald (Mining Division, Prince George) and L. Barazzuol (Mining Division, Victoria).

Weather: sunny and warm

Regional Office: Prince George

NTS map sheet: 093N11W

Location: near the divide between Silver and West Kwanika creeks, approximately 37 kilometres east-northeast of Takla Landing

Access: The main camp is approximately 180 km northwest of Fort St. James, or 77 km west of Germansen Landing on Germansen Lake Road. Bralorne-Takla is less than 1 km north of the camp.

UTM coordinates: n/a

Type of deposit: Almaden Hg

Commodities mined: Mercury

Years mined (open/closed): 1943-1944

Mine Workings Inspected:

Onsite the following was inspected: 1 shaft and headframe, waste rock dump, mill (smelter) site, various buildings and camp infrastructure as well as the calcine tailings.

An open shaft and headframe are located at the north end of the mill complex. The headframe above the main shaft has collapsed on top of the shaft opening. However, the headframe timbers are unstable and alone, pose a hazard to public safety. The shaft is flooded - the water surface is about a 4 second drop. The water from the shaft was sampled. Dump cars and scrap steel noted in area.

The waste rock dump, directly south of the shaft/headframe is comprised of 3 fingers. The dumps are largely composed of limestone and massive crystals of calcite. The rocks are sparsely oxidized in patches to a brown-orange colour. The collective volume of the dump is in the order of 1800 m³.

The former smelter is located south of the shaft. The foundation remains. Remnants of equipment include cooling tubes for mercury vapour condensation, a large rotary retort and a cinder brick-lined fire box. The kiln has been removed. Abundant timbers and scrap located at the mill site.

Various buildings and camp infrastructure remained on site:

- A large foundation, timbers and scrap from what is thought to be an old power house are located west of the shaft.
- Refuse was scattered around the entire mine site (rusting tins, hardened cement still in the bags, etc.).



Photo 58. Bralorne-Takla dump and shaft headframe.



Photo 59. Bralorne Takla mercury mill remains.



Photo 60. Bralorne Takla

- large concrete foundation due east of primary mine building. Scrap metal and timbers noted.

The calcine tailings, the byproduct of ore roasting, are situated south of the camp, across the road. The roasted tailings were deposited as an arcuate shaped dump. The eastern side of the dump is mostly comprised of coarse material (> 10cm) and fines where as the west dump is composed of silt-sized tailings. The surface of the dump appeared to be scattered with limestone, most of which has settled to the toe of the dump. The tailings were a brown-red colour. It appeared as if some of the material had been removed. Partial revegetation has occurred on the top and at the base. The volume of the dump is in the order of ~300 m³. K. MacDonald suspects the tailings were also deposited in 2 small natural lakes nearby. The lakes have an unusual greenish colour. It was not determined if there were tailings in the lake.

Mine Drainage:

No surface drainage observed.

Observations & Analytical Results:

The analytical results of the water from the flooded shaft are as follows: pH=7.8, [SO₄]=7 ppm and H=211 ppm. Metal concentrations above the water quality guidelines for aquatic life include Fe, Hg and Zn.

- Fe exists as dissolved species as well as a colloid/precipitate in the water. The dissolved concentration of Fe is not in excess of the guidelines. The colloid/precipitate concentration is about 0.4 ppm above the guideline threshold concentration.

- Hg is above the guidelines for aquatic life (0 ppm) but below the guidelines for drinking water (1 ppm). The concentration of total Hg in the flooded shaft is 0.0015 ppm. The water was not analyzed for dissolved Hg.
- Zn is in excess of the guidelines but of the same magnitude. Zn in the drainage is both dissolved and as colloid/precipitates. Neither the dissolved or colloidal/precipitate fraction alone is above the guidelines.

See Appendix B for the geochemical data set.

Additional Comments:

The discharge/recharge of the water in the underground workings, and therefore the dispersion of the Hg in the subsurface, is unknown. The u/g workings are ~69,000 m³ (MINFILE).

Up to 10% unrecovered Hg can be in the calcine tailings after ore processing (Rytuba and Klein, 1995). If there is relic Hg in these tailings, it may pose an environmental threat.

If the tailings contain Hg and were deposited in the lake, the Hg may undergo methylation in the aqueous environment. Methylation produces a biologically toxic species of Hg.

References: See MINFILE

Rytuba, J.J. and Klein, D.P., 1995. Almaden Hg deposits. In: du Bray, Edward A., Preliminary compilation of descriptive geoenvironmental mineral deposit models. U.S. Geological Survey Open-File Report 95-831, p. 193-198.

SNOWBIRD

Property name: SNOWBIRD

Map number (see Appendix C): 51

Mine drainage sample numbers: LB00-3601 to 3603

MINFILE number: 093K 036

Date: September 26, 2000

Persons present: Ken MacDonald (Mining Division, Prince George) and L. Barazzuol (Mining Division, Victoria).

Weather: sunny, clear and cool

Regional Office: Prince George

NTS map sheet: 093K07E

Location: southwest shore of Stuart Lake

Access: 7 km rough access trail from the end of public road at Sowchea Bay public campground

UTM coordinates: n/a

Type of deposit: Au-quartz veins; Stibnite veins and disseminations

Commodities mined: Gold, Antimony

Years mined (open/closed): 1939-1953 (intermittently)

Mine Workings Inspected:

Three underground workings were observed, one of which was flooded. One waste rock dump is onsite.

The main adit measures 5' by 7'. No drainage was present. Access to the underground is blocked by caved ground at about 3 m inside. The opening is partially closed by a roughly assembled plywood cap.

An inclined shaft is located about 50 m east of the main adit. The shaft is inclined at about 40 degrees and flooded to within 3 m of the collar. K. MacDonald has never observed surface drainage but there may be movement of water in the subsurface. The water was sampled for further analysis. Access inside the shaft is partially and ineffectively blocked with a roughly constructed timber cap. Conditions of the workings below waterline are unknown.

A third smaller opening is situated about 100 m east of the inclined shaft. The opening is inclined at 40 degrees and caved almost immediately inside the portal. Some broken timbers are inside.

A 25 m long waste rock dump, in the shape of a finger, is located south of the third, smaller opening. The volume of the waste rock dump is on the order of 1000 m³ of material. The dump is partially vegetated. A few pieces of scrap timber are scattered around the workings.

Mine Drainage:

No surface drainage observed. Subsurface drainage of flooded decline is unknown.

Observations & Analytical Results:

The flooded inclined shaft had a field pH=6.0. The water was odourless. No visible precipitates in the water sample. Observations were difficult as the



Photo 61. Northern portal at Snowbird mine containing a collapsed decline.

opening to the decline was partially blocked by timbers.

Water quality results are as follows: pH=7.84, [SO₄]=492 ppm and hardness=1173 ppm.

- the chemical breakdown of ankerite is likely buffering the acid in the system, as indicated by the high hardness value.
- SO₄ is above the water quality guidelines for aquatic life. The concentration is high, indicating that acid is being produced.
- the system has buffering capacity as indicated by the field and lab pH.

Metals in excess of the water quality guidelines for aquatic life include As, Fe and Mn.

- As in the drainage is likely colloidal. The dissolved concentration is below detection (<0.2 ppm) so the speciation cannot be determined. As is 1 order of magnitude above the guidelines. The source of the elevated As may be from the weathering of the arsenopyrite (MINFILE).

- Fe is 1 order of magnitude higher than the water quality guidelines. The Fe is likely a colloidal/particulate species. Although the dissolved concentration is below detection (<0.03 ppm), the total concentration is 2 orders of magnitude higher, implying a large proportion of the Fe is colloidal/particulate. Potential sources of Fe, given the mineralogy, include ankerite, arsenopyrite and pyrite.
- Mn is mostly in the dissolved form. The dissolved (and total) concentration is slightly above the water quality guidelines. The mobile, aqueous species of manganese is Mn²⁺ which is stable in a reducing/acidic environment.

See Appendix B for the geochemical data set.

Additional Comments:

The operation was small scale (MINFILE production was ~48 tonnes).

References: See MINFILE

QUESNEL QUARTZ

Property name: QUESNEL QUARTZ
Map number (see Appendix C): 52
Mine drainage sample numbers: n/a
MINFILE number: 093G015

Date: September 26, 2000

Persons present: Ken MacDonald (Mining Division, Prince George) and L. Barazzuol (Mining Division, Victoria).

Weather: sunny and warm

Regional Office: Prince George

NTS map sheet: 093G07E

Location: 4 km east of Hixon off Hwy. 97.

Access: from Hixon, 2 km along Hixon Creek Road, then 2 km on the old mine access.

UTM coordinates: n/a

Type of deposit: Au-quartz veins

Commodities mined: Gold, Silver

Years mined (open/closed): 1932, 1939

Mine Workings Inspected:

This site has undergone some reclamation. An old ore bin was pulled down and a shaft sealed.

At the site of the former ore bin, ore was scattered (massive quartz with disseminated and veinlets of

pyrite). A concrete mill foundation and wooden debris were also onsite.

The shaft was sealed and covered. The shaft before it was sealed was recorded as flooded.

Despite having a old map of the mine site, no workings, other than those noted above, were located. Hixon Creek shifted course about 5 years ago, making it difficult to reference the workings on the historical map. There was also a heavy overprint of contemporary placer activity in the area. Placer dumps were numerous and may be covering workings. Workings labeled on the map which weren't located include the waste rock dump, 2 of the 3 shafts and 2 adits. The area is well vegetated with no visible signs of oxidation.

Mine Drainage:

n/a

Additional Comments:

n/a

References: See MINFILE

Property File 093G015 (maps in this file)



Photo 62. Site of former ore bin. Note ore and wooden debris scattered on ground.

CARIBOO THOMPSON

Property name: CARIBOO THOMPSON
Map number (see Appendix C): 53
Mine drainage sample numbers: n/a
MINFILE number: 093A091

Date: September 27, 2000

Persons present: Ken MacDonald (Mining Division, Prince George) and L. Barazzuol (Mining Division, Victoria).

Weather: sunny and warm

Regional Office: Prince George

Location: Penny Creek near its confluence with Peter Gulch Creek on Yanks Peak. The site is located near the Snowmobile Club house.

Access: From Wells/Barkerville, 14km east on 3100 Road; right at the cross road for 8 km and then right on the Yank Peaks Road.

UTM coordinates: n/a

Type of deposit: Au-quartz veins

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

Years mined (open/closed): 1937 only

Mine Workings Inspected:

Only one adit was located on the site, which was open and accessible but appeared to be in stable condition. The phyllitic rocks around the collar were weathered an orange-brown colour. Water was draining from the adit but was not sampled.

The waste rock dump was adjacent to the portal to the south. The waste rock was composed of two small adjacent dumps with a collective volume in the order of 100 m³. Visible mineralization included disseminated and massive pyrite. Lithologies include massive quartz vein material and phyllite. The rocks were weathered to a orange-brown colour.



Photo 63. Cariboo Thompson adit.

East of the portal was an open cut and dump that were probably a result of exploratory work. Exposed was an undeveloped quartz vein.

Mine Drainage:

The drainage flowed through the waste rock dump and towards Penny Creek.

Observations & Analytical Results:

The drainage from the adit flowed at a rate of ~2-3 L/min. The field pH was 5.0-5.5 and the conductivity 350 μ s. A dark orange-brown Fe-ppt was present as was sparse grass-like vegetation. The water was odourless.

The drainage was not sampled due to budget constraints. As the drainage at three other mines with similar geology on Yanks Peak were sampled (Jim (093A037), Jane (093A027) and Cariboo Hudson (93A071)), drainage sampling at Cariboo Thompson was not performed.

Additional Comments:

The property inspected may not be Cariboo Thompson as determined by MINFILE. K. MacDonald and B. Lane's (Mining Division, Prince George) findings from their current investigations of the past producers in the Wells/Barkerville area show that this may be a deposit not listed in MINFILE. An accurate identification will be determined at a later date.

References: See MINFILE

Holland, Stuart S., 1954. Geology of the Yanks Peak-Roundtop Mountain Area, Cariboo District. British Columbia. British Columbia Department of Mines, Bulletin No. 34, 102 pages.

CARIBOO HUDSON

Property name: CARIBOO HUDSON

Map number (see Appendix C): 54

Mine drainage sample numbers: LB00-3801, LB00-3802, 3804

MINFILE number: 093A071

Date: September 27, 2000

Persons present: Ken MacDonald (Mining Division, Prince George) and L. Barazzuol (Mining Division, Victoria).

Weather: sunny and warm

Regional Office: Prince George

NTS map sheet: 093A14W

Location: north side of Pearce Gulch, 29 km from Barkerville. Centred on Crown Grant lot 9816.

Access: From Wells/Barkerville, 14km east on 3100 Road; right at the cross road for 8 km and then right on the Yank Peaks Road for approximately 5 km. The last 5 km were on rough road and was accessed by ATV.

UTM coordinates: n/a

Type of deposit: Au-quartz veins

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

Years mined (open/closed): 1938-1939

Mine Workings Inspected:

The Cariboo Hudson workings are the most extensive on Yank's Peak. The site is comprised of 1 adit, waste rock dumps, mill remnants and numerous other building ruins. No tailings were observed. Given the proximity of Pearce Gulch to the mill, the tailings were likely flushed down the gulch.

The adit on Pearce Gulch (known as the 200 level adit) was the main entry to the mine. The portal is located

within an open cut, of which the eastern flank has slumped, leaving uprooted trees in front of the portal. There is no access to the adit as it has been backfilled. The timbers forming the collar appear relatively new. Water is covering the floor of the adit. No apparent oxidation or precipitation exists within or around the adit. Water is draining from the adit and was sampled.

The waste rock dump has partially revegetated with shrubs, moss and immature trees. The dumps are primarily composed of phyllites and schists (~90%). Quartz vein material containing veinlets of mineralization and disseminated pyrite comprise ~1-2% of the dump. The dump is locally weathered to a dark red-brown colour. En masse, the dump appears unweathered as only ~5% of the total dump is oxidized. The volume of the dump is in the order of 1000 m³.

The remnants of the 100 tonne cyanide mill include dilapidated buildings and concrete foundations. Approximately 15 other ruined buildings and sheds are in the area. Many are collapsed and those that are still standing are unstable. Wooden debris is littered over the site.

Mine Drainage:

The drainage from the adit flows for 100 m on the surface before it merges with Pearce Gulch a tributary of Pearce Creek. Pearce Gulch flows through the waste rock dump.



Photo 64. Cariboo Hudson adit. Note drainage in foreground.

Observations & Analytical Results:

The drainage from the portal was flowing at a rate of ~ 2-3 L/min. No visible salts or precipitates are within the drainage. The water is odourless with a pH of 5.0 and a conductivity of 80 μ s. Dark green-black moss is growing within the flow. The drainage flows into a semi-stagnant pool where an oily film is on the water surface. The water was sampled and analyzed.

Water quality results are as follows: pH=8.19, [SO₄]=5 ppm and H=67.54 ppm. All metal concentrations are within compliance with the BC water quality guidelines for aquatic life.

ML/ARD is not occurring at this site. This is consistent with the other mines sampled on Yanks Peak (Jane, Midas and Jim).

See Appendix B for the geochemical data set.

Additional Comments:

Two other portals, one on Simlock Gulch and the other on the "Fourth of July" claim are documented. K. MacDonald, Inspector of Mines - Prince George, has never located these portals.

References: *See* MINFILE

Holland, Stuart S., 1954. Geology of the Yanks Peak-Roundtop Mountain Area, Cariboo District. British Columbia. British Columbia Department of Mines, Bulletin No. 34, 102 pages.

Property File 093A0715.4.7 Jim

JIM

Map number (*see Appendix C*): 55

Mine drainage sample numbers: LB00-3901 to 3903

MINFILE number: 093A037

Date: September 27, 2000

Persons present: Ken MacDonald (Mining Division, Prince George) and L. Barazzuol (Mining Division, Victoria).

Weather: sunny and warm

Regional Office: Prince George

NTS map sheet: 093A14W

Location: on Luce Crk, northeast of Yanks Peak, centred on Crown Granted Lot 4681

Access: From Wells/Barkerville, 14km east on 3100 Road; right at the cross road for 8 km and then right on the Yank Peaks Road for approximately 12 km. The last 12 km were on rough road and accessible by ATV. UTM coordinates: 606811, 5857797

Type of deposit: Au-quartz veins

Commodities mined: Gold, Silver, Lead, Zinc

Years mined (open/closed): no record

Mine Workings Inspected:

The one portal on site was located at the end of an open cut. The timbered collar was standing but the adit roof had failed. Access was blocked by the collapsed roof rock. The wallrock contained carbonates and was composed of fissile phyllite, schists and quartzites. There was no visible oxidation in outcrop. Water was trickling from the adit and was sampled.

To the east of the portal was a 3 fingered waste rock dump. Oxidation of the dump was minor. Visible sulphides include disseminated pyrite in sericitic schistose rocks and disseminated pyrite in quartz vein material. In both lithologies, the sulphides comprised <1% of the rock. Oxidation of the pyrite in the quartz was evident as it was weathering to a brown-orange colour. The lithologies of the dump don't contain carbonate minerals as the rocks didn't

fizz with HCl application. The total volume of the 3 fingered dump is in the order of 1000 m³.

Buildings, both standing and collapsed were onsite. Rusting equipment and rotting wood were present at the toe of the dump. A loading chute for ore was still standing.

Mine Drainage:

The drainage infiltrated the overburden.

Observations & Analytical Results:

The drainage from the adit was flowing at a rate of ~1 L/min. The drainage was odourless with a pH=5.0 and conductivity=110 μ s. No vegetation, visible precipitates or salts were present.

The water quality results are as follows: pH=8.03, [SO₄]=14 ppm and H=98.6 ppm. No metals were in excess of the water quality guidelines for aquatic life.

See Appendix B for the geochemical data set.

Additional Comments:

ML/ARD is likely not occurring at this site. This is consistent with the other mines sampled on Yanks Peak (Jane, Midas and Cariboo Hudson).

Safety hazards are a concern at this site. The area is frequented by snowmobilers.

MINFILE property status is listed as "showing." This status does not reflect the extent of disturbance on site.

References: *See MINFILE*

Holland, Stuart S., 1954. Geology of the Yanks Peak-Roundtop Mountain Area, Cariboo District. British Columbia. British Columbia Department of Mines, Bulletin No. 34, 102 pages.



Photo 65. Open cut leading to an adit at the Jim property.

JANE (Snowshoe)

Property name: JANE (SNOWSHOE)

Map number (see Appendix C): 56

Mine drainage sample numbers: LB00-4001 to 4003

MINFILE number: 093A027, 093A030

Date: September 27, 2000

Persons present: Ken MacDonald (Mining Division, Prince George) and L. Barazzuol (Mining Division, Victoria).

Weather: sunny and warm

Regional Office: Prince George

NTS map sheet: 093A14W

Location: on Yanks Peak, near the headwaters of Luce Creek

Access: From Wells/Barkerville, 14km east on 3100 Road; right at the cross road for 8 km and then right on the Yank Peaks Road for approximately 13 km. The last 13 km were on rough road and was accessed by ATV.

UTM coordinates: 605917, 5857399

Type of deposit: Au-quartz veins

Commodities mined: Gold, Silver, Lead

Years mined (open/closed): no record

Mine Workings Inspected:

Two adits and a waste rock dump were inspected. All the workings were located along the road.

The first, uppermost adit, known as the Camp adit, had collapsed or was backfilled with oxidized rocks. Drainage was flowing from the portal. The water was

sampled after it had merged with the drainage from the lower adit.

Two small waste rock dumps were situated on the south side of the road from the Camp adit. Some minor oxidation was visible. The dumps are partially revegetated. The volume of the dumps was in the order of 50 m³.

The lower adit, known as the Intermediate adit, was about 10 m south of the upper portal. The opening was accessible although very hazardous. The portal timbers were unstable as were the shale/phyllite rocks comprising the roof. Drainage was flowing from the adit. The water merged with that from the Camp adit. A composite of the drainages was sampled.

A small waste rock dump was adjacent to the Intermediate adit. It was slightly oxidized and was revegetated on the lower slope with brush and immature trees. Visible sulphides included disseminated pyrite in phyllite, massive pyrite in quartz as well as ankerite. The volume of the dump was on the order of 250 m³.

A derelict shack was located at the hairpin turn in the road. The shack is still standing but its stability is questionable.

Mine Drainage:

The upper portal drainage flowed over the road, down the lower waste rock dump and then merged



Photo 66. Lower portal at the Jane (Snowshoe) mine site. Note upper adit drainage path at the base of the bank and the hut at the road hairpin.

with the drainage from the lower portal. A sample of the collective drainage was sampled.

Observations & Analytical Results:

Water was draining from the upper portal at a rate of ~2-3 L/min. The pH=5.0 and conductivity =70 µs. The water was odourless with no visible precipitates or salts. No vegetation was present.

The drainage from the lower portal was flowing at a rate of ~2-3 L/min, with a pH=5.0 and conductivity = 160 µs. There were no visible salts or precipitates observed. The water was odourless and dark green hair-like moss was growing in the drainage.

Water quality results are as follows: pH=8.13, [SO₄]=9 ppm, H=70.98 ppm. The metal concentrations were all below the water quality guidelines for aquatic life.

ML/ARD is not occurring at this site. This is consistent with the other mines sampled on Yanks Peak (Jim, Midas and Cariboo Hudson).

See Appendix B for the geochemical data set.

Additional Comments:

Property also referred to as Snowshoe Gold mine.

MINFILE property status is listed as "showing." This status does not reflect the degree of disturbance on site.

The literature indicates a series of buildings once stood on the property as well as 5 adits.

References: See MINFILE

Holland, Stuart S., 1954. Geology of the Yanks Peak-Roundtop Mountain Area, Cariboo District. British Columbia. British Columbia Department of Mines, Bulletin No. 34, 102 pages.

MIDAS

Property name: MIDAS (L. 4670)

Map number (see Appendix C): 57

Mine drainage sample numbers: LB00-4101 to 4103

MINFILE number: 093A035, (093A033)

Date: September 27, 2000

Persons present: Ken MacDonald (Mining Division, Prince George) and L. Barazzuol (Mining Division, Victoria).

Weather: sunny and warm

Regional Office: Prince George

NTS map sheet: 093A14W

Location: east of the apex of Yank's Peak on Crown Granted Lots 4670, 4671, 4673 and 4674. Situated on the ridge separating French Snowshoe and Little Snowshoe Creeks. Directly east of Saddle (093A033).

Access: From Wells/Barkerville, 14km east on 3100 Road; right at the cross road for 8 km and then right on the Yank Peaks Road for approximately 15 km. The last 15 km were on rough road and was accessed by ATV.

UTM coordinates: n/a



Photo 67. Midas adit and drainage.

Type of deposit: Au-quartz veins

Commodities mined: Gold, Silver, Lead, Zinc

Years mined (open/closed): 1949

Mine Workings Inspected:

The main adit is located on the Midas property. The adit is partially blocked/ caved and has been for some time given the established state of the vegetation on the slumped material. Access into the adit is possible but it was flooded and draining water at the time of the inspection. The water was sampled.

According to Bulletin 34 (Stewart, 1954), the purpose of drilling within the adit was to explore the extent of the quartz veining on the property. Access is potentially a health and safety hazard.

Down slope or west of the main portal lies two waste rock dumps.

The larger dump rises to a height of about 18 m and is composed of phyllites and schists. Although the dump is rich in sulphides, in general there is very little observable oxidation. Disseminated sulphides (1-10%) are weathered to a dark-brown red. The dump was partially revegetated on the top.

The smaller dump is comprised of mainly quartz vein containing massive pyrite weathered to a dark-brown red. This dump also has very little visible oxidation despite its high sulphide content. The dump was partially revegetated on the top.

A collapsed building surrounded by wood and metal debris was at the mouth of the portal. This may have been a part of the old mill that was documented in the Minister's Annual Reports. No mill foundations were observed.

Fifty tonnes of test ore from the adjacent Jim property was milled at the Midas property with uneconomic recovery (Stewart, 1954). No tailings were observed on site and the location of the mill, reported to exist, was not found. The tailings may have been flushed down Luce creek.

Mine Drainage:

The drainage from the main adit infiltrates the adjacent waste rock dump, resurfaces at the dump toe and proceeds to drain into Luce Creek.

Observations & Analytical Results:

The drainage from the main adit was flowing at a rate of ~3-5 L/min into a bright green mossy area. No visible precipitates or salts were observed. The pH=5.0 and conductivity=200 μ s. The water was odourless. The drainage was sampled for further chemical analysis.

The water quality results are as follows: pH=8.1, [SO₄]=27 ppm and H=191 ppm. All of the metal concentrations measured were below the threshold values of the BC water quality guidelines for aquatic life.

ML/ARD does not appear to be occurring at this site. This is consistent with the other mines sampled on Yanks Peak (Midas, Jim and Jane).

See Appendix B for the geochemical data set.

References: See MINFILE

Holland, Stuart S., 1954. Geology of the Yanks Peak-Roundtop Mountain Area, Cariboo District. British Columbia. British Columbia Department of Mines, Bulletin No. 34, 102 pages.

Minister's Annual Reports: 1929-C194; 1933-A137; 1934-C30; 1949-A103; 1950-107

WARSPITE

Property name: WARSPITE

Map number (*see Appendix C*): 58

Mine drainage sample numbers: LB00-4201 to 4203
MINFILE number: 093H048

Date: September 28, 2000

Persons present: Ken MacDonald (Mining Division, Prince George) and L. Barazzuol (Mining Division, Victoria).

Weather: sunny and cool

Regional Office: Prince George

NTS map sheet: 093H03W

Location: On Proserpine Mountain, west of the confluence of McCallums Gulch and Williams Creek. Crown Granted lot 9560.

Access: approximately 6.5 km along rough road up Conklin Gulch. Trailhead is from east side of Barkerville, across Williams Creek. ATV access.

UTM coordinates: n/a

Type of deposit: Au-quartz veins

Commodities: Gold, Silver, Lead, Iron

Years mined (open/closed): no record

Mine Workings Inspected:

Two adits, a series of waste rock dumps and a shaft were located and inspected.

The lower adit was located in an open cut along the north side of the access road. The rocks in the open cut were weathered to the same orange-brown colour as the waste rock dump. The portal was timbered and a wooden door provided secure closure to the adit. Red drainage flowing from the adit was sampled.

The lower waste rock dump was adjacent to the lower adit, on the south side of the road. The dump appeared to have been terraced, as it was level. The overall area of the dump was on the order of 200 m² with a volume of ~4,000 m³. Visible sulphides included disseminated pyrite in quartz, disseminated galena and chalcopyrite in argillite/phyllite and 2% disseminated pyrite in a feldspar porphyry. The dump was weathered in patches to an orange-brown colour. Pockets of grass and shrubs were growing on the dump. The southern toe of the dump appeared to have been recently recontoured and thus hosted no vegetation. The drainage flowed over the dump.

The upper adit is located about 20 m east and 20 m above the lower adit. The portal is accessible by a small road from the main road. The portal is timbered and the adit accessible. Immediately inside, the adit is partially caved. No water or drainage was observed in or flowing from the adit.

The upper waste rock is not contained in one dump but rather distributed in various piles adjacent to the upper portal. An estimate of the waste rock was difficult as much of the dump material has been revegetated, the rock is scattered in various piles and

the rock forms the base of the road, which is now covered in vegetation. The area of waste rock disposal was approximately 250 m². The visible waste rock had spotty weathering of an orange-brown colour. Most of the sulphide weathering was within the quartz. No sulphides were visible. Red drainage was seeping from one of the dumps on the east side of the secondary access road, near the main road.

The Warspite shaft is located approximately 350 metres east of the upper adit. The shaft is located within a collapsed log cabin. The collar of the shaft had collapsed and wooden debris was strewn over top and within. Access was possible to the unflooded shaft. The shaft presents a potential health and safety threat. Waste rock was scattered around the vicinity of the cabin. The only visible sulphide was pyrite hosted in the quartz vein material. The pyrite was weathered to a brown-red colour. The piles of waste rock had naturally regenerated with juvenile trees, shrubs and grasses with the exception of those dump areas rich in quartz.

Between the shaft and the adits were a number of collapsed wooden shacks and buildings.

Mine Drainage:

The lower adit drainage flowed over the road and waste rock dump and into the adjacent forest. The Fe precipitate in the water was still evident below the waste rock dump. McCallums Gulch, which is a tributary of Williams Creek, is the receiving watercourse.

Red drainage is seeping from upper waste rock dump.

Observations & Analytical Results:

1. Lower adit

The red drainage from the lower adit was flowing at a rate of approximately 10-15 L/min. The drainage field pH = 5.0 and conductivity 220 μ s. The drainage smelled stagnant. The water was laden with Fe-precipitate. The only signs of vegetation were algal mats, which appeared to grow on/with the Fe-precipitate. The drainage was sampled.

The water quality results are as follows: pH=8.1, [SO₄]=40 ppm and H=161 ppm.

- the system is not acid generating, as implied by the low SO₄ concentration.

Metals in excess include Fe, Mn and Zn.

- Fe is 1 order of magnitude greater than the water quality guidelines. The dissolved concentration is below detection (<0.03 ppm). Given the high content of Fe precipitate in the drainage, the Fe is likely to be mostly precipitate. The mineralogy of the deposit includes arsenopyrite and pyrite (MINFILE), 2 possible sources of Fe.



Photo 68. Drainage, heavy in iron precipitate flowing from the Warspite lower adit.

- Mn is of the same order of magnitude as the water quality guidelines. The Mn species in the drainage are both dissolved and colloidal/particulate.
- Zn is slightly above the threshold value set by the water quality guidelines. Only a small fraction of the Zn in the drainage is dissolved, it mostly resides as colloids and/or particulates. The weathering of sphalerite in the deposit (MINFILE) may be the source of the Zn in the drainage.

2. Upper waste rock dump seep

The waste rock dump seep was rich in Fe-precipitates and flowed at about 2 L/min. The field pH=5.0 and conductivity =180 μ s. The drainage supported a prolific, green mat-like spongy moss as well as red stringy moss. An oily film was on the surface of the water. This drainage was not sampled due to low flow.

Metal leaching not acid rock drainage is an issue at Warspite.

See Appendix B for the geochemical data set.

Additional Comments:

MINFILE property status is listed as “showing.” This status does not reflect the degree of disturbance on site.

Related properties are Proserpine (093H021), Independence (093H051) and Hard Cash (093H052), all of which are MINFILE showings in the vicinity.

References: See MINFILE

Sutherland Brown, A., 1957. Geology of the Antler Creek Area, Cariboo District. British Columbia. British Columbia Department of Mines, Bulletin No. 38, 103 pages.

Property File 093H048

CANUSA

Property name: CANUSA

Map number (see Appendix C): 59

Mine drainage sample numbers: n/a

MINFILE number: 093H 058

Date: September 28, 2000

Persons present: Ken MacDonald (Mining Division, Prince George) and L. Barazzuol (Mining Division, Victoria).

Weather: sunny and cool

Regional Office: Prince George

NTS map sheet: 093H04E

Location: Stouts Gulch, west of Barkerville

Access: short branching trail leading south from the main access road which runs the length of Stout's Gulch. ATV access.

UTM coordinates: n/a

Type of deposit: Au-quartz veins

Commodities: Gold, Lead, Zinc, Bismuth

Years mined (open/closed): 1946-1948

Mine Workings Inspected:

Flooded shaft with collapsed headframe is onsite. The headframe has collapsed over the opening obstructing entry, although access is still possible.

Waste rock dump comprised of argillite and quartz is situated immediately adjacent to the shaft. Its dimensions are 80 m long by 15 m wide at the toe tapering to 2 wide at the crest. The volume is in the order of 8,000 tonnes. The crest is partially vegetated. Scrap steel is at the toe of the dump.

Five wooden buildings onsite. Main building is still standing while the others are in a state of disrepair.

Mine Drainage:

No surface drainage noted.

Additional Comments:

MINFILE property status is listed as "showing." This status does not reflect the degree of disturbance on site.

References: See MINFILE

Sutherland Brown, A., 1957. Geology of the Antler Creek Area, Cariboo District. British Columbia. British Columbia Department of Mines, Bulletin No. 38, 103 pages.



Photo 69. The shaft headframe and buildings (one is collapsed in the foreground) at Canusa mine site.

ISLAND MOUNTAIN

Property name: ISLAND MOUNTAIN

Map number (see Appendix C): 60

Mine drainage sample numbers: LB00-4301 to 4306

MINFILE number: 093H006

Date: September 29, 2000

Persons present: Ken MacDonald (Mining Division, Prince George) and L. Barazzuol (Mining Division, Victoria).

Weather: rainy and cool

Regional Office: Prince George

NTS map sheet: 093H04E

Location: southeast face of Island Mountain.

Access: from Wells

UTM coordinates: n/a

Type of deposit: Au-quartz veins

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

Years mined (open/closed): 1934-1954

Mine Workings Inspected:

Workings inspected include a main waste rock dump, 2 draining portals, 1 collapsed shaft, a flooded and caved opening and 1 ventilation house.

The main waste rock dump is located along the northwest side of the highway and has an approximate volume of 100,000 m³. The dump contains phyllite hosting disseminated pyrite weathered to an orange-brown colour. Some of the phyllite contains carbonate. Quartz vein material containing massive pyrite is also present. Overall, the entire dump appears unoxidized although there are localized, sparse patches of pyritic weathering.

The main 4000 haulage portal is located on top of the dump. The adit was gated and inaccessible. Drainage was flowing south from the adit. The drainage was sampled.

Located 75 m southwest of the main 4000 haulage portal, along a footpath, was a unstable and open collared shaft. A fence with a warning sign surrounds the opening. It was not determined if the shaft was flooded.

Located about 50 m southwest of the shaft, along the same footpath, was a flooded and caved opening. The timbers were rotten and have failed. The type of opening could not be determined although tracks were coming from it. Scrap wood and metal littered the area. The water draining from the underground working was heavy in red iron precipitate and was not sampled.

Southwest of the flooded and caved opening, along the same footpath was an adit with a small building directly outside of the portal. This building is possibly a fan house. A chain link fence blocks access to the adit. Large volumes of water, laden with iron precipi-

tate, were draining from the adit. The drainage was sampled. No dump was visible down slope. K. MacDonald postulates this opening may be a flooded ventilation shaft.

No evidence of mill infrastructure.

Mine Drainage:

Drainage from the main portal flowed south into a ditch. The drainage infiltrated the ground in the ditch.

The caved opening located between the 2 draining adits was flooded and draining water high in iron precipitate. The water was trickling into a small pond of water with an oily film on the surface. The water was not sampled.

The water draining from the adit with a small building at the portal, flowed through and around the small building and southeast down the slope toward the highway. The red, iron precipitate laden water flowed into a flooded ditch along the northwest side of the highway and to a culvert linking the ditch to Willow River. The end of the culvert draining into



Photo 70. Red drainage flowing from the pump house at Island Mountain.



Photo 71. Island Mountain waste rock dump.

Willow River was not located. Highway 26 was under construction during summer/fall 2000. The culvert outflow may have been blocked during construction.

All 3 workings with drainage are at the same elevation.

Observations & Analytical Results:

1. Main production portal

Drainage was flowing from the main production portal at a rate of ~30 L/min. The pH=5.0 and conductivity 310 μ s. The water was clear and odourless. Horsetails and shrubs were proximal to the flow but no vegetation was within the stream of the flow. The water was sampled at this location.

The water quality results are as follows: pH=8.17, [SO₄]=45 ppm and H=250 ppm. No metals are in excess of the BC water quality guidelines for aquatic life.

2. Adit with fan house

An estimate of the flow rate of the drainage from the adit with the fan house was difficult given the large and variable area of the flow path. A ballpark rate is ~20 L/min. The drainage was anomalously warm, heavily concentrated in red iron precipitate and had a strong iron odour. Deposition of the Fe-precipitate was >10cm in places. The pH=5.5 and conductivity 1450 μ s. No vegetation was present in the water but the drainage flows through a well vegetated area. Samples were taken for further geochemical analysis.

The water quality results are as follows: pH=7.52, [SO₄]=1060 ppm, hardness=1296 ppm.

- the system is generating acid as indicated by the high sulphate concentration.
- carbonates, as indicated by the high value of hardness, are present in the system and provide buffering capacity.

Metals in excess of the BC water quality guidelines for aquatic life include Fe and Mn.

- Fe is 2 orders of magnitude greater than the water quality guidelines. However, the dissolved concentration is below detection limits (<0.03 ppm) implying the Fe in the drainage is colloidal and/or a precipitate. This is validated by the heavy iron precipitate observed in the drainage.
- Mn is slightly above the water quality guidelines and is dissolved in the drainage.

See Appendix B for the geochemical data set.

Additional Comments:

The property is adjoined to the north and east by the Mosquito (093H010) and Cariboo (093H019) groups (Cariboo Gold Quartz property).

Water sampling by International Wayside Gold is ongoing due to their application for mine development on nearby Cow Mountain.

References: See MINFILE

- Sutherland Brown, A., 1957. Geology of the Antler Creek Area, Cariboo District. British Columbia. British Columbia Department of Mines, Bulletin No. 38, 103 pages.

CARIBOO GOLD QUARTZ

Property name: CARIBOO GOLD QUARTZ

Map number (see Appendix C): 61

Mine drainage sample numbers: LB00-4401 to 4403

MINFILE number: 093H019

Date: September 29, 2000

Persons present: Ken MacDonald (Mining Division, Prince George) and L. Barazzuol (Mining Division, Victoria).

Weather: overcast and rainy

Regional Office: Prince George

NTS map sheet: 093H04E

Location: north spur of Cow Mountain, Lowhee Creek, and the westerly slopes of Barkerville Mountain.

Access: from Wells, across Lowhee Creek.

UTM coordinates: n/a

Type of deposit: Au-quartz veins

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

Years mined (open/closed): 1902-1967

Mine Workings Inspected:

The main haulage 1500 level adit is located on the top of the waste rock dump. The portal is collared with cement and is gated, making it inaccessible. A strong draft was blowing out of the adit. Water was flowing to the west from the adit at ~5 L/min, toward Jack of Clubs Lake. The water was sampled.

Southwest of the portal is the foundation of the former mill. Structural steel, cinder blocks and scrap metal litter the site. A wooden water tank remains standing, about 100 m west of the mill building.

The waste rock dump contained spotty oxidation of red-orange and yellow-green colourate. The dump was primarily comprised of phyllite containing 1-2% of disseminated pyrite. Other lithologies include quartz vein material and argillite. A fine fraction was also present but this component did not appear oxidized. The top of the dump was naturally revegetated with shrubs, spruce and various grasses. The dump face was too steep to sustain plants. The volume of the dump was ~500,000 m³. There is a massive scrap heap of rusted equipment (mill steel, tanks, etc.) at the toe of the dump.

The tailings extend from the waste rock dump to the northeast shore of Jack of Clubs Lake. Tailings on site are estimated to be 2.9 million tonnes. About 60% of the tailings have naturally revegetated with grasses. Of the non-vegetated areas, about 70% is oxidized orange-brown. Lowhee Creek flows through the tailings and into the northeast end of Jack of Clubs Lake. Jack of Clubs Lake drains from the northeast and forms the headwaters of Willow River. The banks of the headwaters are composed of eroded tailings. Those that are subaqueous are oxidized an orange-brown colour. Drainage resurfaces on the tailings about 25 m southwest of the dump toe and flows into Jack of Clubs Lake. The source of this drainage is unknown but may be the 1500 level adit.

On the east side of the tailings are deteriorating foundations that may have been a powerhouse. Several ruined wooden buildings are in the general vicinity.

The BC Vein workings, part of the historic Cariboo Gold Quartz workings located at the head of Lowhee Creek, is the target of an exploration drill program by



Photo 72. Cariboo Gold Quartz tailings. Note the corner of the mill foundation in the foreground.



Photo 73. The Cariboo Gold Quartz tailings are submerged in Jack of Clubs Lake and the Willow River. Note the oxidized tailings along the bank of the Willow River.

International Wayside Gold Mines Ltd. Reclamation works performed by International Wayside include the capping of the BC shaft and removal of the headframe. Waste dump onsite is in the order of 3,500 tonnes. No drainage noted onsite.

Mine Drainage:

Drainage from the 1500 level portal was flowing to the west from the adit, toward Jack of Clubs Lake. The flow proceeded to the edge of the waste rock dump where it infiltrated the rocks. An ephemeral drainage path to the north also was present but no water was currently flowing in that direction.

Lowhee Creek flows through the tailings and into the northeast end of Jack of Clubs Lake. The Jack of Clubs Lake drains from the northeast and forms the headwaters of Willow River.

Observations & Analytical Results:

The drainage from the 1500 level portal was flowing at ~5 L/min. The pH=5.0 and conductivity 410 μ s. The drainage contained red Fe-precipitates and had a strong iron smell. The drainage was sampled for further analysis.

Water quality results are as follows: pH=8.01, [SO₄]=225 ppm and hardness=327 ppm. Metals in excess of the water quality guidelines include Fe (colloidal/particulate) and Mn (dissolved and colloidal).

- Fe is 2 orders of magnitude greater than the water quality guidelines. However, the dissolved concen-

tration is below detection limits (<0.03 ppm) implying the Fe in the drainage is colloidal and/or a precipitate. This is validated by the heavy iron precipitate observed in the drainage.

- Mn is slightly above the water quality guidelines and is both dissolved and colloidal/particulate in the drainage.

See Appendix B for the geochemical data set.

Additional Comments:

Water sampling by International Wayside Gold Ltd. is ongoing due to their application for a mine development certificate (Environmental Assessment Process) on nearby Cow Mountain (pers. comm. K. MacDonald, Inspector of Mines - Prince George).

The mine workings extend southeasterly from the north end of Jack of Clubs Lake through Cow Mountain to the Cariboo claim (Lot 93) at the head of Lowhee Creek, a distance of 3 kilometres.

References: See MINFILE

- Azcue, J.M., Mudroch, A., Rosa, F., Hall, G.E.M., Jackson, T.A. and Reynoldson, T., 1995. Trace elements in water, sediments, porewater and biota polluted by tailings from an abandoned gold mine in British Columbia, Canada. *Journal of Geochemical Exploration*, 52, 25-34.
- Sutherland Brown, A., 1957. *Geology of the Antler Creek Area, Cariboo District*. British Columbia. British Columbia Department of Mines, Bulletin No. 38, 103 pages.

