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Placer deposits & History of the Horsefly River. Draft Copy March, 1989 093A - general.

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Note: This is an unedited rough draft. Spelling & gramatical mistakes exist. Basic information is complete.

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Records of placer gold occurrences date back to the earliest history of the province. In 1852, mention of indians trading gold nuggets for goods at the Hudsons Bay Trading Co. post at Kamloops. Later, in 1855, substantiated reports of placer gold near Colville (now N.E. Washington state) reached the gold fields in California. By 1858, an influx of several thousand miners had reached Victoria and many moved on to the Fraser river at Yale and Hope. However, many adventurous men worked up the Fraser river in search of the lode gold source. Their continued prospecting efforts took them up the Quesnel river to what is now Quesnel Forks. Rich river bar placer gold was found there. Also,five men lead by two indians, proceeded up through Quesnel Lake and the Horsefly river to the junction with Little Horsefly river. In one week they took out 101 oz. of gold (Carmichael, 1930) before the onset of the winter.

The news of the rich placers in the Cariboo travelled quickly and the great Cariboo gold rush began. In 1860, prospectors worked up the north fork of the Quesnel river (now the Cariboo river) and up Cariboo Lake. Rich placer was found on Keithley and Antler creeks. The next season saw further prospecting up the creeks and over the divide into Williams creek. The phenomenal richness of the gravels in this creek surpassed all the previous diggings to date. Nearly a thousand miners flooded the area and greatly expanded the workings.

For four years the surface gravels produced unheard of amounts of gold, approximately $2,000,000 worth (117,647 oz. @ $17.00 per fine oz.). Placer gold mining continued through to the late 1930's, evolving through many mining methods and volumes. By 1945, a recorded 827,741 oz (Holland, 1950) of gold were recovered from the Cariboo gold fields, including Wells/Barkerville, Lightning Creek, Keithley Creek, Quesnel Forks/Likely and Horsefly River. These areas are still bieng worked for placer gold, though at a reduced scale.

CARIBOO PLACER STRATIGRAPHY AND GEOLOGY

The Cariboo gold fields occur in Pleistocene glacial and interglacial fluvial and till deposits. These sit unconformably on Precambrian through Juro-Triassic rocks of the Slide Mountain, Cariboo, Barkerville and Quesnel terranes. The glacial stratigraphy is confined to sediments deposited during the Wisconsinan glacial stage. This period covers approximately 125,000 ybp to 10,000 ybp (Holocene). Ice directions indicate a WSW to W movement down the Horsefly River and then a deflection to the NW by eastward encroachment of the Coast Mountains Ice Sheet against the Cordilleran Ice Sheet. In the region of the Cariboo (Wells/Barkerville) ice movement is NW and then deflected NE through the region of Prince George to the margin of the Continental Ice Sheet (Fulton, 1984; Eyles and Kocsis, 1988 a&b, 1989)

The oldest gravels may be of late Sangamonian age or earliest Wisconinan age. These are poorly represented and not extensive in the Cariboo. These are glaciofluvial in appearance, but no dating of the sediments has been achieved.(Fulton, 1984)

Unconformably above these are gravels and till related to the early/middle Wisconsin stade (60,000 to 30,000 ybp)(Fulton, 1984) The sediments are a complex of cross bedded fluvial gravels, lateral moraine and basal till

deposits. Frequently, blocks of "slide rock", representing unsorted talus from hillsides adjacent to the ice sheets, are found in the glaciofluvial succession. Together, these are known as the "Lower gravels" and the fluvial channels contained the pay streaks associated with the early drift mining operations.(Fulton, 1984; Eyles and Kocsis, 1988 a&b, 1989)

This sequence is unconformably overlain by a second glaciofluvial section. The unconformity represents the Olympia glacial interstade (60,000 to 30,000 ybp).(Fulton, 1984)

The second glaciofluvial section is a more regular sequence belonging to the Late Wisconsinan Fraser glaciation (30,000 to 10,000 ybp.)(Fulton, 1984). The bottom of this section is a thick, compact lodgement till. This was called the "boulder clay" and represented the "bedrock" of the initial surface placer workings. In early mapping and interpretation, this lodgement till was though to be of volcanic origin.(Johnston and Uglow, 1926) Above the till is a regular sequence of fluvial channel deposits and ablation till. The presence of the ablation till with the fluvial deposits indicates a more regular, continuous retreat of the ice sheet unlike the more discontinuous advance and retreat type of glacial retreat represented by the Early Wisconsinan glaciation.(Eyles, Clark and Clague, 1987)

Covering the Pleistocene sequence is a veneer of Holocene debris and fluvial material. The Pleistocene

section is of variable thickness ranging from 400 feet in the Bullion Pit to a few tens of feet in some of the smaller creeks.(Sharpe, 1939; author-K. Hancock) However, there is a general similarity between all the areas in that the two glacial stade sections are of approximately equal thickness and the second stade lodgement till is approximately a dozen feet thick at most.

BEDROCK GEOLOGY : BARKERVILLE TERRANE

Mapping by several workers including Johnston and Uglow (1926), Alldrick (1983), Eyles and Kocsis (1988) and Struik (1988) have shown a direct correllation between the placer gold and the local lode gold deposits. Most of the placer deposits are associated with the Early Paleozoic Downey succession of the middle Snowshoe Group (Struik, 1988). There is stratigraphic, structural and metamorphic control of the lode gold mineralization and thus the placer gold proximity.

The Downey succession consists of micaceous quartzite, phyllite, marble, calcitic quartzite and tuff. The distinctive feature of the succession is the presence of abundant marble and tuff.

Lode gold mineralization consists of two types. First, there is pyrite - gold replacement of marble and limestone in fold hinges. Second, there is quartz veining with gold associated with pyrite. The quartz veining post dates the

"replacement" sulphide mineralization. Also, the quartz veins follow fractures that cross cut folds. The structural information indicates that the folding and faulting are consistant with a single regional stress field (Struik, 1988).

The lode gold mineralization is related to and is controlled by the metamorphism. Replacement mineralization has been dated at 179 ±8 Ma in associated phyllites. Quartz veining is dated at 141 ±5 in associated sericite. (Andrew et al, 1983) This gives an approximate Early to Middle Jurassic age of mineralization which is contemporaneous with the regional metamorphism of the Barkerville terrane (Struik, 1988). Also, lode gold mineralization is only found in rocks of chlorite grade metamorphism. Metamorphic grade increases to the southeast and there are no known gold occurrences in rocks of garnet grade or higher in the Barkerville terrane. Rocks of the Snowshoe Group in the region of Azure Lake and upper Horsefly River are of kyanite and sillimanite grade and locally, in the region of the Eureka Thrust near Eureka Peak, reach amphibolite grade. (Struik, 1988; Bloodgood, 1989)

GEOLOGY OF THE HORSEFLY RIVER PLACER FIELDS

The Placer gold that occurs in the Horsefly river drainage is significantly differant than that of the other Cariboo gold fields. The significant point is that the gold placers predate the Cariboo placers by about 14 million years. The Cariboo placers represent a reworking of older placers and/or erosion original lode gold deposits (Johnston and Uglow, 1926; Struik, 1988). The Horsefly placers are contained in Miocene fluvial gravels and have an undetermined source to the east.

Locally, the stratigraphic is more extensive and older than the classic Cariboo section. The bedrock is an Upper Triassic to Lower Jurassic volcanic back arc assemblage of shoshonitic affinity in the Quesnel terrane. Phyllites, basalt flows, flow breccias, pyroclastic and epiclastic debris flows and lahars typify the section. The volcanic pile is intruded by small alkalic acid to basic stocks.

Unconformably resting on the bedrock is a 150 m. thick succession of Eocene lacuctrine sediments. These are thinly bedded to laminated and frequently varved. Abundant fossils are found in the sediments including fossil fish and leaves as well as pollens, seeds and spores. Fossil fish (*Eohiodon rosei*) have been dated at 50 -45 Ma by M.V.H. Wilson. (Wilson, 1977) Palynology by Dr. G. Rouse has corroborated the Middle Eocene age of the sediments (G. Rouse, pers. comm.). The lacustrine sediments occupy the Horsefly River valley indicating that this has been a long lived topographic low. Above and adjacent to the lacustrine sediments are biotite latite flows and felsic to intermediate ash tuffs dated at 52.2 ±1.8 Ma (R. Armstrong, U.B.C., Authors). Abundant biotite and thin ash layers in the lacustrine sediments indicate contemporaneous deposition during the Middle Eocene.

Capping the Eocene sedimentary sequence is a 300 foot thick section of Miocene flood basalts. The basalts have been dated at 14.6 ±0.5 Ma (R. Armstrong, U.B.C., Authors). The basalts extend west from Beaver Creek to the west in a continuous plateau. Locally, the basalts are seen as small hilltop cappings as outliers from the main body. This indicates the basalts were originally more extensive but the margin has been eroded along the Horsefly - Quesnel River drainage.

Sandwiched between the Eocene sediments and the Miocene flood basalts is an ancient fluvial drainage. This is the "Miocene Channel" that hosts the Horsefly placer gold. Two distinct channels have been identified by mapping in the area as well as by the placer miners. The fluvial channels are filled with a quartz cobble/pebble conglomerate. In places the bottom 2 to 10 feet has been calcite cemented to form a natural concrete. The main channel has been found to be 500 feet deep and up to 2000 feet across (MMAR, 1931, pp. A97).

The main channel follows the Horsefly River valley down from Black Creek through Horsefly. The Miocene channel then sweeps to the west through Antoine Lake and then down the Beaver Creek valley. The second channel, much smaller than the first, is to the west of the main channel. Tertiary gravels are exposed just below Big Moffat Falls on Moffat Creek. The quartz fluvial channel gravels are capped by Miocene flood basalts at this point. Some prospecting was done, but no gold was recovered. Tertiary gravels outcrop at Gravel Creek where it is crossed by the 150 Mile House-Horsefly road. There the gravels are sandwiched between Miocene basalts and Eocene lacustrine sediments that rest on Triassic basement in Gravel Creek. The sedimentary section is not fully exposed but is no more than 100 feet thick. Also, a small section of Tertiary gravels is exposed just west of China Cabin Creek. The thickness of the gravels, increasing to the north, suggests a small river/large stream flowing north down Beaver Creek, and possably joining the larger Miocene channel.

Pleistocene glaciation has since cut through to the Mesozoic bedrock and scoured the Tertiary section. Variable thickness of till and glaciofluvial deposits have left behind a cover that ranges from a thin veneer a metres thick to a section 75 to 100 m. thick. The glacial section is the same as described above for the Cariboo placers. Glacial and post-glacial reconcentration of the Miocene placer gold is not significant in the Horsefly area.

The source of the placer gold in the Miocene channel is not local. Typical mineralogy of the heavy mineral fraction includes abundant almandine garnet, some spessartine garnet, kyanite, minor blacksand (magnetite, amphibole, pyroxene) and olivine. The gold itself is coarse to fine in size, well beaten, flattened and partially coated with oxide. All these points indicate that the gold has travelled a long distance. Also, the abundance of bull quartz pebbles and the marked lack of heavy minerals and pyroxene indicates that the local volcanic terrane is not the source of the gold. Association with garnets and kyanite would indicate a high grade metamorphic source or host rock for the gold. The nearest such rocks are those of the Barkerville, Cariboo and Slide Mountain terranes. Another possable source for the gold are the Middle Jurassic quartz veins (152 ±5 Ma., Bloodgood, 1989) in the Triassic black phyllites as some of the gold recovered was still attached to either quartz or black 'slate' grains.

HORSEFLY AREA PLACER DEPOSITS

The village of Horsefly was the centre of a small placer mining community through the height of the Cariboo gold rush into the early 1900's. It was first known as Harper's Camp from 1859 through to 1921 when its name was offically change to Horsefly. In more recent years, Horsefly has supported a small community based around logging and recreation. The Horsefly River is a salmon river and as such is presently excluded from the placer staking ground. However Antoine Lake and Beaver Valley still remain in the placer reserve. The initial placer mine is immediately outside of town, to the east, and was known as the Ward's Horsefly mine. The discovery of gold, by whites, on the Horsefly River is accredited to Peter Dunlevey. He and a gang of men were lead up the river by two natives in the spring of 1859 and shown where there was gold in the river.

WARD'S HORSEFLY: Harpers Camp, Horsefly Gold Mining Co. Ltd., J.T. Ward, International Dredging Co. Ltd.

Initial work at the site of Ward's was in Holocene reconcentrated placer at the margin of the Miocene channel. This ground is stated to have been very rich and later workers have indicated that it was the quartz gravels that held the rich pay gravels. Holland (1950) has indicated that a total of 15,216 oz. of gold were reported recovered. However, earlier authors have estimated that 29,000 to 59,000 oz. (MMAR, 1918, pp.K137, $500,000 to $1,250,000; $17.00 per oz. conversion, author) of gold were recovered during the life of the mine.

As reported by the resident mining engineer, Douglas Lay (MMAR, 1931) the Ward's Horsefly operation worked the right edge of the Miocene channel. At this point the channel is 500 feet deep and approximately 2000 feet wide (MMAR, 1931, pp.A97). The stratigraphy at Ward's consists of a thin cover of Quaternary sediment over 20 to 80 feet of white quartz pebble conglomerate. The bottom 5 to 20 feet of this was the `Blue Gravel' pay horizon. The `Blue Gravels' unconformably overly shaley Eocene lacustrine sediments of unknown thickness that dip 30 to 35 degrees to the west. (MMAR, 1918, 1920, 1931)

Initially, the placer gold was recovered by normal mining methods. However, as the pay streaks were mined deeper, the workings progressed below the grade of the Horsefly River and made normal mining methods very difficult. By the late 1880's, drift mining was being done at the site. J.T. Ward took over the operation in 1891 and attempted some hydraulic work for a season. No work was done for the next five years, but an ambitious development wasundertaken by J. Ward. He had two hydraulic elevators

installed in 1896 and a major hydraulic operation began. Water was diverted from both Mussel and Moffat Creeks to supply the monitors and elevators. A large pit, several hundred feet across and up to 60 feet deep was made. Gold recoveries were considered good and the operation continued through to 1904. At that time corporate problems caused the mine to close and that was the end of the hydraulic operation (MMAR, 1904). In 1915, a dredging venture was planned to rework the hydraulic tailings of the Ward operation. However, poor Keysotne drilling results from work done by the B.C. Department of Mines in 1919 caused the venture to fold. No significant work has been done since then at the site.

Due to the overlap of the modern and ancient channels, some recent reconcentration of placer gold has occurred. However, the presence of gold is strictly attributed to the Miocene channel because there is no gold in the Quaternary gravels immediately adjacent to the mine.

MIOCENE SHAFT: Miocene Gravel Mining Co. Ltd., R.N. Campbell

Immediately adjacent to J.T. Ward's hydraulic operation, R.N. Campbell staked at least 12 placer claims extending southwest through Harper's Lake in 1894-7. In 1898-9, R. Campbell sank a shaft, collared 1000 feet southwest of Ward's pit. This shaft cut 275 feet of quartz gravels and then bottomed in 50 feet of shale (Eocene lacustrine sediments; author). From the bottom of the shaft, a 150 foot drift was cut across into the gravels. Also, a 250 foot decline was driven from the shaft bottom, dropping 125 feet along its length. (-39 degrees, similar to the known bedrock dip; author) Both the drift and decline were driven westerly into the gravels. Initially, R.N. Campbell thought the Miocene channel flowed west up through Harper's Lake into the head of Beaver Valley, but this was found to be erroneous. Then in 1900, R. N. Campbell sank a second shaft 2000 feet southwest of Ward's pit. This is the locally well known 'Miocene Shaft', and is located under a utilities at the junction of Walter's Rd. and the main Horsefly road. This was a large three compartment shaft that was sunk a total of 550 feet, bottoming in (Eocene) shales. A 500 foot drift was cut "in the direction of the channel" and raises were cut at 400 and 500 feet to test the gravels. A run of slum from the 500 foot raise flooded the drift and shaft and subsequent work was abandoned. Testing of the gravels was not extensive but it showed gold in less than "paying quantities" (MMAR, 1918, pp.K137). After the flooding of the shaft, no further work was done on the Miocene Gravel Mining Co. ground.

HOBSON'S HORSEFLY: McCallum Claims, Discovery Co. Claims, Horsefly Hydraulic Mining Co., G. Kuchan

The earliest record of activity at the site of the Hobson pit is the 1887 MMAR. By that time work had already been done on reworked placer in the Horsefly River and mining was progressing up the bank. Drift mining was undertaken in the cemented gravels in 1887 and the scope of operations included hydraulic mining in 1890. At this time the site was known as the McCallum claims or the Discovery Co. ground.

In 1892, J. B Hobson, of the Cariboo Hydraulic Mining Co. (Bullion Pit mine), took over the Discovery Co. ground and began extensive water supply, drift mining and hydraulic mining development. A large scale operation flourished through to 1899. Over 6600 feet of drifts and crosscuts webbed the cemented gravels at the close of operations in 1899. As well, several acres worth of ground had been piped off to the level of the cemented gravels.

Further hydraulic mining was carried out from 1908-12 by Mr. E.J. West. Then in 1930, George Kuchan took over the ground and initially reworked the hydraulic tailings. He worked ground the area for several years including Ratdam (Rat) Lake but made no advancements in the old pit itself.

The reported production for the Hobson Pit is 7637 oz. for the years 1894 to 1898 and 1912 (MMAR, 1897, 1902, 1912). As the mine operated for a greater length of time this possably repersents only half of the total amount of gold recovered. Grades in the drift mining (cemented gravels) were around $1.48 per ton (0.0858 oz./ton)(MMAR, 1902, 1931) and $0.25 per yard (0.0147 oz./yd) in the pay gravels (Miocene gravels) and $0.02 per yard (0.00117 oz./yd.) in the overburden (Quaternary gravels)(MMAR, 1912).

The deposit at the Hobson pit consists of 50 to 75 feet of Eocene lacustrine sediment "bedrock" unconformably above Triassic-Jurassic volcanic rocks. In the pit the Miocene channel is about 10 feet thick at the eastern edge and thickens to >30 feet along the western face where it in now covered by talus. The bottom 4 to 10 feet is completely calcite cemented to form natural concrete. The rock is strong enough to support untimbered drifts and crosscuts. At the base of the cemented gravels, a thin layer, barely inches thick, of partially cemented Eocene sediments occurs. Also, rip-up clasts of Eocene sediments are found in the bottom 12 inches of the cemented gravels. The gravels at the Hobson pit area identical to those of Ward's pit. These are a quartz pebble/cobble rich fluvial deposit. Heavy mineral concentrates show abundant garnet, some kyanite and little black sand (pyroxene, magnetite and hornblende). The unconsolidated Miocene gravels carried some gold but the highest values were found at the base of the cemented gravels. Unconformably above the Miocene gravels rests a 100 to 150 foot section of unconsolidated glaciofluvial sediments. These gravels are not considered to carry any

gold. Since G. Kuchan worked on the ground in the early 1930's no further work was done in the pit until 1987. In the summer, a consortium of companies including Laredo Mines Inc. attempted to do some underground drift mining in the cemented gravels. A decline was driven into the west face for approximately 100 feet. This appears to be development work and no gold has been reported to be recovered. It is unknown at the time of writing if the consortium intends to do any further work.

BLACK CREEK: Western Mines Exploration Syndicate, Rowntree Mines Ltd.

Earliest reports of activity on Black Creek indicate prospecting in the late 1890's by a Mr. Campbell (?R.N. Campbell)(L. Shunter, pers. comm.). Later Phil Fraser worked on Black Creek and joined with the Western Mines Exploration Syndicate in 1918 (MMAR, 1918) to do some Keystone drilling on a bench about 2 miles up Black Creek from Horsefly River. The object was to test the bench for gold content and determine if the bench was part of the Miocene channel. Gold recovered from the drilling was poor and testing for the Miocene channel was inconclusive. It appears that no mining was done until 1930 when leases held by G. MacKeracher were optioned by Rountree Mines Ltd. and managed by James Armes for further development. A large ground sluice was set up with the dump at the falls (approximately 3000 m. upstream from the mouth of Black Creek) and extended 1000 feet upstream. A small hydraulic operation worked the 'lower pit' and washed gravels through the sluice. 1000 feet further upstream another, smaller pit was developed and some adits were driven to test the gravels. (MMAR, 1930) The hydraulic operation worked through to about 1935. Holland (1950) records a total of 62 oz. of gold produced from this creek. Since the close of the hydraulic operaton, the Armes family worked the ground intermittently through 1985. No production has been recorded for that time. In 1986, the property was purchased by Mr. Lyle Shunter and he is presently working the ground known as the 'Lower Pit'.

The gravels have been proposed to be part of the Miocene channel by the early placer miners. An inspecton of the deposit by D. Lay, Resident Mining Engineer for the B.C. Department of Mines, stated that the evidence for the Gravels being part of the Miocene channel were inconclusive (MMAR, 1930). Examination of the site in 1988 by the authors has not elucidated the matter any further.

The deposit is located within a narrow steep sided cleft in Triassic volcanic rocks. The gorge is about 100 feet wide at the falls and widens to about 1000 feet at the 'Lower Pit' and then narrows again to 100 feet at the top of the pit. The lowest sediments exposed are thinly layered muds, clays and fine sands of unknown depth. A drill hole 80

feet deep, located in the middle of the pit floor, failed to reach bedrock. Unconformably above the fine sediments are cross-channeled normally graded fluvial gravels, 40 to 60 feet thick. Individual channels are up to 8 feet thick and 20 feet wide. The placer gold occurs as runs in the coarse channel lag gravels. Capping the section is a thin veneer of recent debris.

Field examination by the authors of the upper fluvial gravels reveals that the relative abundance of quartz pebbles/cobbles is not as great as that of the Hobson pit. However, due to active mining at the time of field mapping, the gravels at the bottom of the pit could not be inspected. Quartz pebbles/cobbles are abundant in the tailings as well as large fragments of kyanite. Heavy mineral concentrates from the washplant show abundant garnets, blacksands, as well as kyanite grains. The bench at the Black Creek placer mine may possably be an upstream equivalent of the Miocene channel. The character of the bench is markedly different from a glacial bench about 300 feet lower that holds Patenaude Lake.

The present placer operaton is recovering 'good' quantities of gold from the fluvial gravels. Gold size ranges from flour to nuggets 10 mm across. It is flattened, beaten and frequently coated in oxide, indicating extensive transport.

ANTOINE CREEK: R.N. & J. Campbell

Placer work on Antoine Creek began in 1928 with R.N. Campbell. He worked the ground from the mouth of Antione Lake to the top of the gorge, approximately 1000 m from Robert Lake where Antoine Creek flows in. Initial work consisted of test pitting and shafting along the north bank of the valley followed by a small amount of hydraulicing. The site was worked from 1929 to 1933 as the gravels were not rich. The section worked rested on a false bedrock of red clay/soil of undetermined depth. Above that were 'blue gravels' of variable thickness, similar in character to those of the Miocene channel at Horsefly. Capping the pay gravels is glacial drift, again of variable thickness. (MMAR, 1930, 1931, 1933) The bottom three feet of the 'blue gravels reportedly grade up to $0.50 per yard (0.029 oz./yd.) and was coarse flake gold (MMAR, 1931, 1933). Holland (1950) reports that a total of 189 oz. of gold were recovered form Antoine Creek.

It has been postulated that the gravels at Antoine Creek represent the downstream extention of the Miocene channel seen in Horsefly. The projected Miocene channel swings west from Hobson's pit, through Ratdam Lake and then Antione Lake to discharge in Beaver Valley and flow north from there (MMAR, 1930).

OTHERS:

Placer activity is known on several other creeks in the Horsefly area but there is no record of any gold production from them.

CHINA CABIN CREEK, at the head of Beaver Valley has seen some prospecting and there is some evidence that a small ground sluice operaton was undertaken immediately downstream from China Cabin Lake (authors, field mapping).

CHOATE CREEK (West branch), also known by the oldtimers as Teasdale Creek, produced a small amount of gold. Here, glacial till hosts fine flakes and small nuggets, but no significant grades were ever encountered. Apparently, a Mr. Teasdale, lived off the land and augmented his supplies through purchases made with gold that he had panned (pers. comm.).

BIG LAKE CREEK was prospected in the early 1930's but did not yield any appreciable amount of gold. However, as reported in 1932, the fineness of the gold was the highest for placer gold in the province to that date at a value of 980 fine, equivalent to $20.19 per ounce (MMAR, 1932, pp. 118). This was recovered at a point about half a mile upstream from Beaver Creek.

STARLIKE and TRIPLET LAKES were the site of some prospecting in the late 1920's by J. Williams and associates. Quartz gravels were identified there but could not specifically be related to either the Moffat Creek drainage or the main Miocene channel (MMAR, 1931). The amount of gold, if any, has never been identified.

BULLION PIT: Dancing Bill Gulch (187?-1884), China Pit (1884-1894), Cariboo Hydraulic Mining Co., J.B. Hobson (1894-1905), Guggenheim family interests (1906-1919), small operators (1920-1930), Quatsino Copper-Gold Mines Ltd. - B.C. Hydraulics Ltd (1930-1931), Bullion Placers Ltd. (1932-1942), small operators (1943-present)

The Bullion Pit is on the south side of the Quesnel River, about five miles downstream from Likely. It is on of the largest hydraulic mines in the Cariboo region measuring one mile long, 400 feet deep, 250 feet across the bottom and 1000 feet across the top. Work began in the early 1870's and continued through to the 1940's. The greatest amount of production was through the periods 1894 to 1905 and 1934 to 1941. Estimates of production, by the author, based on a variety of sources, indicate that approximately 175,647 ounces of gold were recovered from all the operations up to 1942. Holland (1950) records a total of 120,187 ounces recovered from the whole of the south fork of the Quesnel river during the period 1874 to 1945.

Initial mining at the site which became the Bullion Pit, began in the early 1870's. Chinese miners followed up rich point bar deposits at the base of Dancing Bill Gulch. They worked a small operation at the bottom of the gulch that was expanded into a small hydraulic mine by 1884. In 1894, a consortium of Canadian Pacific Directors bought up the chinese operation and contracted J.B. Hobson to work the "China Pit" as it had come to be known. The Consolidated Cariboo Hydraulic Mining Co. greatly expanded the water supply network, increased the number of men working and brought in better hydraulic equipment. Huge volumes of gravel were washed and the sluice complex became quite extensive. In 1904, due to a low bedrock grade of 1 to 2 percent, a sluice tunnel was cut from the Quesnel River up to the middle of the pit. The tunnel was 10' by 10' by 1600' with a grade of 4.5 percent and a 100 foot raise to the pit bottom. (MMAR, 1904; Sharpe, 1939; Maps and plans, BCMEMPR Property File). Work continued through 1906 when the mine was purchased by the Guggenheim family. Production continued but mining, financial and legal diffuculties were met and the mine was closed at the end of 1907 (MMAR, 1907, 1918; Sharpe, 1939).

At the close of operations in 1907 a sophisticated town existed at Bullion which included separate quarters for managment, white, chinese and japanese miners, a full smithy, telephone/telegraph to the water supply points and the telegraph along the Fraser River as well as a complex water supply network capable of supplying at least 5000 miner inches of water. (MMAR, 1897; Maps and plans, BCMEMPR Property File). Intermittently, for the next 22 years, small operators attempted to work the China pit.

In 1930 and 1931, the Quatsino Copper-Gold Mining Co. as the B.C. Hydraulics Ltd., worked the China pit by hydraulic methods and had modest recoveries of gold.(MMAR, 1930, 1931) The pit was the worked by Hireen Placers Ltd. in 1932. A disasterous failure of the working face destroyed the hydraulic operaton, swept up several hundred feet of sluice and plugged up the top 130 feet of the sluice tunnel (MMAR, 1932; Sharpe 1939).

In 1933, Bullion Placers Ltd., under the direction of Mr. R.F. Sharpe, President and General Manager, took over the mine and set about refurbishing the town, salvaging the pit, and renovating and expanding the water supply system over the next four years. A second pit was developed in Drop Creek (called the South Fork pit) so that 24 hour mining could be done. This highly sophisticated and well organised operation worked continuously through to 1941. This lead to the present outline of the Bullion pit. Mr. R.F. Sharpe died in 1942 and all work by Bullion Placers Ltd. ceased. No further hydraulic mining was ever done and the water supply system fell into disrepair. The town of Bullion was abandoned. Since the closure only small operators have worked in the pit and no great recoveries of gold have been

made. There is still interest and mining activity in the pit at the present time.

The gravels at the Bullion pit are the same as those in the Cariboo deposits. The gold is believed to be from the Barkerville terrane and so has travelled a short distance. The gold recovered from the gravels was generally fine 'coarse' gold and small nuggets $0.50 to $4.00 in size (0.029 oz. to 0.235 oz.). The gold was well worn and frequently coated with oxide (MMAR, 1897). Abundant pyrite cubes and grains are frequently found in the heavy mineral fraction.

The lowest gravels in the section are fluvial and may represent a pre-Wisconsin fluvial enviroment. Above these are glaciofluvial and glacial gravels of the Early Wisconsin stade. This section is 100 to 300 feet thick and contained the richest gravels in the section. Unconformably above this is a layer of consolidated lodgement till, called the boulder clay by the placer miners. The unconformity represents the Olympia glacial interstade of the Middle Wisconsin. The lodgement till represents the base of the Upper Wisconsin Fraser Glacial stade. The thickness of the lodgement till is not specified but typically it is no more than a few tens of feet thick. Well stratified gravels form the upper 100 to 150 feet of the section. The top of the Pleistocene section is capped by a veneer of Holocene debris. (Clague, 1987; Fulton, 1984; Sharpe, 1939)

The valley fill in the Bullion pit represents an ancient river channel >100,000 ybp (Clague, 1987) and is probably a precursor to the present Quesnel River. It appears that the Miocene and Pleistocene channels followed older water courses. This theory has been presented before by other workers in the area. This could be a useful prospecting tool to find other buried channels, such as the one identified on the Cariboo River by Clague (1987).

YEAR	YARDS QUOTED	DOLLARS QUOTED	EST. OUNCES AT $17.00 PER OZ.	EST. GRADE IN CENTS AT $17.00 PER OZ.	GRADE QUOTED	EST. OUNCES
*1864-1893		900,000	52,941			
1894		8239	484			
1895	210,000	60,306	3,547	28.72		
1896	1,055,350	127,445	7,497	12.08		
1897	840,130	138,559	8,150	16.49		
1898		105,141	6,185		12.78	
1899		92,679	5,451		4.07	
1900		350,086	20,593		18.98	
1901		142,274	8,369		5.80	
1902		61,395	3,611		8.89	
1903		44,917	2,642			
1904		85,896	5,652			
*1905		17,053	1,003			
1927		6,000	353			
*1933	190,000					1,505
*1934	400,000					3,169
*1935	696,974					5,522
*1936	960,000					7,607
*1937	1,323,000					10,482
*1938	861,300					6,824
1939	1,135,000					8,993
1940	--					--
1941	637,000					5,047
Totals:		2,140,000	126,498			49,149

GRAND TOTAL: 175,647 ounces (est.) of gold produced from Bullion Pit

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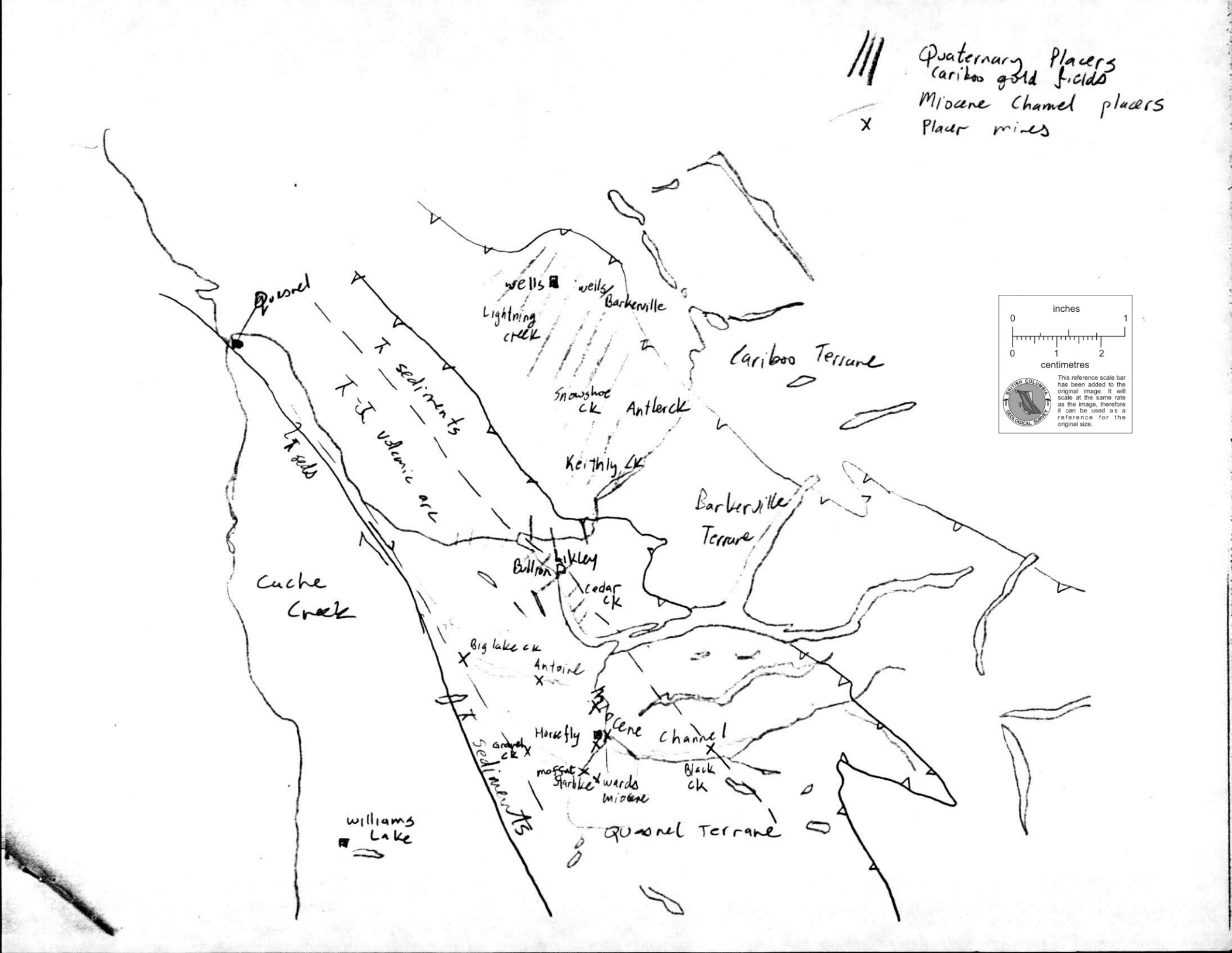
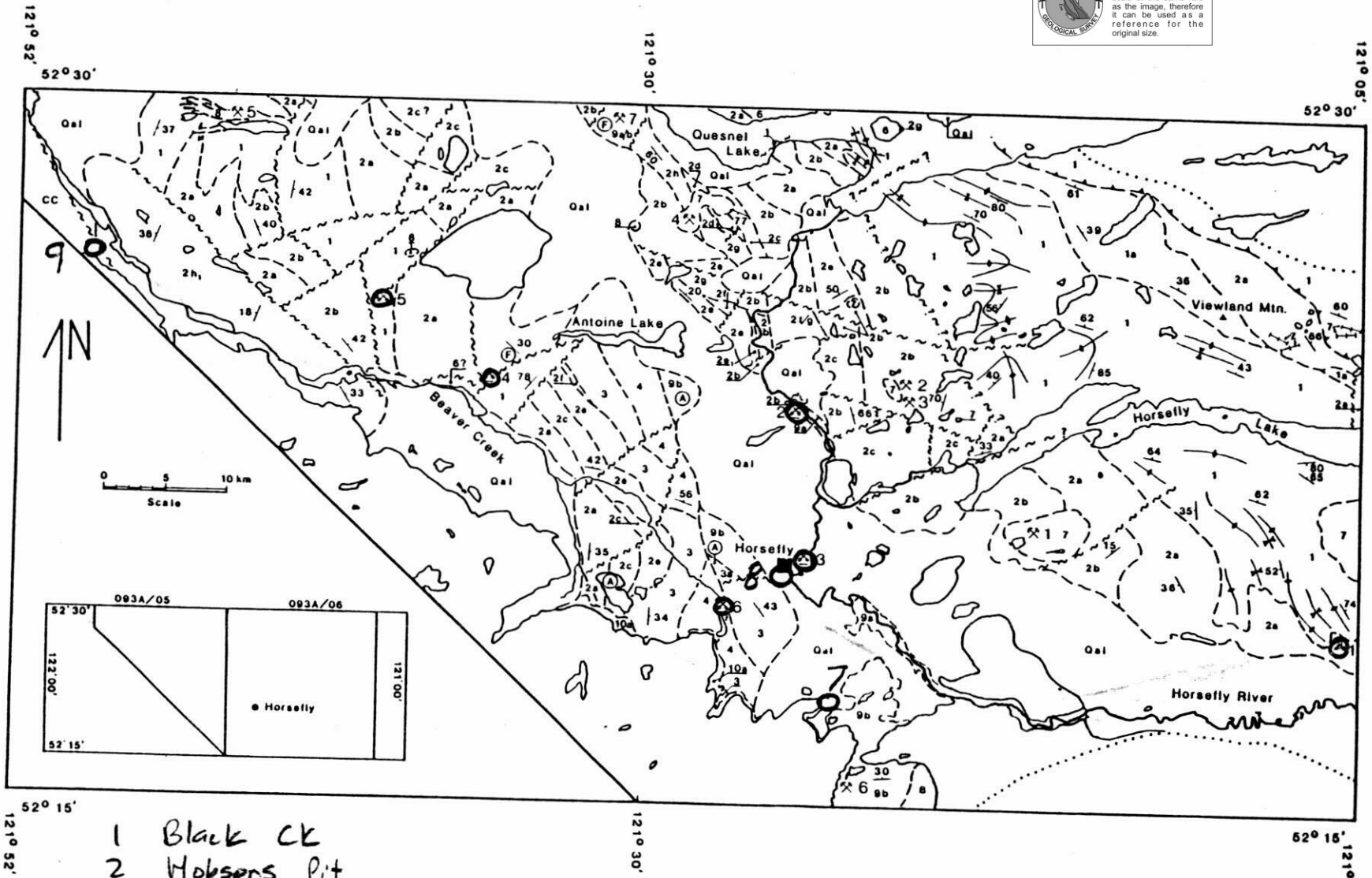

Quaternary Placers
Cariboo gold fields
Miocene Channel placers
Placer mines
Quesnel
wells
wells
Barkerville
Lightning creek
Cariboo Terrane
Snowshoe ck
Antler ck
Keithly Ck
Barkerville Terrane
Bullion
Lowhee
Cedar ck
Cache Creek
Big lake ck
Antoine
Horsefly
Miocene Channel
Black ck
Williams Lake
Quesnel Terrane
inches
0
1
0
1
2
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

Miocene channel

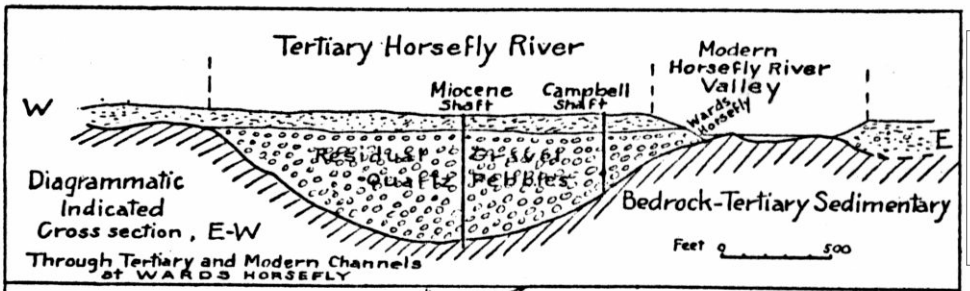
Placer mine

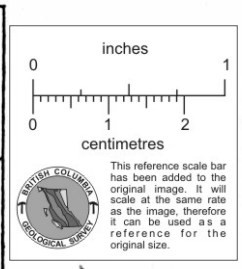


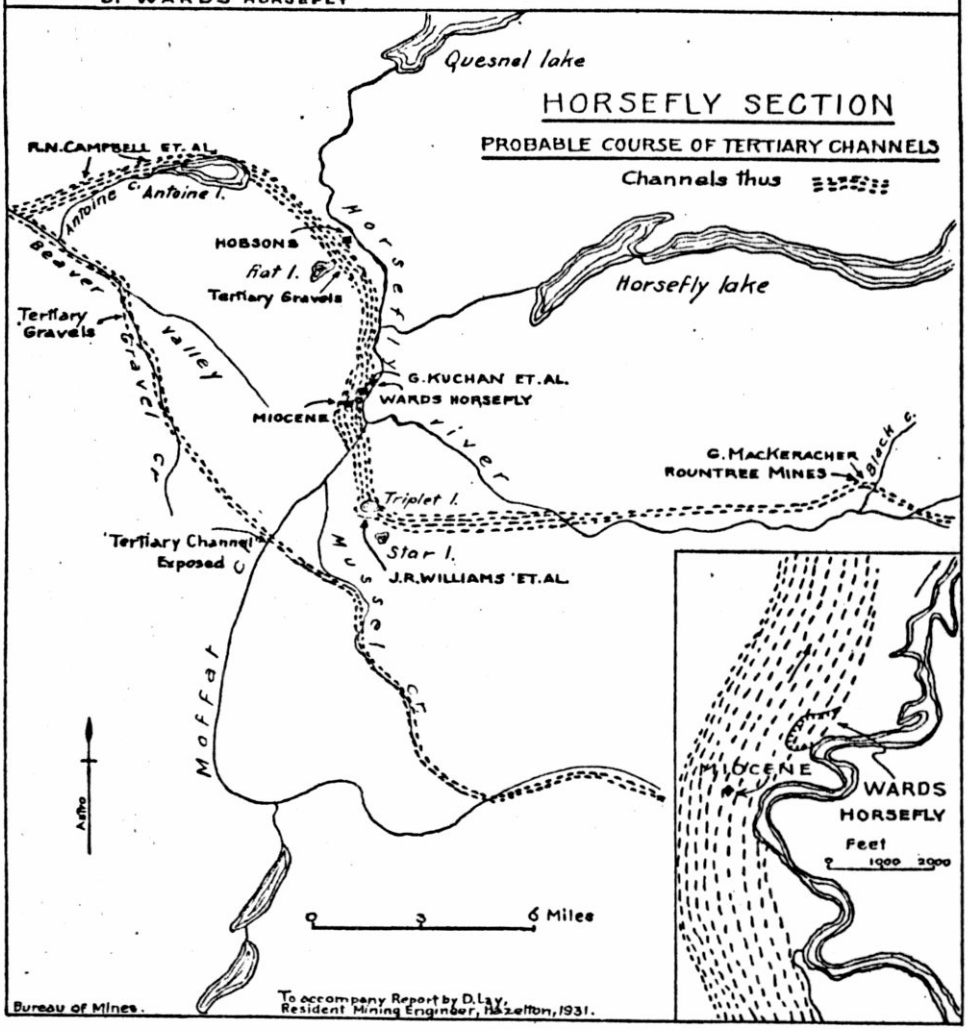
1 Black CK
2 Hobsons Pit
3 WARDS
4 Antoine CK
5 Chaute (W) CK
6 China Cabin CK
7 Starlike lk / Corner lk
8 miocene
9 Rio Into CK

Figure 1-18-2. Geology of the central Quesnel terrane in the Horsefly area.

D. Lay, 1931, MMAR





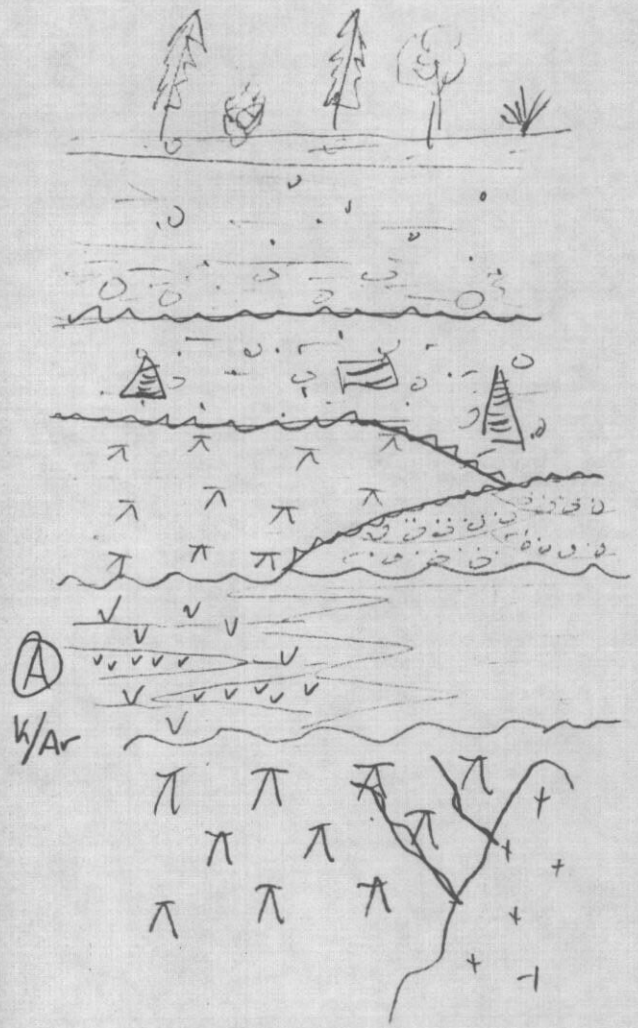


values was gained by these workings, they proved the important fact that the bed-rock and rim-rock of this deposit is a Tertiary shale, and precisely the same as the rock upon which rest the down-stream deposits of Ward's Horsefly and Hobson's Horsefly mines. And it is in this rock that the modern Horsefly river has carved a channel in the vicinity of these last two mines, which are situated on its left bank.

Ward's Horsefly mine is situated nearly 2,000 feet down-stream from the *Miocene* mine, in which area by far the most important deposits were found on the left bank of the Horsefly river, although to a limited extent concentrations were found on the right bank of the river. The indicated age of these deposits is pre-Glacial, and possibly to some extent inter-Glacial.

Quaternary – Tertiary Stratigraphy

Horse fly



— 0

— 10,000 ybp — late Wisconsin Fraser Glacial stade

30,000 / 60,000 — ybp → middle Wisconsin Olympia glacial interstade

early Wisconsin glacial stade

100,000 ybp

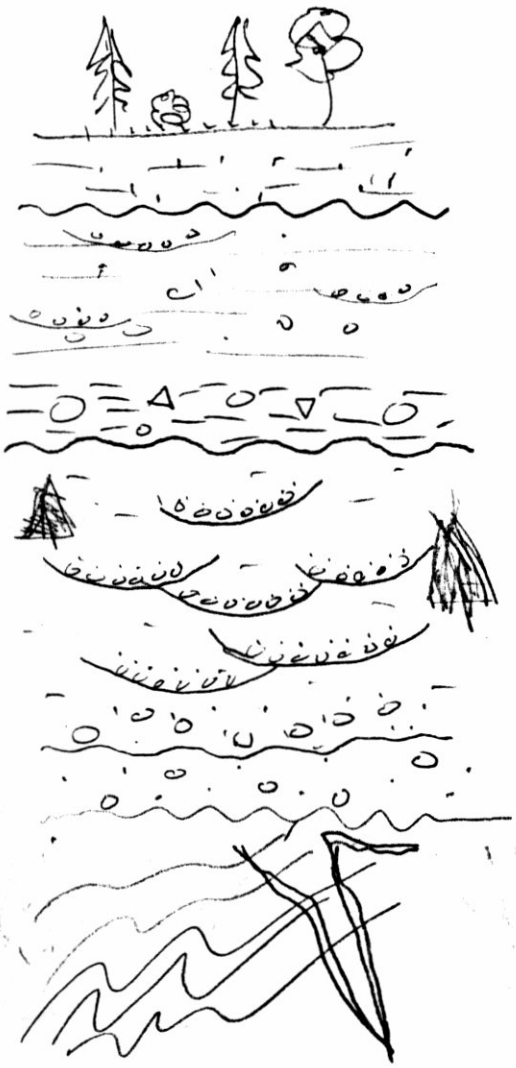
~14 Ma — Miocene Plateau Basalts / Miocene Fluvial Channel

— 45-50 Ma — Middle Eocene Biotite latite flows – Lacustrine beds

— 45-50 ma

T-J — Quesnel terrane Volcanic arc MX.

Pleistocene Stratigraphy.
Cariboo



0 ybp

10,000 ybp

"upper gravels"

late Wisconsin
Fraser Glacial
Stade

"boulder clay"

30,000
60,000 ybp

middle Wisconsin
Olympia Glacial
Interstaid

"lower gravels"

early Wisconsin
glacial stade

100,000 ybp Sangamonian

~~125~~ 125,000 ybp

vein
replacement
py Au

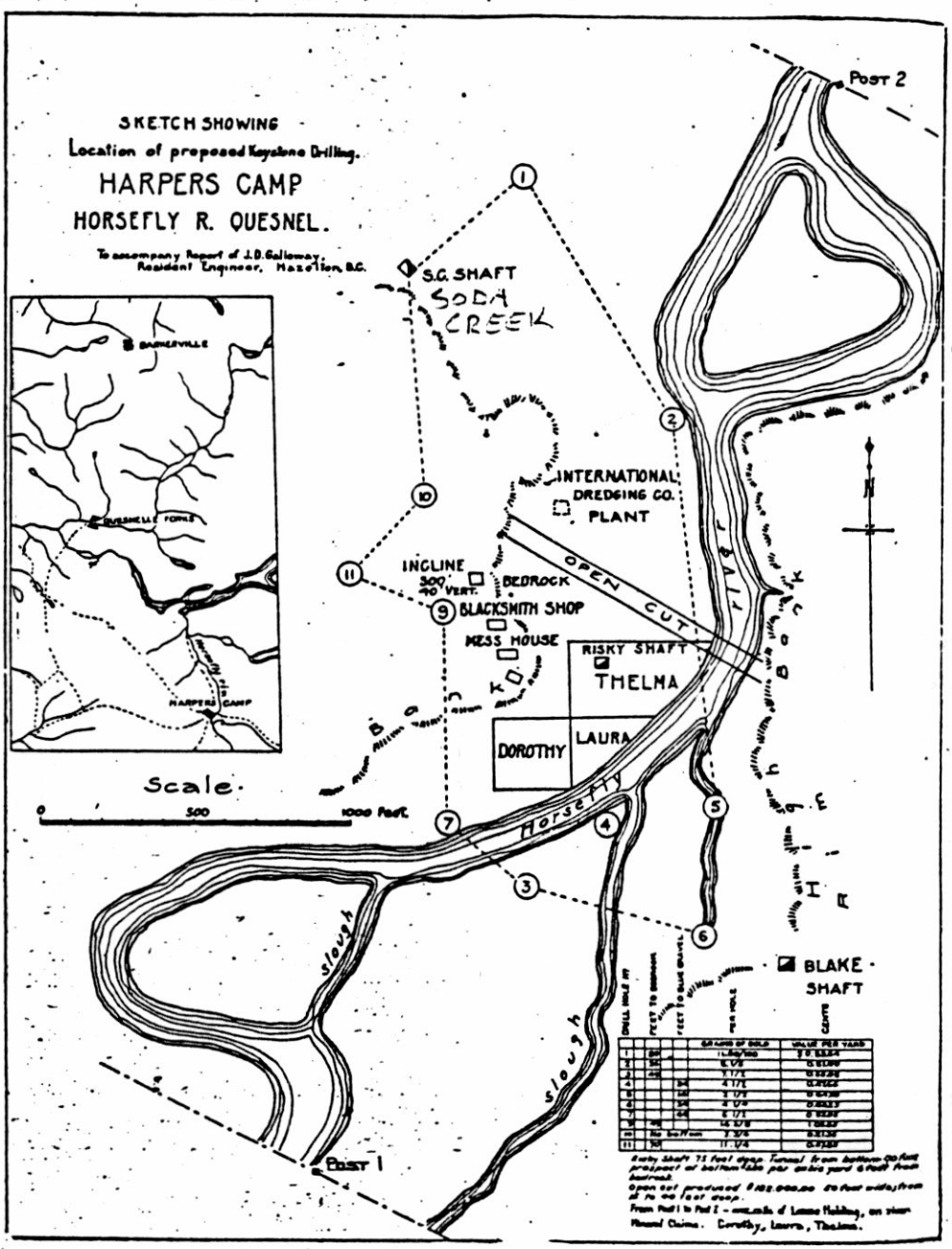
Roberts

m-cP ± P

Cariboo
Barkerville
slide mtn

Some drilling has also been done in the vicinity which will be described later, and also some attempts were made at sinking shafts by hand where the ground was supposed to be shallow.

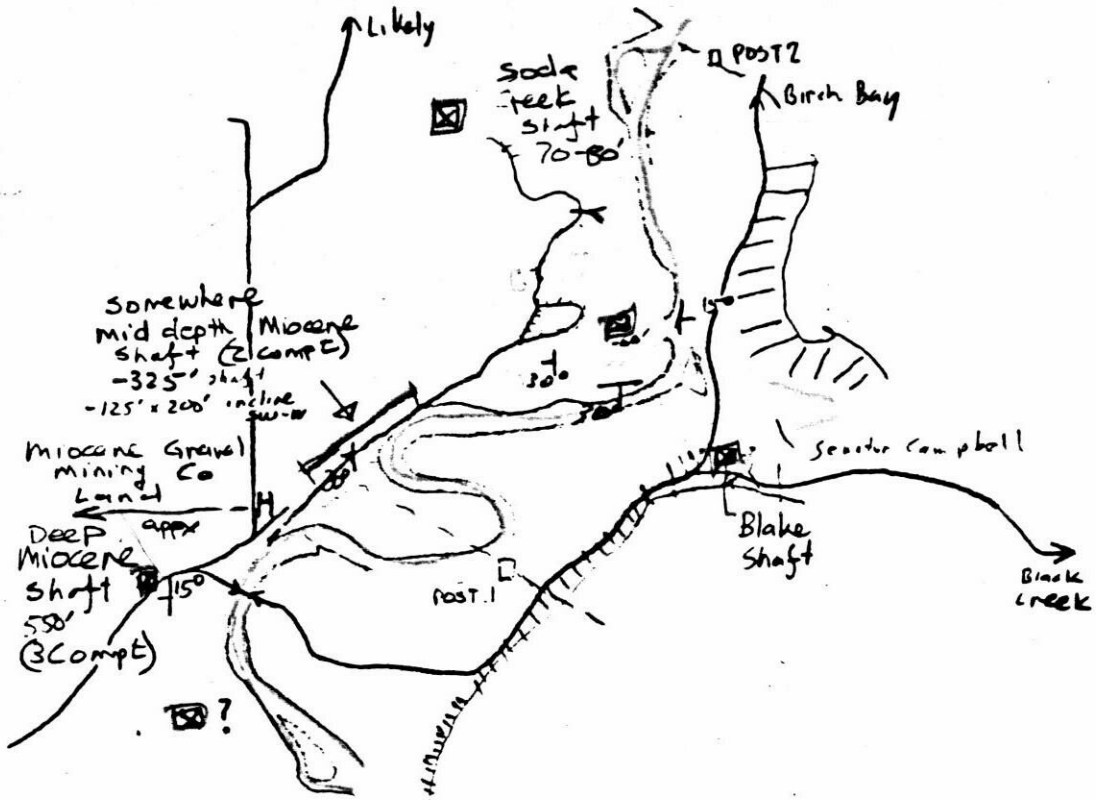
Five miles down the Horsefly river "Hobson's Horsefly" is situated. This was a hydraulic pit equipped and operated on a large scale by J. B. Hobson. The deposit of gravel worked here

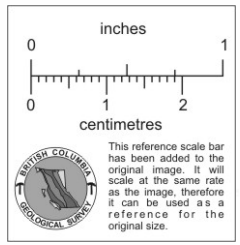


lies only a short distance from the Horsefly river and represents a former channel of the stream. The project was unsuccessful owing to the outside gravel changing to a cemented gravel, which is virtually a conglomerate. Hydraulicking was therefore of no avail and a small stamp-mill

Ward's Pit

BCC 355 nº 180





Plan C

N ↑

To match 1918 MAP pp k138 Wards/Harpers Camp

⊠ shafts

═ Horsefly R.

1:15,000

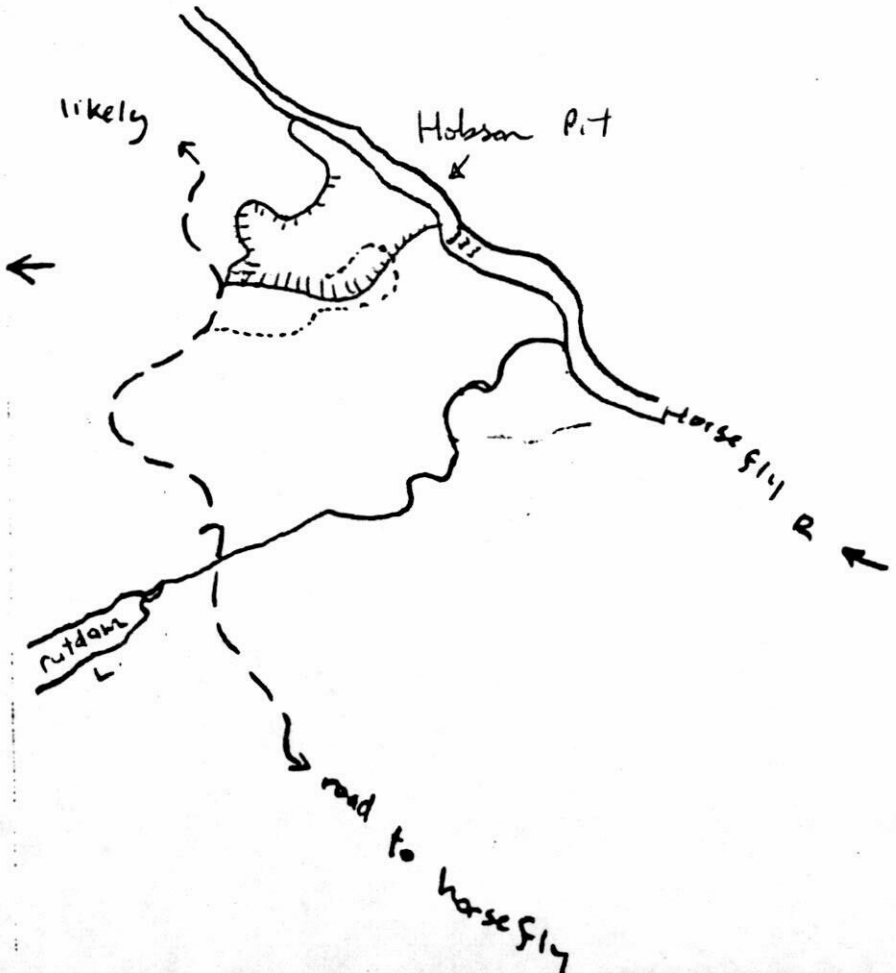
⊥ 'Bedrock' attitudes (Miocene?) strata)

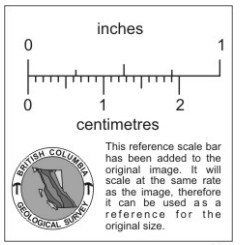
≺ 1947 drift -10° NW 143'// 500' short of the Soda Creek shaft.

to BCC353 no 205

Placer
Hobson's Hydraulic

N





BCC 355 148

Placer
Antoine Creek
~1927 - 1931(?)