

Yukon Placer Mining 2014 Exploration and Development Overview

Jeffrey D. Bond¹ and Sydney Van Loon

Yukon Geological Survey

Bond, J.D. and Van Loon, S., 2015. Yukon Placer Mining 2014 Exploration and Development Overview. *In: Yukon Exploration and Geology Overview 2014*, K.E. MacFarlane and M.G. Nordling (eds.), Yukon Geological Survey, p. 43-56.

INTRODUCTION

The Yukon placer mining industry had a strong year that exhibited stable production from the development sector and encouraging results from a growing number of exploration properties. This healthy outlook has helped offset reduced spending by the hardrock exploration business, and even saw hardrock geologists trading hammers for shovels. Some growth is attributed to the growing number of rookie miners and prospectors arriving in the territory as a result of continued television exposure. This presents some uneasiness amongst the existing operators and challenges for regulators that coach newcomers through the process. Regardless, renewed interest in Yukon's placer industry will undoubtedly introduce new professionals to the industry helping to offset attrition.

CLIMATE

The 2014 mining season started off favourably with mild early season temperatures allowing many operations to commence sluicing prior to the third week of May. Overall, precipitation was consistent for the Kluane, Dawson and Mayo regions, which contrasted with the Carmacks area mining camps (Mt. Nansen and Mt. Freegold) that experienced dry conditions through the month of July. In Dawson, mid-summer temperatures were below normal, which reduced ground thawing rates. This was somewhat offset by favourable late season temperatures that enabled sluicing into the third week of October.

GOLD PRODUCTION SUMMARY

Yukon placer gold production for the reporting period of May 1st to November 14th, 2014 was 54,360 crude ounces for a value of CDN \$60.1 million (Fig. 1). Production was down 5000 crude ounces from 2013 however, additional gold will likely be reported after January 1st, 2015. The current production is consistent with levels since 2008 and the third highest dollar value in the last 10 years (Fig. 1). The total number of active operations in the Territory for 2014 was 160 out of 236 sites documented in the latest industry report covering the years 2010 to 2014 (Van Loon and Bond, 2014).

¹jeff.bond@gov.yk.ca

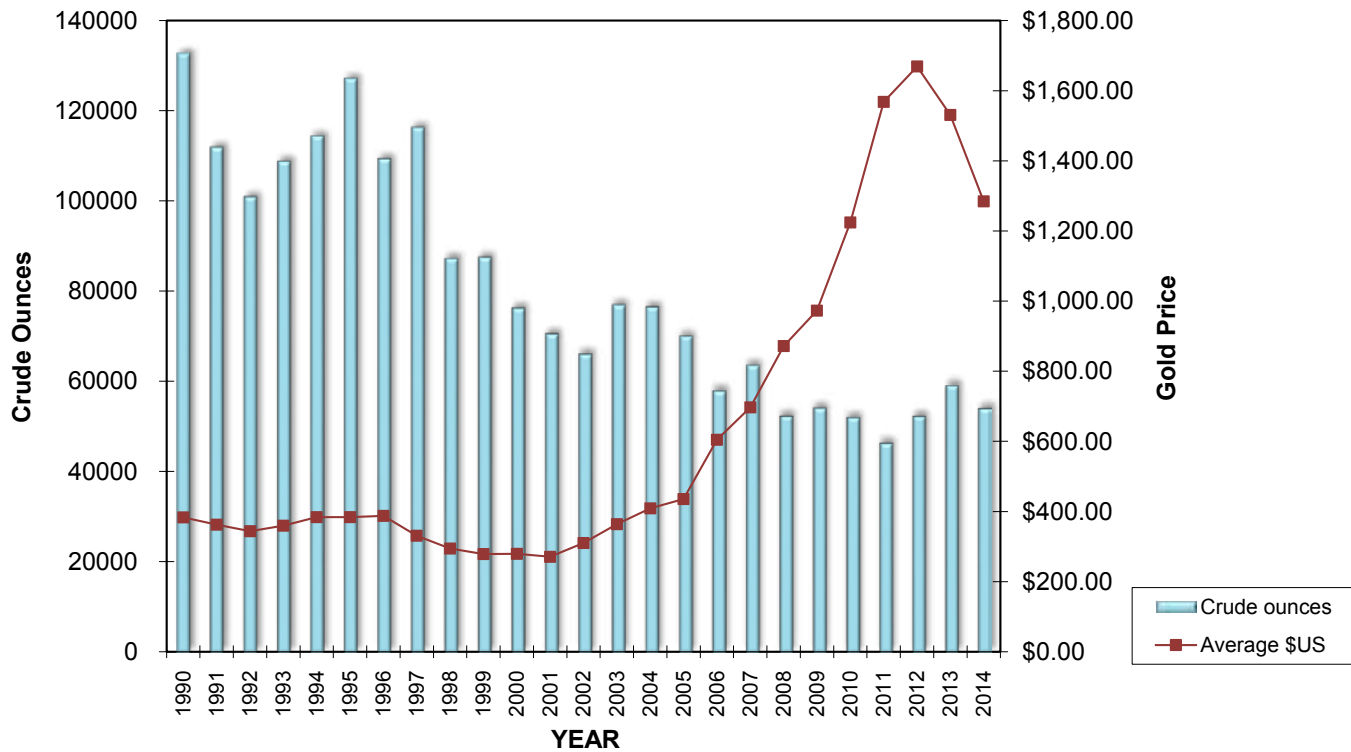


Figure 1. Placer gold production versus the production value (USD) for the last 25 years.

REGIONAL PRODUCTION SUMMARIES

The Yukon placer producing regions are divided into broad geographic groupings that in some areas are related to drainage and other areas to common location. Like most years the majority of placer production (71% in 2014) is derived from two drainages and their tributaries, the Indian River and the Klondike River. The bulk of the remaining production is accounted for from six regions. For all the regions, production figures will reference crude ounces rather than fine ounces. For conversion to fine ounces the general rule of thumb is to multiply the crude ounce figure by 0.80. The production data is derived from the royalty reporting figures collected by the Yukon Mining Recorder.

INDIAN RIVER

Production from the Indian River drainage continued to be the highest for all regions with 25,835 crude ounces reported (Fig. 2). This value is more than 10,000 ounces higher than production in the drainage from 2010 and 2011. The increase is owed largely to activity on Quartz

Creek and on the Indian River (Fig. 3). Production was also strong from Gold Run Creek with a total of 3383 crude ounces reported, which is up 2000 ounces from 2012 (Fig. 2 and 3). Eureka Creek also had a strong year and accounted for 14% of the total production from the Indian River drainage (Fig. 3). Placer gold production from Dominion Creek has been relatively low compared to previous years however it is expected to increase with production ramping up from Dominion Gold Resources on the old Ross mine property.

KLONDIKE RIVER

Production from the Klondike River, which includes Hunker and Bonanza creeks, was 12,184 ounces (Fig. 2). This total has remained very consistent over the past five years. The top producing creeks were Bonanza (3426 oz), Hunker (3093 oz) and Last Chance (1892 oz). Reporting on Bonanza Creek also included production from a significant operation at the base of Jackson Hill, which is geographically part of the Klondike River.

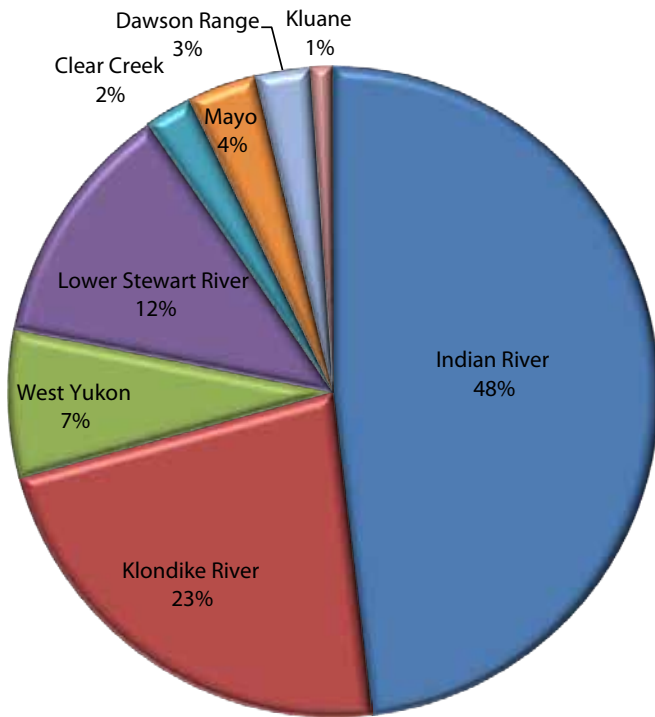


Figure 2. Relative placer gold production from the various production regions in 2014.

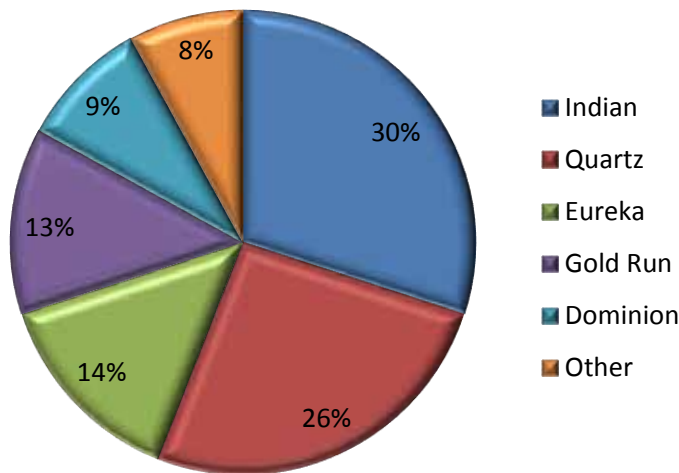


Figure 3. Relative placer gold production from the Indian River drainage.

LOWER STEWART RIVER

In the regional district of the lower Stewart River, production has remained consistent over the past four years. The total reported production for 2014 was 6583 ounces (Fig. 2). The top creeks in the region include Black Hills (1912 oz), Kirkman (1459 oz) and Henderson (1403 oz).

WEST YUKON – FORTY MILE, SIXTY MILE AND MOOSEHORN

Production from the West Yukon placer region was dominated by production from the Sixty Mile River. The total production from the region was 3948 ounces, of which 2500 ounces was derived from the Sixty Mile River and its primary producing tributaries Miller and Glacier creeks. Overall, production in the region was down by 3000 ounces from last year.

CLEAR CREEK AND MAYO

The combined production from Clear Creek and the Mayo area was 3113 crude ounces for 2014. The top producing drainage was Clear Creek where 1275 ounces was reported. Mayo, Davidson Creek, Thunder Gulch, Secret Creek and Duncan Creek produced the majority of the placer gold. Overall production from the Clear Creek drainage is down by almost 600 ounces from 2012. In contrast, production from Mayo has risen steadily in the past four years.

DAWSON RANGE

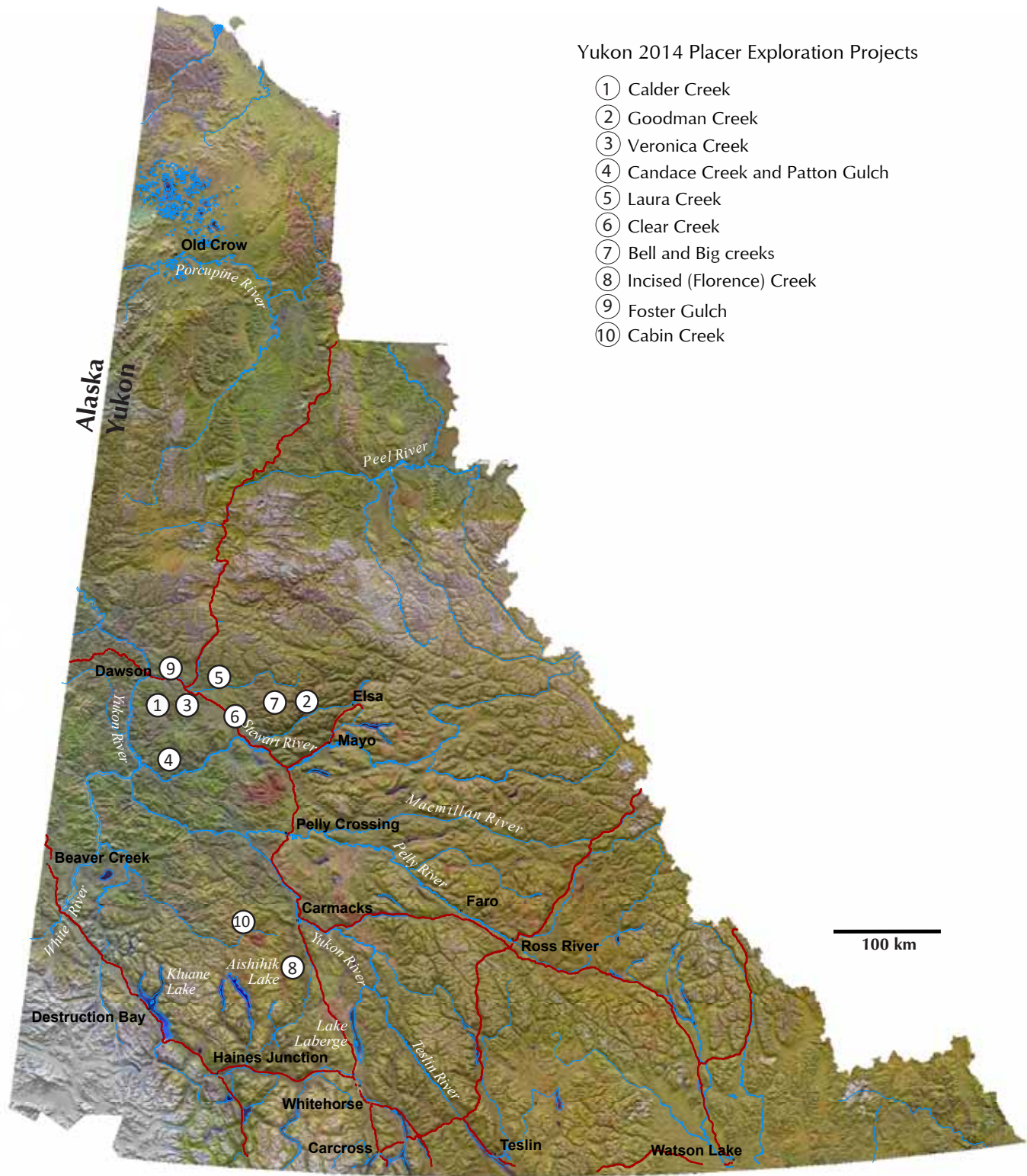
The Dawson Range placer area includes camps such as Mt. Nansen, Mt. Freegold and Sonora Gulch. Combined production from the region totalled 1470 crude ounces, which is up by 400 ounces from last year. The top producing drainages for 2014 were Guder Creek, Nansen Creek, Klaza River and Summit Creek. Average production from the region over the last 5 years is 1411 crude ounces.

KLUANE

The Kluane region includes placer streams in both the Kluane and Ruby ranges. Production reporting, at the time of this publication, was limited to results from Burwash and Ruby creeks. Additional operations were visited on Kimberley, Arch and Wade creeks, however no royalties were filed. Total production from the two reporting creeks totalled 578 crude ounces.

EXPLORATION HIGHLIGHTS

Placer industry reporting is often focused on the development projects, such as those described in the latest Placer Industry Report (Van Loon and Bond, 2014). Placer exploration is a vital and often under-recognized sector that operates in the industry background. This section highlights some of the diversity of placer exploration projects happening in 2014 (Fig. 4).



Yukon 2014 Placer Exploration Projects

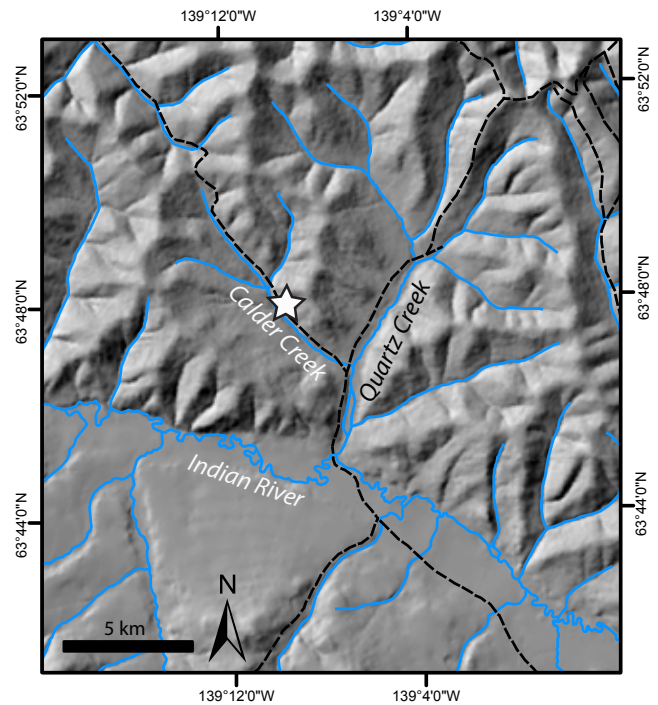
- ① Calder Creek
- ② Goodman Creek
- ③ Veronica Creek
- ④ Candace Creek and Patton Gulch
- ⑤ Laura Creek
- ⑥ Clear Creek
- ⑦ Bell and Big creeks
- ⑧ Incised (Florence) Creek
- ⑨ Foster Gulch
- ⑩ Cabin Creek

Figure 4. The location of the 2014 placer exploration projects discussed in this overview.

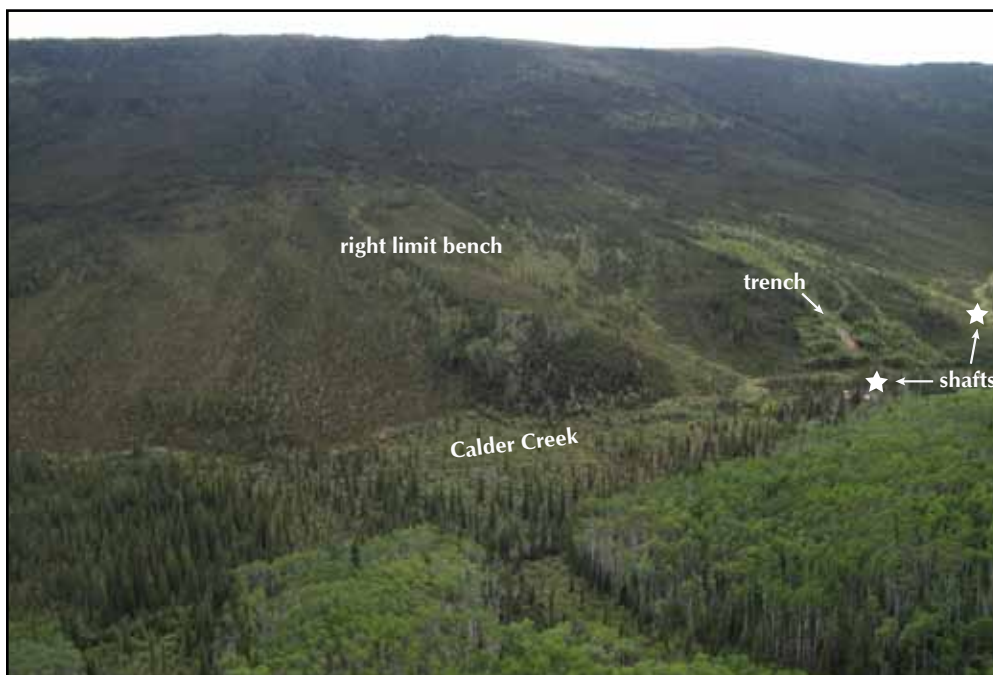
GARY LEE AND PANARC RESOURCES – CALDER CREEK

Exploration activity, with the assistance of the Yukon Mineral Exploration Program (YMEP), was once again active on Calder Creek, a right-limit tributary to Quartz Creek. Calder Creek is a sizeable 8-km-long drainage in the heart of the Klondike Goldfields that has never been mechanically mined. A dirt road provides good access along the north side of the valley bottom. Panarc Resources began exploring the ground in 2011 with work focusing on a left-limit shaft below the access road. In 2014, Gary Lee, in partnership with Panarc Resources, dug two additional shafts that would test the main valley bottom and a right-limit tributary that dissects a bench. Work also included a hand test pit at the base of an old bulldozer trench on the right-limit bench. The shaft in the main valley bottom reached 7 m (23 ft) before encountering ground water problems. Bedrock was not reached and it was decided to return to the shaft during the winter. The shaft in the tributary was started late in the season and reached 6 m (20 ft) before being suspended until the winter. Hand test pitting on the right-limit bench target at the base of the old bulldozer trench reached 4.5 m (15 ft) below the surface of the bench. Fine gold colours were recovered in the trench wall, which provided some encouragement. The right-limit bench is a promising target due to its substantial width and length. The unusual width of the bench appears related to colluviation of loess (muck). The south ridge above the bench has acted as a lee-side trap to loess being carried by the dominant winds.

Under permafrost conditions there has been colluviation of loess downslope and pushed Calder Creek to the north side of the valley. Calder Creek appears offset by approximately 200 m from its paleo-valley center line, which may explain why an economic placer deposit has been so difficult to locate in the valley. Additional work on the existing shafts is expected in early 2015.



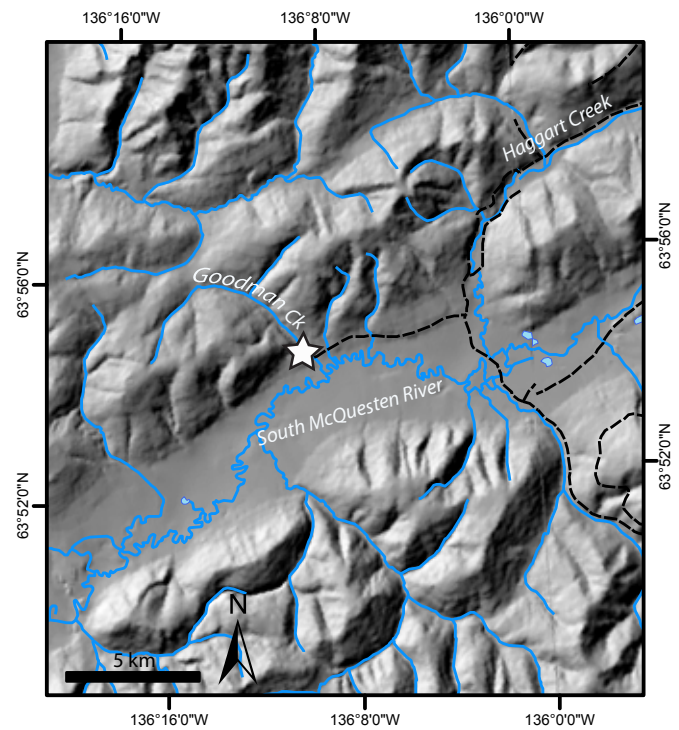
Location of the Calder Creek shafting program.



Aerial view of Calder Creek looking to the southwest. The 2014 shafting locations are visible on the right hand side of the photo and the large right-limit bench is visible on the opposite side of the creek.

GIMLEX ENTERPRISES LTD. – GOODMAN CREEK

Gimlex Enterprises explored Goodman Creek, a right-limit tributary to the South McQuesten River in the Mayo District. This project was conducted with assistance from the YMEP program. Exploration activity on Goodman Creek consisted of a 42 hole auger drilling program and 44 test pits near the mouth of the valley. Drilling encountered up to 12 m (40 ft) of clay-rich Reid till on the left-limit of the creek. Most drill locations did not reach bedrock, however fluvial or glaciofluvial gravel was discovered in some holes and returned encouraging gold values. Test pitting was focused near the modern fluvial channel and on a right-limit bedrock bench. Additional drilling in 2015 is expected to delineate a potential (pre-Reid) deep channel.



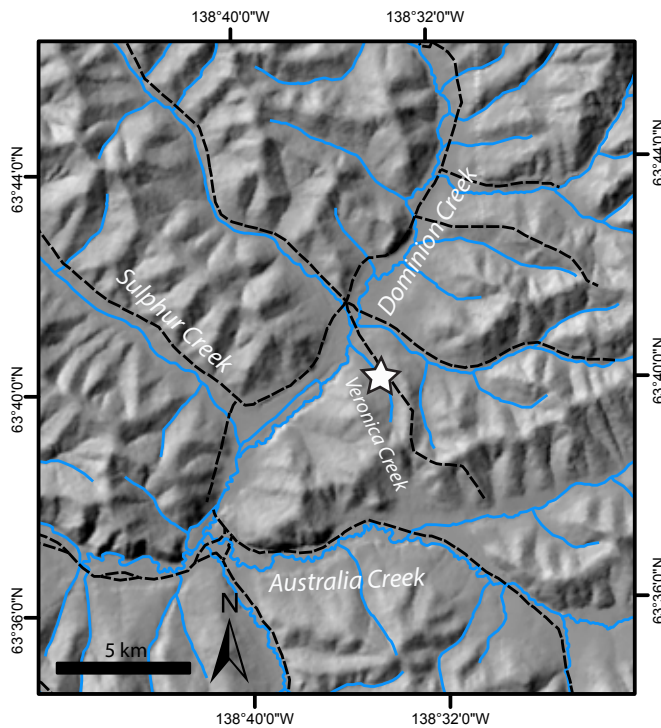
Location of Goodman Creek in the Mayo District.



View of the 8" auger drill and Nodwell used for testing Goodman Creek.

GIMLEX ENTERPRISES LTD. – VERONICA CREEK

Gimlex Enterprises explored Veronica Creek, a left-limit tributary to Dominion Creek in the Dawson District. This project was conducted with assistance from the YMEP program. Exploration work on Veronica Creek consisted of a 15 hole auger drilling program on middle Veronica Creek above the previous mine workings. The rationale for targeting Veronica Creek included previous placer production near the mouth of the creek and favourable bedrock geology identified at the GO-GR property, located adjacent to the creek. The stratigraphic section in the old channel consisted of 9 m (30 ft) of muck overlying 1-3 m (3-10 ft) of fluvial gravel. The old (deposit) channel of Veronica is estimated to be less than 30 m in width in the area drilled.



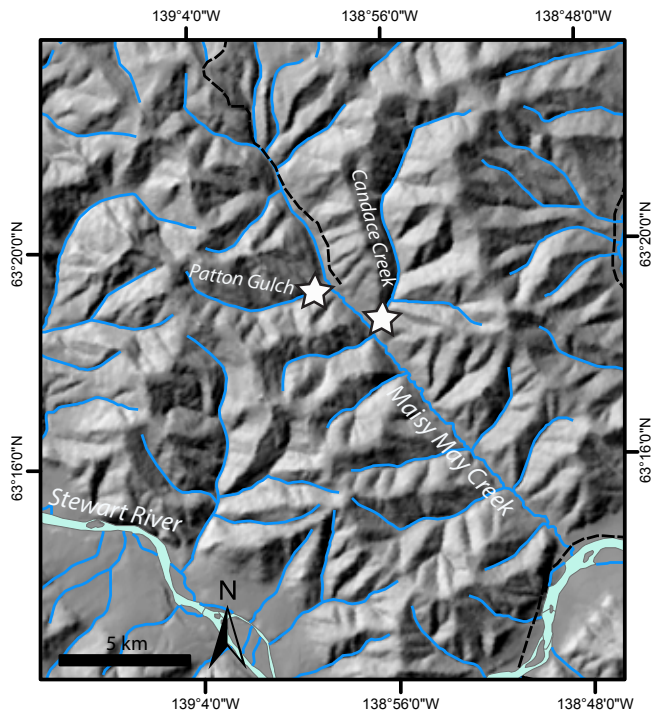
Location of Veronica creek.



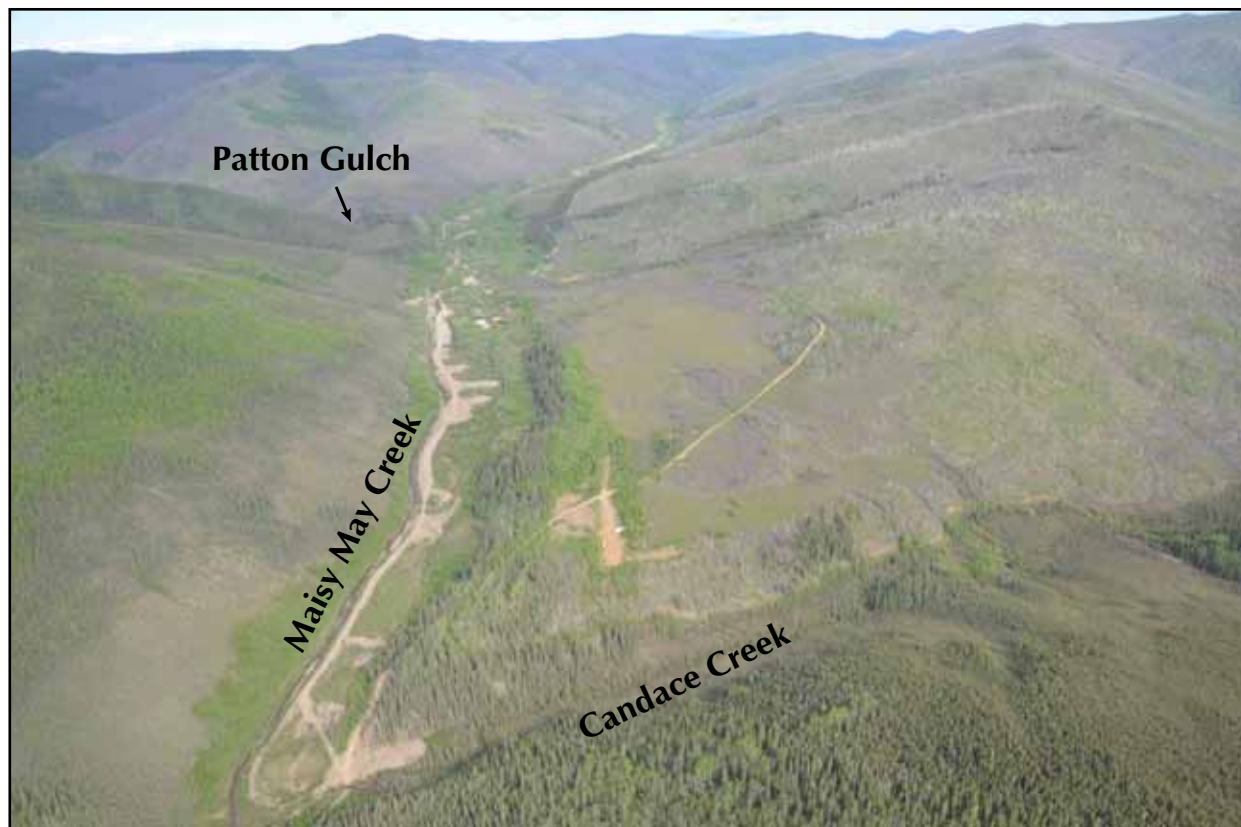
Aerial view looking southwest down Dominion Creek towards Veronica Creek. The 2014 exploration focused upstream of the old workings. Photo courtesy of Bill LeBarge.

GEOPLACER EXPLORATION LTD. AND CANDACE CREEK MINING LTD. – PATTON CREEK AND CANDACE CREEK

In the Maisy May Creek drainage, two tributaries were explored with assistance from YMEP funding. Patton Creek is a right-limit tributary that is 2 km upstream from Candace Creek (left-limit tributary). Previous placer production along this stretch of Maisy May Creek provides the main rationale for targeting the tributaries. Between 1984 and 1989, Queenstake Resources mined 20,000 ounces from this stretch of ground. According to Bill LeBarge of Geoplacer Exploration Ltd., the rich ground may be due to a mineralized bedrock structure that is subparallel to Maisy May Creek and extends through both of the tributaries. Work in 2014 included excavator test pitting/trenching and geophysics. Shallow depths (<4 m) were encountered and placer gold was recovered. Trenching and test pitting is expected to continue in 2015 to further refine the economic viability of the targets.



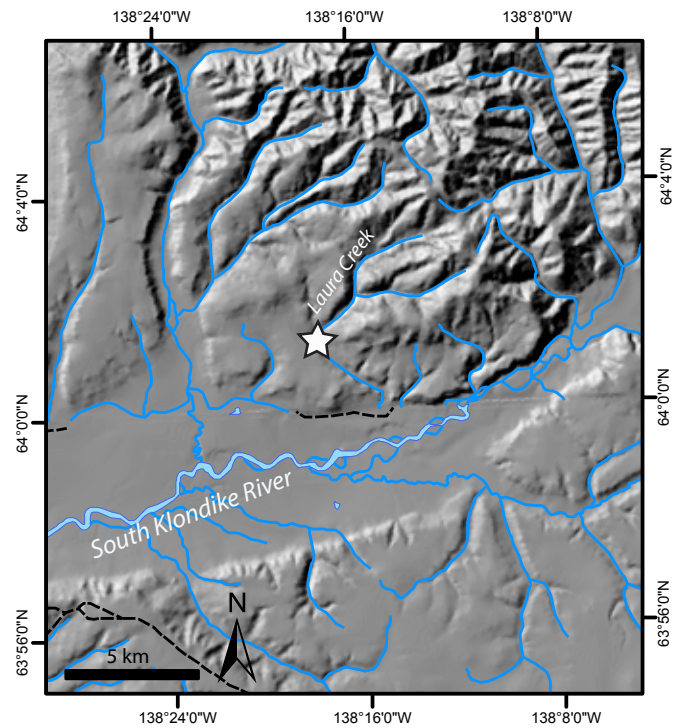
Location of Candace Creek and Patton Gulch in the Maisy May Creek drainage.



Aerial view looking north up Maisy May Creek valley. Candace Creek and Patton Gulch are located on the photograph. A former rich section of Maisy May Creek is located between the two tributaries. Photo courtesy of Bill LeBarge.

CLAYTON JONES – LAURA CREEK

A new discovery was made on Laura Creek near the Brewery Creek mine site. Laura Creek is a right-limit tributary to the South Klondike River and drains the uplands that host to the Brewery Creek deposits. A 9.7 m (32 ft) shaft was constructed to bedrock using an electric jackhammer in early spring. The stratigraphy consists of 6.4 m (21 ft) of organic muck overlying 1 m (3 ft) of matrix-supported gravel, 1.4 m (4.5 ft) of oxidized cobble-pebble gravel and 0.75 m (2.5 ft) of clay-rich gravel. The clay-rich gravel and 0.3 m (1 ft) of foliated shale/siltstone bedrock was sluiced with a total gold recovery of 0.6 grams. The approximate grade of the deposit is CDN \$10.07/cubic yard at CDN \$1350/ounce with an approximate fineness of 80%. The largest placer grain recovered weighed 0.2 grams and has a rounded, flattened shape. A minor population of angular gold grains was also recovered from the deposit. Old timer shafts were discovered lower in the drainage and will be the focus of additional exploration in 2015. This project received funding from the YMEP program.



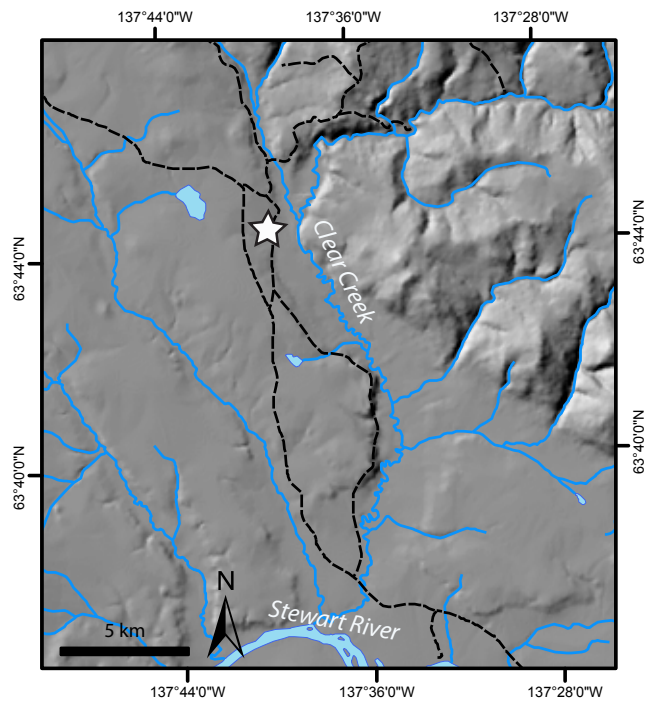
Location of Clayton Jones' property on Laura Creek.



Washing samples from the exploration shaft on Laura Creek. The shaft is visible under the tarp.

WOLFHEAD DISCOVERY AND MINING LLC. – CLEAR CREEK

Exploration and pre-development construction was undertaken on the Big Alex bench deposit on Clear Creek in 2014. This new discovery is located on a right-limit bench to Clear Creek in the Tintina Trench, named after Big Alex MacDonald who prospected in this area. The prospect is conveniently located near the Klondike Highway and features no permafrost and minimal overburden. The origin of the bench deposit is thought to be a cut and fill sequence of coarse Clear Creek gravel on a false-bedrock of pre-Reid sandy glaciofluvial gravel. The thickness of the bench gravel is estimated to be 8-10 m, however additional drilling is required to fully understand thickness variation on the property. A Wounded Moose paleosol, characterized by soil oxidation to depths of >2 m, is preserved in the bench gravel suggesting an early to mid-Pleistocene age for the deposit. Up to 7000 cubic yards of test pit and bulk sample material was processed in 2014. The placer gold tends to be very flat and well-travelled, making it challenging to recover. Pre-development construction work was completed on the water line, holding pond, settling pond and wash plant. Additional exploration is expected in 2015 that will consist of geological mapping, drilling, geophysics and sluice engineering.



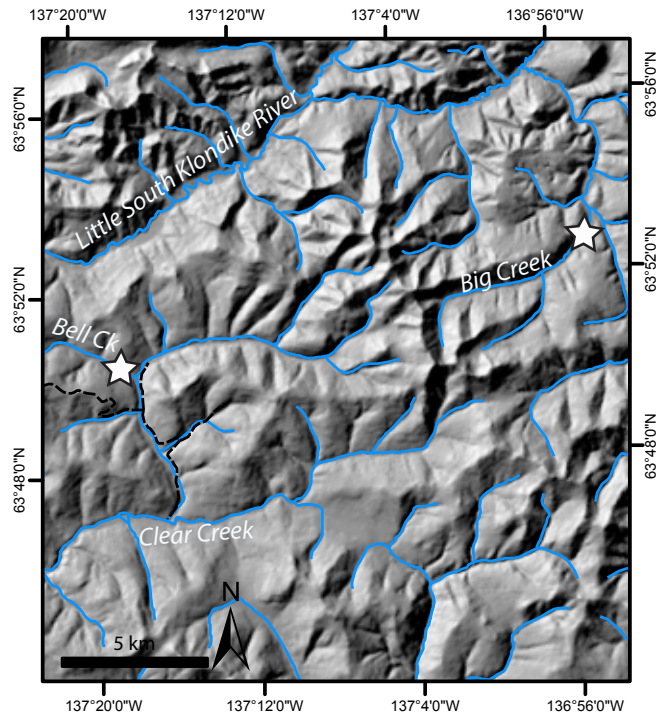
Location of Wolfhead Discovery and Mining's property on Clear Creek.



A view of the water line constructed from Clear Creek. The Big Alex bench and the wash plant is visible in the distance.

SANDRO FRIZZI, JOERG LOTZ AND BRUCE MCARTHUR – BIG AND BELL CREEKS

Exploration in the Clear Creek area included YMEP assisted work on both Big and Bell creeks. Big Creek is located east of Clear Creek on the access road to Red Mountain and is a left-limit tributary to the Little South Klondike River. A complex history of alpine glaciation is present in the upper reaches of the drainage and the Cordilleran Ice Sheet glaciated the lower reaches during the early Pleistocene pre-Reid glaciations. Exploration work included excavator test pitting a series of low-level benches and floodplain locations. Coarse gold was discovered in a right-limit bench deposit and future work will focus on characterizing the deposit genesis and mapping its distribution. A placer discovery in Bell Creek, a right-limit tributary to Left Clear Creek, proved to be challenging. Excavator test pitting suggests the drainage may have been affected by a high energy glacial meltwater flow during a past glaciation. A low pass at the headwaters of the right fork supports this theory, which would have allowed a glacier in the Little South Klondike River valley to direct meltwater into Bell Creek.



Location of Big and Bell creeks in the Clear Creek area.



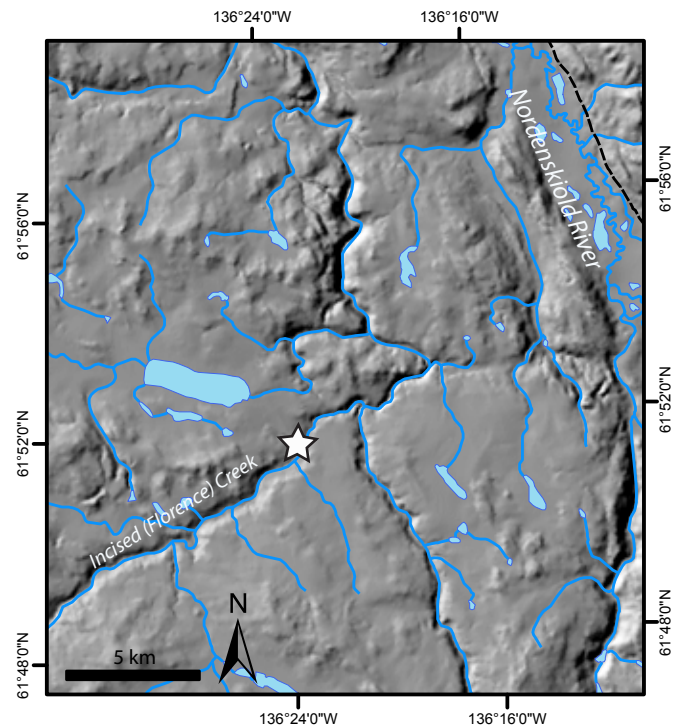
The test plant set up on a right-limit bench of Big Creek.



Using a Komatsu 138 and a small test plant to prospect Bell Creek.

CHARLIE BROWN – INCISED (FLORENCE) CREEK

A late season, YMEP supported exploration program was conducted on Florence Creek, south of Carmacks. Florence Creek, also known as Incised Creek, is a right-limit tributary to Rowlinson Creek. The drainage is over 50 km long and is cut deeply into a low plateau surface. Placer gold and platinum is known to occur immediately above the lower canyon. The primary target on the property is the valley bottom and the lower benches that border both sides of the creek. Excavator testing on the lower bench exposed 3.5 m (12 ft) of coarse glaciofluvial gravel on weathered granitic bedrock. Gold and platinum appear to be mixed within common placer grains and the dominant grain size is greater than 50 mesh. Exploration on the property has focused on the north side of the valley where permafrost is discontinuous, whereas little work has been undertaken in the valley bottom or on the south side benches. Limited testing in the valley bottom suggests depths to bedrock are as shallow as 1 m (3 ft).



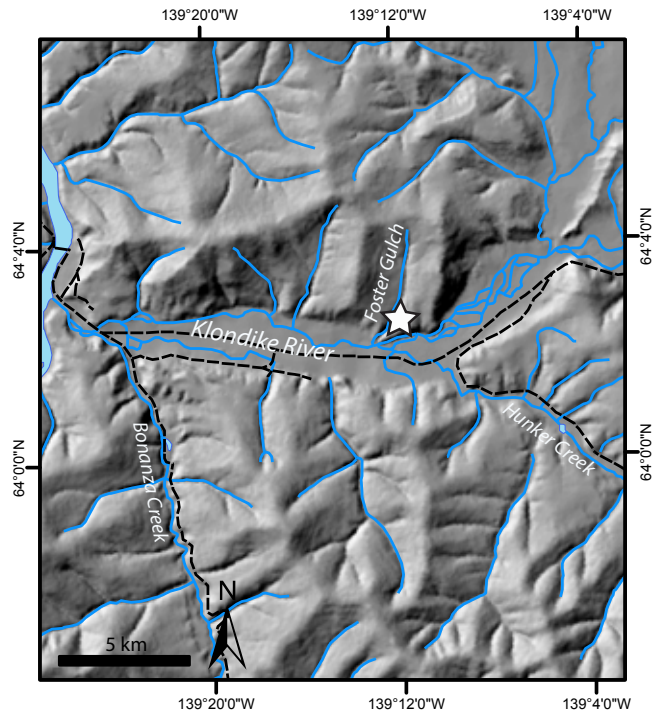
Location of Charlie Brown's property on Florence Creek.



Nick Sawrenko and Charlie Brown using a #10 Gold Machine and a 121-3 Kubota excavator to test the left-limit bench deposit on Florence Creek.

CHARLIE BROWN – FOSTER GULCH

Exploration on Foster Gulch, a right-limit tributary to the Klondike River, in 2014 was limited to hand sluice testing the lowest level, left-limit bench at the mouth of the gulch. Previous mining on the bench exposed a rusty gravel on a soft, brown schist bedrock. Following the first glaciation and deposition of the Klondike wash, considerable incision occurred in the Klondike River valley. Remnant intermediate terraces are preserved (e.g., Slinky Mine) that contain concentrated deposits of pre-glacial White Channel gravel and new placer gold. Foster Gulch has potentially two intermediate-level benches on the left-limit before reaching the glaciofluvial, Klondike wash bench.



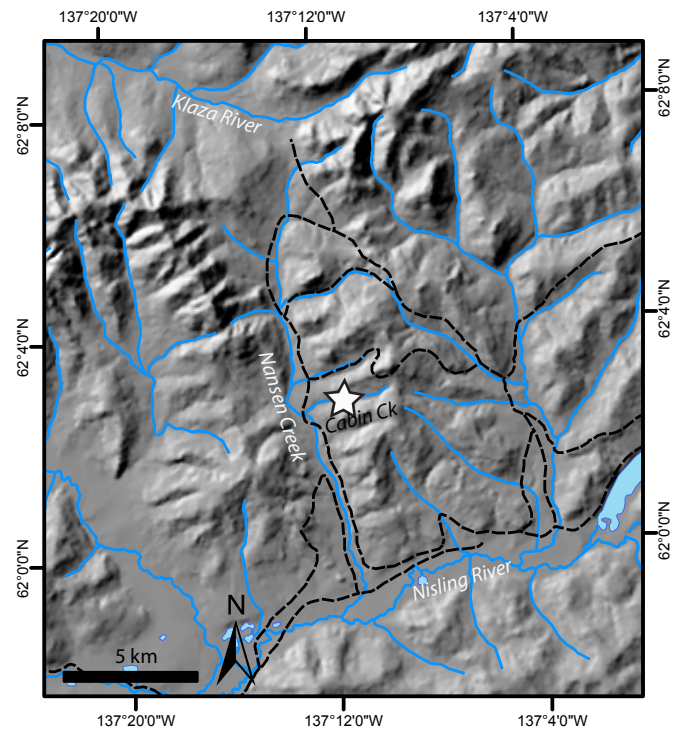
Location of Charlie Brown’s Foster Gulch property on the Klondike River.



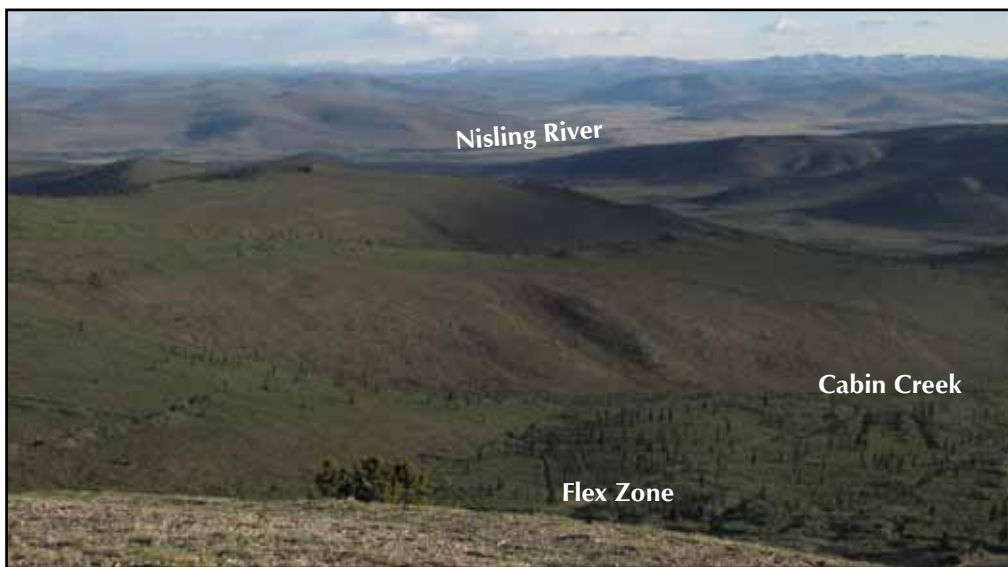
An exposure of the left-limit bench gravel on Foster Gulch. Coarse gravel is visible on bedrock and is the main pay unit.

RON BERDAHL – CABIN CREEK

Placer exploration, with the assistance of YMEP funding, in the Mt. Nansen area included a 7 line 2D resistivity survey on Cabin Creek. Cabin Creek is a left-limit tributary to Nansen Creek and contains epithermal vein mineralization near the headwaters (Flex zone). Recent development work on nearby Back Creek has demonstrated that deep pre-glacial placer deposits can be economically mined. The geophysical survey results hope to identify the distribution of near surface non-auriferous aeolian sand, glacial sediment stratigraphy, pre-glacial fluvial deposit geometry and bedrock morphology. Follow up shafting or drilling in 2015 is planned to verify the stratigraphic interpretations.



Location of Ron Berdahl's Cabin Creek property in the Mt. Nansen district.



A view to the south from the porphyry Dickson stock over the Flex zone and Cabin Creek drainage. The Nisling River is visible in the distance.

REFERENCES

Van Loon, S. and Bond, J.D. (compilers), 2014. Yukon Placer Mining Industry 2010-2014. Yukon Geological Survey, p. 230.