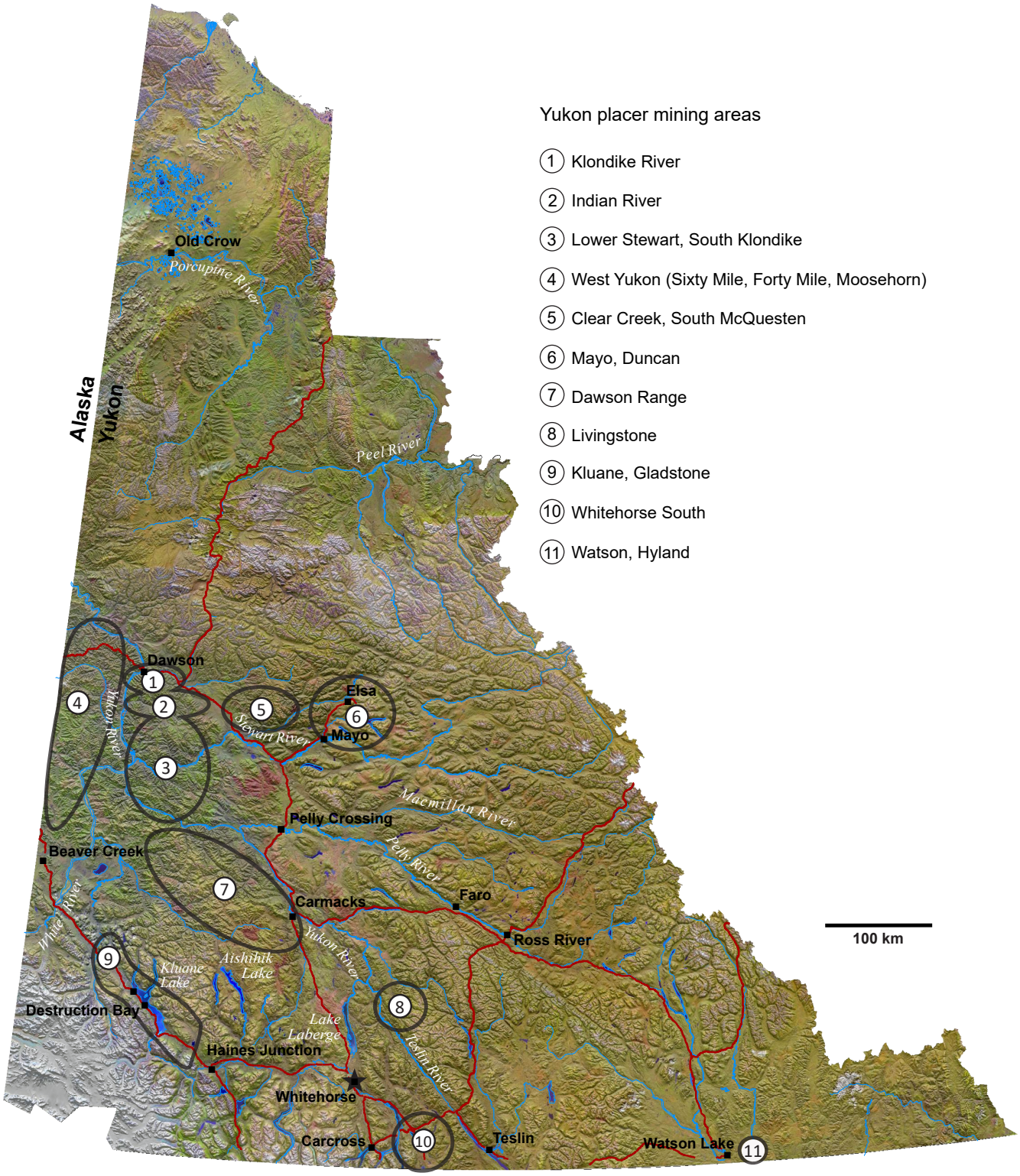


Yukon **Placer Mining** Industry

2018 to 2020

Yukon


Yukon placer mining areas
1 Klondike River
2 Indian River
3 Lower Stewart, South Klondike
4 West Yukon (Sixty Mile, Forty Mile, Moosehorn)
5 Clear Creek, South McQuesten
6 Mayo, Duncan
7 Dawson Range
8 Livingstone
9 Kluane, Gladstone
10 Whitehorse South
11 Watson, Hyland
Alaska
Yukon
Old Crow
Porcupine River
Peel River
Dawson
Yukon River
Stewart River
Elsa
Mayo
Macmillan River
Pelly Crossing
Pelly River
Beaver Creek
White River
Carmacks
Faro
Ross River
Yukon River
Aishihik Lake
Kluane Lake
Destruction Bay
Lake Laberge
Teslin River
Haines Junction
Whitehorse
Carcross
Teslin
Watson Lake
100 km

Yukon **Placer Mining** Industry

2018 to 2020

S. van Loon and J.D. Bond
Yukon Geological Survey
Energy, Mines and Resources
Government of Yukon

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email geology@gov.yk.ca

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Front cover: Placer mining on Fourth of July Creek in the Ruby Range.

Inside front cover: Yukon placer mining areas.

Inside back cover: A map illustrating the maximum extent of glaciation in Yukon.

Back cover: Gold recovered from a Klondike placer operation.

Introduction

The Yukon Geological Survey (YGS) is excited to present the 2018 to 2020 Yukon Placer Industry Report. The volume and breadth of information captured in this report is significant and highlights the strong working relationship between the YGS and the Yukon placer gold mining industry. This relationship is founded on a long history that extends back to the Klondike Gold Rush when the Geological Survey of Canada (GSC) visited the Dawson area mines and provided the first geological framework for the origin and distribution of gold deposits. This included a summary of work activities, published in the volume Mining and Metallurgical Industries of Canada. This combination of geological and work history information summaries by the GSC carried on through ensuing decades and was later picked up by the Exploration and Geological Services Division of Indian Affairs and Northern Development. With a resurgence in placer mining associated with high gold prices in the late 1970s, R.L. Debicki, with support from G. Gilbert and the mining inspections unit, compiled industry summaries capturing the years 1978 to 1984. This modern format continued into the 1990s when the Mining Inspection Division of the Northern Affairs Program became the principal compilers of the report under the supervision of D. Latoski. A 100th anniversary of the Klondike Gold Rush edition was published by this group in the mid-1990s and included contributions by Bill Lebarge, the placer geologist with Exploration and Geological Services. Following devolution in 2003, the Yukon Geological Survey adopted the publication and Bill Lebarge became the principal author and compiler until 2010. For the past 17 years, the Yukon Geological Survey has continued the tradition of this report, which truly reflects a joint effort between government and industry. Without the collaboration and openness of our placer mining clients to share work history and geological insights, there would be no long-term documentation of the industry. This documentation is important for several reasons. Most significant is that it provides a record of where the gold was found, its characteristics, and how it was extracted; information that could assist the industry in the future when trying to understand the potential of an area. Socio-economically, the report is important because it highlights the value of the industry to the economy of Yukon and the specific communities that host gold placers.

The past three years has been particularly interesting for small-scale gold mining in Yukon. With the COVID-19 pandemic gripping the world, the gold mining sector had the opportunity to demonstrate its resilience and emphasize its contribution as other sectors had to reset. It also emphasized the value of economic diversification, something that communities such as Dawson City and Mayo, benefit from. If nothing else, the pandemic has highlighted the economic sustainability that comes with small-scale gold mining.

Moving forward, the industry faces some uncertainty as the political landscape evolves and land use plans are adopted. A goal of the YGS is to continue adapting to the changing needs of the industry. The science we conduct should be focused on pertinent topics and being part of a collaborative evolution. Topics such as analyzing dredge tailings for their missed pay potential, provides both economic and environmental benefits through re-mining and proper reclamation. The YGS sees value in reclamation science and improving best practices. This could include studying post-reclamation ground temperature change to understand permafrost regeneration or identifying methods to maximize wetland regeneration potential. Collectively, there is a lot we can learn and we look forward to assisting the industry in these initiatives.

Once again, thank you to all of our clients who contributed to this report through conversations in the field and over the phone. Our relationship with the placer mining industry, and the many characters it attracts, makes our jobs truly enjoyable. We hope you enjoy this edition of the Yukon Placer Industry Report and we look forward to seeing you on the creeks.

Yukon Geological Survey activities 2018 to 2020

For the past three years, the YGS has been busy serving the placer industry in a number of ways. Our primary focus is field visits during the mining season. There is no replacement for boots on the ground observations and discussions with our clients and this will always be our main communication tool. Each summer, YGS completes more than 80 site visits. In addition to this liaison work we are involved in a number of projects and initiatives, which are summarized below.

Placer Geology Research: In 2018, Sydney van Loon published a paper in Yukon Exploration and Geology that summarized historic gold distribution, using YCGC drill holes and shafts, along lower Hunker Creek. The project examined surficial material thicknesses, gold distribution, and identified areas for further exploration.

Also in 2018, Derek Cronmiller published two products from his Masters of Science thesis focused on Gladstone Creek in the Ruby Range. His Yukon Exploration and Geology paper entitled "Constraints on the evolution of placer gold deposits at Gladstone Creek, Yukon (NTS 115G/7, 8)" outlined the evolution of placer deposits in the drainage. The second product is a surficial geology map encompassing Gladstone Creek and a portion of the Ruby Range. His thesis was completed through Simon Fraser University in partnership with the YGS and is available online for download. Derek is now an employee of the YGS, so if you have any questions about the Gladstone Creek area, give him a shout.

Wetlands have become an increasingly common topic in the placer mining conversation. In 2018, Jeff Bond published a paper in Yukon Exploration and Geology entitled "Analyses of regional wetland distribution using predictive ecosystem mapping data sets for west-central Yukon and east-central Alaska". The goal of the paper was to provide a high-level perspective on the distribution of wetlands, the location of some of the larger complexes, and their general spatial extent across various landscapes.

Historic Data Project: Sydney van Loon spearheads this project; hundreds of vintage maps and information pertaining to thousands of drill holes are accessible through the Historic Placer Data web viewer. The data are now being widely utilized by claim holders in areas previously dredged and have provided important exploration guidance. A detailed summary of this project is provided in this volume (see Historic placer data).

Yukon Placer Forum: This one-day placer conference has been an annual event for the past 13 years. COVID-19 shortened the schedule considerably in 2020, but we were still able to communicate the industry overview presentation via Zoom. The Placer Forum has become an important networking and information sharing opportunity for the industry, and YGS is keen to carry on the tradition. As always, we would like your feedback on presentation topics and encourage anyone to consider sharing information and knowledge through a presentation.

Dawson Land Use Plan: For the past two years Warwick Bullen (Mineral Assessment Geologist, YGS) and Jeff Bond have contributed mineral potential and mining-related information to the Dawson Land Use Planning Commission. This information has highlighted areas of interest for the industry and contributed to an understanding of growth scenarios and cumulative effects modeling.

Yukon Mineral Exploration Program: Exploration grant funding has continued through the past three years and is administered through the YGS. A total of $2.65 million in grants was directed toward 81 placer projects over the three-year period. This included a large COVID-related spending boost in 2020 of $1.33 million. This exploration investment leveraged approximately $7.46 million in direct industry expenditures. Additional revenue generation will undoubtedly occur as some of the projects evolve into new mines or add reserves to existing operations. These projects span a variety of settings from near-mine-site reserve definition to frontier exploration on new creeks. Work programs include geophysics, topographic modeling using drones, test pitting, drilling and shafting to name a few.

In Memoriam

The joy in our job lies in the connections we make with people. Many of these people become friends and we look forward to conversations on the creeks. Their passing leaves a gap in our community and affects the atmosphere and character within a drainage. In this volume, we would like to mention some recent losses to the placer mining community and reflect on their contributions to the industry. By no means is this list exhaustive and we apologize if we have missed someone.

Anton Kosuta – *Clear Creek*, *Hunker Creek*
Art Sailer – *Dominion Creek*
Bud Davis – *Victoria Creek*, *Maisy May Creek*
Chris Glenn – *Bonanza Creek*, *Gumbo Hill*
Darrell Morgan – *Green Gulch*, *YCGC*
Dave Kosuta – *Clear Creek*
Diane Gow – *Mechanic Creek*
Floyd Travis – *Sixtymile River*
Frank Plut – *Swede Creek*
George Wilson – *Sonora Gulch*
Joe Fellers – *Sixtymile River*
John Erickson – *Hunker Creek*
John Van Every – *Van Every Inc. Trucking*
John Zogas – *Atlin*
Nick Palagian – *Hunker Creek*
Peter Bodin – *Victoria Creek*, *Kentucky Creek*
Richard Cull – *South Klondike and Atlin*
Steve Van Bibber – *Bonanza Creek*, *Clear Creek*
Todd Taylor – *Duncan Creek*
Walter Hinnek – *Gauvin Gulch*, *Eldorado Creek*

Acknowledgements

The Yukon Placer Industry Report is a reflection of the strong working relationship between the Yukon Geological Survey (YGS) and the Yukon placer mining industry. Our annual tours into the various gold fields are always productive and provide new details on placer gold settings, which are encapsulated in this report. We owe a big thank you to our industry clients that share information and are committed to this documentation effort. Without their cooperation, we would have so much less to share and this unique volume would not be possible. In particular, I would like to thank the Atlin area miners who welcomed me onto their claims in 2018. We do not have a tradition of liaising with our neighbours across the border so I was not sure what to expect. As it turned out, the visit was highly productive and for the first time ever, Atlin placer geology and mining is documented in this report. We believe their success can only benefit the Yukon.

Sydney and I would also like to thank Derek Cronmiller, Kristen Kennedy and Patrick Sack from the Yukon Geological Survey for contributing information on the placer deposits of Burwash, Gladstone and Nansen areas. These supplementary efforts are a big help for us.

Finally, we would like to thank Karen MacFarlane, Head of Technical Services and Publications Manager at Yukon Geological Survey. Karen is the behind the scenes editor and lay out specialist who pulls our jargon into a professional format. She works tirelessly on this publication and puts up with our erratic and ever changing schedules. We appreciate her patience and recognize that she really does make the publication process easier for us. Thank you Karen.

Jeffrey Bond
Head, Surficial Geology
Yukon Geological Survey
Energy Mines and Resources
Government of Yukon

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Yukon placer mining industry, 2018 to 2020
An overview of activity and production

Introduction

Placer gold activity has remained strong throughout the past three years, building on a nine-year upward trend in production. The steady growth is owed to sustained gold prices, a favourable exchange rate, and the industry's determination to maintain and improve their operations. The number of producing placer mines has remained steady over recent years. During a typical year, about 150 operations will report gold production. This volume includes 201 placer operations, some of which are exploration projects, and others are only intermittently active. The statistics summarized in the following section span a variety of time frames to give the reader a longer term perspective on the state of the industry.

Lease and claim activity

The acquisition of new ground through claim and lease staking is a good measure of the industry's health, and perhaps more importantly, maintenance of those claims in the long term. Placer lease staking reached a high in 2016 and has been dropping to just above average levels in recent years (Fig. 1). The 2016 spike coincided with very strong gold prices that were bolstered by a growing differential between the US and Canadian dollars. Placer claim staking reached its 20-year high in 2018 with 3022 claims staked (Fig. 2). This is the most claims staked in a single year since 1982 (3966). Much of this claim staking resulted from conversion of the 2016 leases into claims. Placer leases held in good standing from 2018-2020 were 25% higher than the 20-year average (Fig. 3). In addition, the trend is currently increasing with 284 leases staked in 2020. In terms of placer claims held on good standing, there are currently 30515 claims (Fig. 4).

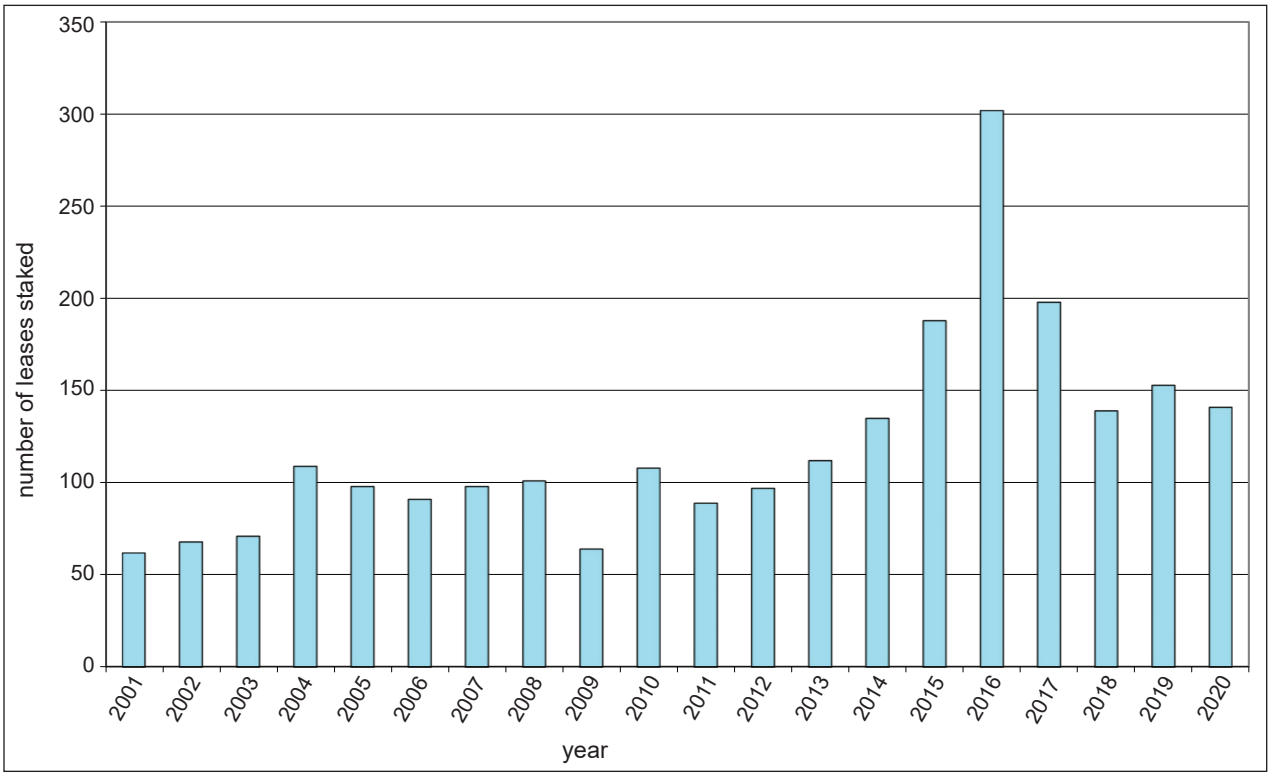


Figure 1. *Yukon placer leases staked, 2001–2020.*

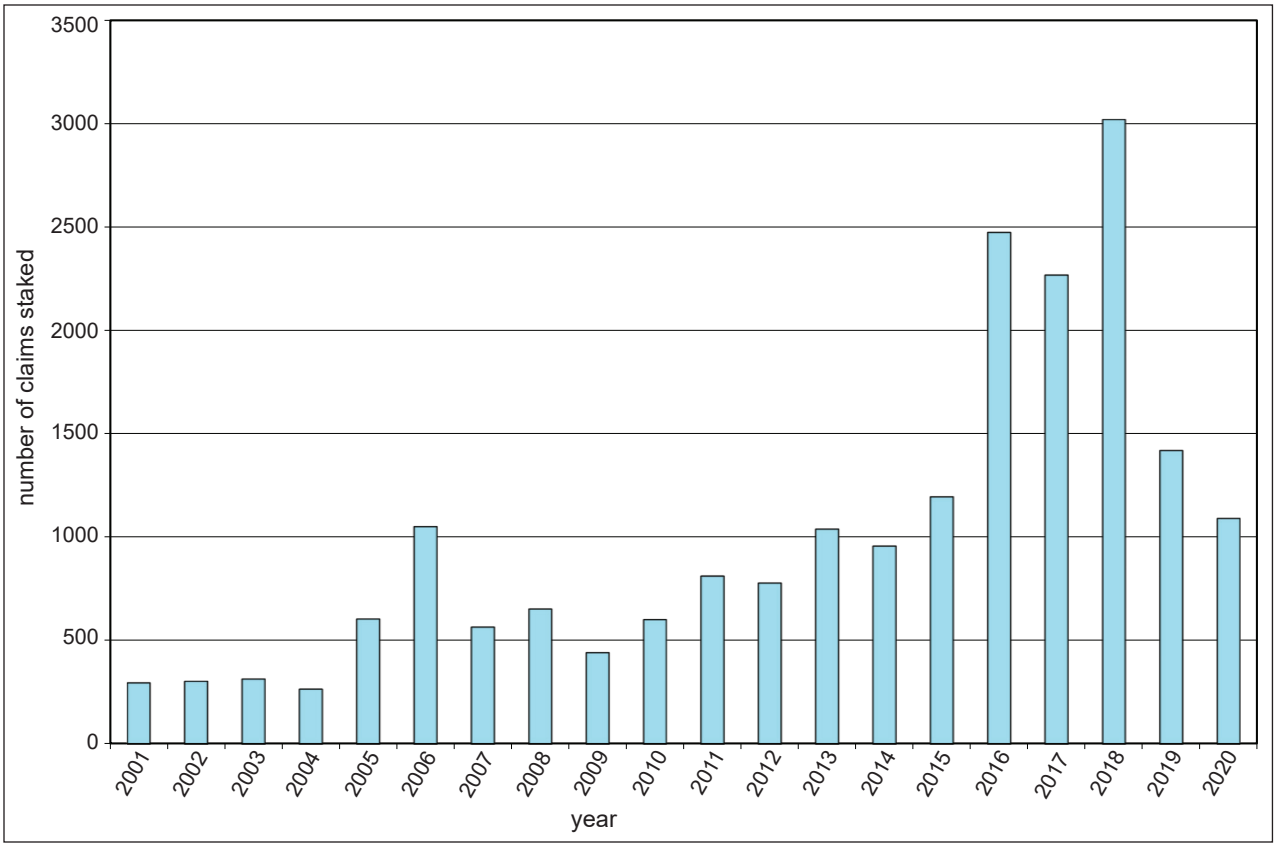


Figure 2. *Yukon placer claims staked, 2001–2020.*

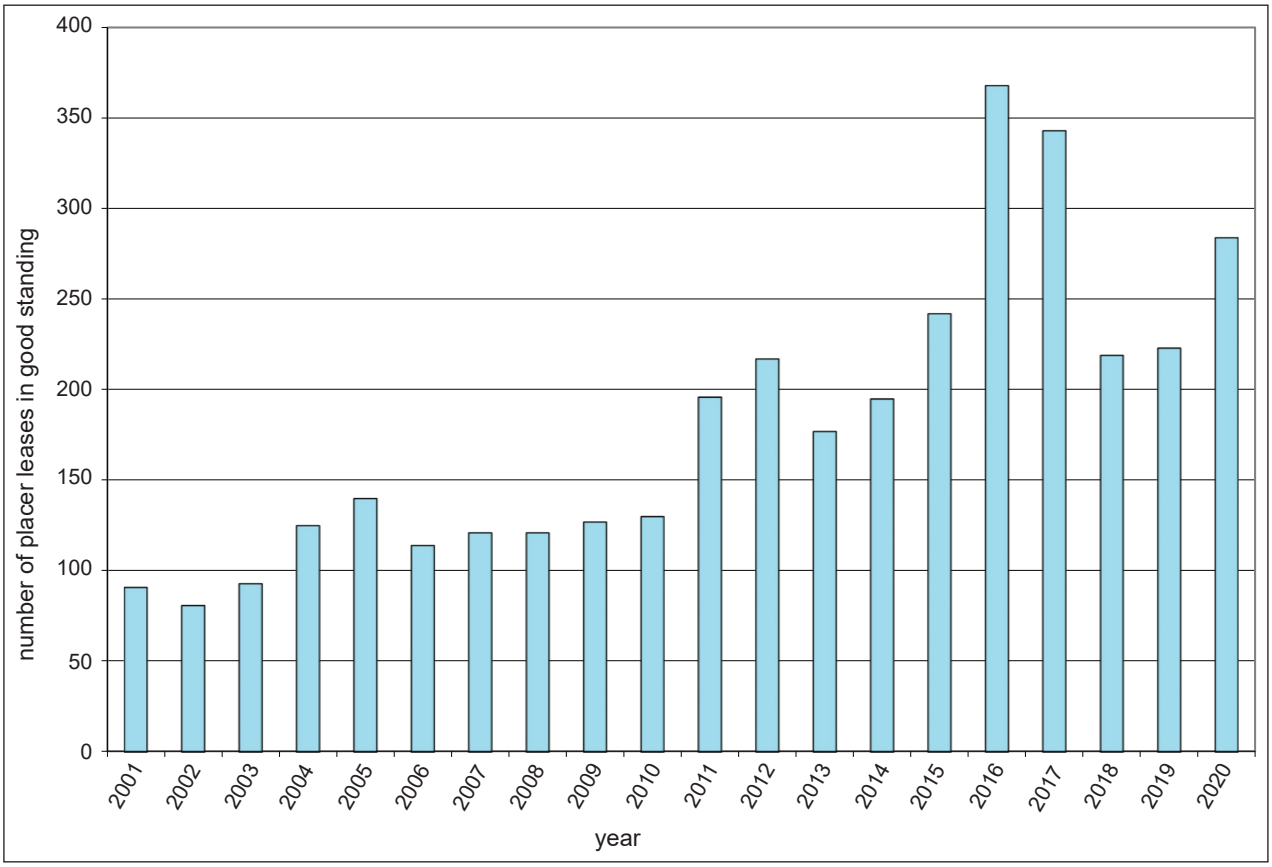


Figure 3. *Yukon placer leases in good standing, 2001–2020.*

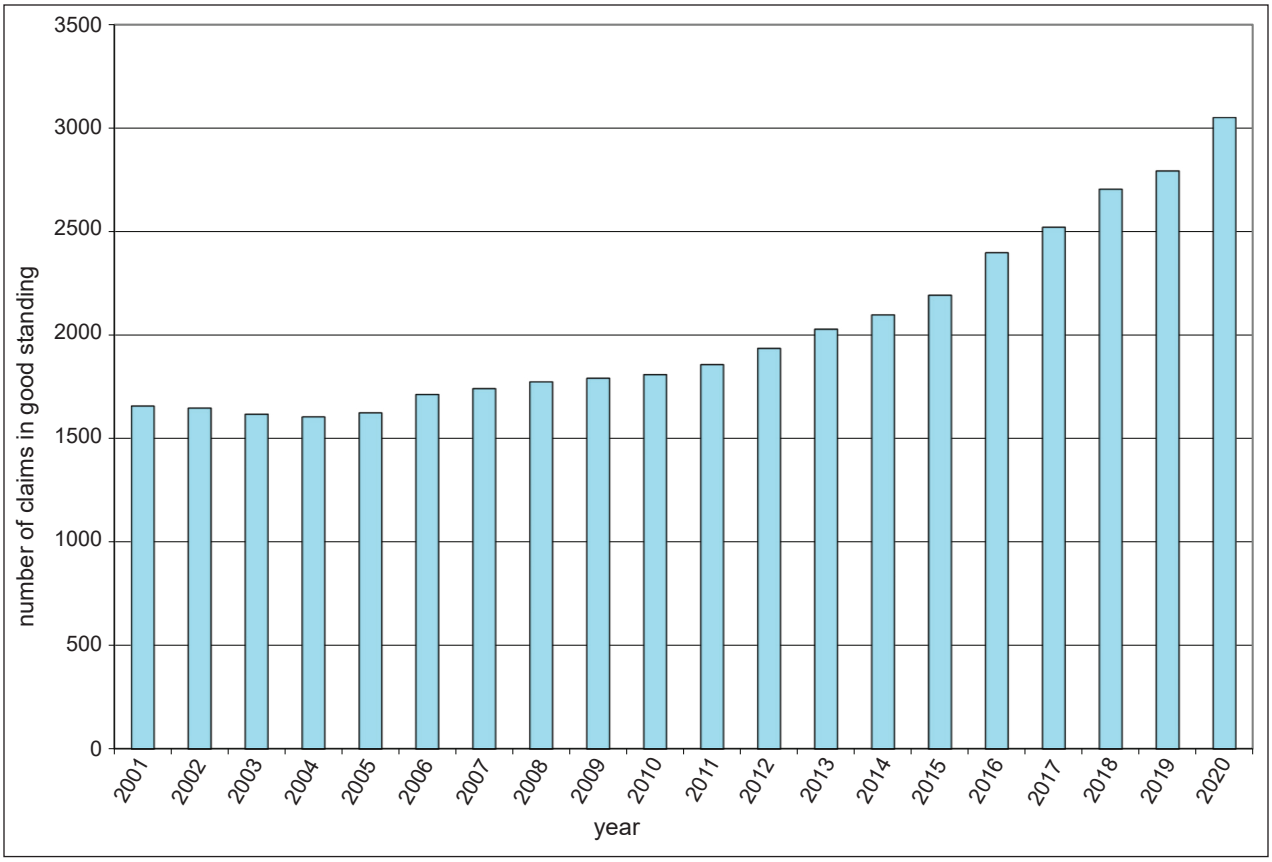


Figure 4. *Yukon placer claims in good standing, 2001–2020.*

World market gold price and local diesel prices

For the past two mining seasons, Yukon gold producers have benefited from record high gold prices (Fig. 5). The recent spike in the price of gold can be attributed to the COVID-19 pandemic. In August of 2020, gold prices soared past $2500 CDN/oz, which marked a familiar scenario where gold becomes a safe haven during global economic downturns. Yukon is no stranger to this pattern, which has occurred previously during the recessions of the 1930s and early 1980s. Gold's counter-swing against recessions and unrest, and the placer industry's capacity to benefit from it, is one of the real benefits of small-scale gold mining. This feature makes placer mining a significant pillar of economic diversification.

Throughout the reporting period, Yukon placer miners have also benefited from a favourable exchange rate with the US dollar. This dollar differential began in 2014 and has continued for the past 7 years. During the last three years, this amounted to a 24.5% average value increase.

Another unforeseen benefit of the pandemic was a drop in diesel prices just before the mining season (Fig. 6). February 2020 pricing in Whitehorse was $1.46/litre and by the end of April had dropped to $1.20/litre. It stayed at this level throughout the 2020 mining season enabling a 20% saving on fuel.

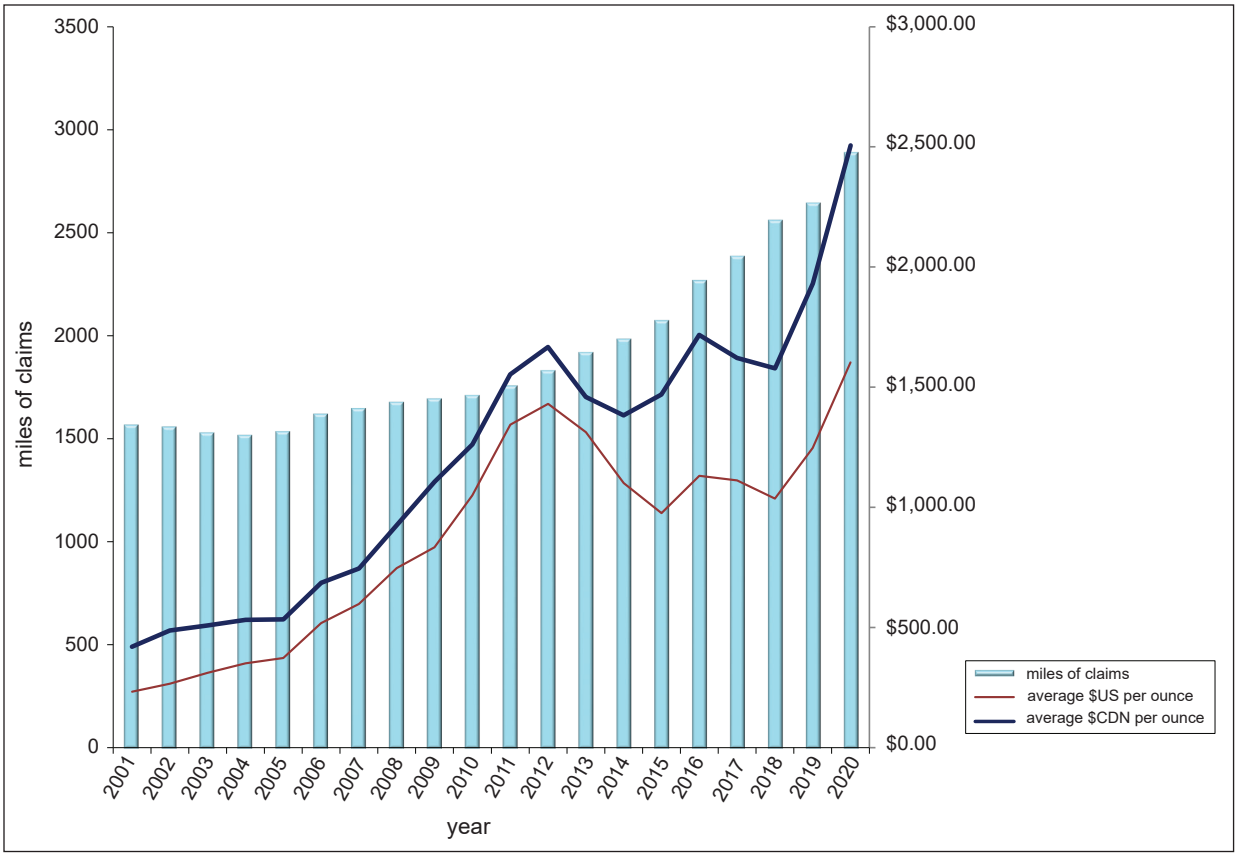


Figure 5. *Miles of Yukon placer ground held versus world gold price in US and Canadian dollars, 2001–2020.*

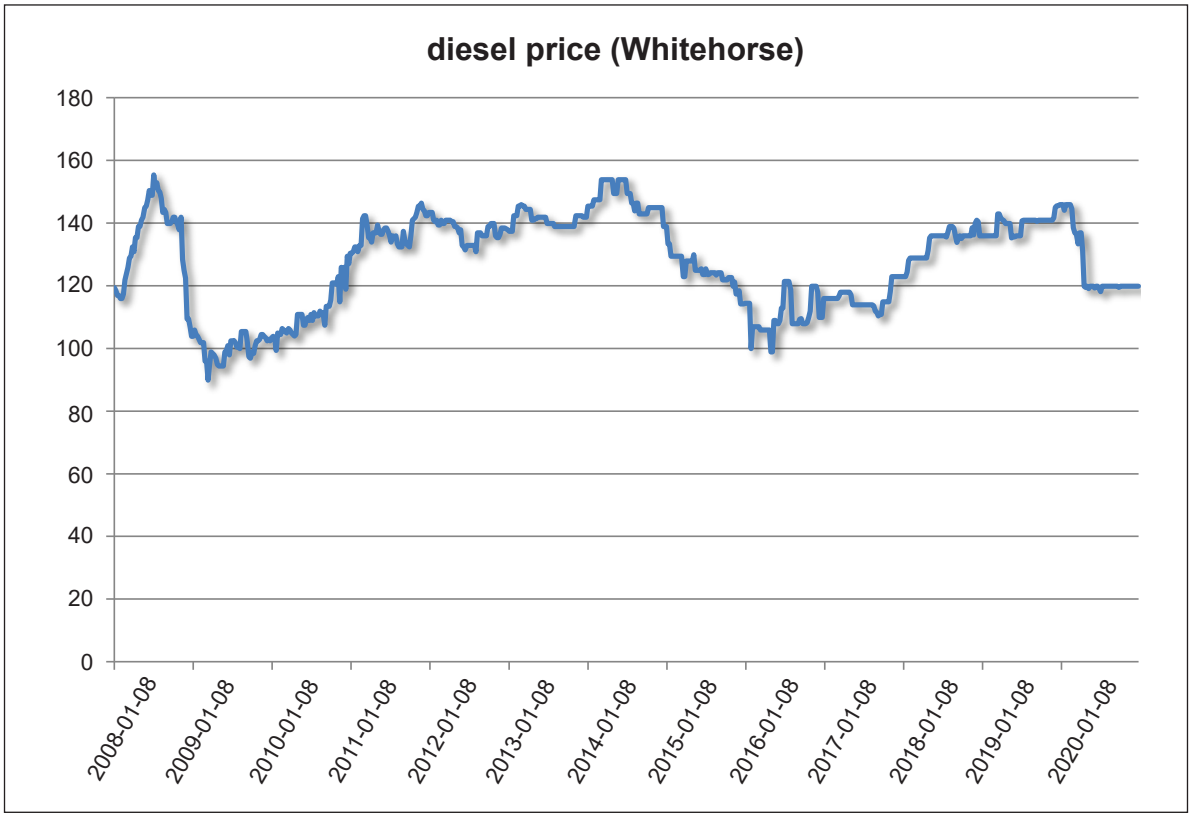


Figure 6. *Price of diesel in Whitehorse, dates from August 1 of each year.*

Yukon placer gold production

The estimated total production of placer gold from Yukon dating back to 1886 is 17.5 million crude ounces. The highest annual production occurred in 1900 when 1.3 million ounces was mined, largely by hand. To put this in perspective, it has taken 20 years of mechanized placer mining from 2001 to 2020 to produce 1.3 million ounces. These outstanding production numbers from the gold rush highlight the geology and metal endowment in Yukon, and exemplify why placer gold continues to be a viable resource. To this day, all of the primary gold rush creeks, along with many others that were not discovered in those early days, are producing placer gold. Finding and recovering all of the concentrated zones of placer gold from a drainage is challenging, which ultimately adds longevity to the industry. Current placer production has been remarkably stable for the past 40 years. The average annual production since 1980 is 87,120 crude ounces and the production in 2020 was 86,507 crude ounces. Obviously, there have been highs and lows during this period, but overall, the contribution to the Yukon economy has been steady.

The production figures in the following section are based on export tax records collected by the Yukon Mining Recorder. The past three years have been good for the industry in terms of production with an average of 78,391 crude ounces reported (Fig. 7). The value of production increased from CDN$89M in 2018 to CDN$173M in 2020, largely thanks to the gold prices response to COVID-19 (Table 1; Fig. 7). This amounts to CDN$383 million during the reporting period 2018 to 2020. Of this value, 87% enters directly into the Canadian economy (CDN $333 million) via goods, services and wages associated with mining. This pandemic-production-bolstered-value will enable operators to improve their fleet of heavy machinery, which will ultimately contribute to the industries sustainability.

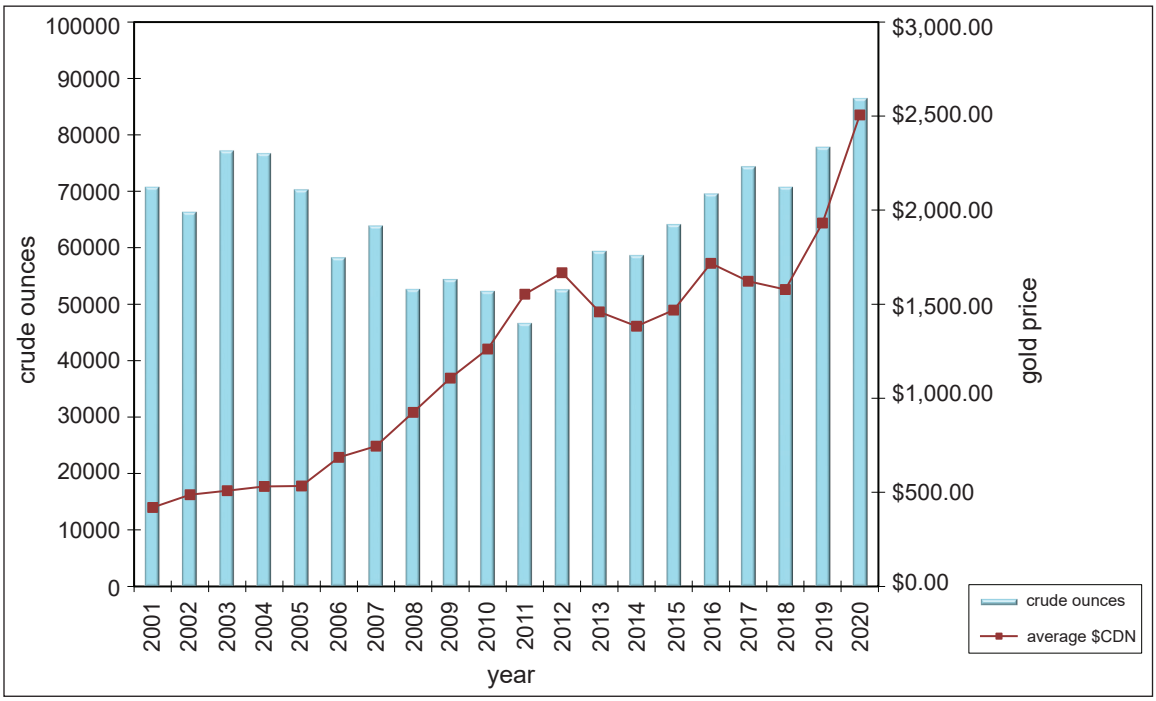


Figure 7. *Yukon placer gold production versus gold price in Canadian dollars, 2001–2020.*

Table 1. *Yukon placer gold production according to royalty reporting for the perios 2018 to 2020.*

Year	Ounces (crude)	Ounces (fine@0.80)	Value (CDN)
2017	74,402	59,522	$96.5 million
2018	70,814	56,651	$89.4 million
2019	77,851	62,281	$120.3 million
2020	86,508	69,206	$173.4 million

Regional production

Regional production from each district for the past ten years is summarized in Figure 8.

Production from the Indian River drainage has fluctuated during the reporting period. A drop in 2019 is attributed to the relocation of a major operation on Quartz Creek to the Clear Creek district. Partial recovery in 2020 occurred with new production on Wounded Moose Creek, expansion of a substantial gold resource on the left limit of the valley above Eureka Creek, and increased production from tributaries like Sulphur. Overall, the Indian River and its tributaries remain the top producing placer area with a ten-year average of 28,000 crude ounces produced annually.

The Klondike River and its primary gold producing drainages, Hunker and Bonanza creeks, has produced on average 12,000 crude ounces annually over the past ten years. Production has increased in the last three years reaching a recent high of 16,000 crude ounces in 2019. Strong production from the White Channel benches, such as Paradise, Dago, Lovett, Cheechako and Gold hills, along with great results from the Klondike River valley below Hunker Creek, has fueled the recent increase.

The West Yukon district, including drainages like Sixtymile, Fortymile, Moosehorn and Ten Mile, has had strong production reporting over the past three years. Much of this is owed to a scaling of activities on the Sixtymile River.

Production from the lower Stewart River drainages also saw a substantial increase. In 2020, more than 13,000 crude ounces were produced from the area. This is 5,000 crude ounces more than the previous 9-year average. Strong production from Henderson Creek contributed significantly to this increase.

New mines on Big and Josephine creeks, along with strong production from Clear Creek, helped the Clear Creek district become an important placer producing area once again. Production doubled each year from 2018 to 2020 reaching a peak of 10,314 crude ounces.

The Mayo-Keno district has also witnessed improved gold production with the past three years being the best since 1997. Much of this increase is owed to success in Granite Creek and strong production from Minto Creek.

Production from the Dawson Range, including Mt. Nansen, Mt. Freegold and the Canadian Creek area has fluctuated over the past ten years between 1200 and 2300 crude ounces annually. A recent spike in production results from renewed interest in upper Canadian Creek near the Casino deposit.

The Kluane district produces a similar amount of gold as the Dawson Range on an annual basis. New ownership of Fourth of July Creek is anticipated to have a positive effect on the district's production, but overall, Gladstone Creek remains the most consistent and top producing drainage in the area.

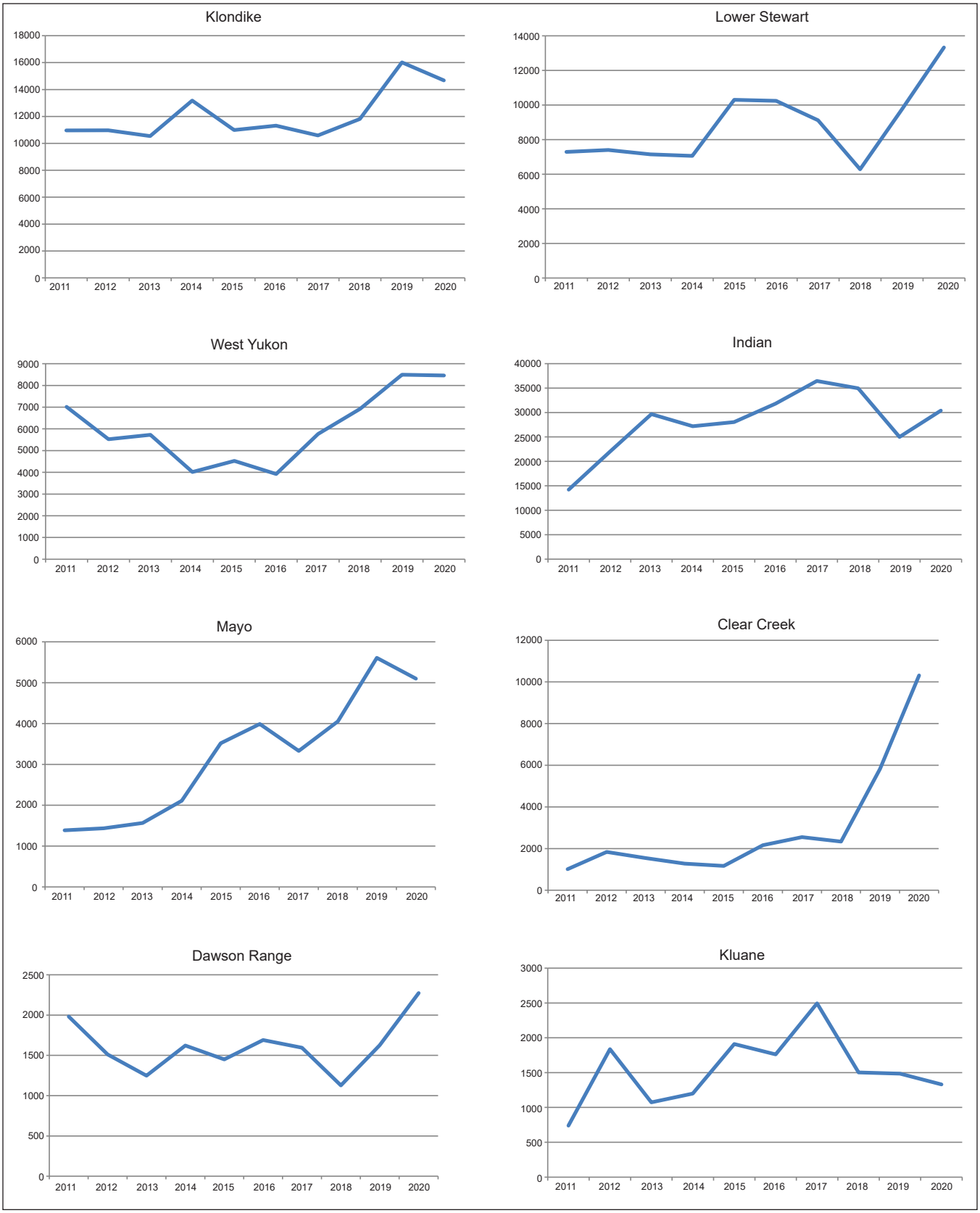
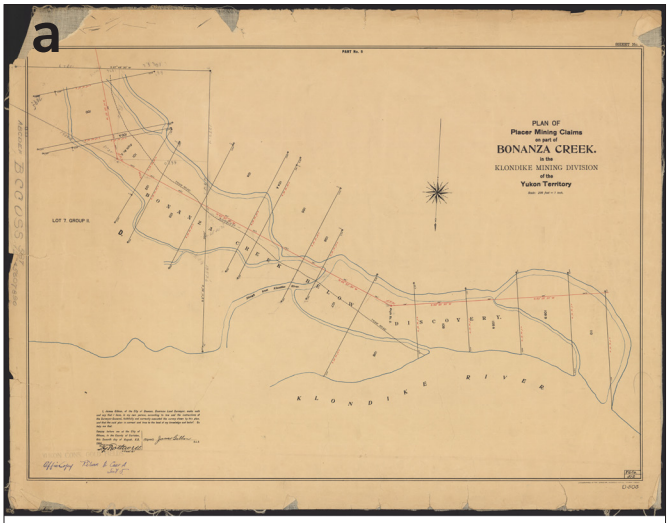


Figure 8. *Regional production for the past 10 years for the main Yukon placer districts.*

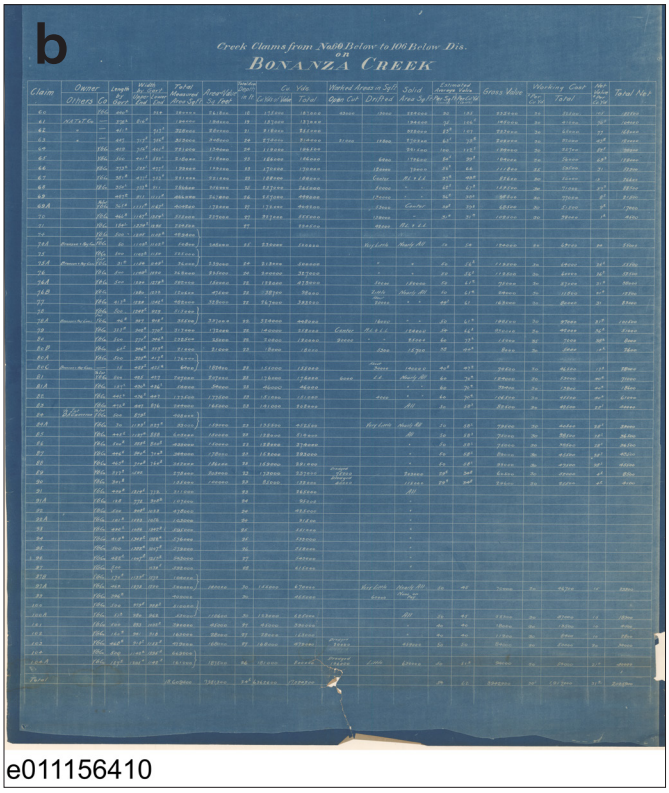
Historic placer data

The Yukon Geological Survey (YGS) began acquiring historic placer data in 2013. Extensive historic mining in the Klondike region has produced significant amounts of data, which have largely been transferred to, and stored by the National Archives in Ottawa, Ontario. The Yukon Consolidated Gold Corporation (YCGC), who operated in the Klondike from 1923 to 1966, are a large source of the archival material. YCGC is unique to the mining industry in Canada, as it is the only large-scale placer mining operation to have existed. For four decades, YCGC operated up to twelve dredges and inventoried the prominent drainages in the Klondike, investigating the Klondike River, Indian River and their tributaries. The main objective of their exploration was to determine which creeks were economic for dredging, and to create an inventory of drainages based on placer gold grade and surficial material characteristics.

Data collected by YCGC, and additional companies and individual operators, includes maps, textual records (eg., drill logs) and photographs, all of which have the ability to capture geological attributes and work history information. Geological attributes present in the data can include ground conditions (permafrost), surficial material thickness, grade measured in cents per cubic yard, surface evaluation and bedrock elevation. Work history information consists of location of mining, thawing layout, dredge limits, dredge block production information and historic workings.



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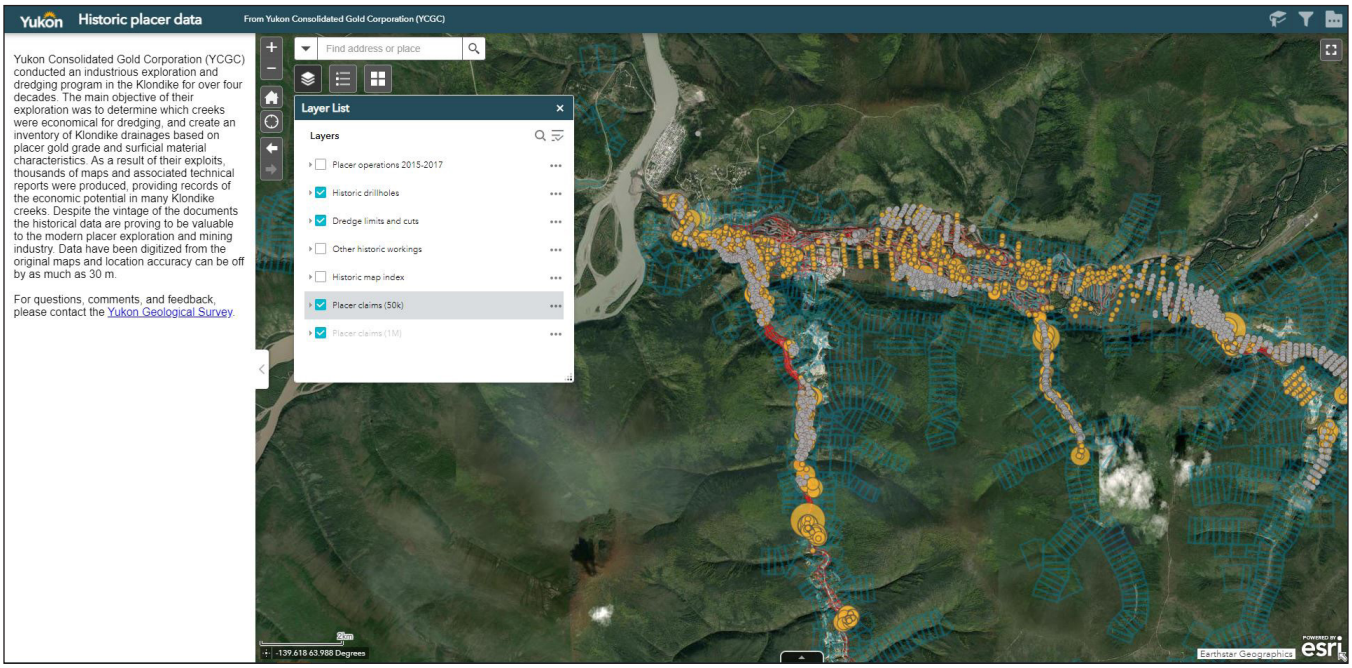
Examples of scanned YCGC materials. ***(a)*** *Plan of placer mining claims on part of Bonanza Creek, displaying the location of claim 104 below.* ***(b)*** *A textual document displaying information pertaining to claim 104 below on Bonanza Creek.* ***(c)*** *Historic photo of dredging at 104 below on Bonanza Creek showing Aklan farm and cabin on the hill; date unknown. Library and Archives Canada, 2021.*

YGS has obtained 1113 maps, 224 textual documents and 37 photographs, largely from the National Archives in Ottawa. In 2019, historic documents were also obtained from Parks Canada facilities in Dawson City and from the Dawson City Museum. Digitizing of the maps is an important step in making the information accessible. This begins with georeferencing the extent of the maps. Once the maps have been imported into ESRI ArcGIS and cross-referenced for accuracy using historic claim and baseline surveys, point and line features are digitized. Point features include drillholes, shafts and thawing points. Line features include dredge limits, dredge blocks and historic workings such as hydraulic tailings. Acquisition of this data set has led to the digitization of 11,646 drillholes and shafts, 4662 polygons of dredge cuts, thawing layouts and historic workings, and footprints of 781 maps from 15 drainages (as of May 31, 2021).

GIS data created from digitizing the historic placer data has been overlaid on current placer claims and satellite imagery, to create the Yukon Geological Survey's Historic Placer Data web map. Within the web app, there are tools for searching and querying the data to analyze drillhole values, gold distribution, dredge limits and surficial material thickness. Research and prospecting opportunities that result from these data facilitate both placer and hard rock exploration. Placer application examples include: targeting economic deposits marginal to the dredge limits, evaluating dredge efficiency and modeling former pay streak geometry. For hard rock exploration, concentrations of placer gold can be modeled against bedrock structural interpretations to target potential mineralization.

Several compilations of historic data have been completed. Publications include digitizing and spatially analyzing historic YCGC drill data from Dominion Creek (van Loon, 2016), digital analysis of historic drilling data to reconstruct the placer gold distribution in Sulphur Creek and lower Dominion Creek (van Loon, 2017) and analysing historic drilling data to investigate gold distribution on lower Hunker Creek and Klondike River (van Loon, 2019).

As data continue to be digitized, additions to the web map are ongoing. Many thanks are owed to Brett Elliot at YGS, who developed the placer web map and manages the data displayed through it. Secondly, thank you to Aspect North (Laura Grieve) for completing the majority of digitizing, and doing a thorough job. To access the Historic Placer Data web map, please visit our website at https://yukon.ca/en/geology-maps or enter 'Yukon historic placer data' into a search engine like Google. If you have any comments, questions, or historic documents you would like to temporarily donate to allow us to scan, please contact Sydney van Loon.



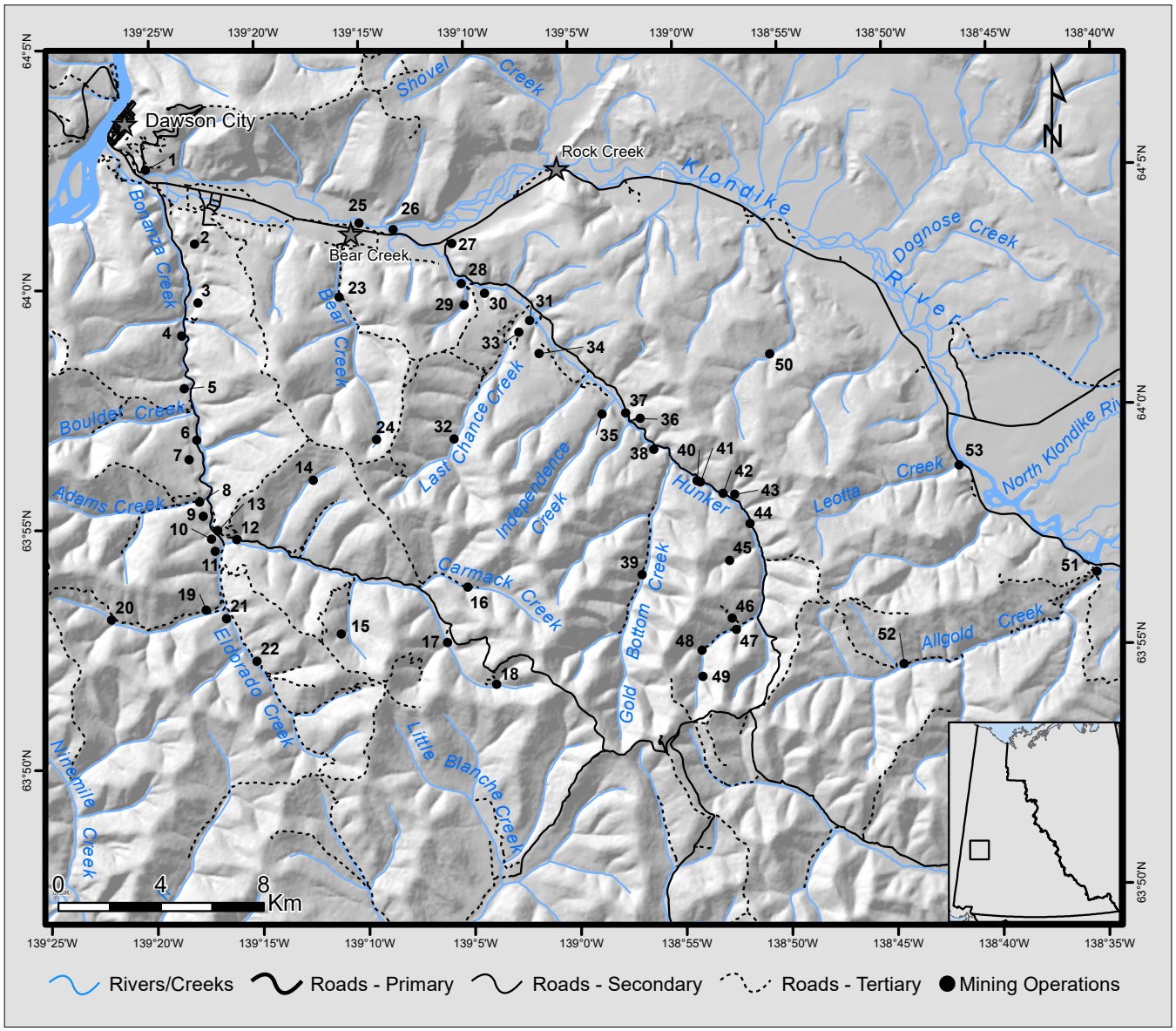
Screen shot of the Historic Placer Data interactive map displaying the layer options.

LEGEND

1. Slinky Placer Mine
2. Northern Shoveler Resources Ltd.
3. Algotsson, H.
4. Kohlman Explorations Ltd.
5. Lewes River Mining
6. Van Bibber, N.
7. Jackson, D.
8. Berglund, R. and D. Trudeau
9. Beron Placers Co. Ltd.
10. Daunt, I. and K. Daunt
11. Dulac Mining
12. Hanulik Enterprises Ltd.
13. Arkinstall, C.
14. R & W Mining
15. McMahon, T.
16. H3 Mining Company
17. Anglerock LLC.
18. McKort Mining Co.
19. Jackson, D.
20. Heslip, A.
21. Cissell, M.
22. Dulac Mining
23. 16406 Yukon Inc.
24. Brong, R. and E. Dotzlar
25. Tatra Ventures Ltd.
26. New Zealand Mid-Arctic Gold Mining Ltd.
27. Slonski, G. and K. Elgie
28. Henry Gulch Explorations Ltd.
29. Gillespie, R.
30. Favron Enterprises Ltd.
31. Ace Placer Mining Ltd.
32. Golden Wrench Mining
33. Moonlight Mining Ltd.
34. Tamarack Inc.
35. Phillips, P. and D.
36. Kreft, B.
37. Daval Mining
38. Fraser, I.
39. Tim Coles Enterprises Ltd.
40. Rodal Placers
41. Millar, D.
42. Thompson, K.
43. Sadek, V.
44. Haijema, J.
45. 535584 Yukon Inc.
46. Ahnert, G. and E.
47. Hunter, T. and B. Lammers
48. George, M. and L.
49. Brong, R. and E. Dotzler
50. Big Valley Mining
51. Henry Gulch Explorations Ltd.
52. Dulac Mining
53. Brown, D. and T. Brown

BONANZA-HUNKER
PLACER AREA

SITES 1–53



Dome Road, intermediate-level bench on the Klondike

116B/03 2018: 64°02'52"N, 139°24'37"W

Slinky Placer Mine, 2002–2005, 2009–2018
Treadstone Services, 2015–2018

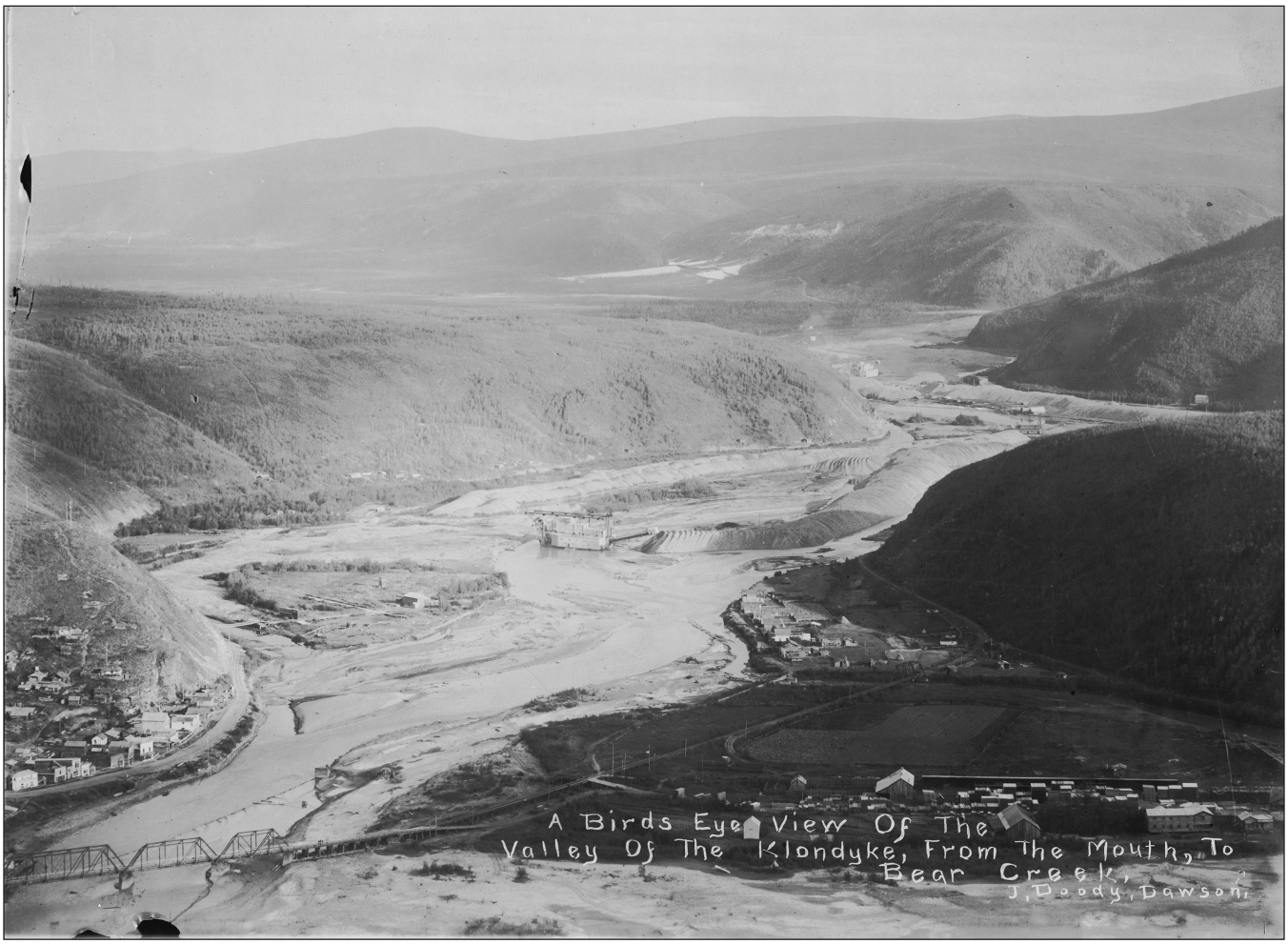
Water License: PM17-086 (Active 06/2024)
Water License: PM14-045 (Expired 06/2020)
Active Producer (2018) **Operation no. 1**

Location Right limit bench of the Klondike River, 1.5 km downstream from Thomas Gulch.

Work History and Mining Cuts Slinky Placer Mine concluded their mining efforts on their placer claims located on the west side of the Dome Road in fall 2018. They established an agreement with Treadstone Services and mined together through 2018. During the season they processed gravel both at the bottom of the bench on their valley bottom claim and on top of the mid-level Klondike River bench on their claim. A significant amount of reclamation was completed by the end of the 2018 season; tailing and cut exposures were contoured and fine-material was used to cap the gravel in order to promote vegetation re-establishment. Camp and mining efforts were relocated east of the Dome Road and a new license was permitted for Slinky Placer Mines claims beginning at Thomas Gulch. No activity occurred in 2019 or 2020.

Equipment and Water Treatment Equipment present on site included a Terex loader, Link-Belt 210 excavator, Kubota KX161-3 excavator, and two dump trucks. The wash plant consisted of a 1.2 by 5.5 m (4 × 18 ft) trommel with a single sluice run 0.6 m (2 ft) wide by 6 m (20 ft) long and could process up to 26 yd^3 (20 m^3)/hr. Water was pumped from the Klondike River to their sluicing location at the base of the Dome Road. Effluent was recirculated through dredge pond tailings and resulted in no surface discharge.

Surficial Geology and Stratigraphy The Dome Road cut in 2018 consisted of 14 m (46 ft) of moderately sorted, coarse outwash gravel on bedrock.



Historic photo of 'A birds eye view of the valley of the Klondyke [River], from the mouth, to Bear Creek.' The right limit bench, where Slinky Placer Mine was active last in 2018, is on the left of the photo, and no development is visible. Library and Archives Canada, e011309061_Klondike_dome.

In previous cuts, the outwash gravel was underlain by an interglacial fluvial gravel and silt, however at this cut these units were reworked by the outwash gravel. Generally a 1.5 m (5 ft) section of gravel and up to 4.5 m (15 ft) of bedrock was sluiced. The top of the section is overlain by 2 m (6 ft) of silt.

Bedrock Geology Bedrock is diorite.

Gold Characteristics Gold recovered from the main pay unit is coarse with dendritic textures and quartz, while very fine gold is recovered from the upper well-washed pebble gravels.



Gold recovered from the Slinky-Treadstone placer mine on the Dome Road in 2018. A significant amount of quartz is present with the gold and many of the nuggets have not travelled a great distance.

Jackson/Lovett Hill, high-level bench on the Klondike and Bonanza

116B/03 2020: 64°01'19"N, 139°21'46"W
116B/03 2019: 64°01'16"N, 139°21'19"W
116B/03 2018: 64°01'17"N, 139°21'15"W

Northern Shoveler Resources Ltd., 2005–2020

Water License: PM12-074 (Active 12/2022)
Water License: PM11-018 (Expired 07/2021)
Active Producer (2018–2020) **Operation no. 2**

Location Jackson Hill, Lovett Hill, Klondike River and Bonanza Creek.

Work History and Mining Cuts Over the course of the past three mining seasons, Northern Shoveler has focused on Lovett Hill with some work occurring on Jackson Hill in 2020. Mining cuts on Lovett Hill target the 457 m wide (1500 ft) pay streak in the White Channel gravel at the mouth of Bonanza Creek that extends through to Jackson Hill. Individual cuts are generally located in one of three locations relative to the pay streak: left limit (west), high grade center, and right limit (east). Each section represents one third of the total pay streak width or 152 m (500 ft). The high grade center of the pay streak is about 12 m (40 ft) lower in elevation than the lower grade limits. Old-timer drifts are encountered every season and recently a French-Canadian newspaper from 1917 was discovered on the right limit. In 2018, work focused on the right limit



A cross section view of the Dome Road cut at the Slinky-Treadstone mine in 2018. The section is 16 m (52 ft) in height.

where a 91 by 91 m (300 × 300 ft) cut was excavated producing 40,000 yd^3 (30 582 m^3) of material. A total of 9 employees operated a single-daily shift. In 2019, portions of the paystreak on the right limit cut were completed and stripping of the paystreak on a left limit cut commenced. In 2020, the left limit cut was completed and a right limit cut, close to the high grade center of the pay streak, was initiated. A small operation commenced on the east side of Jackson Hill (right limit of paystreak) that involved removing slough and preparing to square the face. A total of 20 personnel were employed at both projects.

Many of the cuts on Lovett Hill are in excess of 85 m (280 ft) to bedrock. Stripping ratios range from 20:1 to 30:1 depending on the slope of the topography. Stripped material consists of the Klondike outwash gravel and the upper portions of the White Channel gravel (see geology below). The economics of the project benefit from short haul distances on generally level terrain. Elevation of the terrace allows for ample space for dumping stripped material and reduces haul distances. Combined fuel and labour costs average 0.80 yd^3.



A view to the east of Lovett Hill. Northern Shoveler is commencing a stripping program on the left limit of the White Channel gravel pay streak. To reach the pay streak, 60 m (200 ft) Klondike outwash and upper White Channel gravel needs to be stripped. The elevation of the deposit allows for short and level haul distances, which reduces the fuel and maintenance costs.



The lower White Channel gravel exposed on the left limit of Lovett Hill. The exposure is approximately 25 m (82 ft) and trucks are visible near the top of the photograph for scale. The lowermost 10 m (33 ft) is more oxidized and contains a greater abundance of locally derived schist clasts. Chloritic schist bedrock is exposed in the cut.

Equipment and Water Treatment Between 2018 and 2020 an Hitachi EX1100 excavator was used for loading haul trucks with overburden or pay. Three Caterpillar 773B trucks were used for transporting stripping material or pay gravel. The wash plant is fed with a Caterpillar 966F loader. Bulldozers are used for stripping. A 1.8 m (6 ft) diameter trommel plant on Lovett Hill is used for washing and classifying gravel. The sluice runs are lined with expanded metal and nomad matting. Water is 100% recycled through a series of three settling ponds near Trail Hill.

Surficial Geology and Stratigraphy The stratigraphy at Lovett Hill consists of two units. Unit 1 is the White Channel gravel and is 48 m (157 ft) thick. Within the White Channel gravel the lower 10 m (33 ft) on bedrock is more cohesive and is slightly oxidized. The top of the low grade pay is 7.5 m (25 ft) above bedrock and the high grade pay is contained in the lowest 3.6 m (12 ft). The placer gold does not penetrate deeply into bedrock. Efficient processing of the low grade pay can cover costs to move the material. Plans are underway to experiment with processing an increased volume of lower White Channel gravel through the use of a Ross box. The box will be placed proximal to the cut where the haul trucks can dump directly into the hopper. This could relieve additional costs associated with stripping down to the high grade pay gravel. The pay gravel consists of a moderately to poorly sorted, stratified and oxidized gravel on the bedrock surface. The lower 2.4 m (8 ft) contains a considerable amount of local bedrock fragments indicating an erosional environment at the time of deposition. The gravel consists of 70% clasts and 30% silty sand matrix. Clasts content is made up of 60% pebbles, 38% cobbles and 2% boulders. Clasts up to 33 cm in length are present. In terms of clast lithology, the upper part of the pay gravel consists of 80% quartz and 20% chloritic schist. The lower pay gravel near the bedrock contact consists of 50% quartz, 40% chloritic schist and 10% other schist fragments. The bedrock consists of decomposed chloritic schist that is variably oxidized. The 2020 cut, on the west side of the pay streak, exposed a 3° dip in the bedrock surface marking the edge of the 457 m (1500 ft) wide pay streak.

The upper beds of the White Channel gravel preserve sedimentary structures characteristic of a braided river. These beds contain low-grade gold concentrations. The White Channel gravel is overlain by 22 m (72 ft) of Klondike outwash, a glaciofluvial gravel from the first glaciation to advance near to the Klondike goldfields 2.64 million years ago (Hidy *et al*., 2013). The Klondike outwash gravel is a pebble-rich gravel with a high clast content. Abundant quartzite and chert are present within the gravel. The overall weight of the Klondike outwash gravel is about 25% greater than equal volumes of White Channel gravel due to the lithological differences. These factors need to be accounted for in stripping costs.

Bedrock Geology Bedrock exposed on Lovett Hill is a chloritic schist.

Gold Characteristics Gold is fine, with a fineness of 780 to 790 in the Klondike River valley and a fineness of 815 to 820 on Lovett Hill.



This contact between the White Channel gravel and Klondike outwash marks a significant moment in Yukon history when the first regional glaciation occurred 2.64 million years ago. Ice advanced from the Ogilvie Mountains to the current site of Rock Creek and large volumes of outwash gravel were deposited into the Klondike River valley. The moment in time when the first outwash entered the drainage is recorded by this geological contact.

Hillside on Bonanza Creek, a tributary of Klondike

116B/03 2020: 64°00'05"N, 139°21'18"W

Algotsson, H., 1989–2020

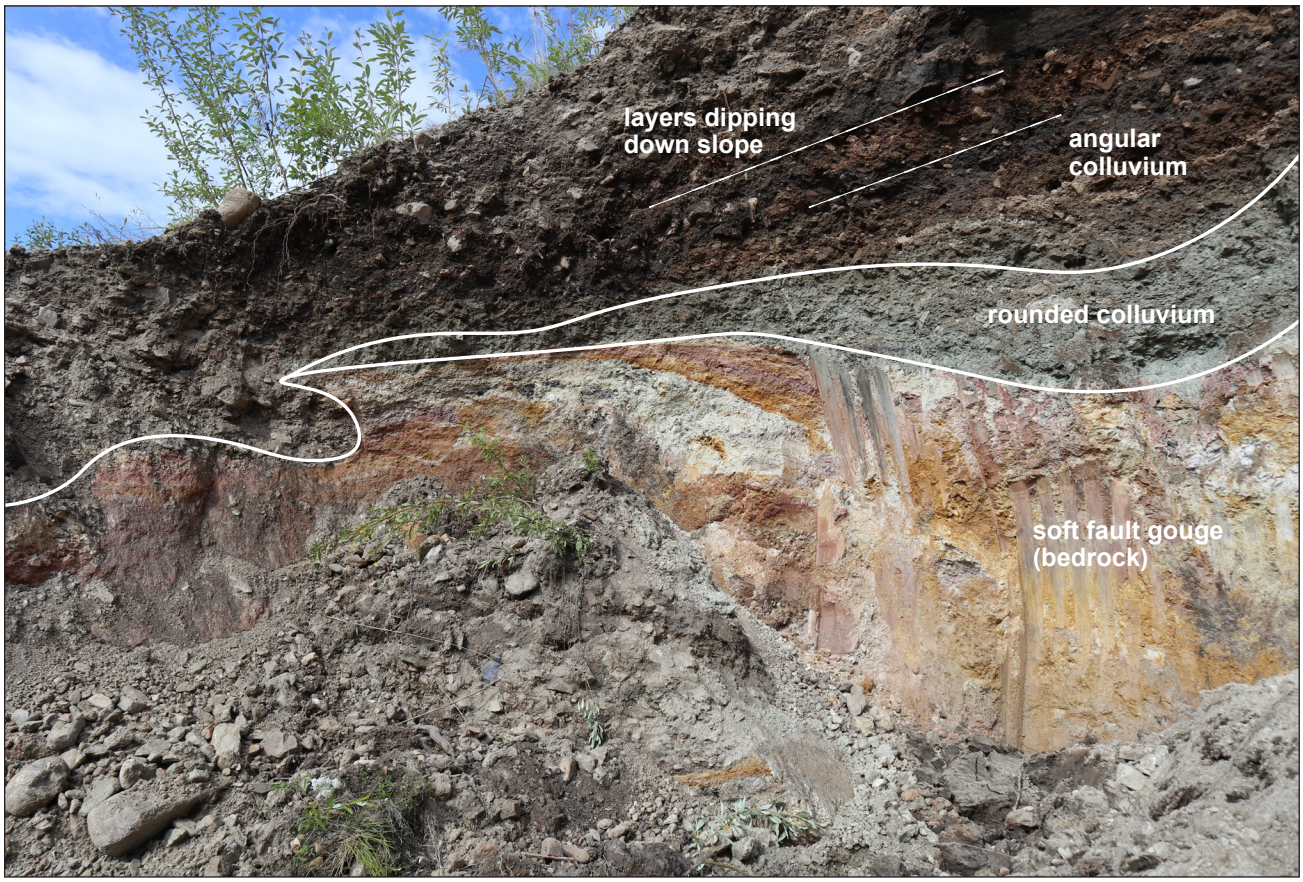
Water License: PM16-041 (Active 07/2026)
Water License: PM07-584-1 (Expired 06/2018)
Active Producer (2018–2020) **Operation no. 3**

Location Hillside between Cripple Gulch and Pure Gold Gulch.

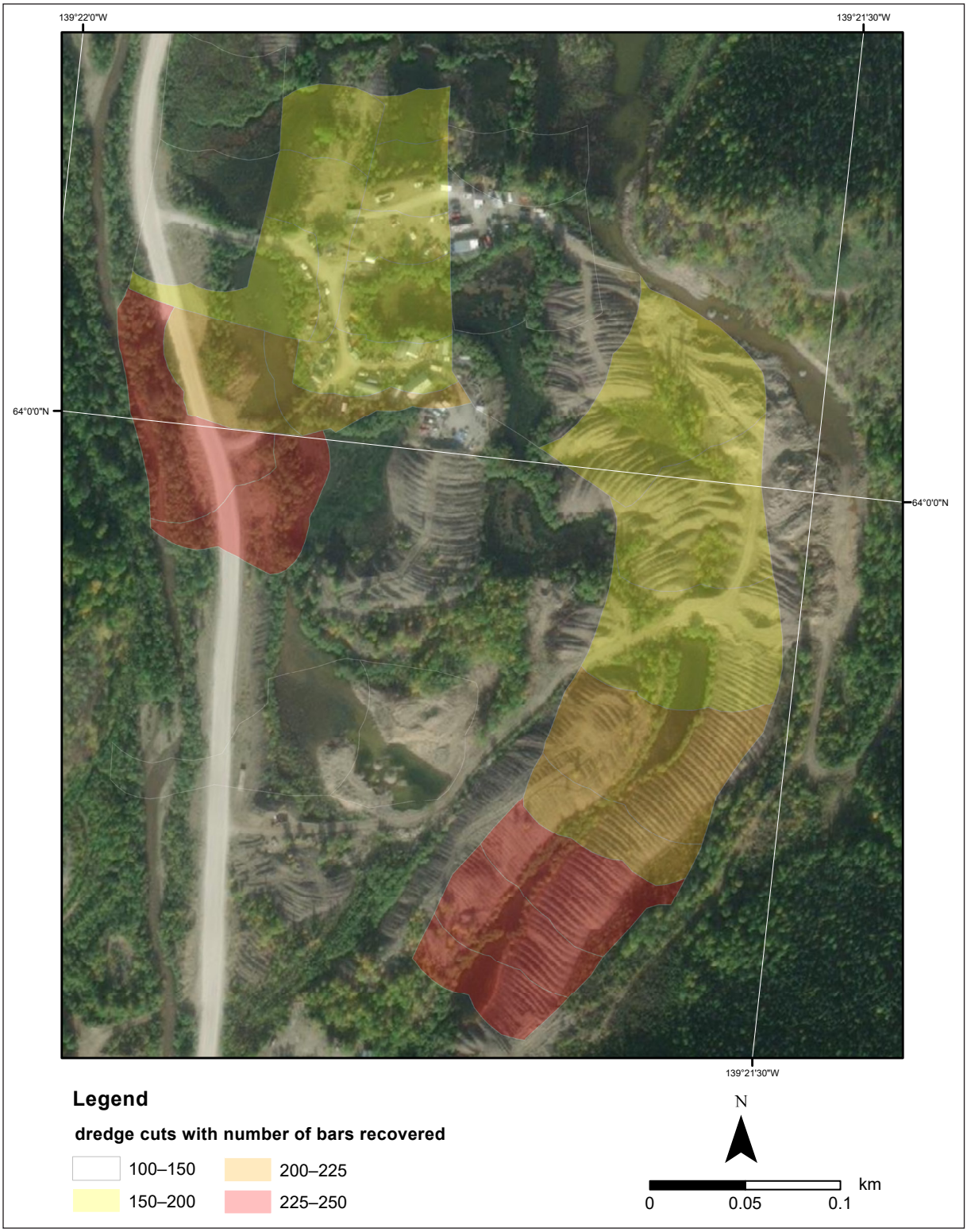
Work History and Mining Cuts Mr. Algotsson has mined in various locations of lower Bonanza Creek since 1989. In 2018 and 2019, Mr. H. and Mr. D. Algotsson mined on Fortynine Gulch and in the valley bottom on the left limit of Bonanza Creek. A mid-level bench between Cripple Gulch and Pure Gold Gulch was examined in 2020 by Renegade Gas & Oilfield Services Ltd. Additional testing was conducted on Fortynine Gulch, at its confluence with Bonanza Creek. The Algotsson's claims are situated in the valley bottom and right limit hillsides of Bonanza Creek, an area historically dredged in 1910 to 1912 and again in the late 1940s. Prospects are present on the far limits of Bonanza Creek on the margins of the dredge limits. Several prospects may also be present in the dredged areas. The dredge tailings may be economic to re-sluice, due to their vintage and dredge inefficiencies. Prospects may also remain below the dredge piles themselves, especially in rich areas where gold recovery was highest. A historic compilation of dredge cuts and drillholes, accompanied by bedrock geology and modern mining could help to determine exploration targets.

Equipment and Water Treatment Equipment on site included a John Deere 240D LC excavator, a Komatsu PC75 mini excavator and a double screen deck. A 6 by 4" pump supplied water to the plant and water was 100% recirculated. The equipment used by Renegade Gas & Oilfield Services Ltd. in 2020 included an Hitachi 250 excavator, a John Deere excavator and a trommel.

Surficial Geology and Stratigraphy An exposure on a mid-level bench between Cripple and Pure Gold Gulch is at an elevation of 472 m (1548 ft). Previous mining has excavated the width of the mid-level bench, which is the result of an incision event of reworked White Channel gravel from the high-level bench. Three units were exposed. Unit 1 is bedrock, and consists of soft fault gouge. A wedge of grey colluvium is unit 2.



Renegade Gas & Oilfield Services Ltd. testing Mr. Algotsson's ground on a mid-level bench of Bonanza Creek in 2020.



A compilation of the Bonanza Creek dredge cuts between Cripple Gulch and Pure Gold Gulch, on placer claims P 42116, P 37721, P 37724 and P 42645. These dredge cuts are from Dredge 2 and 3 who were active in this location in 1911, 1912 and 1913. The number of bars recovered from each dredge cut are published on YCGC map YCGC26283. Using ArcGIS, the dredge limit polygons were classified by colour based on the number of bars recovered. Additional dredge cuts are present in this location, and encompass the entire drainage width, but this map was produced displaying dredge cuts that reported a recovery of greater than 100 bars.

This unit is rounded colluvium, as it contains rounded quartz pebble-sized clasts and represents the reworking of a bench deposit further upslope. Unit 3 is angular colluvium, which consists of silt (loess) and angular weathered bedrock fragments. The slow continuous downslope creek of unconsolidated sediments and weathered bedrock has created layering dipping downslope.

Bedrock Geology Bedrock is mapped as silvery grey muscovite-chlorite quartz phyllite and micaceous quartzite (Mortensen, 1996).

Gold Characteristics All gold recovered is fine grained.

Bonanza, a tributary of Klondike

115O/14 2020: 63°59'21"N, 139°21'53"W

Kohlman Explorations Ltd., 1983–2007, 2011–2020

Water License: PM18-071 (Active 02/2031)
Water License: PM10-063 (Expired 02/2021)
Active Producer (2018–2020) **Operation no. 4**

Location Bonanza Creek, left limit, 1.4 km downstream from Fortynine Gulch.

Work History and Mining Cuts In 2018 and 2019, Kohlman Explorations Ltd. continued to excavate the farthest left limit margin of Bonanza Creek, progressively mining west into the hillslope. As mining continues to excavate farther in-slope, the side pay thickness remains consistent while overburden thickness increases. The valley bottom of Bonanza Creek is wider in this location than it appears and speaks to the potential of buried side pay on Bonanza Creek. The margins have been buried by loess and material that has deposited at the base of the hillslope, disguising the buried floodplain. In 2020, Mr. Haines mined under PM10-063, but no specific work history is known.

Equipment and Water Treatment The equipment in 2018 included a Komatsu WA450 wheel loader, a Borger 550 LC excavator, a Komatsu 650 excavator, a Komatsu 400 excavator, and two rock trucks. A Derocker is used to process 40 yd^3 (31 m^3)/hr. Effluent was filtered through tailings and settled in a series of four settling ponds on the left limit.

Surficial Geology and Stratigraphy At the location in 2018, the cut on the far left limit consisted of two units. Unit 1, from 0 to 2.7 m (0–9 ft) is a coarse boulder-cobble gravel that fines upwards. A boulder lag is present on the bedrock surface. The clast composition of the lower half of unit 1 includes 10% boulders, 60% cobbles and 30% pebbles. As it fines, it becomes pebble dominated with 50–60% large pebbles in the upper 0.4 m (1.5 ft). All clasts are subangular and boulders on the bedrock surface have a paleo-flow imbrication in the down valley direction. Unit 2, from 2.7 to 34.4 m (9.0–112.9 ft) is colluviated weathered bedrock with loess and organic beds.

Bedrock Geology Bedrock is blocky, competent quartzite and quartz-muscovite schist.

Exploration Potential Untapped side pay potential exists in areas of Bonanza Creek buried by thick colluvial deposits. Kohlman Explorations Ltd. has demonstrated that side pay exists in areas that were too deep (or lean) for old-timer shafting and under too much overburden for dredge and Cat-mining thawing and stripping. Although the lateral extent of the gravel has not been defined, extreme side pay potential for the drainage is an intriguing exploration target.

Gold Characteristics Gold is fine, flat and has a fineness of 800.



Kohlman Exploration Ltd.'s left limit cut face in 2018. They mined the far limit of Bonanza Creek, targeting the lowermost 3 m (9 ft) of gravel beneath 32 m (104 ft) of overburden.

Bonanza, a tributary of Klondike

115O/14 2018: 63°58'16"N, 139°21'30"W

Lewes River Mining, 2014–2020

Water License: PM18-016 (Active 12/2028)
Water License: PM08-616-2 (Expired 07/2020)
Active Producer (2018–2020) **Operation no. 5**

Location Bonanza Creek, 500 m downstream from Mosquito Gulch.

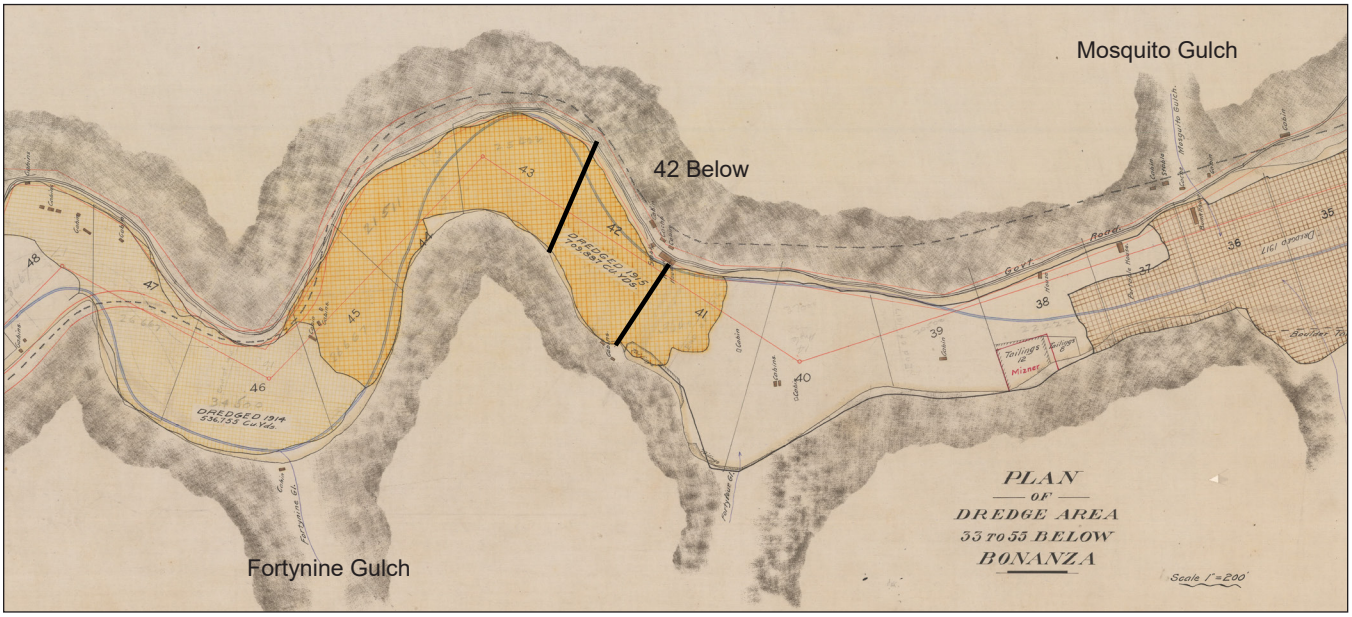
Work History and Mining Cuts In 2018 and 2019, Lewes River Mining primarily conducted hand-based exploration. A growing interest in the economics potentially remaining in dredge tailings intrigued Mr. Nibecker and became his focus in 2020. With a crew of three people, they processed up to 400 yd^3 (306 m^3)/day and sluiced for 120 days throughout the season. In 2018 and 2019, the claims were transferred, but an agreement was established between the new owner and Mr. Nibecker to allow him to continue mining.

Equipment and Water Treatment In 2020, the equipment utilized at site included a Caterpillar 318 excavator, a John Deere 160 excavator and a Caterpillar 966C wheel loader. The wash plant is a Model 50 Gold Watch Project shaker deck, measuring 0.6 by 2.4 m (2 × 8 ft). Sluice runs are 0.8 m (2.7 ft) wide by 1.5 m (5 ft) long, and are configured with blast mat, then 0.4 m (1.3 ft) of expanded metal and 0.9 m (3 ft) 1" riffles. Dredge tailings are processed in the plant at a rate of 12 to 15 yd^3 (9–11 m^3)/hr.

Surficial Geology and Stratigraphy Mr. Nibecker has been active at the location where the first dredge on Bonanza Creek was initially employed. In 1901 the Lewes River Mining and Dredging Company was established and initiated mining with the Discovery Dredge on 42 Below on Bonanza Creek (Green, 1977). Coinsidentally, Mr. Nibecker named the operation after his winter residence and was unaware of the name of the 1901 dredge operation. Discovery Dredge was



Walking dredge tailing piles downstream of Mosquito Gulch with Mr. Nibecker in 2018. Dredge tailings can be evaluated by looking for the presence or absence of bedrock fragments on the surface, indicating the dredge effectively reached the bedrock surface.



Clip of historic map number YCGC26038, showing the location of the historic 42 Below claim on Bonanza Creek. Dredge polygons from 1914 and 1915 are also visible.



Historic photo of a dredge operating on Bonanza Creek. Date and location are unknown. Library and Archives Canada, PA-122782.

originally assembled at Cassiar Bar of the Yukon River in September 1898 (Green, 1977). For two seasons the dredge was operational between Monte Cristo Gulch and Fortynine Gulch. The area was dredged again from 1914 to 1916, and again in 1954 and 1955.

Dredge tailing piles from various vintages are preserved in the Bonanza Creek valley below Mr. Nibecker's camp. After several seasons exploring the intermediate and high-level benches, focus has shifted to the dredge tailings themselves. Dredge inefficacies, variable capacities and the conditions in which they are mining, result in targets below dredge piles and in the piles themselves. In 2018 and 2019, excavations beneath the dredge tailings occurred and in 2020, work focused on extracting gold from the dredge tailings.

Bedrock Geology Bedrock is foliated and weathered schist.

Gold Characteristics Gold from the dredge tailings is fine to superfine.

Monte Cristo Hill, high-level bench on Bonanza

115O/14 2018: 63°57'14"N, 139°20'39"W

Van Bibber, N., 2018
Van Bibber, S., 2009, 2013–2017

Water License: PM18-015-1 (Active 07/2028)
Water License: PM08-597 (Active 04/2018)
Active Producer (2018) **Operation no. 6**

Location Bonanza Creek, Monte Cristo Hill above Fox Gulch.

Work History and Mining Cuts Mr. S. Van Bibber established himself as a fixture in the Klondike, and most recently mined on Monte Cristo Hill and Fox Gulch. He also mined on Eldorado Creek, Stampede Gulch, at the mouth of Sourdough Gulch, and various other locations for four decades. With his passing in 2019, the water license was reassigned to his wife, Mrs. N. Van Bibber. In 2018, 654 yd^3 (500 m^3) of material was sluiced, and activity is unknown in 2019 and 2020.

Equipment and Water Treatment Equipment marshaled on the Bonanza Creek road included

a Caterpillar 225LC excavator, a John Deere 892 excavator, a Caterpillar D8H bulldozer, a Warner and Swasey excavator, and a wash plant consisting of a double screen deck.

Surficial Geology and Stratigraphy Not reported.

Bedrock Geology Bedrock is mapped as silvery grey muscovite-chlorite quartz phyllite and micaceous quartzite (Mortensen, 1996).

Gold Characteristics Not reported.



Mr. Van Bibber excavating pay on Monte Cristo Hill in 2017.

American Hill, high-level bench on Bonanza

115O/14 2020: 63°56'48"N, 139°20'55"W

Jackson, D., 2004–2020

Water License: PM19-036 (Active 04/2030)
Active Producer (2018–2020) **Operation no. 7**

Location American Hill, left limit bench on Bonanza Creek between Magnet and American gulches.

Work History and Mining Cuts From 2018 to 2020 Mr. Jackson operated on American and Orofino Hills, a left limit bench deposit of Bonanza Creek. Mr. Jackson worked as a one-person operation and activity was focused on the upper end of Orofino Hill near American Gulch. In 2019, stripping of muck was also initiated in American Gulch.

Equipment and Water Treatment Equipment included an Hitachi EX200LC excavator, a Hanomag 66D loader, a Caterpillar 950 loader, and a Caterpillar 631B scraper. A 1.67 m (5.5 ft) diameter by 8.5 m (28 ft) long trommel with a ¾" screen was utilized to process the pay material. Sluice runs were 1.2 m (4 ft) wide by 1.5 m (5 ft) long over another sluice run measuring 1.2 m (4 ft) by 3 m (10 ft) long, lined with Nomad matting and expanded metal. Water was 100% recycled in a closed system with no discharge.

Surficial Geology and Stratigraphy The high-level bench of Orofino Hill consists of 39.5 m (130 ft) of White Channel gravel at its thickest location. The surface contour of the hill drops to the south into American Gulch and therefore is considerably thinner at its south end. Bedrock was not exposed in the cut at the time of the visit, however, considerable amounts of eroded chloritic schist bedrock fragments are present in the lower 2 m (6.6 ft). American Hill at its north end consists of 9 m (30 ft) of White Channel gravel, of which the bottom 4.5 m (15 ft) of gravel and 1 to 1.2 m (3–4 ft) of bedrock is sluiced.

Bedrock Geology Bedrock varies from blocky andesite to decomposed chloritic schist.

Gold Characteristics Not reported.



A view looking south along Orofino Hill with American Gulch and American Hill in the background. Mr. Jackson has been focused on stripping within American Gulch and taking thin slices of White Channel gravel exposures.

Adams, a tributary of Bonanza

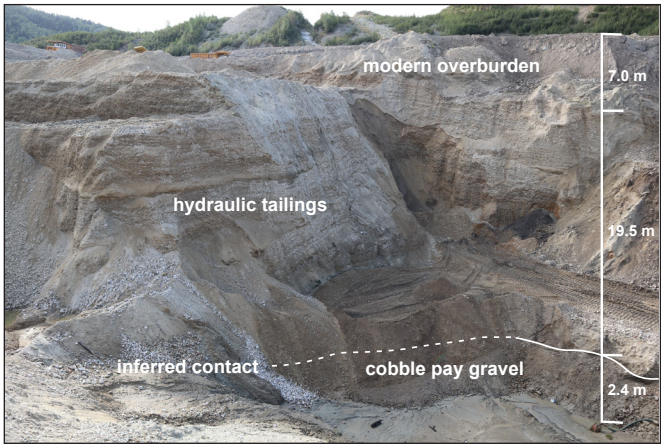
115O/14 2019: 63°55'57"N, 139°20'12"W

Berglund, R. and D. Trudeau, 2019–2020
Lucky Strike Ventures Inc., 2012–2018

Water License: PM18-006-1 (Active 08/2028)
Water License: PM08-595-3 (Expired 06/2018)
Active Producer (2018–2020) **Operation no. 8**

Location Adams Creek, lower, 520 m upstream from its confluence with Bonanza Creek.

Work History and Mining Cuts Lucky Strike Ventures joint venture with R. Berglund and D. Trudeau continued throughout the 2018 season. The right limit of lower Adams Creek has been the focus for them since 2017, with each year extending the width of the cut farther towards the base of Cheechako Hill. *In situ* side pay is irregularly preserved on the right limit, buried beneath the historic hydraulic tailings from Cheechako Hill. Hydraulic mining occurred on the hill from its



Right limit cut on Adams Creek, at the base of Cheechako Hill. Operators Berglund and Trudeau have been targeting gravel buried beneath hydraulic tailings since 2017.

discovery in 1898 until the early 1900s. As a result, a mass of up to 19.5 m (64.0 ft) of White Channel gravel-derived hydraulic tailings accumulated on the right limit of lower Adams Creek. Up to six employees mined a 42 by 70 m (138 × 230 ft) cut and sluiced for 63 days in 2018. In December 2018, the claims on Adams Creek were transferred from Lucky Strike Ventures Inc. to Berglund and Trudeau. Additional claims upstream were also acquired in 2018, previously held by E. Gardener. In 2019, a four-person crew completed a 30 by 40 m (98 × 131 ft) cut, continuing to target gravel under the hydraulic tailings on lower Adams Creek. An intermediate bench was also mined, located above E. Gardener's camp. The lower portion of Adams Creek continued to be mined in 2020.

Equipment and Water Treatment Equipment in 2018 included a Caterpillar 275 excavator, a caterpillar 345 excavator, a Halla 220 excavator, two Kawasaki 952 wheel loaders, a Caterpillar D8 and D10 bulldozer, and two 50 tonne Pay Hauler trucks. An oscillating screen deck was able to process 75 yd³ (57 m^3)/hr. A 6" Cornell pump powered by a 471 Jimmy engine, recirculated the water throughout one large pond, in a 100% recycled system. Clean-ups were conducted using a pan and gold wheel.

Surficial Geology and Stratigraphy The main placer deposit target on Adams Creek is *in situ* gravel on either limit of the drainage. Historically and in modern times, both limits of the creek have been mined, but in 2017, the operators undertook stripping a thick package of hydraulic tailings to expose an unknown extent of right limit side pay. With each season, the gravel continues to extend farther into the base of Cheechako Hill. The thickness of the gravel varies from 1.8 to 3.0 m (6–10 ft). The section exposed in 2018 consists of two units. Unit 1, from 0 to 2.4 m (0–8 ft) is a very compact, moderately sorted, pebble-cobble gravel with 60% cobbles and 40% pebbles. Unit 1 has a weakly formed boulder lag in the lower 0.5 m (1.6 ft) of the unit, with a maximum clast size of 1 m (3 ft). Boulder-sized clasts are largely quartz lithology. The gravel is matrix-supported with fine to medium sand and minor silt.



Drone imagine in 2018 at Lucky Strike Ventures Ltd. operating on Adams Gulch. The view is looking downstream towards the Bonanza Creek valley.



Historic photo of view from Gold Hill, looking downstream to Cheechako Hill. The date of the photo is unknown. Significant workings have occurred on the hill since its discovery by Oliver Millet in 1898, including a large hydraulic operation on the hills' backside (not visible in photo). Library and Archives Canada, e0113172.

A weak imbrication is present both downstream and orientated to the north (cross-valley), indicating a change in flow direction, possibly representing the maximum right limit extent of side pay. A bed of silt, organics, and fine sand that is 0.6 m (2.0 ft) thick is present at the contact between unit 1 and unit 2. Unit 2 is overburden, and consists of two different technogenic deposits. A fan composed of hydraulic tailings derived from Cheechako Hill is present from 2.4 to 21.9 m (7.9–71.8 ft), and consists of interbedded pebble-gravel, sand and silt. Modern overburden, from 21.9 to 28.9 m (71.8–94.8 ft) is a technogenic deposit formed in the 1980s where fine sand and silt accumulated from the presence of a settling pond.

Bedrock Geology Bedrock is quartz-rich, green mafic schist.

Gold Characteristics Gold ranges in size from 10 to 12% over 3⁄16", 28 to 40% over 1⁄16" and 50% fine. The fineness is 650.

Cheechako Hill, a high-level bench on bonanza

115O/14 2020: 63°55'39"N, 139°19'56"W

Beron Placers Co. Ltd., 2015–2020

Water License: PM14-025 (Active 09/2024)
Active Producer (2018–2020) **Operation no. 9**

Location Cheechako Hill, between Skookum Gulch and Adams Creek.

Work History and Mining Cuts Beron Placers continued to mine the south facing side of Cheechako Hill from 2018 to 2020. In 2019 they stripped 10,000 yd^3 (7646 m^3) of overburden and sluiced 20,000 yd^3 (15 291 m^3).

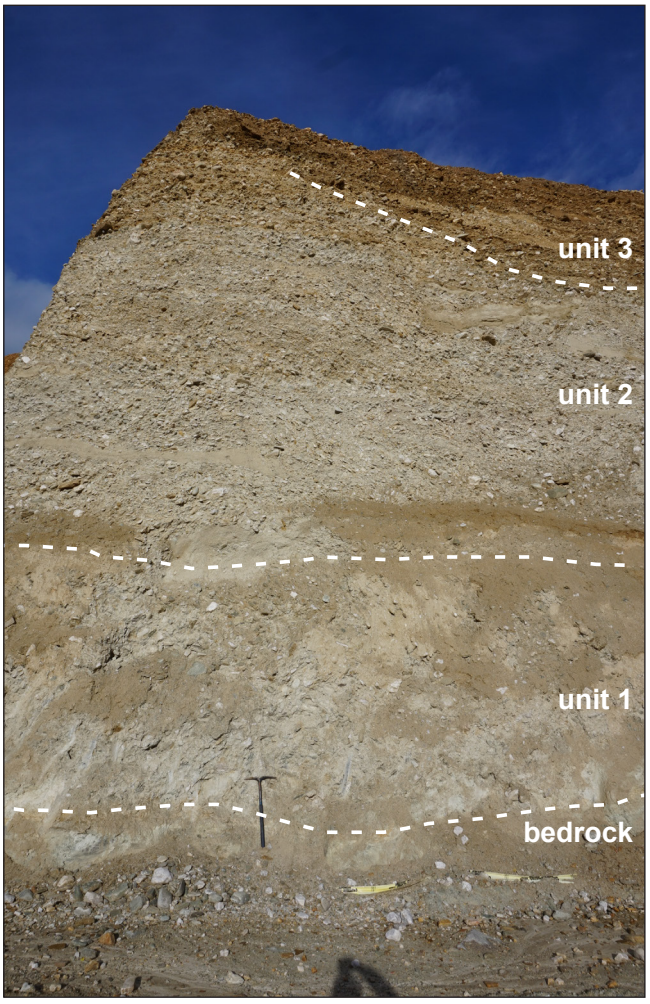
Equipment and Water Treatment In 2020, the equipment included a Caterpillar 345 and 349 excavator for digging pay and feeding the plant, a Caterpillar 966C and 980H wheel loader for removing coarse tailings, a John Deere 690 excavator, two Caterpillar bulldozers (D8K and D6C), and two Komatsu HM400 truck used for stripping. The processing plant consists

of two screen decks placed in sequence off the bench rim above Little Skookum Gulch. The first screen deck has ¾" by 2" slot screens and two sluice boxes with alternating expanded metal and slick plates that narrow into a run of angle iron riffles. The sluice tailings are then directed through metal troughs to the hopper of the second wash plant. The second plant classifies to 3⁄16" and the sluice box contains expanded metal. Both plants have a 15 m (50 ft) conveyor for handling oversized material. Water use for the plant is 2500 US gallons/min and is 100% recycled through a system of three settling/holding ponds located in Little Skookum Gulch. The plant processes 180 yd³/hour.

Surficial Geology and Stratigraphy Recent mining on Cheechako Hill has largely removed the shallower ground underlying the natural slopes of the bench. Full thickness White Channel gravel units are now exposed at the mine site. In 2018, the total thickness of surficial units on the hill measured 38 m (126 ft). This can be roughly divided into three units. Unit 1 is the lowermost 2 m (6.5 ft) and is a poorly sorted, matrix-supported, cobble-rich diamicton containing a significant amount of weathered bedrock. This unit was clearly erosional at the time of emplacement. High grade placer gold concentrations are contained within the bottom 1 m (3 ft) of gravel and 0.6 m (2 ft) into bedrock. In the classic stratigraphy of the Klondike, this unit is part of the lower White Channel gravel. However, its erosional characteristics and high gold content suggest it could be either a subunit or separate unit altogether. Unit 2, from 2 to 12 m (6.5–41 ft) is a moderately sorted, stratified, unoxidized, quartz-rich gravel. This unit is considered lower White Channel gravel. Stratification within unit 2 improves toward the upper contact. Unit 3, from 12 to 32 m (41–105 ft) is a sandy, moderately to well-sorted, stratified and oxidized gravel. This unit is considered to be upper White Channel gravel. The lower contact with unit 2 is erosional and in some areas a small boulder lag has accumulated on the lower White Channel gravel contact. Unit 4, from 32 to 38 m (105–126 ft) is a mixture of loess and gravel. The loess (massive silt) component appears to increase in thickness toward the back of the hill, suggesting it is likely resedimented off the slope. An unidentified tephra is present within the loess layer. Overlying the loess within this unit is additional, very oxidized, gravel. The degree of oxidation is indicative of paleosol weathering (relict soil weathering). This sequence of loess and gravel at the top of the section indicates that paleo-Bonanza Creek was becoming increasingly confined within the valley bottom as loess sedimentation increased just prior to the first continental glaciation 2.6 million years ago.

Bedrock Geology Bedrock is Klondike schist.

Gold Characteristics Gold is described as 20% >4 mesh, 30% between 4 and 8 mesh, 15% between 8 and 12 mesh and 35% <12 mesh.



The lower units of the White Channel gravel exposed on Cheechako Hill at Beron Placers operation in 2018. The lower 1 m of unit 1 contains the majority of the gold and is mixed with a large quantity of weathered bedrock. This suggests that during the Pliocene, approximately 4 million years ago, Bonanza Creek was very erosional at the time of deposition.

Gold Hill, a high-level bench on Bonanza and Eldorado

115O/14 2020: 63°55'12"N, 139°19'26"W

Daunt, I. and K. Daunt, 1973–2020

Water License: PM20-043 (Active 12/2030)
Water License: PM15-029-1 (Expired 11/2020)
Active Producer (2018–2020) **Operation no. 10**

Location Gold Hill, north facing (downstream) side.

Work History and Mining Cuts Mr. I. Daunt first set foot in the Klondike in 1975. Now in his mid-90s he is no longer able to spend the summer on his claims. From 2018 to 2020, Mr. K. Daunt has mined as a two-person operation on the north facing side of Gold Hill. Sluicing occurred from 2018 to 2020: 75 days in 2018, 45 days in 2019 and 60 days in 2020. Historically, Gold Hill was a host for up to 1000 people. Evidence of their workings are present, with shafts and drifts commonly exposed along the length of the cut.

Equipment and Water Treatment In 2018 the equipment present on site included two Hitachi 230 excavators, a Caterpillar 966 wheel loader and a Caterpillar D250E wiggle wagon. A trommel, 1.5 by 2.4 m (5 × 8 ft) with a 1" screen, processed 70 to 80 yd^3 (54–61 m^3)/hr. The initial sluice run is 0.9 by 1.5 m (3 × 5 ft), then splits into two 0.9 m (3 ft) runs configured with 1.2 m (4 ft) angle iron, 1.2 m (4 ft) expanded metal and 1.2 m (4 ft) angle iron. Self-leveling hydraulic jacks on the plant allow for easy adjustments and effortless moves. Water is supplied to the plant with an 8 × 6" pump and water is 100% recycled.

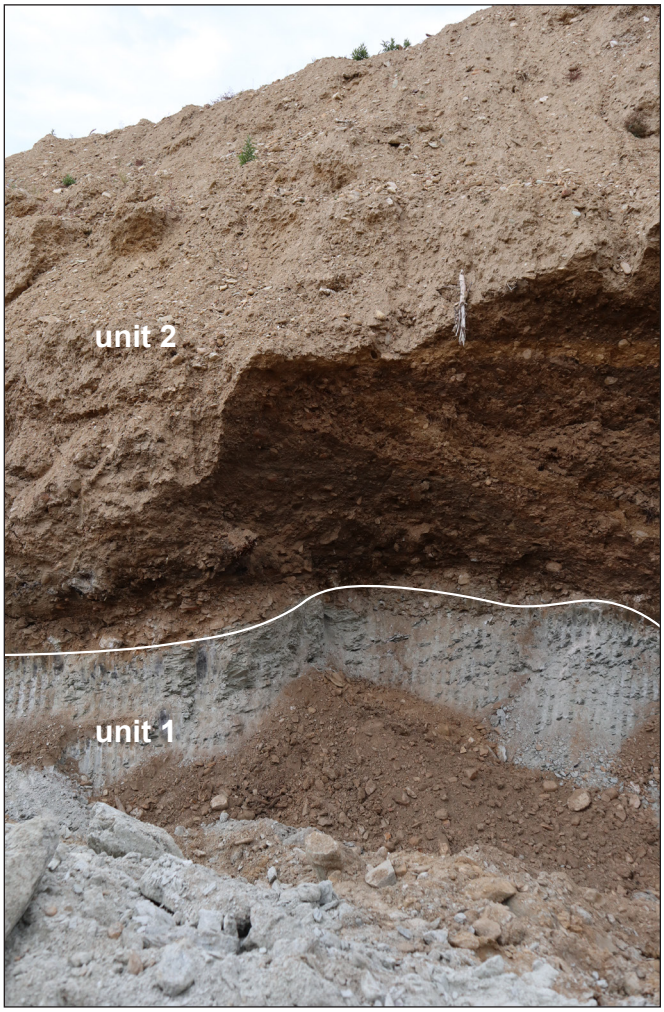


Drone image from 2020 of Gold Hill. The view is looking upstream Eldorado Creek valley, and Mr. Daunt's camp and wash plant are visible in the bottom right of the image.

Surficial Geology and Stratigraphy Gold Hill is a high-level bench comprising White Channel gravel. The cut face mined by Daunt from 2018 to 2020 consists of 33 m (108 ft) of gravel, of which is simplified into two units. Unit 1, from 0 to 2.4 m (0–8 ft) is white in colour, and is very compact, poorly sorted and dominated by cobble sized clasts. The matrix is primarily decomposed sericite schist bedrock, creating a compact gravel that is white in colour. Unit 2, from 2.4 to 30.5 m (8–100 ft) is brown in colour, and is stratified pebble-gravel, sand and silt. This unit represents a braided stream deposit that aggraded under periglacial (cold climate) conditions. All of unit 1 and between 1.2 to 1.8 m (4–6 ft) of bedrock is sluiced.

Bedrock Geology Bedrock is muscovite-schist with varying degrees of weathering.

Gold Characteristics Up to 30% of the gold is 35-mesh. The fineness is 780.



K. Daunt's cut on Gold Hill in 2018. The entire thickness of unit 2 is not captured in the image.

Gold Hill, a high-level bench on Bonanza and Eldorado

115O/14 2019: 63°54'57"N, 139°19'12"W

Dulac Mining, 2017–2019
535969 Yukon Inc., 2007–2016

Water License: PM15-090-2 (Active 07/2026)
Active Producer (2018–2019) **Operation no. 11**

Location Gold Hill, south facing (upstream) side.

Work History and Mining Cuts Dulac Mining began operating on Gold Hill in 2017. Gold Hill was first staked and mined by A. Lancaster in 1897 (Acland, 1926). For a decade, the hill was extensively mined and at one time hosted up to 1000 people. Today, evidence of their workings are still present and miraculously intact, including the cribbed, moss-insulated, shaft exposed in the 2019 cut. In 2018, the six-person operation completed another slice off the face of Gold Hill, in their 160 m (540 ft) long cut. Operations scaled down in the 2019 season and a second operation was established on upper Eldorado Creek. No activity in 2020 occurred on Gold Hill.

Equipment and Water Treatment In 2018, equipment included a Komatsu 400 excavator, a John Deere 800 excavator, a Caterpillar 345C excavator, a JCB 330 excavator, a Caterpillar 980 wheel loader, a Caterpillar D7 bulldozer and two Caterpillar 769B haul trucks. The wash plant consisted of a 1.5 by 3.6 m (5 × 12 ft) shaker screen deck with ⅝" openings. Sluice runs contained a boil box, hydraulic riffles, expanded metal and an 2.4 m (8 ft) wide oscillator at the end. The plant is capable of processing up to 120 yd³ (92 m³)/hr. A reservoir and out-of-stream settling pond enabled 100% recycling of water.

Surficial Geology and Stratigraphy The White Channel gravel thickness measures 33 m (108 ft). The upper part of the stratigraphy consists of iron stained, stratified gravel with abundant sand lenses, whereas the lower part of the section consists of poorly sorted, minty white-coloured gravel. The lower 1.8 m (6 ft) of the gravel and 0.6 to 1.8 m (2–6 ft) of bedrock is processed as pay. The lower gravel contains subangular clasts, has a high density, perhaps due to high decomposed bedrock content (sericite schist), and is cobble dominant. The clast component makes up 60% of the deposit whereas the silty sand matrix is 40%. The pay is challenging to sluice due to the high clay content. In order to facilitate gold recovery the pay is mixed with the sandier gravel and processed slowly. The pay is also described as a green gumbo and can be up to 6 m (20 ft) thick. Quartz boulders are present near the bedrock surface. Old-timer drifts and shafts are common on Gold Hill. High grade zones can return 10 oz/40 yd³ and old-timers reportedly mined ground with 1 oz/yd³.



Old-timers shaft preserved in Dulac Mining's cut in 2019 on Gold Hill.

Bedrock Geology Bedrock is mapped as silvery grey muscovite-chlorite quartz phyllite, micaceous quartzite (Mortensen, 1996).

Gold Characteristics The gold has a fineness of 770. Gold shape is described as angular with rough edges with variable amounts of quartz attached to some pieces. The quartz content on gold grains can sometimes exceed the gold content. Approximately 10% small nuggets with abundant quartz, 20% coarse gold and 70% fine gold was recovered. A few nuggets reaching a ⅓ of an ounce were also recovered.

Upper Bonanza, a tributary of Klondike

115O/14 2019: 63°55'15"N, 139°18'14"W

Hanulik Enterprises Ltd., 2011–2020

Water License: PM14-051 (Expired 06/2020)
Active Producer (2018–2020) **Operation no. 12**

Location Upper Bonanza Creek, 45 m (148 ft) downstream from the mouth of Spring Gulch.

Work History and Mining Cuts In 2018 and 2019, Hanulik Enterprises Ltd. primarily conducted reclamation on his claims. Mr. Hanulik's claims were transferred to Mr. Arkinstall in May 2020.

Equipment and Water Treatment Equipment located on site included a Caterpillar 235 excavator, Caterpillar D9 bulldozer, a Western-Star dump truck, and a 1.2 by 6 m (4 × 20 ft) trommel with a ¾" screen. Water was 100% recycled.



Drone image from 2019 of Hanulik Enterprises Ltd.'s camp and claims on Upper Bonanza Creek.

Surficial Geology and Stratigraphy Stratigraphy consists of 2 m (6.6 ft) of gravel and 10 m (33 ft) of overburden.

Bedrock Geology Bedrock is mapped as quartzite, quartz-mica schist, gneiss and amphibolite (Mortensen, 1996).

Gold Characteristics Not reported.

Upper Bonanza, a tributary of Klondike

115O/14 2020: 63°55'24"N, 139°19'11"W

Arkinstall, C., 2009–2014, 2017–2020

Water License: PM18-025 (Active 08/2028)
Active Producer (2018–2020) **Operation no. 13**

Location Upper Bonanza Creek, at the mouth of Spring Gulch.

Work History and Mining Cuts In 2017, Mr. Arkinstall tested an intermediate bench, opposite from the mouth of Skookum Gulch on the right limit of Bonanza Creek. The presence of hand-stacked rocks indicating old-timers had been working on the hillside, led Mr. Arkinstall up-slope from his usual place of mining in the valley bottom. With encouraging results, the 2019 season consisted of a four-person crew that mined two cuts on the intermediate bench: the first cut measured 55 by 20 m (164 × 66 ft) and the second measured 15 by 33 m (49 × 108 ft). In 2020, mining on the bench continued with a crew of up to three employees. As excavating of the bench occurred, significant historic workings of drifts, timbered shafts and rooms were uncovered. Old-timers efficiently excavated the bench deposit, mining the majority of the oxidized pay gravel. *In situ* gravel is sporadically preserved in pillars between shafts and drifts, and the interface between the gravel and bedrock is specifically targeted by Mr. Arkinstall.

Equipment and Water Treatment Equipment in 2019 included an Hitachi EX300 excavator, an Hitachi 200 excavator Volvo excavator, and a Fiat-Allis 31 bulldozer. A trommel 1.8 by 14 m (6 × 47 ft) with a ½" screen was used to process material. The plant has four 3.3 m (11 ft) long oscillating sluice runs, and a final 6 m (20 ft) long sluice run. Water was supplied to the plant using a 6" pump, allowing the plant to process up to 125 loose yd³ (96 m^3)/hr. Water was 100% recycled in a series of three out-of-stream ponds. Clean-ups were conducted on a table in town.

Surficial Geology and Stratigraphy Intermediate benches between the upper White Channel gravel and the modern valley floor are poorly preserved and are usually patchy in nature. They can be difficult to identify due to colluvium overburden cover. The best way to prospect for these deposits is to look for the presence of historic working, as Mr. Arkinstall did. If located, the extent of an intermediate bench can be hard to determine, therefore drilling or geophysics is recommended. Bulk sampling can also be utilized to determine the economics of a bench, prior to stripping overburden.

Unit 1, up to 1.2 m (4 ft) thick are pillars and irregular pockets of oxidized pebble-cobble gravel. A reworked White Channel equivalent, these *in situ* remnants escaped being mined by old-timers due to their importance as architectural supports. Overlying the gravel (if present) is unit 2, up to 10 m (33 ft) thick. It consists of overbank material (silt) with a 2% clast enrichment. All clasts are angular. Unit 3 is a 0.2 m (0.6 ft) thick organic layer.

Bedrock Geology Bedrock is blocky quartzite. Bedrock slabs the size of a pickup have been encountered.

Gold Characteristics Gold is mostly well-rounded but the odd dendritic piece is recovered. The fineness is 789 to 792.



Gold recovered from the intermediate Bonanza Creek bench by Mr. Arkinstall in 2019.



Intermediate bench, opposite from the mouth of Skookum Gulch on the right limit of Bonanza Creek where Mr. Arkinstall mined in 2019 and 2020. The view is looking up Upper Bonanza Creek.

Gauvin, a tributary of Upper Bonanza

115O/14 2020: 63°56'39"N, 139°14'54"W
115O/14 2018: 63°56'48"N, 139°14'35"W

R & W Mining, 1989–2020

Water License: PM13-016 (Active 06/2023)
Active Producer (2018–2020) **Operation no. 14**

Location Gauvin Gulch, 3.2 km upstream from its confluence with Upper Bonanza Creek.

Work History and Mining Cuts R & W Mining has been active in Gauvin Gulch since 1988. The property was initially purchased based on the abundance of old-timer workings in the upper part of the drainage. Mr. Roberts (Red) has been in partnership on the property with Ralph Nordling for the past nine years. From 2018 to 2020, R & W Mining continued to excavate the left limit of Gauvin Gulch, targeting a bench preserved beneath a thick section of overburden. In 2020, the cut measured 17 by 110 m (56 × 361 ft). Approximately 220 yd³ (168 m³) are processed per day.

Equipment and Water Treatment Equipment utilized by the operation included an Hitachi EX 300 excavator, a Case 220 B excavator, a Caterpillar D8 bulldozer, a Terex 7251-A wheel loader and a Terex T30 rock truck. A double screen deck was used to process material, with a maximum capacity of 70 loose yd³ (53 m³)/hr. The upper screen was 1¼" while the lower screen classified material through a ¾" screen. Three sluice runs were each 2.4 m (8 ft) wide by 3.6 m (12 ft) long and contained expanded metal with a nugget trap at the top of the run. Water was acquired from a reservoir pond that was fed from a spring on the right limit hillside. Five settling ponds were utilized to create a 100% recycled system.

Surficial Geology and Stratigraphy A bench deposit on the left limit of Gauvin Gulch has been the target for this operation for many years. The section exposed in 2020 is located 250 m (820 ft) downstream from the wash plant. The total depth to bedrock is 12 m (39 ft) and the lowermost 5 m (16 ft) is targeted for pay. A boulder lag containing clasts up to 125 cm in length is present at the top of the pay, which provides a distinctive marker horizon. Below the boulder lag the pay gravel becomes finer and then becomes coarser again on the bedrock contact. The pay gravel is consolidated and



A view looking downstream of the left limit bench deposit on Gauvin Gulch. The coarse boulder lag zone is visible in the middle of the section and marks the upper contact of the pay zone.

contains abundant clasts consisting of chloritic schist with quartz veining. In 2018, a section was exposed closer to the wash plant. The section was 11.3 m (37 ft) in thickness and consisted of three units. Unit 1 at the base from 0 to 9 m (0–30 ft) is a poorly sorted gravel with a silty sand matrix. Larger boulders can be found in the deposit and there is a lag accumulation 4.6 m (15 ft) above the bedrock contact. This similar lag accumulation was noted farther downstream on the bench. The majority of the boulders consist of a light green (chloritic?) schist with variable amounts of vein quartz. A considerable amount of vein quartz is present within unit 1. Unit 2, from 9 to 9.3 m (30–31 ft) consists of an organic-rich silt, representing a former soil. A 1 to 2 cm thick tephra bed (unidentified) is present within the soil. Unit 3, from 9.3 to 11.3 m (31–37 ft) consists of crudely stratified, oxidized, weathered bedrock colluvium. Beds within the colluvium are parallel to the hillslope, which is consistent with gravitational deposits.

Placer gold within the Gauvin Gulch bench is present throughout the unit 1 gravels, however, is generally only half as concentrated above 5 m level. The boulder lag within the lower gravel marks a former period of partial incision and concentration that boosted grades at the 5 m (15 ft) level, providing a thicker concentration zone down to the bedrock surface.

Bedrock Geology Bedrock is undulating weathered brown schist.

Gold Characteristics Gold is both coarse and fine, with a rough surface texture, and has a fineness of 666. The largest piece recovered was the size of a fingernail.



A typical schist boulder with abundant oxidized, vuggy, vein quartz found in the Gauvin Gulch pay gravel.

13 Pup, a tributary of Victoria

115O/14 2020: 63°53'31"N, 139°12'47"W

McMahon, T., 2012–2020

Water License: PM14-061 (Active 05/2025)
Active Producer (2018–2020) **Operation no. 15**

Location 13 Pup, a left limit tributary of Victoria Gulch.

Work History and Mining Cuts As a one-person operation, Mr. McMahon was active from 2012 to 2017 on Homestake Gulch, a right limit tributary of Upper Bonanza Creek. In 2018 he relocated across the valley to Victoria Gulch, a left limit tributary of Upper Bonanza Creek. His activities focused on 13 Pup, a very steep and narrow tributary of upper Victoria Gulch. This drainage has had extensive historic workings as well as more modern mining activity in the 1990s. As a one-person operation, mining commenced at the bottom of 19 Pup, where its confluence meets Victoria Gulch. In 2020, Mr. McMahon relocated his activities 0.3 km up 13 Pup.

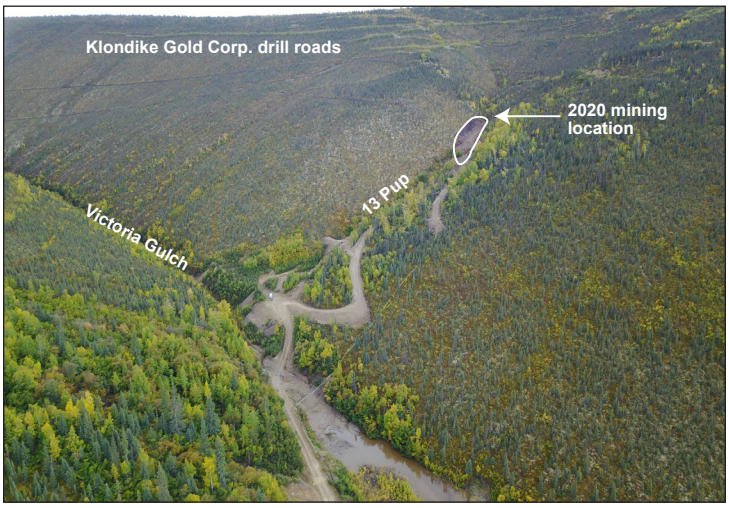
The hillside is riddled with drill roads and trenches that represent hard rock exploration in the head waters (and farther south) of Victoria Gulch. The Lone Star gold occurrence was first discovered in 1897. Between 1912 and 1914, 7650 tonnes of ore was mined from underground from the Boulder Lode deposit (Bremner and LeBarge, 1991). Klondike Gold Corp. now holds the property and has conducted extensive exploration drilling and trenching.

Equipment and Water Treatment In 2020, the equipment present on site included a John Deere 330LC excavator, a Daewood Solar 220LC-III excavator and a Caterpillar D8H bulldozer. A 1.2 m (4 ft) diameter trommel with a ⅝" and ½" screen, processed up to 60 yd^3 (46 m^3)/hr. Water was 100% recycled. Clean-ups were conducted using a long-tom and concentrates were tabled in town.

Surficial Geology and Stratigraphy 13 Pup is a steep drainage and only 18 m (60 ft) wide where mining occurred in 2020. The section is an eluvial placer consisting of weathered bedrock and soil. All material below the moss mat is sluiced. Due to the proximity of this operation to a historically proven hard rock gold source, the targeted placer deposit appears to be a locally enriched, reworked colluvium, directly sourced from up-slope.

Bedrock Geology Bedrock is micaceous quartzite.

Gold Characteristics Gold is all very local, and has a fineness of 820.



Drone image in 2020 of Mr. McMahon's operation on 13 Pup.



Mr. McMahon's operation in 2020, on 13 Pup. The photo provides a sense of how steep the tributary is.



Historic photo (C-009123) of hydraulic mining on Victoria Gulch in 1914. The location of the photo is believed to be immediately downstream from 13 Pup. Library and Archives Canada, C-009123.

Carmack Fork, a tributary of Bonanza

115O/14 2019: 63°54'46"N, 139°07'02"W

H3 Mining Company, 2016–2019

Water License: PM17-021 (Active 09/2027)
Active Producer (2018–2019) **Operation no. 16**

Location Carmack Fork, 1.3 km upstream from Flannery Pup.

Work History and Mining Cuts H3 Mining Company operated on their claims in 2018 and 2019, while activity in 2020 is unknown. In 2018, a cut on the left limit of Carmack Fork, 1.3 km upstream from Flannery Pup, was mined. Operating with a four person crew, they targeted placers in the valley bottom, in the modern Carmacks Fork gravel. In 2018 and 2019, a bulk sample and trenching occurred in the upper reaches of Carmack Fork. Exploration was the focus for them throughout the season, and using a remote sensing method called LiDAR (light detection and ranging), they were able to identify benches on both limits in the drainage.

Equipment and Water Treatment In 2018 the equipment included a Caterpillar 345C excavator, a Komatsu 400 excavator, a Caterpillar D8L bulldozer, a John Deere 250 articulated dump truck, a Komatsu HM400 truck, a Caterpillar 980 wheel loader, and a Caterpillar 305.5 mini hydraulic excavator. Material was processed in a 2 by 9 m (7 × 30 ft) trommel with a ⅝" screen. An automatic feeder supplies material to the trommel, which can process 70 yd³ (53 m^3)/hr. Sluice runs consisted of 2.4 m (8 ft) of angle iron, which then split into 4 runs each 2.4 m (8 ft) long by 0.6 m (2 ft) wide containing expanded metal. Water was supplied to the plant by an 8" pump and effluent was settled in a series of two ponds. A table and sprigs jig were used for clean-ups.

Surficial Geology and Stratigraphy Low-level bench deposits can be mapped several hundred metres up the Carmack Fork drainage. On both limits, the benches are overlain by organics and colluviated loess. Angular clasts of bedrock are incorporated into the overburden that can be up to 3 m (10 ft) thick. Thickness of this overburden will increase as bench mining extends farther into the slope. In 2018, a road cut on the right limit exposed a 0.8 m (2.6 ft) thick section of low-level bench gravel that is 5.4 m (18 ft) above the modern valley bottom. It is a loose gravel comprising up to 5% boulders, 40% cobbles and 60% pebbles. Clasts are predominatley well-rounded, with angular bedrock fragments scattered throughout. Large rounded quartz boulders are present. Weak oxidation and the matrix-rich nature of the gravel can blend the bench gravel into the overbuden, making it difficult to distinguish. The thickness of the bench deposit can be determined by identifying rounded clasts and large quartz boulders up to 0.9 m (2.9 ft) in diameter.

Using LiDAR, H3 Mining Company was able to identify buried benches in the headwaters of Carmack Fork. Surface expression of these benches are weak because the deposits are buried under a thick apron of colluvial sediments. Exploration conducted on foot can also help to identify and prove prospective areas in a drainage, by locating historic workings such as this shaft encountered on an unnamed tributary of Carmack Fork.

A historic shaft located at 63°54’42.3"N, 139°07’8.4"W was identified on a left limit tributary to Carmack Fork.

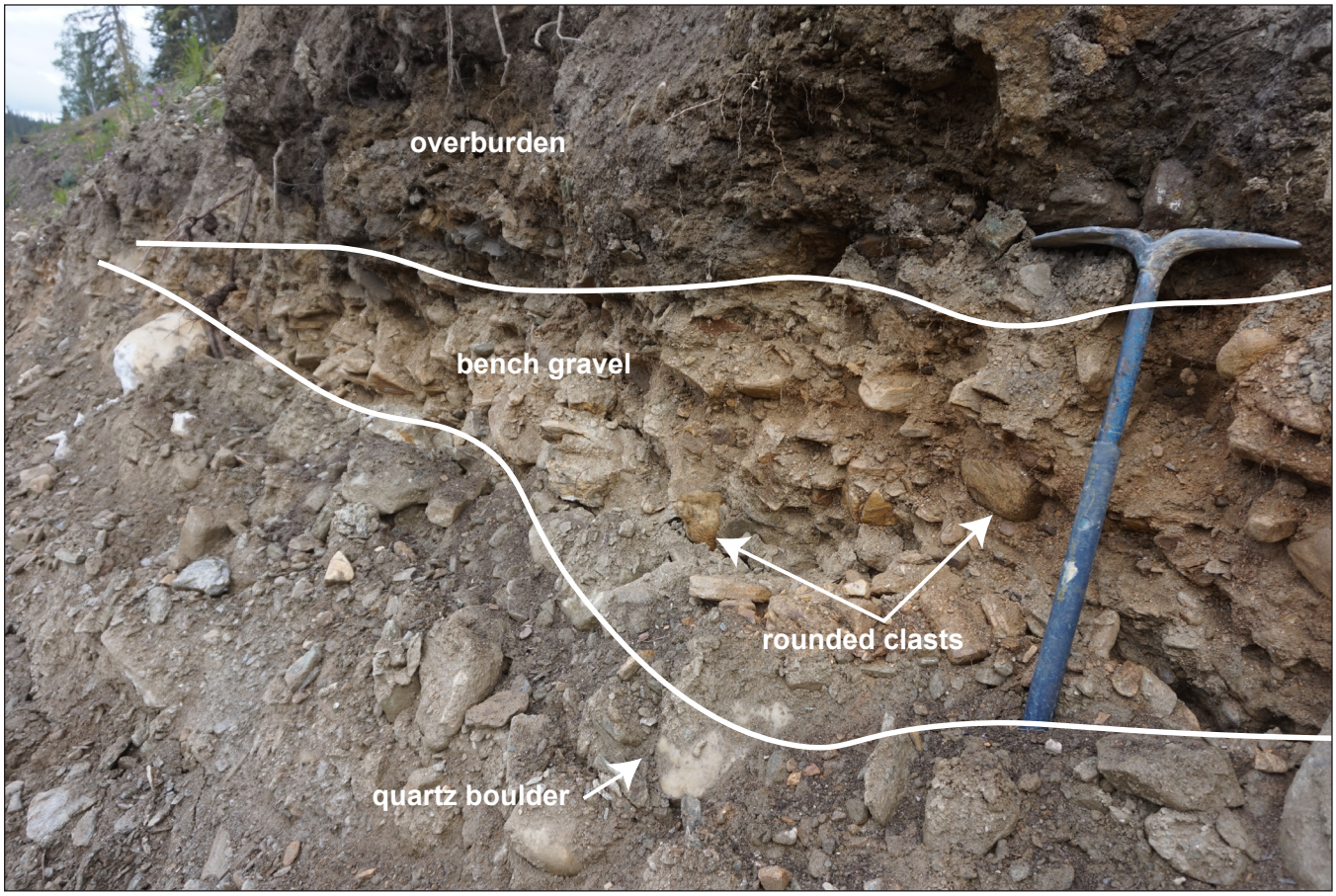
Bedrock Geology Bedrock is undulating micaceous schist that varies in weathering, and is interbedded with blocky quartzite.

Gold Characteristics Gold is flat and dull.

Exploration Potential Colluviation of hillslope muck and weathered bedrock has buried the floodplain and/or low-level benches on the left limit of Carmack Fork. The buried section extends from the mouth of the creek for approximately 2 km upstream. The width of buried fluvial deposits is estimated to range between 30 and 50 m. Drilling is recommended to evaluate the overburden thickness and extent/grade of pay gravel. The northerly facing aspect of the slope indicates the ground will be permanently frozen.



LiDAR helped identify this historic shaft encountered on an unnamed tributary of Carmack Fork.



Right limit bench gravel exposed in 2018 at H3 Mining Company's cut.

Bonanza, a tributary of Klondike

115O/14 2019: 63°53'34"N, 139°07'42"W

Anglerock LLC, 2013–2019

Water License: PM21-031 (application)
Water License: PM11-051-1 (Active 03/2022)
Active Producer (2018–2019) **Operation no. 17**

Location Bonanza Creek, upper, across from the mouth of Ready Bullion Gulch.

Work History and Mining Cuts Mining occurred at the Danielson's operation in 2018 and 2019, operating as a two-person crew. For several seasons they have excavated a low-level right limit bench, directly across from the mouth of Ready Bullion Gulch. In 2019, a left limit area of Ready Bullion Gulch was stripped. No activity occurred in 2020.

Equipment and Water Treatment Equipment on site included a Komatsu PC300 LC excavator, a Caterpillar D5 LG bulldozer and a 1 m (3.5 ft) diameter by 3 m (10 ft) long trommel. The trommel screened material to ¾", has a 6 m (20 ft) tailings conveyor, and is able to process 46 yd³ (35 m³)/hr. A 6" pump supplied water to the plant and effluent was settled in a series of three out-of-stream settling ponds. Clean-ups were conducted daily using a small long tom and pan.

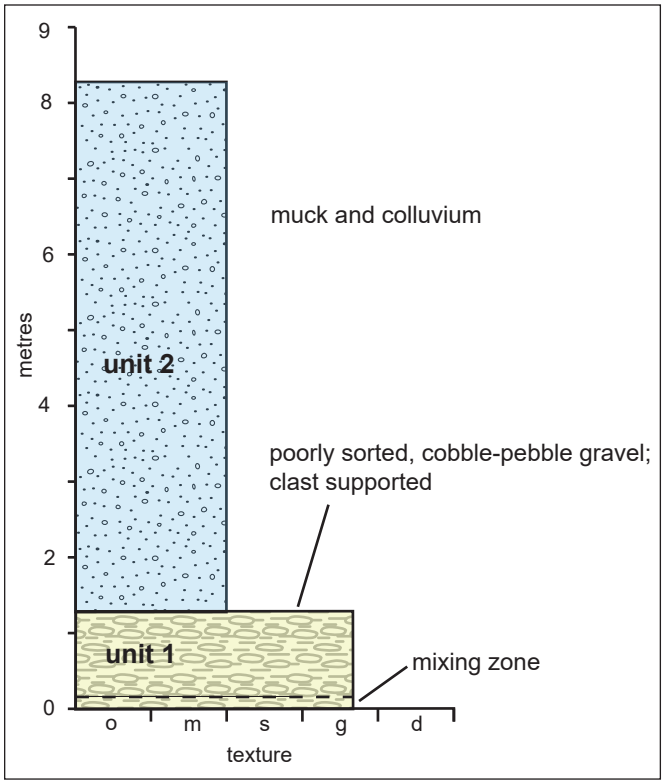


The Danielson's processing material on the right limit of Upper Bonanza Creek.

Surficial Geology and Stratigraphy A substantial low-level right limit bench has been the target for several seasons. It consist of two units, with unit 1 from 0 to 1.3 m (0–4.3 ft) and unit 2 from 1.3 to 8.3 m (4.3–27.3 ft). Unit 1 is a poorly sorted, cobble-pebble gravel with 60% of the clasts cobble-sized, and with quartz boulders up to 0.6 m (2 ft) present throughout the unit. A mixing zone is present at the bedrock contact, where angular fragments are mixed into the lower fluvial gravel indicating a high energy deposition, and/or could be nearing the lateral right limit extent of the bench. Primarily clast-supported, the gravel also has lenses of fine to medium-grained sand present throughout. Unit 2 is muck and colluvium. All gravel, up to 1.8 m (6 ft) thick, and up to 0.9 m (3 ft) of bedrock was sluiced.

Bedrock Geology Bedrock is weathered green schist that varies in oxidation from moderately to pervasively throughout.

Gold Characteristics Gold is flaky, fairly coarse and also recovered is an abundance of black sand. Ready Bullion Gulch has a fineness of 700.



Stratigraphy of upper Bonanza Creek.

Upper Bonanza, a tributary of Bonanza

115O/14 2020: 63°52'49"N, 139°05'11"W

McKort Mining Co., 2014–2020

Water License: PM14-054 (Active 02/2027)
Active Producer (2018–2020) **Operation no. 18**

Location Bonanza Creek, headwaters, 90 m upstream on the right fork from its confluence with the left fork.

Work History and Mining Cuts McKort Mining Co. has held their 5 claims on Upper Bonanza Creek since 2014. An initial cut measuring 20 by 30 m (65 × 98 ft) was prepared in 2017, and each season has been extended farther upstream. Mining as a one to two person operation, they sluiced up to 1000 yd^3 (765 m^3) per season.

Equipment and Water Treatment In 2020, the equipment on site included an Hitachi EX200 LC excavator, a Michigan wheel loader, a Caterpillar D8 bulldozer and a dump truck. A 2 by 6 m (7 × 20 ft) trommel was used to process material, up to 25 yd^3 (19 m^3)/hr. The trommel screened to ½" and has one main sluice run, 0.9 by 3.0 m (3 × 10 ft) configured with expanded metal. A new trommel is being fabricated and will be utilized in 2021.

Surficial Geology and Stratigraphy Upper Bonanza Creek was dredged as far as Victoria Gulch in 1917. The headwaters of the drainage where McKort Mining Co. are operating remains largely unexplored in modern times. Minimal historic work has been documented in YCGC records, although there are cabins and historic workings present.



Bonanza Creek gravel exposed in McKort Mining Co.'s cut in 2020.



McKort Mining Co.'s operation in 2019 in the headwaters of Bonanza Creek.

The headwaters of Bonanza Creek are steep and narrow, with creek gravel up to 1.5 m (5 ft) thick. Evidence of rounded clasts in the hillside on the left limit could be evidence of low-level benches present (or were once present) in the drainage. They may be thin deposits and reworked into the modern valley, or they could also be buried beneath a thick apron of colluvial sediments. In 2020, the Bonanza Creek gravel exposed in the section was 0.9 m (3 ft) thick and was a moderately oxidized, matrix-supported cobble-boulder gravel. Clasts are subround, with angular schist clasts reworked throughout.

Bedrock Geology Bedrock is decomposed muscovite-calcite schist.

Gold Characteristics Gold has a dull appearance and is angular.

French Hill and Gulch, a high-level bench on Eldorado

115O/14 2020: 63°53'43"N, 139°19'20"W
115O/14 2020: 63°53'53"N, 139°18'38"W

Jackson, D., 2020
Archibald, J., 1978–2019

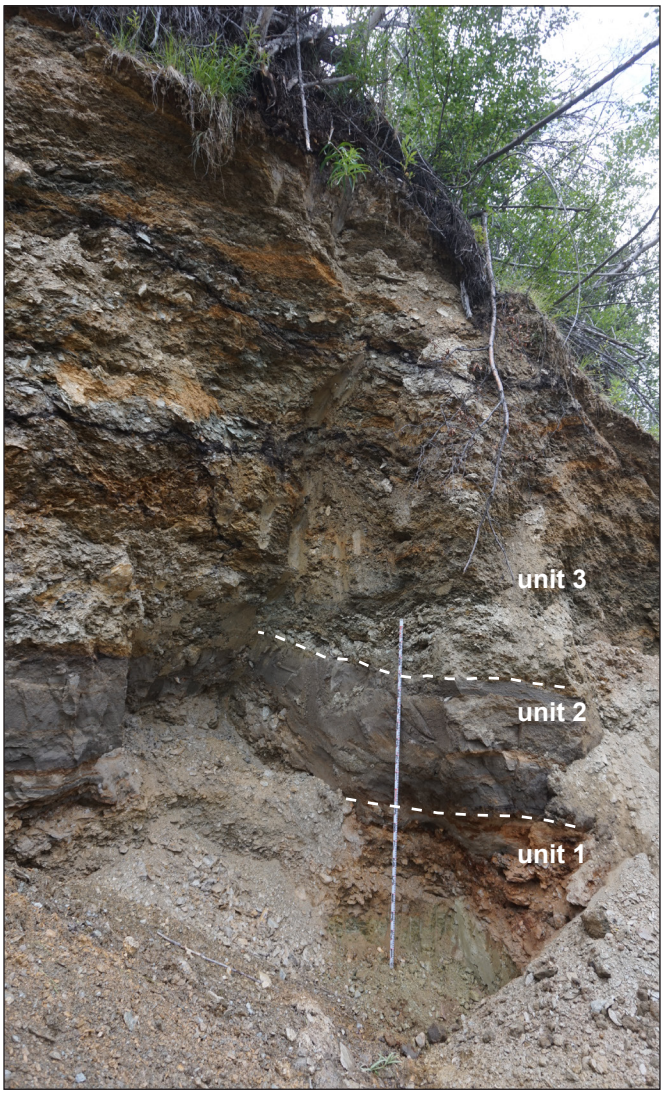
Water License: PM10-078 (Active 03/2021)
Active Producer (2018–2020) **Operation no. 19**

Location French Hill, French Gulch and Eldorado Creek, downstream of the mouth of French Gulch.

Work History and Mining Cuts Mr. Archibald staked his first claim in the Klondike in 1962. Since that time he has mined for 58 years. In 2020, he sold his ground to Mr. D. Jackson. Mr. D. Jackson focused on monitoring a left limit cut in French Gulch and exposed left limit side pay in Eldorado Creek below the French Gulch road.

Equipment and Water Treatment Equipment present on site in 2018 and 2019 included two Kobelco excavators, 2 Caterpillar 980B loaders and two Caterpillar D6 bulldozers. Pay is hauled off French Hill down to Eldorado Creek using a Kenworth truck. A Derocker plant is used for processing pay and water is recycled.

Surficial Geology and Stratigraphy A test cut on the left limit of Eldorado Creek, below the French Gulch road, exposed a low-level terrace of Eldorado Creek buried under thick weathered-bedrock colluvium. Bedrock exposed in the cut consists of chloritic schist. Unit 1, from 0 to 0.4 m (0–1.3 ft) is a heavily oxidized, manganese-stained gravel with an abundance of sand and pebbles. Large clast fragments are rare. Unit 2, from 0.4–1.4 m (1.3–4.6 ft) consists of grey coloured, overbank silt and sand. This unit is a good marker indicating that coarser floodplain sediments are likely at depth. Unit 3, from 1.4 to 5.4 m (4.6–17.7 ft) is a banded, weathered bedrock colluvium (slide rock) with organic stringers. This unit is an accumulation of weathered bedrock that has been transported into the valley bottom by gravitational processes.



Test cut exposure of a low-level Eldorado Creek terrace gravel below the French gulch road. The oxidized gravel (unit 1) is overlain by fine-grained floodplain sediments (unit 2) and weathered bedrock colluvium (unit 3).

Bedrock Geology Bedrock is chlorite-sericite schist.

Gold Characteristics The gold fineness is 720 and has a crystalline shape. Most of the gold is 14 to 16 mesh in size and rare 7 to 10 g nuggets are present.

French Gulch, a tributary of Eldorado

115O/14 2020: 63°53'17"N, 139°23'45"W

Heslip, A., 2020

Water License: PM17-004 (Active 05/2027)
Active Producer (2018–2020) **Operation no. 20**

Location French Gulch, approximately 4.6 km upstream from its confluence with Eldorado Creek.

Work History and Mining Cuts Mr. Heslip operates on 5 claims in upper French Gulch. In 2020 he was testing the valley bottom near camp and an old shaft that measuring 1.8 by 1 m (6 × 3 ft).

Equipment and Water Treatment Equipment present on site in 2020 included a Komatsu PC200 excavator and a test plant consisting of a large dump box feeding a single run sluice. Water is acquired from French Gulch.



A view looking downstream on French Gulch of Andrew Heslip's test cut. A large old-timer shaft is present in this part of French Gulch, which adds to the grounds potential.

Surficial Geology and Stratigraphy Poor exposure and water issues precluded a detailed geological description of the ground. Mr. Heslip estimates the depth to bedrock to be in the range of 4.5 to 6.0 m (15–20 ft).

Bedrock Geology Bedrock is mapped as silvery grey muscovite-chlorite quartz phyllite, micaceous quartzite (Mortensen, 1996).

Gold Characteristics Not reported.

Eldorado, a tributary of Bonanza

115O/14 2020: 63°53'35"N, 139°18'19"W
115O/14 2018: 63°53'41"N, 139°18'17"W
115O/14 2018: 63°53'44"N, 139°18'06"W

Cissell, M., 2018–2020
McKinney, O., 2016–2017

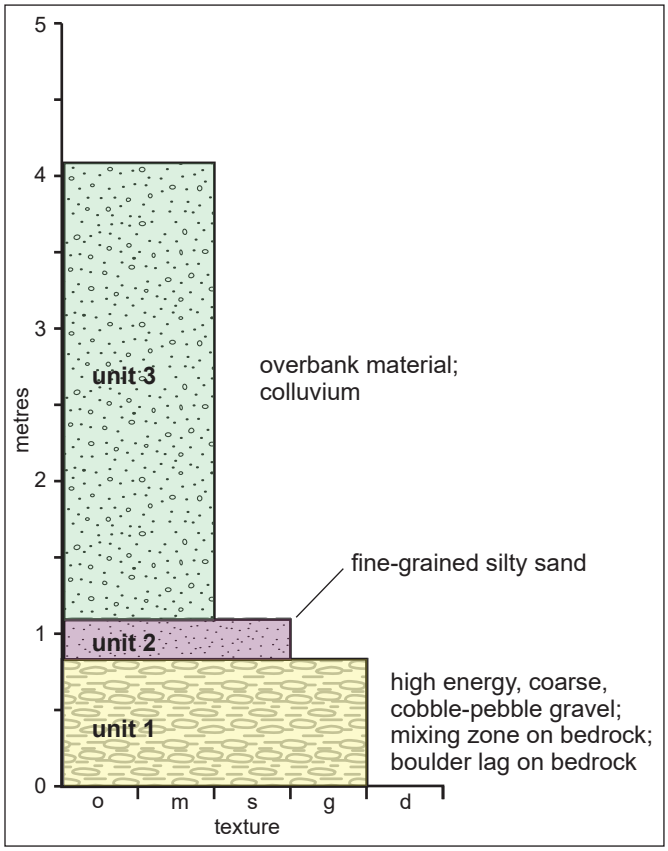
Water License: PM15-059-2 (Active 11/2025)
Active Producer (2018–2020) **Operation no. 21**

Location Eldorado Creek, at the mouth of Glacier Gulch, a right limit tributary of Eldorado Creek.

Work History and Mining Cuts The first year of mining for new claim owners M. and K. Cissell was in 2018. They partnered with Mr. Loewen and mined at the mouth of Glacier Gulch and on the right limit of Eldorado Creek. The Glacier Creek cut, located 180 m (590 ft) upstream from its confluence with Eldorado Creek measured 65 m (213 ft) long by 8 m (26 ft) wide. An ice-filled shaft, 1.2 by 1.2 m (4 × 4 ft) was present in the 2018 cut, with additional old-timers workings within the vicinity of Glacier Gulch. In 2019, a total of 252 hours was spent sluicing from the left limit of Eldorado Creek. Mining continued throughout 2020, with no specific work history known.

Equipment and Water Treatment In 2018, the equipment present on site included a Caterpillar 235C excavator for preparing the cut and digging pay, a Caterpillar 235C excavator for feeding the plant, a Caterpillar D8 bulldozer for stripping and removing tailings, and two Caterpillar rock trucks were used to haul pay from Glacier Creek cut to the wash plant located on Eldorado Creek. The wash plant consisted of a 7.6 m (25 ft) long trommel with a 1" screen and a 1.5 m (5 ft) wide by 6 m (20 ft) long sluice run with Hungarian riffles and nomad matting. Pumps measuring 2", 3" and 6" supplied water to the plant to process 60 to 80 yd³ (46–61 m³)/hr.

Surficial Geology and Stratigraphy Glacier Gulch is a narrow, steep, right limit tributary on Eldorado Creek, with its headwaters situated in Klondike Gold Corp.'s Lone Star property. In 2018, three units comprised the 4.1 m (13.5 ft) section at the mouth of Glacier Gulch. Unit 1, from 0 to 0.7 m (0–2.3 ft) is a coarse, cobble-pebble gravel that was deposited as a high energy Glacier Gulch flood deposit. Undulations in the bedrock surface affect the thickness of the pay gravel. A boulder lag, consisting of quartz boulders up to 0.3 m (0.9 ft), is present on the undulating bedrock surface. The matrix-rich unit of sand and silt also contains wood debris and angular clasts. A weakly formed mixing zone between the undulating bedrock surface and the high-energy gravel is present. Unit 2, from 0.7 to 1.1 m (2.3–3.6 ft) is an undulating bed of fine grained silty sand. Unit 3, from 1.1 to 4.1 m (3.6–13.5 ft) is overburden that consists of overbank material and colluvium. Angular schist (bedrock) fragments are incorporated throughout, with less clast enrichment at the top of the unit. Material 1.8 to 2.4 m (6–8 ft) above bedrock and up to 1.8 m (6 ft) of bedrock is sluiced.



Right limit cut on Glacier Gulch in 2018.



Image from 2018 of Cissell and Loewen mining a cut on lower Glacier Gulch. Material was transported from the cut, down to the trommel stationed in Eldorado Creek valley. The view is looking upstream.

Bedrock Geology Bedrock is decomposed muscovite schist. Undulations up to 0.5 m (1.6 ft) are present in the bedrock surface.

Gold Characteristics Gold from Glacier Gulch is primarily coarse and has a fineness of 764. Eldorado Creek gold fineness ranges from 730 to 750.

Eldorado, a tributary of Bonanza

115O/14 2020: 63°52'46"N, 139°16'40"W
115O/14 2019: 63°51'45"N, 139°14'33"W

Dulac Mining, 2019–2020

Water License: PM11-071-1 (Active 07/2022)
Active Producer (2019–2020) **Operation no. 22**

Location Eldorado Creek, upper, 400 m upstream from Oro Grande Gulch.

Work History and Mining Cuts Dulac Mining optioned Klondike Gold Corporation's upper Eldorado Creek claims in 2019 and 2020. L. Lougheed managed a 3-person operation that commenced mining near the confluence with Chief Gulch and progressively worked upstream targeting side pay and bedrock fractures. The wash plant was established near camp at the mouth of Chief Gulch where there is more room for settling facilities. Pay gravel was hauled to the plant using a truck. Side pay remains under a layer of colluviated bedrock and increased pay volumes and better grades are found near small right limit (north side) draws.

Previous dozer mining in the area was completed by G. Hakonson between 1978 and 1988. They worked upper Eldorado Creek and Chief Gulch during this period. Mr. Hakonson recalls his father mentioning a nugget called "The Baseball" that had been mined at the mouth of Chief Gulch. The nugget was on display

in the bars during the 1940s and 50s. This was enough encouragement for them to give Chief Gulch a try, which consisted of 18 to 24 m (60–80 ft) of muck and gravel. When they reached the bottom they encountered a continuously cribbed drift that had removed much of the pay from the narrow bedrock channel. Following in the footsteps of the old-timers remains one of the challenges mining in this historic district.

Equipment and Water Treatment Equipment included a John Deere 800C excavator with a 6 yd^3 bucket for digging and loading pay, a Caterpillar 769B truck for hauling pay and an Hitachi 200LC excavator for feeding the plant. An additional John Deere 892ELC excavator was on site. The plant consists of a screen deck with ¾" openings and processed 60 yd^3 (46 m^3)/hr. The sluice run consists of a boil box that catches 50% of the gold, hydraulic riffles and expanded metal. The plant is fitted with a tailings stacker for oversized material. A long tom containing a slick plate, expanded metal and spaghetti matting is used for clean-ups.

Surficial Geology and Stratigraphy Placer mining targeted missed pay in upper Eldorado Creek that is contained in bedrock fractures and virgin deposits adjacent to the valley sides. The better side pay is contained in a red gravel at the mouth of small draws on the right limit (north side). Pay thickness is



A typical nugget from upper Eldorado Creek. Gold attached to vein quartz is common and the fineness averages 700.



A view looking toward upper Eldorado Creek from the mouth of Chief Gulch in August, 2020. Dulac's processing equipment is visible in the foreground and an excavator is visible in the distance where mining occurred.

generally about 60 cm (2 ft) and is buried under 2 m (6 ft) of weathered bedrock colluvium (slide rock) or finer gravel when located near the mouth of a draw. An isolated remnant of a right limit terrace was identified immediately upstream of the 2020 workings. The terrace is located on the inside bend in the valley, which makes it prospective for hosting some or all of the former pay streak.

Bedrock Geology Bedrock is a chloritic schist.

Gold Characteristics Gold is hackly and has quartz attached. The majority of the gold is fine-grained although nuggets are present. The fineness is 700.

Bear, a tributary of Klondike

116B/03 2020: 64°00'32"N, 139°14'37"W

16406 Yukon Inc., 2011, 2013–2020

Water License: PM11-029 (Active 09/2021)
Active Producer (2018–2020) **Operation no. 23**

Location Bear Creek, 2.2 km upstream from its confluence with Klondike River.

Work History and Mining Cuts From 2018 to 2020, mining occurred on both limits of Bear Creek by 16406 Yukon Inc. A left limit cut, upstream from the unnamed left limit tributary was mined in 2019. In 2020, mining as a one person operation, Mr. Morgan stripped on the right limit targeting virgin gravel against the hillside. The cut was 305 m (1000 ft) long.

Equipment and Water Treatment Equipment documented on site included an Hitachi EX300LC excavator for mining pay and loading the 25 ton International rock truck, a Caterpillar 330C excavator for feeding the plant and a Caterpillar D8K bulldozer for moving tailings. The wash plant was a 1.2 by 6 m (4 × 20 ft) trommel that screens to 1½" and feeds a 1.2 m (4 ft) wide sluice run. A Ross box was also present on site.



A view looking upstream on Bear Creek of T. Morgan's hydraulic monitoring cut.

Surficial Geology and Stratigraphy Mining on the left limit near camp has exposed a thick sequence of loess and organics overlying up to 3.5 m (11.5 ft) of coarse, boulder–cobble gravel. The gravel is variably oxidized, with the more oxidized gravel hosting more of the placer gold. The muck overburden sequence is 13 m (42 ft) thick. Upstream from the lower cut, mining occurred on the right limit against the dredge limit. Virgin gravel is overlain by a coarse colluvium (slide rock) that was avoided by the dredge.

Bedrock Geology Bedrock is slabby to decayed schist bedrock.

Gold Characteristics The gold size is described as dominantly 20-mesh with some grains around 3/16". Heavy minerals reported in the placer deposit include barite, pyrite, hematite and goethite.

Lindow, a tributary of Bear

115O/14 2019: 63°57'38"N, 139°12'06"W

Brong, R. and E. Dotzlar, 2019
Alf Roberts Mining, 2002–2018

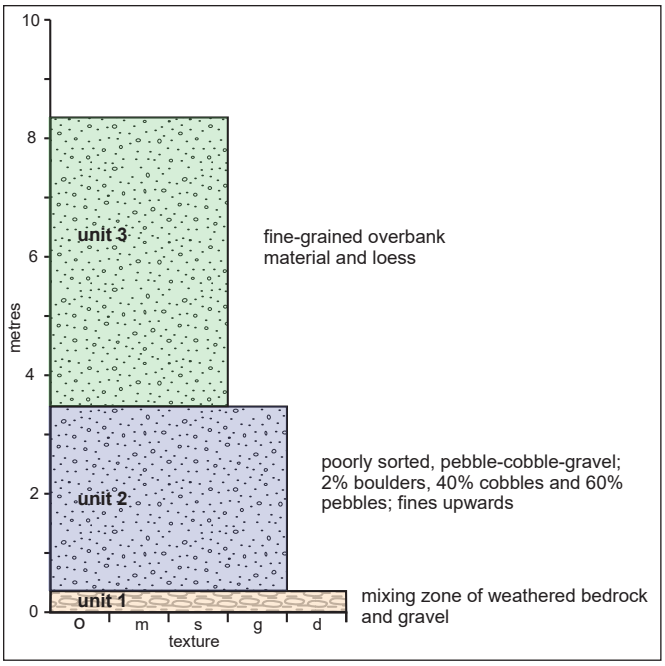
Water License: PM12-001-2 (Active 04/2023)
Active Producer (2018–2019) **Operation no. 24**

Location Lindow Creek, 560 m downstream from its headwaters.

Work History and Mining Cuts Mr. A. and Mrs. M. Roberts spent close to three decades operating in the Lindow Creek drainage. Their last active year was in 2018, sluicing a 30 m (98 ft) wide by 55 m (180 ft) long cut. They spent each summer excavating pay gravel and also recovering significant amounts of evidence that old-timers were heavily active in the drainage. The Roberts have mined in the Klondike since 1978, exuding passion and curiosity about all aspects of placer mining, from landscape evolution to the flora and fauna on the creek. In spring 2019 they sold the operation to Mr. R. Brong and Ms. E. Dotzlar. The new operators spent 100 hours sluicing in their first season. No activity occurred in 2020.

Equipment and Water Treatment In 2018, the equipment on site included a Caterpillar 312BL excavator, a Caterpillar D8H bulldozer, a Bay City Dragline, an International 125C track loader and a Fleetstar 2000 International dump truck. A double screen deck measuring 1.2 by 3 m (5×10 ft) processed up to 30 yd³ (23 m^3)/hr. It has two sluice runs, each 0.6 by 3.0 m (2 × 10 ft) consisting of 0.6 m (2 ft) of riffles and 2.4 m (8 ft) of expanded metal that is lined with unbacked noodle matt. Effluent was settled in a series of three ponds. A tub and a 6" wide long tom was used for clean-ups.

Surficial Geology and Stratigraphy Lindow Creek is a narrow valley with a maximum width of 50 m (164 ft). The right limit cut in 2018 exposed variably decomposed metamorphic bedrock overlain by three units. Unit 1 is a 0.4 m (3.0 ft) thick zone of gravel and weathered bedrock, with a gold enrichment present on the contact with the competent bedrock surface.



Stratigraphy on the right limit of upper Lindow Creek in 2018.



Drone image of Mr. A. and Mrs. M. Roberts operation on upper Lindow Creek. The view is looking downstream with the 2018 mining location in the middle of the photo.

The thickness of unit 1 varies as it is controlled by undulations in the bedrock surface. Unit 2, from 0.4 to 3.4 m (3-11 ft) is a poorly sorted gravel with clast composition consisting of up to 2% boulders, 40% cobbles and 60% pebbles. The gravel fines upwards to include up to 80% pebbles. The majority of clasts are subround with the exception of boulders that appear to be local bedrock fragments. Minor open work sections, up to 10 cm (4") are present throughout the unit. Unit 3, from 3.4 to 8.4 m (11–27 ft) is fine-grained overbank material and loess, with a clast enrichment between 25 and 35%. Sluiced material consists of 1.8 to 2.4 m (6–8 ft) of the lowermost gravel and as much bedrock is present until competent bedrock is reached.

Bedrock Geology Bedrock is decomposed schist with interbedded phyllite and micaceous quartz rich schist.

Gold Characteristics Gold is mostly fine, with larger pieces fairy rough and locally sourced. The fineness is 650.

Klondike, a tributary of Yukon

116B/03 2020: 64°02'05"N, 139°14'12"W
116B/03 2019: 64°02'07"N, 139°14'02"W
116B/03 2018: 64°02'08"N, 139°14'04"W

Tatra Ventures Ltd., 2017–2020

Water License: PM14-055 (Active 05/2025)
Active Producer (2018–2020) **Operation no. 25**

Location Klondike River, left limit, approximately 1 km downstream from Foster Gulch.

Work History and Mining Cuts Tatra Ventures Ltd. second season mining their Klondike River claims was in 2018. Heavy precipitation increased ground water flow, forcing them to operate seven pumps 24/7, in order to keep the cuts dewatered. The 2018 cuts measured 137 by 100 m (450 × 328 ft), 75 by 160 m (250 × 525 ft) and a sliver on the west side. In 2019, a crew of up to six people mined three separate areas around an initial center cut. Total yardage stripped was 180,000 yd^3 (137 600 m^3) and total sluiced material was 90,000 yd^3 (68 800 m^3). In 2020, dewatering issues continued in the spring causing a temporary pause on mining until the freshet had passed. A total of 9 personnel were employed in 2020.



Drone image from 2018 of Tatra Ventures mining on the left limit of Klondike River. The view is looking upstream towards the mouth of Hunker Creek valley.

Equipment and Water Treatment In 2018, the equipment included two John Deere 450DLC excavators for digging pay, two Caterpillar D400D haul trucks for transporting pay and waste material, and a John Deere 230CLC excavator to feed the plant, and a Volvo L220E loader for managing tailings. A 2 by 11.5 m (6 × 38 ft) trommel with ½" punch plate was used to process up to 150 yd^3 (115 m^3)/hr. In 2020, seven pumps were employed to keep up with ground water entering the pit.

Surficial Geology and Stratigraphy In 2020, the depth to bedrock measured 8 m (26 ft). Unit 1, from 0 to 2 m (0–6.5 ft) is a coarse, poorly sorted, high-energy gravel containing rounded boulders. The gravel is clast-supported with 80% of the material consisting of clasts and 20% consisting of sandy matrix. Unit 2, from 2 to 8 m (6.5–26 ft) is a stratified, moderately sorted, cobble-pebble gravel. They sluice between 1.2 to 2.1 m (4–7 ft) of gravel and up to 1.5 m (5 ft) of bedrock.

A project was completed in 2018, which analyzed historic YCGC drilling data from Hunker Creek and Klondike River (van Loon, 2019). Using drill data, the gold distribution was reconstructed and displayed a heavy pay channel present on Hunker Creek, but disappears as it enters into the Klondike River valley. The Hunker Creek pay channel is hypothesized to be perched on the flank of Australian Hill, preserved beneath overburden on the left limit of lower Hunker Creek at its confluence with Klondike River valley, or was reworked by glacial outwash in the Klondike River valley. It is possible this pay streak extended into the Klondike valley where it

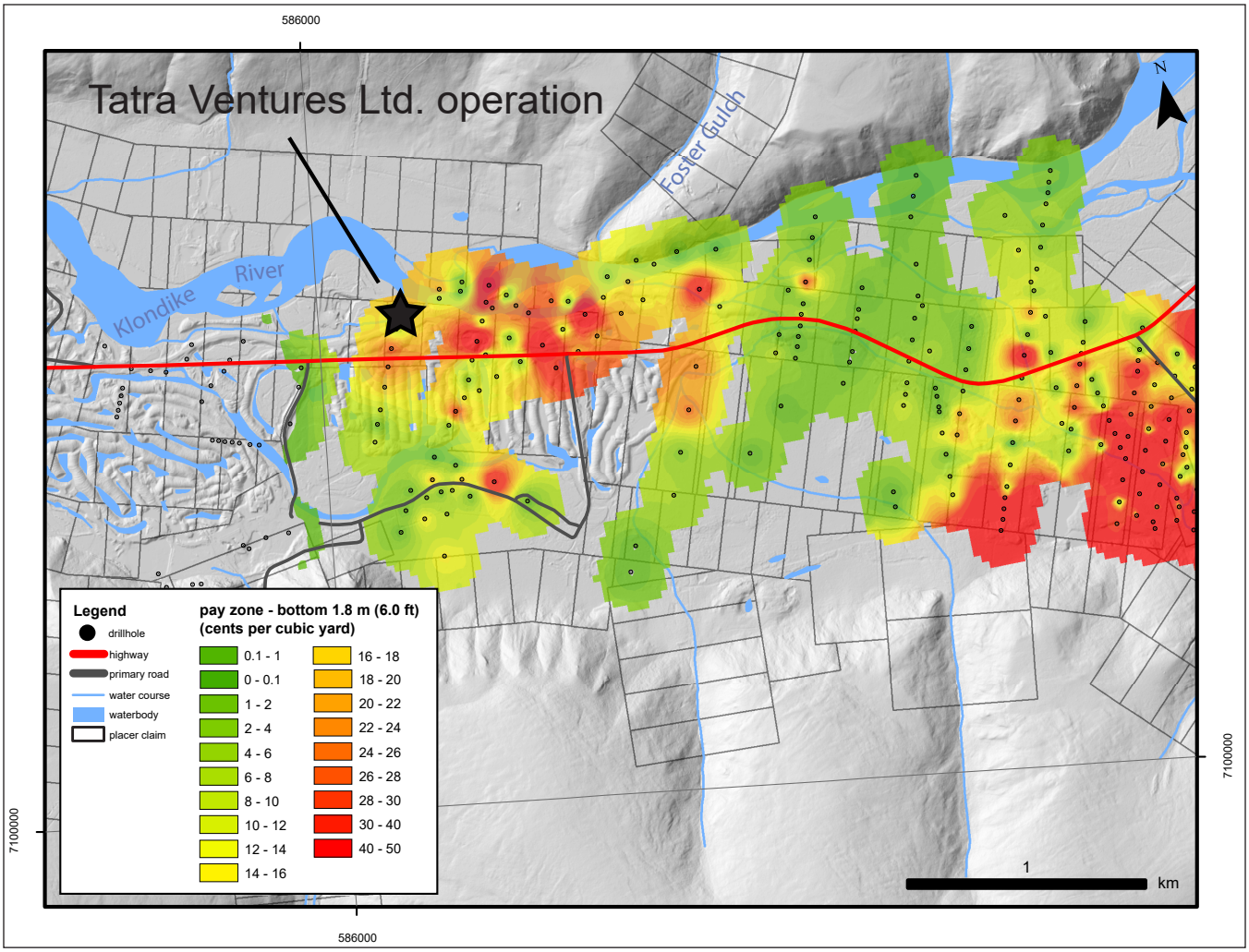


Figure from van Loon (2019, pg. 117) of the drill holes and their 'pay zone' grade on the Klondike River, immediately downstream from the mouth of Hunker Creek. The pay zone grade is a recalculated version of the drill hole value to account for dilution in the 'dredge section' caused by the increased overburden section in the Klondike River valley.

has been reworked into modern Klondike valley gravel. The enriched paleo-Hunker pay streak may be visible in a series of small, partially connected lenses in the Klondike valley rather than a continuous streak, and becomes destroyed farther downstream as it meanders its way to the Yukon River. A second possible source for the locally enriched gold values is from bedrock sources in the Klondike River itself. Mining along the Klondike River conducted by Tatra Ventures Ltd. has recovered small angular nuggets of gold, which suggests a local source. Further information about this project and results is available in the Yukon Exploration and Geology 2018 publication (van Loon, 2019).

Bedrock Geology Bedrock is graphitic schist with quartz veins.

Gold Characteristics Gold is coarse and has a fineness of 730.

Klondike, a tributary of Yukon

116B/03 2019: 64°02'03"N, 139°12'22"W

New Zealand Mid-Arctic Gold Mining Limited, 2018–2019

Water License: PM14-076-2 (Active 06/2025)
Active Producer (2018–2019) **Operation no. 26**

Location Klondike River, left limit, 440 m upstream from Foster Gulch.

Work History and Mining Cuts Eight claims on the immediate left limit of Klondike River, previously owned by Mr. Alton, were transferred to New Zealand Mid-Arctic Gold Mining Limited in 2018. Initial activities in 2018 included preparatory work prior to commencing sluicing in 2019. A berm was established to limit water seepage from the Klondike River through the porous gravel into their 2019 cut. In 2019, a three-person

operation sluiced a 70 m (230 ft) wide by 55 m (180 ft) long cut. With the aid of historic maps, the operators were able to compile dredge history and drillhole data, to help determine the areas that may have escaped dredging and produced encouraging drill results.

Equipment and Water Treatment Equipment present in 2019 included a Hitachi 450LC excavator for digging and loading pay, a Volvo EC360B for feeding the plant, and two 40 ton rock trucks were intermittently brought on site to transport pay. A Minequip Mobile 1200-XPL trommel, measuring 1.2 by 3.6 m (4 × 12 ft) was used to process pay. Water was supplied to the plant using a 6" pump which allowed the trommel to process 70 yd^3 (53 m^3)/hr. Water management is a challenge in the Klondike River valley. Klondike River gravel is a porous deposit, as are the dredge tailings that inundate the valley, therefore keeping cuts dewatered can pose a significant challenge. To keep the cut dewatered in 2019, it was required to pump approximately 1 000 000 litres of water per hour. Electricity was established at site to supply power to the electric pumps. Initially two 12" pumps were used to dewater the cut and once the levels had been largely decreased to bedrock, one 12" operating 24/7 was able to keep the cut dry.

Surficial Geology and Stratigraphy Stratigraphy in the Klondike River drainage is consistent and comprises one gravel unit, the Klondike River gravel. Lower portions of the gravel likely have origins as glacial meltwater deposits, however the upper layers represent modern river valley deposits. The main characteristic that makes Klondike gravel distinguishable from White Channel is the presence of dark lithological units of chert, slate and quartzite. These lithological units originated from the Ogilvie Mountains to the north of the Klondike, and are not associated with other gravel locally found in the Dawson area (White Channel gravel or modern creek gravel derived from Klondike schist).

The 7.3 m (24.0 ft) thick exposure in 2019 is a braided-stream deposit that is a crudely stratified, clast-supported pebble-cobble gravel with 2–5% boulder lag at the bedrock contact. Beds vary in matrix, with clast percent fluctuating from 20 to 60%. Matrix is a fine to medium sand with a varying percent of silt. Clasts are well rounded. The lowermost 1.2 to 1.8 m (4–6 ft) of gravel and up to 0.6 m (2 ft) of bedrock is sluiced.

Bedrock Geology Bedrock is foliated quartz-muscovite schist with graphitic-schist reefs. Bedrock surface undulations vary up to 1 m (3 ft) in relief.



Drone image from 2019 of New Zealand Mid-Arctic Gold's operation in the Klondike River valley. The 2019 cut is outlined by black dashed line.

Gold Characteristics Gold is coarse and has a fineness of 870 to 890.



Section of Klondike River in New Zealand Mid-Arctic Gold's cut in 2019. The yellow field notebook is used for scale. Total thickness of the section is 7.3 m (24.0 ft).

Klondike, a tributary of Yukon

116B/03 2020: 64°01'54"N, 139°09'30"W

Slonski, G. and K. Elgie, 2020

Water License: PM15-032-1 (Active 07/2025)
Active Producer (2020) **Operation no. 27**

Location Klondike River valley, left limit, at the base of Australian Hill.

Work History and Mining Cuts Mr. Slonski and Mr. Elgie purchased the claims and assets from Farley's Machine Inc. in spring 2020. Approximately 300 holes were drilled on the property prior to excavating a 46 by 91 m (150 × 300 ft) cut. Sluicing occurred from end of August to end of September. A total of 180 hours was spent sluicing.

Equipment and Water Treatment Equipment in 2020 included an Hitachi 400 excavator and two Terex 30 ton rock trucks. The wash plant processed 100 yd^3 (76 m^3)/hr. Water was 100% recirculated.

Surficial Geology and Stratigraphy Drillholes ranged in depth from 9 to 13 m (30–43 ft) on the far left limit of Klondike River valley.

Bedrock Geology Bedrock is mapped as dark grey to black carbonaceous metasedimentary rocks and metachert (Mortensen, unpublished).

Gold Characteristics Not reported.



Approximately 300 drill holes were completed on the left limit of the Klondike River below Australia Hill by Slonski and Elgie in 2020.

Hunker, a tributary of Klondike

116B/03 2020: 64°01'05"N, 139°08'52"W

Henry Gulch Explorations Ltd., 1997–2000, 2005–2020

Water License: PM14-069 (Active 05/2025)
Active Producer (2018–2020) **Operation no. 28**

Location Hunker Creek, below Hattie Gulch.

Work History and Mining Cuts In 2018 Henry Gulch Explorations Ltd. mined on the left limit of Hunker Creek downstream of Henry Gulch in areas that were previously dredged. Work continued on the Hunker Creek diversion channel including contouring, top coating with organics, and rock armoring within the channel. In 2019, limited work occurred on the property although an automatic monitor was used to strip muck off the left limit Hunker Creek hillside below Henry Gulch. Following an initial sluicing program on Allgold Creek in 2020, hydraulic monitoring and ripping recommenced on Hunker Creek with plans to process pay in 2021. A second location was active in 2020 just below the mouth of Henry Gulch and outside of the dredge limit. Work consisted of stripping and mining along the dredge limit up to the mouth of Henry Gulch. Plans for a second plant are being made to mine Hattie Gulch on the Australia Hill claims across the valley.

Equipment and Water Treatment Mining was completed using three excavators, an Hitachi EX400 excavator for digging overburden and pay, an Hitachi EX270 and an Hitachi EX200LC excavator for feeding the plant. Two Caterpillar D400E articulating trucks were used to haul waste and pay out of the cut. A Caterpillar D9H bulldozer was used to assist back filling by leveling overburden piles. An Hitachi excavator is used for feeding the plant and a Volvo L220E loader is used for managing sluice tailings. The wash plant consists of a single deck, oscillating screen with a ¾" punch plate leading to two sluice runs with expanded metal over mats, four boil boxes, and hydraulic riffles. The plant processed 80 to 100 loose yd^3 (61–76 m^3)/hr and water was supplied at 1500 igpm by a 6 by 6" Indeng pump, powered by a Isuzu engine. A long tom over a two-cell jig and 3 ft gold wheel was used for clean-ups.



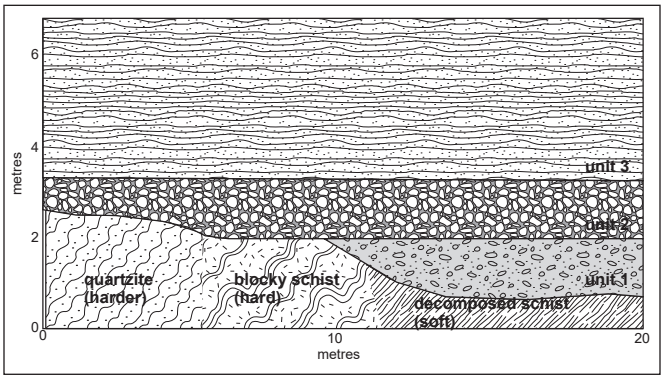
An aerial view looking to the west along the left limit of Hunker Creek below Henry Gulch. The 2020 test cut is visible in the foreground and the hydraulic monitoring cut is visible in the distance.

Surficial Geology and Stratigraphy The left limit of Hunker Creek below Henry Gulch is a large former cut bank of Hunker Creek. This is a location where Hunker Creek was able to carve significantly into the hillside and deposit gold-bearing stream gravels. These deposits were subsequently buried under a thick accumulation of muck. The area has been the focus of mining for many years and requires hydraulic monitoring to strip the thick, frozen muck.

In 2020, a test cut was made into a low-level bench on the left limit immediately downstream from Henry Gulch. The bench contained two gravel units. The upper gravel (unit 2) is coarser and contains slabs of bedrock, small rounded quartz boulders and large cobbles. Flow directions within the upper gravel are parallel to the face of the hillside. The lower gravel (unit 1) is preserved in troughs cut into the bedrock surface, particularly where the bedrock is softer. The lower gravel is not as coarse and consists mostly of pebbles with some quartz cobbles and small boulders. Flow direction preserved in clast imbrication suggests the lower unit was coming obliquely out of the hillside face from the direction of Henry Gulch. This suggests that additional unit 1 gravel is likely present farther into the hillside. The overall thickness of the two gravels is 2 m (6.5 ft) and they are covered by 4 m (13 ft) of muck and colluviated weathered bedrock overburden. The overburden thickness will increase into the face of the cut.

Bedrock Geology Bedrock blocky grey schist.

Gold Characteristics Gold is predominately 16 to 18 mesh and angular. Fineness ranges from 730 to 750.



A schematic diagram of the left limit exposure on Hunker Creek below Henry Gulch. The diagram shows how changes in bedrock hardness impact channel development and location. The unit 1 channel gravel is cut into decomposed schist and the bedrock levels increase to the left with changes to harder rocks. Unit 1 also has a flow direction coming out of the bank suggesting the channel may continue into the bank.

Henry Gulch, a tributary of Hunker

116B/03 2020: 64°00'39"N, 139°08'36"W

Gillespie, R., 1995–2020

Water License: PM19-053 (Active 01/2030)
Water License: PM09-649 (Expired 01/2020)
Active Producer (2018–2020) **Operation no. 29**

Location Henry Gulch, 1.2 km upstream from its confluence with Hunker Creek.

Work History and Mining Cuts Mr. Gillespie mines on lower Henry Gulch, predominately as a one-person operation. Both limits in the narrow gulch were mined. Extensive old-timer workings in the drainage are present, and prospective areas remain in the pillars of virgin ground located between shafts and old workings.

Equipment and Water Treatment Equipment included a Caterpillar 225 excavator, a Caterpillar 212 excavator, a Caterpillar 966C loader, and a Volvo rock truck. A 1.5 by 3 m (5 × 10 ft) oscillating screen deck is used to process 50 to 60 yd^3 (38–46 m^3)/hr. A single sluice run 1 by 3 m (3 × 10 ft) consists of 1¼" angle iron and expanded metal. Water for sluicing was 100% recycled and acquired from a reservoir pond on Henry Gulch.

Surficial Geology and Stratigraphy Henry Gulch has been extensively worked by old-timers. The placer target for Mr. Gillespie is locating *in situ* gulch gravel that remains on the undulating bedrock surface. Henry Gulch gravel is a high energy cobble-pebble gravel with wood and angular bedrock fragments incorporated throughout. Gravel lenses that have been previously disturbed by old-timers can be hard to differentiate from *in situ* gravel. In general, undisturbed gravel is less sorted and has a higher sand matrix content. Following disturbance, the fines were likely washed downstream and reworked. Up to 12 m (40 ft) of loess is stripped.



A lens of high energy Henry Gulch gravel, situated on bedrock. The scraper used for scale is 10 cm (4").



Historic image from 1901 of Claim No. 1 on Henry Gulch. Steam points for thawing the ground are visible. Yukon Archives, YA#9098.

Bedrock Geology Bedrock varies from decomposed schist to blocky quartzite.

Gold Characteristics Gold is coarse with up to ½ oz nuggets.

Dago Hill and Last Chance, a bench and tributary of Hunker

116B/03 2018: 64°00'56"N, 139°07'42"W

Favron Enterprises Ltd., 2000–2020

Water License: PM14-022 (Active 11/2024)
Water License: PM14-023 (Active 11/2024)
Active Producer (2018–2020) **Operation no. 30**

Location Last Chance and Dago Hill.

Work History and Mining Cuts Mining focused at three locations: Bremner Hill, a deep cut on the south side of Dago Hill, and on Hunker Creek near Dago Gulch. Bremner Hill is a high-level bench of Last Chance Creek, immediately upstream from Dago Hill and Eight Pup. Intermittent work at Bremner Hill occurred from 2018 to 2020 on a 23 by 122 m (75 × 400 ft) cut. Stripping of muck and White Channel gravel occurs through the use of an excavator and trucks. The pay is removed using a combination of excavation and hydraulic monitoring depending on clay content and bedrock roughness. Effluent is handled through a series of on-site ponds and recirculated. On Dago Hill, mining and processing of pay continued during 2018 at a deep cut on the south side of the hill. At Dago Gulch, located on left limit of Hunker Creek at the base of Dago Hill, a cut was excavated using a hydraulic monitor. The target is a 9 m (30 ft) high terrace just upstream from Dago Gulch that is buried under muck and slide material from Dago Hill. The cut measured 122 by 152 m (400 × 500 ft). Mining and processing of pay from the Dago Gulch was primarily completed during 2018. A sonic drilling program was also conducted in 2018 consisting of a fence of 5 holes attempting to map the continuation of the White Channel pay streak from Bremner Hill to Dago Hill. A significant effort was directed towards reclamation from 2018 to 2020. Work consisted of contouring

White Channel gravel surfaces and top-coating with silt. The nutrient quality of top coat material can vary at the site, likely depending on organic content of the muck. If the organic content of the material is low then spreading of a top-coat pile may be delayed by a year. This allows the material to break down, spread more evenly, and have a root mass establish that can facilitate productivity of the soil. This work was conducted on both Dago Hill and Bremner Hill.

Equipment and Water Treatment Equipment included a John Deere 850D excavator, an Hitachi EX750 excavator, an Hitachi Zaxis 850 excavator, a John Deere 330 excavator, Caterpillar D9N and D10N bulldozers, two Terex 8220 bulldozers, a Komatsu D155-6 bulldozer, a Caterpillar 988G loader, a Volvo L190 loader, three Komatsu HM400 rock trucks and four John Deere 460E rock trucks. This equipment is used interchangeably with their Sulphur Creek operation. The loaders were used to feed the wash plant that consisted of a 1.8 m (6 ft) diameter by 13.7 m (45 ft) long trommel with a 9 m (30 ft) wash section and 4.5 m (15 ft) of ¾" screen. Eight sluice runs were each 0.9 by 6 m (3 × 20 ft), comprising expanded metal, riffles, and lined with unbacked nomad matting. A small, 1 m (3.5 ft) diameter test trommel was also used. Water was supplied via a 10" Pioneer pump powered by a Detroit diesel engine. Water was fully recycled with no discharge.

Surficial Geology and Stratigraphy Placer gold targets on Favron Enterprises' Dago Hill property include Pliocene gravel terraces (White Channel and Paradise gravel) on Hunker and Last Chance creeks, gulch placers on small tributaries or pups that eroded Pliocene deposits and technogenic placers under hydraulic tailings. The mining program near Dago Gulch targeted an intermediate-level left limit terrace of Hunker Creek at the base of Dago Hill. Placer gold accumulations on the terrace reflect reworking of the Pliocene White Channel gravel paystreak that is located immediately upslope from the cut. Muck overburden overlying the terrace also contains lenses of White Channel gravel reworked off the rim of the bench. For this reason, hydraulic monitoring is a good approach to capture gold derived both from the colluvium and the terrace gravel.

The geology of Bremner Hill consists of White Channel gravel overlain by a variable thickness of colluviated



An aerial view of Hunker Creek and Dago Hill looking west. White Channel gravel deposits are visible on the hill and hydraulic tailings from former mine operations on the high-level bench are visible in the valley bottom. The Dago Gulch cut is visible at the base of the hill where a muck deposit is being monitored back to expose a Hunker Creek terrace deposit. The wash plant is positioned on the hydraulic tailings and is sluicing into the holding pond.

loess (silt-rich muck). The thickness of the White Channel gravel varies due to erosion of the hill surface, which has washed some material into neighboring gulches. Maximum thickness is approximately 10 to 12 m (33–39 ft). The bedrock surface is very uneven and decomposed, making it difficult to clean. Pay gravels are contained to the lower 2.1 m (7 ft), and the uppermost 1.5 m (5 ft) is extracted easily using an excavator. The lower 0.6 m (2 ft) on the bedrock surface is difficult to extract due to the nature of the bedrock surface. In order to reduce the clay content in the pay and maximize gold recovery, hydraulic monitoring is undertaken of the remaining gravel on bedrock prior to excavation.

Bedrock Geology Bedrock is altered black and orange schist and Cretaceous Carmacks group volcanic and sedimentary rock.

Gold Characteristics Gold from Dago Hill is nuggety, up to ¾ oz with 80% fines. Last Chance gold is moderately coarse.

Hunker, a tributary of Klondike

116B/03 2020: 64°00'28"N, 139°05'25"W

Ace Placer Mining Ltd., 2017–2020

Water License: PM16-073 (Active 01/2027)
Active Producer (2018–2020) **Operation no. 31**

Location Hunker Creek, left limit, immediately upstream from the mouth of Last Chance Creek.

Work History and Mining Cuts Ace Placer Mines continued to divide their time between operations on Dominion and Hunker creeks. On Hunker Creek mining focused on the left limit immediately upstream from the mouth of Last Chance Creek. Work consisted of mechanical (bulldozer) and hydraulic stripping of the muck, and mining of a low-level bench. Stripped material was pushed or washed into an adjoining pit on Hunker Creek.

Equipment and Water Treatment Equipment on site included a Caterpillar 235C excavator and a Caterpillar 349F excavator for digging and loading pay, an International 350B haul truck, two Caterpillar D9H bulldozers, and two Caterpillar 980C loaders for



An aerial view of Ace Placer Mining Ltd.'s operation on the left limit of Hunker Creek. The excavators are cleaning the low-level bedrock terrace surface while a bulldozer and monitor strip muck in the background. Dago Hill is visible in the distance.

managing tailings. A 36 m (120 ft) conveyor feeder was added to the plant, which consists of screen deck classifying to ¾".

Surficial Geology and Stratigraphy The low-level terrace surface mined in 2020 rises approximately 5 m (16 ft) off the valley bottom and is buried by a wedge of organic-rich muck. Gravel on the bedrock terrace was poorly exposed, but appeared to be thin. Crude flow directions derived from clast imbrication suggest the gravel may be derived from Last Chance and Hunker creeks. This is encouraging as the landform appears to extend into the Last Chance Creek drainage to the west. Old-timer workings are prevalent on the terrace.

Bedrock Geology Bedrock is a decomposed phyllite.

Gold Characteristics Not reported.

Last Chance, a tributary of Hunker

115O/14 2019: 63°57'50"N, 139°08'25"W
115O/14 2019: 63°59'44"N, 139°07'09"W (Gumbo Hill)

Golden Wrench Mining Ltd., 2016–2020

Water License: PM14-063-1 (Active 05/2025)
Active Producer (2018–2020) **Operation no. 32**

Location Last Chance Creek, in two locations: 0.8 km downstream from the forks, and on Gumbo Hill, a left limit hill between Eight Pup and 8 Above Pup.

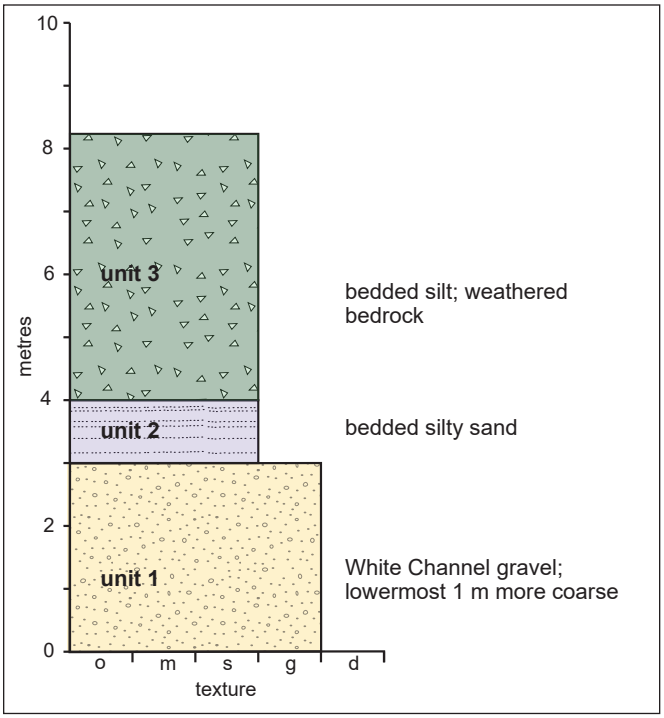
Work History and Mining Cuts Golden Wrench Mining Ltd. mined as a three to four person operation from 2018 to 2020. In 2018 and 2019, mining continued on Last Chance Creek, predominately on the left limit. A cut on Gumbo Hill was also completed. In 2020, sluicing occurred on No Name Pup, situated between Eight Pup and 9 Above Pup.

Equipment and Water Treatment In 2019, the equipment included a Caterpillar 324DL excavator, a Link Belt 460LC excavator, a Caterpillar 980C wheel loader, an Hitachi Zaxis 270LC excavator, two pay hauler rock trucks, and Caterpillar D7, D8 and D9L bulldozers. Two plants were used to process material: a small trommel able to process 30 yd^3 (23 m^3)/hr and a larger trommel, a Model 100 Gold Machine able to process 100 yd^3 (76 m^3)/hr.

Surficial Geology and Stratigraphy A cut on Gumbo Hill near Discovery Pup consisted of three units for a total thickness of 8.1 m (27 ft). Unit 1, from 0 to 3 m (0–10 ft) on the bedrock surface consists of a clay-rich White Channel gravel. The lower 1 m (3 ft) consists of a coarser gravel whereas the upper 2 m (6 ft) is a cobble-pebble gravel with oxidized beds and sandy silt lenses that represent slower water movement. Unit 1 is overlain by unit 2, from 3 to 4 m (10–13 ft) of overbank bedded silty sand, which represents the paleo-floodplain surface. Unit 3, from 4 to 8.1 m (13–27 ft) is a bedded silt and weathered bedrock colluvium.



Aerial view looking downstream of upper Last Chance Creek where Golden Wrench Mining Ltd. was operating in 2019. Numerous old-timer shafts and drifts were uncovered in the valley bottom at this location in an area where the pay streak is about 6 m (20 ft) wide.



Stratigraphy on Gumbo Hill in 2019, consisting of three units.

A second location was mined in 2019, located 0.8 km downstream from the forks on main stem Last Chance Creek. The left limit cut consists of 3.2 m (10.5 ft) of cobble gravel that fines upwards into a 1 m (3 ft) thick pebble gravel that caps the top of the unit. The gravel is poorly sorted, loose, clast-supported and has a 20% matrix consisting of fine sand and silt. Clasts are subangular with maximum clast size 0.4 m (1.3 ft). Gold increases in gravel that is compact and coarse, dominated by cobble clasts. The Last Chance Creek pay streak meanders limit-to-limit.

Bedrock Geology Bedrock is flat lying muscovite-chlorite schist.

Gold Characteristics Gold is like 'oatmeal' with rare nuggets. The fineness is 670.

Preido Hill, a bench on Hunker

116B/03 2018: 64°00'12"N, 139°05'52"W
116B/03 2018: 64°00'06"N, 139°05'39"W
115O/14 2018: 63°59'48"N, 139°05'37"W (Paradise gravel cut)

Moonlight Mining Ltd., 2013–2019

Water License: PM16-068 (Active 03/2027)
Active Producer (2018–2019) **Operation no. 33**

Location Preido Hill, left limit bench of Hunker Creek, upstream from the mouth of Last Chance Creek.

Work History and Mining Cuts Moonlight Mining Ltd. completed mining on Preido Hill early in the 2020 season and moved to Barlow Creek for the remainder of the summer. In 2018, 5 miners were employed working 6 days per week. Mining focused on the north end of the hill where a cut measuring 40 by 109 m (133 × 358 ft) was processed. The depth of the cut measured 21 m (70 ft). A test cut measuring 30 by 50 m (100 × 164 ft) that was initiated in 2017, continued in 2018 to a depth of 10 m (32 ft). This is located on the south side of the hill in a zone underlain by Paradise gravel. A significant reclamation effort was completed on Preido Hill in 2019 that consisted of grading slopes and top-coating with organic-rich silt. The effort was recognized for a Robert E. Leckie reclamation award in 2019. One month of sluicing tailings was completed at the beginning of the 2020 season while waiting for adequate thaw on Barlow Creek.

Equipment and Water Treatment Equipment on site includes an Hitachi 200 excavator, an Hitachi EX300 excavator, an Hitachi Zaxis 450LC and an Hitachi ZX-470 excavator used for digging pay and stripping. A Caterpillar 966 loader was used for feeding the wash plant and a Komatsu 375-A for stripping. Two Caterpillar 740 rock trucks were also utilized for stripping and hauling pay. Water was initially acquired from Last Chance Creek and became a complete recirculation system with zero discharge. The wash plant consists of an automatic dumping grizzly-conveyor that feeds a New Zealand-style trommel. Classified material is fed into sluice boxes on either side of the trommel that are lined with angle iron riffles and expanded metal.

Surficial Geology and Stratigraphy Surficial sediments on Preido Hill comprise Pliocene fluvial sediments that drained Hunker Creek valley between approximately 2.6 and 5 million years ago. This includes both the upper and lower White Channel gravel deposits and pre-White Channel, Paradise gravel (Bond, 2016). Mining in 2018 within the White Channel gravel exposed both the lower White Channel and upper White Channel units. The lower White Channel gravel (LWC) is 15 m (49 ft) thick, however varies slightly due to pop-ups in the bedrock surface, which normally have not been encountered on Preido Hill. Near the bedrock contact the LWC gravel is a pebble-cobble gravel containing 50% clasts and 50% matrix. The gravel is poorly sorted and almost has a diamicton appearance. Oxidation within the LWC is variable and depends on the bedrock surface that was formerly eroded. At the northeast end of the hill an oxidized siltstone of the Indian River formation forms the bedrock surface. Here the LWC is very oxidized near the bedrock interface. Quartz boulders up to 2 m (6.6 ft) in diameter were also encountered in this area of the hill.



A close-up view of an oxidized and raised bedrock surface in a Preido Hill cut. Lower White Channel and upper White Channel gravel are visible in the distance. The section height is approximately 23 m (75 ft).



An aerial view of Preido Hill in 2019. A significant reclamation effort was undertaken that included sloping surfaces and top-coating with organic material. The Paradise gravel cut is visible near the bottom of the photo.

An exploration test cut into the Paradise gravel continued in 2018. The bedrock contact was reached at approximately 10.6 m (35 ft). This was unexpected as drilling predicted upwards of 14 m (47 ft) of Paradise gravel. The discrepancy is likely due to the soft, decomposed nature of both the Paradise gravel and the bedrock, which makes it difficult to verify the contact in drill cuttings. Further delineation of the Paradise gravel in this area of Preido Hill would benefit from sonic drilling. The Paradise gravel was described at the 9.7 m (32 ft) level and consists of highly decomposed, oxidized, poorly sorted, cobble-pebble gravel. A variety of lithological units are present within the Paradise gravel, which unlike the lower White Channel gravel, is one of its defining characteristics. Stringers of organic-like material were also documented in the base of the cut, which is unusual considering no organic material has been collected from the lower White Channel gravel. Gold concentrations increased near the bedrock contact. The upper contact of the Paradise gravel appears overprinted with paleosol weathering (increased oxidation) in the upper 2 m and has a higher silt content due to loess inputs. Mining of the Paradise gravel is challenging given its frozen nature and high clay content. Exploitation of the gravel would benefit from hydraulic monitoring.

Bedrock Geology Bedrock consists of decomposed fine-grained sedimentary rocks of the Indian River formation.

Gold Characteristics Generally fine grained with rare small nuggets.

Paradise Hill, a bench on Hunker

115O/14 2020: 63°59'48"N, 139°04'48"W
115O/14 2019: 63°59'33"N, 139°04'19"W

Tamarack Inc., 1983–1986, 1989–1999, 2005–2012, 2015–2020

Water License: PM18-022 (Active 02/2029)
Water License: PM07-571 (Expired 06/2018)
Active Producer (2018–2020) **Operation no. 34**

Location Paradise Hill and Hunker Creek, between Last Chance Creek and Hester Creek.

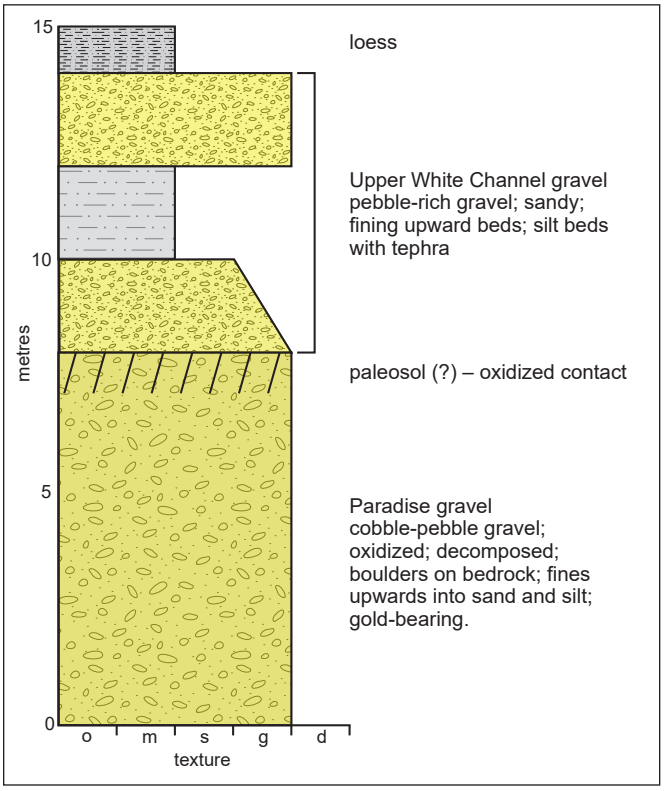
Work History and Mining Cuts Work focused near the upstream end of Paradise Hill in 2019 and 2020. Approximately 5 personnel were active at the cut during a shift.

Equipment and Water Treatment Equipment documented at the cut in 2019 included a Volvo EC460B excavating pay, two Volvo A40D haul trucks delivering pay to the plant, a Volvo EC460B excavator for feeding the trommel and a Volvo loader for managing the tailings. Pay is delivered to the trommel using a 9 m (30 ft) conveyor. The wash plant consisted of a 2.4 m (8 ft) diameter land trommel that is 15 m (50 ft) in length and screens to ¾". The trommel is lined with 6" flights to help agitate and breakdown the clay-rich gravel. The sluice runs consist of six 0.6 by 4.5 m (2 × 15 ft) oscillating runs and the plant is able to process 300 to 350 loose yd^3 (229–268 m^3)/hr. The water requirement for the plant is 1500 gal/min. The water was collected from an in-stream reservoir on Hunker Creek and effluent was released into a series of settling ponds in the Hunker Creek valley.

Surficial Geology and Stratigraphy In 2019 and 2020 the area of mining on Paradise Hill exposed both Paradise gravel and upper White Channel gravel. The Paradise gravel is a pre-White Channel gravel that is highly altered and contains a larger variety of clasts of differing lithology. When climate change initiated erosion and formation of the White Channel gravel, the Paradise gravel was already highly weathered and most clasts, apart from quartz, were reduced to clay and sand. Erosion of the Paradise gravel resulted in removal of the non-quartz rocks from the Hunker Creek basin leaving behind an accumulation of quartz. This period of reworking also affected the gold distribution. According to personal communication with T. Beets, gold distribution in the Paradise gravel is more disseminated throughout the deposit but does have increased concentrations on the bedrock surface. Where reworking of the Paradise gravel by the White Channel gravel occurred, there would have been an increased concentration of gold on the bedrock surface. The Paradise gravel was first recognized at Paradise Hill and has since been documented at Preido and Dago hills to the north (Bond, 2016). Recognition of this deposit is significant because much of the remaining gravel on Paradise Hill consists of this unit.

The Paradise gravel exposed in 2020 varied in thickness from 8 to 11 m (26–36 ft), and contained approximately 25–30% quartz clasts and large boulders on the bedrock surface up to 80 cm in length. The gravel is highly altered and a knife can be used to cut all but the quartz clasts. All of the Paradise gravel is processed for placer gold. Overlying the Paradise gravel is upper White Channel gravel that was deposited approximately 3 million years ago. It is a stratified pebble-rich gravel locally interbedded with fluvial silt and loess. The upper White Channel gravel is 5.4 m (17.7 ft) thick. A unit of loess that has been disturbed by bulldozer activity caps the section.

Bedrock Geology Bedrock consists of highly decomposed fine-grained sedimentary rocks that are interpreted to be Indian River formation.



A stratigraphic section from the 2020 cut on Paradise Hill. The exposure consists of Paradise gravel overlain by upper White Channel gravel. All of the Paradise gravel is processed for placer gold.

Gold Characteristics The gold fineness in the Paradise gravel is reported as 860.



A view to the south of the 2020 cut at Paradise Hill show some of the larger boulders on the bedrock surface. Paradise gravel (oxidized gravel) is visible in distance at the base of the cut.



A close-up view of the Paradise gravel on Paradise Hill. Non-quartz clasts are highly decomposed and many have been distorted due to pressure and slight colluviation of the deposit. The mottled appearance, reflecting weathered clasts of differing lithology is typical of the Paradise gravel.

Independence, a tributary of Hunker

115O/14 2019: 63°58'40"N, 139°01'29"W

Phillips, P. and D., 2011–2020

Water License: PM18-013-1 (Active 06/2028)
Water License: PM16-083 (Active 06/2027)
Active Producer (2018–2020) **Operation no. 35**

Location Independence Creek, approximately 750 m upstream from the Hunker Creek valley.

Work History and Mining Cuts The Phillips mined both the left and right limits of Independence Creek from 2018 to 2020. On either limit there is considerable stripping of muck overburden. On the left limit this was accomplished using a combination of sprinklers and excavators, working concurrently at the base and on top of the section respectively. On the right limit, the overburden was largely monitored and periodically an excavator was used to pull back the thawed material. In 2018, 176 hours were spent sluicing. In 2019, the cut measured 73 by 158 m (240 × 520 ft) and 120 hours were spent sluicing. Four employees operated a daily 10 hour shift.

Equipment and Water Treatment Equipment included a Komatsu PC200 and a PC400 excavators, an Hitachi EX300 excavator, two Caterpillar 8L bulldozers, Caterpillar 980 wheel loader, and two Caterpillar 300B haul trucks. The plant consists of a New Zealand-style trommel (5 × 20 ft) on skids that screens to 1.2" and runs 100 yd^3 (76 m^3)/hr.

Surficial Geology and Stratigraphy Significant accumulations of muck have buried the creek gravel in Independence Creek valley. On the right limit



Drone image from 2019 of the Phillip's operation on Independence Creek. View is looking upstream towards the headwaters of the drainage.



A view to the northeast of the left limit of Independence Creek on the Phillips claims. Buried floodplain gravel visible at the base of the cut is gradually exposed for sluicing as the frozen muck is monitored back.

(northwest-facing slope) the upper and outer layers of muck are peat-rich and contain fewer clastic sediments. As monitoring washes this cover peat off, there is a more sediment-rich muck buried in the cut. On the left limit, the muck is more sediment-rich with only lenses and beds of organics. The differences in muck characteristics reflect past climatic conditions. The more organic and peat-rich mucks formed during the current or past interglacial periods, whereas the sediment-rich muck reflects a glacial climate at the time of deposition. During glacial climates, the Klondike became increasingly arid. Vegetation was dominated by grasslands, runoff was more rapid, and loess (wind-blown dust) more prevalent. Mobilization of the loess into the valley bottoms contributed to the buildup of the sediment-rich muck that is being stripped today. In Independence Creek the majority of the buried floodplain sediment is located under the left limit muck.

In 2019, the exposure 750 m up Independence Creek consisted of two units for a total thickness of 18 m (59 ft). Unit 1 is the gravel situated on the bedrock contact, which varies from 0.2 to 1.5 m (0.5–5 ft) thick. Gravel is a pebble–cobble gravel with subangular clasts. Gravel is overlain by unit 2, which is up to 17 m (56 ft) thick. Unit 2 is loess with massive ice lenses up to 2 m (6 ft) thick.

Bedrock Geology Bedrock is graphitic schist with quartz veins.

Gold Characteristics Gold at the mouth is typical 'Hunker Gold', with a fineness of 788. As you move farther upstream, gold becomes coarser and rougher, and has a fineness of 740.

Trilby Hill, a Bench on Hunker

115O/15 and 16 2019: 63°58'40"N, 138°59'40"W

Kreft, B., 2018–2020

Land Use Permit: LPO1238 (Active 11/2028)
Active Explorer (2018–2020) **Operation no. 36**

Location Trilby Hill, a right limit, high-level bench of Hunker Creek across from Colorado Creek.

Work History and Mining Cuts B. Kreft has been sporadically testing the high-level bench gravel on Trilby Hill for the past three seasons. The White Channel gravel has been previously exploited on the hill, however additional resources remain on the terrace. A YMEP-funded project was completed in 2019 that consisted of a series of small bulk samples along the face of the hill exposure. Additional work included patching of the water-holding pond. A total of 3 personnel were employed on the project.

Equipment and Water Treatment Equipment onsite in 2019 included an Hitachi Zaxis 200 used for stripping and a Komatsu 320 loader also used for stripping.

Surficial Geology and Stratigraphy A section exposed in 2019 consisted of 18 m (59 ft) of sediment. Unit 1, from 0 to 6 m (0–20 ft) is interpreted as lower White Channel gravel. It is poorly sorted and dominated by subangular to subrounded quartz cobbles. The full thickness of unit 1 was not apparent in the existing cut. Unit 2a, from 6 to 7 m (20–23 ft) represents the lower contact of the upper White Channel gravel. This gravel is more oxidized, moderately sorted and contains a wider lithological variety of clasts. Unit 2b, from 7 to 9 m (23.0–29.5 ft) is an overbank floodplain silt characteristic of a time when the site was distal to the active White Channel stream. This unit is considered a part of the upper White Channel gravel. Unit 2c, from 9 to 13 m (29.5–43.0 ft) consists of additional upper White Channel gravel. It is moderately to well-sorted, pebble dominated with sandy beds and oxidized. Unit 3, from 13 to 18 m (43–59 ft) is a dark grey to black, pebble and cobble dominated gravel containing an abundance of grey quartzite clasts. These clasts are likely derived from Finlayson (Nasina) assemblage, which is known to contain carbonaceous metasedimentary rocks. Unit 3 likely originates from a tributary drainage such as Bee or Trilby gulches, whereas the lower and upper White Channel units originate from Hunker Creek.

Bedrock Geology Bedrock consists of both Klondike schist and Finlayson assemblage quartzite and schist.

Gold Characteristics Not reported.



An aerial view to the southeast looking over Trilby Hill and up Hunker Creek valley. Testing equipment was working near the southern edge of the hill, exposing lower White Channel gravel for sluicing.



A close-up view of units 1 and 2 on Trilby Hill. The lower quartz dominated gravel is considered lower White Channel gravel and is the target for sluicing. It is overlain by unit 2 an oxidized, pebble-dominated upper White Channel gravel.

Hunker, a tributary of Klondike

115O/15 2020: 63°58'45"N, 139°00'23"W
115O/15 2019: 63°58'45"N, 139°00'26"W

Daval Mining, 1982–2020

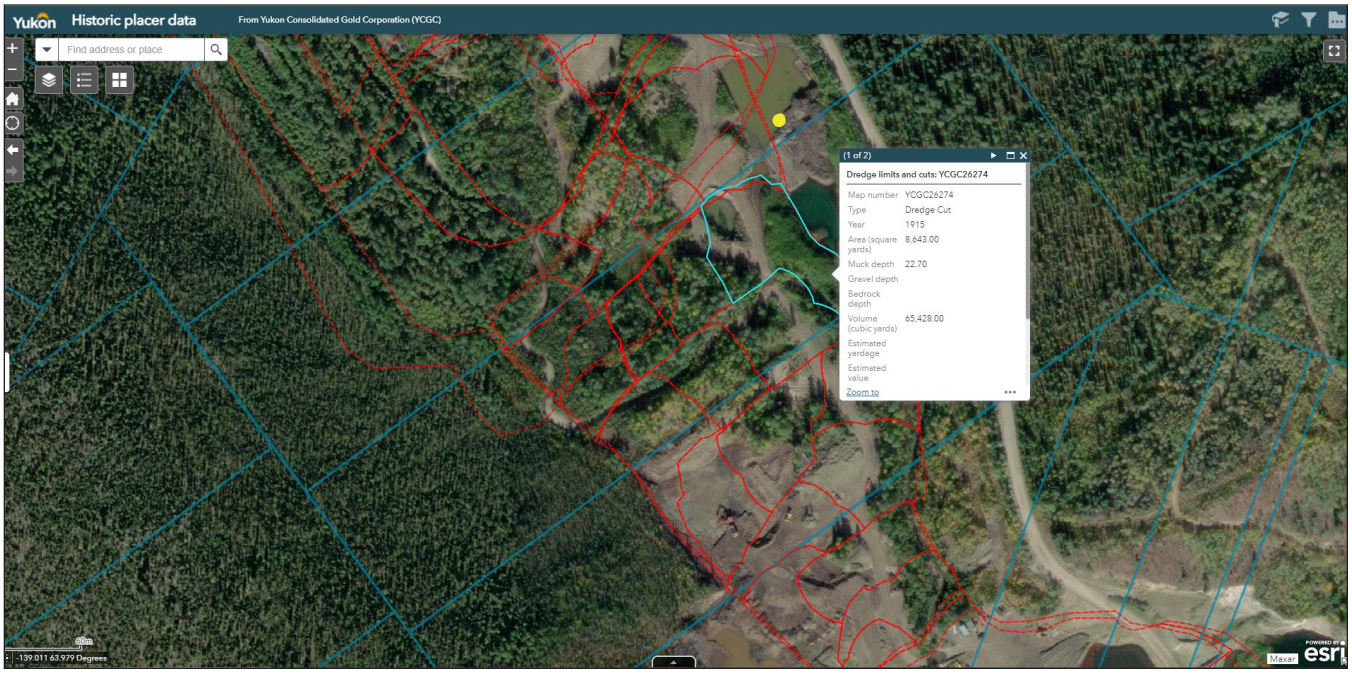
Water License: PM19-009 (Active 03/2030)
Water License: PM09-654 (Expired 03/2020)
Active Producer (2018–2020) **Operation no. 37**

Location Hunker Creek, 450 m downstream from the mouth of Colorado Creek.

Work History and Mining Cuts Daval Mining operated with a three to four person crew from 2018 to 2020. They target two placer settings on Hunker Creek: Hunker Creek side pay and deposits beneath dredge tailings. This can include virgin pillars of gravel, the enriched bedrock and gravel interface, and patches of virgin Hunker Creek gravel left behind within the dredge limits. These patches represent challenges faced by the dredging operations, such as frozen ground, and/or an undulating bedrock surface that was difficult to effectively clean. *In situ* gravel encountered varies from slivers to piles. Historic dredge and drill maps have contributed to Daval Mining's choice of cut locations. In 2019, a 75 by 75 m (246 × 246 ft) cut on the right limit targeted the outer margin of dredged ground. In 2020, a YMEP funded project assisted them in conducting a 26 hole drill program. They drilled outside the dredge limits on the right limit of Hunker Creek and at the mouth of Colorado Creek. Through the drill program they were able to identify mineable ground on the far right limit, and the left limit of Hunker Creek, at and immediately downstream of Colorado Gulch. A total of 390 hours was spent sluicing in 2020.

Equipment and Water Treatment The equipment utilized by Daval Mining included an Hitachi Zaxis 450 excavator, a Komatsu PC220 excavator, a Caterpillar D9N bulldozer, a Caterpillar D3 bulldozer and two Caterpillar 769B haul trucks. A 1.5 by 6.1 m (5 × 20 ft) trommel, with a ½" screen was used to process up to 35 yd^3 (27 m^3)/hr. A single side sluice run is 3 m (10 ft) wide by 2.4 m (8 ft) long and consists of hydraulic riffles and expanded metal. Water is 100% recycled and no direct effluent is discharged to Hunker Creek. A screen and magnet is initially used for clean-ups, and concentrate is completed on a wheel.

Surficial Geology and Stratigraphy In 2019, a cut on the right limit of Hunker Creek was situated on the dredge limit. The exposure on the edge of the dredge limit consisted of two units. Unit 1, from 0 to 1.7 m is a pebble-cobble gravel and presents a paleo Hunker Creek deposit. The loose, matrix-rich gravel with a 30% silty sand matrix, fines upward towards its contact with unit 2. All clasts are subround. Thickness of unit 1 varies due to the presence of undulations in the



A screen shot from the Historic Placer Data web app, an interactive map that allows you to view, query and download digitized historic placer data. Daval Mining's 2019 cut is marked by the yellow pin. The red dashed lines outline dredge cuts from various vintages: 1914, 1915, 1916 and 1942. This web application can be used to view dredge cuts and can be filtered by year. The web application is accessed via our website at http://yukon.ca/en/geology-maps.

bedrock surface. Unit 2, from 1.7 to 6.0 m (5.6–19.7 ft) is dredge slickens, consisting of fine-grained sandy silt. Throughout the cut, inside the dredge limit, the thickness of unit 1 varies from 0 to approximately 0.3 m (0–1 ft). All gravel encountered is sluiced, and if none is encountered, up to the lowermost 0.3 m (1 ft) of fine-grained sediment on the bedrock contact is processed. Up to 10 to 15 cm (4–6") of bedrock is sluiced.

Historic data is compiled by Daval Mining, which allows them to reconstruct the dredge history on their claims. It is helpful in mine planning to know the dredge history and relative efficiency in order to be successful in a drainage like Hunker Creek.

Bedrock Geology Bedrock is a pyrite-rich muscovite schist. Pyrite cubes up to several inches are recovered.

Gold Characteristics The gold is bright and very fine, with 4% of the gold larger than 12 mesh. Fineness is 815.

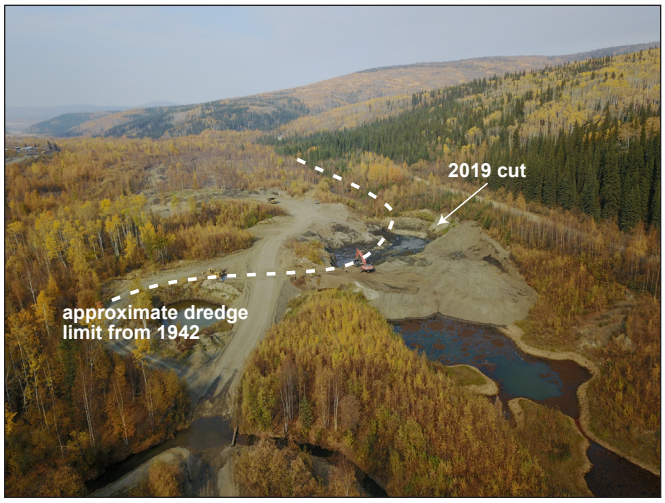


Image from 2019 of Daval Mining's right limit cut. The dashed line is an approximate dredge limit from 1942. The view is looking down the Hunker Creek valley.

Hunker, a tributary of Klondike

115O/15 2020: 63°58'03"N, 138°58'52"W

Fraser, I., 2014–2020
Fraser, J., 1978–1998

Water License: PM13-023 (Active 07/2023)
Active Producer (2018–2020) **Operation no. 38**

Location Hunker Creek, left limit, 700 m downstream from Gold Bottom Creek confluence.

Work History and Mining Cuts The Fraser Family has held their claims on Hunker Creek, downstream from Gold Bottom Creek since 1978. In 2016 and 2017, mining occurred on Temperance Hill and in 2018, Mr. Fraser relocated back to the valley bottom. Mr. Fraser, primarily operating as a one person crew, is mining in an area that has been dredged, as well as historically cat mined. Extensive historic mining has taken place on Hunker Creek, but due to dredge inefficiencies and the characteristics of the bedrock, some areas were poorly worked. Due to inefficiencies and/or variables in ground conditions and bedrock characteristics, Mr. Fraser has been able to target a thin unit of gravel that overlies the bedrock surface. A triangle shaped cut, 37 by 60 m (122 × 196 ft) was completed in 2020, which was an extension of the 2018 and 2019 cuts.

Equipment and Water Treatment In 2020, the equipment included an Hitachi Zaxis 350LC excavator for feeding the plant, a Caterpillar D6 bulldozer for stripping, and a Caterpillar 950 wheel loader and a dump truck for transporting pay. A 2.1 by 4.6 m (7 × 15 ft) screen deck with ¾" screen is used to process 30 yd^3 (23 m^3)/hr. Water is supplied to the plant using a 6 by 6" pump. Effluent is settled in one pond and seeps through tailings and is a close system that is 100% recirculated.



Historic photo labeled 'Bench claims opp 35 Hunker Creek owned by D.Y.M.Co' which is across the valley from Mr. Fraser's operation, on Bee Gulch. Library and Archives Canada, C-003087.

Surficial Geology and Stratigraphy Mr. Fraser recently uncovered material from a railway and railway carts used to mine underground in the early 1900s. Old-timers prove their meticulousness, as they left minimal *in situ* gravel behind. The deposit that Mr. Fraser targets on Hunker Creek is up to 0.6 m (2 ft) into the bedrock and what remains on the bedrock surface, and between drifts and under the railway. An enrichment of gold is present on the gravel–bedrock contact because of the nature of the bedrock. It is a decomposed clay-altered micaceous schist and due to how compact it is, it prevents gold from descending much beyond 0.6 m (2 ft).

Bedrock Geology Bedrock is quartz-sericite schist that is often decomposed.

Gold Characteristics Gold is 60% fine and 40% intermediate/coarse. The fineness is 810.



Mr. Fraser's operation in 2018 on Hunker Creek. The dashed lines outline cuts completed 2018 to 2020. The view is looking upstream, towards his recent workings on Temperance Hill.

Gold Bottom, a tributary of Hunker

115O/15 2020: 63°55'10"N, 138°58'53"W
115O/15 2019: 63°55'24"N, 138°58'48"W

Tim Coles Enterprises Ltd., 2016–2020

Water License: PM12-008-3 (Active 07/2022)
Active Producer (2018–2020) **Operation no. 39**

Location Gold Bottom Creek, 1.3 km downstream from West Gold Bottom Creek.

Work History and Mining Cuts Tim Coles Enterprises Ltd. focused mining 1.3 km downstream from West Gold Bottom Creek from 2018 to 2020. A three to four person crew mined the center of the valley and both limits, with a significant gravel deposit on the right limit extending under the hillslope. In 2018 and 2019, six claims were stripped and mining began on the lowermost claim. In 2018, the mined area totaled 43 by 380 m (140 × 1250 ft). In 2019, the mined area totaled 61 by 305 m (200 × 1000 ft) and in 2020, the total length of the cut measured 426 m (1400 ft). A total of 600 hours of sluicing was completed in 2019 and 500 hours in 2020.

Equipment and Water Treatment Equipment included a variety of excavators used for stripping muck, digging pay and feeding the plant. These included a Caterpillar 349E, a Caterpillar 235C, a Kobelco SK350 and a John Deere 380. A Terex 4060 rock truck was used during the 2020 season for hauling pay. A Caterpillar D9H bulldozer was used for pushing pay to the plant. Approximately 80% of earth moving is conducted by excavator, while the other 20% is completed with bulldozers. A double screen deck, consists of vibrating ¾" punch plate that overlies a second screen deck with a ½" punch plate. Material that passes through the bottom screen feeds two 1.5 m (5ft) wide by 1.2 m (4ft) long sluice runs containing expanded metal and angle iron. In 2020, a trommel plant capable of processing 125 yd^3/hr was added to the operation. Effluent was settled in a series of two ponds and water was 100% recycled.

Surficial Geology and Stratigraphy Gold Bottom Creek is the largest tributary of the Hunker Creek drainage. Previous mining, in the area where Tim Coles Enterprises is active, targeted the center of



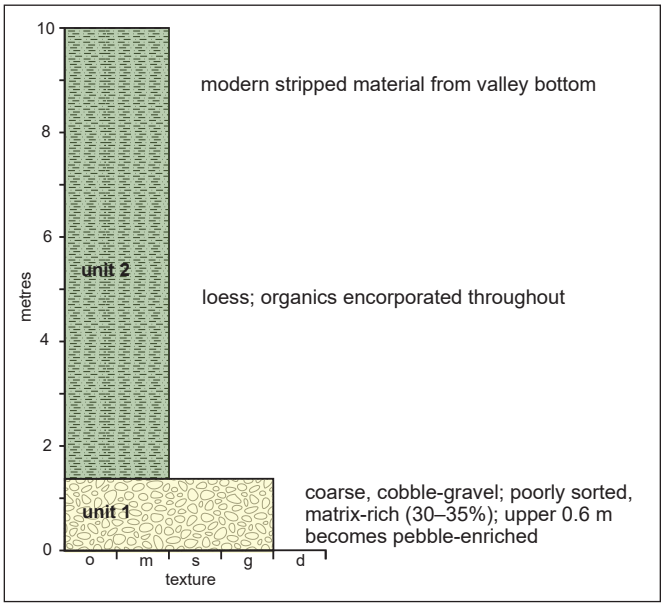
Drone image from 2019 of Tim Coles Enterprises Ltd. on Gold Bottom Creek. The view is looking downstream towards the confluence with Hunker Creek.

the valley and ignored behind side pay on both limits. Current mining is attempting to process the entire width of the valley bottom by exposing the buried side pay and excavating farther into bedrock in mined areas. The best pay is located on the right limit under muck overburden. In 2019, the right limit stratigraphy of the cut had two units, with unit 1 consisting of side pay and unit 2 a colluvium. Unit 1, from 0 to 1.2 m (0–3.9 ft) is a coarse, boulder-cobble gravel with 2% boulders, 60–70% cobbles and 30–40% pebbles. It is a poorly sorted, matrix-rich deposit (30–35%), that appears to fine upwards into a pebble dominated gravel in the uppermost 0.6 m (2.0 ft) of the unit. Imbrication is not present, and the thickness of the gravel does appear to increase in-slope. Unit 2, from 1.2 to 10 m (3.9–32.8 ft) is loess with organics and overlain by modern strippings from the valley bottom. All of unit 1 and 0.6 m (2 ft) of bedrock was sluiced.

In 2018, a mixing zone of weathered bedrock and gravel was encountered, which contained the best gold concentrations. Gravel thicknesses averaged 1.5 m (5 ft), but were up to 3 m (10 ft) in some locations. Generally, 0.6 m (2 ft) of gravel is stripped and the remainder is sluiced.

Bedrock Geology Bedrock is foliated and moderately weathered to slabby micaceous schist.

Gold Characteristics The fineness is 785. Fine gold with some 1 to 2 g nuggets. 90% <12 mesh.



The 2019 stratigraphy of Gold Bottom Creek, 1.3 km downstream from West Gold Bottom Creek.

Hunker, a tributary of Klondike

115O/15 2020: 63°57'29"N, 138°56'39"W

Rodal Placers, 2018–2020

Water License: PM17-075 (Active 04/2028)
Water License: PM07-588 (Expired 04/2018)
Active Producer (2018–2020) **Operation no. 40**

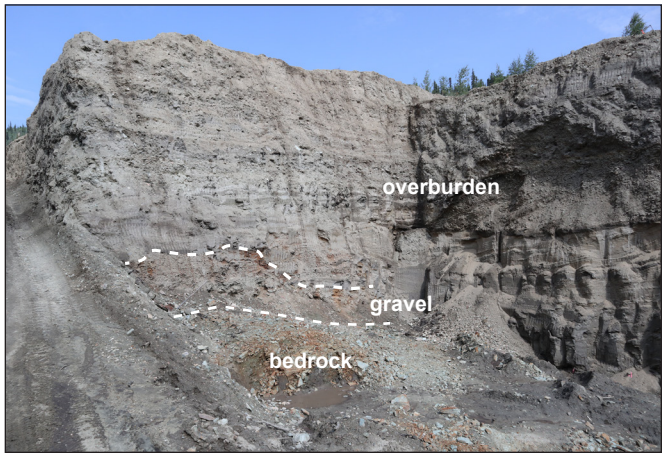
Location Hunker Creek, 0.7 km downstream from 16 Below Pup.

Work History and Mining Cuts Rodal Placers operated on Mr. Millar's claims from 2018 to 2020. As a two-person operation, their cut on the mid-to-left limit side of Hunker Creek targeted paleo-Hunker Creek gravel overlain by a thick deposit of overburden. In 2018, three cuts were mined, all on the far left limit of Hunker Creek valley. Cut 1 was 9 by 46 m (30 × 151 ft), cut 2 was 15 by 30 m (49 × 98 ft) and cut 3 was unmeasured. Mining continued the following season, with two locations mined. The first cut in 2020 was 45 m^2 (484 ft^2) and the second location downstream was 60 m^2 (646 ft^2).

Equipment and Water Treatment In 2020, the equipment included a Komatsu 300 excavator, a John Deere 200LC excavator, an Hitachi 270 excavator, and a Caterpillar D8 bulldozer. A 1.2 m (4 ft) diameter by 4.8 m (16 ft) long trommel with a ³/₄" screen was used to process 30 yd^3 (27 m^3)/hr. One main sluice run divides concentrate into two 0.6 by 2.4 m (2 × 8 ft) sluice runs configured with expanded metal and Hungarian riffles. An 8 by 6" pump supplied water to the plant and effluent was settled in one settling pond.



Drone image from 2020 of Rodal Placers' cut on Hunker Creek. The cut is 45 m^2 (484 ft^2) and targeted virgin Hunker Creek gravel.



Stratigraphy in 2019, in the cut located mid-to-left limit of Hunker Creek at Rodal Placers operation.

Surficial Geology and Stratigraphy Two placer settings are mined by Rodal Placers. They operate across the Hunker Creek valley from the mouth of 23 Gulch, which is a narrow portion of the drainage, constrained by a bedrock outcrop on the left limit. Historic workings in the area include dredging in 1913 and 1918, and hand mining in the early 1900s. Three tiers of low-level benches on the left limit were mined. The first tier is approximately 2.4 m (8 ft) above the modern creek level, and consists of 1.5 m (5 ft) of pebble-cobble gravel overlain by a wedge shaped unit of colluvium. In 2020, the valley bottom was excavated, beginning with the thick unit of overburden. The overburden, up to 5 m (16 ft) thick consists of dredge slickens, fine dredge tailings and colluvium from the hillside. Gravel situated on bedrock is believed to be virgin Hunker Creek gravel and varies in thickness from 1.2 to 1.5 m (4–5 ft). It is a pebble–cobble gravel that is pervasively oxidized and consists of a medium to coarse sandy matrix.

Bedrock Geology Bedrock is mapped as silvery grey muscovite-chlorite quartz phyllite, micaceous quartzite (Mortensen, 1996).

Gold Characteristics Gold is coarse.

Hunker, a tributary of Klondike

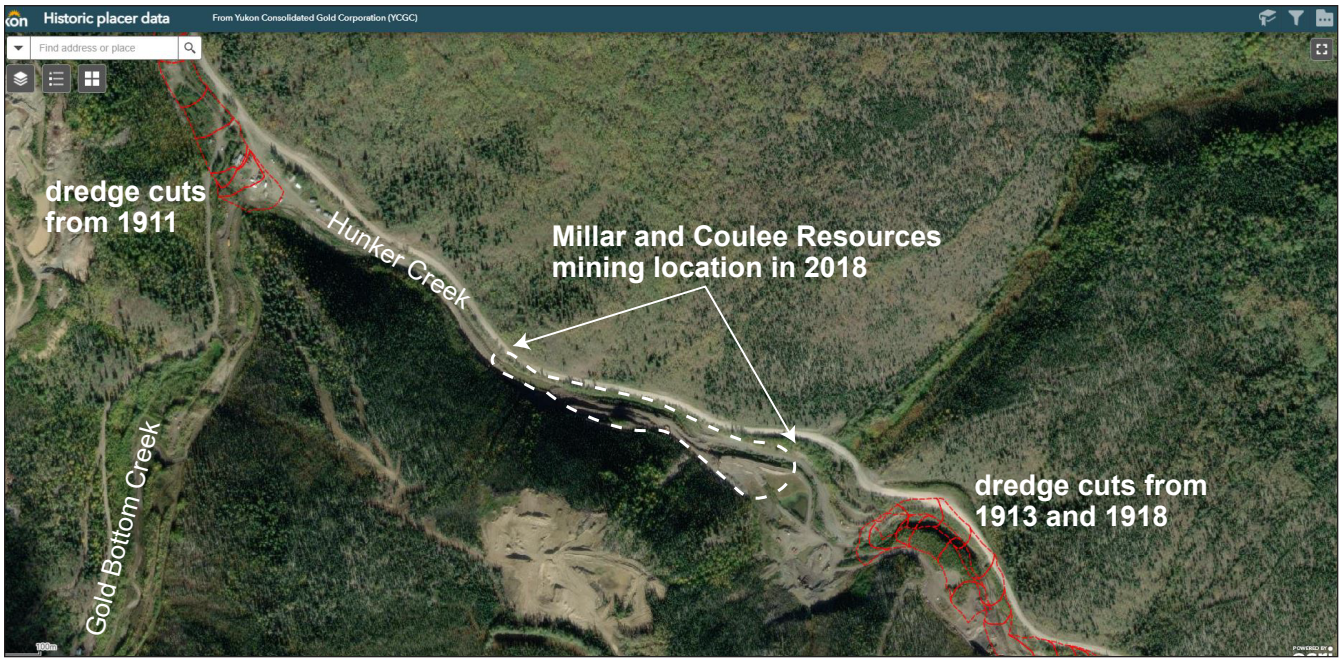
115O/15 2020: 63°57'28"N, 138°56'30"W

Millar, D., 2005–2020

Water License: PM17-075 (Active 04/2028)
Water License: PM07-588 (Expired 04/2018)
Active Producer (2018–2020) **Operation no. 41**

Location Hunker Creek, 0.5 km downstream from 16 Below Pup.

Work History and Mining Cuts In 2018, Mr. Millar and Coulee Resources established a partnership to mine an area immediately upstream from the Gold Bottom Creek confluence. This location is a narrow spot in the Hunker drainage, approximately 800 m long, with a valley bottom width of 35 to 55 m (115–180 ft). Due to the narrow setting, this area was never dredged. Also in 2018, a German television production operated under



A screen shot from the Historic Placer Data web map. Shown here, Millar and Coulee Resources operating location in 2018, in an area that was not historically dredged.

Mr. Millar's water license on Ontario Gulch. With a crew conducting hand mining, they established a collaborative mining operation with Mr. Millar. Operations moved upstream of the narrows in 2019 and 2020. In 2019, all mining occurred on the left limit. In 2020, a three-person crew operating a daily ten hour shift, completed a right limit cut measuring 38 by 189 m (125 × 620 ft).

Also operating under PM17-075 and leasing ground from Mr. Millar is Mr. Aimola. He was active from 2018 to 2020 as a one-person operation on lower Gold Bottom Creek.

Equipment and Water Treatment In 2020, the equipment present included an Hitachi 270 excavator, an Hitachi 300 excavator, a Caterpillar 966C wheel loader, a Caterpillar D9G bulldozer and two Caterpillar D40D articulated rock trucks. Material was sluiced using a 1.5 m (5 ft) diameter trommel, that could process 45 to 50 yd^3 (34–38 m^3)/hr. A single oscillating sluice run is 3 m (10 ft) wide with 1.2 m (4 ft) of hydraulic riffles and 1.2 m (4 ft) of expanded metal. Water is supplied to the plant using a 10 by 12" pump. A 100% recycle system is employed, using one large settling pond measuring 41 by 75 m (136 × 245 ft). Clean-ups are conducted using a long tom, a wheel and final concentrate is tabled in town.

Surficial Geology and Stratigraphy Prominent drainages in the Klondike, like Hunker Creek, have been heavily worked. Robert Henderson first panned on Gold Bottom Creek in summer 1896, and soon thereafter, the development sprung up on Hunker Creek. The Hunker Creek drainage and its tributaries have been hand mined, hydraulic mined, dredged and cat mined. Similar to other operations in the drainage, the Millar's target *in situ* side pay and deposits remaining beneath dredge tailings. In the 2018 mine cut located in the Hunker narrows, the remaining pay gravel consisted of a thin, oxidized, sandy, cobble-pebble gravel overlain by overbank silt. On the left limit, a coarse, slabby colluvium sliding off Delhi Hill needed to be stripped. On the right limit, gravel is overlain by fill from the Hunker Creek road.



Excavating pay in 2020 at the Millar's operation on Hunker Creek. They target deposits that remain beneath dredge tailings and Hunker Creek side pay. The view is looking upstream, towards their wash plant and upper end of claims.

In 2019 and 2020, pockets of *in situ* Hunker Creek gravel buried beneath dredge tailings and modern tailings were mined. A right limit exposure consists of two units: unit 1, from 0 to 1.5 m (0–5 ft) and unit 2, from 1.5 to 7.3 m (5–24 ft). Unit 1 varies from dredge mud, gravel spilled off the dredge buckets and the odd pocket of *in situ* Hunker Creek gravel. The paleo-Hunker Creek deposit is an oxidized pebble–cobble gravel. Unit 2 consists of colluvium and material hauled in to build the Hunker Creek road. All of unit 1, any material with rounded pebble and cobble sized clasts, and up to 0.9 m (3 ft) of bedrock is sluiced.

Bedrock Geology Bedrock is weathered chlorite schist.

Gold Characteristics Hunker Creek gold is rough in appearance, coarse and minimal fines are recovered.

Hunker, a tributary of Klondike

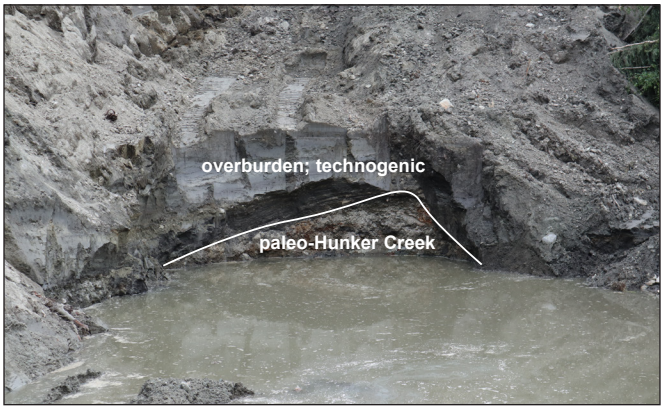
115O/15 2018: 63°57'16"N, 138°55'21"W

Thompson, K., 2007; 2018

Water License: PM15-089 (Active 05/2026)
Active Producer (2018) **Operation no. 42**

Location Hunker Creek, right limit, 140 m downstream from Little Gem Gulch.

Work History and Mining Cuts Mr. Thompson acquired his three Hunker Creek claims and two bench claims in 2007. A drilling and trenching program previously occurred, and his first year sluicing was in 2018. A 40 m (130 ft) long cut was excavated to mine preserved Hunker Creek side pay that escaped cat mining in the early 1980s. As a one-person operation, he sluiced for one week in July.



Right limit Hunker Creek exposure in 2018 at K. Thompson's operation. A wedge of paleo Hunker Creek side pay is visible in the ramp of the cut.

Equipment and Water Treatment In 2018, the equipment used to excavate a cut and sluice material included a Volvo 220 loader, an Hitachi 200 excavator and an Hitachi 450 excavator. A 1.2 by 5.5 m (4 × 18 ft) trommel with a ¾" screen was used to process material. Water was supplied to the plant using a 6" pump and water was 100% recycled.

Surficial Geology and Stratigraphy A section of *in situ*, paleo-Hunker Creek gravel is preserved on the right limit immediately downstream from Little Gem Gulch. Using drilling and trenching to conduct exploration, Mr. Thompson was able to identify its extent. Technogenic tailings, 4.3 m (14 ft) thick overlie the virgin gravel, that is up to 1.2 m (4 ft) thick. The gravel appears to taper off as the cut moves away from the hillside, which could represent the contact between previously cat mined ground and the unworked area. A gold enrichment is noted on the bedrock contact. All *in situ* gravel and up to 0.2 m (0.6 ft) of decomposed bedrock was sluiced.

Bedrock Geology Bedrock is decomposed chlorite-sericite schist, which becomes more competent after a depth of 0.3 m (1 ft).

Gold Characteristics Not reported.

Whiskey Hill, a bench of Hunker

115O/15 2020: 63°57'17"N, 138°54'48"W

Sadek, V., 2013–2020

Water License: PM12-023-1 (Active 05/2022)
Active Producer (2018–2020) **Operation no. 43**

Location Whiskey Hill, a right limit bench of Hunker Creek, located between Little Gem Gulch and Six Below Pup.

Work History and Mining Cuts Hydraulic operations mined on Whiskey Hill in the late 1920s, leaving behind piles of washed tailings and *in situ* gravel remnants. Mr. Sadek, a one-person operation, has explored Whiskey Hill since 2013, and with each season has continued to compile the extensive work history that has occurred on the high-level bench. Operations have occurred both on Whiskey Hill and on Little Gem Gulch on the north facing side of the hill. In 2018 and 2019, historic tailings were processed from the top of the hill. In 2020, a cut exposed virgin gravel on the west-facing side of the hill.

Equipment and Water Treatment In 2020, the equipment present included a Caterpillar 312BL excavator, a Caterpillar 966C wheel loader and a Case 480E backhoe. A screen deck with a ⅜" screen was used to process material until 2020, when a new plant was fabricated. A double screen shaker plant measuring 1 by 2 m (3 × 6 ft) was used to process up to 35 yd^3 (27 m^3)/hr. Clean-ups were conducted using a long tom with Goldhog matting, and final concentrate is tabled.

Surficial Geology and Stratigraphy Deposits on Whiskey Hill include the historic hydraulic tailings, and pillars of *in situ* gravel that remain between shafts and trenches. Up to 0.6 to 0.9 m (2–3 ft) of the oxidized gravel situated on bedrock, and up to 0.3 m (1 ft) of bedrock is sluiced.

Bedrock Geology Bedrock is decomposed quartz-mica schist.

Gold Characteristics Gold from virgin ground is all fine, while gold recovered from tailings has a small coarse component. All gold is bright and the fineness is 835.



Mr. Haijema's operation in 2019 on Hunker Creek.

mining *in situ* Hunker Creek side pay can be economic. Additional targets include reprocessing cat push tailings from historic operations, as their processing methods and excavating techniques could be inefficient.

Bedrock Geology Bedrock is mapped as quartz-mica schist (Gordey and Ryan, 2005).

Gold Characteristics Not reported.

Hunker, a tributary of Klondike

115O/15 2019: 63°56'42"N, 138°53'55"W

Haijema, J., 2018–2019

Water License: PM19-061 (Active 04/2030)
Active Producer (2019) **Operation no. 44**

Location Hunker Creek, 0.9 km downstream from Mint Gulch.

Work History and Mining Cuts Mr. Haijema purchased the claims in 2018 from Mr. Hawker. Mr. Hawker acquired the claims from long time Hunker Creek miner, J. Erickson who originally staked them in 1974. Mr. Erickson's first season of mining on Hunker Creek was 1973, and continued for over four decades. He is missed for his friendly smile and rich wealth of knowledge.

Equipment and Water Treatment In 2019, the equipment at site included a Caterpillar 235 excavator, a Caterpillar D9G bulldozer and a trommel.

Surficial Geology and Stratigraphy The middle section of Hunker Creek valley has been thoroughly excavated, leaving behind *in situ* side pay on both limits of the drainage. Likely to be variable preserved,

Mint, a tributary of Hunker

115O/15 2019: 63°55'53"N, 138°54'43"W

535584 Yukon Inc., 2015–2020

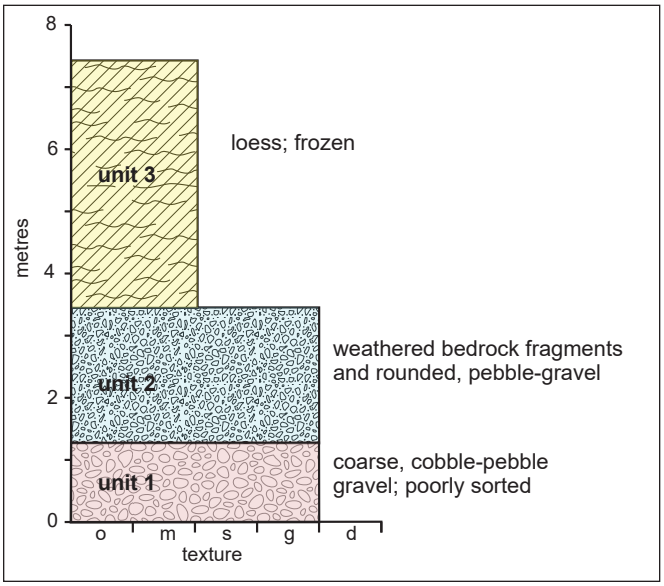
Water License: PM13-033-2 (Active 08/2023)
Active Producer (2018–2020) **Operation no. 45**

Location Mint Pup, approximately 900 m from its confluence with Hunker Creek.

Work History and Mining Cuts Mint Pup was heavily worked in the early 1900s, and evidence of these workings are frequently uncovered. Despite the drainage being heavily shafted and drifted, and mined in the early 1990s, it is a gulch that continues to produce gold. 535584 Yukon Inc. has been mining on Mint Pup and on the Hunker Creek valley bottom since 2015. In 2018, only stripping occurred on Mint Pup, with mining re-initiating in the Hunker Creek valley bottom. In 2019 and 2020, all activity occurred on Mint Pup, beginning 500 m upstream from its confluence with Hunker Creek. A monitoring program in the beginning of each season was completed to thaw the frozen black muck overlying Mint Pup gravel, as the two operators progressively mined upstream. Each season, between 4500 and 5500 yd^3 (3440–4205 m^3) of material was sluiced.

Equipment and Water Treatment Equipment on site included an Hitachi EX450LCH excavator for removing overburden and excavating pay, an Hitachi EX200 excavator to feed the plant, a Caterpillar 740 rock truck to haul material to the sluice location and two water monitors. A custom fabricated shaker screen deck wash was used to process material at 40 yd^3 (30 m^3)/hr. The plant has two sluice runs, each 2.4 by 2.4 m (8 × 8 ft), and consists of expanded metal. Water was supplied to the plant using a 10 by 6" pump and water was acquired from Hunker Creek and settled in the Hunker valley. A large settling pond in the Hunker Creek valley is used to settle effluent. Clean-ups were conducted with a long tom.

Surficial Geology and Stratigraphy Mint Pup is steep and narrow; only 17 m (56 ft) wide at the mining location in 2019. Stratigraphy consists of three units, with unit 1 considered pay. Unit 1, from 0 to 1.3 m (0–4.3 ft) is a high energy, poorly sorted cobble-



Stratigraphy in 2020 at the Hawker's cut on Mint Pup.



535584 Yukon Inc.'s operation on Mint Pup in 2019. Each season the Hawker's continue to move upstream, first thawing the thick unit of frozen black muck using a water monitor.

pebble gravel. Clasts are predominately cobbled sized (60–70%) and only 10% are rounded. Remaining clasts are subangular to angular, and largely consist of angular bedrock fragments. It is matrix supported, with a fine to medium sand and silt composition, up to 30–40%. Unit 2, from 1.3 to 3.5 m (4.3–11.5 ft) is weathered bedrock fragments and rounded pebble-gravel. Unit 3, from 3.5 to 7.5 m (11.5–24.6 ft) is frozen black muck (loess) with organics. Massive ice, from 10 to 15% is present throughout the unit. Sluiced material consists of all of unit 1 and up to 0.3 m (1 ft) of bedrock. The pay channel favors the right limit or base of the north-facing slope.

Bedrock Geology Bedrock varies from decomposed to slabby, micaceous schist.

Gold Characteristics Gold is mostly coarse with the largest nugget recovered weighing ⅓ oz. Fineness ranges from 820 to 850.

24 Pup, a tributary of Hunker

115O/15 2019: 63°54'42"N, 138°54'20"W

Ahnert, G. and E., 1978–2019

Water License: PM15-081 (Active 02/2026)
Active Producer (2018–2019) **Operation no. 46**

Location 24 Pup (locally known as No Bottom Gulch), a left limit tributary of the right fork of Hunker Creek.

Work History and Mining Cuts The Ahnert's have spent close to five decades on 24 Pup, conducting mining activities by hand. Two days of sluicing occurred in 2018 and 2019, and no activity occurred in 2020.

Equipment and Water Treatment The Ahnert's mine by hand and process material over a 7.3 m (24 ft) long by 0.3 m (1 ft) wide long tom. Water from the ground-sluicing operation flows onto a fluvial fan and dissipates into the subsurface prior to reaching upper Hunker Creek.

Surficial Geology and Stratigraphy The stratigraphic sections on 24 Pup consisted of 0.6 to 1 m (2.0–3.2 ft) of poorly sorted cobble-pebble gravel that is overlain by up to 3.0 m (10 ft) of loess containing some rock fragments. The gravel unit contains small boulders of quartzite and vein quartz. All gravel was sluiced.

Bedrock Geology Bedrock varies from weathered quartz-muscovite-calcite schist to blocky quartzite.

Gold Characteristics Three types of gold are recovered from 24 Pup—nuggets, dendritic gold, and very fine gold. The gold fineness is 845.



A photo of Mr. Ahnert in 2015, hand mining on 24 Pup.

Hunker, a tributary of Klondike

115O/15 2020: 63°54'28"N, 138°54'04"W

Hunter, T. and B. Lammers, 2015–2020

Water License: PM16-075 (Active 03/2027)
Active Producer (2018–2020) **Operation no. 47**

Location Hunker Creek, right fork, 920 m upstream from its confluence with left fork.

Work History and Mining Cuts Mr. Hunter and Mr. Lammers each own a claim on the left fork of Hunker Creek. In 2018, a cut on the left limit was processed. In 2019, the two-person operation completed a 20 by 30 m cut on the left limit of their bottom claim (P 45550). They sluiced for a total of 21 days. Activity occurred on site in 2020 but specific work history is unknown.

Equipment and Water Treatment The equipment present in 2019 included a 20 ton excavator, a CanDig mini excavator, a front-end loader and a Caterpillar D6 bulldozer. A 0.6 m (2 ft) diameter trommel was used to process up to 20 yd^3 (15 m^3)/hr. A 3" trash pump delivered water to the plant and effluent was settled in a series of two ponds. Clean-ups were conducted using a pan and small long tom.

Surficial Geology and Stratigraphy Not reported.

Bedrock Geology Bedrock is mapped as silvery grey muscovite-chlorite quartz phyllite and micaceous quartzite (Mortensen, 1996).

Gold Characteristics Gold is coarse.



Mr. Hunter and Mr. Lammers' active operation on right fork Hunker Creek in 2020. (Photo credit: Brian Naef).

Right fork of Hunker, a tributary of Klondike

115O/15 2020: 63°53'58"N, 138°55'36"W

George, M. and L., 1997–2017, 2019–2020

Water License: PM15-025 (Active 06/2025)
Active Producer (2019–2020) **Operation no. 48**

Location Hunker Creek, right fork, at the mouth of 36 Pup.

Work History and Mining Cuts Sluicing occurred at M. and L. George's operation in 2019 and 2020. In 2019, they were active on their lowermost claim (P 00796) and sluiced for a total of 11 hours. An additional 230 m^3 of material was stockpiled for sluicing in 2020. Activities continued at the same location in 2020, with 20 days spent sluicing between 2 and 4 hours per day.

Equipment and Water Treatment Equipment includes an International wheel loader backhoe with a ¼ yd^3 bucket and a trommel. The trommel fed a 2" screen over 4.2 m (14 ft) wide by 1.2 m (4 ft) long sluice runs that are lined with a boil box and expanded metal. Water is supplied to the plant using a 3" pump and was 100% recycled.

Surficial Geology and Stratigraphy Not reported.

Bedrock Geology Bedrock is decomposed muscovite-calcite schist.

Gold Characteristics Gold is coarse and flakey with no nuggets. Fineness ranges from 780 to 800.

Hunker, a tributary of Klondike

115O/15 2020: 63°53'25"N, 138°55'26"W

Brong, R. and E. Dotzler, 2012–2020

Water License: PM20-038 (Active 05/2031)
Water License: PM10-069-1 (Expired 05/2021)
Active Producer (2018–2020) **Operation no. 49**

Location Hunker Creek, right fork, 95 m upstream from its confluence with left fork.

Work History and Mining Cuts From 2018 to 2020, Mr. Brong and Ms. Dotzler continued mining their claims on upper left fork of Hunker Creek. Hours were spent each season sluicing material: 156 hours in 2018, 90 hours in 2019 and 147 hours in 2020.

Equipment and Water Treatment Equipment included a Caterpillar 910 loader to excavate gravel and Kubota KX080-3 excavator to feed the wash plant. Pay is hauled from the cut to the wash plant, located close to camp. The plant is a 0.6 m (2 ft) diameter trommel, with a hopper and grizzly over a single sluice run 0.6 by



Mr. Brong and Ms. Dotzler's operation on the right fork of Hunker Creek. The view is looking upstream. (Photo credit: Brian Naef).

2.4 m (2 × 8 ft), consisting of all expanded metal. Water is supplied to the plant using a 3" pump, allowing the trommel to process 10 yd^3 (8 m^3)/hr. Water was 100% recycled in a series of four ponds and no discharge occurred. A pan and wheel were used for clean-ups.

Surficial Geology and Stratigraphy The right fork of Hunker Creek is narrow and has steep hillsides. An abundance of old-timer workings are present in the drainage (shafts, tailings, flume and drainage ditch) and therefore it was likely heavily worked by earlier miners. There is evidence that open-cut mining has occurred in the valley center whereas the side pay on either limits was mined using shafts and drifts. The stratigraphic section consists of anthropogenic material, which is represented by the very poorly sorted gravel. Gravel thickness ranges from 0.6 to 1.8 m (2–6 ft) throughout the drainage. It is predominately clast supported and clasts range from subround to subangular. Large boulders are present, comprising up to 10% of the gravel, and are as large as 0.7 m (2.3 ft) in diameter. Ground was stripped by the previous owner, so no overburden is present for the operators to remove. All gravel and up to 0.6 m (2 ft) of bedrock was sluiced.

Bedrock Geology Bedrock is blocky quartz-rich muscovite-schist.

Gold Characteristics Two different types of gold are present on the upper right fork of Hunker Creek: one is more weathered than the other. The fineness is 805.

Goring, a tributary of Klondike

116B/02 2020: 64°00'17"N, 138°53'49"W

Big Valley Mining, 2007–2020

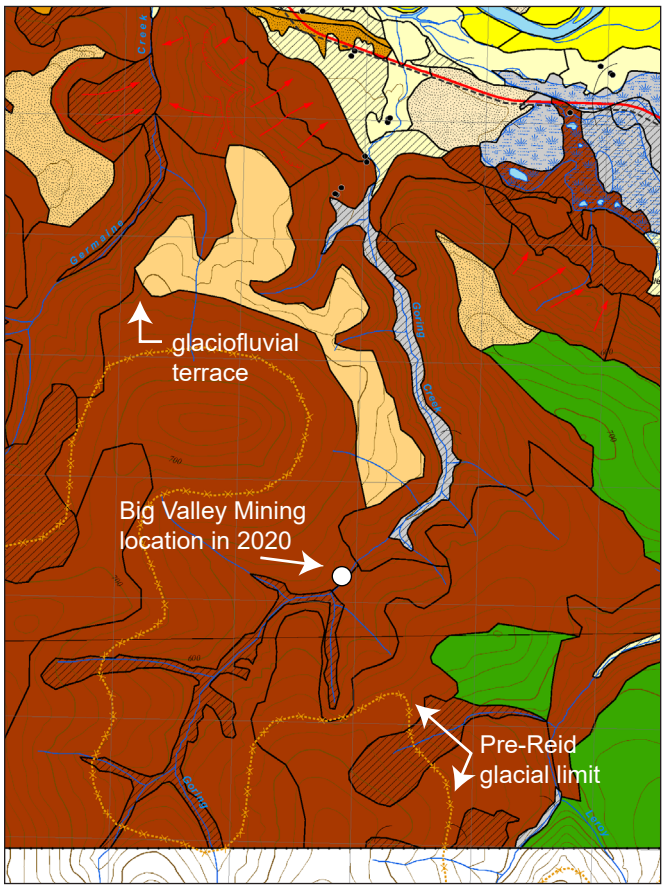
Water License: PM13-056-1 (Active 04/2024)
Active Producer (2018–2020) **Operation no. 50**

Location Goring Creek, 5.3 km upstream from its confluence with the Klondike River.

Work History and Mining Cuts Big Valley Mining, operating as a small family operation, completed minimal work in 2018 and no work history is known for 2019. In 2020, a drift on bedrock was conducted to sample the bedrock and gravel interface. A cut was also made on the bench, consisting of 1.2 m (4 ft) of mud overlying gravel.

Equipment and Water Treatment Equipment in 2020 included a Hough 65 payloader and a track loader to excavate gravel and transport pay to the plant, and a Caterpillar D9G bulldozer for overburden removal. A (4 × 16 ft) trommel is used to process material 30 to 40 yd^3 (23–31 m^3)/hr. A shaker deck with a 40 yd^3 (31 m^3)/hr capacity was being fabricated to be utilized in 2021. Water was supplied to the operation using a 12 by 10" pump powered by a GM diesel engine. A long tom was used for clean-ups.

Surficial Geology and Stratigraphy Goring Creek is situated in glaciated terrain, with the assumed pre-Reid (early Pleistocene) limit situated in the drainage. This means that glacial deposits are present, and the largest landform is a pre-Reid glaciofluvial terrace on the left limit. This intermediate terrace deposit, approximately 53 m (175 ft) above the modern creek level, is covered by a blanket of organic material. As ice advanced from the Ogilvie Mountains and into the Klondike River valley, this landform, along with moraines, marked the event. A publication pertaining to the surficial geology in the Dawson Region is available in Open File 2014-12 by McKenna and Lipovsky (2014).



Surficial geology map of Goring Creek area (McKenna and Lipovsky, 2014). The location where Big Valley Mining operated in 2020 is marked with a white circle.

Bedrock Geology Bedrock is mapped as quartzite and quartz-rich muscovite-schist (Mortensen, unpublished).

Gold Characteristics Nuggets weighing 1 g are common, with the largest recovered being 10.4 g.

Allgold, a tributary of Flat

115O/15 2020: 63°56'26"N, 138°37'13"W

Henry Gulch Explorations, 2013, 2016–2017, 2019–2020

Water License: PM15-024 (Active 07/2025)
Active Producer (2019–2020) **Operation no. 51**

Location Allgold Creek, 0.4 km upstream from its confluence with Flat Creek.

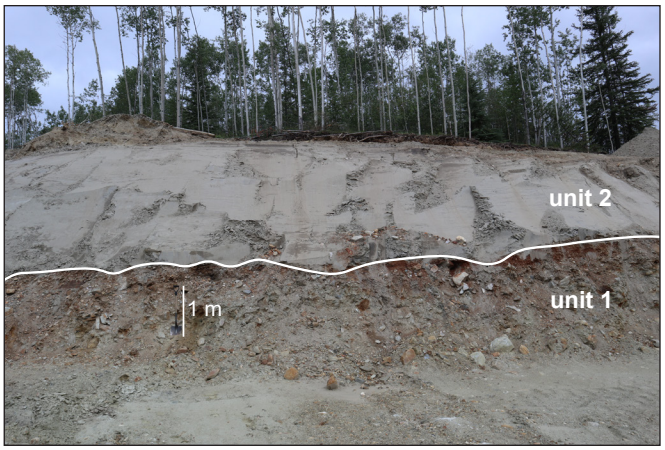
Work History and Mining Cuts Henry Gulch Explorations mined on lower Allgold Creek in 2019 and 2020. They focused excavating a low-level bench on the left limit and in the valley bottom. In 2019, 461 hours were spent sluicing from the valley bottom. In 2020, a cut 30 by 114 m (100 × 375 ft) was completed and 125 hours were spent sluicing. Extensive reclamation occurred on lower Allgold Creek; the ground was contoured into low-relief piles covered with organics.

Equipment and Water Treatment Equipment at site included an Hitachi EX200LC excavator, two Volvo L220E wheel loaders, a Caterpillar D9H bulldozer, and two Caterpillar rock trucks—a D400E and D350. The wash plant consisted of a two-deck screener that classifies to ½" minus over expanded metal and mats. Sluice runs included boil boxes and hydraulic riffles. Clean-ups were conducted with a long tom over a two-cell jig and a 3" wheel for fines.

Surficial Geology and Stratigraphy Stratigraphy of the bench in 2020 consisted of two units. Unit 1, from 0 to 2.2 m (0–7.2 ft) is a fluvial deposit, and unit 2, from 2.2 to 6.1 m (7.2–20 ft) is overburden. A mixing zone between bedrock and unit 1 is present in areas where bedrock is more competent, as angular cobble-sized slabs have been reworked into the lower



Henry Gulch Explorations operation in 2020, looking down Allgold Creek into the Flat Creek valley. The low-level bench mined on the left limit is shown in the dashed white line.



Stratigraphy in 2020 of the low-level bench mined by Henry Gulch Explorations. Shovel for scale is 1 m (3.3 ft).

0.3 m (1 ft) of gravel. Unit 1 is a cobble–pebble gravel with 40% cobbles and 60% pebbles. The gravel is matrix-supported with subrounded clasts that are weakly imbricated downstream. Open work structures are present near the top of the unit. Unit 2 consists of bedded silt and sand with ~10% clast enrichment in the upper 2 m (6.5 ft) of the unit.

Bedrock Geology Bedrock is weathered muscovite schist, and in some areas has been completely weathered to sand.

Gold Characteristics Gold is flat, smooth and chunky, and has a fineness of 840 to 850.

Allgold, a tributary of Flat

115O/15 2019: 63°54'06"N, 138°45'57"W

Dulac Mining, 2012–2019

Water License: PM14-062 (Active 05/2025)
Active Producer (2018–2019) **Operation no. 52**

Location Allgold Creek, upper, immediately downstream from Alexander Pup.

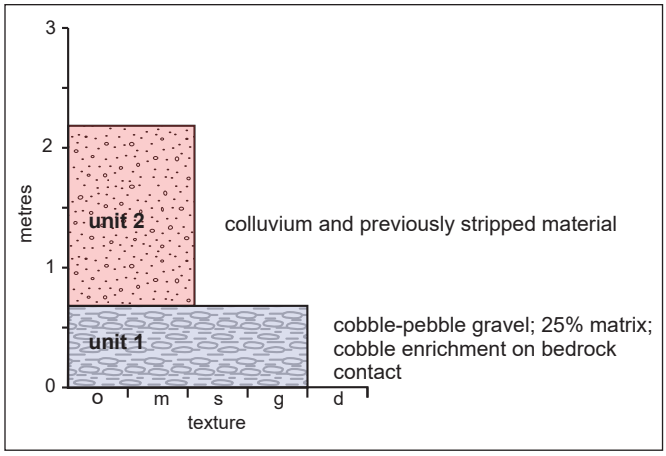
Work History and Mining Cuts A one-person operation mined immediately downstream from Alexander Pup in 2018 and 2019. They targeted an intermediate bench, on the left limit of the drainage. A total of 132 hours was spent sluicing in 2018.

Equipment and Water Treatment In 2018, the equipment on site included a Hitachi EX200 excavator, a John Deere 450B bulldozer and a screen deck. The screen deck has a single sluice run 0.4 by 4.6 m (1.4 × 15.0 ft) and consists of punch plate, expanded metal and angle iron. A mini screen deck and a wheel were used for clean-ups.

Surficial Geology and Stratigraphy The stratigraphy of the left limit intermediate-level consists of two units. Unit 1, from 0 to 0.7 m (0–2.3 ft) is a cobble–pebble gravel with 60% pebbles and 40% cobbles. It has a 25% matrix consisting of medium sand. The gravel is matrix supported with subrounded clasts and subangular bedrock schist fragments incorporated throughout. A cobble enrichment is present on the undulating bedrock contact and the most economic pay is deposited in the bedrock undulations and in the more coarse gravel situated on bedrock. Unit 2, from 0.7 to 2.2 m (2.3–5 ft) consists of colluvium and stripping piles from historic operators that were once active in the valley bottom. Up to 0.6 m (2 ft) of bedrock and all gravel was sluiced.

Bedrock Geology Bedrock is a soft, brown schist.

Gold Characteristics Placer gold from the bench is 20% >8 mesh, 50% between 8 and 16 mesh, 15% between 16 and 30 mesh and 15% <30 mesh. The gold is described as oatmeal shaped and is very similar to the gold recovered from mining in the valley bottom. The fineness is 880.



Stratigraphy of the left limit Allgold intermediate bench, directly downstream from Alexander Pup.

Leotta, a tributary of Klondike

115O/15 2020: 63°58'22"N, 138°44'16"W

Brown, D. and T. Brown, 2018–2020

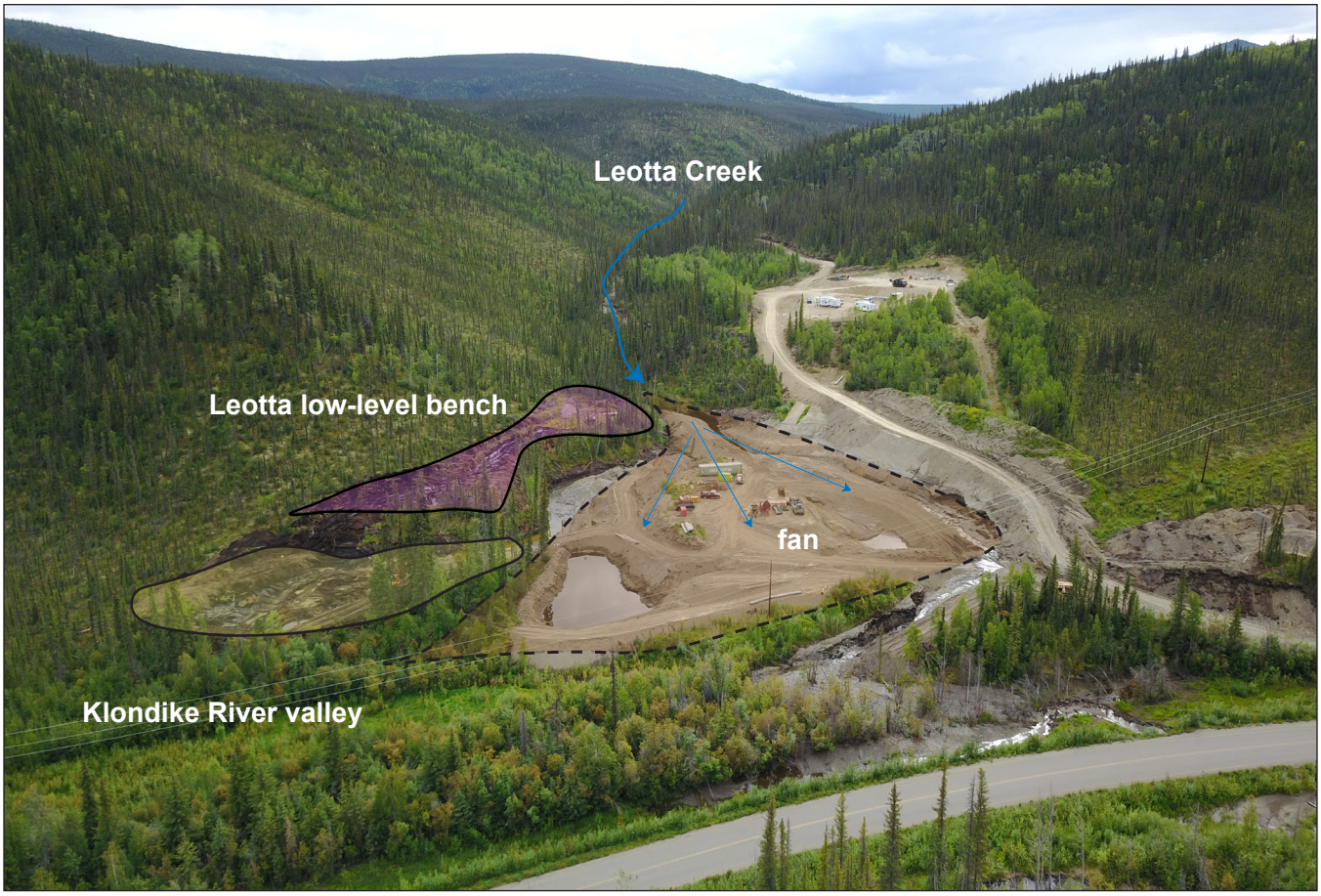
Water License: PM13-017-1 (Active 07/2023)
Active Producer (2018–2020) **Operation no. 53**

Location Leotta Creek, 350 m upstream from its confluence with Klondike River.

Work History and Mining Cuts The Browns have been active on Leotta Creek since 2018, mining at the mouth of the drainage. In 2018, 176 hours were spent sluicing and in 2019 it was 572 hours. The two-person operation mined two placer settings in 2020, a Klondike River valley cut and a low-level Leotta Creek bench. The first cut, 22 by 50 m (73 × 164 ft) was located in the modern Klondike River valley, slightly upstream from where Leotta Creek flows into the Klondike River. The second cut was on a small remnant bench, on the right limit of Leotta Creek that has been largely reworked by the Klondike River. The bench is perched approximately 6 m (20 ft) off the bedrock surface of the Klondike River valley.

Equipment and Water Treatment In 2020, equipment located on site included an Hitachi 330LC excavator, a John Deere 50D mini excavator and a Caterpillar D8 bulldozer. A custom fabricated gravity screen deck, 2.4 m (8 ft) wide by 6.1 m (20 ft) long was used to process material up to 90 yd^3 (69 m^3)/hr. The punch plate varies ½" to ¾" to 1" and concentrate is fed into a primary 0.6 by 4.9 m (2 × 16 ft) run, followed by a secondary 0.9 by 3. 0 m (3 × 10 ft) run. The primary run consists of expanded metal and the secondary run consists of a slick plate and vortex matting on the lower half. Water was supplied to the plant using a 6" pump and water was 100% recirculated. Clean-ups were conducted using a long tom and pans.

Surficial Geology and Stratigraphy Stratigraphy in the Klondike River valley, on lower Leotta Creek consists for Klondike outwash gravel and locally derived Leotta Creek gravel. A fluvial fan deposit has built out of the Leotta Creek drainage, incising into the left limit valley margin of the Klondike River valley. This has established a mixed fan deposit and has been variably reworked by the Klondike River. Sections of



Drone image from 2020 at the mouth of Leotta Creek. Outlined in solid lines are the cut locations from 2020, and the dashed line outlines the variably reworked Leotta Creek fluvial fan.

the fan is Leotta Creek gravel, and on the margin of the fan, Klondike River gravel has been incorporated. The presence of clasts of foreign lithology, like chert, indicate a reworked version of the Klondike outwash gravel. Overburden thickness varies, as muck thickness increases toward the valley margins.

Bedrock Geology Bedrock is undulating, weathered chlorite schist.

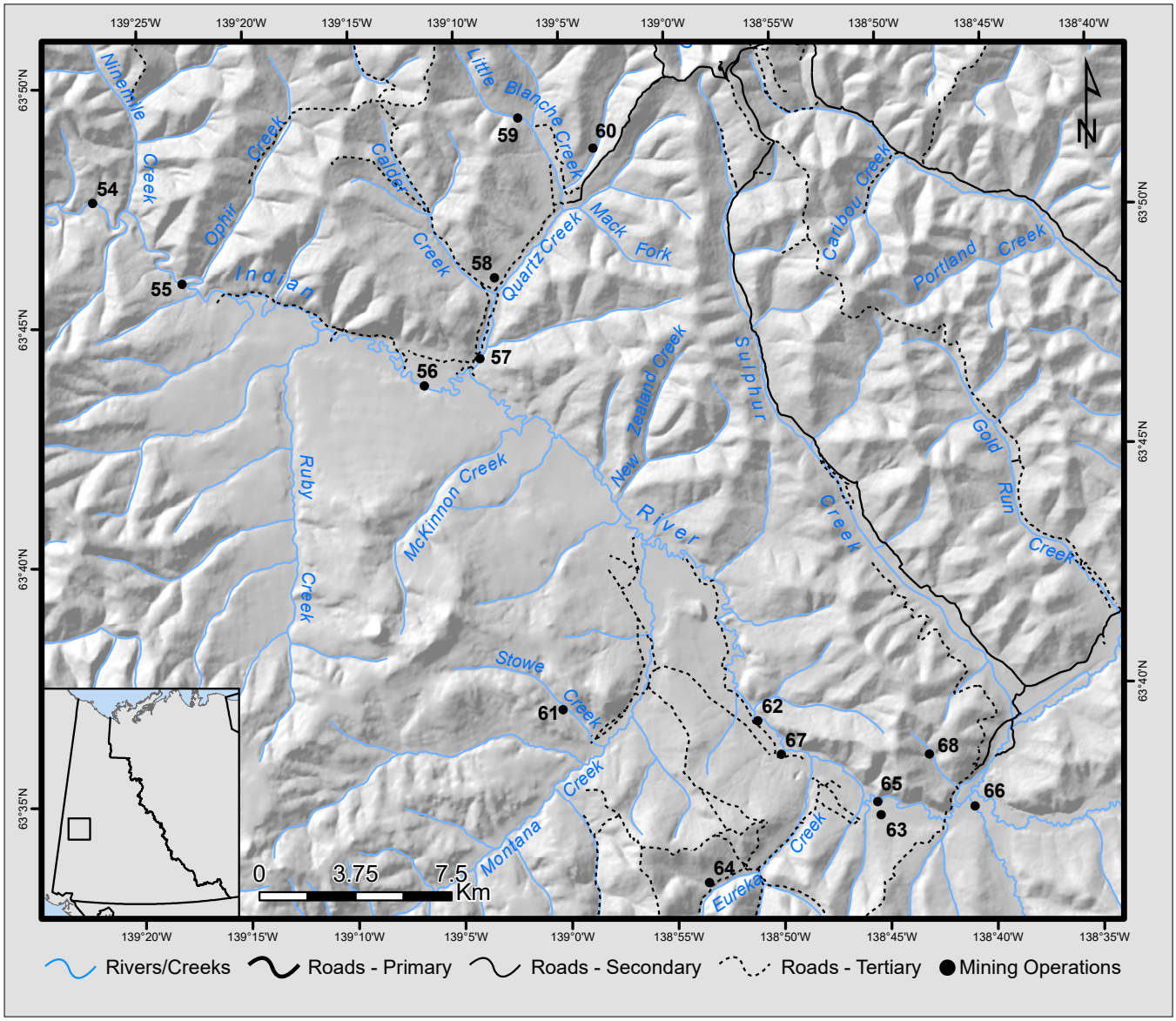
Gold Characteristics Gold is mostly fine and fineness is 820.



Klondike River valley cut being stripped in July 2020 at the Brown's operation.

INDIAN
PLACER AREA

SITES 54–68



LEGEND

54. Slate River Mining
55. DNS Gold-Wash Canada Inc.
56. Northern Exposures Inc.
57. McNeil, G.
58. Schmidt Mining Corp.
59. Sight Unseen Mining Company
60. Canyon Creek Mining
61. CTS Earthwork Ltd.
62. Tamarack Inc.
63. Fine Gold Resources Ltd.
64. Treadstone Services
65. Alluvium Gold Mining Inc.
66. Lonesome Dove Mining
67. Little Flake Mining ULC
68. Lakeland Vegetation Management Ltd Yukon Division

Indian, a tributary of Yukon

115O/14 2020: 63°47'45"N, 139°26'12"W
115O/14 2018: 63°47'44"N, 139°26'38"W

Slate River Mining, 1994–2020

Water License: PM14-047 (Active 06/2025)
Active Producer (2018–2020) **Operation no. 54**

Location Indian River, 2.5 km downstream from the mouth of Ninemile Creek.

Work History and Mining Cuts Two miners worked daily twelve-hour shifts. The McBurneys typically sluice between 50,000 and 100,000 yd^3 (38 228–76 455 m^3) per season. In 2018, an intermediate-level bench was targeted on the right limit of the Indian River. Production from the bench is not complete, however it has been stripped to facilitate thaw. In 2019, mining focused on a left limit point bar of the Indian River where a 1 km long cut ranging between 32 and 73 m (35–80 yd) in width was mined. In 2020, a second strip was mined on the left limit point bar cut before finishing the season on the opposite bank near the mouth of a small tributary and access road.

Equipment and Water Treatment Equipment includes a Caterpillar D9G bulldozer with u-blade and ripper used primarily for stripping trees and organics down to the silt layers, and for leveling tailings and reclamation. Excavators employed for stripping and digging pay include an Hitachi ZX200, an Hitachi EX200-3, an Hitachi EX200-1, and an Hitachi 450. Transport of stripped material is accomplished using a 30 m (100 ft) conveyor with a 0.9 m (3 ft) wide belt mounted on a 20-ton excavator. A second conveyor measuring 40 m (130 ft) in length and mounted on a 450 excavator was added. A John Deere 400 rock truck is used for hauling stripped material and pay, and a John Deere excavator is used for tailings. The wash plant consists of a 2.4 by 2.4 m (8 × 8 ft) wet hopper feeding a New Zealand style trommel measuring 1.5 by 6.1 m (5 × 20 ft) with a mobile, self-powered, 12.2 m (40 ft) tailings conveyor. The trommel classifies to ⅜" and the plant is mounted on 20-ton excavator tracks. Two sluice runs are mounted on either side of the trommel and consist of two sections. The upper section is 0.6 m (2 ft) wide and 1.8 m (6 ft) long and contains angle iron riffles. The sluice runs flare to a 1.8 by 1.8 m (6 × 6 ft) lower section containing hydraulic riffles. Water for the



A view of Slate River Mining's Indian River operation in 2020. Their in-cut style processing is very efficient, well suited to shallow deposits, and facilitates excellent reclamation.

plant is obtained from the Indian River using an 8 by 6" Cornell pump powered by an Isuzu engine. The plant processed 100 loose yd^3 (76 m^3)/hr and effluent was settled out-of-stream. Clean-ups were completed with a long tom and gold wheel. Exploration is completed using an 8" Nodwell auger.

Surficial Geology and Stratigraphy Mining on the right limit, intermediate-level bench exposed 2.5 m (8 ft) of gravel that is overlain by 3 m (10 ft) of loess. The loess thickness increases into the bank and an old-timer production shaft is anticipated in the next cut. Mining of the bench was challenging due to poor drainage conditions associated with the bedrock slope. As a result material had to be transported off the bench and processed at river level.

Placer mining on the point bar setting (flat) is conducted systematically using conveyors for stripping overburden and in-cut processing to extract placer gold. This method is ideally suited for shallow ground and significantly reduces mining costs. A two-person crew is capable of processing a 1 km (3280 ft) long by 50 m (164 ft) wide cut in one season (100,000 yd^3/76 455 m^3), which is likely the most for any two-person crew in Yukon. This style of mining, where material transport is minimized, is also ideally suited for reclamation and closure of the mine site. After conveyor stripping is completed, the target sluice section consists of two gravel units and a portion of bedrock. At the 2020 cut, 1 m (3 ft) of grey blocky quartzite bedrock, 0.4 m (1.3 ft) of muddy, poorly sorted gravel on the bedrock contact and 0.6 m (2 ft) of coarse, moderately sorted, sandy gravel was processed.



A close-up view of the sluice section targeted by Slate River Mining on their lower Indian River property. Approximately 1 m (3 ft) of bedrock and 1 m (3 ft) of gravel is processed for placer gold.

The silty gravel unit on bedrock is remnant from a flood event that eroded to the bedrock surface and reworked pre-existing placer gold.

Bedrock Geology Bedrock varies from soft and decomposed to hard and blocky schist and quartzite.

Gold Characteristics Gold is mostly fine, flakey, and flat with a fineness of 810.

Indian, a tributary of Yukon

115O/14 2018: 63°46'16"N, 139°21'33"W

DNS Gold-Wash Canada Inc., 2014–2018

Water License: PM11-002-3 (Expired 07/2021)
Active Producer (2018) **Operation no. 55**

Location Indian River, 820 m downstream from mouth of Ophir Creek.

Work History and Mining Cuts A two-person operation was active on the right limit of the Indian River valley in 2018, and mined a cut 25 by 28 m (82 × 92 ft). Later in the season, an additional cut was stripped and mined. No work history is known for 2019 or 2020.

Equipment and Water Treatment Equipment present on site in 2018 included a Caterpillar D4G bulldozer and a Caterpillar 312C excavator. A small trommel wash plant is utilized for processing the gravel.



The wash plant utilized at DNS Gold-Wash Canada's mine on an Indian River bench.

Surficial Geology and Stratigraphy Mining occurs on a narrow bench of the Indian River. The slate bedrock surface undulates by up to 1 m (3 ft). Total gravel thickness on the bench is 3.5 m (11.5 ft) and mostly consists of a well-sorted pebbly gravel with localized cobbles and boulders. Coarser gravel beds are not necessarily confined to the bedrock surface, however the upper 1.5 m (5 ft) does become finer with mostly sand and minor pebbly lenses. Clasts within the gravel resemble the Klondike wash with abundant subround to rounded chert and quartzite present. Some local vein quartz is also present in the gravel. This gravel is likely associated with glaciofluvial (meltwater) drainage down the Indian River during an early Pleistocene glaciation, as confirmed by the presence of chert pebbles that are not derived from the basin. An intermittent to patchy, quartz-pebble-rich gravel is present on the bedrock surface and appears preserved in the lee of a bedrock ridge. The matrix within the white gravel is dominantly quartz sand with minor silt. No chert is present within the white gravel and it is less than 20 cm in thickness where exposed in the 2018 cut. This gravel may represent a remnant portion of the Pliocene gravel (White Channel gravel equivalent) that formerly blanketed the valley bottom prior to meltwater erosion and deposition. Variable reworking of the white gravel has occurred since the onset of the Pleistocene glaciations 2.6 million years ago, which included the meltwater flow down the drainage and regional base-level change causing incision and abandonment of the Pliocene surface.

Bedrock Geology Bedrock is fractured slate. Undulations up to 2.5 m (8.2 ft) are present in the bedrock surface.

Gold Characteristics Not reported.



A cut exposed at DNS Gold-Wash Canada's mine on an Indian River bench in 2018. A quartz-rich gravel is exposed at the base of the cut that differs from the overlying, oxidized material. This is interpreted as a remnant Pliocene (White Channel gravel-equivalent) gravel that is reworked and overlain by outwash gravel from an early Pleistocene glaciation.

Indian, a tributary of Yukon

115O/11 2020: 63°44'41"N, 139°09'35"W
115O/11 2019: 63°44'26"N, 139°07'32"W
115O/11 2018: 63°45'04"N, 139°11'16"W

Northern Exposures Inc., 2009–2020

Water License: PM15-062 (Active 06/2026)
Active Producer (2018–2020) **Operation no. 56**

Location Indian River, 4.1 km downstream from McKinnon Creek.

Work History and Mining Cuts In 2018, mining focused on virgin ground remaining in previously disturbed areas. Four cuts were mined with one of them measuring 76 by 305 m (250 × 1000 ft). In 2019, a cut on the left limit, 560 m upstream from Quartz Creek was mined by a 10-person crew. Mining in 2020 occurred downstream from the 2019 cut, approximately 4.1 km downstream from McKinnon Creek. A crew of 12 people operating 24/7 completed two cuts: one 24 by 213 m (80 × 700 ft) and the other 30 by 283 m (100 × 930 ft), both on the left limit of the valley. Substantial reclamation was completed in 2020, with mining cuts contoured and topped with organics, as well as recontouring historic tailings from the 1990s.

Equipment and Water Treatment In 2020, equipment located on site included two Caterpillar D9L bulldozers used for stripping and pushing pay towards the plant. An Hyundai excavator, Komatsu PC490LC excavator and a Komatsu PC750LC excavator are used for feeding the plant and removing tailings. Two Caterpillar 9L rock trucks are used to haul overburden and deliver material to the plant. A 15 yd Elrus feeder supplied material to the screen deck which processed up to 150 yd^3 (115 m^3)/hr.

Surficial Geology and Stratigraphy Historic air photos of varying vintages were compiled to conduct desktop exploration to identify unmined areas in the Indian River valley below Quartz Creek. With substantial mining activity occurring throughout the valley, it can be challenging to determine areas with *in situ* virgin gravel.



Drone image from 2020 at Northern Exposure Inc.'s operation. The view is looking downstream Indian River valley and cuts are outlined by dashed white line.



Stratigraphy on the far left limit cut exposing two units in 2020. Shovel for scale is 1 m (3.3 ft).

One specific area targeted in 2020 was the far left limit, 4.1 km downstream from McKinnon Creek, where the operator exposed a section consisting of paleo-Indian River or a paleo-side channel. Stratigraphy in the cut consists of two units. Unit 1, from 0 to 2.1 m (0–7 ft), is a high energy, coarse gravel. The clast composition includes 5% boulders, 60% cobbles and 35% pebbles, and vary from subangular to subround. Contributions of large cobbles and boulders are likely being contributed from the hillside or being reworked from a nearby bedrock outcrop. Unit 2, from 2.1 to 3.7 m (7–12 ft) is a pebble-cobble gravel that fines upwards into medium sand.

Bedrock Geology Exposed bedrock in the Indian River valley cut consists of Albian-age Indian River formation quartz pebble conglomerate and sandstone.

Gold Characteristics Three types of gold were recovered: crystalline, flat and travelled, and oxidized.

Quartz, a tributary of Indian

115O/14 2020: 63°45'22"N, 139°07'05"W

McNeil, G., 2005–2006, 2011–2018, 2020

Water License: PM14-015 (Active 07/2024)
Active Producer (2018, 2020) **Operation no. 57**

Location Quartz Creek, at its confluence with the Indian River.

Work History and Mining Cuts No work history is known for 2018 or 2019 under Mr. McNeil's license on lower Quartz Creek. In 2020, 2700 yd^3 (2064 m^3) was sluiced and no additional information is known.

Equipment and Water Treatment Equipment on site included a Caterpillar D9N bulldozer for pushing pay and a Caterpillar 235C excavator is for feeding the plant. The plant consists of a shaker deck feeding a single sluice run that feeds a triple splitter that drops material onto three oscillating sluice runs. Effluent was settled out-of-stream in a series of two ponds.

Surficial Geology and Stratigraphy Stratigraphy of the Quartz Creek cut consists of two units. Unit 1, from 0 to 4 m (0–13 ft), consists of a fining upward gravel deposit. On bedrock, the gravel is coarse and consists of a moderately sorted pebble-cobble gravel. Clast imbrication suggests a flow direction consistent with the Indian River. The upper 2.5 m (8 ft) of gravel fines into a sandy-pebbly gravel, which appears to have been stripped. Unit 2, from 4 to 8 m (13–26 ft), consists of silt and minor organics.

Bedrock Geology Bedrock is mapped as variably foliated, K-feldspar augen granite and metaporphyry (Gordey and Makepeace, 1999).

Gold Characteristics Not reported.

Quartz, a tributary of Indian

115O/14 2018: 63°47'06"N, 139°06'49"W
115O/14 2018: 63°49'06"N, 139°04'21"W

Schmidt Mining Corp., 2009–2020

Water License: PM13-029 (Active 04/2024)
Active Producer (2018–2020) **Operation no. 58**

Location Quartz Creek, Little Blanche Creek and Canyon Creek.

Work History and Mining Cuts Schmidt Mining Corp. had a full mining operation in the Quartz Creek drainage in 2018 before relocating the main wash plant to Big Creek in 2019. In 2019 and 2020, work focused on stripping and preparing cuts for processing at a later date. In 2018, four cuts were worked on in Quartz Creek and near the mouths of Canyon and Little Blanche creeks. Three of the cuts were on the Quartz Creek bench and the fourth cut was in lower Canyon Creek. A cut measuring 33 by 317 m (108 × 1041 ft) was stripped to the top of pay just above the mouth of Calder Creek on the Quartz Creek bench, and a cut was mined at the mouth of Little Blanche Creek on the Quartz Creek bench. This second cut measured 103 by 610 m (340 × 2000 ft) and had a total thickness of 14.6 m (48 ft). On lower Canyon Creek, hydraulic

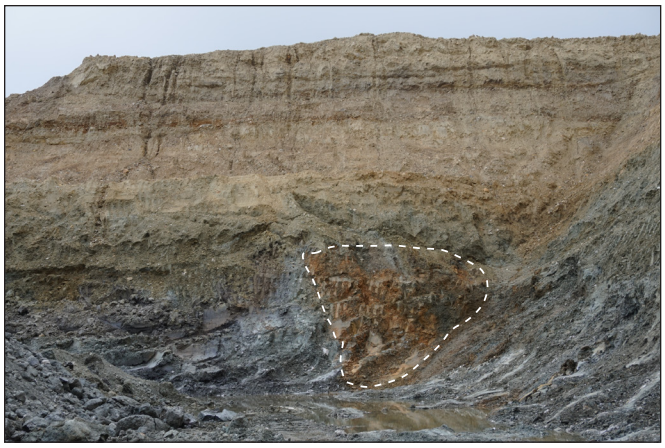
monitoring and sluicing occurred in two locations focused in the valley bottom.

Equipment and Water Treatment Equipment on site included a Caterpillar D11T crawler tractor, a Caterpillar D9L crawler tractor, a Caterpillar 374D excavator for digging and loading pay, an Hitachi EX700 excavator, and two 40-ton Caterpillar articulating rock trucks. Two conveyors with 1.5 m (5 ft) wide by 45.7 m (150 ft) long belts, and one feeder with a 1.5 m (5 ft) wide by 18.3 m (60 ft) long belt were also utilized on site for stripping. Another conveyor with a 1.2 m (4 ft) wide by 30.5 m (100 ft) long belt was used for sluicing in conjunction with a portable sluice plant. The plant has a 2.4 m (8 ft) wide trommel with 1.1 m (3.5 ft) wide conveyor for oversize removal. Three 1.2 m (4 ft) wide sluice runs, totaling 7.3 m (24 ft) in length, were located on each side of the conveyor. The wash plant processed up to 200 loose yd^3 (153 m^3)/hr. An auger drill rig is used for in-cut monitoring of depths to bedrock and determining the optimum sluice section.

Surficial Geology and Stratigraphy The White Channel gravel bench on the right limit of Quartz Creek contains three general units. Unit 1, from 0 to 10 m (0–33 ft), is a distinctive greenish grey gravel that contains abundant cobbles and small quartz boulders near the bedrock surface (lower White Channel gravel). These large quartz clasts are a defining characteristic of the pay channel, which roughly measures between 61 and 91 m (200–300 ft) in width. The gravel fines upward into a cobble-pebble texture that contains laterally discontinuous beds of overbank sandy silt units with organics and logs near the upper contact. The light green colour of unit 1 is derived from erosion of the underlying mafic schist bedrock and is suggestive of the unit eroding into bedrock during emplacement. At the mouth of Little Blanche Creek, bedrock blocks are thrusted into unit 1 pay gravel, likely related to neotectonic activity along a fault in the drainage. These blocks make identification and isolation of the sluice section challenging. Unit 1 is overlain by upwards of 14.6 m (48 ft) of upper White Channel gravel (unit 2). This deposit consists of moderately sorted, stratified, pebble gravel with minor cobbles. Sand lenses make up 10% of the gravel and oxidation is most prevalent in the uppermost 6 m (20 ft). Unit 3 consists of colluviated silt (loess) that has been stripped off the bench.



Schmidt Mining Corp.'s mining cut on the Quartz Creek bench near the mouth of Little Blanche Creek in 2018.



A view of the White Channel gravel on the Quartz Creek bench near the mouth of Little Blanche Creek. A block of oxidized, thrusted bedrock in the lower gravel is visible at the base of the exposure (dashed white line). Bedding within the upper gravel has not been disturbed by the bedrock thrust suggesting the bedrock was emplaced prior to the deposition of the upper gravel.

The stratigraphic section on the left limit of Canyon Creek near its confluence with Little Blanche Creek consists of two general units. Unit 1, deposited on bedrock, is 2 m (6.5 ft) of sandy pebble-cobble gravel containing imbricated flat schist clasts. Subangular cobble-size clasts of quartz are also present. Gravel beds are interbedded with sand beds and lenses. Unit 2 consists of 21 m (69 ft) of muck overburden.

Bedrock Geology Bedrock varies between gneiss, quartzite and muscovite-calcite-schist.

Gold Characteristics The Quartz Creek bench gold fineness averages 750.

Little Blanche, a tributary of Quartz

115O/14 2020: 63°50'29"N, 139°06'30"W

Sight Unseen Mining Company, 2008–2020

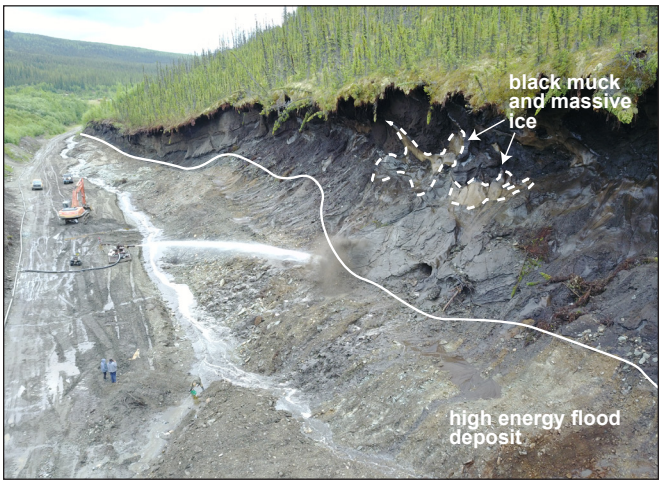
Water License: PM19-008 (Active 06/2029)
Water License: PM08-602 (Expired 03/2019)
Active Producer (2018–2020) **Operation no. 59**

Location Little Blanche Creek, left fork, 750 m upstream from the mouth of the forks.

Work History and Mining Cuts For the past three seasons, Sight Unseen Mining Company has been advancing both upstream and in-slope on the left fork of Little Blanche Creek. All mining has occurred on the right limit of the fork, where monitoring is utilized to thaw and remove the substantial amount of frozen black muck overlying the frozen pay gravel. Primarily active as a one to two person operation, they haul material to the sluice plant as the material is exposed and thawed. A 305 m (1000 ft) long cut has been continually expanded in-slope (laterally), and continues to uncover more gravel indicating the width of paleo-Little Blanche Creek was substantially wider than it is today. Each season the operator spent between 350 to 400 hours sluicing.

Equipment and Water Treatment Overburden is thawed by a #2 Henby monitor with a 6" pipe, using an 8 by 6" pump powered by a Detroit engine. A Caterpillar D8K bulldozer is also used to remove thawed overburden and strip ground, and an Hitachi 270 excavator is used to excavate pay gravel. Material was delivered to the plant using two Koehring rock trucks and the plant was fed using a Caterpillar IT28G wheel loader. The wash plant consists of an automatic, 12-yard hopper that feeds into a 1.2 by 3.7 m (4 × 12 ft) trommel, which screens material to ⅝". Sluice runs consist of a nugget trap followed by two 0.9 by 2.4 m (3 × 8 ft) runs, consisting of expanded metal lined with unbacked miners moss. The trommel was able to process 40 yd^3 (30.6 m^3)/hr, using a 6" pump to supply water to the plant. Effluent was settled in a series of two ponds and water was 100% recirculated. Clean-ups were conducted using a long tom and gold pans. Final concentrates were processed on a table in Dawson.

Surficial Geology and Stratigraphy Stratigraphy on the left fork of Little Blanche Creek greatly varies depending on the presence of bedrock reefs and undulations in the bedrock surface. Highs in the bedrock surface, high energy stream hydraulics and



Drone image looking downstream Little Blanche Creek in 2020, with the monitor actively thawing frozen black muck. The solid white line indicates the contact between unit 1 and unit 2.

varied topography influence deposition, causing gravel thickness to range from 0 to 1.8 m (0–6 ft) on the right limit. In 2020, the gravel thickness continued to increase as excavating continued in-slope, which could support the theory of a buried channel. Paleo-Little Blanche Creek could have at one time been situated on the right limit margin of the valley and subsequently became buried in loess and massive ice. Shafts and drifts have been unearthed on the right limit, indicating that the old-timers were aware of the extension of pay gravel farther into the right limit, and warranted tunneling through 7 m (23 ft) of frozen black muck to reach it.

The left limit edge of the cut in 2020 consists of two units. Unit 1, from 0 to 1.8 m (0–6 ft) is a high-energy flood deposit that is oxidized and manganese-stained. It is poorly sorted, has 40% matrix of silty-sand and the clast composition consists of 60% cobbles and 40% pebbles. Unit 2, from 1.8 to 7.0 m (6–23 ft) is muck, including massive ice, loess, an abundance of wood fragments and clast-enriched beds with sand lenses up to 0.5 m (1.6 ft) thick. Approximate 5% of the unit is massive ice and the largest ice lens is 2 m (6.6 ft) thick. All gravel in unit 1 and up to 1.2 m (4 ft) of bedrock was sluiced.

Little Blanche Creek produces an abundance of Ice Age mammal fossils with the most common being steppe bison (*Bison priscus*), horse (*Equus sp.*) and Woolly Mammoth (*Mammuthus primigenius*). Additional fossils recovered include Short-faced Bear (*Arctodus simus*), American Lion (*Panthera leo spelaea*), Helmeted Muskox (*Bootherium bombifrons*), wolverine (*Gulo gulo*), and wolves (*Canis lupus*) (Elizabeth Hall and Susan Hewitson, *pers. comm.*).



Miles Carlson with a mammoth tusk; an example of the type of Ice Age mammal fossils recovered from Little Blanche Creek. (Photo credit: Elizabeth Hall).

Bedrock Geology Bedrock varies between blocky competent quartzite and highly fractured muscovite schist.

Gold Characteristics Half of the gold is coarse and the other half is fine, contains 33% silver and has a fineness of 650. The largest piece of gold recovered is ½ ounce.

Canyon, a tributary of Little Blanche

115O/14 2019: 63°50'01"N, 139°02'47"W

Canyon Creek Mining, 2015–2019

Water License: PM17-088 (Active 06/2028)
Water License: PM07-572 (Expired 06/2018)
Active Producer (2018–2019) **Operation no. 60**

Location Canyon Creek, upper, 4.8 km from its confluence with Little Blanche.

Work History and Mining Cuts Mining on Canyon Creek focused on the valley bottom of the drainage in 2018 and included 45 exploration drillholes in the upper part of the claim block. A total of 200 m (650 ft) of creek length was mined and a total of 400 hours was spent sluicing. Six exploration test pits were completed in the fall of the season and a discovery of a right limit bench was made. In 2019, drilling of the bench was completed in collaboration with the Yukon Mineral Exploration Program. The bench was subsequently opened up and test mining was completed. A total of 500 hours of sluicing occurred in 2019 and included both bench gravel and valley bottom material. No activity occurred in 2020. Three personnel were employed each season.

Equipment and Water Treatment Equipment on site included John Deere 450 and 350D excavators for digging and loading pay, a Terex TA30 haul truck for delivering pay to the plant and a John Deere 644J loader for feeding the plant and removing tailings. A Caterpillar D9N bulldozer is used for reclamation. A combination grizzly and conveyor feeds the wash plant. The wash plant and sluice consist of two shaker decks. The upper deck classifies to 1.25" (punch plate) and feeds a large boil box. The bottom deck classifies to ⅜" and feeds two sets of two oscillating sluices on either side of the plant that contain hydraulic riffles. The plant uses 2000 gal/min fed from a 10 by 8" Morris pressure pump. A sequence of six settling ponds are utilized to manage processed water in the narrow valley setting.



Lori Cail's bench discovery test pit in 2018. The base of the pit has exposed an oxidized, sandy gravel under organics.

Surficial Geology and Stratigraphy The discovery of a right limit bench deposit on upper Canyon Creek provided a significant boost to the property in 2018. With the majority of the valley bottom deposits having been exploited, the bench resource added a potentially significant volume of pay gravel to the drainage. Discovery of the bench was made by Lori Cail, with assistance by Jeff Bond, on September 10, 2018 after a day of test pitting on the hillside above the modern creek. Frozen ground prohibited excavations in most locations, until an attempt was made where valley bottom strippings had been stacked on the valley side. This disturbance facilitated thawing of the ground and easier digging. Test mining of the bench in 2019 exposed a channel that is 12 to 15 m (40–50 ft) wide at the base. Bedrock within the channel is highly weathered, which made excavations and ground conditions challenging. The bedrock surface of the bench was u-shaped and not flat. The total gravel thickness is 8 m (26 ft) and consists of two gravel units. Unit 1, from 0 to 4 m (0–13 ft) consists of a decomposed gravel, containing a high local bedrock content that is susceptible to weathering. There were abundant heavies and coarse magnetite within the channel, which have not been found within the modern valley bottom deposits. Determining the gravel–bedrock interface was challenging in the weathered material. Unit 2, from 4 to 8 m (13–26 ft) is coarse at the base and grades into a moderately sorted,



Aerial view of Canyon Creek Mining's right limit bench cut in 2019. View is looking up valley. The base of the channel that is cut into bedrock on the bench is 12–15 m in width.

cobbly gravel. Overall unit 2 is much less decomposed and sandier than unit 1 is. The coarse gravel at the base of unit 2 likely represents a lag related to a down-cutting episode. This lag also contains placer gold. A large boulder was present at the top of the unit, which appeared out of place, and could indicate that a higher bench level has yet to be discovered within the hillside. It is possible that the upper 1 m of unit 2 is actually a colluviated gravel dispersed from a higher bench level. This would have been the material obtained from the 2018 discovery test pit. Unit 3 consists of a 1 m (3 ft) thick layer of organic-rich colluvium.

Bedrock Geology Bedrock is chlorite schist with quartz veining.

Gold Characteristics Fineness of the gold on the bench is 743 to 750 and 750 to 770 in the valley bottom.

Stowe, a tributary of Montana

115O/11 2018: 63°38'14"N, 139°01'27"W

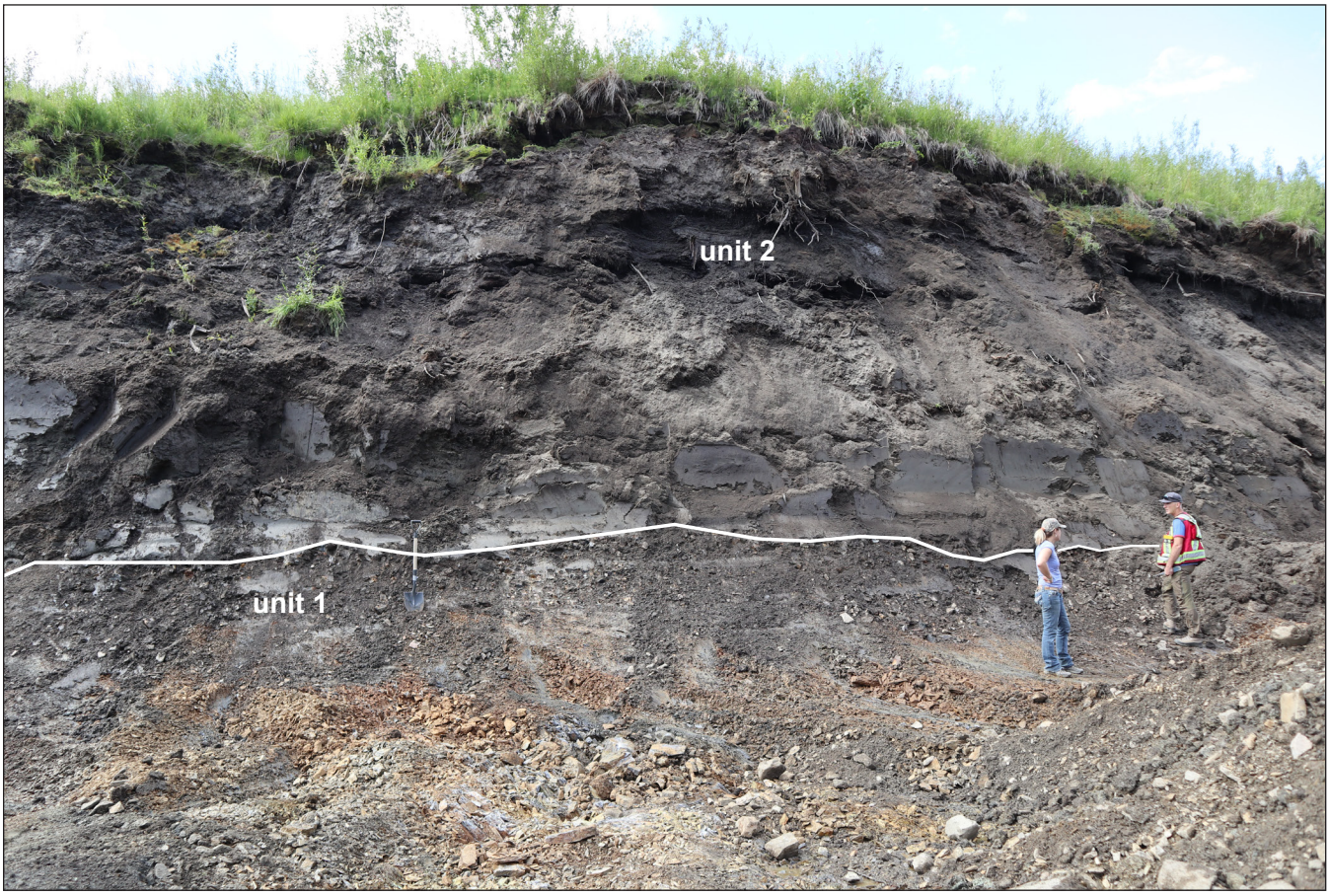
CTS Earthwork Ltd., 2012–2018

Water License: PM18-056 (Active 08/2030)
Water License: PM07-594-2 (Expired 10/2018)
Active Producer (2018) **Operation no. 61**

Location Stowe Creek, 2.8 km upstream from its confluence with Montana Creek.

Work History and Mining Cuts CTS Earthwork Ltd. was last active in 2018, when they stripped and completed a 15 by 66 m (49 × 216 ft) cut on the left limit of Stowe Creek. No activity has occurred on site from 2019 to 2020.

Equipment and Water Treatment In 2018, the equipment inventory included a Kobelco SK250 excavator, a Kobelco SK330 excavator, a John Deere excavator, a Caterpillar D9H bulldozer, a HM 400



Right limit cut exposed in 2018 on Stowe Creek. The shovel for scale is 1 m (3.3 ft).



A view looking downstream on Stowe Creek over CTS Earthwork's operation.

rock truck and a Komatsu 40-ton rock truck. Material was processed at 180 yd^3 (138 m^3)/hr by a 1.5 by 3.6 m (5 × 12 ft) Elrus screen deck with a 2.4 by 4.9 m (8 × 16 ft) hopper. It has two side sluices, with the upper sluice runs 1.1 by 1.5 m (3.5 × 5 ft) and the bottom runs 2.4 by 3.0 m (8 × 10 ft). The runs consist of 1" angle iron and expanded metal over nomad matting. Effluent was settled in a series of four ponds and water was 100% recycled. A Klondike Series side tip long tom was used for clean-ups.

Surficial Geology and Stratigraphy The stratigraphic section on the right limit of Stowe Creek consists of two units. Unit 1, from 0 to 0.8 m (0–2.6 ft) is a relatively thin package of cobble-gravel with clast content consisting of 2% boulders, 60% cobbles and 38% pebbles. Maximum clast size is 0.3 m (1.0 ft) and angular fragments of bedrock are incorporated throughout the bottom 0.2 m (0.7 ft) of the gravel section. Unit 2 is muck, fluvial sand, silt and organics from 0.8 to 8.0 m (2.6–26.2 ft). All of unit 1 and up to several feet of bedrock was sluiced.

Bedrock Geology Bedrock is primarily highly decomposed quartz-muscovite schist and blocky quartzite.

Gold Characteristics Fineness is 785 to 790.

Indian, a tributary of Yukon

115O/10 2018: 63°38'25"N, 138°52'14"W

Tamarack Inc., 2009–2018

Water License: PM20-071 (application phase)
Water License: PM18-066 (application phase)
Water License: PM08-618-1 (Expired 05/2019)
Active Producer (2018) **Operation no. 62**

Location Indian River, right limit, 1.5 km downstream from the mouth of Eureka Creek.

Work History and Mining Cuts Activity on the Indian River claims was limited to 2018 before Mr. Beets moved to Paradise Hill on Hunker Creek. In 2018, 40 personnel were employed working two shifts per day. Four plants were operational in the Indian River valley including a dredge, a trommel, a screen deck and a Pearson box. Work was underway to move the Thistle Creek dredge to the Indian River in 2018.

Equipment and Water Treatment The dredge consists of a 40 m (130 ft) long bucket line that is capable of mining a 34 m (110 ft) wide swath that is approximately 6 m (20 ft) deep. The capacity of the dredge and its 7.5 m (25 ft) long trommel is 100 to 120 yd^3 (76–92 m^3)/hr, uses 10 gallons of fuel per hour; a two person crew operates the dredge. This is regarded as one of the most efficient placer mining methods. At Tamarack's conventional mining operation downstream from the dredge, a Volvo EC460CL is used for excavating and loading pay, three Volvo A35D rock trucks are used to haul pay and a Volvo PL3005D excavator is used to feed the screen deck plant. A Caterpillar 988B loader is used to remove tailings. Material is fed to the plant using a feeder grizzly and conveyor. The screen deck plant consists of a vibrating screen deck that classifies pay and distributes it across four sluice runs. A conveyor handles all of the oversize tailings off the plant and stacks the material behind the dredge. No information was obtained for the trommel or Pearson box sluicing operations.

Surficial Geology and Stratigraphy In 2018 the dredge mined a section consisting of 0.6 to 1.2 m (2–4 ft) of bedrock, 2.4 to 3 m (8–10 ft) of Indian River gravel and 3 m (10 ft) of river silt. In general, the dredge was processing on average a sluice section consisting of 4.3 m (14 ft) of gravel and bedrock combined. Thawing of the ground is completed by ditching around



Tamarack Inc.'s screen deck wash plant on the Indian River.

the cut area and then "raining" water on the cut using an irrigation sprinkler system (rain thawing). At the conventional mining cut 1.3 m (4 ft) of bedrock and 1.4 m (4.5 ft) of Indian River cobble-pebble gravel was sluiced. Approximately 3 m (10 ft) of finer gravel and overbank silt deposits were stripped.

Bedrock Geology Bedrock is mapped as quartz-muscovite-chlorite schist (Gordey and Ryan, 2005).

Gold Characteristics Not reported.

Eureka, a tributary of Indian

115O/10 2020: 63°36'42"N, 138°45'58"W
115O/10 2020: 63°36'60"N, 138°48'00"W
115O/10 2020: 63°36'54"N, 138°47'28"W
115O/10 2020: 63°36'34"N, 138°45'55"W
115O/10 2017: 63°37'14"N, 138°49'05"W

Fine Gold Resources Ltd., 2008–2020

Water License: PM17-017 (Active 06/2027)
Water License: PM15-067 (Active 02/2026)
Water License: PM10-001 (Expired 06/2020)
Active Producer (2018–2020) **Operation no. 63**

Location Indian River and several locations on Eureka Creek: the mouth of Eureka Creek; a left limit bench approximately 4 km upstream from the mouth of Eureka Creek; an upper left fork near Eureka Dome; and a left limit bench on the Indian River immediately upstream of Eureka Creek.

Work History and Mining Cuts Fine Gold Resources was active in a number of areas on their Eureka Creek and Indian River claims during the reporting period. The left limit of the Indian River and lower Eureka Creek were the focus of much of the production. In 2018, Mr. Heisey employed 30 personnel and operated two daily shifts. Activity in Eureka Creek focused on targeting virgin pay gravel buried under old stripping piles from the 1970s and 80s. This work focused on the mouth of Eureka Creek and a mid-valley cut. Near the headwaters of Eureka Creek, a cut was completed at the mouth of Thirteen Pup. In the Indian River valley, work in 2018 focused on cleaning up portions of the lower left limit ground before taking a more systematic approach upstream. In 2019, a 122 by 1280 m (400 × 4200 ft) cut was processed on the left limit of the Indian River valley. This cut required two plants in order to process the area. Two additional plants were operational in 2019, one at the mouth of Eureka Creek and a second located in the mid-valley of Eureka Creek that processed both creek and bench pay. Thirty personnel processed 2,000,000 yd^3 (1 529 110 m^3) of material. Also in 2019, 65 hectares of legacy-mining ground was reclaimed by Fine Gold Resources that included contouring, stabilizing slopes, and top-coating with organics. Small shallow water ponds were established to benefit waterfowl. A second area located in the mid-valley of Eureka Creek was also reclaimed. In terms of exploration, Fine Gold Exploration invested in 10 sonic drillholes aimed at delineating the left limit bench channel on Eureka Creek.

In 2020, the crew increased to 45 personnel and three plants were operational, two on the Indian River and one in Eureka Creek. The Eureka Creek plant was set up in the mid-valley location adjacent to the left limit bench. Mining on the Indian River continued to target the left limit. Typical cut sizes measured in 2020 were 55 by 310 m (180 × 1017 ft) and 72 by 100 (236 × 328 ft).

Equipment and Water Treatment Fine Gold Resources operates at a number of mining locations during any given season. Equipment is shared between locations, particularly the rock trucks. On the Indian River left limit bench claims upstream of Eureka Creek, the mining pits were stripped using Komatsu 475A-3 and 375A-6 bulldozers. Once stripped, several Hitachi 450-3 excavators were used for digging and loading pay into two articulated Komatsu HM400 rock trucks. The pay pile was maintained and pushed up to the plant by a Caterpillar D9H bulldozer where it was fed with an Hitachi ZX350 excavator. The same Caterpillar D9H bulldozer and a Komatsu WA500-1 loader removed tailings. The sluice plant is an Elrus shaker deck with a 1.5 by 4.9 m (5 × 16 ft) double screen deck, powered by a 30 hp motor. The plant has a capacity of 250 yd³ (191 m^3)/hr and it classified material to ⅝", which flows into four 1.2 by 3.0 m (4 × 10 ft) oscillating sluice runs lined with expanded metal. Water is 100% recycled with zero discharge, from a nearby pond and into a settling pond prior to returning to the initial holding pond. In 2017, a 43 m (140 ft) long "Hollis Hauler" excavator-mounted conveyor was added to the operation to speed up the stripping of fine-grained loess overburden and upper gravel (at a rate of 1000 yd³ (765 m^3)/hr), which dramatically reduced the cost of stripping.



A view of Fine Gold Resource's wash plant in the Indian River valley in 2020. The view is looking upstream and left limit mine cuts are visible in the background.

Two plants operated in the main Eureka Creek valley downstream of the forks. Near the mouth of Eureka Creek, stripping was completed with a Komatsu 475 Super Dozer and a Komatsu 275-5 bulldozer. An Hitachi 450-3 and a John Deere 450D excavator were used to strip overburden and load pay into HM400-2 rock trucks, which hauled pay to the plant. A Komatsu WA500-3 loader with a 7.5 yd³ bucket fed the pay into a 20 yd³ capacity belt driven feeder which conveyed the material to an Elrus shaker deck plant with a 1.5 by 3.6 m (5 × 12 ft) double screen deck, powered by a 30 hp motor. This plant has a capacity of 150 yd³ (115 m^3)/hr and it classifies the material to ¾". The minus ¾" material flows into six 0.9 by 3.0 m (3 × 10 ft) long sluice runs lined with expanded metal, a boil box and hydraulic riffles. Water is 100% recycled with zero discharge from a large pond in a previously mined pit, through the plant, into a settling pond and back in the initial pond. The same loader used to feed the plant is used to remove tailings at the end of a 50 ft stacking conveyor.

At mid-valley on Eureka Creek, mining on the left limit bench used a Komatsu 375-6 and a Komatsu 475 Super Dozer for stripping. A John Deere 650D excavator was used to assist with stripping the 30 m (100 ft) deep paleochannel deposit. The excavator was also used to load pay into a Caterpillar 773B rock truck for transport to the mid-valley plant. This plant is a former 1.8 by 12 m (6 × 40 ft) dredge trommel, which has a throughput capacity of 125 yd³ (95.5 m^3)/hr and is mounted on a raised framework. A Komatsu WA500-6 loader with a 7.5 yd³ bucket feeds pay into an 18 yd³ capacity belt-driven feeder, which conveys the material to the trommel. The pay material from the paleochannel is clay-rich and requires vigorous scrubbing in the trommel to achieve disaggregation. Each rock makes 17 revolutions in the trommel prior to exiting. The end of the trommel has 1.8 m (6 ft) of ¾" punch plate for screening. A 24 m (80 ft) stacking conveyor removes oversized material and the same loader removes tailings. The screened material from the trommel is fed through a 1 m (3 ft) wide chute lined with expanded metal and a boil box prior to entering a run with 3.6 m (12 ft) of width that is split into four separate oscillating runs lined with expanded metal. Water is pumped from a dam in Eureka Creek and settled out of stream.

The operation on Thirteen Pup near Eureka Dome used a Komatsu 375-6 bulldozer for initial stripping. An Hitachi 450-1 excavator was used for additional stripping and to load pay into a Komatsu HM400-2 rock truck. The rock truck transported the pay approximately 500 m

downstream to a 1.8 by 6 m (6 × 20 ft) trommel sluice plant with a capacity of 75 yd³ (57 m³)/hr. An Hitachi 400-1 excavator fed the plant and a Caterpillar D6M dozer pushed away the tailings. The plant screens to ¾" and the sluice runs consist of a boil box, expanded metal, hydraulic riffles and a second set of expanded metal. In-stream settling is required in the narrow valley setting of this operation.

The upper mats of each plant were cleaned up after each shift and placed in a concentrate tub, which was taken to the clean-up station for processing. Clean-ups were performed using the following steps: a "Lizotte live-bottom box" concentrating machine, demagnetizing, screening, an RP4 shaker table, a 3 ft diameter custom made wheel, a Miller Dredge rinsing table, and a "Clarkson rod mill".

Surficial Geology and Stratigraphy Mining on the left limit of the Indian River has exposed a number of low-level benches that are buried under a wedge of resedimented loess (silt). The silt overburden thickness varies considerably depending how close you are to the hillside. In 2020, a cut measuring 55 m (180 ft) in width contained 6 m (20 ft) of overburden on the valley side of the cut and 15 m (49 ft) of overburden on the hill side of the cut. Overburden is mostly resedimented loess with some organic beds and gravel lenses. The gravel thickness on bedrock measured 3 m (10 ft) and contained a lower 1 m (3 ft) thick unit of cobbly, moderately sorted, unoxidized, matrix-supported gravel with 50% cobbles and 50 % pebbles. This is overlain by 2 m (7 ft) of oxidized, stratified and well-sorted gravel containing 90% pebbles and 10% cobbles. Bedrock is a blocky, grey schist.

A fluvial intermediate-level bench documented in 2020, was exposed 6 m (20 ft) above the lower level bench cut and had 3.8 m (12 ft) of gravel and 4 m (13 ft) of loess on its surface. The loess cover will increase into the hillside as this higher level is mined. The width and length of the benches can be erratic due to variable erosion by lower level fluvial activity along the hillside. Small gullies also cut through the benches, which affects their continuity and gold concentrations. The gulley washes will rework placer gold from higher-level benches and deposit the gold onto lower level surfaces where they fan-out near the valley bottom. This can significantly increase the grades on a bench surface, but is generally localized to the crosscutting gully.



An aerial view looking upstream of the left limit of the Indian River valley. Fine Gold Resources is targeting a number of buried intermediate-level benches preserved under a thick layer of resedimented silt.

In Eureka Creek virgin gravel was discovered under old tailings near the mouth of the valley and at mid-valley. Systematic stripping across the valley bottom revealed that previous mining efforts had been light, despite the prime locations. In many areas, no bedrock had been sluiced, perhaps because small bulldozers were the main piece of heavy equipment initially used. In addition, thawing was perhaps inadequate making complete extraction difficult.

Mining on the left limit Pliocene bench in Eureka Creek focused on shallower ground near the edge of the bench. The left limit bench deposit on Eureka Creek is more than 5 km long and has an approximate width of 200 m. Typical gravel thicknesses on the bench are 16 m (52 ft) and this is overlain by 9 m (30 ft) of colluviated loess and/or tributary gravel deposits. The bench gravel deposits are dominated by cobble-size clasts that have a subangular shape. The deposit is crudely stratified and poorly to moderately sorted. Approximately 1.5 to 2 m (5–6.5 ft) of bedrock and 2 m (6.5 ft) of gravel is processed for placer gold. Low-grade placer gold concentrations are found throughout the gravel stratigraphic column. A bedrock fault near the rim of the bench has thrusted the bedrock surface and overlying gravel up 2 m (6.5 ft). The bedrock surface tends to be more undulatory or erosional in the upper reaches compared to the middle or lower reaches.

At the mouth of Thirteen Pup, old-timer workings were discovered on the right limit and included multiple shafts. The pay streak hugs the inside corner of Thirteen Pup as it enters the left fork of Eureka Creek, and this gravel deposit is overlain by colluviated organics. Bedrock also jumps up on the inside corner. The pay streak then travels across to the left limit of the left fork and continues down the valley.

Bedrock Geology Bedrock is decomposed to blocky quartz-muscovite schist.

Gold Characteristics Gold recovered from the Indian River is primarily fine grained, dark yellow, and has a purity of 850. Eureka Creek gold is approximately 20% coarse and 80% fine with some small nuggets. Coarse gold is rough and commonly attached to quartz. Colour varies from bright, shiny yellow to dark red-brown, suggesting two different lode sources. Fineness ranges from 780 at the mouth of Eureka Creek to 740 in mid-valley and 700 on the upstream forks. Gold grain shape is reported as coarse, dendritic and leaf shape on the upper left fork below Eureka Dome.

Unnamed, a tributary of Eureka

115O/10 2019: 63°34'56"N, 138°53'44"W
115O/10 2019: 63°34'54"N, 138°53'34"W

Treadstone Services, 2019–2020

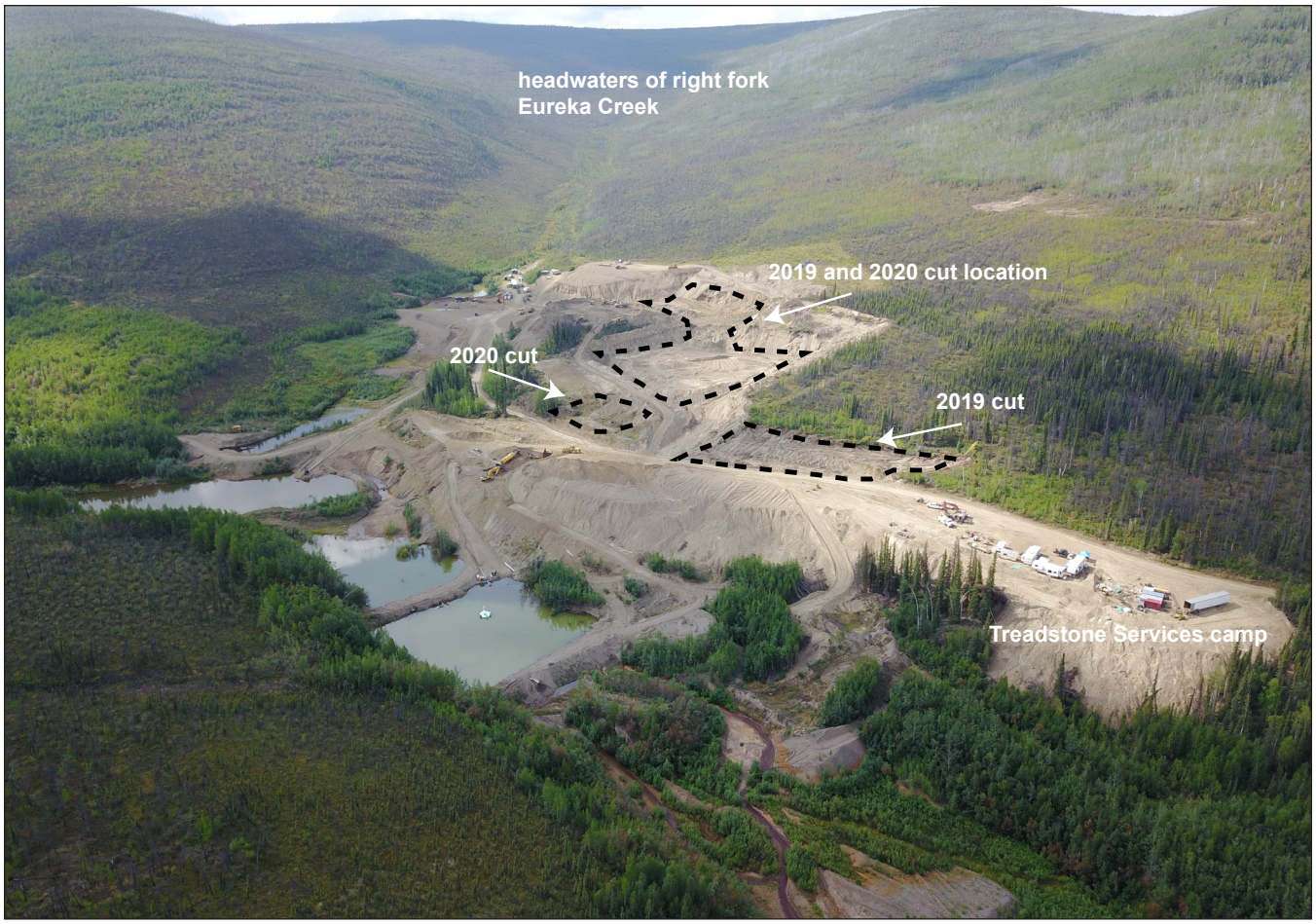
Water License: PM15-067-1 (Active 02/2026)
Active Producer (2019–2020) **Operation no. 64**

Location Left limit bench on the right fork of Eureka Creek, 2.8 km downstream from the headwaters of the right fork.

Work History and Mining Cuts Treadstone Services established a lease agreement with the claim owner, Fine Gold Resources, and initiated mining in 2019. A buried left limit bench deposit on Eureka Creek was the target for Treadstone Services in 2019 and 2020. Each season they employed a crew of 8 to 9 people and operated a daily 12-hour shift. Two cuts were mined in 2019: one 65 by 90 m (213 × 295 ft) cut situated within the buried bench, and a second cut 25 by 45 m (82 × 148 ft) beside the road, to target the eastern rim of the buried bench.

Equipment and Water Treatment Kobelco 470 and 480 excavators are used for stripping and digging pay. Two 30-ton Terrex trucks and a John Deere truck are used for hauling material. A JCB excavator is used for feeding the plant. Up to four Caterpillar D9 bulldozers are also utilized at the mine. A Foremost auger drill is utilized for definition drilling on the bench. Information on the wash plant was not obtained.

Surficial Geology and Stratigraphy In 2019, Treadstone Services began mining the rim of the bench, and excavated in-slope towards the main buried bench deposit. Two units were exposed, the lowermost unit situated on the undulating bedrock contact being unit 1. Unit 1, from 0 to 4.1 m (0–13.5 ft) is a cobble gravel that fines upwards into the upper 1 m (3.3 ft) thick layer dominated by pebbles and medium sand. The gravel is poorly sorted at the base and becomes moderately sorted at its contact with unit 2. No imbrication is present. Unit 2, from 4.1 to 10.4 m (13.5–34.1 ft) is reworked overbank material. An unknown amount of overburden has been previously stripped, therefore the original thickness of unit 2 is unknown. In 2020, the rim cut contained 6 m (20 ft) of gravel and gold was obtained throughout the section. This cut likely exposed an intermediate-level bench deposit that contains a different gold distribution than the main bench deposit. This variability in gold distribution is important to understand when mining near high-level benches. The presence of a slightly lower bench level could result



View looking upstream on the right fork of Eureka Creek in 2019. On the left limit of the drainage, Treadstone Services camp and first cut are visible. In this image, the rim cut has only been stripped and is located 300 m up-valley from the camp.

in changes to the gold distribution both laterally and vertically within the sediment column.

In 2020, the main bench deposit was exposed. The total cut thickness was 24 m (79 ft) and the lowermost 3 m (10 ft) was targeted for placer gold. The pay unit is a silty, cobbly gravel with small boulders. It has a high energy and disorganized appearance. The stripped gravel is sandier, stratified and still quite coarse. Faulted bedrock is visible in the back wall of the bench and overlies some of the gravel. The bedrock consists of soft schist and fault gouge material. Gravel clasts are oriented parallel to the fault plane within the cut supporting movement as a thrust. The complicated relationship between the bedrock and gravel within this area of Eureka Creek needs to be anticipated in future drilling exercises that attempt to delineate mine cuts on the high-level bench.



A view of the rim cut at Treadstone Services mine on the right fork of upper Eureka Creek in 2020. The entire 6 m (20 ft) thick gravel column was processed for placer gold. The main, deeper bench cut is visible in the background.

Bedrock Geology Bedrock is decomposed quartz-muscovite-schist and blocky quartzite.

Gold Characteristics Not reported.

Indian, a tributary of Yukon

115O/10 2020: 63°36'58"N, 138°46'11"W
115O/10 2020: 63°37'01"N, 138°46'12"W

Alluvium Gold Mining Inc., 2019–2020
Rical Mining Ltd., 2017-2019

Water License: PM10-031-2 (Active 02/2023)
Active Producer (2018–2020) **Operation no. 65**

Location Indian River, left limit, 2.7 km downstream from the Indian River bridge.

Work History and Mining Cuts Rical Mining Ltd. began operating under Little Flake Mining ULC's water license in spring 2017. They continued to mine the property until mid-season in 2019, completing a 122 by 122 m (400 × 400 ft) cut and a 30 by 60 m (100 × 200 ft) cut in the same location as the previous season.

Alluvium Gold Mining Ltd. established an agreement with Rical Mining Ltd. in mid-2019 and they sluiced approximately 11,000 yd^3. They returned the following season in a lease agreement with Little Flake Mining ULC and completed two cuts. The first cut, 91 by 213 m (300 × 700 ft), was a continuation of the 2019 cut. The second cut, 40 by 125 m (130 × 410 ft), was located immediately beside the Indian River. Operating as a three person crew, they sluiced 19,503 yd^3 (14 911 m^3) in 2020.

Equipment and Water Treatment Alluvium Gold Mining Ltd.'s heavy equipment on site in 2020 included an Hitachi EX450LC excavator, an Hitachi EX200 excavator, a Kawasaki 95ZIII wheel loader, a TS80 24 m (80 ft) conveyor, and a 37 m (120 ft) long "Hollis Hauler" rented from Fine Gold Resources. Material was processed in a gravity fed Ross box that was able to process up to 120 yd^3 (92 m^3)/hr. Water was supplied to the plant using a 12" pump, and effluent was settled into tailings and a side cut prior to recirculating. Clean-ups were conducted with a Devin Gold Vortex Drop Riffle Sluice System, a Gold Grinder or Rod Mill and a RP-4 Gold Table. Concentrates were screened from 12 mesh to 100 mesh prior to grinding and tabling.



Southern view (across valley) of the Indian River at Alluvium Gold Mining Inc. in 2020.



Gravity fed Ross box plant at Alluvium Gold Mining Inc. in 2020.

Surficial Geology and Stratigraphy Stratigraphy in the Indian River valley consists of modern floodplain deposits of cobble-pebble gravel, finer grained lenses of pebbles, granules and silt, overlain by muck and sand. In 2020, a right limit cut exposure consisted of two units. Unit 1, from 0 to 1.7 m (0–5.5 ft) is a loose pebble gravel that is clast supported and consists of 20% fine to medium sand matrix. Clast composition consists of 80% pebbles and 20% cobbles, with the maximum clast 0.3 m (1 ft) in diameter. Two continuous silt-rich beds of organics undulate within unit 1. Unit 2, from 1.7 to 2.5 m (5.5–8.2 ft) consists of interbedded fine sand and silt with organic enrichment (wood debris, root structures) overlain by a moss matt. The sluice section includes up to 1.8 m (6 ft) of gravel and up to 0.9 m (3 ft) of bedrock. Panning is used to determine the pay layer.

Bedrock Geology Bedrock is blocky competent quartzite and micaceous garnet schist with thumb-sized garnets.

Gold Characteristics Gold is primarily fine with the largest pieces weighing 0.4 g. Fineness is 840.

Wounded Moose, a tributary of Indian

115O/10 2020: 63°36'05"N, 138°41'29"W
115O/10 2019: 63°37'05"N, 138°41'36"W

Lonesome Dove Mining, 2019–2020
Wounded Moose Mining Co. Inc., 2003, 2009–2018

Water License: PM14-036-2 (Active 02/2025)
Active Producer (2018–2020) **Operation no. 66**

Location Wounded Moose, 520 m upstream from its confluence with Indian River.

Work History and Mining Cuts Wounded Moose Mining Co. Inc. was present at their operation in 2018 and in 2019 Lonesome Dove Mining took over the property. In 2019, work was focused on establishing camp and conducting excavator test pitting. In 2020, full-scale mining commenced on the left limit of the valley bottom. Seventeen personnel were employed at the site. Sluicing crews operated in two shifts. In August of 2020 the active cut measured 120 by 350 m (393 × 1148 ft) and a total of 100,000 yd^3 (76 455 m^3) of material was sluiced for the season.

Equipment and Water Treatment Equipment utilized for mining in 2020 included a Caterpillar D10 bulldozer for stripping and pushing pay, a Caterpillar 385 excavator for trenching and digging pay, a John Deere 850 excavator for loading trucks, three John Deere 460 trucks and a John Deere 400 truck for hauling pay, a Caterpillar 345 excavator for feeding the plant, and a Caterpillar 988 loader for moving tailings. The wash plant is a Macon Industries SD300 plant that screens to ½" and uses 2300 gallons of water per minute. Effluent is settled out-of-stream and recirculated to the plant. A jig is used for clean-ups.

Surficial Geology and Stratigraphy The left limit of Wounded Moose Creek valley bottom consisted of three units overlying a grey to brown schist bedrock. Unit 1, from 0 to 1.6 m (0–5.2 ft) at the base of the cut consists of a coarse, poorly to moderately sorted, crudely imbricated pebble-cobble gravel. The silt content increases near the bedrock contact within a zone that is 0.75 m (2.5 ft) thick and there are small quartz boulders present. There are some open worked beds within unit 1, which speaks to its high-energy characteristics. Unit 2, from 1.6 to 2.6 m (5.2–8.5 ft) is a sandy, pebbly gravel that is well sorted and cross-bedded. Woody debris and logs are present within this unit. Unit 3, from 2.6 to 4 m (8.5–13 ft) is a silty organic layer capping the section.

Bedrock Geology Bedrock varies between blocky quartzite and moderately decomposed schist.

Gold Characteristics Two different types of gold are recovered from Wounded Moose Creek, smooth and chunky. The fineness is 840.



A view looking downstream at the mouth of Wounded Moose Creek of Lonesome Dove Mining's Macon Industries wash plant and settling system in 2020.

Indian, a tributary of Yukon

115O/10 2020: 63°36'49"N, 138°44'33"W
115O/10 2019: 63°37'46"N, 138°50'58"W
115O/10 2018: 63°36'40"N, 138°43'57"W
115O/10 2018: 63°36'40"N, 138°44'00"W

Little Flake Mining ULC., 2013–2020

Water License: PM10-031-2 (Active 02/2023)
Active Producer (2018–2020) **Operation no. 67**

Location Indian River, upper.

Work History and Mining Cuts Little Flake Mining ULC mined three locations in the Indian River valley in 2018, with a twenty person crew operating 24/7. The main two locations were a 145 by 200 m (475 × 657 ft) cut immediately downstream from Wounded Moose Creek, on the east side of the Indian River bridge, and a 185 by 205 m (607 × 672 ft) cut on left limit Indian River valley, 0.8 km downstream (to the west) of the Indian River bridge. The third location was a low-level, left limit bench downstream from Eureka Creek, on which they drilled and completed a small cut late in the season. In 2019, activity was primarily focused on the left limit of Indian River, 1.6 km downstream from Eureka Creek. Two cuts were completed, one 65 by 152 m (215 × 500 ft) and the one 85 by 200 m (279 × 656 ft). In 2020, two plants operated, each having a double shift and processing material for a total of 2200 hrs/plant. Mining focused on the middle of the Indian River valley below camp and above Eureka Creek. The pit measured 160 by 320 m (525 × 1050 ft).

Equipment and Water Treatment Equipment present on site in 2018 included three Volvo L250 loaders, one L220 loader, four Volvo 460 excavators, two Volvo 700 excavators, four Volvo 840 haul trucks, two Caterpillar 10N bulldozers, a Caterpillar 10T bulldozer, a

Volvo 6960B grader and a Volvo EC20C mini excavator. A 76 m (250 ft) conveyor delivers pay to an automatic hopper, which supplies the Macon Industries SD-600 inclined screen deck with pay. It is a 1.8 by 4.2 m (6 × 14 ft) vibrating screen deck, able to process up to 200 loose yd^3 (153 m^3)/hr. Sluice runs are configured with a series of hydraulic riffles, Hungarian riffles, expanded metal and a boil box, and it has a tailing stacker 15 m (50 ft) long. The second plant is a similar screen deck, with a maximum sluicing capacity of 150 loose yd^3 (115 m^3)/hr. Both wash plants are supplied with water using 10 by 10" pumps. Effluent is settled in a series of four ponds and water was fully recirculated. A table was used for clean-ups.

Surficial Geology and Stratigraphy The stratigraphy of the two cuts exposed in 2018 were similar. Cut one contained 2.4 to 3.6 m (8–12 ft) of gravel that is overlain by 1 m (3 ft) of silt and organics. The gravel is stratified, moderately sorted and fines upward to the middle of the section before becoming coarser again at the top of the section. The mafic schist bedrock surface is very uneven and undulates up to 1 m (3 ft) in amplitude. The bedrock is highly fractured, which likely affected the gold grade positively. The second cut contained 1.2 m (4 ft) of coarse, poorly sorted gravel on bedrock with a few rounded boulders present. The clast distribution consisted of 45% cobbles, 45% pebbles, and 10% boulders. The overall unit was cohesive. Unit 2, from 1.2 to 4.2 m (4–14 ft) is a moderately sorted, stratified, pebbly gravel with sand lenses. The lack of silty matrix made the unit recessive. Unit 3, from 4.2 to 5.2 m (14–17 ft) is a layer of silt and organics.



A close up view of the sediment sluiced in the Indian River at the Little Flake Mine. The high silt content is visible in the lower portions of the gravel unit. This is indicative of flood-like conditions that emplaced the gravel onto the bedrock surface.



A view of Parker Schnabel's plant at the Little Flake Mine on the Indian River in 2020. A cut is visible in the background.

In 2020, the cut stratigraphy consisted of 3 m (10 ft) of gravel overlain by 2 m (6.5 ft) of silt. The lower 1 m (3 ft) of gravel is coarser and contained more silt whereas the upper 2 m (6.5 ft) of gravel was well sorted, stratified and oxidized. A total of 1.5 m (5 ft) of gravel and 1 m (3 ft) of bedrock was generally sluiced during each season.

Bedrock Geology Bedrock downstream of Eureka Creek is gneiss and weathered sericite schist. Undulations of up to 0.2 m (0.6 ft) are present in the bedrock surface.

Gold Characteristics Gold is mostly fine and fineness ranges from 820 to 840.

Scribner, a tributary of Indian

115O/10 2019: 63°38'04"N, 138°43'59"W
115O/10 2018: 63°37'58"N, 138°43'53"W

Lakeland Vegetation Management Ltd. Yukon Division, 2015–2019

Water License: PM16-038 (Active 12/2026)
Active Producer (2018–2019) **Operation no. 68**

Location Scribner Creek, 1.9 km upstream from its confluence with Dominion Creek.

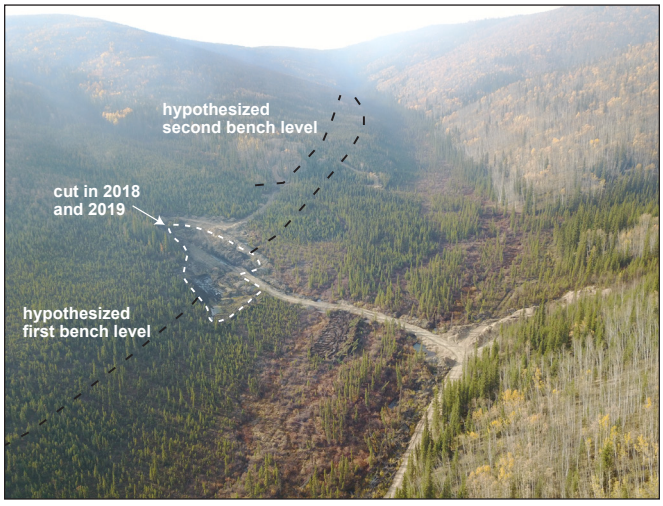
Work History and Mining Cuts Lakeland Vegetation Management has been exploring the Scribner Creek drainage since 2015. In 2018 a two person crew excavated a 15 by 40 m (49 × 131 ft) cut on the right limit, and also conducted bulk sampling farther upstream to explore for potential bench gravel. A test pit was completed in the modern valley bottom and on the right limit in 2019. In the fall of 2020, the water license and claims were transferred to 535901 Yukon Inc.

Equipment and Water Treatment Equipment onsite in 2019 included an Hitachi Zaxis 250LC excavator for digging pay, test holes and feeding the plant, a Caterpillar D6 bulldozer for stripping, and a loader and dump truck for hauling pay. A 0.9 by 6.1 m (3 × 20 ft) trommel was used to process material up to 20 yd^3 (15 m^3)/hr. One large settling pond was used to settle effluent.

Surficial Geology and Stratigraphy Scribner Creek is a narrow tributary that broadens to 100 m (328 ft) wide approximately 1.5 km upstream from its confluence with Dominion Creek. The main placer target is the modern valley bottom where drilling determined the total section thickness to be 12 m (40 ft). The section consists mostly of frozen black muck with a thin unit of Scribner Creek gravel. Two mid-level benches are present on the upper right limit of Scribner Creek, with testing occurring on both elevations.

Bedrock Geology Bedrock is decomposed muscovite schist.

Gold Characteristics Gold is fine, flat and bright.



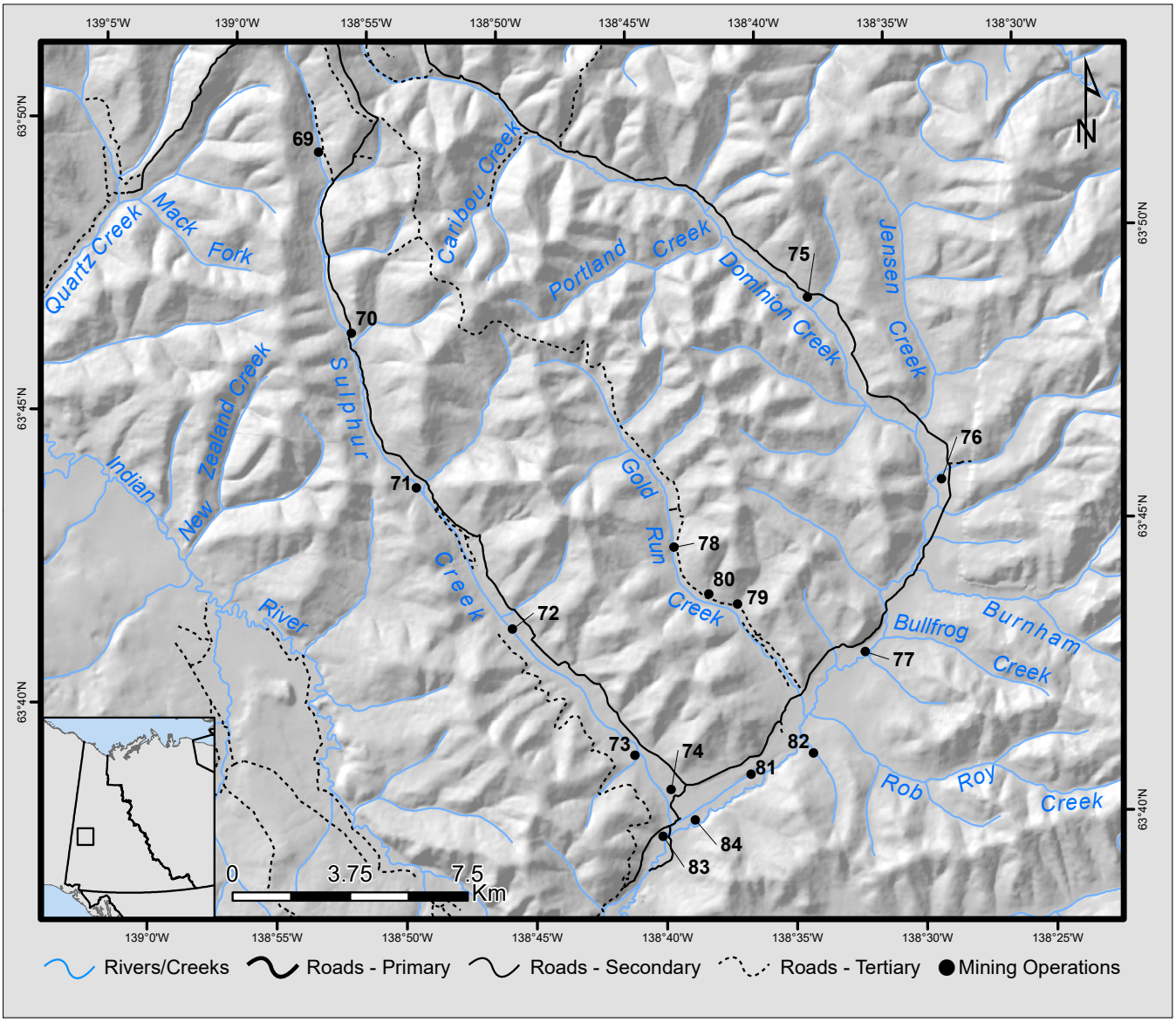
Drone image looking upstream Scribner Creek in 2019.



Trommel processing material at Lakeland Vegetation Management's camp in 2019.

DOMINION-SULPHUR
PLACER AREA

SITES 69–84



LEGEND

69. Tunica Gold Placers
70. D.C. Klippert Exploration
71. Schmidt Mining Corp.
72. Yukon Heli Ski
73. Favron Enterprises Ltd.
74. T.D. Oilfield Service Ltd.
75. Ace Placer Mining Ltd.
76. Hollis, A.
77. Dominion Gold Resources Ltd.
78. 536712 Yukon Inc.
79. 536784 Yukon Inc.
80. T.D Oilfield Services Ltd.
81. NBC Contracting
82. McGuffie, J.
83. Alluvium Gold Mining Inc.
84. Fuerstner, M.

Sulphur, a tributary of Dominion

115O/15 2018: 63°49'52"N, 138°56'24"W

Tunica Gold Placers, 1980–2019

Water License: PM15-027 (Active 07/2025)
Active Producer (2018–2019) **Operation no. 69**

Location Sulphur Creek, upper, 1.1 km upstream from the mouth of Green Gulch.

Work History and Mining Cuts Although present on their claims from 2018 to 2020, the Sprokkreeffs only conducted mining activities in 2018 and 2019. The family staked claims in the drainage in 1980, and continued to target remnants of Sulphur Creek side pay and rework the modern valley that had not been previously excavated by old-timers. An abundance of old-timer shafts have been uncovered and preserved and the vast amount speaks to the volume of established camps and people that once inhabited the drainage. Stripping on both limits with minimal sluicing occurred in 2018 and 2019, with the operation remaining idle in 2020.



A photo taken in 1898 by G. Hicks and is believed to be a small settlement on the upper end of Sulphur Creek—located approximately on Claim 45 above Discovery; above where the reservoir was. Photo courtesty of the Dawson City Museum.

Equipment and Water Treatment As a cat mining operation, a Caterpillar D8K bulldozer is used to push pay to the gravity fed wash plant. Additional equipment on site include an American Model 35A excavator and a wheel loader. The custom fabricated high banker with a single main run is able to process material at a rate of 60 yd^3 (46 m^3)/hr.

Surficial Geology and Stratigraphy The upper part of the drainage where Tunica Gold Placers operates is narrow and gulch-shaped with a steep grade. As they continue to advance upstream, the overburden (black muck) present in the modern valley is increasing in thickness to greater than 7.6 m (25 ft). *In situ* Sulphur Creek gravel is a clast-supported pebble-cobble gravel with 30% cobbles and 70% pebbles, with a 15% matrix content comprising fine to medium sand. Gravel thickness varies across the drainage depending on preservation from reworking and old–timer workings, but maximum thickness is 2.0 m (6.5 ft).

Bedrock Geology Bedrock is muscovite schist and is weathered to varying degrees.

Gold Characteristics Gold is mostly fine grained with a fineness of 800.



Aerial photo of Tunica Gold Placer's operation on upper Sulphur Creek in fall 2017. The view is looking upstream towards the headwaters of the drainage.

Sulphur, a tributary of Dominion

115O/15 2020: 63°46'50"N, 138°54'25"W

D.C. Klippert Exploration, 2007–2020

Water License: PM19-065 (Active 07/2030)
Water License: PM09-657 (Expired 07/2020)
Active Producer (2018–2020) **Operation no. 70**

Location Sulphur Creek, upper, at the mouth of Meadow Gulch.

Work History and Mining Cuts Mr. Klippert primarily mined as a one-person operation from 2018 to 2020.

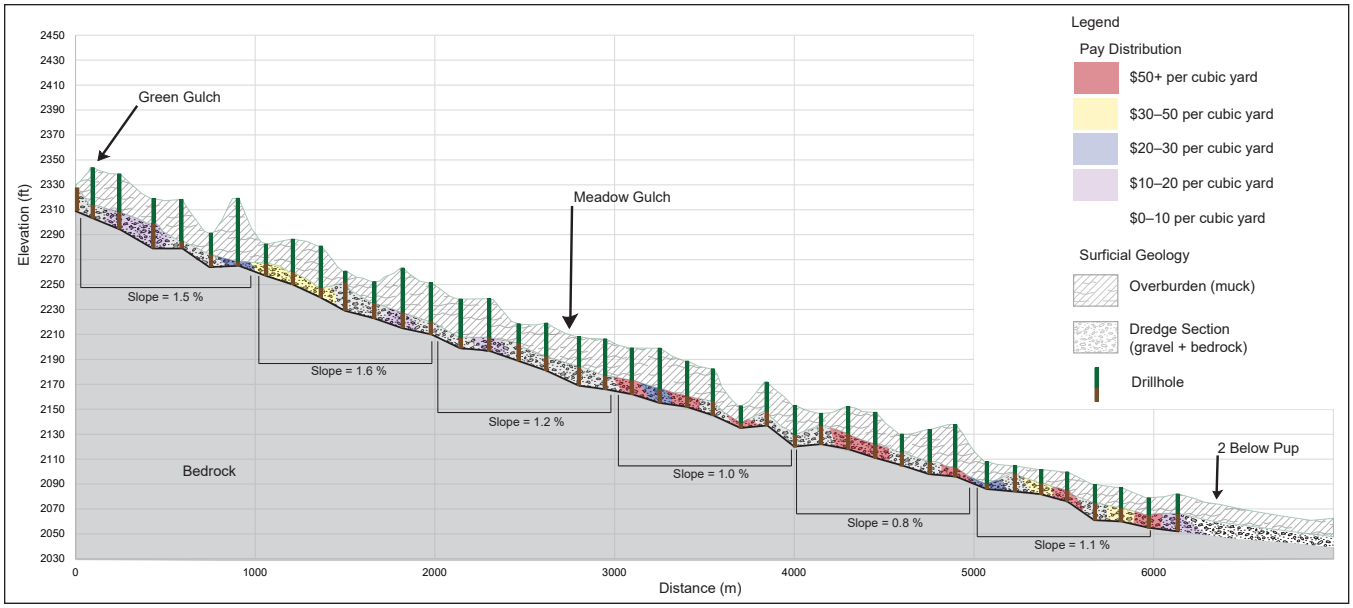
In 2020, in collaboration with the Yukon Mineral Exploration Program, exploration test pitting was completed on the left limit near the Sulphur Creek Road. Results were encouraging and work transitioned into mining for the remainder of the season.

Equipment and Water Treatment Equipment on site includes a John Deere 450D LC excavator used for digging pay and feeding the plant, a Caterpillar D8K bulldozer, a haul truck, and a Michigan 120 loader. The wash plant consists of a skid mounted 'graves brother' 1.5 m (5 ft) diameter by 6.1 m (20 ft) long trommel, with a ¾" screen, that is capable of processing up to 120 yd^3 (92 m^3)/hr. The sluice run is 2.4 m (8 ft) wide and contains 0.9 m (3 ft) of expanded metal, 0.9 m (3 ft) of hydraulic riffles and 0.9 m (3 ft) of angle iron. Water was supplied to the plant via a 6" to 4" pressure pump, and effluent was settled in a series of three settling ponds and discharged back into Sulphur Creek. A long tom was used for clean-ups.

Surficial Geology and Stratigraphy Two types of placer deposits are present on upper Sulphur Creek and consist of stream gravel and a low-level creek terrace. D.C. Klippert Exploration has been predominantly mining stream gravel, which is up to 2.0 m (6.6 ft) thick in the valley bottom and overlain by up to 13 m (43 ft) of overburden. Stream gravel is a cobble-pebble gravel with subround to subangular clasts, and an abundance of quartz lithology. Overburden is up to 10% massive



D.C. Klippert Exploration's trommel wash plant on Sulphur Creek in 2020.



Longitudinal section of upper Sulphur Creek from the mouth of Green Gulch downstream to 2 Below Pup.

ice, interbedded fine sand, tephra and organics. In 2020, a low-level creek terrace on the left limit of Sulphur Creek, downstream from camp was excavated. The section consisted of 1 m (3 ft) of Sulphur Creek gravel on bedrock that is overlain by 50 cm (1.5 ft) of overbank silt, 1 m (3 ft) of colluvium and 3 m (10 ft) of material from stripping.

A substantial amount of historic data are available for the prominent drainages of the Klondike and are a good resource to assist miners in exploration. Yukon Consolidated Gold Corporation (YCGC) conducted an industrious exploration and dredging operation in the Klondike for more than four decades and, as a result, left behind an abundance of data that is proving to be both accurate and useful for the modern industry. The YGS have published several examples of existing data and its applications (van loon, 2016, 2017, 2019). One example is a compilation of drillhole data for Sulphur Creek; gold distribution and surficial material thickness data from 1134 drillholes that extend from Green Gulch downstream into the Dominion Creek valley, were analyzed. A longitudinal section was constructed using the lowest bedrock elevations for a 6-km long section of upper Sulphur Creek between the mouth of Green Gulch and the mouth of 2 Below Pup. This includes 41 drillholes, with gravel thickness ranging from 0.6 to 6.4 m (2 to 21 ft) and overburden thickness up to 15 m (50 ft). Downstream of the confluence of Meadow Gulch, where D.C. Klippert Exploration is mining, the pay increases for a length of 500 m having grades greater than $20 (0.014 oz/yd^3). Farther downstream, additional isolated concentrations of gold occur with grades greater than $50 (0.035 oz/yd^3).

Bedrock Geology Bedrock is quartzite and schist.

Gold Characteristics Gold is fine and has a fineness of 800 to 810.

Sulphur, a tributary of Dominion

115O/10 2018: 63°44'18"N, 138°51'18"W

Schmidt Mining Corp., 2019
Lucky Lady Placers, 1980–2018

Water License: PM14-006 (Active 08/2024)
Active Producer (2018) **Operation no. 71**

Location Sulphur Creek and lower Brimstone Gulch, a left limit tributary of Sulphur Creek.

Work History and Mining Cuts The last year of activity for Lucky Lady Placers was 2018; they operated at the confluence of Sulphur and Brimstone creeks. Mr. L. Gibson and Mr. Kana have mined on Sulphur Creek together since 1979 and their presence, along with extensive knowledge of the Klondike will be greatly missed. In 2018, they spent 80 hours sluicing material from the left limit of Sulphur Creek. In July 2019, the claims were transferred to the new property owner, Schmidt Mining Corp. No activity occurred in 2020.

Equipment and Water Treatment Equipment included a John Deere 370 excavator, a John Deere 450 excavator, a Caterpillar 980C wheel loader, two Caterpillar D9 bulldozers, and two Terex TA 40 rock trucks. A screen deck was fed by a 46 m (150 ft) conveyor and able to process up to 100 yd^3 (76 m^3)/hr. Two sluice runs, each 6 m (20 ft) long were configured with 1" riffles and followed by two 2.4 m (8 ft) long runs with expanded metal. Runs were lined with unbacked nomad matting. Water was supplied to the plant using an 8 by 10" Cornell pump and was settled out-of-stream in a single large settling pond. Clean-ups were completed with a wheel, table jigs and a long tom.



Wash plant set up on Sulphur Creek in 2017. Brimstone Creek cut is on the far right of the image.



The Gibson family first arrived in the Klondike in the early 1930s, where Mr. M. Gibson initially hand mined at Granville and then staked claims on Sulphur Creek. In the image, Mr. M. Gibson is holding a mammoth tusk recovered from Sulphur Creek. Photo courtesy of the Dawson City Museum.

Surficial Geology and Stratigraphy The right limit of lower Brimstone Gulch consists of both Brimstone Gulch gravel and gravel at the mouth of the gulch that was influenced by Sulphur Creek. A right limit intermediate bench of Brimstone Gulch exposed 0.9 to 1.5 m (2.9–4.9 ft) of gravel that is clast supported with 65% pebbles, 35% cobbles and 5% boulders. Clasts are subangular to subround and the matrix is predominately medium sand with isolated lenses of granules. Manganese staining and oxidation is present throughout the gravel, with pervasive oxidation in the upper 0.6 m (2 ft). Gravel is capped with either a discontinuous 5 cm (1.9") thick lens of well-sorted medium sand, or overbank silt up to 28 cm (11") thick. A sharp contact between the overlying colluvium and fine-grained material (sand and silt) is present. The overbanked silt could represent a pause in deposition on Brimstone Gulch or could be derived from Sulphur Creek. Gravel thickness is declining farther into the bench, possibly indicating the margin of that particular bench level. Colluvium, up to 2.5 m (8.2 ft) thick, caps the lower unit of gravel, and consists of weathered bedrock that is highly decomposed and oxidized. Overlying the colluvium is 1 m (3 ft) of weathered bedrock, loess, organics, and reworked weathered bedrock fragments. Approximately 1.2 m (4 ft) of gravel and up to 0.6 m (2 ft) of bedrock was sluiced.

Bedrock Geology Bedrock is undulating and interbedded schist and phyllite.

Gold Characteristics Brimstone Gulch gold is coarser than Sulphur Creek gold and has a fineness of 780. The fineness of Sulphur Creek gold is 820.

Sulphur, a tributary of Dominion

115O/10 2019: 63°42'03"N, 138°47'03"W

Yukon Heli Ski, 2018–2020
Tusk Explorations Ltd., 2015–2017

Water License: PM14-027 (Active 09/2024)
Active Producer (2018–2020) **Operation no. 72**

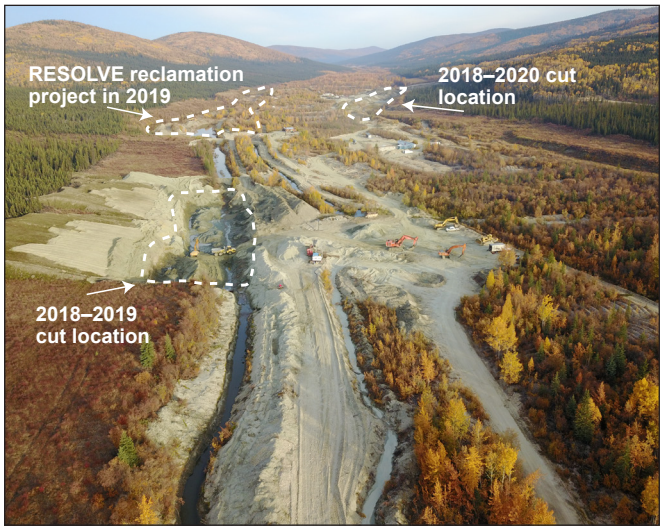
Location Sulphur Creek, approximately 7.5 km upstream from its confluence with Dominion Creek.

Work History and Mining Cuts In September 2018, the claims were transferred from Mr. Kruger to Tusk Explorations Ltd. and in 2019 from Tusk Explorations Ltd. to Grim Estates Ltd. Yukon Heli Ski has been present on the property since 2018 and each year mined both upstream and downstream from camp. In 2018, a continuation of the 2017 cut on the left limit of the creek was completed. In 2019, stripping and mining occurred on a new 36 by 173 m (118 × 568 ft) cut downstream from camp on the right limit of Sulphur Creek. In 2020, the cut on the right limit was extended farther downstream and mined; the extension measured 25 by 250 m (82 × 820 ft).

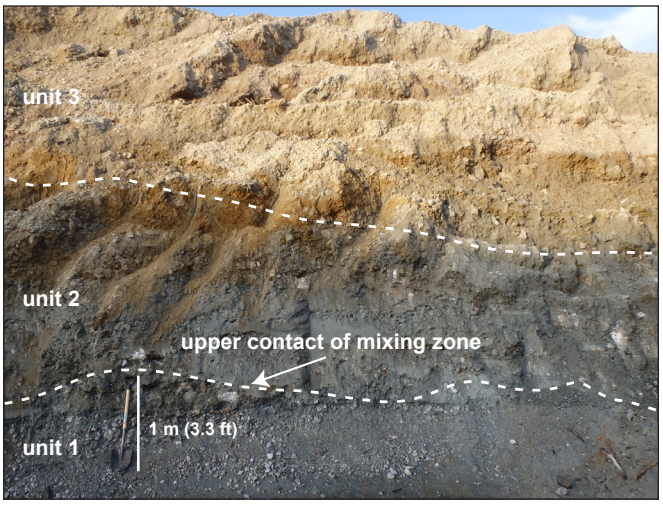
In 2019, Yukon Heli Ski collaborated with RESOLVE's Salmon Gold initiative to complete a restoration project. The project focused on stream channel reconstruction, recontouring of historic dredge tailings and top-coating with fines. The project was completed in the fall of 2019 and soon after grayling occupied the improved stream channel. In the spring of 2020, high water altered the new channel; however, multiple pool and riffle sets remained due to the placement of willow root-balls onto the floodplain, which helped control erosion of the channel. Channel banks were re-sloped in 2020 and the project was expanded in the downstream direction. The positive environmental project demonstrated the potential for restoring legacy placer disturbances through strategic planning, and capitalizing on local equipment and operators.

Equipment and Water Treatment Equipment in 2020 included an Hitachi Zaxis 450 LC excavator, Samsung and Hitachi EX1100 excavators for digging and loading pay gravel, a Komatsu HM400 truck for hauling pay and an Hitachi EX150 excavator for feeding the plant. Effluent was settled in a series of two large settling ponds.

Surficial Geology and Stratigraphy The right limit of Sulphur Creek, downstream from camp, targeted a mixing zone pay unit overlain by early Pleistocene incised-valley gravel locally known as the Ross gravel, and interbedded sand and silt. Loess overburden was stripped and stockpiled for later use during reclamation. The mixing zone (unit 1), varying in thickness from 0.3 to 0.6 m (1.0–2.0 ft) is weathered schist and gneiss fragments, often weathered completely to sand, and competent pebble and cobble sized clasts. Unit 2, from 0.6 to 2.8 m (2.0–9.2 ft) is a massive, imbricated matrix-filled gravel known as the Ross gravel. Ross gravel is an incised-valley gravel and similar to White Channel gravel, but significantly younger (Froese et *al*., 2001). Unit 4, from 2.8 to 7.6 (9.2–25.0 ft) is a fine-grained unit consisting of sand and silt, with up to 5% clasts present throughout. The lowermost 0.5 m (1.6 ft) of gravel and up to 1.0 m (3.3 ft) of bedrock was sluiced.



Looking upstream on Sulphur Creek during a drone flight in 2019. The dashed line outlines cut locations and the area of the RESOLVE reclamation project.

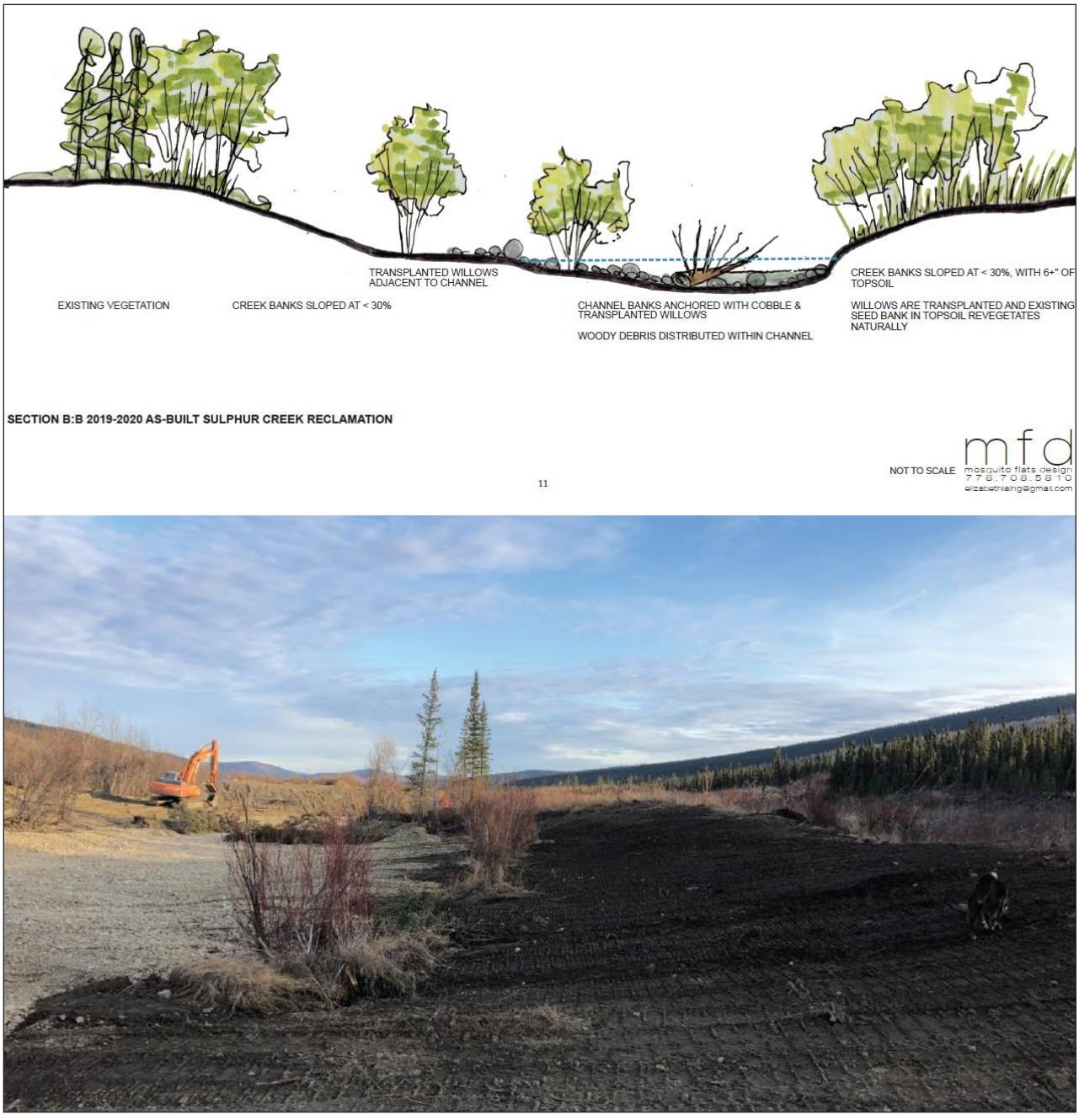


Cut exposure in 2019 on the right limit of Sulphur Creek. Unit 1 is the mixing zone of weathered bedrock and the upper gravel unit. The lower contact of unit 1 is not drawn due to its poor exposure. A shovel is present for scale.

Data recorded by the Yukon Consolidated Gold Corporation aided in delineating the cut on the left limit of Sulphur Creek. Using historic drill data and dredge limits, Yukon Heli Ski was able to target *in situ* side pay on the far left limit of the drainage. In addition, using historic and modern drilling campaigns to direct upstream advancement, they have mined a continuous cut from 2018 to 2020.

Bedrock Geology Bedrock is flat lying micaceous schist with minor quartz veinlets. An abundance of pyrite is recovered.

Gold Characteristics Gold is predominately fine.



As part of the Salmon Gold reclamation project completed in partnership with Yukon Heli-Ski on Sulphur Creek, schematic drawings of reclamation outcomes were constructed by Mosquito Flats Design to help guide the project. The cross section illustrates bank grading, channel anchoring methods and local vegetation transplanting. The photograph shows the new stream channel under construction along with bank improvements in 2019. Schematic drawing courtesy of Mosquito Flats Design and photograph by Yukon Heli-Ski.

Sulphur, a tributary of Dominion

115O/10 2019: 63°40'07"N, 138°41'52"W

Favron Enterprises Ltd., 2018–2020

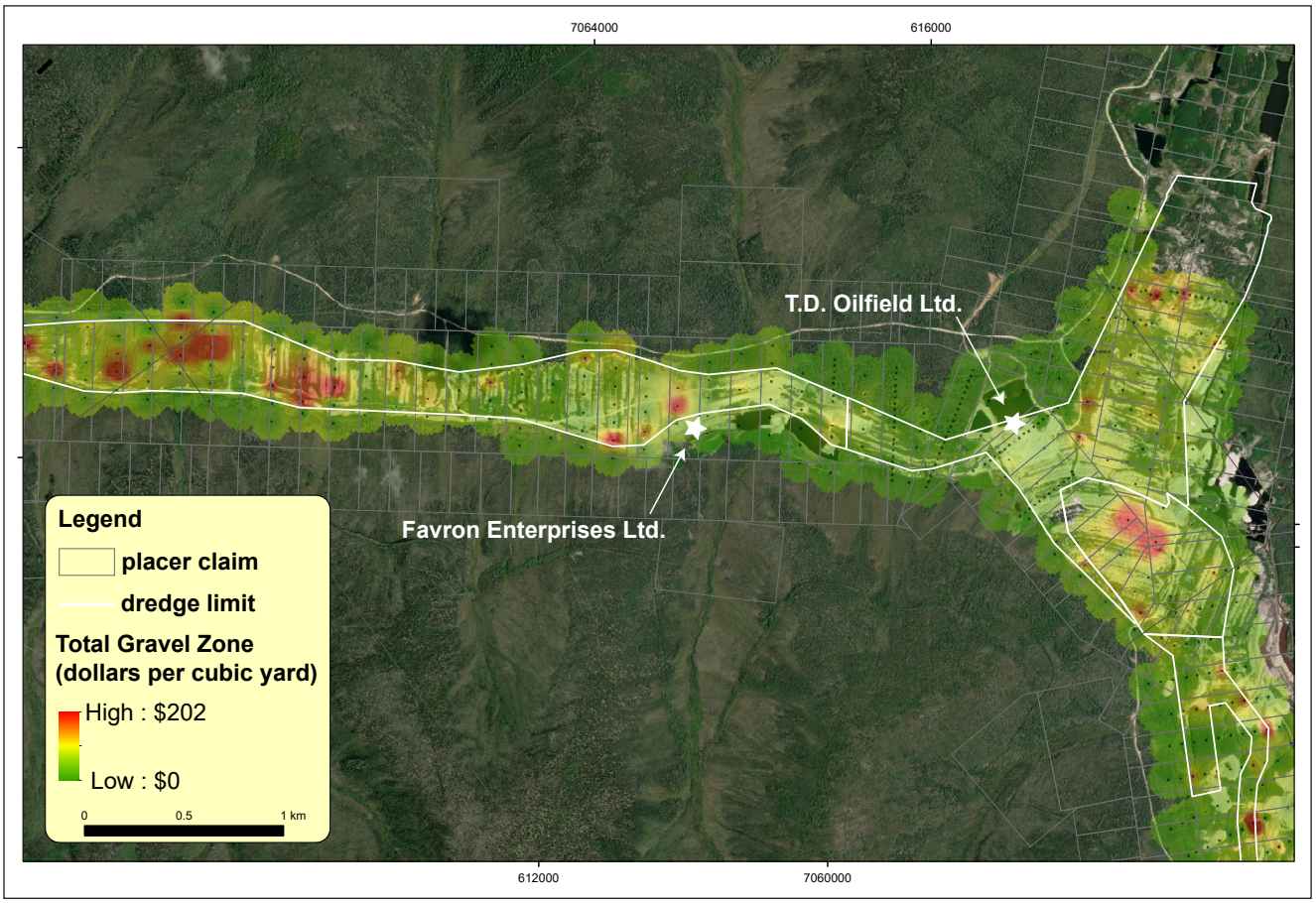
Water License: PM17-069 (Active 01/2028)
Active Producer (2018–2020) **Operation no. 73**

Location Sulphur Creek, 2.5 km upstream from its confluence with Dominion Creek.

Work History and Mining Cuts Favron Enterprises Ltd. re-initiated operations on Sulphur Creek in late 2018 when they conducted a stripping program. In 2019, a 700,000 ft^2 (535 188 m^3) cut was mined, and sluicing commenced. Throughout the 2020 season, a crew of six people sluiced for 24 hours a day. Initial focus was on both limits, where the operator targeted side pay that remained outside of the dredge limits. These cuts measured 70,000 ft^2 (53 518 m^3) on the left limit and 300,000 ft^2 (229 366 m^3) on the right limit. They also discovered *in situ* gravel present under dredge tailings and opened up a 125,000 ft^2 (95 570 m^3) cut to excavate the 0.6 to 1.2 m (2–4 ft) section of untouched gravel. A significant stripping program, encompassing 380,000 ft^2 (290 530 m^3) was completed at the bottom/downstream end of the property. Reclamation is progressive and ongoing, with a large section downstream from the mining location of 2020 recontoured and covered with organic-rich overburden.

Equipment and Water Treatment In 2020, the equipment on site included two Komatsu 375 bulldozers for stripping, Caterpillar 9N and 10N bulldozers for stripping and pushing dumps, an Hitachi 850 and John Deere excavators for digging pay and stripping, four Komatsu HM-400 and two John Deere 460E rock trucks for hauling pay and overburden, a Komatsu 155 bulldozer for pushing pay and a Caterpillar 988 loader for feeding the plant. The system is nearly 100% recirculating.

Surficial Geology and Stratigraphy For the prominent drainages in the Klondike, a significant amount of historic data are available and can aid in directing future operations. As an operator mining in an area that has undergone significant workings since the early 1900s, Favron Enterprises Ltd. has turned to



Lower Sulphur total gravel zone grade raster (calculated using the price of gold at CAD $1,400/oz); red colour indicates areas containing the richest ground. Dredge limit is outlined in solid white line and the two operations, Favron Enterprises Ltd. and T.D. Oilfield Ltd. locations in 2019 are indicated with the black star symbol.

some of this historic data to support their mine planning. Using historic drilling data and dredge limits, they focused on mining side pay remaining outside the dredge limit. Historic drilling has also assisted in finding areas of economic gravel, whether that be in areas never dredged, or in previously dredged areas that are economic to reprocess due to ground conditions and/or dredge inefficiencies. The company used satellite imagery overlain by historic drillhole data, placer claims and dredge limits to create a raster image that displayed the grade in a shade of colour ranging from red being highest grade to dark green the lowest.

In 2020, while mining the virgin right limit side pay, Favron Enterprises exposed the edge of a dredge cut. Virgin gravel was noticed under the dredge slickens and it was decided to open up a 125,000 ft^2 (11 613 m^2) cut. Stripping the dredge tailings proved to be more challenging than initially thought due to the presence of permafrost within 1.2 m (4 ft) of surface. The area was last dredged in the 1960s so the presence of permafrost was unexpected and likely due to the high reflectance of the quart-rich gravel on surface. Under the tailings, approximately 0.6 to 1.2 m (2–4 ft) of virgin Sulphur Creek gravel remained over 70% of the cut area. Reasons for the inefficiency of the dredge in this area are uncertain and it speaks to the potential for additional reserves within the dredge limits on this and neighboring claim blocks.

Bedrock Geology Bedrock is mapped as quartzite, schist, gneiss and amphibolite (Gordey and Makepeace, 1999).

Gold Characteristics Not reported.



A view looking north up Sulphur Creek and Favron Enterprises 2020 dredge cut. The pickup truck is parked on top of the tailings, which marked the outer edge of the dredge limit. Up to 1.2 m (4 ft) of virgin gravel remained on the bedrock surface due to inefficient dredging in the 1960s.

Sulphur, a tributary of Dominion

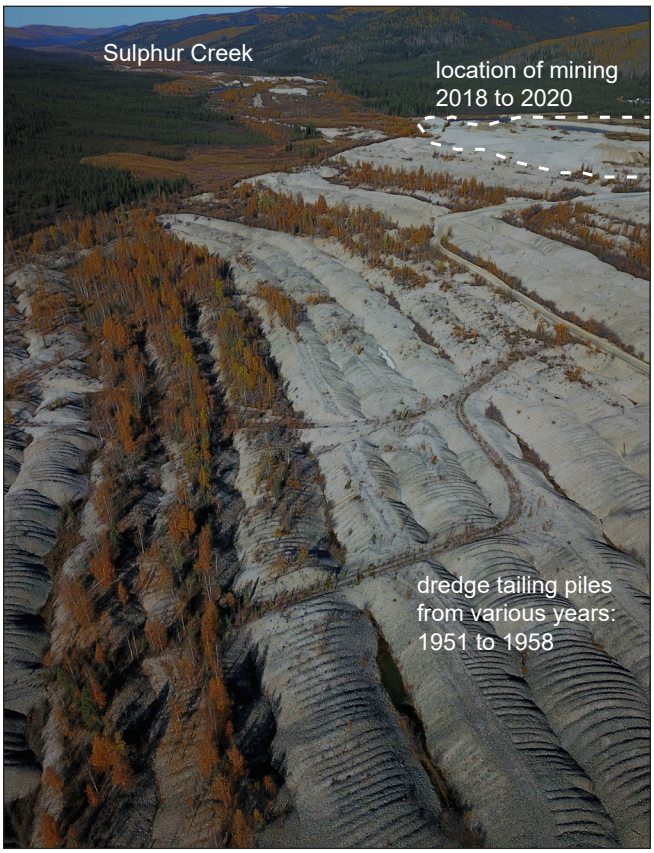
115O/10 2019: 63°39'35"N, 138°40'20"W

T.D. Oilfield Services Ltd., 2019–2020
Tatra Ventures Ltd., 2010-2014, 2017

Water License: PM11-017-1 (Active 09/2021)
Active Producer (2019–2020) **Operation no. 74**

Location Sulphur Creek, at its confluence with Dominion Creek.

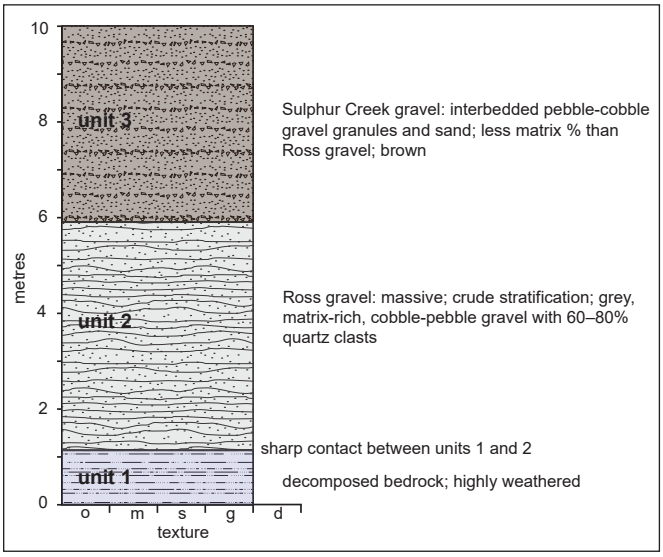
Work History and Mining Cuts In 2018, Tatra Ventures Ltd. processed a stockpile of pay and conducted approximately 150 hours of sluicing. Mining continued throughout 2019 and approximately 650 hours of sluicing was completed using a crew of up to six employees. Reclamation was conducted at the end of the season. In early 2020, a lease agreement was established between Gatenby Enterprises Ltd. and T.D. Oilfield Services Ltd. In August 2020, T.D. Oilfield employed a crew of four people to strip the ground. Two additional crew were employed in September to sluice 15,000 yd^3 (425 m^3) of material.



Drone image from 2018, looking northwest (upstream) in the Sulphur Creek drainage. The location of mining for Tatra Ventures Ltd. and T.D. Oilfields Ltd. The dashed line outlines the location of mining for Tatra Ventures Ltd. and T.D. Oilfields Ltd. Dredge tailings piles from the 1950s are abundant throughout the Klondike and well preserved, as shown in the image.

Equipment and Water Treatment In 2020, the equipment on site included a Caterpillar 345 excavator, a John Deere 450 excavator and an Hitachi 450 excavator, two Volvo 40-ton rock trucks and a Caterpillar D10T bulldozer. An SD-400 wash plant fabricated by Macon Industries was purchased in 2020. The 1.2 by 3.0 m (4 × 10 ft) double screen deck was able to process up to 110 yd^3 (84 m^3)/hr. The primary run is 2.4 m (8 ft) in length, configured with Hungarian riffles, followed by a 3.7 m (12 ft) long secondary run with a boil box, hydraulic riffles and expanded metal. Two secondary runs on either side of the plant are utilized. Water to the plant was supplied by an 8" pump and was recirculated in a series of three ponds. Clean-ups were conducted using a jig, wheel and a reverse trommel.

Surficial Geology and Stratigraphy Lower Sulphur Creek stratigraphy consists of three units and remains uniform throughout the cut exposed in 2017. Unit 1 is decomposed bedrock that has a highly weathered zone 1.2 m (3.9 ft) thick and competency increases below that depth. The contact between bedrock and unit 2 is not erosive, indicating that the bedrock decomposed after deposition of unit 2. Unit 2 is 4.7 m (15.4 ft) of Ross gravel with planar-tabular cross-bedding. It is a medium sand and granules rich, pebble-cobble gravel where cobbles represent 40% and pebbles 60%. Overlying the Ross gravel is unit 3 from 4.7 to 9.0 m (15–29 ft) thick, which is Sulphur Creek gravel. Sulphur Creek gravel is brown in colour and more clast-rich than the underlying Ross gravel. Fine-grained lenses of sand are up to 1 m (3 ft) thick, and interbedded between the clast-rich gravel. Clasts are subrounded and the largest clast present is 0.4 m (1.3 ft). Stripping has disturbed the top of the section but the overburden consisted of loess and organics.



Stratigraphy of lower Sulphur Creek where it flows into the broad Dominion Creek valley.

The Ross gravel, an incised valley-fill gravel, hosts the majority of gold on lower Sulphur Creek. Sulphur Creek gravel overlies the Ross gravel, often in modern creek terraces several metres from the valley floor. Modern stream gravel overlying the floors of lower Sulphur Creek are thick, up to 4 m (13 ft) and could be fluvial fan processes from Sulphur Creek depositing sediment at the confluence with Dominion Creek. Alternatively, the thick package could be the result of a base level change that resulted in increased accommodation space at the mouth of the drainage.

Bedrock Geology Bedrock is highly decomposed quartz-muscovite-chlorite schist.

Gold Characteristics Gold is predominately fine-grained and has a fineness of 840.

Dominion, a tributary of Indian

115O/15 2019: 63°48'13"N, 138°36'55"W

Ace Placer Mining Ltd., 1971–2020

Water License: PM14-064 (Active 03/2025)
Water License: PM16-067 (Active 04/2027)
Active Producer (2018–2020) **Operation no. 75**

Location Dominion Creek, downstream from Nevada Creek.

Work History and Mining Cuts Ace Placer Mining Ltd. has been present in the territory since the early 1960s, and in recent years have operated as a three generation mine. In May 2019, Mr. A. Sailer passed



Ace Placer Mining Ltd. processing material on Dominion Creek in 2020. (Photo credit: Ross Sailer).

away and his cheerful presence and vast knowledge of the creek is missed. Activity in recent years has been on both limits of the drainage, downstream from Nevada Creek. In 2019 and 2020, a crew of two to three people conducted various smaller cuts that were processed using a portable trommel. Cuts were located on the left limit of Dominion Creek, both upstream and downstream from the mouth of Nevada Pup.

Equipment and Water Treatment Equipment on site in 2020 included a Caterpillar 235 excavators, a Caterpillar 225 excavator, a Caterpillar D10 bulldozer, two Caterpillar 980C wheel loaders, and one Caterpillar 740B rock truck. A portable trommel was used to process material 70 to 80 yd^3 (53–61 yd^3)/hr.

Surficial Geology and Stratigraphy The Sailers have identified four levels of Pleistocene terraces preserved on the left limit of Dominion Creek. Minimal preservation of those former floodplain levels are present on the right limit, although very small deposits may remain near the mouth of some tributaries. A left limit bench cut at an elevation of 627 m was mined in 2016. The bench cut, 500 m (1640 ft) downstream from the mouth of Lemare Gulch, and approximately 10 m above the modern creek level, consists of two units. Unit 1 is 1.8 m (6 ft) of a poorly to moderately sorted cobble-pebble gravel. It has a coarse–fine–coarse stratigraphy and is primarily clast-supported with a 20% matrix comprising fine to medium sand. A discontinuous lens, up to 0.3 m (1 ft) thick, of fine sand to silt is present in the middle of the gravel package, which likely represents a meandering stream. Unit 2 is a 3.7 m (12 ft) thick fine-grained overbank and aeolian material (loess) and caps unit 1.

Bedrock Geology Bedrock is decomposed sericite schist.

Gold Characteristics Gold from the right limit of Dominion Creek is mostly fine, whereas the left limit produces flat, flakey fine gold. Fineness is 800.

Dominion, a tributary of Indian

115O/15 2020: 63°45'20"N, 138°31'04"W

Hollis Mining & Exploration Ltd., 2001–2020

Water License: PM13-010-1 (Active 04/2023)
Water License: PM15-026 (Active 07/2025)
Active Producer (2018–2020) **Operation no. 76**

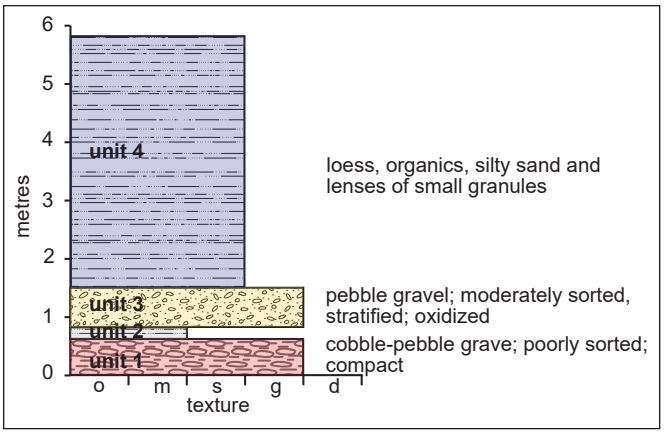
Location Dominion Creek, 0.3 km downstream from Kentucky Creek.

Work History and Mining Cuts For the past several seasons, Hollis Mining & Exploration Ltd. has been focused on mining several elevations of fluvial benches on the left limit, between Jensen Creek and Arkansas Creek. In 2018, Mr. Hollis finished mining a 1219 m (4000 ft) long cut that had been worked in previous years. The cut was located below the mouth of Kentucky Creek. In 2019, two cuts were completed: a 500 m (1640 ft) long cut immediately upstream from Arkansas Creek; and a 52 by 90 m (171 × 295 ft) cut on the highest level terrace. A third cut, measuring 34 by 66 m (113 × 216 ft), was stripped at the end of 2019 and mined in 2020. A second cut measuring 40 by 49 m (130 × 160 ft) was also completed, immediately downstream from the previously mined cut that season. In 2020, 290 hours was spent sluicing. Mr. Hollis, along with one employee operate a daily twelve-hour shift.

The use of excavator-mounted conveyor systems facilitates the economics of mining on the Dominion Creek benches. Fabricated on site, these conveyors can be used in tandem to efficiently transport overburden. One conveyor, plus the excavator feeding it, can transport material 50 m (160 ft) at a cost of $0.30/$yd^3$. The conveyors can move upwards of 1000 yd^3/hr, which represents a cost saving that is five times less expensive than using a D10 bulldozer. Up to three conveyors have been used in tandem at the mine site.

Equipment and Water Treatment Equipment present in 2020 included a John Deere 892E LC excavator, John Deere 370 excavator, John Deere 450 excavator, and a Komatsu PC300 excavator. Two conveyors, one 110 ft (34 m) long and the other 130 ft (40 m) long are used for transporting overburden. Pay gravel was processed using a 1.5 by 3.3 m (5 × 11 ft) oscillating screen deck with ½" screen, and a 12 m (40 ft) tailings stacker. Sluice runs, lined with unbacked Nomad matting, are 2.4 m (8 ft) wide and

consist of 0.6 m (2 ft) of expanded metal, a boil box, 0.6 m (2 ft) of hydraulic riffles, and a final 2 ft of expanded metal at a steeper grade. The plant processed 80 yd^3 (61 m^3)/hr, using water acquired from Dominion Creek and supplied to the plant by a 5 by 5" Cornell pump. Pumps used to dewater cuts were powered by an automatic rotating solar panel. Settling ponds in a series of dredge tailings were used to filter effluent. Water was 100% recycled. A wheel was used to conduct the clean-ups.



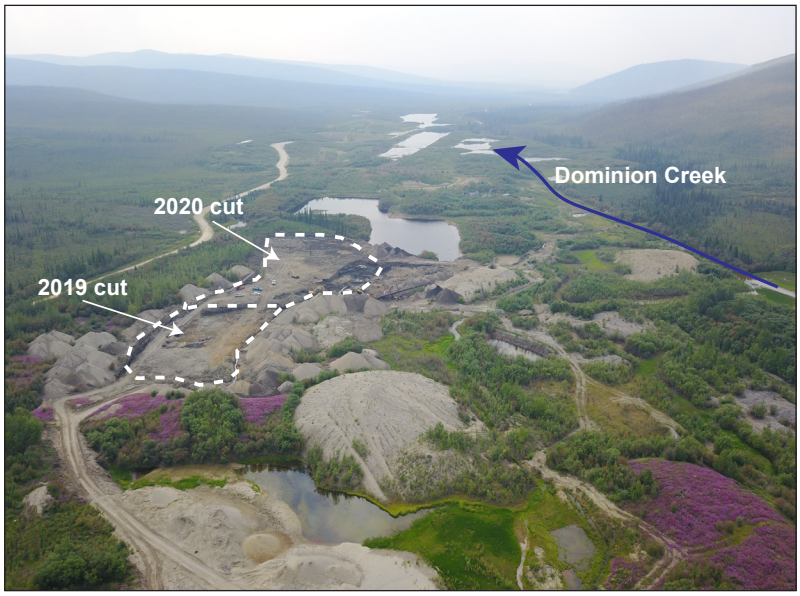
Stratigraphy of the highest tier terrace exposed in 2020, on the left limit of Dominion Creek, immediately downstream from Kentucky Creek.

Surficial Geology and Stratigraphy Multiple tiers of fluvial terraces are present on the left limit of Dominion Creek. In most recent years, the uppermost tier has continued to extend farther east, towards the Dominion Creek road. Lateral extension of the cut, towards the left limit (east side) of the valley, exposes a slight increase in bedrock elevation; elevation increases 0.9 m (3 ft) over a distance of 46 m (150 ft). The gravel thickness remains consistent across the width of the bench.

At the 2020 cut location, the fluvial terrace consists of four units. Unit 1 is 0.6 m (2.0 ft) thick and the main characteristic that distinguishes it from the overlying gravel units is its hard, compact nature and slightly larger clast size. It is a poorly sorted, cobble-pebble gravel with 70% cobbles and 30% pebbles that have a subround shape. Matrix content is 30% and consists of silt with minor fine-grained sand. Unit 2, from 0.6 to 0.8 m (2.0–2.6 ft), is a thin lens of silt with minor sand. This accumulation of silt likely represents overbank flood accumulations associated with the paleo-Dominion Creek floodplain surface. Unit 3, from 0.8 to 1.5 m (2.6–4.9 ft) is an oxidized, moderately sorted, stratified pebble gravel, that is loose and clast supported. Unit 4, from 1.5 to 5.8 m (4.9–19 ft) is overburden consisting of loess, organics with lenses of silty-sand and small granules. Pay is considered the bottom 0.6 m (2 ft) of gravel (all of unit 1) and up to 0.1 m (4") of bedrock. The pay zone is very well defined due to its compact and coarse nature.

Bedrock Geology Bedrock is a highly fractured and decomposed muscovite schist. Large undulations up to 2 m (6.6 ft) are present in the bedrock surface. Late Cenozoic tectonic activity has offset gravel units and highlights several areas of faulting.

Gold Characteristics Gold is primarily fine and has a fineness of 850.



Hollis Mining & Exploration Ltd.'s mining cuts from 2019 and 2020 outlined by a dashed white line. Drone image from 2018.



A series of three conveyors moving material at A. Hollis' operation in fall 2018. Operating these conveyors in tandem allowed material to be moved over 150 m (500 ft) quickly and efficiently. These custom fabricated "Hollis Haulers" with conveyors mounted on excavator chassis, is an innovation in the Klondike that is gaining momentum throughout the industry.

Dominion, a tributary of Indian

115O/10 2018: 63°42'16"N, 138°33'22"W
115O/10 2018: 63°42'13"N, 138°33'38"W

Dominion Gold Resources Ltd., 2013–2020

Water License: PM12-054-3 (Active 03/2023)
Water License: PM19-031 (Active 05/2030)
Active Producer (2018–2020) **Operation no. 77**

Location Dominion Creek, at the mouth of Bullfrog Creek.

Work History and Mining Cuts Dominion Gold Resources Ltd. has continued to mine upstream on Dominion Creek from 2018 to 2020. With a crew of up to 27 people, they operated 24/7 and moved/processed a substantial amount of material each season. In 2018, a cut 95 by 118 m (312 × 387 ft) in mid-Dominion Creek, directly across from Eagle Creek, was mined. A second cut mined that season, 950 m upstream from Grant Pup was 260,000 ft^2 (24 155 m^2). In 2019, activity focused on the left limit of Dominion Creek near Eagle Creek and 4 million yd^3 of material was sluiced from an area of 800,000 ft^2 (74 322 m^2). Two cuts were mined in 2019, the first cut measured 50 by 308 m (165 × 1010 ft) and the second cut was horseshoe shaped and totaled 508,000 ft^2 (47 195 m^2).

Two cuts in 2020, one 300,000 ft^2 (27 870 m^2) and the other 700,000 ft^2 (65 032 m^2), were completed on the right limit to center valley, advancing towards Bullfrog Creek. Several seasons of mine planning was aided by a 167 hole drilling campaign in 2017. Additional drilling was completed in 2020; 44 holes were drilled on the left limit to advance the cut for next season.

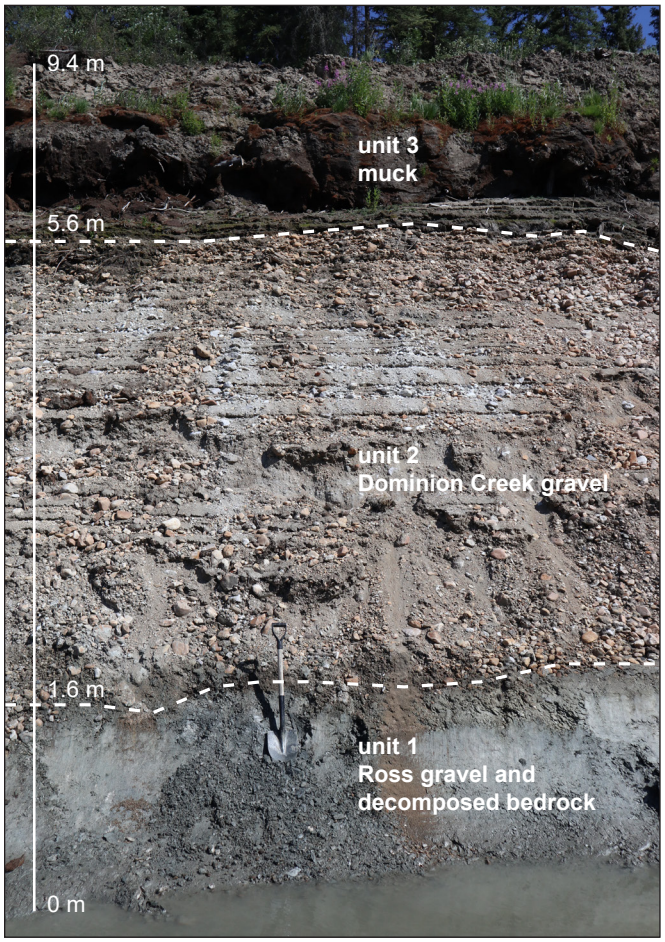
Dominion Gold Resources Ltd. is another operation that utilizes excavator-mounted conveyor systems for transporting and segregating overburden. Two 36.5 m (120 ft) conveyors in tandem with a 3 m (10 ft) hopper

are capable of transporting material over 91 m (300 ft) when including the excavators 7.5 m (25 ft) reach; this is equivalent to six 40-ton rock trucks working on a 3 minute turn around. Up to 30% less fuel is used by employing the conveyor system as well as a significant cost savings associated with parts and labour. In addition to the cost savings, overburden material can be easily segregated, which facilitates reclamation.

Equipment and Water Treatment Equipment present in 2020 included a Caterpillar 245 excavator, two Caterpillar 349 excavators, an Hitachi 450 excavator, a John Deere 350 excavator, eight 40-ton rock trucks, four Caterpillar wheel loaders (two 980s, one 988 and one 992), and six Caterpillar bulldozers (two D8s, one D9, two D10Ts and one D11). Also present were two track-mounted conveyors each 37 m (120 ft) long. An automatic 16-yd^3 hopper with a conveyor fed the 6.0 by 8.0 (20 × 26 ft) double screen deck and classified material to 2" on the upper deck and ⅝" on the lower deck. Four sluice runs 1.2 m (4 ft) wide by 6.1 m (20 ft) long and two sluice runs 1.5 m (5 ft) wide by 6.1 m (20 ft) long are configured with expanded metal on 3M unbacked Nomad matting, and angle iron riffles at the head and tail of the sluice runs. Using two 18" pumps, water was supplied to the plant for processing more than 300 yd^3 (230 m^3)/hr. Effluent was settled in a series of two large ponds and water was 100% recycled. Clean-ups were conducted using a custom-built power auger system into a Ray Lozzette live bottom concentrator. The magnetic material is removed from the final concentration that is ground in the Clarkson rod mill. Material that is difficult to separate is treated on the RP-4 gold recovery shaker table or Miller table.

Surficial Geology and Stratigraphy The Dominion Creek valley is a broad, mature valley with consistent stratigraphy. Typically, a section consists of a mixing zone of weathered bedrock and gravel, overlain by Ross gravel, which is capped by Dominion Creek gravel. The two gravel units vary in thickness significantly from limit-to-limit; Ross gravel thickness varies from 0.5 to 4.0 m (1.6–13.1 ft) and Dominion Creek gravel thickness varies from 2 to 5 m (6.6–16.4 ft). The mixing zone can be none existent in some locations, as it depends on the bedrock-weathering characteristic in order to create decomposed bedrock, which then combines with gravel.

In 2018, a section exposed on the right limit of Dominion Creek consisted of three units. The mixing zone, from 0 to 1.6 m (0–5.2 ft) is unit 1. In this location, Ross gravel is fully incorporated into the decomposed bedrock and it is difficult to differentiate between weathered bedrock



Section exposed on the right limit of Dominion Creek in 2018. The stratigraphy remains similar each season, as the operator continued to mine the broad Dominion Creek valley. The shovel used for scale is 1 m (3.3 ft).



White dashed outlines indicate Dominion Gold Resources Ltd.'s 2018 cuts. They were situated on the right limit of Dominion Creek, 950 m upstream from Grant Pup. The view is looking downstream towards the southwest.

and a matrix-rich version of the Ross gravel. Due to the presence of rounded pebbles and the rare cobble sized clasts, this is interpreted as a mixing zone with upwards of 80% silty fine-grained sand matrix (weathered bedrock). Clasts (and likely the associated gold) are derived from Ross gravel based on the abundance of quartz which are indicative of the older gravel. Unit 2, from 1.6 to 5.6 m (5.2–18.4 ft) is Dominion Creek gravel, a weakly stratified cobble-pebble gravel with 70% pebbles and 30% cobbles. Cross-bedding and clast imbrication is consistent with down-valley Dominion Creek flow. Unit 3, from 5.6 to 9.4 m (18.4–30.8 ft) is black muck and organics.

A section measured in the 2019 cut had a total thickness of 8.5 m (28 ft). Unit 1, from 0 to 3 m (0–10 ft) is a quartz-rich unit interpreted as the Ross gravel. Beds within the Ross gravel alternate between moderately and poorly sorted and are each about 50 cm thick. The moderately sorted beds have imbricated clasts, a sandy matrix, and display cross-bedding structures, whereas the poorly sorted beds have little to no structure and have a silt-rich matrix. The variation in bed characteristics is due to stream flow intensity with the poorly sorted beds derived from higher energy conditions. The upper contact of the Ross gravel has vertically oriented clasts suggesting the floodplain surface at the time was exposed to intense freeze-thaw or periglacial conditions. This periglacial surface at the top of the Ross gravel forms a relatively resistant upper contact, which can be useful marker during stripping. The lower portion of the Ross gravel is processed for placer gold. Unit 2, from 3 to 5.5 m (10–18 ft) is a stratified, pebbly gravel with abundant sand beds. Coarser beds are visible elsewhere in the cut suggesting considerable lateral variation is present This unit is the Dominion Creek gravel and is not processed for placer gold. Unit 3, from 5.5 to 8.5 m (18–28 ft) is bedded silt and organics (muck).



An aerial view looking over Dominion Gold Resources Ltd.'s 2019 mining cut. Excavator-mounted conveyors are visible in the distance. The strategically positioned conveyor piles located around the perimeter of the cut allow for easy backfilling.

Bedrock Geology Bedrock is psammite interbedded with quartz-mica schist.

Gold Characteristics Gold from the right limit of Dominion Creek is 70% 30 to 50 mesh in size, whereas on the left limit the gold is coarser. Fineness is 830 to 840.

Gold Run, a tributary of Dominion

115O/15 2018: 63°43'44"N, 138°41'08"W

536712 Yukon Inc., 2018–2020

Water License: PM19-052 (Active 05/2030)
Active Producer (2018–2020) **Operation no. 78**

Location Gold Run Creek, 0.6 km upstream from the mouth of Laskey Creek.

Work History and Mining Cuts Mr. Ruman has owned the claims on Gold Run Creek for more than a decade, but his first year of mining activity in the drainage occurred in 2018. In 2018, a significant stripping program was completed, where Mr. Ruman opened up a left limit cut upstream from Laskey Creek. In 2019, tailings piles and open cuts from historic mining on the property were reclaimed. An area amounting to approximately 41 587 m^3 (300 × 500 ft), was stripped in 2020. No other specific work history is known for 2019 or 2020.

Equipment and Water Treatment Equipment present in 2018 included a Volvo 460 excavator, a Komatsu PC270LC excavator, a Volvo excavator with unknown model number, a Caterpillar D8K bulldozer and a rock truck. The wash plant, was an oscillating screen deck.

Surficial Geology and Stratigraphy Three bench levels are present on the left limit of Gold Run Creek. Significant loess accumulations still exist along the margins of the valley bottom. In 2019, a measured section consisted of 7 m (23 ft) of loess (silt) overlying a thin gravel layer on bedrock. Initial analyses on a tephra preserved in the middle of the loess unit suggests it is Dawson tephra, deposited around 26,000 to 29,000 years ago. Significant amounts of



Drone imagine looking upstream Gold Run Creek, with 536712 Yukon Inc.'s operation on the left limit of the drainage. Dashed lines approximate the outline of three bench levels.

historic workings have occurred on Gold Run Creek; one of Klondikes' first dredging operations worked the drainage from 1914 to 1923. As a result, technogenic deposits are present, and often mask virgin ground.

Bedrock Geology Bedrock is mapped as quartz-mica schist, and described by the operator as decomposed.

Gold Characteristics Not reported.

Whitman, a tributary of Gold Run

115O/15 2020: 63°42'52"N, 138°38'28"W

536784 Yukon Inc., 2018–2020

Water License: PM19-073 (Active 05/2030)
Active Producer (2018–2020) **Operation no. 79**

Location Whitman Gulch, 0.2 km upstream from its confluence with Gold Run Creek.

Work History and Mining Cuts 536784 Yukon Inc. staked the lower claims on Whitman Gulch in 2018 and purchased the upper claims in 2019. The lower claims were first active in 2018, where the operator monitored for 1 month. For the past three seasons the operator has continued to mine upstream of a cut initiated 0.2 km upstream from the confluence of Whitman Gulch and Gold Run Creek. The primary method of overburden removal is to monitor the frozen black muck to expose the pay gravel. A crew of up to three people were present at the operation, with two additional younger miners who primarily collected rock samples. A total of 3000 yd^3 (2294 m^3) of material was sluiced in 2019. In addition to mining, a 6" auger drilling exploration program was completed in 2020 that followed up on some 2016 results.

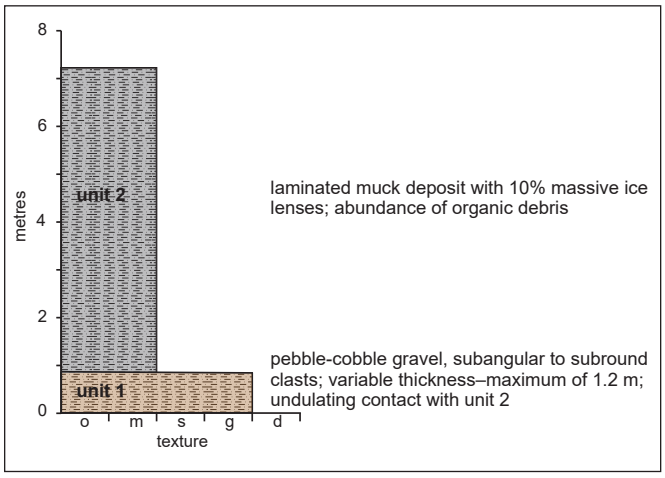
Equipment and Water Treatment Equipment on site in 2020 included an Hitachi EX270LC excavator for digging and stock piling pay, and a monitor.

Pay material was stockpiled until a bulk sluicing effort was conducted, in which the T.D. Oilfield Ltd. wash plant located on Gold Run Creek was utilized.

Surficial Geology and Stratigraphy Whitman Gulch is a narrow tributary with a maximum width of 47 m (154 ft), in its lower reaches. Monitoring occurred from limit-to-limit, to thaw and remove the thick section of frozen black muck. Two units are present in lower Whitman Gulch. Unit 1 varies in thickness up to a maximum of 1.2 m (3.9 ft) but on average is 0.6 m (2 ft) thick. It is a moderately to pervasively oxidized pebble-cobble gravel with 70% pebbles, 30% cobbles, and rare boulders (less than 2%) on the bedrock contact. Clasts vary between subround to subangular and the largest clasts, although uncommon, is 0.5 m (1.6 ft) in diameter.



Monitoring on Whitman Gulch in 2019, where they spent the majority of the season thawing and hydraulically removing frozen black muck, in order to liberate the gravel situated on bedrock.



Stratigraphy of lower Whiteman Gulch.

The gulch gravel is a high-energy gravel deposit that is poorly sorted and appears to have reworked bedrock fragments throughout. Unit 2, from 1.2 to 7.2 m (3.9–23.6 ft) consists of laminated muck with 10% massive ice, an abundance of organics throughout, and clast-rich lenses. The bedrock surface in the gulch significantly increases at the margin of Gold Run Creek, and as a result, Gold Run Creek likely reworked its alluvial fan. All gravel encountered, from limit-to-limit and up to an additional 0.9 m (3 ft) of bedrock was sluiced.

Bedrock Geology Bedrock is oxidized quartz-mica schist.

Gold Characteristics Gold is chunky, has a bright red tinge, and an abundance of quartz inclusions. The largest piece recovered is ¾ ounce. Fineness is 880.

Gold Run, a tributary of Dominion

115O/10 2020: 63°42'59"N, 138°39'37"W

T.D. Oilfields Services Ltd., 2010–2020

Water License: PM18-028-1 (Active 12/2028)
Water License: PM08-599 (Expired 12/2018)
Active Producer (2018–2020) **Operation no. 80**

Location Gold Run Creek, at the mouth of 34 Pup.

Work History and Mining Cuts In the past three seasons, T.D. Oilfield Services Ltd. has mined several locations between Whitman Gulch and 34 Pup. A cut 100 by 110 m (328 × 360 ft) downstream from 34 Pup was mined in 2018, as well as a larger cut in mid-valley. In 2019, a cut immediately downstream from Whiteman Gulch was processed. A drillhole program identified a mid-level bench at the mouth of 34 Pup and stripping was conducted to open a cut on the bench. Immediately upstream of 34 Pup, and within the dredge limits of Gold Run Creek, a cut measuring 76 by 370 m (377 × 427 ft) was processed. In 2020, a crew of 17 employees focused efforts on a 115 by 130 m (377 × 427 ft) cut, 200 m upstream 34 Pup, on the left limit of the Gold Run Creek valley. T.D. Oilfield Services Ltd. also operated at a second location on Sulphur Creek in 2020.

Equipment and Water Treatment Equipment utilized by T.D. Oilfields Services Ltd. in 2018 included two John Deere 450D excavators, a Caterpillar 345 excavator, a Caterpillar 330 excavator, a Caterpillar D8L bulldozer, a Caterpillar D10N bulldozer, a Caterpillar D10T bulldozer, a Volvo 220 E wheel loader, a Caterpillar 982 wheel loader and a Caterpillar 982 wheel loader.



Evidence of historic workings on the recently discovered bench at the mouth of 34 Pup.

Six rock trucks, two 30-tonne Volvo rock trucks, two 35-tonne Volvo rock trucks and two 40-tonne Volvo rock trucks, were utilized for hauling overburden and pay to the plant. A 1.5 by 4.9 m (5 × 16 ft) shaker deck with an automatic 7-yard hopper was used to process up to 140 yd^3 (92 m^3)/hr. A 14" Cornell pump, powered by a Caterpillar 3608 Industrial diesel engine, supplied water to the plant. Effluent was settled in one pond and water was 100% recycled. Clean-ups were conducted using a jig, wheel and a small reverse trommel.

Surficial Geology and Stratigraphy Two placer settings were mined in the past several years on Gold Run Creek. Extensive historic mining has taken place on Gold Run Creek, but due to dredge inefficiencies and the characteristics of the bedrock, *in situ* gravel remains buried beneath a thick technogenic deposit. This technogenic deposit consists of dredge slickens, overbank material and fine-grained material, and can be up to 7 m (23 ft) thick overlying the bedrock surface. Bedrock in the drainage is predominately decomposed quartz-mica schist and quartzite, and its surface topography undulates, which allowed for preservation of remnants of paleo-Gold Run Creek gravel to remain untouched. These *in situ* gravel pockets can be up to 0.6 to 0.9 m (2–3 ft) in thickness in the 2018 cut.

A drilling program in late 2019 targeted the second placer setting, a bench at the mouth of 34 Pup. The bedrock surface exposure in 2020 consists of three different levels, or low terracettes. These are likely the results of gradual down-cutting of Gold Run Creek. The elevation difference between the terracettes is 0.9 to 1.2 m (3–4 ft) and only recognizable in the cleaned bedrock surface. Stratigraphy on the exposed bench includes 2.7 m (8.8 ft) of a pervasively oxidized cobble-pebble gravel, with weak imbrication indicating a downstream direction on Gold Run Creek. Weathered clasts are present throughout the matrix-rich gravel. Matrix varies from 20–30%, with discontinuous lenses of silty-sand beds. The gravel is coarsest at the base and toward the upper contact becomes increasingly finer and better sorted. The overall thickness of the terrace gravel varied between 0.2 m and 2.7 m. Up to 1.8 m (6 ft) of black muck and organics was stripped off as overburden. Up to 1.3 m (4.3 ft) of bedrock and most of the terrace gravel was processed for pay.

Bedrock Geology Bedrock is interbedded quartzite and decomposed quartz-mica schist. An abundance of pyrite was also recovered.

Gold Characteristics Gold from virgin ground outside the dredge limit yielded 90% 50 mesh-sized gold, while gold from inside the dredge limit, in either tailings or virgin sediment produced 60% 25 mesh sized gold. The largest piece recovered was ¾ ounce and the fineness ranges from 850 to 860. Gold from 34 Pup is coarser, chunkier and has a fineness of 865.



Drone image from 2018 looking downstream Gold Run Creek. T.D. Oilfield Services Ltd.'s cut where they targeted in situ gravel remaining below dredge tailings is at the bottom of the photo where the excavator is loading the rock truck. Camp is located in the distance, on the left limit side of the photo.

Dominion, a tributary of Indian

115O/10 2020: 63°39'59"N, 138°37'19"W

NBC Contracting, 2020
Gimlex Enterprises Inc., 1994–2017

Water License: PM15-009 (Active 05/2025)
Active Explorer (2020) **Operation no. 81**

Location Dominion Creek, 3.5 km downstream from the mouth of Gold Run Creek.

Work History and Mining Cuts Mining activity resumed on Gimlex Enterprises Inc.'s claims in 2020, where they leased the property to NBC Contracting. In May 2020, NBC Contracting received YMEP funding to conduct a program that included 12 drillholes and bulk sampling. From June to October, with a crew of up to ten people operating a single 12-hour shift, 1570 hours was spent sluicing. All activity was focused on the left limit of Dominion Creek and a cut 65 by 580 m (213 × 1902 ft) was stripped.

Equipment and Water Treatment In 2020, NBC Contracting used a Caterpillar 390 excavator, a Caterpillar 336F excavator, a Caterpillar 982M wheel loader, a Volvo A40F rock truck, two 30-tonne rock trucks and a Caterpillar D10T2 bulldozer. A Macon Industries SS-800 with three 2.4 m (8 ft) screen decks was used to process pay. Initially material was sluiced at a rate of 115 yd^3 (88 m^3)/hr but the company planned to increase the rate to 150 to 180 yd^3 (115–138 m^3)/hr. The sluice runs consist of 3.0 m (10 ft) of Hungarian riffles and another lower run of expanded metal. Water was supplied to the plant using a 10" inlet to an 8" outlet, and effluent was settled in a series of two settling ponds. A daily clean-up on the upper matts was conducted using a shaker table and reciprocating jig.

Surficial Geology and Stratigraphy The stratigraphy on the left limit of Dominion Creek consists of three units. Unit 1, from 0 to 1.6 m (0–5.2 ft) is the Ross gravel, which is grey in colour and is a quartz-rich cobble-pebble gravel. The matrix percentage is higher on the bedrock contact at 30%, and decreases to 20% towards the upper part of the unit. It is overlain by unit 2, from 1.6 to 3.6 m (5.2–11.8 ft), the Dominion Creek gravel, which is brown in colour and has less fines than the lower Ross gravel. Capping the Dominion Creek gravel is unit 3, which consists of frozen black muck. Prior to sluicing, up to 6.1 m (20 ft) of overburden is removed. All Ross gravel from unit 1 and up to 0.3 m (1.0 ft) of bedrock is processed as pay.



NBC Contracting's cut on the left limit of Dominion Creek.



Drone image from 2020 of NBC Contracting's Makon Industries SS-800 wash plant on lower Dominion Creek. The view is looking downstream towards the Indian River valley in the distance.

Bedrock Geology Bedrock is graphitic schist.

Gold Characteristics Gold is bright, with the coarse component yielding in an average size of 0.5 g.



Mr. McGuffie's operation in 2020, using his can-dig excavator and trommel on his claims on Lee Creek. (Photo credit: Jack McGuffie).

Lee, a tributary of Dominion

115O/10 2020: 63°40'27"N, 138°34'59"W

McGuffie, J., 2020

Water License: PM20-014 (Active 06/2030)
Active Producer (2020) **Operation no. 82**

Location Lee Creek, 760 m upstream from Dominion Creek baseline.

Work History and Mining Cuts Mr. McGuffie's first known active year on Lee Pup was 2020. No specific work history is known.

Equipment and Water Treatment Equipment located on site in 2020 included a small trommel with a 3" pump to supply water, and a small can-dig excavator that can be towed behind an ATV.

Surficial Geology and Stratigraphy Not reported.

Bedrock Geology Bedrock is mapped as quartz-mica schist (Gordey and Ryan, 2005).

Gold Characteristics Not reported.

Dominion, a tributary of Indian

115O/10 2018: 63°38'47"N, 138°40'28"W

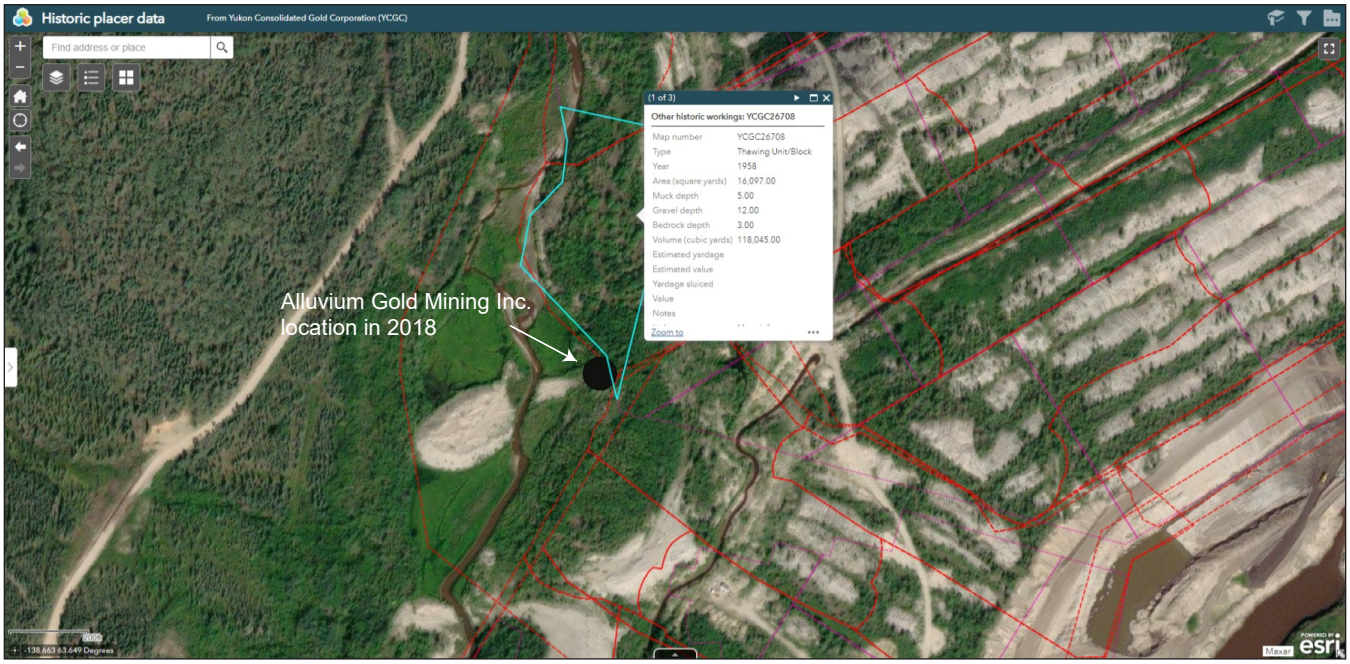
Alluvium Gold Mining Inc., 2017–2019
Gatenby Enterprises Ltd., 1998–2016

Water License: PM14-046 (Active 05/2025)
Active Producer (2018–2019) **Operation no. 83**

Location Dominion Creek, 3.1 km upstream from Scribner Creek.

Work History and Mining Cuts Alluvium Gold Mining Inc. leased ground from Gatenby Enterprises Ltd. from 2017 to 2019. They mined on the right limit of the Dominion Creek valley, targeting virgin ground that remains below historic dredge workings. In 2018, a crew of up to three people mined a cut 15 by 55 m (49 × 180 ft). They received YMEP funding to conduct a drill program to explore for additional remnant virgin pay gravel situated beneath dredge tailings. No sluicing occurred at this site in 2019, and at mid-season Alluvium Gold Mining Inc. relocated to a property on the Indian River.

Equipment and Water Treatment Equipment present on site included an Hitachi 200 excavator, an Hitachi 450LC excavator, a Kawasaki 95Z3 wheel loader, and a 24 m (80 ft) Edge TS80 conveyor to feed



A screen shot from the Historic Placer Data web map, an interactive map that allows you to view, query and download digitized historic placer data. Operators in areas where significant historic work has occurred can find this tool useful to locate dredge limits and historic workings. Alluvium Gold Mining Ltd. was operating in and on the margin of dredge limits that date to as early as 1939 and from 1958 to 1960. In addition, they operated adjacent to a thawing unit that was being prepared for stripping in 1958.

the 15 m (48 ft) long Ross box. The gravity fed Ross box was able to process up to 250 yd^3 (191 m^3)/hr, and is configured with angle iron and expanded metal with unbacked nomad matting. Water was supplied to the plant using a Global 12" diesel driven pump. Effluent was settled in one pond and water was 100% recycled. A gold wheel and a Devon Gold vortex table was used for clean-ups.

Surficial Geology and Stratigraphy A significant amount of historic workings, both by the dredges and by cat miners, makes it difficult to interpret this ground. The disturbance of tailing piles, and additional material piled on top of them, pose a challenge when reconstructing the dredge history in this section of Dominion Creek. Despite the high likeliness of windrows and zones of untouched gravel, *in situ* gravel likely remains buried beneath up to 15 m (50 ft) of technogenic deposits. These heavily dredged areas warrant exploration. The use of historic data coupled with modern imagery and drilling can be an effective way to prospect for remnant placer deposits.

In 2018, a cut on the right limit of the Dominion Creek valley exposed three units. Both unit 1 and unit 2 were poorly exposed and hard to examine at the time of the visit, but consisted of Ross gravel (unit 1) and Dominion Creek gravel (unit 2). The contact between unit 1 and unit 2 is unclear, and as a result, the combined 'gravel unit' is 2.2 m (7.2 ft) thick. The thickness varies and undulates both on the bedrock surface and on the upper contact with unit 3. Unit 3, from 2.2 to 10.0 m (7.2–32.8 ft) is of technogenic origin and includes dredge slickens, fine tailings and organics. All gravel and up to several feet of bedrock is sluiced.



Alluvium Gold Mining Ltd.'s operation in 2018 where they opened up a cut to find in situ gravel remaining below dredge tailings.



Section exposed in Alluvium Gold Mining Ltd.'s cut during the 2018 mining season.

Bedrock Geology Bedrock is fractured orthogneiss.

Gold Characteristics Gold is fine, flat, well-travelled 'flour' gold.

Dominion, a tributary of Indian

115O/10 2019: 63°39'04"N, 138°39'18"W

Fuerstner, M., 2019–2020

Water License: PM14-046 (Active 05/2025)
Active Producer (2019–2020) **Operation no. 84**

Location Dominion Creek, 3.7 km upstream from Australia Creek.

Work History and Mining Cuts Mr. Fuerstner has been mining on Dominion Creek for the past several seasons, under a lease agreement with Gatenby Enterprises Ltd. In 2019, mining occurred in a 5290 m^2 (6326 yd^2) cut on the right limit of the creek at the mouth of Sulphur Creek valley. Additional work in 2019 included improving the access road and armouring along Dominion Creek. In 2020, mining occurred on claims P07001 and P06332, with two cuts totaling 6,370 yd^3 (4870 m^3) stripped and processed. The operation employed two miners.

Equipment and Water Treatment Equipment located on site in 2019 included two Hitachi Zaxis 450 excavators for digging pay and feeding the plant. A Caterpillar D10 bulldozer was used for pushing pay to the plant and clearing tailings. The screen deck plant was capable of processing 100 yd^3 (76 m^3)/hr and has 5⁄16" screen openings. Three sluice runs are used for catching the placer gold. Water was settled in a series of historic cuts and 100% recirculated.

Surficial Geology and Stratigraphy The area processed in 2019 had been previously buried by Gatenby's strippings and the underlying undisturbed material was unfrozen. The total thickness of the undisturbed Dominion Creek surficial sediment was 4.3 m (14 ft). Bedrock in the cut consists of a dark grey,

crumbly, decomposed schist that is not clayey. The bedrock surface undulates by as much as 50 cm (1.5 ft) indicating variable erosion by the overlying gravel. Unit 1, at the base of the section from 0 to 3.3 m (0–11 ft), consists of a fining upward sequence of Dominion Creek gravel that is cobble-dominant in the lower 1.5 m (5 ft) and is a sandy pebbly gravel in the upper 1.8 m (6 ft). Sorting within the gravel increases upward. Portions of unit 1 have a high content of quartz clasts resembling a reworked White Channel gravel. Unit 2, from 3.3 to 4.3 m (11–14 ft) consists of an organic-rich silt interpreted as an overbank floodplain silt. Up to 1 m (3 ft) of bedrock and 1.5 m (5 ft) of gravel is processed for pay.

Bedrock Geology Bedrock is mapped as quartzite, qt-ms-cl schist, gneiss and amphibolite (Gordey and Makepeace, 1999).

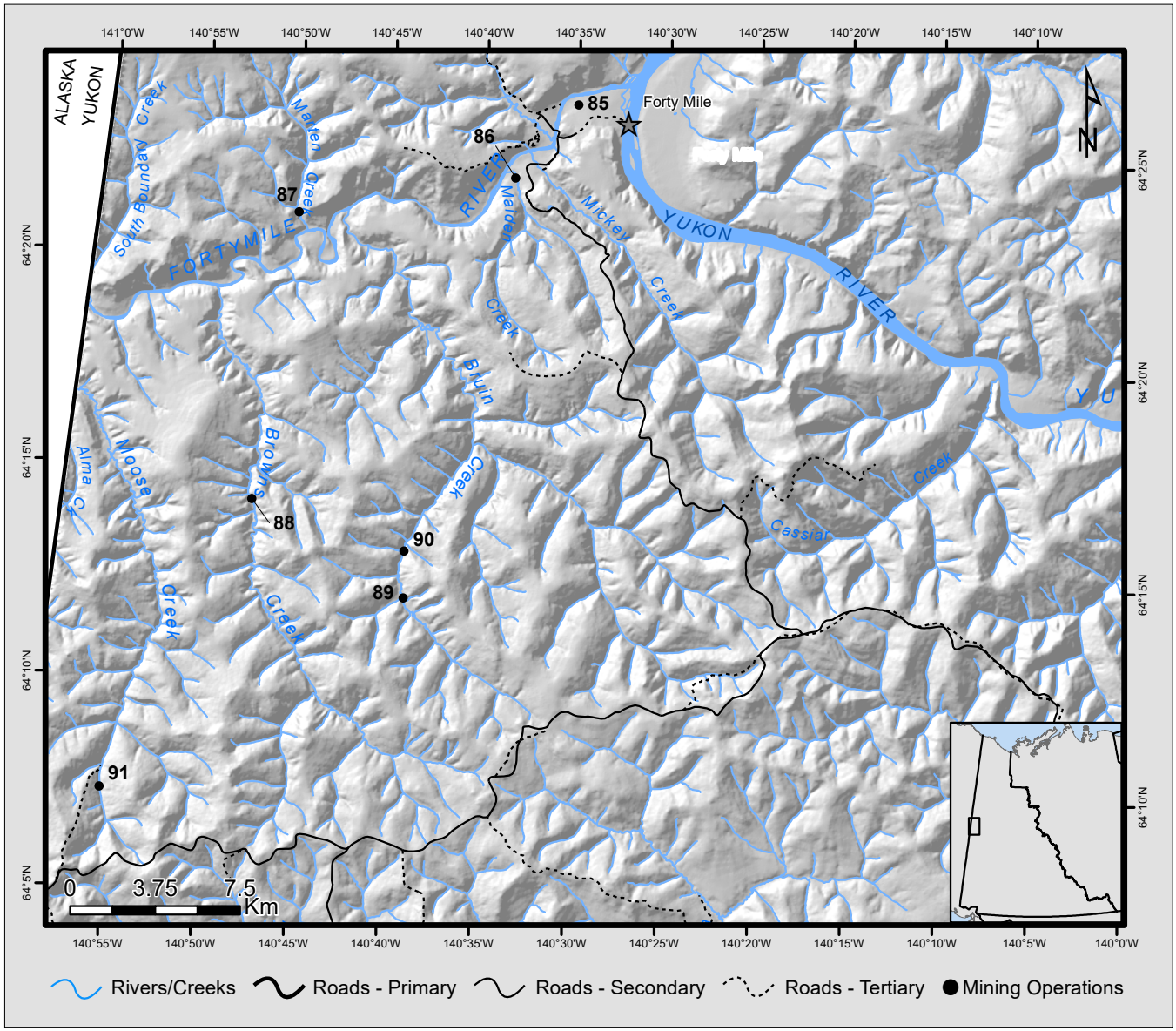
Gold Characteristics Not reported.



An aerial view looking up Dominion Creek over M. Fuerstner's operation near the mouth of Sulphur Creek valley.

FORTYMILE
PLACER AREA

SITES 85–91



LEGEND

85. 41497 Yukon Inc.
86. Groundhog Exploration Co. Ltd.
87. Fortymile Placers
88. 41497 Yukon Inc.
89. Yukon Strike Mining Limited
90. Van Bibber, K.
91. Bondarchuk, V.

Mickey, a tributary of Fortymile

116C/07 2019: 64°24'56"N, 140°34'41"W

41497 Yukon Inc., 2009, 2012–2017, 2020

Water License: PM10-077 (Expired 04/2021)
Water License: PM08-603 (Expired 09/2018)
Active Producer (2020) **Operation no. 85**

Location Mickey Creek, 500 m upstream on Mickey Creek, a right limit tributary of Fortymile River.

Work History and Mining Cuts Minimal activity occurred on Mickey Creek from 2018 to 2020. Testing was completed in 2020.

Equipment and Water Treatment Prospecting was conducted using pans and by shafting.

Surficial Geology and Stratigraphy Gold values are present in the White Channel equivalent (Pliocene to late Pleistocene in age) gravel that is found in the Mickey Creek drainage and down the Fortymile River. In 2020, the total section depth to bedrock was 7.6 m (25 ft).

Bedrock Geology Bedrock is mapped as quartzite and quartz-muscovite-chlorite-schist (Mortensen, 1996).

Gold Characteristics Gold is fine.

Maiden, a tributary of Fortymile

116C/07 2018: 64°23'02"N, 140°37'38"W

Groundhog Exploration Co. Ltd., 2003–2005, 2010–2020

Water License: PM18-046 (Active 12/2028)
Water License: PM12-067 (Expired 05/2018)
Active Producer (2018–2020) **Operation no. 86**

Location Maiden Creek, 0.7 km upstream from its confluence with Fortymile River.

Work History and Mining Cuts The activity on Maiden Creek from 2018 to 2020 consisted of auger drilling, scouting for a new access road and stripping a cut.

Equipment and Water Treatment Equipment consists of an Hitachi EX300 excavator and an Hitachi UH07 excavator. Material was processed in a New Zealand style trommel able to process 24 yd^3 (18 m^3)/hr. A Nordwell FN60 auger was used to conduct exploration. Water was 100% recycled.

Surficial Geology and Stratigraphy Placer gold is found at the base of a Pliocene (?) paleo-Fortymile River gravel, which has been down-faulted to below present-day Maiden Creek water levels. There is a correlation between recent faulting and placer gold 'pay', and a local quartz-diorite (?) is a probable gold source (Woodsend, pers. comm).

Bedrock Geology Bedrock is graphitic metaphyllite (Woodsend, *pers. comm*).

Gold Characteristics Gold is primarily fine with the majority of gold recovered <100 mesh. The purity is 840.

Marten, a tributary of Fortymile

116C/07 2020: 64°21'34"N, 140°49'11"W

Fortymile Placers, 1974–2020

Water License: PM15-045 (Active 07/2025)
Water License: PM07-579 (Expired 10/2018)
Active Producer (2018–2020) **Operation no. 87**

Location Marten Creek, 860 m upstream from its confluence with Fortymile River.

Work History and Mining Cuts Mining continued on Marten Creek just below the forks using a two-person floating trommel-style operation. Approximately 100 days of sluicing were completed each season.

Equipment and Water Treatment Equipment used for mining in 2020 included an Hitachi EX200 excavator and a floating New Zealand-style trommel. The trommel measured 1.2 by 3.6 m (4 × 12 ft), classified to 5/16", and had a 10.4 m (34 ft) conveyor stacker. On each side of the plant are sluice boxes that measure 1.8 m (6 ft) wide by 2.4 m (8 ft) long and consist of a boil box, hydraulic riffles, expanded metal, and are lined with unbacked nomad matting. The operation is very fuel efficient, burning 4 gallons/hr for both the excavator and the plant. A command bridge located on top of the plant controls the floating trommel through a series of hand winches connected to tie points on land. This enables the plant captain to position the plant within convenient reach of the excavator and rotate the tailings stacker to disperse coarse material. The plant captain also controls the water to the plant and it is turned off when the plant needs repositioning or if no gravel is in the hopper. Water is supplied to the plant by a 4" electric flight pump powered by a 35 kilowatt generator, enabling the plant to process 50 yd^3 (38 m^3)/hr. Water is

acquired from Marten Creek and 100% recycled within the active cut. Recirculation of water within a relatively confined area means there can be problems with woody debris being introduced into the pump and affecting the hydraulic riffles; a pond skimmer is used to remove the woody debris. A clean-up is conducted every 50 hours and a long tom and gold wheel were used to process concentrate.

Surficial Geology and Stratigraphy Marten Creek is a narrow, south-flowing tributary to the Fortymile River. The valley sides are relatively steep and no evidence of high benches were visible. Bedrock outcrops are present along the valley sides where Marten Creek has over-steepened the banks. The active channel of Marten Creek meanders through portions of the floodplain that are buried under thicker accumulations of finer-grained sediment and organics. These accumulations may in part have originated from slides, or zones of active creep, off the valley sides. Mining has avoided the areas covered by thicker overburden and focused on the active floodplain. Gravel depths within the active floodplain range from 1.8 to 4.5 m (6–15 ft) and bedrock is slatey. The lithology of the gravel within the tailings includes schist, weakly foliated granite, slate and vuggy oxidized quartz. Some quartz clasts are rounded whereas others are angular and locally derived. Overall, the percentage of quartz clasts in the tailings is approximately 1–2%. Quartz boulders are commonly found on the bedrock surface. Due to the mining method, the entire section of gravel is processed in the floating wash plant. Current mining activities are approaching a fork in the valley producing two very narrow drainages.

Bedrock Geology Bedrock in Marten Creek varies between graphitic schist, blocky quartzite and muscovite-schist.

Gold Characteristics Gold from Marten Creek varies from fine gold at 30–40 mesh and up to ¼" to 5/16" for the larger fragments. Fineness from Fortymile River is 845 and fineness from Marten Creek is 875.



Fortymile Placers mining on Marten Creek using a floating New Zealand-style trommel.

Browns, a tributary of Fortymile

116C/02 2019: 64°14'41"N, 140°49'42"W

41497 Yukon Inc., 2010–2017

Water License: PM13-045-1 (Active 01/2024)
Active Producer (2015–2017) **Operation no. 88**

Location Browns Creek, mid, 10.2 km upstream from its confluence with Fortymile River.

Work History and Mining Cuts Shafting is the only known activity to have occurred on Browns Creek in 2018. In 2019, the operator S. Payne was present and conducted testing with a long tom. Work history is unknown for 2020.

Equipment and Water Treatment Not reported.

Surficial Geology and Stratigraphy Not reported.

Bedrock Geology Bedrock is quartzite, graphitic quartzite and quartz-muscovite-calcite schist (Mortensen, 1996).

Gold Characteristics Not reported.

Bruin, a tributary of Fortymile

116C/02 2020: 64°12'48"N, 140°40'48"W

Yukon Strike Mining Limited, 2018–2020
Yukon Green Gold Exploration, 2016–2017

Water License: PM17-008-1 (Active 06/2027)
Active Producer (2018–2020) **Operation no. 89**

Location Bruin Creek, 8 km downstream from its headwaters.

Work History and Mining Cuts Exploration efforts, over several seasons, have occurred on this property by owner Sandro Frizzi. In 2017, a 2-D resistivity program under the Yukon Mineral Exploration Program (YMEP) was completed and with encouraging results. In 2018, Taiga Ventures bulked sampled in August but no sluicing occurred, while in 2019 they sluiced for 550 hours. In 2020, Yukon Strike Mining Limited operated with a crew of up to four employees and worked a daily 12-hour shift. As an operation utilizing a floating trommel and coming from a mining background in British Columbia, they are able to process gravel efficiently. In 2020 they sluiced 50,400 yd^3 (38 533 m^3) of material.

Equipment and Water Treatment Equipment on site in 2020 included a Komatsu D85 bulldozer for stripping and tailings contouring tailing piles and a Komatsu PC300LC excavator for opening the cut (establishing a pond for the floating trommel) and feeding the wash plant. Material was processed by a 1.5 by 3.0 m (5 × 10 ft) trommel that was mounted on pontoons and floated in the cut. The trommel was able to process up to 100 yd^3 (76 m^3)/hr and water was 100% recycled. An 8" pump mounted on the pontoons supplied water to the plant and was recycled in the current mine cut.

Surficial Geology and Stratigraphy Yukon Green Gold Exploration focused their exploration around a regional fault crosscutting the drainage, upstream from where the leasee was operating in 2020. Gravel thickness is noted to have decreased downstream of the fault, therefore the structure could be a significant influence on both deposition of the surficial material and gold distribution in the drainage. A 2 m (6.5 ft) section was exposed in the 2020 mining location and consisted of a clast supported, well-sorted, cobble-pebble gravel, with a boulder lag on bedrock. Clasts were subround to subangular and the maximum clast size was up to 0.7 m (2.3 ft). A 30% matrix consisted of silt and find sand. All gravel was processed, with minimal stripping of overburden required.



Yukon Strike Mining Limited processing material on their floating trommel in 2020.



Drone image looking downstream Bruin Creek at Yukon Strike Mining Limited's operation in 2020.

Bedrock Geology Bedrock is mapped as marble (Mortensen, unpublished).

Gold Characteristics Gold is mostly all fine, with a fineness of 790 to 830.

Bruin, a tributary of Fortymile

116C/02 2019: 64°13'55"N, 140°41'04"W

Van Bibber, K., 2019–2020

Water License: PM17-066 (Active 01/2028)
Active Producer (2019–2020) **Operation no. 90**

Location Bruin Creek, approximately 18 km upstream from its confluence with Fortymile River.

Work History and Mining Cuts Activity on Bruin Creek under PM17-066 first occurred in 2019. With a crew of four personnel, sluicing occurred on the two top claims, downstream from camp, with activity focused on the left limit. A bulk sampling program was completed in 2020 to prospect for side pay potential on mid-Bruin Creek, with support from the Yukon Mineral Exploration Program (YMEP).

Equipment and Water Treatment Equipment present on site in 2020 included a Komatsu 400 excavator, a mini-hoe and a trommel for processing material.

Surficial Geology and Stratigraphy Bruin Creek is a drainage varying in width from 60 to 300 m (197–984 ft). The total section depth to bedrock is 1.5 m (5 ft). Bruin Creek gravel is coarse and consists of well-rounded, predominantly cobble-sized clasts.

Bedrock Geology Bedrock is mapped as silvery grey muscovite-chlorite quartz phyllite and micaceous quartzite (Mortensen, unpublished).

Gold Characteristics Gold is fine and fineness ranges from 810 to 820.



Drone image in 2020 looking down Bruin Creek valley towards the workings completed in 2019. K. Van Bibber's camp is located at the base of the road, on the left limit.



Left limit activity in 2019 on Bruin Creek, approximately 17 km upstream from its confluence with Fortymile River. The view is looking down Bruin Creek.

Moose, a tributary of Fortymile

116C/02 2020: 64°07'27"N, 140°55'54"W

Bondarchuk, V., 2020

Water License: PM19-063 (Active 12/2028)
Active Producer (2020) **Operation no. 91**

Location Moose Creek, 4.1 km downstream from Top of the World Highway.

Work History and Mining Cuts A new water license was issued on Moose Creek in late 2019 and a new operator, V. Bondarchuk was on site in 2020. Initial activities included an auger drill program to investigate the gravel thickness and gold distribution in Moose Creek. The one-person operation also bulk sampled on the right limit of Moose Creek and will be sluicing a larger cut in 2021.

Equipment and Water Treatment Not reported.

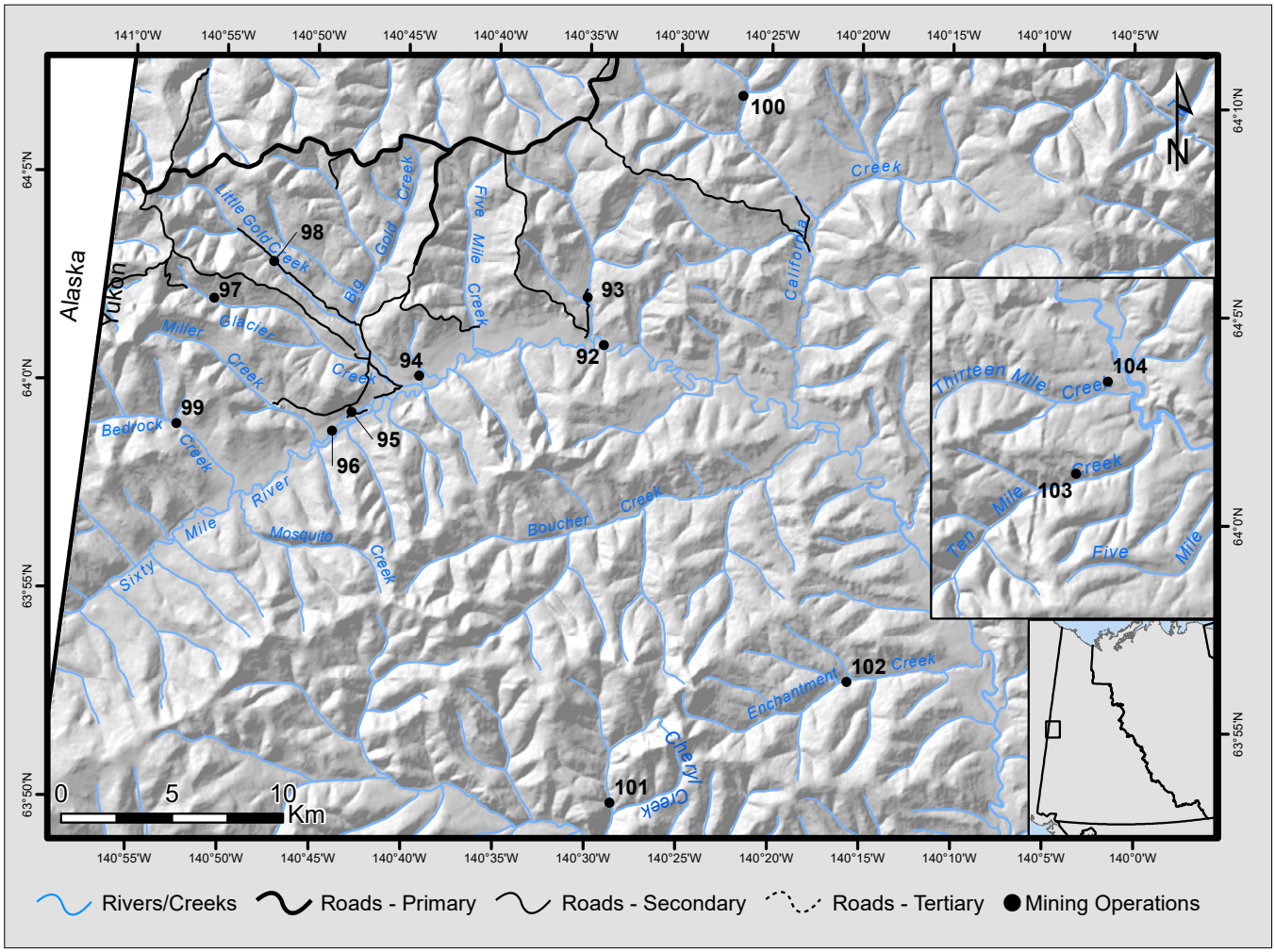
Surficial Geology and Stratigraphy Not reported.

Bedrock Geology Bedrock is mapped as quartzite, quartz-muscovite-calcite schist, gneiss and amphibolite (YGS, 2020).

Gold Characteristics Not reported.

SIXTY MILE
PLACER AREA

SITES 92–104



LEGEND

92. M2 Gold Mines Limited
93. F.W. Grant and Yukon Exploration Green Gold Inc.
94. Hawk Mining
95. K-1 Mining & Services
96. Miller Creek Mining Company Ltd.
97. Cope, M.W.
98. Trautwein, A.
99. K-1 Mining & Services
100. Hardclay Resource Services Ltd. and Yukon Exploration Green Gold Inc.
101. 50 Mile Mining Corp.
102. Fellhawk Enterprises Ltd.
103. No Name Resources Inc.
104. Gemmer, B.

Sixty mile, a tributary of Yukon

116C/02 2020: 64°02'32"N, 140°32'16"W
116C/02 2019: 64°02'27"N, 140°33'19"W
116C/02 2019: 64°02'30"N, 140°34'23"W

M2 Gold Mines Limited, 2016–2020

Water License: PM17-053 (Active 07/2027)
Active Producer (2018–2020) **Operation no. 92**

Location Sixty Mile River, near the mouth of Twelvemile Creek.

Work History and Mining Cuts M2 Gold Mines Ltd. worked a 3 km stretch of the Sixty Mile River valley that included production on benches and floodplain cuts. Two plants were utilized during each season and 12 to 18 miners were employed that worked two shifts daily. In 2018, a bench cut measuring 67 by 232 m (220 × 760 ft) and a cut on the floodplain were completed. In addition, a 670 m long (2200 ft) diversion was completed. In 2019, a 700 m (2300 ft) long diversion of the Sixty Mile River was create near the mouth of Twelvemile Creek. This enabled access to modern channel deposits. Mining is completed using a New Zealand-style in-cut method whereby once the cut is stripped and prepared, one operator can dig pay, feed the plant, and move the plant within the cut. By using this method, all sluice tailings are retained within the cut facilitating final reclamation. In 2020, a crew of 18 people operated a 23-hour split shift and sluiced 15 to 18 hours per day. Three locations were mined: a cut on a left limit mid-level bench upstream from camp, a right limit low-level bench cut, and a floodplain cut downstream from camp. Activity was primarily on the left limit but a discovery this season led to a cut on a right limit low-level bench. This side of the drainage has not typically been economic, but this season has proven that there may be additional potential on the right limit of the Sixty Mile River.

Equipment and Water Treatment Equipment on site in 2020 consisted of an Hitachi Zaxis 240LC excavator, an Hitachi 330 excavator, a Caterpillar 323F excavator, two Caterpillar 329 excavators, a John Deere 270 excavator, three D10T bulldozers and a Caterpillar D9N bulldozer. In 2020, a Makon SD-500 plant with a ½" screen was used to process up to 180 yd^3 (138 m^3)/hr. A 2.7 m (9 ft) long run of Hungarian riffles were situated immediately below the dump box and followed by a boil box, 0.9 m (3 ft) of hydraulic riffles and 2.4 m (8 ft) of expanded metal. The second wash plant, a 1.2 by 4.9 m (4 × 16 ft) Zealand-style trommel with a ⅜" screen openings and a 9 m (30 ft) long conveyor stacker was used to process 70 to 100 yd^3 (54–76 m^3)/hr. Sluice runs on either side of the plant contain angle iron riffles, a boil box, and hydraulic riffles.

Surficial Geology and Stratigraphy The bench deposit, located 20 m (66 ft) above the floodplain, consists of 1.5 to 2 m (5–6.6 ft) of gravel overlain by 2.8 m (10 ft) of silt and organics. Both the gravel and overlying silt thicknesses decrease towards the rim of the bench. The gravel consists of 70% pebbles, 30% cobbles and rare boulders primarily found near the bedrock surface. Sediment within the gravel is moderately sorted, cross-bedded and clast imbrication is consistent with flow parallel to the modern Sixty Mile River. Gravel thicknesses on the intermediate-level benches and modern floodplain are between 0.6 and 1.8 m (2–6 ft) in thickness. The overall gold grade is twice as good on the floodplain compared to the benches, partly due to a higher percentage of coarse gold on the floodplain. Gold distribution is erratic on the floodplain and requires a large sampling area to understand representative grades. This is an important characteristic of high energy, bedrock-bound river valleys. Stratigraphically, gold is tight to the bedrock surface and 1 m (3.5 ft) of bedrock is also sluiced.

Bedrock Geology Bedrock is orthogneiss.

Gold Characteristics Gold is coarser on the modern floodplain and on intermediate-level benches compared to the high-level bench. The majority of gold averages 35 mesh and no gold is finer than 60 mesh. Coarse gold is chunky and not flat. Fineness is 841.



Mike Cawood of M2 Gold Mines and Sydney van Loon discussing the in-cut processing technique used on the Sixty Mile River in 2018.



A view in 2019 of M2 Gold Mines area of active mining. In 2018, the river was repositioned into a new channel shown on the right hand side. This allowed for mining to take place in the former active channel. The new channel was designed with coarse rock piles along the shoreline to promote fish habitat. Top-coating of the floodplain surface with organics is visible in the distance showing progressive reclamation practices. The area of active mining is also visible and provides a good overview of the mine layout and in-cut processing technique. Effluent is settled downstream within the mined out cuts. Following gold extraction the mined area will be re-contoured using the high windrow of material located between the river and the wash plant.

Twelvemile, a tributary of Sixty Mile

116C/02 2019: 64°03'38"N, 140°33'30"W

F.W. Grant and Yukon Exploration Green Gold Inc., 2016–2020

Water License: PM15-078-1 (Active 03/2026)
Active Producer (2018–2020) **Operation no. 93**

Location Twelvemile Creek, 2.2 km upstream from its confluence with Sixty Mile River.

Work History and Mining Cuts Limited mining occurred on the property between 2018 and 2020. An area was stripped in the valley bottom and testing of valley bottom gravel occurred at the bench site.

Equipment and Water Treatment Equipment on site in 2019 included a John Deere 200C excavator, a Caterpillar bulldozer, a Volvo A40G haul truck for transporting pay and an Hitachi 350 Zaxis excavator for feeding the plant. The wash plant consisted of a dump box and screen deck feeding an initial single sluice run, which then drops material into an oscillating lower double run. Riffles included angle iron and expanded metal. The tributary is the source for water and settling is through a series of three ponds.

Surficial Geology and Stratigraphy Excavations into the right limit bench deposit exposed 8 to 10 m (26–33 ft) of poorly to moderately sorted pebble-cobble gravel with rare boulders. The right limit tributary dissects the Twelve Mile Creek bench in this location, which allows miners to access gravel near the bedrock contact in a number of locations. Gravel within the bench appears to be unfrozen at the face whereas valley bottom deposits are overlain with silt and contain permafrost.

Bedrock Geology Bedrock is mapped as hornblende-bearing metagranodiorite, metadiorite and metatonalite (Mortensen, unpublished).

Gold Characteristics Not reported.

Sixty Mile, a tributary of Yukon

116C/02 2020: 64°01'14"N, 140°42'12"W
116C/02 2020: 64°01'16"N, 140°41'33"W
116C/02 2020: 64°01'19"N, 140°41'32"W

Hawk Mining, 1989–2020

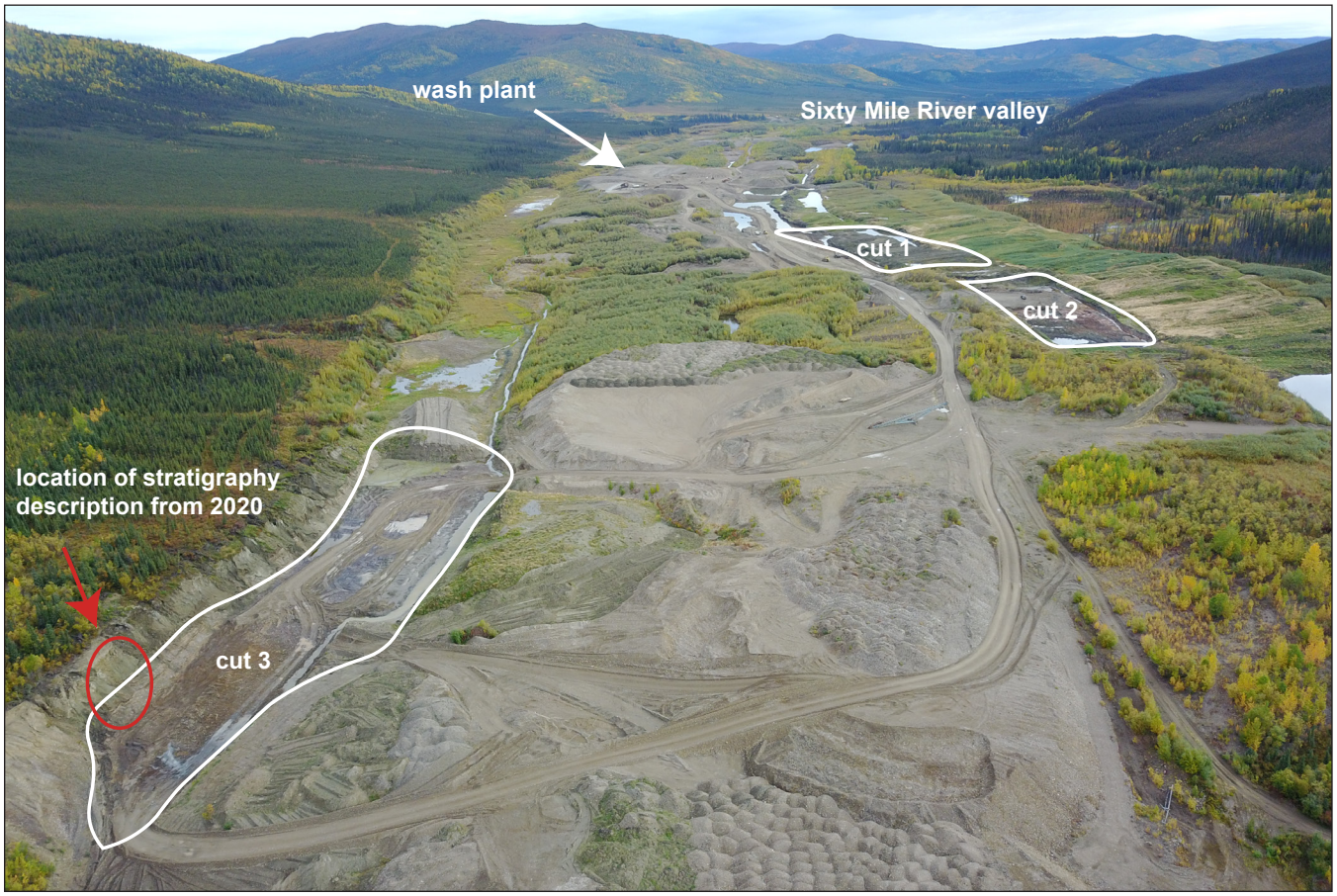
Water License: PM14-040 (Active 02/2025)
Active Producer (2018–2020) **Operation no. 94**

Location Sixty Mile River, 0.6 km downstream of Big Gold Creek.

Work History and Mining Cuts From 2018 to 2020 mining continued along the left limit of the Sixty Mile River valley immediately below Big Gold Creek. A total of 8–10 people are employed working two daily shifts. In 2020, three cuts were mined. Two cuts are located in mid-valley, measuring 35 by 218 m (115 × 715 ft) and 66 by 175 m (215 × 575 ft), and the third cut 91 by 213 m (300 × 700 ft) is located on far left limit. The total area mined in 2020 was 152 147 m^2 (1,637,700 ft^2). They target a series of low-level benches only a few feet above the modern valley and have noticed the influence that some of the left limit tributaries have on gold distribution.

Equipment and Water Treatment Equipment on site in 2020 consisted of two Volvo EC 480D excavators, an Hitachi 450 excavator, three Caterpillar 9L bulldozers, a Volvo 250 wheel loader, two Caterpillar 980 wheel loaders and Volvo A35 and Caterpillar 735 haul trucks. The plant consists of a grizzly hopper, 18 m (60 ft) El-Russ conveyor feeder, 6 m (20 ft) long screen deck with ½" openings and is capable of processing 200 yd^3 (153 m^3)/hr. A Caterpillar 14G grader is also on site for maintaining roads. Settling ponds are located out-of-stream in former mining cuts.

Surficial Geology and Stratigraphy The geology of the site resembled past exposures with 3 to 4 m (10–13 ft) of gravel on bedrock. The gravel is buried by 3 m (10 ft) of silt. The gravel consists of two general units. The lower 1 m (3 ft) is a pebble-cobble gravel with rare small boulders. The upper 2 m (6 ft) is dominantly

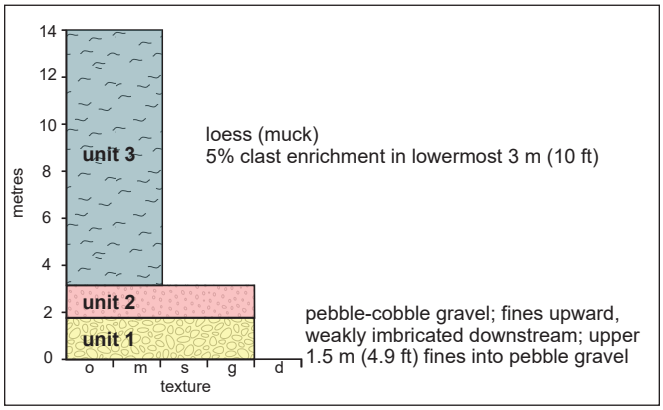


Hawk Mining's three cut locations in 2020. The view is looking up the Sixty Mile River valley.

composed of moderately sorted, stratified, pebbles and rare cobbles. The lower unit of gravel and 0.6 m (2 ft) of bedrock was processed for pay. The distribution of gold in this area of the Sixty Mile River contains distinctive contributions from the gold-bearing left limit tributaries up stream. Coarse gold is present on the left limit, which likely originated from the upstream tributaries, whereas finer, brighter (Sixty Mile) gold is extracted from the middle of the valley. Very little gold is present on the right limit. A hard blue-black bedrock acts as a preferable trap for placer gold and can increase grades by as much as four times. The miners theorize that the gold is "skating" across the decomposed bedrock and getting caught in these zones of harder bedrock. An average of 0.9 m (3 ft) of gravel and up to 1.2 m (4 ft) of bedrock was sluiced.

Bedrock Geology Bedrock varies from undulating, gumbo bedrock to shale.

Gold Characteristics Gold is predominately fine and fineness is 860.



Stratigraphy exposed on the far left limit cut in 2020 at Hawk Mining. The location where it was described is marked on the previous image, circled in red.

Sixty Mile, a tributary of Yukon

116C/02 2019: 64°00'09"N, 140°45'39"W
116C/02 2019: 64°00'24"N, 140°44'54"W

K-1 Mining & Services, 2008–2020

Water License: PM15-001 (Active 12/2025)
Water License: PM12-073 (Active 03/2023)
Active Producer (2018–2020) **Operation no. 95**

Location Sixty Mile River valley between Glacier and Miller creeks.

Work History and Mining Cuts K-1 Mining operated at three locations on the Sixty Mile River between 2018 and 2020. In 2018, mining was completed near the site of the old family shop in a cut 55 by 77 m (180 × 253 ft). Significant previous work completed by old-timers in the area includes hand mining on the low-level bedrock bench, dredging between the years 1921 and 1941 and Cat mining. The ground remained economic thanks to protection of a portion of the ground by the old shop, inefficient past processing techniques, and challenging geography created by the rock terrace that made dredging difficult. A second cut, 3 by 73 m (10 × 240 ft) was completed on the right limit of Sixty Mile River, slightly downstream from the main cut. In 2019, a monitoring cut was opened on the left limit at the mouth of a small tributary below Miller Creek on the Sixty Mile River. In addition, a second cut was opened just downstream that measured 40 by 200 m (131 × 656 ft), which had been formerly buried by tailings from past mining.

Equipment and Water Treatment Equipment included two Hitachi EX200 excavators, an Hitachi ZX270LC excavator, an Hitachi ZX450 LC-3 excavator, a 30-tonne Komatsu HM300-2 dump truck, a 20-tonne Moxy 5552B dump truck and a Komatsu D375A-2 crawler tractor with a Ublade and 4 BBL ripper. The wash plant consisted of a 1.5 m (5 ft) diameter New Zealand trommel with ¾" mesh and expanded metal over nomad carpet and hydraulic riffles. Tailings were stacked with an 11 m (35 ft) long conveyor. An Isuzu diesel engine, powered a 6 by 6" Indeg pump at 800 igpm, was able to process 50 to 65 loose yd³ (38–50 m³)/hr. Water was acquired from Sixty Mile River, and effluent was treated out-of-stream in old mine cuts in a series of three ponds approximately 76 by 46 m (250 × 150 ft). Clean-ups used a two-cell jig, followed by a long tom, and a gold wheel and hand panning for final concentration.



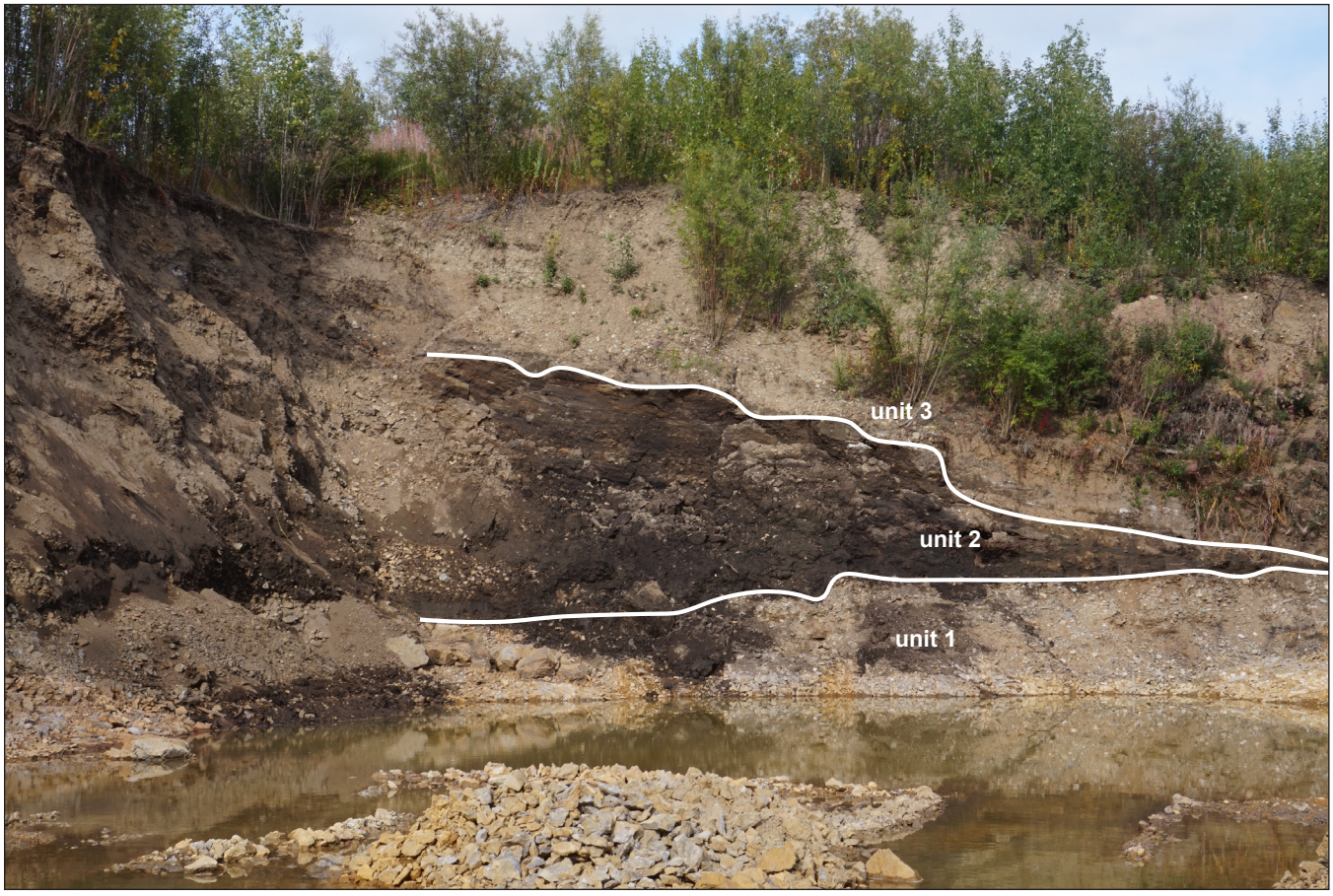
An aerial view of K-1 Mining's monitor cut at the mouth of a small tributary to the Sixty Mile River.

Surficial Geology and Stratigraphy In 2019 and 2020 a monitoring cut was completed on the left limit of the Sixty Mile River at the mouth of a small tributary. The stratigraphy exposed in the cut consisted of fluvial fan sediments overlying Sixty Mile River gravel and all units were frozen. The underlying gravel was poorly exposed at the time of the visit so no thickness was obtained. The gravel is dominated by cobbles and pebbles with both angular and subangular shape. The gravel likely lies on a low terrace of the river. The overlying fan material consisted of 12 m (39 ft) of bedded angular fan gravel and organic-rich silt with some woody material and rooted tree stumps. Bodies of massive ice were also present within the unit. All beds within the fan material were dipping south or toward the Sixty Mile River.

The second cut documented in 2019 was located a short distance downstream from the monitoring cut and consisted of Sixty Mile River gravel overlain by colluviated loess and former stripped material. The stripped material had buried the virgin gravel and disguised its presence. Unit 1, from 0 to 1.5 m (0–5 ft) consisted of stratified, moderately sorted, imbricated cobble-pebble Sixty Mile River gravel. Unit 2, from 1.5 to 7 m (5–23 ft) consisted of an apron or wedge-shaped blanket of colluviated loess (silt), organics and rare gravelly lenses. The material originated from upslope and was transported onto the floodplain (unit 1) by gravity and runoff. The wedge-shape to the unit is typical of sediment that accumulates at the base of slope. Unit 3, from 7 to 15 m (23–49 ft) is a poorly sorted gravelly deposit that appears to be entirely stripped material from past mining. The overall bedrock surface within the cut was rising toward the back of the cut and unit 1 gravel was pinching out suggesting the full width of the target had been exploited. Approximately 0.5 to 1 m (1.6–3 ft) of bedrock was included in the sluice section.

Bedrock Geology Bedrock is andesite and schist.

Gold Characteristics Not reported.



A section exposed at K-1 Mining's operation on the Sixty Mile River. Gravel tailings (unit 3) from past mining were piled on top of virgin gravel and organics (units 1 and 2) along the left limit of the valley, disguising the target. Intersecting the bedded organic-rich silt, and identifying its natural wedge-shape, is a good indicator that virgin gravel will be present at depth on the bedrock surface.

Sixty Mile, a tributary of Yukon

115N/15 2019: 63°59'38"N, 140°46'34"W

Miller Creek Mining Company Ltd., 1991–2020

Water License: PM14-004 (Active 06/2024)
Active Producer (2018–2020) **Operation no. 96**

Location Sixty Mile River near the mouth of Miller Creek.

Work History and Mining Cuts The Miller Creek Mining Company initiated mining in the Sixty Mile River valley near the mouth of Miller Creek in 2018 after completing work on the Miller Creek bench. They have been primarily targeting missed pay within the dredge limits. Their operation employs two personnel. The 2018 test cut measured 30 by 91 m (100 × 300 ft) and their 2019 cut measured 60 by 91 m (200 × 300 ft). Known work history in 2020 consisted of mining a cut in mid-valley of Miller Creek, and they completed reclamation.

Equipment and Water Treatment Equipment utilized at the operation included two Hitachi Zaxis 330 excavators for stripping and moving pay, an Hitachi 200 excavator for feeding the trommel, and two Komatsu HM 300 haul trucks for transporting overburden and hauling pay gravel to the wash plant. The wash plant has a 2.4 by 2.4 m (8 × 8 ft) hopper that feeds a 2.0 by 12 m (6.5 × 40 ft) trommel containing a 1.8 m (6 ft) length of ¾" screen. Coarse tailings are stacked with a 15 m (50 ft) conveyor. Water was supplied to the plant by a 10" pump, which allowed the plant to process 115 yd^3 (88 m^3)/hr. The sluice contains 3.6 m (12 ft) of expanded metal and 2 m (7 ft) of hydraulic riffles. An Hitachi EX700H excavator is used to manage tailings. A jig was used for clean-ups.



Miller Creek Mining's trommel wash plant used on the Sixty Mile River in 2019.

Surficial Geology and Stratigraphy This section of the Sixty Mile River valley was dredged between the years 1938 and 1942, and the mouth of Miller Creek was reportedly a rich area, making the remaining effort economic. The geology of the dredge areas is challenging to interpret given the past disturbance. In general, 0.6 m (2 ft) of gravel and up to 1.5 m (5 ft) of bedrock is excavated for sluicing.

Bedrock Geology Bedrock consists of Carmacks Group volcanic rocks.

Gold Characteristics Gold is largely coarser than Miller Creek with 3/16" flakes common.

Glacier, a tributary of Big Gold

116C/02 2019: 64°02'27"N, 140°54'00"W

Cope, M., 2017–2019
Hagen, G., 1983–1984, 1998–2001, 2007–2012

Water License: PM15-072 (Active 07/2026)
Active Producer (2018–2019) **Operation no. 97**

Location Glacier Creek, upper.

Work History and Mining Cuts Mr. Cope mined upper Glacier Creek as a one-person operation in 2018 and 2019. All activity occurred on a right limit, low-level terrace and in the modern valley bottom. No activity occurred in 2020.

Equipment and Water Treatment Equipment on site included a Caterpillar 330B excavator and a Hein-Werner C-128 excavator. The plant consists of a small shaker deck test plant with ¾" punch plate openings.

Surficial Geology and Stratigraphy Not reported.

Bedrock Geology Bedrock is chlorite-biotite schist, amphibolite, gneiss and quartzite (Mortensen, 1996).

Gold Characteristics Not reported.

Little Gold, a tributary of Big Gold

116C/02 2020: 64°03'31"N, 140°50'58"W

Trautwein, A., 2010–2020

Water License: PM15-028-1 (Active 05/2025)
Water License: PM13-021 (Active 08/2023)
Active Producer (2018–2020) **Operation no. 98**

Location Little Gold Creek, 5.4 km downstream from its headwaters.

Work History and Mining Cuts Mr. Trautwein continued mining on the left limit of Little Gold Creek from 2018 to 2020. He is primarily active as a one-person operation. No additional work history is known.

Equipment and Water Treatment Equipment on site included an Hitachi EX350H excavator for digging pay, a Caterpillar 225 excavator for feeding the plant and a 12 yd³ dump truck for hauling pay. The plant is a 1.2 by 7.6 m (4 × 25 ft) trommel with a ¾" screen. The sluice box consists of a single 0.6 by 3.6 m (2 × 12 ft) run containing a boil box, angle iron riffles and expanded metal. Effluent was settled out-of-stream.

Surficial Geology and Stratigraphy The pay gravel consists of a coarse, oxidized gravel containing abundant dark grey schist clasts. The gravel is a poorly sorted, silty, cobble-pebble gravel with few boulders. The section had been previously disturbed so a complete stratigraphic section was not present. The overall thickness of sediment was 3 m (10 ft).

Bedrock Geology Bedrock is quartzite and quartz-muscovite-chlorite-schist (Mortensen, 1996).

Gold Characteristics Gold is coarse.

Bedrock, a tributary of Sixty Mile

115N/01 2020: 63°59'20"N, 140°55'10"W
115N/01 2020: 63°59'15"N, 140°54'55"W

K-1 Mining & Services, 2019–2020

Water License: PM12-015-1 (Active 06/2022)
Active Producer (2019–2020) **Operation no. 99**

Location Bedrock Creek, left limit, 4.3 km upstream from the confluence with the Sixty Mile River.

Work History and Mining Cuts K-1 Mining initiated placer mining activities on Bedrock Creek in 2020 after numerous exploration programs and historical research. Initial testing on Bedrock Creek occurred in 2005 and was followed with preliminary drilling in 2009, geophysics in 2011, reconnaissance drilling in 2015 and extensive drilling in 2019. Approximately 80 drillholes have been completed near the mouth of Winter's Gulch. In 2020, a cut targeted left limit side pay on Bedrock Creek below the mouth of Winter's Gulch and measured 17 by 137 m (56 × 450 ft). Afterwards, operations moved onto a prominent bench located on Bedrock Creek immediately below Winter's Gulch. Material on the bench includes deposits from both Winter's Gulch and Bedrock Creek. A total of 5 miners were employed at the site.

Equipment and Water Treatment Equipment on site in 2020 included an Hitachi Zaxis 450LC-3 excavator used for stripping, an Hitachi ZX270LC excavator for digging pay, a Komatsu HM300-2 haul truck for transporting pay to the plan, an Hitachi EX200 excavator feeding the plant, a Komatsu D375A-2 crawler tractor and a D8K bulldozer pushing overburden. The wash plant consisted of a 1.5 m (5 ft) diameter New Zealand trommel with ¾" mesh and expanded metal over nomad carpet and hydraulic riffles. Tailings were stacked with



A view driving down Little Gold Creek from the Trautwein mine site in 2020. (Photo credit: Johnny Nunan).



An aerial view of K-1 Mining's bench cut on Bedrock Creek near the mouth of Winter's Gulch.

an 11 m (35 ft) long conveyor. An Isuzu diesel engine, powered a 6 by 6" Indeg pump at 800 igpm, was able to process 50 to 65 yd³ (38–50 m³)/hr. Water was acquired from Bedrock Creek and treated out-of-stream in a series of three ponds. Clean-ups used a two-cell jig, followed by a long tom, and a gold wheel and hand panning for final concentration.

Surficial Geology and Stratigraphy Placer mining on Bedrock Creek has had a long and intermittent history. Shafts and ditches are thought to originate from the 1890s within the drainage and exploration work was ongoing in 1917 according to the Geological Survey of Canada. Evidence of hand workings are visible on pre-1950s vintage air photos, which could date to the resurgence of mining in the 1930s. According to Mr. McDougall, some of these workings were present in the valley bottom below Winter's Gulch. Cat mining was initiated in the 1950s and ran for five years before continuing again in the 1970s and 80s. The drainage has been relatively quiet until this recent work by K-1 Mining.

The geology of the two areas exposed on Bedrock Creek in 2020, included a side pay cut in the valley bottom and a bench cut near the mouth of Winter's Gulch. The valley bottom cut is located adjacent to an old camp from the 1980s. Three units were exposed in the 2.6 m (8.5 ft) deep cut. Bedrock consists of an orange weathering, slabby, silvery schist. Unit 1 consists of 0.4 m (1.3 ft) of poorly sorted, silty gravel containing cobbles, pebbles and rare boulders. The gravel is stained orange and contains wood. Overall, the gravel has high-energy characteristics consistent with a flood deposit. Unit 2, from 0.4 to 1.6 m (1.3–5.2 ft) is a moderately sorted, oxidized cobble-pebble gravel that is well imbricated. Unit 3, from 1.6 to 2.6 m (5.2–8.5 ft) is a deposit of silt and organics that partially derived from hillside creep and partially derived from floodplain overbank sedimentation. The full width of the valley bottom does not appear to have been mined. Silt and organic overburden appears to thicken toward the hillside, however the depth to gravel could remain relatively shallow if intermediate or low-level terraces are encountered.



A close-up view of the contact between the pay gravel and bedrock on the Bedrock Creek bench. The high percentage of weathered bedrock and fines within the pay gravel make it difficult to identify the bedrock contact when mining.

The bench exposure was much larger and consisted of four units in a 14.4 m (47 ft) thick deposit (measured near the back of the bench). Overall thickness of materials would have been thinner near the rim of the bench. Bedrock was poorly exposed at the time of the visit and unit 1 consists of 1 m (3 ft) of matrix-rich, poorly sorted gravel or diamict. The unit resembled a mixing zone between basal gravels and weathered bedrock. The matrix is a yellow, silty sand that has a micaceous texture. The matrix content is 70% whereas the coarse fragments (pebbles and cobbles) account for 30%. The thickness of the unit appears to also be variable with fluctuations up to 0.5 m (1.6 ft). Unit 2, from 1 to 3.7 m (3–12 ft) consists of a moderately sorted, oxidized and manganese-stained pebbly gravel with minor cobble beds. There is an abrupt lower contact with unit 1. This gravel is interpreted as paleo-Bedrock Creek gravel. Unit 3, from 3.7 to 7.4 m (12–24 ft) is a coarser gravel with boulders present and appears to have flow indicators suggesting it is derived from Winter's Gulch. The base of the unit is poorly sorted and is manganese-stained. Rare boulders are present near the upper contact that are 0.6 m (2 ft) in diameter. Unit 4, from 7.4 to 14.4 m (24–47 ft) is a moderately sorted, weakly stratified, cobble gravel with some sand lenses. Again, imbrication of clasts suggests the gravel originated from Winter's Gulch.

The stratigraphy exposed in the bench cut suggests paleo-Bedrock Creek gravel was buried under a coarser gravel originating from Winter's Gulch, likely as a fluvial fan deposit. It is possible that some of the beds within the upper two units were derived from Bedrock Creek, however most beds are attributed to flow from the gulch. Constraining the sluice section within the bench material has proven to be challenging. Unit 1 contains very little gravelly material and has a high component of weathered bedrock, making it is difficult to identify the actual bedrock contact. The best grades are contained within unit 1, despite its fine-grained nature. Spatially, better grades were located near the rim of the bench compared to closer to the hillside. Old-timer workings are located downstream on Bedrock Creek from this bench suggesting that the pay streak may fall off the bench and at least partially, get reworked into the valley bottom. Intermediate-level terraces, buried under muck, between the prominent bench level and the valley bottom could therefore be an important target in the downstream direction.

Bedrock Geology Bedrock is orange weathering flaggy schist.

Gold Characteristics Placer gold in Bedrock Creek has a fineness of 820. Approximately 80% of the gold is considered fine-grained and 20% is greater than 10 mesh.

Right limit Tributary to California, a tributary of Sixty Mile

116C/01 2019: 64°08'57"N, 140°26'19.5"W

Hardclay Resource Services Ltd. and Yukon Exploration Green Gold Inc., 2016–2020

Water License: PM15-079-3 (Active 03/2026)
Active Producer (2018–2020) **Operation no. 100**

Location Unnamed right limit tributary to California Creek, 7 km upstream from its confluence with California Creek.

Work History and Mining Cuts Mining has continued on upper California Creek and in 2019, operations were moved 2 km downstream from their initial set-up location from 2016. Also, in 2019 exploration testing was completed on a right limit bench



Brandon Clayton, Sandro Frizzi and Jorg Lotz examine a test pit on an upper California Creek bench, which was initially recognized in an access road exposure.

deposit that was intersected by the access road. They continued to operate in the new downstream location in 2020.

Equipment and Water Treatment Equipment was not documented during the site visit.

Surficial Geology and Stratigraphy The 2019 exploration on the bench above 2016 mine location identified rounded cobbles and boulders in a silty matrix. The overall width of the deposit was not determined due to permafrost limitations at the time of excavation. A section exposed in a test pit consisted of 2.6 m (8.5 ft) of coarse, moderately sorted, boulder gravel. This unit was overlain by 1 m (3 ft) of colluvium or slide rock derived from mass movement off the valley slope. The thickness of the overburden was likely greater prior to road construction. No geological information was obtained from the active cut downstream.

Bedrock Geology Bedrock is shale and marble.

Gold Characteristics Small nuggets have rounded edges and preserve some of their crystalline morphology. Iron and manganese surface staining is common.

Cheryl, a tributary of Fifty Mile

115N/16 2018: 63°51'33"N, 140°28'46"W

50 Mile Mining Corp., 2013–2020

Water License: PM12-022 (Active 07/2022)
Active Producer (2018–2020) **Operation no. 101**

Location Cheryl Creek, 2.6 km upstream from its confluence with Fifty Mile Creek.

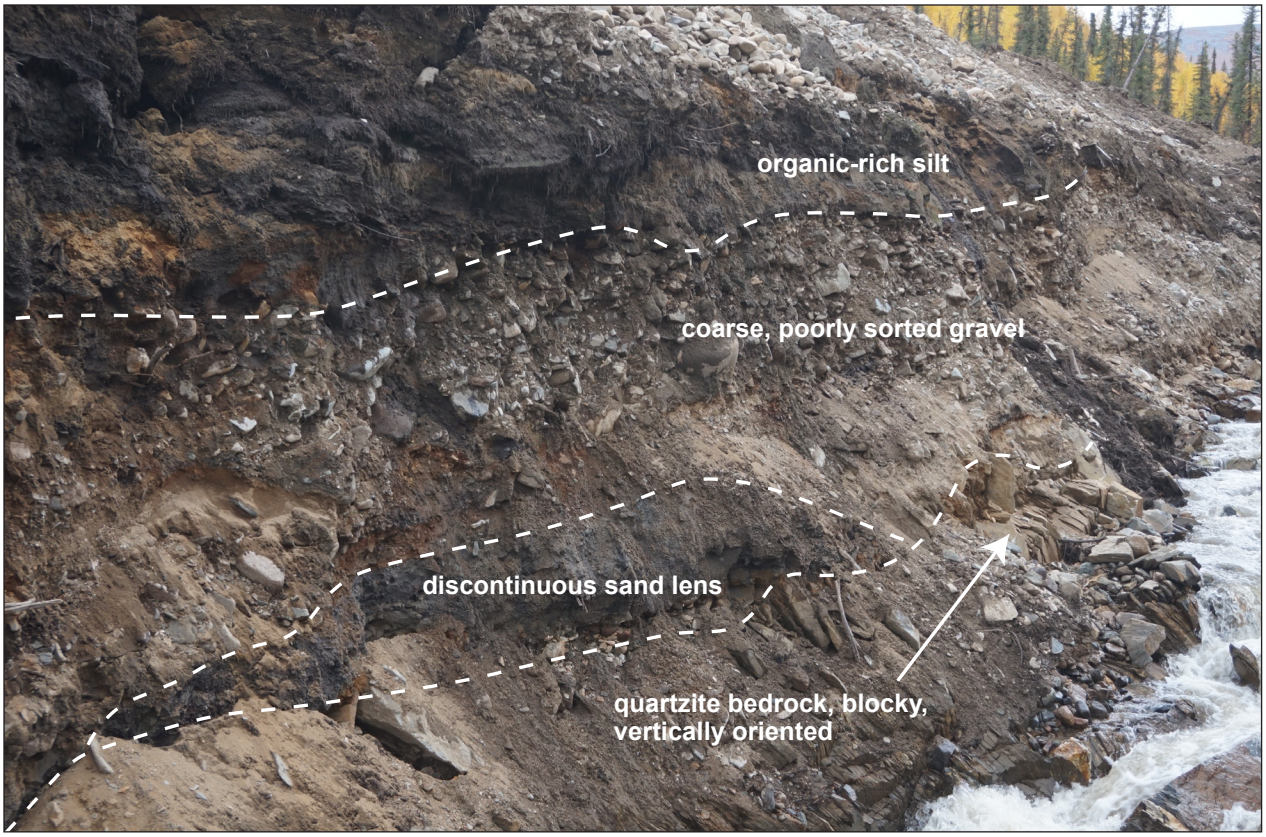
Work History and Mining Cuts Mining on Cheryl Creek in 2018 occurred immediately below the forks. A crew of 8 mined limit-to-limit and exploration work above the forks was initiated. A cut in mid-valley (45 × 70 m) was stripped in preparation for 2019 and a total of 150 hours was spent sluicing throughout the season. In 2019, 1308 yd^3 (1000 m^3) of material was tested and 1308 yd^3 (1000 m^3) of material was stripped. In 2020, 3924 yd^3 (3000 m^3) of material was tested and 3924 yd^3 (3000 m^3) of material was stripped.

Equipment and Water Treatment In 2018, equipment on site included an Hitachi Zaxis 450 excavator, a John Deere 450LC excavator, a Volvo 220E wheel loader, a Caterpillar D8L bulldozer and a Caterpillar D400D haul truck. Pay was initially transported to the plant and deposited into an automatic hopper with a grizzly, feeding a 9 m (30 ft) Clemro conveyor to a double screen deck. The 1.8 by 4.3 m (6 × 14 ft) woven wire screen has ¾" openings and classifies material in two 1.8 by 2.4 m (6 × 8 ft) sluice runs. The sluice runs contain an initial run of expanded metal, a double nugget trap followed by hydraulic riffles. A 12 by 10" pump feeds an 8" water line. The screen deck can process from 100 to 130 yd^3 (76–99 m^3)/hr. Water is treated out-of-stream in a series of two settling ponds. Final clean-ups were completed using a Devon vortex sluice and a Keene long tom with miracle mat.

Surficial Geology and Stratigraphy A section logged on the right limit of Cheryl Creek had a total thickness of 4.3 m (14 ft). The bedrock consists of a flaggy quartzite oriented near vertically and is quite suitable for trapping placer gold. Unit 1, from 0 to 2.4 m (0–8 ft) consists of a coarse, poorly sorted gravel with abundant cobbles and minor boulders. Beds of discontinuous sand occur within the gravel. A layer of



50 Mile Mining Corp.'s operation on Cheryl Creek in 2018.



A typical mine section on Cheryl Creek in 2018 where 50 Mile Mining has been active since 2013.

overbank flood silts and woody debris is present near the bedrock surface suggesting two phases of floodplain deposition are present within the section. Unit 2, from 2.4 to 4.3 (8–14 ft) is a deposit of organic-rich silt with sand lenses.

Mining on lower Cheryl Creek has been relatively free of permafrost, in part to its southern exposure and active floodplain (steep gradient) that limits organic accumulation. For this reason, the mining cuts have more or less spanned the width of the valley bottom from rim to rim. Just below the forks the ground has begun to change and organic-rich overburden thickens. Permafrost is more widespread and continues into the left and right forks, which have more shaded exposures. This may in part be due to a gradient change in the valley, also known as the inflection point. Future mining may have to invest in detailed drilling to identify the optimum mine area where the paystreak is located. This would avoid marginal side pay that may not be economic due to higher stripping costs in frozen ground.

Bedrock Geology Bedrock is blocky quartzite that undulated. Bedrock reefs are present throughout the drainage.

Gold Characteristics The gold is described as travelled with some smaller angular pieces. Gold grain sizes are around 16 to 20 mesh and the fineness is between 881 and 910. The largest nugget recovered was 46.5 g.

Enchantment, a tributary of Sixty Mile

115N/16 2019: 63°55'10"N, 140°16'39"W

Fellhawk Enterprises Ltd., 2014–2019

Water License: PM10-040-1 (Active 03/2022)
Active Producer (2018–2019) **Operation no. 102**

Location Enchantment Creek, 6.6 km upstream from its confluence with Sixty Mile River.

Work History and Mining Cuts Operations continued on Enchantment Creek in 2018 and 2019. Fellhawk Enterprises Ltd. sluiced for 35 hours in the 2018 season with a crew of up to four personnel. In 2019, 78 hours was spent sluicing and reclamation occurred on claims PM 01995 to PM 01999. All equipment was removed from site and the operator moved locations to their property on Sixty Mile River, at the California Creek confluence.

Equipment and Water Treatment Equipment included a John Deere 450D excavator, a John Deere 270D LC excavator, a Caterpillar D8K bulldozer, and a Caterpillar 730 rock truck. Fuel is transported from the Sixty Mile River using a big wheel fuel hauler. The wash plant consisted of an Elrus 1.5 by 4.9 m (5 × 16 ft) double shaker screen deck, capable of processing 200 yd^3 (153 m^3)/hr. Two 0.9 m (3 ft) wide sluice runs are present on either side of the screen deck, and feed into four 0.9 by 6.1 m (3 × 20 ft) runs. Water was supplied to the plant by a Cornell 6RB 8 × 6" pump feeding a 10" pipe.

Surficial Geology and Stratigraphy The stratigraphy is relatively shallow on Enchantment Creek and consists of 1.2 m (4 ft) of silt overlying 2.4 m (8 ft) of coarse gravel containing boulders. The pay gravel consists of 70% clasts and 30% coarse sand matrix. The clast composition includes 30% boulders, 30% cobbles and 40% pebbles. Boulders are up to 1 m (3.3 ft) in length and all clasts have an angular to subangular shape. Oxidation and manganese staining is common in the pay material. A total of 0.6 m (2 ft) of gravel and 1 m (3 ft) of bedrock was sluiced.

Bedrock Geology Bedrock is mapped as hornblende-bearing metagranodiorite, metadiorite and metatonalite (Mortensen, unpublished).

Gold Characteristics Gold is all fine, with the largest piece recovered up to 1.0 g, and has a fineness of 840.

Ten Mile, a tributary of Sixty Mile

115O/12 2019: 63°31'37N", 139°58'14"W
115O/12 2018: 63°32'13"N, 139°55'24"W

No Name Resources Inc., 2010–2019

Water License: PM15-008-1 (Active 06/2025)
Active Producer (2018–2019) **Operation no. 103**

Location Ten Mile Creek, 4.1 km upstream from its confluence with Sixty Mile River.

Work History and Mining Cuts A left limit high-level bench, upstream from camp was mined in 2018. A crew of five people opened a cut 35 by 110 m (115 × 361 ft). A low-level bench was discovered in 2018 below camp. In 2019, a crew of five people, operating a single 12-hour shift were briefly active in the valley bottom but spent most of the season on a series of left limit benches. They began mining on a low-level bench and continually excavated up-slope, to uncover that the bench had three tiers. The 2019 season was completed on the high-level bench upstream from camp. Mining in 2020 continued on the left limit bench, with activity continuing in the downstream direction.



Enchantment Creek in 2018 at Fellhawk Enterprises Ltd. operation. Mining activities have been focused in this location since the operator first moved into the drainage in 2014.

Equipment and Water Treatment In 2019, the equipment present at the operation included a John Deere 450D-LC excavator, a John Deere 270C excavator, a John Deere 330C excavator and a Caterpillar D9H bulldozer for stripping. The wash plant consisted of a dump box feeding a 1.5 m (5 ft) diameter trommel that classified material to ½". Sluice runs were 1.0 by 3.6 m (3 × 12 ft) and configured with hydraulic riffles. The plant was able to process 150 yd³ (115 m^3)/hr. Water was supplied from 10 Mile Creek and settled in the valley bottom, and in 2019 when mining the bench cut, was 100% recirculated. Clean-ups were conducted using a shaker table.

Surficial Geology and Stratigraphy The 2018 discovery of a low-level bench downstream from camp, provided an easy-to-access, unfrozen resource, and highlighted the potential for small, high-grade deposits disguised on steep slopes. The discovery was made on the inside bend of the valley where Ten Mile Creek turns to the north. Potential for preservation of multiple flights of narrow benches are generally best on the inside of a bend rather than the cutbank or outside bend. In this area, the high-level bench is well preserved on the left limit, and at least two flights of intermediate-level benches are present below the high-level. These intermediate-level benches are narrow, discontinuous in their length, and have subtle surface expression due to organic cover. At the 2018 discovery, the bench is approximately 8 m (26 ft) in width and has a length of about 100 m (328 ft). The bench pinches out at either end. The economics of such deposits are dependent on the location of the high-level pay streak and the spatial proximity of the intermediate bench to that original pay streak. In this area of Ten Mile Creek, the high-level paystreak is known to be on the left limit and therefore was reworked on to the lower bench levels during base-level change of the drainage. The stratigraphy of the intermediate-level bench deposit consisted of 0.6 m (2 ft) of cobble-pebble gravel with boulders up to 50 cm in diameter. The gravel is overlain by 1 m (3 ft) of coarse, weathered bedrock colluvium (slide rock) and 1.5 m (4.5 ft) of organics.

In 2019, a section was logged on the high-level bench upstream from camp. The cut width at the time of the visit measured 44 m (144 ft); however, more gravel extended into the bank. The overall thickness of the



No Name Resources Inc. operation on the multi-tiered bench on lower Ten Mile Creek in 2019. Inset: An example of the gold recovered from No Name Resources Inc. cut on the high-level bench in 2019.

section measured 13.5 m (44 ft) and is predominantly gravel considered to be correlative with the Pliocene White Channel gravel in the Klondike. Bedrock consists of a grey schist that is variably oxidized. Unit 1, from 0 to 3.5 m (11.5 ft) is a boulder-cobble-pebble gravel with a silty sand matrix. This unit is considered the pay gravel. The lowermost 0.5 m of unit 1 is quite sandy, which may be due to a higher component of weathered bedrock mixed into the gravel. Unit 2, from 3.5 to 13.5 m (11.5–44 ft) is a finer gravel that is predominantly cobble-pebble, is stratified and interbedded with silt and minor organic-rich silt. The overall stripping ratio on the bench so far has been favourable because unit 2 is thinner near the edge of the bench. As mining progresses into the bank, unit 2 thickens and it becomes more expensive to strip.

Bedrock Geology Bedrock is variably oxidized sericite-schist.

Gold Characteristics Gold from the bench is primarily 20 mesh although nuggets are present. On the low-level bench, approximately 15% of the gold is greater than 6 mesh. The gold has a fineness of 845.



An aerial view looking down Ten Mile Creek at No Name Resources Inc. operation in 2018. They are exploiting a narrow, intermediate to low-level bench that was disguised under a thin layer of colluvium.

Thirteen Mile, a Tributary of Sixty Mile

115O/12 2019: 63°33'36"N, 139°57'16"W
115O/12 2019: 63°33'33"N, 139°57'14"W

Gemmer, B., 2018–2019

Water License: PM17-006 (Active 06/2027)
Active Producer (2018–2019) **Operation no. 104**

Location Thirteen Mile Creek, 0.7 km upstream from its confluence with Sixtymile River.

Work History and Mining Cuts Minimal historic workings have been uncovered in the drainage, despite being in the vicinity of the historically rich and well-prospected areas of Ten Mile Creek and Sixty Mile River. Mr. Gemmer's first year of activity on Thirteen Mile Creek was in 2018 and activities consisted of constructing an airstrip and establishing a road from Ten Mile Creek. In 2019, a crew of four people conducted bulk sampling on the lower portion of the drainage, on a Sixty Mile River bench. An additional bulk sample test was conducted in the Thirteen Mile Creek valley bottom, on the left limit of the modern stream channel. No activity occurred in 2020.



A test pit trying to locate the rim of the bench, which appears to have a Thirteen Mile Creek influence with higher quartz and less chert clast content.

Equipment and Water Treatment Equipment in 2019 included a Kobelco K935 excavator for digging test holes and excavating pay, a Caterpillar D8N bulldozer for stripping and road building and a John Deere 770BH grader for maintaining the roads and airstrip.

Surficial Geology and Stratigraphy A test pit, 0.7 km upstream the Thirteen Mile Creek drainage was conducted in 2019. It is a bench of Sixty Mile River origin, and is a well-sorted, low energy gravel deposit that is 2.2 m (7.2 ft) thick overlain by 0.3 m (1.0 ft) of fine sand. The gravel clast composition consists of 70% pebbles, 30% cobbles, with chert dominating the lithology at approximately 10%. Clasts are subround and the largest is 0.2 m (0.7 ft).

Bedrock Geology Bedrock is mapped as foliated metagranite, augen granite, and quartz monzonite and granodiorite (Gordey and Ryan, 2005).

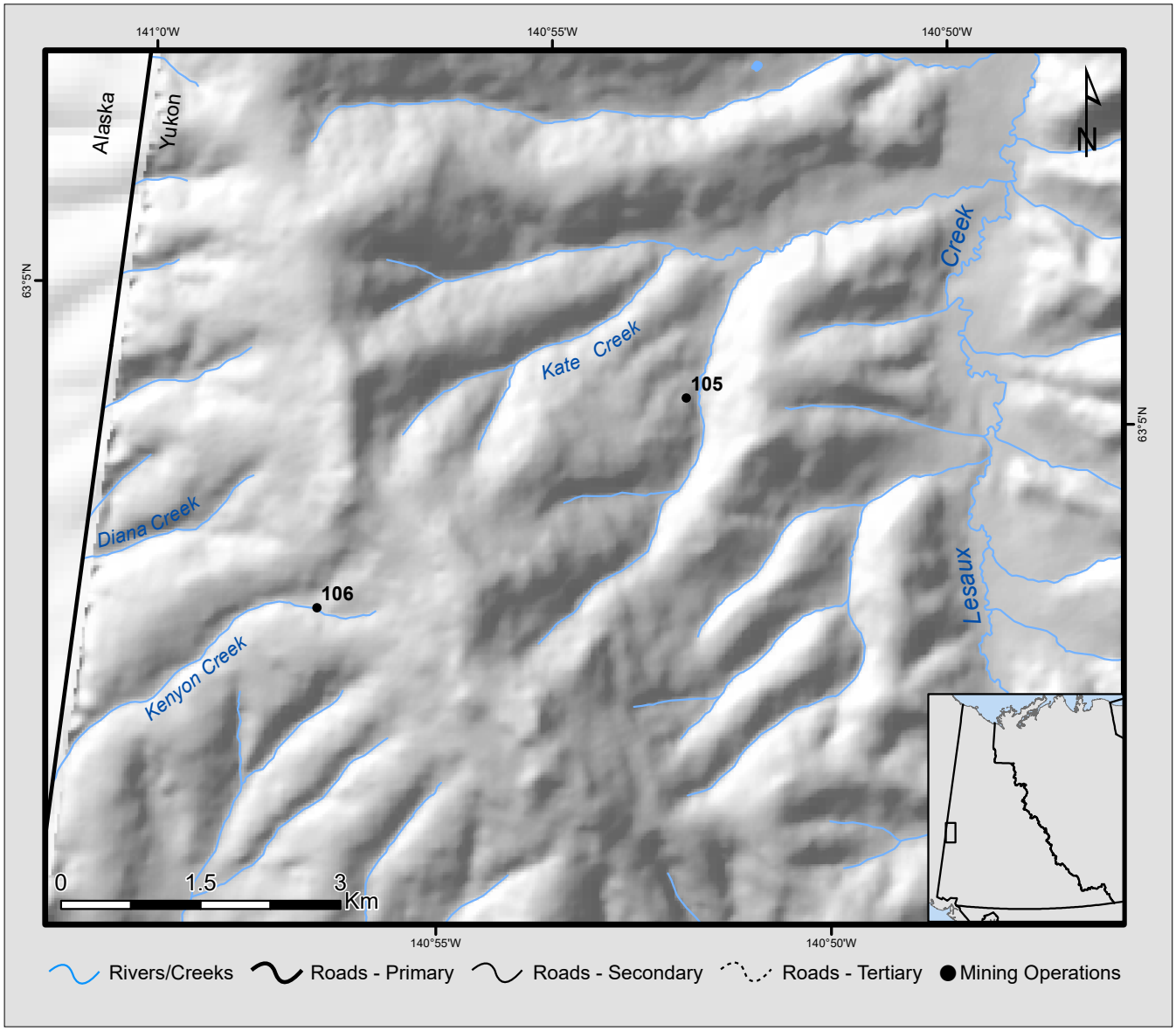
Gold Characteristics Gold is fine.



An aerial view looking up Thirteen Mile Creek. The airstrip and lay-down area is constructed on a bench of the Sixty Mile River. Exploration was occurring up Thirteen Mile Creek approximately 1 km.

MOOSEHORN
PLACER AREA

SITES 105–106



LEGEND

105. Moosehorn Exploration Ltd.
106. Moosehorn Exploration Ltd.

Great Bear, a tributary of Lesaux

115N/02 2018: 63°04'49"N, 140°52'42"W

Moosehorn Exploration Ltd., 1989–2020

Water License: PM16-022 (Active 05/2027)
Water License: PM08-607 (Expired 09/2018)
Active Producer (2018–2020) **Operation no. 105**

Location Great Bear Creek, approximately 4.5 km upstream from its confluence with Lesaux Creek.

Work History and Mining Cuts The Warrick family own and operate one of the most remote operations in Yukon. For nearly six decades, Moosehorn Exploration Ltd. has mined on Swamp, Soya, Kenyon and Great Bear creeks, and locally named Kate Creek. Up to four people were present at the operation each season. Activity from 2018 to 2020 occurred on both the east-facing drainages (Kate and Great Bear creeks) and west-facing drainages (Swamp, Soya and Kenyon creeks) of the Moosehorn Range. In 2018, 240 hours were spent sluicing on Kate Creek. Activity in 2019 focused on mining on Swamp and Kenyon creeks, and 40 hours of sluicing was conducted on Kate Creek. A total of 87 hours was spent sluicing in 2020. Reclamation in the drainage also took place in 2020.

Equipment and Water Treatment Equipment utilized on Great Bear Creek included a Caterpillar 345B excavator, an Hitachi 350 excavator, a Caterpillar 980G wheel loader, a Caterpillar 8N bulldozer and two Terex TA30 rock trucks. A wet dump box with ¾" spacing on grizzly bars was utilized to process 60 yd^3 (46 m^3)/hr and was configured with two components to their sluice run. The initial run measures 1.2 by 3.6 m (4 × 12 ft) and contains 1" Hungarian riffles with 3.5" spacing. The lower run has an initial area of 1.1 by 0.9 m (3.5 × 3 ft) and then splits into three 1.1 by 3.6 m (3.5 × 12 ft) runs.



A section of Great Bear Creek side pay at Moosehorn Exploration Ltd's operation in 2019. The measuring tape is 2 m (6.5 ft) in length.

The lower runs contain 4 lb expanded metal. A 20 by 150 m (66 × 492 ft) settling pond was used to settle effluent and water was 100% recycled. Clean-ups were conducted using a long tom, wheel, rod mil, jig and table.

Surficial Geology and Stratigraphy The 2019 side-pay section on Great Bear Creek was approximately 6 m (20 ft) in height. The gravel unit is fairly uniform with more boulders present near the bedrock contact. Overall the gravel is poorly to moderately sorted and was likely deposited rapidly in the gulch setting. The bedrock is partially decomposed. The clast content is dominantly pebbles and cobbles and the matrix is silty coarse sand. All clasts are subangular in shape. Up to 1 m (3 ft) of bedrock was included in the sluice section.

Bedrock Geology Bedrock is granodiorite and varies in degree of decomposition.

Gold Characteristics Approximately 25% of gold recovered is 45 mesh, and a portion around 200 mesh. The fineness is 800.



Moosehorn Exploration Ltd's actively mining on Great Bear Creek. (Photo credit: Kate Warrick).

Kenyon, a tributary of Scottie

115N/02 2019: 63°03'20"N, 140°57'02"W

Moosehorn Exploration Ltd., 2015–2020

Water License: PM17-079 (Active 09/2028)
Water License: PM08-607 (Expired 09/2018)
Active Producer (2018–2020) **Operation no. 106**

Location Kenyon Creek, 840 m upstream from the Canada-United States border.

Work History and Mining Cuts The most westerly placer operation in Yukon is located on Kenyon Creek, which drains into Scottie Creek, located in Alaska. In 2018, Moosehorn Exploration Ltd. focused activity on their claims located on Great Bear Creek. In 2019, 110 cumulative hours were spent sluicing on Swamp, Soya and Kenyon creeks. In 2020, 33 hours were spent sluicing on Kenyon Creek and 51 hours were spent sluicing on Swamp Creek. The operator is reprocessing old-timer push box tailings from the mid-1970s.

Equipment and Water Treatment In 2020, the equipment present at site included a Caterpillar 345B excavator for stripping and stockpiling pay, an Hitachi Zaxis 350LC excavator for feeding the plant, and a John Deere 300D rock truck used to transport pay material and haul tailings. The operation uses 25 to 30 litres of fuel per hour. Material is processed using a wet dump box and 2.5" grouser with a unique tapered grizzly bar. An initial run, (4 × 6 ft) consists of 1¼" angle iron riffles at 11°, which then distributes material into three 4 by 16 ft runs of expanded metal at 8°. The sluice runs were lined with unbacked 3M Nomad matting. The entire riffle tray folds off the mats simultaneously, which allows for frequent clean-ups. Water was supplied to the plant using an 8 by 8" pump, allowing the plant to process 65 yd^3 (50 m^3)/hr.

Surficial Geology and Stratigraphy The upper Kenyon Creek mine site is located in a high-elevation southwest-facing drainage near the summit of the Moosehorn Range. Surficial sediment at this topographic position consists of transitional sediments between the colluvial and fluvial environment. Colluvial placers are those produced from gravitation transport of weathered bedrock sources, whereas fluvial involves water-sorting processes. The sediment exposed exhibits a very immature fluvial deposit, consistent with the transitional environment mentioned above. An exposure of side pay gravel consisted of 50% clasts (20% boulder, 50% cobbles and 30% pebbles), and 50% coarse sand and granule matrix. The gravel is poorly sorted, oxidized and manganese-stained. Much of the matrix is likely derived from the decomposed granodiorite bedrock. As a result of the high sand and low silt content in the matrix, the pay gravel does not require a lot of washing to liberate the gold grains. The sluice section consisted of virgin side pay, all of the tailings in the middle of the valley and excavating deeper into bedrock.

Bedrock Geology Bedrock is decomposed granodiorite.

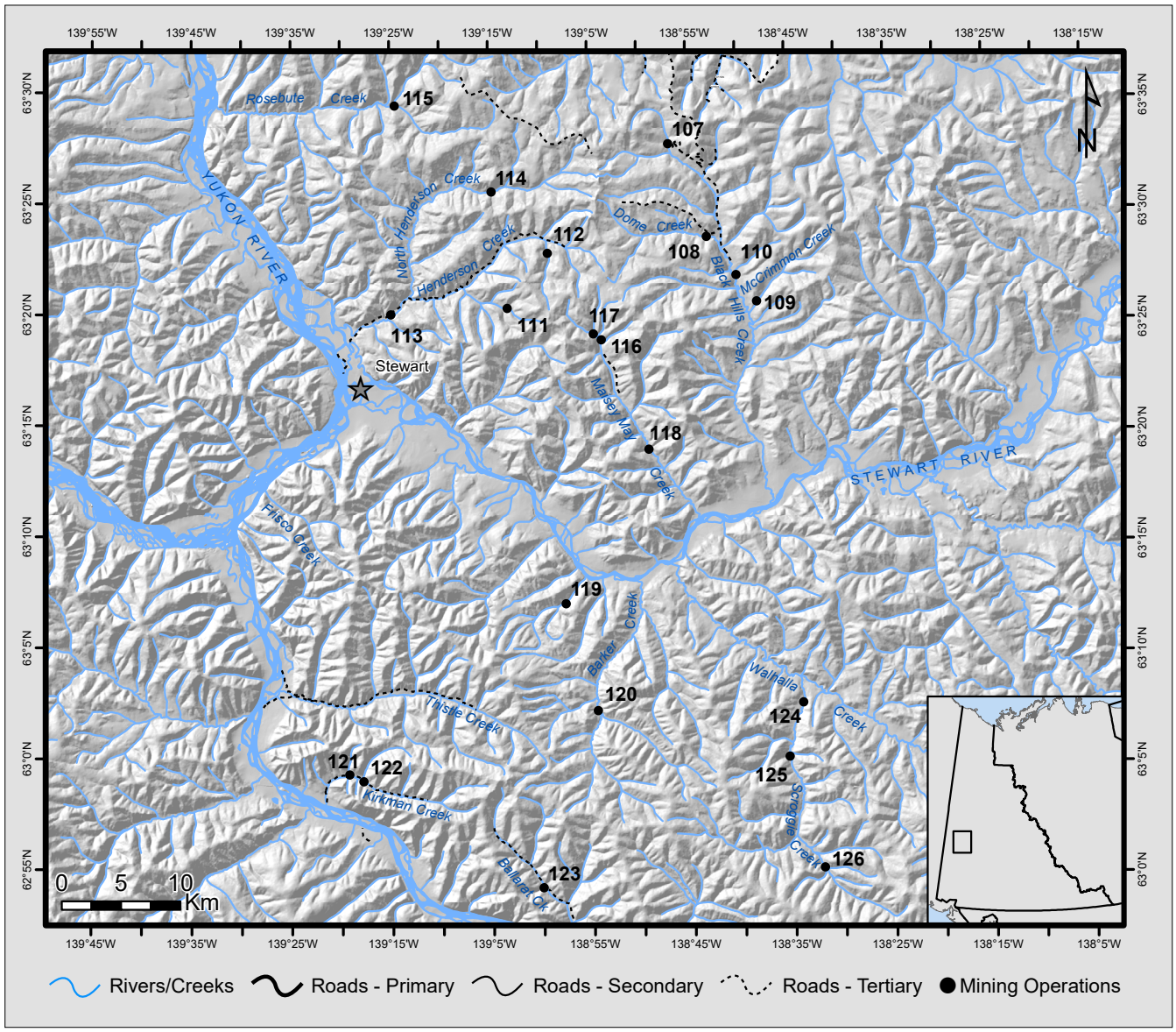
Gold Characteristics Gold is mostly fine with some small hackly pieces with quartz inclusions is recovered. No gold is larger than 20 mesh. Fineness is 830.



The Warrick's operation on Kenyon Creek in 2020. (Photo credit: Colin Warrick).

SOUTH KLONDIKE
PLACER AREA

SITES 107–126



LEGEND

107. R. Smith Placer Mining
108. 2074098 Alberta Ltd.
109. Hughes, S.
110. Stuart Placers Ltd.
111. Vincent, M. and S. Larose
112. Northern Gold Resources LLC
113. H.C. Mining Ltd.
114. Fellhawk Enterprises Ltd.
115. Paydirt Holdings (1982) Ltd.
116. Christiansen, A.
117. 40419 Yukon Inc.
118. Bedrock Mining Company Inc.
119. No. 203 Dynamic Endeavours Inc.
120. Schmidt Mining Corp.
121. Sager, M. and R.
122. Fellhawk Enterprises Ltd.
123. Weber, B.
124. True North Gold Ltd.
125. Bidrman, Z.
126. Aquila Mining

Black Hills, a tributary of Stewart

115O/10 2020: 63°30'47"N, 138°55'42"W

R. Smith Placer Mining, 1996–2020

Water License: PM16-020 (Active 06/2026)
Active Producer (2018–2020) **Operation no. 107**

Location Black Hills Creek, upper, 10.7 km upstream from Mills Creek.

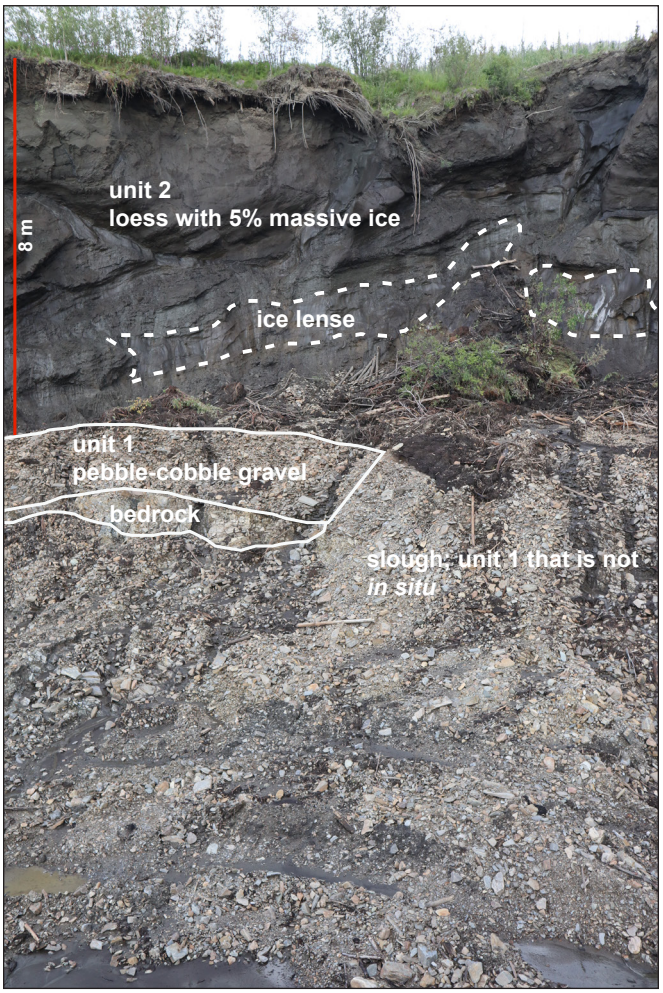
Work History and Mining Cuts The upper portion of Black Hills Creek has been mined by Mr. Smith since 1996. He primarily operates as a one to two person operation and in the recent mining seasons all activity has been focused on the left limit of the drainage. In 2018, Mr. Smith continued to use one ten-inch monitor to thaw and remove the thick overburden overlying the bench deposit on the left limit. A 25 by 205 m (82 × 672 ft) cut was also completed upstream on the left limit. Monitoring continued as the main activity in 2019, and pay gravel was stockpiled. The stockpiled pay gravel was sluiced in early 2020, and again monitoring continued to liberate the frozen pay gravel buried beneath 8 m (28 ft) of frozen black muck. For the past three seasons, mining has occurred in a cut measuring approximately 120 m (394 ft) long, and each season the width of the cut extends 5 to 10 m (16–33 ft); the cut width in 2020 measured 70 m (230 ft). Drilling in 2020 determined that the buried left limit bench at the current mining location consists of 1.2 m (4 ft) of gravel and that the gravel extends farther into the bank. Using drilling and geophysics, Mr. Smith has mapped the extent of the bench and he is progressively mining the deposit beginning at his lowermost claim located 6 km downstream from the headwaters of Black Hills Creek.



Mr. Smith monitoring his cut on the left limit of upper Black Hills Creek in 2020.

Equipment and Water Treatment In 2020 the equipment present on site included two Caterpillar 345B excavators, an Hitachi 330LC excavator, a Caterpillar D9 bulldozer, a Michigan wheel loader, a Caterpillar 966C wheel loader, and three haul trucks (Caterpillar D300E, D400 and 735). The wash plant was a 1.2 by 7.6 m (4 × 25 ft) trommel that classifies into three individual sluice runs, each measuring 1.2 by 3.6 m (4 × 12 ft) and consisting of angle iron, hydraulic riffles and expanded metal. Water was supplied to the plant by a 6" pump powered by a Ford industrial diesel engine, which enabled the wash plant to process up to 60 yd^3 (46 m^3)/hr. Effluent was settled in a series of five settling ponds. The final stages of clean-up were done using a long tom, gold wheel, pan, and completed on a table in town.

Surficial Geology and Stratigraphy A significant left limit bench deposit is present on the upper reaches of Black Hills Creek and continues down the drainage an unknown extent. Mr. Smith has focused all mining



Buried left limit bench excavated by Mr. Smith from 2018 to 2020. Unit 1 is poorly exposed due to monitoring. Dashed lines outline ice lenses in unit 2.

efforts in recent years to prospect and exploit this significant deposit buried beneath 8 m (27 ft) of frozen black muck that contains up to 5% ice. Ice lenses are discontinuous and up to 1.7 m (5.6 ft) thick. Gravel exposed on the rim of the buried bench is a pebble-cobble gravel with well-rounded clasts. All gravel is sluiced and gravel thickness is 0.6 to 1.2 m (2–4 ft).

Bedrock Geology Bedrock is blocky gneiss.

Gold Characteristics Gold has a rusty appearance and grains are either well-rounded or pounded flat.

Dome, a tributary of Black Hills

115O/07 2020: 63°26'47"N, 138°50'51"W

2074098 Alberta Ltd., 2016–2020

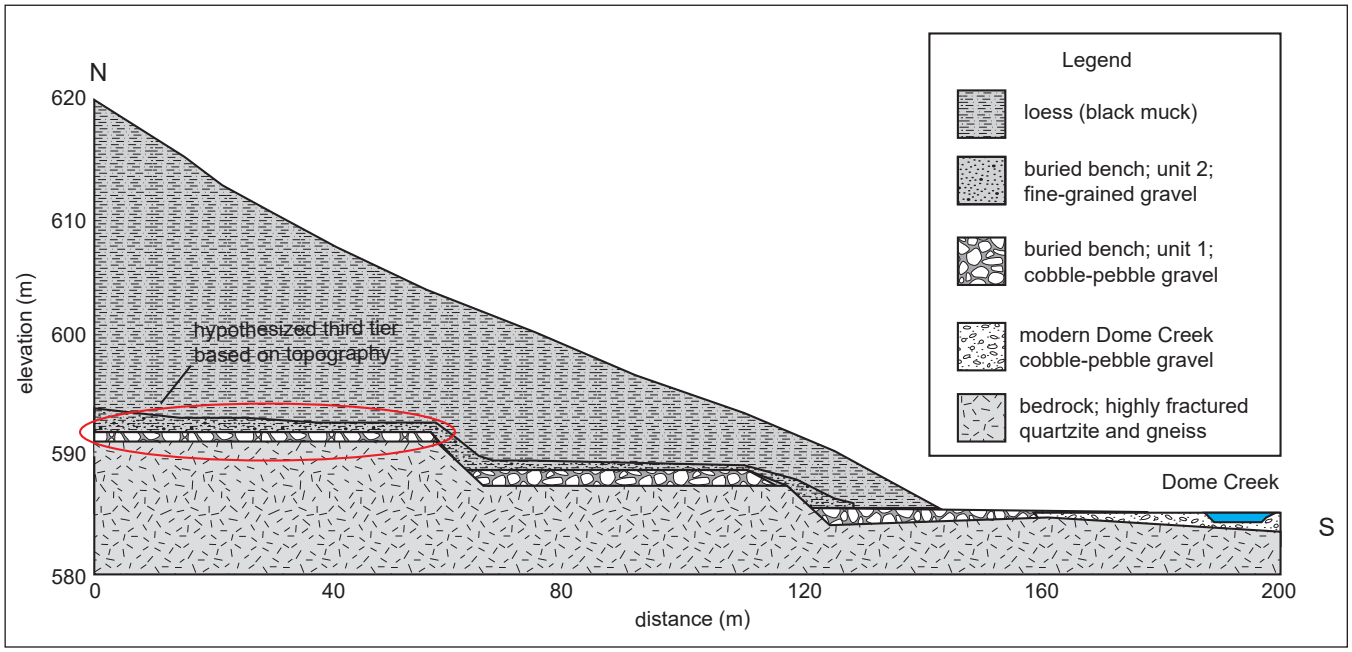
Water License: PM16-014 (Active 07/2026)
Active Producer (2018–2020) **Operation no. 108**

Location Dome Creek, 1.2 km upstream from its confluence with Black Hills Creek.

Work History and Mining Cuts Activity on Dome Creek conducted by 2074098 Alberta Ltd. has been steadily increasing since they purchased the property in 2016. They have been mining progressively upstream from Mr. Armstrong's work in the drainage; Mr. Armstrong mined for twenty years on Dome Creek. In 2018 and 2019 the operation consisted of two operators mining upstream from camp, at the narrowing point in the drainage. Two left limit cuts were mined in 2019, one was unmeasured and the second measured 40 by 100 m (131 × 328 ft). A total of 20,000 yd^3 (15 290 m^3) of material was sluiced in 2019. In 2020, a four-person operation completed two cuts on the left limit: 30 by 274 m (100 × 900 ft) and 64 by 125 m (210 × 410 ft).

Equipment and Water Treatment In 2020, equipment on site included a John Deere 790 excavator, a Caterpillar 235 excavator, a Caterpillar D8H bulldozer and a Komatsu D455A bulldozer. An oscillating screen deck built by Arctech Circle Welding was added to the operation in 2019, which classifies material to ⅜" and has two sluice runs each 2.1 m (7 ft) wide by 2.4 m (8 ft) long. Sluice runs were lined with Nomad matting under a configuration of expanded metal, a boil box and hydraulic riffles and lastly, expanded metal again. The plant could process material at a rate of 100 yd^3 (76 m^3)/hr. An 8" pump powered by a Caterpillar D315 engine supplied water to the plant, and effluent was settled in a series of three ponds.

Surficial Geology and Stratigraphy Activity began in 2016 at the location in the drainage where the creek narrows due to the presence of bedrock on either limit. Upstream of this location, the valley dramatically expands and its gradient decreases. The change in



Cross section of the three hypothesized benches present on the left limit of Dome Creek.

gradient is referred to as the inflection point. All mining has occurred upstream from the inflection point, and on the left limit of the drainage. Two stratigraphic units were mapped in 2020: unit 1, varying in thickness to a maximum of 0.3 m (1 ft) is a cobble-pebble gravel with an undulating upper contact. Unit 2, from 0.3 to 2.4 m (1–8 ft) is a mix of surficial material; pebble-cobble gravel, wood debris, mud, reworked bedrock and large boulders. Matrix percent varies between 25 and 40% and comprises fine sand and silt. Large subround boulders, accounting for up to 2% of the clast content, are present. No imbrication is present, indicating a high-energy deposition due to the chaotic nature of the environment. The sluiced section consists of unit 1 and up to 2.4 m (8 ft) of bedrock. The majority of gold is concentrated in the bedrock fractures.

A series of two, and possibly three distinguishable bench levels are present on the left limit of Dome Creek, with the first one being only approximately 3 m (10 ft) higher in elevation from modern Dome Creek floodplain. Future efforts plan to prospect the bench levels and evaluate them for placer potential.

Bedrock Geology Bedrock is highly fractured quartzite and gneiss.



Drone image of the 2020 mining location at the lower end of Dome Creek. The tailings pond is where the valley narrows, bedrock is present on both limits.

Gold Characteristics Gold is primarily coarse with the fines described as thick and weighty, and associated tightly with the bedrock contact. The fineness is 760.

McCrimmon, a tributary of Black Hills

115O/07 2018: 63°24'06"N, 138°45'07"W

Hughes, S., 2008–2019

Water License: PM18-003 (Active 09/2028)
Water License: PM11-040 (Expired 09/2018)
Active Producer (2018–2019) **Operation no. 109**

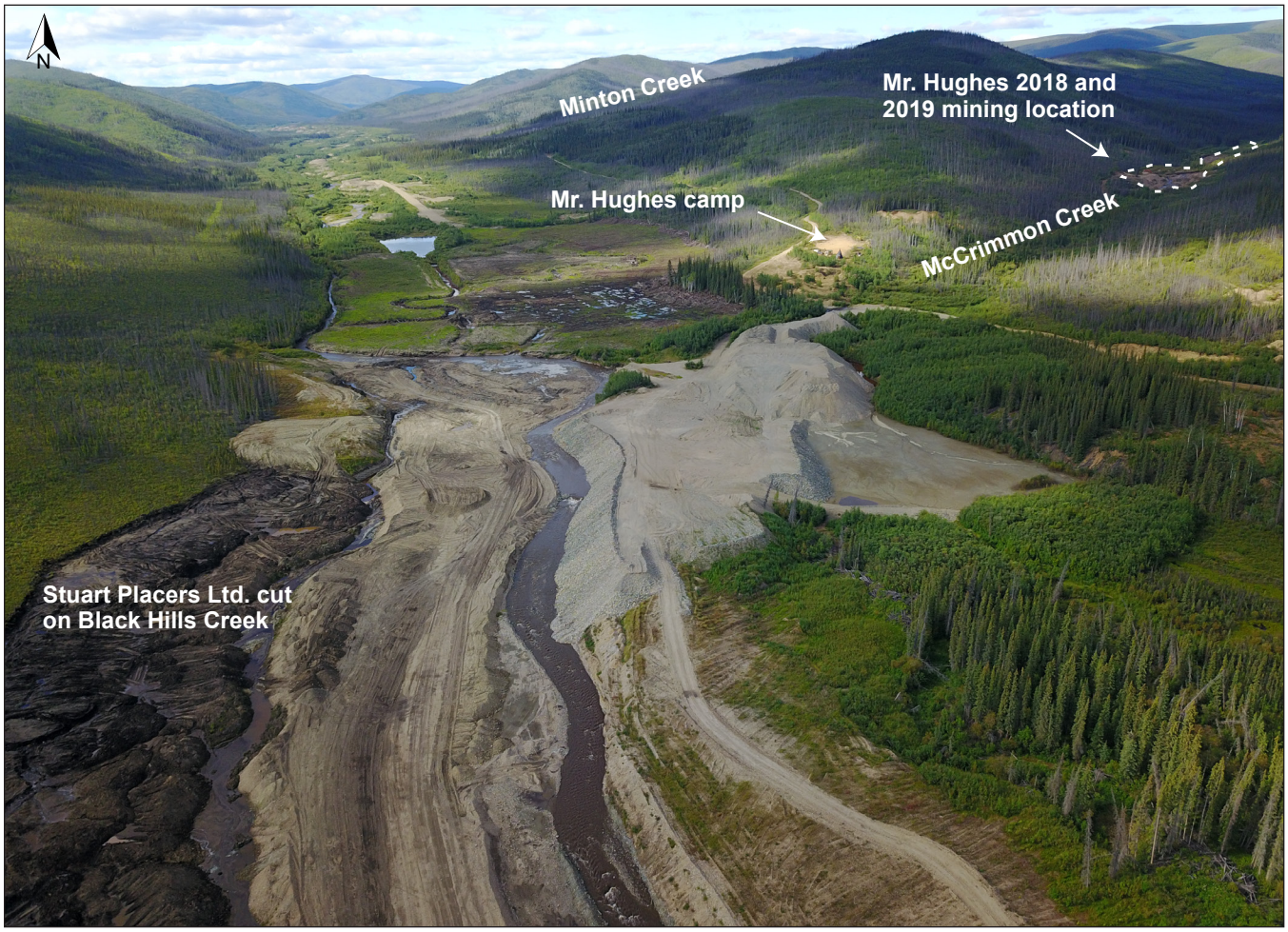
Location McCrimmon Creek, 1.3 km from its confluence with Black Hills Creek.

Work History and Mining Cuts Mr. Hughes continued to mine McCrimmon Creek as a one-person operation in early 2018 and later in the season a partnership was established to complete the season. A crew of three people began sluicing a cut approximately 18 by 120 m (60 × 394 ft) that was located mid-valley on the left limit of the drainage. Stripping on the left limit occurred throughout the following season and Mr. Hughes assisted an operator downstream while he waited for thaw. No activity occurred in 2020.

Equipment and Water Treatment Mr. Hughes' equipment included an Hitachi EX60 excavator, an Hitachi EX270 LC excavator, an Hitachi 300 excavator and a Caterpillar D8K bulldozer. The wash plant consisted of a 0.8 m (2.6 ft) diameter trommel with a 7.6 m (25 ft) long ¾" screen. The sluice run is 0.6 by 2.4 m (2 × 8 ft) and contains expanded metal. A 3" gasoline-powered Honda pump supplied enough water



Operations on McCrimmon Creek in fall 2018, when a partnership enabled a cut 18 by 120 m (60 × 394 ft) to be sluiced. Mr. Hughes had spent 2016 and 2017 stripping the cut in preparation.



Drone image looking up the Black Hills Creek valley, with the McCrimmon Creek valley on the right side of the image. Dashed outlines indicate Mr. Hughes mining location.

for processing up to 20 yd^3 (15 m^3)/hr. Water was acquired from McCrimmon Creek and settled in one large pond prior to discharge back into McCrimmon Creek. Clean-ups were completed with a long tom. In 2018, the partnership brought an Hitachi 300 excavator, a Caterpillar 740 rock truck and a small vibrating screen deck able to process up to 55 yd^3 (42 m^3)/hr.

Surficial Geology and Stratigraphy The stratigraphy of McCrimmon Creek consists of 0.6 to 2.4 m (2–8 ft) of cobble-pebble gravel overlain by 2.4 to 3.7 m (8–12 ft) of frozen black muck. The gravel is poorly sorted, contains lenses of silt and organics and is oxidized near its upper contact. Most clasts have a subangular shape. Up to 3 m (10 ft) of muck and 0.6 m (2 ft) of upper gravel is stripped off prior to sluicing. In 2018, the material sluiced consisted of up to 0.6 m (2 ft) of unit 1 and minimal bedrock.

Bedrock Geology Bedrock is predominately phyllite with reefs of hard, blocky quartzite on the left limit.

Gold Characteristics Gold varies greatly in size and is often dull in colour. The fineness is 880.

Black Hills, a tributary of Stewart

115O/07 2020: 63°25'11"N, 138°47'28"W
115O/07 2020: 63°23'07"N, 138°45'16"W
115O/07 2018: 63°26'30"N, 138°49'13"W

Stuart Placers Ltd., 2009–2020

Water License: PM20-048 (Active 05/2031)
Water License: PM12-037 (Expired 03/2020)
Active Producer (2018–2020) **Operation no. 110**

Location Black Hills Creek, two locations: at the mouth of McCrimmon Creek in the middle of the valley and a right limit bench across from the mouth of Kernine Creek.

Work History and Mining Cuts In 2018, Stuart Placers mined a right limit bench cut below camp, a 152 m (500 ft) long cut at the mouth of McCrimmon Creek and a low-level bench cut on Mills Creek. Exploration was conducted on bench claims at Mills and McCrimmon creeks in late 2017, and cuts were prepared in early 2018 for mining that season. A mid-valley cut measuring 46 by 355 m (150 × 1165 ft) downstream from Mills Creek and another cut near Mills Creek were completed in 2019. Three placer settings were mined in 2020 by Stuart Placers. The first cut was located on the far right limit in the modern Black Hills valley. The second cut, 91 by 150 m (300 × 490 ft) targeted a left limit mid-level bench downstream from the mouth of McCrimmon Creek. The third setting targeted buried right limit Black Hills side pay under an alluvial fan derived from a right limit tributary, slightly downstream from McCrimmon Creek. Throughout the season, a crew of 8 people, worked a daily 12-hour shift and spent 1340 hours sluicing.

Equipment and Water Treatment In 2020, equipment included two Hitatchi Zaxis 450 excavators, an Hitachi 470 excavator, an Hitachi EX300 excavator, an Hitachi 330 excavator, a John Deere 450 excavator, a Caterpillar D10R bulldozer, a Caterpillar D9N bulldozer, two Caterpillar 9H bulldozers, two Caterpillar 985 wheel loaders, a Bell 40 ton articulating haul truck and two International Payhauler 350C haul trucks. Two wash plants were used to process pay. The first was a 1.5 by 6.1 m (5 × 20 ft) trommel with 1.8 by 3.0 m (6 × 10 ft) sluice run lined with Nomad matting and 2" hydraulic riffles, that could process up to 75 yd^3 (57 m^3)/hr. The second plant, a Derocker, could process up to 100 yd^3 (76 m^3)/hr. Water was acquired from Black Hills Creek and effluent was settled in out-of-stream ponds with no discharge back to the creek. A daily clean-up of the top mats occurred and clean-ups were conducted using a single cell jig.

Surficial Geology and Stratigraphy Black Hills Creek consists of placer deposits in the modern valley and on low-level to mid-level benches. Side pay remains on the farthest extent on both limits, as well as, perched on low-level benches several feet off the modern valley floor that can be hard to recognize due to the minor elevation difference in bedrock elevation.

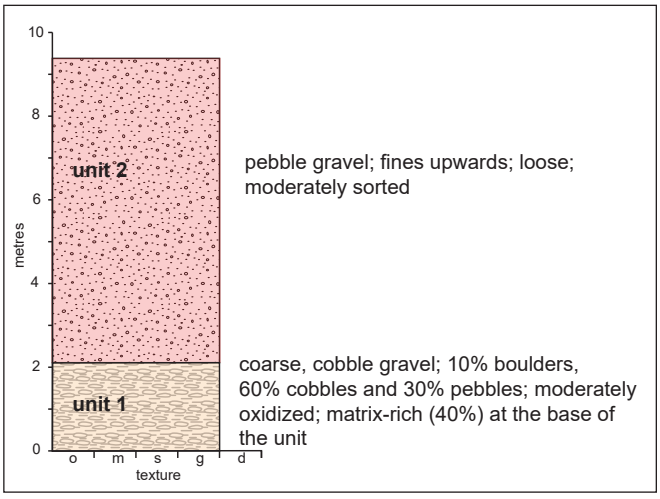
In 2020, a cut on the right limit at the mouth of an unnamed tributary consisted of a low-level bench of Black Hills fluvial gravel, overlain by an alluvial fan deposit derived from the tributary. The overlying fan material consisted of a fining upward gravel overlain by mud. Buried beneath the fan is Black Hills side pay. At the time of



Downstream view of the 2020 cuts at the mouth of McCrimmon Creek. The cuts are outlined by dashed lines.

the visit, the top of the Black Hills Creek gravel was exposed and appeared to be imbricated downstream, indicating the tributary gravel had not eroded and reworked the Black Hills Creek gravel at that location. An exposure of side pay that had been stripped of overburden, farther downstream, consisted of two gravel units. Unit 1, from 0 to 0.9 m (0–3 ft) is a cobble-pebble gravel with a minor mixing zone indicated by rare clasts embedded into the gumbo bedrock. Clasts are subround to subangular, and comprise a clast-supported gravel with a 20% matrix consisting of medium sand. The unit is more compact at its contact with the undulating bedrock surface, which is a good indicator for identifying the most economic gravel. Unit 2, from 0.9 to 2.7 m (3–9 ft) is bedded sand and silt.

A second exposure on the left limit, downstream from McCrimmon Creek exposed a mid-level bench in Black Hills Creek valley. This bench is believed to be a continuation of the bench/buried channel that is mined upstream by previous operator, R. Smith. Depth to bedrock according to drilling is 9.1 m (30 ft) and consists of two units. Unit 1, from 0 to 2.1 m (7 ft) consists of coarse gravel, and unit 2, from 2.1 to 9.4 m (7–24 ft) consists of fine gravel. Unit 1 is a moderately oxidized cobble gravel with 60% cobbles, 30% pebbles and 10% boulders. Matrix percent is higher at its contact with the bedrock (40%) and decreased upwards into a more clast-supported gravel with a 30% matrix. Clasts vary from subround to subangular, with the larger clasts having a subround to round shape. Unit 2, which is considered overburden, consists of a fining upward gravel sequence of primarily loosely consolidated pebbles and cobbles.



Stratigraphy exposed at the left limit mid-level bench at Stuart Placers Ltd. in 2020.

Bedrock Geology Bedrock varies between gumbo, highly fractured chlorite-schist and pervasively oxidized fractured schist. Quartz veins and fault zones crosscutting the valley are common.

Gold Characteristics Gold ranges from flat and flaky to round and nuggety, with a purity of 790 to 830.

Moosehorn, a tributary of Henderson

115O/06 2019: 63°22'36"N, 139°10'11"W

Vincent, M. and S. Larose, 2008–2020

Water License: PM19-018 (Active 10/2029)
Water License: PM09-666 (Expired 10/2019)
Active Producer (2018–2020) **Operation no. 111**

Location Moosehorn Creek, 4.3 km upstream from its confluence with Henderson Creek.

Work History and Mining Cuts Extensive drilling and exploration shafting has been conducted on Moosehorn Creek in the past decade. In 2018, activities included stripping and cut preparation conducted by a two-person operation. A cut 8 by 51 m (26 × 167 ft) was sluiced in 2019 by Mr. Vincent and Mr. Larose. In 2020, approximately sixty hours of sluicing occurred up until mid-August. Total material sluiced and additional work history in 2020 is unknown.

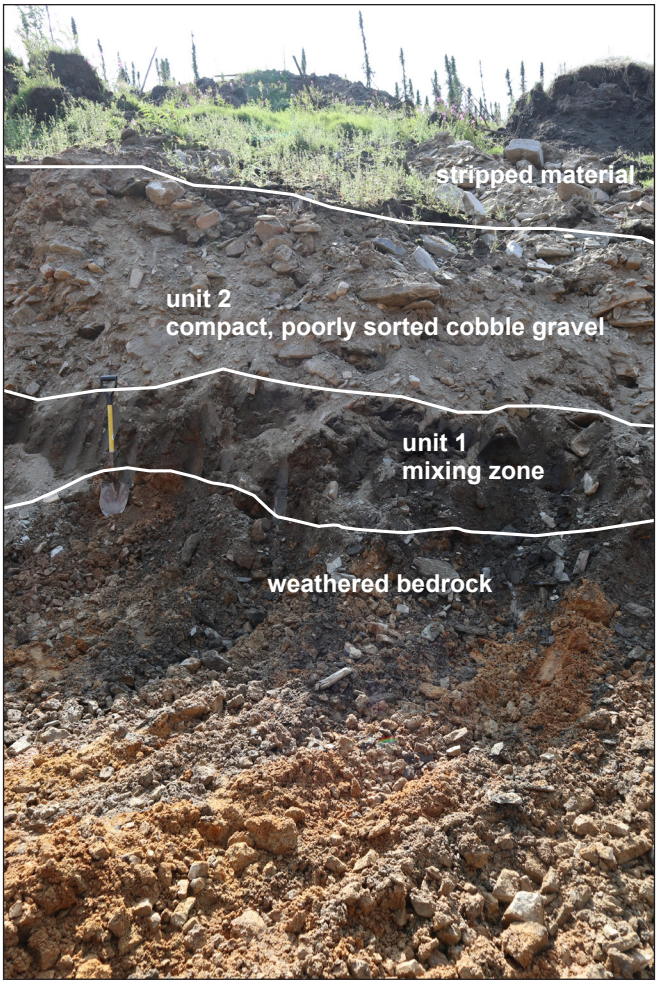
Equipment and Water Treatment Equipment utilized in 2019 included an Hitachi Zaxis 330LC excavator and a Bantam excavator. A vibrating screen deck with a ¾" screen was used to process between 30 and 40 yd^3 (23–31 m^3)/hr. The plant had a single side run 0.6 m (2 ft) wide by 3.7 m (12 ft) long and



Location on Moosehorn Creek that has been mined for the past three season. The view is looking upstream in 2019 and the section described in the next image is located on the left limit of the drainage, behind the excavator.

configured with 2.4 m (8 ft) of expanded metal and 1.2 m (4 ft) of angle iron. A 3" pump supplied water to the plant and an additional 2" pump was used to deliver water directly to the hopper. Water was 100% recycled in a series of two ponds. Clean-ups were conducted using a shaker table.

Surficial Geology and Stratigraphy Moosehorn Creek is a narrow drainage that requires a systematic mine plan in order to strip and stack material, open a cut, and recycle water in a series of settling ponds. This is a high energy drainage and as the operator continues to work upstream, the valley width will continue to narrow. The left limit of the 2019 cut exposed a high energy, matrix-rich mixing zone at the bedrock interface overlain by a coarse cobble gravel. The mixing zone, unit 1, is 0 to 0.8 m (2.6 ft) thick and consists of orange weathered bedrock and high energy Moosehorn Creek gravel. As the high energy gravel was deposited it was able to rework the weathered bedrock surface during its deposition and created an undulating contact on the bedrock surface. Unit 2, from 0.8 to 2.4 m (2.6–7.9 ft) is a poorly sorted, compact, cobble gravel with subround to rounded clasts. The overburden is not intact but the operators stripped up to 3 m (10 ft) of loess and organics. All of unit 1 and up to 0.6 m (2 ft) of bedrock was sluiced. In order to sluice the decomposed bedrock, it was dried which enables the material to break down in the wash plant.



Left limit exposure in 2019, with unit 1 and 2 clearly exposed. The contact between the orange weathered bedrock and unit 1 is poorly exposed, but an undulating contact was observed.

Bedrock Geology Bedrock is weathered granitic rock (metagranodiorite or metadiorite) that is biotite-rich causing pervasive iron and magnesium oxidation.

Gold Characteristics Gold is flat and has a fineness of 780.

Russian, a tributary of Henderson

115O/06 2019: 63°25'17"N, 139°06'43"W

Northern Gold Resources LLC, 2016–2020

Water License: PM12-025-2 (Active 08/2022)
Active Producer (2018–2020) **Operation no. 112**

Location Russian Gulch, a locally named tributary of Henderson Creek, 1.1 km upstream from its confluence with Henderson Creek.

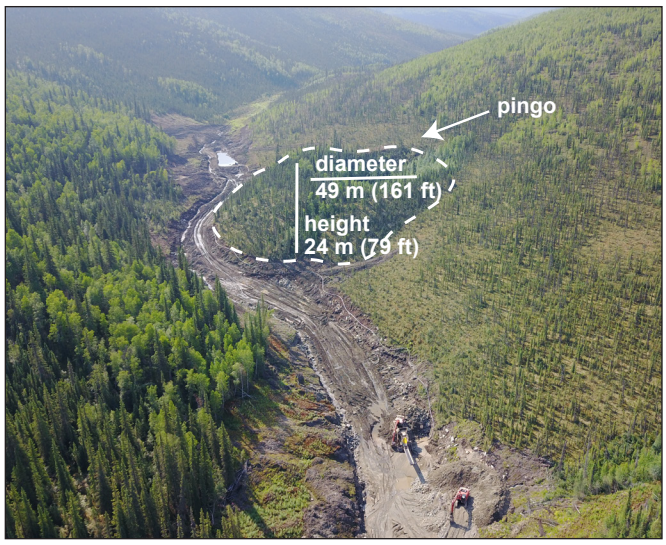
Work History and Mining Cuts For the past three seasons, Northern Gold Resources LLC has operated as a two to five person crew, sluicing up to 25,000 yd^3 (19 114 m^3) per year. In 2018, they focused activity on a 30 m (100 ft) long continuous, low-level bench on the left limit of lower Russian Gulch, and stripped an additional 396 m (1300 ft) upstream towards a pingo. Stripping occurred upstream from the pingo on a total of four claims. Mining continued upstream towards and past the pingo in 2020, and 152 hours were spent sluicing.

Equipment and Water Treatment Equipment included a Caterpillar 235 excavator, an Hitachi Zaxis 330 LC excavator, an Hitachi 450 excavator, a Caterpillar D9 bulldozer and a Caterpillar 988 wheel loader. A double screen deck 1.5 by 3.0 m (5 × 10 ft) with a 14.6 m (48 ft) tailings conveyor was able to process up to 100 yd^3 (76 m^3)/hr. The initial sluice measures 0.9 by 1.8 m (3 × 6 ft) which splits into three runs each measuring 1.2 by 2.4 m (4 × 8 ft). Water was supplied to the plant by a 10" pump. A reservoir pond was established upstream on Russian Gulch to allow for a consistent supply of water. Effluent was settled

in a series of settling ponds and was discharged into Henderson Creek. A long tom was used to conduct clean-ups, and final concentrate was completed on a table in Dawson.

Surficial Geology and Stratigraphy Stratigraphy in Russian Gulch is coarse, high-energy gulch gravel that is overlain by muck and colluvium, which is typically found in these narrow gulch settings in unglaciated terrain. Also present are low-level benches, approximately 1.8 m (6 ft) in elevation above the modern gulch-bottom, and discontinuously preserved. Overburden thickness dramatically increases as excavations move farther in-slope to excavate the benches, and large rockslide debris was encountered beneath the muck. Unit 1, the coarse boulder gravel is 2.4 m (8 ft) thick, poorly sorted and consists of large boulders up to 3.6 m (12 ft) in length. Clasts are predominantly subangular and the silty-sand matrix content varies throughout from 15 to 25%. Wood debris is also found throughout the gravel section. Unit 2, from 2.4 to 4.9 m (8–16 ft) is overburden, which consists of muck and colluvium. Gravel on the low-level bench is similar in coarseness to the modern valley bottom deposits but consists of a higher sand content in the matrix.

A prominent landform on the left limit of Russian Gulch is a pingo; an ice-cored mound that forms where a concentration of ground water encounters a permafrost environment and freezes through expansion (Huscroft et. al., 2017). The pingo is 49 m (161 ft) in diameter and 24 m (79 ft) in height. A crater-like depression can be found on top of the pingo, which indicates that the ice core has at least partially melted and collapsed.



Drone image from 2019, looking upstream from Northern Gold Resources LLC sluice plant. The dashed line outlines a pingo.

Bedrock Geology Bedrock varies between blocky, competent, mafic orthogneiss and decomposed orthogneiss.

Gold Characteristics Gold is 50% coarse and 50% fine in size. Gold from Henderson Creek has a fineness of 700 and Russian Gulch gold is 750.

Henderson, a tributary of Yukon

115O/06 2020: 63°21'45"N, 139°21'50"W
115O/06 2018: 63°21'52"N, 139°21'27"W

H.C. Mining Ltd., 2004–2020

Water License: PM18-067 (Active 08/2029)
Water License: PM08-623-1 (Expired 08/2019)
Active Producer (2018–2020) **Operation no. 113**

Location Henderson Creek, 4.4 km from the Yukon River.

Work History and Mining Cuts H.C. Mining Ltd. has progressively mined downstream the past several seasons, and is currently 4 km from the Yukon River. Sluicing, stripping and progressive reclamation occurred in 2018 with a crew of 8 people operating 24/7. Stripping was conducted at the confluence of Yukon River and Henderson Creek, and a cut 1219 m (4000 ft) long was sluiced throughout the season. In 2019, a small cut was completed on North Henderson Creek, as well as a 61 by 427 m (200 × 1400 ft) cut, 800 m downstream from Henderson forks. Four cuts, one unmeasured and the others measuring 61 by 1280 m (200 × 4200 ft), 61 by 518 m (200 × 1700 ft), and 30 by 183 m (100 × 600 ft) were mined in the modern valley in 2020. A crew of twelve people operated a continuous 24 hour split-shift, processing up to 500 yd^3 (306 m^3)/hr for 23 sluicing hours per day. They used up to four screen decks in the 2020 season and sluiced for more than 5800 hours. Additional activity included stripping on Tenderfoot Creek and the headwaters of Maisy May Creek, in preparation for sluicing in 2021.

Equipment and Water Treatment In 2020, the equipment used onsite included two Hitachi ZX350-3 excavators for digging drains and feeding sluice plants, two Hitachi ZX470-5 excavators for feeding sluice plants, a Caterpillar 336 excavator for digging drains and feeding sluice plants, a Caterpillar 374 excavator for loading rock trucks, a Caterpillar 988K loader with a 9-yard bucket for moving tailings, two Komatsu D475-5 bulldozers for stripping and pushing tailings, two



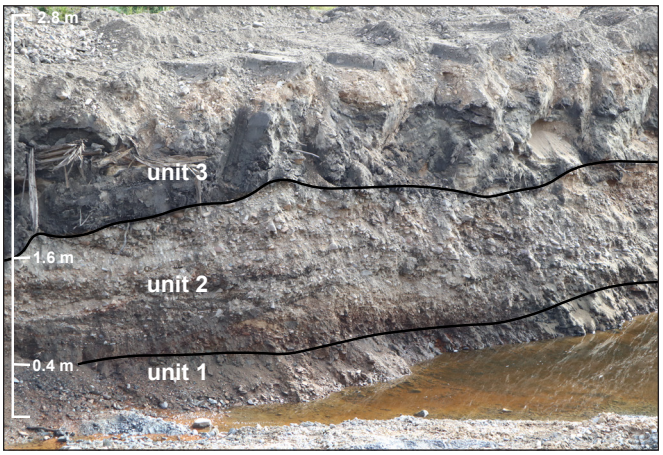
Two newly acquired Macon Industries SD-600 vibrating screen decks sluicing alongside a third screen deck. (Photo credit: Hayden Cowan).

Caterpillar D10T bulldozers for stripping and pushing pay, a Caterpillar 9T bulldozer used for stripping, building roads, pushing pay and reclamation, and two Volvo A60H rock trucks for hauling pay. A vibrating double screen deck measuring 1.5 by 4.3 m (5 × 14 ft) with a 3 by 3 m (10 × 10 ft) hopper, as well as another unmeasured screen deck, was used to process pay. Additionally, two custom fabricated Macon Industries SD-600 vibrating screen decks were added to the operation in late 2020. With up to four wash plants operating at one time, they were able to process over 500 yd^3 (306 m^3)/hr. Water was supplied to the plants using three 10" pumps. Effluent was settled in a series of two ponds. A jig and wheel were used to conduct clean-ups.

Surficial Geology and Stratigraphy Stratigraphy remains consistent on lower Henderson Creek as H.C. Mining continues to mine lengthy strips on either limit. In 2020, the section consisted of three units. Unit 1, varying in thicknesses throughout the cut, is a 0.4 m (1.5 ft) thick mixing zone of weathered mafic schist bedrock and cobble gravel. It is darker grey in appearance, slightly more compact and contains a larger percentage of cobble-sized clasts (60%) compared to the overlying cobble-pebble gravel. Unit 2, from 0.4 to 1.6 m (1.5–5.3 ft) is a cobble-pebble gravel with 45% pebbles, 50% cobbles, and up to 5% boulders, that fines upwards into a pebble gravel. The gravel is clast supported, moderately sorted, and has a fine to medium sand matrix. Unit 3, from 1.6 to 2.8 m (5.3–9.3 ft) is considered overburden and consists of mud, woody debris and fine organic material. Overburden thickness varies in the valley from 3.7 to 6.1 m (12–20 ft). Up to 1.2 m (4 ft) of gravel and 0.6 m (2 ft) of bedrock is sluiced, with the majority of gold recovered from unit 1.

Bedrock Geology Bedrock varies between orthogneiss and highly fractured and variably weathered mafic schist. The bedrock surface undulates with a relief of up to 1.8 m (6.0 ft).

Gold Characteristics Gold is all fine and flat, with fineness ranging from 800 to 810.



Stratigraphy on lower Henderson Creek in 2020.

North Henderson, a tributary of Henderson

115O/06 2020: 63°27'46"N, 139°13'03"W

Fellhawk Enterprises Ltd., 2019–2020

Water License: PM15-088 (Active 05/2026)
Active Producer (2019–2020) **Operation no. 114**

Location North Henderson Creek, approximately 14 km upstream from its confluence with Henderson Creek.

Work History and Mining Cuts An option agreement was established between claim owners H.C. Mining and Fellhawk Enterprises Ltd. in 2019. H.C. Mining drilled at the location that Fellhawk Enterprises Ltd. is now actively mining. In fall 2019, a stripping program was conducted and the site was prepared for the following season of mining. In 2020, a month was spent constructing a new access road and sluicing commenced in mid-summer. A four person crew operated a daily 12-hour shift throughout the remainder of the season and 50,000 yd^3 (38 228 m^3) of material was sluiced.

Equipment and Water Treatment The equipment present at the operation in 2020 included a Caterpillar 324 excavator, a John Deere 470 excavator, Caterpillar 735 haul truck and three Caterpillar D9L bulldozers. The wash plant consisted of an Elrus 1.5 by 4.9 m (5 × 16 ft) double shaker screen deck that processed up to 200 yd^3 (153 m^3)/hr. Two 0.9 m (3 ft) sluice runs are present on either side of the screen deck and feed into four 0.9 m (3 ft) by 6.1 m (20 ft) runs. A 10" pump supplied water to the plant, powered by a Caterpillar 3208 engine. A series of two ponds were used to settle effluent.

Surficial Geology and Stratigraphy North Henderson Creek is a relatively underexplored drainage, with the only known activity in the past having occurred in the lower 1 km near its confluence with Henderson Creek. Sharing similar erosional history and bedrock



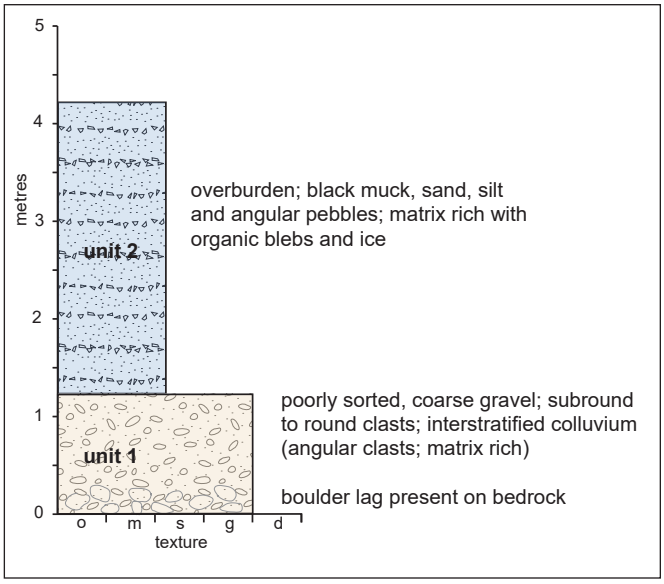
Fellhawk Enterprise Ltd. sluicing on North Henderson Creek in 2020. The view is looking upstream, towards the east.

geology to Henderson Creek, placer deposits in benches and valley bottoms are rational exploration targets. North Henderson Creek is a broad drainage that occupies a flat bottom valley and is bound by fairly steep slopes. Mid to low-level benches may be preserved and disguised under colluvial/loess accumulations on the flanks of the valley.

The cut opened in the modern valley bottom in 2020 consisted of two units. Unit 1, up to 1.2 m (4 ft) in thickness is a poorly sorted, coarse gravel, with a boulder lag present on the bedrock surface. Clasts are predominately subround to round, with some angular clasts present which represents colluvium being reworked. It is a matrix rich unit, with up to 30% fine to medium sand and minor silt. Unit 2, from 1.2 to 4.2 m (4–14 ft) is overburden. It consists of a mixture of black muck, sand, silt and pebbles. This unit is a mixture of material predominately derived from upslope as a colluvium. Up to 0.3 m (1 ft) of the lowermost gravel and 0.6 to 0.9 m (2–3 ft) of bedrock was sluiced.

Bedrock Geology Bedrock is mapped as intermediate to mafic orthogneiss (Gordey and Ryan, 2005).

Gold Characteristics Gold is fine, flat and fineness is 770.



Stratigraphic section from the modern valley bottom of North Henderson Creek in 2020.

Rosebute, a tributary of Yukon

115O/11 2018: 63°31'10"N, 139°23'46"W

Paydirt Holdings (1982) Ltd., 2015–2018

Water License: PM16-017 (Active 06/2026)
Active Producer (2018) **Operation no. 115**

Location Rosebute Creek, approximately 16.5 km upstream from its confluence with Yukon River.

Work History and Mining Cuts Paydirt Holdings (1982) Ltd. shifted operations from upper Black Hills to Rosebute Creek beginning in 2015. During the 2018 season, operations focused on their claims in the mid to upper Rosebute drainage, mining both limits and chasing the meandering pay channel. A cut on the right limit terrace immediately downstream from the left fork was also mined. A five person crew mined a total of four claims in 2018. No activity occurred in 2019 or 2020.

Equipment and Water Treatment Equipment utilized at the mine included a John Deere 650D-LC excavator for digging pay, a Caterpillar D10N bulldozer for pushing pay, a Caterpillar 735 rock truck for hauling pay and an Hitachi Zaxis 350 excavator for feeding the plant. The wash plant was able to process up to 130 yd^3 (99 m^3)/hr.



Aerial view of Paydirt Holdings (1982) Ltd.'s operation in 2018, where they excavated the meandering pay channel by mining limit to limit.

Surficial Geology and Stratigraphy Rosebute Creek is a relatively narrow drainage despite its length, with a maximum width of 35 m (115 ft) at the mining location in 2018. Two placer settings were mined in the season: a Pleistocene fluvial terrace on the right limit immediately below the left fork, and the modern fluvial plain at the forks. The terrace, approximately 12 m (40 ft) above the modern creek, consists of cobble-pebble gravel with a sandy matrix and overlain by fine sand and silt. In the valley bottom, mining progressed through the forks area and continued up the right fork. The initial reach of the right fork is narrow and has a steeper gradient. As a result, the fluvial deposits are very thin and contain a significant component of locally weathered blocky bedrock. Stratigraphy in the valley bottom at the mouth of the right fork consists of a cobble-pebble-boulder gravel with a matrix of coarse sand and granules. The thickness varied from 0.5 to 1.0 m (1.6–3.2 ft). Overlaying the undulating gravel unit is sand, silt and colluvial diamicton. Rosebute Creek is locally known for a significant amount of coarse boulders in the drainage, with clasts up to 1.5 m (5 ft) in diameter. The blocky nature of the gneiss bedrock underlying the floodplain contributes to this coarse nature, as well as contributions from the valley sides. Near the area of active mining at the mouth of the right fork, the left limit could host a thicker package of gravel due to the bedrock topography and protection from erosion by the creek.

Bedrock Geology Bedrock is blocky, intermediate to mafic orthogneiss.

Gold Characteristics Gold varies in size, with the largest nugget recovered being ½ ounce. The fineness is 820.



Section exposed on the right limit of Rosebute Creek where Paydirt Holdings (1982) Ltd. was active in 2018. A thicker section of gravel is present on the left limit (not shown in image), with gravel thickness greatly varying in the drainage from 0.5 to 2.4 m (1.6–8 ft). Large boulder slabs up to 1.5 m (5 ft) are common in the drainage.

Maisy May, a tributary of Stewart

115O/06 2020: 63°21'38"N, 139°00'22"W

Christiansen, A., 1993–2020

Water License: PM17-040 (Active 01/2028)
Water License: PM10-071-1 (Active 09/2021)
Water License: PM09-637-1 (Expired 04/2020)
Active Producer (2018–2020) **Operation no. 116**

Location Maisy May Creek; 350 m upstream on an unnamed left limit tributary.

Work History and Mining Cuts The Christiansen family has been active in upper Maisey May Creek for close to three decades. In the most recent seasons, the focus of activity has been on two unnamed left limit tributaries. An additional small scale operation was mining under PM17-040 in the 2018 season, with S. Reimer active on the lower portion of Mr. Christiansen's claims. In 2020, the tributary closest to camp was mined, with a cut approximately 350 m upstream on the left limit. Claims were transferred in fall 2020 and water license PM17-040-1 is in the process of assignment.

Equipment and Water Treatment Equipment present at the site included an Hitachi EX200 excavator, a Caterpillar D8H bulldozer and a Caterpillar 950 wheel loader. A screen deck was used to process material. Effluent was settled using an in-stream reservoir and an in-stream settling pond.

Surficial Geology and Stratigraphy In 2017, a left limit exposure on the left limit tributary to Maisy May exposed four units. In areas where the mafic schist is weathered, a mixing zone (unit 1) between bedrock and gravel is up to 0.3 m (1 ft) thick. Unit 2, ranging from 0.5 to 0.6 m (1.5–2 ft) in thickness is a cobble-pebble gravel that is compact and clast supported. The pay unit, unit 3, is up to 1.2 m (4.0 ft) thick and is a coarse, muddy, compact gravel. The matrix accounts for 40 to 50% of the deposit and consists of medium to coarse sand. Unit 3 is not observed on the right limit of the valley and appears below a large left limit tributary. The operator suspects the pay gravel may originate from the tributary, 500 m upstream from the 2017 mine cut location. All of unit 2 and 3 was processed for placer gold. Unit 4, up to 1.8 m (6 ft) thick, is weathered bedrock colluvium and muck. This material is considered overburden. No recent geological information is available for the site.



The Christianson's sluicing operation in 2020. The view is looking upstream the unnamed left limit tributary. (Photo credit: Lee Mierau).

Bedrock Geology Bedrock is mapped as quartz-mica schist (Gordey and Ryan, 2005).

Gold Characteristics Gold is mostly fine and the fineness is 765.

Maisy May, a tributary of Stewart

115O/06 2018: 63°21'52"N, 139°01'14"W

40419 Yukon Inc., 2013–2014, 2016–2020

Water License: PM10-022-1-2 (Expired 11/2020)
Active Producer (2018–2020) **Operation no. 117**

Location Maisy May Creek, upper, 18 km from its confluence with Stewart River.

Work History and Mining Cuts In 2018, 40419 Yukon Inc. mined at the upper fork of Maisy May Creek and continued upstream in 2019 and 2020.



Location of 40419 Yukon Inc. operation in 2018 at the forks on upper Maisy May Creek. The view is looking downstream to the south.

Equipment and Water Treatment Equipment utilized in 2018 included a Komatsu PC450LC excavator for liberating pay and feeding the wash plant, a Caterpillar D8 bulldozer for removing overburden, and a Caterpillar rock truck. A trommel was used to process the pay material.

Surficial Geology and Stratigraphy Not reported.

Bedrock Geology Bedrock is mapped as quartz-mica schist (Gordey and Ryan, 2005).

Gold Characteristics Not reported.

Maisy May, a tributary of Stewart

115O/07 2020: 63°16'56"N, 138°54'27"W

Bedrock Mining Company Inc., 2013–2017,2019–2020

Water License: PM13-052 (Active 03/2024)
Active Producer (2018–2020) **Operation no. 118**

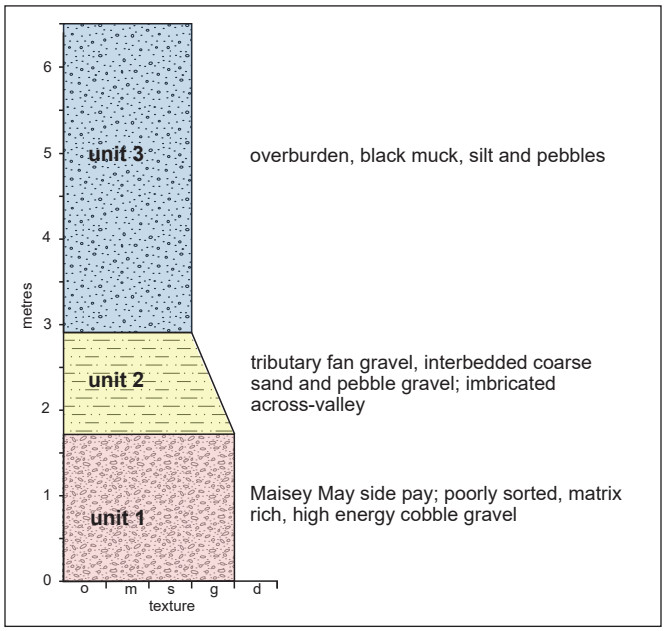
Location Maisy May Creek, lower, 7 km upstream from its confluence with Stewart River.

Work History and Mining Cuts Bedrock Mining Company Inc. continued to operate downstream from their camp on the lower portion of Maisy May Creek in 2019 and 2020; no mining occurred in 2018. In 2019, a five-person operation mined a cut 135 by 1000 m (443 × 3280 ft). In 2020, they received funding through the Yukon Mineral Exploration Program (YMEP), which assisted in completing a 56-hole drill program. A crew of four people, operating a daily twelve-hour shift completed three cuts in the season. The first cut was on the right limit at the mouth of an unnamed tributary and measured 32 by 127 m (105 × 415 ft), the second cut was located in the middle of the valley and measured 50 by 156 m (165 × 512 ft), and third cut was located slightly upstream.

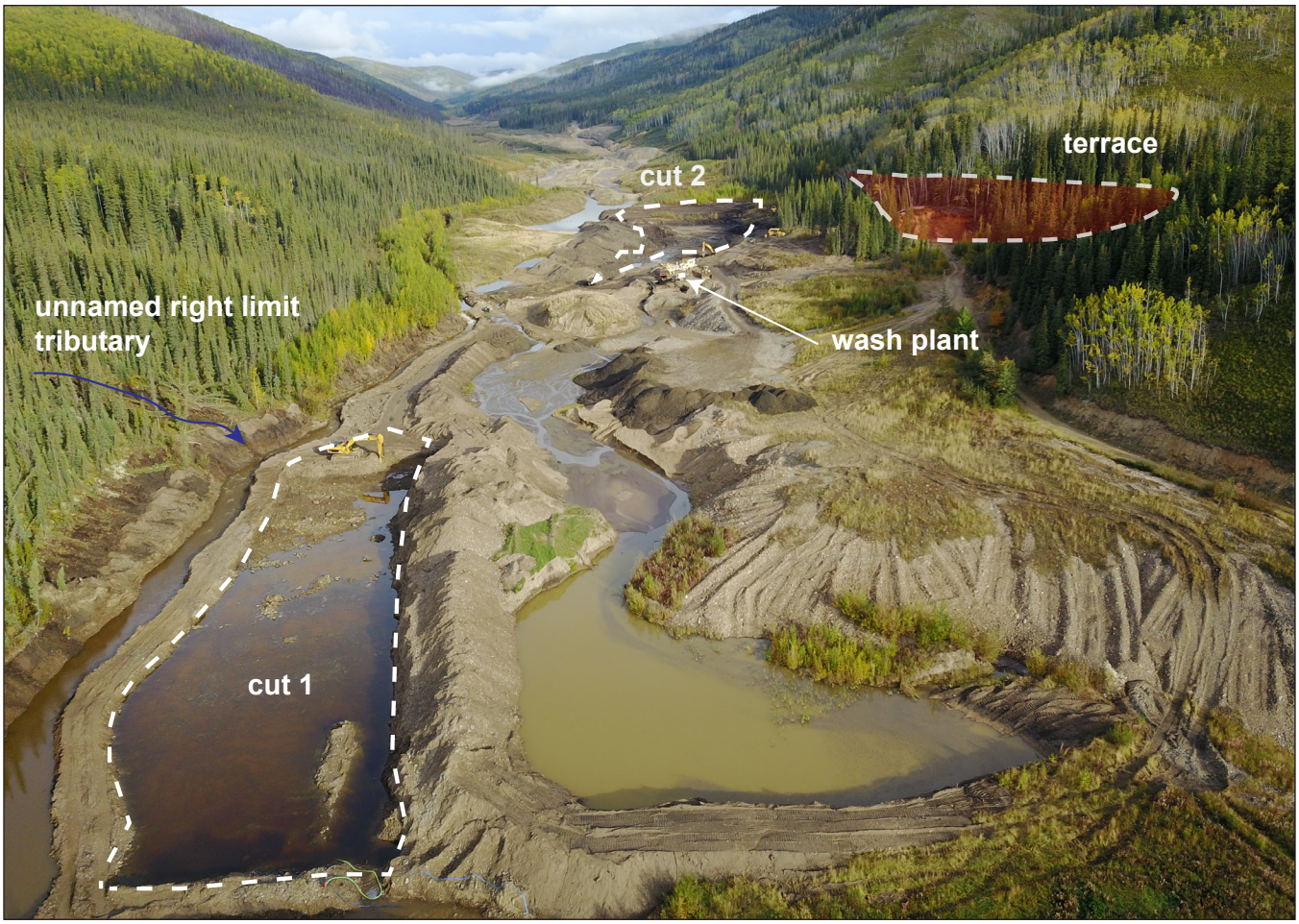
Equipment and Water Treatment Equipment included a Caterpillar 345 excavator, a Caterpillar 330 excavator, a Caterpillar 988 loader, a Volvo 250 wheel loader, a Caterpillar D10N bulldozer, a Caterpillar D8 and D10 bulldozer, and two Caterpillar 730 articulated dump trucks. A Macon T-600 plant with a 1.8 m (6 ft) diameter trommel was used to process pay. A 10 by 8" pump supplies water to the plant, allowing the plant to process 180 to 200 yd^3 (138–153 m^3)/hr. Effluent was settled in a series of two ponds. A small trommel was used to process the concentrate.

Surficial Geology and Stratigraphy Historic and present day mining has predominately focused on mining the fluvial plain. Less activity has occurred on the fluvial terrace deposits that are sporadically preserved on both limits of the drainage. A terrace deposit on the left limit, immediately downstream from the largest unnamed tributary, was the location that Bedrock Mining Company Ltd. mined in 2020. Terraces are also present downstream, both north and south of the largest left limit tributary on lower Maisey May, which is 3.2 km upstream from the Stewart River confluence. Gravel on intermediate-level terraces was originally deposited on the floodplain of paleo-Maisey May Creek, and as the creek incised through the sediment and bedrock, the terraces formed. Placer gold has been concentrated in the modern valley bottom where the floodplain was destroyed by fluvial incision, but exploration is warranted to further test the terraces for economic deposits that did not get reworked into the valley bottom.

The right limit cut in 2020, at the mouth of the tributary, consists of Maisey May Creek side pay overlain by a tributary fan deposit. Material derived from the fan has been truncated by the modern drainage, so preservation only occurs on the very far right limit of the cut, where a well-sorted pebble gravel with flow indicators from the tributary is located. Maisey May side pay (unit 1) is 1.7 m (5.5 ft) thick and is a poorly sorted, high energy, pebble-cobble gravel. It has a high matrix percentage at 50% consisting of medium sand and silt. Wood debris,



The stratigraphy exposed in the 2020 mine cut on the right limit of Maisy May Creek.



Drone image in 2020 looking up Maisey May Creek towards the north west. Bedrock Mining Company Inc.'s two cuts are outlined by dashed lines. Material was hauled from the cuts to the centralized sluice plant location. The left limit terrace is approximately drawn and indicated by the polygon outlined by a dashed line and infilled.

silt lenses and open work sections up to 10 cm (4") thick are present throughout. Unit 2, from 1.7 to 2.9 m (5.5–9.5 ft) is interbedded lenses of pebble gravel, fine and coarse sand. The clasts are well-rounded. An undulating and poorly defined contact exists between unit 2 and unit 3. Unit 3, from 2.9 to 6.5 m (9.5–21.3 ft) is massive muck and sand. Up to 0.6 m (2 ft) of bedrock and all coarse gravel, up to 1.8 m (6 ft) thick, was sluiced.

Bedrock Geology Bedrock is decomposed quartz-feldspar gneiss.

Gold Characteristics Gold is well-travelled, and has a fineness of 790.

Brewer, a tributary of Stewart

115O/03 2018: 63°09'34"N, 139°01'10"W

No. 203 Dynamic Endeavours Inc., 2016–2020

Water License: PM15-073 (Active 03/2026)
Active Producer (2020) **Operation no. 119**

Location Brewer Creek, 2.8 km upstream from its confluence with Stewart River.

Work History and Mining Cuts The extent of activity conducted on Brewer Creek is unknown for 2018 and 2019. In 2020, C. Sager mined in the drainage and spent 140 hours sluicing.

Equipment and Water Treatment Not reported.

Surficial Geology and Stratigraphy Brewer Creek is a narrow valley containing a high energy, poorly sorted gulch gravel overlain by a thick package of

frozen, black muck overburden. Overburden thickness ranges from 2.4 to 6.1 m (8–20 ft).

Bedrock Geology Bedrock is mapped as quartzite, psammite and schist (Ryan et *al*., 2013).

Gold Characteristics Not reported.

Barker, a tributary of Stewart

115O/02 2019: 63°04'55"N, 138°56'51"W

Schmidt Mining Corp., 2004–2020

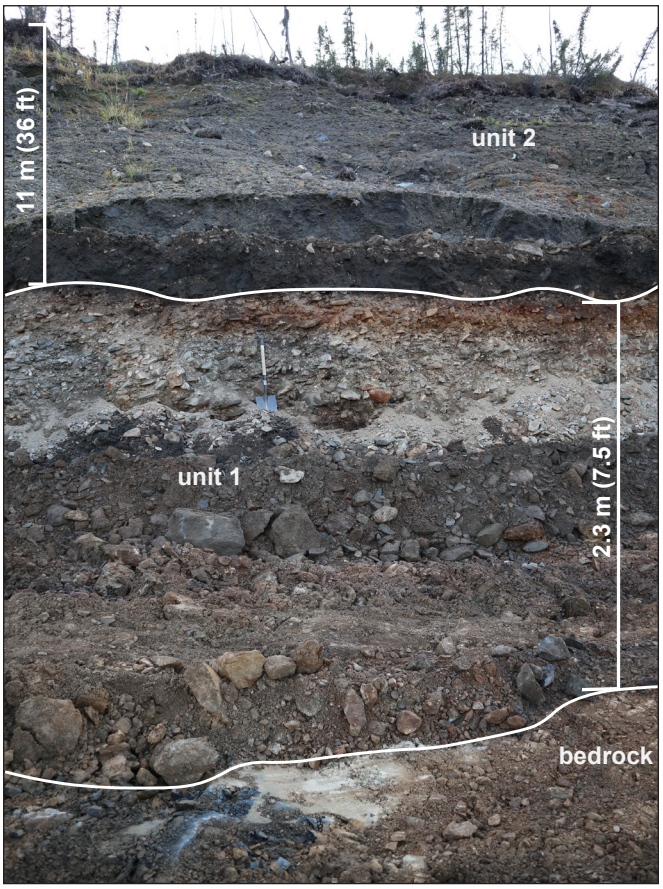
Water License: PM15-076 (Active 04/2026)
Active Producer (2018–2020) **Operation no. 120**

Location Barker Creek, approximately 12 km upstream from its confluence with Stewart River.

Work History and Mining Cuts In 2018, Schmidt Mining Corp. only conducted stripping on Barker Creek. The following season Mr. Procee and his crew of seven completed a cut on Barker Creek that they had been preparing for three seasons. The cut was located 350 m downstream from Iron Creek, a right limit tributary of Barker Creek. Additional cuts were completed on the Dixie Bench as well as, directly below camp. In 2020, three days were spent testing the Dixie Bench, but operations were primarily focused on upper Barker Creek, progressively mining upstream towards Agate Creek. Total yardage sluiced in 2020 equated to 250,000 loose yd^3 (191 138 m^3). Work was also initiated on lower Barker Creek, approximately 1.5 km from the Stewart River. This work included a 600 m (2000 ft) stripping program on the left limit.

Equipment and Water Treatment Equipment utilized at Barker Creek included an Hitachi 700 excavator, a Caterpillar 345 excavator and two Caterpillar D10N bulldozers. A 1.8 by 6.1 m (6 × 20 ft) Elrus screen deck with 6.1 m (20 ft) of total sluice run width was capable of processing 250 yd^3 (191 m^3)/hr. Water was supplied to the plant using a 10" pump and effluent was settled back into historic cuts, as they continued to mine upstream. Initial clean-ups were conducted using a long tom and the final clean-up was completed at Quartz Creek.

Surficial Geology and Stratigraphy Three placer settings are present in the Barker Creek drainage: modern creek, low-level benches and high-level benches. The benches represent fragments of older valley-bottoms partially destroyed by erosion of the stream over the last 3 million years. In 2019, mining primarily occurred in the modern creek valley, on the left limit of the drainage. Unit 1, from 0 to 2.3 m (0–7.5 ft) is a poorly sorted, cobble-pebble gravel with 45% cobbles and 65% pebbles. An enrichment of larger cobble to boulder-sized clasts are situated on the bedrock contact. It is matrix-supported with a 35% silty matrix. Up to 0.9 m (3 ft) of gravel and 0.9 m (3 ft) of bedrock was sluiced. In 2020, an unusual depression was encountered on the left limit of Barker Creek on the floodplain level. The depression measured approximately 50 m (164 ft) in diameter and was 8 to 10 m (26–33 ft) in depth. Rounded fluvial rock mixed with weathered bedrock was located in the hole, which provided encouragement to excavate. A 'glory hole' of gold was not discovered and it was speculated that the depression formed where a former pingo may have been located. No evidence of the landform remained other than the depression where the core of ice may have originated, but has since melted out.



Stratigraphy exposed in 2019 on the left limit of Barker Creek. Unit 1 is a poorly sorted cobble-pebble gravel that lies in sharp contact with unit 2 which is muck with minor organics. The bedrock surface is poorly exposed and the uppermost 0.9 m (3 ft) has been excavated as pay.



Schmidt Mining Corp.'s operation on Barker Creek in 2018. The view is looking down Barker Creek where the operator conducted an extensive stripping program all season.

Bedrock Geology Bedrock is very blocky gneiss and orthogneiss.

Gold Characteristics Barker Creek gold is predominately coarse with 50% greater than 12 mesh. Fineness ranges from 850 to 860.

Kirkman, a tributary of Yukon

115O/03 2020: 63°00'49"N, 139°20'56"W

Sager, M. and R., 1993–2020

Water License: PM19-074 (Active 09/2030)
Water License: PM10-015 (Expired 09/2020)
Active Producer (2018–2020) **Operation no. 121**

Location Kirkman Creek, 3.9 km upstream from its confluence with Yukon River.

Work History and Mining Cuts Activity on lower Kirkman Creek was consistent at the Sager's operation from 2018 to 2020. In 2020, they mined two locations: a cut below camp at the mouth of an unnamed right limit tributary, and a cut that is downstream from camp and 2.6 km upstream from the Yukon River confluence. A crew of six people operated a daily ten-hour shift. The cut directly below camp is 244 m (800 ft) in length and targets a fan deposit derived from the unnamed tributary. The second cut was 800 m (2625 ft) downstream from the first cut, and was approximately 50 by 427 m (166 × 1400 ft).

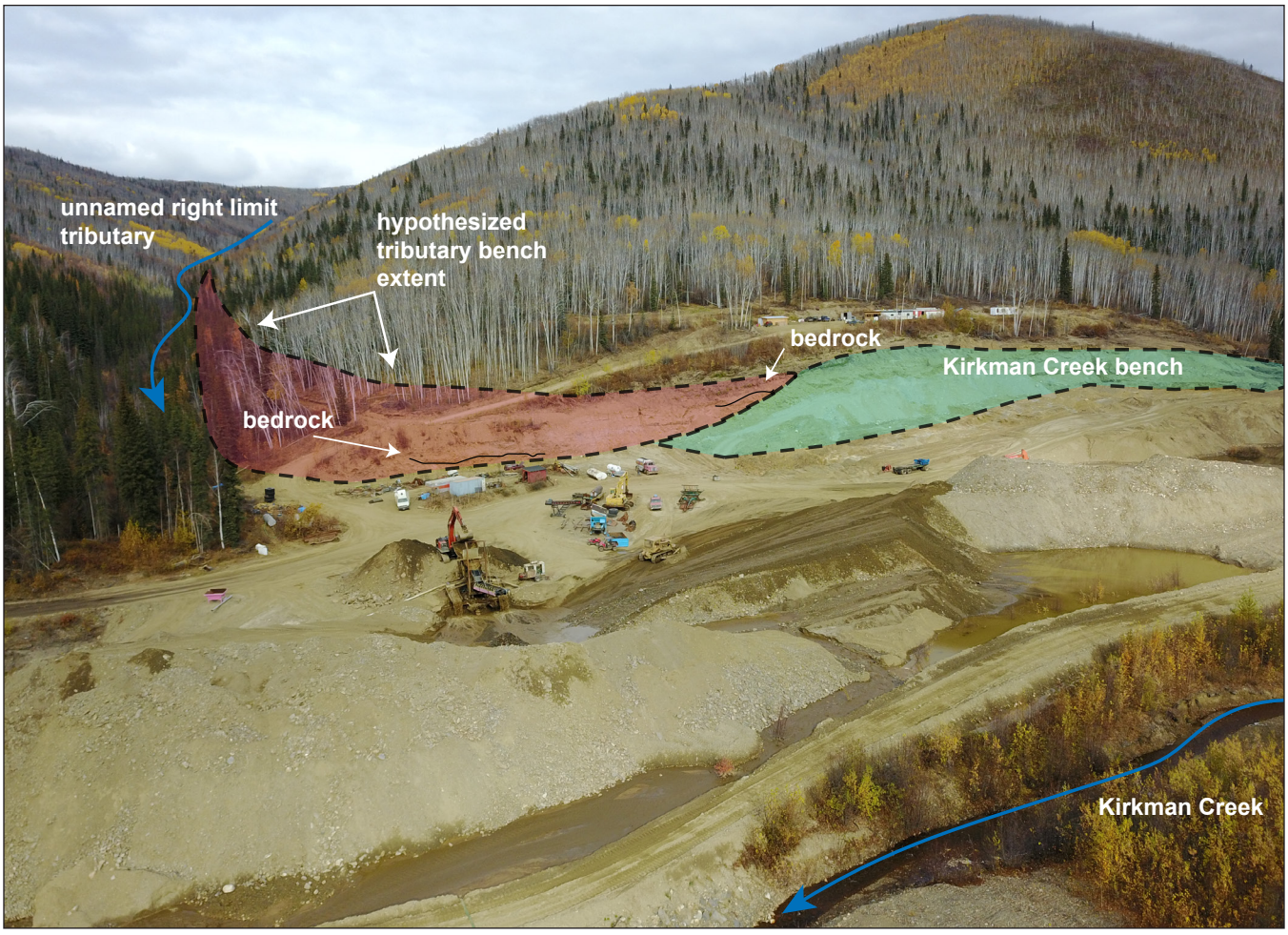
Equipment and Water Treatment Equipment present in 2020 included an Hitachi 350 excavator, two Hitachi Zaxis 450 LC excavators, a Volvo 210 excavator, a Dressta D135 bulldozer, two Volvo 35 ton rock trucks and two Fiat bulldozers (FD40 and HD31). The wash plant is a double vibrating screen deck with a hopper that classified to 1¼" and two sluice runs containing a nugget trap, angle iron riffles and expanded metal. The plant, with a 14 m (45 ft) tailing stacker, is able to process 150 to 180 yd^3 (115–138 m^3)/hr. Water is 100% recycled.

Surficial Geology and Stratigraphy In 2020, an area at the junction of an unnamed right limit tributary and Kirkman Creek was mined. The stratigraphy exposed in fall 2020 suggested evidence for it to be a tributary bench (versus a Kirkman Creek bench) and for it to continue extending upstream on the left limit of the tributary. A different population of gold was recovered from the bench (large and rounded), suggesting it must be reworking and/or receiving inputs from an alternative source other than being derived from the Kirkman Creek drainage. The bench consists of two units: unit 1, from 0 to 1.4 m (0–4.5 ft) and unit 2 from 1.4 to 6.7 m (4.5–22.0 ft). Unit 1 is a poorly sorted, matrix-supported, 40% cobble and 60% pebble gravel. Matrix varies between fine to medium sand and silt, and clasts are subround with angular cobble sized bedrock fragments incorporated throughout. Unit 2 is overbank sediment, consisting of angular bedrock fragments, fine silt and sand, and minor amounts of wood debris. The lowermost 1.8 m (6 ft) of material (all of unit 1 and into lowermost portion of unit 2) and up to 1.2 m (4 ft) of bedrock was processed as pay.

Undulations up to 0.7 m (2.3 ft) are present in the bedrock surface, and an abundance of sand is present at the contact between bedrock and unit 1. The sand represents a zone of bedrock that has been weathered. Clasts permeate into the sand but infrequently, suggesting that weathering occurred post-deposition.



Active sluicing at the Sager's operation in fall 2020.



Location of mining in 2020, downstream of camp at the mouth of the unnamed right limit tributary.

Bedrock Geology Bedrock is oxidized and weathered micaceous schist.

Gold Characteristics The characteristics of the gold vary across the valley. On the left limit, there is less coarse gold and the purity is 840. On the right limit, the gold is coarser with a typical size of 4 mesh (0.64 cm) and nuggets up to 1 oz. The fineness of the right limit gold is 850.

Kirkman, a tributary of Yukon

115O/03 2018: 63°00'35"N, 139°19'26"W

Fellhawk Enterprises Ltd., 1990–1992, 1998–1999, 2003–2010, 2013–2020

Water License: PM19-033 (Active 12/2029)
Water License: PM09-630-1 (Expired 12/2019)
Active Producer (2018–2020) **Operation no. 122**

Location Kirkman Creek, at the mouth of Discovery Pup.

Work History and Mining Cuts Fellhawk Enterprises Ltd. has spent the last several seasons winding down their operations on Kirkman Creek. It is a drainage that they have been active in for three decades and in most recent years, mining as a two generation operation. From 2018 to 2020, a crew of six to nine people were present at the operation, and conducted a daily twelve-hour shift. In 2018, activity was focused on the far right limit upstream from the mouth of Discovery Pup where they mined a cut 76 by 366 m (250 × 1200 ft). A cut 61 by 305 m (200 × 1000 ft) was mined in 2019 and a cut 61 by 244 m (200 × 800 ft) was mined in 2020. Reclamation was conducted in 2019 at the mouth of Discovery Creek.

Equipment and Water Treatment Equipment present on site included a John Deere 450D excavator, an Hitachi Zaxis 330, an Hitachi Zaxis 450 excavator, Caterpillar D8L, D9L and D7 bulldozers and two Caterpillar D300E rock trucks. The wash plant consisted of a trailer mounted screen deck with a 2.4 by 3.0 m (8 × 10 ft) hopper and a 9.1 (30 ft) tailings stacker. The initial 1.2 by 1.8 m (4 × 6 ft) long sluice run consisted of expanded metal and angle iron, and fed two 1.2 by 3.6 m (4 × 12 ft) runs with a mix of expanded metal and angle iron. All sluice runs were lined with nomad matting with a nugget trap at the bottom. Water was 100% recirculated. The clean-up process started with a jig, then a small trommel, into two centrifugal wheels and completed on a long tom. A rod mill was used to pulverize the brittle heavies and separate them from the fines.

Surficial Geology and Stratigraphy The stratigraphy of the valley bottom cut near Discovery Pup consisted of 2 m (7 ft) of organic silt overlying



Fellhawk Enterprises Ltd. has been mining on Kirkman Creek for three decades. This is a photo from 2017 when they were active at the mouth of Discovery Pup.

2.4 m (8 ft) of Kirkman Creek gravel. All of the silt and approximately 1.8 m (6 ft) of gravel is stripped. The sluice section consists of 0.7 m (2.3 ft) of lower Kirkman Creek gravel and 1.4 m (4.6 ft) of weathered bedrock. The sluice gravel is poorly sorted, matrix-supported with 50% clasts (10% boulders, 40% cobbles and 50% pebbles) and 50% medium to coarse sand matrix. Boulders within the Kirkman Creek gravel are slabby and up to 80 cm (2.6 ft) in length. The disorganized structure of the pay gravel and high matrix content suggest it was deposited in a high energy, hyperconcentrated flood flow environment. The pay streak in the valley is characterized as wandering. Material sluiced was 1.2 m (4 ft) of gravel and 1.2 (4 ft) of bedrock.

Bedrock Geology Bedrock is moderately oxidized quartz-mica schist and blocky quartzite.

Gold Characteristics Gold is mostly coarse (largest nugget was 1 ounce) and has rounded to rough or pristine edges. The gold grain classification is 60% <10 mesh and 40% >10 mesh. Gold from the bench is polished and round. The fineness is 865.

Ballarat, a tributary of Yukon

115J/14 2020: 62°56'40"N, 139°00'26"W

Weber, B., 2008–2020

Water License: PM11-055 (Active 09/2022)
Active Producer (2018–2020) **Operation no. 123**

Location Ballarat Creek, approximately 8 km upstream from its confluence with Yukon River.

Work History and Mining Cuts Mr. Weber, mining as a one-person operation, focused his activity on the right limit of Ballarat Creek from 2018 to 2020. Cut locations have all been approximately 7 to 8 km up the drainage from its confluence with the Yukon River. In 2020, a cut slightly upstream from an unnamed right limit tributary was mined and pay was hauled to the plant located downstream in a previously mined cut.

Equipment and Water Treatment During a fly-over in 2020, equipment present in the cut included a John Deere 330LC excavator, an Hitachi EX200LC excavator, a rock truck, a bulldozer and an oscillating screen deck. As a recirculating system, water was acquired from an out-of-stream pond, with make-up water received from Ballarat Creek.



Aerial view in 2020 of Mr. Weber's operation on mid-Ballarat Creek. The view is looking upstream the drainage, northwest towards Thistle Mountain.

Surficial Geology and Stratigraphy Not reported.

Bedrock Geology Bedrock is mapped as quartzite, psammite, pelite and marble (Ryan et *al.*, 2013).

Gold Characteristics Not reported.

Scroggie, a tributary of Stewart

115O/02 2019: 63°06'13"N, 138°36'28"W

True North Gold Ltd., 2015–2019

Water License: PM16-006 (Active 08/2026)
Active Producer (2018–2019) **Operation no. 124**

Location Scroggie Creek, 2.4 km from its confluence with Walhalla Creek.

Work History and Mining Cuts Between 2018 and 2019 True North Gold Ltd. progressively mined upstream and primarily focused on the left limit of the drainage. Operating with a crew of up to five people, they conducted a daily twelve-hour shift. In 2018, a cut 55 by 142 m (180 × 466 ft) was mined and a total of 650 hours were spent sluicing. A large stripping program occurred in spring 2019, upstream of the previous years' cut and an area of 80 by 176 m (262 × 577 ft) was prepared for sluicing. Throughout the season a cut 102 by 107 m (335 × 351 ft) was sluiced. No activity occurred in 2020.

Equipment and Water Treatment Equipment present at the operation included a Caterpillar 330D excavator for stripping and stockpiling pay, a Kobelco SK250LC excavator for feeding the wash plant, a Caterpillar D6 bulldozer for stripping, a Caterpillar 9L bulldozer for stripping and pushing pay, and a Caterpillar 980G wheel loader for moving tailings. An oscillating double screen deck, screening to ½" and 1¼" was utilized to process material at a rate of 140 yd³ (107 m³)/hr. It is a 1.5 by 4.3 m (5 × 14 ft) Allis Chalmers screen deck with initial 2 m (7 ft) wide by 0.9 m (3 ft) long sluice run, fed into four 0.3 m (1 ft) sluice runs each 3.7 m (12 ft) long and configured with angle iron. In 2019, a feeder was added that increased the overall efficiency of the plant enabling a volume similar to that of 2018 to be sluice in 300 less hours. This is a significant saving as the sluicing process consumes about 110 litres of fuel per hour. A jig was used for clean-ups. Fifty percent of the water is recirculated.

Surficial Geology and Stratigraphy Lower Scroggie Creek is a narrow valley containing coarse, high-energy gravel deposits. A left limit bench is present in the lower part of the valley, which was tested in late 2018. Overburden (loess) varies in thickness from 1.5 to 3.7 m (5–12 ft) and is often frozen requiring substantial thawing time prior to stripping. Beneath the overburden the gravel package is up to 2.2 m (7.2 ft) thick and contains a mixing zone of weathered bedrock and coarse, high energy Scroggie Creek gravel. As a function of the high water velocity during deposition, fragments of the weathered bedrock are reworked into the lower 0.5 m (1.6 ft) of the unit. The gravel is poorly sorted, matrix-rich and contains 10% boulders, 50% cobbles and 40% pebbles. Clasts are subround and have a maximum size up to 1.5 m (5 ft) in diameter. Matrix percentage ranges from 35 to 40% and it increases slightly towards the top of the unit. The gravel fines upward to the contact with the overlying unit. An abundance of heaver minerals are associated with the main pay channel on Scroggie Creek, including coarse magnetite, and were used as an indicator to direct the progression of mining upstream.

The lowermost 0.6 m (2 ft) of unit 1 and up to 0.6 m (2 ft) of bedrock was sluiced in 2019. In the previous season the operator was sluicing a thicker section, but noticed that pay dilution was occurring so therefore narrowed the sluice section.

Bedrock Geology Bedrock on the left limit is weathered granodiorite with large quartz inclusions, and on the right limit, it is graphitic schist. Undulations up to 0.5 m (1.6 ft) are present in the bedrock surface.



View looking down Scroggie Creek towards the Walhalla Creek confluence with True North Gold Ltd.'s operation in 2018. The screen deck is situated behind the excavator perched on the ramp, at the south end of the cut. Activity in 2018 and 2019 was predominately on the left limit.



True North Gold Ltd.'s operation in 2019 on lower Scroggie Creek. The view is looking downstream.

Gold Characteristics Both coarse and fine gold is recovered, and all is described as smooth. The fineness is 900.

Scroggie, a tributary of Walhalla

115O/02 2018: 63°03'42"N, 138°37'18"W

Bidrman, Z., 1989–2020

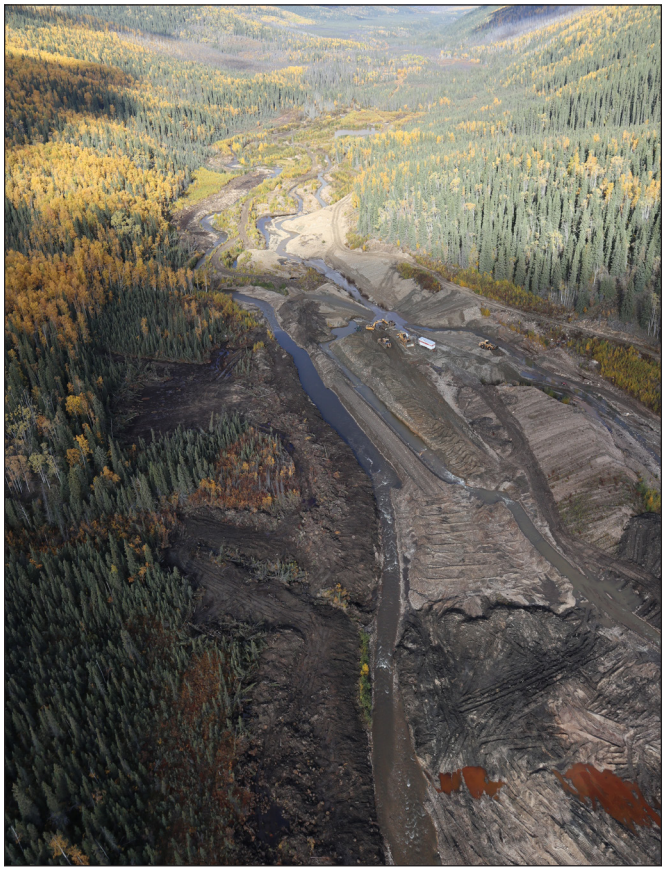
Water License: PM14-038 (Active 04/2025)
Active Producer (2018–2020) **Operation no. 125**

Location Scroggie Creek, 7 km upstream from its confluence with Walhalla Creek.

Work History and Mining Cuts Mr. Bidrman relocated from upper Mariposa Creek (a right limit tributary to upper Scroggie) in early 2018, back to the main stem of Scroggie Creek. As a two-person operation, they prepared a 46 by 130 m (151 × 427 ft) cut and spent 150 hours sluicing. No specific information is known for 2019 or 2020.

Equipment and Water Treatment In 2018 the equipment utilized included a Komatsu 400 excavator and Komatsu 375A bulldozer to strip and excavate pay, a John Deere 330LC excavator to feed the wash plant and a Komatsu WA500 wheel loader to remove tailings. The wash plant consisted of a single screen deck with 1" bars and a 1.2 by 4.9 m (4 × 16 ft) sluice run with punch plate and hydraulic riffles. A 10" pump supplied water to process up to 180 yd^3 (138 m^3)/hr.

Surficial Geology and Stratigraphy The 2018 mining location was reportedly the site of considerable historic workings. The stratigraphic section on the left limit consisted of two units with a minimum thickness of 4.6 m (15 ft). Unit 1 was partially exposed so the true thickness of the section was unknown. Unit 1, approximately 1.8 m (6 ft) thick consists of a coarser gravel with minor boulders that fines upward into sand and pebbly sands near the upper contact. Unit 2, from 1.8 to 4.6 (6–15 ft) consists of interbedded organics and sand.



Scroggie Creek in 2018 where Mr. Bidrman was active. The view is looking downstream towards the confluence with Walhalla Creek valley.

Bedrock Geology Bedrock is mapped as foliated biotite-hornblende granodiorite (Ryan et *al.*, 2013).

Gold Characteristics Gold from the 2018 Scroggie Creek cut contained no nuggets. Gold from Mariposa Creek was very jagged and fineness was 900.

Scroggie, a tributary of Walhalla

115J/15 2020: 62°58'52"N, 138°32'42"W

Aquila Mining and Exploration, 2017–2020

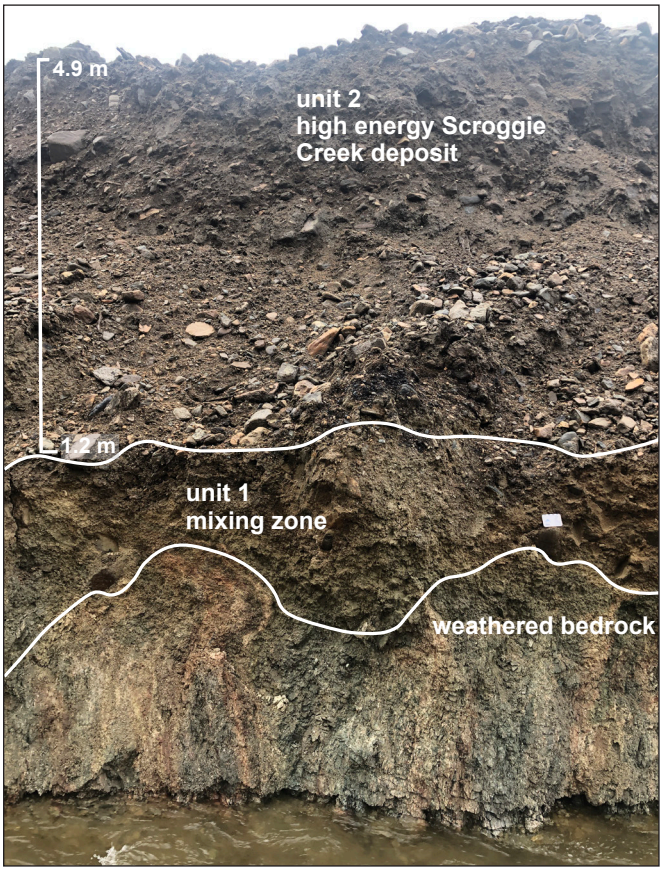
Water License: PM14-038 (Active 04/2025)
Active Producer (2018–2020) **Operation no. 126**

Location Scroggie Creek, 18 km from its confluence with Walhalla Creek.

Work History and Mining Cuts A lease agreement was established between Aquila Mining and Mr. Bidrman in 2017. In 2018 they operated two shifts per day with a crew of six people. No specific work history is known for 2019. In 2020, Aquila Mining was active as a four-person operation. They worked a 76 by 85 m (250 × 280 ft) cut located 1.3 km upstream from Mariposa Creek confluence.

Equipment and Water Treatment Equipment utilized in 2020 included a Volvo 460B excavator, an Hitachi 330 excavator, a Komatsu D375A bulldozer and a Caterpillar D9G bulldozer. A double screen deck, with a 1¾" top deck and 9⁄16" bottom deck was utilized to process material at a rate between 150 and 180 yd^3 (114–137 m^3)/hr. Double runs on either side of the deck were each 0.9 by 3.7 m (5 × 12 ft). The main run consisted of hydraulic riffles to process concentrate from the top deck. The other run had Hungarian riffles and expanded metal to process concentrate from the bottom deck. A 10" John Deere 6090 pioneer pump supplied water to the plant. Clean-ups were conducted using a jig.

Surficial Geology and Stratigraphy The section exposed in 2018 consisted of three units. Unit 1, from 0 to 1 m (0–3 ft) is a poorly sorted, sand-rich gravel that exhibits the effects of cryoturbation near the upper contact. The cryoturbation is displayed by vertically-



Left limit exposure of the cut from the 2020 mining season. The solid white line represents the contact between the weathered bedrock, unit 1 and unit 2.

oriented clasts that represent intense freezing and thawing periods typical during glacial climates. Also known as periglacial gravel, these deposits can have a cohesive upper contact and often will be positioned near bedrock. Unit 2, from 1 to 3.5 m (3–11.5 ft) is a stratified pebbly sand with coarse gravel beds. Wood is present in the upper half of the unit and manganese-stained beds are common in high porosity lenses. Unit 3, from 3.5 to 4 m (11.5–13 ft) is an overbank silt and sand with variable thickness.

The cut in 2020 consisted of two units. An undulating but abrupt contact is present between the weathered bedrock surface and unit 1. Unit 1, from 0 to 1.2 m (4 ft) is a mixing zone of weathered bedrock and fluvial sediment with a high matrix content. Matrix consisted of medium to fine sand with minor silt. Clasts were subround and the size distribution is 40% cobbles and 60% pebbles. Unit 2, from 1.2 to 4.9 m (4–16 ft) is a poorly sorted, cobble-pebble gravel with mottled oxidation. It is matrix-supported with a varying matrix percent ranging from 30 to 40% and consisting of fine to medium sand with minor silt. Wood debris is common throughout unit 2. Up to 0.9 m (3 ft) of gravel and 0.9 m (3 ft) of bedrock was sluiced.

A low-level bench on the left limit of upper Scroggie Creek is present near the operator's mining location in 2020. It has been dissected and reworked by small left limit tributaries, in that particular location. Due to the overburden thickness and the minor elevation difference between the modern valley bottom and the bench, its surface expression is faintly visible. Exploration is warranted to determine the lateral extent of the bench and how far pay gravel may or may not be present on the bench surface.

Bedrock Geology Bedrock is weathered mafic orthogneiss.

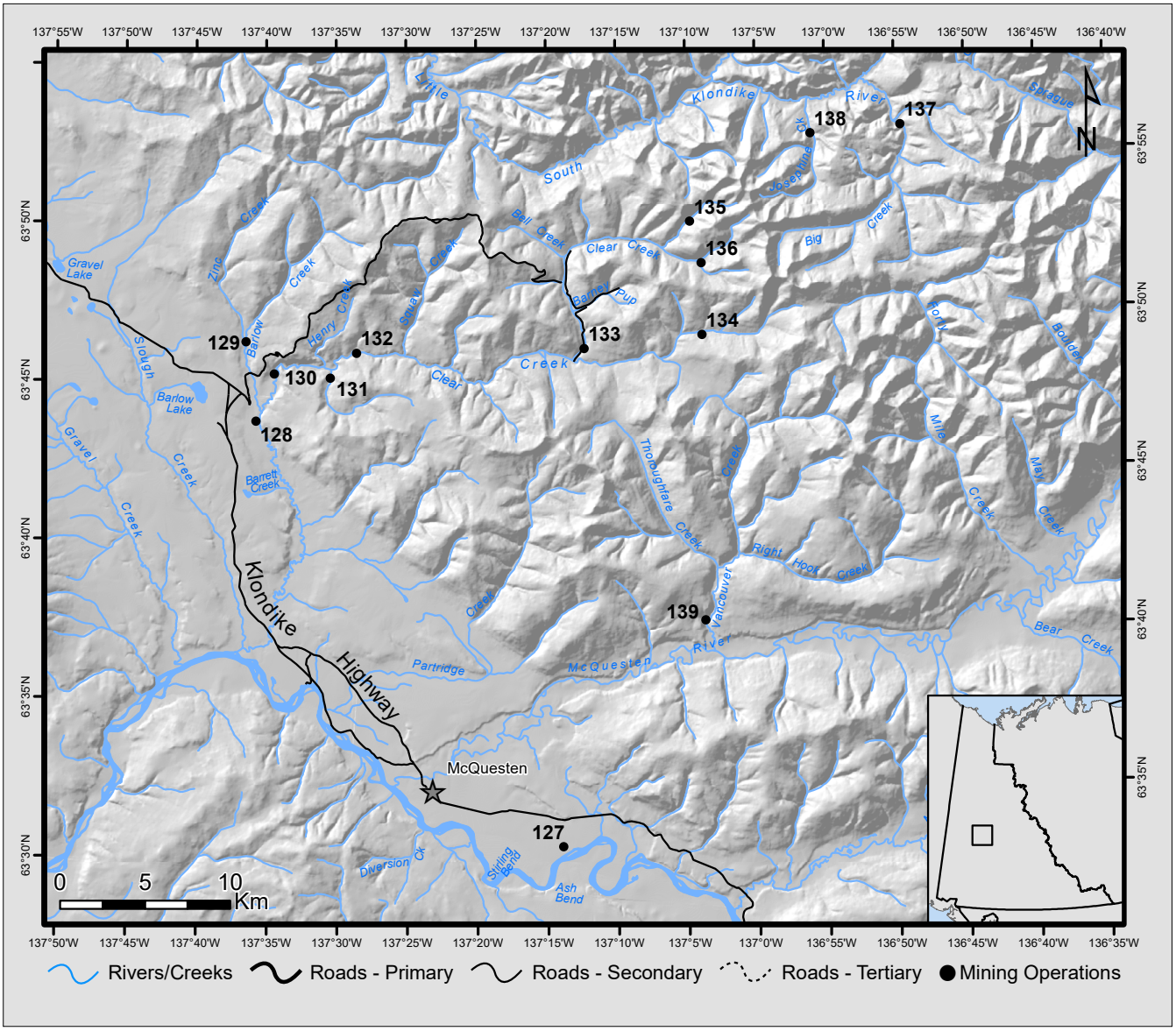
Gold Characteristics Gold is 25% coarse (pinky sized) and the fineness is 900.



View is looking upstream towards Aquila Mining's operation in 2020. They have stripped an area 500 m past their present location and will be progressively mining upstream in 2021.

CLEAR CREEK–MCQUESTEN
PLACER AREA

SITES 127–139



LEGEND

127. Stirling, B.
128. Wolf Head Discovery and Mining LLC
129. Moonlight Mining Ltd.
130. Wasylenko, W.
131. Hollingsworth, M.
132. Kowalski Trucking Ltd.
133. Scott and Son Mining
134. Phillips, P.
135. Coe, R.
136. Blackstone Placer Mining Ltd.
137. Schmidt Mining and Yukon Exploration Green Gold Inc.
138. Schmidt Mining and Nevada Zinc Corp.
139. 44830 Yukon Inc.

Stewart, a tributary of Yukon

115P/12 2018: 63°31'34"N, 137°14'20"W

Stirling, R., 2015–2020

Class 3: LP01135 (Active 11/2026)
Active Explorer (2018–2020) **Operation no. 127**

Location Stewart River bars at McQuesten airstrip and New Crossing in Tintina Trench.

Work History and Mining Cuts Prospecting on the New Crossing property continued from 2018 to 2020. Work focused on trenching and sampling to identify anomalous quantities of flood gold. A typical trench measured 1.2 m (4 ft) wide, 35 m (115 ft) long and 0.9 m (3 ft) deep. Approximately 25 to 40 samples were collected from each trench. Reclamation was completed by backfilling the trenches and returning the organic mat to the top of the section. Work was conducted between late May and early September.

Equipment and Water Treatment Test pits were completed using a Kubota KX41 excavator. Hand samples were uniformly collected using a 5.5 by 9" bread pan that holds 94 in^3. According to Mr. Stirling, there are 500 bread pans per 1 in place cubic yard. The bread pan samples are processed using a gold pan.

Surficial Geology and Stratigraphy Near surface placer gold deposits have been known on the Stewart River bars since their discovery in 1883. High grade, discontinuous fine gold deposits develop where hydraulic traps occur on river meanders. These deposits are also called skim bar deposits and can be quite rich.

Bedrock Geology Bedrock does not outcrop in the vicinity of the claims although it is mapped as mid-Cretaceous porphyritic rocks (Ryan *et al.*, 2010).

Gold Characteristics Placer gold is very fine whereby it is estimated that 500,000 colours are needed to equal 1 ounce. A good pan will contain between 500 and 3000 colours.



R. Stirling explaining how to systematically sample for fine gold placer deposits on his Stewart River project.



Exploration trenches are backfilled and leveled allowing for rapid revegetation on R. Stirling's Stewart River project.

Clear, a tributary of Stewart

115P/12 2020: 63°44'13"N, 137°38'34"W
115P/12 2019: 63°44'30"N, 137°39'20"W

Wolf Head Discovery and Mining LLC, 2014–2020

Water License: PM14-009-1 (Active 05/2024)
Active Explorer (2018–2020) **Operation no. 128**

Location Clear Creek, right limit bench (Big Alex bench) and valley bottom.

Work History and Mining Cuts From 2018 to 2020 Wolf Head Discovery and Mining conducted exploration on the right limit bench and mining in the valley bottom adjacent to Clear Creek. Exploration work on the Big Alex bench consisted of auger drilling, test pitting and bulk sampling. This work focused on bench rim deposits located adjacent to camp and the access road to the lower mine site near Clear Creek. Additional staking was completed in 2020 on the left limit of Clear Creek. Also in 2020, auger drilling was completed in the valley bottom in advance of mining. Mining activities focused on floodplain deposits on the right limit of Clear Creek and progressively advanced in the down-valley direction. A typical cut size in the valley bottom in 2018 and 2020 measured 128 by 155 m (420 × 508 ft). Thirteen people were employed at the mine.

Equipment and Water Treatment Equipment utilized while bulk testing the bench in 2018 consisted of a Caterpillar D10N bulldozer pushing pay to the plant, a Caterpillar 385C excavator feeding the plant and a Johne Deere 844K loader managing tailings. The plant consisted of a Tyler 1100 T-class screen deck, fitted with a ¼" bottom screen, feeding 3 sluice runs on each side of the plant. Each sluice run measured 2.4 by 3.6 m (8 × 12 ft) and contain hydraulic riffles and expanded metal. This plant was designed to process 400 yd^3 (306 m^3)/hr. In 2018, the mine cut in the valley used a smaller screen deck plant capable of processing 80 yd^3 (61 m^3)/hr. Additional equipment on site in 2018 included a second Caterpillar D10N bulldozer, a Caterpillar 980G loader and a Caterpillar 350 excavator. A plant was fabricated on site in 2019 and utilized in the valley bottom during the 2020 mining season. This new

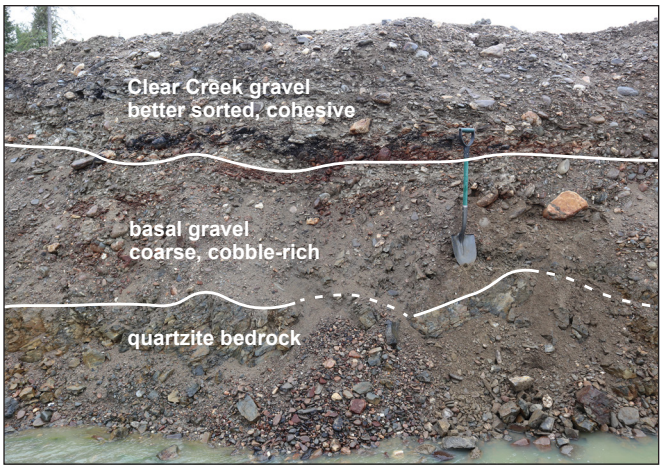


Wolf Head Discovery and Mining processing material on their Clear Creek property in 2020. Later in the season, an Elrus feeder-conveyor system was added to this setup, which boosted production.

screen deck plant was fitted with two sluice runs, each measuring 1.5 by 3 m (5 × 10 ft) and supported with a 1.2 by 2.4 m (4 × 8 ft) Elrus feeder-conveyor. The plant processed 120 yd^3 (92 m^3)/hr.

Surficial Geology and Stratigraphy The stratigraphy of the Clear Creek floodplain deposits has remained relatively consistent. In the area being mined, Clear Creek is located very close to the far left limit of the valley bottom and bedrock outcrops a short distance from the creek. Mining has occurred on the right limit adjacent to the creek, but is technically still closer to the left limit of the valley. Bedrock is accessible at a relatively shallow depth when mining near to the creek. As mining progresses away from the creek, the bedrock surface drops and the pay gravel remains perched on a false bedrock of sand. Tracking pay gravel off the bedrock surface and onto an undulating false bedrock surface can be challenging. Two gravel units are generally identified in the stratigraphy. The basal gravel (unit 1) is a coarse, consolidated, cobble-rich gravel containing some quartz boulders. This unit is up to 1.8 m (6 ft) thick and it is considered the target pay gravel. Overlying unit 1 is the modern Clear Creek gravel (unit 2), which is less cohesive and displays better sorting than unit 1. Unit 2 is up to 3 m (10 ft) thick. Finally, the gravel units are overlain by floodplain silts and organics that are up to 1 m (3 ft) thick. Permafrost distribution is controlled by proximity to Clear Creek. As mining progresses downstream, and farther from the active Clear Creek floodplain, permafrost will be more widespread.

The geology and distribution of placer gold within the bench deposit is not as well understood. The Big Alex bench formed when glacial outwash flowed out of Clear Creek valley and into Tintina Trench during an early Pleistocene glaciation. The outwash gravel eroded into pre-existing glacial sediments that filled the Tintina Trench. Since that time, Clear Creek has down-cut into the Tintina Trench sediments leaving a portion of the outwash gravel preserved at surface on the bench. The thickness of the surface outwash gravel on the bench is approximately 9 m (30 ft). Exploration and bulk testing of the outwash gravel indicates that gold is widespread in the gravel, however is not economic throughout. Detailed testing either by drilling or test pitting is required to pin-point beds that contain higher grades. The spatial extent of these beds has not been well-constrained and presents a challenge. However, the outwash gravel is extensive, free of permafrost, and presents a potentially large gold resource, which makes it an attractive target.



Section exposed in 2020 at Wolf Head Discovery and Mining LLC. This is the consistent stratigraphy of Clear Creek valley bottom. Shovel for scale is 1 m (3.3 ft).

Bedrock Geology Bedrock is blocky quartzite. The bedrock surface can have undulations of up to 1.2 m (4 ft).

Gold Characteristics The gold grains are typically 0.5 to 1 mm (35–18 mesh), can be up to 7 mm long and are very flat.

Barlow, a tributary of Clear

115P/13 2020: 63°46'42"N, 137°39'44"W
115P/13 2019: 63°46'36"N, 137°39'42"W

Moonlight Mining Ltd., 2019–2020
Storm Structures, 2015–2019
Caw Mining and Exploration Ltd., 2008–2014

Water License: PM14-073 (Active 04/2025)
Active Producer (2018–2020) **Operation no. 129**

Location Barlow Creek, 3 km upstream from the mouth.

Work History and Mining Cuts Storm Structures in collaboration with Caw Mining and Exploration Ltd. mined Barlow Creek during the 2018 and 2019 seasons. This included a cut measuring 163 m (550 ft) in width. Previous cuts were up to 244 m (800 ft) wide. Eight crew operated a daily 11-hour shift. Storm Structures agreement with Caw Mining and Exploration Ltd. was not renewed following the 2019 season. Moonlight Mining optioned the ground late in the fall of 2019 and completed 10 days of stripping in preparation for the 2020 season. In 2020, Moonlight Mining began sluicing in the middle of June, employed six personnel

and scaled to a double shift later in the season. They typically processed 850 yd^3 (650 m^3)/12-hr shift. Initial mining cuts started at 182 m (600 ft) in width but were narrowed to 137 m (450 ft) later in the season.

Equipment and Water Treatment Equipment on site in 2019 included a John Deere 450D excavator for digging pay, an Hitachi EX300 excavator, Volvo A35D and Terex TA30 haul trucks, a Volvo L180F loader with a 5 yd^3 bucket for feeding the plant and managing coarse tailings, a John Deere 744H loader, a Caterpillar D8H and a D9 bulldozer and a Champion 760 grader. The wash plant consists of a remote controlled MSI grizzly feeder that delivers pay to a conveyor and hopper. The trommel classifies the pay to ½" and the sluice deck consists of two runs each fitted with a boil box, hydraulic riffles, slick plates and expanded metal with matting. Water was pumped from Barlow Creek and discharged out-of-steam into multiple ponds. Equipment operated by Moonlight Mining in 2020 included an Hitachi 200 excavator, an Hitachi EX300 excavator, an Hitachi Zaxis 470LC excavator, a wheel loader, bulldozer and two Caterpillar D40 haul truck. The wash plant consists of an automatic dumping grizzly-conveyor that feeds a New Zealand-style trommel. Classified material is fed into sluice runs on either side of the trommel, and are configured with angle iron and expanded metal.

Surficial Geology and Stratigraphy The surficial geology of Barlow Creek resembles the geology documented in lower Clear Creek. In most areas, the gold-bearing gravel is situated on a false bedrock of sand. The pay gravel is described as a periglacial gravel that is coarse, contains large rounded quartz boulders (10%), is cohesive or dense, can contain significant silt content near its upper contact, and is often channelized into the underlying sand. The gravel was deposited during a cold period based on the presence of vertically oriented or frost-heaved clasts in the gravel. These climates occur during past glacial periods. During these periods, very little vegetation covers the landscape, which results in rapid run-off during spring melts or during summer storms. This causes more frequent high-energy creek flows and erosion, resulting in reworking of the pre-existing placer gold into this periglacial deposit. These types of deposits have been documented in Mayo (Minto Creek), Carmacks (Seymour Creek) and Kluane (Gladstone Creek). The periglacial pay gravel in Barlow Creek is typically 1.8 to 2.4 m (6–8 ft) thick. In 2020, the pay was better on the right limit of the cut despite more boulders being present on the left limit of the cut. The periglacial pay gravel is overlain by modern, more loosely consolidated, and finer Barlow Creek gravel that is around 2 m (6 ft) thick. The gravel units are overlain by a variable thickness of muck that is anywhere from 1 to 5 m (3–16 ft) in thickness depending how close it is to the hillside.

Bedrock Geology Bedrock is phyllite, shale, sandstone, conglomerate and limestone (Green and Roddick, 1972).

Gold Characteristics Gold recovered is mostly fine and flat and has a purity of 840. In 2019, the purity dropped to 820 and the gold became slightly more angular. Silver comprises the remainder of the precious metal content.



Typical pay gravel on Barlow Creek exposed in 2019. The vertically oriented clasts originate from cold conditions associated with glacial periods. These periglacial gravels often represent the pay unit in gold-bearing drainages.



Moonlight Minings' cut in 2020, at the confluence of Zinc Creek. The view is looking down Barlow Creek.

Clear, a tributary of Stewart

115P/13 2018: 63°45'46"N, 137°37'32"W

Wasylenko, W., 1993–2020

Water License: PM12-078 (Active 05/2023)
Active Producer (2018–2020) **Operation no. 130**

Location Clear Creek, 2.5 km upstream from the mouth of Barlow Creek.

Work History and Mining Cuts Mr. Wasylenko has been mining lower Clear Creek since 1993. Over the past several decades, the ground has been mined by various joint ventures. No specific work history is known from 2018 to 2020, but periodic mining activities are noted.

Equipment and Water Treatment Not reported.

Bedrock Geology Bedrock is mapped as phyllite, shale, sandstone, grit, conglomerate and limestone (Green and Roddick, 1972).

Gold Characteristics Not reported.



Mr. Wasylenko's operation on Clear Creek. (Photo credit: Blake Vandecamp).

Wally, a tributary of Clear

115P/13 2019: 63°45'46"N, 137°33'31"W

Hollingsworth, M., 2014–2020
Wilson, K., 2008–2009, 2011, 2013

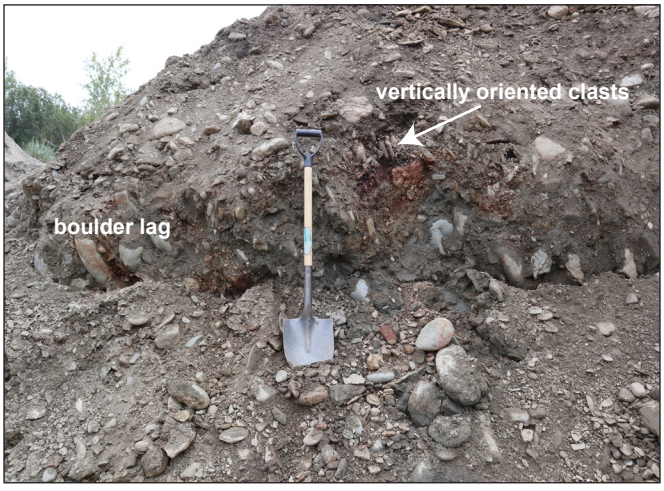
Water License: PM17-074 (Active 05/2028)
Water License: PM07-586-3 (Expired 05/2018)
Active Producer (2018–2020) **Operation no. 131**

Location Wally Creek, 0.5 km upstream from its confluence with Clear Creek.

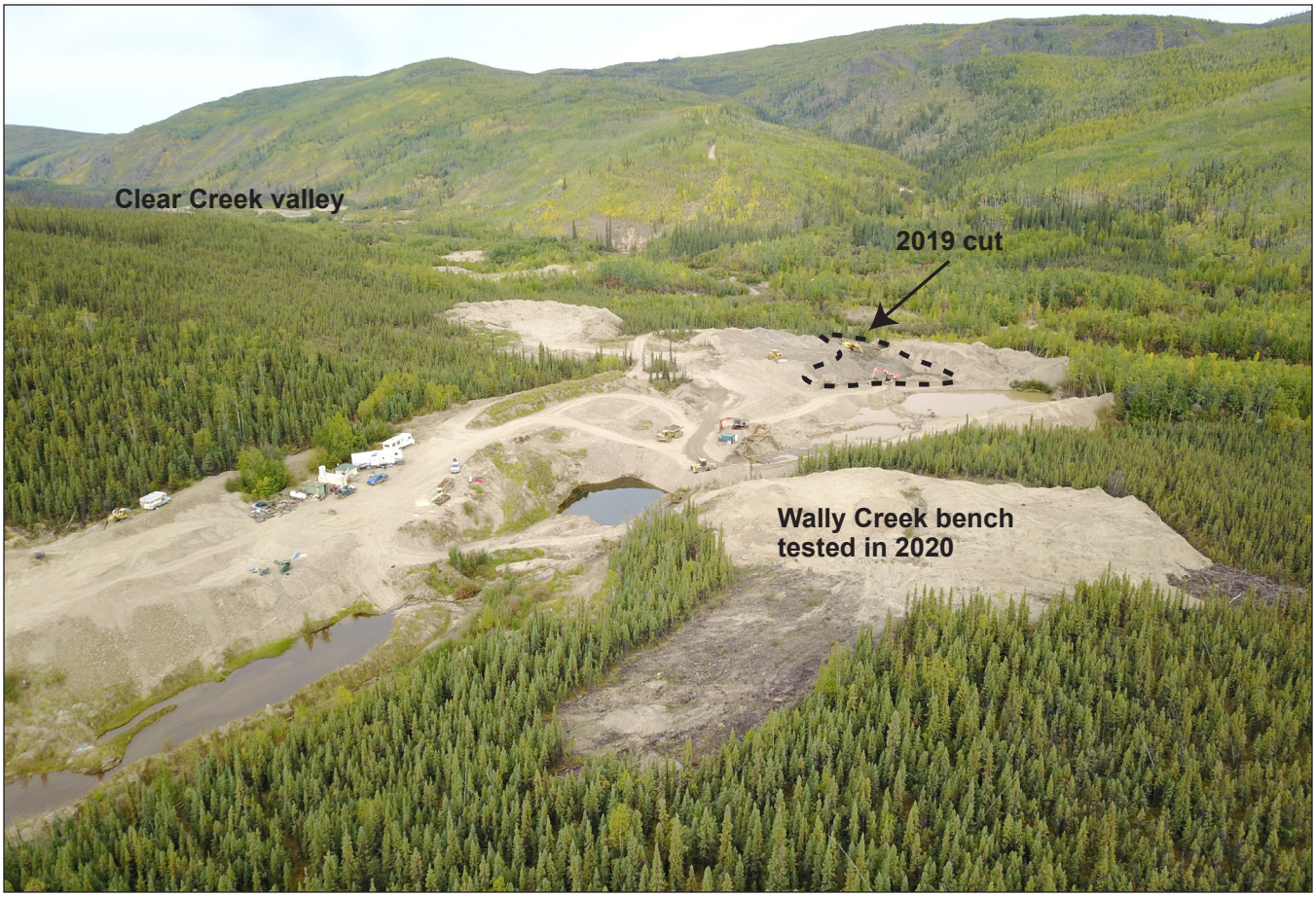
Work History and Mining Cuts Mining was conducted from 2018 to 2020 on two placer settings on lower Wally Creek. In 2018 and 2019, a three-person crew mined the valley bottom at the confluence of Clear Creek. A total of 366 hours was spent sluicing in 2018. A 20 by 20 m (65 × 65 ft) cut was processed and a total of 423 hours was spent sluicing in 2019. Cut locations from 2020 are unknown, but 170 hours were spent sluicing in July and 144 hours were spent sluicing in August.

Equipment and Water Treatment The equipment on site in 2019 included a John Deere 450LC excavator, an Hitachi EX450LC excavator, an Hyundai HL760 loader, a Caterpillar D9L bulldozer and a Caterpillar articulated haul truck. The wash plant consists of a grizzly feeder, a 12 m (40 ft) conveyor feeding a vibrating shaker deck with a 2" screen and a ½" screen. Classified material is fed into an initial single sluice run that splits material into two runs and then into six runs. Angle iron riffles and expanded metal are used in the sluice runs. The plant was able to process up to a maximum of 60 yd^3 (46 m^3)/hr. Water is obtained from Wally Creek and effluent is settled in a series of four ponds before being recirculated.

Surficial Geology and Stratigraphy In 2019, a section at the mouth of Wally Creek consisted of 2.3 m (7.5 ft) of a compact, high energy, coarse, poorly sorted Wally Creek gravel, incised into a low-level Clear Creek terrace. When the length of the cut was observed, clast imbrication was present at the farthest upstream and downstream extent, with the middle gravel section lacking any imbrication. The gravel lacking imbrication consisted of 20% boulders, 50% cobbles and 30% pebbles, and clasts were well-rounded with angular



Section in 2019 exposed at the confluence of Wally and Clear Creek.



The Hollingsworth operation on lower Wally Creek in 2019. The view is looking down Wally Creek at its confluence with Clear Creek. Shovel for scale is 1 m (3.3 ft).

fragments of bedrock incorporated throughout the lower half of the section. A boulder lag is present on bedrock. Due to sloughing, the contact between bedrock and gravel was poorly exposed. In the upper portion of the section, vertically oriented clasts are present. These arrangements can be related to post-depositional cryoturbation or frost heaving. All gravel and up to 0.9 m (3 ft) of bedrock was sluiced.

Bedrock Geology Bedrock is granite and quartz monzonite (Bostock, 1964).

Gold Characteristics Two different populations of gold are recovered from Wally Creek. As they mined upstream, the gold became coarser.

Clear, a tributary of Stewart

115P/13 2019: 63°46'37"N, 137°31'46"W

Kowalski Trucking Ltd., 2015–2020
Kosuta, D., 1995–1996, 2003, 2006, 2008–2013

Water License: PM14-044-1 (Active 05/2025)
Active Producer (2018–2020) **Operation no. 132**

Location Clear Creek, approximately 2.4 km upstream from Henry Creek.

Work History and Mining Cuts Kowalski Trucking Ltd. sluiced from 2018 to 2020, as a two-person operation. In 2018, stripping occurred on the right limit, upstream from the previous years' cut. Mining continued upstream in 2019 and 2020, but no specific work history is known.

Equipment and Water Treatment Equipment documented in 2018 included a small bulldozer, a wheel loader and a screen deck wash plant. Effluent was settled in one large settling pond.

Surficial Geology and Stratigraphy The right limit side pay section consisted of two units. Unit 1, from 0 to 3.2 m (0–10.5 ft), is a clast-supported gravel consisting of 65% clasts and 35% medium to coarse sand matrix. Clast imbrication shows a down valley paleo-flow direction and the clast composition consists of 60% pebbles, 35% cobbles and 5% boulders. The underlying contact with the decomposed quartz monzonite bedrock is wavy. Oxidation and manganese-staining is prevalent in the lower 2 m (6.6 ft) and in the decomposed bedrock. Unit 2, from 3.2 to 5.7 m (10.5–19 ft), is a silty sediment that is possible loess.

Bedrock Geology Bedrock is mapped as brown to pale green shale, quartz-rich sandstone, grit, pebble conglomerate (Green and Roddick, 1972).

Gold Characteristics Not reported.

Clear, a tributary of Stewart

115P/14 2020: 63°47'20"N, 137°15'33"W
115P/14 2018: 63°46'54"N, 137°16'35"W

Scott and Son Mining, 1998–2020

Water License: PM11-037-2 (Active 10/2021)
Active Producer (2018–2020) **Operation no. 133**

Location Left Clear Creek, 1.2 km upstream from Clear Creek.

Work History and Mining Cuts In 2018, Scott and Son Mining operated immediately upstream from camp on Clear Creek, targeting a low, left limit bench. Two miners and one camp cook were employed. In 2020, operations had scaled up, focusing on lower Left Clear Creek. Both areas had not been dredged in the past. A total of 600 to 800 sluicing hours are completed in a season.

Equipment and Water Treatment Equipment utilized in 2020 included a John Deere 400 excavator for digging pay, a John Deere 400D haul truck and a Caterpillar 740 truck for transporting pay, an Hitachi 350 excavator for feeding the plant and a John Deere 450D excavator for managing tailings. Two spare excavators, an Hitachi and a John Deere 450 were also present. An Hyundai 780 loader, a Caterpillar 980 loader and a Caterpillar D10N bulldozer were also present on site. The wash plant consists of a 1.8 by 6 m (6 × 20 ft) double screen deck with 2.5" and ¾" openings. Two oscillating sluice runs each measure 1.5 by 6 m (5 × 20 ft) and contain hydraulic riffles and diamond mesh. The plant is capable of processing up to 180 yd^3 (138 m^3)/hr and uses two 6" pumps for water supply. Effluent is settled out-of-stream.

Surficial Geology and Stratigraphy Previous mining on lower Left Clear Creek was completed by old-timers that hand-mined the center of the channel. At present, mining is targeting the remaining stream



The section exposed at Scott and Son Mining on Left Clear Creek in 2020. Two gravel units are visible in the photograph, a silty and compact lower periglacial gravel and a upper sandy gravel. Both units are process for placer gold. A pick is visible for scale.

gravel on the margins of the valley that were not mined previously. This reach of Left Clear Creek was not dredged due to the gradient of the creek and shallow depth of the deposits. A section measured on the right limit below the main road in the valley consisted of three units. Unit 1, from 0 to 1 m (0–3 ft) is a silt-rich gravel containing vertically oriented clasts at the upper contact. The gravel is matrix-supported and consists of 50% matrix and 50% clasts (50% pebbles, 45% cobbles and 5% boulders). The gravel has a diamict appearance due to the abundance of matrix, which is largely derived from aeolian (wind) inputs that occurred at the time of deposition. The gravel is similar to that observed on lower Clear Creek and Barlow Creek, and represents creek deposition during a cold glacial climate. Unit 2, from 1 to 3 m (3–10 ft) is a moderately sorted, fining upward, imbricated, Left Clear Creek gravel. Unit 2 is in sharp, erosional contact with unit 1. Small boulders and cobbles are typical at the base of the unit whereas the gravel becomes increasingly sandy towards the top. The overall gravel has high-energy characteristics. Unit 3 is a variably thick cover of silt and organics that can be up to 2.5 m (8 ft) thick. All of the gravel is processed for placer gold and the pay is expected to continue under the road.

Bedrock Geology Bedrock is a grey schist bedrock with small oxidized faults crosscutting the valley bottom.

Gold Characteristics Not reported.

Clear, a tributary of Stewart

115P/14 2020: 63°48'03"N, 137°07'12"W

Phillips, P., 2005–2020

Water License: PM13-050 (Active 02/2024)
Active Producer (2018–2020) **Operation no. 134**

Location Clear Creek, 6.4 km downstream from the headwaters.

Work History and Mining Cuts Activity on upper Clear Creek was intermittent during the reporting period. In 2020, a left limit bench deposit was discovered just upstream from camp, which became the focus of mining for the season. A total of four personnel worked a single daily shift.

Equipment and Water Treatment Equipment on site in 2020 included a Komatsu PC400 excavator digging pay and stripping, a Caterpillar D300B and a D400E haul truck for transporting pay, an Hitachi EX300LC excavator, a John Deere 450D excavator, and a Caterpillar 980G loader. The wash plant consists of grizzly hopper and conveyor that feeds a 1.2 m (4 ft) diameter by 9 m (30 ft) long trommel. Two sluice runs measuring 1.8 by 2.7 m (6 × 9 ft) are fitted with boil boxes, expanded metal with matting and flat iron riffles. Waste water is settled out-of-stream in a series of two ponds.

Surficial Geology and Stratigraphy The pay gravel targeted in 2020 is located on a low-level bench on the left limit of Clear Creek. The hillside is marked by a low-angle slope that is underlain by a layer of frozen muck and coarse clast-support gravel. The muck thickness increases into the hillside. The gravel unit was poorly exposed at the time of the visit, but is upwards of 3 m (10 ft) thick and contains 70% clasts and 30% matrix.

Bedrock Geology Bedrock is a dark grey schist with quartz veins.

Gold Characteristics The fineness is 720 and increases to 840 downstream.



A view looking upstream at the Phillips property in 2020 on upper Clear Creek. A left limit bench deposit was discovered that significantly increased the volume of pay gravel in the area.

Lewis, a tributary of Left Clear

115P/14 2020: 63°51'36"N, 137°08'41"W

Coe, R., 2016–2020

Water License: PM19-09 (Active 9/2029)
Active Explorer (2018–2020) **Operation no. 135**

Location Lewis Gulch, 2.5 km upstream from its confluence with Left Clear Creek.

Work History and Mining Cuts Lewis Gulch is a right limit tributary to Left Clear Creek and was staked by R. Coe in 2016. Exploration in 2017 consisted of test pitting approximately 1 km upstream from the mouth. In 2018, the program consisted of bulk sampling at targeted locations where gold was discovered. A total of 85 yd^3 (65 m^3) was processed from two pits. In addition, two trenches were excavated in 2018. The program was co-funded by the Yukon Mineral Exploration Program. The 2019 program included digging four test pits and trenches where no previous data had been collected. In 2020, a trenching program was completed on the right limit of the drainage in partnership with the Yukon Mineral Exploration Program. The trench was excavated to bedrock, although it was not exposed in the trench at the time of the visit. Three personnel worked a single daily shift.



The exploration trench dug in Lewis Gulch in 2020 by R. Coe. Gravel deposits are relatively thin and have high-energy characteristics in the gulch.

Equipment and Water Treatment An excavator was used for trenching although was not present on site at the time of the 2020 visit. Processing of trench and test pit samples was completed using a small high-banker sluice box. Samples are pre-sieved in a pail prior to sluicing.

Surficial Geology and Stratigraphy The 2020 trench exposed approximately 1.8 to 2.4 m (6–8 ft) of gravel in the valley bottom and spanned approximately 75% of the valley bottom width. The depth to bedrock is variable and immediately upstream from the trench bedrock outcrops in the streambed where a resistant bedrock unit crosscuts the valley. Two gravel units are present in the trench including a coarse, siltier, higher energy deposit near the bedrock surface. The true thickness of this unit is uncertain but is estimated to be 0.6 m (2 ft) thick. Boulders are present in unit 1. Overlying unit 1, is a second unit that makes up most of the section (1.5 m) and is described as a moderately sorted, imbricated, cobble-rich gravel. All deposits are unfrozen within the trench.

Bedrock Geology Bedrock is mapped as brown to pale green shale, quartz-rich sandstone, grit, pebble conglomerate (Green and Roddick, 1972).

Gold Characteristics The placer gold is fine and has an angular shape.

Left Clear, a tributary of Clear

115P/14 2019: 63°50'18"N, 137°07'37"W

Blackstone Placer Mining Ltd., 1978–2017

Water License: PM18-063 (Active 05/2029)
Water License: PM08-604 (Expired 05/2019)
Active Producer (2018–2020) **Operation no. 136**

Location Left Clear Creek, 3.7 km downstream from its headwaters.

Work History and Mining Cuts The first season for the Harpers on upper Left Clear Creek was 1978. Since then, they have been actively sluicing on their claims located in the headwaters of the drainage. From 2018 to 2020, activity was largely focused on the left limit. Specific work history is unknown in 2018 and 2019, with 82 hours spent sluicing in 2020.



Drone image from 2019 of Blackstone Placer Mining's operation on Left Clear Creek. The view is looking upstream.

Equipment and Water Treatment Equipment on site in 2019 included a Caterpillar 235 excavator to mine and stockpile pay, a Hough 90E wheel loader to feed the wash plant and remove tailings, and a Caterpillar D8 bulldozer for stripping overburden. The wash plant consisted of a 5 yd^3 wet hopper that has a controlled discharge into a 12 m (40 ft) trommel. The trommel feeds a double screen deck with a 1½" screen over a ¾" screen. The oversize from the ¾" screen empties into a sluice run which is 0.6 m (2 ft) wide by 6 m (20 ft) long and lined with 2" angle iron riffles for the first 0.6 m (2 ft), followed by a nugget trap and expanded metal on Nomad matting. The undersize from the ¾" screen flows into a sluice run that is 1.2 m (4 ft) wide by 6 m (20 ft) long with expanded metal riffles. Water was supplied to the plant using a 10" pump.

Surficial Geology and Stratigraphy The 2017 cut, located on the left limit of Left Clear Creek, consists of two units. Unit 1, from 0 to 1.5 m (0–5 ft), is a highly oxidized, manganese-stained, pebble-cobble gravel with rare boulders. This unit is considered pay. Unit 2, from 1.5 to 2.5 m (5–8.2 ft), is modern Left Clear Creek gravel and consists of a pebble-cobble gravel that is better sorted than the underlying oxidized gravel. Approximately 0.5 m (1.6 ft) of bedrock is also processed for pay.

Bedrock Geology Bedrock is mapped as brown to pale green shale, quartz-rich sandstone, grit, pebble conglomerate (Green and Roddick, 1972).

Gold Characteristics The placer gold is a mixture of fine and coarse gold with some nuggets. The fineness is 820.

Big, a tributary of Little South Klondike

115P/15 2020: 63°55'09"N, 136°54'06"W
115P/15 2019: 63°54'14"N, 136°53'50"W

Schmidt Mining and Yukon Exploration Green Gold Inc., 2015–2020

Water License: PM14-010-3 (Active 07/2024)
Active Producer (2018–2020) **Operation no. 137**

Location Big Creek, 3.8 km upstream from the Hobo Creek confluence.

Work History and Mining Cuts Schmidt Mining continued exploration of their Big Creek property in 2018, which largely consisted of exploration test pitting. In 2019, the operation transitioned to mining and focused on a discovery 2 km downstream from camp. A typical cut size measured 124 by 200 m (407 × 656 ft). In 2020, mining progressively advanced downstream and reached a distance of 4 km from camp at the confluence of a prominent right limit tributary. In addition, a significant exploration drilling campaign was undertaken in 2020 with Northern Sonic. In total, 241 sonic holes were drilled and aimed at tracking the pay streak farther downstream and determining the depth and character of overburden. Exploration holes were also completed near camp and upstream from camp in order to locate additional economic ground in Big Creek.

Equipment and Water Treatment Equipment on site in 2019 included a Caterpillar 374D excavator for digging pay, two Volvo A40E trucks for transporting pay and overburden, a Caterpillar 340 excavator for feeding the plant, a John Deere 450D excavator, and Caterpillar D9L and D10N bulldozers. The large wash plant that operates on the Quartz Creek bench was mobilized to Big Creek in 2019. The plant has a 2.4 m (8 ft) wide trommel with 1.1 m (3.5 ft) wide conveyor for oversize removal. Three 1.2 m (4 ft) wide sluice runs, totaling 7.3 m (24 ft) in length are located on each side of the plant. The wash plant processed gravel at a rate of 200 loose yd^3 (153 m^3)/hr.

Surficial Geology and Stratigraphy The 2 km reach of valley mined in 2019 and 2020 varied in depth from 3.2 to 6.3 m (10.5–20 ft). Typical stratigraphy consists of a weathered silvery phyllite, graphitic schist and shale bedrock overlain by three gravel units. Unit 1 at the base of the section is up to 2.8 m (9 ft) thick and consists of a coarse, moderately sorted, imbricated, weakly stratified, oxidized, cobble gravel with some boulders near the bedrock interface. The gravel composition consists of 50% cobbles, 40% pebbles and 10% boulders (up to 1 m in length). The matrix in unit 1 is variable, but is typically silt-rich near the bedrock contact due to the nature of the soft bedrock. Laterally across the valley floor, the overall coarseness of unit 1 is variable. A high-energy zone is present that is unsorted, highly oxidized, open worked, and contains ripped-up angular bedrock fragments. These zones, or channels, contain the best pay and likely reflect the thalweg (main channel) during the down-cutting event. Unit 2 is a 1 m thick (3 ft) layer of matrix-supported, discontinuous, gravelly silt. The lower contact with unit 1 is gradational, whereas the upper contact is sharp or erosional. The unit contains 50% clasts and 50% sandy silt matrix. Some cobbles and pebbles within unit 2 are vertically-oriented, which indicates the former surface was exposed to intense freezing and thawing, which is consistent with cryoturbation during a glacial climate. The silt would have originated partially from wind-blown sources or loess. Unit 2 is considered the former floodplain paleosol surface associated with the coarse underlying gravel of unit 1. The discontinuous nature of unit 2 is because it is variably eroded by the overlying unit. Unit 3 is a 1.5 m thick (4.5 ft) layer of moderately sorted, imbricated, horizontally-stratified, pebble to cobble-dominated gravel. The gravel composition consists of 80% pebbles and 20% cobbles. Oxidation is variable within the unit. Unit 3 represents the modern gravel associated with Holocene floodplain activity. The sluice section consisted of 1.5 m (5 ft) of the lowermost gravel and 1 m (3 ft) of bedrock.



A view looking down Big Creek at Schmidt Mining's wash plant and cut in 2019. Mining advanced in a downstream direction and sluicing utilized the previous upstream cut for settling. Pay gravel was trucked to the plant.



A typical gravel section on Big Creek at Schmidt Mining's operation. The thickness of gravel has typically not exceeded 6 m (20 ft), however glacial scouring increases downstream from the 2020 cut and is expected to exceed 15 m (50 ft). Two gravel units were generally present in the 2019 and 2020 cuts. A lower, coarse gravel and an upper finer, stratified gravel. Iron oxidation and manganese staining on the gravel and gold is common.

Exploration drilling farther downstream from the prominent right limit tributary, and the area of 2019 mining, indicates that the valley becomes deeper. The left limit remains relatively shallow at around 10 m (35 ft), however the right limit and location of the paystreak increases to 15 m (50 ft). Farther downstream, where the road to Hobo Creek leaves the Big Creek valley, the left limit remains shallow, however a glacial trough is cut into the right limit that exceeds 21 m (70 ft).

Near camp, a glacial overdeepening anomaly was discovered in 2019. The glacially scoured depression in Big Creek valley exceeds 65 m (215 ft) in depth as determined from sonic drilling. Sediment that infilled the depression consisted of 45 m (150 ft) of predominantly glacial lake sediment (silt) that is overlain by 20 m (65 ft) of gravel. The hole was abandoned before reaching the bottom. Glacial overdeepenings have been documented in the Alps and are thought to form in zones of friable bedrock (faults), where the former glacier was able to preferentially focus scouring. The trough has a length of approximately 1.8 km and an average width of 125 m (410 ft). Due to its assumed nature of formation, no gold accumulation is expected at its base.

Bedrock Geology Bedrock is mapped as thin bedded, silty limestone and grey lustrous calcareous phyllite (Murphy and Héon, 1996b).

Gold Characteristics Gold is relatively coarse, has a purity of 80% and is coated in iron-oxide.

Josephine, a tributary of Little South Klondike

115P/15 2020: 63°54'39"N, 137°00'31"W

Schmidt Mining and Nevada Zinc Corp., 2019–2020

Water License: PM18-019 (Active 07/2028)
Active Producer (2019–2020) **Operation no. 138**

Location Josephine Creek, middle reaches.

Work History and Mining Cuts Schmidt Mining Corp. optioned Josephine Creek from Nevada Zinc Corp. and commenced exploration and mining in 2019. In 2020, mining was focused below a prominent, unnamed, left limit tributary 2.7 km upstream from the mouth of the creek, and continued in the downstream direction. Approximately 1.5 km of creek bed was mined during the 2020 season. In addition to mining, a significant sonic drilling exploration program was completed. This included 91 drillholes completed by Northern Sonic that largely focused on mapping the pay streak down to the mouth of the drainage.

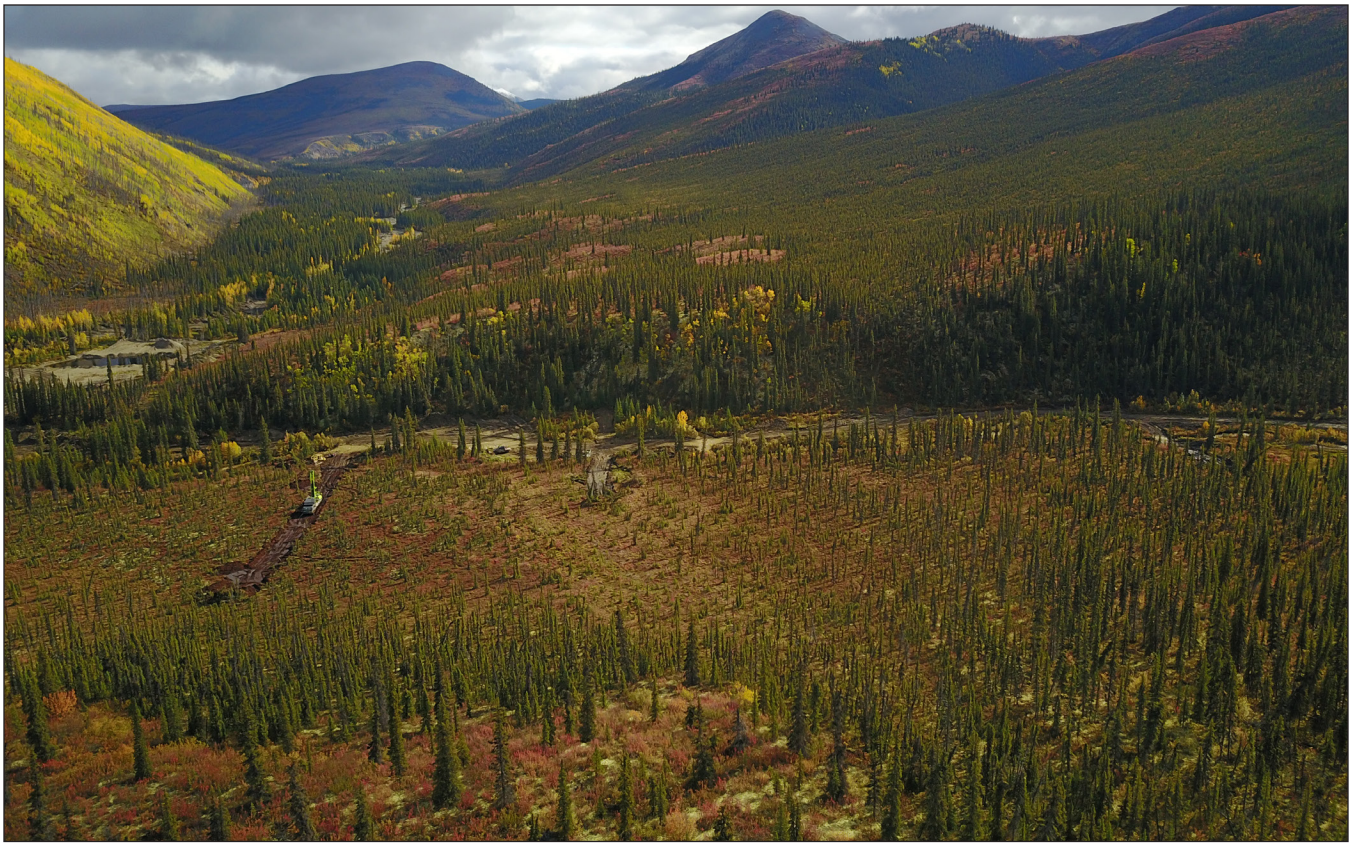
Equipment and Water Treatment Equipment on site included Caterpillar 349E and Caterpillar 374 excavators, and two Volvo A40G rock trucks for stripping and hauling pay. The wash plant consists of a 6 m (20 ft) hopper, 1.5 m (5 ft) diameter trommel with a ¾" screen and a 9 m (30 ft) tailings stacker. The plant is mounted on excavator tracks. Sluice runs on either side of the plant use angle iron riffles, slick plates and expanded metal to concentrate gold. A 10" pump supplies water to the plant and it is capable of processing 80 yd^3 (61 m^3)/hr. Water was settled out-of-stream on the right limit of Josephine Creek. Later in the 2020 season, the large plant on Big Creek was mobilized to Josephine Creek for the remainder of the season.

Surficial Geology and Stratigraphy Deposits mined in the Josephine Creek valley were relatively shallow in the area of mining in 2020. Depths to bedrock ranged from 3 to 6 m (10–20 ft), however increase to 18 m (60 ft) on the left limit of the valley near its mouth. The primary target in 2020 was a thin till layer that contains much of the placer gold (unit 1). In most areas mined, the till is less than 1 m (3 ft) thick and commonly 0.5 m (1.5 ft) thick. It has a grey-green to brown colour that resembles the underlying schist bedrock. A significant amount of local schist bedrock fragments are incorporated into the till. A coarse gravel (unit 2) is in erosional (sharp) contact with the till and variably reworks it. Some of the placer gold is incorporated into the gravel where erosion was sufficiently deep. In most places, the gravel does not erode the till completely and the gravel has a silty sand matrix that likely reflects incorporation of the till matrix. The gravel is approximately 1 m thick (3 ft). Overlying the coarse gravel is a 2 m (6.5 ft) thick layer of oxidized gravel (unit 3). The oxidation is distinctive and likely reflects the sandier texture of the matrix within the gravel. This increases the porosity within the gravel and movement of iron-rich groundwater through the unit. Unit 3 is overlain by 0.5 m (1.5 ft) of overbank silt. Approximately 0.6 m (2 ft) of bedrock and 1 m (3 ft) of till and gravel are processed for placer gold.



A typical section on Josephine Creek in 2020. The cut is 3 m (10 ft) in height and consists of a variably reworked alpine till deposit that is overlain by coarse oxidized gravel. The schist bedrock is visible at the base of the section.

Till deposits in Josephine Creek are associated with local alpine glaciation that originated in cirques at the headwaters and advanced to the mouth of the drainage. The age of glaciation that produced the till deposit in the area of mining is uncertain, however is assumed to be older than the Reid glaciation (120,000 years ago). This is based on the presence of glacial limits farther up the valley that are assumed to represent the McConnell



An aerial view at the mouth of Josephine Creek looking east up Big Creek drainage. Northern Sonic's drilling rig is visible on the left limit of Josephine Creek on the left hand side of the photo. Depths to bedrock near the creek are very shallow (1.5 m) and increase to 18 m (60 ft) near to where the drill rig is located.

and Reid glaciations. Depths to bedrock at the mouth of Josephine Creek increase substantially compared to the rest of the valley. A glacial trough, 18 m (60 ft) deep, is cut on the left limit of the creek near the mouth of the valley and largely filled with till. The right limit at the mouth, where the modern creek is running, is very shallow (1.5 m or 5 ft) and represents valley widening subsequent to the formation of the adjacent glacial trough. The better gold values are located in the deeper ground.

Bedrock Geology Bedrock is mapped as brown to pale green shale, quartz-rich sandstone, grit, and pebble conglomerate (Murphy and Héon, 1996b).

Gold Characteristics Half of the gold nuggets in Josephine Creek are flat, whereas the other half are subangular with body and some have quartz attached.

Vancouver, a tributary of McQuesten

115P/11 2018: 63°39'03"N, 137°05'26"W

44830 Yukon Inc., 2015–2020

Water License: PM15-033-2 (Active 05/2025)
Active Producer (2018–2020) **Operation no. 139**

Location Vancouver Creek, 2.1 km upstream from its confluence with McQuesten River.

Work History and Mining Cuts 44830 Yukon Inc. acquired the claims on Vancouver Creek in fall 2018. The following season they sluiced 10,000 yd^3 (7646 m^3) from mid-valley. A continuation of the cut continued upstream in 2020, and a total of 13,000 yd^3 (994 m^3) was sluiced. Approximately 4000 yd^3 (3058 m^3) of the mined material was repurposed to conduct reclamation. Up to three employees were present each season.

Equipment and Water Treatment Equipment present on site includes a Caterpillar 345 excavator, a Volvo 390 excavator, a John Deere 744E wheel loader

and a Caterpillar D8N bulldozer. The plant is a 1.2 by 2.4 m (4 × 8 ft) screen deck with a ⅜" screen, capable of processing 40 yd³ (31 m³)/hr. Two runs are present on either side of the plant, each 0.9 by 3.0 m (3 × 10 ft) consisting of expanded metal and lined with Nomad matting. A 6" pump was used to deliver water to the plant, and water was 100% recycled. A vortex riffle table was used for clean-ups.

Surficial Geology and Stratigraphy The stratigraphy of Vancouver Creek consists of 0.6 m (2 ft) of overbank silt and sand overlying two gravel units. The lowermost gravel unit is aproximately 6.1 m (20 ft) thick and consists of a periglacial gravel. The unit was poorly exposed due to high water in the cut, however boulders were excavated from the lower contact with bedrock. The upper contact is defined by a silt and gravel-rich layer that was the floodplain surface of Vancouver Creek during the last glacial period. Loess (silt) was added to the floodplain surface and cryoturbated into the gravel making a hardpan layer. The periglacial gravel is overlain by 2.4 m (8 ft) of modern Vancouver Creek gravel. Gold is recovered from both gravel units at their lower contacts.

Bedrock Geology Bedrock is mapped as brown to pale green shale, quartz-rich sandstone, grit, pebble conglomerate (Green and Roddick, 1972).

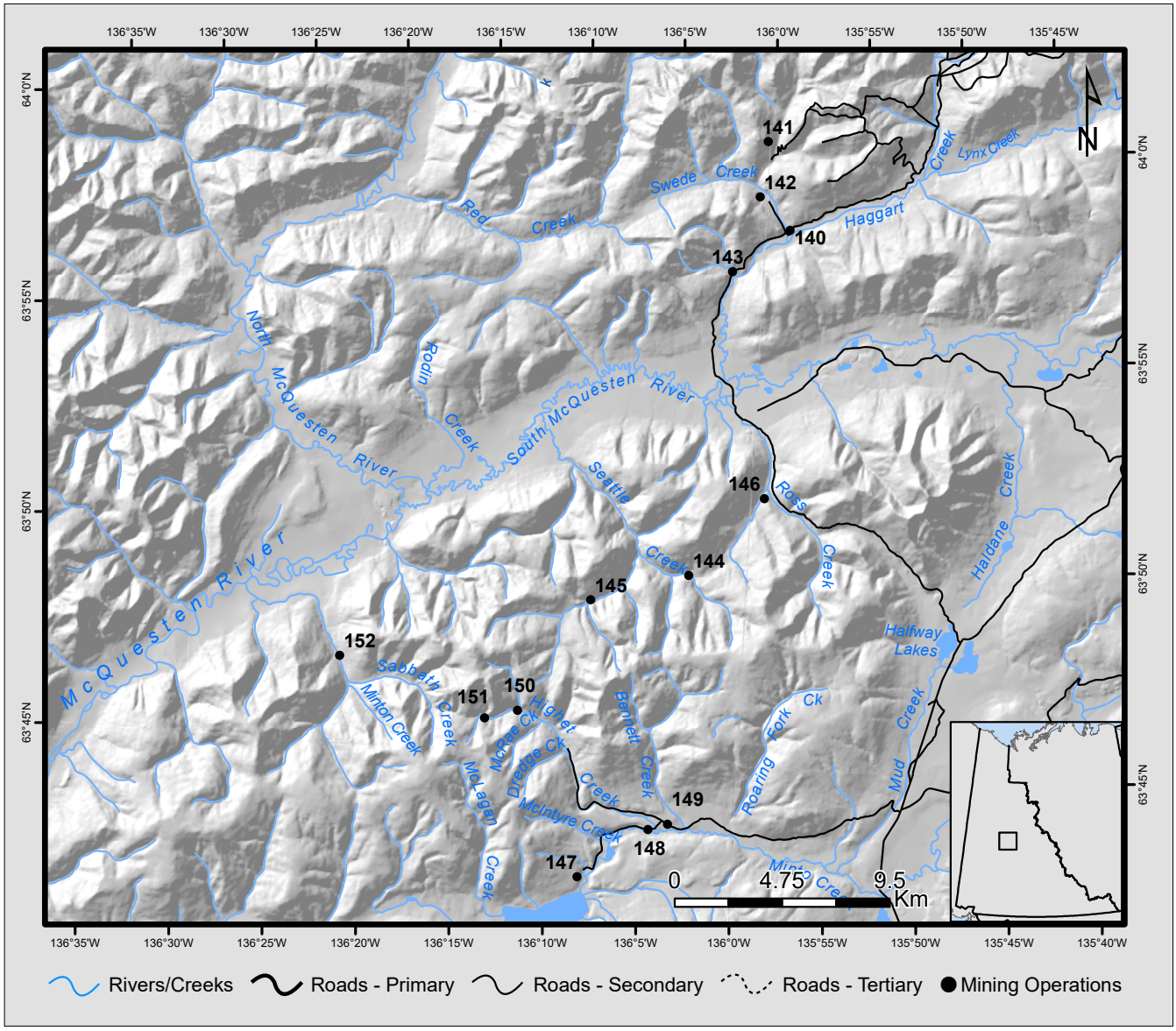
Gold Characteristics Gold is well-travelled, super thin and flat and of 'cornflake' appearance. The fineness is 830.



Well-traveled gold recovered from Vancouver Creek. (Photo credit: Stacey Hassard).

MAYO
PLACER AREA

SITES 140–152



Legend

140. Victoria Gold Corp.
141. Evans, V.
142. Minelli, T.
143. 532 Placer Mining
144. Reno Contracting Ltd.
145. Moman, T.
146. Yukon Mining Ventures Ltd.
147. 535785 Yukon Inc.
148. Jardine, E.
149. Wilson, K.
150. Lone, H. and B.
151. Steppler Mining Co.
152. Barchen, R.

Haggart, a tributary of South McQuesten

105M/13 2020: 63°57'43"N, 135°58'45"W

Victoria Gold Corp., 2017–2020

Water License: PM17-070 (Active 12/2022)
Active Producer (2018–2020) **Operation no. 140**

Location Haggart Creek, upper, and its tributaries of Eagle Creek and Dublin Gulch.

Work History and Mining Cuts For the past three seasons, Victoria Gold Corp. has been conducting exploration on their placer claims situated on upper Haggart Creek, Dublin Gulch, and Eagle Creek. In 2018, they completed sonic drilling in four locations: Haggart Creek, immediately downstream of Platinum Gulch; Haggart Creek, upstream from confluence with Dublin Gulch; on the access road to Rex Peso; and Dublin Gulch, which was a continuation from drilling conducted in 2017. Reverse circulation drilling was undertaken at the mouth of Fisher Gulch in 2019 and 21 holes (623 m; 2045 ft) were completed. Yukon Mineral Exploration Program (YMEP) funding supported their exploration at the mouth of Swede Creek in 2020, where they drilled 17 holes totaling 259 m (850 ft).

Equipment and Water Treatment Not reported.

Surficial Geology and Stratigraphy
Exploration targeted alluvial fans derived from Haggart Creek tributaries to evaluate the placer potential in the area. The alluvial fans accumulated during past periglacial climates. These fans are partially preserved and they have endured some reworking by Haggart Creek. L. Weston (1999) describes the sedimentology and stratigraphy of placer deposits in Haggart Creek, including placer settings associated with alluvial fans. Floodplain deposits buried under alluvial fan accumulations and concentrations associated with fan apex environments are considered relevant. Victoria Gold Corporation completed additional exploration at the mouth of Swede Creek. Here, where they drilled a low-level, right limit bench to determine its general geographic extent.

Bedrock Geology Bedrock is mapped as brown to pale green shale, quartz-rich sandstone, grit and pebble conglomerate (Green and Roddick, 1972).

Gold Characteristics Gold recovered from the drillholes was up to 50 mg in weight. Abundant of scheelite and pyrite was observed.

Secret, a tributary of Haggart

105M/13 2019: 63°59'48"N, 136°00'11"W

Evans, V., 2005–2020

Water License: PM11-052 (Active 04/2022)
Water License: PM12-068 (Active 06/2023)
Active Producer (2018–2020) **Operation no. 141**

Location Secret Creek is the largest left limit tributary of Swede Creek, a right limit tributary of Haggart Creek. The mining location in 2019 was 2.2 km upstream from the confluence of Secret and Swede creeks.

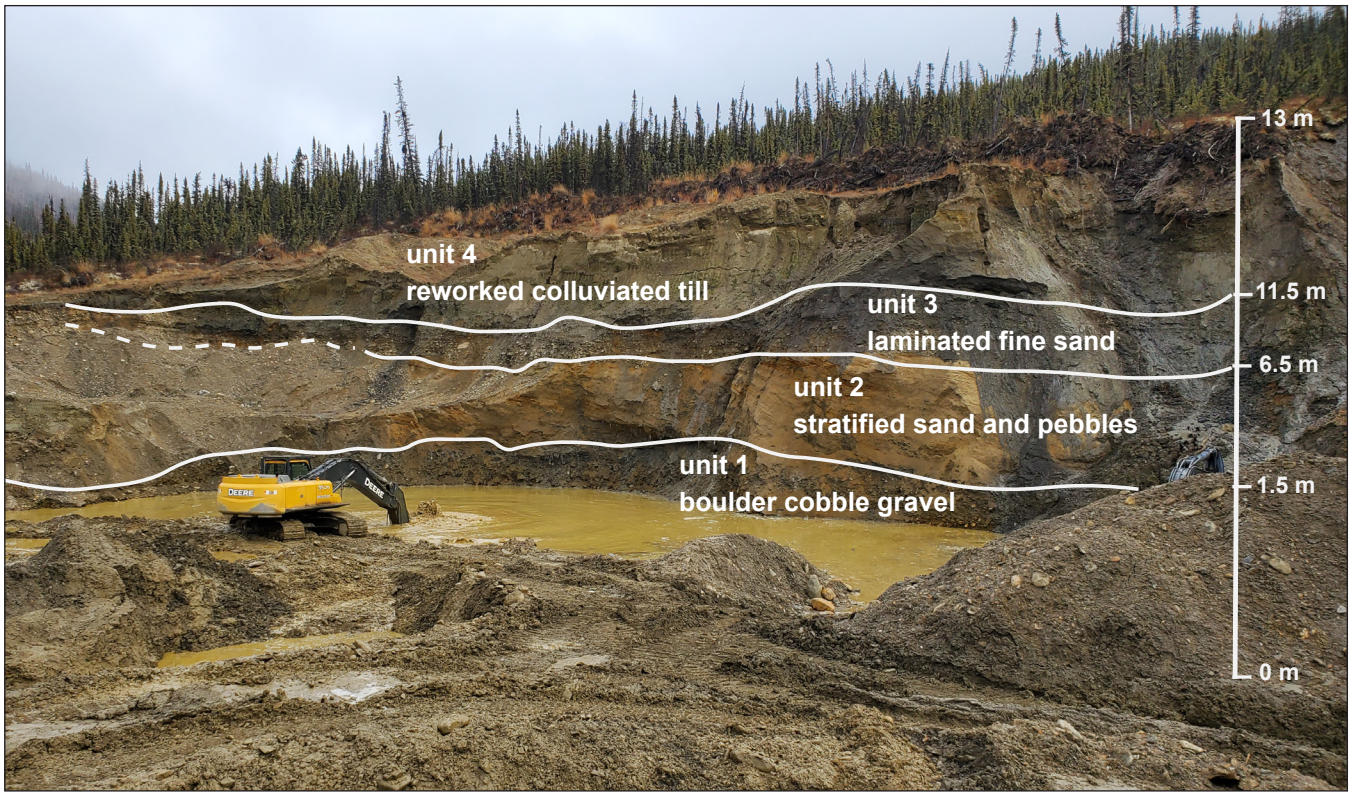
Work History and Mining Cuts Secret Creek has been tested and mined for the past fifteen years by Mr. Evans, operating under Enviro-Gold Investments Ltd. Activity from 2018 to 2020 remained consistent and between two and five people have worked the operation. Mining has focused on the left limit below the forks of Secret Creek.

Equipment and Water Treatment Equipment on site includes a John Deere 350D excavator, Caterpillar 330 excavator and a Hy-hoe excavator. The wash plant consists of a trommel connected to a single sluice run.

Surficial Geology and Stratigraphy Although poorly exposed in 2019, the base of the left limit cut consists of a boulder-rich gravel approximately 1.5 m (5 ft) thick (unit 1). Unit 2, from 1.5 to 6.5 m (5–21 ft), is a sequence of stratified sand and pebbles that coarsens upward into cobble-pebble gravel. Unit 3, from 6.5 to 11.5 m (21–37 ft), is a massive to crudely laminated fine sand that resembles deposition in a lacustrine (lake) environment. Organic material is also present. Unit 4, from 11.5 to 13 m (37–43 ft), is a stratified, matrix-supported, colluviated till. Immediately downstream of the thick Quaternary sequence is a gravel terrace. It is unclear whether the gravel terrace is inset into the previously described sequence or is part of the lowermost gravel. The terrace sediment consists of 5.8 m (19 ft) of gravel and 1 m (3 ft) of overbank flood silts. The lower 2.8 m of the gravel section is coarser, more poorly sorted and siltier compared to the upper 3 m (10 ft).

Bedrock Geology Bedrock is mapped as brown to pale green shale, quartz-rich sandstone, grit and pebble conglomerate (Green and Roddick, 1972).

Gold Characteristics Gold recovered is of various shapes and sizes, 95% fine and 5% coarse with a fineness of 899 to 902.



Cut on the left limit of Secret Creek in 2019. Scale on the right hand side is approximate. (Photo credit: Scott King).

Swede, a tributary of Haggart

115P/09 2020: 63°58'29"N, 136°00'28"W

Minelli, T., 2020
Plut, F., 2005–2016

Water License: PM15-038-1 (Active 08/2025)
Active Producer (2020) **Operation no. 142**

Location Swede Creek, a left limit tributary of Haggart Creek; 2.4 km upstream from its confluence with Haggart Creek.

Work History and Mining Cuts Mr. Plut's cheerful presence is missed on the creek, as he passed away in March 2020. As an avid outdoor enthusiast and miner, he is fondly remembered as a true pioneer in the Canadian jade mining industry and for his 20 plus years spent placer mining in the Mayo district. In 2020, his claims were leased to Mr. Minelli and mining commenced on the uppermost claims, directly downstream from Secret Creek. No specific work activity is known.

Equipment and Water Treatment Not reported.

Surficial Geology and Stratigraphy Not reported.

Bedrock Geology Bedrock is mapped as brown to pale green shale, quartz-rich sandstone, grit and pebble conglomerate (Green and Roddick, 1972).

Gold Characteristics Not reported.

Murphy's Pup, a tributary of Haggart

115P/16 2018: 63°56'40"N, 136°01'44"W

532 Placer Mining, 2011–2020

Water License: PM17-049 (Active 10/2027)
Active Producer (2018–2020) **Operation no. 143**

Location Murphy's Pup, 300 m upstream from its confluence with Haggart Creek.

Work History and Mining Cuts The activity on Murphy's Pup has continued from 2018 to 2020, as a two person operation and primarily mining downstream of camp on the lower part of the drainage. In 2018, activity focused on the left limit and testing was planned to occur both farther downstream and upstream of camp on the north side of the South McQuesten/ Haggart Creek Road. Work history for 2019 and 2020 is unspecified.

Equipment and Water Treatment Equipment present onsite included a Caterpillar 322 excavator, a John Deere 710 D backhoe and a dump truck. The wash plant consisted of a 1.2 by 7.3 m (4 × 24 ft) trommel that screens to ¾" into a 1 by 3 m (3 × 10 ft) single run sluice. They operated a closed-cell settling facility with a full recycle pumping system. A pan and wheel were utilized for clean-ups.

Surficial Geology and Stratigraphy Pay is excavated from a fluvial fan deposit that has built out into Haggart Creek from Murphy's Pup. Unit 1 is a false-bedrock of compact Reid-age till that underlies the fan sediment. Unit 2, from 0 to 1 m (0–3ft), is a coarse channel gravel containing boulders that originate from Murphy's Pup. These deposits form during high-energy flow events and will have a channel trajectory trending toward the fan apex. The width of the channels was not evident in the 2017 cut. Unit 3 varies in thickness from 1 to 2 m (3–6 ft) and overlies, and is adjacent to, the coarse channel gravel. Unit 3 is a typical fan gravel sediment consisting of stratified, clast-supported, pebble-rich gravel. Unit 4, from 2 to 5 m (6–16 ft), consists of fine-grained overbank silt, sand and landslide diamict. A large landslide affected the right limit slope within Murphy's Pup and moved the creek to the left limit. Landslide sediments flowed out of the valley and onto the fan surface forming an additional layer of overburden.

Bedrock Geology Bedrock is mapped as brown to pale green shale, quartz-rich sandstone, grit and pebble conglomerate (Green and Roddick, 1972).

Gold Characteristics Gold is all fine with no nuggets and has a fineness of 850–860.



A view looking down upper Seattle Creek from the forks. Preparations for a plant set-up were being make on the right limit where the equipment is located. Placer gold has been mined through the narrow section immediately downstream, and testing was focused at the forks to locate the paystreak orientation.

Seattle, a tributary of south mcquesten

115P/16 2019: 63°49'24"N, 136°03'11"W

Reno Contracting Ltd., 2015–2019

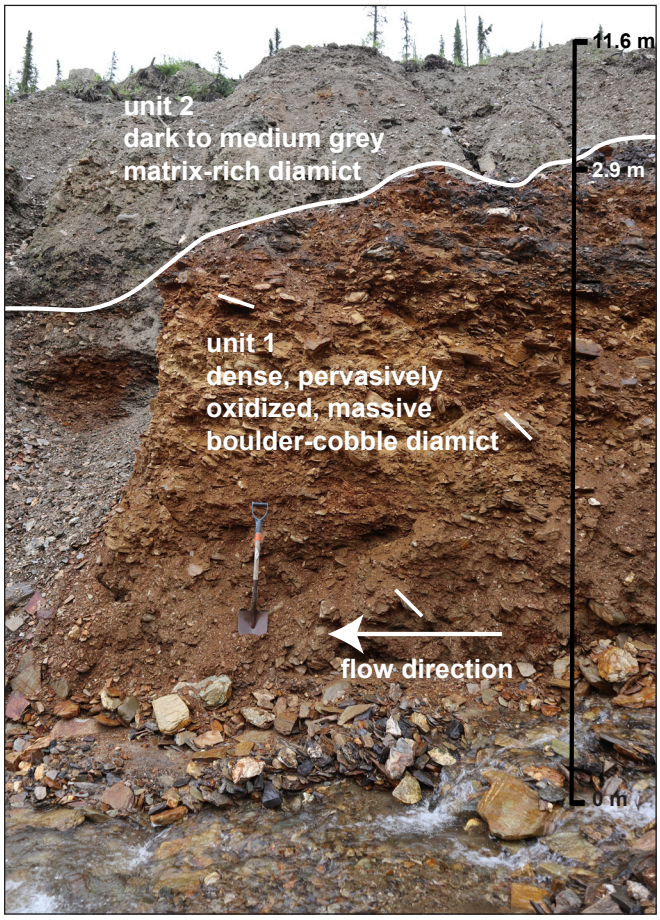
Water License: PM17-073 (Active 01/2028)
Active Producer (2018–2019) **Operation no. 144**

Location Seattle Creek, upper, and Dan's Pup, 800 m from the confluence with Seattle Creek.

Work History and Mining Cuts In 2018 and 2019, Reno Contracting Ltd. operated as a four person crew, actively mining on the main stem of Seattle Creek, as well as Dan's Pup, a left limit tributary of Seattle Creek. In 2018, a geophysical program outlined the location and extent of the pay channel on Seattle Creek. To follow-up on the geophysical survey, a small auger drilling program was completed but faced challenges due to the extensive depth of the material; further drilling is warranted. A large test pit on the alluvial fan at the mouth of Morrison Creek was conducted in 2018. An area 24 m (80 ft) by 6 m (20 ft) was excavated; the total thickness of material to bedrock was 5 m (16 ft). Additional bulk samples were collected on Morrison Creek, as well as farther upstream on Seattle Creek to test a low-level bench on the left limit. Approximately 6000 loose yd^3 (4587 m^3) of material was sluiced in 2018. In 2019, an exploration cut was opened up at the upper forks of Seattle Creek, 2 km upstream from camp. The goal was to determine which fork supplied the gold into the canyon. A pad for the wash plant was constructed on a right limit terrace below the forks. No activity occurred in 2020.

Equipment and Water Treatment Equipment utilized by Reno Contracting Ltd. included a Caterpillar D6D bulldozer for stripping, a Hitachi 270 excavator for digging pay and stripping, a Caterpillar 950G loader and a rock truck for hauling pay to the plant, and an Hitachi 270 excavator for feeding the plant. The wash plant consisted of a 1.2 m (4 ft) wide by 6 m (20 ft) long trommel containing 2" screen. This fed a single 1 m (3 ft) by 7.3 m (24 ft) sluice run containing expanded metal. The plant is capable of processing 45 to 50 yd^3 (34–38 m^3)/hr.

Surficial Geology and Stratigraphy A cut on Dan's Pup, located 0.8 km upstream from its confluence with Seattle Creek, was mined in 2018. Two units were exposed; unit 1 from 0 to 2.9 m (9.5 ft) and unit 2 from 2.9 to 11.6 m (9.5–38 ft). Unit 1 was poorly exposed and believed to be approximately (15 ft) above the bedrock surface, therefore unit 1 thickness is estimated to be up to 5.5 m (18 ft) thick. The lowermost section of unit 1 may also be different material but with no exposure, it remains unknown. Unit 1 is a dense, pervasively oxidized, massive, boulder-cobble diamict with minimal rounded clasts and composed of a silty, fine to medium sand matrix. The lithology composition of the diamict appears locally derived (phyllite/shale/sandstone) and an imbrication on the elongated clasts in the section suggest an upstream flow direction. Due to the fabric and lack of structure, this unit is interpreted as lodgement or basal till. Unit 2, overlying unit 1, is a dark to medium grey matrix-rich diamict. Similarly to unit 1, it is dense and well-consolidated, but clasts are disorganize and weakly stratified. Clast-rich lenses are present.



Cut exposed on Dan's Pup in 2018, approximately 0.8 km upstream from its confluence with Seattle Creek. Small white lines highlight the clast imbrication, suggesting an upstream flow direction.

The test cut exposed in 2019 near the upper forks of Seattle Creek consisted of gravel overlying a false bedrock of till. Testing focused on the gravel unit. The till is from the Reid glaciation, 120,000 years ago, and may have reworked a pre-existing gold-bearing gravel. Testing the till–bedrock contact is recommended.

Bedrock Geology Bedrock is mapped as Yusezyu Formation, muscovite-chlorite phyllite, quartzofeldspathic and micaceous psammite and rare calc-silicate rock and marble (Murphy and Héon, 1996a).

Gold Characteristics At the mouth of Dan's Pup, coarse gold was recovered with most grains greater than 4 mesh. Gold recovered from Seattle Creek ranges in a fineness 790 to 810, with a slight increase in the headwaters of the drainage.

Morrison, a tributary of Seattle

115P/16 2019: 63°48'42"N, 136°08'23"W

Moman, T., 2018

Water License: PM16-042 (Active 10/2026)
Active Producer (2018) **Operation no. 145**

Location Morrison Creek, 3.3 km upstream from the mouth.

Work History and Mining Cuts In 2018, T. Moman and C. Steppler completed a bulk sample on Morrison Creek, immediately below the granite outcrop and on the left limit of the valley. The site was visited in 2019 and no equipment remained on site at the time. No activity occurred in 2019 or 2020.

Equipment and Water Treatment No equipment was present on site at the time of the visit.

Surficial Geology and Stratigraphy The geology of the Morrison Creek cut records a series of events that occurred during the Reid glaciation. Unit 1 is a cobble-boulder gravel that is 13 m (43 ft) thick and appears to coarsen upward. This unit is interpreted to be a coarse gravel fan deposit that accumulated during the onset of the Reid glaciation, prior to ice reaching the local area. Unit 1 is dissected by unit 2 to the bedrock surface and is a silty boulder gravel that is compact, manganese stained, and contains coarse placer gold. Unit 2 is poorly exposed and partially submerged under water, and estimated to be 3.5 m (11.5 ft) thick. This unit is thought to have formed when the Cordilleran Ice Sheet

advanced up Highet Creek and spilled meltwater into upper Morrison Creek. Drainage off the ice sheet would have significantly increased the flow in Morrison Creek causing incision into the unit 1 fan gravel. Unit 3, from 3.5 to 6.5 m (11.5–21.0 ft), is also a boulder gravel but is sandier and contains less silt. This unit may represent the waning stages of the meltwater flow. Unit 4, from 6.5 to 13 m (21–43 ft), is a bedded silt and sand deposit containing drop stones that is interpreted to be glacial lake sediment. Damming of Morrison Creek would have occurred when the Cordilleran Ice Sheet advanced into the Seattle Creek valley and flowed past the mouth of Morrison Creek valley, effectively blocking the drainage.

Bedrock Geology Bedrock is mapped as Yusezyu Formation, muscovite-chlorite phyllite, quartzofeldspathic and micaceous psammite and rare calc-silicate rock and marble (Murphy and Héon, 1996a).

Gold Characteristics Coarse gold was reported in Morrison Creek.

Ross, a tributary of Haggart

105M/13 2019: 63°51'20"N, 135°59'20"W

Yukon Mining Ventures, 2018–2019

Water License: PM19-013 (Active 06/2029)
Active Producer (2019) **Operation no. 146**

Location Ross Creek, 5 km upstream from its confluence with Haggart Creek.

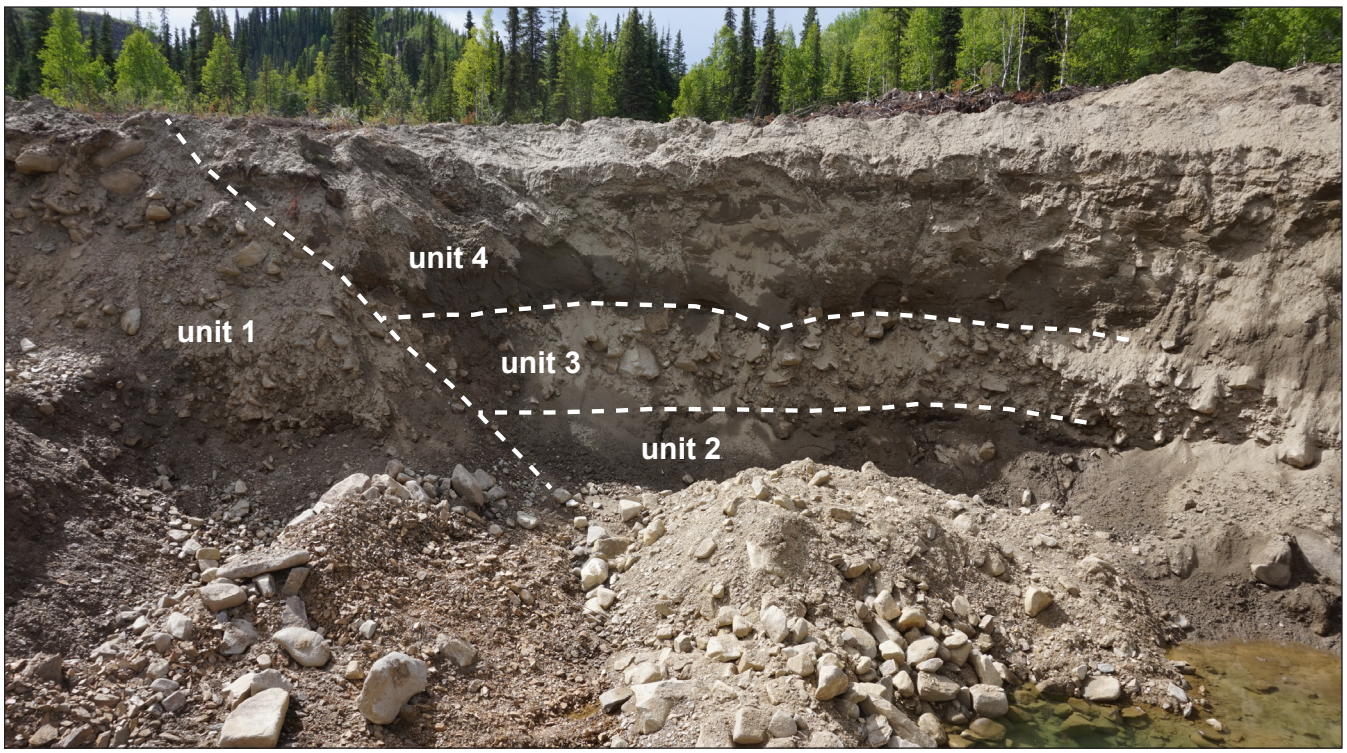
Work History and Mining Cuts Yukon Mining Ventures staked Ross Creek in August 2018 and their first year mining the drainage was 2019. Activity focused on the left limit and they progressively mined upstream, primarily working as a one-person operation. No activity occurred in 2020.

Equipment and Water Treatment There is little information regarding equipment; a 1.2 by 4.9 m (4 × 16 ft) trommel was used to process material.

Surficial Geology and Stratigraphy Not reported.

Bedrock Geology Bedrock is mapped as brown to pale green shale, quartz-rich sandstone, grit and pebble conglomerate (Green and Roddick, 1972).

Gold Characteristics Not reported.



A view looking upstream on Morrison Creek of the 2018 bulk sample cut. The distribution of the units is illustrated and described in the associated text. The section is 13 m (43 ft) in height.



Stripping on the left limit of Ross Creek, with the view looking downstream towards the Haggart Creek valley. (Photo credit: Scott King).

Jarvis, a tributary of Minto Creek

115P/09 2019: 63°42'07"N, 136°08'16"W

535785 Yukon Inc., 2017–2020

Water License: PM15-061 (Active 11/2025)
Active Producer (2018–2020) **Operation no. 147**

Location Jarvis Creek; high-level bench above Minto Creek near Minto Lake.

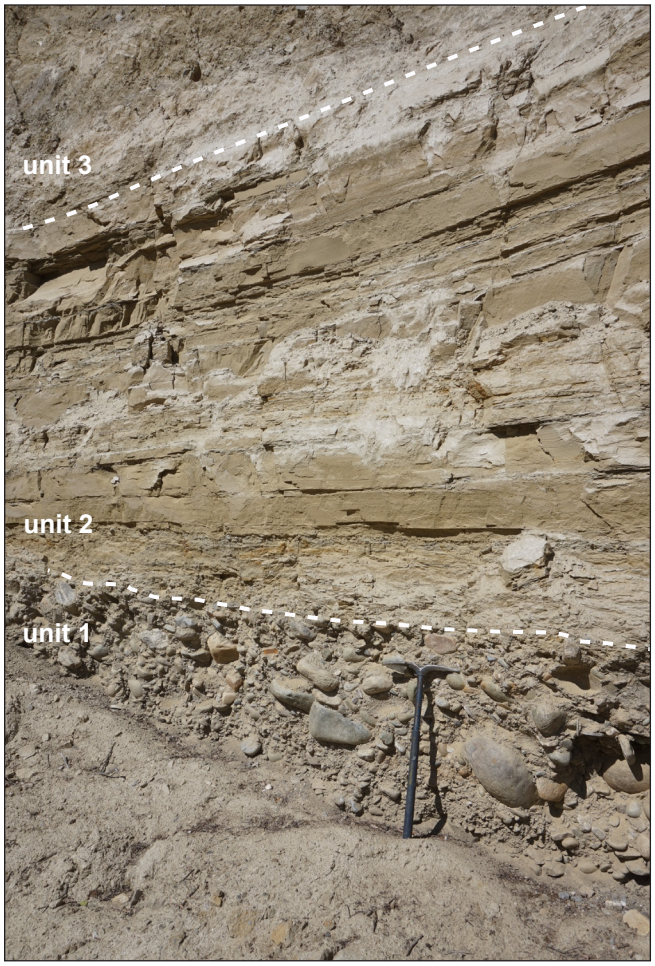
Work History and Mining Cuts 535785 Yukon Inc.'s initial efforts on the high-level bench of Jarvis Creek consisted of drilling and bulk sampling in 2018 and 2019. In 2020, operations restarted in early spring and a two-person operation stripped and prepared a cut to be mined later in the season.

Equipment and Water Treatment Not reported.

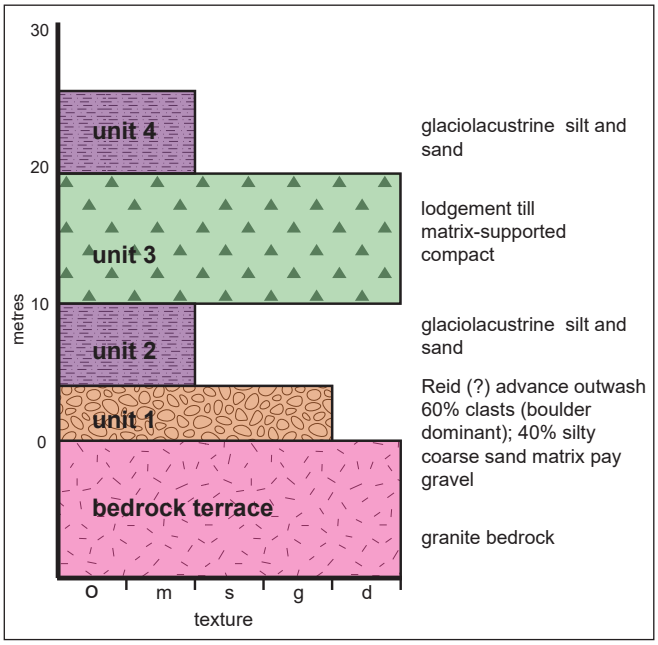
Surficial Geology and Stratigraphy The mine cut is located on the right limit of Minto Creek approximately 50 m (164 ft) above the valley bottom. Past hydraulic stripping or mining is evident at the site where old gullies dissect the surficial sediments through to bedrock. The age of these workings is unknown, but it is assumed to date to the 1930s. A bedrock surface is exposed in the cut and is overlain by a complex glacial sequence possibly dating to the Reid glaciation, 120,000 years ago. Bedrock consists of a silvery phyllite in contact with an oxidized granitic rock. Lenses of vein quartz (10 cm in thickness) were observed within the phyllite. Unit 1, in contact with the bedrock surface, is an advance glacial outwash gravel. The gravel is bouldery, with abundant rounded to subrounded clasts, consolidated, and displays a paleo-flow direction to the southwest. This unit was processed for placer gold. Unit 2 is a glacial lake sediment consisting of laminated silt and sand. Damming of the Minto Creek and Minto Lake valleys would have occurred when ice entered the area farther downstream via the Stewart River valley. Overlying the glacial sediment is a compact, matrix-supported till, deposited when westward flowing ice in Minto Creek advanced over the area. Following the retreat of the ice sheet from the area, a second phase of glacial lake sedimentation occurred on top of the till surface. The entire sediment package is at least 26 m (85 ft) thick and possibly thicker due to the poor exposure of the upper units. Exploration bulk sampling of the bedrock terrace has focused along the rim where surficial sediments are thinner. It is encouraging to see a pre-glacial gravel protected from ice erosion by a glacial lake sediment. This stratigraphy and style of pay gravel preservation has been observed in the Livingstone and Atlin placer gold camps.

Bedrock Geology Bedrock is Yusezyu Formation phyllite and granite of the Minto Creek stock.

Gold Characteristics Not reported.



Close-up view of the pay gravel exposed in the high level Minto Creek terrace cut, near Jarvis Creek. The coarse gravel (unit 1) at the base is considered pay and is buried by a glacial lake deposit (unit 2) and till (unit 3). The pick for scale is 60 cm in length.



The stratigraphy of the high-level Minto Creek terrace deposits exposed near Jarvis Creek. The true thickness of the deposits is likely greater than shown here due to the exposures location on the rim of the terrace.

Minto, a tributary of Mayo River

115P/09 2020: 63°43'20"N, 136°04'37"W

Jardine, E., 2015–2020

Water License: PM18-050 (Active 08/2029)
Water License: PM14-001 (Expired 08/2019)
Active Producer (2018–2020) **Operation no. 148**

Location Minto Creek, upper, 4.8 km downstream from Minto Lake.

Work History and Mining Cuts Mr. Jardine has five placer claims in the Minto Creek valley located near the confluence with Highet Creek. Two people are present at the operation each season and mining has continued from camp and downstream throughout the past three seasons. Limited work in 2019 allowed for Mr. Jardine to process 200 yd^3 (153 m^3) but throughout the past few seasons he processed approximately 1600 yd^3 (1223m^3) in the location immediately downstream from camp. Operations increased in 2020, as he moved farther downstream and mined on the left limit of Minto Creek (modern creek is currently on the far right limit of the Minto Creek valley).

Equipment and Water Treatment Equipment in 2020 included an Hitachi 143 excavator, 50 ft conveyor, bobcat and an oscillating screen deck with a 1.8 by 3.7 m (6 × 12 ft) hopper able to process up to 30 yd^3 (23 m^3)/hr. The double deck 2.4 by 2.4 m (8 × 8 ft) sluice run consisted of expanded metal and unbacked Nomad matting.

Surficial Geology and Stratigraphy A near surface high-energy gravel, up to 2.1 m (7.0 ft) thick is being mined on a low-level terrace on the left limit of Minto Creek. The uppermost 0.6 m (2 ft) of the high-energy gravel is very coarse in nature, and contains boulders up to a couple feet in diameter. Overlying the gravel is up to 1.2 m (4.0 ft) of sand. The sand unit thickens to the north. The coarseness and poorly sorted nature of the gravel indicates that it is a glacial outwash gravel that originated downstream and was deposited as it flowed up-valley towards Minto Lake. Various amount of reworking and incision have occurred in the valley bottom, but the target unit for Mr. Jardine is the high-energy, coarse, uppermost gravel unit.

Bedrock Geology Bedrock is mapped as phyllite, shale, sandstone, grit, conglomerate and limestone (Green and Roddick, 1972).

Gold Characteristics Gold is fine.

Minto, a tributary of Mayo River

115P/09 2019: 63°43'29"N, 136°03'35"W

Wilson, K., 2013–2020

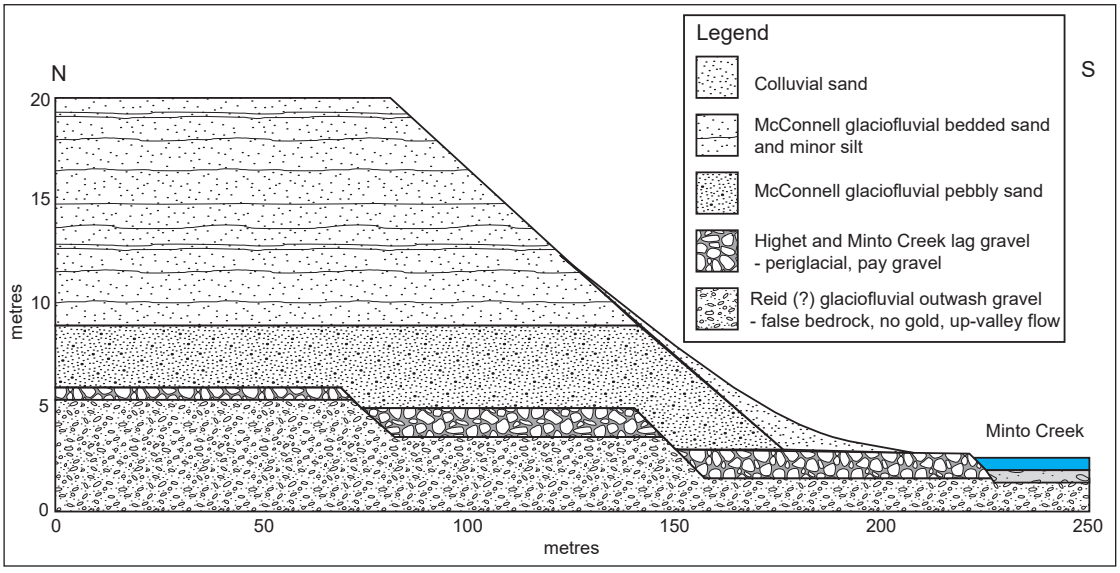
Water License: PM17-024 (Active 05/2027)
Water License: PM15-031 (Expired 08/2020)
Active Producer (2018–2020) **Operation no. 149**

Location Minto Creek near its confluence with Highet Creek.

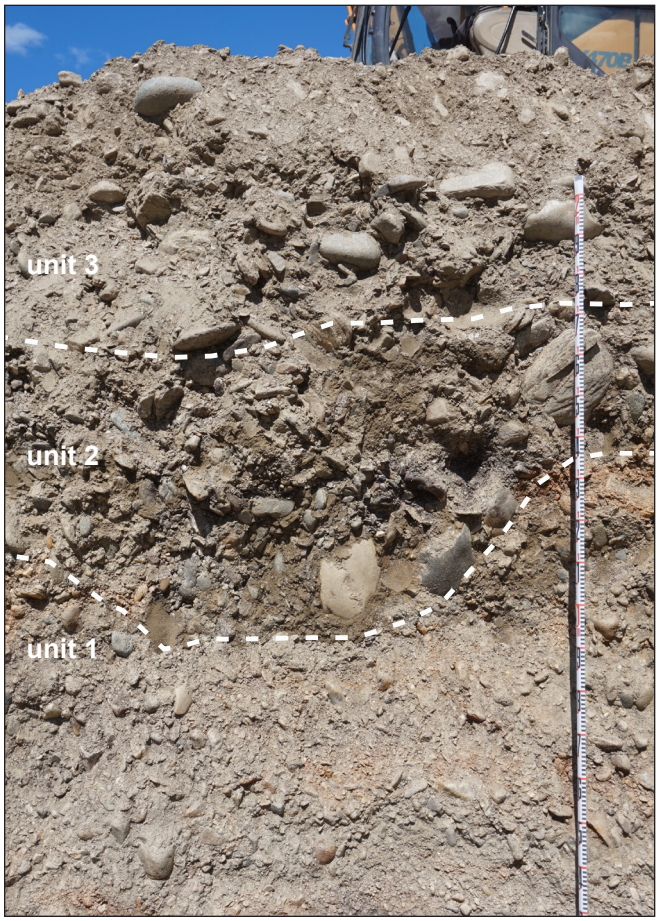
Work History and Mining Cuts Between 2017 and 2020, Mr. Wilson operated on the left limit of Minto Creek. Mining progressed upstream and farther into the left limit bank. A crew of 8 personnel were employed at the mine and operated a 12-hr shift. Progressive recontouring reclamation occurs each season.

Equipment and Water Treatment Equipment on the site included two Caterpillar D9 bulldozers for stripping, a 350 Liebherr excavator, a 350 Samsung excavator, a 470B Case excavator, a Caterpillar D300E rock truck, a Volvo 350 rock truck, and two Hyundai 770 loaders. Processing water is 100% recirculated in a large L-shaped pond. The wash plant consists of an oscillating 2.4 by 3.7 m (8 × 12 ft) deck with ½" screen for fine gold and the high sand content. The sluice runs consist of six, 0.6 m (2 ft) wide runs lined with long (1 cm) strand matting and backward-facing expanded metal riffles. The angle of the runs was increased by 15%, which reduced the concentrate volume and still caught the gold. The plant was able to processes material at 120 yd^3 (92 m^3)/hr.

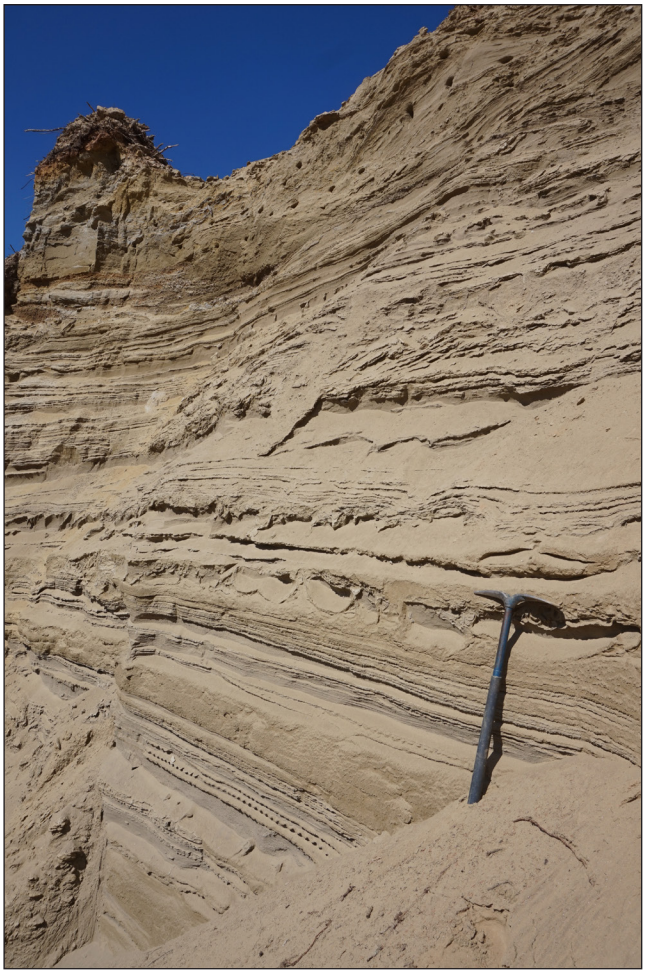
Surficial Geology and Stratigraphy Mining on the left limit of Minto Creek near the mouth of Highet Creek has exposed a gravel-terraced landscape buried under a thick accumulation of outwash sand. The pay gravel overlies a false bedrock (unit 1) consisting of a moderately sorted, imbricated, pebble-rich gravel. Flow directions within the false-bedrock gravel are to the west or toward Minto Lake. Based on the flow direction, this gravel is interpreted to be an outwash gravel from a glaciation that preceded the last glaciation. The pay gravel (unit 2) consists of a boulder-rich gravel with a high silt content that is in sharp contact with unit 1. Some clasts within the pay gravel are oriented vertically suggesting that the former floodplain surface was exposed to periglacial weathering associated with an extreme cold climate. The silt content originates from wind-blown sources (loess) that is common in areas marginal to glaciation. Imbrication within the gravel is disrupted by the former cryoturbation and therefore a source direction could not be determined. This unit is processed for placer gold. Overlying the periglacial gravel is a poorly sorted boulder-rich gravel that does not have the high silt content and appears to originate from Highet Creek. This unit is also processed for placer gold. Both units 2 and 3 are lag deposits that formed during erosion of unit 1. As down-cutting occurred into unit 1, placer gold was introduced and to some extent, incorporated from unit 1. The original thickness of unit 1 is not known but at least 5 m separates two terrace levels.



A cross section of Minto Creek valley near the mouth of Highet Creek–view looking downstream. The figure illustrates the buried terraces under the sandy outwash deposits in the valley bottom that are targeted at the Wilson mine.



Close-up view of the pay gravel mined in Minto Creek. Unit 1 is a glacial outwash gravel that acts as a false bedrock for the overlying placer gold-bearing units. Units 2 and 3 are locally derived from Minto and Highet creeks. These gravels are coarser and were deposited prior to and during the last ice age. Increments on the measuring tape are 10 cm.



Close-up view of the sandy outwash deposits that drape the former gravel terraces in Minto Creek.

The entire gravel-terrace landscape is buried under a thick package of sand with minor gravel that inundated the Minto Creek valley at the height of the last glaciation. Ice from the Selwyn Mountains advanced from the east and terminated at the mouth of the valley about 20,000 years ago. This ice margin dammed the Minto Creek valley and meltwater drained through the area. Meltwater flow was sufficiently slow that primarily sand was deposited. The lowermost unit in the sand complex consists of alternating, well-sorted sand and gravel beds (unit 4). Some cobble-rich channels that are contained within this unit show flow directions out of Highet Creek. The majority of the deposit exhibits flow directions from east to west. Unit 5 forms the majority of the outwash sand and consists of planar bedded, rippled, sand and minor silt beds. This unit is interpreted as a glaciolacustrine unit deposited into a shallow lake formed in Minto Creek valley. Ice wedge casts within the bedded sand indicate exposure of the surface to freeze-thaw.

Bedrock Geology Bedrock is mapped as phyllite, shale, sandstone, grit, conglomerate and limestone (Green and Roddick, 1972).

Gold Characteristics Gold is fine with 50% less than 50 mesh. The fineness equals 840.

Highet, a tributary of Minto Creek

115P/16 2018: 63°45'59"N, 136°11'59"W

Lone, H. and B., 1998–2018

Water License: PM14-032 (Active 01/2025)
Active Producer (2018) **Operation no. 150**

Location Highet Creek, upper, across the valley from the mouth of Rudolph Gulch.

Work History and Mining Cuts Mr. and Mrs. Lone have been residents of Highet Creek during the mining season for about thirty years. Their connection to the area extends long past that, as Betty's father first mined in the drainage in the 1940s. In their last known active year of 2018, they along with their daughter Kyla, were present on the creek. The majority of the season consisted of maintenance on camp and equipment, with unknown amount of material sluiced.

Equipment and Water Treatment The equipment stationed at camp included a D8H Caterpillar bulldozer, a Caterpillar 330B excavator, a Trojan loader, and a screen deck able to process 50 to 60 loose yd^3 (38–46 m^3)/hr.

Surficial Geology and Stratigraphy The Lone's have been targeting an interglacial right limit bench that is well preserved on their claims. A corner of this bench was exposed in 2018 and it consisted of a loose, cobble-pebble gravel that had a silty sandy matrix and angular to subangular clasts, overlain by a thick lens of massive sand and silt. Capping the fine-grained unit is a poorly sorted deposit with a silty matrix and an abundance of angular fragments. It is interpreted as reworked overbank material and colluvium, which masks the full extent of the bench.

Bedrock Geology Bedrock is mapped as phyllite, shale, sandstone, grit, conglomerate and limestone (Green and Roddick, 1972).

Gold Characteristics Gold has a fineness of 830 to 840.



Drone image of the Lone's operation on the right limit of Highet Creek in 2018. The view is looking to the west, towards the headwaters of Highet Creek valley.

Highet, a tributary of Minto Creek

115P/16 2018-: 63°46'46"N, 136°13'43"W

Steppler Mining Co., 2016–2018

Water License: PM15-092 (Active 06/2026)
Active Producer (2018) **Operation no. 151**

Location Highet Creek, headwaters of the drainage; mid-level bench across the valley from the mouth of Harvey Gulch.

Work History and Mining Cuts Steppler Mining Company continued to excavate the buried right limit bench on upper Highet Creek in 2018. Remnants of the bench remain buried and they continued to mine the feature downstream until it disappeared as it became dissected and reworked by a right limit tributary. They operated primarily as a two-person crew and sluiced approximately 50,000 yd^3 (38 228 m^3) a season. In 2020, they moved their operations to their claims located on Edmonton Creek, a tributary of Mayo Lake.

Equipment and Water Treatment Equipment present in 2018 included a Caterpillar D8 bulldozer, Caterpillar 988 loader, a Doosan 225 excavator, a 14 yd^3 haul truck and a 35 ton rock truck. In 2018 the 1.2 by 7.3 m (4 × 24 ft) trommel was replaced with a Derocker able to process up to 100 loose yd^3 (76 m^3)/hr. Water was supplied to the plant using a 6" pump and water was 100% recycled.

Surficial Geology and Stratigraphy An interglacial right limit bench is preserved as an intermittent feature extending from the headwaters of Highet Creek. Steppler Mining Co. moved from the modern valley bottom up slope, and began excavating a portion of this preserved bench across from the mouth of Harvey Gulch. Initially they were inspired to move up-slope as they followed old-timer workings and the presence of historic shafts targeting the poorly exposed bench. Upwards of 4.6 m (15.0 ft) of overburden is overlying the bench, which protected the recognizable feature from being previously mined. The bench gravel

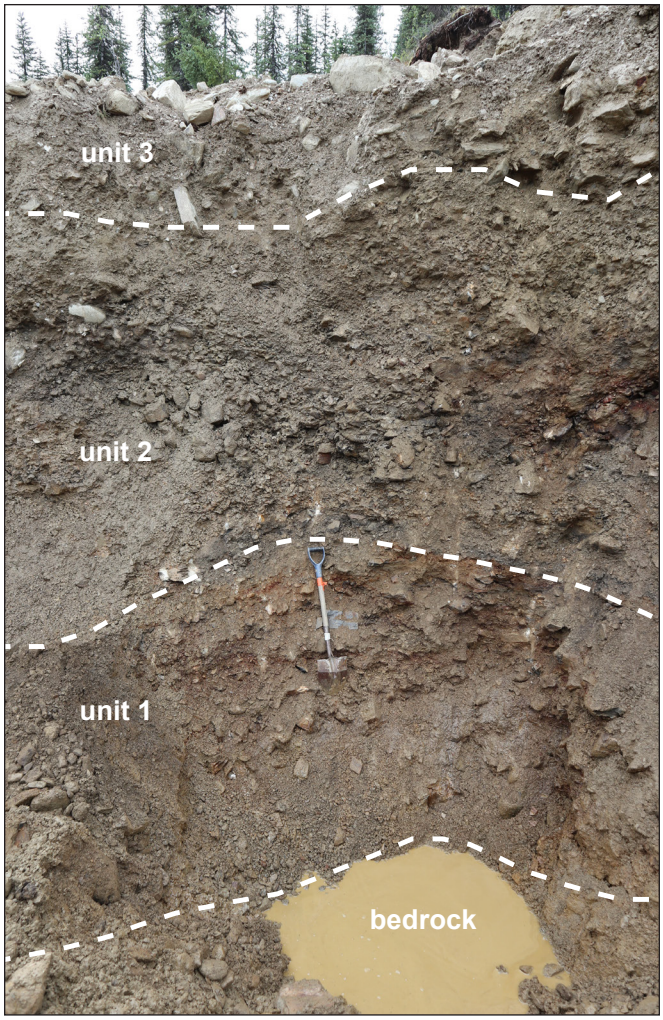


View looking downstream the Highet Creek valley, with Steppler Mining Co.'s operation on the mid-level right limit bench in 2018. The approximate extent of the actively mined bench is outlined by dashed line and the potential for additional remnants remains downstream are also indicted by a dashed line.

is 3.6 m (12 ft) thick and contains large boulders up to 2 m (6 ft) in diameter. Unit 1, 0 to 1.6 m (5.2 ft) is a compact boulder-cobble gravel with a silty-sand matrix. Open work sections are present in the upper portion of the unit, and the majority of clasts are subrounded. Unit 2, from 1.6 to 4.0 m (5.2–13.1 ft), overlies unit 1 and is a finer grained unit compared to unit 1. Unit 2 has an abundance of angular components, likely from colluviation reworking angular bedrock fragments from the hillslope. Large bounders are present throughout both units 1 and 2. The main pay target is pervasively oxidized. Unit 3 is colluvium, which consists of reworked overbank material and can be up to 4.6 m (15.0 ft) thick.

Bedrock Geology Bedrock is biotite schist and blocky, competent quartzite.

Gold Characteristics Gold recovered from the bench is very fine.



Exposed section on the Highet Creek bench in 2018 with the units (as described above) outlined.

Johnson, a tributary of McQuesten River

115P/16 2020: 63°47'02"N, 136°21'42"W

Barchen, R., 2018–2020

Water License: PM20-049 (Active 11/2030)
Water License: PM15-017 (Active 05/2025)
Active Producer (2018–2020) **Operation no. 152**

Location Johnson Creek on the right limit, approximately 1.2 km downstream from the mouth of Sabbath Creek.

Work History and Mining Cuts Ralph Barchen is mining a low-level, right limit bench on Johnson Creek adjacent to areas that were previously mined by the Barchen family. A Geological Survey of Canada industry report entry from 1967 indicates that Barduson Placers Ltd., owned by Hans Barchen, operated a bulldozer-sluicing plant from 1958 to 1967 on Johnson Creek (Findlay, 1967). Total production from 1958 to 1966 was 7419 crude ounces. In 2019, mining continued in the modern creek valley and later in the season, operations were relocated onto a low-level right limit bench 1.8 m (6 ft) above the modern valley. In 2018 and 2019, approximately 50,000 yd^3 (38 228 m^3) of material was sluiced each season.

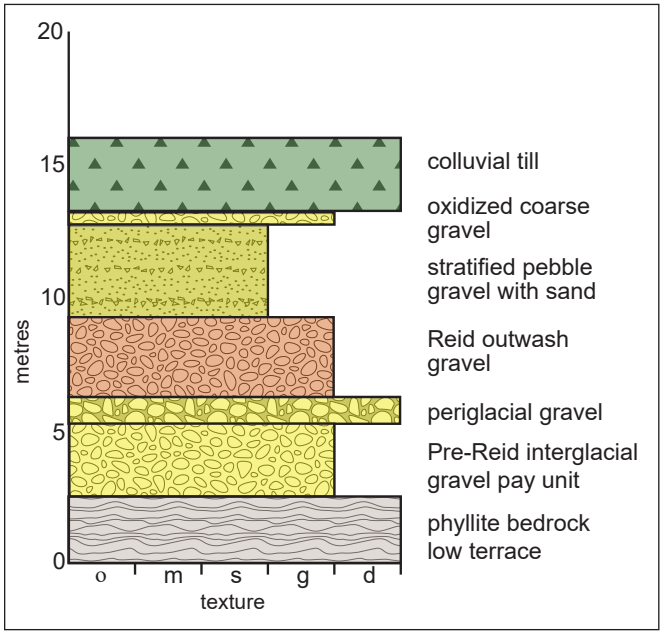


Aerial view looking up Johnston Creek at Ralph Barchen's mine cut on the right limit. The middle of the valley where the road is located is where the historic mining activity occurred. The Derocker plant is visible in the lower left corner of the photo.

Equipment and Water Treatment Equipment utilized in 2020 included a John Deere 922D-LC excavator, a Caterpillar D9H bulldozer, a Komatsu 355 crawler tractor and a Caterpillar 992C wheel loader. A Derocker was used to process between 130 and 150 yd^3 (99–115 m^3)/hr depending on material. The sluice run was 1.2 m (4 ft) wide and consisted of 0.3 m (1 ft) of angle iron, 0.5 m (1.5 ft) of ½" minus punch plate and 3.7 m (12 ft) of angle iron. Concentrate separated by the punch plate was then split into two 1.2 by 3.0 m (4 × 10 ft) runs, each with a 0.9 m (3 ft) slick plate, 0.5 m (1.5 ft) angle iron, 0.9 m (3 ft) expanded metal and 0.5 m (1.5 ft angle iron). An 8 × 8" pump supplied water to the plant and effluent was settled in one large settling pond.

Surficial Geology and Stratigraphy The 2020 mine cut is located on the right limit against the hillside. The cut exposes a complex sequence of coarse gravel that is buried by colluvium and gully fan sediments off the hillside. This added overburden may have precluded previous attempts to mine the full width of the valley bottom in this location.

Johnson Creek was last glaciated during the Reid glaciation, 120,000 years ago. At this time, ice flowed into the area via Minto Creek and the McQuesten River. As the ice thickness increased, it advanced up Highet Creek and eventually overtopped the divide into Sabbath and Johnson creeks. During this process, meltwater would have flowed down Johnson Creek from the divide area. The mine cut contains sediments associated with the Reid glaciation and fluvial gravel from immediately prior to the Reid glaciation. The total thickness of sediments is 13.9 m (46 ft) and the lowermost unit, which contains the placer gold, consists of a coarse, iron and manganese-stained gravel that is poorly sorted, clast-rich and has a silty coarse sand matrix (unit 1). A diamict or periglacial gravel overlies unit 1 and represents the floodplain surface immediately prior to the Reid ice sheet advancing into the area. Both units 1 and 2 are dissected by unit 3, a Reid outwash gravel from the Highet Creek pass. The Reid outwash reworked units 1 and 2 completely near the edge of the cut and only partially closer to the hillside. As a result, Reid outwash contains economic placer gold concentrations where reworking was complete, whereas closer to the hillside, pre-Reid interglacial gravel contains the majority of the placer gold. Differentiating Reid outwash from pre-Reid interglacial gravel is based on the lithology and roundness of the cobbles and boulders. Reid outwash contains an abundance of foreign rock types that have a moderately-rounded to well-rounded shape. Pre-Reid interglacial gravel contains some foreign rock types but largely contains locally derived schist, phyllite and granitic rocks. The Reid outwash is overlain by a finer sequence gravel and colluviated till.



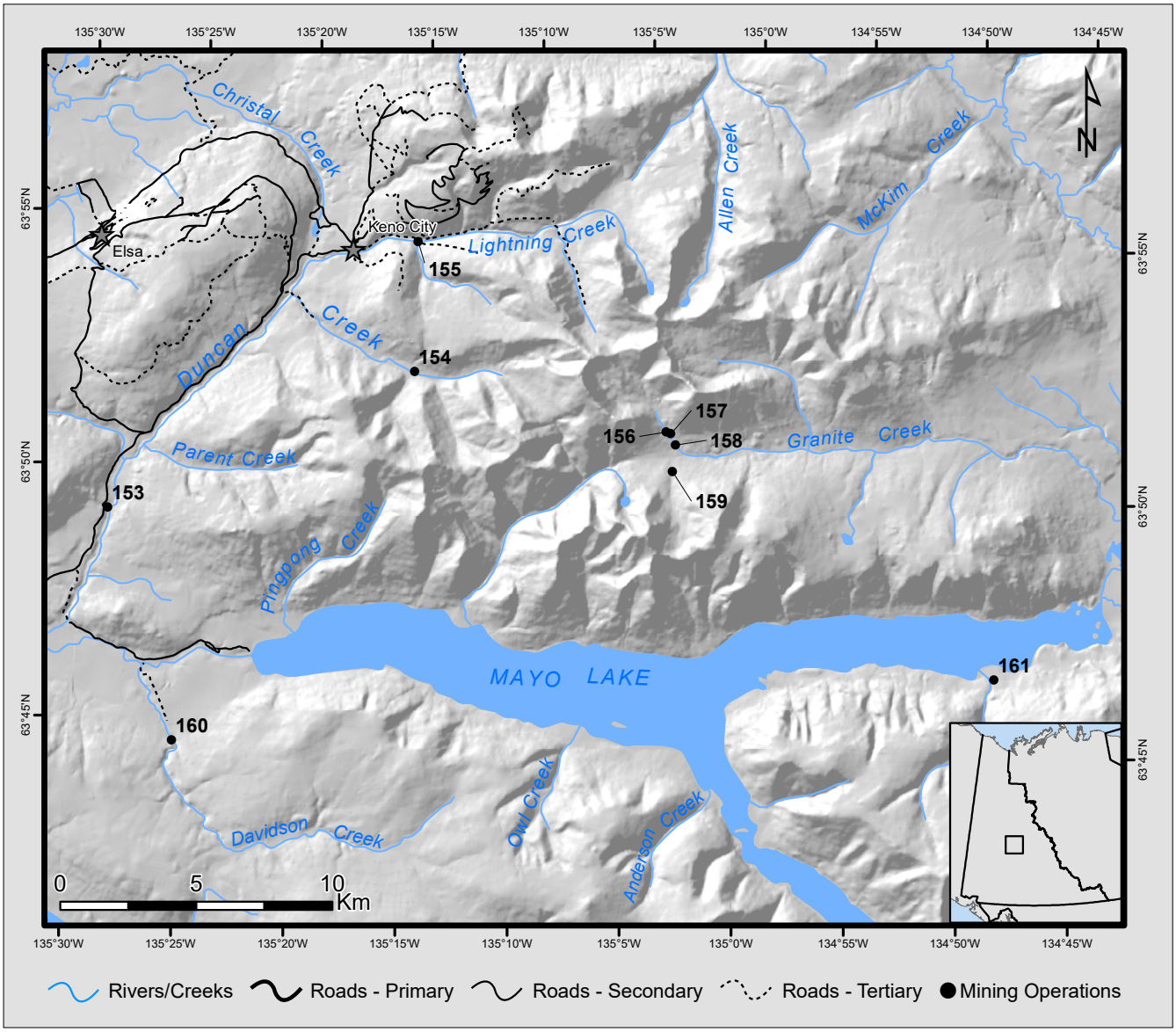
The stratigraphy exposed in the 2020 mine cut on Johnson Creek (right limit).

Bedrock Geology Bedrock is phyllite, shale and sandstone of the Yusezyu Formation. The Late Cretaceous Scheelite Dome stock occurs at the headwaters of the drainage.

Gold Characteristics Gold derived from the right limit cut is all fine gold. The fineness varies from 817 to 820 in Johnson Creek.

KENO
PLACER AREA

SITES 153–161



LEGEND

153. Duncan Creek Golddusters Ltd.
154. Earth & Iron Mines Inc. and Rally! Mining ULC
155. Bardusan Placers Ltd.
156. Granite Creek Resources
157. Earth & Iron Mines Inc.
158. Dulac Mining
159. Gemmer, B.
160. 535785 Yukon Inc.
161. Steppler Mining

Duncan, a tributary of Mayo River

105M/14 2020: 63°49'10"N, 135°28'40"W

Rally! Mining ULC, 2019–2020
Duncan Creek Golddusters Ltd., 1975–2018

Water License: PM18-058 (Active 01/2029)
Water License: PM14-066 (Active 04/2025)
Active Producer (2018–2020) **Operation no. 153**

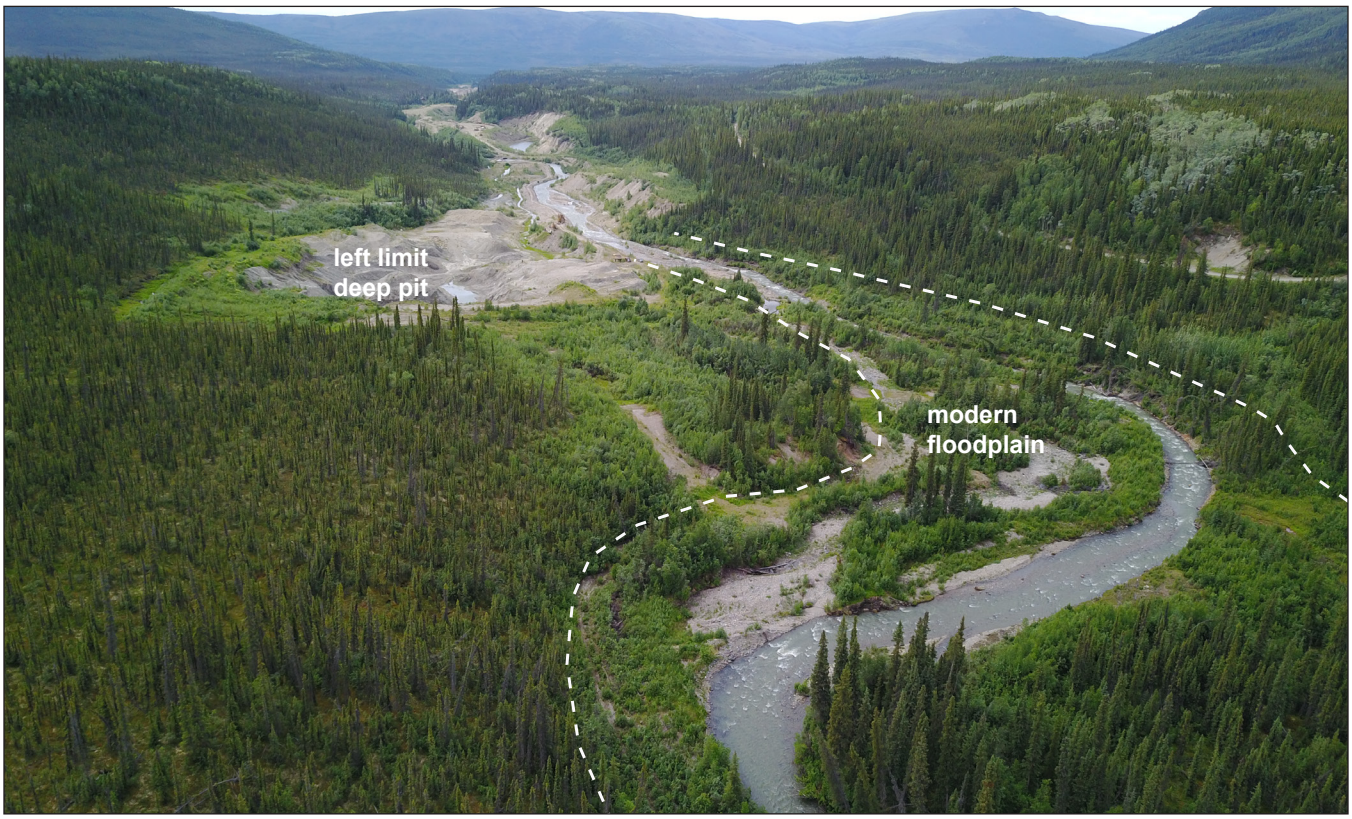
Location Duncan Creek, approximately 6.3 km upstream from its confluence with Mayo River.

Work History and Mining Cuts In 2018, Duncan Creek Golddusters Ltd. operated with two miners and one camp personnel on a daily 12-hour shift. A portion of the Duncan Creek floodplain was targeted above camp. Minor trail building and limited mining occurred in 2019. Later in 2019, Rally! Mining ULC conducted a bulk test on the left limit above camp. In 2020, Rally! Mining ULC moved their own camp onto the property and mining commenced on the modern floodplain and a deeper left limit cut 800 m downstream from the property boundary. They conducted a single shift with six operators.

Equipment and Water Treatment Equipment on site in 2018 and 2019 included a Caterpillar 330BL excavator with a 2 yd bucket, a Caterpillar 330DL excavator with a 2 yd bucket, a Komatsu D355A bulldozer with a u-blade and ripper, a Caterpillar 988 loader, and a Caterpillar 769C 35-ton rock truck. The wash plant consists of a Clemro vibrating grizzly feeder with a 1.2 by 5.2 m (4 × 17 ft) deck containing 0.7" by 1.2" holes and a 1.8 by 3 m (6 × 10 ft) prewash. Sluice runs include a 1.8 by 2.7 m (6 × 9 ft) run with 1" angle iron riffles, and 3.6 by 2.7 m (12 × 9 ft) run with expanded metal riffles and nomad matting. A John Deere generator powered the Clemro. A 6" Gorman Rupp trash pump supplied water to the wash plant at 1200 igpm, allowing the plant to process 125 yd^3 (96 m^3)/hr. Process water was acquired from Duncan Creek and effluent was settled out-of-stream in one pond approximately 68 by 46 by 3 m (225 × 150 × 9 ft). A two-cell jig with a long tom was used for clean-ups.

In 2020, Rally! Mining ULC utilized a Volvo EC700 excavator, Volvo EC4800L excavator, Caterpillar 330B excavator, four Volvo A40F rock trucks and two Volvo L220 wheel loaders.

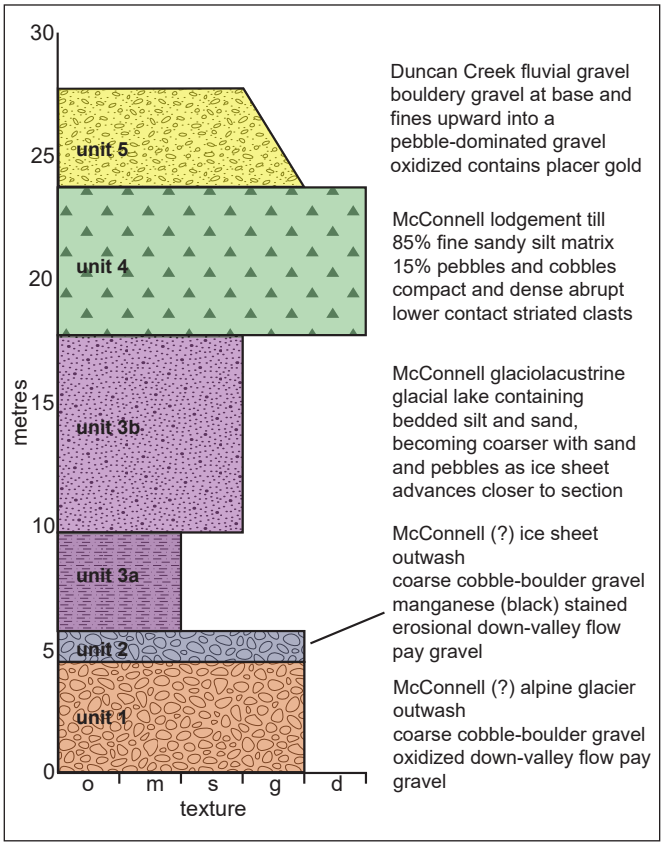
Surficial Geology and Stratigraphy Two deposits were targeted for placer mining between 2018 and 2020; a modern floodplain gravel and a buried glaciofluvial gravel on the left limit above camp,



View in 2018, looking downstream on Duncan Creek. The image shows the two placer mining areas of interest, the left limit deep pit located near the McConnell glacial limit and the modern floodplain deposit.

six claims below the upstream boundary of the claim block. The Duncan Creek floodplain gravel consists of a coarse gravel layer, 1 to 2 m (3–6 ft) thick that overlies a false bedrock of glaciolacustrine silt and till. The gravel is moderately to well-sorted, imbricated and represents the modern channel deposit of Duncan Creek. Previous drilling and geophysics suggests the glaciolacustrine silt and till is at least 24 m (80 ft) thick.

Adjacent to the floodplain cut and closer to the left limit hillside is a deeper deposit. Despite the discovery of gold in the drainage by Gustavus Gustavusen and his sons in 1898, deposits like this in Duncan Creek have remained largely undeveloped due to equipment capacity limitations and geologic complexities. In 2019 and 2020, it became the focus of attention for Rally! Mining ULC. The deposit consists of glaciofluvial gravel overlain by an up-valley-flowing glacial sequence and modern Duncan Creek gravel. The glaciofluvial gravel consists of two units, and while both units are processed for placer gold, it is the upper (black) gravel that contains better values. The lower gravel is an oxidized, boulder-rich unit that sits on bedrock (bedrock was not exposed when section was logged). The upper manganese-stained black gravel is very coarse and is in erosional contact with the lower gravel suggesting a down-cutting event occurred that partially reworked the lower gravel.



Detailed stratigraphy found in the left limit deep pit on Duncan Creek.



A view of the left limit deep pit that was formerly targeted by Duncan Creek Golddusters showing a coarse, placer gold-bearing gravel at the bottom of the cut (units 1 and 2).

This reworking explains the higher gold concentrations in the upper gravel. Both units are derived from Duncan Creek and were likely deposited from meltwater draining small alpine glaciers in the headwaters. Increase in flow and energy, recorded by the upper black gravel, could be associated with incursion of the Cordilleran Ice Sheet into the Keno City area resulting in a high-energy meltwater pulse down Duncan Creek. A sequence of fine-grained gravel, planar-bedded silt and a unit of till overlie the glaciofluvial gravel. These units represent advance of the Cordilleran Ice Sheet, likely during the last glaciation, up the drainage from the Mayo River valley. Fine-grained sediments overlying the pay gravel document the damming of water flow within Duncan Creek by the Cordilleran Ice Sheet. As the ice sheet passed over this part of the valley the till unit was deposited at the base of the glacier. The ice sheet terminated immediately up-valley from this section, which may account for the thicker till unit associated with an end moraine. Glacial erosion at the base of the ice sheet was limited because the site is near the terminus where ice thickness, flow energy, and overall duration of glaciation is reduced. Upon retreat of the ice sheet from Duncan Creek valley, fluvial activity commenced and deposited the uppermost gravel.

Bedrock Geology Bedrock is muscovite-schist, in varying degrees of decomposition.

Gold Characteristics Recovered gold is typically smooth and flat with some rough and rounded pieces. The majority of the gold is smaller than screen size 18. Nuggets are typically smooth and locally includes quartz. The fineness of gold is 780.

Upper Duncan, A tributary of Mayo River

105M/14 2019: 63°52'06"N, 135°15'10"W

Earth & Iron Inc., 2018, 2020
Rally! Mining ULC, 2019–2020

Water License: PM16-015-2 (Active 06/2026)
Active Producer (2018–2019) **Operation no. 154**

Location Upper Duncan Creek, 5.5 km upstream from its mouth.

Work History and Mining Cuts Limited information is available for Upper Duncan Creek in 2018 and 2019. Earth and Iron Inc. optioned Upper Duncan Creek to Rally! Mining ULC in 2019. Mining continued on a right limit glaciofluvial fan deposit near camp that had been previously explored in 2017. In 2020, Earth & Iron Inc. received Yukon Mineral Exploration Program (YMEP) funding for an electrical resistivity survey, drone imagery and 170 m of reverse circulation drilling. Reclamation work was completed by Rally! Mining ULC in 2020 after they move to lower Duncan Creek.

Equipment and Water Treatment No Equipment was documented in 2019.

Surficial Geology and Stratigraphy The fan deposit mined on the right limit of Upper Duncan Creek has a complex origin associated with glaciofluvial sedimentation during the Reid glaciation and subsequent fluvial sedimentation. During the Reid glaciation, the Cordilleran Ice Sheet advanced south up Thunder Gulch and meltwater drained over the divide into Upper Duncan Creek. This process resulted in erosion of a bedrock canyon in a first-order tributary stream to Upper Duncan Creek. Sediment carried in the outwash off the melting ice sheet and locally derived eroded bedrock accumulated in a fan deposit. The sediment is poorly sorted, primarily clast-supported and has a silty sand matrix. Boulders are common within the gravel. The total thickness of the glaciofluvial fan gravel is approximately 10 m (33 ft). Overlying the glaciofluvial fan gravel is a modern fan gravel deposited from on-going fluvial drainage from the tributary. This material is finer grained and the matrix consists of primarily sand. Placer gold is extracted from the lower portions of the glaciofluvial fan deposit.

Bedrock Geology Upper Duncan Creek lies near the Robert Service thrust fault and includes Mississippian clastic rocks (principally the Keno Hill quartzite) and Neoproterozoic sedimentary and metasedimentary rocks of the Yusezyu Formation (Colpron, 2017).

Gold Characteristics Placer gold has a rough, angular shape.

Thunder, a tributary of Lightning

105M/14 2020: 63°54'41"N, 135°15'16"W

Bardusan Placers Ltd., 1991–1992, 1998–2012, 2014–2020

Water License: PM13-055 (Active 04/2024)
Active Producer (2018–2020) **Operation no. 155**

Location Thunder Gulch, at its confluence with Lightning Creek.

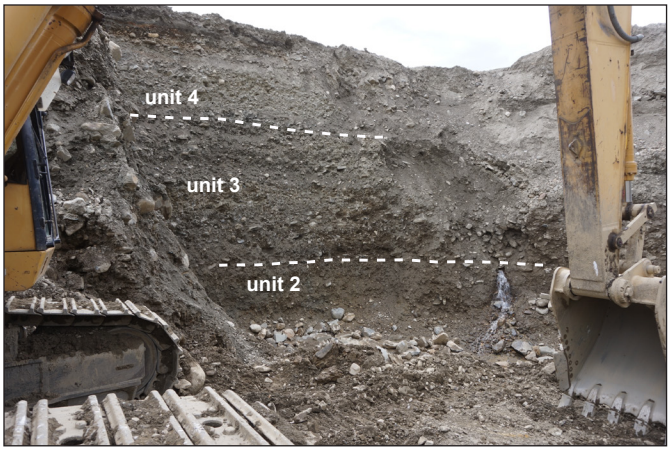
Work History and Mining Cuts For the past three years Bardusan Placers Ltd. has targeted a thick package of Thunder Gulch fan gravel and till at the junction with Lightning Creek. They operated a daily eight to ten hour shift and employed five people.

Equipment and Water Treatment Equipment present on site included an Hitachi 450 excavator to strip and stockpile pay, an Hitachi UH20 excavator for stripping, a Caterpillar 980C front end loader for digging pay and feeding the sluice plant, and one Caterpillar 988B front end loader to strip and move tailings. The wash plant consisted of a 3 by 6 m (10 × 20 ft) Derocker screen deck, which fed three stacked sluice runs with flat bar riffles in the upper run and 1" angle iron riffles and expanded metal in the lower two runs. The Derocker was able to process 70 loose yd^3 (53 m^3)/hr. During 2019, water was pumped from Lightning Creek and discharged through a series of settling ponds located on the left limit of Lightning Creek. The initial pond uses fine tailings as an outer barrier and coarse tailings as an inner barrier. Water percolates through the barrier walls as a filtration mechanism. Tailings are progressively added to as mining continues, which provides increasing water filtration. Clean-ups were conducted using a long tom to concentrate, a magnet to isolate the magnetics, and the concentrate was melted into a doré bar.

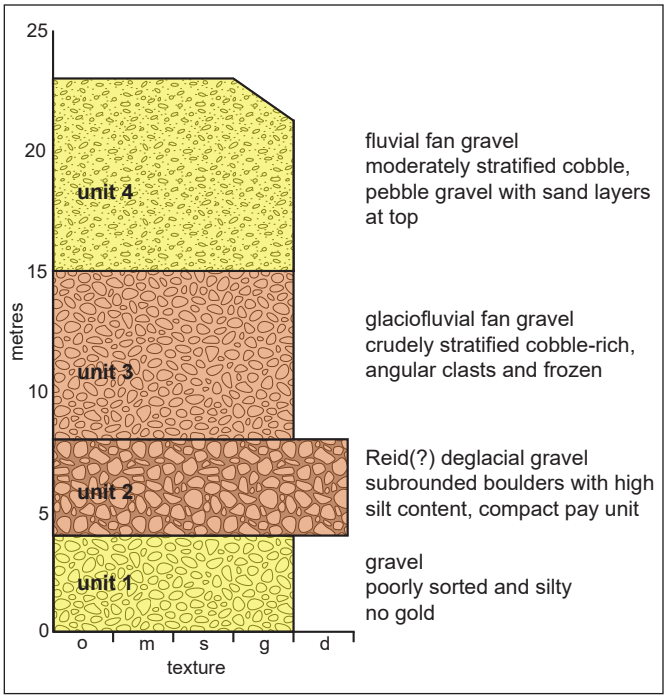
Surficial Geology and Stratigraphy In 2019 a 23 m (70 ft) section was described at the mouth of Thunder Gulch on the right limit. The sediment package consists of coarse Thunder Gulch fluvial fan gravel overlying a coarse, compact glacial-like sequence. Unit 1 at the base is a poorly sorted, blue-grey coloured, silty coarse gravel that has mottled oxidation and is approximately 1 to 2 m (3.3–6.6 ft) thick. This unit, despite sitting on bedrock, does not contain pay. Overlying unit 1 is a boulder diamicton (unit 2) interpreted to be a reworked till derived from Thunder Gulch. Approximately 25% of the deposit consists of subrounded boulders and the clasts are crudely imbricated. Unit 2 is 4 m (13 ft) thick and is processed for placer gold. A 15 m thick (50 ft) fluvial fan gravel overlies the till and consists of two units. Overall, the fan gravel is coarsest at the base and becomes progressively finer towards the top. These gravel units do not contain economic placer gold concentrations and are stripped.



A view upstream of the Bardusan Placers Ltd. cut on Thunder Gulch in 2019. The deposit consists of a 15 m (49 ft) thick fan gravel overlying a high-energy gold-bearing Thunder Gulch gravel. Lightning Creek is visible in the lower left corner.



A close-up view of the stratigraphic sequence and the silt-rich gravel at the base that defines unit 2. This unit is processed for placer gold. Unit 1 is not visible in the photograph.



Stratigraphic section from the mouth of Thunder Gulch in 2019.

Evolution of the Thunder Gulch sequence appears associated with a high-energy reworking event that was followed by fan gravel aggradation. According to mapping by Bond (1997), this portion of Thunder Gulch and Lightning Creek were last glaciated during the Reid glaciation 120,000 years ago. At that time, the Cordilleran Ice Sheet advanced from the east and flowed down Lightning Creek. The ice was thick enough to advance up Thunder Gulch to at least the forks. Local alpine glaciation in Thunder Gulch was limited, but small ice accumulations may have contributed increased water volumes in the drainage during melt periods. During the retreat of these glaciers from the area, significant erosion may have occurred due to increased meltwater flows. This erosion may have been vigorous enough to down-cut and rework sediment onto the bedrock surface, particularly in Lightning Creek. In Thunder Gulch much of the Reid glacial sediment would have been eroded and reworked, including any underlying pay gravel. The erosion event that followed the Reid glaciation is recorded in the 4 m (13 ft) thick pay gravel near the base of the section (unit 2). The underlying barren gravel on bedrock likely represents a pre-Reid Thunder Gulch gravel that was off the pay streak and escaped the erosion event. During the waning stages of the erosion event water flows decreased and the fan gravel began to accumulate. The fan gravel continued to accumulate during the Gladstone glaciation 60,000 years ago. During the McConnell glaciation, from 30,000 to 16,000 years ago, this area remained unglaciated; however, meltwater flowed down Lightning Creek. The meltwater initiated another erosion event and much of the Thunder Gulch fan sequence would have been reworked in the middle of the valley. The fan gravel sequence and underlying pay unit positioned to the side of the valley on the right limit survived McConnell reworking. Erosion appears to have been focused in the middle of the valley and toward the left limit.

Much of the Thunder Gulch fan sequence is positioned near the left limit of the Lightning Creek valley. This opens up the possibility of exposing gravel from Lightning Creek within the stratigraphy. Bardusan Placers is considering the potential for a left limit Lightning Creek deposit in this area, however, exploration efforts are challenging due to the steep organic-rich, permafrost-covered slope.

Bedrock Geology Bedrock varies between shale, quartzite and schist.

Gold Characteristics Recovered gold is bright with slight red staining, angular, flat and round with 10% greater than size 6 mesh. The purity of the gold is 780 to 800.

Granite, a tributary of Roop Lakes

105M/14 2020: 63°51'08"N, 135°03'47"W

Granite Creek Resources, 2014–2020

Water License: PM19-049 (Active 01/2030)
Water License: PM12-012-3 (Active 07/2022)
Active Producer (2018–2020) **Operation no. 156**

Location Upper Granite Creek, to the southeast of Mount Hinton.

Work History and Mining Cuts For the period 2018 to 2020 Davies Contracting operated on the right limit of upper Granite Creek. Most of the mining cuts were located above the McConnell end moraine. A 2020 cut measured 65 by 65 m (213 × 213 ft) at surface and tapered to 50 by 50 m (164 × 164 ft) at the bottom of the cut. In 2018, a YMEP-funded exploration project consisting of test-pitting was conducted above a well-developed recessional moraine. In 2020, a second YMEP-funded exploration program focused on the downstream-end of the Brodie claims in the pass area between Granite and Keystone creeks.

Equipment and Water Treatment Two John Deere 450 excavators are used to move overburden and pay; a John Deere 270 excavator is kept as a spare. A Caterpillar D98 bulldozer is utilized for stripping. Thirty-ton Terex and Caterpillar rock trucks haul pay from the cut to the wash plant. A Caterpillar 966C loader is used to feed the wash plant and remove tailings. The wash plant consists of a Derocker that screens to 1.25", and sluice runs containing hydraulic riffles, Hungarian riffles and expanded metal. A 10" pump feeds water to the plant, which uses 1200 gal/min and can process 45 to 50 yd^3 (34–38 m^3)/hr. A series of three settling ponds are located out-of-stream, immediately downstream from the wash plant with zero discharge to the creek.



A view looking north into the upper Granite Creek basin. Placer mining is concentrated just beyond and near the McConnell end moraine (dashed line).

Surficial Geology and Stratigraphy Placer deposits in upper Granite Creek are contained in a variety of settings associated with both glacial and interglacial deposits. The variety of depositional settings reflects the complex glacial history, which has significantly affected the distribution and sedimentology of the placer gold deposits. The Gustavus Range has been glaciated numerous times during the Quaternary Period by both locally produced alpine glaciers and the distally sourced Cordilleran Ice Sheet. The most recent glaciations, including the McConnell (29–14 ka BP), Gladstone (71–57 ka BP), and Reid (191–123 ka BP), all had a significant effect on the Granite Creek area. Periglacial weathering (e.g. frost shattering) of veins in the Keno Hill quartzite, and erosion and milling by former glaciers liberated placer gold in the Granite Creek cirque. Once liberated into colluvium or morainal sediments, the placer gold could then become concentrated through fluvial processes during interglacial periods. The most recent interglacial/interstadial warm intervals include the period 29 to 57 ka BP and 71 to 123 ka BP. Fluvial pay channels associated with these warm periods may have been reworked during subsequent glacial periods, enriching the basal till environment of the glacier. Where the fluvial interglacial pay channel has cut into bedrock, or lies beyond a glacial limit, it may have escaped glacial erosion, and be preserved under morainal or glaciofluvial sediment. Despite placer gold being widespread in the upper Granite Creek surficial sediments, economic concentrations are generally restricted to deposits that have a fluvial or glaciofluvial history, or, where highly mineralized bedrock was eroded directly by glaciers. Recent hardrock exploration within the cirque by Strategic Metals has identified visible gold in veins and rock assays grade between 1 and 30 g/t gold (ref. web site). The anomalies extend under the glacial cover in the valley bottom and they would have been susceptible to glacial erosion.

Placer deposits near the McConnell end moraine that have been mined in recent years include the following settings: pre-McConnell (Gladstone?) oxidized till, McConnell till, pre-McConnell interglacial fluvial gravel, and modern Holocene fluvial gravel. As mining progresses upstream into the Granite Creek cirque, McConnell glacial and glaciofluvial processes will dominate the placer settings. Placer mining beyond the McConnell end moraine in the Keystone pass area will have to take into account added complexities associated with incursion by the Cordilleran Ice Sheet from the east; this incursion caused glacial lake sedimentation in the pass area. Placer deposits below the glacial lake sediment will be associated with pre-McConnell interglacial sediments and Gladstone (?) till.

Bedrock Geology Bedrock is mapped as shale and quartzite (Roots, 1997).

Gold Characteristics Gold shape is pristine to reshaped. Gold grain-size distribution is 60% -4 mesh and 40% +4 mesh.



A reclaimed portion of upper Granite Creek featuring a well-armoured channel. Mountainous terrain is known for extreme precipitation and channel reinforcements, such as this, are effective at controlling erosion and sediment release. Adjacent areas are top-coated with silt and sand providing good soil moisture conditions for revegetation.

Granite, a tributary of Roop Lakes

105M/14 2020: 63°51'06"N, 135°03'34"W
105M/14 2019: 63°50'59"N, 135°03'24"W

Earth & Iron Mines Inc. 2018–2020

Water License: PM17-014 (Active 06/2027)
Water License: PM17-009 (Active 05/2027)
Water License: PM16-081-1 (Active 03/2027)
Active Producer (2018–2020) **Operation no. 157**

Location Granite Creek, headwaters.

Work History and Mining Cuts Earth & Iron Mines Inc. mined and explored under an option agreement with Granite Creek Resources during the 2018 to 2020 period. Earth & Iron made significant investments in exploration during the reporting period with technical guidance provided by Geoplacer Exploration Ltd. In 2018, a YMEP funded exploration program was undertaken on Allen, Faith and MacMillan creeks to the north of Granite Creek. This included resistivity geophysics and limited

test pitting. On Granite Creek, 18 reverse circulation holes totaling 255 m were drilled on the Brodie claims. The drillholes ranged from 8 to 20 m in depth. Resistivity geophysics were undertaken on the Dean and Brodie claims. In 2019, a resistivity survey, totaling 3.75 km in 13 lines was conducted on Granite Creek, and three holes were drilled; drillhole depths ranged from 16 to 25 m. From 2018 to 2020, 11 people were employed and mining cuts were located on the left limit of Granite Creek below the McConnell end moraine on the Brodie claims. A 2019 cut measured 60 by 110 m (200 × 360 ft) with a depth of 9 m (30 ft) on the creek side and 11 m (36 ft) on the hillside. In 2020, mining progressed up to and into the McConnell moraine on the left limit of Granite Creek. A cut measured in mid-July was 40 by 90 m (131 × 295 ft) with a depth to bedrock of 40 m (130 ft).



Dean and Stuart Gray (left and center) of Earth & Iron Mines Inc., discuss wash plant optimization with Randy Clarkson on Granite Creek.

Equipment and Water Treatment Equipment includes a Caterpillar 355 excavator for digging and loading pay gravel, a Caterpillar 345B excavator for feeding the wash plant, a Caterpillar 988F loader for managing tailings and Caterpillar 740 trucks are used for hauling pay or overburden. The wash plant consists of a grizzly-conveyor feeder and double screen deck. The sluice box is fitted with an initial 1.2 m (4 ft) wide section of angle iron and boil box that subsequently fans to a 3.6 m (12 ft) wide section consisting of an initial slick plate, expanded metal, hydraulic riffles, boil box, angle iron and additional expanded metal. The total length of the sluice box is 10.4 m (34 ft). The plant is capable of processing 120 to 150 yd^3 (92–115 m^3)/hour. Settling facilities are located out-of-stream, and consist of a series of four initial settling ponds that drain into a former mine cut. Coarse tailings are used to filter waste-water prior to it entering the former mine cut. Pumps are located at the far end of the mine cut for recirculation back to the plant.

Surficial Geology and Stratigraphy Placer settings for the Granite Creek area are described in the previous entry (see Granite Creek Resources).



A view looking north up Granite Creek at Earth & Iron's 2019 cut.

Earth & Iron Mines Inc. extracted placer gold from both till and fluvial gravel deposits. At the 2019 cut, which is located downstream from the McConnell end moraine and near the modern channel of Granite Creek, 5 m (16 ft) of till is overlain by 4 m (13 ft) of modern fluvial gravel. Both the lower portion of the gravel and the till were processed for placer gold. In 2020, mining progressed up to the McConnell moraine. This resulted in increased thickness of morainal sediment to be stripped.

Bedrock Geology Bedrock is Keno Hill quartzite and schist.

Gold Characteristics Gold shape is pristine to reshaped. Gold grain-size distribution is 60% -4 mesh and 40% +4 mesh.

Granite, a tributary of Roop Lakes

105M/14 2020: 63°50'53"N, 135°03'20"W

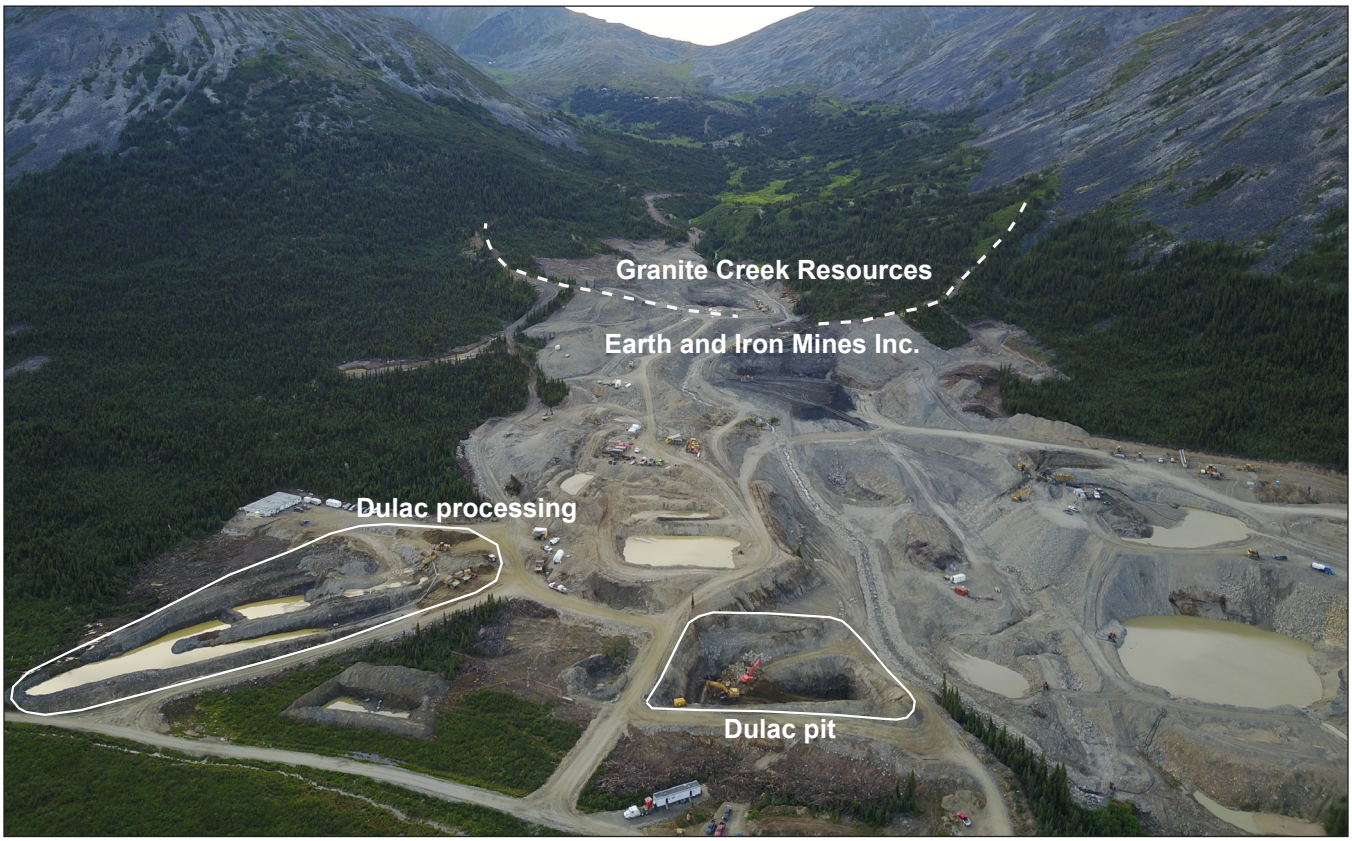
Dulac Mining, 2020

Water License: PM12-012-3 (Active 07/2022)
Active Producer (2020) **Operation no. 158**

Location Granite Creek, 1.6 km downstream from its headwaters.

Work History and Mining Cuts In 2020, Dulac Mining optioned ground on the right limit of Granite Creek from Davies Contracting. Seven personnel worked a single 11 hr shift per day. The first cut, measuring 30 by 90 m (100 × 300 ft), was located below the McConnell end moraine and immediately upstream from the Davies camp. Later in the season, the cut advanced to the west for a total size of 60 by 180 m (200 × 600 ft). Pay gravel from the cut was hauled to a processing area near the Dulac camp.

Equipment and Water Treatment Equipment in 2020 included a Zaxis 450LC excavator, a John Deere 800C excavator, a Caterpillar D7 bulldozer, two Caterpillar 769B rock trucks and a Caterpillar 980 wheel loader. A Derocker was used to process up to



A view north looking up Granite Creek and the location of the various operators and the McConnell end moraine (dashed line).

60 yd^3 (46 m^3)/hr. Settling facilities are located out-of-stream, and consist of three ponds. The initial pond captures the coarse sluice tailings (sand and pebbles), which is excavated and applied to the nearby camp pad. The second pond captures sand and silt and the third (larger U-shaped) pond settles silt and clay. Water is recirculated back to the plant from the third pond.

Surficial Geology and Stratigraphy The placer deposit settings for the Granite Creek area are described in a previous entry (see Davies Contracting, operation 156). The Dulac cut stratigraphic sequence consists of two glaciations and an interstadial period. The lowermost unit (unit 1) consists of an oxidized till originating from the Granite Creek cirque. The till contains some rounded clasts, which are interpreted to be reworked from a former stream gravel that was eroded by the alpine glacier as it advanced from the cirque. This unit is processed for placer gold and the unit is interpreted to be a Gladstone alpine basal till, but additional studies are required to confirm this. Overlying the oxidized till is a grey, mottled till containing larger clasts. A boulder lag is present near the upper contact. Vertically oriented clasts found near the upper contact suggest cryoturbation (near surface permafrost process) has affected the former surface. This unit is interpreted to be an ablation till (debris deposited from a melting glacier) associated with the underlying Gladstone alpine basal till. A thin unit of silt is draped over the ablation till and it is interpreted to be loess (wind-blown silt) deposited on the glacier ablation surface at the end of the Gladstone glaciation. Unit 4 is a 3 m (9.8 ft) thick gravel unit that originated from upper Granite Creek. This gravel is interpreted to be McConnell advance glaciofluvial outwash draining off the Granite Creek alpine glacier that reformed at the onset of the last glaciation. Unit 4 is buried by a 7 m (23 ft) thick layer of glacial lake sediment (unit 5a) that coarsens upward into a pebbly gravel.



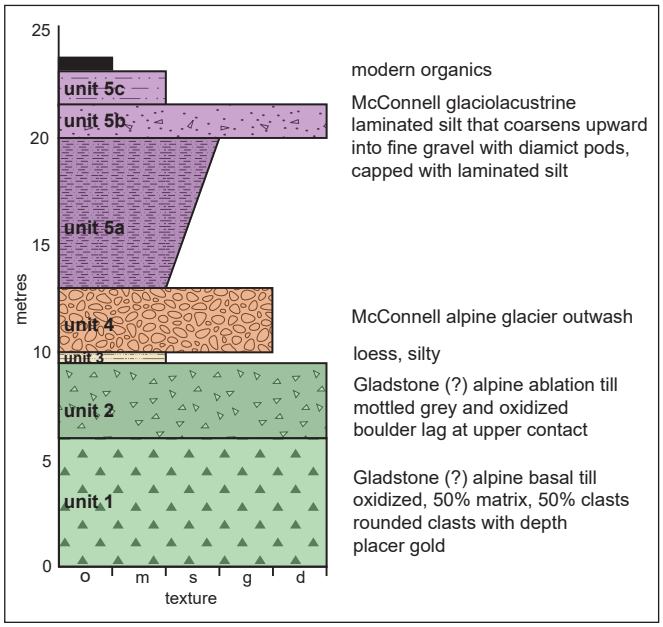
Dulac Mining cut on Granite Creek in 2020.

This unit formed when the Cordilleran Ice Sheet advanced westward into the area and dammed lower Granite Creek. A glacial lake would have formed in the pass area and drained into Keystone Creek. A glaciofluvial delta would have been present in front of the Granite Creek alpine glacier, which contributed progressively coarser sediment into the lake as the alpine glacier advanced. At the height of the last glaciation, the Granite Creek alpine glacier deposited blocks of till and coarse debris into the lake (unit 5 b). During the waning stages of the last glaciation around 16,000 years ago, the ice began to retreat and additional glaciolacustrine sediment was deposited into the glacial lake (unit 5c).

Future development on the right limit or west side of Granite Creek, below the McConnell end moraine, should target a potential interglacial channel that drained west into Keystone Creek. If a channel formed during a previous interglacial period, it may have been reworked by subsequent glaciation and therefore the till will be enriched on bedrock. Mapping the bedrock surface with a series of east-west oriented geophysical lines and drill fences is recommended.

Bedrock Geology Bedrock is Keno Hill quartzite and schist.

Gold Characteristics Gold shape is pristine to reshaped. Gold grain-size distribution is 60% -4 mesh and 40% +4 mesh.



Stratigraphic section from Granite Creek beyond the McConnell end moraine at Dulac Mining cut in 2020.

Unnamed, a tributary of Granite

105M/14 2020: 63°50'21"N, 135°03'25"W

Gemmer, B., 2020

Water License: PM12-012-3 (Active 07/2022)
Active Producer (2020) **Operation no. 159**

Location Unnamed right limit tributary of Granite Creek; 0.6 km up the tributary from the main Granite Creek valley, located directly northeast of Mount Albert.

Work History and Mining Cuts An unnamed right limit tributary of Granite Creek was optioned by Mr. Gemmer from Granite Creek Resources in 2020. A six-person crew initially established camp and in early summer mobilized their sonic drill rig onto site. Four holes were drilled in the lower part of the drainage, and there are plans to expand the exploration program in 2021.

Equipment and Water Treatment Equipment utilized in 2020 included an Hitachi EX400LC excavator, an Hitachi 850 excavator and two Caterpillar D350E articulated dump trucks. A Derocker was located on site, but no sluicing on their own plant occurred. A bulk sample was collected and material was processed using J. Davies wash plant.

Surficial Geology and Stratigraphy Mechanized equipment has not been used to explore this unnamed right limit tributary drainage. The placer potential in the drainage is probable due to its potential to host mineralized gold veins in the Keno Hill quartzite, proximity to the proven placer ground in Granite Creek, and the districts favorable glacial history that has permitted placer preservation. The tributary has hosted alpine glaciers in the past that have had restricted extent. During the McConnell glaciation, the glacier terminated near the Granite Creek valley. Because of the restricted glaciation in the valley, there is potential for preservation of a paleo-placer that has been reworked but not completely removed from the drainage as the ice advanced downstream. The potential for a modern placer deposit to occur in a gulch gravel or till in this high gradient tributary warrants further exploration. Drillholes encountered up to 9 m (30 ft) of material on bedrock that consists largely of near surface modern gravel and till at depth.

Bedrock Geology Bedrock is mapped as black to silvery shale or carbonaceous phyllite (Roots, 1997).

Gold Characteristics Gold recovered is fine.



A view looking south up the unnamed right limit tributary of Granite Creek, where B. Gemmer's exploration took place.

Davidson, a tributary of Mayo River

105M/11 2020: 63°44'37"N, 135°25'19"W

535785 Yukon Inc., 2018–2020

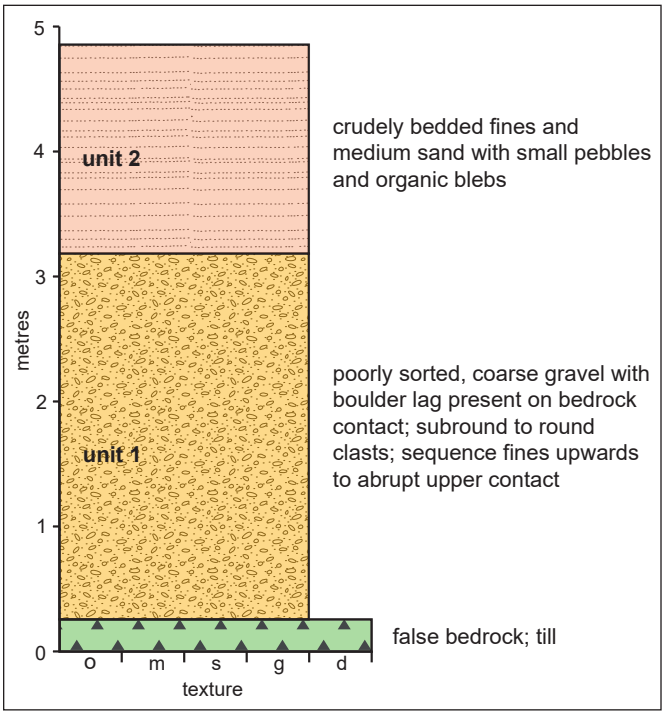
Water License: PM14-005-1 (Active 05/2024)
Active Producer (2018–2020) **Operation no. 160**

Location Davidson Creek, approximately 2.6 km upstream from its confluence with Mayo River.

Work History and Mining Cuts The operator has focused work on the lower portion of Davidson Creek for the past three years. With a crew of two to four people each season, they have progressively mined downstream on the left limit of the creek, approximately 0.4 km downstream from camp. The cut in 2019 measured 20 by 70 m (65 × 230 ft). In 2020, a downstream extension of the 2019 cut was mined and measured 55 by 34 m (180 × 110 ft).

Equipment and Water Treatment In 2020, the equipment present included three excavators: a John Deere 330LC used for stripping, a Doosan DX420LC for digging pay, and an Hitachi EX330LC for feeding the plant. Two Caterpillar D400E rock trucks were used for hauling pay. A Caterpillar D6 bulldozer was also present on site. An oscillating screen deck fabricated by Arctech Circle replaced a Derocker in 2020. The oscillating screen deck consists of two split runs each 2.0 m (6.6 ft) wide by 3.8 m (12.5 ft) long, and each having both 1.5" and ⅜" screens. Run configuration consists of a 0.3 m (1 ft) slick plate, a boil box and 1.0 m (3.4 ft) of expanded metal, and are lined with 3M backed vortex matting. Water was supplied to the plant using a 6" pump at the rate of 2500 gal/per minute. The plant could process between 100 and 120 yd^3 (76–92 m^3)/hr depending on material. Clean-ups were conducted every 20 hours and utilized a jig, screens, demagnetizer and a pan. Water is 100% recycled.

Surficial geology and stratigraphy The lower portion of Davidson Creek enters the Mayo River valley, cutting through the glacial fluvial valley fill that resulted from multiple glaciations. In the Mayo River valley, thick deposits of fine-grained gravel deposits are present on both limits and tributaries of the Mayo River rework these deposits. In 2019 and 2020, 535785 Yukon Inc. was mining at the point in the drainage where Davidson Creek initially eroded into this thick package of glacial-fluvial gravel. Unit 1, from 0 to 3.2 m (0–10.5 ft), is a poorly sorted coarse gravel consisting of 10% boulders, 60% cobbles and 30% pebble. A coarse boulder lag containing well-rounded clasts up to 1.2 m (3.9 ft) in diameter was present on the (false) bedrock surface. A hard-packed clay layer acts as the false bedrock surface. The coarse cobble-boulder enrichment on the false bedrock likely accumulated during reworking. All of unit 1 is sluiced. Unit 2, from 3.2 to 4.9 m (10.5–16.0 ft), directly overlies unit 1. Unit 2 consists of crudely bedded silt and medium sand with small pebbles and organic blebs throughout. At the downstream end of the cut is a poorly exposed gravel



Stratigraphic section from the lower left limit of Davidson Creek in 2020.



Drone image of lower Davidson Creek looking upstream, with the new oscillating screen deck and 2020 cut location.

that is pervasively oxidized, very silty and contains decomposed clasts. It appears to underlie unit 1, however the lateral context is unclear within the mining cut. Its decomposed nature could indicate a paleo-Davidson Creek or Mayo River gravel is preserved at depth and escaped erosion by modern Davidson Creek.

Bedrock Geology Bedrock is weathered grey schist.

Gold Characteristics Gold is primarily fine to super fine, with no percentage of coarse gold recovered. It is flat and flakey, and fineness ranges from 830 to 840.

Edmonton, a tributary of Mayo Lake

105M/15 2020: 63°46'28"N, 134°48'39"W

Steppler Mining, 2019–2020

Water License: PM19-023 (Active 07/2029)
Active Producer (2019–2020) **Operation no. 161**

Location Edmonton Creek, approximately 0.5 km upstream from its confluence with Mayo Lake.

Work History and Mining Cuts The discovery claim on Edmonton Creek was staked in 1904 and aside from minor activity in the 1980s, no modern mining has been conducted in the drainage (YGS, 2010). Steppler Mining relocated from Highet Creek in 2020 to the mouth of Edmonton Creek where they began prospecting the alluvial fan-delta, on the right limit of the creek. A crew of two people worked the operation and in 2020 they conducted a 5000 yd^3 (3822 m^3) test on the upper end of the claim as well as processed 1000 yd^3 (765 m^3) of fan gravel.

Equipment and Water Treatment In 2020, they utilized a Doosan 225 excavator, a Caterpillar D8H bulldozer, a 5 yd Hitachi loader and a 3 by 6 m (10 × 20 ft) Derocker for processing material.

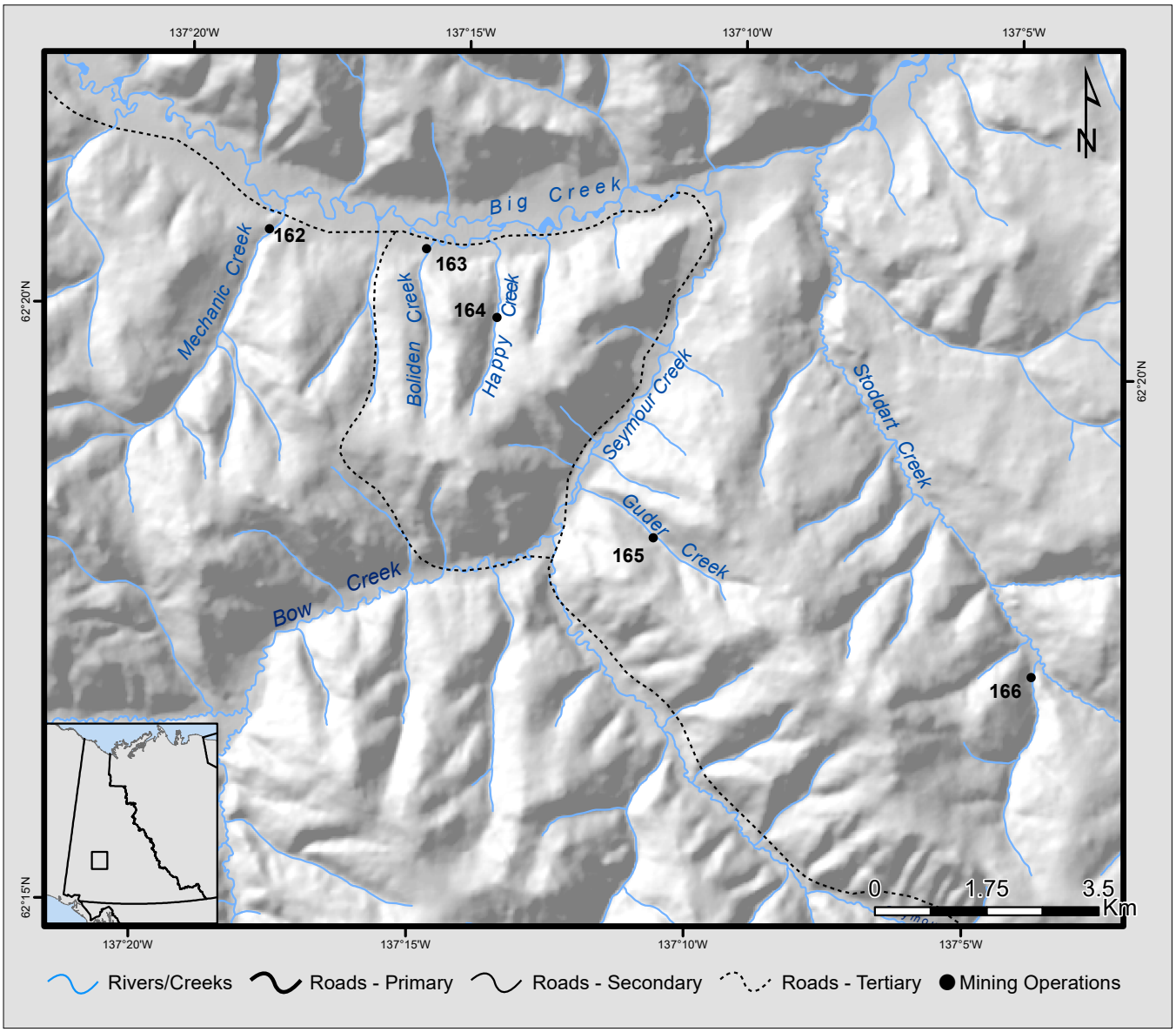
Surficial Geology and Stratigraphy Coarse, well-rounded boulders up to 3 m (10 ft) in diameter and angular blocks of diorite are common in the drainage (YGS, 2010). The operator was targeting the sizeable alluvial fan-delta that developed at the mouth of the creek (LeBarge *et al*., 2002).

Bedrock Geology Bedrock is mapped as black to silvery shale or carbonaceous phyllite (Roots, 1997).

Gold Characteristics Gold is fine.

BIG CREEK
PLACER AREA

SITES 162–166



Legend

162. Right Fork Mining
163. Warde, M.
164. 641166 Alberta Ltd.
165. Dodge, D.
166. 40056 Yukon Inc.

Mechanic, a tributary of Big

115I/06 2020: 62°20'45"N, 137°18'24"W
115I/06 2020: 62°20'07"N, 137°18'53"W

Right Fork Mining, 2000-2020

Water License: PM14-008 (Active 07/2024)
Active Producer (2018–2020) **Operation no. 162**

Location Mechanic Creek, 350 m upstream from its confluence with Big Creek; and 1.5 km upstream from its confluence with Big Creek.

Work History and Mining Cuts In 2018 work focused in the middle reaches of Mechanic Creek near the upper end of their claim block. A right limit cut was excavated. In 2019, pay gravel from mid-Mechanic Creek was stockpiled and in 2020 it was sluiced. Prior to relocating downstream, the Gows mined an extension of the 2019 cut on the right limit of mid-Mechanic Creek. A 50 by 45 m (164 × 145 ft) cut was made in the fluvial fan at the mouth of the creek in the fall of 2020 and will be extended farther into the right limit in 2021.

Equipment and Water Treatment In 2020, the equipment located on site included: four excavators, a Caterpillar 235, a Caterpillar 375, an Hitachi UH172 and an Hitachi UH09-7LC; a Caterpillar 980B loader; a grader; and three Caterpillar bulldozers, a D7E, a D7G and a D9L. A vibrating triple screen deck was used to process material at a rate of up to 60 yd^3 (45 m^3)/hr. The initial deck screened to 4", the secondary deck screened to 2", and finally a ⅝" screen is utilized on the third deck. The minus ⅝" sediment is fed into multiple sluice runs that have a combined width of 3 m (10 ft). Sediment that is <2" and >⅝" passes over a second 2" screen and is fed into lower portions of the sluice runs that have an increased slope angle to manage the larger clast size. A series of nine settling ponds are present in the Mechanic Creek drainage, and mostly occupy previously mined areas. Water is 100% recycled. Clean-ups were conducted using a jig and an XTruder 255 shaker table.



Buddy and John Gow conduct a final clean-up on their XTruder 255 shaker table in fall 2020.

Surficial Geology and Stratigraphy As mining has progressed upstream, Right Fork Mining has noticed that the pay gravel has become coarser and more channelized, and the bedrock surface has ledges. Placer gold and heavy minerals like magnetite have become more segregated with coarser gold grain sizes located in the coarse, basal gravel and finer gold grain sizes, together with more magnetite, in the overlying gravel. In some areas, the placer gold is elevated off the bedrock surface by 6 to 8" (15–20 cm), and may be influenced by the ledges in the bedrock surface. The gold segregation, both vertically and into multiple channels or pockets, has resulted in spotty panning. In the valley bottom, gravel is typically 1 to 2 m (3–6 ft) thick, poorly sorted and is clast supported. The gravel texture consists of 70% clast (20% boulders, 40% cobbles and 40% pebbles) and 30% silty coarse sand matrix. Most clasts have a subangular shape. The gravel is overlain by silty organic sediment that is 1 to 2 m (3–6 ft) thick in the middle of the valley and increase in thickness toward the valley side.

Bedrock Geology Bedrock is a partially decomposed quartz-feldspar porphyry with abundant quartz veinlets.

Gold Characteristics Placer gold has variable shapes including wire textures, subrounded grains that are nearly spherical (difficult to table) and larger pieces with rounded edges and crystalline pockets. Magnetite is attached to some pieces. The fineness is 890.



Cut measuring 50 by 45 m (164 × 145 ft) in the fluvial fan at the mouth of Mechanic Creek in 2020. The view is looking downstream, towards the Big Creek valley.

Boliden, a tributary of Big

115I/06 2020: 62°20'41"N, 137°15'32"W

Warde, M., 1999–2020

Water License: PM15-049 (Active 09/2025)
Active Producer (2018–2020) **Operation no. 163**

Location Boliden Creek, a tributary of Big Creek located between Revenue and Happy creeks.

Work History and Mining Cuts As a two person operation, Mr. Warde has been active on the lower reaches of Boliden Creek from 2018 to 2020. He, along with three additional people own the 15 claims on Boliden Creek. In 2020, a cut measuring 12 by 5 m (40 × 15 ft) was present mid-valley of the drainage immediately upstream from camp. Evidence of previous working and stripping continued up the drainage from camp for approximately 400 m (1312 ft).

Equipment and Water Treatment Equipment present on site in 2020 included a John Deere 450C bulldozer, a Caterpillar 235 excavator, a Caterpillar D6 bulldozer and a screen deck.

Surficial Geology and Stratigraphy In 2020, a cut on the Boliden Creek fan, on the left limit of the drainage consisted of 2 to 3 m (6.6–9.8 ft) of Boliden Creek gravel overlain by 3 m (10 ft) of reworked overbank material and muck.

Bedrock Geology Bedrock is mapped as orange to pink weathered, fine to medium-grained biotite hornblende granodiorite to quartz monzonite orthogneiss with local K-feldspar augen (Allan and Friend, 2018).

Gold Characteristics The fineness is 890.



Activity at the mouth of Boliden Creek in 2020. The view is looking south into the higher elevation of the Dawson Range.

Happy, a tributary of Big

115I/06 2020: 62°20'09"N, 137°14'10"W

641166 Alberta Ltd., 2017–2020

Water License: PM17-026 (Active 04/2027)
Active Producer (2018–2020) **Operation no. 164**

Location Happy Creek, 1.3 km from its confluence with Big Creek.

Work History and Mining Cuts The Von Harten's mine on Happy Creek is a two-person operation, and they have been progressively mining upstream since their first season in 2017. They operate in a narrow valley bottom setting that in 2020 was 14 m (47 ft) wide. In 2018, they were mining below a pingo located on the right limit of lower Happy Creek. In 2020, they began the season by opening a cut on the sidewall of the pingo located 1.1 km up Happy Creek, at the confluence of a small unnamed right limit tributary. After completing the pingo cut the Von Harten's moved slightly upstream and mined a total cut length of 60 m (200 ft) throughout the season. Approximately 7000 yd^3 (5352 m^3) of material was sluiced in 2019 and 5000 yd^3 (3823 m^3) was sluiced in 2020.

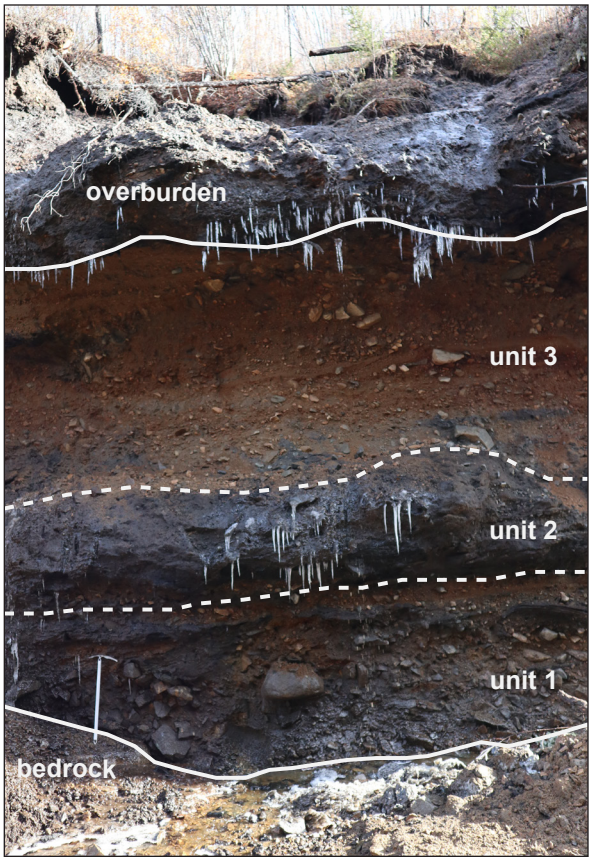
Equipment and Water Treatment The equipment in 2020 included a Caterpillar 235 excavator and a Caterpillar 966G loader. The wash plant consists of a track mounted Terex Finlay hydrascreen deck with 1" punch plate and a stacker conveyor. The sluice box is 0.9 m (3 ft) wide and consist of three sections: the upper section is 4.9 m (16 ft) of expanded metal at 2:1 slope; the middle section is 1.2 m (4 ft) with no riffles; and the lower section is 3.0 m (10 ft) with angle iron riffles at a 3:1 slope. The plant is capable of processing up to 32 yd^3 (24 m^3)/hr. Water from the sluice plant is settled instream using a series of eight ponds and water was 100% recirculated. Locally the pay is frozen and hydraulic stripping is utilized to liberate the gravel for the excavator to deliver to the plant. Clean-ups were conducted using a GoldHog longtom and a wheel.

Surficial Geology and Stratigraphy In 2018, a 4 m (14 ft) section was exposed on the right limit of Happy Creek. The section consisted of 1.2 m (4 ft) of weathered bedrock, 0.6 m (2 ft) of semi-cohesive oxidized gravel, and 0.6 m (2 ft) of coarse grey gravel with angular to subangular clasts. The gravel units are overlain by 1.8 m (6 ft) of weathered bedrock colluvium and minor organics. All of the gravel units are processed for placer gold.

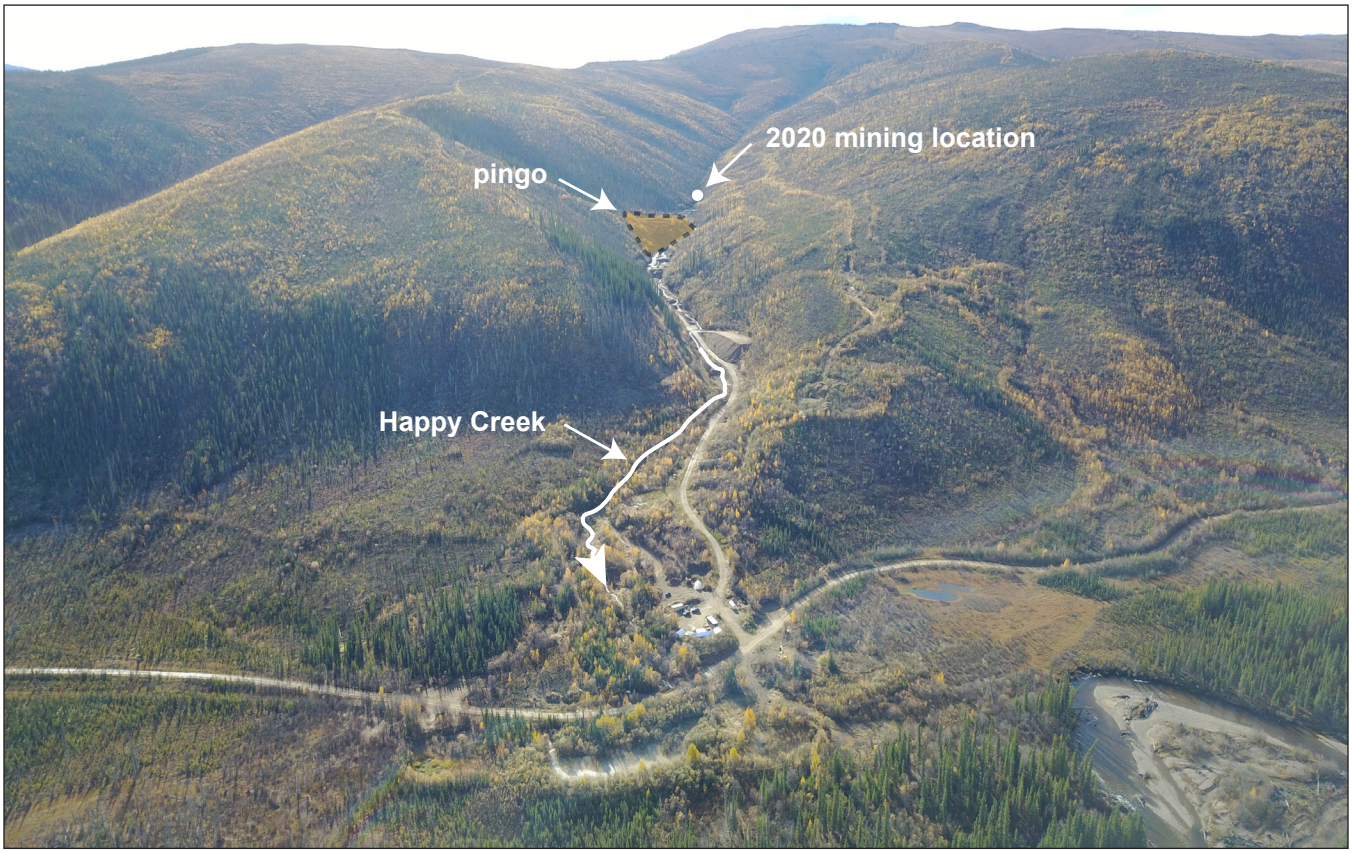
In 2020, the company processed sediment from the wall of the pingo. Pingos are ice-cored mounds that form where ground water encounters a permafrost environment (Huscroft, et. *al*., 2017). The pingo on this property is located on a cross-valley bedrock fault, which is often a focal area for groundwater flow. The growth of ice within the valley bottom acts to thrust the ground surface upward creating a large mound of ice-cored sediment. Material thrusted up by the pingo in Happy Creek consists of broken bedrock at the base and fluvial gravel at the top. This particular pingo has begun to collapse due to melting of the ice core, creating a crater in the upper surface.

Bedrock Geology Bedrock is predominately undulating, decomposed schist.

Gold Characteristics Gold is 60% flour gold and 40% coarse. The fineness varies from mid to upper 800s. An abundance of scheelite is recovered in the concentrate.



Stratigraphy from the right limit of Happy Creek, at the mining location in September 2020.



Aerial view of 641166 Alberta Ltd.'s operation on Happy Creek, with the extent of the pingo outlined by a dashed line.

Seymour, a tributary of Big

115I/06 2020: 62°18'24"N, 137°11'03"W
115I/06 2019: 62°17'36"N, 137°12'13"W
115I/06 2018: 62°18'36"N, 137°12'37"W

Dodge, D. and I., 2015-2020

Water License: PM12-024-1 (Active 10/2022)
Water License: PM14-075-1 (Active 05/2025)
Active Producer (2018–2020) **Operation no. 165**

Location Two locations: Seymour Creek, at the confluence with Bow Creek; and Guder Creek, a right limit tributary of Seymour Creek; 1.4 km upstream from its confluence with Seymour Creek.

Work History and Mining Cuts In 2018, Mr. Dodge operated on the right limit of Seymour Creek immediately below the confluence with Bow Creek. Mining targeted shallow ground along the right limit, downstream to the mouth of Guder Creek. A crew of four personnel were employed for the season and operated a single 10-hour shift per day. Pay gravel was trucked upstream to a processing and settling area located near camp. In 2019, Mr. Dodge moved back upstream on Seymour Creek to the deep pit that was excavated in 2016. The pit drain was lowered by 3.9 m (13 ft) in order to facilitate dewatering. Excavations focused at the upper end of the pit, which had been incompletely excavated in 2016. The cut on bedrock measured 30 by 30 m (100 × 100 ft). Pay gravel was hauled from the pit to a processing area adjacent to the cut. In 2020, a three person operation sluiced approximately 15,000 yd^3 (11 468 m^3) of material, mining a 30 by 37 m (100 × 120 ft) cut on Seymour Creek. The road was re-established into Guder Creek and an area 122 m (400 ft) in length was stripped, approximately 1.4 km upstream from its confluence with Seymour Creek.

Equipment and Water Treatment Equipment used during the 2018 to 2020 seasons included a Boart Longyear track mounted mini sonic LS250 drill and a Komatsu PC228 excavator used for servicing the drill. A Volvo EC700CL excavator, a Komatsu PC 400LC excavator, and an Hitachi excavator were used for digging overburden and pay. Two Volvo A40G haul trucks transported overburden and pay from the pit. A Caterpillar D8L bulldozer was used to push pay and remove tailings. A Volvo L180E loader was used to manage tailings and feed the plant, and a Komatsu 328 excavator was also used to feed the plant. The wash plant(s) consists of two Derockers situated side by side. They have 2" openings that feed two sluice runs lined with expanded metal and angle iron riffles. The sluice runs measure 1 by 7.6 m (3 × 25 ft). Each Derocker has a capacity of 70 yd^3 (54 m^3)/hr and water requirements of 600–700 igpm.

Surficial Geology and Stratigraphy Two types of placer deposits occur in Seymour Creek, each characterized by their depth to bedrock. A deep channel or former canyon is buried in the valley bottom at a depth of approximately 24 m (80 ft). The canyon was eroded by glacial outwash streams that flowed down the valley during recent glaciations. The canyon has since been infilled with glacial and interglacial deposits. In 2019, a poorly sorted, clast-supported, boulder-rich gravel (unit 1) was exposed at the base of the canyon. Many of the boulders have a subround to rounded shape. Near the margins of the channel, angular bedrock fragments from erosion of the bedrock canyon walls are incorporated into the gravel. The thickness of the deposit is 3 m (9 ft). Bedrock exposed at the base of the canyon consists of fractured intrusive rock. The walls of the



Close up view of the coarse, boulder pay gravel at the base of the Seymour Creek deep channel. Only the top of the boulder gravel is visible in the photograph near the water line. It is overlain by a thin, silty organic sediment and finer grained gravel.

canyon are near vertical on the left limit and sloping on the right limit (east side). A high concentration of coarse magnetite pebbles and cobbles are contained within the gravel. Based on the coarseness and the abundance of bedrock fragments in the gravel, it is assumed to represent sediment left over from the canyon-forming event. The 2019 cut was situated in a narrow section of the canyon (30 m width at the base), which may have contributed to its high-energy character. According to drill records, immediately upstream from the cut the canyon appears to widen, which may be a more favourable area for gold deposition (leading into the constriction) and a larger overall pay-gravel volume. The basal gravel unit in the canyon is overlain by 50 cm of bedded silt with minor amounts of organics near the upper contact (unit 2). Unit 3, from 3.5 to 4.5 m (11.5–15 ft), is an angular, dominantly cobble-size gravel. Unit 4, from 4.5 to 6.3 m (15–21 ft), is bedded sand with minor grey silt. Unit 5, from 6.3 to 10.7 m (21–35 ft), consists of alternating bedded sand and angular cobble-pebble gravel. Unit 6, from 10.7 to 16.7 m (35–55 ft), is a stratified cobble-pebble gravel that coarsens upward. On the right limit of the cut a small fan deposit from a side tributary adds an additional 7.3 m (24 ft) of stratified gravel and sand to the cut (unit 7). A significant layer of White River tephra colluvium caps the section.

The second type of placer deposit in Seymour Creek lies on the bedrock surface marginal to the buried canyon. Depth to bedrock is generally 6 m (20 ft). This corresponds with unit 6 of the stratigraphy described in the deep cut. Placer gold is concentrated on the bedrock surface and within fractures in the granitic bedrock. Potential exists to re-mine areas where bedrock was ineffectively cleaned in the past.



A view looking up Seymour Creek to the south of the deep channel exposure at D. Dodge's mine. Walls of the buried canyon are near vertical at the base and flare towards the top. Depths to bedrock range from 17 to 24 m (56–79 ft) and gold was mined from the upper rim of the channel on the left limit (right side of this photo) and from the base of the channel.

Mining in 2018 focused on the shallow deposits below the confluence with Bow Creek. The rim of the deep channel was encountered; however, significant exploration of the channel deposits was not completed.

The presence of the deep channel complicates the distribution of placer gold in Seymour Creek. Initial concentrations of gold within the valley bottom would have occurred on the shallower bedrock surface. Subsequent erosion of the deep channel likely occurred during the Reid glaciation 124,000 years ago. Incorporation of gold into the deep channel would largely rely on reworking gold from the shallower surface. Therefore, the distribution of placer gold on the shallower surface is relevant to the richness of the deep channel. Mining the deep channel in an area where the shallower bedrock surface was particularly rich might not be the best strategy since the deep channel may have down-cut in a low-grade zone of the valley bottom. In addition to understanding pay streak distribution, it is also relevant to understand the morphology of the deep channel. The width of the deep channel is important for understanding the volume of the shallow surface that was reworked (and potential for reworking placers off the shallow surface). The width of the channel is also a good indicator of the water velocity and potential for retention of fine gold within the channel.

Bedrock Geology Bedrock is moderately oxidized and weathered granodiorite.

Gold Characteristics Two populations of gold were observed in the 2017 cut; a coarser, subangular to subrounded population, that is characteristic of Seymour Creek and a fine and flat population that likely originates from Bow Creek. Gold concentrations are higher over brittle fractured bedrock versus bedrock that is softer and decomposed in proximity to valley perpendicular fault zones. Gold from Guder Creek is described as wire and crystalline, and has a fineness of 860.

Stoddart, a tributary of Big

115I/06 2020: 62°17'27"N, 137°04'02"W

40056 Yukon Inc., 2019–2020

Water License: PM20-024 (Active 08/2030)
Active Producer (2019–2020) Operation no. 166

Location Stoddart Creek, 9.3 km upstream from its confluence with Big Creek.

Work History and Mining Cuts Although Stoddart Creek was first staked in 1931 by Julia and Joseph Horsfall, activity in the drainage was minimal until the 1980s (YGS, 2010). In 2017, 40056 Yukon Inc. staked their claims on mid Stoddart Creek. Minimal site preparation occurred throughout 2019. In 2020, mining occurred on an unnamed left limit tributary, 200 m upstream from its confluence with Stoddart Creek. From July to mid-September, two people sluiced for 35 days, and processed approximately 3600 yd^3 (2752 m^3).

Equipment and Water Treatment In 2020, the equipment present included a Link-Belt excavator and a mini excavator. A screen deck with a single sluice run was used to process material at 20 yd^3 (15 m^3)/hr.

Surficial Geology and Stratigraphy Stoddart Creek valley is an incised drainage, bound by steep hillsides. Placer settings in the drainage include the valley bottom, intermediate benches up to 30 m (98 ft) above the valley bottom, and high-level benches up to 300 m (985 ft) above the valley bottom (YGS, 2010).

Bedrock Geology Bedrock is mapped as granodiorite (Allan and Friend, 2018).

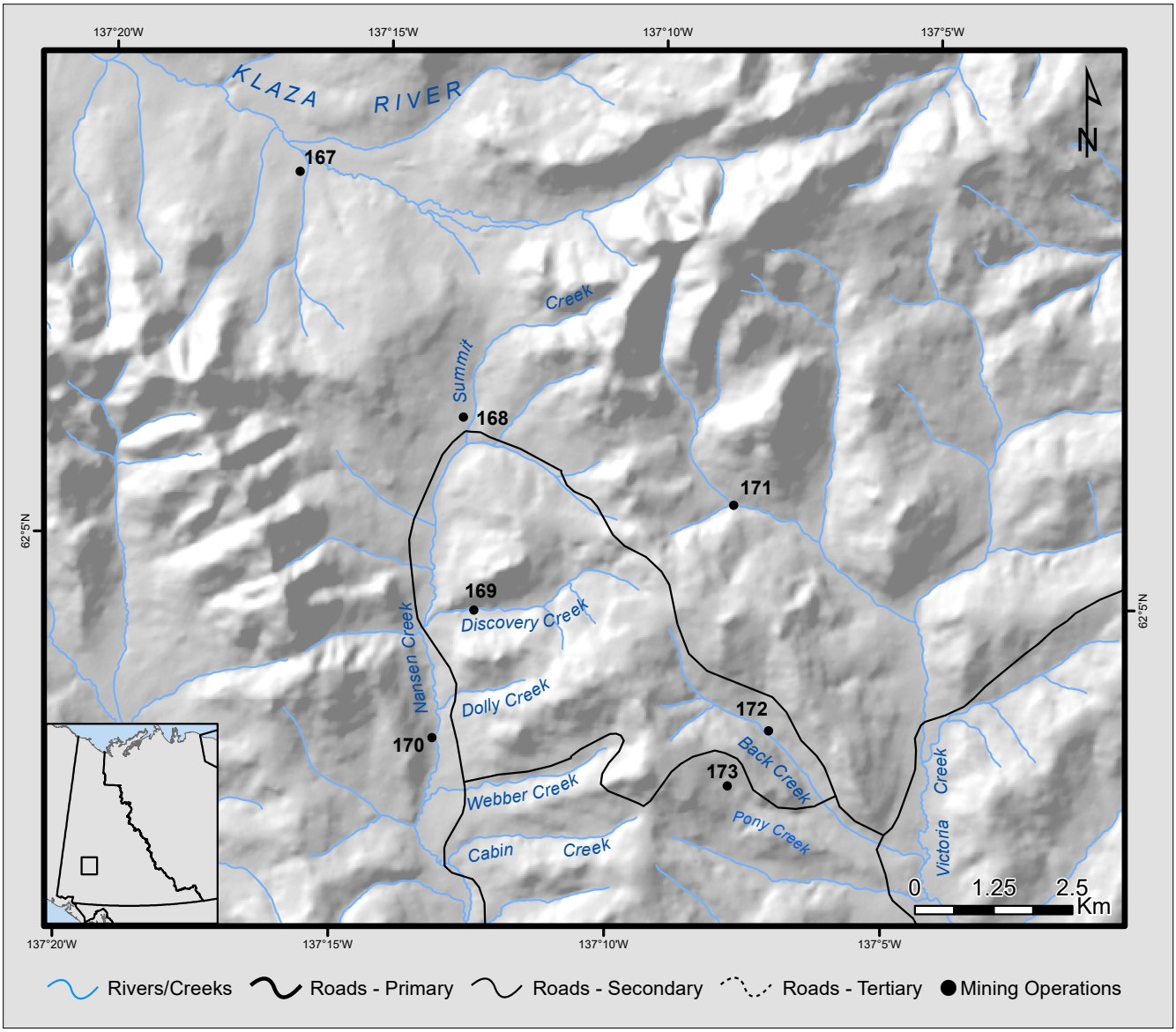
Gold Characteristics Not reported.



40056 Yukon Inc's operation in 2020 on the unnamed left limit tributary of Stoddart Creek.

NANSEN
PLACER AREA

SITES 167–173



LEGEND

167. Canaan Gold Resources Inc.
168. Pishon Gold Resources Inc. and Okanagan Contracting Services
169. 536214 Yukon Inc.
170. Chaschin, K.
171. Mammoth Mining Inc.
172. 38857 Yukon Inc.
173. Tulk, G.

Unnamed Left Limit, a tributary of Klaza

115I/03 2020: 62°08'13"N, 137°16'31"W

Canaan Gold Resources Inc., 2009–2020

Water License: PM09-665 (Closed 12/2019)
Active Producer (2018–2020) **Operation no. 167**

Location Unnamed left limit tributary, locally known as Canaan Creek, in the headwaters of Klaza River.

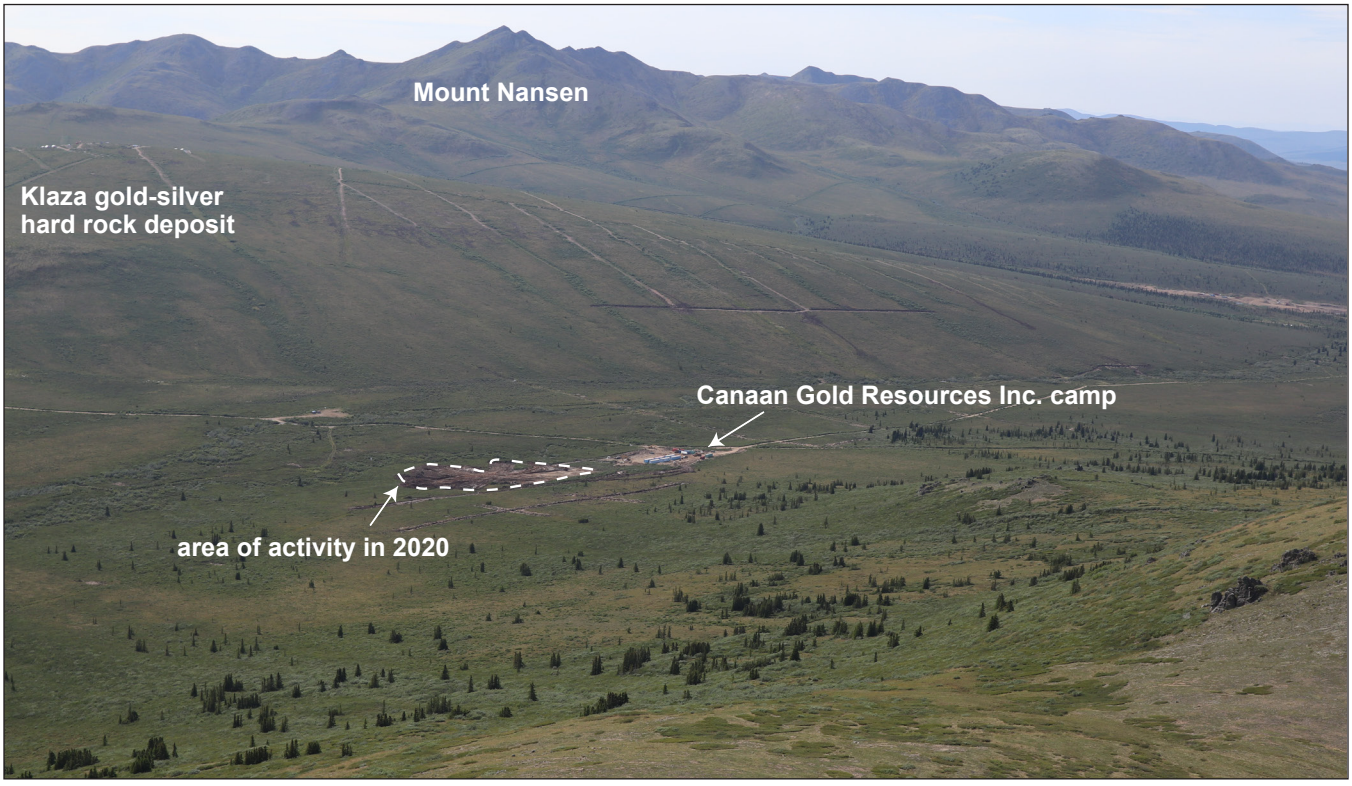
Work History and Mining Cuts Canaan Gold Resources Inc. has been present in the Klaza River drainage from 2018 to 2020. In 2018, they employed up to six personnel and mined a left limit cut on the unnamed tributary. Trenching occurred on the left limit of the Klaza River valley in 2019 with no other work history reported. A cut upstream from camp on the right limit of Klaza River was prepared in 2020 with a crew of 5 personnel.

Equipment and Water Treatment Equipment in 2020 included a Komatsu PC360 excavator, a Komatsu PC240LC excavator, two Komatsu HM300 articulated trucks, a Caterpillar D10R bulldozer and a JCM 200 excavator. A new plant assembled on site in 2020, consisted of a triple screen deck, equipped six jigs and one centrifuge. The screen deck classifies to ¾", ¼" and 6 mm. The 5 mm fraction runs through the centrifuge and the minus 5 mm fraction is processed in the jigs. The plant is capable of processing 300 yd^3 (229 m^3)/hr.

Surficial Geology and Stratigraphy The upper Klaza River valley was last glaciated during an early Pleistocene advance of the Cordilleran Ice Sheet. Periglacial weathering, erosion and deposition has largely erased the surface expression of glacial depositional landforms on the landscape. Recent stream erosion has not been significant in this area and as a result, glacial deposits are buried under middle to late Pleistocene fluvial and colluvial deposits in valley bottoms. On valley sides, evidence of former glaciation remains in the form of meltwater channels cut into bedrock. Near camp, the depth to bedrock is 15 m (50 ft).

Bedrock Geology Granodiorite and quartz diorite of the Minto and Whitehorse plutonic suites, respectively, underlie the drainage; the hills flanking the drainage are predominantly andesitic volcanic rocks of the Mount Nansen group. Gold (± silver) veins in the area are associated with relatively small felsic dikes and plugs of the Casino and Prospector Mountain plutonic suites (Sack *et al.*, 2021).

Gold Characteristics Gold is 70% fine, with rare nuggets. Fineness is 750.



View of the Klaza River valley at Canaan Gold Resources Inc. camp in the valley bottom. The view is looking southwest towards Mount Nansen.

Summit, a tributary of Nansen

115I/03 2019: 62°06'14"N, 137°13'13"W

Glacier Drilling Ltd., 2019
Barnes, J. and T., 2018
Pishon Gold Resources Inc., 2005–2017

Water License: PM16-074 (Active 05/2027)
Active Producer (2018–2019) **Operation no. 168**

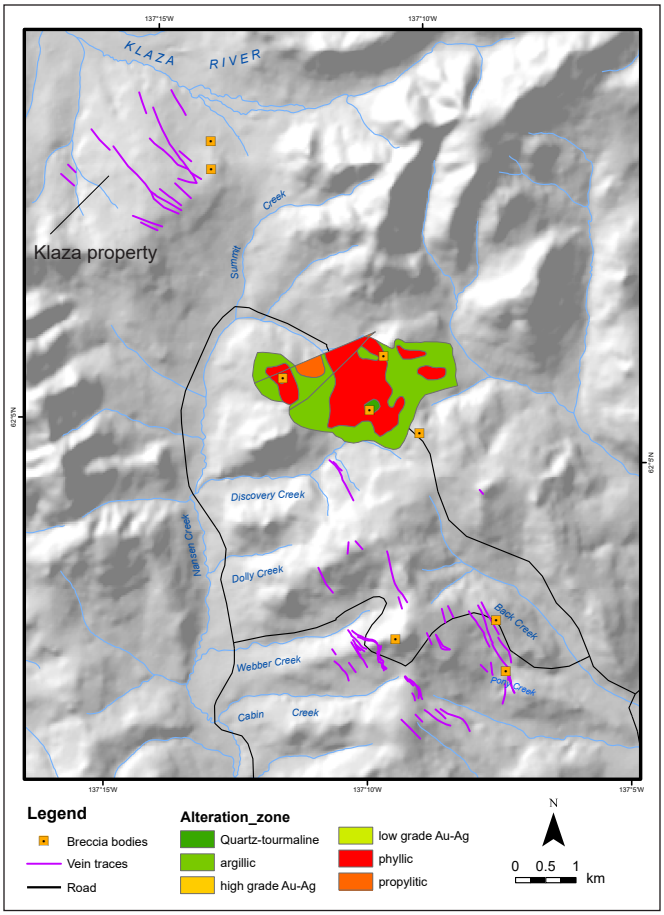
Location Summit Creek, 440 m upstream from its confluence with upper Nansen Creek.

Work History and Mining Cuts J. and T. Barnes operated at site in 2018, with a crew of 4 to 6 people. They extended the cut from 2017 on the right limit of Summit Creek, at its confluence with upper Nansen Creek. An agreement between Pishon Gold Resources and Glacier Drilling Ltd. was established in 2019. Glacier Drilling Ltd. completed a 21 by 65 m (69 × 213 ft) cut with a crew of 6 personnel, operating 10 to 15 hours a day. Geophysics was used to prospect for the buried deep channel on Summit Creek in 2019. No activity occurred in 2020.

Equipment and Water Treatment Equipment used by Glacier Drilling Ltd. in 2019 included a Doosan 350LC excavator, an Hitachi 330 excavator and an Hitachi 270 excavator used for stripping and digging pay, two 40 ton Caterpillar D400D rock trucks for hauling pay and tailings, a Caterpillar 988 loader for managing tailings and a Caterpillar D8L bulldozer used for stripping. A trommel was used to process pay.

Surficial Geology and Stratigraphy The Klaza Property in the headwaters of Summit Creek is a gold-silver-lead-zinc hard rock deposit, and extensive exploration has occurred in the area to investigate the deposit. An ongoing multi-year YGS field program led by Patrick Sack is investigating late-Cretaceous (ca. 80 to 66 Ma) magmatic rocks and associated porphyry systems in Yukon. The highest density of mineral occurrences of probable Late Cretaceous age in Yukon are in the Freegold and Nansen districts, which includes the Klaza property. A compilation by P. Sack (2021) is shown in the map figure, indicating the location of vein traces, breccia bodies and alteration zones.

A placer-source relationship is associated with the presence of these gold-bearing veins and the host rocks throughout the Nansen placer district. Placer gold present in Summit Creek is closely associated with the at-surface vein and breccia bodies in the headwaters of the drainage. The weathering and reworking of these veins into colluvium can blanket the hillsides and is an



Vein traces, breccia bodies and alteration zones in the Nansen Creek area, compiled by Walls and Eaton (1987). Drainages that have active placer operations in the district (Summit, Nansen, Discovery, Back and Pony) all have veins or mineralized zones located in their headwaters. Future mapping and the association of placer gold to this regional geology could lead to additional placer gold-bearing prospects.



Cut on the right limit of Summit Creek, 440 m upstream from its confluence with upper Nansen Creek. Glacier Drilling Ltd. conducted geophysics which identified the Summit Creek paleochannel to be 12 m (40 ft) wide. This cut was conducted to intercept the paleochannel.



Location where Glacier Drilling Ltd. was active in 2019. The view is looking down upper Nansen Creek.

important source for placer gold in the Nansen area. Creeks draining the northwest and to the southeast (Summit Creek) report similar gold characteristic and fineness.

In 2019 the cut on the right limit consists of two units. Unit 1, from 0 to 1.8 m (6 ft), is a matrix-supported oxidized diamicton with 50% sandy silt matrix and 50% clasts. The clasts have a subangular shape and a size distribution of 50% pebbles, 45% cobbles and 5% small boulders. This unit has a very dense consistency and is processed as pay. The genesis of unit 1 is interpreted as colluvium. Unit 2, from 1.2 to 3.0 m (6–10 ft), is an oxidized fluvial pebble gravel with 40% silty sand matrix and 60% subangular clasts made up of 80% pebbles and 20% cobbles.

Bedrock Geology The lower portion of the drainage is underlain by Whitehorse suite granodiorite; gold is likely associated with Casino suite dikes and plugs related to the Kelly porphyry occurrence [MINFILE 115I 156]. The headwaters of the creek drain Mount Nansen andesite.

Gold Characteristics Summit Creek gold is very fine; significantly smaller than 35 mesh. The largest pieces can get up to thumb side. Fineness ranges from 800 to 820.

Nansen and Discovery, a tributary of Nisling

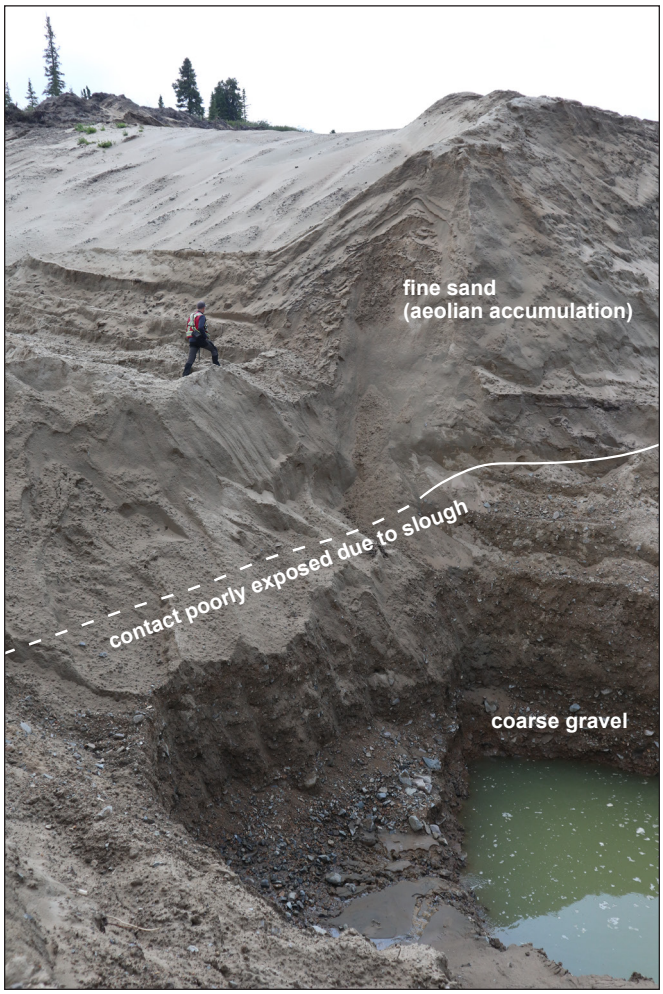
115I/03 2020: 62°04'36"N, 137°12'46"W
115I/03 2020: 62°04'28"N, 137°13'26"W

536214 Yukon Inc., 2017–2020
Johnson Exploration, 1994–2016

Water License: PM15-002-1 (Active 07/2025)
Active Producer (2018–2020) **Operation no. 169**

Location Two locations: Discovery Creek, 0.9 km upstream from its confluence with Nansen Creek; and Nansen Creek, left limit, at the mouth of Discovery Creek.

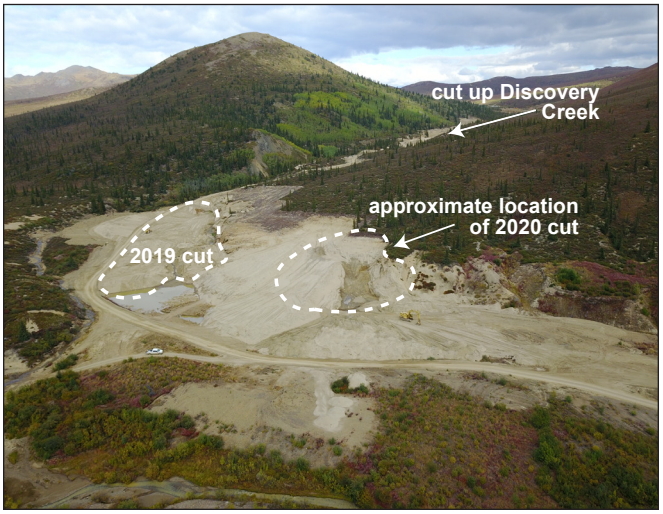
Work History and Mining Cuts The second year of mining the property for 536214 Yukon Inc. was in 2018. They continued to mine two locations on Discovery Creek in 2018, and spent a total of 456 hours sluicing. In 2019, with a crew of up to 6 people, two cuts were completed. One cut on a low-level bench on the left limit of Nansen Creek and another cut, 12 by 46 m (40 × 150 ft) on the left limit of Discovery Creek. Throughout the season they sluiced for 560 hours. Activity continued on Discovery Creek throughout 2020, where they mined a cut 13 by 69 m (42 × 225 ft), 0.9 km upstream from its confluence with Nansen Creek. A second cut, which was initiated in 2019 is located at the immediate mouth of Discovery Creek, on the margin of the left limit of Nansen Creek. During a visit in July 2020, the cut exposed a planar view of the Discovery Creek buried channel as it intercepts Nansen Creek. Bedrock in the cut defined the channel. A total of 200 hours were spent sluicing.



Stratigraphy of the left limit of Discovery Creek in 2020. A cobble-pebble gravel on bedrock is overlain by a 14.6 m (48 ft) thick aeolian deposit consisting of bedded sand.

Equipment and Water Treatment Equipment documented in 2019 included three Caterpillar excavators, two Caterpillar loaders, two Caterpillar bulldozers and two Volvo rock trucks. The wash plant consisted of a grizzly dump box with 9" spacing, a 9 m (30 ft) long trommel with 2 m (6 ft) of 1" square screen. Two, 1 by 11 m (3 × 36 ft) sluice runs included two 3 m (10 ft) "live bottom" boxes. The sluice runs were lined with 2" expanded metal, angle iron and Nomad matting. The trommel could process up to 100 yd^3 (76 m^3)/hr.

Surficial Geology and Stratigraphy The main target on Discovery Creek is buried under the left limit of the valley. Much of the modern down-cutting by the creek is focused on the right limit due to an abundance of sand that is washing into the valley bottom from the south slope. This process pushes the creek to the north side of the valley (right limit). These sands are a common feature in the Nansen area and cause similar offsetting issues in Dolly and Webber creeks. Mining therefore needs to focus on the left limit to exploit the paleo-valley bottom. Unit 1, from 0 to 2 m (6.5 ft) is a poorly sorted, cobble-pebble gravel that is crudely imbricated and has a silty sand matrix. There are rare erratics (rounded, foreign clasts) within the unit, suggesting a glacial deposit was formerly reworked at this location. Clasts are angular to subangular in shape. Unit 2, from 2 to 5.5 m (6.5–18 ft) is an interbedded sand and gravel. Unit 3, from 5.5 to 21 m (18–67 ft) is a planar-bedded sand with rare pebbly to cobbly beds that have erosive lower contacts. Most clasts contained within the sand are angular and rare erratics are present.



Drone image at the confluence of Discovery Creek and Nansen Creek. The cut locations are outlined by white dashed line.

In 2020, the cut at the confluence of Discovery and Nansen creeks displays a cross sectional view of the Discovery Creek valley. The cut appears to show a potential secondary channel coming out of Discovery Creek on the left limit (south of modern creek channel). The base of the channel was not exposed, and the upper units consisted of matrix-supported till overlain by sand. Geophysics is recommended to test the potential for a secondary channel.

Bedrock Geology Bedrock underlying these drainages is interpreted to primarily be granodiorite of the Whitehorse plutonic suite (Sack et *al*., 2021). From the perspective of placer gold, it is notable that the headwaters of these drainages are underlain by a composite Casino and Prospector Mountain suite plug with associated porphyry occurrences (Kelly and Kelly South [115I 157]; Cyprus [115I 066]; Cyprus South [115I 140]; Sack et *al*., (2021)). This magmatic and hydrothermal centre may be the heart of mineralization in the Klaza area (Sawyer and Dickinson, 1976).

Gold Characteristics The gold is mostly flat and fine with the majority of gold having a size of 30 mesh. Some ¼ oz nuggets are recovered. On the margins of the Nansen Creek valley, gold grains are commonly 50–60 mesh. The fineness averages 800 to 810. Coarse gold is recovered from the buried bench on Discovery Creek.

Nansen, a tributary of Nisling

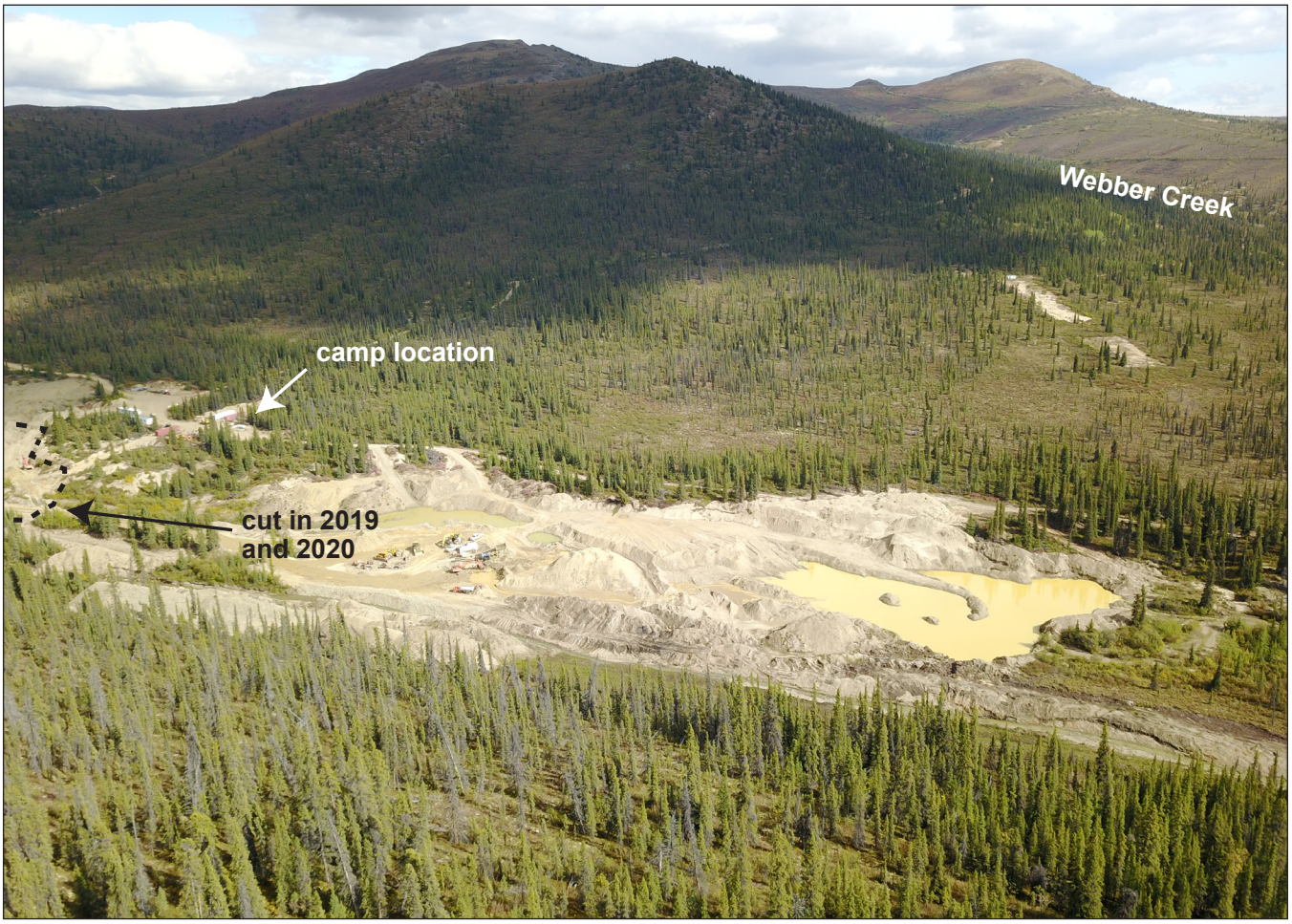
115I/03 2020: 62°03'29"N, 137°13'21"W

Chaschin, K. and M., 2014–2020

Water License: PM17-087 (Active 06/2028)
Water License: PM08-596-1 (Expired 06/2018)
Active Producer (2018–2020) **Operation no. 170**

Location Nansen Creek, 0.6 km downstream from Dolly Creek.

Work History and Mining Cuts Mining from 2018 to 2020 continued on both limits of Nansen

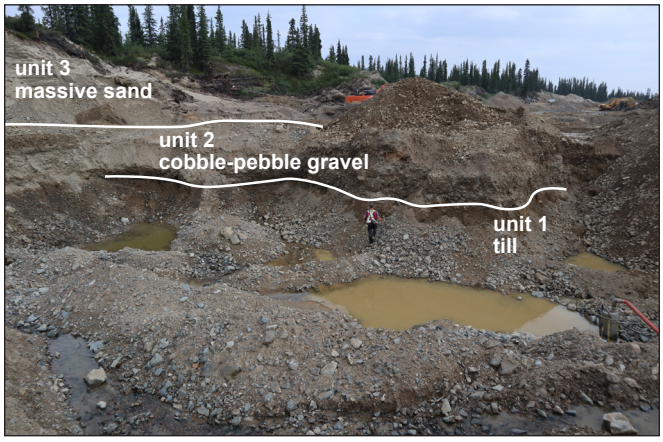


Drone image from 2019 looking northeast (across) Nansen Creek valley towards K. and M. Chaschin's operation. Cut locations in 2019 and 2020 are outlined by a dashed line.

Creek, between Dolly and Webber Creek, for the Chaschin operation. Each season they sluice 50,000 yd^3 (38 227 m^3). In 2020, a 20 by 46 m (65 × 150 ft) cut was processed by Mr. Chaschin along with his additional two-person crew, operating a daily 15 hour shift. A total of 1,060 hours was spent sluicing, between early June and the end of September.

Equipment and Water Treatment In 2020, the equipment present on site included an Hitachi EX550LC excavator, a Daewoo 280 excavator, an Hyundai HL780-9 wheel loader, a Caterpillar 980B wheel loader and a Caterpillar D6 bulldozer. The wash plant consisted of a 2.4 by 3.2 m (8 × 10.5 ft) hopper with a 9" spaced grizzly that fed a 1.8 by 6 m (6 × 20 ft) non-chain driven spiral trommel that classified material to ¼". The spirals allow for 30 m (100 ft) of travel within the trommel. Two 2.0 by 3.6 m (7 × 12 ft) sluice runs are configured with hydraulic, vibrating riffles. The trommel tailings feed into a 7.6 m (25 ft) conveyor, allowing the plant to process 35 to 40 yd^3 (27–31 m^3)/hr. Water was supplied to the plant using a 4" pump and effluent was settled in two ponds. Clean-ups were conducted using a jig, power classifier, and a magnetic wheel and table.

Surficial Geology and Stratigraphy In 2020, the exposure on the left limit consisted of three units situated on a false bedrock surface of till. Unit 1 is an early Pleistocene matrix-supported till that has a peanut butter consistency and contains smooth, rounded rocks. This unit was not exposed in the 2020 cut but has been observed consistently throughout the valley. Unit 2 is a periglacial gravel that contains much of the near-surface placer gold. The gravel has a high silt content that originated from loess blowing into the valley during the last glaciation. The high silt content in the gravel should not be mistaken for the till, which is less sandy compared to the periglacial unit. The complete thickness of unit 2 was not exposed, however, about 2 m (6.5 ft) was exposed at the base of the cut. Unit 2 is overlain by 2.3 m (7.5 ft) of cobble-pebble gravel that is a high energy, poorly sorted, and represents modern Nansen Creek gravel. Matrix consists of open-worked, medium to coarse sand and granules. All clasts are subangular to angular and clast composition is 55% cobbles, 40% pebbles and 5% small boulders. Up to 7 m (23 ft) of massive sand overlies the cobble-pebble gravel on the left limit and is considered unit 3.



Exposure on the left limit of Nansen Creek, 0.6 km downstream from Dolly Creek in 2020. Jeff Bond is used for scale.

Bedrock Geology This section of the drainage is near a contact between older country rocks of the Finlayson assemblage composed primarily of mafic schist which have been intruded by younger granodiorite of the Whitehorse suite (Sack *et al.*, 2021).

Gold Characteristics Gold is 90% fine (0.25 to 1 mm), with some nuggets up to ¼" in size. The majority of the fine gold is flaky although some if it is wiry and hackly. There is also an ultra-fine component that is 0.05 to 0.1 mm, is angular in shape and has body. The fineness is 790–800 with the highest 810.

Victoria, a tributary of Nisling

115I/03 2018: 62°05'39"N, 137°08'11"W

Mammoth Mining Inc., 2012–2018
Spring Cove Enterprises Ltd., 2007–2012

Water License: PM17-085 (Active 05/2028)
Water License: PM06-524-1 (Expired 04/2017)
Water License: PM07-565-1-2 (Expired 04/2017)
Active Explorer (2018) **Operation no. 171**

Location Victoria Creek, left fork.

Work History and Mining Cuts Mammoth Mining Inc. conducted a Yukon Mineral Exploration Program (YMEP) project on Victoria Creek in 2018. They excavated and drilled three target areas on left fork Victoria Creek: 3.5 km upstream from the confluence, 2.1 km from the confluence and at the confluence of left fork to main stem of Victoria Creek. Work history for 2019 and 2020 is unknown.

Equipment and Water Treatment Equipment used to execute the YMEP program in 2018 consisted of an ODEX drill, a 6" auger drill, a Komatsu PC400LC excavator, an Hitachi EX400LC excavator and a test trommel.

Surficial Geology and Stratigraphy Exploration in the farthest upstream target determined areas that had not been previously mined. All drillholes completed encountered frozen conditions. To date, drilling has confirmed that depths to bedrock exceed 23 m (75 ft) and a clay unit (possibly till or glacial lake sediment) is present from 6 to 16 m (20–55 ft).

Bedrock Geology This portion of the drainage is primarily underlain by granodiorite of the Whitehorse plutonic suite (Sack *et al*., 2021). The headwaters of this, and subsidiary, drainages are underlain by the eastern portion of the composite Cyprus porphyry system, a likely source of gold, and andesite of the Mount Nansen group (Sack *et al*., 2021).

Gold Characteristics The gold is generally fine.



Mammoth Mining Inc.'s test pit from 2018. This pit is located 2.1 km up left fork of Victoria Creek. (Photo credit: Steve Harasimiuk).

Back, a tributary of Victoria

115I/03 2020: 62°03'45"N, 137°07'15"W
115I/03 2019: 62°03'23"N, 137°06'31"W

38857 Yukon Inc., 2018–2020
A-1 Cats, 2014–2017
38857 Yukon Inc., 2006–2013

Water License: PM19-056 (Active 08/2030)
Water License: PM10-019 (Expired 08/2020)
Active Producer (2018–2020) **Operation no. 172**

Location Back Creek, 3.4 km upstream from its confluence with Victoria Creek.

Work History and Mining Cuts In 2019, 38857 Yukon Inc. mined as a two-person operation and completed a 30 by 40 m (98 × 131 ft) cut on mid Back Creek. The cut was located 2.3 km up the drainage from Victoria Creek. Previously, the operation focused on mining the deep Back Creek channel and in recent seasons focused on upper gravel processing surface pay. A total of 1200 yd^3 (917 m^3) of material was sluiced throughout the season. In 2020, Mr. Hearn and his employee moved upstream to continue to mine a cut opened up in previous years. With a substantial amount of drilling on Back Creek (200 drillholes), they have been trying to interpret the ground from their currently undrilled area downstream to where they have drilled to date. A left limit cut measuring 12 by 67 m (40 × 220 ft), 3.4 km up Back Creek from its confluence with Victoria Creek on the far valley limit of the drainage was mined. Significant reclamation was also completed in 2020.

Equipment and Water Treatment In 2019, the equipment included a Caterpillar 235C excavator for digging pay, a Caterpillar 320CL excavator for feeding the plant, a Caterpillar 966C wheel loader for loading the dump truck, a Caterpillar D7 bulldozer for pushing tailings and a Kenworth dump truck for delivering pay to the plant. A 1.2 by 9.1 m (4 × 30 ft) trommel was used to process material at a rate of 35 yd^3 (27 m^3)/hr. The single sluice run is 1.2 m (4 ft) wide and 9.1 m (30 ft) in length. It consists of consists of 0.3 m (1 ft) of expanded metal, 0.6 m (2 ft) of hydraulic riffles, 0.3 m (1 ft) of slick plate with two boil boxes, another 0.3 m (1 ft) of slick plate, 1.2 m (4 ft) hydraulic riffles, 2.4 m (8 ft) expanded metal and 2.4 m (8 ft) of slick plate. A 4" pump supplies water to the plant, powered by a 4" flight pump. Water was 100% recycled.



Left limit cut mined by 38857 Yukon Inc. in 2020. A significant amount of historic stripping had been stockpiled on the left limit, so prior to reaching pay, up to 9.1 m (30 ft) of overburden had to be removed.

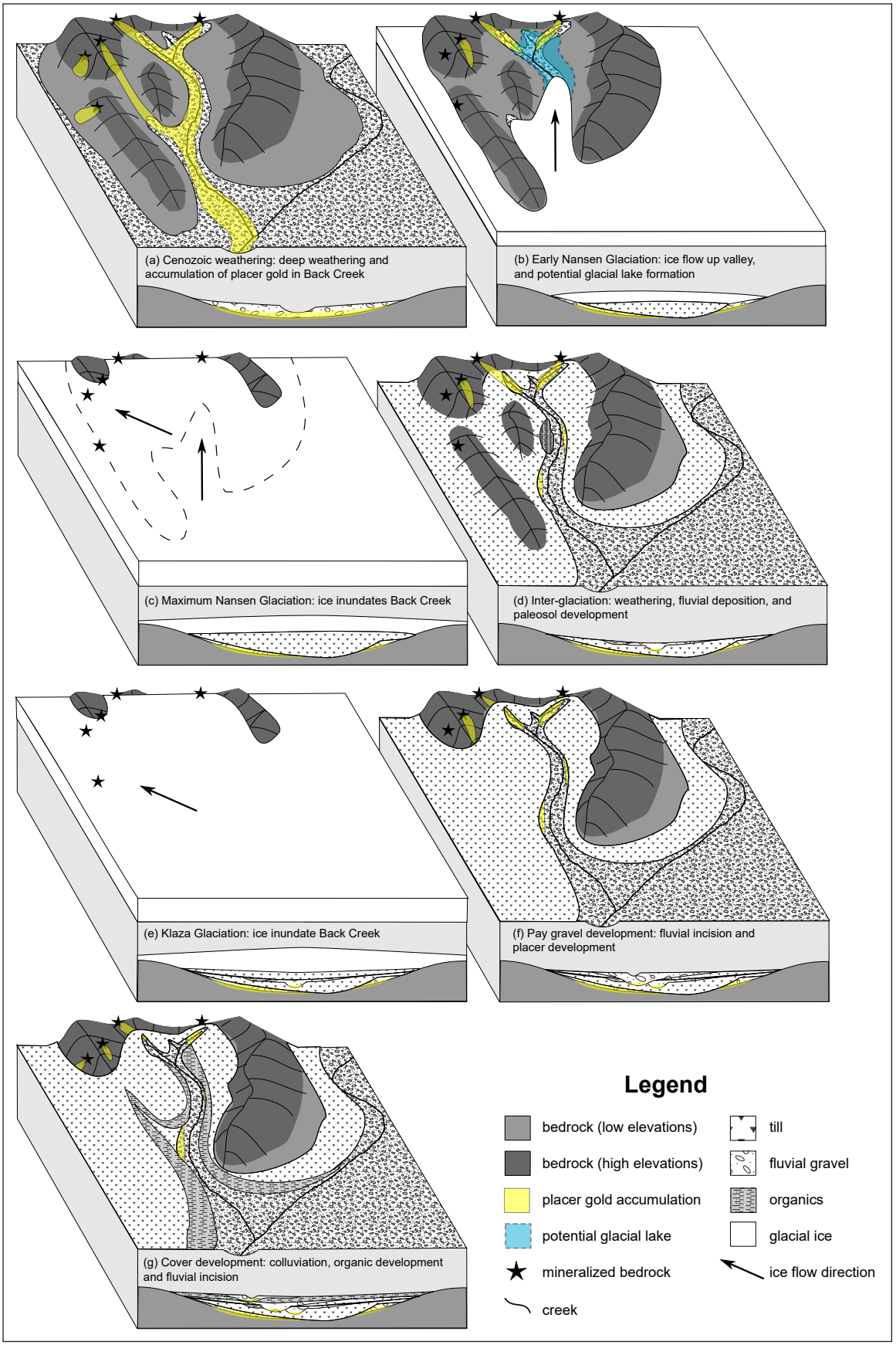
Surficial Geology and Stratigraphy Exposures in Back Creek were investigated by Englehardt et *al*. (2016) and it was determined that early Pleistocene glaciation had a significant effect on placer gold deposits in Back Creek. Stratigraphic evidence suggests it has been glaciated twice during the Pleistocene advances of the Cordilleran Ice Sheet. These two episodes, the Nansen glaciation (>780 ka) and more recent Klaza glaciation, both varied in their contributions to the landscape evolution of modern Back Creek. Nansen glaciation was very erosive as it moved up valley and redistributed and reworked most placer gold accumulations in paleo-Back Creek. The Klaza glaciation was less erosive and inter-glacial deposits that re-accumulated placer gold between the two episodes were not removed from the drainage. Further information on the early Pleistocene glaciation and implications for placer gold deposits in Back Creek is available in the Yukon Exploration and Geology 2015 publication (Englehardt et *al*., 2016).

The 2019 cut on lower Back Creek exposed a section of modern gravel overlaying Klaza till, which acted as a false bedrock. Bedrock has never been encountered on lower Back Creek, as surface gravel has proven to be accessible and economic. Pay gravel is very distinct due to its yellow and silt-rich nature and varies in thickness from 1.8 to 3.6 m (6–12 ft). In the lower Back Creek cut, 2.4 m (7.9 ft) of grey gravel was present. It is a moderately packed, weakly imbricated reworked Back Creek gravel that consists of up to 2% boulders and from 40 to 50% pebbles and 50 to 60% cobbles. Vertical clasts at the top of the section are present, indicating cold glacial conditions frost-jacked the clasts to be orientated upwards on the long axis.

In 2020, a deep cut was made to bedrock on the left limit. At the base of the cut, the pay gravel is poorly exposed, however does have a crude, down-valley imbrication and gravelly texture. The thickness of this unit is 3 m (10 ft). The pay gravel is overlain by 2 m (6.5 ft) of colluvium and 5 m (16 ft) of till.



View looking downstream Back Creek, at the cut in 2019 mined by 38857 Yukon Inc.



A figure from Englehardt et. al. (2016, pg. 125) that illustrates the evolution of placer gold distribution in Back Creek from pre-glacial to modern time.

Bedrock Geology This drainage is primarily underlain by granodiorite and quartz diorite of the Minto and Whitehorse plutonic suites, respectively (Sack et *al*., 2021). Gold (± silver) veins such as those in the nearby Brown-McDade pit are likely associated with felsic dikes and plugs of the Whitehorse suite or, possibly with mafic plugs of the Casino suite (Sack et *al*., 2021).

Gold Characteristics Gold is coarse with nuggets up to 5–6 g. The fineness is 815 to 850. An abundance of garnet and pyrite is also recovered.

Pony, a tributary of Back

115I/03 2019: 62°03'15"N, 137°07'56"W

Tulk, G., 2018–2019
Ladouceur, J., 2014–2017
Tulk, G., 2013

Water License: PM11-022 (Active 04/2023)
Active Producer (2018–2019) **Operation no. 173**

Location Pony Creek, upper.

Work History and Mining Cuts Activity on Pony Creek has been minimal in recent seasons. In 2019 a small crew tested the left limit, upstream from camp. Benches are present on both limits of the drainage, and have undergone various amounts of activity since the Back Creek area was first staked in 1912.

Equipment and Water Treatment In 2019 the equipment on site included an Hitachi 200PC Zaxis excavator used for stripping and feeding the plant. A Derocker and a trommel were both present. Water was 100% recycled.

Surficial Geology and Stratigraphy Pony Creek is a narrow, steep gulch with frozen black muck up to 4.5 m (15 ft) thick.

Bedrock Geology This drainage is primarily underlain by granodiorite and quartz diorite of the Minto and Whitehorse plutonic suites, respectively (Sack et *al*., 2021). The Brown-McDade pit which was mined for gold and silver in veins is within the source region of this drainage and is the likely source of gold. The veins in the area are likely associated with felsic dikes and plugs of the Whitehorse suite or, possibly with mafic plugs of the Casino suite (Sack et *al*., 2021).

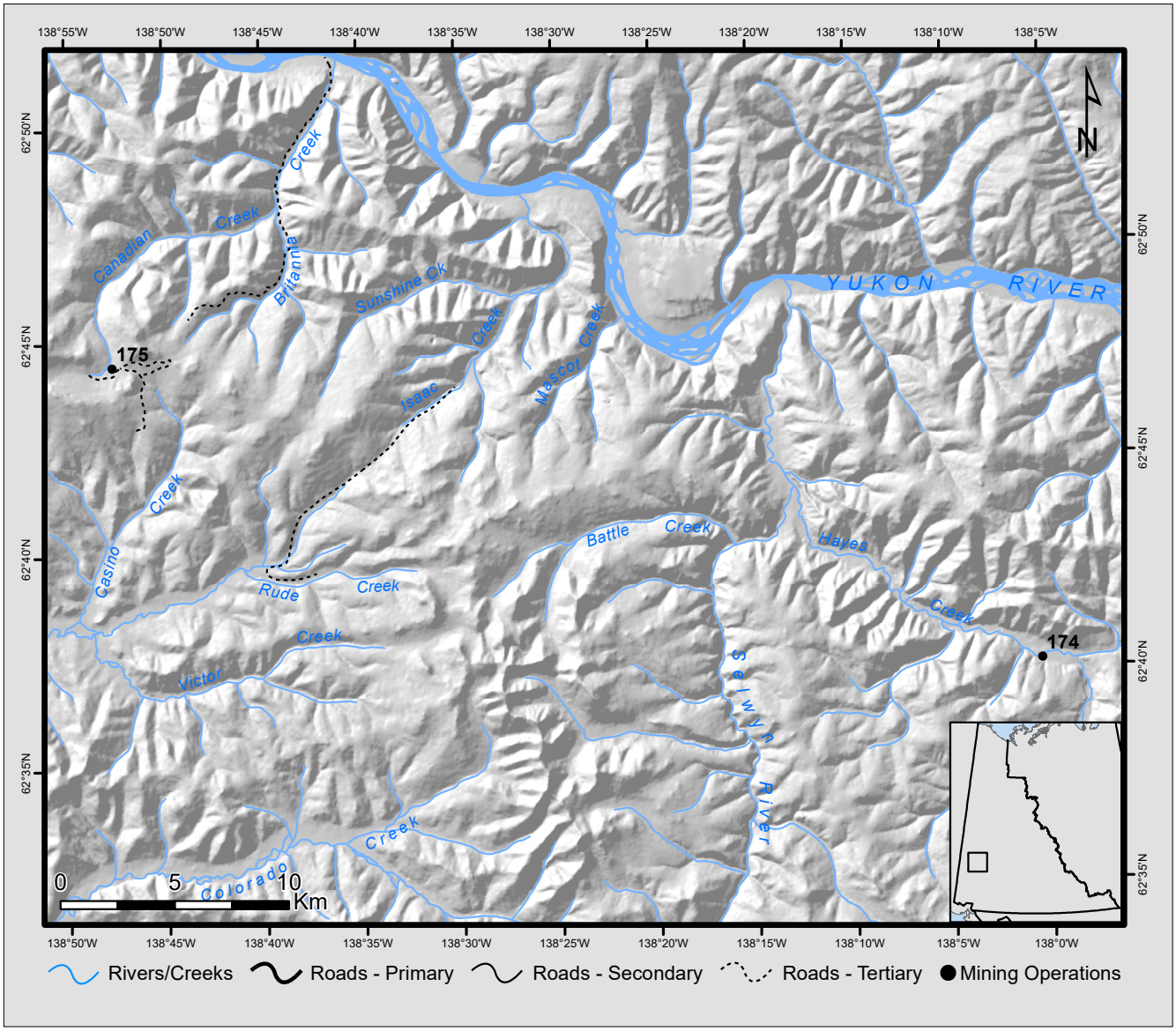
Gold Characteristics Not reported.



View of upper Pony Creek in 2019. (Photo credit: Blake Vandecamp).

HAYES–CANADIAN PLACER AREA

SITES 174–175



LEGEND

174. Singh Gold Mine Inc.

175. Batavia Mining

Sonora, a tributary of Hayes

115J/09 2018: 62°39'57"N, 138°01'53"W

Singh Gold Mine Inc., 2020
Wilson, G., 2000–2017

Water License: PM15-005 (Active 06/2025)
Active Producer (2020) **Operation no. 174**

Location Sonora Gulch, 900 m upstream from its confluence with Hayes Creek.

Work History and Mining Cuts Mr. Wilson passed away in December 2017, after two decades of mining on Sonora Gulch. He was present in the drainage each season and conducted mining as a one-person operation spending most of his time out on the creek. Mr. Wilson was a true placer miner: capable, resourceful and inquisitive. In spring 2020, the claims and water license were transferred to Singh Gold Mine Inc. No specific work history is known for 2020.

Equipment and Water Treatment Equipment located on site in 2018 included a Caterpillar EL300 excavator, a Caterpillar 988 wheel loader, an International TD-21 bulldozer and a Fiat-Allis bulldozer.

Surficial Geology and Stratigraphy Sonora Gulch is a narrow gulch setting that lies near the pre-Reid glacial limit in the Hayes Creek drainage. The main target is a locally derived, coarse, angular gulch gravel. In previous years, the gulch gravel was exploited where it overlies and is incised into a pre-Reid glaciofluvial terrace. In these areas, the gulch gravel is preserved in shallow, narrow channels that are overlain by muck. Farther downstream, Sonora Gulch becomes more incised into the terrace gravel and exposes bedrock.



The late George Wilson picking nuggets from his sluice box during a site visit by the Yukon Geological Survey in 2010.

Exploration work by Mr. Wilson has potentially identified a buried meandering pay channel that underlies the pre-Reid outwash on the bedrock surface. According to Mr. Wilson, the buried pay is overlain by up to 7 m (23 ft) of pre-Reid glaciofluvial outwash gravel. The outwash gravel is a clast-supported, coarse gravel with subrounded clasts and a coarse sand matrix. Frozen muck, up to 8 m (26 ft) thick, overlies both the gulch gravel and the outwash gravel.

Bedrock Geology Bedrock is quartz-mica-schist and quartzite.

Gold Characteristics Four types of gold are recovered from Sonora Gulch: very fine gold; well-travelled gold; tetradymite with gold; and gold pieces that have formed as a conglomerate. The largest nugget recovered was 2 ounces and the fineness ranges from 850 to 880.

Canadian, a tributary of Britannia

115J/10 2020: 62°44'37"N, 138°50'48"W

Batavia Mining, 2018–2020

Water License: PM16-037 (Active 09/2026)
Active Producer (2018–2020) **Operation no. 175**

Location Canadian Creek, 3 km downstream from its headwaters.

Work History and Mining Cuts Batavia Mining purchased the claims on Canadian Creek in 2018 and their first active mining season began in 2019. Activities during their first season were focused at the mouth of Patton Gulch; a cut was prepared at the headwaters of Canadian Creek and 60,000 yd^3 (45 873 m^3) of material was sluiced. Three locations were mined in 2020: the headwaters of Canadian Creek, the mouth of Patton Gulch, and a low-level Canadian Creek bench immediately upstream from the Patton Gulch confluence. A crew of four people operated in 2020 and sluiced between 70,000 and 80,000 yd^3 (53 518–61 164 m^3) of material.

Equipment and Water Treatment In 2020, two Hitachi Zaxis 290LC excavators and one Caterpillar 349 excavator were used to prepare cuts, transport pay and feed the plant. A 1.2 by 4.9 m (4 × 16 ft) screen deck with a ⅝" screen and two side runs was used to process up to 120 yd^3 (92 m^3)/hr. Sluice runs were configured with two sections of hydraulic riffles, expanded metal

and a boil box. Water was supplied to the plant using an 8" pump and water was recycled. Clean-ups were conducted every three days and processed on a long tom, and the final concentrate was tabled in town.

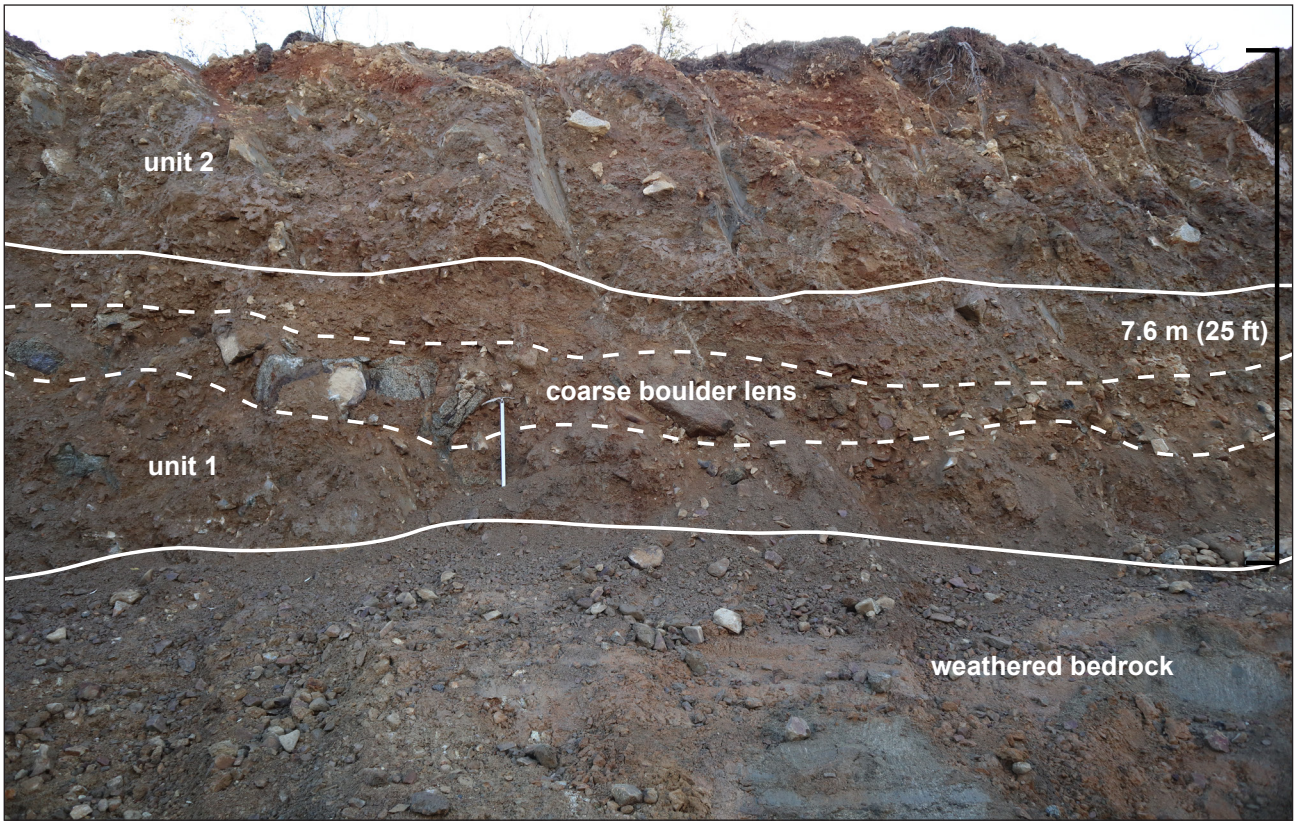
Surficial Geology and Stratigraphy Batavia Mining are operating at a high elevation (1200 m/3937 ft), close to the headwaters of Canadian Creek. Situated in unglaciated terrain, gold in the drainage is sourced locally from the Casino copper, gold, molybdenum and silver deposit situated immediately upslope and upstream of their operation.

The large, broad Canadian Creek valley hosts a valley-bottom placer deposit, as well as, a low-level terrace deposit on the right limit that was uncovered in 2019. The bench deposit was intersected immediately upstream from the Patton Gulch confluence. No topographical expression of the bench is visible on the surface due an apron of colluvium covering the landform. The bench surface is only 0.6 m (2 ft) higher than the modern valley, and at the mouth of Patton Gulch it has been dissected and reworked into the Canadian Creek valley bottom.

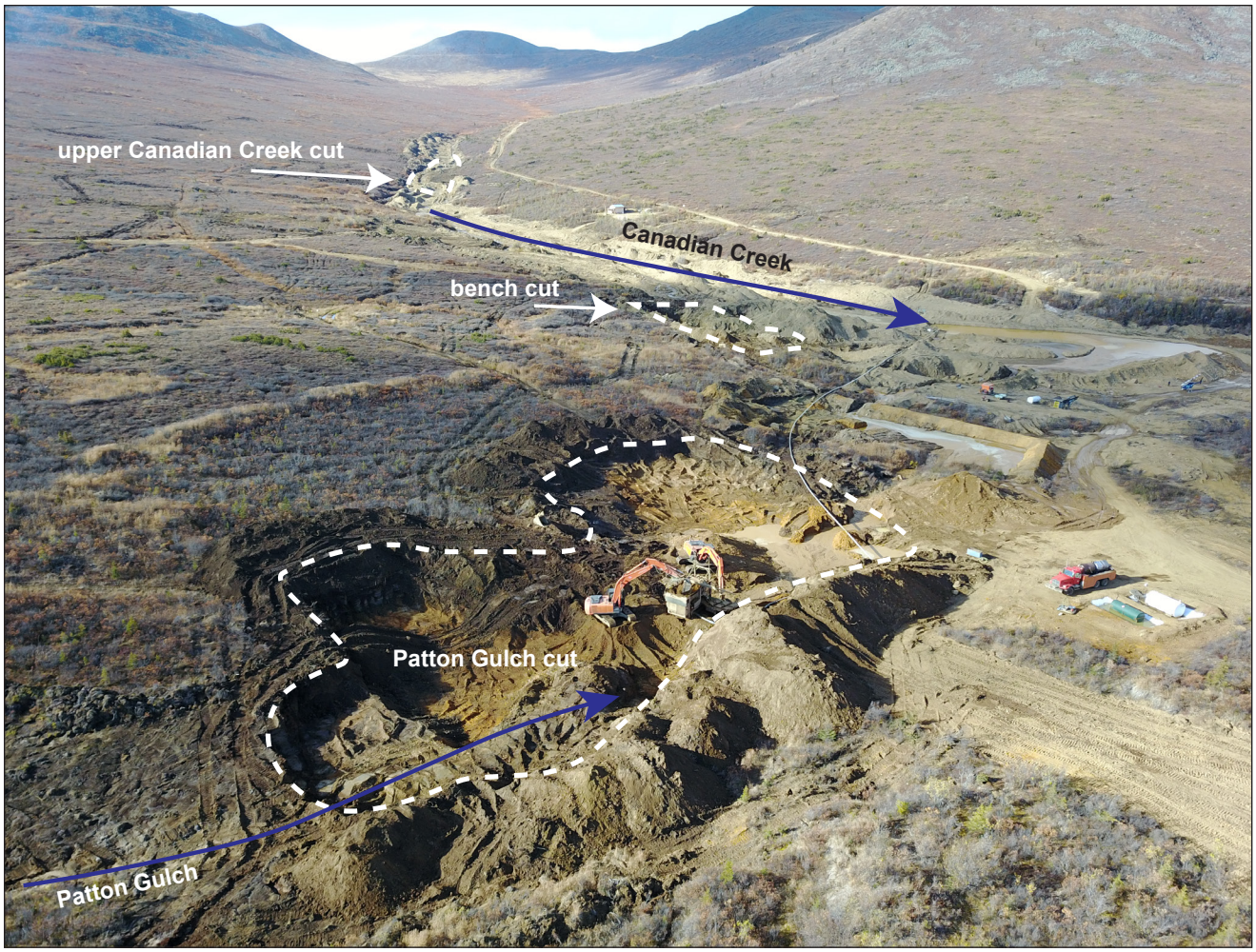
The right limit bench cut in 2020 exposed two distinct units. Unit 1, from 0 to 3 m (0–10 ft) is a pebble-cobble gravel containing a ~0.9 m (3 ft) thick coarse boulder lag in the middle of the unit. Unit 1 appears to coarsen upwards and the matrix percentage slightly increases towards the top of the section from 25 to 30% fine sand and silt. A noticeable increase in cobble-sized clasts are present in the lowermost 1.2 m (4 ft) of unit 1. Clasts are predominately subround to round. Unit 2, from 3.0 to 7.6 m (10–25 ft) is colluviated silt and organics, and stripped off prior to mining. The lowermost 3 m (10 ft) of gravel was sluiced, with the most economic gravel situated on the bedrock contact.

Bedrock Geology Bedrock is granodiorite, granite and/or diorite completely weathered to sand and pervasively oxidized.

Gold Characteristics Gold derived from the bench is local and possesses a ‘popcorn’ appearance, so likely reworked directly out of the Casino deposit. 50% is 20 mesh, 40% is 5 mesh and 10% is nuggets. The largest nugget recovered was 12 grams, and the average size is 4 to 6 grams. An abundance of magnetite and hematite was also recovered. Fineness is 876.



Stratigraphic section described above, displaying the undulating weathered bedrock, unit 1 and unit 2 contact. This section was exposed in 2020 at Batavia Mining on the right limit bench.



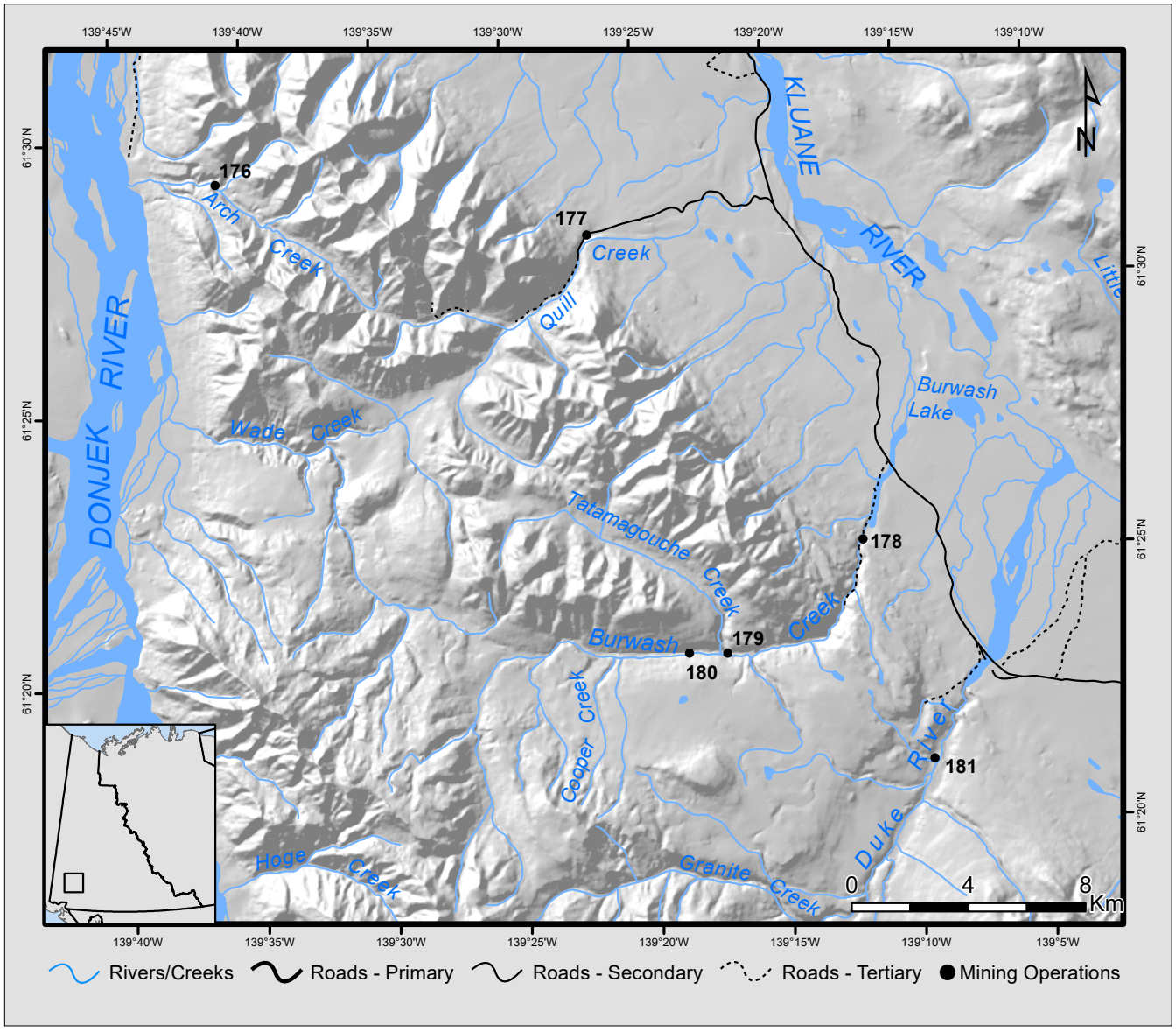
Drone photo from 2020 of Batavia Mining on upper Canadian Creek. Dashed outlines indicate the three mining locations. The view is looking upstream, to the west, with the Casino deposit situated in the mountains to the south and not captured in the photo.



Google Earth image of terrace on the right limit of Canadian Creek where Batavia Mining has been actively mining. Bond and Lipovsky (2012) identified the terrace during fieldwork conducted in the area.

KLUANE
PLACER AREA

SITES 176–181



LEGEND

176. Nelson, R.
177. Quill Creek Placers
178. Johnson, S. Jr.
179. Johnson, S.L.
180. Aurem Alliance Ltd.
181. Marshall, C.

Arch, a tributary of Donjek

115G/05 2020: 61°29'40"N, 139°40'15"W

Nelson, R., 2010–2020

Water License: PM13-028 (Active 11/2023)
Water License: PM15-020 (Active 06/2025)
Active Producer (2018–2020) **Operation no. 176**

Location Arch Creek, above the second canyon approximately 3.5 km from its confluence with Donjek River.

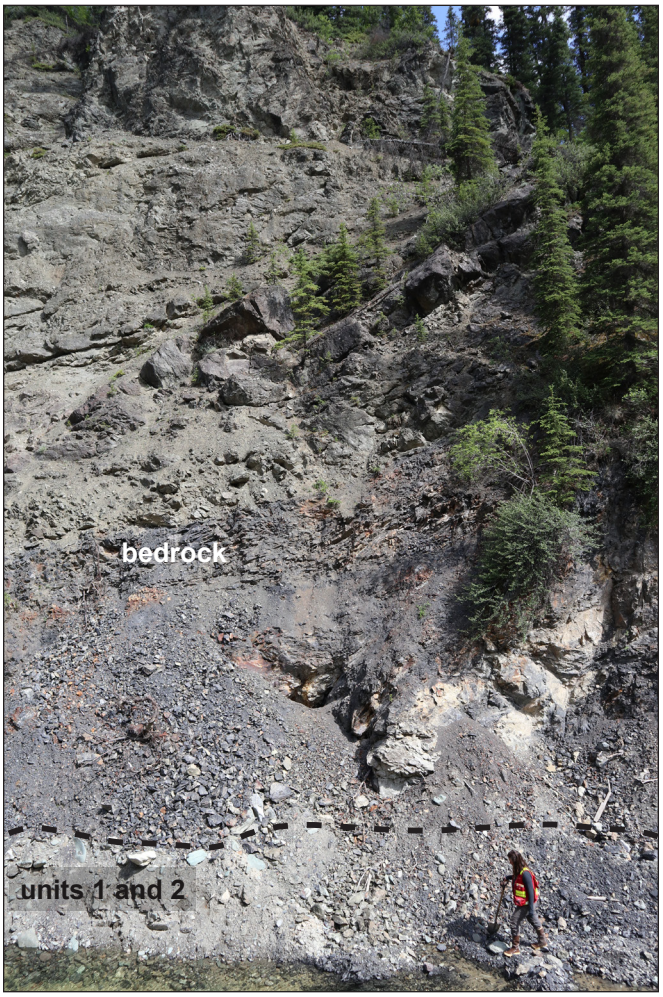
Work History and Mining Cuts From 2018 to 2020, activity focused on the right limit of Arch Creek, just upstream from the mouth of the canyon. Mr. Nelson continued to excavate into side pay on the far right limit, beneath an increasing amount of overburden. A major reclamation project occurred in 2019; the far left limit cut was stabilized and channel restoration using large boulders to act as rip rap was completed. Beginning in 2019 and ending in 2020, a right limit cut measuring 15 by 75 m (49 × 246 ft) was mined.

Equipment and Water Treatment Equipment present on site in 2020 included a Komatsu 500 wheel loader, a John Deere 700J XLT crawler tractor, a Caterpillar 235C excavator, and a Derocker wash plant. The wash plant consisted of two 1.2 by 7.3 m (4 × 24 ft) sluice runs with 2" riffles, and unbacked miners moss. Water supplied to the plant by a 10" Cornell pump enabled the plant to process up to 100 yd^3 (76 m^3)/hr. Effluent was settled in a series of two settling ponds prior to discharge into Arch Creek. A jig, long tom and wheel were used for clean-ups.

Surficial Geology and Stratigraphy Arch Creek is a very high-energy drainage and modern gravel is frequently reworked by flooding. Modern channel and side pay increases and decreases each year as gold is remobilized in high-energy flood events. The right limit cut targets modern side pay and the cut width has gradually increased from 2018. Four units are present on the right limit. Unit 1 is 0.5 m (1.6 ft) thick and consists of boulder-rich, angular, pebble-cobble gravel overlying bedrock. Unit 2 is a 1 m (3.3 ft) thick pebble gravel with a fine-grained sand to silty matrix and has



View looking upstream Arch Creek from the second canyon, of Mr. Nelson's operation in 2020.



Units 1 and 2 (side pay) preserved on the right limit in the canyon of Arch Creek. Person for scale.

weak planar, downstream-dipping stratification. Unit 3 is a coarse, angular, pebble-cobble-boulder gravel with a coarse sand matrix and a thickness of up to 1.6 m (5 ft). Unit 4, up to 5 m (16.4 ft) thick, consists of colluvium that overlie the gravel units, and obscure low terraces on both the left and right limits. The operation is active immediately above the second canyon and *in situ* side pay remaining on the far right limit is visible. The side pay is poorly exposed so the contact between unit 1 and unit 2 is not visible.

Bedrock Geology Bedrock is mapped as light grey to light green volcanic tuff and volcaniclastic siltstone (Israel *et al*., 2007).

Gold Characteristics Gold is 80% coarse and 20% fine and flour gold. It ranges from polished and bright, to rough and angular, and has a fineness of 879. Copper, platinum and silver nuggets have also been recovered in Arch Creek.

Quill, a tributary of Kluane

115G/06 2020: 61°29'31"N, 139°25'48"W

Quill Creek Placers, 2000–2017, 2020

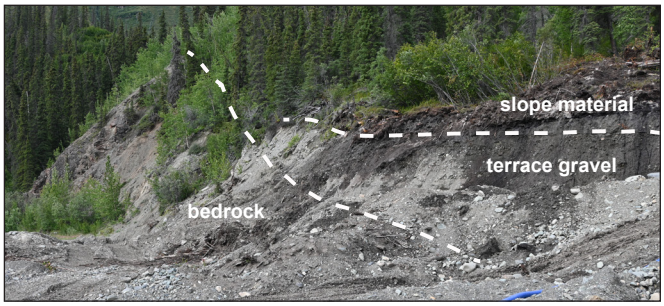
Water License: PM16-064 (Active 06/2022)
Active Producer (2020) **Operation no. 177**

Location Quill Creek, approximately 0.5 km downstream from the mouth of the lowermost canyon.

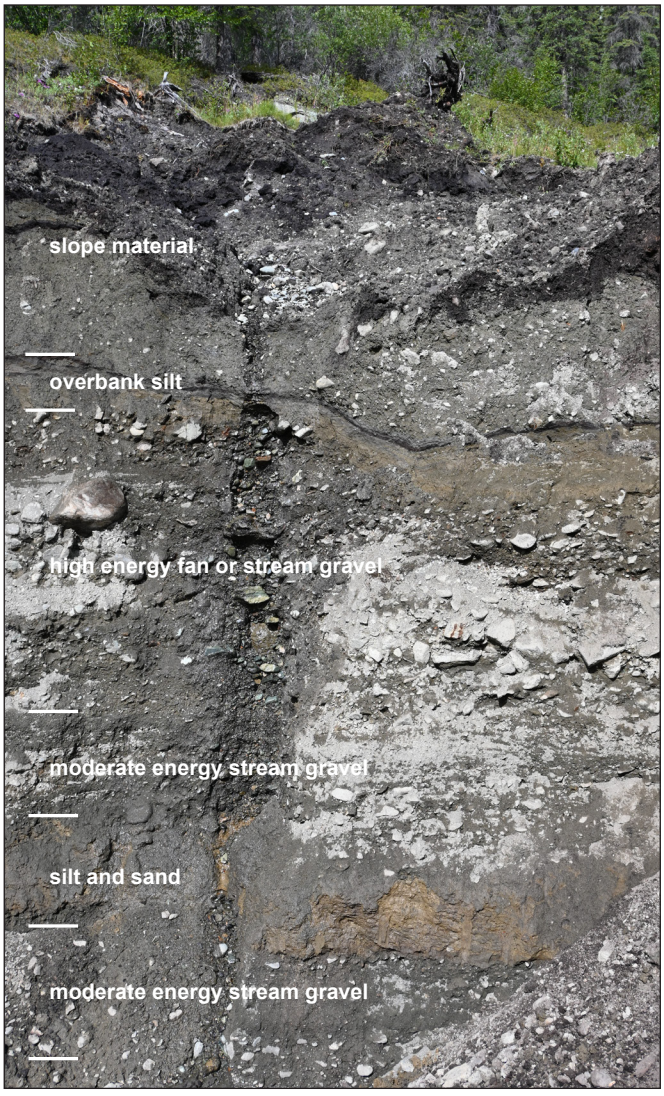
Work History and Mining Cuts Mr. Nichols has been inactive on lower Quill Creek for several seasons but mining restarted in 2020. Activities concentrated on extending the low-level left limit bench, which has proven to continue into the slope. Initial activities included stripping up to 1.0 m (3.3 ft) of overburden to reach 6 m (20 ft) of pay gravel. As a one-person operation, Mr. Nichols was present on the creek from June to August and worked an 8-hour shift.

Equipment and Water Treatment In 2020 equipment included Caterpillar 320 excavator, Caterpillar D8 bulldozer and Caterpillar 966 wheel loader. The wash plant consisted of a 1.2 by 2.4 m (4 × 8 ft) grizzly with a spray bar, over a single 0.9 by 3.6 m (3 × 12 ft) long sluice run with angle iron. The wash plant processed 50 yd^3 (38 m^3)/hr, and water was supplied by a 6" pump powered by a GM engine. Water was acquired from Quill Creek and effluent was treated out-of-stream through a series of settling ponds. Clean-ups were conducted using a gold wheel.

Surficial Geology and Stratigraphy A low-level terrace is present on the left limit of Quill Creek, a deposit that Mr. Nicols has targeted for several seasons. The terrace is overlain by ice-rich colluvium and the thickness of this overburden has



The terrace and its contact with the bedrock canyon immediately upstream from where Mr. Nichols is operating. The white dashed line represents the three different units: bedrock, terrace gravel and slope material (colluvium).

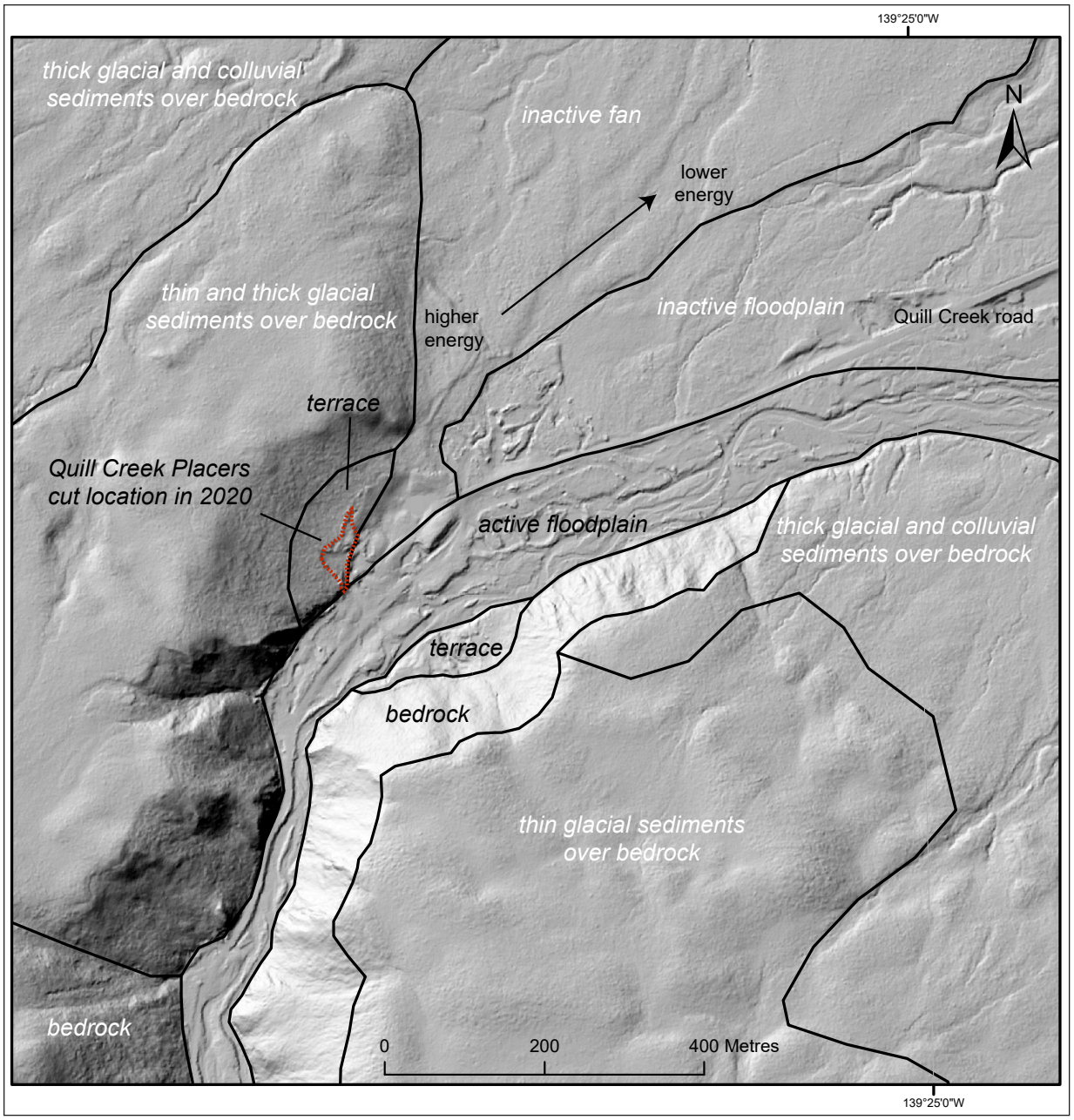


Stratigraphy of the exposed terrace cut in July 2020. The contacts between the units was poorly exposed.

been increasing as he extends farther into the slope (to the northwest). Although the dimensions of the terrace are unknown, this deposit has the potential to continue due to its location slightly downstream from a bedrock outcrop that may have protected it from being reworked/eroded. Terrace sediments comprise ~6 m (20 ft) of interbedded gravel and silty sand units. The bedrock surface descends sharply from west to east and is visible on the upstream end of the active cut. Up to 0.3 m (1 ft) of bedrock and all gravel, up to 9 m (30 ft) thick was sluiced.

Bedrock Geology Bedrock is mapped as light grey to light green volcanic tuff and volcaniclastic siltstone (Israel and van Zeyl, 2004).

Gold Characteristics Gold derived from the left limit terrace is coarser than that from the valley bottom. A few nuggets up to 2 to 3 g were recovered. Fineness is 870.



Surficial mapping of lower Quill Creek modified from Kennedy and Ellis (2020) with Mr. Nichols 2020 cut location outlined in the red dashed line. The feature he is mining is a terrace deposit at the mouth of the canyon on the left limit of lower Quill Creek. A thick unit of overburden blankets the terrace feature, but on the right limit of the creek, another terrace is present. Although it appears to have been previously worked, it has less overburden and could warrant future exploration.

Burwash, a tributary of Kluane

115G/06 2020: 61°24'30"N, 139°13'58"W

Johnson, S. Jr., 2005–2009, 2011–2020

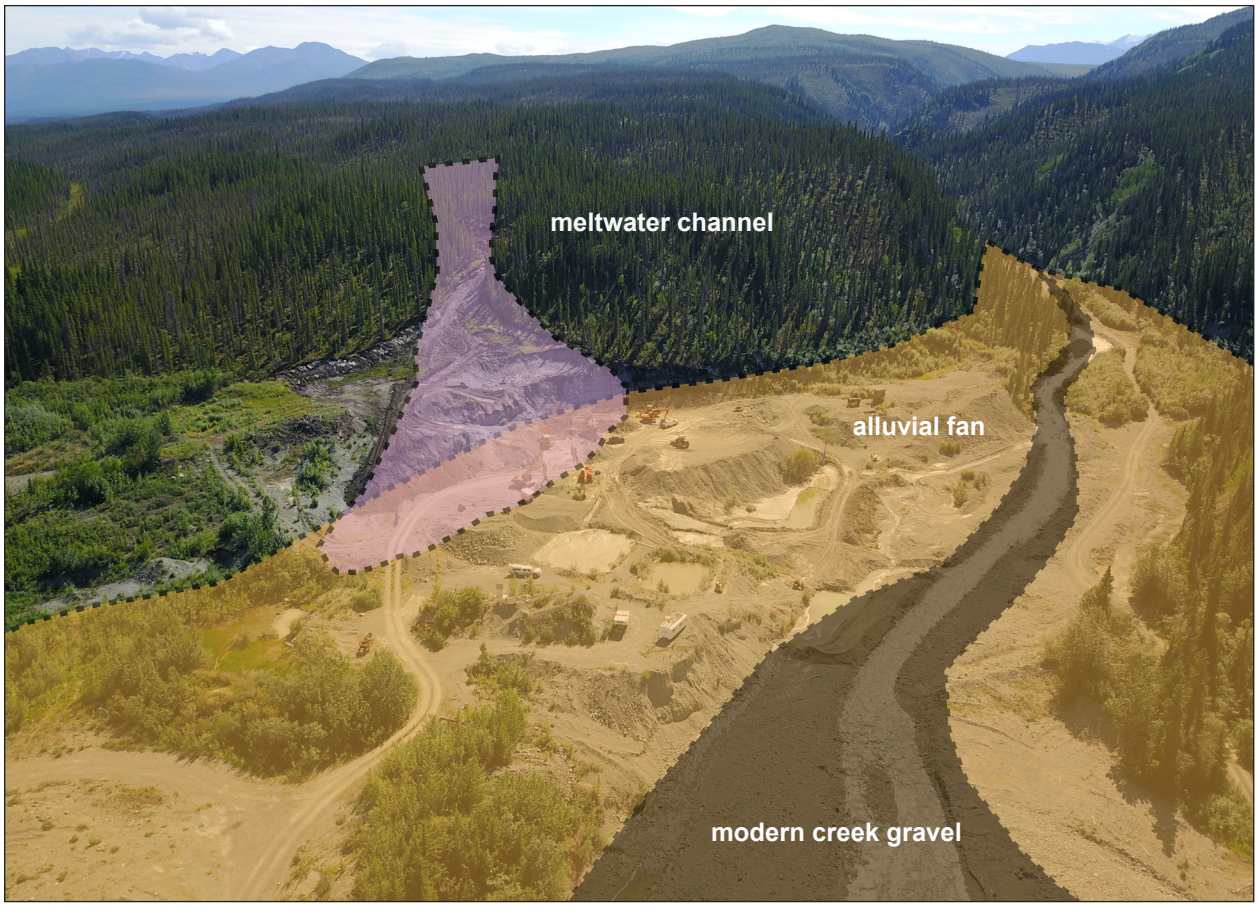
Water License: PM15-037 (Active 08/2025)
Active Producer (2018–2020) **Operation no. 178**

Location Burwash Creek, 9.8 km upstream of the Kluane River.

Work History and Mining Cuts Mr. Johnson has been mining immediately downstream of the lowermost canyon on Burwash Creek for nearly two decades. Recent work is focused on excavating two different placer deposits. The primary resource is a fluvial fan deposit that has accumulated and subsequently been reworked by Burwash Creek. The second resource is related to glacial meltwater deposition on the right limit, oriented northwest-southeast, or roughly perpendicular to Burwash Creek. In 2018, up to four people were present at site. They stripped a cut, 27 by 48 m (88 × 157 ft), at the upper end of the meltwater channel and further excavated into the far right limit of the fan extent. In 2019, Mr. Johnson was active on the fan deposit where 2 miners were employed. Mining continued on the far right limit of the fan in 2020.

Equipment and Water Treatment In 2018 there were four excavators including a Caterpillar 330B, a Koehring 666E, an Hitachi EX200, and a PC200 Komatsu, a Caterpillar D7 bulldozer, a Komatsu WA420 wheel loader and a Caterpillar C966B wheel loader. A 1.2 by 6.1 m (4 × 20 ft) track-mounted trommel with a 1¼" screen was used to process material. It has a 2.1 by 2.1 m (7 × 7 ft) hopper, a single sluice run 1.2 by 6.1 m (4 × 20 ft) long with angle iron and expanded metal, and a 9.1 m (30 ft) long tailings stacker. The wash plant processed up to 80 yd^3 (61 m^3)/hr depending on material. Clean-ups were conducted with a jig and finished on a wheel.

Surficial Geology and Stratigraphy Where Burwash Creek empties from the lower canyon fluvial fan deposits consist of 9 m (29.5 ft) of planar bedded, stratified gravel comprising 50–60% cobbles and boulders with 30–40% pebbles, and ~10% matrix of silty-sand. The fan gravel is overlain by 5 m (16 ft) of massive to crudely bedded sand. All gravel was sluiced.



Drone image looking up Burwash Creek, with Mr. Johnson's operation on the right limit. The meltwater channel is shown in purple intersecting the alluvial fan deposit.

Bedrock Geology Bedrock is weathered biotite schist.

Gold Characteristics Gold is primarily rounded and smooth with a fineness of 850 to 860. The largest nugget recovered is 1.5 ounces.

Burwash, a tributary of Kluane

115G/06 2019: 61°22'08"N, 139°18'40"W
115G/06 2018: 61°22'36"N, 139°18'59"W

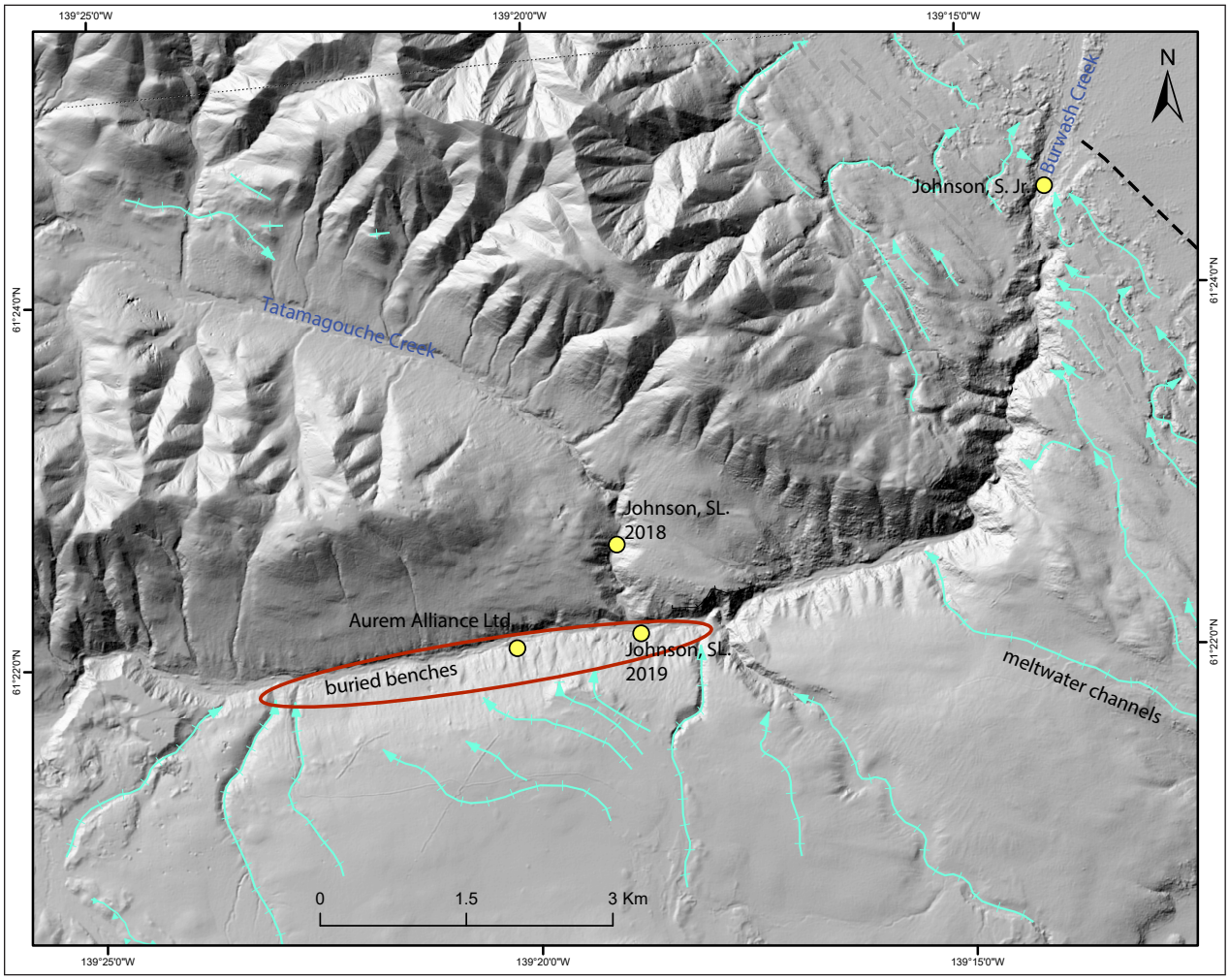
Johnson, S.L., 1993–2002, 2004–2019

Water License: PM17-001 (Active 06/2027)
Active Producer (2018–2019) **Operation no. 179**

Location Burwash Creek, downstream from the mouth of Tatamagouche Creek, and lower Tatamagouche Creek.

Work History and Mining Cuts In 2018, two locations were active. The first location was 850 m upstream Tatamagouche Creek from its confluence with Burwash Creek. The second location was a right limit low-level terrace on Burwash Creek, downstream from the Tatamagouche Creek confluence. For the 2019 season the operator and two crew members focused in the Burwash Creek drainage, working both in the canyon area and above the canyon near the mouth of Tatamagouche Creek. For most of the season, they worked near camp, reworking tailings from the 1970s. The operator was not present in the drainage in 2020.

Equipment and Water Treatment Equipment used at the operation included a Link-Belt 330LX excavator, a Link-Belt 2800 excavator, a Case Drott excavator, a Komatsu WA500 wheel loader, a Caterpillar 977 bulldozer, a Caterpillar D8 bulldozer and a Caterpillar 420D backhoe. Up to three



Lidar imagery of mid to lower Burwash Creek with the three operations in the drainage labeled with yellow circles (S. Johnson, SL. Johnson and Aurem Alliance Ltd.). The abundant meltwater channels that flow off the ice sheet as it retreated are highlighted in teal. Two important deposit types in Burwash Creek are buried low-level benches and meltwater channels. In locations such as where Aurem Alliance Ltd. was operating in 2019, the meltwater channel has dissected the bench.



S.L. Johnson's cut in 2018, approximately 850 m upstream the Tatamagouche Creek drainage.



S.L. Johnson's cut on the right limit terrace in 2019. The measuring stick is 2 m in height. Units 1 and 2 are shown in the photograph. Unit 1 is processed for placer gold.

different wash plants were used to process pay: a New Zealand style floating plant which processed 170 to 200 yd^3 (130–153 m^3)/hr; a floating shaker plant which processed 170 to 200 yd^3 (130–153 m^3)/hr; and a land-based oscillating plant which processed 90 yd^3 (68 m^3)/hr. Both floating plants acquired water with a 6" pump, while a 4" pump supplied the land-based plant. Water was 100% recycled. Clean-ups were conducted using a hand sluice, jig, and a 6 ft wheel.

Surficial Geology and Stratigraphy In 2018, the low-level terrace on Tatamagouche Creek varied in thickness but when observed in July it was 3.2 m (10.5 ft) thick. Thickness varies in the lower part of the drainage due to bedrock exposure and the narrow valley setting. From limit to limit, the valley width was 60 m (197 ft) wide, with the terrace deposit approximately 30 m (98 ft) wide. Angular, muddy, matrix-rich gravel with glacial (very well rounded) boulders and cobbles is targeted for gold.

Mining activity in 2019 focused on processing tailings from the early 1970s located beside camp. Early and late season mining targeted a right limit terrace upstream from the S-bend. Old photographs from the National Archives helped rediscover the bench, which had been the focus of hand mining activity in 1915. Four units were exposed in the right limit terrace exposure. Unit 1, from 0 to 2.8 m (0–9 ft), is a boulder gravel containing 65% clasts and 35% silty sand matrix. Clast imbrication shows a flow trajectory in the down-valley direction. Unit 2, from 2.8 to 5.8 m (9–19 ft) is a sand deposit that coarsens upward into a cobble-pebble gravel. The gravel contains 40% clasts and 60% sand matrix. Unit 3, from 5.8 to 7.8 m (19–26 ft) is a laminated silt or lake sediment. No dropstones were noted so it is uncertain whether unit 3 is related to glacier damming of the valley. Another possibility is the lake sediment is attributed to a landslide that temporarily blocked the valley. Unit 4, from 7.8 to 20.8 m (26–68 ft) is a silt-rich colluvium that is interpreted as a mudslide deposit. Permafrost is present on the slope making it challenging for operations.

Bedrock Geology Bedrock is mapped as granite, granodiorite, quartz diorite, diorite and gabbro (Israel *et al.*, 2005).

Gold Characteristics Tatamagouche gold is chunky and an abundance of copper nuggets have been recovered. The terrace deposit gold varies from flat to coarse, with some nuggets and has a fineness of 860. In the tailings near camp 10% of the gold is larger than ¼".



Copper nuggets recovered from the cut mined up Tatamagouche Creek in 2018. The largest nugget recovered was 7.6 cm (3.0 in).

Burwash, a tributary of Kluane

115G/06 2018: 61°22'03"N, 139°20'07"W

Aurem Alliance Ltd., 2006–2019

Water License: PM19-066 (Active 02/2030)
Water License: PM13-030 (Active 07/2023)
Water License: PM10-007 (Expired 07/2020)
Active Producer (2018–2019) **Operation no. 180**

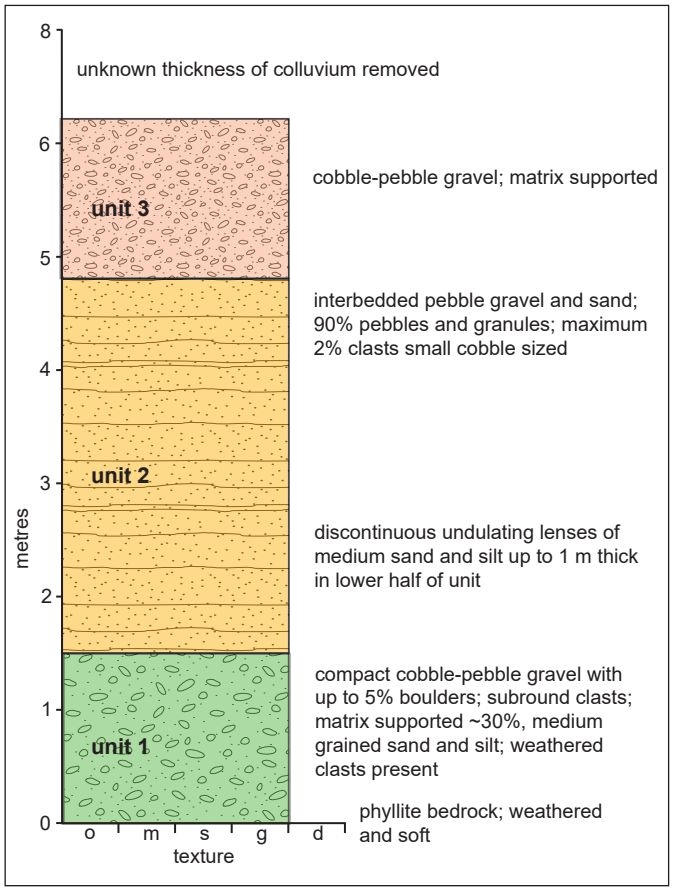
Location Burwash Creek, 1.1 km upstream from the mouth of Tatamagouche Creek.

Work History and Mining Cuts Throughout 2018 and 2019, Aurem Alliance Ltd. continued to focus on a low-level bench deposit on the right limit of Burwash Creek. A cut 30 m (100 ft) long was completed in 2018. Aurem Alliance Ltd. was not active in 2020.

Equipment and Water Treatment Equipment present included an Hitachi 700 excavator, a Caterpillar 365B excavator, a Caterpillar 345 excavator, a Caterpillar 980 wheel loader, a Caterpillar 988 wheel loader as backup, Caterpillar D7E and D9L bulldozers, a John Deere 310G loader backhoe, and a rock truck.

A Derocker was used to process material and classify material to 2" minus. The wash plant could process up to 100 loose yd^3 (76 m^3)/hr, and received water from an 8" pump. Sluice runs were 1.5 by 9.1 m (5 × 30 ft) long and consisted of boil boxes, hydraulic riffles, and expanded metal, all lined with unbacked miner's moss. Water was acquired from Burwash Creek and effluent is settled in a series of three settling ponds prior to discharge back into Burwash Creek.

Surficial Geology and Stratigraphy A series of discontinuous right limit terraces are present on Burwash Creek and are difficult to identify due to colluvium overburden cover. Aurem Alliance Ltd. has continued to explore for the presence of these terraces upstream from the mouth of the Tatamagouche Creek confluence. Meltwater channels derived from the Burwash Uplands, above the right limit, have potentially dissected and reworked this low terrace in places throughout the drainage, hence their discontinuous preservation. The amount of colluvium removed from the cut in 2018 is unknown, but the thickness increases in-slope as the cut moves farther away from the modern creek channel. The lowermost unit, up to 1.5 m (4.9 ft) of cobble-pebble gravel was sluiced.



Exposure on the right limit terrace cut in 2018; all of unit 1 is considered pay.

Bedrock Geology Bedrock is weathered phyllite.

Gold Characteristics Gold greatly varies in size and shape from flat to coarse, with some nuggets. Fineness is 867.

Bee, a tributary of Duke

115G/06 2018: 61°20'38"N, 139°10'20"W

Marshall, C., 2014–2019

Water License: Class 3 (LP00964)
Active Producer (2018–2019) **Operation no. 181**

Location Bee Creek, 330 m upstream from its confluence with Duke River.

Work History and Mining Cuts Bee Creek was first explored in the 1980s and the lower part of the drainage was panned and bulk sampled. In 2014, Mr. Marshall purchased the claims but little information is known about the extent of activity that has occurred on the property since then. Mr. Marshall was sluicing in 2018 and 2019, with much of the activity occurring on the lower left limit of the drainage. No activity occurred in 2020.

Equipment and Water Treatment Equipment in 2018 included a mini Volvo excavator and a shaker deck with a 1.8 by 3.0 m (6 × 10 ft) deck that split into two 0.5 by 2.4 m (1.5 × 8 ft) sluice runs. The runs were configured with angle iron and expanded metal.

Surficial Geology and Stratigraphy Not reported.

Bedrock Geology Bedrock is mapped as amygdaloidal basaltic and andesitic flows (Israel *et al.*, 2005).

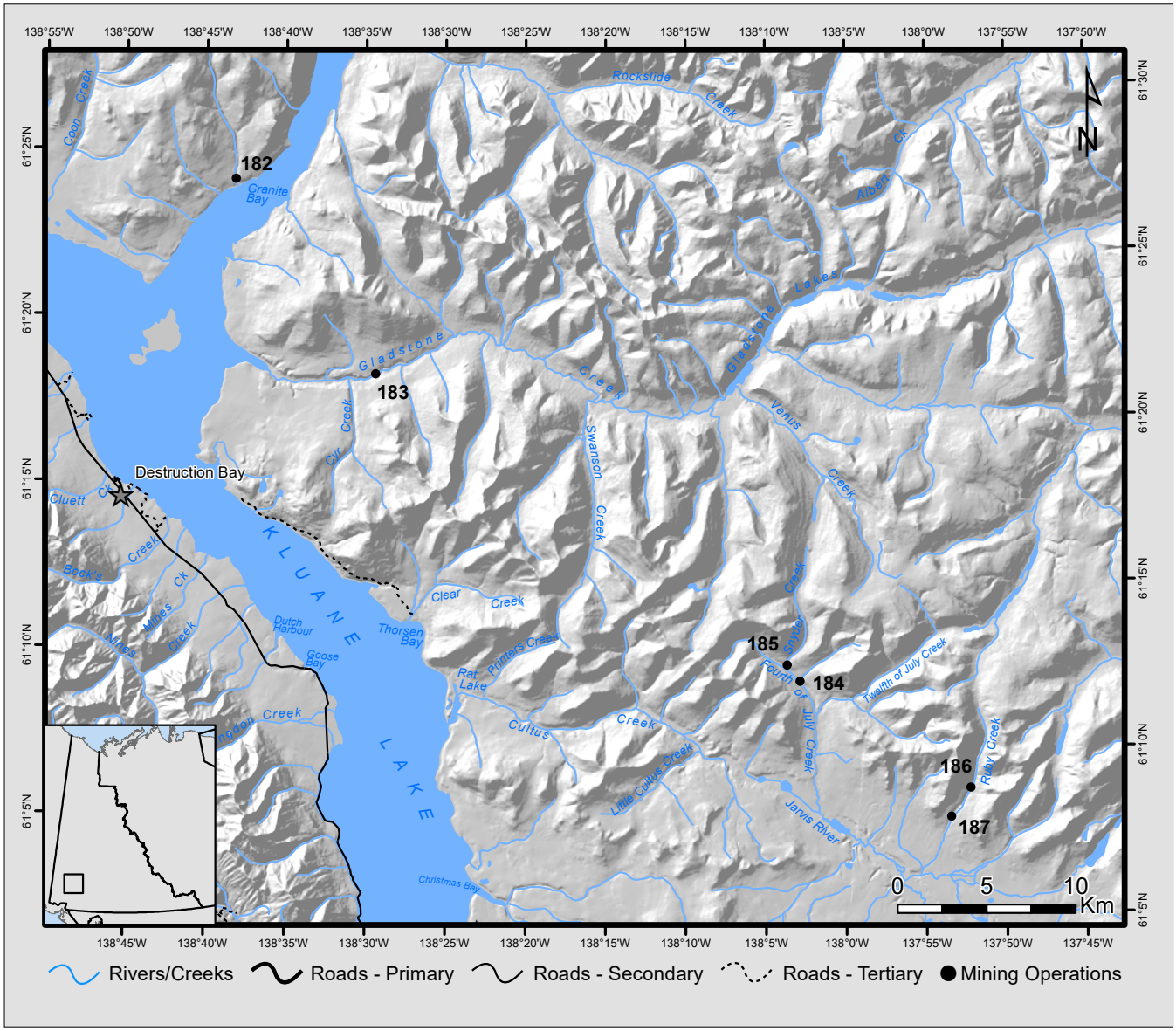
Gold Characteristics Gold is mostly fine and the fineness is 870.



Equipment located on the left limit of Bee Creek in 2018. A large test pit had been completed.

RUBY RANGE
PLACER AREA

SITES 182–187



LEGEND

182. Jabberwocky Exploration Ltd.
183. Tic Exploration Ltd.
184. FTG Placers
185. Canyon Mining Ltd.
186. Brewster, D.
187. MacKinnon, B.

Bliss, a tributary of Kluane Lake

115G/07 2018: 61°24'37"N, 138°42'26"W

Jabberwocky Exploration Ltd., 2013–2018

Water License: PM15-046-2 (Active 12/2025)
Active Producer (2018) **Operation no. 182**

Location Bliss Creek (locally named); a tributary on the west side of the Talbot Arm of Kluane Lake.

Work History and Mining Cuts Jabberwocky Exploration Ltd. continued mining on Bliss Creek in 2018, upstream from the 2017 location. They operated with a four-person crew. The 2018 operations were located 530 m upstream from Bliss Creeks' confluence with Kluane Lake. A total of 180 hours was spent sluicing in 2018. No mining activity occurred on site in 2019 or 2020, and the water license was transferred to Cordillera Quarry Services Ltd. in early 2021.

Equipment and Water Treatment Equipment included a Caterpillar 963B track loader for pushing pay to the plant, a Caterpillar 326F excavator for feeding the plant and a Volvo 290D excavator for removing tailings. The wash plant was a model 100 Gold Machine powered by a 50kW plant. The electrical system also powered a 4" submersible pump to supply water to the Gold Machine. Water was settled out-of-stream and clean-ups were completed using a Goldtron jig, 12 mesh screen and wave table.

Surficial Geology and Stratigraphy Bliss Creek is a narrow, steep drainage draining into Granite Bay. The modern fluvial gravel, which varies from 1.2 to 4.8 m (4–16 ft) thick, is the target pay unit for the operation.

Bedrock Geology Bedrock is mapped as foliated granodiorite (Murphy, 2014).

Gold Characteristics Gold is predominately 12 mesh size and the fineness ranges from 830 to 860.

Gladstone, a tributary of Kluane Lake

115G/07 2020: 61°19'08"N, 138°32'30"W

Tic Exploration Ltd., 1992–2020

Water License: PM15-068 (Active 03/2026)
Active Producer (2018–2020) **Operation no. 183**

Location Gladstone Creek, 6.3 km upstream from Kluane Lake.

Work History and Mining Cuts Tic Exploration has been present on Gladstone Creek for nearly three decades. Throughout that time they have continued to mine up the drainage, unearthing economic gravel on both limits of the creek. In 2020, all activity was focused on the right limit, slightly upstream of the lowermost canyon (1.5 km upstream from Cyr Creek). Six people were present throughout the season, and operated a daily 12-hour shift, which advanced to 24 hours later in the season.

Equipment and Water Treatment Equipment included three Caterpillar 330 excavators, a Caterpillar 325 excavator, a Caterpillar 345C excavator, two Caterpillar D9H bulldozers, a Caterpillar D10N bulldozer and a Caterpillar 966 loader. Two wash plants were utilized. One wash plant was a 1.5 m (5 ft) diameter trommel with a 1.8 by 1.8 m (6 × 6 ft) sluice run and a 0.7 m (2.5 ft) wide tailings conveyor. The other wash plant was a 1.8 m (6 ft) diameter floating trommel with a 2.7 by 1.8 m (9 × 6 ft) sluice run and a 0.9 m (3 ft) wide tailings conveyor. Both sluice runs contained hydraulic riffles. The total amount of material sluiced through both plants was 125 yd^3 (96 m^3)/hr. A 'gold bowl' that classifies concentrates to ¼" and a gold wheel were utilized for clean-ups.

Surficial Geology and Stratigraphy Gladstone Creek has been glaciated by the Cordilleran Ice sheet at least three times, and with each glaciation came eroding, reworking and redepositing of surficial material in the drainage. Glaciations saw both up-valley and down-valley ice-flow, resulting in complex stratigraphy and transport of materials from both Ruby Range and the Shakwak Trench. Economic deposits typically form on bedrock and till (false bedrock) surfaces during deglaciations and non-glacial intervals. The right limit cut in 2020 consisted of four units. Unit 1 is a till false bedrock at the base of the cut, which is matrix-supported and compact. This unit is derived from glacial advancement from the Ruby Range during the Gladstone glaciation 60,000 years ago. Unit 2, from 0 to 1.8 m (6 ft), is a compact pebble-cobble gravel with subrounded to rounded clasts, with 30% matrix of medium to fine sand and silt. Matrix percentage gradually increases near the upper contact with unit 3. Unit 3, from 1.8 to 3.7 m (6–12 ft), is the coarsest gravel in the section. The loose, clast-supported boulder gravel contains 10% small boulders, 55% cobbles and 35% pebbles. An abundance of well-rounded granodiorite clasts up to 3 m (10 ft) in diameter are present in units 2 and 3, most often associated with



Stratigraphy section of the 2020 cut, immediately upstream of the bedrock Canyon on lower Gladstone Creek.

the false bedrock interface. Both units 2 and 3 are interpreted as modern Gladstone Creek gravel that were emplaced following significant down-cutting after the last glaciation. Gold in these units was derived from the reworking of the thick sequence of glacial sediment that once covered the middle of the valley. In addition, any pre-last glacial gravel on the false bedrock surface would also have been reworked. Capping the section is unit 4, from 3.7 to 5.3 m (12–17.5 ft), which represents technogenic tailings and/or workings from when the operator was last present in the area. On the farthest right limit edge of the cut the technogenic deposit is not present and instead unit 3 is overlain by interbedded sand and pebble gravel. Interbedded sand and pebble gravel likely represents fan material from the tributary/meltwater channel immediately upslope from the cut. Unit 2 and unit 3 were sluiced. Further literature on the surficial stratigraphy and placer potential in the Gladstone Creek area is available in the Yukon Exploration and Geology 2018 publication (Cronmiller et *al.*, 2019).

Bedrock Geology Bedrock is mapped as light to dark grey, fine-grained, quartz-muscovite schist (Israel et *al.*, 2011).

Gold Characteristics Gold varies between rough, smooth, and flat, and has a fineness from 830 to 840. Coarser fragments of gold are recovered as the operator advances upstream.



Drone image looking downstream Gladstone Creek towards the bedrock canyon. This is Tic Exploration's mining location in 2020.

Fourth of July, a tributary of Jarvis

115H/04 2019: 61°11'03"N, 138°04'14"W
115H/04 2019: 61°11'06"N, 138°04'21"W
115H/04 2019: 61°11'18"N, 138°04'39"W

FTG Placers, 2016–2019

Water License: PM17-015 (Active 06/2027)
Active Producer (2018–2019) **Operation no. 184**

Location Fourth of July Creek, upper, between Twelfth of July and Alie Creek.

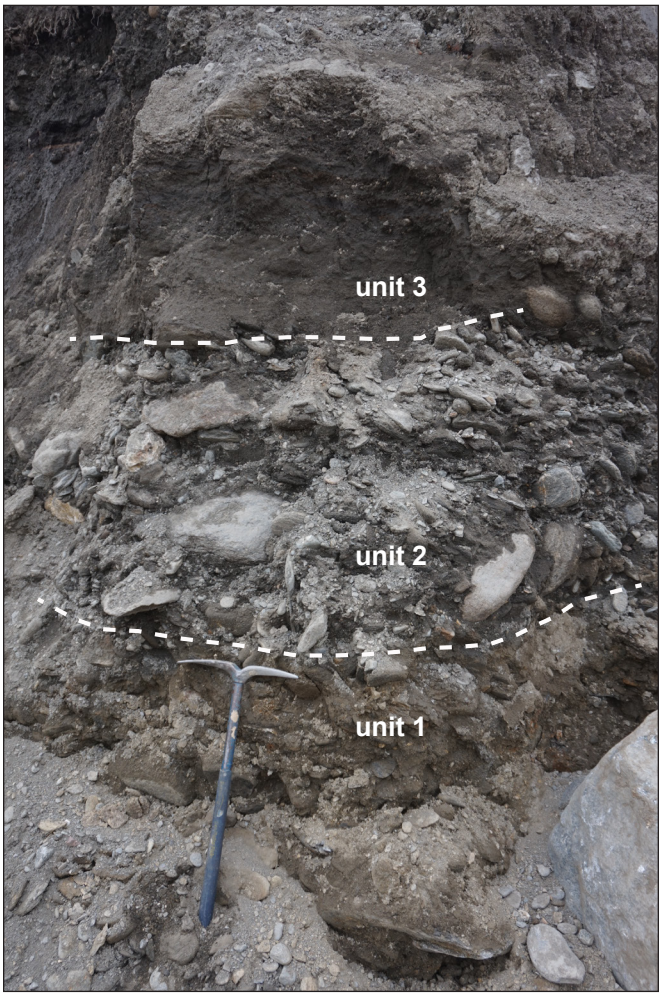
Work History and Mining Cuts FTG Placers entered into a one-year option agreement with Canyon Mining Ltd. for the 2019 mining season. They moved their equipment from Rabbit Creek, a tributary to Larose Creek, and started sluicing on June 13. Mining focused in the upper reaches of Fourth of July Creek near the mouths of Snyder and Alie creeks. This was the first mining activity on Fourth of July Creek in a number of years and therefore limited preparation was possible for opening up new areas. FTG Placers focused on accessible side pay units on both the left and right limits, and also targeted missed pay under tailings. A seven-person crew worked a single 10-hour shift/day. In addition to mining on Fourth of July Creek, FTG Placers conducted reclamation work on their Rabbit Creek mine site during the reporting period.

Equipment and Water Treatment Equipment included a Caterpillar 330 excavator for digging and loading pay, a Terex TA30 rock truck for delivering pay to the plant, an Hitachi EX200 excavator for feeding the plant and a Caterpillar D6C bulldozer for managing tailings and roads. The sluice plant is a T-400 by Macon Industries that includes a 1.2 by 4.8 m (4 × 16 ft) trommel with ⅝" openings. The sluice consists of three 1 by 2.4 m (3 × 8 ft) runs of expanded metal and miners moss. The three runs converge into a 2 by 2 m (6 × 6 ft) run of hydraulic riffles at the lower end of the sluice. A 7.3 m (24 ft) conveyor is used for stacking oversize material. The plant uses water at a rate of 1850 gal/min and settling occurs out-of-stream.



A view looking upstream towards the headwaters of Fourth of July Creek. FTG Placers operation from 2019 is visible in the foreground. They were targeting side pay along the right limit that consisted of modern Fourth of July Creek gravel buried under till and organic colluvium.

Surficial Geology and Stratigraphy Mining on the right limit targeted coarse gravel units overlying a yellow gravel that acts as a false bedrock. The yellow gravel (unit 1) contains decomposed clasts, is cohesive, moderately sorted and imbricated. Thickness of the unit is variable due to different amounts of erosion by the overlying boulder gravel. Near the wash plant, the yellow gravel had a thickness of 7 m (23 ft). Unit 2 is a black, boulder gravel that is in sharp, erosional contact with unit 1. Within unit 2, the clasts are weakly imbricated, poorly sorted, and fine upwards into a pebbly sand.

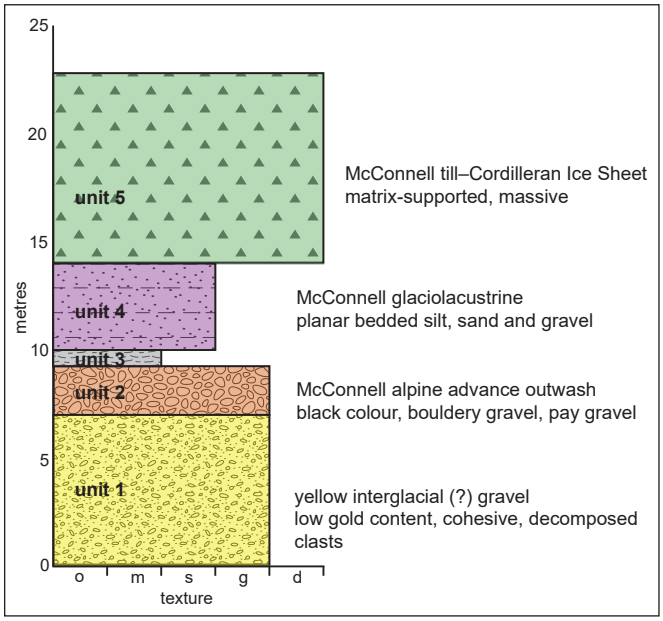


A close-up view of the right limit pay gravel on Fourth of July Creek that was targeted by FTG Placers. Unit 2 (pay gravel) is in erosional contact with unit 1 (yellow gravel) and is overlain by a veneer of fine-grained silty sand.

Unit 3 is an overbank deposit of silt and sand. Unit 4 consists of up to 6 m (20 ft) of frozen till and organic colluvium. Farther downstream on the right limit unit 3 is overlain by a poorly exposed, thick package (12 m; 39 ft) of recessive weathering cobble pebble gravel.

Mining on the left limit targeted a 3 m (10 ft) thick poorly sorted, boulder gravel containing 70% clasts and 30% sandy matrix (unit 2). This gravel cuts into the yellow gravel (unit 1) described on the right limit. Unit 2 is processed for pay, however, the gravel is discontinuous and could not be followed into the face of the cut. Unit 2 is overlain by a fine-grained overbank deposit (unit 3). A thick fine-grained unit containing planar stratified sand, silt and gravel, or laminated silt and fine sand (unit 4) overlies unit 3. Unit 4 is a well-sorted unit and clasts show a down-valley flow to their imbrication. Unit 4 is interpreted as a subaqueous fan or a glaciolacustrine deposit that developed when the valley became blocked by the up-valley advancing Cordilleran Ice Sheet. Unit 5 is 8 m (26 ft) of massive, compact, basal till with some lenses of glaciolacustrine sediment.

The stratigraphy exposed on both the left and right limits of upper Fourth of July Creek appear to record pre-last glacial, last glacial and modern Holocene sedimentation.



A composite stratigraphic section for upper Fourth of July Creek. The sequence above the yellow gravel records events from the last (McConnell) glaciation. The pay gravel is eroded into the yellow gravel suggesting that some of the gold is derived from reworking the yellow gravel. The McConnell outwash gravel is buried by a glacial lake sequence and till deposited at the base of the Cordilleran Ice Sheet that advanced up the valley.

The valley was affected by both local alpine glaciation and by the Cordilleran Ice Sheet that entered the valley from the Jarvis River/Cultus Creek area and flowed up-valley. The yellow gravel is interpreted as an interglacial gravel that contains low gold content and acts as a false bedrock in the valley. When this unit is reworked, economic gold concentrations can result. Reworking of the yellow gravel by a higher energy stream appears to have occurred when alpine ice formed at the headwaters of Fourth of July Creek during the onset of the last glaciation. Meltwater off this small glacier resulted in greater water volumes and higher energy flows. In addition, new placer gold may have been introduced into the meltwater flow from the glacier erosion. Advance of the alpine ice was restricted and is marked by a boulder accumulation in the current stream channel near the 2019 mine cut (61°11'18.8"N, 138°04'39.4"W). As the last glaciation progressed, glaciers from the St. Elias Mountains (Cordilleran Ice Sheet) advanced across the Shakwak Trench and into the Ruby Range. Eventually these glaciers reached Fourth of July Creek valley and advanced up the valley. This resulted in the formation of a glacial lake against the ice front. With a glacial lake filling Fourth of July Creek valley, the energy of the stream was reduced and abundant fine-grained deposits accumulated, including pebbly gravel, and laminated silt and sand. Ice advanced over the glacial lake sediments depositing thick till deposits in the valley bottom and on the valley sides. Following deglaciation, Fourth of July Creek began eroding the various glacial deposits that filled the valley. Holocene erosion cut a trench through the glacial sediments and into the underlying pre-last glacial sediments. Through this process, the modern stream deposits have become enriched in placer gold in some areas. These deposits have been largely exploited in the valley bottom, although pockets may remain under piles of stripped material and tailings. On the flanks of the modern floodplain, Fourth of July Creek cuts into the benches containing glacial and pre-last glacial sediment. Mining in 2019 exploited some of these buried deposits where overburden was relatively thin at the margin of the bench. This work proved that additional placer gold resources exist at the base of the bench deposits; however, overburden thicknesses increase substantially farther into the face. Cut and fill sequences into the yellow gravel are particularly important. Caution should be exercised as increased thickness of the yellow gravel within the bench deposit indicates that it has not undergone significant reworking.

Bedrock Geology Bedrock is mapped as Kluane schist (Colpron, 2017).

Gold Characteristics The majority of gold is characterized as sugar-size gold. Concentrates contain abundant garnets and minor platinum. The fineness is 810.

Fourth of July, a tributary of Jarvis

115G/01 2020: 61°11'30"N, 138°05'07"W

Canyon Mining Ltd., 2017–2020

Water License: PM17-015 (Active 06/2027)
Active Producer (2018–2020) **Operation no. 185**

Location Fourth of July Creek and Snyder Creek, 5 km downstream from the headwaters of Fourth of July Creek.

Work History and Mining Cuts Canyon Mining Ltd. purchased the claims in 2016, and all activity since has occurred in the upper half of the drainage. Exploration and establishing camp were the main activities in 2018. In 2019, they leased the property. Their first year of operation was 2020, and a seven-person crew worked a 12–14 hour shift. Minor activity occurred in Fourth of July Creek itself, as they spent the majority of the season mining up Snyder Creek. They mined a 30 by 150 m (98 × 492 ft) cut 150 m up the drainage from its confluence with Fourth of July Creek. Later in the season, the cut was extended as mining upstream continued, but the total amount of material sluiced is unknown.

Equipment and Water Treatment Equipment utilized in 2020 included a Caterpillar 330C excavator, two Link-Belt 330 excavators, a Caterpillar 988H wheel loader, three Terex TA30 haul trucks, a Caterpillar D8N bulldozer, a Caterpillar 16G grader and a fuel truck. Two plants, a Derocker and screen deck were configured to sluice in tandem; the Derocker was situated on a landing 10.7 m (35 ft) higher than the screen deck,



Two plants, a Derocker and screen deck were configured to sluice in tandem. Material was hauled from Snyder Creek and processed in the Fourth of July Creek drainage. A 10.7 m (35 ft) height difference was required for the Derocker to feed into the screen deck.

allowing the tailings to be immediately re-sluiced. Due to the fine nature of the gold, this allowed for enhanced gold recovery. Depending on the material, the plant can process between 100 and 200 yd^3 (76–153 m^3)/hr. Water was supplied to the plant using a 10" pump and series of three ponds were used to settle effluent.

Surficial Geology and Stratigraphy A right limit to mid-valley cut 150 m (492 ft) up Snyder Creek from its confluence with Fourth of July Creek was mined in 2020. It consisted of two units: unit 1 from 0 to 3.6 m (0–12 ft) and unit 2 from 3.6 to 5.5 m (12–18 ft). Unit 1 is a very muddy, coarse fluvial gravel with a 40% matrix comprising silt and fine-grained sand. The gravel is poorly sorted and most clasts are subangular and boulders are up to 2 m (7 ft) in diameter. A boulder concentration appears to be present in the uppermost 1.5 m (5 ft) of unit 1. This unit is a locally derived Snyder Creek gravel due to the presence of local lithological units. An undulating contact between unit 1 and unit 2 is present. Unit 2 is a boulder colluvium, the likely source being the steep hillslope on the right limit of the drainage. All of unit 1 and up to 0.3 m (1 ft) of bedrock was sluiced.

Bedrock Geology Bedrock is mapped as light to dark grey, fine-grained quartz-muscovite schist (Israel *et al.*, 2011).

Gold Characteristics Gold is 60% fine but coarse fragments up to thumbnail size are encountered.



Mining location in 2020 at the mouth of Snyder Creek. The view is looking upstream, to the north east into the Ruby Range.

Ruby, a tributary of Jarvis

115H/04 2020: 61°08'18"N, 137°52'59"W

Brewster, D., 1998–2020

Water License: PM11-046 (Active 03/2022)
Active Producer (2018–2020) **Operation no. 186**

Location Ruby Creek, upper.

Work History and Mining Cuts Since 1998, Mr. Brewster has been actively mining eight claims on the upper part of Ruby Creek. Operating in partnership with Mr. Bjork from 2018 to 2020, they continued to undertake cuts on both limits of the drainage and most recently moved to the canyon on the upper end of the claims.

Equipment and Water Treatment Equipment present included a Caterpillar 325B excavator, a Caterpillar 516 skidder, a Caterpillar D6C bulldozer and a Caterpillar D6 bulldozer. The wash plant consisted of a 1.2 by 1.8 m (4 × 6 ft) Clemro vibrating grizzly wash plant with ¾" screen, a 3 m (10 ft) run of punch plate and a 0.4 m (16") by 0.9 m (3 ft) riffle run. The wash plant processed 40 loose yd^3 (30 m^3)/hr, using a 6" pump to acquire water from Ruby Creek at a rate of 600 gpm. A series of three settling ponds are located downstream. Clean-ups are conducted using a longtom.

Surficial Geology and Stratigraphy Exposures from previous work contained three units. Unit 1, at the base of the section, is a false bedrock of compact olive-green till. Unit 2 is a 1 m thick cobble-pebble gravel with a silty sand matrix. This unit is also described as a

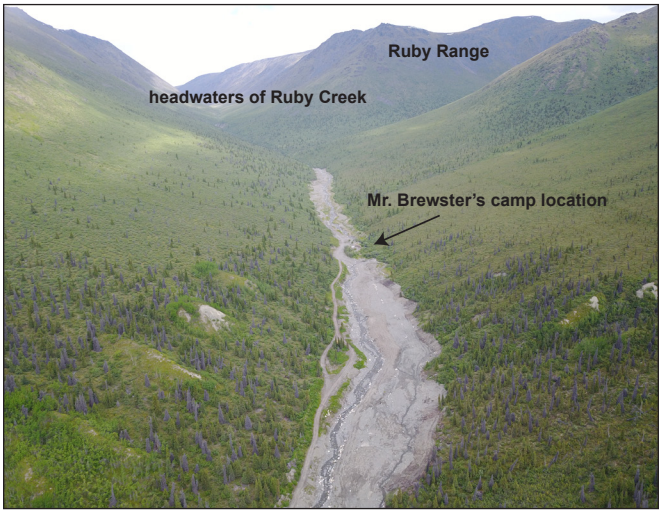


Image taken in 2020 looking upstream towards of the headwaters of Ruby Creek. Mr. Brewster's camp is located on the left limit of the drainage and labeled on the photo. All recent activity occurred out of view, at the upper end of the claims.

muddy gravel and is the target pay material. Test pans in this unit typically contain from 5 to 35 colours. Unit 3 (2.5 m thick) is a clast-supported (80% clasts), crudely imbricated boulder gravel. It is much coarser than unit 1, however it does not contain economic placer gold concentrations (at this specific location). The clasts composition consists of 40% boulders, 40% cobbles and 20% pebbles. Most of the clasts are subangular to subrounded in shape with numerous disk-shaped schist clasts present. The maximum clast size is 140 cm. The matrix consists of a coarse sand.

Bedrock Geology Bedrock is mapped as Late Cretaceous Kluane muscovite schist (Israel *et al.*, 2011). Bedrock outcropped in the creek near the right limit cut described above, and was encountered much deeper on the left limit.

Gold Characteristics Three different types of gold are recovered from upper Ruby Creek.

Exploration Potential Pre-glacial Ruby Creek gravel may underlie the till false bedrock. In addition, side pay prospects on both the left and right limits have not been exploited in the Ruby Creek valley.

Ruby, a tributary of Jarvis

115H/04 2020: 61°07'22"N, 137°54'02"W

MacKinnon, B., 1998–2020

Water License: PM19-043 (Active 05/2030)
Water License: PM10-002 (Expired 07/2020)
Active Producer (2018–2020) **Operation no. 187**

Location Ruby Creek, mid and upper reaches.

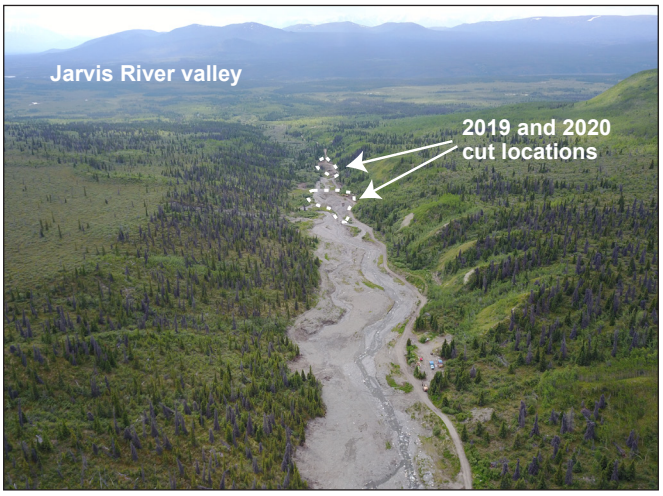
Work History and Mining Cuts Activity on Ruby Creek has remained consistent for the past three seasons, as Mr. MacKinnon has continued to further excavate cuts on his upper and lower creek claims. As a one-person operation, he sluiced between 7000 and 10,000 loose yd^3 (5352–7646 m^3) in 2018 and 2019, and 5000 loose yd^3 (3822 m^3) in 2020. In 2020, the initial activities for the season included reconfiguring the wash plant and bulk sampling on the lower creek claims; all activity was focused on the right limit of the drainage.

Equipment and Water Treatment In 2020, the equipment included a John Deere 790-LC excavator, an Hitachi 250 excavator, a John Deere 544B loader, and a John Deere 750 bulldozer. The wash plant consisted of a 1.5 m (5 ft) diameter chain driven trommel that screens to ¾" and has a single 1.2 by 1.8 m (4 × 6 ft) sluice run lined with two boil boxes, expanded metal and hydraulic riffles. A 6" pump was used to supply water to the plant, which allowed it to process material at a rate of 30 yd^3 (23 m^3)/hr.

Surficial Geology and Stratigraphy Exposures near Mr. MacKinnon's camp consist of an impermeable clay unit (till) overlain by 3.0 m (10 ft) of a coarse boulder-cobble-dominated sandy gravel and capped by 0.6 to 0.9 m (2 to 3 ft) of sand. The coarse gravel is siltier near the base perhaps due to erosion of the underlying silt-rich till. Up to 3.0 m (10 ft) of gravel was sluiced, with the highest grades yielded from clay-rich gravels extracted from the base of the unit. The clay unit acts as a false bedrock surface, so no mining occurred below it.

Bedrock Geology Bedrock is mapped as Late Cretaceous Kluane muscovite schist (Israel *et al.*, 2011) and outcrops along the valley side and in the creek in several locations.

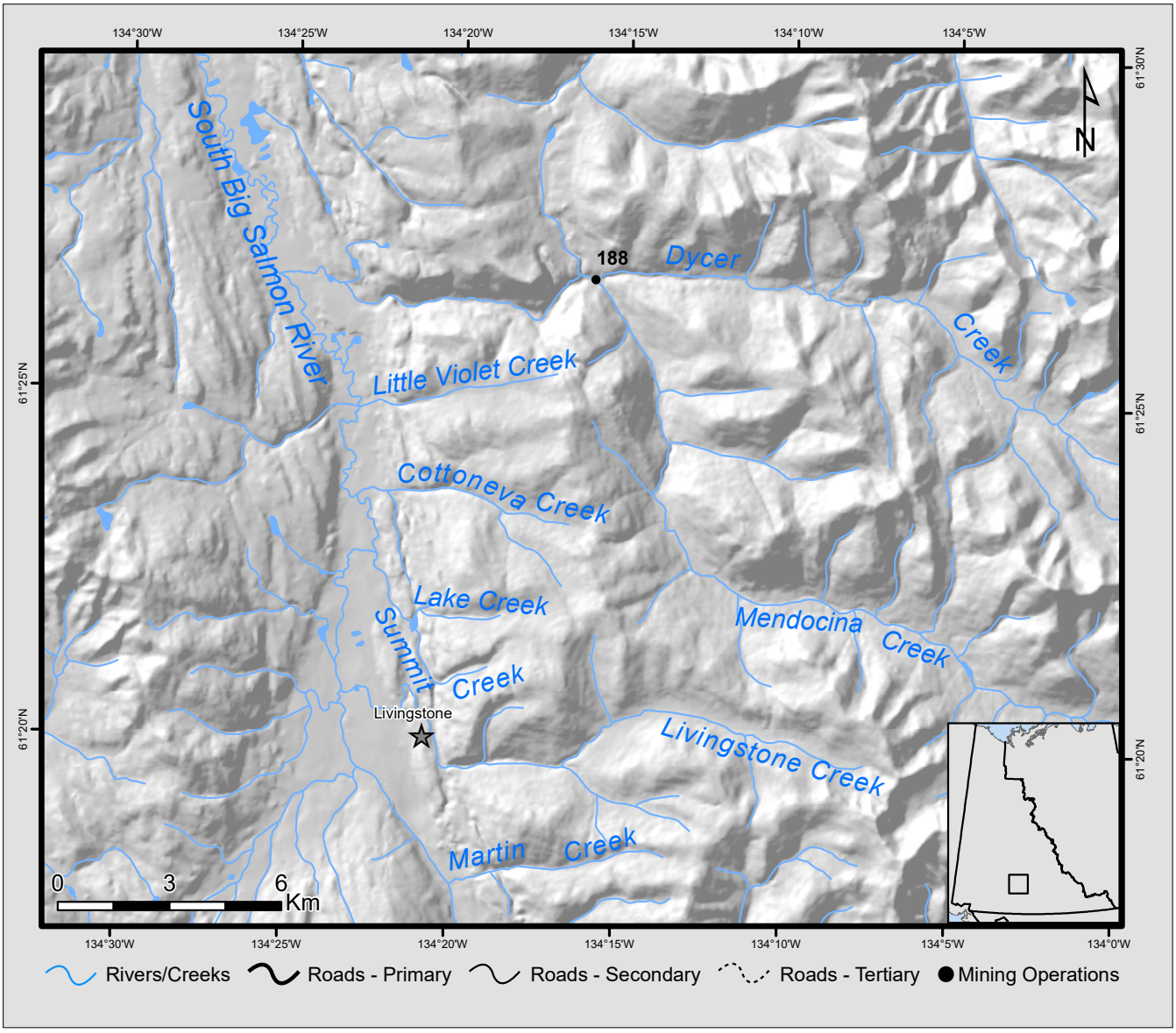
Gold Characteristics 5% jewelry gold was recovered with rare nuggets that averaged 5 to 6 g. The fineness is 845.



Drone image looking southwest down the Ruby Creek drainage. Outlined in the dashed line is the location of activity for Mr. MacKinnon in 2019 and 2020.

LIVINGSTONE
PLACER AREA

SITES 188



LEGEND

188. 0877617 BC Ltd.

Dycer, a tributary of Mendocina

105E/08 2018: 61°26'44"N, 134°15'56"W

0877617 BC Ltd., 1993–2020

Water License: PM18-014 (Active 10/2028)
Water License: PM05-497 (Expired 10/2018)
Active Producer (2018–2020) **Operation no. 188**

Location Dycer Creek, 200 m upstream from its confluence with Mendocina Creek.

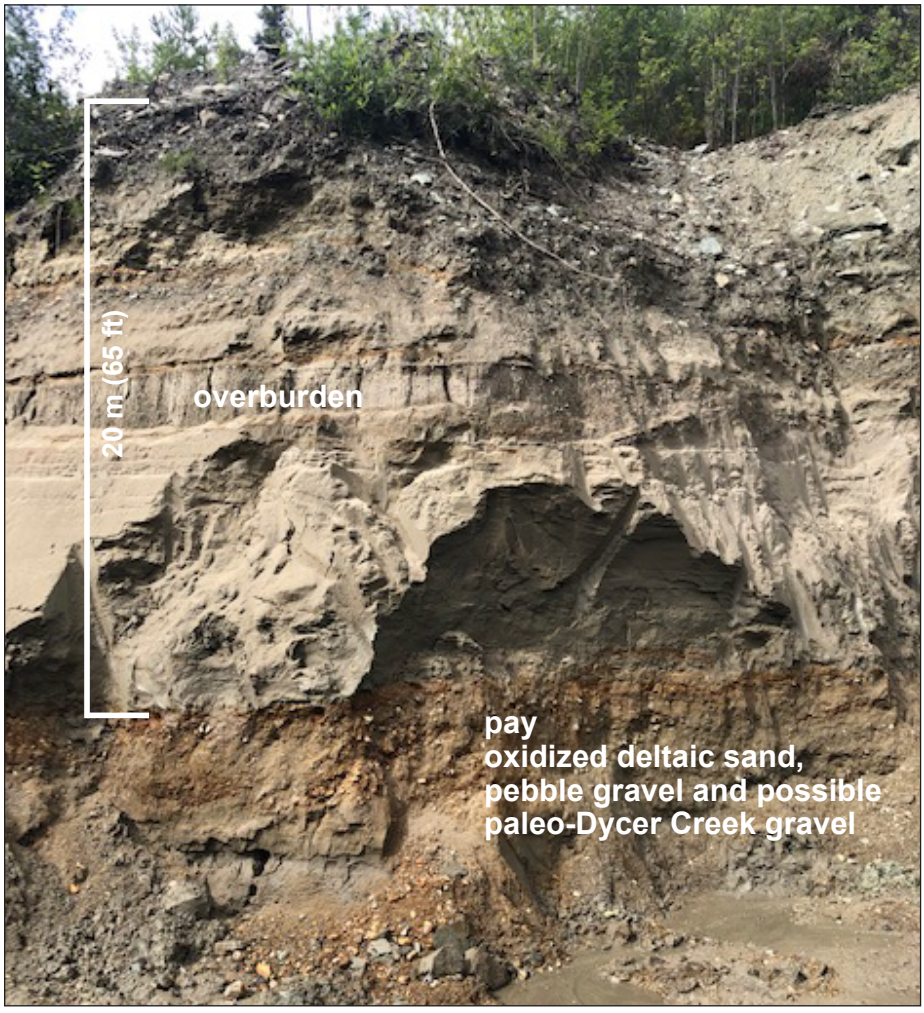
Work History and Mining Cuts For the past three seasons, Mr. Swaim has stripped in the area and configured his wash plant. The stripping area that is prepared for sluicing in 2021 is 24 m (80 ft) wide by 60 m (200 ft) long.

Equipment and Water Treatment Equipment present included a Komatsu 300HD excavator used to strip and excavate gravel, a Caterpillar D5 bulldozer to remove overburden and relocate tailings, and a Caterpillar D25B rock truck utilized for transporting pay to the sluicing location. A large trommel will be used to process pay.

Surficial Geology and Stratigraphy Laminated sand overlain by till comprises the 20 m (65 ft) thick overburden present on the right limit of lower Dycer Creek. Beneath the overburden is oxidized sand and pebble gravel with the potential for older gravel (paleo-Dycer Creek) to be preserved at depth. The stratified, fine-grained sediments were deposited in a glacial lake. This occurred when the Cordilleran Ice Sheet dammed the valley. This setting is excellent for preserving placer gold-bearing sediment at depth due to the protective nature of the lake sediments during glaciation.

Bedrock Geology Bedrock is decomposed quartz-muscovite-schist. Bedrock reefs are present in lower Dycer Creek.

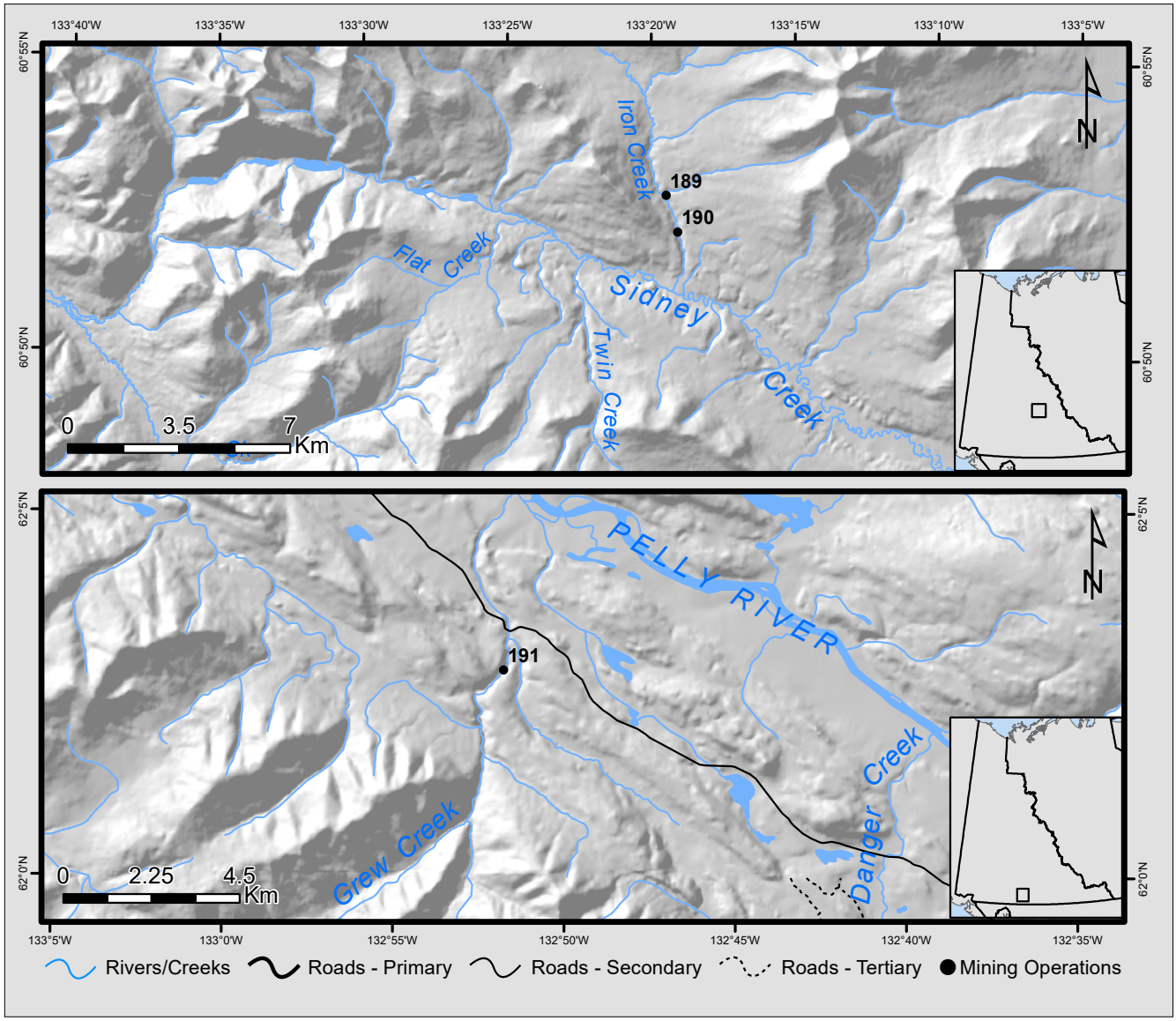
Gold Characteristics Gold recovered from the lower compact gravel is very fine. Fineness is 860.



Stratigraphic section exposed on the right limit of Dycer Creek. Units associated with the last glaciation are visible including deltaic sand and gravel, glaciolacustrine and mixed till and proglacial outwash. (Photo credit: S. Swaim).

NISUTLIN–PELLY
PLACER AREA

SITES 189–191



LEGEND

189. R&M Mining
190. Cartwheel Mining
191. Maltby, T.

Iron, a tributary of Sydney

105C/14 2018: 60°52'44"N, 133°19'25"W

R&M Mining, 2020
Hrehirchek, D. and Cook, C., 2011–2019

Water License: PM15-057-1 (Active 11/2025)
Water License: PM07-577 (Expired 06/2018)
Active Producer (2018–2020) **Operation no. 189**

Location Iron Creek, 3.2 km upstream from its confluence with Sydney Creek.

Work History and Mining Cuts Mr. Hrehirchek and Mr. Cook were present on Iron Creek each placer season between 2011 and 2019; activities have consisted of testing ground and maintaining camp. The claims were transferred to Mr. and Mrs. Manary in February 2020. In spring 2020, the Manary's operating as R&M Mining, arrived on site and operated with two people for 90 days on their claims. In that time, they conducted three small cuts: one measuring 30 by 46 m (100 × 150 ft) and the other two cuts measuring 23 by 23 m (75 × 75 ft). They sluiced 8000 loose yd^3 (6116 m^3) of material.

Equipment and Water Treatment Equipment used by R&M Mining in 2020 included a Caterpillar 325B excavator and a 1.5 by 4.2 m (5 × 14 ft) double screen deck. Material was screened to ½". The screened material was fed into a single sluice run configured with a 1.5 m (5 ft) wide boil box, followed by 0.6 m (2 ft) of hydraulic riffles, and 0.9 m (3 ft) of expanded metal. A 6" pump was used to supply water to the plant, enabling it to process between 30 and 40 yd^3 (23–30 m^3)/hr. A long tom and gold wheel were used for clean-up.

Surficial Geology and Stratigraphy The primary target for operators on Iron Creek has been an alluvial fan deposit close to the confluence of Iron and Sydney creeks. At the apex (top) of the fan, the sediment consists of a coarse angular gravel that becomes thicker and finer grained towards the distal part of the fan. Bedding is absent in the high-energy gravel at the top of the fan, and weak to moderate cross-bedding developed in gravel lower on the fan. Angular large cobble and boulder-sized material is present throughout, indicating the material is likely sourced in part by erosion and reworking of local bedrock, scoured within the nearby canyon. In 2020, the exposed section consisted of 0.6 m (2 ft) of organics overlying 5 m (16 ft) of coarse gravel with boulders throughout. All coarse gravel was sluiced. The coarse boulder gravel is situated on a false bedrock consisting of very compact sandy clay that is interpreted to be till (R. Manary, *pers. comm.*).

Bedrock Geology Bedrock is mapped as quartzite and quartz-muscovite-schist (Gordey and Stevens, 1994).

Gold Characteristics Gold is very flat and fine. The fineness is 850.



Wash plant located on site in 2020 at the Manary's operation. (Photo credit: Jason Colbert).

Iron, a tributary of Sydney

105C/14 2018: 60°52'06"N, 133°18'59"W

Cartwheel Mining, 2013–2014, 2016–2020

Water License: PM16-050 (Active 05/2027)
Active Producer (2018–2020) **Operation no. 190**

Location Iron Creek, 2.2 km upstream from its confluence with Sydney Creek.

Work History and Mining Cuts Iron Creek was first staked in 1905 and extensive activity occurred in the drainage in the 1920s and 1930s. Notably in 1932 and 1933, 6500 feet of flume and 2000 feet of pipeline was assembled to serve three monitors (YGS, 2010). The following year, equipment was moved into the drainage and 75,000 yd^3 (57 342 m^3) of material was processed (YGS, 2010). Pieces of the flume and monitors, as well as historic drifts of varying vintages remain in the drainage. Mr. Dunne spent the 2018 season operating downstream on the right limit of claim P33092 and in 2019 only stripping occurred. In 2020, the presence of historic workings encouraged Mr. Dunne to move farther upstream to the upper end of his claims. He completed a right limit cut measuring 20 by 22 m (66 × 72 ft) and 4 m (13 ft) deep.

Equipment and Water Treatment Equipment in 2018 consisted of a Caterpillar 320C excavator, a Caterpillar D6C bulldozer and vibrating screen deck. In 2019, a Caterpillar 966C wheel loader was added to the operation. The screen deck classified material to ¾" and the 0.6 by 4.9 m (2 × 16 ft) sluice run was configured with 1.2 m (4 ft) of expanded metal and 3.7 m (12 ft) of angle iron. A 4" pump was utilized to supply the plant with water, which was able to process up to 18 yd^3 (14 m^3)/hr. Water was 100% recycled. Clean-ups were conducted using a long tom and gold wheel.

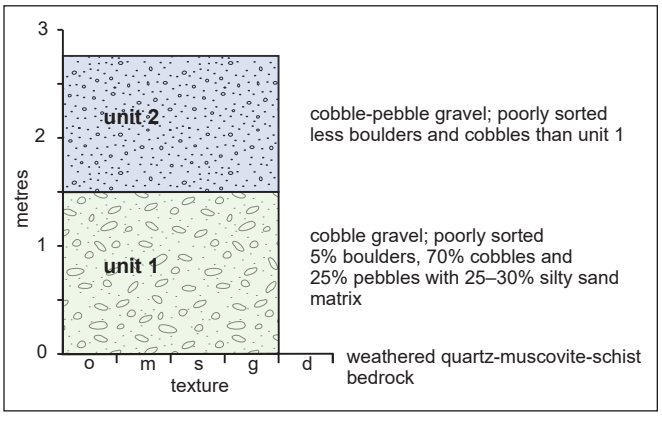


The cut in 2018 at Cartwheel Mining's operation on the right limit of Iron Creek; note the coarseness of the gravel.

Surficial Geology and Stratigraphy Iron Creek has experienced less erosion than Sydney Creek has, allowing for the preservation of low-level benches in the drainage. Although discontinuous, they can be present on both limits of the creek and located 1 m (3 ft) off the modern valley. Mr. Dunne has been targeting these low-level benches, most recently on the right limit. Gravel is slightly coarser on the benches than the modern valley, likely due to the higher energy stream that formed the benches. A section in 2018 exposed two units above a weathered bedrock surface. Unit 1 is a loose, poorly sorted cobble gravel, 1.5 m (5 ft) thick, and overlies bedrock. Unit 1 gravel is up to 5% boulders, 70% cobbles and 25% pebbles with 25–30% silty sand matrix. Unit 2 extends from the top of unit 1 to the top of the section and consists of 1.2 m (4 ft) of gravel that is distinguished from unit 1 by fewer cobble-sized clasts. Up to 1.5 m (5 ft) of unit 1 and up to 0.6 m (2 ft) of bedrock was sluiced as pay. The main pay zone is situated in the contact between unit 1 and the weathered bedrock.

Bedrock Geology Bedrock is quartzite and quartz-muscovite-schist and varies in degree of weathering. Undulations are also present in the bedrock surface.

Gold Characteristics Gold is rough and bright, with minimal fine gold recovered. Gold is predominately coarse (pinky sized), with a ¼ ounce nugget being the largest piece recovered. The fineness is 864.



Exposure in 2018 on the right limit of Iron Creek.



Mr. Dunne's operation in 2018 on the right limit of Iron Creek. The view is looking upstream (north) towards the Big Salmon Range.

Grew, a tributary of Pelly

105K/02 2020: 62°02'50"N, 132°51"47"W

Maltby, T. and T., 2015–2020

Water License: PM12-060-1 (Active 12/2022)
Active Producer (2018–2020) **Operation no. 191**

Location Grew Creek, 5.4 km upstream from its confluence with Pelly River.

Work History and Mining Cuts The Maltby's have been mining on Grew Creek since 2015. Activity on Grew Creek primarily consisted of exploration test pitting on a left limit bench.

Equipment and Water Treatment Equipment on site in 2020 consisted of a Case backhoe, Bobcat 335 track hoe and a 42" by 6 ft trommel that can process 20 yd^3 (15 m^3) of gravel per hour. Clean-ups were conducted using a gold cube and wheel.

Surficial Geology and Stratigraphy Grew Creek flows northeast out of the Pelly Mountains and into the Tintina Trench where it joins the Pelly River. Access to the property is via the Robert Campbell highway about 33 km southeast of Faro. Upon exiting the Pelly Mountains, Grew Creek incises deeply into bedrock and is confined to a narrow canyon. Placer gold is found where the creek cuts through a zone of epithermal mineralization in Eocene volcanic and sedimentary rocks that formed within the Tintina fault zone. In the down-cutting process, small, discontinuous benches are preserved within the canyon. Gravel thickness on the bench is 6 m (20 ft) and there is a well-defined boulder accumulation on bedrock.

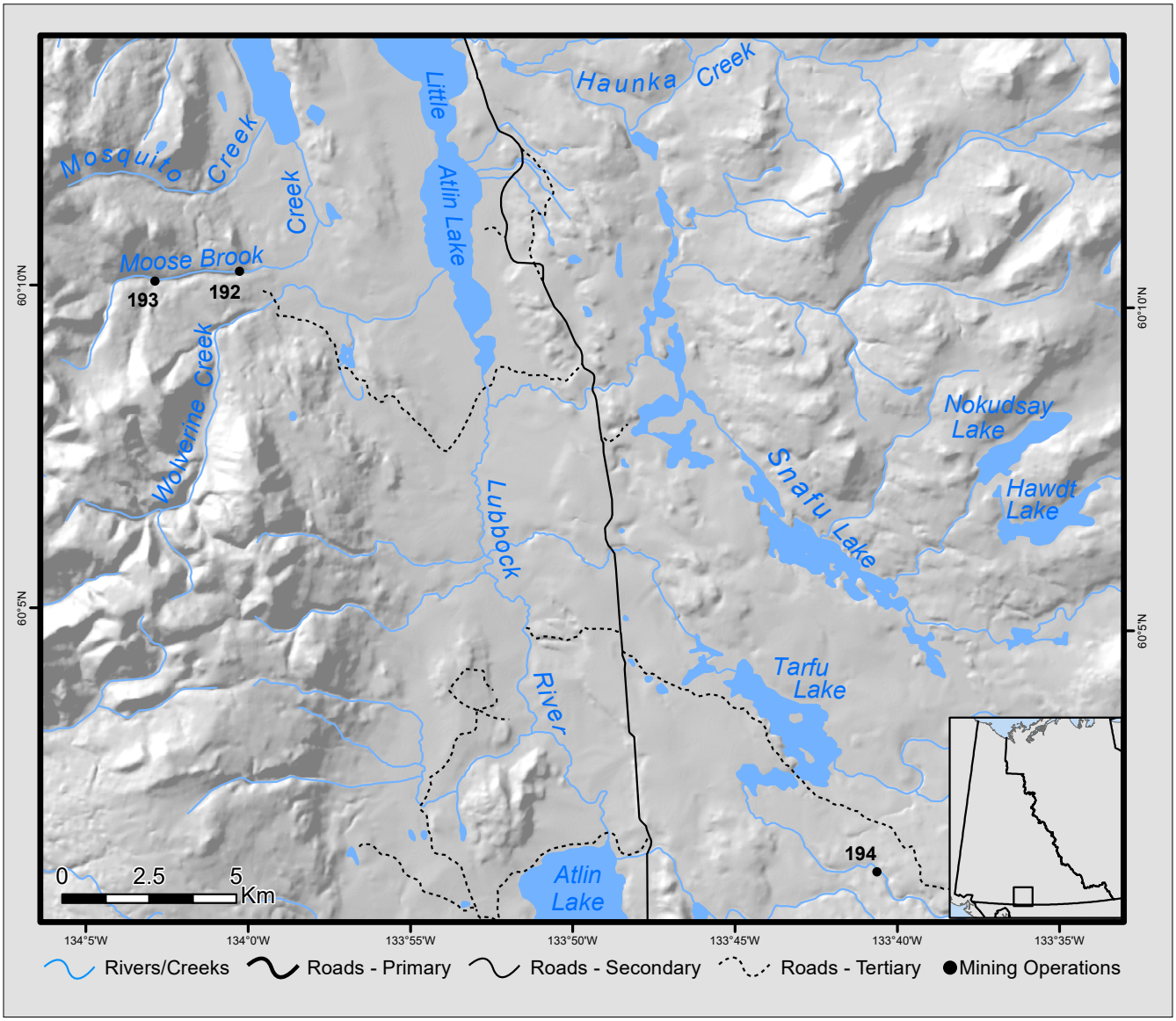
The Grew Creek canyon is indicative of an immature drainage morphology for a stream. Its formation is likely associated with glacial deflection during the retreat of ice within the Tintina Trench. This suggests a paleo-valley may be present in the area and buried by glacial deposits.

Bedrock Geology Bedrock is Eocene volcanic rocks.

Gold Characteristics Gold recovered is flat, flakey and has a fineness of 920.

WHITEHORSE SOUTH
PLACER AREA

SITES 192–194



LEGEND

192. 46007 Yukon Inc.
193. Kabanak, T.
194. Black Mountain Mining

Moose Brook, a tributary of Little Atlin

105D/01 2020: 60°10'21"N, 134°00'14"W

46007 Yukon Inc., 2015–2020

Water License: PM15-018 (Active 07/2025)
Active Producer (2018–2020) **Operation no. 192**

Location Moose Brook Creek, southeastern side of Jubilee Mountain, tributary of Little Atlin Lake.

Work History and Mining Cuts Treadstone Services and Mr. Gilbert established a lease agreement in 2015. The first active season onsite for Mr. Gilbert was 2016; prior to 2016 he conducted exploration on Wolverine Creek, a tributary paralleling Moose Brook Creek to the south. In 2020, two separate locations were mined. A cut in the mid-valley of the drainage, slightly upstream from camp was mined, as well as a location slightly downstream from camp on the left limit. In 2019, they sluiced 1000 loose yd^3 (765 m^3) and in 2020 approximately 1200 loose yd^3 (917 m^3) of material was sluiced.

Equipment and Water Treatment The heavy equipment present on site in 2020 included a Mitsubishi 450 backhoe and a Terex 72-51 wheel loader. A gravity fed sluice plant with a dump box and a ¼" and ¾" punch plate was used to process pay material. The sluice run is 7.3 m (24 ft) long and had three separate runs, two outer runs 0.8 m (2.5 ft) wide and the middle run 0.6 m (2 ft) wide, consisting of expanded metal. Water was supplied to the plant using a 6" pump, which enabled the plant to process up to 35 yd^3 (27 m^3)/hr depending on material. Water was pumped out of Moose Brook Creek and discharged out-of-stream into a series of two ponds. Final clean-ups were conducted using a long tom and a gold wheel.

Surficial Geology and Stratigraphy Moose Brook Creek is a deeply incised drainage with a width of up to 135 m (443 ft). The modern creek valley is filled with glaciofluvial and glacial material from the McConnell glaciation and the thickness of surficial material on the right limit (12 m/40 ft) is up to twice as thick as the left



Drone image looking east, down Moose Brook Creek, with Little Atlin Lake in the background. Mr. Gilbert's camp is visible in the photo and his two mining locations in 2020 are outlined in dashed line.

limit (8 m/25 ft). This asymmetrical preservation could be due to modern Moose Brook Creek being perched on the left limit, or an indication that a bedrock gutter is present on the left limit. Exploration for a deep pre-glacial bedrock gutter is warranted. In 2020, Mr. Gilbert and his family predominately mined in mid-valley and the left limit of Moose Brook Creek, 4.2 km downstream from the Moose Brook Fork near the headwaters of the drainage. An 8 by 8 m (25 × 25 ft) cut exposed 9 m (30 ft) of stratified sand, cobble gravel and silt, which is interpreted as modern Moose Brook Creek.

Bedrock Geology Bedrock present near the mid-valley mining location in 2020 was a limestone breccia.

Gold Characteristics Gold is very fine, although rough in texture. The fineness is 830.

Moose Brook, a tributary of Little Atlin

105D/01 2018: 60°10'06"N, 134°03'21"W

Kabanak, T., 2013–2019

Water License: PM12-019 (Active 08/2023)
Active Producer (2018–2019) **Operation no. 193**

Location Moose Brook Creek, upper, tributary of Little Atlin Lake.

Work History and Mining Cuts The Kabanak's continued actively mining their upper Moose Brook Creek claims in 2018 and 2019. Activity occurred 15 km upstream from the tributary's outlet into the west side of Little Atlin Lake. In 2019, two locations were stripped on the left limit of the drainage; the first in the modern creek valley and the second on a mid-level bench. No activity occurred at the operation in 2020.

Equipment and Water Treatment In 2019, the equipment used at the Kabanak's operation included a small backhoe, bulldozer, small trommel and Derocker wash plant.

Surficial Geology and Stratigraphy Not reported.

Bedrock Geology Bedrock is mapped as massive, finely crystalline, local crinoidal and fusiline grey limestone (Wheeler, 1961).

Gold Characteristics Not reported.

Unnamed, a tributary of Tarfu Lake

105C/04 2018: 60°01'11"N, 133°40'38"W

Black Mountain Mining, 2010–2020

Water License: Class 1 (P 509708)
Active Producer (2018–2020) **Operation no. 194**

Location Unnamed tributary south of Tarfu Lake, 5.2 km upstream from the confluence with Tarfu Lake.

Work History and Mining Cuts Black Mountain Mining has been exploring the placer potential of the unnamed Tarfu Lake tributary since 2010, conducting bulk sampling and auger drilling. Activity in 2020 included small scale prospecting and sluicing. Approximately 50 loose yd^3 (38 m^3) of material was processed on the discovery claim (P42028) in 2020.

Equipment and Water Treatment Equipment present at site included a small Kubota excavator, used to excavate test holes and deliver material to the wash plant. A screen deck, with a 1" screen was used to process up to 30 yd^3 (23 m^3)/hr. The upper sluice was 1.2 by 2.1 m (4 × 7 ft) with ¾" riffles. A two-run secondary sluice, each 0.6 m (2 ft) wide by 3.0 m (10 ft) long, consisted of ¾" riffles, expanded metal and nomad matting. Water was obtained from the drainage under a Schedule 3 permit and was ground discharged. Clean-ups were conducted using a gold cube after concentrate was screened to 10 mesh.

Surficial Geology and Stratigraphy The tributary that Black Mountain Mining has been exploring is located in a deep valley created by glacial meltwater at the end of the last glaciation. High-energy meltwater streams were able to erode and concentrate glacial



Wash plant and stockpile of pay to be processed in the 2020 season (Photo Credit: Tracie Guidolin).

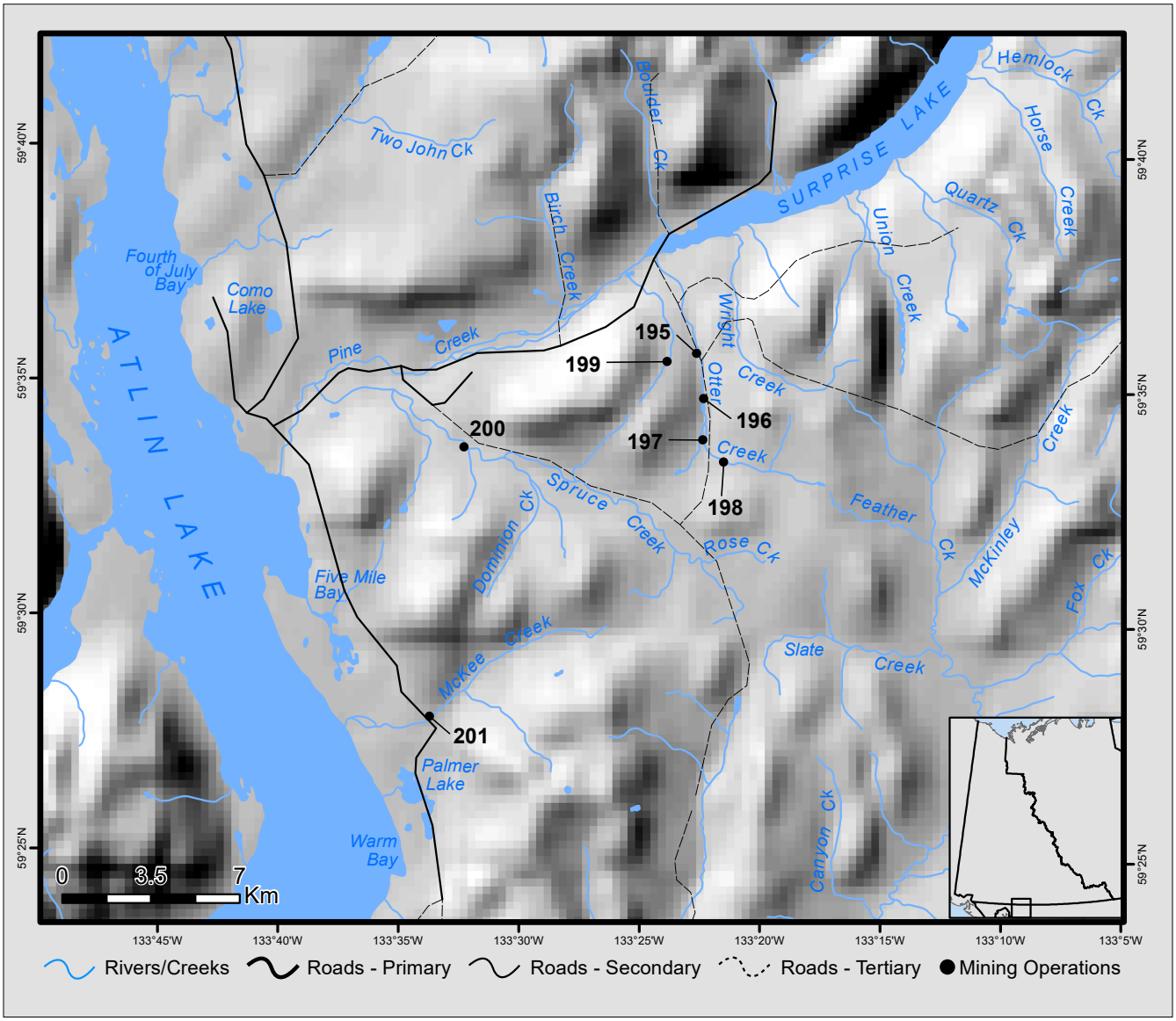
materials more efficiently than the streams today. Prospective depositional environments (channels, bars) in glaciated terrain are often related to former streams draining ice sheets, particularly if they are dominantly erosional. The modern streams that now occupy these valleys are often less prospective and have not had sufficient time to rework underlying gold-bearing units. Deposits left by glacial meltwater at the mine are often massive to weakly bedded, with a wide variety of textures from sand to boulder sized clasts. Where mining has occurred on this tributary, up to 4 m (13 ft) of massive, crudely bedded gravel has been exposed and is interpreted as a glaciofluvial deposit.

Bedrock Geology Bedrock is chert-siltstone.

Gold Characteristics Gold varies from subround to subangular and between 40 to 60 mesh. Gold is rice-sized and rare larger pieces are up to 6 and 8 mesh. Bismuth was recovered in the 2020 season.

ATLIN
PLACER AREA

SITES 195–201



LEGEND

195. RMK Resources
196. Rayna Au Enterprises Ltd.
197. Pelly Construction
198. Zogus, J.
199. Mihoc, R.
200. Sector Resources
201. Wrightson

Otter, a tributary to Surprise Lake

104N/11 2018: 59°35'46"N, 133°22'55"W

RMK Resources, 2019–2020
Otter Creek Mines Inc., 2018

Tenure Number ID: 572210
Active Producer (2018–2020) **Operation no. 195**

Location Otter Creek, above Snake Creek road turn off, approximately 4.5 km upstream from its confluence with Surprise Lake.

Work History and Mining Cuts The Wenzel family has mined on Otter Creek for a number of years. In 2018, their operation was located at the south boundary of their tenure, targeting the deep ground through the middle reaches of Otter Creek. The cut is generally located on the left limit of the valley bottom. Ten people were employed. The property was sold to RMK Resources in 2019.

Equipment and Water Treatment Equipment present on site in 2018 included a Komatsu PC 450LC, 600 and 650 excavators for digging pay and overburden, three Caterpillar 740 haul trucks for transporting pay and overburden, a Komatsu PC 650 excavator for feeding the plant, and a Komatsu 450 loader for managing tailings. A reverse circulation drill was used for exploration. The plant set up consisted of an initial grizzly with 10" openings, which drops into an Elrus feeder. The wash plant consisted of a 1.8 by 7.6 m (6 × 25 ft) trommel with ⅜" openings in the front half and 1.5" openings in the back half. A vertical pipe was used for equalizing water pressure within the plant. Sluice runs were outfitted with hydraulic riffles. Upper pay was processed at 140 yd^3 (107 m^3)/hr whereas the lower pay was processed at 60 yd^3 (46 m^3)/hr.

Surficial Geology and Stratigraphy In 2018, the cut exposed a complex stratigraphic sequence of glacial and post-glacial sediments. Within the cut there is general stratigraphic consistency apart from minor variation between the west and east walls. Mining targeted a pay zone measuring 9 m (30 ft) in width at a depth of approximately 36.5 m (120 ft). The total length of pay streak mined in the cut was 30 m (100 ft). The lower pay gravel (unit 1) on bedrock ranges between 3.0 and 4.5 m (10–15 ft) thick and the upper pay zone (unit 2), directly overlying the lower pay zone, is 3 m (10 ft) thick. The lower pay gravel was not exposed at the time of the visit. The upper pay zone consists of a poorly sorted, oxidized, cobble and boulder-rich gravel with a silty sand matrix. This gravel is indicative of a high-energy flow likely associated with meltwater drainage off a glacier. Unit 3 consists of 4.5 m (15 ft) of till that is mixed with some washed sediment. Clast content in unit 3 is quite high, particularly at the upper contact where a zone of boulders has accumulated. This could suggest a period of ablation or meltout. On the east wall of the cut the till is in lateral contact with a pebble-rich gravel (unit 4) and may represent a glaciofluvial channel deposit associated with ablation. Units 3 and 4 are overlain by 12 m (40 ft) of glaciolacustrine silt (unit 5) that is present across the width of the cut. Unit 6 consists of 2 m (6 ft) of till and is overlain by 9 m (30 ft) of a glaciolacustrine silt and pebbly glaciofluvial gravel complex (unit 7). On the east face of the cut the glaciofluvial gravel is absent and the glaciolacustrine sediment appears to grade into lacustrine silt indicating a lake remained in the valley bottom following the last glaciation. No drop stones were present in the lacustrine unit and it has an organic odour, however no organic material was noted. The lake eventually filled with sediment and was overlain by 3 m (9 ft) of modern Otter Creek gravel and 1.2 m (4 ft) of silty peat (units 8 and 9).

The Otter Creek Mines exposure suggests at least two periods of glaciation are recorded in the stratigraphy. It is currently unclear whether the two tills represent two separate glaciations or two phases within the last glaciation. No paleosols of organic material were noticed between the two intervals. The lower units record a period of glaciation in which water flowed freely down Otter Creek valley. This would suggest that the ice flow was down-valley and this initial phase was likely sourced from the nearby Coast Mountains to the west of Atlin Lake (Levson, 1991). This is an important period in the valley's history because the down-valley flow was sufficiently vigorous to cut into mineralized bedrock, generate new placer gold, and rework any pre-existing placer deposits into the high-energy flow.



A view of Otter Creek Mines Inc. operation on Otter Creek in 2018. The benched open pit is nearing the bedrock interface.

The upper units in the cut suggest that Otter Creek became blocked by ice and infilled with glaciolacustrine sediment. Blockage of the valley likely occurred when Coast Mountain ice advanced up Pine Creek valley and reached sufficient thickness to dam the valley. Glacial maximum, when the entire landscape was covered by ice, is likely recorded by the uppermost till deposit. A second period of glacial lake sedimentation occurs after glacial maximum during ice retreat, followed by resumption of fluvial processes.

Bedrock Geology Bedrock is graphitic argillite and phyllite.

Gold Characteristics 80% of the gold is fine grained. The purity is 800 to 810.

Otter, a tributary to Surprise Lake

104N/11 2018: 59°34'48"N, 133°22'36"W

Rayna Au Enterprises Ltd., 2018–2020

Tenure Number ID: 1037053
Active Producer (2018–2020) **Operation no. 196**

Location Otter Creek, middle reaches on left limit of valley, approximately 6.3 km upstream from its confluence with Surprise Lake.

Work History and Mining Cuts Allan Mytrash acquired placer lease tenure 1037053 from G. Slonski and Godkin Construction in 2017. Rayna Au Enterprises first year of operation on Otter Creek was 2018. Fifteen people were employed at the mine.

Equipment and Water Treatment Equipment present on site in 2018 included a Caterpillar 374 excavator, an Hitachi 670 excavator for benching, an Hitachi 470 excavator for final scraping of bedrock, five Caterpillar 775 haul trucks for transporting overburden and pay, a John Deere 250 excavator and a Komatsu 490 excavator for feeding the plants, a Caterpillar 980K wheel loader and a Komatsu 375 bulldozer for managing tailings. Two plants were utilized on the property, one for handling low-grade pay and a second for handling high-grade pay. The low-grade pay plant consisted of a shaker screen deck with ¾" × 2" slot openings capable of processing 300 yd^3 (229 m^3)/hr and is outfitted with a conveyor stacker. The high-grade plant is a vibrating grizzly or finger plant with 1" spacing between bars and has hydraulic riffles and expanded metal in the sluice box.

Surficial Geology and Stratigraphy The surficial geology exposed in Rayna Au Enterprises' cut is consistent with exposures documented at Otter Creek Mines downstream. Bedrock exposed in the base of the pit consisted of argillaceous and pale green phyllite that is cut by northeast-southwest striking dikes. Coarse gold-bearing quartz veins cutting the phyllite have been documented in this area of the Otter Creek valley bottom (Mihalynuk *et al.*, 2017). The dikes also contribute to the uneven surface topography of the bedrock creating traps for placer gold accumulation. A narrow trough or gutter is cut into the bedrock and has a width of about 4 m (13 ft). According to previous documentation, the gutter is controlled by the north-trending Otter Creek fault (Aspinall, 2016). The uneven bedrock topography in the base of the pit has a glaciated or Roche mountonée morphology with up-valley-facing bedrock surfaces being rounded and down-valley-facing surfaces having



A view looking southwest across the bedrock gutter in Otter Creek at Rayna Au's pit. Large boulders are present in the pay gravel and it is overlain by glacial sediment from the last ice age.

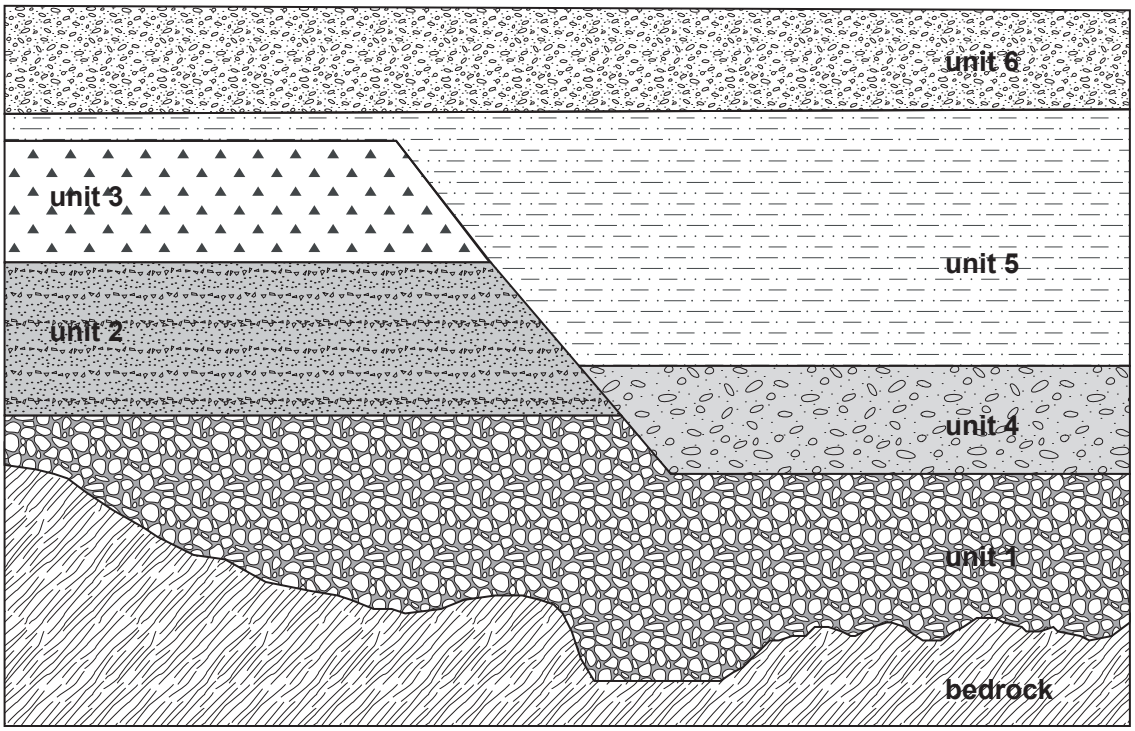


A view looking east of the bedrock surface and overlying surficial sediments in Rayna Au's pit on Otter Creek. The bedrock has a glaciated appearance with rounded surfaces on the upstream side of the outcrops and rough or plucked surfaces on the downstream side.

sharp or near vertical faces. This is consistent with glacial scouring (stoss) and plucking (lee) that occurs during the passing of a glacier in the down-valley direction. Till was not present on the bedrock surface; therefore, this is a remnant morphology from earlier glaciation. Liberation of gold-bearing quartz veins at the bed of the former glacier may have ultimately contributed to the build-up of placers in the Otter Creek valley and their preservation was facilitated by the uneven bedrock topography.

Surficial sediments overlying bedrock vary between the west and east sides of the cut. A coarse, boulder-rich gravel (unit 1) reaches thicknesses of 8.5 m (28 ft) and is present across the width of the cut. The boulders have an angular to subround shape depending on their lithological make-up. Locally derived metasedimentary boulders are angular in shape, whereas more distally derived volcanic greenstones are subrounded in shape. The unit is variably oxidized in the lower 2 m (6 ft). The pay gravel is clast supported and in places has an open work texture (very low fine content) suggesting a high-energy flow was responsible for its deposition. On the west side of the cut, the bedrock surface is higher and therefore the unit 1 gravel is only 2 m (6 ft) thick. It is overlain by 7 m (23 ft) of stratified till (unit 2) that is interpreted as flow till into a glacial lake. Unit 2 is overlain by 5.5 m (18 ft) of massive, basal lodgement till (unit 3), 1.5 m (5 ft) of glaciolacustrine silt and sand (unit 5) and 5 m (16.5 ft) of modern Otter Creek gravel (unit 6, fig strat section). On the east side of the cut, which is closer to the middle of Otter Creek valley, the till has been eroded by a glaciofluvial gravel that is 6.5 m (21 ft) thick (unit 4). This is interpreted as a glaciofluvial cut and fill sequence and the lower contact is marked by a discontinuous lag accumulation of coarse gravel. This unconformity could host a secondary accumulation of placer gold in the valley. On the east side of the cut the glaciofluvial gravel is overlain by 10.5 m (35 ft) of glaciolacustrine silt and sand (unit 5) and only a veneer is present overlying the till on the west side of the cut. Up to 5.7 m (19 ft) of oxidized pebble-rich gravel caps the section and represents modern Otter Creek gravel (unit 6).

The stratigraphy of the Rayna Au section records events from the last glaciation in Otter Creek. Initial ice build-up in the area occurred in the Coast Mountains to the west and advanced into the Otter Creek area prior to the Cordilleran Ice Sheet glaciating the region. The Coast Mountain ice would have entered the Otter Creek drainage from the Spruce Creek pass and advanced down the lower part of the drainage. Meltwater flowed freely down Otter Creek off the



A cross section depicting the stratigraphy at the Rayna Au's cut on Otter Creek. View is looking downstream to the north.

Coast Mountain ice and deposited the high-energy pay gravel (unit 1). As the ice front advanced down the drainage the flow-till, preserved on the west side of the cut, was deposited (unit 2). This transitions into a massive, matrix-supported till deposited during glacial maximum (unit 3). Post-glacial down-cutting occurs following glacial maximum resulting in erosion of the till and deposition of unit 4. This is subsequently halted by damming of the valley, possibly during an ice re-advance in the Pine Creek valley. Glaciolacustrine silt and sand is deposited at this time (unit 5). Modern gravel is deposited across the width of the valley floor during the Holocene (unit 6).

Bedrock Geology Bedrock is graphitic and siliceous phyllite. Dikes up to one metre wide cut the phyllite (Mihalynuk *et al.*, 2017).

Gold Characteristics 80% of the gold is fine grained. The purity is 800 to 810.

Otter, a tributary to Surprise Lake

104N/11 2018: 59°33'55"N, 133°22'37"W

Pelly Construction, 2018

Tenure Number ID: 636503
Active Producer (2018) **Operation no. 197**

Location Otter Creek, middle reaches near forks to Spruce Creek pass, approximately 7.8 km upstream from its confluence with Surprise Lake.

Work History and Mining Cuts Pelly Construction optioned ground below where Otter Creek turns to the east from John Zogus.

Equipment and Water Treatment No equipment was recorded during the site visit.

Surficial Geology and Stratigraphy The open pit excavated by Pelly Construction was 23.5 m (77 ft) to bedrock. Unit 1, from 0 to 1 m (0–3 ft), consists of a boulder-rich gravel and overlies bedrock. Unit 2, from



A view looking at the eastern wall of Pelly Construction's pit in Otter Creek. Bedrock is exposed at the base and the pit depth is 23.5 m (77 ft). The gold-bearing gravel at the base (unit 1) is buried by a full sequence of glacial deposits from the last ice age.

1 to 2 m (3–6 ft), is a silt layer that likely represents overbank floodplain fines associated with the boulder gravel. Unit 3, from 2 to 17 m (6–56 ft), is a coarse gravel that is interbedded with glaciolacustrine silt in the upper 3 m (10 ft). This unit is interpreted as an outwash gravel that flowed off the ice sheet as it advanced over the pass from Spruce Creek. The valley was eventually blocked by ice in Pine Creek/Surprise Lake valley, which resulted in damming of Otter Creek valley and formation of a lake recorded by the glaciolacustrine sediments. Unit 4, from 17 to 20 m (56–66 ft), is a basal till deposited by the ice sheet as it flowed over Otter Creek valley. Unit 5, from 20 to 23.5 m (66–77 ft), is modern Otter Creek gravel.

Bedrock Geology Bedrock is graphitic and siliceous phyllite.

Gold Characteristics Not reported.

Otter, a tributary to Surprise Lake

104N/11 2018: 59°33'27"N, 133°21'44"W

Zogus, J., 2018

Tenure Number ID: 636503

Active Producer (2018) **Operation no. 198**

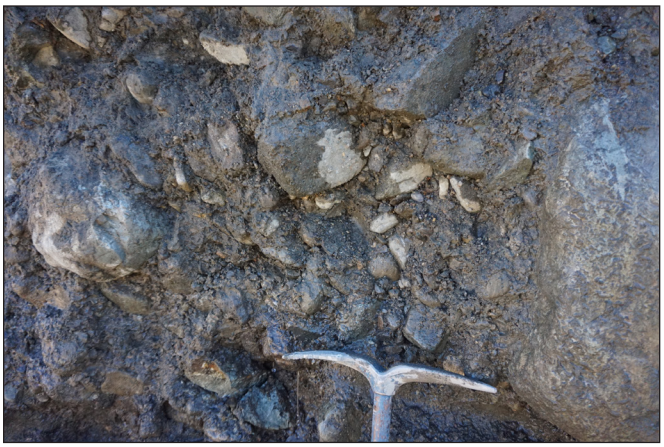
Location Otter Creek, upper reaches, approximately 8.8 km upstream from its confluence with Surprise Lake.

Work History and Mining Cuts According to Mr. Zogus, upper Otter Creek was a focal point for historic mining activity, including work in the bedrock canyon and hydraulic mining on the right limit below camp. Considerable keystone or churn drilling has taken place in upper Otter Creek; however, information pertaining to drilling is unavailable. In 2018, mining focused above the bedrock canyon in a series of cuts below camp.

Equipment and Water Treatment No equipment was recorded during the site visit.

Surficial Geology and Stratigraphy A section was logged immediately below camp and upstream of the bedrock canyon. The 14.5 m (47.5 ft) high exposure on the left limit of Otter Creek consisted of three units. Unit 1, from 0 to 3 m (0–10 ft), is a very compact, impermeable, matrix-supported, yellow-coloured, lodgement till that is situated on bedrock. The till contains pebbles (80%) and cobbles (20%) and include angular grey quartzite, and rounded chert. The long-axis orientation of pebbles within the till (fabric) suggest the unit was deposited by ice flowing from the southwest (240–260°), which is consistent with ice advancing into the area from the Spruce Creek pass. According to Mr. Zogus, despite this unit being on bedrock at this location, no gold is present, however it does act as a false bedrock for the overlying unit. Unit 2, from 3 to 11 m (10–35.5 ft), consists of a moderately dense, basalt boulder-rich, dark grey till. The till contains 40% clasts (60% pebbles, 30% cobbles and 10% boulders) and 60% sandy silt matrix. The boulders are more numerous within a 1 m thick layer near the base of the unit. Closer to Otter Creek, about 50 m to the north of this section, a coarse gravel is present between units 1 and 2. The gravel is poorly sorted, permeable and contains water-washed boulders up to 1 m (3.3 ft) in length. The upper contact of the gravel with the grey till is abrupt and interpreted as erosional. The grey till has a clast fabric suggesting the ice flow was parallel with the orientation of upper Otter Creek suggesting flow down the valley during glacial maximum. Both the grey till and the underlying gravel were processed for placer gold. Unit 3, from 11.0 to 14.5 m (35.5–47.5 ft), is a loose, ablation moraine forming a hummocky surface topography. The sediment is coarse at the lower contact. In the upper 2.5 m (8 ft) the sediment is stratified pebbly material.

The stratigraphy exposed on upper Otter Creek supports the regional understanding of the glacial history. Initial ice advance into the area occurs from the Coast Mountains and into Otter Creek drainage from the Spruce Creek pass. This ice advance would have deposited the yellow till. Gold was not recovered from the yellow till, however if the glacier reworked an interglacial stream bed it could become enriched. Following deposition of the yellow till, the Cordilleran Ice Sheet entered



A close up view of the pay gravel found between the yellow and grey tills on upper Otter Creek. The gravel contains water-sculpted boulders that suggest an interglacial channel that formed over a significant length of time was reworked by the glacier outwash flow shown in this photograph.



The section exposed at John Zogus' mine on the left limit of upper Otter Creek. The exposure illustrates the contact between the yellow and grey tills. The lower portion of the grey till containing large clasts and is processed for placer gold.

the drainage at the headwaters and began sending meltwater down the drainage. This high-energy stream would be capable of reworking pre-existing placer deposits and incorporating the gold into the boulder-rich gravel documented between units 1 and 2, in one area of the cut. The Cordilleran Ice Sheet continued to advance down upper Otter Creek and variably rework the gold-bearing gravel on the floodplain. Some of the gold-bearing gravel was incorporated into the grey till (unit 2) making the till economic to process. In other areas, erosion by the ice sheet was less and the coarse gravel was preserved under the grey till. The end of the ice age is marked by stagnation of the ice sheet and deposition of unit 3.

The stratigraphy exposed in Mr. Zogus' cut highlights the challenges of mining in heavily glaciated ground. Variable erosion by glaciers entering an area from multiple directions can result in abrupt changes to the characteristics of the pay material. In one area, the gold-bearing unit might be a coarse gravel, whereas farther upstream the gravel eroded by the Cordilleran Ice Sheet may have gold incorporated into the till, often referred to as a boulder clay. By understanding the general stratigraphy of the setting, and regularly testing the units for their gold content, these challenges can be overcome.

Bedrock Geology Bedrock is graphitic and siliceous phyllite.

Gold Characteristics Not reported.

Snake, a tributary to Pine

104N/11 2018: 59°35'34"N, 133°24'9"W

Mihoc, R., 2018

Tenure Number ID: 364322

Active Producer (2018) **Operation no. 199**

Location Snake Creek, middle reaches, 4.2 km upstream from its confluence with Pine Creek.

Work History and Mining Cuts Early in the 2018 season, work focused on getting the mine organized for the super sluice. Bedrock was encountered on the right

limit and slopes toward the middle of the valley. A 9 m (30 ft) test pit was excavated in the middle of the valley in order to locate bedrock, but it was unsuccessful. As a result, drilling was planned to determine depth to bedrock.

Equipment and Water Treatment A Caterpillar 330D and a Caterpillar 345 excavator are used for digging overburden and pay. A Volvo A35D and A30D haul trucks are used for transporting overburden and pay. A Case 9050B excavator is used for feeding the plant. At the time of the visit a trommel test plant capable of processing 30 yd^3 (23 m^3)/hr was being used. The sluice runs utilized Hungarian riffles and expanded metal for trapping the gold.

Surficial Geology and Stratigraphy The stratigraphy of the Snake Creek exposure consists of a glacial sequence dissected by modern Snake Creek stream sediments. The oldest unit at the base of the section consists of a yellow, matrix-supported, cohesive till (unit 1). The till contains angular fragments of local schist as well as other lithologic units. The matrix consists of a silty fine sand and the unit thickness is approximately 1 m (3 ft). According to Mr. Mihoc no gold is found within the yellow till. Overlying unit 1 is a 1 m thick (3 ft), very poorly sorted, crudely imbricated gravel containing 70% clasts and 30% matrix (unit 2).



A close-up view of the modern Snake Creek gravel overlying an older, finer-grained gravel at depth. At this locality, the best pay is derived from the modern gravel.



An aerial view looking over R. Mihoc's project on Snake Creek.

The clast content consists of 30% pebbles, 40% cobbles and 30% boulders. The high percentage of boulders indicates flood-like conditions were responsible for the genesis of the gravel. Imbrication of clasts indicates a down-valley flow and many of the clasts consist of volcanic greenstones. Unit 3 is a 1.8 m thick (6 ft) deposit of moderately sorted, imbricated, matrix-supported cobble-pebble gravel. A few small boulders are concentrated near the lower contact and the matrix consists of coarse sand. Unit 4 consists of a 20 cm thick silty fine sand bed that is continuous along the face of the exposure. The unit contains dropstones, which indicate a small, localized glacial lake once filled the basin. Unit 5 consists of a 1 m thick (3 ft) pebbly gravel that is poorly sorted, crudely bedded and has some open-worked lenses. Both the upper and lower contacts are sharp. This unit is interpreted as an advance outwash deposited off a glacier margin. Unit 6 is a 1 m thick (3 ft) matrix-supported, compact lodgement till containing 30% clasts and 70% matrix. Unit 7 is a 1 m thick clast-supported pebble-cobble gravel. Towards the middle of the valley, the modern channel of Snake Creek has down-cut through units 7 to 4 and partially into unit 3 (unit 8). The modern gravel is 2.1 m thick (7 ft) and has a coarse texture with numerous boulders. The best gold is derived from this unit and moderate pay grades are obtained from units 2 and 3. The gold contained in unit 8 is derived from reworking the older units upstream.

Bedrock Geology Bedrock is graphitic and siliceous phyllite.

Gold Characteristics The gold distribution in Snake Creek is 20% >6 mesh and 80% <6 mesh. Nuggets up to 26 grams have been found and some have quartz attached. Overall the gold is described as hackly. Some larger pieces are flat and in places folded.

Spruce Creek, a tributary to Pine Creek

104N/12 2018: 59°33'41"N, 133°32'34"W

Sector Resources, 2018

Tenure Number ID: 368918
Active Producer (2018) **Operation no. 200**

Location Spruce Creek, lower, 7.5 km from its confluence with Pine Creek.

Work History and Mining Cuts Sector Resources has been exploring Atlin placers since 2011. Their work has consisted of drilling, open pit mining, establishing a drain on their Spruce Creek ground, optioning ground and preparations for underground mining. Their main project is focused on lower Spruce Creek where they are constructing an underground placer mine in the deep (Pliocene?) yellow gravel channel while concurrently surface mining the grey channel. Significant underground mining on the property occurred between 1932 and 1952 when the Nolan and Colpe mines operated on Spruce Creek. This early mining focused on the center-line (high grade) portions of the paystreak, which ran ½ oz to the ton. Sector Resources is planning to mine the side pay associated with the paystreak that the Nolan mine exploited. To do this, a 5.4 m (17.7 ft) wide by 5.2 m (17.1 ft) high metal adit will advance into the channel and drifting will occur perpendicular to the adit to exploit the paystreak margins. The property is extensive: 900 m of side pay channel occurs below the Nolan mine; 1.2 km of side pay channel occurs above the Nolan mine; and 1.9 km of virgin channel occurs farther up Spruce Creek. An anticipated rate of penetration will



A view of Sector Resources adit being set into the yellow gravel in Spruce Creek.

equal 4 m (13 ft) during a 10-hr shift or 9 m (30 ft)/day on two 11-hr shifts. The ultimate goal is to mine 11 months per year. Seventeen people are employed on the project and work one daily shift.

Equipment and Water Treatment Equipment used for mining the grey channel included a Caterpillar 345B excavator, a Caterpillar E300 B excavator feeding the plant, and two Caterpillar 773 rock trucks hauling overburden and pay. The plant is a shaker-screen deck that classifies to ½" and processes 100 yd^3 (76 m^3)/hr.

Surficial Geology and Stratigraphy The sedimentology of Spruce Creek surficial deposits is described by Levson (1991). In 2018, Sector Resources targeted two gravel units for placer gold. A thick yellow (oxidized) gravel found on bedrock and a grey "mid-channel" outwash gravel cut into the upper surface of the yellow gravel unit. At the adit entrance, the yellow gravel is 36.5 m (120 ft) thick. The lower 15 m (50 ft) consists of a coarse, clast-supported, heavily oxidized gravel interpreted as high-energy fluvial channel deposits. Placer gold is largely concentrated in the lowermost 4 m (13 ft) with gold grades of up to approximately 25 g/m^3 closer to the bedrock surface (Levson, 1991). According to Sector Resources, the cut-off grade at the Nolan Mine was ½ oz/ton indicating considerable resources should remain in side-channel deposits. The age of the yellow gravel is speculated to be pre-glacial with the barren, upper portions of the unit representing valley aggradation associated with the onset of Pleistocene glaciation.



The erosional contact between the grey outwash gravel and the lower oxidized yellow gravel in lower Spruce Creek. Up to 3 ounces gold per 100 yd^3 (76 m^3) are mined from this contact.

Downstream from the adit entrance, Sector Resources was exploiting the mid-channel gravel (grey channel) that is in erosional contact with the yellow gravel. The grey channel is 3 m (10 ft) thick, imbricated, and contains boulders up to 1.5 m (5 ft) in diameter. This coarse gravel is interpreted as a glaciofluvial outwash gravel and contains up to 3 oz of gold per 100 yd^3. The mid-channel pay unit is overlain by 10 m (32 ft) of contorted glacial lake sediments and stratified gravel, and 19 m (62 ft) of consolidated till. The depth of incision by the grey gravel into the yellow gravel is variable, which undoubtedly affects the overall gold content within the gravel.

Bedrock Geology Bedrock is altered basaltic rock.

Gold Characteristics The largest nugget ever recovered from Spruce Creek weighed 85 ounces. The gold fineness in the yellow gravel is 790 whereas the fineness in the grey channel is 830.

McKee Creek, a tributary to Atlin Lake

104N/05 2018: 59°27'57"N, 133°33'50"W

Wrightson, 2018

Tenure Number ID: 389761

Active Producer (2018) **Operation no. 201**

Location McKee Creek, 3.7 km upstream from Atlin Lake.

Work History and Mining Cuts In 2018, the Wrightsons were mining a section of ground located on the right limit, adjacent to the downstream end of the high exposure. Old-timers mined the ground hydraulically; however, placer gold remains within the decomposed bedrock under tailings. Plans are being made to take a slice off the right limit high wall to access the paleo-channel. In addition, virgin ground has been found on the left limit below the 2018 cut in the middle of the valley. A total of three miners were employed at the site.

Equipment and Water Treatment Equipment used for mining in 2018 included a John Deere 690E-LC excavator and a John Deere 450D excavator for digging pay and removing overburden. A Caterpillar D8L bulldozer is used for pushing pay to the plant and a Link Belt LS-5800 excavator is used for feeding the plant. The plant consists of a Derocker capable of processing 70 yd^3 (53 m^3)/hr. The sluice run is 1.5 by 6 m (5 × 20 ft) and contains hydraulic riffles and expanded metal.

Surficial Geology and Stratigraphy The stratigraphy exposed in McKee Creek includes an interglacial (or pre-glacial) gold-bearing channel deposit on bedrock that is overlain by a sequence of glacial deposits associated with a glacier advance across Atlin Lake and up the McKee Creek drainage. The glacial sediments are most likely associated with the last glaciation around 20,000 years ago. Based on limited exposure of the gold-bearing channel deposit it is very poorly sorted, boulder-rich (many have an angular shape) and heavily oxidized. The angularity of the boulders could indicate proximity to a bedrock wall or slope a short distance into the face. Levson (1991) described the paleo-channel deposit as a high-energy hyperconcentrated flow. These can be associated with extreme flood events that are highly erosional and capable of reworking pre-existing gold-bearing units. The overlying glacial deposits consist of ice contact, up-valley dipping, laminated fine gravel, sand and silt that is overlain by a massive, compact till.

Bedrock Geology Bedrock is dark grey chert and minor dark grey argillite.

Gold Characteristics McKee Creek is known for its coarse gold.



A view looking southwest down McKee Creek and the right limit exposure at the Wrightson's mine. Fractured, decomposed bedrock under hydraulic tailings and recent fluvial deposits was the focus of mining in 2018. Glaciers visible in the distance advanced across Atlin Lake during the last glaciation and flowed up McKee Creek depositing thick glacigenic sediments over the fluvial paleo-channel deposit.

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Fineness of Yukon Placer Gold

Dawson Mining District	Fineness (Historic)	Fineness (Recent)
5 Above Pup		680-832
7 Pup		790-860
8 Above Pup		680-700
15 Pup	700	675-700
24 Pup		827-850
27 Pup	845	
27 Gulch	750	
49 Pup		780
65 Pup	960	
Adams Gulch	615-750	750
Allgold Creek	858-860	870, 820-870, 890
American Hill (Bonanza)	864	800
Anderson Creek (Fortymile area)	720-728	
Australia Creek		850-860
Australian Hill (Hunker)	850-860	860
Ballarat Creek	852-860	850
Barker Creek	793-900	
Barlow Creek	853	
Barney Pup		820-860
Bear Creek	644-746	
Bedrock Creek	820	830
Big Gold Creek	847-854	720-870
Black Hills Creek	730-855	660-855
Blueberry Creek	880	880
Bonanza Creek (upper)	809-827	750-780, 830-850
Bonanza Creek (middle)	781	
Bonanza Creek (lower)	739-798	
Bow Pup Creek		889-900
Brewer Creek	830-890	
Brimstone Gulch	830	
Browns Creek	800	800
Bruin Creek	800	
Canyon Creek		750
Caribou Creek	816-840	820-850, 805
Carmack Fork		670-692
Cheechako Hill	750-785	
Childs Gulch	750	740-750, 734
Clear Creek	820-860	784-860, 889
Clear Creek (left fork)	730	
Clear Creek (right fork)	720-740	
Dago Gulch		780-920, 700-790
Dago Hill (Hunker)	798-859	760
Dawson Hill (Klondike)	790-825	
Discovery Pup	700	690-700
Dome Creek		750
Dominion Creek (upper)	805-832	770-790
Dominion Creek (middle)	817-849	825-860
Dominion Creek (lower)	790-840	865
Eighty Pup	797	
Eldorado Creek	733	703-803
Eureka Creek	677-745	620-690, 670
Fiftymile Creek		890-910
Fortymile River	814-845	
French Gulch	631-750	625-760
Friday Gulch	790-804	790-810
Gauvin Gulch	664	663, 660-675
Gay Gulch	780-790	
Glacier Creek	830-860	820-860
Gold Bottom Creek	780-800	820
Gold Hill	768	
Gold Run Creek	830-878	840-850
Goring Creek	738	730
Green Gulch		750-830
Groetschier Bench	790-825	
Hattie Gulch		710-770
Henderson Creek	720-760	700-750, 800
Henry Gulch	605-650	650-700
Hester Creek	850	650-720, 820
Homestake Gulch	660-750	
Hunker Creek (upper)	798-859	790
Hunker Creek (middle)	725-820	800-870
Hunker Creek (lower)	701-726	699-770, 780, 800
Independence Creek	780-794	708-817, 820
Indian River	780-843	850
Irish Gulch	624-742	650, 750
Jackson Gulch	829-842	
Jackson Hill (Klondike)	835	790
Kentucky Creek		800-825
King Solomon Hill (Bonanza)	785-800	
Kirkman Creek		860-896, 840, 900
Klondike City	780-790	
Klondike River		790-825, 780, 850
Lake Creek		895
Last Chance Creek	683-832	680
Lindow Creek		650-658, 640
Little Blanche Creek	650-710	640, 700-720
Little Gold Creek	860	780
Lombarde Pup	860	800, 850
Lousetown Bench (Klondike)		800-830, 842
Lovett Gulch	860	795-860

Dawson Mining District	Fineness (Historic)	Fineness (Recent)
Lulu Creek		860-880
Maisy May Creek	780-782	770-860
Mariposa Creek	895-900	
Matson Creek	776-893	
McCrimmon Creek		780
Miller Creek	827-857	710-820
Mint Gulch	820-851	
Montana Creek	770	790
Monte Cristo Gulch	784-796	
Moose Creek	855	840-850
Moosehorn Creek		790-820
Nugget Hill (Hunker)		820-910
Oro Grande Gulch	775	730-740, 720
Paradise Hill (Hunker)	735-802	810-840
Poker Creek		873
Portland Creek		820-835
Quartz Creek	732-800	670-750, 820
Ready Bullion Creek	710-717	800
Rosebute Creek	800-810	
Scroggie Creek	895-905	890
Sestak Creek	810-815	
Sixtymile River	810-840	860
Skookum Gulch		630-660
Soap Creek		763-766
Sparkling Creek	880	
Squaw Creek		870-920
Stewart River	837-850	780-850
Stowe Creek		770
Sulphur Creek	790-832	780-840
Ten Mile Creek	830-845	860
Thistle Creek	848-895	800-860
Toronto Creek		890
Touleary Creek		
Trail Gulch		820
Trail Hill (Bonanza)	800-805	
Treasure Hill		700
Victoria Gulch	807-820	800-860, 760-820
Wounded Moose		820-840, 856

Mayo Mining District	Fineness (Historic)	Fineness (Recent)
15 Pup		876-890
Anderson Creek	870	840, 890-910
Boulder Creek	800	
Canyon Creek	825	
Davidson Creek	840	820-860
Dublin Gulch	860-923	
Duncan Creek		788-830, 760
Empire Creek	910	910-915
Fisher Gulch	900	895
Gem Gulch	895	880-895
Gill Gulch	870	
Goodman Creek		820
Haggart Creek	885-895	870
Highet Creek	820-845	800
Johnson Creek	760-820	830
Ledge Creek	805-825	790-800
Lightning Creek	830	
McLagan Creek		820-850
McNeil Creek		760
McQuesten River	870	
Minto Creek	826-835	845
Morrison Creek		815-840
Murphy's Pup	800-900	
Owl Creek		840-870
Partridge Creek		845-850
Rudolph Gulch		830
Russell Creek	850	
Sabbath Creek		800
Seattle Creek		820
Steep Creek	931-946	890-910
Swede Creek	895	880, 750
Thunder Gulch	790-825	
Upper Duncan Creek		810, 792
Van Bibber Creek		840-860
Vancouver Creek		800

Whitehorse Mining district	Fineness (Historic)	Fineness (Recent)
Arch Creek	870	
Back Creek	760-836	
Boliden Creek	890	870-890
Bullion Creek	871	
Burwash Creek	860-876	850-860, 740
Canadian Creek	864-883	
Cottoneva Creek	830	
Discovery Creek	820-850	
Dollis Creek		834-960
East Fork Nansen Creek		800, 790-860
Eva Creek	790	
Fourth of July Creek	800-810	820
Gladstone Creek	820	767-820, 839
Great Bear Creek		820-825
Guder Creek	838	
Hayes Creek	860-880	
Iron Creek		850
Kate Creek	800-820	
Kenyon Creek	750	800-820
Kimberley Creek	850-860	
Klaza River (unnamed tributaries)	760-830	
Lake Creek	895	
Little Violet Creek	866	870-900
Livingstone Creek	880	
Martin Creek	870	
May Creek	892	
Mechanic Creek	880-910	870
Moose Brooks Creek	820-837	793-900

Whitehorse Mining district	Fineness (Historic)	Fineness (Recent)
Nansen Creek	800	805-820, 790
Quill Creek	878	870
Reed Creek	889-896	
Revenue Creek	860-880	890-920
Ruby Creek		835-845
Rude Creek	840-850	860
Rusk Creek	830	
Seymour Creek	860	840-870
Slate Creek	800	
Soya Creek		800
Summit Creek		860-900
Swamp Creek	800	840
Tatamagouche Creek		860
Tatshenshini River	850-866	
Twelfth of July Creek		810
Victoria Creek	720-730	780, 790-810
Wade Creek	900-930	

Conversions and equivalents

LENGTH	
1 centimetre (cm)	= 0.394 in
1 metre (m)	= 39.4 in = 1.094 yd
1 kilometre (km)	= 0.6214 (5/8) mile
1 inch (in)	= 2.54 cm
1 foot (ft)	= 30.48 cm
1 yard (yd)	= 0.914 m = 3 ft
1 mile	= 1.609 km = 1760 yd

AREA	
1 hectare	= 2.471 acres
1 acre	= 0.405 hectare = 4,840 yd^2
1 square yard	= 0.836 m^2

VOLUME	
1 litre (l)	= 1 000 millilitres (ml) = 1 000 litres = 0.21998 gallon (Imp.) = 0.26417 gallon (US)
1 gallon (Imp.)	= 4.5459 l
1 gallon (US)	= 3.785 l
1 cubic yard	= 0.764 m^3

WEIGHT	
1 troy pound	= 12 troy ounce
1 troy ounce	= 31.1035 g = 20 pennyweights = 480 grains
1 pennyweight	= 24 grains
1 grain	= 0.06479 g
1 gram (g)	= 15.43 grains
1 avoirdupois pound	= 16 avoirdupois ounces = 0.454 kg
1 avoirdupois ounce	= 28.35 g
1 kilogram (kg)	= 32.15 troy ounce = 1 000 g = 2.205 pounds (lbs)
1 long ton	= 2,240 lbs
1 short ton	= 2,000 lbs
1 tonne	= 1.102 short tons = 2,204.62 lbs

WEIGHT PER VOLUME CONVERSION	
1 ounce/cubic yard	= 40.68 g/m^3
1 ounce/ton	= 34.2848 g/tonne

GOLD PURITY		
pure gold	= 24 karats	=1 000 fine
91.6%	= 22 karats	= 916 fine
90%	= 21.6 karats	= 900 fine
75%	= 18 karats	= 750 fine
58.3%	= 14 karats	= 583 fine
41.6%	= 10 karats	= 416 fine

GRAIN SIZE	
	Average diameter
Boulders	greater than 256 mm
Cobbles	64 mm to 256 mm
Pebbles	4 mm to 64 mm
Gravel	greater than 2 mm
Sand	2 mm to 1/16 mm
Silt	1/16 mm to 1/256 mm
Clay	less than 1/256 mm

TEMPERATURE
°C = (°F - 32) x .555
°F = (°C x 1.8) + 32

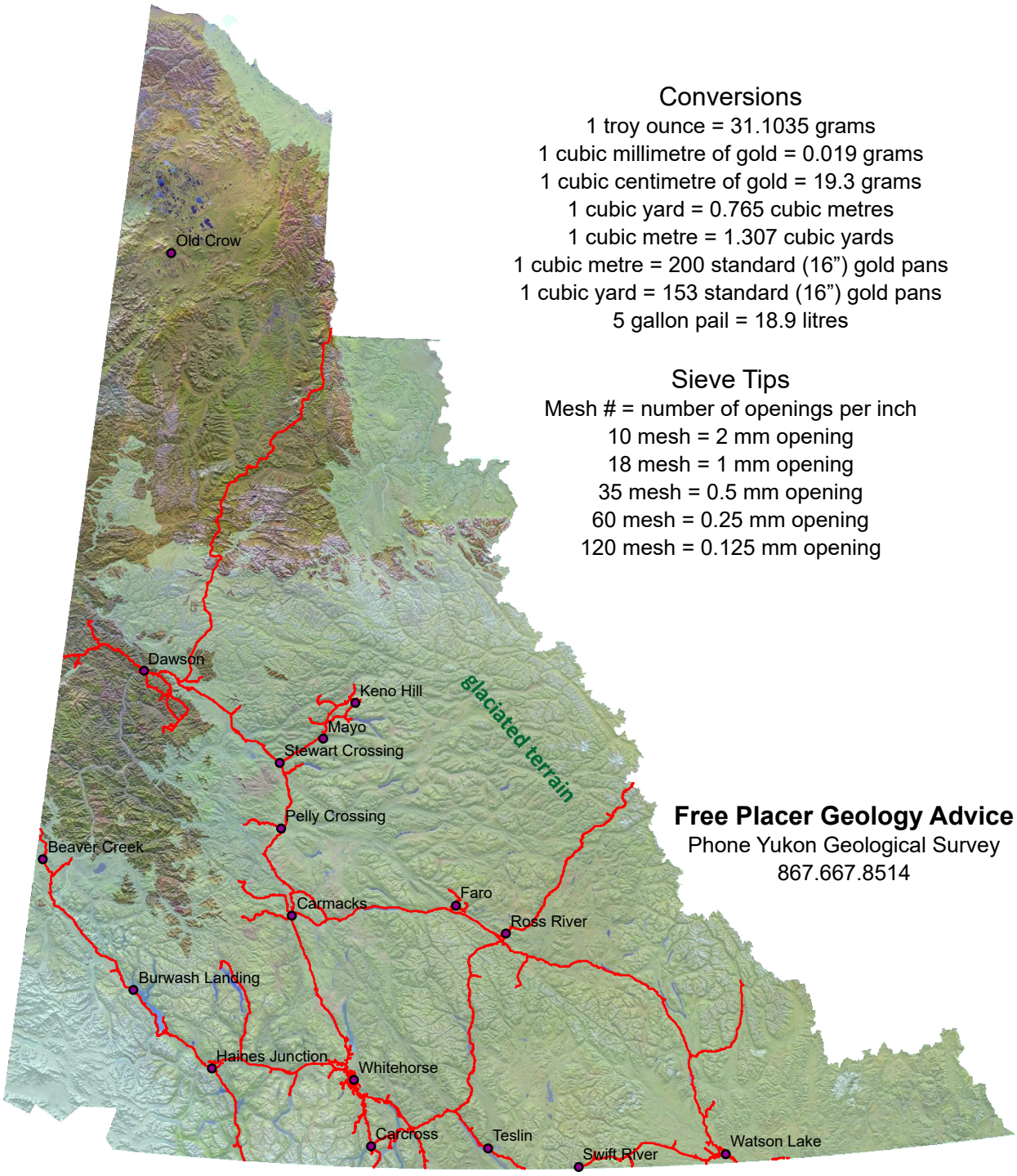
MISCELLANEOUS	
The following measures are not absolute values but are used by many miners to make working estimates:	
1 standard gold pan	= 16 inch diameter top = 10 inch diameter bottom = 2.5 inch depth holds 0.007 yd^3 or 0.005 m^3 weighs approximately 21 lbs (ordinary gravel)
1 cubic yard	= approximately 153 standard gold pans
weight of ordinary gravel in place	= 2500 to 3000 lbs/yd^3
specific gravity of ordinary gravel in place	= 1.48 to 1.78 g/cm^3
specific gravity	
gold garnet magnetite pyrite quartz	= 15.6 to 19.3 = 3.56 to 4.32 = 4.9 to 5.2 = 4.0 to 5.2 = 2.6
1 ounce gold/ton ordinary gravel	= 1.25 to 1.50 ounces/cubic yard
1 gram gold/tonne ordinary gravel	= 1.48 to 1.78 grams/cubic metre
Swell factor of ordinary gravels	= 20 to 30% increase in volume

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41497 Yukon Inc.	Fortymile	88	124
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Conversions

1 troy ounce = 31.1035 grams
1 cubic millimetre of gold = 0.019 grams
1 cubic centimetre of gold = 19.3 grams
1 cubic yard = 0.765 cubic metres
1 cubic metre = 1.307 cubic yards
1 cubic metre = 200 standard (16”) gold pans
1 cubic yard = 153 standard (16”) gold pans
5 gallon pail = 18.9 litres

Sieve Tips

Mesh # = number of openings per inch
10 mesh = 2 mm opening
18 mesh = 1 mm opening
35 mesh = 0.5 mm opening
60 mesh = 0.25 mm opening
120 mesh = 0.125 mm opening

Free Placer Geology Advice
Phone Yukon Geological Survey
867.667.8514

Glacial limits map of Yukon (after Duk-Rodkin, 1999)

Yukon Geological Survey
Energy, Mines and Resources
Government of Yukon

