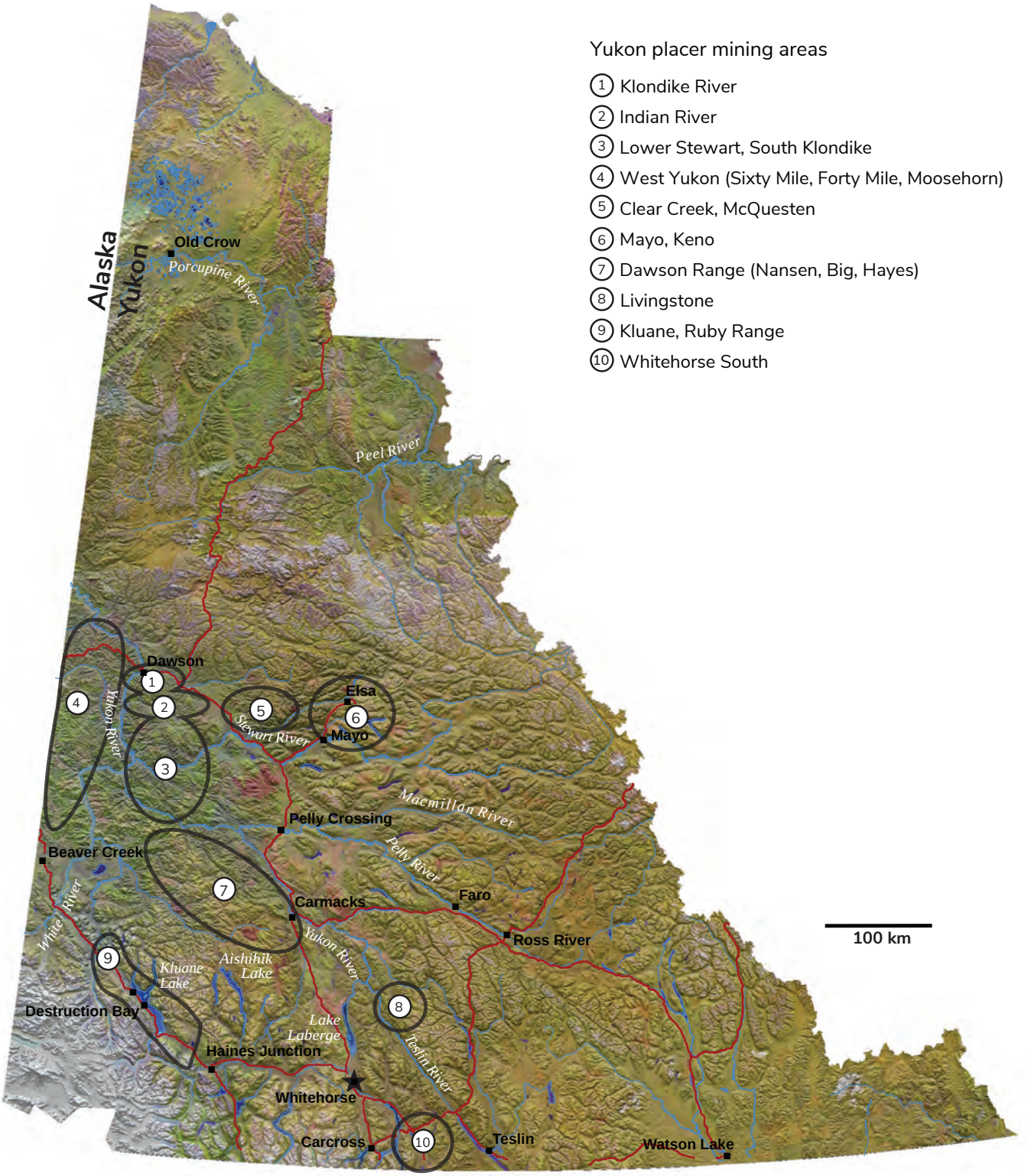
# Yukon **Placer Mining** Industry

## 2015 to 2017

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, McQuesten
6 Mayo, Keno
7 Dawson Range (Nansen, Big, Hayes)
8 Livingstone
9 Kluane, Ruby Range
10 Whitehorse South
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
100 km
Kluane Lake
Aishihik Lake
Destruction Bay
Lake Laberge
Teslin River
Haines Junction
Whitehorse
Carcross
Teslin
Watson Lake

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## 2015 to 2017

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

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Front cover: An aerial perspective of Beron Placers operation on Cheechako Hill, Bonanza Creek. The Pliocene age White Channel gravel, and its paystreak, were discovered by Oliver Millet on this hill during the Klondike gold rush.

Inside front cover: Yukon placer mining areas.

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

Back cover: Siblings Evelyn, Patience and Waylon supervise fun at the Dulac Mine on Gold Hill.

Photos by Jeffrey Bond, Yukon Geological Survey.

## PREFACE

This report is a synthesis of the Yukon Geological Survey's placer fieldwork and captures information collected from approximately 120 site visits conducted each season by Jeffrey Bond and Sydney van Loon. Information is supplemented by details from staff at Compliance Monitoring and Inspections and, from conversations throughout the off-season with miners. This edition of the placer industry report is larger than ever, which speaks to the level of activity in the various districts and our commitment to providing an accurate record. In order to provide practical information, we have continued to increase the amount of geological detail in the report. The scope of the report also aims to capture mining activity and equipment utilized at each site. This helps frame the style of mining and gives a general idea about mine layout and processing techniques. The overall aim of the property descriptions is to provide a reference that is both insightful in the short term and informative decades into the future.

An economic synthesis is provided in the Overview of Activity and Production section. This is a high-level perspective on the health of the industry, based on production figures and staking activity. The last three years have been positive for the Yukon placer mining industry, thanks to favourable gold prices and exchange rates.

We have also included a short section that summarizes the "other" placer-related work conducted by the Yukon Geological Survey. We hope that this provides a clearer understanding of our role and how we contribute and support the business of gold mining. It is important to us that the public is aware of how their tax dollars benefit their business.

Finally, we are pleased to present two articles from contributing authors in this report. Jennifer Roberts, from the Yukon Archives, researched a diary written in 1897 by Latham B. Hamlin who staked Mint Gulch. In the second article, Gary Lee, a local prospector, researched the history of William Ogilvie's dredging dreams on the Stewart River. Both articles capture the richness of Yukon's gold rush history and we welcome their contributions.

## ACKNOWLEDGMENTS

This report is possible because placer miners opened their doors and generously shared information. We are thankful to all the miners who took the time to explain the intricacies of gold distribution, the latest mining methodology, and history of their ground.

Compilation of this report benefited from contributions of the staff at Compliance Monitoring and Inspections branch with Energy, Mines and Resources. Of notable mention is Jim Leary who is always prompt and keen to contribute photographs and site information. Thank you also to Inspectors Matthew Jenner, Sevn Bohnet, Lee Mierau, Johnny Nunan and Brett Isbister for contributing information.

Within the Yukon Geological Survey, we received technical information from Kristen Kennedy on geology in the Kluane district and we appreciated her assistance. This publication would not come together without help from Karen MacFarlane, Head of Technical Services and Publications Manager. She completed timely editorial reviews, patiently corrected our repetitive mistakes and completed the layout of the report. Thank you Karen. Once again, thank you to Jennifer Roberts and Gary Lee for their contributing articles. In future publications, we welcome contributions about Yukon placer mining's heritage or compilations of knowledge that would be informative and beneficial to the industry.

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

# INTRODUCTION

Yukon Geological Survey is proud to present the 2015 to 2017 Yukon Placer Industry Report. Sydney and I have worked hard over the past three years to document mining activity and the geology of Yukon's varied placer gold deposits. The level of detail we provide is directly connected to the openness of the industry to share subtleties that only a miner would know. We thank everyone who took time to welcome us on their claims and discuss the complexities of their ground. The more we come to understand the industry, the more we appreciate the challenges and risks faced by every operator every year. A successful mine requires more than gold in the ground. It requires a dedicated and hard working team, a mine plan that fits the geological setting, ability to trouble-shoot equipment issues and often, a spell of good luck. When all of this comes together, and after the wages, maintenance costs, fuel, food and taxes are paid, only then can a small-scale gold miner hope to put a piece of every ounce in the bank. Of course, only those who seek the lifestyle can fully understand this reality and how the challenges make it a fulfilling way of life. The process of toiling in the creeks creates good-hearted, genuine, and unique individuals. This, along with the fantastic geological exposures, makes our job one of the finest in Yukon.

Awareness of the placer industry has grown in recent years and this presents an opportunity to have a conversation about how it functions. The Yukon Geological Survey is committed to help educate the public and to being a source of knowledge that both governments and non-government organizations can draw upon. As Sydney and I drive around the creeks, we witness different ways of mining. There is a constant evolution that is driven by reducing costs and a willingness to mine smarter and more efficiently. This includes aspects such as adopting the latest earth-moving equipment, improving gold recovery, reducing pumping costs, and improving reclamation. Our role in this evolution is to expedite good ideas by maintaining a network; a network built on face-to-face communication and shared via this report, the placer forum and Gold Show, and during casual conversation. This network of good ideas is something we want to foster to assist evolution. If you have a new idea then we would like to hear about it so the industry can make positive changes together.

We hope you enjoy this edition of the Yukon Placer Industry Report. Once again, it is organized in the same general format as previous reports. The sections are arranged by drainage groupings with corresponding maps and photos included.

### Yukon Geological Survey Activities 2015 to 2017

The Yukon Placer Industry Report is just one of the ways in which we serve the industry. Over the last three years, we have been busy with a number of projects and initiatives that are summarized below. We welcome any additional ideas or comments in order to improve our service delivery.

Yukon Consolidated Gold Corporation files: Sydney has worked hard to compile the Yukon Consolidated Gold Corporation (YCGC) files. Over the last three years, she has published two papers on case studies that demonstrate how the data can be used to find new placer resources (van Loon, 2016, 2017; see references section). Currently, she is coordinating the process of making the YCGC files more accessible to clients. This will include an online, map-based search engine to locate and download digital copies of the historic maps and reports.

Placer Geology Research: In 2015, a project developed out of routine site visits in the Hunker Creek drainage. Recent mining has clarified the stratigraphy and revealed an older, pre-White Channel gravel, informally called the Paradise gravel (Bond, 2016). This discovery provides a new framework to understand gold distribution in these classic deposits, and the publication is available for download on our website.

In 2016, Kristen Kennedy and Sydney van Loon investigated the placer gold settings in Arch Creek, Kluane district (Kennedy and van Loon, 2017). Their work predicted the location of possible paleo-channels and placer deposits in glacial sediments.

Over the last three years, we have co-supervised two geology masters theses directed at placer research. These are being completed with funding assistance from Canadian Northern Economic Development Agency. In 2015, Patrick Englehardt investigated the placer stratigraphy of Back Creek in the Mount Nansen area and published his results as a paper in our Yukon Exploration and Geology (Englehardt *et al.*, 2016). In 2017, Derek Cronmiller

launched an investigation into the stratigraphy and glacial history of the Ruby Range. This includes ideas pertaining to the evolution of placer deposits of Gladstone Creek. Both of these projects are supervised collaboratively with Dr. Brent Ward at Simon Fraser University, Jeffrey Bond at the Yukon Geological Survey and Dr. Matthew Leybourne at Queen's University.

Yukon Placer Forum: This year will be our 10th anniversary hosting the Yukon Placer Forum, which is held in November in conjunction with the Yukon Geoscience Forum. Every year we organize, in collaboration with the Klondike Placer Miners Association, a diverse selection of placer-oriented talks and upwards of 100 delegates attend for the day. We encourage you to schedule this event into your winter calendar. Please contact us for presentation ideas.

Gold Show: Every year the Yukon Geological Survey hosts a booth at Gold Show. This is to showcase our latest work and connect with miners about their summer plans. In 2018, we will be collaborating with Compliance, Monitoring and Inspections to host an afternoon session of technical talks. Our goal is to deliver technical information to more miners than is otherwise possible just through the Placer Forum.

Government Regulatory and Land Use Topics: The Yukon Geological Survey is playing an increasing advisory roll on environment-related topics that factor into placer regulation. Wetlands and water quality are two subjects that we will continue to work on by providing geological context. In the near term, we will be contributing to the Dawson land use plan to ensure that placer resource assessments are accurately accounted for.

Yukon Mineral Exploration Program (YMEP): This program promotes and enhances prospecting and exploration activities in Yukon. A portion of the allocated funds are directed at placer exploration projects. We are available to provide feedback prior to the application deadline of March 31st and are directly involved in working with the program coordinator, Derek Torgerson, to determine which projects receive funding. For more information, please see the YMEP website: http://www.geology.gov.yk.ca/ymep.html.

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# Yukon placer mining industry, 2015 – 2017
## An overview of activity and production

### INTRODUCTION

The Yukon placer mining industry has been busy over the last three years. Production has been increasing steadily, more prospecting leases are being explored, and new operators are catching on to the business of washing wealth from gravel. High gold prices have driven the current bull-run, which is gradually permeating into the industry and will only strengthen operations into the future. Equipment modernization and technical innovation are just two examples of noticeable changes from these good years. The statistics summarized in the following section span a variety of time frames to give the reader a relative perspective on the reporting period 2015 to 2017.

### STAKING ACTIVITY

The staking and maintenance of placer leases provides a good measure of interest in growing the industry and committing capital to exploration and discovery. The last three years have seen the highest levels of lease staking in the last twenty years (Fig. 1). In 2016, 302 placer leases were staked which was the highest number since 1988 when 318 leases were staked. Similarly, the commitment to work leases and keep them in good standing has been exceptional during the reporting period. As of 2017, 343 leases are in good standing, which is the highest number since 1990 and 100% above the 20-year average (Fig. 2).

Placer claim staking trends have paralleled those of placer leases, and confirms the industry's confidence (Fig. 3). In 2016, 2 476 placer claims were staked, which was the highest number since the boom of the early 1980s. In terms of the last 20 years, this value is nearly 300% higher than the average. Fewer claims are being allowed to lapse, and since 2004 there has been a steady increase in the number of claims in good standing (Fig.4). As of 2017, there are 25 219 placer claims in good standing, which is the highest number of claims dating back to 1973 when our records were initiated.

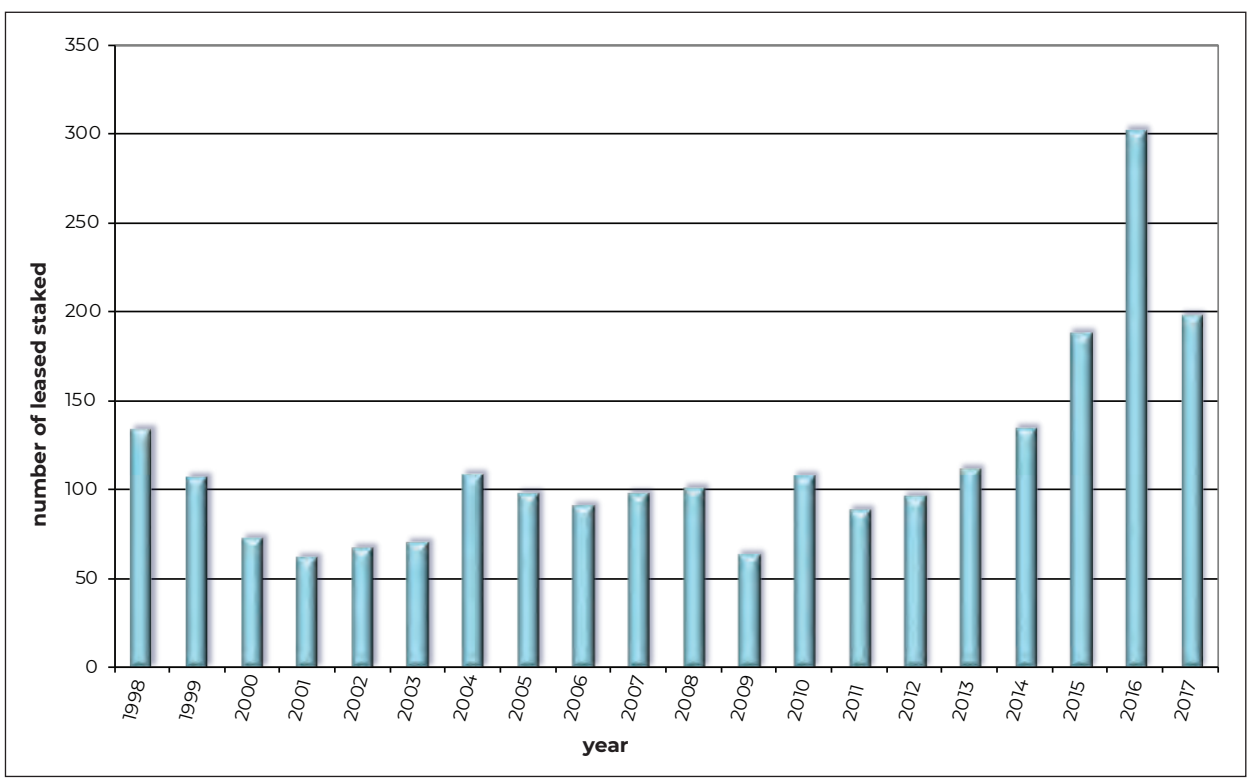



***Figure 1.*** *Yukon placer leases staked, 1998-2017.*

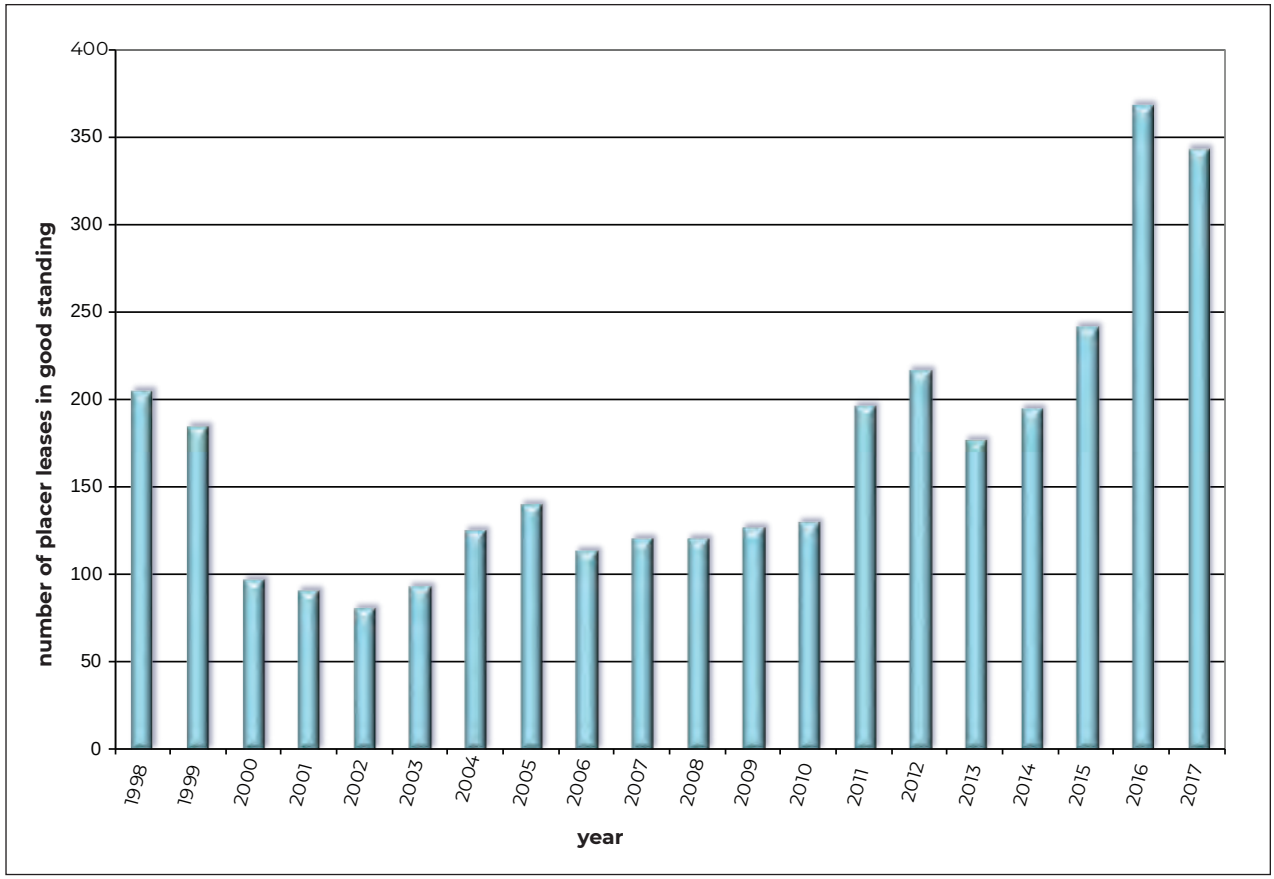



***Figure 2.*** *Yukon placer leases in good standing, 1998-2017.*

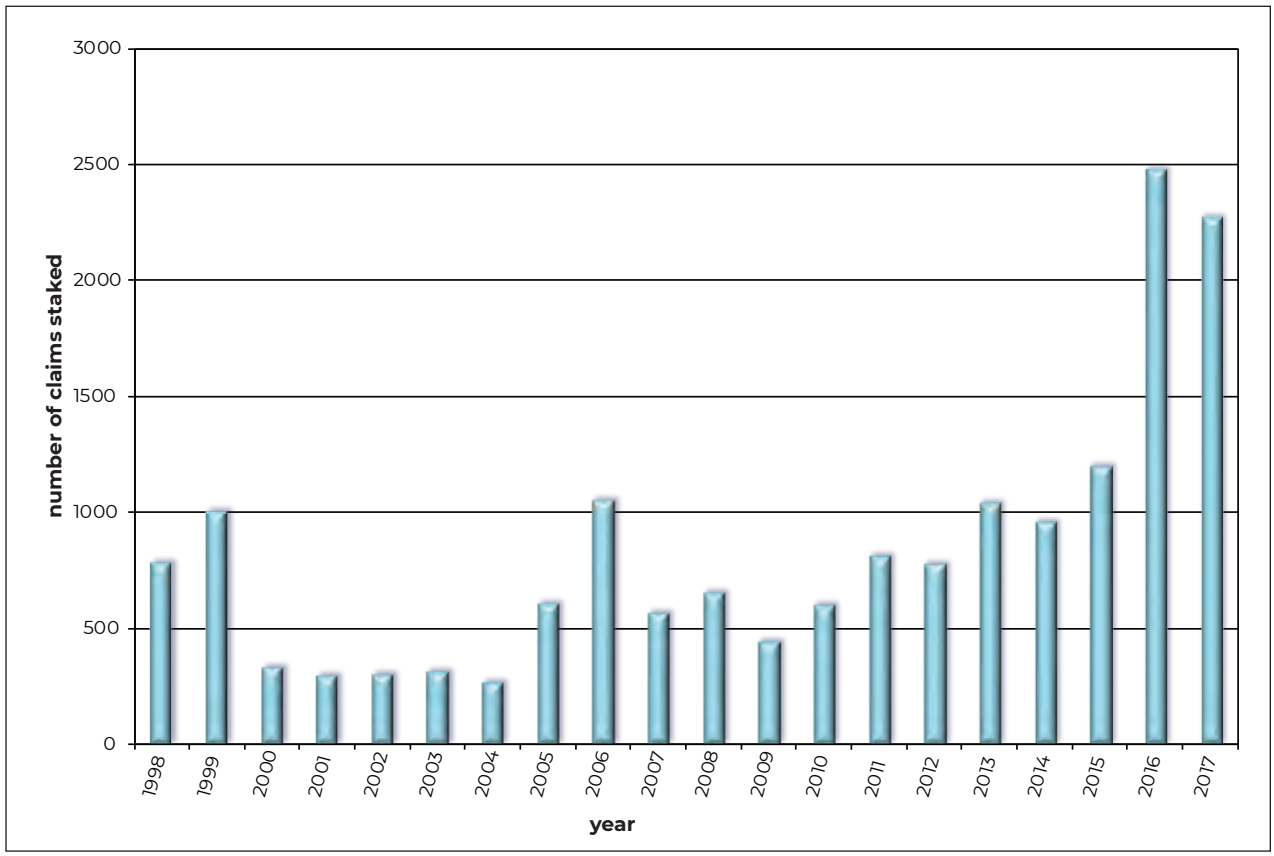



***Figure 3.*** *Yukon placer claims staked, 1998-2017.*

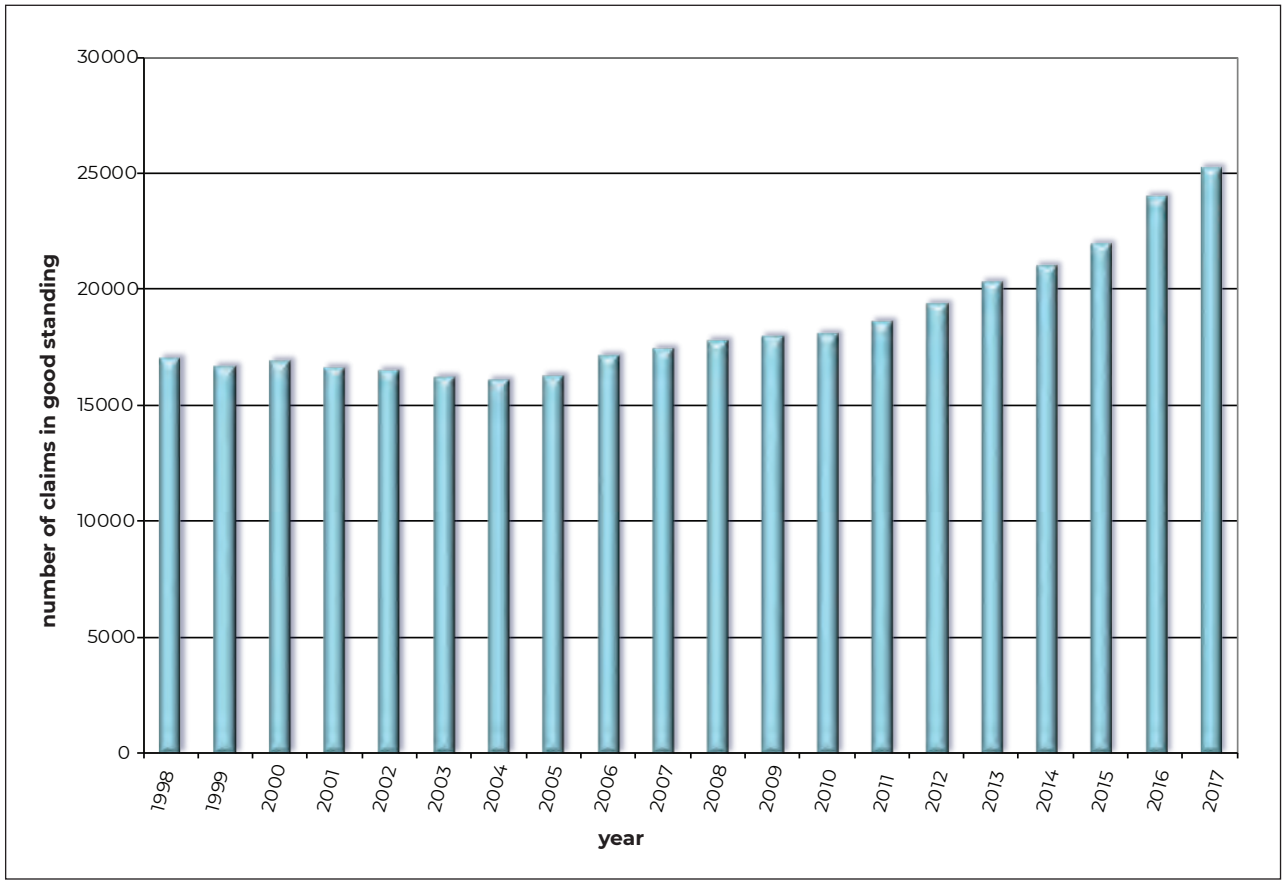



***Figure 4.*** *Yukon placer claims in good standing, 1998-2017.*

## WORLD MARKET GOLD PRICE AND LOCAL DIESEL PRICE

Sustained high gold prices over the last decade has been the main driver in the placer industry's recent success. Gold prices have averaged over CDN$1400.00/oz in the last ten years and that has given producers the confidence to maintain claims, grow their operations and replace ailing equipment (Fig. 5). In the last three years, Canadian gold miners have also benefited from a departure in parody from the US dollar. This has bolstered the Canadian price per ounce by as much as 23% and further shielded the industry from the recent price swing (Fig. 5).

Diesel fuel consumption accounts for approximately 30% of the extraction cost in placer mining, and movement in fuel prices can significantly affect the profit margin. In the last three years, diesel prices, according to National statistics for Whitehorse, are 7% lower than the ten-year average (Fig. 6). This is largely due to geopolitics and innovations in shale oil extraction. Despite the benefit of lower fuel prices, placer miners remain diligent about reducing overall fuel consumption. A prime example of this is being shown in hauling innovation. The "Hollis Hauler" as it is locally known, is an excavator-mounted conveyor that can move sediment at a cost five times less than a bulldozer. This invention has been around for a number of years, but recent modifications have improved its functionality. As profits allow new investment, more of these conveyors are showing up on the creeks. This is good for improving economics and reducing the industries carbon footprint.

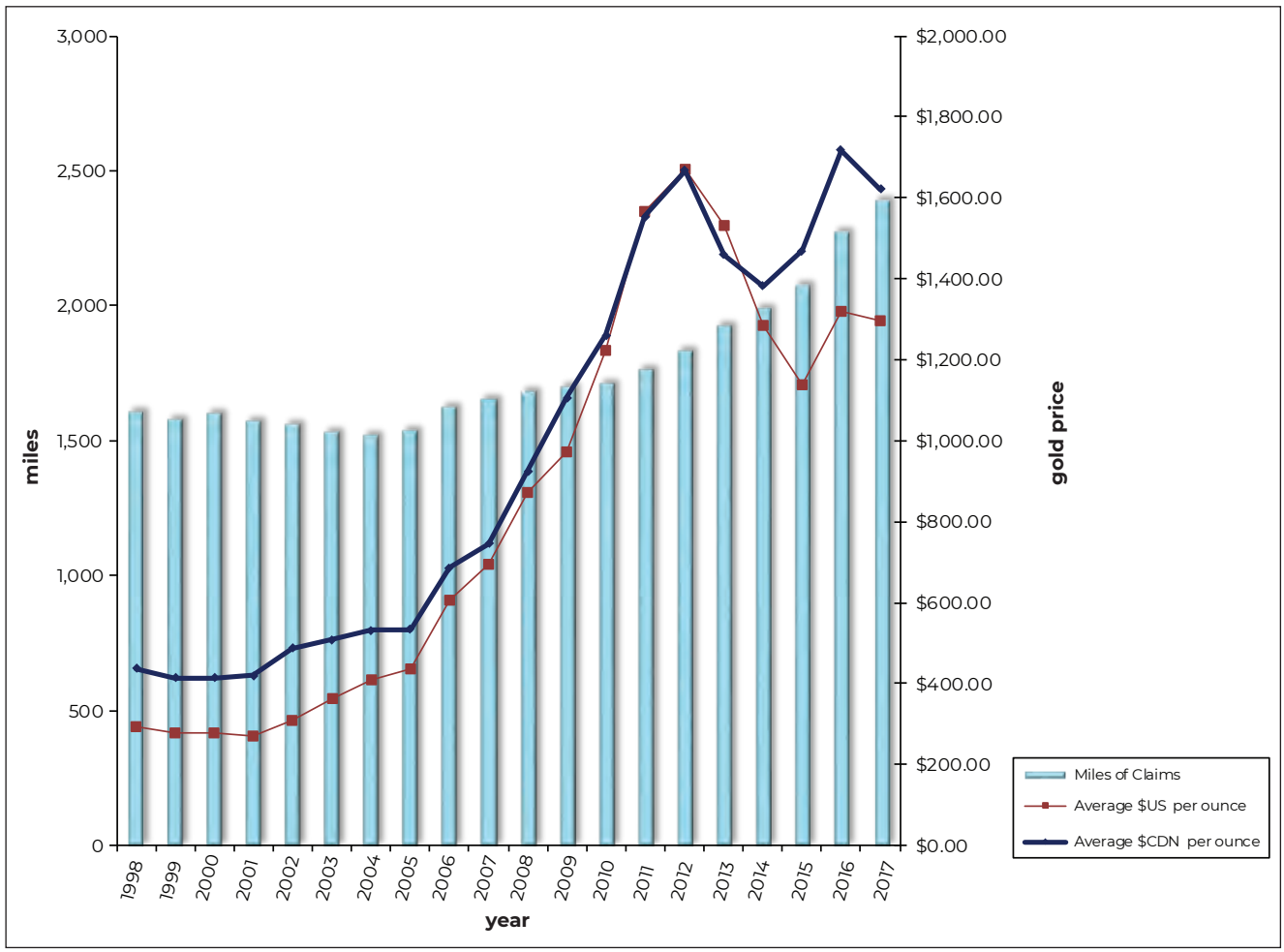



***Figure 5.*** *Miles of Yukon placer ground held versus world gold price in US and Canadian dollars, 1998-2017.*


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

## YUKON PLACER GOLD PRODUCTION

The production figures discussed in the following section are based on royalty records collected by the Yukon Mining Recorder. The 2014* to 2017 reporting period showed strong production numbers with a steady increase each year (Table 1 and Fig. 7). Perhaps even more impressive has been the value of the production, which has benefited from both high gold prices and favourable exchange rates. The production value in 2016, based on 69,625 crude ounces reported, was CDN$95.6M. Eleven years earlier, in 2005, when 70,322 crude ounces were reported, the value was considerably less at CDN$30M. The production growth we have seen in the last four years is largely based on increased gold sales by well-established miners that have been able to gradually scale-up operations, improve efficiencies and increase sluice volumes. This kind of growth is encouraging because it is fueled by extra profit rather than desperation gold sales commonly seen during years when gold prices are low.

*2014 is included in this analysis because it was incomplete during publication of the 2010-2014 Placer Industry Report.

**Table 1.** *Yukon placer gold production according to royalty reporting for 2014 to 2017.*

| YEAR | OUNCES (crude) | OUNCES (fine@ 0.80) | VALUE (CDN) |
|---|---|---|---|
| 2014 | 58,700 | 46,960 | $65 million |
| 2015 | 64,170 | 51,336 | $75.4 million |
| 2016 | 69,625 | 55,700 | $95.6 million |
| 2017 | 72,464 | 57,971 | $94 million |

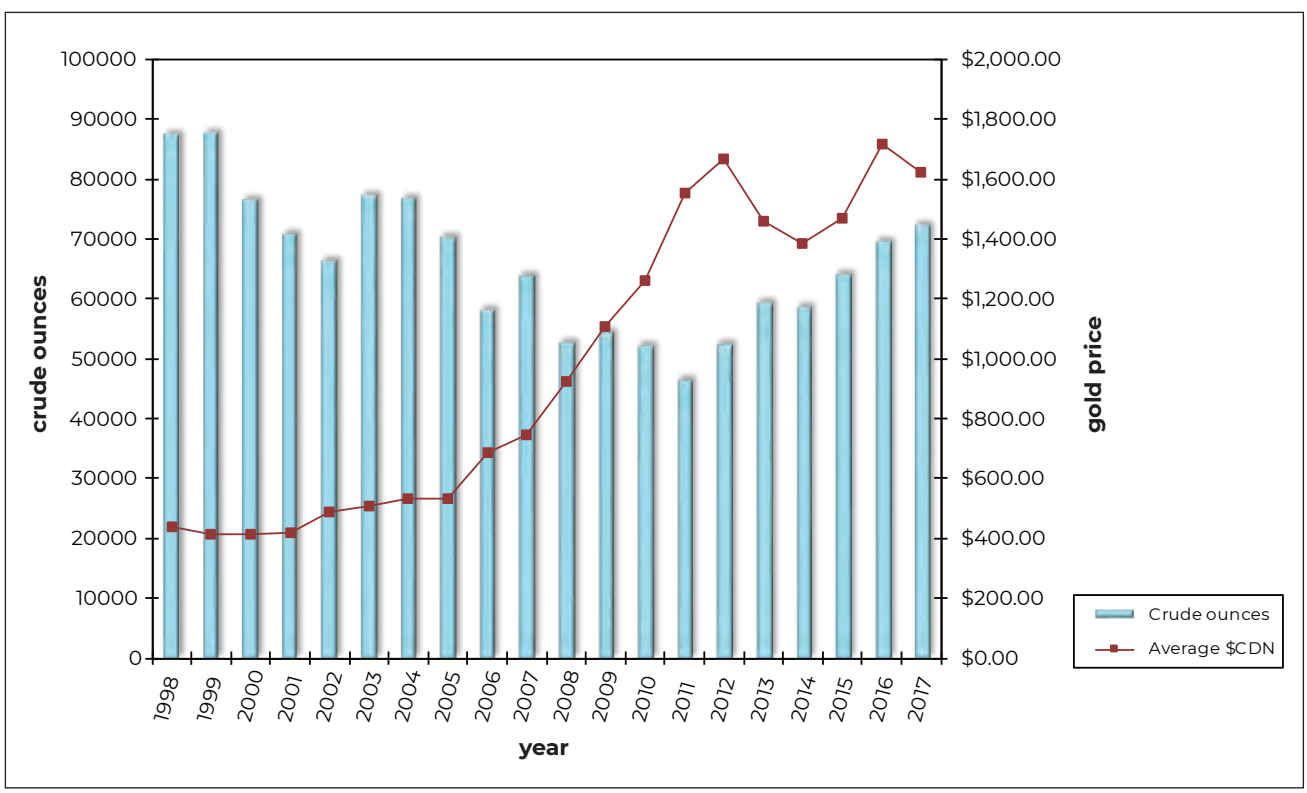



***Figure 7.*** *Yukon placer gold production vs. CDN gold price, 1998-2017.*

The regional production from each district over the past eight years is summarized in Figure 8.

Production from the Indian River drainage, including many of the most prolific placer creeks in Yukon, has doubled in the past eight years, and in 2017 accounted for 50% of the total placer gold contribution. Strong production numbers from Quartz Creek, Eureka Creek, Dominion Creek and the Indian River have been largely responsible for the growth.

The Klondike River drainage, including Hunker and Bonanza creeks, has returned steady placer production numbers over the last eight years. This area has the most contributing mines of all districts, which likely moderates variability from year to year.

West Yukon district includes all producing mines west of the Yukon River. Sixtymile River and its tributaries is the primary drainage where placer gold is mined. After a fall in production in 2014, reporting leveled off in 2015 and 2016, and increased significantly in 2017. The increase can be attributed to two new mines operating in the district.

The lower Stewart River district, including the Black Hills, Maisy May, Henderson, Scroggie and Barker creeks drainages, continued to show steady production with an average of 9,000 crude ounces reported in each of the last four years.

The Clear Creek district had a very successful four years and shows promise heading into the next reporting period. From 2014 to 2017, placer production doubled and exceeded 2,500 crude ounces in 2017. Strong results have been reported from Barlow Creek and the main stem of Clear Creek. Looking ahead, two advanced stage placer operations are poised in the district to increase gold resources further.

The Mayo-Keno district has also seen a significant increase in production over the last four years. In 2016, 4,000 crude ounces were reported nearly doubling production from 2014. A noticeable increase in activity has occurred in the Gustavus Range following strong production from Granite Creek. Farther west, operations on Minto Creek have increased and mining has recommenced on Johnson Creek near Scheelite Dome.

Production from the Dawson Range has fluctuated between 1,000 and 2,000 crude ounces annually over the last eight years. Multiple properties are ramping up activities in the district so a production increase is anticipated during the next three years. Dawson Range is also the focus of significant exploration efforts, which could solidify production from the district in the medium-term.

The Kluane district production is influenced significantly by operations on Gladstone Creek. In 2015, the Gladstone mine re-opened, which added to the large increase. Renewed attention has turned to other creeks in the Ruby Range, which could further boost production from the district. Within the Kluane Range, placer reporting has been steady from Burwash Creek and exploration efforts have increased in Tatamagouche Creek.

## PLACER EXPLORATION

Placer exploration in Yukon has been very active over the past three years. One measure of industry interest in finding new ground is to look at placer lease activity. In 2016, the number of placer leases staked and in good-standing rivalled activity not seen since the 1980s. A second measure of exploration interest is looking at projects funded through the Yukon Mineral Exploration Program (YMEP). In 2017, a placer module was added to the program to formalize placer funding and clarify application requirements (http://www.geology.gov.yk.ca/ymep.html). The Government of Yukon's commitment to YMEP has been strong over the last three years with funding ranging between $1.4 and $1.6 million annually. The number of placer projects supported through YMEP in the last three years has totalled 51 and on average, placer receives 30% of the total YMEP budget (Torgerson, 2018). This has amounted to an annual average contribution of $440,000 to placer exploration that is typically split between 15 to 21 projects.

Exploration interest has occurred in nearly all of the Yukon placer districts and has included the full range of exploration activity from grassroots to advanced stage projects. The majority of exploration interest is occurring in central Yukon in the Sixtymile, Indian, lower Stewart, Dawson Range and Mayo-Keno districts.

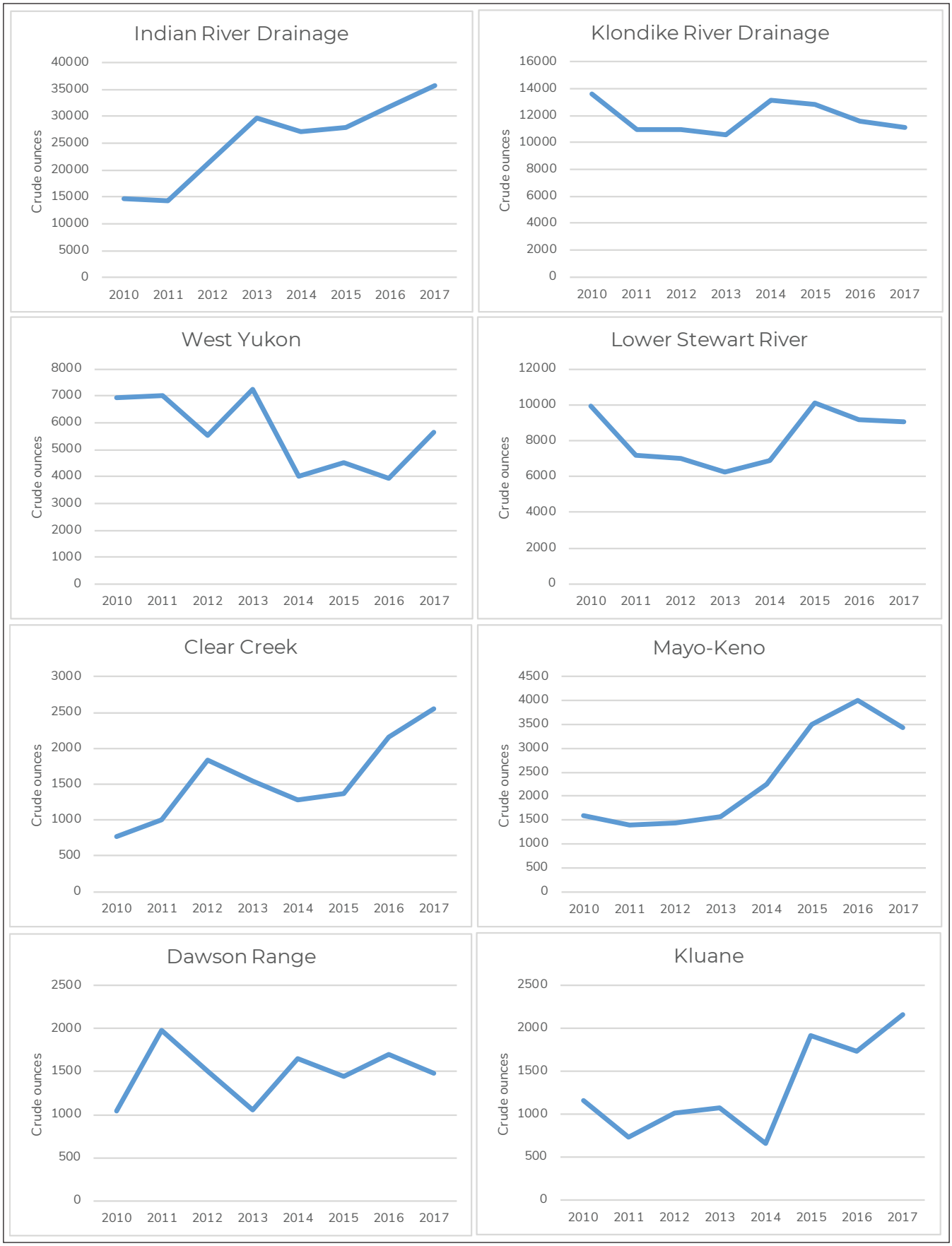



***Figure 8.*** *Regional production for the past eight years for the main Yukon placer districts.*

Near Keno City, there has been significant effort aimed at locating placer deposits in the glaciated valleys of the Gustavus Range. This has included resistivity and seismic geophysics, reverse circulation and rotary air-blast drilling and test pitting. In the Freegold Mountain area, northwest of Carmacks, an operation invested in a dedicated sonic drill for their property. This has enabled them to test previously mined ground for missed resources and map the orientation of the deep channel in Seymour Creek. Farther to the northwest, in the Dawson Range, resistivity and drilling commenced on creeks near the Coffee Gold project. This placer exploration project uses heli-portable drills, which is a new level of exploration expenditure commitment normally reserved for the hard rock industry (Fig. 9). Tributaries to the Sixtymile River are also receiving some attention. A recent discovery in California Creek was brought into production in 2016, and bulk testing has commenced on Enchantment Creek. In the Klondike, projects have focused on both advanced stage drill targets and step-out projects involving resistivity geophysics, auger drilling and shafting. This has included two significant definition-drilling projects on Dominion Creek, resistivity surveys on Australia Creek, shafting and drilling programs on Calder Creek, and testing high-level benches on Hunker Creek. In the Clear Creek district, numerous leases and claims have been staked in tributaries to the Little South Klondike River. A YMEP-funded discovery on Big Creek, east of Clear Creek, has lead to a significant investment in road improvements and commitment to discovering resources in the district.

Interest in discovering new placer gold resources has grown over the past few years. This has already started to pay-off with production from new creeks. Continued effort will undoubtedly add longevity to the Yukon's placer mining future, enabling it to remain as a reliable contributor to the economic well-being of many Yukon communities.

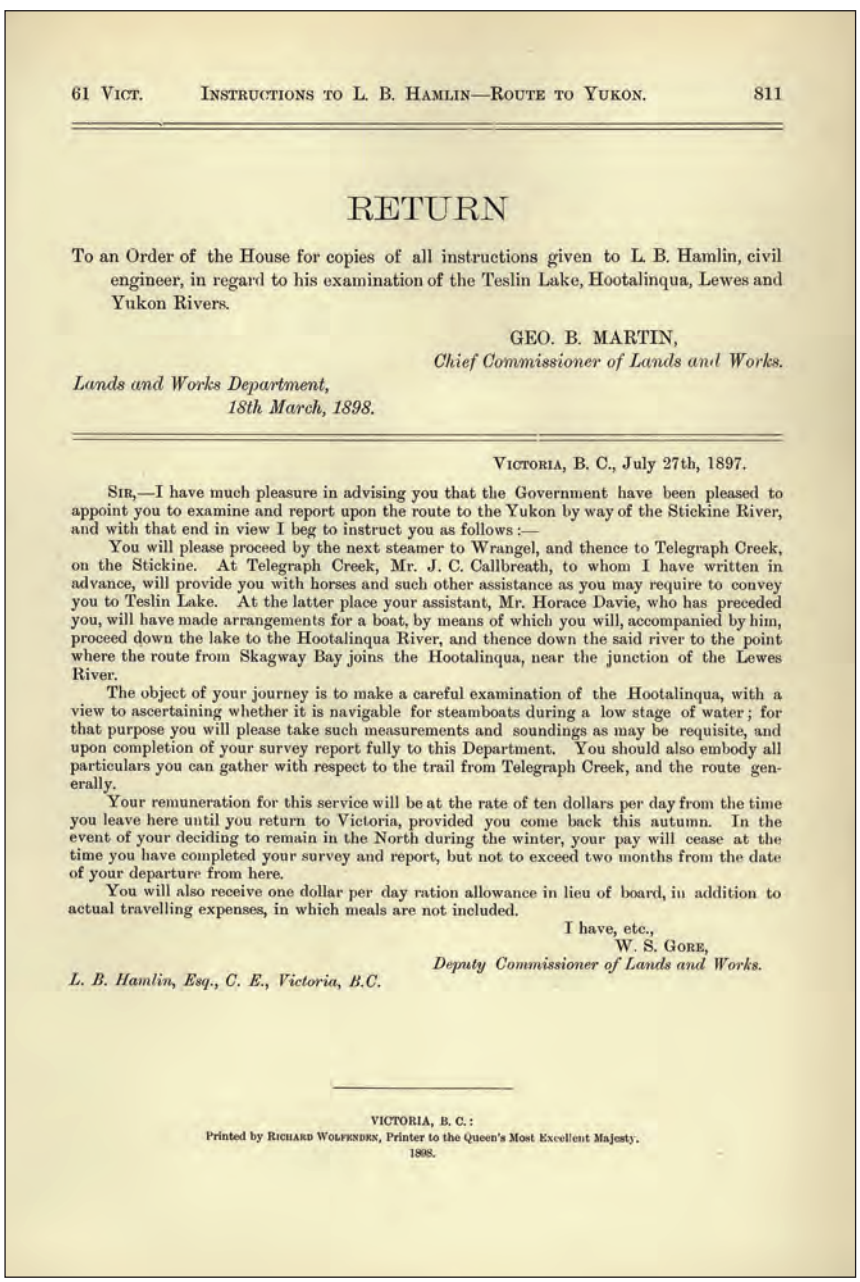
**Figure 9.** *GroundTruth Explorations heli-portable rotary air-blast drill working in a tributary to Coffee Creek in 2017.*

# A journey in 1897 to stake Mint Gulch

**Jennifer Roberts**
*Private Records Archivist, Yukon Archives*
Jennifer.roberts@gov.yk.ca

The generalities of the Klondike Gold Rush are well-known but specific, personal experiences among the enormity of the event are brought sharply into focus when you can read and touch a first-hand account from someone who was there. An opportunity to hold history in my hand presented itself in May 2016 when Ralph Troberg of Dawson donated records, including a diary written in 1897, to Yukon Archives.

When the Archives received the diary, it was not obvious who had written it and it took me some time to figure that out. Based on a receipt I found folded among the diary's pages, it eventually became clear that the narrative was written by 64-year-old engineer and land surveyor Latham B. Hamlin. Hamlin was sent to Yukon by the BC government in July 1897 (Fig. 1) to investigate the area around Hootalinqua and to determine whether the Stikine River was a navigable route to the Klondike (Fig. 2).



61 VICT. INSTRUCTIONS TO L. B. HAMLIN—ROUTE TO YUKON. 811

RETURN

To an Order of the House for copies of all instructions given to L. B. Hamlin, civil engineer, in regard to his examination of the Teslin Lake, Hootalinqua, Lewes and Yukon Rivers.

GEO. B. MARTIN,
*Chief Commissioner of Lands and Works.*

*Lands and Works Department,*
*18th March, 1898.*

VICTORIA, B. C., July 27th, 1897.

SIR,—I have much pleasure in advising you that the Government have been pleased to appoint you to examine and report upon the route to the Yukon by way of the Stickine River, and with that end in view I beg to instruct you as follows:—

You will please proceed by the next steamer to Wrangel, and thence to Telegraph Creek, on the Stickine. At Telegraph Creek, Mr. J. C. Callbreath, to whom I have written in advance, will provide you with horses and such other assistance as you may require to convey you to Teslin Lake. At the latter place your assistant, Mr. Horace Davie, who has preceded you, will have made arrangements for a boat, by means of which you will, accompanied by him, proceed down the lake to the Hootalinqua River, and thence down the said river to the point where the route from Skagway Bay joins the Hootalinqua, near the junction of the Lewes River.

The object of your journey is to make a careful examination of the Hootalinqua, with a view to ascertaining whether it is navigable for steamboats during a low stage of water; for that purpose you will please take such measurements and soundings as may be requisite, and upon completion of your survey report fully to this Department. You should also embody all particulars you can gather with respect to the trail from Telegraph Creek, and the route generally.

Your remuneration for this service will be at the rate of ten dollars per day from the time you leave here until you return to Victoria, provided you come back this autumn. In the event of your deciding to remain in the North during the winter, your pay will cease at the time you have completed your survey and report, but not to exceed two months from the date of your departure from here.

You will also receive one dollar per day ration allowance in lieu of board, in addition to actual travelling expenses, in which meals are not included.

I have, etc.,
W. S. GORE,
*Deputy Commissioner of Lands and Works.*

*L. B. Hamlin, Esq., C. E., Victoria, B.C.*

VICTORIA, B. C.:
Printed by RICHARD WOLFENDEN, Printer to the Queen's Most Excellent Majesty.
1898.

***Figure 1.*** *University of British Columbia Library, Sessional Papers of the Province of British Columbia. Instructions to L.B. Hamlin – Route to Yukon, 1898.*

Hamlin's diary begins with descriptions of his life in Victoria – things like how many raspberries were growing in his garden – and ends with his daily activities in Dawson. Interestingly, he didn't write about the actual journey to the Klondike at all.

Within a month of his arrival in Dawson City, gold fever appears to have struck Mr. Hamlin. He chose not to return to Victoria, where his wife still lived, and instead staked a claim on Mint Creek and stayed for the winter in a small cabin he shared with a man named Owen Batchelor.

In 1897, many of the people who arrived in Dawson before freeze-up were not sufficiently prepared for winter and starvation was a real possibility. As a government surveyor, Hamlin would have been part of the upper ranks of Klondike society, but even this did not render him immune to the harsh conditions of a Dawson winter. Hamlin writes about the climate, "weather said to be -58°"; and the scarcity of provisions, "called on Capt. Hansen A.C. store to see if he would let me have any flour, but he would not."


***Figure 2.*** *Between 1897 and 1898, thousands of gold-seekers did use the challenging Stikine Route. This map illustrates several routes to the Klondike including the Stikine route, highlighted. Yukon Archives, map H-828.*

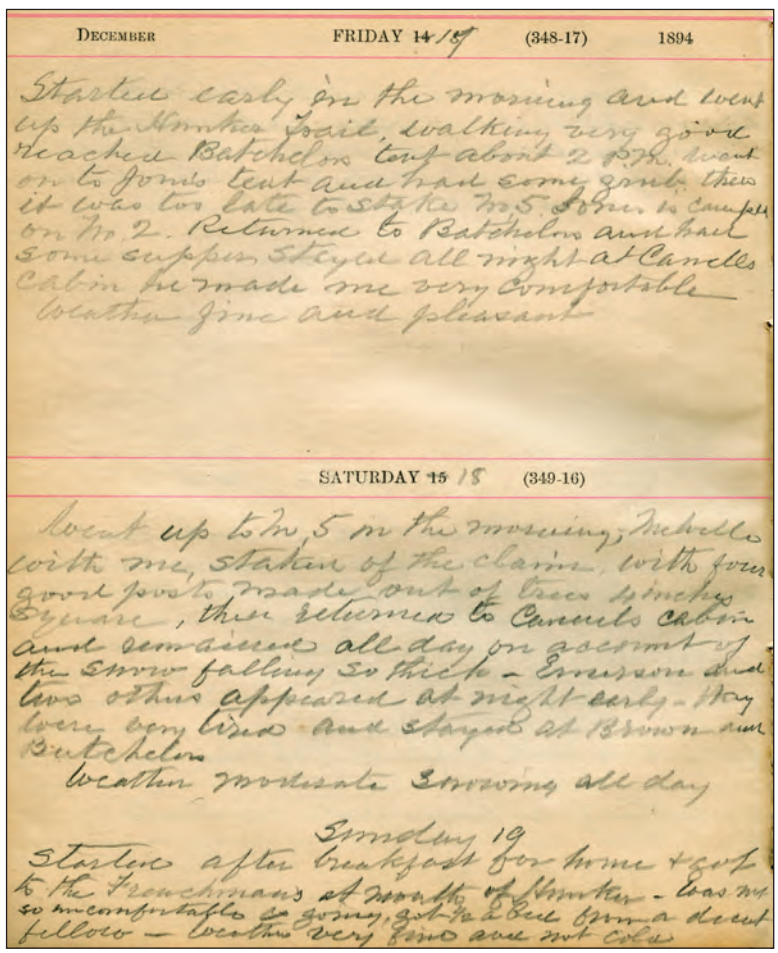
He also mentions visiting with many of the officials living in Dawson and, judging from the speed and ease at which he was able to register his mining claim, it appears that he was able to curry some favour with Gold Commissioner Thomas Fawcett. Prospectors lined up for days at the mining recorder's office amidst the chaos of the gold rush, and officials were overwhelmed. But Hamlin "called on Mr. Fawcett" on December 13 and obtained "an understanding that No 5 claim Mint Creek would be reserved until I could stake it out."

On December 16, Hamlin and his friend Melville started for Mint Creek. They pulled a sleigh with provisions and stopped for the night at the mouth of Hunker Creek, a 14 km walk from Dawson. Early the next morning, they started up the Hunker trail and reached Owen Batchelor's tent located at "8 left fork of Hunker" by 2 pm. They made it as far as J. Jones' claim at No 2 Mint Creek that day but decided it was too late to start staking No 5, which was up-river. Finally, on December 18, Hamlin was able to stake his claim on Mint Creek (Fig. 3). The return journey to Dawson also took two days and eventually, on December 22, Hamlin made arrangements to see the Gold Commissioner. Later that day, for the sum of $15, his claim was officially recorded.

Latham Hamlin spent Christmas dinner with Captain and Mrs. Healy of the Alaska Commercial Company. He considered it "very thoughtful" of Mrs. Healy to invite him and he "met several people" that evening. The last pages of his diary are filled with descriptions of a very ill man named Whitaker who groaned his way through the nights. Hamlin's concern for this man, who was diagnosed with congestion of the brain, is distressing – "I have not much hope for him" – but was ultimately unfounded as archival records show that Whitaker lived beyond New Year's Eve 1897. However, Hamlin himself would soon succumb to the severe reality of winter in the Yukon.

Hamlin's chronicle ends when the diary does: December 31, 1897. We do not learn how much, if any, money he earned from his mining efforts. We don't know why he chose to stay in Dawson for the winter of 1897-98, and we don't know what he was thinking when he set out in pursuit of another claim in the middle of winter. What we do know, according to newspapers of the time, is that in a "frenzied rush for the February finds", Hamlin died of exposure while taking a shortcut to stake additional claims. Reports name both Sulphur Creek and the area of Lake Creek and Swedish Gulch as Hamlin's destination. Setting out with a companion named Clark, Hamlin took a route over the "table-land lying between Bonanza and Dominion creeks and here lost his way" (Fig. 4). The two men were found semi-conscious, but alive, by prospectors on their return to Dawson. A party of North-West Mounted Police was sent out to retrieve them and both men were brought back to town via sled. Clark survived the ordeal but had to have his frozen feet amputated. Hamlin was admitted to St. Mary's Hospital on February 16 and he died there on February 17, 1898 (Fig. 5). His claim on Mint Creek was sold to H.A. Constantine and T.H. McGuire but by December 1900 the claim was cancelled for non-representation (Fig. 6). In January 1901 a new grant from the crown was issued to an E.A. Cochran and the area has been active ever since. Mint Gulch has been intermittently mechanically mined since the early 2000s and gold production generated is approximately 650 ounces. Since the 2015 season, 535584 Yukon Inc. has conducted a large stripping and sluicing program on Mint Gulch active 1 km upstream, which coincides with the upper end of the claim staked by Hamlin in 1897.

Hamlin's diary and other mining records are available to the public at Yukon Archives. Everyone is welcome to explore Yukon's mining history in our research room.



DECEMBER FRIDAY 14/18 (348-17) 1894

Started early in the morning and went up the Hunker Trail, walking very good reached Batchelors camp about 2 P.M. went on to Jones tent and had some grub then it was too late to stake No 5. Jones is camped on No 2. Returned to Batchelors and had some supper. Stayed all night at Camels Cabin he made me very comfortable Weather fine and pleasant

SATURDAY 15/18 (349-16)

Went up to No 5 in the morning, Melville with me, staked of the claim, with four good posts made out of trees 4 inches square, then returned to Camels cabin and remained all day on account of the snow falling so thick – Emerson and two others appeared at night early – they were very tired and stayed at Brown and Batchelors

Weather moderate Snowing all day

Sunday 19

Started after breakfast for home + went to the Frenchmans at mouth of Hunker – was my so uncomfortable on going, got a bed from a decent fellow – weather very fine and not cold

**Figure 3.** *On December 18 Hamlin's diary entry reads: "Went up to No 5 in the morning, Melville with me, staked of [sic] the claim, with four good posts made out of trees 4 inches square, then returned to Camels cabin and remained all day on account of the snow falling so thick. Emerson and two others appeared at night early – they were very tired and stayed at Brown and Batchelors. Weather moderate snowing all day." The printed journal book is from the year 1894 but Hamlin crossed out each date to align with the year 1897. Yukon Archives, Ralph E. Troberg collection, 2016/11, MSS 248.*

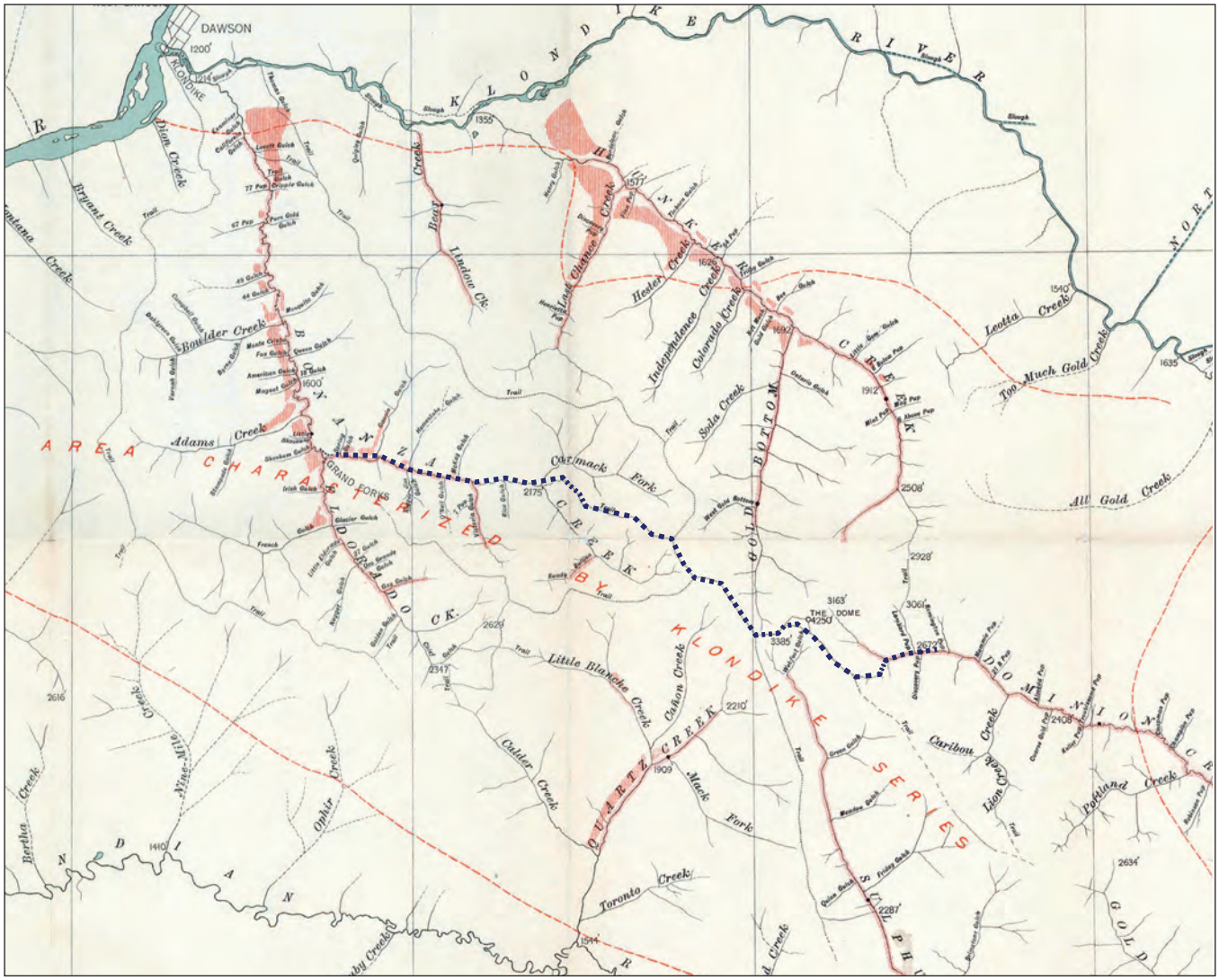



***Figure 4.*** *Route Hamlin possibly took which was a short cut between Bonanza and Dominion creeks along the 'table-land' lying between them. The believed route is the blue dashed line. Map is from Johnston, J.F.E. 1900; Map of the Klondike gold fields, Yukon District; Geological Survey of Canada, Multicoloured Geological Map 688.*

VICTORIA DAILY COLONIST SUNDAY MARCH 27 1898

Klondikers' Medical Outfits.

HALL & CO.,

MINERS Going to the Yukon

OGILVIE'S HUNGARIAN FLOUR

—OGILVIE.—

IN THE RACE FOR GOLD.

Engineer Hamlin of Victoria Loses His Life Through a Klondike Stampede.

Discoveries of Gold Gravel on Swedish Gulch and Lake Creek on the Yukon.

Average Pans of Nine Dollars on the Former —That Nugget a Fable.

Customs Authority Delegated to a Private Monopoly at Skagway—Interior Mining

Queen Olives

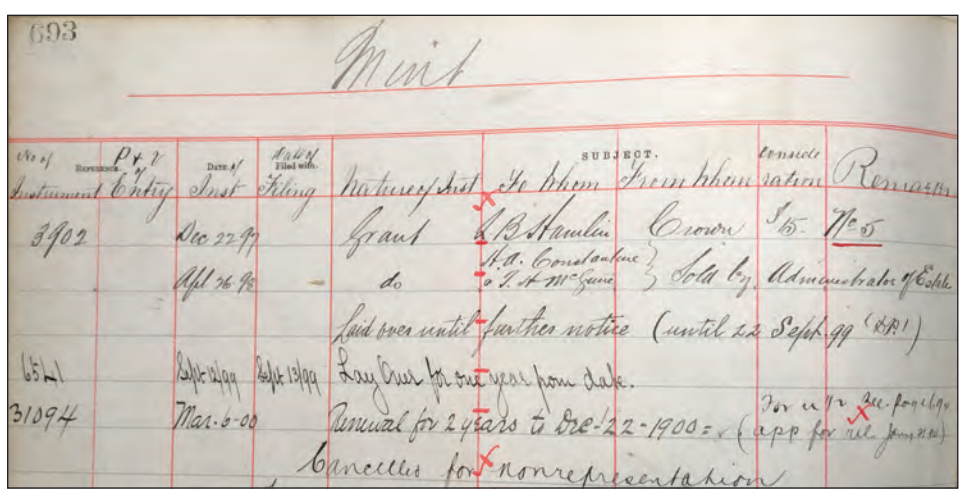
D. R. POTTINGER,

MEN'S WEARABLES

CAMERON,

Ralph Charlton, Auctioneer.

***Figure 5.*** *Latham B. Hamlin's death was reported in the Victoria Daily Colonist on March 27, 1898.*



693

Mint

| No of Instrument | Entry | Date of Inst | Date of Filing | Nature of Inst | To whom | From whom | Consideration | Remarks |
|---|---|---|---|---|---|---|---|---|
| 3902 | | Dec 22 99 | | Grant | L B Hamlin | Crown | $15 | No 5 |
| | | Apl 26 00 | | do | H.A. Constantine & J.H. McGuire | Sold by | Administrator of Estate | |
| | | | | Laid over until further notice (until 22 Sept 00 (BA)) | | | | |
| 6541 | | Sept 13 99 | Sept 13 99 | Lay Over for one year from date. | | | | |
| 31094 | | Mar 5-00 | | Renewal for 2 years to Dec 22-1900 = (app for rel ...) | | | | For ... see page ... |
| | | | | Cancelled for non representation | | | | |

***Figure 6.*** *The record book for Mint Creek. This entry shows the owners and transactions for No 5 Mint Creek from the original grant to Hamlin in 1897 to when the claim was cancelled in 1900. Yukon Archives, Series 10 Mining Recorder Records, GOV 78, page 693.*

# Dredging on the Stewart River, Yukon

**Gary Lee**
*Prospector*

Placer deposits on the Stewart River played an important role in Yukon's early mining history. Some of the first prospectors into Yukon were responding to news of the bar deposits on the Stewart River near the Tintina Trench. These easy-to-access deposits were both lucrative and reliable, providing a grubstake income to fund prospecting ventures into surrounding areas. As early as 1885, hand miners on the bars of the Stewart River were reportedly earning from $30 to $100.00 per day, when the gold price was $20.67 per ounce. This amounts to $1,800.00 to $6,000.00 per day at current prices, an impressive amount of gold considering only hand rockers, picks and shovels were used.

Many of these deposits were subject to flooding, especially when the Stewart River was running at high water, which made them difficult to mine. Furthermore, the thawed nature of the gravel bars near the river bank meant groundwater was an issue. To overcome these obstacles drainage ditches were constructed to maintain a lower water level. Evidence of one of these ditches is preserved at Nelson Point, one of the rich bars located 85-90 miles upstream from the mouth of the Stewart River near the McQuesten Airstrip (Figs. 1 and 2). Excavation of this ditch would have been a difficult task and required the use of horses and scrappers or slashers. It is more than one kilometre long and would have likely been constructed before all the men left for the Klondike Gold discovery on August 17, 1896.

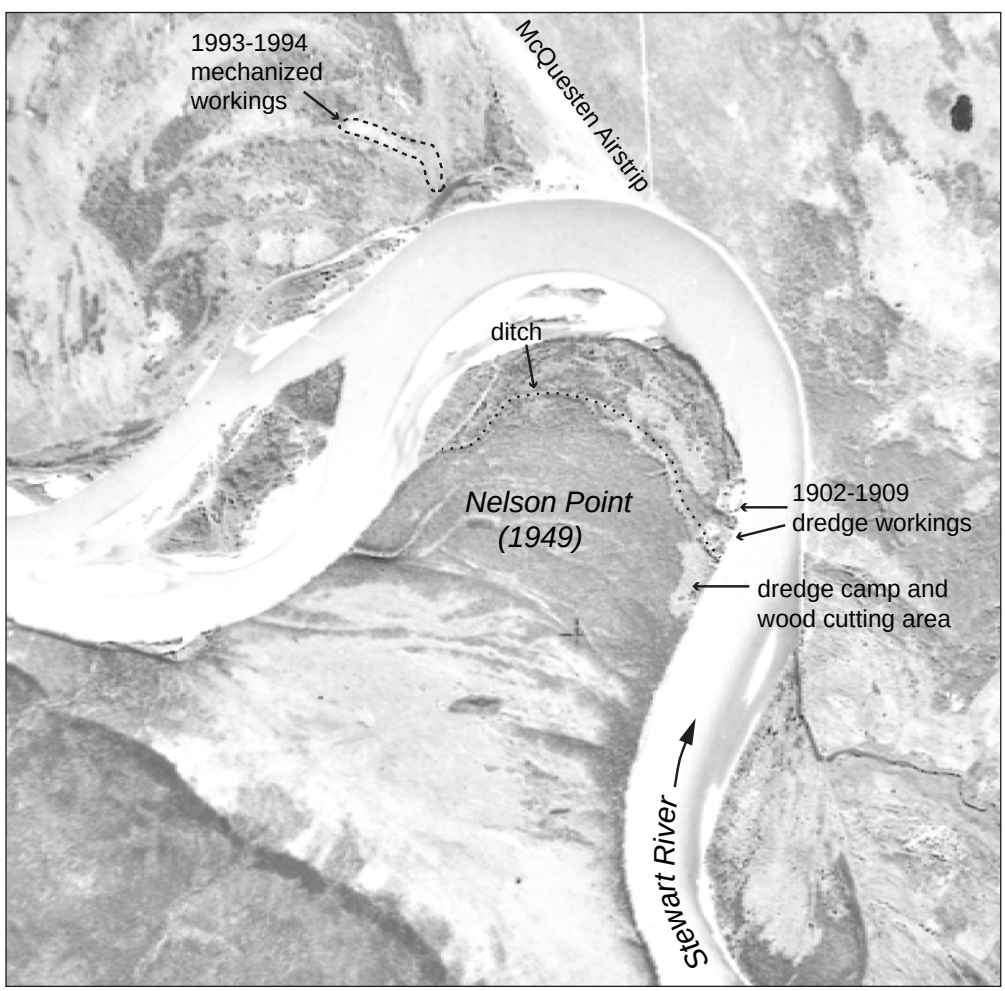



***Figure 1.*** *A 1949 aerial photograph of Nelson Point on the Stewart River (National Air Photo Library, 1949). The drainage ditch parallels the river about 300 m back from the shoreline. Dredge tailings are also visible on the upstream end of the bar. An area mined using excavators between 1993 and 1994 is also outlined.*

***Figure 2.*** *The author, surveying the drainage ditch in 2015. Jeff Bond photograph.*

Following the Klondike Gold Rush, speculators began looking at the Stewart River bars as a potential dredging opportunity. This was a logical transition considering the bucket line of a floating dredge works well under water and would eliminate the dewatering issue. William Ogilvie, former Commissioner of Yukon, was the main promotor of this idea. He formed a company called the "Yukon Basin Gold Dredging Company Ltd." of which he was president. Later on, he was also involved with the "Stewart River Gold Dredging Company Ltd."(Fig. 3). The sole purpose of these companies was to sell shares to raise money to build and operate dredges on the Stewart River and its drainages. There were many gold bearing bars on the river, some without names and some with, such as Boswell, Wildcat, Tender float, Peg Leg, Copper, Barker, Culumet, Chapman and Steamboat bars. Steamboat bar got its name because a steamboat ("New Racket") was tied up there for a month and its engines were used to drive water pumps. These pumps provided water for large sluice boxes used by 3 or 4 placer miners. This was the first mechanized mining to occur in Yukon (Coutts, 1980).

POPULAR MECHANICS ADVERTISING SECTION 119

"The Greatest Gold Dredging Enterprise in the World"

—William Ogilvie

**THE YUKON BASIN GOLD DREDGING COMPANY** is an international company organized under the territorial laws of the United States, registered and sanctioned by the strict laws of the Dominion of Canada. Its properties are 105 miles river frontage, or more than 10,000 acres on the famous Stewart River, the richest gold-bearing placer field in the world. Title absolute from the Canadian government through William Ogilvie, formerly governor of Yukon Territory and now president and actual field manager of Yukon Basin Gold Dredging Co.

**THE GOLD DREDGE IS A WONDERFUL MODERN INVENTION**

Each dredge put in the field will do the work of 1,000 men, and we propose to install twenty as rapidly as it is possible to make arrangements. **Our first dredge is now being assembled at White Horse, Yukon Territory,** and will be floated to our holdings on the Stewart River and will at once begin the recovery of gold for our stockholders. The ground is fully tested and immensely valuable.

This is the biggest gold dredging proposition in America. Careful tests covering 30 miles of our leaseholds went as high as $11.00 and averaged more than $1.05 per yard. Fabulous fortunes are being made dredging in California on ground averaging only 15 cents per yard.

**PRICE OF STOCK NOW 25 CENTS** We consider this stock intrinsically worth par and in a reasonable length of time it will be paying large dividends on that amount. A limited amount of full paid, non-assessable treasury stock will be sold at **25 CENTS** per share. **Price will be advanced soon. Par value $1.00.** Stock may be had on ten monthly installment payments.

Write for prospectus containing minutest details. Write and ask questions Address

**YUKON BASIN GOLD DREDGING COMPANY** 184 Scarritt Building KANSAS CITY, MO.

***Figure 3.*** *An advertisement for the Yukon Basin Gold Dredging Company published in Popular Mechanics in July 1908 (Popular Mechanics, 1908).*

On March 8, 1898, Clifford Sifton, Minister of Interior, granted 110 miles of Stewart River dredging leases (#140 to 161) for William Ogilvie's operations. The cost was $1,100.00 per year and required the installation of one dredge every 5 miles. The first dredge was to be working within 3 years. This was extremely ambitious since 20 dredges would have to be built to cover the 110 miles. Only 3 dredges were built from 1902 to 1909 resulting in multiple lease extensions being granted by the Canadian government. All dredge components were shipped to Skagway and thence to Whitehorse by rail.

The first dredge to arrive and be constructed in Whitehorse was in 1902; it was given the name Golden Crown #1. The steamer, Wilbur Crummin, was used to transport the dredge downstream to the Stewart River (Fig. 4). This first dredge was only a small prospect dredge that would enable Ogilvie to demonstrate the viability of dredge mining on the Stewart River bars. Newspaper articles reported that the 1902 prospect dredge proved the feasibility of dredging, however, it was too small for production (Fig. 5). Hence, the Yukon Basin Gold Dredging Co. ordered larger dredges to be built.

On June 15, 1908, Yukon Basin Gold Dredging Co. launched its second dredge on the Yukon River in Whitehorse. These later dredges were much larger and contained more than 100 tons of steel machinery making them too heavy to be towed up the Stewart River. Hence, on the first trip, only the floats and wooden super structures built in Whitehorse and minimum cargo were transported downstream by a steamer. Most of the steel machinery was shipped separately and erected on site at Nelson Point on the Stewart River in July of 1908 (Fig. 6). It was reported in the October 14, 1908, Yukon Morning World: "The dredge was closed down October 6 and placed in quarters for the winter. A crew of six or seven men will remain at Nelson Point during the closed season getting out wood for next summer as there will be two or three more machines (dredges) to supply next summer".

***Figure 5.*** *The Golden Crown #1 dredge on the Stewart River. YT Library and Archives Canada, W. Ogilvie collection, PA-017504, .*

***Figure 4.*** *The steamer "Wilbur Crummin" is being fastened to the Golden Crown #1 dredge on the Whitehorse waterfront, in preparation for the trip to the Stewart River. YT Library and Archives Canada, W. Ogilvie collection, PA-102057.*

***Figure 6.*** *The Yukon Basin Gold Dredging Companies second dredge being assembled on the Stewart River in 1908. YT Library and Archives Canada, W. Ogilvie collection, e011166289.*

When completely outfitted with all its machinery the second dredge was reported to weigh 110 tons and capable of 35,000 yds/month or 90-100yds/hr. For the November 18th, 1908 Annual General Meeting of the Yukon Basin Gold Dredging Co. in Kansas City, Missouri, their annual report stated that the clean-up amounted to $1,324.00 on September 3rd, and $2,639.00 on September 10th, 1908, amounting to 64 and 128 fine ounces respectively. Unlike the positive dredge results reported in newspaper articles (The Weekly Star in Whitehorse, June 19, July 10, 31, August 31, October 23, 31, 1908 and the Yukon Morning World, October 6, 14, September 26, 1908), at the annual meeting it was reported that the dredge was a disappointment. Complaints included that the dredge was not built to design standards and had many break downs, such as the main bucket line shaft pin and many bucket pins breaking, along with numerous other defects.

By 1909 these defects must have been corrected. In a telegram (by Morley Ogilvie) on June 26, 1909, contained in the July 17, 2009 quarterly report of the Yukon Basin Gold Dredging Company, it is stated that the dredge had a clean-up of $2,100.00. Also, in the Mining Edition of the Dawson Daily News July 21, 1909, it was reported that the dredge was "not working the river, but part of the left bank locally known as Nelson's Point or Bar". The company "has acquired title to seven mining (bench) claims on the point". These claims were purchased from Mr. Nelson and the workings are visible in the 1949 aerial photo (Fig. 1).

The third dredge was built by a company in Glasgow, Scotland instead of San Francisco, US and the steel machinery reportedly weighed 160 tons with 5 cubic foot buckets capable of processing 3,000 yds/day (Yukon Basin Gold Dredging Co. Quarterly Report, Kansas City, July 17, 1909) and left Whitehorse on July 13, 1909. Both the 1908 and 1909 dredges were transported down the Yukon River and up the Stewart River towed by the Casca steamer (Fig. 7). It was reported in the Sept 17, 1909 edition of the Whitehorse Weekly Star that the larger dredge "was started to work...only a few days ago". No records could be found about production or clean-ups.

By 1911, the largest or #3 dredge had been moved upstream 4 miles to the right limit of the Stewart River on a bar just below the McQuesten River. Here again, no records could be found regarding clean-ups. However, the tailings are still visible. Dredging operations ceased by 1912, which happens to coincide with William Ogilvie's death.

A few years later the Titus Dredging Co., and thence the Highet Creek Dredging Co., acquired the dredge at the mouth of the McQuesten River. They moved it by steamer up the Stewart River to Mayo in 1919. A road was built from Mayo to Highet Creek and this dredge was hauled up to the creek with horses and wagons (Fig. 8). Parts of this dredge are still visible on Highet Creek.

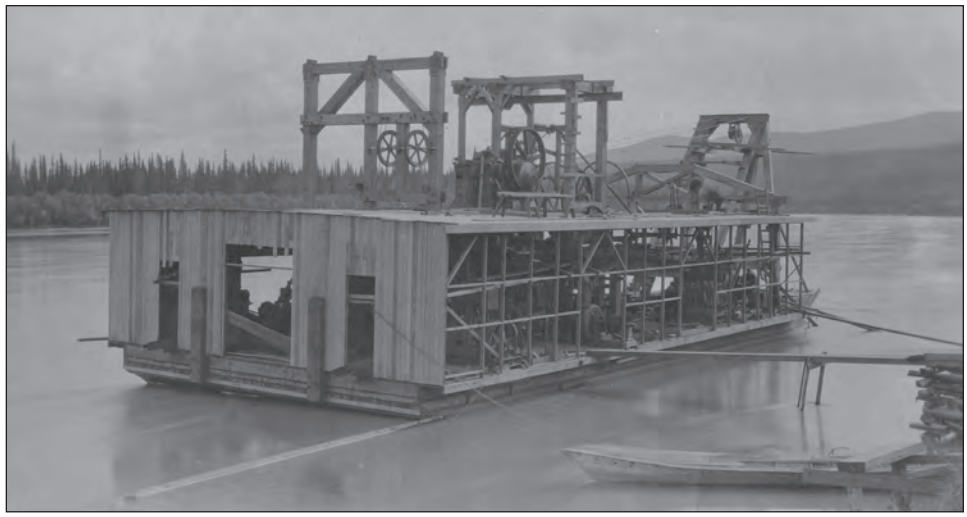


***Figure 7.*** *The Yukon Basin Gold Dredging Companies third dredge being assembled on Nelson Point in 1909. YT Library and Archives Canada, W. Ogilvie collection, e011166287.*


***Figure 8.*** *The third dredge operating on Highet Creek in July 1922. The dredge struggled on Highet Creek due to the large boulders. Library and Archives Canada, PA-164035.*

The low-level benches and bars on the Stewart River still potentially contain very rich, easy to mine deposits. Relatively recent mechanized mining on a Stewart River bar near the McQuesten Airstrip helped characterize gold distribution in the deposits (Fig. 1). Long periods of river reworking have sorted the gold and heavy minerals, similar to how a clean-up table segregates minerals according to their specific gravity. Rich gold streaks are present in the bars, but they are discontinuous, both vertically and laterally, and buried under silty overburden anywhere from 1 to 9 ft thick. In all cases these deposits form on false-bedrock of previously deposited river sediment. Bedrock has not been intersected by mining and is at an unknown depth in the valley. Overall, the discontinuous nature of these deposits, and the broad nature of the Stewart River floodplain makes these deposits challenging to find.

## ABOUT THE AUTHOR

Gary “Deep Hole” Lee is a prospector and placer claim owner on Nelson Point. He has sunk over 25 shafts on his property and continues to look for those fabulous grades that made the Stewart River an important early prospecting locality in Yukon.

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Coutts, R.G., 1980. Yukon Places and Names. Gray’s Publishing Limited, 297 p.

National Air Photo Library, 1949. Air photo, A12243, photo 358, 1:40 000. Natural Resources Canada, Ottawa, Ontario.

Popular Mechanics, 1908. Popular Mechanics Advertising Section. July, 1908.

# Robert E. Leckie Awards

## 2014 AWARD FOR EXCELLENCE IN ENVIRONMENTAL STEWARDSHIP IN PLACER MINING: FELL-HAWK PLACERS

Fell-Hawk Placers operated on Ballarat Creek in the Dawson mining district until 2013. Throughout the life of this operation the company adhered to extremely high operational standards. This was demonstrated in a number of areas including water conveyance structures, new road and trails, camp construction and the final decommissioning of the site.

The site location typically has narrow valleys which leave little space for stockpiling material. The Fellers family undertook tremendous planning and foresight in order to accomplish the high level of reclamation that was completed on Ballarat Creek.


*Reclamation on Ballarat Creek.*

## 2015 AWARD FOR OUTSTANDING PLACER RECLAMATION: CAW MINING LTD.

CAW Mining, working on Barlow Creek, in the Mayo district, has owned and mined the claims since the 1970s. An organized, thoughtful and structured annual mining plan has resulted in lower operating costs with professional final reclamation. Initial site cleanup from previous activity and an insightful initial operation placement created a property for future development and systematic mining while placement allowed for outstanding reclamation of the initial settling ponds and waste piles.

The fish habitat features created for Barlow Creek have enhanced the quality and quantity of habitat available for a wide range of species in the wetlands.

*Reclamation at CAW Mining, along Barlow Creek.*

## 2016 AWARD FOR OUTSTANDING PLACER RECLAMATION: HC MINING LTD.

Henderson Creek has had a long and varied mining history. Historically it was an active creek that supported dredging operations in the 1940s and 50s; before the switch to dozer and excavator mining. Throughout this period, the area saw a succession of owners until Hayden Cowan acquired much of it through his company HC Mining Ltd. in the late 1990s.

*Natural revegetation of contoured ground with a natural seed source.*

HC Mining Ltd. has mined several locations on the Henderson Creek watershed since 2000, including Henderson Creek, North Henderson Creek and Moosehorn Creek.

HC Mining Ltd. begins reclaiming areas where mining has been completed as soon as possible, and every finished site has been fully reclaimed. The method of reclamation is to contour the ground into low-relief piles covered with overburden and organics. Most of the areas mined by HC Mining Ltd. are rapidly being overgrown with new tree growth. This nomination recognizes that Mr. Cowan has completed a significant amount of reclamation, and that the timeliness and finished results are commendable.

## 2017 AWARD FOR OUTSTANDING PLACER RECLAMATION: M2 GOLD MINES LTD.

M2 Gold Mines Ltd. has been mining along 2.7 km of the Indian River for the past six mining seasons and covered a surface area of 330,000 m². Their reclamation efforts on Bear Roast Flat and Raven's Ridge Flat, demonstrate the quality of work completed during the 2016 and 2017 seasons.

*Reclamation on Bear Roast Flat and Raven's Ridge Flat, Indian River.*

Reclamation methods included meticulous contouring and strategic placement of scalloped boulder piles to create back eddies in the efforts to enhance fish habitat. Reclamation efforts included placing willows along the top of boulder piles and tailings, contouring overburden and black muck piles, and spreading trees and vegetative material over the mud surface to promote regrowth.

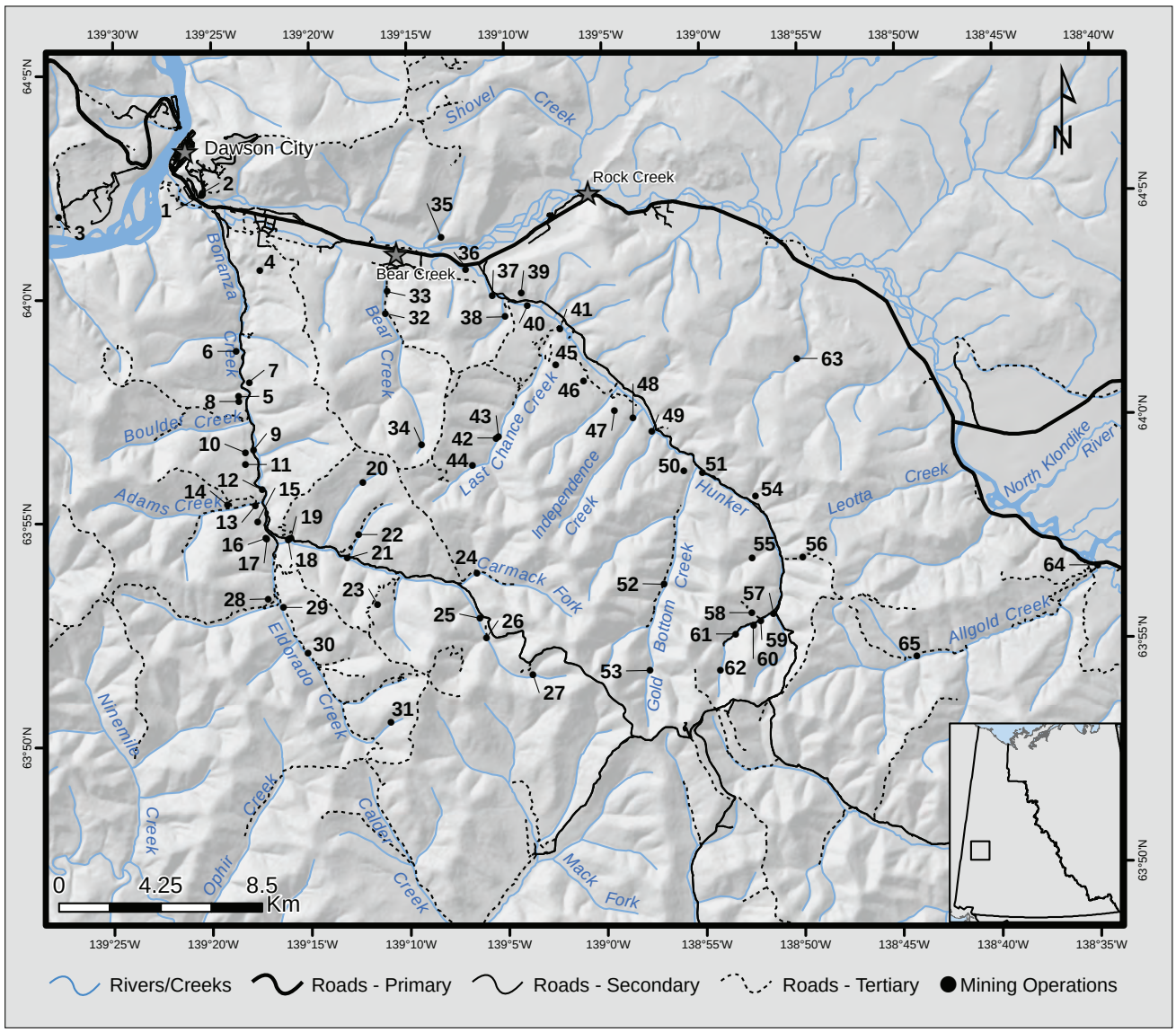
It is without question Mike Cawood and Mike Langtry have demonstrated industry leadership and are promoting environmental stewardship by their outstanding reclamation standards.

**LEGEND**

1. Slinky Placer Mine
2. Treadstone Services
3. OK Creek Mining and Exploration Inc.
4. Northern Shoveler Resources Ltd.
5. Algotsson, H.
6. Kohlman Explorations Ltd.
7. Harapchuk, M.
8. Lewes River Mining; Nibecker, B. and D.
9. Van Bibber, S.
10. LaBonte, R.
11. Jackson, D.
12. Bonanza Creek Mining
13. Lucky Strike Ventures Inc.
14. Gardiner, E.
15. Beron Placers Ltd.
16. Daunt, I.
17. Dulac Mining
18. Hanulik Enterprises Ltd.
19. Arkenstall, C.
20. R & W Mining
21. Beyer, L.
22. McMahon, T.
23. Gillespie, R.
24. H3 Mining Company Ltd.
25. Pitman, B.
26. Danielson, S. and R.
27. McKort Mining Co.
28. Archibald, J.
29. Farley's Machine Inc.
30. Rodal Placers
31. Matkowski, D.
32. 16406 Yukon Inc.
33. Brickner, D.
34. Alf Roberts Mining
35. Devin Gold Exploration
36. Tatra Ventures Ltd.
37. Henry Gulch Explorations Ltd.
38. Gillespie, R.
39. Australian Hill Mining
40. Favron Enterprises Ltd.
41. Ace Placer Mines Ltd.
42. Last Chance Placers Ltd.
43. Golden Wrench Mining
44. WAM Exploration Ltd
45. Moonlight Mining Ltd.
46. Tamarack Inc.
47. Brickner, D.
48. Phillips, P. and D.
49. Daval Mining
50. Fraser, I.
51. Mogul Gold
52. NZ Mid-Arctic Gold Mining Ltd.
53. Tim Coles Enterprises Ltd.
54. Sadek, V.
55. 535584 Yukon Inc.
56. Ruman, D.
57. Larose, S.
58. Ahnert, G. and E.
59. Blattler, E.
60. Hunter, T.
61. George, M. and L.
62. Brong, R. and Dotzler, E.
63. Gaven, W.
64. Henry Gulch Explorations Ltd.
65. Dulac Mining

# BONANZA-HUNKER
## PLACER AREA

**SITES 1-65**



## Dome Road, intermediate-level bench on Klondike

116B/03 2017: 64°02'44"N, 139°24'39"W

### Slinky Placer Mine, 2002-2005, 2009-2017

Water License: PM14-045 (Active 06/2020)
Water License: PM09-633 (Expired 06/2015)
Active Producer (2015-2017) **Operation no. 1**

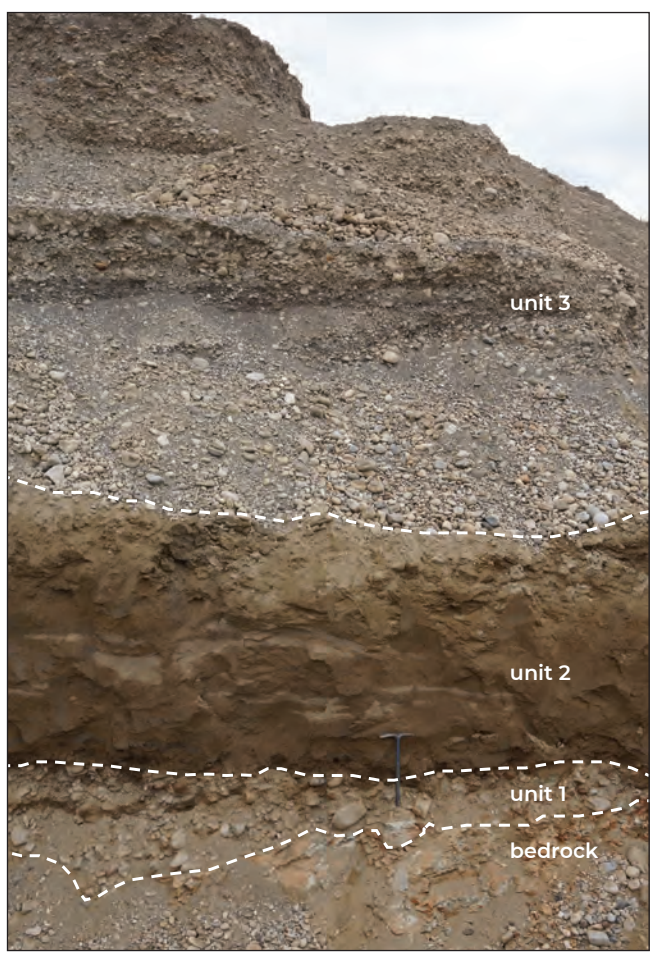
**Location** Right limit bench of the Klondike River, 1.7 km downstream from Thomas Gulch.

**Work History and Mining Cuts** Mining along the Dome Road bench occurred throughout 2015 to 2017. The main target was previously mined ground, and virgin ground is preserved in bedrock undulations. Slinky Placer Mine operated a single 10-hour shift with up to five personnel. The intermediate-bench cut focused on uncovering a bedrock reef that preserved pay gravel, where the bulldozer blade was unable excavate thoroughly.

**Equipment and Water Treatment** Equipment present on site in 2017 included a Terex loader, a Link-Belt 210 excavator, a Kubota KX161-3 excavator, and two dump trucks. The wash plant consisted of a 1.2 m (4 ft) diameter, 5.5 m (18 ft) long trommel with a single sluice run 0.6 m (2 ft) wide by 6 m long (20 ft), 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 mine exposes the geology of an intermediate-level Klondike River terrace. Recent exposure of the bedrock surface shows that the terrace consists of multiple levels, or low terracettes, that were created during gradual down-cutting by the river. In places, the bedrock surface is also channelized and has a relief up to 2 m (6.6 ft). The pay gravel (unit 1) on bedrock ranges in thickness from 0.4 to 2 m (1.3-6.6 ft). It is a coarse gravel with crude imbrication, poor sorting and contains sand lenses. The clast content equals 60% and the majority of clasts are pebble or cobble sized. The matrix consists of a medium-grained sand. Foreign clasts of rock, like chert, are present and likely derived from reworking the Klondike outwash gravel. Unit 2, overlying the pay gravel, consists of 2 m (6.6 ft) of bedded sand and minor silt. This deposit is likely associated with unit 1 and represents flood sediment typically deposited marginal to the active channel during high water events. Overlying, and in sharp contact with unit 2, is 5.7 m (18.7 ft) of moderately to well-sorted, stratified, glacial outwash gravel (unit 3). An ice wedge cast penetrates from unit 3 into unit 2. These soil cracks formed during extremely cold periods, and support the interpretation of unit 3 originating during a glacial period.

*Slinky Placer Mine's cut on the right limit bench of the Klondike River in 2016.*




*Slinky Placer Mine exposure on the intermediate-level terrace of the Klondike River. Undulations in the bedrock affect the thickness of the pay gravel. Here the pay gravel (unit 1) is about 0.5 m (1.6 ft) thick and overlain by bedded sand (unit 2) and glacial outwash gravel (unit 3). The entire exposure is 8 m (23 ft) thick.*

**Bedrock Geology** Bedrock is diorite.

**Gold Characteristics** Gold recovered from the main pay unit is coarse, while very fine gold is recovered from the upper well-washed pebble gravel. The largest nugget recovered is 17 g.

## Dome Road, intermediate-level bench on Klondike

116B/03 2017: 64°02'47"N, 139°24'38"W

### Treadstone Services, 2015-2017

Water License: PM14-045 (Active 06/2020)
Active Producer (2015-2017) **Operation no. 2**

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

**Work History and Mining Cuts** Treadstone Services optioned ground from Mr. Carey from 2015 to 2017. A cut measuring 12 by 30 m (40 x 100 ft) was stripped in the fall of 2015, and activity continued in that location in 2016. With a crew of three people, they were primarily focused on developing the mine site, completing the plant fabrications and initiating sluicing in mid-September. Mining continued in the cut in 2017 by a crew of up to four people.

**Equipment and Water Treatment** Machinery utilized in 2017 included a Daewoo 470 LCV excavator, a Kobelco SK290 excavator, a Caterpillar D7 bulldozer, and custom fabricated wash plant. The plant is termed the Treadstone Prototype SW200 double screen deck and was fabricated from a Powerscreen Chieftain 1400. It is capable of processing 90 loose $yd^3$ (68 $m^3$)/hr. The plant consists of a 7 $yd^3$ hopper with a 1½" screen that classified to ¾" and feeds 1.2 m wide by 6 m long (4 x 20 ft) runs. The sluice runs were configured with a 6" boil box at the end of the slick plate, 1.5 m (5 ft) expanded metal, 0.6 m (2 ft) slick plate, 0.6 m (2 ft) hydraulic riffles, 0.4 m (1.5 ft) slick plate, and 0.9 m (3 ft) of expanded metal. Water was 100% recirculated through a single pond.

**Surficial Geology and Stratigraphy** A cut beside the Dome Road in 2017 consisted of two units. Unit 1 varied in thickness from 2.4 to 5 m (8-16 ft) and consisted of 70% pebble and 30% cobbles that are well rounded, and the matrix is a medium to coarse sand that becomes increasingly mafic-rich in the lower 0.9 m (3 ft) of the section. The unit is interpreted as Klondike outwash gravel that was partially eroded resulting in the range of thickness. The bottom 1.2 m (4 ft) of gravel and up to 1.2 m (4 ft) of bedrock was sluiced. Overlying the Klondike outwash gravel is 2 to 5 m (8-16 ft) of bedded silt and fine sand. This deposit represents loess (wind blown) that has washed off the nearby hillside and accumulated on the terrace surface.

**Bedrock Geology** Bedrock is fractured and oxidized schist.

**Gold Characteristics** Not reported.

*Treadstone Services cut in 2017. Klondike outwash gravel overlies blocky bedrock and is buried by resedimented loess (silt).*

## OK, a tributary of Yukon

116B/04 2017: 64°01'52"N, 139°31'49"W

### OK Creek Mining and Exploration Inc., 2016-2017

Water License: PM16-029 (Active 08/2026)
Active Producer (2016-2017) **Operation no. 3**

**Location** OK Creek, approximately 0.8 km upstream from its confluence with Yukon River.

**Work History and Mining Cuts** A new operation in 2016 was established on the lower section of OK Creek.

Exploration, consisting of a small-scale drill program and panning, was conducted in previous years. A right limit bench was stripped in 2016, and several test pits were dug on the left limit. Minimal activity occurred in 2017 and reclamation of the test pits from 2016 was completed.

**Equipment and Water Treatment** Water was 100% recycled with no discharge into Yukon River.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is dark grey to black carbonaceous metasedimentary rocks (YGS, 2017).

**Gold Characteristics** Not reported.

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

116B/03 2016: 64°01'12"N, 139°21'15"W

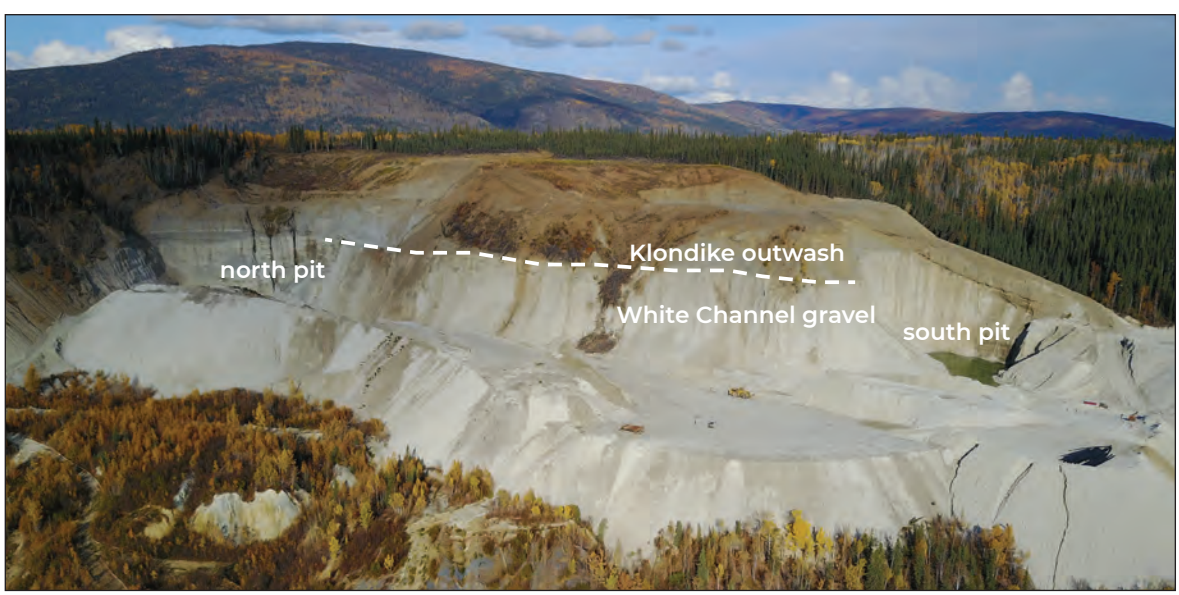
### Northern Shoveler Resources Ltd., 2005-2017

Water License: PM11-018 (Active 07/2021)
Water License: PM12-074 (Active 12/2022)
Active Producer (2015-2017) **Operation no. 4**

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

**Work History and Mining Cuts** In 2015 Northern Shoveler concurrently mined in two locations. The first cut targeted Klondike River gravel under the Jackson Hill hydraulic tailings. The pit dimension measured 88 by 130 m (288 x 426 ft). The second cut targeted White Channel gravel on Lovett Hill. The stripping ratio was 20:1 and the bottom 3.6 m (12 ft) was processed. The volume of pay gravel processed at this location was 21,000 $yd^3$ in 2015. In 2016, an additional 14,000 $yd^3$ was processed from the Lovett Hill cut. A second cut was stripped and mined at the north end of Lovett Hill where the Klondike outwash gravel is significantly thicker. The stripping ratio was closer to 30:1 at this location, however the target was closer to the center of the paleo-channel that runs through the hill. In 2017, work shifted to Bonanza Creek where virgin gravel buried under hydraulic tailings from Trail Hill was mined.

**Equipment and Water Treatment** In 2015, on the Klondike River gravel cut, machinery utilized included a Caterpillar 245B excavator for digging pay, a Caterpillar D10N bulldozer for pushing pay and a Caterpillar rock truck for hauling pay. On Lovett Hill, stripping of overburden gravel was completed using Caterpillar D11N and D10N bulldozers. As excavation progressed to deeper levels, stripping shifted to hauling material with rock trucks. Pay gravel was excavated using an Hitachi EX1100 and transported to the wash plant using Caterpillar 773B rock trucks. A Caterpillar 980C loader was also on site. On the Bonanza Creek cut, the Hitachi EX1100 excavator was used for digging overburden and pay, which was then transported using three Caterpillar 773B rock trucks. The wash plant is fed using a Caterpillar 966F loader. A 1.8 m (6 ft) diameter trommel plant on Trail Hill is used for washing and




*A view to the northeast of Lovett Hill. The south pit (2015 and 2016) and north pit (2016) are labeled on the photo. The contact between the White Channel gravel and the Klondike outwash is also highlighted with a dotted line. The overall thickness of the two units combined is approximately 100 m (328 ft).*

classifying gravel. The sluice runs are lined with expanded metal and nomad matting. Water is 100% recycled through a series of three settling ponds on Trail Hill.

**Surficial Geology and Stratigraphy** The geology of Northern Shoveler's projects is described according to the different extraction settings presented in the work history.

Klondike River: At the Klondike River project below Jackson Hill, unit 1 consists of 3 to 6 m (10-20 ft) of Klondike River gravel. The unit thins toward the hillside. It is typical Klondike River gravel consisting of coarse, subrounded, cobble-rich gravel. Unit 1 is overlain by 7 m (23 ft) of fine hydraulic tailings (unit 2a); the tailings appear to be largely sand and pebble-size. Unit 2b, a coarser unit of hydraulic tailings, is 12 m (40 ft) thick.

*An aerial view to the east of Northern Shoveler's pit in the Bonanza Creek valley at the base of Trail and Cripple hills. Bonanza Creek gravel is overlain by 35 m (115 ft) of White Channel gravel hydraulic tailings. The wash plant and settling ponds are located in the upper left hand corner at the base of Trail Hill.*

Lovett Hill: The White Channel gravel at Lovett Hill is 46 m (151 ft) thick and overlain by Klondike outwash gravel that increases in thickness from 24 m (79 ft) at the south end of the hill to 50 m (164 ft) at the north end of the hill. On bedrock, the White Channel gravel is poorly sorted and shows evidence of weak clay alteration in schist clasts and is mottled with oxidation. The gravel is clast-supported and consists of 70% clasts and 30% matrix. The clast component is 70% pebbles, 28% cobbles and 2% small boulders, whereas the matrix component is medium to coarse sand. The gravel becomes less coarse above the lower 3 m (10 ft). Lithologically the gravel consists of 50% quartz, 20% sericite schist, 20% felsic schist and 10% quartzite. The lower 3.6 m (12 ft) is considered pay and only a thin layer of bedrock is sluiced. The Klondike outwash gravel lies in sharp contact with the White Channel gravel and is interbedded near the contact. The Klondike outwash is a distally derived glacial gravel from the first glaciation to spill meltwater into the paleo-Hunker valley at Rock Creek 2.64 million years ago (Hidy et al., 2013).

Bonanza Creek: The Bonanza Creek sediment was approximately 7 m (23 ft) thick and part of that material was stripped. The hydraulic tailings are 35 m thick (115 ft). No detailed observations of the Bonanza Creek gravel were made.

**Bedrock Geology** Bedrock exposed on Lovett Hill is a dark grey to graphitic schist that is contact with a oxidized felsic 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.


*A close-up view of the Lovett Hill White Channel gravel section with a grey schist bedrock exposed. The White Channel gravel is 46 m (151 ft) thick. The inset photo shows a close-up of the White Channel gravel texture on bedrock.*

## Fortynine, a tributary of Bonanza

115O/14 2017: 63°58'19"N, 139°21'38"W
116B/03 2016: 64°00'05"N, 139°21'22"W

### Algotsson, H., 2013-2017

Water License: PM07-584-1 (Active 06/2018)
Water License: PM16-041 (Active 07/2026)
Active Producer (2015-2017) **Operation no. 5**

**Location** Several locations; right limit of Fortynine Gulch, between Cripple Gulch and Trail Gulch, and at the mouth of Pure Gold Gulch, on the right limit of Bonanza Creek.

**Work History and Mining Cuts** The two person operation was active in 2015, where they hand stripped an area and conducted a small testing program upstream from Trail Gulch. In 2016 they were active on a high-level right limit bench, located upstream of Cripple Gulch. Northern Shoveler Resources Ltd. transported pay material to Mr. Algotsson's property and sluiced under PM07-584-1 in 2016 and 2017. D. Algotsson mined 350 m upstream of Fortynine Gulch in 2017. The cut was approximately 18 by 5 m (60 x 16 ft) and was located on the right limit of Fortynine Gulch on a high-level bench.

Leasing ground from Mr. H. Algotsson in 2017, Mr. Unra operated a two-person mine at the mouth of Pure Gold Gulch, on the right limit of Bonanza Creek. He conducted a drilling program in 2016 to determine the total section depth to bedrock; there is 9 m (30 ft) of gravel. Dredge No. 4 was assembled in this location in 1912-1913, therefore virgin ground remains below the construction site (Green, 1977). A floating trommel, capable of processing up to 130 loose yd³ (99 $m^3$)/hr, sluiced material until early August.

**Equipment and Water Treatment** Equipment utilized on Fortymine Gulch at D. Algotsson's operation in 2017 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.

**Surficial Geology and Stratigraphy** On the right limit high-level bench, 4.7 m (15 ft) of White Channel gravel is overlain by 2.4 m (8 ft) of cat push, tailings and colluvium. The bottom gravel and up to 0.6 m (2 ft) of bedrock was sluiced.

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

**Gold Characteristics** All gold recovered is fine grained.

## Bonanza, a tributary of Klondike

115O/14 2016: 63°59'19"N, 139°22'01"W

### Kohlman Explorations Ltd., 1983-2007, 2011-2017

Water License: PM10-063 (Active 02/2021)
Active Producer (2015-2017) **Operation no. 6**

**Location** Bonanza Creek, approximately 1 km upstream from the mouth of Sourdough Gulch.

**Work History and Mining Cuts** From 2015 to 2017 activity was concentrated on an intermediate low-level bench cut on the left limit of Bonanza Creek. Up to six miners, working a single shift, excavated the cut westward toward the hillside. Their target is focused outside the historic dredge limits to determine the extent of the preserved side pay.

**Equipment and Water Treatment** Heavy equipment utilized by the operation included a Komatsu WA450 wheel loader, a Borger 550 LC excavator, a Komatsu 650 excavator, a Komatsu 400 excavator, and two rock trucks. The newly fabricated D-Rocker is able to process 40 loose $yd^3$ (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 Kohlman Explorations Ltd. mine the preserved side pay is buried by a thick layer of muck and weathered bedrock colluvium, making overburden removal a major undertaking. The overburden thickness increases toward the hillside and ranges from 10 to 27 m (33-89 ft) in thickness. The lower half of the overburden consists of colluviated weathered bedrock with organics, whereas the upper portion is predominantly loess, organic beds, and colluviated weathered bedrock. Technogenic tailings overlie part of the virgin gravel. The gravel is up to 2.5 m (8 ft) thick and containing imbricated boulders on bedrock, with a boulder enrichment in the bottom 1 m (3 ft). Clasts are predominately subangular, with maximum clast size of approximately 0.4 m (1.3 ft). Overlying the boulder-rich zone on bedrock is a cobble-pebble gravel that fines upwards into sand. The upper section of the gravel is planar and cross-stratified with open work structures in the cross-stratified sections. Varying degrees of oxidation in the upper materials suggest an influence from groundwater related iron precipitaiton.

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

**Exploration Potential** Untapped side pay potential exists in Bonanza Creek in areas buried by thick colluvial

*Sluicing, transporting pay, and recovering virgin Bonanza Creek gravel at Kohlman Exploration Ltd.'s operation in 2016.*

*Northeasterly view, on the right limit of Bonanza Creek at Mr. Harapchuk's operation in 2015.*

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, side pay potential for the drainage is an intriguing exploration target.

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

## Bonanza, a tributary of Klondike

115O/14 2015: 63°58'39"N, 139°21'09"W

### Harapchuk, M., 2011, 2014-2015

Water License: PM10-075 (Active 03/2021)
Active Producer (2015) **Operation no. 7**

**Location** Bonanza Creek, at the mouth of Fortynine Gulch.

**Work History and Mining Cuts** Stripping and sluicing occurred in 2015 under PM10-075. Activity occurred on both the left and right limit of Bonanza Creek, with the majority of workings occurring on the right limit, across from the mouth of Fortynine Gulch. The site was primarily inactive in 2016, aside from conducting reclamation.

**Equipment and Water Treatment** Equipment present on site in 2015 included a Caterpillar 266C wheel loader and a 1 m diameter by 4.6 m long (3 x 15 ft) trommel.

**Surficial Geology and Stratigraphy** A test pit on the right limit encountered a section of primarily colluviated weathered bedrock with a discontinuous lens of pebble gravel and sand up to 0.5 m (1.6 ft) thick.

**Bedrock Geology** Bedrock is quartzite, quartz-muscovite-calcite schist, gneiss and amphibolite (YGS, 2017).

**Gold Characteristics** Not reported.

## Boulder Hill, intermediate and high-level benches on Bonanza

115O/14 2017: 63°58'13"N, 139°21'35"W

### Lewes River Mining; Nibecker, B. and D., 2014-2017

Water License: PM08-616-2 (Active 07/2020)
Active Producer (2015-2017) **Operation no. 8**

**Location** Boulder Hill and 44 Gulch, 700 m downstream from Boulder Creek.

**Work History and Mining Cuts** As a continuation from previous years, Mr. Nibecker mined the right limit intermediate-level bench of Bonanza Creek in 2015. Mining was completed when the eastern limit of the claim boundary was reached in late 2015. At this time, Mr. Nibecker moved to Boulder Hill and completed a bulk sampling program in late fall. A large test pit at the base of Boulder Hill was worked in early summer 2016, and led to the development of a new cut located downstream of Boulder Creek on a left limit intermediate bench. The remainder of the season was spent excavating this bench that is located near 44 Gulch. A continuation of the test pit at the base of Boulder Creek was extended in 2017, with a cut approximately 40 by 70 m (131 x 230 ft). Aside from the cut at the base of Boulder Hill, efforts were focused on the cut on the intermediate bench of Bonanza Creek initiated in 2016. A cut, measuring 10 by 60 m (33 x 197 ft), was mined throughout 2017 by a crew of up to four personnel operating an 11-hour shift.

**Equipment and Water Treatment** Equipment in 2017 included an Hitachi 270 excavator, Caterpillar 318CL excavator, and a Caterpillar 966G wheel loader. A shaker screen deck, gold Watch Project Model 50, was utilized to process pay gravel at 30 loose $yd^3$ (23 $m^3$)/hr. The main sluice run is 0.8 m (2.8 ft) wide and delivers concentrate to a 3 m (10 ft) long run, lined with 1" angle iron spaced at 2.5" and lined with 3M carpet. Water was acquired from a reservoir pond in Bonanza Creek valley and 100% recycled. Clean-ups were conducted using a long tom and pan.

**Surficial Geology and Stratigraphy** On the left limit intermediate bench of Bonanza Creek near 44 Gulch, clast imbrication indicates that the gravel was flowing eastward. The trajectory is consistent with Bonanza Creek flow being directed by the local bedrock topography of 49 Hill. The deposit looks similar to the reworked White Channel deposit that Mr. Nibecker targeted on the right limit of Bonanza Creek in 2015. Gravel thickness decreases laterally to the east, which may be the result of post-deposition erosional processes that have truncated the deposit. Four units are present in the section. Unit 1 is a 0.15 m (0.5 ft) thick mixing zone between decomposed bedrock and a cobble gravel unit. Unit 2, from 0.15 to 2.1 m (0.5-6.9 ft), is a gravel sequence that fines upwards. The bottom 1 m (3.3 ft) of the gravel is poorly sorted, coarse, and comprises approximately 2% boulders, 60% cobbles and 38% pebbles, with the largest clast up to 0.4 m (1.3 ft). As the gravel fines upward, it becomes better sorted


*Sluicing on the intermediate bench on the left limit of Bonanza Creek near 44 Gulch in 2016.*


*Mr. Nibecker's operation on the Bonanza Creek intermediate bench in 2017. They continued to extend the bench deposit to the west and determined that the deposit may have significant lateral continuity.*

and has an increased matrix content consisting of medium to coarse sand. Overlying the upper fine gravel is unit 3, a 0.5 m (1.6 ft) thick unit of pebble gravel with 40% matrix and beds of open work structure. A bed of mud and sand lenses up to 0.2 m (0.7 ft) is present at the contact between unit 3 and unit 4. Unit 4 is up to 4.5 m (14.8 ft) thick and consists of colluvium and woody debris. All gravel in unit 1 and 2 and up to 0.3 m (1 ft) of bedrock was sluiced.

**Bedrock Geology** Bedrock is foliated and weathered schist.

**Gold Characteristics** Gold from the intermediate bench of left limit Bonanza Creek is very rough and coarse, with an average size of 24 mesh. Fineness is 754.

## Monte Cristo Hill, high-level bench on Bonanza

115O/14 2017: 63°57'11"N, 139°20'33"W

**Van Bibber, S., 2009, 2013-2017**

Water License: PM08-597 (Active 04/2018)
Active Producer (2015-2017) **Operation no. 9**

**Location** Bonanza Creek, Monte Cristo Hill above Fox Gulch.

**Work History and Mining Cuts** In 2016 and 2017, Mr. S. Van Bibber and Mr. E. LaBonte partnered to mine a left limit bench on Monte Cristo Hill above Fox Gulch, on Mr. LaBonte claims. Pay material was transported from the bench cut to Mr. Van Bibber's operation across the Bonanza Creek road where it was sluiced.

**Equipment and Water Treatment** The partnership in 2016 utilized a John Deere 892 ELC excavator, a Caterpillar 980C wheel loader, a Caterpillar 966 wheel loader and a dump truck. Pay material was hauled to a screen deck processing plant beside the Bonanza Creek road.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is quartzite, quartz-muscovite-calcite schist, gneiss and amphibolite (YGS, 2017).

**Gold Characteristics** Not reported.

## Orofino Hill, high-level bench on Bonanza

115O/14 2016: 63°56'59"N, 139°20'56"W

**LaBonte, R., 2003-2017**

Water License: PM13-040 (Active 11/2023)
Active Producer (2015-2017) **Operation no. 10**

**Location** Orofino Hill, left limit bench on Bonanza Creek, between Fox Gulch and American Gulch.

**Work History and Mining Cuts** In 2015, Mr. E. LaBonte conducted a small exploration drilling program on the right limit of Bonanza Creek, upstream from the mouth of Mosquito Gulch. He continued to mine Orofino Hill located between Fox Gulch and American Gulch throughout 2015, and partnered with Mr. Van Bibber in 2016 and 2017 to continue exploiting the extensive White Channel gravel deposit.

**Equipment and Water Treatment** Not reported.

**Surficial Geology and Stratigraphy** The high-level White Channel gravel is 33 m (108 ft) thick, with pay concentrated in the lowermost 3 m (10 ft). The bottom 3 m (10 ft) of gravel and up to 0.5 m (1.6 ft) of bedrock was sluiced.

**Bedrock Geology** Bedrock is quartzite and muscovite-calcite schist.

**Gold Characteristics** Gold is generally fine. The upper half of the White Channel gravel yields fine gold whereas the bedrock contact contains nuggets and coarse gold.

*Mr. LaBonte and Mr. Van Bibber mining the high-level bench between Fox Gulch and American Gulch in 2016.*

## American Hill, high-level bench on Bonanza

115O/14 2017: 63°56'49"N, 139°20'54"W

### Jackson, D., 2004-2017

Water License: PM10-006 (Active 04/2020)
Active Producer (2015-2017) **Operation no. 11**

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

**Work History and Mining Cuts** From 2015 to 2017 Mr. Jackson operated on American Hill, a left limit bench of Bonanza Creek. American Hill is located downstream from Parks Canada's Dredge No. 4 National Historic Site. Mr. Jackson worked as a one-person operation and activity was focused on the left limit of American Gulch, working along the downstream end of American Hill.

**Equipment and Water Treatment** Equipment included an Hitachi 200 excavator, Hanomag 66D loader, Caterpillar 950 loader and Caterpillar 631B scraper. A 1.8 m (6 ft) diameter by 9 m (30 ft) long trommel with a ½" 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 American Hill 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.

## Adams, Magnet and American hills, high-level benches on Bonanza

115O/14 2017: 63°56'17"N, 139°19'55"W

### Bonanza Creek Mining, 2003-2017

Water License: PM13-051 (Active 05/2024)
Active Producer (2015-2017) **Operation no. 12**

**Location** Bonanza Creek, left limit high-level benches; Adams Hill, Magnet Hill and American Hill.

**Work History and Mining Cuts** Activity in 2015 and 2016 was concentrated on Adams Hill, Magnet Hill and American Hill; all left limit benches of Bonanza Creek. They targeted White Channel gravel, the initial mature braided stream gravel that was widely deposited across Bonanza Creek valley. Pay material derived from the lower few metres of the White Channel gravel was hauled from the bench cuts to their sluicing location upstream from the Dredge No. 4 National Historic Site. Yardage sluiced in 2015 and 2016 was approximately 60,000 yd³/season. In 2017, a joint venture between Lucky Strike Ventures Ltd. and Bonanza Creek Mining was established to excavate the *in situ* gravel preserved beneath hydraulic tailings from Cheechako Hill. Magnet Hill was also mined in 2017, where material was transported to their sluicing location in the valley bottom.

**Equipment and Water Treatment** Equipment utilized included a Caterpillar 375 excavator, a Komatsu 300 excavator, a Samsung 280 excavator, two Halla 220 excavators and three International 50 ton Pay

*Section on Adams Hill in 2015, exposing 28 m (92 ft) of White Channel gravel. Placer gold is concentrated in the lower 2.4 m (8 ft) of gravel present at the bedrock contact.*

Haulers. The wash plant consisted of a screen deck with two 1.2 m (4 ft) wide by 2.4 m (8 ft) long sluice runs with a combination of expanded metal and angle iron. Water was supplied by a 6" pump powered by a 4 cylinder John Deere pump, which enabled the plant to process between 60 to 80 loose yd³ (45-61 m³)/hr, depending on material. One settling pond was utilized in both the 2015 and 2016 season. A pulsating jig was used for clean-ups.

**Surficial Geology and Stratigraphy** A section on Adams Hill in 2015 consisted of 28 m (92 ft) of White Channel gravel. From the bedrock contact to 9.2 m (30 ft), the percentage of sand is higher than the upper part of the section. The bottom half of the section contains pervasive oxidation in sand lenses, whereas oxidation appears to increase toward the top in the upper part of the section. Material sluiced from the high-level White Channel deposits included 1.5 to 2.4 m (5-8 ft) of gravel and 0.6 to 1.2 m (2-4 ft) of bedrock.

**Bedrock Geology** Bedrock is Klondike schist.

**Gold Characteristics** Gold is mostly fine with 1% nuggets, and the fineness ranges from 780 to 800.

*Looking downstream Bonanza Creek, from Adams Hill, towards Dredge No. 4 National Historic Site.*

## Adams, a tributary of Bonanza

115O/14 2017: 63°55'56"N, 139°20'10"W

### Lucky Strike Ventures Inc., 2012-2017

Water License: PM08-595-3 (Active 06/2018)
Active Producer (2015-2017) **Operation no. 13**

**Location** Adams Creek, lower, 500 m upstream from its confluence with Bonanza Creek.

**Work History and Mining Cuts** In 2015, a joint venture with Lucky Strive Ventures Ltd. was established between D. Fry and D. Law. The Fry family has been present in the Klondike since 1928, when Art Fry first arrived in Dawson City. Mr. Law, also has deep roots in the Klondike related to his grandfather Charles Boutillier arriving in Yukon in 1904 and his mother being born in Whitehorse and moving to Dawson in 1914. Both families operated on Adams Creek throughout the 2015 season and processed 28,000 loose yd³ of material. Activity was focused on the right limit of the drainage, approximately 700 m upstream from its confluence with Bonanza Creek. In 2016, a second joint venture between Lucky Strike Ventures Ltd. and D. Law was initiated and they sluiced a total of 8,000 yd³ throughout the season. Their uppermost claim and another claim was leased from Mr. Gardener in 2016. In 2017, Lucky Strike Ventures established a third joint venture, this time with Bonanza Creek Mining to open up the mouth of Adams Creek. This cut exposed virgin Adams Creek right limit side pay that is buried beneath hydraulic tailings from Cheechako Hill. A crew of up to four people prepared a cut 50 by 120 m (164 x 394 ft) for sluicing. The section consisted of approximately 18 m (60 ft) of hydraulic tailings, 9 m (30 ft) of overburden and then the *in situ* gravel. Once they stripped off the overburden and tailings, they intended to drill the ground to determine gravel thickness. A total of 17,000 yd³ was sluiced during the 2017 season.

**Equipment and Water Treatment** Equipment in 2017 included an Hitachi 120 excavator, a Samsung 280 excavator, a Caterpillar 345 excavator, a Caterpillar 375 excavator, a Halla 220 excavator, two Kawasaki 952 wheel loaders, two Pay hauler haul trucks and a Caterpillar D8 bulldozer. An oscillating wash plant with a ⅜" screen, and a secondary run with a ¾" punch plate, was utilized to process pay up to 150 loose yd³ (115 m³)/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** An exposure in lower Adams Cree in 2015 consisted of 1.5 m (5 ft) of imbricated, coarse, cobble gravel on bedrock (unit 1). This material was considered pay gravel. Overlying the gravel was a finer fluvial deposit of bedded sand measuring 1 m (3 ft) in thickness (unit 2). The sand and gravel units were buried under 3.7 m (12 ft) of interbedded organics and angular colluvium (unit 3). The contact between units 2 and 3 dropped off toward the valley center suggesting that units 1 and 2 may have been a buried low-level terrace deposit.

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

**Gold Characteristics** Gold is mainly of jewelry grade in color and shape. Size ranges include 10 to 12% over $^{3}/_{16}$", 28 to 40% over $^{1}/_{16}$" and 50% fine. The largest nugget recovered is approximately 28 g.

*View at the mouth of Adams Creek, looking upstream as Bonanza Creek Mining and the Fry's remove the hydraulic tailings from Cheechako Hill to reach the untouched gravel on the right limit.*

*Exposure of valley bottom sediments in Adams Creek on Lucky Strike Ventures property in 2015. Pay gravel is overlain by organics and angular colluvium (slide rock).*

## Adams, a tributary of Bonanza

115O/14 2017: 63°55'52"N, 139°21'36"W

### Gardiner, E., 2010-2016

Water License: PM10-051-1 (Active 11/2020)
Active Producer (2015-2016) **Operation no. 14**

**Location** Adams Creek, upper, approximately 1.6 km upstream from its confluence with Bonanza Creek.

**Work History and Mining Cuts** A left limit cut on the lower end of Mr. Gardiner's claims was prepared in 2015 and mined throughout 2016. No activity occurred on the claims in 2017.

**Equipment and Water Treatment** Equipment included an Hitachi 270 excavator, a John Deere 500C excavator, a Caterpillar 966 wheel loader, a Caterpillar 980 wheel loader, a John Deere 450C bulldozer and an International fire truck for the pumps. A 6" Gorman Rupp pump powered by a John Deere 600 engine supplied the screen deck with water through a 100% recycled system. The 0.8 by 4.9 m (2.5 x 16 ft) screen deck had a ¾" punch plate with a 3.6 by 3.6 m (12 x 12 ft) vibrating table at the end of three sluice runs, each 1.2 m (4 ft) wide. Runs contained expanded metal with an upper boil box, all lined with unbacked nomad matting. Clean-ups were conducted using a long tom and completed on a table in Dawson.

**Surficial Geology and Stratigraphy** All old tailings were mined.

**Bedrock Geology** Bedrock is muscovite-calcite schist.

**Gold Characteristics** Gold derived from virgin ground is coarse, with a maximum size of 2.5 g.

*View of upper Adams Gulch, looking downstream, at Mr. Gardiner's operation in 2017.*


*Gold recovered from Mr. Gardiner's operation in 2015.*

## Cheechako Hill, a high-level bench on Bonanza

115O/14 2017: 63°55'35"N, 139°19'58"W

### Beron Placers Ltd., 2015-2017

Water License: PM14-025 (Active 09/2024)
Active Producer (2015-2017) **Operation no. 15**

**Location** Cheechako Hill, between Skookum Gulch and Adams Creek.

**Work History and Mining Cuts** Beron Placers moved to the south end of Cheechako Hill in 2015 and began mining in 2016. The goal of this project is to mine the remaining bench gravel that was not exploited during hydraulic operations in the early 1900s. This remaining component of the White Channel gravel is adjacent to the main pay streak and represents the paleo-side channel of Bonanza Creek. Beron Placers is evaluating a processing plant that takes advantage of the bench's elevation to sequence two stages of screen deck classification. Future efforts plan to test a third stage of concentration using centrifuges and spirals. In 2016 and 2017, this operation employed two miners that worked a single shift daily. In 2016, 60,000 yd³ were stripped and 30,000 yd³ were sluiced.

**Equipment and Water Treatment** Equipment on site included a Caterpillar 245 excavator for digging pay and feeding the plant, a Caterpillar 966C loader for removing coarse tailings, a John Deere 690 loader and two Caterpillar bulldozers (D8K and D6C) 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 over-size material. Water use for the plant is 2500 US gal/min and is 100% recycled through a system of three settling/holding ponds located in Little Skookum Gulch. The plant processes 180 yd³ (138 m³)/hour.

*Plan view of Beron Placers Ltd. two stage screen deck plant on Cheechako Hill. Sufficient elevation is available to add a third stage to the plant such as a centrifuge or spiral concentrator if testing warrants sufficient ultra-fine gold is present.*

**Surficial Geology and Stratigraphy** The White Channel gravel exposure on Cheechako Hill varies due to the slope of the hill; a measurement of 6.5 m (21 ft) was obtained in 2016 and 10 m (33 ft) in 2017. The lower 5 m (18 ft) is being processed and consists of a slightly tighter gravel that contains less clay and silt compared to the upper half of the section. The lower gravel is clast supported, contains 25% medium to coarse sand matrix and 75% clasts that are primarily pebble and

*Beron Placers Ltd. operation on the south rim of Cheechako Hill. A crosscut of the remaining White Channel gravel is being completed in order to evaluate gold grades both vertically and laterally on the bench. The elevated site facilitates a tiered processing system.*

cobble size. The lower gravel is imbricated and displays varied flow direction between beds. Small boulders less than 30 cm in length are present. The upper 5 m (18 ft) is more oxidized, contains sand lenses and some silt and clay. The bedrock surface is generally level with the exception of a 1 m (3 ft) rise which also coincides with better gold grades. Lateral variation in texture of the gravel on bedrock is also observed. Coarser gravel is present near the east end of the cut, which is nearer to the center of the paleo-valley and mined-out high grade channel. Quartz clast content in the lower gravel is estimated to equal 30%.

**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.

## Big Skookum, a tributary of Bonanza

115O/14 2016: 63°55'14"N, 139°19'27"W

### Daunt, I., 1973-2017

Water License: PM15-029 (Active 11/2020)
Water License: PM04-409 (Expired 04/2015)
Active Producer (2015-2017) **Operation no. 16**

**Location** Big Skookum Gulch, upper.

**Work History and Mining Cuts** Mr. I. Daunt has mined in the Klondike for over forty years. 2015 was his last year of activity on Bonanza Creek and Big Skookum Gulch, and his son Mr. K. Daunt took over the operation in 2016. In 2016, an option agreement was established between Mr. Daunt and Matkowski Trucking Ltd. to work the northern edge of Gold Hill, on the right limit of Big Skookum Gulch.

Mr. K. Daunt was also active on the upper reaches of Big Skookum Gulch throughout 2016 and 2017. An agreement was established between Mr. Daunt and Dulac Mining in 2017, where they extended their operation from Gold Hill towards Mr. Daunt's claims on Big Skookum Gulch.

**Equipment and Water Treatment** Equipment present in 2016 associated with Matkowski Trucking Ltd.'s operation included a Volvo EC290-BLC excavator, a John Deere 544J wheel loader, a Caterpillar D7R bulldozer, a Komatsu PC270-LC excavator, a Caterpillar 769B rock truck, and a trommel able to process 80 loose yd³ (61 $m^3$)/hr.

*Northern end of Gold Hill where Matkowski Trucking Ltd. was mining throughout 2016.*

**Surficial Geology and Stratigraphy** In 2016, Matkowski Trucking Ltd. was stripping up to 7.6 m (25 ft) of overburden to expose up to 1.5 m (5 ft) of gravel. All gravel and minimal bedrock was sluiced.

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

**Gold Characteristics** Gold recovered in 2016 had a fineness of 780.

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

115O/14 2017: 63°55'13"N, 139°19'24"W

### Dulac Mining, 2017
### 535969 Yukon Inc., 2007-2016

Water License: PM15-090 (Active 07/2026)
Water License: PM05-503 (Expired 07/2016)
Active Producer (2015-2017) **Operation no. 17**

**Location** Gold Hill, at the confluence of Eldorado Creek and Bonanza Creek.

**Work History and Mining Cuts** Between 2015 and 2016, 535969 Yukon Inc. focused on mining slices off the face of Gold Hill. In 2017, the operation was purchased by Dulac Mining and they continued mining the face of Gold Hill on the downstream (northern) side of the bench. A total of 60,000 yd³ was sluiced in 2017, and they operated a daily 12-hour shift with up to six people.

**Equipment and Water Treatment** Equipment on site in 2017 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 x 12 ft) shaker screen deck with ⅝" openings. Sluice runs contained a boil box, hydraulic riffles, expanded metal and a 2.4 m (8 ft) wide oscillator at the end. The plant is capable of processing 80 to 120 loose yd³ (61-92 $m^3$)/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 the decomposed bedrock content (sericite schist). 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.

*A close-up view of Gold Hill's White Channel gravel stratigraphy. The light-coloured lower gravel emphasizes the pay channel. The majority of the placer gold is concentrated within 30 cm (1 ft) of the bedrock surface.*

*A view of Dulac Mining's operation on the north end of Gold Hill in 2017.*

**Bedrock Geology** Bedrock is quartzite, quartz-muscovite-calcite schist, gneiss and amphibolite (YGS, 2017).

**Gold Characteristics** The gold has a fineness of 770. Gold shape is described as angular with rough edges and having 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 1/3 oz were also recovered.

## Upper Bonanza, a tributary of Klondike

115O/14 2017: 63°55'15"N, 139°18'19"W

### Hanulik Enterprises Ltd., 2011-2017

Water License: PM14-051 (Active 06/2020)
Water License: PM10-013 (Expired 06/2015)
Active Producer (2015-2017) **Operation no. 18**

**Location** Upper Bonanza Creek, 40 m (130 ft) downstream from the mouth of Spring Gulch.

**Work History and Mining Cuts** Hanulik Enterprises Ltd. has been actively mining the right limit of upper Bonanza Creek from 2015 to 2107.

**Equipment and Water Treatment** Equipment located on site included a Caterpillar 235 excavator, a Caterpillar D9 bulldozer, a Western-Star dump truck, and a 1.2 by 6 m (4 x 20 ft) trommel with a 3/4" screen. Water was 100% recycled.

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

*Hanulik Enterprises Ltd.'s 1.2 by 6 m (4 x 20 ft) trommel on the right limit of Bonanza Creek in 2017.*

**Bedrock Geology** Bedrock is quartzite.

**Gold Characteristics** Not reported.

## Upper Bonanza, a tributary of Klondike

115O/14 2017: 63°55'18"N, 139°18'10"W
115O/14 2017: 63°55'22"N, 139°19'09"W

### Arkenstall, C., 2009-2014, 2017

Water License: PM15-090-1 (Active 07/2026)
Water License: PM07-582 (Active 05/2018)
Active Producer (2017) **Operation no. 19**

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

**Work History and Mining Cuts** Mr. Arkinstall has been active in the Klondike since 1988 and is currently mining under 535969 Yukon Inc.'s land use permit. After a short hiatus, the 2017 season was his first active year back mining, and he had a crew of up to three people excavating a cut measuring 12 by 40 m (40 x 131 ft). A second location on an intermediate bench, opposite from the mouth of Skookum Gulch on the right limit of Bonanza Creek was bulk sampled. Colluvium on the left limit of Bonanza Creek was bulked sampled with a screen deck test plant.

**Equipment and Water Treatment** In 2017 equipment utilized at site included an Hitachi EX200 excavator, a Volvo excavator, an Allis Chalmers HD 41 bulldozer, a Liebherr 981 excavator and a Terex 90C wheel loader. A 1.8 by 14 m (6 x 47 ft) trommel, had four 3.3 m (11 ft) long oscillating sluice runs, a final 6 m (20 ft) long sluice run, and screened material down to 1/2". Fed by a 6" pump, the plant was able to process gravel at a rate of 125 loose $yd^3$ (96 $m^3$)/hr. Water was 100% recycled in a series of three out-of-stream ponds.

**Surficial Geology and Stratigraphy** Colluvium on the left limit of Bonanza Creek was tested for its placer potential since it is reworked material from the known hard rock source upslope. The Klondike schist bedrock is a known host to an abundance of outcrop and subcrop quartz veining that contains visible gold. This material is liberated upslope by mechanical weathering processes such as freeze-thaw cycles and is incorporated into the colluvium to form eluvial placers. Although this placer setting is rare, operations nearby have been known to sluice colluvium.

The main target for Mr. Arkenstall was the right limit of Upper Bonanza Creek, 40 m (131 ft) downstream from the mouth of Spring Gulch. *In situ* Bonanza Creek gravel remains in this locale under the road bed. Up to 2.0 m (6.6 ft) of moderately sorted, fining upward pebble gravel is preserved on the bedrock contact. A coarse boulder lens, composed of predominately quartz, is present on bedrock, where clasts are up to 0.6 m (2.0 ft) in diameter. The upper part of the unit, where the gravel becomes finer, consists of predominately granules, small pebbles and medium sand. Isolated lenses of silt with minor fine sand is present throughout the section. Overburden, up to 10 m (33 ft) thick, overlies the gravel and consists of a clast enriched silt (weathered bedrock colluvium) and reworked overbank floodplain material. All gravel and the underlying weathered bedrock interface was sluiced.

**Bedrock Geology** Bedrock is quartzite and quartz-muscovite-calcite schist.

**Gold Characteristics** Gold is fine and fineness ranges from 780 to 800.

## Gauvin, a tributary of Upper Bonanza

115O/14 2016: 63°56'42"N, 139°14'49"W

### R & W Mining, 1989-2017

Water License: PM13-016 (Active 06/2023)
Active Producer (2015-2017) **Operation no. 20**

**Location** Gauvin Gulch, 3.3 km upstream from its confluence with Upper Bonanza Creek.

**Work History and Mining Cuts** From 2015 to 2017, R & W Mining continued to excavate the left limit of Gauvin Gulch, targeting a low-level bench preserved beneath a thick section of overburden. The bench is a substantial deposit that has been preserved and buried by up to 9.5 m (31 ft) of overburden. From 2015 to 2017, a cut 270 m (885 ft) long continued to be laterally extended into the hillside on the left limit to excavate farther into the bench. Throughout several seasons they focused on various sections along the face of the cut. Operating as a two person mine, Mr. Roberts and Mr. Nordling sluiced approximately 15,000 to 20,000 yd³/season. A significant amount of stripping occurred each season to prepare the cut for the following year.


*Section exposed downstream of Spring Gulch, on the right limit of Bonanza Creek, where Mr. Arkenstall is targeting in situ side pay gravel that remained untouched under the Bonanza Creek road.*


*Aerial view looking upstream Gauvin Gulch (towards the north-west) with the dotted line estimating the extent of the buried low-level bench on the left limit of the drainage.*

**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 low-level bench deposit on the left limit of Gauvin Gulch has been the target for this operation. The section consists of three units, of which the unit sitting on bedrock, consisting of a coarse gravel, is considered the pay. Bedrock surface undulates and can abruptly rise 1 m (3.3 ft) across the valley bottom. Unit 1, from 0 to 9 m (30 ft), is a coarse, boulder-cobble gravel with 10% boulders, 60% cobbles and 30% pebbles. It is poorly sorted, frozen, and moderately to pervasively oxidized throughout. Clasts are subrounded with maximum boulder size reaching 1.5 m (5.0 ft) diameter, and contains 30% matrix consisting of minor silt and medium sand. Unit 2, from 9 to 16.5 m (30-54 ft), is composed of interbedded cobble gravel, fine-grained silty sand with organics, and fine sand. Unit 3, from 16.5 to 19.3 m (54-64 ft), is loess. All coarse gravel, up to 9 m (30 ft), and 0.3 to 0.9 (1-3 ft) of bedrock was sluiced.

**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.

*Thick overburden on the left limit of Gauvin Gulch, looking towards the north (right limit of the drainage) where the wash plant and equipment are stationed.*

## Homestake, a tributary of Upper Bonanza

115O/14 2017: 63°54'58"N, 139°15'12"W

### Beyer, L., 2005-2017

Water License: PM03-306 (Active 06/2026)
Water License: PM15-086 (Active 07/2026)
Active Producer (2015-2017) **Operation no. 21**

**Location** Lower Homestake Gulch, at its confluence with Upper Bonanza Creek.

**Work History and Mining Cuts** Mr. Beyer has been mining for nearly forty years and from 2015 to 2017 he conducted testing on his property, which included shafting and hand sluicing. Stripping occurred in 2017 on lower Homestake Gulch, at its confluence with Upper Bonanza Creek.

**Equipment and Water Treatment** Equipment utilized by the operator included a Case 880 excavator, a John Deere 444 wheel loader, and a 1.2 m (4 ft) diameter by 9 m (30 ft) long trommel.

**Surficial Geology and Stratigraphy** Mining at the confluence of Homestake Gulch and Upper Bonanza Creek, Mr. Beyer encountered up to 1.8 m (6 ft) of cobble-pebble gravel.

**Bedrock Geology** Bedrock is quartzite, quartz-muscovite-calcite schist, gneiss and amphibolite (YGS, 2017).

**Gold Characteristics** Not reported.

## Homestake, a tributary of Bonanza

115O/14 2017: 63°55'32"N, 139°14'45"W

### McMahon, T., 2012-2017

Water License: PM14-061 (Active 05/2025)
Water License: PM08-615-1 (Expired 05/2015)
Active Producer (2015-2017) **Operation no. 22**

**Location** Homestake Gulch, 1.2 km upstream from its confluence with Upper Bonanza Creek.

**Work History and Mining Cuts** As a one-person operation, Mr. McMahon mined on mid-Homestake Gulch from 2015 to 2017. In 2015 he stripped a large cut focused on the left limit, but he mines both limits as the gulch is quite narrow. A cut 120 m (394 ft) long by 40 m (131 ft) wide was stripped and prepared for sluicing in 2016.

**Equipment and Water Treatment** In 2016, equipment present on site included a Daewoo 220 excavator, a John Deere 330LC excavator, and a Caterpillar D8H bulldozer. The wash plant is a 1.2 m (4 ft) diameter by 12 m (40 ft) long trommel with conveyor and is capable of processing 60 to 65 loose yd³ (46-50 $m^3$)/hr. Water was 100% recycled using a series of five in-stream dams. A long tom and pans were used for clean-ups and concentrate was completed on a table in Dawson.

**Surficial Geology and Stratigraphy** Mr. McMahon is working a paleo-gulch deposit and since 2012 has encountered an abundance of historic shafts and drifts. As a function of the high gradient, narrow valley setting of Homestake Gulch, gravel thickness is a maximum of 1.8 m (6 ft) and overburden is up to 9.1 m (30 ft) thick. The deposit consists of a poorly-sorted cobble dominated fluvial gravel, interbedded with debris-flow material of organics, angular bedrock and fine-grained sediments. The overburden consists of frozen muck, loess and colluvium. All gravel and as much liberated bedrock as possible is sluiced.

**Bedrock Geology** Bedrock is hard blocky quartzite.

**Gold Characteristics** Gold is mostly coarse and chunky and has a fineness of 675.

*A view looking downstream of Mr. McMahon's operation in the narrow confines of mid-Homestake Gulch in 2016.*

## 7 Pup, a tributary of Victoria

115O/14 2017: 63°54'00"N, 139°13'24"W

**Gillespie, R., 2013-2017**

Water License: PM13-004 (Active 05/2023)
Active Producer (2015-2017) **Operation no. 23**

**Location** 7 Pup, 750 m upstream from its confluence with Victoria Gulch.

**Work History and Mining Cuts** Actively mining the mid to upper reaches of 7 Pup for 5 years, Mr. Gillespie is also active at his other operation on Henry Gulch, a left limit tributary of Hunker Creek.

**Equipment and Water Treatment** A Caterpillar 320L excavator and double 1 by 2 m (3 x 6 ft) screen deck is utilized at the operation. The 'Super Sluice III', able to process 30 to 40 loose yd³ (23-31 $m^3$)/hr, consists of an initial 1 m (3 ft) wide by 2 m (6 ft) long run, which feeds a 2 m (6 ft) long by 0.5 m (1.5 ft) wide run, followed by a 3 m (10 ft) long by 0.6 m (2 ft) wide run. Angle iron and expanded metal riffles are used in the sluice. Effluent was settled in a series of two ponds and water was 100% recycled.

**Surficial Geology and Stratigraphy** A mixing zone between the bedrock contact and reworked colluvium represents the majority of the section; small lenses of locally derived 7 Pup gravel are reworked throughout the section. Minor organic-rich pods and lenses of silty fine-grained sand are exposed. Nearly all of the clasts range from subangular to angular suggesting a local origin. The main target is the weathered bedrock and colluvial/eluvial placers. The total section thickness is 1.8 m (6 ft) and all material was sluiced, including up to 1.2 m (4 ft) of bedrock.

**Bedrock Geology** Bedrock is muscovite schist with an abundance of quartz veining, and varying in degrees of weathering.

**Gold Characteristics** Gold is dendritic and very locally derived.


*Mr. Gillespie's active cut and sluice plant in 2016 on the upper reaches of 7 Pup.*

## Carmack Fork, a tributary of Bonanza

115O/14 2016: 63°54'57"N, 139°08'32"W

### H3 Mining Company Ltd., 2016-2017

Water License: PM17-021 (Active 09/2027)
Water License: PM06-542 (Expired 07/2017)
Active Producer (2016-2017) **Operation no. 24**

**Location** Carmack Fork, at the mouth of Flannery Pup.

**Work History and Mining Cuts** H3 Mining Company Ltd. purchased the claims from Mr. Trainer in 2015 and drilled in the late fall to determine where they would initiate operations. Their first mining season, in 2016, consisted of a five person crew with up to nine people in camp, and operated a daily 12-hour shift. They mined a 23 by 16 m (75 x 52 ft) cut at the confluence of Carmack Fork and Flannery Pup, and conducted bulk sampling and prepared ground on upper Carmack Fork for 2017. A total of eight claims on upper Carmack Fork were stripped and prepared for mining in spring 2017. Minimal sluicing occurred throughout 2017, with a new water license issued near the end of the mining season.

**Equipment and Water Treatment** Equipment present on site in 2016 included a Caterpillar 345C excavator, a Komatsu 300 excavator, a Caterpillar D8L bulldozer, a John Deere 250 articulated dump truck, a Caterpillar 980 wheel loader and a Caterpillar 305.5 mini hydraulic excavator. The 2 m (7 ft) diameter by 9 m (30 ft) long trommel screens to 5/8" and was able to process up to 70 loose yd³ (53 m³)/hr. In 2017, an automatic feeder was added to provide a continuous feed and improve recovery. 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 and 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** At the confluence of Carmack Fork and Flannery Pup, the section consists of 0.9 m (3 ft) of poorly sorted cobble-dominated gravel with rounded quartz boulders up to 0.6 m (2 ft) concentrated on the bedrock contact. Clasts vary from subrounded to rounded, and at the undulating bedrock contact angular bedrock fragments are incorporated into the bottom 0.3 m (1 ft) of the gravel. Minor open work sections, up to 10 cm (4"), are present throughout the section and the gravel is matrix supported with fine to medium sand and minor silt. Imbrication in the gravel is not evident, therefore they could be largely derived from either or both drainages (Carmacks Fork or Flannery Pup). Up to 2.1 m (7 ft) of black muck and reworked overbank material was stripped off prior to encountering the gravel. All gravel and up to 1.8 m (6 ft) of weathered

*An aerial view looking down Carmack Fork toward the mouth of Flannery Pup. Fluvial gravel is likely buried under a left limit apron of colluvial sediments (outlined by dashed line) and is a good target for exploration.*

*H3 Mining Corporation's cut in 2016 at the junction of Flannery Pup and Carmack Fork.*

bedrock was sluiced. Buried bench potential exists on the left limit of Carmack Fork, in which the operator intended to explore in late 2017 or early 2018.

**Bedrock Geology** Bedrock is undulating micaceous schist that varies in weathering, and 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 deposit 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.

## Bonanza, a tributary of Klondike

115O/14 2016: 63°53'57"N, 139°08'08"W

### Pitman, B., 2015-2017

Water License: PM16-057 (Active 02/2027)
Water License: PM06-515 (Expired 11/2016)
Active Producer (2015-2017) **Operation no. 25**

**Location** Bonanza Creek, upper, 1.6 km upstream from Carmack Fork; approximately 760 m upstream from the mouth of Rainbow Gulch.

**Work History and Mining Cuts** Mr. Pitman purchased the operation from 6077 Yukon Ltd. in July 2015. As a one-man operation, he was active throughout mid-2015 to 2017. Activity was focused on the right limit of the upper portion of the claims. Monitoring occurred to remove frozen black muck on some of the cuts, while others were left to thaw naturally. In 2016, he mined a low-level bench cut on the right limit, approximately 140 m (460 ft) long by 6 m (20 ft) wide. Minimal activity occurred in 2017, with primarily testing up Rainbow Gulch, a left limit tributary of upper Bonanza Creek.

**Equipment and Water Treatment** Equipment utilized in the 2016 season included a Caterpillar D8 bulldozer, a Caterpillar 980 front end loader and an International 640 HD excavator. The wash plant, supplied with water by a 4" pump, consisted of a single deck shaker with a 1" screen, able to sluice gravel at a rate of 30 $yd^3$ (23 $m^3$)/hr. The sluice run is 1.1 m (3.5 ft) wide by 1.8 m (6 ft) long with the upper part of the run consisting of expanded metal to a nugget trap, followed by 0.9 m (3 ft) of hydraulic riffles and another 0.9 m (3 ft) of 1" angle iron. Clean-ups were conducted once a week and a spring jig was utilized. Effluent was settled in a series of two settling ponds.

**Surficial Geology and Stratigraphy** The right limit valley-bottom exposure in 2016 consisted of two units. The first unit is poorly exposed, with an undulating upper contact. Unit 1, from 0 to 1.8 m (6 ft), is a pebble-cobble gravel that varies from clast-supported to matrix-supported, and has a matrix composed of fine to coarse-grained sand. Weakly imbricated downstream, the clasts vary from subrounded to subangular, with angular local bedrock incorporated into the lower section of the unit. With the increased percent of bedrock fragments incorporated into the lower gravel, this may indicate proximity to the margin of the side pay and edge of the valley. This gravel represents virgin upper


*Gold recovered by Mr. Pitman on upper Bonanza Creek.*

Bonanza Creek side pay that has remained untouched due to the thickness of frozen muck overlying the gravel. Frozen muck and colluvium comprise unit 2, which is present from 1.8 to 10.7 m (6-35 ft). All of unit 1 was sluiced.

**Bedrock Geology** Bedrock is weathered muscovite-chlorite quartz phyllite.

**Gold Characteristics** Gold is bright, moderately traveled and has a fineness of 870. The largest nugget recovered was 2.5 g.

## Bonanza, a tributary of Klondike

115O/14 2017: 63°53'32"N, 139°07'41"W

**Danielson, S. and R., 2013-2017**

Water License: PM11-051-1 (Active 03/2020)
Active Producer (2015-2017) **Operation no. 26**

**Location** Bonanza Creek, upper, at the mouth of Ready Bullion Gulch.

**Work History and Mining Cuts** The claim owner, Anglerock LLC has owned the claims on upper Bonanza Creek since 1992. Since 2013, the ground has been leased to the Danielsons. The Danielsons drilled in 2015 and 2016, and their first year sluicing occurred in 2017. As a two-person operation, mining was focused on a low-level, right limit bench cut approximately 30 by 60 m (98 x 196 ft), across from the mouth of Ready Bullion Gulch.

**Equipment and Water Treatment** Heavy machinery utilized at the property 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 loose $yd^3$ (35 $m^3$)/hr. Water was acquired from upper Bonanza Creek and effluent was settled in a series of three ponds prior to discharge back into the creek. Clean-ups were conducted daily using a small long tom and pan.

**Surficial Geology and Stratigraphy** A substantial low-level right limit bench was explored throughout 2017. It consists of 1.3 m (4.3 ft) of 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 section. 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. Up to 7 m (23 ft) of muck and colluvium overlie the buried bench gravel. All gravel, up to 1.8 m (6 ft) thick, and up to 0.9 m (3 ft) of bedrock was sluiced.

*View of the Danielson's operation on the right limit bench of upper Bonanza Creek in 2017.*

**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.

## Bonanza, a tributary of Klondike

115O/14 2017: 63°52'49"N, 139°05'09"W

### McKort Mining Co., 2014-2017

Water License: PM14-054 (Active 02/2027)
Active Producer (2015-2017) **Operation no. 27**

**Location** Upper reaches of Bonanza Creek, 125 m upstream on the right fork from its confluence with the left fork.

**Work History and Mining Cuts** D. McKort and M. McKort first staked their claims on Upper Bonanza Creek in 2014. In 2015 they drilled 11 holes to determine a location for their first cut. Minimal activity occurred in 2016 while they waited for permitting. Their first year of sluicing occurred in 2017 where a cut measuring 20 by 30 m (65 x 98 ft) was stripped and a bulk sample was processed.

**Equipment and Water Treatment** Equipment present in 2017 included an Hitachi EX200 LC excavator and a 0.3 m (1 ft) diameter by 1.5 m (5 ft) long test trommel. A Caterpillar D8 bulldozer and 2 m (7 ft) diameter by 6 m (20 ft) long trommel will be added to the operation in 2018.

**Surficial Geology and Stratigraphy** Drilling results indicate that depth to bedrock in the valley bottom ranges from 6.7 to 8.2 m (22-27 ft). Water management and keeping the cut dewatered is a challenge for the operator due to the narrow valley width of 45 m (148 ft). The exposed upper part of the cut consists of 1.5 m (5 ft) of coarse cobble-gravel comprising subangular clasts and minimal fines. At the margins of the cut, overbank material and colluvium are incorporated into the upper coarse gravel. Gravel encountered on bedrock is rounded, compact, and was the primary target for the bulk sample.

**Bedrock Geology** Bedrock is muscovite-calcite schist.

**Gold Characteristics** Gold is bright and flat.

*Easterly view towards the headwaters of upper Bonanza Creek with McKort Mining Co.'s access road visible on the left hand site of the photo, and their 2017 activity slightly upstream of the forks.*


*A view of McKort Mining Co.'s mine site in 2017 where they are stripping overburden to reach gravel on the bedrock surface.*

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

115O/14 2017: 63°53'53"N, 139°19'00"W

### Archibald, J., 1978-2017

Water License: PM10-078 (Active 03/2021)
Active Producer (2015-2017) **Operation no. 28**

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

**Work History and Mining Cuts** Mr. Archibald has been actively mining in the Klondike for 59 years. From 2015 to 2017 mining focused on the White Channel gravel section on French Hill, near camp. One cut lies parallel to the rim of the bench along French Gulch whereas the second cut was slightly to the north. Approximately 2000 loose $yd^3$ are mined each season.

**Equipment and Water Treatment** Equipment present on site in 2017 included two Kobelco excavators, two 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** The stratigraphic section in 2017 consisted of 14 m (46 ft) of White Channel gravel. The White Channel gravel consists of two units. Unit 1, from 0 to 2 m (0-6.6 ft), is a greenish-white gravel on bedrock. Schist fragments (90%) and quartz makes up the gravel clasts. The gravel is poorly sorted and discontinuous sand lenses are present near the bedrock contact. Clasts are imbricated in the gravel and indicate flows out of French Gulch. Clasts make up 50% of the gravel and the clast size distribution consists of 70% pebbles, 29% cobbles and 1% boulders. Some decomposed schist clasts are present and the quartz clasts have an angular to subangular shape. The matrix component of unit 1 is predominantly medium to coarse sand. The abundance of sand within unit 1 appears derived from the local bedrock and may be the result of the White Channel stream eroding decomposed bedrock during emplacement. A decomposed bedrock character would also limit placer gold penetration into the bedrock. Significant old timer underground tunneling was present in unit 1. The bottom 1.5 to 2 m (5-6.6 ft) is sluiced. Unit 2, from 2 to 14 m (6.6-46 ft), is a moderately oxidized, stratified, and moderately sorted White Channel gravel. Gravel beds are typically 0.5 m (1.6 ft) thick, contain sand lenses and clast imbrication shows a flow out of French Gulch. The gravel consists of 60% clast (50% pebbles, 45% cobbles and 5% boulders) and 40% medium to coarse sand matrix.

**Bedrock Geology** Bedrock is chlorite-sericite schist.

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

*A view to the north looking over French Hill on the left limit of Eldorado Creek. An old-timer underground room is visible in the White Channel gravel near the excavator.*

## Eldorado, a tributary of Bonanza

115O/14 2016: 63°53'43"N, 139°18'11"W

### Farley's Machine Inc., 2009-2017

Water License: PM15-059 (Active 11/2025)
Water License: PM05-484 (Expired 11/2015)
Active Producer (2015-2017) **Operation no. 29**

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

**Work History and Mining Cuts** The right limit of Eldorado Creek, at the mouth and downstream of Glacier Gulch was mined in 2015. Mr. McKinney and an employee operated a daily 12-hour shift throughout the season. Focus was shifted in 2016 to explore the mouth and upstream potential of Glacier Gulch, where a cut 45 m (147 ft) wide by 100 m (328 ft) long was mined. Minimal activity occurred in 2017, and the property was sold to another operator.

**Equipment and Water Treatment** Equipment utilized in 2016 included three Caterpillar 235C excavators, a Caterpillar EL300 backhoe, a Caterpillar 988 wheel loader, a Caterpillar 9H bulldozer, and a Caterpillar D35C rock truck. 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. Water to the plant was supplied by three pumps (2, 3 and 6"), which allowed the plant to process 60 to 80 loose $yd^3$ (46-61 $m^3$)/hr. Water was 100% recycled. An oscillating mini-sluice, screen, and table were used for clean-ups.

**Surficial Geology and Stratigraphy** Glacier Gulch is a narrow, steep, right limit tributary on Eldorado Creek with its headwaters located in the historic Lone Star zone. The paleo-gulch placer setting exposed on lower Glacier Gulch in 2016 consisted of two units. Unit 1, up to 1.5 m (5.0 ft) thick, is a poorly sorted and crudely stratified boulder-cobble pay unit, which includes a mixing zone between the bedrock and gravel interface up to 0.5 m (1.6 ft) thick. Clasts are subrounded to subangular, and are predominately boulders, with the maximum clast diameter up to 1 m (3.3 ft). Quartz boulders are common throughout unit 1, with a concentration in the mixing zone at the bedrock contact. Interbedded lenses of mud, angular pebble-sized material, and minor organics (debris-flow deposit) is present in unit 1. The paleo-gulch gravel is overlain by approximately 7.6 m (25 ft) of silt-rich colluvium with angular weathered bedrock fragments. Up to 3.6 m (12 ft) of gravel and 3 m (10 ft) of bedrock was sluiced.

**Bedrock Geology** Bedrock is decomposed muscovite schist.

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

*Aerial view of Mr. McKinney's operation at the mouth of Glacier Gulch on Eldorado Creek in 2016.*

## Eldorado, a tributary of Bonanza

115O/14 2015: 63°52'46"N, 139°16'40"W

### Rodal Placers, 2011-2015

Water License: PM10-076 (Active 05/2021)
Active Producer (2015) **Operation no. 30**

**Location** Eldorado Creek, between Gay Gulch and Oro Grande Gulch.

**Work History and Mining Cuts** Rodal Placers was predominately active on the right limit of Eldorado Creek in 2015. Throughout the season they progressively mined upstream and completed a cut measuring approximately 12 by 90 m (40 x 295 ft). In 2016 and 2017, Rodal Placers joined ventures with Mr. Fraser on Hunker Creek where they were active on Temperance Hill.

**Equipment and Water Treatment** Equipment included an Hitachi 270 excavator, a John Deere 200LC excavator, a Caterpillar D8K bulldozer and a Caterpillar D25C rock truck. Their 1.2 m (4 ft) diameter by 4.8 m (16 ft) long trommel with a ¾" screen was fabricated from a 1000 gallon propane tank, and included a 2 by 2 m (6 x 6 ft) hopper with 8" spacers. The sluice configuration consisted of a single side run with two 2.4 m (8 ft) long by 0.6 m (2 ft) wide runs. The upper 0.6 m (2 ft) contained Hungarian riffles, with the lower 2.4 m (8 ft) covered with expanded metal. An 8 by 6" pump supplied water to the plant, allowing it to process 30 loose yd³ (27 m³)/hr. Effluent was settled in a series of two ponds prior to discharge back into Eldorado Creek.

**Surficial Geology and Stratigraphy** The right limit cut in 2015 exposed an 8 m (26 ft) section that consists of four units. Unit 1, from 0 to 1.1 m (3.6 ft), is a mixture of coarse gravel with bedrock fragments inset into the fractured and decomposed bedrock. The gravel is quartz-rich, predominately a subrounded cobble gravel with 30% matrix consisting of medium sand. It fines upward into medium to coarse sand lenses that are 10 cm (4") thick at the contact with unit 2. This lowermost unit has clasts strongly imbricated downstream. Unit 2, from 1.1 to 1.4 m (3.6-4.6 ft) is a pebble-gravel with 60% coarse sand and granule matrix, which is also strongly imbricated downstream (northwest). An undulating contact exists between unit 2 and unit 3. Unit 3, from 1.4 to 5.0 m (3.6-16.4 ft), is primarily loess with minimal organics and contains isolated lenses of weathered bedrock colluvium. Unit 4, from 5.0 to 8.0 m (16.4-26.2 ft), is technogenic and likely dredge tailings.

*Sluicing at Rodal Placer's in 2015, on the right limit of Eldorado Creek.*

All gravel from units 1 and 2, and 0.9 to 1.2 m (3-4 ft) of bedrock was sluiced.

**Bedrock Geology** Bedrock is micaceous quartz-rich schist, and undulates with a relief of up to 1 m (3 ft).

**Gold Characteristics** Gold greatly varies between three main types: flat coarse flakes, rounded and bright, and dendritic. As they mined upstream, the gold became more coarse and cube-shaped. The fineness is 740.

## Heaven, a tributary of Chief

115O/14 2017: 63°51'25"N, 139°12'06"W

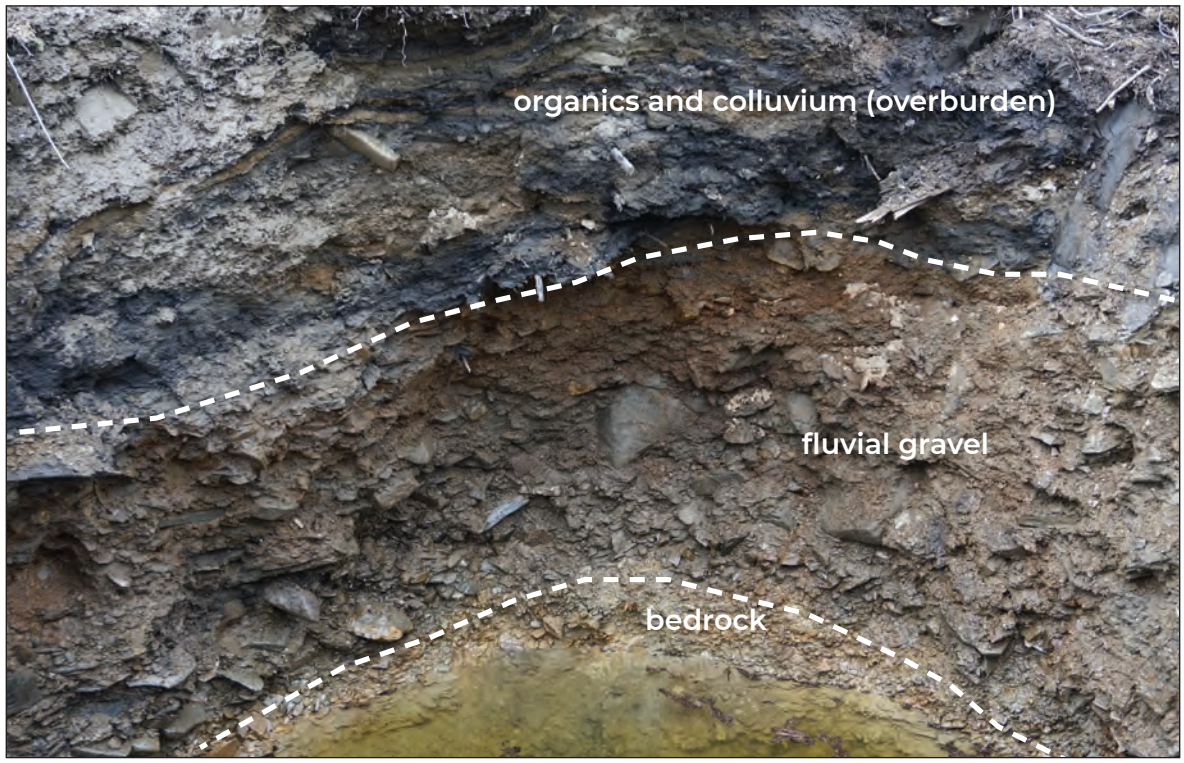
### Matkowski, D., 2015-2016

Water License: PM09-639-2 (Active 10/2019)
Active Producer (2015-2016) **Operation no. 31**

**Location** Heaven Creek, upper reaches.

**Work History and Mining Cuts** In 2015, a new operation on Heaven Creek was established. This property was previously funded as a Yukon Mineral Exploration Program (YMEP) project which assisted a drilling program. In mid-spring 2015 an access road was completed and stripping began on the mid-upper reaches of Heaven Creek. In 2016, Mr. Matkowski and his mining partner Mr. Cain mined a small section of upper Heaven Creek. A total of three miners sluiced a total of 5,073 yd³ throughout 2016. A testing program was conducted in 2017 on the property.

**Equipment and Water Treatment** Equipment in 2016 included a Volvo EC290B excavator, a Komatsu PC270LC excavator, a Caterpillar D7R bulldozer and a Deere 544J loader. The wash plant, able to process 75 loose yd³ (57 m³)/hr, consisted of a 8.5 m (28 ft) long trommel that screened to ½" and fed a single sluice run.




*View of a test pit exposure on upper Heaven Creek, a tributary to Chief Gulch. The pit depth is approximately 2 m (6.5 ft) deep and exposes the potential pay gravel at the base. The bedrock contact is located near the water line.*

The top of the sluice was 0.75 m (2.5 ft) in width by 1.2 m (4 ft) in length and contained angle iron riffles. This upper run then split into two 3 m (10 ft) runs containing expanded metal and matting. A Tsurumi pump supplied water to the plant and clean-ups used a Devin Gold – Klondike Series portable sluice. Effluent was settled through three ponds and a freshwater collection pond was also required due to the elevation of the mine. Water restrictions limited the operation to 60 to 70 yd³ (46-53 m³)/day.

**Surficial Geology and Stratigraphy** The stratigraphic section consists of 1 m (3 ft) of mixed organics and colluvium overlying 1 to 1.5 m (3-5 ft) of fluvial gravel. The fluvial gravel is poorly sorted, oxidized near the upper contact and contains subangular to angular platy clasts. The matrix in the gravel is silty sand and comprises about 40 to 50% of the gravel content. The bedrock is a yellow, finely fractured, decomposed schist that is easy to excavate. Placer gold is unlikely to penetrate the bedrock more than 0.6 m (2 ft).

**Bedrock Geology** Bedrock is yellow, decomposed schist.

**Gold Characteristics** Gold is coarse, some fine, and is bright and angular.

## Bear, a tributary of Klondike

116B/03 2015: 64°00'32"N, 139°14'37"W

**16406 Yukon Inc., 2011, 2013-2017**

Water License: PM11-029 (Active 2021)
Active Producer (2015-2017) **Operation no. 32**

**Location** Bear Creek and Discovery Pup.

**Work History and Mining Cuts** Between 2015 and 2017 Mr. Morgan continued to mine the left limit of Bear Creek near the mouth of Discovery. In 2017, D. Brickner optioned three claims from Mr. Morgan and mined below the mouth of Discovery Pup.

**Equipment and Water Treatment** Equipment documented on site in 2015 included an Hitachi EX300LC excavator for mining pay and loading the 25 ton International rock truck. A Caterpillar 330C excavator was used for feeding the plant and a Caterpillar D8K bulldozer was used for moving tailings. The wash plant is a 1.2 by 6 m (4 x 20 ft) trommel that screens to 1½" and feeds a 1.2 m (4 ft) wide sluice run.

**Surficial Geology and Stratigraphy** In 2015, the stratigraphy of the left limit exposure consisted of two units. Unit 1, from 0 to 3.5 m (11.5 ft), is a coarse boulder-cobble gravel made up of two distinct facies. The older, or original, gravel tends to have more oxidation (red), higher sand content and contains higher gold concentrations. A younger gravel is inset into the red gravel and resembles high energy cut and fill channels. These channels have a coarser texture, less oxidation and a low percentage of matrix. Old-timer drifts in the bank appear to follow the red gravel. Unit 1 gets thinner downstream toward the mouth of Discovery Pup and the gold concentrations are not as high. Unit 2, from 3.5 to 16 m (11.5-52.5 ft), is a laminated muck deposit with massive ice lenses.

**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.

## Bear, a tributary of Klondike

116B/03 2017: 64°01'02"N, 139°14'38"W

**Brickner, D., 2017**

Water License: PM10-030 (Active 11/2020)
Active Producer (2017) **Operation no. 33**

**Location** Bear Creek, 2.1 km downstream from Discovery Pup.

**Work History and Mining Cuts** In 2017 Mr. Brickner optioned three claims from Mr. Morgan and opened up a small right-limit cut on Bear Creek.

**Equipment and Water Treatment** Equipment documented on site in 2017 included two Komatsu excavators and a screen deck plant.

**Surficial Geology and Stratigraphy** The right limit stratigraphy of lower Bear Creek consisted of two general units. At the base of the section, unit 1 consists of 3 m (10 ft) of poorly sorted, cobble-rich, clast-supported Bear Creek gravel. The gravel has 60% clasts (50% pebbles, 45% cobbles and 5% boulders) and 40% medium to coarse sand matrix. The upper 1 m (3 ft) of unit 1 fines into a pebbly sand. Unit 2, from 3 to 7 m (10-23 ft), consists of muck and material from previous mine stripping. Bedrock was not exposed in the cut.

*Left limit cut on Bear Creek just above the mouth of Discovery Pup. The better pay is concentrated in the oxidized or red gravel. The section is 16 m (53 ft) in height.*

*Right limit cut on Bear Creek below Discovery Pup at D. Brickner's operation. Bear Creek gravel is buried under muck and material from mine stripping. The section is 7 m (23 ft) in height.*

**Bedrock Geology** Bedrock is Klondike schist.

**Gold Characteristics** Not reported.

## Lindow, a tributary of Bear

115O/14 2017: 63°57'42"N, 139°12'02"W

### Alf Roberts Mining, 2002-2017

Water License: PM12-001 (Active 04/2023)
Active Producer (2015-2017) **Operation no. 34**

**Location** Lindow Creek, 2.7 km upstream from its confluence with Bear Creek.

**Work History and Mining Cuts** The Roberts have been operating in the Klondike since 1978, where they mined on Homestake Gulch (upper Bonanza) until 2000. They have since acquired ground on upper Lindow Creek and have been progressively mining upstream. Extensive old timer workings, including production shafts, are abundant throughout the mid to upper reaches of Lindow Creek. A right limit cut in 2015 was the primary focus, and in 2016 activity occurred on both the right and left limits. As an extension from the previous year's cut, the operators plan on working upstream and continuing to target buried side pay. Stripping is planned for two claims in 2018 and 2019, and subsequently sluiced. An average of 3,000 to 4,000 $yd^3$ of material are sluiced each year.

**Equipment and Water Treatment** Equipment in 2017 included a Caterpillar 312BL excavator, a Caterpillar D8H bulldozer, a Bay City Dragline, an International 125C trackloader, a Fleetstar 2000 International dump truck and a 1.2 by 3 m (5 x 10 ft) double deck screen plant able to process up to 30 loose $yd^3$ (23 $m^3$)/hr. The two sluice runs fed by the screen deck are 0.6 m (2 ft) wide by 3 m (10 ft) long with 0.6 m (2 ft) of riffles and 2.4 m (8 ft) of expanded metal that is lined with unbacked noodle matt. Until 2017 they operated a closed cell settling facility using a series of up to 7 ponds to 100% recycle water. In 2017 the structure was altered, where effluent was settled in a series of 7 ponds and discharged back into Lindow Creek. A tub and a 6" wide long tom was used for clean-ups.

**Surficial Geology and Stratigraphy** The right limit exposure of upper Lindow Creek consists of three units. Unit 1, the pay zone, is 0.9 m (3.0 ft) thick and is a poorly sorted cobble-pebble gravel with incorporated bedrock fragments throughout. Undulations up to 0.5 m (1.6 ft) are present in the bedrock surface, which contributes to the incorporation of bedrock fragments into mixing zone. The cobble-pebble gravel is matrix supported and comprising medium sand and silt, and clasts are subrounded with the largest clast up to 0.3 m (1.0 ft). Minor discontinuous open worked beds and silt enriched lenses are present throughout the pay gravel. Unit 2, from 0.9 to 1.3 m (3.0-4.3 ft), is a moderately oxidized, pebble-gravel with 70% pebbles and 30% cobbles. Unit 3, from 1.3 to 2.8 m (4.3-9.1 ft), consists of overbank fines and colluvium, which also contains substantial organic material. Overburden is up to 3.6 m (12 ft) thick on the upper part of Lindow Creek and 5.4 m (18 ft) thick near previously mined ground on downstream sections. Two pay streaks have been identified by Mr. Roberts, both of which are located in a seam of gravel that overlies a lens of competent fine-grained material throughout the lowermost gravel unit, which acted as a false bedrock. This could represent two phases of high energy, local creek gravel deposition within the drainage. Up to 0.7 m (2.5 ft) of bedrock and 0.9 m (3 ft) of gravel was sluiced.

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

**Gold Characteristics** Gold is dull, chunky and the largest piece recovered was 3 g. Approximately 50% of the gold is fine and has a purity of 650.

*The narrow mine cut on upper Lindow Creek where Alf and Marlene Roberts were active in 2017. The view is looking downstream and bedrock is visible on the left limit.*

## Foster, a tributary of Klondike

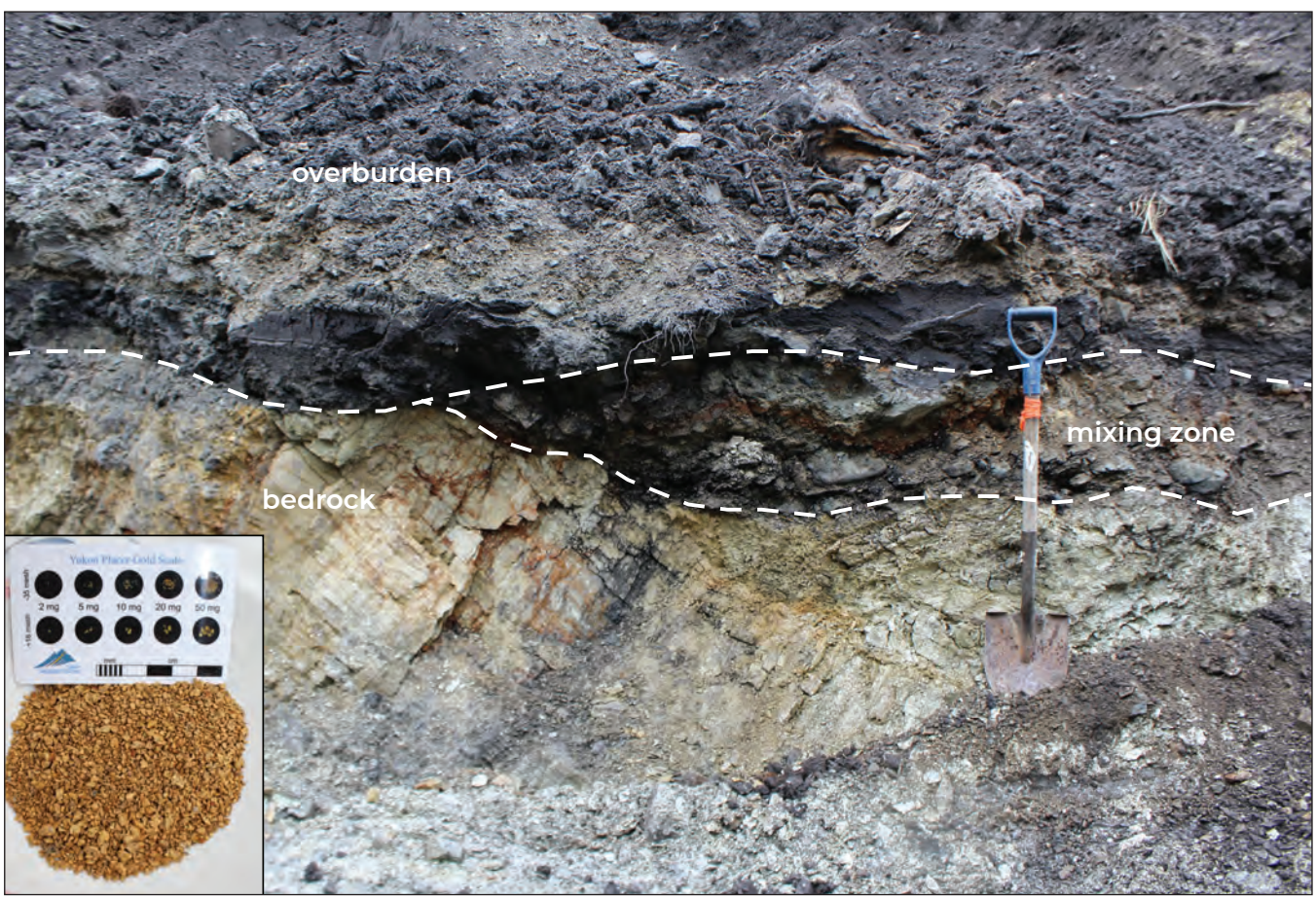
116B/03 2016: 64°02'22"N, 139°12'11"W

**Devin Gold Exploration, 2016**
**Semple, R., 2013-2015**

Water License: PM15-014 (Active 11/2019)
Water License: PM11-025 (Expired 04/2017)
Active Producer (2015-2016) **Operation no. 35**

**Location** Foster Gulch, approximately 750 m upstream from the mouth.

**Work History and Mining Cuts** Mining was conducted in 2015 by Mr. Semple at the mouth of Foster Gulch. He focused primarily on the left limit and worked several large 4 by 6 m (13 x 20 ft) bulk sampling test pits. The ground was optioned in early 2016, and a bulk sampling and drilling program was conducted by Renegade Gas & Oilfield Services Ltd. They drilled a total of 12 holes to evaluate the potential of several different bench tiers present upstream from mid-Foster. A large cut, approximately 15 by 40 m (50 x 131 ft) was mined on the low-level bench, which has historically been tested.




*View of bedrock undulation on the left limit of Lindow Creek, where a mixing zone of gravel and bedrock fragments is up to 0.5 m (1.6 ft) thick. Shovel for scale is 1 m (3.3 ft). Inset on lower left: gold recovered from Lindow Creek.*

*Renegade Gas & Oilfield Services Ltd. bulk sampling operation in 2016.*

**Equipment and Water Treatment** Equipment utilized by Renegade Gas & Oilfield Services Ltd. in 2016 included an Hitachi EX 200LC excavator, an Hitachi Zaxis 250LC excavator, a Caterpillar 312BL excavator and a Case 650 bulldozer. The wash plant consisted of an oscillating screen deck with water supplied by a 6" pump. Sluice runs were 1.2 m (4 ft) wide and consisted of 0.6 m (2 ft) of vortex plate, then 1.2 m (4 ft) of expanded metal, and another 0.6 m (2 ft) of vortex plate. The vortex sections were backed with urethane rubber vortex drop riffle mats, and the expanded metal was lined with backed miners mat.

**Surficial Geology and Stratigraphy** Test pitting in 2015 exposed modern Foster Creek gravel on bedrock. The thickness of the fluvial deposit is approximately 2 to 3 m (6.5-10 ft) and consists of a coarse deposit of angular cobble-boulder gravel. Maximum clast size is 0.5 m (1.6 ft). The lower 1.2 to 1.8 m (4-6 ft) of gravel and up to 0.15 m (0.5 ft) of bedrock was sluiced. The intermediate-level benches near the mouth of Foster Gulch is overlain by 7.9 m (26 ft) of massive, matrix-supported, cobble-pebble gravel with 60% pebbles and 40% cobbles. Rare large boulders are present, with the largest clast up to 0.5 m (1.6 ft) in diameter. Pay gravel is situated near the bedrock contact with the lowermost 1.2 to 1.8 m (4-6 ft) of gravel and up to 0.2 m (0.5 ft) of bedrock sluiced. Gravel deposits on the intermediate-level bench near the mouth of Foster Gulch may largely originate from flows within the Klondike River valley. These may be interglacial or glacial in origin. Permafrost is patchy to discontinuous on the Foster Gulch benches due to its southern exposure.

**Bedrock Geology** Bedrock is light brown to dark brown decomposed schist.

**Gold Characteristics** Not reported.

## Hunker, a tributary of Klondike

116B/03 2016: 64°01'43"N, 139°10'45"W
116B/03 2015: 64°00'39"N, 139°05'42"W

### Tatra Ventures Ltd., 2010-2016

Water License: PM04-433 (Active 2015)
Water License: PM10-027 (Active 2015)
Active Producer (2015, 2016) **Operation no. 36**

**Location** Mouth of Last Chance Creek and confluence of Hunker Creek and Klondike River valley.

**Work History and Mining Cuts** Tatra Ventures Ltd. mined on Hunker Creek at the mouth of Last Chance Creek in 2015. The program consisted of reworking ground previously mined by Yukon Consolidated Gold Corporation Dredge 11 up until 1963. Initial work tested surface piles of dredge tailings in 2014 to rerun clay-rich bedrock that had been inefficiently washed by the dredge. Based on this work and historic maps, a decision was made to open-pit the site to evaluate the efficiency of the dredge and the potential for missed pay gravel. The open-pit exposed bedrock around the remains of Dredge 11 and out into Hunker Creek valley. In 2016, work focused near the mouth of Hunker Creek where a pit measuring 56 by 130 m (183 x 427 ft) was mined. Five miners were employed at each operation. No activity occurred on Last Chance in 2016 or 2017 as they moved operations to lower Sulphur Creek in 2017.

**Equipment and Water Treatment** Equipment in 2016 included two John Deere 450DLC excavators for digging pay and excavating drains, two Caterpillar D400D haul trucks for transporting pay and waste material and a John Deere 230CLC excavator to feed the plant. At the mouth of Last Chance Creek the wash plant consisted of a 2 by 11.5 m (6 x 38 ft) trommel with ½" punch plate, 4.8 m (16 ft) wide runs with boil boxes and expanded metal. The plant is able to process gravel at a rate of 150 loose $yd^3$ (115 $m^3$)/hr.

**Surficial Geology and Stratigraphy** Mouth of Last Chance Creek: Mining in the previously dredged ground at the mouth of Last Chance Creek proved successful for Tatra Ventures. Significant volumes of virgin gravel remained, including a complete section of Hunker Creek gravel immediately under the dredge. A stratigraphic section described along the south wall of the cut consisted of decomposed graphitic schist bedrock, overlain by 1 to 2.5 m of (3.2-8 ft) of virgin Hunker Creek gravel consisting of a poorly sorted, clast-supported cobble-pebble gravel. The gravel was laterally discontinuous due to past partial dredge extraction. The gravel was overlain by 4.3 m (14 ft) of fine-grained sandy to pebbly dredge slickens and 3 m (10 ft) of coarse stack tailings from Dredge 11.

*View of Tatra Ventures Ltd cut on Hunker Creek at the mouth of Last Chance Creek. Fire damaged Dredge 11 overlies 2.5 m (8 ft) of virgin Hunker Creek gravel. About 1 m (3 ft) of bedrock has been excavated for placer gold.*

Mouth of Hunker Creek: At the mouth of Hunker Creek a 16 m (52 ft) deep pit was excavated in 2016. Unit 1, at the base from 0 to 8 m (0-26 ft), consists of high energy, coarse, clast-supported pebble-cobble gravel with 5% boulders at the base. Above the lower metre, unit 1 becomes finer grained and stratified. Discontinuous sand lenses are present. The clasts are very smooth and have a rounded to subrounded shape. Occasional blocky vein quartz boulders are present near the bedrock contact and contain oxidized vugs. This unit is interpreted to be glacial outwash gravel deposited during a pre-Reid glaciation that terminated in the Tintina Trench and spilled meltwater down the Klondike River valley. Unit 2, from 8 to 9 m (26-29.5 ft), is a well-sorted, stratified, pebble gravel. This unit is interpreted to be derived from Hunker Creek. Unit 3, from 9 to 11.5 m (29.5-38 ft), is bedded silt deposited during overbank flooding events. From 11.5 to 16 m (38-52 ft) is an accumulation of disturbed material from the excavation process.

*A close-up view of the coarse pay gravel at the base of Tatra Venture Ltd.'s cut in the Klondike River valley at the mouth of Hunker Creek. Quartz veins are visible in the graphitic schist bedrock and quartz boulders are visible near the bedrock contact. The lower 1 m (3 ft) of gravel and 1.5 m of bedrock was processed for gold. Placer gold is typically located close to the bedrock contact in the Klondike River valley.*

**Bedrock Geology** Bedrock at the mouth of Hunker Creek is a partially decomposed graphitic schist with vuggy quartz veins.

**Gold Characteristics** Gold from Klondike River deposits near the mouth of Hunker Creek is fine grained with very few nuggets and has an average purity of 775. Gold grains from 2 to 4 mm in size are common.

## Hunker, a tributary of Klondike

116B/03 2017: 64°01'11"N, 139°09'15"W

### Henry Gulch Explorations Ltd., 1997-2000, 2005-2017

Water License: PM14-069 (Active 05/2025)
Water License: PM14-065 (Active 10/2025)
Active Producer (2015-2017) **Operation no. 37**

**Location** Hunker Creek, below Hattie Gulch.

**Work History and Mining Cuts** Henry Gulch Explorations Ltd. worked the left limit of Hunker Creek below Hattie Gulch between 2015 and 2017. Mining targeted ground previously worked by dredging in 1908-09 and Cat-mined areas from the 1950s. Remnant pay is derived from dredge spillage and improperly cleaned bedrock specifically near a bedrock high where the dredge and Cats had difficulty mining. Four miners and a mechanic were employed at the Henry Gulch Explorations mine.

**Equipment and Water Treatment** Mining was completed using two excavators, an Hitachi EX450 for digging overburden and pay, and an Hitachi EX270 for maintaining the drain in the cut. 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. In 2016, a John Deere excavator was used for digging pay. The wash plant consisted of a single deck, oscillating screener with a ¾" punch plate leading to two sluice runs with expanded metal over mats, four boil boxes, and hydraulic riffles. The plant processed gravel at a rate of 80 to 100 loose yd³ (61-76 m³)/hr and water was supplied at 1500 igpm by a 6 by 6" Indeng pump, powered by an Isuzu engine. A long tom over a two-cell jig and 3 ft gold wheel were used for clean-ups.

**Surficial Geology and Stratigraphy** In 2015, the general stratigraphic section in the previously mined ground consisted of patchy remnants of virgin Hunker Creek gravel overlain by 6 m (20 ft) of fine-grained dredge slickens. All material was unfrozen. A bedrock high with a relief of 6 m (20 ft) was the main feature targeted in 2015. Groundwater management is an important consideration when mining in well-sorted, highly permeable, dredge tailings. A standard practice to mitigate unpredictable groundwater flows is to maintain sediment berm piles along the top edge of the mine cut. If high ground water flows are accidently intersected the berms can be quickly pushed into the pit to plug the conduit and reduce the flow of slickens into the pit.

**Bedrock Geology** Bedrock in the valley on the left limit is yellow layered to dark blocky schist.

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

*Henry Gulch Explorations has been re-mining sections of lower Hunker Creek. In this area, remnant pay is targeted near a bedrock high that was difficult for dredges and bulldozers to mine thoroughly.*

## Henry, a tributary of Hunker

116B/03 2017: 64°00'40"N, 139°08'32"W

### Gillespie, R., 1995-2017

Water License: PM09-649 (Active 01/2020)
Active Producer (2015-2017) **Operation no. 38**

**Location** Henry Gulch, left-limit tributary of Hunker Creek; approximately 800 m upstream from its confluence with Hunker Creek.

**Work History and Mining Cuts** Mr. Gillespie was active on Henry Gulch from 2015 to 2017, and he split his time between his property and an additional property on upper Bonanza Creek. He was primarily active as a one-person operation, and mined progressively upstream on both limits of the narrow gulch. 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. The best pay is located in the blocky bedrock and likely the result of miners being unable to mine the bedrock surface thoroughly.

**Equipment and Water Treatment** Equipment included a Caterpillar 225 excavator, a Caterpillar 212 excavator, a Caterpillar 966C loader, and Volvo rock truck. Able to process material at a rate of 50 to 60 loose $yd^3$ (38-46 $m^3$)/hr, the wash plant consisted of a 1.5 by 3 m (5 x 10 ft) oscillating screen deck with a stacker leading to a 1 m (3 ft) wide and 3 m (10 ft) long sluice run which consisted of 1¼" angle iron and expanded metal. Water for sluicing was 100% recycled and acquired from a reservoir pond on Henry Gulch.

*Mr. Gillespie stripping in 2017 at his operation on Henry Gulch. The view is looking upstream the gulch towards the southwest.*

**Surficial Geology and Stratigraphy** Due to the presence of extensive old-timer workings, narrow gulch setting, and an abundance of colluviated material, the stratigraphy is difficult to describe. In 2017, a section on the left limit of Henry Gulch exposed a bedrock-high of blocky quartzite capped by a thin lens of gulch gravel and overlain by reworked colluvium. Up to 3 m (10 ft) of blocky bedrock and the thin gravel was sluiced. Best pay is located in the lower mixture of colluviated materials and gulch gravel and blocky bedrock. Up to 12 m (40 ft) loess was removed prior to mining.

**Bedrock Geology** Bedrock varies from decomposed schist to blocky quartzite.

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

## Australia Hill, a high-level bench on Hunker

116B/03 2015: 64°01'18"N, 139°07'47"W

### Australian Hill Mining, 2012-2015

Water License: PM13-022 (Active 08/2023)
Active Producer (2015) **Operation no. 39**

**Location** Right limit bench of Hunker Creek, between 21 Pup and Hattie Gulch, locally known as Australian Hill.

**Work History and Mining Cuts** Australian Hill was initially acquired by the Gould family when it was first staked in 1901 by A.C. Gould. The family regained the bench ground in the 1930s and since 1980 it has been extensively mined. In 2015, Australian Hill Mining operated a daily shift with one to two miners. No activity occurred on site in 2016 or 2017.

**Equipment and Water Treatment** In 2015, equipment included a John Deere 330C LC excavator and a 1.2 m (4 ft) diameter by 6 m (20 ft) long trommel that screened to ¾" minus over a sluice section of 1" angle iron and two 1.2 m (4 ft) wide by 3.6 m (12 ft) long sluice runs with expanded metal. The trommel is able to process 50 loose $yd^3$ (38 $m^3$)/hr. Water was supplied to the plant by initially using a John Deere 6 by 3" pump in Hunker Creek to supply make-up water to the ponds on the hill. Two other pumps, an 8 by 10" Cornell and 8 by 3" Cornell are used to monitor and deliver water to the plant. Effluent is settled in a series of settling ponds and water is recirculated aside from additional make-up water that is received from Hunker Creek.

*Activity near Hattie Gulch on Australian Hill at Mr. Gould's operation in 2015.*

**Surficial Geology and Stratigraphy** The stratigraphy consists of two units. Unit 1, from 0 to 19.4 m (0-3.6 ft), is White Channel gravel that varies in oxidation throughout the unit, is crudely stratified and bedded, and contains predominately quartz clasts (60%). Lenses of fine-grained sand and granules up to 0.5 m (1.6 ft) thick are present in the upper part of the unit. Overlying the White Channel gravel is Klondike glaciofluvial outwash gravel. This brown gravel, unit 2, from 19.4 to 28.0 m (63.6-91.9 ft) is moderately sorted, well-rounded and coarser than the underlying White Channel gravel. The bottom 3 m (10 ft) of White Channel gravel and up to 0.3 m (1 ft) of bedrock is sluiced.

Australian Hill Mining have operated on the bench for several decades, and have gained significant knowledge regarding the pay channel and its trajectory. The main pay channel is approximately 20 m (65 ft) wide, with gold enrichment present up to 35 m (114 ft) in width.

**Bedrock Geology** Bedrock undulates and is black decomposed quartz-sericite schist.

**Gold Characteristics** Gold is mostly fine with a few nuggets recovered, and has a fineness range of 740 to 750.

## Dago Hill and Last Chance, a high-level bench and tributary of Hunker

| | |
|---|---|
| 116B/03 | 2017: 64°01'03"N, 139°07'24"W |
| 115O/14 | 2017: 63°59'49"N, 139°06'58"W |
| 116B/03 | 2016: 64°00'06"N, 139°06'40"W |
| 116B/03 | 2016: 64°00'45"N, 139°07'17"W |
| 116B/03 | 2016: 64°00'16"N, 139°06'51"W |

### Favron Enterprises Ltd., 2000-2017

Water License: PM14-022 (Active 11/2024)
Water License: PM14-023 (Active 11/2024)
Active Producer (2015-2017) **Operation no. 40**

**Location** Last Chance and Dago Hill.

**Work History and Mining Cuts** From 2015 to 2017, mining targeted a diversity of sites on or near Dago Hill. In 2015 and 2016, a monitoring project mined Eight Pup in the Last Chance Creek valley. In 2016, two additional pits were mined on the White Channel gravel benches, one at the northwest end of Dago Hill above Dago Gulch that measured 45 by 72 m (148 x 236 ft) and a second on a left limit bench of Last Chance Creek below Eight Pup. A total of 1200 hours of sluicing occurred during the season. In 2017, mining continued on Last Chance Creek and moved above Eight Pup on the White Channel gravel bench. Buried low-level bench was also targeted under the hydraulic fan in the Hunker Creek

valley near Dago Gulch. Eight miners and one camp personnel worked at the mine between 2015 and 2017.

**Equipment and Water Treatment** Equipment included a John Deere 8509D, an Hitachi EX750 excavator, an Hitachi Zaxis 850 excavator, a John Deere 330 excavator, Caterpillar D9N and D10N bulldozers, two Terex 8220 bulldozers, a Caterpillar 988G loader, a Volvo L190 loader, and three Komatsu HM400 rock trucks. 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, each 0.9 by 6 m (3 x 20 ft), and consisting of 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 on Eight Pup targeted the section of drainage that is eroded into the left limit Last Chance Creek White Channel gravel bench. The bench pay was concentrated into the pup and subsequently buried under resedimented aeolian deposits. The gravel deposit was approximately 1 m (3.3 ft) thick and overlain by 10 m (33 ft) of frozen muck. Up to 1 m (3.3 ft) of colluviated bedrock overlies the fluvial gravel near to the hillsides of the pup. The fluvial gravel also contained abundant woody debris. Old-timer workings were visible in the hydraulic cut and bedrock was composed of Carmacks volcanic rock and an underlying schist-rich conglomerate.

*An aerial view to the northeast looking down the left limit bench of Last Chance Creek towards Dago Hill on Hunker Creek. Favron Enterprises mine from 2017 is visible in the foreground and shows the distribution of settling/holding ponds required to manage water when mining bench deposits. Eight Pup is the small tributary that cuts the Last Chance Creek bench on the far side of the settling ponds. This pup was partially mined in 2016.*

In 2017, a virgin low-level Hunker Creek bench was discovered under the hydraulic tailings from Dago Hill. The bench is located 10 m (33 ft) above the valley floor and 1.7 km downstream from the mouth of Last Chance Creek. Gravel on the bench is 1 to 1.5 m (3.3-5 ft) thick and described as a pebble-cobble gravel with quartz boulders up to 60 cm in length. The gravel consists of 60% clasts and 40% medium to coarse sand matrix. Clasts are subrounded and the unit is oxidized. Overlying the gravel is 2 m (6 ft) of sand and muck containing wood. Hydraulic tailings from Dago Hill are 14 m (46 ft) thick at the base of Dago Hill.

**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, and weighs up to ¾ oz with 80% fines. Last Chance gold is moderately coarse.

## Last Chance, a tributary of Hunker

116B/03 2017: 64°00'37"N, 139°05'37"W

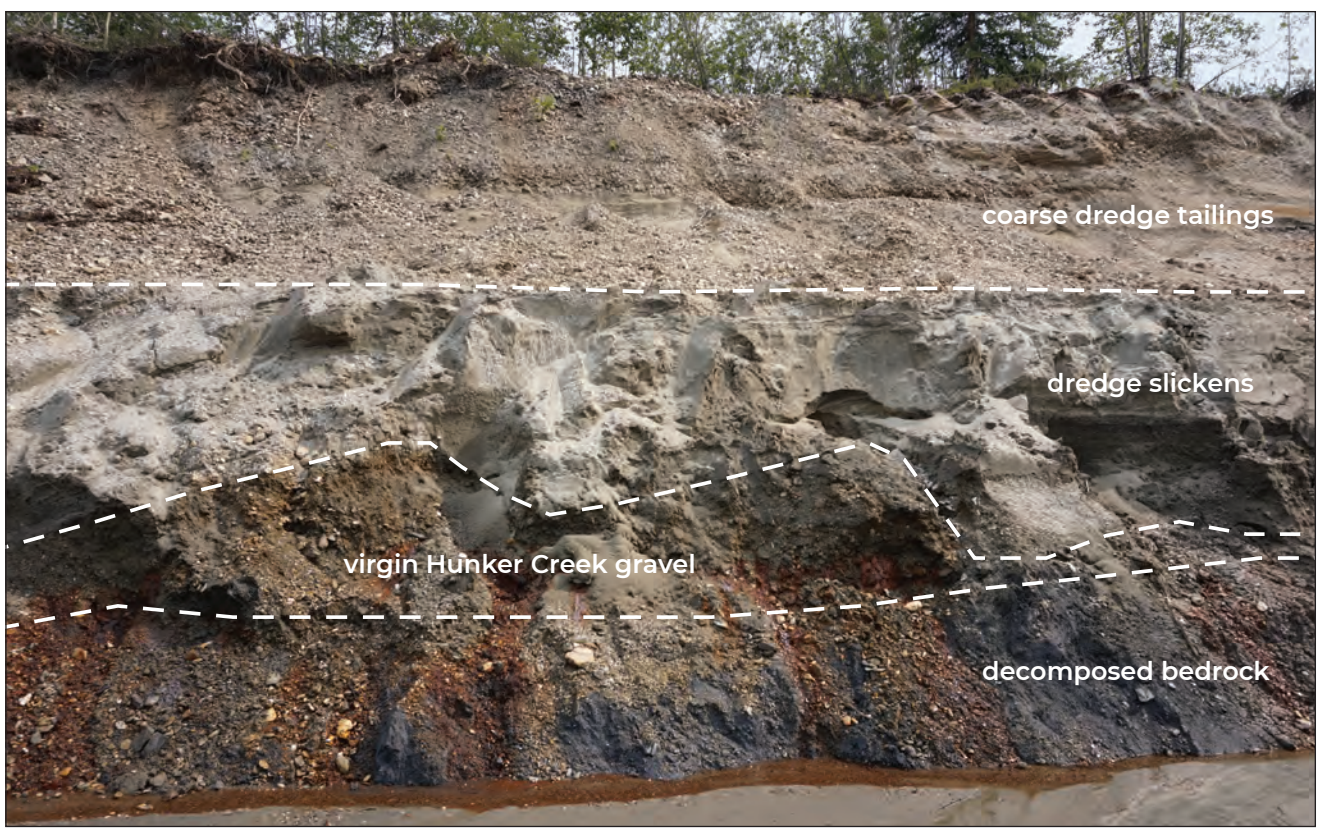
### Ace Placer Mining Ltd., 2017

Water License: PM16-073 (Active 01/2027)
Active Producer (2017) **Operation no. 41**

**Location** Last Chance, 360 m upstream from its confluence with Hunker Creek.

**Work History and Mining Cuts** Ace Placer Mines Ltd. divided their operations between mid-Dominion Creek and the mouth of Last Chance Creek in 2017. The 2017 season was their first year active at the Hunker location, with the majority of the spring spent preparing the cut for sluicing. A cut measuring 100 by 170 m (328 x 558 ft) was mined in 2017.

**Equipment and Water Treatment** Equipment on site included a Caterpillar 235C excavator for digging and loading pay, a Caterpillar D400D haul truck, a Caterpillar D9H bulldozer, a John Deere 270LC for feeding the plant, and a loader for moving tailings. The wash plant is a 1.5 by 6 m (5 x 20 ft) trommel that screens to ¾" and feeds four sluice runs. A conveyor stacked the oversize fraction off the trommel.




*A typical section at the mouth of Last Chance Creek. An intermittent layer of virgin gravel is visible on bedrock and overlain by dredge slickens and coarse dredge tailings. This photo demonstrates how variable the remnant pay may appear in dredged areas. The section is 10 m (33 ft) in height.*

**Surficial Geology and Stratigraphy** Varying amounts of virgin gravel remained when the pit was excavated around Dredge 11. In most areas, dredging had mined the majority of the gravel section. Material that remained included patches of gravel between dredge bucket-line passes, incompletely mined decomposed bedrock, and more continuous gravel sections over elevated bedrock towards the mouth of Last Chance Creek. A complete section of Hunker Creek gravel was exposed under and near the dredge that consisted of high energy, clast-rich gravel up to 1.5 to 2 m (5-6.5 ft) thick. On bedrock, the gravel is described as a poorly sorted, silty, cobble-pebble gravel that grades upward into a moderately sorted, weakly stratified and oxidized pebble-rich gravel. The maximum clast size was up to 40 cm in length. The gravel is overlain by silt (loess or fluvial) from 0.5 to 3.5 m (1.6-11.5 ft) thick. A gravel imbrication appeared to show flow directions down Hunker Creek. In areas more completely dredged, the remnant Hunker Creek gravel was overlain by up to 4.3 m (14 ft) of pebbly sluice box slickens and 3 m (10 ft) of coarse tailings from Dredge 11.

**Bedrock Geology** Bedrock is a decomposed phyllite.

**Gold Characteristics** Not reported.

## Last Chance, a tributary of Hunker

115O/14 2015: 63°58'18"N, 139°08'08"W
115O/14 2015: 63°59'43"N, 139°06'51"W

### Last Chance Placers Ltd., 1991-2015

Water License: PM04-424 (Expired 04/2016)
Active Producer (2015) **Operation no. 42**

**Location** Last Chance Creek, from mouth of Discovery Pup upstream to 15 Above Pup.

**Work History and Mining Cuts** 2015 was the last year that Last Chance Placers Ltd. fully operated on Last Chance Creek before selling in 2016. They operated a daily 10.5-hour shift with four to five miners. Work focused on Last Chance Creek below Henrietta Pup and 1.5 claim lengths were mined in 2015. In 2015, the Glenn's mined on Discovery Pup; also under Mr. Olynyk's license.

**Equipment and Water Treatment** Equipment documented on site in 2015 included an Hitachi EX450 LC excavator and an Hitachi EX270 LC excavator for digging pay and feeding the plant and a Caterpillar D9H bulldozer for pushing tailings and a 50 ton International Harvester 350 Pay hauler dump truck. The wash plant consisted of a 1.5 by 3.3 m (5 x 11 ft) single deck oscillating screen with ¾" punch plate, feeding a 1.2 by 2 m (4 x 6 ft) tray lined with Nomad matting and 1" angle iron riffles, which fed into two 1.2 m (4 ft) by 8" oscillating trays with Nomad matting under large expanded metal. Supplied at 1800 igpm by an 8 by 6" Cornell pump, powered by a John Deere diesel engine, the recirculated water allowed the plant to process 90 loose yd³ (69 $m^3$)/hr. Water was acquired from a 24 by 15 by 1.8 m deep (80 x 50 x 6 ft) recirculating pond and discharged to a settling pond and eventually into Last Chance Creek and the recirculation pond. Approximately 50% of water was recirculated. Concentrate was run on the long tom and finished on a wheel during clean-ups.

The Glenns operated with a Caterpillar 313 excavator and a custom 1 m diameter by 2.7 m long (3.5 x 9 ft) trommel with a 1" screen and a hydraulic grizzly on a 1.2 by 1.8 m (4 x 6 ft) hopper built by Mr. Glenn. This plant was able to process 30 yd³ (23 $m^3$)/hr.

*Left limit exposure on upper Last Chance Creek in 2015. The majority of the placer gold is contained within the highly fractured bedrock.*

**Surficial Geology and Stratigraphy** Mining focused on the left limit of Last Chance Creek where the better pay is said to be located. The 2015 left limit exposure was stripped of muck overburden so did not represent a complete section. Approximately 1.2 m (4 ft) of fractured, decomposed chloritic schist was mined. The fracture consistency of the bedrock was blockier in the more resistant quartz-rich zones of the schist. Overlying the bedrock is unit 1 from 0 to 0.75 m (0-2.5 ft); it is a layer of mixed weathered bedrock and fluvial sediment with a high matrix content. This mixing zone was also processed for pay. Unit 2, from 0.75 to 1.85 m (2.5-6 ft), is a poorly to moderately sorted, oxidized cobble-pebble gravel. The texture of the gravel consists of 80% clasts (65% pebbles and 35% cobbles) with the maximum clast size equaling 20 cm and most have an angular to subangular shape. The matrix component accounts for the remainding 20% and is a fine to medium sand. Overlying the gravel, from 1.85 to 2.85 m (6-9.3 ft), is unit 3 that consists of organic-rich silt with wood and likely represents overbank sedimentation during flood events. The majority of the gold is concentrated in the bedrock fractures.

The Glenns focused their mining on Discovery Pup on the left limit of the Pup below and onto a left limit intermediate-level bench of Last Chance Creek. Initial testing identified coarse gold in hillside colluvium that was sourced from the intermediate-level bench. A channel of Last Chance Creek measuring 4.9 to 6 m (16-20 ft) in width was discovered cut 1 m (3 ft) into bedrock on the bench and was oriented parallel with Last Chance Creek. The channel had a sinuous nature and contained a decomposed, compact, quartz-rich gravel. Clast content in the channel equaled 40% and consisted of 60% pebbles, 30% cobbles and 10% boulders with the maximum clast size equaling 25 cm. The matrix content accounted for 60% of the channel material and was a silty, medium-grained sand.

**Bedrock Geology** Bedrock varied from graphitic schist, decomposed schist, and blocky quartzite.

**Gold Characteristics** Gold on Last Chance Creek varies in fineness from 690 to 695.

*A view looking down into Discovery Pup to the southwest from the intermediate-level bench on Last Chance Creek. A paleo-Last Chance Creek paystreak was discovered on the bench (marked) and was mined by pushing pay downhill with the bulldozer to the small trommel plant. The bench is also visible on the opposite side of Discovery Pup.*

## Last Chance, a tributary of Hunker

| | |
|---|---|
| 115O/14 | 2017: 63°58'03"N, 139°08'11"W |
| 115O/14 | 2017: 63°59'43"N, 139°06'50"W |
| 115O/14 | 2016: 63°58'0.6"N, 139°08'17"W |

### Golden Wrench Mining, 2016-2017

Water License: PM14-063 (Active 05/2025)
Active Producer (2016-2017) **Operation no. 43**

**Location** Last Chance Creek, two locations: (1) approximately 300 m upstream from the mouth of Henrietta Pup, and (2) Discovery Pup (local name), a left tributary of Last Chance Creek between 8 Above Pup and Eight Pup.

**Work History and Mining Cuts** The first mining season for Gold Wrench Mining was in 2016 after purchasing the ground from Mr. Olynyk in 2015. A three-person operation worked one shift daily. They progressively mined upstream from the mouth of Henrietta Pup throughout 2016 and 2017. In late 2016, they tested the hydraulic tailings from Dago Hill that were deposited downstream, on the left limit of Last Chance Creek. In 2017, operations continued to mine upstream from their 2016 location above Henrietta Pup. Golden Wrench Mining was also active on a left limit tributary between 8 Above Pup and Eight Pup.

**Equipment and Water Treatment** Equipment utilized included a Caterpillar 324DL excavator, a Caterpillar 980C wheel loader, an Hitachi Zaxis 270LC excavator, two pay hauler rock trucks, and Caterpillar D9L, D7 and D8 bulldozers. The trommel, a Model 100 Gold machine is able to process 100 $yd^3$ (76 $m^3$)/hr.

**Surficial Geology and Stratigraphy** An exposure on the left limit, upstream of Henrietta Pup consists of 0.15 m (0.5 ft) of mixing zone between the weathered schist and lowermost fluvial gravel. The second unit, from 0.15 to 0.9 m (0.5-3 ft), is a poorly sorted cobble

*Golden Wrench Mining's operation upstream from Henrietta Pup in 2016.*

*Aerial view of Gold Wrench Mining in 2016.*

dominated gravel with approximately 40% matrix comprising fines ranging from silt to fine and medium-grained sand. From 0.9 to 1.5 m (3-5 ft), unit 3 consists of smaller clasts, predominately small cobbles and pebbles, and fines upwards with a decreasing matrix percent. Approximately 3 m (9.8 ft) of overburden (black muck and colluvium) overlies the gravel units. The pay channel at the current location is sharply cut into the schist bedrock and is located on the left limit with an approximate width of 2.4 m (8 ft). All gravel, and 0.6 to 0.9 m (2-3 ft) of bedrock was sluiced.

**Bedrock Geology** Bedrock is flat lying muscovite-chlorite schist.

**Gold Characteristics** Gold is all fine and has a fineness of 670.

## Last Chance, a tributary of Hunker

115O/14 2017: 63°57'21"N, 139°09'20"W

### WAM Exploration Ltd., 2007-2009, 2011, 2013-2017

Water License: PM17-020 (Active 06/2027)
Water License: PM06-541 (Expired 11/2016)
Active Producer (2015-2017) **Operation no. 44**

**Location** Upper Last Chance Creek, approximately 650 m upstream on the right fork of Last Chance Creek.

**Work History and Mining Cuts** Mr. McIntyre has been present in the Klondike for forty years, and during the last ten has spent the mining season sluicing on upper Last Chance Creek. Active in 2015 and 2016, WAM Exploration continued to mine downstream on the right fork of Last Chance Creek. In 2016, a one to two-person operation mined primarily on the left limit of the right fork. In 2017, WAM Exploration Ltd. operated as a two-person operation and mined the entire valley width. In the fall, both limits were stripped and prepared for sluicing in 2018. WAM Exploration Ltd. sluices approximately 8,000 $yd^3$/season.

**Equipment and Water Treatment** Equipment utilized in 2017 included an Hitachi Zaxis 330 LC excavator, an Hitachi UH14 excavator and a Caterpillar 966C wheel loader. The plant was a vibrating screen deck with an 18 $yd^3$ hopper, and a 1.5 m (5 ft) wide by 6.1 m (20 ft) long run. The run consisted of a nugget trap, expanded metal and a slick plate. Water was supplied to the screen deck by a 6" pump which allowed the plant to process material at 40 $yd^3$ (30 $m^3$)/hr. Two settling ponds were used to settle the effluent and water is 100% recycled. A long tom was utilized for clean-ups and concentrate was completed on a table in Dawson.

**Surficial Geology and Stratigraphy** Significant amounts of historic workings are present on the right fork of Last Chance Creek. As the operator has progressively mined downstream, the pay has become less channelized as the drainage widens. The upper part of the right fork is narrow with steep hillsides, which makes mine planning, stripping operations and material management a challenge.

The right fork of Last Chance Creek consists of three distinct layers of gravel, separated by 6" of organic-rich mud. Gravel layers vary in width between 0.9 to 1.5 m (3 to 5 ft) and consist of a cobble-pebble gravel with 60% pebbles and 40% cobbles. The 25% matrix is fine to medium sand and the clasts are predominately subrounded. More coarse and angular clasts are present throughout the gravel, which could be colluvium being

*WAM Exploration active on the right fork of upper Last Chance Creek in fall 2016.*

reworked into the system or a mixing zone between the bedrock and gravel where bedrock fragments are liberated into the fluvial sediment. The lowermost gravel on the bedrock contact has up to 5% boulders, with the largest being 0.3 m (1 ft). Placer gold is concentrated on the bedrock surface in a layer measuring 0.9 m (3 ft) in thickness that contains quartz boulders. Sometimes the upper gravel is economic as well, and the entire section is sluiced depending upon panning results and the presence of coarse material. Material sluiced consists of 0.9 m (3 ft) of the lowermost gravel and 0.6 m (2 ft) of bedrock.

**Bedrock Geology** Bedrock is weathered Klondike schist.

**Gold Characteristics** Gold is mostly fine and has a fineness of 670.

## Preido Hill, a high-level bench on Hunker

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|---|---|
| 115O/14 | 2017: 63°59'48"N, 139°05'38"W |
| 116B/03 | 2016: 64°00'09"N, 139°05'51"W |
| 116B/03 | 2015: 64°00'02"N, 139°05'46"W |

### Moonlight Mining Ltd., 2013-2017

Water License: PM16-068 (Active 03/2027)
Water License: PM07-561-2 (Expired 03/2017)
Active Producer (2015-2017) **Operation no. 45**

**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. mined a number of cuts on Preido Hill between 2015 and 2017. Worked focused on the main part of the hill and targeted paleo-channels cut into the bedrock surface where grades were more favourable. One of the larger cuts in 2015 measured 88 by 113 m (288 x 370 ft) and had an average depth of 20 m (65 ft). In 2016, they mined a large cut 75 m (246 ft) wide by 140 m (460 ft) long. In 2017, work focused on hill locations above Eighty Pup, including an experimental cut at the southern edge of the previously disturbed area. The cut measured 30 by 50 m (100 x 164 ft) and was slower to excavate than anticipated due to permafrost conditions. Mining at this cut will resume in 2018.

**Equipment and Water Treatment** Equipment on site includes an Hitachi 200 excavator, an Hitachi EX300 excavator, an Hitachi Zaxis 450LC excavator and three Caterpillar D40D rock trucks. 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 4 million years ago. This includes both the upper and lower White Channel gravel deposits and pre-White Channel, Paradise gravel (Bond, 2016). Most of the mining between 2015 and 2017 targeted channels cut into bedrock within the lower White Channel gravel or Paradise gravel. The total thickness of Pliocene sediments on the bench varies between 20 and 26 m (66 & 85 ft). Due to the geography of the hill, very little loess accumulation has occurred on the bench and most sediments are gravelly. The oldest sediment documented on Preido Hill is the Paradise gravel found partially preserved on bedrock. More complete and intact sections of Paradise gravel were being excavated at the south end of the bench towards the hillside. The Paradise gravel is typically oxidized, poorly sorted, and is dominated by subangular to subround cobbles and pebbles, although, some boulders (67 cm length) are present. The quartz content in the Paradise gravel is typically <50% with the remaining clasts consisting of light brown rhyolite, sericite schist, grey Nasina quartzite and black graphitic schist. Most non-quartz clasts are weathered to clay. In the middle of the bench, the Paradise gravel has been eroded by White Channel gravel so only thin remnants remain. These are often approximately 2 m (6.6 ft) in thickness, however can also be completely reworked by the younger White Channel gravel. The target pay material is located in the lower 2 m (6 ft) of gravel and 1 m (3 ft) of bedrock. Lower White Channel (LWC) gravel has a maximum thickness of 15 m (49 ft) and thins toward the valley side. The LWC gravel is a cobble-pebble gravel with a silty sand matrix. More than 80% of the clasts are quartz with the remainder being quartzite and clay-altered schist and rhyolite. Most of the gravel unit is bleached white although oxidation zones are present near the upper contact. The upper contact of the LWC consists of a debris-flow diamicton deposit that is very dense and difficult to excavate. The debris-flow material consists of sediment similar to the LWC gravel and appears to have originated from the Last Chance Creek valley. Organics and soil properties are preserved at the upper contact within the diamicton. Overlying the LWC gravel

is the upper White Channel (UWC) gravel that forms a distinctive cap across much of the bench. The UWC gravel is 9 m (30 ft) thick near the outer edge of the bench and becomes thinner towards the hillside. The UWC gravel is an oxidized, sandy, cobble-pebble gravel that is moderately to well-sorted, contains sand and silt lenses and ice wedge casts. Overall, it contains a fairly high quartz content, especially near the sharp erosional contact with the underlying LWC gravel. This gravel contains uneconomic concentrations of placer gold and is stripped.

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

**Gold Characteristics** Generally fine-grained with rare small nuggets.

*Close-up view of the Paradise gravel exposed in 2017 at the back of Preido Hill. The gravel is highly clay-altered, oxidized and frozen. This photo was taken at 6 m (20 ft) depth. The quartz content and clast size is anticipated to increase near the bedrock contact. Note the deformed shape to some of the clay-altered clasts.*


*Aerial view looking northeast over Moonlight Mining's operation on Preido Hill. Hunker Creek valley is visible in the distance and Last Chance Creek is visible on left. Most of the mining in 2015-2017 focused within the polygon in the distance. A new cut was started at the back of the bench (lower right corner) in 2017 and uncovered Paradise gravel, which is older than the White Channel gravel. The economics of this area will be determined in 2018.*

## Paradise Hill, a high-level bench on Hunker

115O/14 2015 and 2016: 63°59'30"N, 139°04'07"W

**Tamarack Inc., 1983-1986, 1989-1999, 2005-2012, 2015-2016**

Water License: PM07-571 (Active 06/2018)
Active Producer (2015-2016) **Operation no. 46**

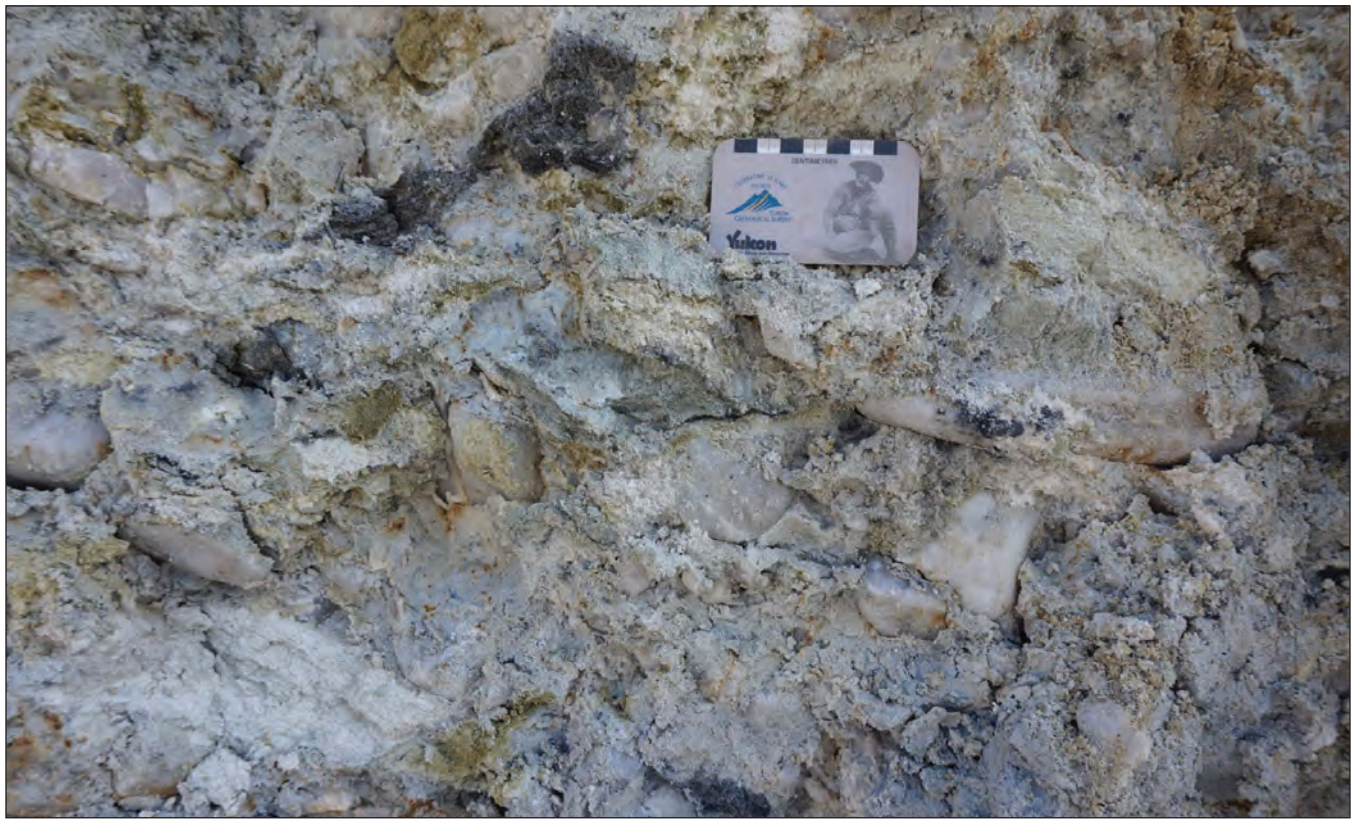
**Location** Paradise Hill and Hunker Creek, between Last Chance Creek and Hester Creek.

**Work History and Mining Cuts** Work focused near the upstream end of Paradise Hill in 2015 and 2016, in a cut working towards the southwest. Approximately five personnel were active at the cut during a shift.

**Equipment and Water Treatment** Equipment documented at the cut in 2015 included a Caterpillar D10 bulldozer pushing pay, a Caterpillar 245B excavator digging pay and loading the rock trucks, two Caterpillar 769C rock trucks delivering pay to the wash plant, and a Caterpillar 245 excavator feeding the plant. A Caterpillar 988B loader was used to handle tailings. Some coarse tailings are delivered back to the cut using a rock truck, and used as a platform for the excavator on the decomposed bedrock surface. The wash plant consisted of a 2.4 m (8 ft) diameter land trommel that is 15 m (50 ft) in length. Pay is delivered to the trommel using a 9 m (30 ft) conveyor. 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 x 15 ft) oscillating runs and the plant is able to process gravel at 300 loose $yd^3$ (229 $m^3$)/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** Surficial sediments on Paradise Hill are similar to those documented on Preido and Dago hills farther downstream. In 2015 and 2016, work focused on mining to the south towards the back of the bench. The stratigraphy in this location differs from sections mined in the past nearer to the edge of the bench. The main difference is that the degree of weathering or alteration in the gravel appears to have increased. In addition, the White Channel gravel appears to pinch-out and is underlain by the Paradise gravel. The section measured consisted of three general units. Unit 1, from 0 to 9 m (0-30 ft), is a highly decomposed, weakly stratified, cobble-pebble gravel with mottled oxidation. The quartz clast content in this gravel is approximately 50% and the remaining 50% of the clasts are quartzite and decomposed rhyolite and schist. Subrounded boulders up to 1 m (3 ft) in length are found near the bedrock contact. This gravel is interpreted to be the Paradise gravel that is older than the White Channel gravel. The entire unit is processed for placer gold. Unit 2, from 9 to 11.5 m (30-38 ft), is a layer of oxidized, quartz-pebble gravel. The majority of the pebbles are quartz (>90%) and the unit is in sharp, erosional contact with unit 1. This unit is interpreted as a local stream deposit that resulted from reworking the surface of the Paradise gravel. The erosional nature of this deposit results in an undulating contact with the underlying Paradise gravel and placer gold accumulations are reported from the contact zone of the two units (Beets, *pers. comm.*). This may suggest that the Paradise gravel contains

*Tectonic activity, such as this bedrock thrust, are common on Paradise Hill and can result in layers of pay gravel under slabs of bedrock. In this situation, soft decomposed fine-grained sedimentary rock on the right has been thrusted upward and distorted decomposed gravel on the left.*




*A close-up view of the decomposed gravel being mined at Paradise Hill. Virtually all of the non-quartz clasts have been weathered to clay. This gravel is called the Paradise gravel, after this locality, and is interpreted to be older than the White Channel gravel. The high quartz content of the White Channel gravel resulted when the Paradise gravel was reworked and the decomposed clasts turned to sand (Bond, 2016).*

sufficient gold accumulations higher in the section that when concentrated by partial downcutting can result in an elevated pay streak. Unit 3, from 11.5 to 18.5 m (38-61 ft), is a sequence of organic-rich silt or muck. The entire section is frozen.

Evidence of bedrock thrusting or tectonism was noted near the north side of the cut. In places, thrusting has displaced decomposed bedrock over gravel deposits resulting in hidden pay. In other areas, the bedrock thrusts are vertical in nature, and extend for 6 m (20 ft) vertically and clearly displace the overlying decomposed gravel.

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

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

## Nugget Hill, a high-level bench on Hunker

115O/14 2016: 63°58'54"N, 139°02'24"W

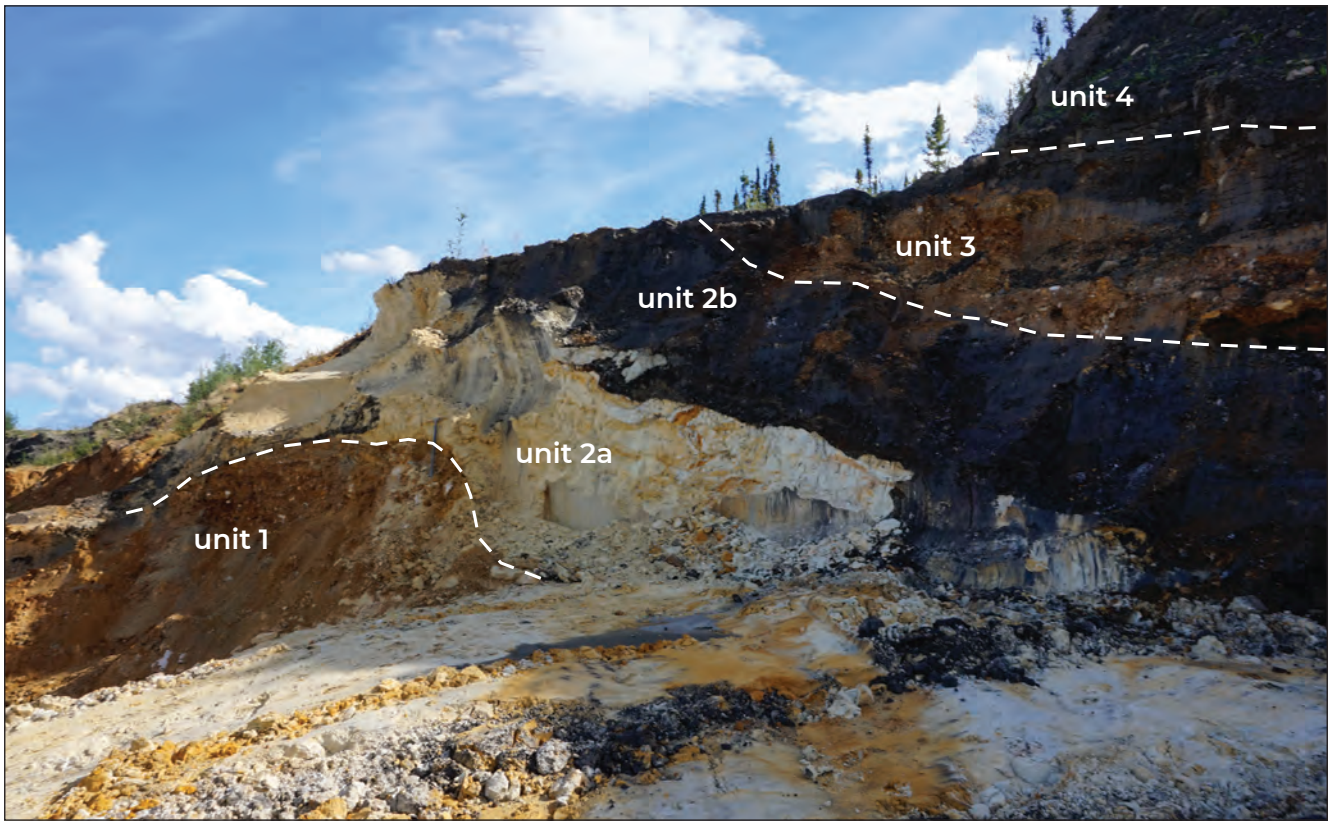
**Brickner, D., 2015-2017**

Water License: PM16-083 (Active 06/2027)
Active Producer (2015-2017) **Operation no. 47**

**Location** Nugget Hill, left limit bench of Hunker between Hester Creek and Independence Creek.

**Work History and Mining Cuts** Work focused on mining the back wall of virgin material on the middle of the bench, and some rim material near camp. Two people were employed at the mine in 2016.

**Equipment and Water Treatment** In 2016, Mr. Brickner was using an Hitachi UH14 excavator, two Komatsu 400 excavators and two GMC dump trucks for hauling pay. Pay is fed to the plant using the dump truck, a slope and a water cannon. The plant has an oscillating screen deck that feeds two levels of sluice runs. Each level has two side by side 1.2 by 2.4 m (4 x 8 ft) runs that are lined with expanded metal and matting. Water is derived from Independence Creek and is stored in a former ditch holding pond on the property.




*The section on Nugget Hill reflects the complex tectonic history of Hunker Creek. Bedrock (units 2a and 2b) and gravel (unit 3) have been tectonically thrusted over unit 1 (gravel). Units 1 and 3 are equivalent age. Unit 4 is muck overburden.*

**Surficial Geology and Stratigraphy** The surficial geology of the back wall on Nugget Hill shows evidence of tectonic activity that has affected the stratigraphy on the bench. Gravel in this area of the bench is highly oxidized, decomposed Paradise gravel. Most clasts in the Paradise gravel are cobble and pebble size, and all but the quartz clasts are completely decomposed. Some recognizable non-quartz clasts in the gravel include white rhyolite and black phyllite. Unit 1 at the base of the cut consists of 2 m (6.6 ft) of Paradise gravel. Unit 2, that consists of 2.6 m (8.5 ft) of decomposed bedrock, overlies unit 1. The decomposed bedrock is divided into two distinctive subunits, a white rhyolite (unit 2a) at the base and a black-carbonaceous phyllite (unit 2b) on top. Unit 3, from 4.6 to 6.1 m (15-20 ft), is a second layer of Paradise gravel that looks similar to unit 1. The main difference between units 1 and 3 is the upper gravel (unit 3) contains very large quartz boulders, which are not present in the lower gravel. The boulders are up to truck size and have a subangular to angular shape. Unit 4, from 6.1 to 10.5 m (20-34 ft), is a silty colluvium with abundant carbonaceous phyllite clasts.

The genesis of a gravel unit buried by bedrock (and gravel) can only occur by either mass wasting (landslides) or tectonic activity. At Nugget Hill the topography of the site is very flat and therefore tectonic activity must play a role in developing this stratigraphy. This would likely occur through a compressional force that activated a low angle fault. The rhyolite dike or sill may lend supporting evidence of a fault, as these bodies tend to flow into zones of structural weakness. The presence of angular quartz boulders within the upper-most Paradise gravel unit suggests there must be colluvial rafting of a bull quartz vein occurring upslope. Because the upper gravel was moved tectonically, it provides a preview of how the gravel will appear to the southwest as mining progresses toward the hillside.

**Bedrock Geology** Bedrock is a carbonaceous phyllite and rhyolite. Oxidized quartz stringers are found in the phyllite.

**Gold Characteristics** Gold on Nugget Hill is mostly fine-grained with 4% occurring as small nuggets. The fine gold has a sugar grain-like shape and has not travelled far. A local source for the gold is supported by the change in fineness across the bench. At the upstream end of the bench the gold has a fineness of 760 and it progressively increases by 2% for every 90 m (100 yd) until it reaches 920 fineness at the northwest end of the bench.

## Independence, a tributary of Hunker

115O/14 2016: 63°58'47"N, 139°01'25"W

### Phillips, P. and D. 2011-2017

Water License: PM08-622 (Active 01/2020)
Active Producer (2015-2017) **Operation no. 48**

**Location** Independence Creek, approximately 250 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 2015 to 2017. 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. Four employees operated a daily 10-hour shift. In 2017, the Phillips purchased Hester Creek and conducted a monitoring program.

**Equipment and Water Treatment** Equipment included Komatsu PC200 and PC400 excavators, an Hitachi EX300 excavator, two Caterpillar 8L bulldozers, a Caterpillar 980 wheel loader, and two Caterpillar 300B haul trucks. Two trommels were present. The first was a 1.2 m (4 ft) trommel with a 5/8" screen, able to process 50 $yd^3$ (38 $m^3$)/hr, and the other a 1.2 m (4 ft) New Zealand-style trommel, able to sluice 40 $yd^3$ (30 $m^3$)/hr. A series of four ponds enabled the water to be 100% recycled. Top mats were cleaned daily and a sluice box was used for clean-ups.

**Surficial Geology and Stratigraphy** A section from 2016, on the right limit near the mouth of Independence Creek, consisted of two units. Unit 1, from 0 to 3 m (0-10 ft), is a platy, pebbly gravel that appeared to fine upward. Unit 2 ranged in thickness from 7 to 11 m (23-36 ft) and is mostly a peat accumulation with some lenses of pebbly colluvium. The entire package is frozen. Muck overburden on the left limit has a higher silt content, although organic-rich beds are present.

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

**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.

*A view of the right limit bank of Independence Creek looking upstream. The frozen peaty overburden and underlying pay gravel is thawed using a monitor and periodically cleaned-up using a Komatsu excavator.*

## Hunker, a tributary of Klondike

115O/15 2016: 63°58'31"N, 139°00'23"W

### Daval Mining, 1982-2017

Water License: PM09-654 (Active 03/2020)
Active Producer (2015-2017) **Operation no. 49**

**Location** Hunker Creek, at the mouth of Colorado Creek.

**Work History and Mining Cuts** From 2015 to 2017, four operators conducted a daily 10-hour shift at the mouth of Colorado Creek, on the left limit of Hunker Creek. In 2015, they mined a cut 16 by 30 m (52 x 98 ft), and in 2016 extended that previous year's cut farther downstream. While working at the mouth of Colorado Creek, they encountered an abundance of production and exploration shafts.

**Equipment and Water Treatment** Equipment utilized from 2015 to 2017 included an Hitatchi 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 x 20 ft) trommel is used to process gravel at 35 $yd^3$ (27 $m^3$)/hr. It classified material with a ½" screen and the sluice runs are 3 m (10 ft) wide by 2.4 m (8 ft) long and are a combination of hydraulic riffles and expanded metal. Water is 100% recycled and no direct effluent is discharged to Hunker Creek. For clean-ups, a screen and magnet is initially used, and concentrate is completed on a wheel.

**Surficial Geology and Stratigraphy** The left limit of Hunker Creek, downstream from the mouth of Colorado Gulch contains 1 m (3 ft) of pay gravel. It is a cobble-pebble gravel enriched with up to 5% quartz boulder clasts that lie on or near the bedrock contact. Clasts are subround with large angular clasts of schist incorporated throughout, possibly representing the lateral limit of the Hunker Creek side pay. It is a matrix-supported gravel with fine to medium-grained sand and minor silt. Small beds of open worked sediment are also present. Farther downstream, a pebble gravel up to 1 m (3 ft) thick overlies the pay unit. A large bedrock reef was encountered in Hunker Creek at the mouth of Colorado Creek. The reef is oriented perpendicular to Hunker Creek and much of the gravel mined downstream of the reef appeared to be derived from Colorado Creek. Extensive old-timer shafting and the presence of underground rooms have led the operators to continue following the gravel along the left limit. Up to 13 m (43 ft) of reworked colluvium, overbank material, and dredge tailings overlie the side pay. All of the lowermost cobble-pebble gravel and 0.3 to 1.8 m (1-6 ft) of bedrock was sluiced.

*Cut at the mouth of Colorado Creek, on the left limit of Hunker Creek, in 2016.*

**Bedrock Geology** Bedrock is a pyrite-rich muscovite schist.

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

## Temperance Hill, a high-level bench of hunker

115O/15 2017: 63°57'42"N, 138°58'31"W

### Rodal and Fraser Ventures, 2016-2017
### Fraser, I., 2014-2015
### Fraser, J., 1978-1998

Water License: PM13-023 (Active 07/2023)
Active Producer (2015-2017) **Operation no. 50**

**Location** Temperance Hill, a left limit bench on the downstream side of Gold Bottom Creek confluence with Hunker Creek.

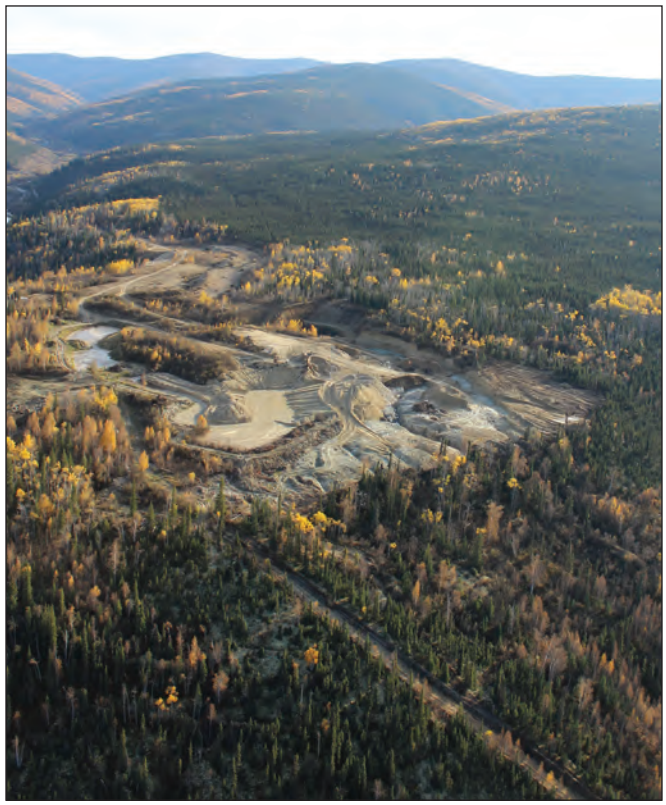
**Work History and Mining Cuts** Mr. J. Fraser and his mining partner Mr. A. Close hand-mined on Paradise Hill for several seasons prior to relocating to 'Fraserville' on mid Hunker Creek in 1978. They focused operations on Temperance Hill and the valley bottom until 1998. Mr. I. Fraser re-opened the operation in 2014, and in 2015 focused on the valley bottom of Hunker Creek, below the mouth of Gold Bottom Creek. The 2016 season was the first year that Temperance Hill had been mechanically mined since the mid-1990s. To help with excavating the bench, a partnership was established between Rodal Placers and Fraser Ventures, and they sluiced approximately 13,000 $yd^3$ in 2016. In 2017 a

cut measuring 24 by 55 m (79 x 180 ft) was mined, which was located on the rim of the bench and focused on excavating *in situ* material that was left behind from the old timers. Additional workings occurred on the bench, on the southwestern corner. A crew of three people operated a daily 8-hour shift throughout 2016 and 2017.

**Equipment and Water Treatment** Equipment utilized in 2016 included a John Deere 200 excavator, a Caterpillar 225 excavator, a Caterpillar D25C rock truck, a Caterpillar D6 bulldozer and a Caterpillar 950 wheel loader. New equipment in 2017 included an Hitachi 350 excavator and a Komatsu 300 excavator. The wash plant was a 2.1 by 4.6 m (7 x 15 ft) screen deck with ¾" screen, able to process approximately 30 $yd^3$ (23 $m^3$)/hr. A 6 by 6" pump supplied water to the plant. A closed circuit system was used, where water was transported by an 8 by 6" pump to the top of the hill every three days to re-supply the reservoir. A vibrating high banker, wheel and Devin Gold table were used for clean-ups.

**Surficial Geology and Stratigraphy** Temperance Hill was once the site of extensive excavations where old-timers flocked to mine the heavy pay channel on the left limit bench of Hunker Creek. With gold contributions also likely from Gold Bottom Creek valley, the hill is situated in a productive placer area. Rodal and Fraser Ventures' main target on the hill was pillars of *in situ* gravel and tailings from the hand sluicing operations left behind. In 2016 and 2017, they worked both on the rim of the hill as well as continued to excavate farther back into the hillside, towards the south. The stratigraphic section at the back of the bench consists of three units. The grey-dull white bedrock at the base of the cut is weathered to medium to coarse sand with approximately 30% competent fragments. A sharp contact is present between the weathered bedrock and unit 1. Unit 1, from 0 to 2.2 m (7.2 ft), is a compact, cobble-pebble gravel with 2% boulders, 50% cobbles and 48% pebbles. Quartz clasts are abundant throughout the unit, and clasts are subrounded, with the maximum boulder size up to 0.5 m (1.6 ft) in diameter. It is matrix supported with a varying matrix percent from 30 to 40%, and

*Historic workings present on Temperance Hill. The old-timers excavated large amounts of gravel and stacked the boulders, which enabled the fine-grained material to be sluiced.*



*Aerial view of Temperance Hill where Mr. Fraser and Rodal Placers were active in 2016 and 2017. The view is looking to the south where you can see Gold Bottom Creek drainage on the far left of the image.*

consisting of fine to medium sand. Unit 2, from 2.2 to 2.4 m (7.2-7.9 ft), varies in thickness across the face of the cut between 0.2 and 0.6 m (0.6 and 2 ft) thick and is massive sand with no primary sedimentary structure. The sand is fine to medium grained with minor silt incorporated throughout. An undulating but abrupt contact is present between unit 2 and unit 3. Unit 3, from 2.4 to 8.3 m (7.9-27.2 ft), is interbedded pebble-gravel with varying matrix percent. Silty sand beds and sand lenses up to 0.2 m (0.6 ft) are present throughout the unit. This upper gravel contains few boulders and is consistent with a meandering river system. Minimal stripping is required on the bench.

**Bedrock Geology** Bedrock is quartz-muscovite-calcite schist that is often completely weathered to sand.

**Gold Characteristics** *In situ* gravel produces fine gold that is flat and pounded. Gold from the rim of the bench is coarser and the fineness is 810.

## Delhi Hill, a high-level bench of Hunker, tributary of Klondike

115O/15 2017: 63°57'43"N, 138°57'35"W
115O/15 2015-2016: 63°57'34"N, 138°57'24"W

### Mogul Gold, 2005-2017

Water License: PM17-075 (application in process)
Water License: PM07-588 (Active 04/2018)
Active Producer (2015-2017) **Operation no. 51**

**Location** Hunker Creek and lower Gold Bottom Creek, and Delhi Bench.

**Work History and Mining Cuts** Mining on Delhi Bench commenced in 2015. A recirculation pond was constructed on the bench and a settling pond was constructed out-of-stream on the left limit of Hunker Creek, 1 km upstream from the mouth of Gold Bottom Creek. Overburden stripping and pay transport was completed using a bulldozer. Work focused on the edge of the bench immediately northwest of the old-timer ground sluice workings. Two miners worked one shift daily. In 2016, a resistivity geophysical and RAB drilling program was completed in partnership with the Yukon Mineral Exploration Program. The goal of the program was to identify reserves along the bench towards Gold Bottom Creek. Also in 2016, a cut measuring 40 by 80 m (131 x 262 ft) was mined on the right limit of Gold Bottom Creek, at the mouth of Ontario Gulch. Activity shifted from Gold Bottom Creek in 2016 and relocated to the left limit of Hunker in 2017, 650 m upstream from the Gold Bottom Creek confluence. In 2017, a joint venture with 535785 Yukon Inc. was established and a total of three to four personal were present throughout the season.

**Equipment and Water Treatment** Equipment present on Delhi Hill included an Hitachi EX200 excavator, a Caterpillar 966C loader, and a Caterpillar D9G bulldozer. The wash plant consisted of a 1.5 m (5 ft) diameter trommel with a hopper over a 3 m (10 ft) wide oscillating sluice run with 1.2 m (4 ft) of hydraulic riffles and 1.2 m (4 ft) of expanded metal. Tailings were stacked with a 9 m (30 ft) conveyor. The trommel was able to process up to 80 $yd^3$ (61 $m^3$)/hr. Water is settled out-of-stream on the left limit of Hunker Creek below the hill. In 2017, equipment included a Volvo excavator, a Daewoo 220LC excavator, a Caterpillar 966C wheel loader, a Caterpillar D8G bulldozer and two Kenworth dump trucks.

**Surficial Geology and Stratigraphy** Delhi Bench is approximately 75 m (250 ft) above the modern Hunker Creek valley bottom. Sediments being stripped and

sluiced on the bench are Pliocene White Channel gravel. The gravel is mostly fine grained consisting of moderately sorted pebble gravel. Coarser grained sediment is present near the bedrock contact and likely where the main pay channel was located. Old-timer workings on the bench consist of a series of ground-sluiced drainage ditches and piles of small quartz boulders. According to a report by McConnell (1905), a portion of the old paystreak was preserved near the rim of the hill and was the target of mining efforts during the early 1900s. Future exploitation of unmined resources on the hill should assume that gold distribution will resemble other White Channel deposits and be concentrated close to the bedrock surface.

Side pay on the left limit of Hunker Creek, upstream from the Gold Bottom confluence consists of up to 1.5 m (5 ft) of a moderately oxidized cobble-gravel with 40% matrix. Clasts are subrounded with angular bedrock fragments incorporated into the lower gravel situated on the bedrock contact. Minor open work sections are present in the matrix supported gravel, and sand lenses are present up to 0.5 m (0.15 ft) thick. A discontinuous mud seam provided a reliable indicator for locating preserved side pay in 2017. Up to 5.4 m (17.7 ft) of overburden overlies the gravel, which consists of historic tailings, overbank material and reworked loess with woody debris. Sluiced material includes 0.9 to 1.5 m (3-5 ft) of gravel and up to 0.6 m (2 ft) of bedrock.

**Bedrock Geology** Bedrock is blocky and foliated quartz-muscovite schist.

**Gold Characteristics** Coarse gold is recovered from lower Gold Bottom Creek.


*Up to 1.5 m (5 ft) of side pay being excavated on the left limit of Hunker Creek in 2017. A long narrow strip, approximately 650 m upstream from the Gold Bottom Creek confluence was mined throughout the season.*

*View of the mining activity on Delhi Hill in 2015. The old–timer's water holding pond is visible on the right side of the photo.*

## Gold Bottom, a tributary of Hunker

115O/15 2017: 63°55'08"N, 138°58'57"W

### NZ Mid-Arctic Gold Mining Limited, 2017

Water License: PM12-008-2 (Active 07/2022)
Active Producer (2017) **Operation no. 52**

**Location** Gold Bottom Creek, 850 m downstream from the confluence of West Gold Bottom Creek.

**Work History and Mining Cuts** NZ Mid-Arctic Gold Mining Limited mined on mid-Gold Bottom Creek in 2017. They purchased the three lowermost claims included under PM12-008-2, and plan to progressively mine upstream. A crew of three people operated the mine.

**Equipment and Water Treatment** A Kobelco SK350 excavator was used to strip overburden and deliver pay material to the sluice plant. The plant was a Minequip Mobile 1200-XPL, which is a 1.2 by 3.6 m (4 x 12 ft) trommel able to process up to 70 $yd^3$ (53 $m^3$)/hr. A series of two settling pond was used to settle effluent and deliver water back to Gold Bottom Creek.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is blocky weathering grey schist.

**Gold Characteristics** Gold is all fine.


*Fine gold recovered from mid-Gold Bottom Creek in 2017 by NZ Mid-Arctic Gold Mining Limited.*

## Soap, a tributary of Gold Bottom

115O/15 2017: 63°53'11"N, 138°59'13"W

### Tim Coles Enterprises Ltd., 2016-2017

Water License: PM12-008-2 (Active 07/2022)
Active Producer (2016-2017) **Operation no. 53**

**Location** Soap Creek, 200 m upstream from its confluence with Gold Bottom Creek.

**Work History and Mining Cuts** Tim Coles Enterprises Ltd. purchased all of the claims in 2016 and joined ventures with NZ Mid-Arctic Gold Mining Limited for the 2016 season. In spring, with encouraging results from a 6-hole drilling program, they began stripping and preparing a cut for sluicing. In 2017, a second auger drilling program was conducted in the middle of valley to locate remnant virgin pay gravel. Depths to bedrock were 5 m (17 ft). Mining was initiated at the forks of Soap Creek and Gold Bottom, and the crew of three personnel progressed upstream on Soap Creek (the right fork).

**Equipment and Water Treatment** A Caterpillar 349E excavator was used for stripping, digging pay and feeding the plant. A Caterpillar D9H bulldozer was used for pushing pay to the plant. Approximately 80% of material moving is conducted by excavator, while the other 20% is completed with bulldozers. The wash plant, a double screen deck, consists of vibrating ¾" punch plate that overlies a second screen deck that classifies to ½". Material that passes through the bottom screen feeds two 1.5 m (5 ft) wide by 1.2 m (4 ft) long sluice runs containing expanded metal, angle iron and matting. Two settling ponds are located on the left limit of Gold Bottom Creek, which were also used as water reservoirs. Water was 100% recycled.

*An aerial view looking up Soap Creek, the right fork tributary to upper Gold Bottom Creek. The oxidized placer deposit is overlain by organic-rich weathered bedrock colluvium.*

**Surficial Geology and Stratigraphy** The surficial geology near the mouth of Soap Creek, before its confluence with Gold Bottom Creek, consisted of two units. Unit 1, from 0 to 0.7 m (0-2.5 ft), is an oxidized, poorly sorted cobble-rich gravel with rare boulders. It is matrix supported consisting of fine to medium sand with minor silt. The maximum clast size is 0.2 m (0.8 ft) in diameter. A minimal mixing zone between the weathered bedrock and overlying pay gravel is present on the undulating bedrock surface. The gravel likely originated during a high-energy stream flow event and deposited onto an uneven fractured bedrock surface. Areas of quartz cobble enrichment are present throughout the gravel. This unit and 1 to 2 m (3.3-6.6 ft) of bedrock were the main placer targets. Unit 2, from 0.7 to 7.5 m (2.5-25 ft), is a mixed unit containing organics, loess and weathered bedrock fragments.

**Bedrock Geology** Bedrock is blocky weathering grey mica-schist.

**Gold Characteristics** Soap Creek gold is 80% fine and 20% coarse. The fineness in Gold Bottom is 785, whereas fineness in Soap creek is 755.

## Whiskey Hill, a tributary of Hunker

115O/15 2016: 63°57'19"N, 138°54'45"W

**Sadek, V., 2013-2017**

Water License: PM12-023 (Active 05/2022)
Active Producer (2015-2017) **Operation no. 54**

**Location** Whiskey Hill, a right limit bench of Hunker Creek, located between Little Gem Gulch and 6 Below Pup.

**Work History and Mining Cuts** Mr. Sadek purchased the property in 2013 and has mined Whiskey Hill annually from 2013 to 2017. Activity in 2015 consisted of improving road access to the claims and primarily sluicing the historic tailings at the base of Whiskey Hill that were washed and deposited from the top of the bench. Exploration changed focus in 2016 and Mr. Sadek processed overbank material on the left limit of Little Gem Gulch at the base of Whiskey Hill, and also on top of Whiskey Hill. In 2017, the main target was excavating pillars of *in situ* gravel that were untouched by the old-timers at the top of the bench. Total yardage sluiced in 2017 included 3,000 $yd^3$ of tailings and approximately 1,000 $yd^3$ of *in situ* gravel on top of the hill.

*Aerial view looking southwest at Whiskey Hill where you can see Mr. Sadek's base camp on the left limit of Little Gem Gulch, and recent workings on top of the bench.*

*Loader feeding historic tailings at the base of Whiskey Hill to Mr. Sadek's custom built screen deck (Photo credit: Vladan Sadek).*

**Equipment and Water Treatment** From 2013 to 2015, Mr. Sadek used a Case 480E backhoe, and in 2016 he acquired a Caterpillar 950 wheel loader. In 2017, the Caterpillar 950 wheel loader was replaced by a Caterpillar 966 wheel loader. His custom-built screen deck with grizzly and ⅜" screen is able to process 25 to 30 $yd^3$ (19-23 $m^3$)/hr. The sluice runs are 2.4 m (8 ft) long by 0.9 m (3 ft) wide, with the upper 1.2 m (4 ft) consisting of rubber matting and the second 1.2 m (4 ft) consisting of expanded metal with GoldHog matting and miners moss.

**Surficial Geology and Stratigraphy** Whiskey Hill was hydraulically monitored in the late 1920s and extensive workings are present on the property. The first resource mined on Whiskey Hill in 2015 was a fan consisting of hydraulic tailings derived from the workings on top of Whiskey Hill. The historic tailings are White Channel gravel, which consists of cobble and boulder sized clasts, predominately quartz, and lacks fines since it was previous washed and the matrix was removed.

**Bedrock Geology** Bedrock is quartzite, quartz-muscovite-calcite schist, gneiss and amphibolite (YGS, 2017).

**Gold Characteristics** Gold is very fine and the fineness is 820.

## Mint, a tributary of Hunker

115O/15 2017: 63°55'56"N, 138°54'36"W

### 535584 Yukon Inc., 2015-2017

Water License: PM13-033 (Active 08/2023)
Active Producer (2015-2017) **Operation no. 55**

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

**Work History and Mining Cuts** Mint Gulch was heavily mined by the old-timers and has subsequently been mined since the 2000s by various operators. Operating on Mr. Erickson's ground, 55584 Yukon Inc. first prepared ground in 2015. This included stripping, monitoring and site preparation. Sluicing commenced in 2016. Monitoring was also conducted in 2016 to thaw the frozen overburden and reach the gravel preserved below. Throughout 2017, the Hawker's continued to progressively mine upstream and extended the cut into ground that had not be mechanically mined. In 2016, a cut 15 m (50 ft) wide by 80 m (262 ft) long was mined and 5,500 $yd^3$ was sluiced. A cut of similar size was mined in 2017, and 4,500 $yd^3$ was processed.

**Equipment and Water Treatment** Equipment utilized included an Hitachi EX200 excavator, an Hitachi EX450LCH excavator, a Caterpillar 740 rock truck and a 1.2 m (4 ft) diameter trommel able to process 50 $yd^3$ (38 $m^3$)/hr. In 2017, a shaker screen wash plant was fabricated and utilized on site starting mid-season. It was able to process 40 $yd^3$ (30 $m^3$) and consisted of two sluice runs each 2.4 by 2.4 m (8 x 8 ft). Water was supplied to the plant using a 10 by 6" pump, was acquired from Hunker Creek, and settled in the Hunker valley. Clean-ups were conducted with a long tom.

*Monitoring the upper portion of the Mint Gulch cut in 2016 to thaw and remove the frozen loess and reworked overbank material (Photo credit: Jim Leary).*

*The Hawkers standing in the 2016 cut on mid-Mint Gulch. Mint Gulch is a narrow gulch-placer setting with thick, frozen overburden ranging from 4 to 8 m (13-26 ft) thick.*

**Surficial Geology and Stratigraphy** The typical Mint Gulch stratigraphy consists of undulating bedrock with 2.5 m (8.2 ft) of coarse, cobble dominated muddy gravel overlain by another 2.5 m (8.2 ft) of reworked colluvium, and capped by 3.7 m (12.1 ft) of loess and reworked overbank material. Due to the extensive old-timer workings, massive ice and ice-rich stratified fines have filled the rooms that were once excavated in the early 1900s. The pay gravel consists of cobble pebble gravel with 60% cobble-sized clasts and a silty fine-grained sand matrix. Sluiced material consists of up to 1.5 m (5 ft) of gravel and 0.3 m (1 ft) of bedrock.

**Bedrock Geology** Bedrock is primarily weathered mica-schist.

**Gold Characteristics** Gold is mostly coarse with the largest nugget recovered weighing 1/3 oz. Fineness ranges from 820 to 850.

**Work History and Mining Cuts** Mr. Dassylva and Mr. Toth staked Six Above Pup in spring 2015, with testing commencing during the following months. Throughout the season, they conducted five test holes, each 1.2 by 1.2 by 1.8 m (4 x 4 x 6 ft). In spring of 2016, the water license was assigned to Mr. Ruman. Stripping occurred on a section of the creek in the modern valley and the amount sluiced is unknown. No activity occurred in 2017.

**Equipment and Water Treatment** In 2016, an excavator and a bulldozer were present on site.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is quartzite, quartz-muscovite-calcite schist, gneiss and amphibolite (YGS, 2017).

**Gold Characteristics** Not reported.

## Six Above, a tributary of Hunker

115O/15 2015: 63°56'03"N, 138°52'01"W

**Ruman, D., 2016**
**Dassylva, R., 2015**

Water License: PM15-065 (Active 03/2026)
Active Producer (2015-2016) **Operation no. 56**

**Location** Six Above Pup, a right limit tributary of upper Hunker Creek, between May Pup and Ontario Creek.

## Hunker, a tributary of Klondike

115O/15 2016: 63°54'50"N, 138°53'11"W

**Larose, S., 2007-2017**

Water License: PM06-531 (Expired 06/2017)
Active Producer (2015-2017) **Operation no. 57**

**Location** Hunker Creek, at its confluence of left and right fork.

*Mr. Larose's trommel situated upstream on right fork Hunker in 2016 (Photo credit: Jim Leary).*

**Work History and Mining Cuts** Mr. Larose has been stripping the upper part of his claims throughout 2015 to 2017. In 2015, sluicing occurred where the operator targeted virgin side pay preserved on the edges of the narrow drainage.

**Equipment and Water Treatment** Equipment utilized for his stripping program included a Caterpillar D9 bulldozer and a 17 ton mini excavator. An Hitachi 450 excavator was purchased in 2017. A 1.2 by 10.7 m (4 x 35 ft) trommel was used to process up to 30 $yd^3$ (23 $m^3$)/hr.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is quartzite, quartz-muscovite-calcite schist, gneiss and amphibolite (YGS, 2017).

**Gold Characteristics** Gold is mostly fine with the largest piece the size of a fingernail.

## 24 Pup, a tributary of Hunker

115O/15 2015: 63°54'42"N, 138°54'20"W

### Ahnert, G. and E., 1978-2017

Water License: PM15-081 (Active 02/2026)
Water License: PM04-379 (Expired 05/2015)
Active Producer (2015-2017) **Operation no. 58**

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

**Work History and Mining Cuts** In 2015, mining activity on 24 Pup consisted of hand-mining with the assistance of a ground-sluicing mechanism. An in-stream reservoir is used to collect water over a 3-hour period from the small drainage. This reservoir is released and directed downstream in a trough of corrugated metal approximately 30 m (100 ft) long. The lower end of the trough is directed at the bank where the water washes the gravel and overburden. No specific work history is known for 2016 and 2017.

**Equipment and Water Treatment** The Ahnerts mine by hand; therefore no heavy equipment was utilized. The wash plant consisted of 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 (2-3.2 ft) of poorly sorted, cobble-pebble gravel and 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.

*Mr. Ahnert digging pay on 24 Pup. Hand-mining occurs with the assistance of a ground-sluicing apparatus consisting of a small holding pond and a trough of corrugated metal. Waste-water is minimal and dissipates on the fluvial fan.*

## Hunker, a tributary of Klondike

115O/15 2017: 63°54'32"N, 138°53'51"W

### Blattler, E., 2015-2017

Water License: PM11-060 (Active 05/2023)
Active Producer (2015-2017) **Operation no. 59**

**Location** Hunker Creek, right fork, 670 m upstream from its confluence with left fork Hunker Creek.

**Work History and Mining Cuts** Operating under Mr. Blattler's license, Mr. Gagnon has been active on the property from 2015 to 2017. As a one-person operation, 40 hours are spent mining each season. Each season one or two test pits, 2.4 by 6.1 m (8 x 20 ft), were sluiced. In 2015, 60 $yd^3$ was processed. In 2016, 400 $yd^3$ was processed, and in 2017, 950 $yd^3$ was processed. The ground has been dredged previously; water management is therefore an issue due to the porosity of the coarse gravel dredge tailings.

**Equipment and Water Treatment** Equipment utilized in 2017 included a Liebherr 971 excavator and a 4" water pump that supplied the 1.2 m (4 ft) diameter trommel. The trommel was able to process material at a rate of 20 $yd^3$ (15 $m^3$)/hr. Water was 100% recycled. A nelson concentrator was used for clean-ups.

**Surficial Geology and Stratigraphy** All gravel encountered was sluiced and no bedrock was processed due to the thickness of the gravel. Since the ground had already been mined, it was thawed and made excavation easier.

**Bedrock Geology** Bedrock is quartzite, quartz-muscovite-calcite schist, gneiss and amphibolite (YGS, 2017).

**Gold Characteristics** Gold is fine and bright.

## Hunker, a tributary of Klondike

115O/15 2017: 63°54'26"N, 138°54'12"W

### Hunter, T., 2015-2017

Water License: PM16-075 (Active 03/2027)
Active Producer (2015-2017) **Operation no. 60**

**Location** Hunker Creek, right fork.

**Work History and Mining Cuts** Mr. Hunter has two claims located on the right fork of Hunker Creek, approximately one kilometre above the confluence of the left fork of Hunker Creek. In 2015, several small test pits and trenches were conducted on the lowermost claim. Twenty days were spent mining in 2016, using a two-person crew. Operations increased in 2017 and 2,500 $yd^3$ of tailings and overburden were removed. A cut 9.1 by 16.8 m (30 x 55 ft) with an average depth of 1.5 m (5 ft) was mined, and approximately 400 $yd^3$ was sluiced throughout the season.

**Equipment and Water Treatment** In 2015, a Can Dig mini excavator was utilized to dig the test pits and trenches. A Kubota 040 excavator and a Kubota SV75 skid steer were used to strip material, haul pay and feed the plant. The wash plant consists of a 0.6 m (2 ft) trommel that is hydraulically driven, and water is supplied by a 3" trash pump. Material was processed by the trommel at 20 $yd^3$ (15 $m^3$)/hr. The single sluice run is 0.4 by 2.7 m (1.3 x 9 ft) and the upper 1.8 m (6 ft) consists of rubber riffles and the lower 0.9 m (3 ft) expanded metal with nomad matting. Two small settling ponds were used to settle effluent, which were used in conjunction with the final settling pond located in a part of the active cut. The sluice runs were cleaned daily and clean-ups were conducted using a pan and small long tom concentrator.

**Surficial Geology and Stratigraphy** The ground has been previously disturbed as it contains undulating and discontinuous lenses of wood and gravel. All gravel encountered, and up to 0.2 m (0.8 ft) of decomposed bedrock, was sluiced.

**Bedrock Geology** Bedrock is quartzite, quartz-muscovite-calcite schist, gneiss and amphibolite (YGS, 2017).

**Gold Characteristics** Gold is coarse and rounded with 80% larger than 20 mesh and 15% between 0.5 and 1 g nuggets.


*Active mining occurring on the right fork of Hunker Creek at Mr. Hunters mine in 2017 (Photo credit: Jim Leary).*

## Right fork of Hunker, a tributary of Klondike

115O/15 2015: 63°54'11"N, 138°55'03"W

### George, M. and L., 1997-2017

Water License: PM15-025 (Active 06/2025)
Water License: PM04-394 (Expired 02/2015)
Active Producer (2015-2017) **Operation no. 61**

**Location** 36 Pup and 2.2 km upstream the right fork of Hunker Creek.

**Work History and Mining Cuts** The Georges have been present in the Hunker Creek drainage for more than two decades. As a small-scale operation, minimal ground preparation and sluicing occurs each season. A majority of the workings focused the left limit of right fork Hunker Creek.

**Equipment and Water Treatment** Equipment includes an International wheel loader backhoe with a ¼ yd³ 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.

*Test pit on the right limit at Mr. Georges's operation in 2015. The lowermost gravel situated on the bedrock contact was hand sluiced in a long tom.*

**Surficial Geology and Stratigraphy** A small hand-sluicing operation on the left limit of right fork Hunker Creek exposed three units in 2015. The first unit, from 0 to 0.9 m (3 ft), is a cobble gravel that is clast supported and weakly imbricated downstream. Placer gold is recovered from unit 1, and increases in grade occur in the bedrock undulations. Bedrock surface undulations vary up to 0.6 m (2 ft) in relief. Unit 2, from 0.9 to 1.2 m (3-3.9 ft), is colluvium which consists of small angular bedrock fragments being reworked off the hillsides. Unit 3, from 1.2 to 2.2 m (3.9-7.2 ft), is old tailings and previously mined gravel that had been stockpiled.

**Bedrock Geology** Bedrock is decomposed muscovite-calcite schist.

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

## Right fork of Hunker, a tributary of Klondike

115O/15 2015: 63°53'20"N, 138°55'38"W

### Brong, R. and Dotzler, E., 2012-2017

Water License: PM10-069 (Active 05/2021)
Active Producer (2015-2017) **Operation no. 62**

**Location** Hunker Creek, right fork.

**Work History and Mining Cuts** As a narrow drainage, 10 m (33 ft) wide, Mr. Brong and Ms. Dotzler are required to carefully managed tailings and water management as they progressively mine upstream. The two-person operation mines both limits of the creek and processes up to 50 $yd^3$/day.

**Equipment and Water Treatment** Equipment included a Caterpillar 910 loader to excavate gravel, and a Kubota KX080-3 excavator to feed the wash plant. The wash plant consisted of a 0.6 m (2 ft) reverse trommel with a hopper and grizzly over one sluice run 0.6 by 2.4 m (2 x 8 ft) with expanded metal. The plant, supplied with water by a 3" pump, was able to process gravel at a rate of 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** Right fork 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 was likely heavily worked by earlier miners. There is evidence that open-cut mining has occurred in the valley center

*View upstream right fork Hunker Creek where Mr. Brong and Ms. Dotzler have been mining since 2012. They progressively mine upstream, working in a narrow drainage only 10 m (33 ft) wide.*

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 upper right fork Hunker Creek: one is more weathered. The fineness is 805.

## Goring, a tributary of Klondike

116B/02 2017: 64°00'29"N, 138°53'21"W

**Gaven, W., 2007-2017**

Water License: PM13-056 (Active 04/2024)
Active Producer (2015-2017) **Operation no. 63**

**Location** Goring Creek, approximately 4.6 km upstream from its confluence with the Klondike River.

**Work History and Mining Cuts** Minimal activity occurred in 2015 and 2016, with the 2017 season increasing to three employees that conducted a large bulk sampling program. Activity focused on upper Goring Creek, where a glacial terrace on the left limit of the drainage was exploited. Several test pits and stripping locations were completed throughout the season.

**Equipment and Water Treatment** Equipment present in 2017 included a Hough 65 payloader to excavate gravel and transport pay to the plant, and a Caterpillar D9G bulldozer for overburden removal. In 2016, a gravity fed Ross box was used to sluice material. A shaker deck with a 1" screen was utilized in 2017, which was able to process up to 30 $yd^3$ (23 $m^3$)/hr. Effluent was settled out of stream. A long tom was used for clean-ups.

**Surficial Geology and Stratigraphy** A terrace is present on the left limit of Goring Creek. The terrace is approximately 53 m (175 ft) above the modern creek level and has a thickness of up to 13.3 m (43.6 ft). Goring Creek is situated close to the maximum advance of the Cordilleran Ice Sheet and the terrace on upper

*A glacial diamict unit exposed on the terrace in 2017. It is a compact, matrix-rich gravel with an abundance (30%) of weathered clasts.*


*Mr. Gaven displaying his 10.4 g nugget recovered from Goring Creek.*

Goring Creek is overlain by possible glaciofluvial material derived from north of the Tintina Trench. A cut on the bench exposed three units. Unit 1 (not well exposed) is 6.8 m (22.3 ft) thick and consists of an oxidized pebble gravel. Unit 2 is a 3.1 m (10.2 ft) thick diamict (possibly glacial) that is poorly sorted, contains 30% weathered clasts, is very compact and matrix rich. Overlying the diamict is unit 3, a 3.4 m (11.2 ft) thick unit of interbedded pebble-gravel and sand.

**Bedrock Geology** Bedrock is mapped as brown weathering, variably serpentinized ultramafic rocks (YGS, 2017).

**Gold Characteristics** 1 g nuggets are common, with the largest recovered being 10.4 g.

## Allgold, a tributary of Flat

115O/15 2017: 63°56'32"N, 138°36'58"W

### Henry Gulch Explorations Ltd., 2013, 2016-2017

Water License: PM15-024 (Active 07/2025)

**Active Producer (2016-2017)** **Operation no. 64**

**Location** Mouth of Allgold Creek.

**Work History and Mining Cuts** Drilling was conducted in 2016 to determine the cut location for the 2016 and 2017 mining season. In 2016, the cut measured 45 by 300 m (148 x 984 ft). A low-level bench cut, 35 by 50 m (115 x 164 ft) was mined in 2017 using three personnel operating a daily 10-hour shift. A second cut 30 by 48 m (98 x 157 ft) was mined upstream on the right limit.

**Equipment and Water Treatment** Equipment present on site in 2016 included an Hitachi EX200LC excavator used for digging and loading pay, Caterpillar D400E and D350 rock trucks for transporting pay to the plant, and a Volvo L220E loader for feeding the plant and managing tailings. A Caterpillar D9H bulldozer was also on site. 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. A 6 by 6" Indeng pump powered by an Isuzu engine supplied water to the plant at 1200 igpm, allowing it to process 70 to 80 $yd^3$ (53-61 $m^3$)/hr. Water was acquired from a reservoir pond and treated out-of-stream in a 61 by 76 by 3.6 m (200 x 250 x 12 ft) settling pond. Clean-ups were conducted with a long tom over a two-cell jig and a 3 ft wheel for fines.

*A view looking upstream along the right limit of Allgold Creek. The stratigraphy is visible along the left side of the photo and a resistant quartz vein is visible in the distance.*

**Surficial Geology and Stratigraphy** In 2016, the cut was located in the valley bottom along the right limit of Allgold Creek. The section consisted of two units. Unit 1, from 0 to 4.5 m (0-15 ft), consisted of moderately to well-sorted cobble-pebble gravel containing rare small boulders of vein quartz on bedrock. Unit 2, from 4.5 to 10.5 m (15-34 ft), is a blanket of loess and minor organics. Approximately 1 m (3 ft) of bedrock and 2 m (6 ft) of gravel is processed for pay.

**Bedrock Geology** Bedrock consists of a grey schist cut by a resistant quartz vein measuring 4 m (13 ft) in width.

**Gold Characteristics** Gold is flat, smooth, and chunky with minor red staining. 13% is +10 mesh, 50% is -10 to +18 mesh, and 37% is -18 mesh. Gold has a fineness of 840 to 850.

## Allgold, a tributary of Flat

115O/15 2017: 63°54'06"N, 138°45'43"W
115O/15 2016: 63°55'17"N, 138°40'19"W

### Dulac Mining, 2012-2017

Water License: PM15-044 (Active 06/2025)
Water License: PM14-062 (Active 06/2025)
Active Producer (2015-2017) **Operation no. 65**

**Location** Allgold Creek, downstream from the mouth of 71 Pup, and left limit bench upstream from 71 Pup.

**Work History and Mining Cuts** The Dulacs have operated on Allgold Creek for six seasons, and more recently have begun mining on the left limit bench in the drainage. While mining in the valley bottom in 2015, they also conducted exploration and bulk sampling of a high-level bench upstream from 71 Pup. In 2016, activity was focused on the bench with a crew of five miners and a camp cook. In 2017, a two-person operation was active on upper Allgold Creek. Their operation mined an intermediate bench cut measuring 24 by 56 m (79 x 184 ft) on the left limit of the drainage, immediately downstream from the mouth of Alexander Pup.

**Equipment and Water Treatment** Equipment used to mine the bench in 2016 included a John Deere 800C excavator for excavating pay, two Caterpillar D300 rock trucks for hauling pay, and a John Deere 270 excavator was used to feed the wash plant. Caterpillar 988A and 988B loaders were used to move tailings. A Caterpillar D9 bulldozer was used for maintaining the road ramp in the cut.

The wash plant was a Model 200 Gold Machine, which included a vibrating wet grizzly, turbo trommel, reverse helix, tail sluice, and side sluices. The plant is able to process 150 to 220 $yd^3$ (115-168 $m^3$)/hr and is supplied with water at 1500 igpm by an 8 by 6" John Deere pump. Water was acquired from an intake ditch on Allgold Creek and effluent was settled in-stream through a pond measuring 61 by 213 m (200 x 700 ft) and 3.6 m (12 ft) deep. Clean-ups were completed on a Model 200 Gold Machine slick plate and side sluice and panning of the final concentrate.

In 2017, the equipment included an Hiatachi EX200 excavator, a John Deere 450B bulldozer and a screen deck. It had a single sluice run 0.4 m (1.4 ft) wide by 4.6 m (15 ft) long, with a punch plate, expanded metal and angle iron. For clean-ups, a mini screen deck and a wheel were utilized.

**Surficial Geology and Stratigraphy** The stratigraphy exposed on the 2016, left limit bench cut consisted of two units of gravel, likely of Pliocene age, overlain by a glaciolacustrine silt. Unit 1, from 0 to 3.4 m (0-11 ft), is a clast-supported, moderately sorted, cobble-pebble

*Small-scale two-person operation active at the mouth of Alexander Pup in 2017.*

gravel with rare sand lenses. The gravel is compact, but is not decomposed, and generally contains beds with fining upward sequences. The coarsest beds are not always situated at the bedrock contact. A possible ice wedge cast was documented at the base of the section and extended into the soft schist bedrock. These features are normally associated with the upper White Channel gravel elsewhere in the Klondike, which was deposited during a cooling climate just prior to the first continental glaciation 2.6 million years ago. The placer gold distribution in unit 1 is concentrated in the lower 1 m (3 ft) and 0.6 m (2 ft) of bedrock. Mining has determined that a paystreak with abrupt edges exists in unit 1 and there does not appear to be a defining feature of the paystreak in the gravel sedimentology. Unit 2, from 3.4 to 9.4 m (11-31 ft), is a stratified, pebble-rich gravel with numerous sand lenses. The contact between unit 1 and 2 is abrupt. Near the hillside part of the cut, unit 2 is interstratified with a mudflow deposit. Unit 2 is oxidized and contains beds with manganese-staining. The oxidation is very strong near the upper contact, which may indicate past soil weathering-related oxidation. Unit 3, from 9.4 to 12.4 m (31-41 ft), is a coarsening upward sequence of bedded silt to fine sand. The lower contact with unit 2 is sharp and this unit represents sediment deposition at the base of a glacial lake, possibly during the first Pleistocene glaciation. Allgold Creek was susceptible to damming by glaciers that originated in the Ogilvie Mountains, which flowed south across the Tintina Trench and blocked the mouth of the drainage. There was no evidence of direct sedimentation by ice (till) so it is assumed this locality was beyond the ice limit. The glacial lake deposit has a variable thickness due to surface erosion subsequent to deposition.

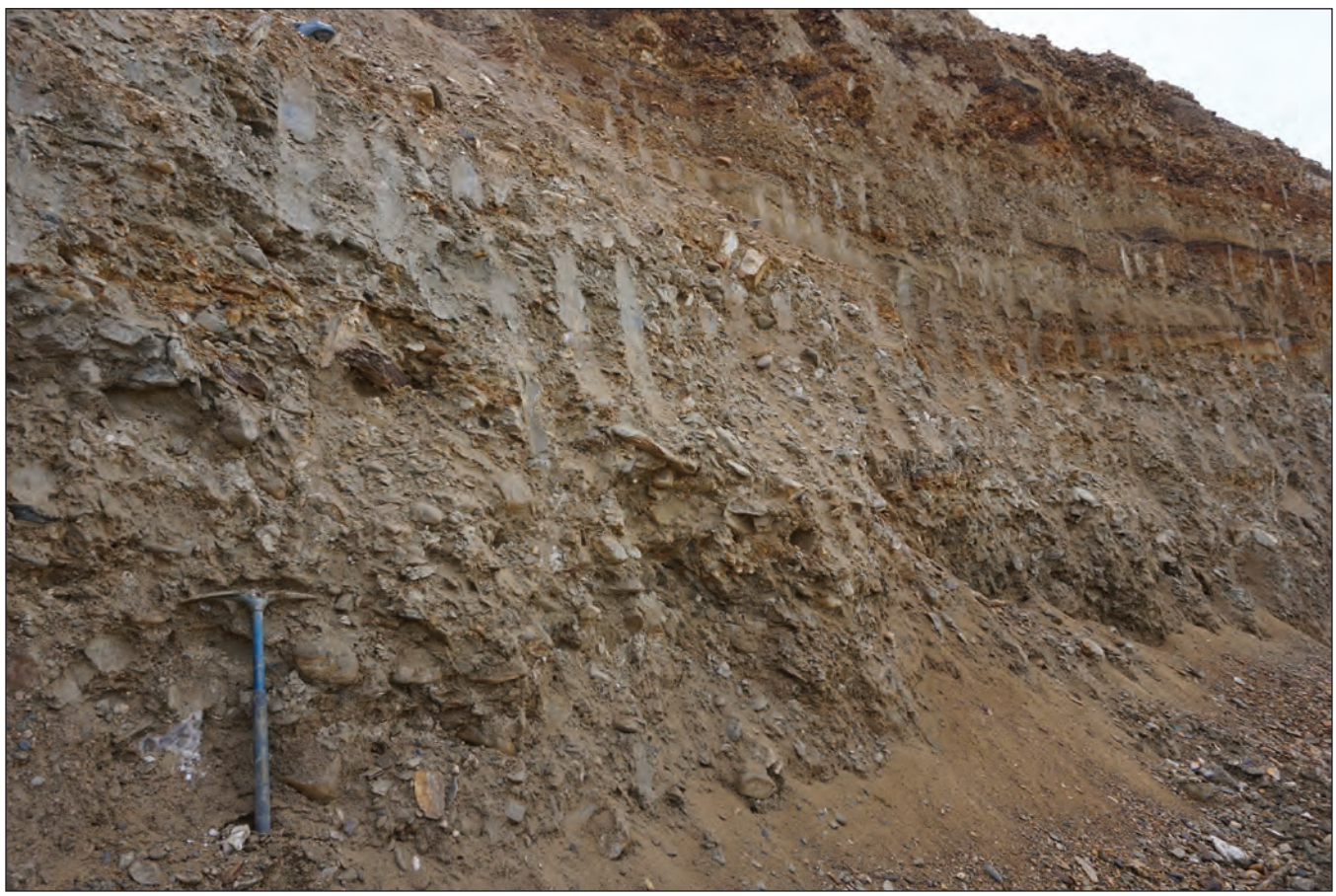
The left limit intermediate-level bench exposure in 2017 consisted of two units. Unit 1, from 0 to 0.7 m (2.3 ft), is a cobble-pebble gravel with 60% pebbles and 40% cobbles. It has a 25% matrix consisting of medium sand. The gravel is matrix supported with subrounded clasts and subangular bedrock schist fragments incorporated throughout. A cobble enrichment is present on the undulating bedrock contact, and the most economic


*A view looking downstream on Allgold Creek of the bench stratigraphy at Dulac's mine. The Pliocene gravel deposits (unit 1 and 2) are overlain by a glacial lake sediment (unit 3) deposited when an early Pleistocene glacier from the Ogilvie Mountains blocked the mouth of Allgold Creek.*

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.

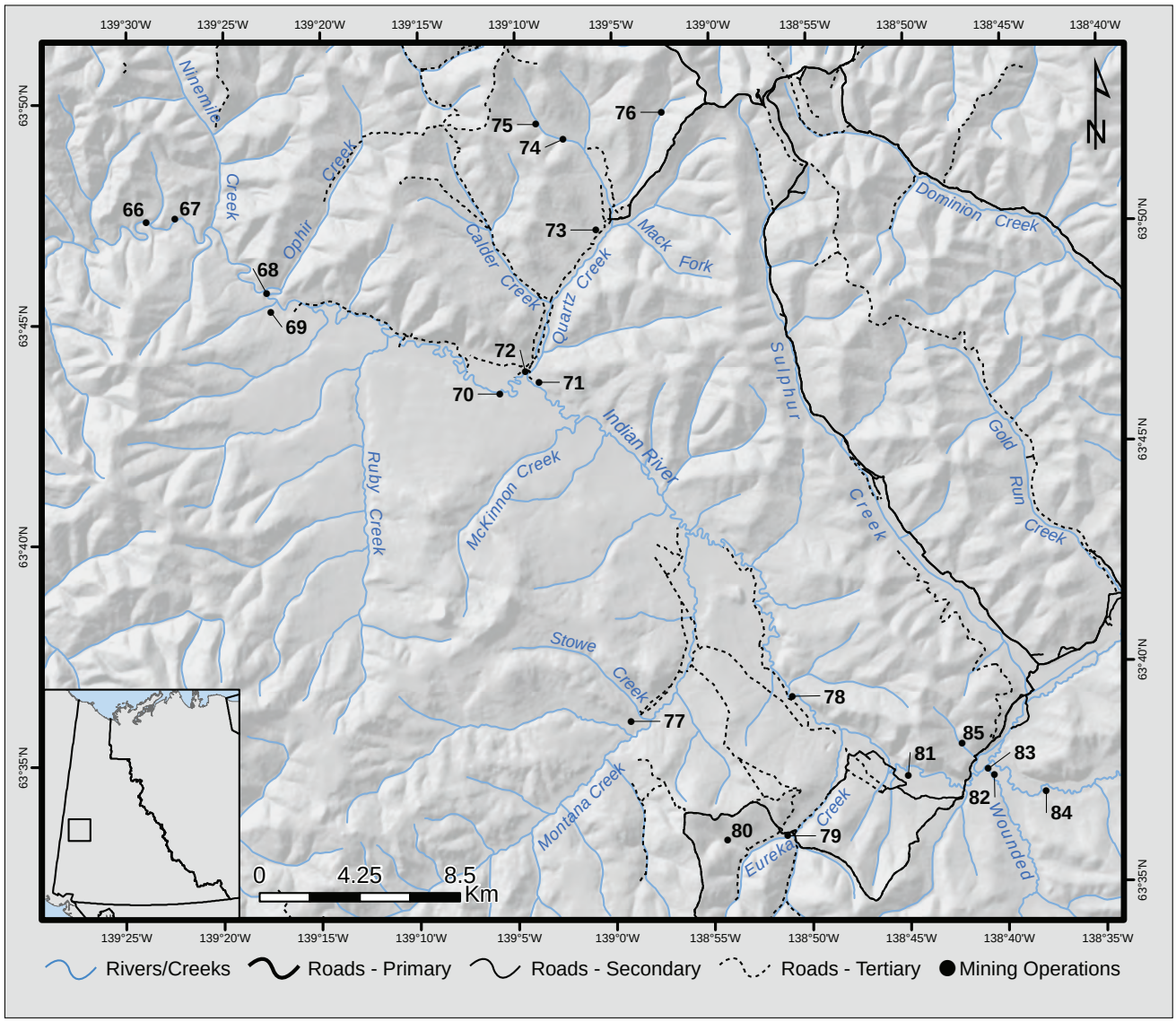
**Gold Characteristics** Placer gold from the bench is 20% >8 mesh, 50% between 8 and 16 mesh, 15% between 16 and 30 mesh and 15% <30 mesh. The gold is described as oatmeal shaped and is very similar to the gold recovered from mining in the valley bottom. The fineness is 880.



*A close-up view of unit 1 near the base of Dulac's cut on the left limit Allgold bench. Unit 1 is coarser and contains fewer sand lenses compared to the overlying unit 2 gravel.*

# INDIAN RIVER
## PLACER AREA

**SITES 66-85**




### LEGEND

66. M2 Gold Mines Ltd.
67. McBurney, D.
68. DNS Gold-Wash Canada Inc.
69. Renegade Gas & Oilfield Services
70. Northern Exposures Inc.
71. 535883 Yukon Inc.
72. McNeil, G.
73. Schmidt Mining Corp.
74. Sight Unseen Mining Company
75. Kreft, B.
76. Canyon Creek Mining
77. CTS Earthwork Ltd.
78. Tamarack Inc.
79. Fine Gold Resources Ltd.
80. 46205 Yukon Inc.
81. Rical Mining Ltd.
82. Wounded Moose Mining Company
83. Little Flake Mining ULC
84. Fry Exploration & Mining Inc.
85. Lakeland Vegetation Management Ltd Yukon Division

**INDIAN, A TRIBUTARY OF YUKON**

115O/14 2017: 63°47'37"N, 139°27'56"W

## M2 Gold Mines Ltd., 2012-2017

Water License: PM17-025 (Active 07/2027)
Water License: PM06-535-2 (Expired 07/2017)
Active Producer (2015-2017) **Operation no. 66**

**LOCATION** Indian River, approximately 14 km upstream from its confluence with the Yukon River.

**WORK HISTORY AND MINING CUTS** In 2015, work focused immediately upstream from camp on a left limit meander bend of the Indian River. The deposit consists of floodplain and low terrace sediments measuring more than 1.2 km (4,000 ft) in length and 110 m (360 ft) in width, and is bounded by the Indian River. To effectively mine this style of deposit, extraction occurs in strips, working from outside to the inside of the meander bend. A total of three strips were mined between 2015 and 2017. The outer strip measured 1.2 km in length (4,000 ft) and 48 m (160 ft) in width. The second strip measured 1 km (3,280 ft) in length and was 61 m (200 ft) in width. The third strip measures approximately 500 m (1,640 ft) in length and 100 m (328 ft) in width and was completed in 2017. Previous work on the meander bend has also exploited an intermediate level terrace deposit. Sequential removal of overburden on the incised meander bends is completed using a track-mounted conveyor capable of moving 700 $yd^3$ (535 $m^3$)/hr. Tailings are stacked on previously mined ground and mining progresses from downstream to upstream to allow a common settling facility to be used throughout the project. On completion of processing, the tailings are leveled and contoured using a bulldozer.

In 2016, work moved approximately 1 km downstream from camp to a partially exploited right-limit meander bend. A strip was mined near the river and reclaimed later in the season. In 2017, mining was finished on the bar upstream from camp. Reclamation work was completed and included leveling and contouring coarse tailings, top-coating with mixed organics and sediment, and decommissioning drainages and settling ponds. In preparation for a camp move in 2018, road planning and building was initiated to access downstream claims. Seven crew plus a cook are employed at the mine.

**EQUIPMENT AND WATER TREATMENT** Equipment located on site included a Caterpillar D9N bulldozer with U-blade and ripper, Hitachi 290, 240 and 330 excavators with 1.1 $m^3$ (1.45 $yd^3$) buckets, and a John Deere 270 excavator. Stripping was assisted using a track-mounted conveyor. The wash plant, in 2015 and 2016, consisted of a 2.1 m (7 ft) diameter mobile New Zealand-style trommel with a total sluice length of 4.9 m (16 ft). The sluice contains expanded metal and wide 1" angle iron riffles underlain by Nomad matting. The plant is mounted on tracks and is self-propelled using a hydraulic drive; it can process 100 to 140 $yd^3$ (76-107 $m^3$)/hr. Water was supplied at 2600 igpm by a 6 by 6" Cornell 6HNTA pump powered by an Isuzu engine. In 2017, the 2.1 m (7 ft) trommel was moved to M2 Gold Mines Ltd.'s 60 Mile River claims and replaced with a smaller, 1.2 by 4.9 m (4 x 16 ft), New Zealand-style trommel that classifies to ⅜". The plant was fed by a 9 m (30 ft) conveyor and the sluice runs contain angle iron, boil box and hydraulic riffles. Water consumption is 850 US gal/min. Sluice water was acquired from the Indian River and effluent was settled in old cuts and discharged back to the Indian River. Clean-ups utilized a long tom and were completed on a table.

*A view of M2 Gold's mining operation on the lower Indian River. Cut sizes are determined according to excavator reach and the throw distance of coarse tailing by the conveyor. The wash plant is mounted on skids that are oriented parallel to the cut face and water supply to facilitate easy movement throughout a shift. The mobility of the sluice reduces pay transport to the swing of the excavator.*

**Surficial Geology and Stratigraphy** M2 Gold Mines Ltd. is mining on the lower Indian River where base-level change has caused the Indian River to down-cut into high-level gravel and bedrock. The total incision depth is approximately 61 m (200 ft) from the highest gravel terrace to the modern floodplain. Gravel characteristics differ between the highest terrace, intermediate terraces and the modern floodplain sediments.

#### High-level terrace

In general, the highest terrace deposits are not favoured placer gold targets and consist of well-sorted, stratified, cross-bedded, chert-rich cobble-pebble gravel. In at least one test pit on M2 Gold Mines Ltd.'s property, a quartz-rich gravel underlying the chert-rich gravel has been observed on the high-level terrace. This suggests multiple origins for the gravel on the high-level terrace. The stratigraphically older, quartz-rich unit, may be a locally derived, pre-glacial Pliocene gravel. Whereas, the well-sorted chert-rich gravel is likely a glaciofluvial outwash gravel derived from an early Pleistocene glaciation that spilled into the basin near its headwaters (Australia Creek).

#### Intermediate-level terraces

An intermediate-level terrace, 28 m (92 ft) above the modern river, consists of poorly sorted cobble-rich gravel on bedrock and was exploited in previous years. Erosional holes in the bedrock surface containing high-energy gravel were observed, but did not necessarily contain better gold concentrations. These poorly sorted deposits are overlain by a moderately sorted and stratified cobble-pebble gravel. The section is capped with a thin, poorly sorted, angular boulder-rich gravel. Gold is concentrated evenly within the section and is coarser at this level compared to placer gold in the modern floodplain sediments. Much of the gold is 20 to 40 mesh and contains small nuggets. This terrace deposit is interpreted as a glaciofluvial gravel that formed during an erosional phase of the early Pleistocene outwash flow within the drainage. It is not known if this glaciofluvial gravel is from the same or a separate glaciation that deposited the finer gravel on the highest terrace.

#### Modern Floodplain and low-level terraces

The 2015 exposure, near floodplain-level, consisted of 0 to 0.6 m (0-2 ft) of mixed decomposed bedrock and gravel (unit 1) at the base of the section. The bedrock surface can have undulations of up to 1 m (3 ft). Unit 2 consists of 0.6 to 2.7 m (2-9 ft) of imbricated cobble-pebble gravel and minor boulders up to 45 cm in length (unit 2) that fine upward into a sand layer. The thickness of this unit is variable depending on floodplain landforms that are buried by the uppermost unit. Unit 3, from 2.7 to 4.3 m (9-14 ft) is an overbank flood deposit consisting of mixed sand and silt. This unit forms the modern soil parent material. Both unit 1 and the lower portions of unit 2 are considered pay material. At floodplain-level the gold tends to be fine and 70% is between 40 and 60 mesh.

#### Placer Gold Distribution

According to M2 Gold Mines Ltd. and their experience from mining on the lower Indian River, the spatial distribution of placer gold in the incised meander bends does not always follow a 'text book' distribution. The common assumption is that bar-heads or the upstream end of a point bar will contain better concentrations of placer gold. While this is generally true it is not always the case. To explain the gold distribution near river level they suggest it may be necessary to understand gold distribution within the fluvial system that predated river incision. This gold-enriched channel was established during the Pliocene similar to the channels preserved on high-level terraces in Hunker and Bonanza creeks. The morphology of the Pliocene channel in the Indian River is unknown but M2 Gold Mines Ltd. suggests it may have been centrally located in the valley. This channel was subsequently reworked by a meandering river and depending on the location of meander bends relative to the central Pliocene channel the gold distribution may appear somewhat erratically dispersed in the modern meander bends. Reflection of the Pliocene placer gold distribution in the active fluvial system supports the resiliency of paleo-pay channels in an eroding fluvial environment.

**Bedrock Geology** The bedrock surface is smooth where present above the water-course level, and varies from blocky to pervasively weathered. Bedrock is quartzite and quartz-muscovite-calcite.

**Gold Characteristics** Gold is flat with a medium to high aspect ratio and occasionally contains quartz inclusions. The size distribution is 11% +20 mesh, 36% -20 mesh to +30 mesh, 20% -30 mesh to +48 mesh, 11% -48 mesh to +60 mesh and 22% -60 mesh. A few nuggets are also recovered. The fineness is 810. Heavy minerals consist of abundant garnet, minor magnetite and some cassiterite.


*M2 Gold is an industry leader in progressive reclamation. This aerial photo pair shows a section of the lower Indian River that was under full development in 2015. By September 2017, with mining nearly completed at this location, the coarse tailings have been leveled, contoured and capped with organics. The drainage channel was still being utilized for mining when this photo was taken and was planned for decommissioning in October.*

**Indian, a tributary of Yukon**

115O/14 2017: 63°47'46"N, 139°26'28"W

## McBurney, D., 1994-2017

Water License: PM14-047 (Active 06/2025)
Water License: PM04-412 (Expired 06/2015)
Active Producer (2015-2017) **Operation no. 67**

**Location** Indian River, 1.6 km downstream from the mouth of Ninemile Creek.

**Work History and Mining Cuts** Three miners worked 12-hour shifts. Mr. McBurney typically sluices between 50,000 and 100,000 $yd^3$/season. In 2017, multiple right limit cuts were worked including floodplain-level (flats) deposits and intermediate-level terrace deposits. There are floodplain-level sites located at the mouth of two small tributaries entering into the Indian River. The intermediate-level terraces have elevations between 13 and 26 m above the floodplain.

**Equipment and Water Treatment** Equipment present in 2017 included 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. This is one of the original excavator-mounted conveyors constructed in the Klondike in 1999. In awkward corners, an articulated John Deere 400 rock truck is used for hauling stripped material and pay. The wash plant consists of a 2.4 by 2.4 m (8 x 8 ft) wet hopper feeding a New Zealand-style trommel measuring 1.5 by 6.1 m (5 x 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 x 6 ft) lower section containing hydraulic riffles. Water for the plant is obtained from the Indian River using an 8 by 6" Cornell pump powered by an Isuzu engine. The plant processed 100 $yd^3$ (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** Floodplain-level deposits are generally shallow consisting of 0.6 to 2.4 m (2-8 ft) of pay gravel overlain by 1.2 to 4.6 m (4-15 ft) of overburden. Boulders are present in the pay gravel and the overburden mainly consists of silt, sand and fine gravel. Permafrost is pervasive in both the gravel and silty overburden and thawing is required prior to stripping. Removing vegetation allows the silt to thaw at a rate of 2.4 m (8 ft)/season. Where tributary streams enter the Indian River valley the pay material may be overlain by fan sediment containing coarser gravel. Drilling, stripping and test mining on a right limit intermediate-level terrace, 26 m above river-level exposed 1.5 m (5 ft) of cobble-pebble gravel that fines to a pebble gravel near the upper contact. The gravel is overlain by silt (colluviated loess) that increases in thickness into the hillside to as much as 18 m (60 ft). Near the outer rim of the terrace the gravel is intermixed with broken bedrock suggesting a bedrock cliff may have been undercut. No evidence of the cliff remains, however the bedrock surface slopes into the hillside and drops 4 m (13 ft) at its lowest level. Gravel thickness remains consistent into the terrace.

High-level gravel deposits are exposed throughout the property in road cuts and test pits. Two units are generally observed. Unit 1 is a quartz-rich gravel situated on a bedrock terrace level 47 m (154 ft) above river level. Evidence of old-timer exploration test

*An example of vegetation regrowth on an area of lower Indian River that was mined 18 years ago by Mr. McBurney. The tree stand consists of a mix of aspen, birch and white spruce, and the ground cover includes kinnikinnick, vetch and assorted grasses. Mining and reclamation experience by Mr. McBurney has determined that the best top coat to encourage tree regeneration is a mix of organic silts and gravel.*

*An aerial view of an Indian River bench deposit being prepared at the McBurney mine on lower Indian River. The bench is 26 m (85 ft) above the Indian River and has a bedrock surface that appears to be sloping into the hillside. A mobile conveyor is used for stripping the fine-grained overburden.*

pitting is present on ridges where the gravel-bedrock contact is accessible. Unit 1 is interpreted to be a Pliocene White Channel gravel-equivalent deposit. Unit 2 is a pebbly gravel containing polished black chert clasts. This unit is interpreted to be outwash gravel deposited during an early Pleistocene glaciation that spilled meltwater into Australia Creek from the Stewart River valley. This unit is likely correlative with the Klondike outwash gravel that overlies the White Channel Gravel at the mouths of Hunker and Bonanza creeks. Together, the two gravel units have a combined maximum thickness of 59 m (193 ft) on Mr. McBurney's property. Considering that any placer gold will likely lie in the lower part of unit 1, this thickness of gravel likely makes the deposit uneconomic. Development opportunities on the high-level terraces should focus on locating areas where unit 2 has been dissected by river downcutting. One of these areas was documented on the McBurney property and revealed bedrock, 2.5 m (8.2 ft) of coarse quartz-rich gravel (unit 1) overlain by 2 m (6.5 ft) of pebbly outwash (unit 2). In this location, erosion of much of the early Pleistocene and Pliocene section has greatly reduced the gravel thickness on the high-level bench and increased the economic potential. No information is known on the characteristics of a pay channel in deposits of this age from the Indian River. Given our knowledge of White Channel gravel pay streaks elsewhere in the Klondike, it should be assumed that a pay streak will have abrupt edges and may have been fully or partially dissected during river downcutting.

**Bedrock Geology** Bedrock varies from soft and decomposed to hard and blocky quartz-schist.

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

## Quartz, a tributary of Indian

115O/14 2015: 63°46'17"N, 139°21'20"W

### DNS Gold-Wash Canada Inc., 2014-2016

Water License: PM11-002-3 (Active 07/2021)
Active Producer (2015-2016) **Operation no. 68**

**Location** Indian River, right limit, at the mouth of Ophir Creek.

**Work History and Mining Cuts** First year of activity was 2014, where DNS Gold-Wash Canada Inc. operated with a crew of three miners. Sluicing occurred on the right limit of the Indian River and on a right limit bench. Activity from 2015 to 2017 is unknown but the operator's equipment remains present on site and appears to continue targeting bench tailings from the previous operator.

**Equipment and Water Treatment** Not reported.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is quartzite and quartz mica schist (YGS, 2017).

**Gold Characteristics** Not reported.

## Indian, a tributary of Yukon

115O/14 2017: 63°45'53"N, 139°21'01"W

### Renegade Gas & Oilfield Services Ltd., 2017

Water License: PM14-058 (Active 08/2025)
Active Producer (2017) **Operation no. 69**

**Location** Indian River, approximately 520 m upstream from the mouth of Ophir Creek.

**Work History and Mining Cuts** Renegade Gas & Oilfield Services Ltd. leased ground from Northern Exposures Inc. and operated under water license PM14-058. Six miners split shifts to operate 24 hr/day throughout their first active season on the Indian River in 2017. Several cuts were mined on the left limit of the Indian River.

**Equipment and Water Treatment** Equipment utilized in 2017 included an Hitachi Zaxis 250 LC excavator, a Caterpillar 312 excavator, a Caterpillar D9H bulldozer, and a John Deere 544J wheel loader. An oscillating double screen deck, fabricated by Arctech Circle Welding Services, was used to process material at a rate of 150 $yd^3$ (115 $m^3$)/hr. It has a 3 $yd^3$ hopper, 10.6 m (35 ft) tailings stacker, and two 2.1 by 2.4 m (7 x 8 ft) sluice runs with a boil box and stainless steel hydraulic riffles.

*Aerial view in 2016 of DNS Gold-Wash Canada Inc.'s operation on the right limit of Indian River.*

**Surficial Geology and Stratigraphy** Material mined by Renegade Gas & Oilfield Services in 2017 is a paleo floodplain deposit of a wandering river system. A river fill exposure on the left limit of the Indian River consists of two units. Unit 1, from 0 to 3.3 m (0-10.8 ft), is a pebble-cobble gravel with a cobble-boulder lag on bedrock. It is horizontally bedded, fines upward to a pebble dominated gravel and has a silty, medium sand matrix. A 0.5 m (1.6 ft) section of planar bedded sand is present between the contact of unit 1 and unit 2. Overlying the gravel is unit 2, from 3.3 to 5.3 m (10.8-17.4 ft), which is colluvium consisting of interbedded fine-grained sand and silt, loess and old workings that ranges.

**Bedrock Geology** Bedrock is blocky quartzite.

**Gold Characteristics** Gold recovered is very fine.

*New custom built wash plant on site in 2017 at the Renegade Gas & Oilfield Services Ltd. operation.*

## Indian, a tributary of Yukon

115O/11 2016: 63°44'35"N, 139°08'48"W

### Northern Exposures Inc., 2009-2017

Water License: PM15-062 (Active 06/2026)
Water License: PM04-446-1 (Expired 06/2015)
Active Producer (2015-2017) **Operation no. 70**

**Location** Indian River, Ruby and Kathleen creeks.

**Work History and Mining Cuts** Northern Exposures Inc. focused on a left limit bench of Kathleen Creek and a left limit bench of Ruby Creek in 2015 and early 2016. In the second half of the 2016 season, mining equipment was moved to the Indian River where virgin ground was discovered in a previously disturbed area on the right limit of the Indian River at the mouth of Quartz Creek. In 2017, exploration and development continued to target virgin ground in the disturbed areas near the mouth of Quartz Creek.

**Equipment and Water Treatment** Two Caterpillar D9L bulldozers are used for stripping and pushing pay towards the plant. A Hyundai excavator and a Komatsu PC750LC excavator are used for feeding the plant and removing tailings. A screen deck was utilized to process material at a rate of 125 $yd^3$ (96 $m^3$)/hr.

**Surficial Geology and Stratigraphy** The stratigraphy exposed in the Indian River cut in 2016 consisted of 3 units. Unit 1, from 0-0.6 m (0-2 ft), consists of a pebble-cobble gravel in a silty sand matrix. The gravel is poorly to moderately sorted, contains subround to rounded clasts and wood fragments. The unit reflects a high energy depositional environment. Unit 2, from 0.6 to 3 m (2-10 ft), consists of an oxidized, cross-bedded, pebble-rich gravel with silt lenses and logs. The gravel is moderately to well-sorted. Unit 2 reflects a meandering stream channel consistent with the modern Indian River. Unit 3, from 3 to 3.3 m (10-11 ft), consists of silt deposited during overbank flooding events and surface wash off the north-facing valley slope. This unit may have been thicker; previous stripping may have included some of unit 3. Both units 1 and 2 are processed for placer gold, and up to 0.3 m (1 ft) of bedrock was sluiced.

*Al McGregor and geologist Kevin Kivi pose in front of the mine cut on the Indian River. The cross-bedded pebble-rich gravel (unit 2) is exposed behind them.*

*Aerial view of Northern Exposures Inc. in 2016.*

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

**Gold Characteristics** Gold is mostly fine.

## Quartz, a tributry of Indian

115O/11 2016: 63°44'57"N, 139°06'52"W

### 535883 Yukon Inc., 2016-2017

Water License: PM11-010-2 (Active 07/2021)
Active Producer (2016-2017) **Operation no. 71**

**Location** Quartz Creek, lower left limit bench, at its confluence with the Indian River.

**Work History and Mining Cuts** In 2016, work focused on building camp, and stripping and testing an area of the bench near camp. A total of three miners were employed.

**Equipment and Water Treatment** Equipment utilized on site in 2016 included a Caterpillar 215 excavator, a Sumutomo SH60 excavator with a ½ $yd^3$ bucket, a Caterpillar DH8 bulldozer used for stripping, and a Michigan loader. The plant consisted of a 7.6 m (25 ft) trommel with a ½ $yd^3$ hopper and one sluice run measuring 0.7 m (2.5 ft) wide by 4.3 m (14 ft) long. The sluice run has two nugget traps, Hungarian riffles, and miners matting. The plant capacity is 30 to 50 loose $yd^3$ (23-38 $m^3$)/hr depending on the nature of the gravel. Water is 100% recycled.

*Mining a right limit bench on Quartz Creek, at the confluence of the Indian River in 2016 at 535883 Yukon Inc.'s operation.*

**Surficial Geology and Stratigraphy** The mine site is located on a bench on the left limit of Quartz Creek at the confluence with the Indian River valley. Gravel on the bench, where mining occurred in 2016, consisted mostly of Indian River influences. A section measured from the base consisted of unit 1 from 0 to 2.7 m (0-9 ft) of grey-oxidized, stratified and imbricated (flow to the west) pebble gravel. Unit 2, from 2.7 to 4.5 m (9-15 ft), is an imbricated, cobble-pebble gravel that is stratified and cross-bedded. Unit 2 is in erosional contact with unit 1, however it is uncertain whether it originates from Quartz Creek or the Indian River. The two gravel units are overlain by 4 m (13 ft) of muck consisting mainly of aeolian silt (loess) that disguises the morphology of the bench surface. Permafrost is widespread in areas overlain by the thick muck deposits.

**Bedrock Geology** Bedrock is quartzite, gneiss and amphibolite (YGS, 2017).

**Gold Characteristics** Not reported.

## Quartz, a tributary of Indian

115O/14 2016: 63°45'09"N, 139°07'37"W

### McNeil, G., 2005-2006, 2011-2017

Water License: PM14-015 (Active 07/2024)
Active Producer (2015-2017) **Operation no. 72**

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

**Work History and Mining Cuts** In 2016, work focused on the right limit of Quartz Creek (west of the dredge) near the confluence with the Indian River valley. Activity in 2017 continued on the right limit of Quartz Creek, mining a cut as a three person operation. A cut at the mouth of Quartz Creek, on the right limit of the Indian River valley was also excavated in 2017.

**Equipment and Water Treatment** A Caterpillar D9N bulldozer is used for pushing pay and a Caterpillar 235C excavator is used 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 quartzite, graphite-quartzite and quartz-muscovite-calcite-schist (YGS, 2017).

**Gold Characteristics** Not reported.

*Shaker deck and excavator present at Mr. McNeil's operation in 2016.*

## Quartz, a tributary of Indian

115O/14 2017: 63°48'32"N, 139°04'46"W

### Schmidt Mining Corp., 2009-2017

Water License: PM13-029 (Active 04/2024)
Active Producer (2015-2017) **Operation no. 73**

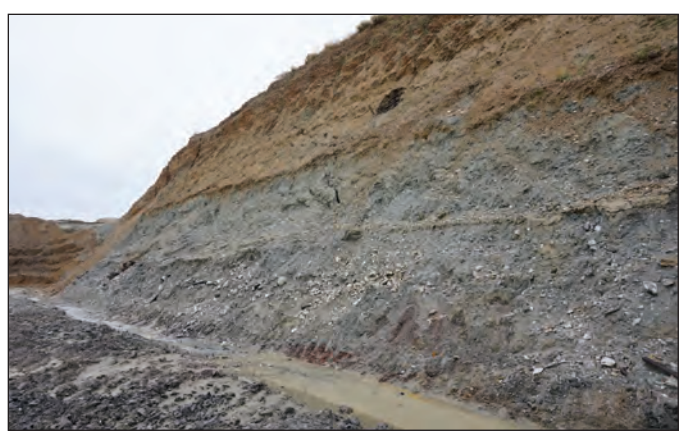
**Location** Quartz Creek, Little Blanche Creek and Canyon Creek.

**Work History and Mining Cuts** The Schmidt Mining Corp. base camp is located on Quartz Creek near the mouth of Calder Creek and operated twenty-four hours a day during the 2015 to 2017 mining seasons. Sixteen employees work at the mine. Activity from 2015 to 2017 focused on progressively mining the White Channel gravel bench on the right limit of Quartz Creek. Mechanical stripping used a combination of crawler tractors and conveyors placed in sequence to provide 183 m (600 ft) of transport distance. Stripping depth control is maintained using an auger drill. The bench is mined in creek-parallel strips beginning near the rim and working westward toward the hillside. The pay gravel is pushed to the plant using a crawler tractor.

Work continued on the lower left limit of Canyon Creek, a tributary to Little Blanche, and consisted of hydraulic monitoring and sluicing. A cut was also mined on the lower left limit of Quartz Creek.

**Equipment and Water Treatment** Equipment on site included two Caterpillar D11T crawler tractors, two Caterpillar D10N crawler tractors, one Caterpillar D11R crawler tractor, one Caterpillar D9L crawler tractor, one Caterpillar 349 excavator, two Hitachi EX700 excavators, one John Deer 450 excavator, four 40-ton 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. 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, totalling 7.3 m (24 ft) in length, were located on each side of the conveyor. The wash plant processed gravel at a rate of 200 loose $yd^3$ (153 $m^3$)/hr.

**Surficial Geology and Stratigraphy** Mining cuts on the Quartz Creek bench expose a complete section of the White Channel gravel. The deposit can be subdivided into three stratigraphic units. Unit 1, from 0 to 10 m



*A close-up view of the White Channel gravel section on the Quartz Creek bench. Bedrock is exposed at the base of the cut. Clusters of large quartz clasts are visible near the base of the section, which marks the pay gravel. The lower 2 m (6.5 ft) of gravel and 1 m (3 ft) of bedrock is sluiced. Old timer shafts and drifts are visible in the photograph. The section is approximately 30 m (98 ft) in height.*

(0-33 ft), is a distinctive greenish grey gravel that contains abundant cobbles and small quartz boulders near the bedrock surface. These large quartz clasts are a defining characteristic of the pay channel, which is said to measure 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. Near the mouth of Little Blanche Creek, exposures have revealed a highly undulatory and channelized bedrock surface, which supports an erosive emplacement history. Unit 2, from 10 to 25.6 m (33-84 ft), is a mixed unit of oxidized, crudely stratified, cobble-pebble gravel, bedded overbank silts, organics and loess. The overbank and loess beds tend to be discontinuous along the section and the gravel beds have a finer texture near the upper contact. The presence of overbank silt and organic deposits indicates proximity to floodplain margin environments. Unit 3, from 25.6 to 30.6 (84-100 ft), is a laterally continuous colluviated loess deposit.

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. The lower part of the muck section spans a time frame from approximately 80,000 to 115,000 years ago whereas the upper part of the section may be younger than 30,000 years (Zazula et *al*., 2016). Pleistocene fossil specimens from the overall deposit include steppe-bison, horse, mammoth, western camel, short-faced bear, brown bear, grey wolf, fox and Beringian lion.

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

**Gold Characteristics** The Quartz Creek bench gold fineness averages 750.

*Schmidt Mining Corp.'s wash plant situated on stripping piles near the rim of the Quartz Creek bench. The plant is capable of processing 200 yd$^3$ (153 m$^3$)/hr.*

## Little Blanche, a tributary of Quartz

115O/14 2017: 63°50'31"N, 139°06'56"W
115O/14 2016: 63°50'39"N, 139°05'48"W

### Sight Unseen Mining Company, 2008-2017

Water License: PM08-602 (Active 03/2019)
Active Producer (2015-2017) **Operation no. 74**

**Location** Left fork of Little Blanche Creek; approximately 1 km upstream from the mouth of the forks.

**Work History and Mining Cuts** In 2015 and 2016, both forks of Little Blanche Creek were mined. Activity was primarily focused on the right fork (looking upstream). Hydraulic monitoring, using high pressure water to accelerate the thaw of frozen black muck, was conducted on the left fork in 2016 and exposed a cut 250 m (820 ft) in length by 10 m (33 ft) wide. An additional cut was prepared for the following season. In 2017, mining focused on the left fork of Little Blanche Creek along both limits. With a two to three person crew, Sight Unseen Mining Company mined a cut 15 m (49 ft) wide by 182 m (600 ft) long, and sluiced approximately 10,000 $yd^3$ in 2017. At the end of the season, approximately 1.5 claims were stripped on both forks. Future plans include drilling the unnamed right limit tributaries upstream.

*A pile of bones stacked on a monitor at left fork Little Blanche Creek in 2016.*

*Mining activity on the left fork of Little Blanche in 2017, looking upstream. On the right side of the photo, you can see a bedrock high and the highly fractured bedrock. On the left side of the photo, massive ice, loess and the thin gravel is present.*

**Equipment and Water Treatment** A Caterpillar D8K bulldozer, a Caterpillar IT28G wheel loader, an Hitachi 270 excavator, and two Koehring rock trucks were utilized throughout 2015 to 2017. The wash plant consisted of an automatic, 12 $yd^3$ hopper that fed into a 1.2 m (4 ft) diameter by 3.6 m (12 ft) long trommel, screening to 5/8". Sluice runs consisted of a nugget trap followed by two runs, 0.9 m (3 ft) wide by 2.4 m (8 ft) long of expanded metal lined with unbacked miners moss. Water was supplied to the plant by a 6" pump which allowed for the trommel to process gravel at 40 loose $yd^3$ (31 $m^3$)/hr. Effluent was settled in a series of two ponds and water was 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** Two placer settings are mined in the Little Blanche drainage – modern gravel in the valley bottom and bench gravel. In previous years the left limit bench of the right fork was extensively mined and produced decent grades from the upper gravel. In 2017, a preserved section of the bench consisted of two units; unit 1 is White Channel gravel and appears to be sporadically preserved in the section. Unit 2 is a coarser gravel with an increased percentage of fines, which likely eroded and reworked the White Channel gravel. Gravel thickness on the bench is approximately 9 m (30 ft).

Gravel thickness is greater on the right limit than on the left limit of the left fork Little Blanche Creek. This could represent a deep channel, due to a bedrock gully or constraint, or be a function of the hydraulics of paleo-Little Blanche. Due to the nature of a monitoring operation, all gravel is sluiced and therefore the exact thickness of the gold-enriched zone in the gravel is unknown. A monitoring exposure on the left fork of Little Blanche in 2017 provided a stratigraphic section. Unit 1 at the base of the section is a thin, high energy flood deposit. The presence of mud, woody debris, angular clasts and isolated lenses of sand indicate a turbid environment that reworked pre-existing gravel in the drainage. Unit 1 is generally thin, and thickness varies between 0.6 and 1.8 m (2-6 ft) due to bedrock highs and the high energy stream hydraulics. Bedrock in the cut undulates up to 1 m (3.3 ft) in relief and causes spotty gold enrichment due to segregation of gold into natural traps in the bedrock surface. Unit 2, overlying the gravel, consists of 11.5 m (37.7 ft) of muck, including massive ice, loess, an abundance of wood fragments and clast-enriched beds with sand up to 0.5 m (1.6 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 horse (*Equus sp.*) and Woolly Mammoth (*Mammuthus primigenius;* Elizabeth Hall and Susan Hewitson, pers. comm.). 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*). Aside from fossils, they have also uncovered substantial old timer workings.

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

**Gold Characteristics** Gold is half coarse and half fine, contains 33% silver and has a bulk fineness of 650. The largest piece of gold recovered is one half ounce.

## Little Blanche, a tributary of Quartz

115O/14 2015: 63°50'47"N, 139°08'25"W

**Kreft, B., 2015-2017**

Water License: PM12-066-1 (Active 03/2023)
Active Producer (2015-2017) **Operation no. 75**

**Location** Left fork of Little Blanche Creek; upper; approximately 2.4 km upstream from the mouth of the forks.

**Work History and Mining Cuts** Operations were focused on their farthest downstream claim. A total of forty holes have been drilled on the property to help determine the pay channel. A cut 80 m (262 ft) long by 22 m (72 ft) wide was mined in 2015, and an additional 130 m (426 ft) long by 25 to 35 m (82-115 ft) wide area was stripped and prepared for sluicing in the 2016 and 2017 seasons.

**Equipment and Water Treatment** Equipment utilized at the property included an Hitachi ZX 200 excavator, a John Deere 892e excavator and a Case 330 excavator. The wash plant was a double deck 1.2 by 2.4 (4 x 8 ft) screen deck, able to process material at 33 $yd^3$ (25 $m^3$)/hr depending on the clay content. The sluice run is 1.2 by 2.4 m (4 x 8 ft) and configured with 1" angle iron riffles. A complete recycle system was established for mining due to the minimal water available in the drainage. A gold pan was used for clean-ups.

**Surficial Geology and Stratigraphy** The stratigraphic section of upper Little Blanche on the left fork consists of 1.2 to 1.5 m (3.9-4.9 ft) of a quartz cobble dominated gravel with variable clay content. Approximately 4.5 to 6.1 m (14.75-20 ft) of black muck and clay overlie the gravel. All gravel and approximately 0.5 m (1.6 ft) of fractured bedrock was sluiced.

**Bedrock Geology** Bedrock is quartzite, schist, gneiss and amphibolite (YGS, 2017).

**Gold Characteristics** Gold varies from chunky to flattened, and larger pieces may include quartz. The fineness is approximately 650.

## Canyon, a tributary of Little Blanche

115O/14 2017: 63°51'22"N, 139°02'01"W

### Canyon Creek Mining, 2015-2017

Water License: PM07-572 (Active 06/2018)
Active Producer (2015-2017) **Operation no. 76**

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

**Work History and Mining Cuts** Mr. Cail acquired the property on upper Canyon Creek in 2015. Together with 3 to 4 employees Mr. Cail mined 350 m (1,150 ft) of valley bottom in 2015, 380 m (1,250 ft) in 2016, and 350 m (1,150 ft) in 2017. Each year, Mr. Cail mined rim to rim. Upper Canyon Creek is in a narrow valley and requires excavators to “double throw” overburden up onto the valley side in order to create adequate mining space and reduce the issue of muck sliding into the cut. Most of the overburden is placed on the left limit (western) slope as it is gentler and less likely to remobilize. Once the muck overburden has dried adequately on the hill slope it is stabilized through compaction and re-contoured with a dozer. Revegetation of the stripped muck overburden occurs rapidly in upper Canyon Creek due to the high silt content of the overburden and well-managed re-contouring efforts.

**Equipment and Water Treatment** Equipment on site in 2017 included a John Deere 450 excavator for digging and loading pay, a Caterpillar D300B haul truck, a 30 ton Terex haul truck for delivering pay to the plant and a John Deere 644J loader for feeding the plant and removing tailings. Two other excavators, a John Deere 200C and 350D, are on site. A Caterpillar D9N bulldozer is used for reclamation. The wash plant is fed by a combination grizzly and conveyor feeder. The wash plant and sluice consist of two shaker decks. The upper deck classifies to 1¼" and feeds a large boil box. The bottom deck classifies to ⅜" and feeds two sets

*Upper Little Blanche where Mr. Kreft and his crew were active from 2015 to 2017.*

of two 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 utilize to manage process water in the narrow valley setting.

**Surficial Geology and Stratigraphy** The stratigraphy of Canyon Creek consists of three general units. The gravel unit on bedrock varies in thickness from 2.5 to 4.5 m (8-15 ft) although 2.5 m is generally more common. The gravel is a cobble-pebble texture with a silty, coarse sand to granule matrix and is poorly sorted. Clasts are angular to subangular and consist of schist and quartz fragments. The pay is described as being muddy and plant classification improves if the pay has had a chance to dry out prior to sluicing. This allows disaggregation to occur more readily. The lower 1.5 m (5 ft) is processed as pay and it is generally uneconomic to process the complete gravel deposit. Overburden consists of 2 to 8 m (6.6-26.2 ft) of muck with colluviated weathered bedrock layers.

**Bedrock Geology** Bedrock is chlorite schist with quartz veining.

**Gold Characteristics** There is very little black sand in the concentrate and garnets commonly occur with the gold. Gold fineness is 739.

## Stowe, a tributary of Montana

115O/11 2016: 63°37'29"N, 139°00'21"W
115O/10 2016: 63°37'45"N, 138°59'58"W

### CTS Earthwork Ltd., 2012-2017

Water License: PM07-594-2 (Active 10/2018)
Active Producer (2015-2017) **Operation no. 77**

**Location** Lower left limit Montana Creek and lower left limit Stowe Creek.

**Work History and Mining Cuts** A cut measuring 150 by 50 m (492 x 164 ft) on the left limit bench of Montana Creek, and a smaller cut measuring 45 by 40 m (148 x 131 ft) were completed at the mouth of Bismark Creek in 2015. A three person crew mined two locations in 2016. The first location was a left limit bench on Montana Creek, 450 m upstream from the mouth of Stowe Creek. The second location was on the left limit of Stowe Creek 550 m upstream from its confluence with Montana Creek. The cut on Stowe Creek was 182 m (600 ft) long by 40 m (131 ft) and the cut on the bench of Montana Creek was 25 by 300 m (82 x 984 ft). Activity in 2017 continued on the left limit bench of Montana, extending the previous year's cut to the mouth of Bismark Creek. A total of 108,000 $yd^3$ (82 500 $m^3$) was sluiced in 2017.

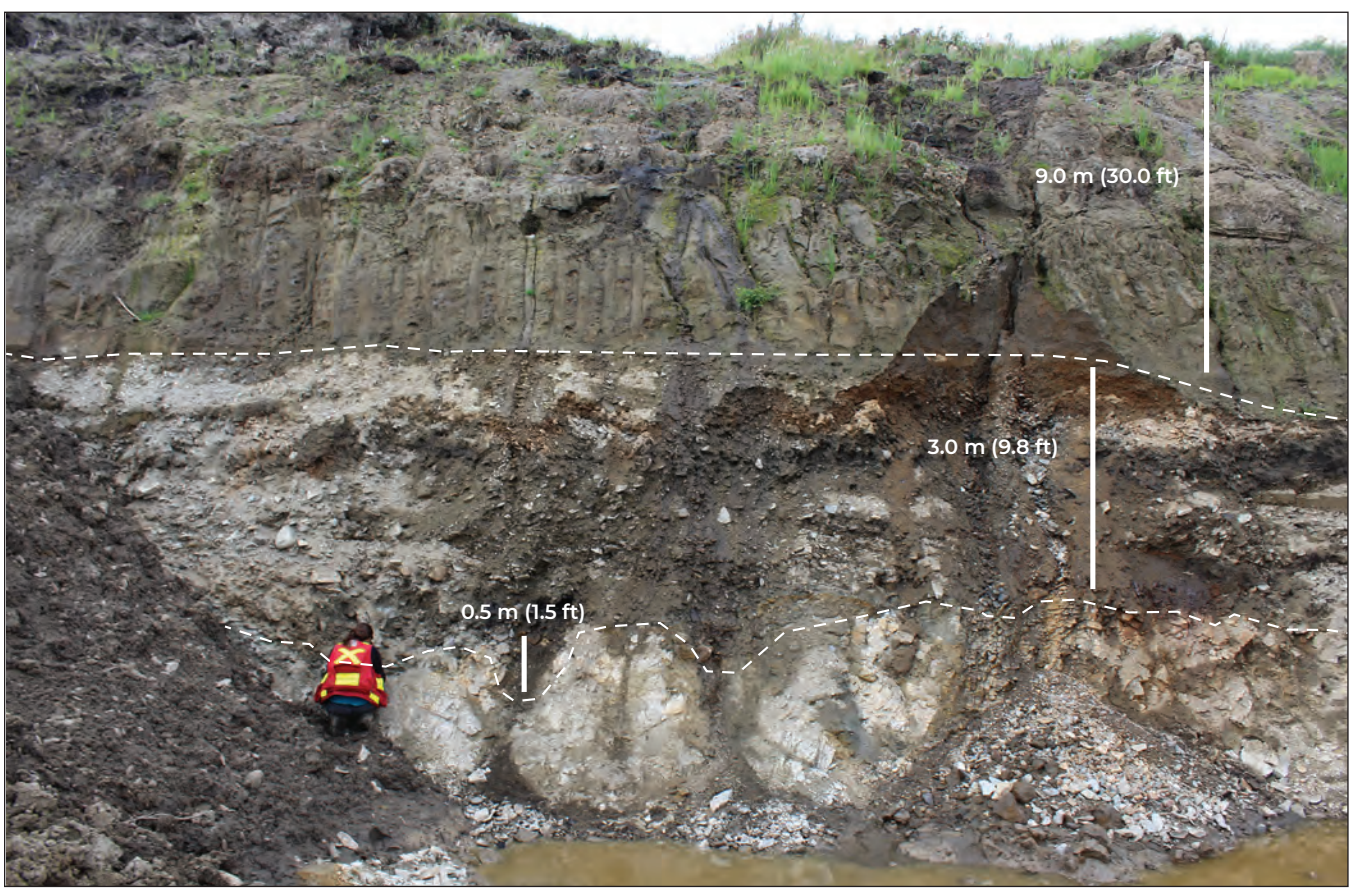
*A view looking down Canyon Creek over Mr. Cail's property. Multiple settling ponds are constructed in the narrow valley setting. Revegetation of stripped overburden is apparent along the right limit of the creek.*

**Equipment and Water Treatment** Heavy equipment located on site in 2016 included a Kobelco SK250 excavator, a Kobelco SK330 excavator, a John Deere excavator, a Caterpillar D9H bulldozer and a HM 400 rock truck. A 1.5 by 3.6 m (5 x 12 ft) Elrus screen deck with a 4.9 by 2.4 m (16 x 8 ft) hopper was able to process up to a maximum of 180 loose $yd^3$ (138 $m^3$)/hr, depending on material. It has two side sluices, with the upper sluice runs 1.1 m (3.5 ft) wide by 1.5 m (5 ft) long and the bottom runs 2.4 m (8 ft) wide by 3.0 m (10 ft) long. The runs contain 1" angle iron and expanded metal over nomad matting. A Klondike Series side tip long tom was used for clean-ups.

**Surficial Geology and Stratigraphy** The stratigraphic section at the mouth of Stowe Creek, on a left limit bench several metres off the valley floor, consists of 1.8 m (5.9 ft) of compact cobble-pebble gravel that contains approximately 70% cobble-sized material. The stream-terrace alluvium is clast-supported with a medium to coarse-grained sandy matrix, and clasts are subangular to subround. Maximum clast size is 0.3 m (1.0 ft) and angular fragments of bedrock are incorporated throughout the gravel section. Overlying the gravel is 5.4 m (17.7 ft) of reworked overbank material consisting of fluvial sand, silt and organics. Up to 0.9 m (3 ft) of gravel and 0.9 m (3 ft) of bedrock was sluiced on Stowe Creek. A distinct bedrock drop-off occurs in the cut, perpendicular to the creek, and could represent a bedrock fault.

From 2015 to 2017, the Montana Creek bench cut was expanded upstream. Several tiers of benches exist in the Montana Creek drainage and the mid-level bench is

*Screen deck processing gravel on the left limit of Stowe Creek in 2016, near its confluence with Montana Creek.*




*Left limit bench exposure of Montana Creek in 2016. It is a high energy fluvial gravel with bedrock surface undulations with a relief of up to 0.5 m (1.6 ft).*

the primary target. Extensive shafting evidence on the benches reveal that old timers were once heavily active in the drainage, possibly warranting the potential for future exploration work in the valley. The Montana Creek bench gravel is the result of a high energy fluvial system and is underlain by an undulating bedrock surface up to 0.5 m (1.6 ft) thick. A consolidated sand-rich green pay gravel is inset into the bedrock undulations and is overlain by 3.0 m (9.8 ft) of coarse gravel. The lateral accretion deposit is a coarse, cobble-rich gravel with angular to subangular clasts, and a medium to coarse sandy matrix. An abundance of decomposed schist clasts are incorporated throughout the section. In the upper part of the gravel, the material fines into an undulating bed of medium sand up to 0.3 m (1 ft) thick indicating that the environment became less energetic. The overburden stratigraphy consists of 9 m (30 ft) of muck and interbedded lenses of fine-grained sand. Sluiced material included 0.6 to 1.2 m (2-4 ft) of gravel and up to 1.5 m (5 ft) of bedrock.

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

**Gold Characteristics** The Montana Creek bench produces two different types of gold; flat and pounded, and coarse with quartz inclusions. Fineness on Montana Creek is 795. Stowe Creek gold has a fineness of 785 to 790.

## Indian, a tributary of Yukon

115O/10 2017: 63°38'25"N, 138°52'14"W

### Tamarack Inc., 2009-2017

Water License: PM08-618 (Active 05/2019)
Active Producer (2015-2017) **Operation no. 78**

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

**Work History and Mining Cuts** Mr. Beets operated opposite the mouth of Eureka Creek on the right limit of the Indian River. Work included both dredge and conventional mining techniques. The reconstructed Queenstake dredge operated for its first season in 2015 and continued to work through 2017. In 2017, Tamarack Inc. had three projects focused on their Indian River ground. Twenty-six employees covered two shifts/day.

**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. It uses 10 gallons of fuel per hour, and uses a two person crew. 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

*Tamarack Inc.'s dredge on the Indian River in 2017.*

loading pay, three Volvo A35D rock trucks are used to haul pay, and a Volvo PL3005D excavator is used to feed the plant. A Caterpillar 988B loader is used to remove tailings. Material is fed to the plant using a feeder grizzly and conveyor. The 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.

**Surficial Geology and Stratigraphy** In 2017, 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. 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 quartzite, schist, gneiss and amphibolite (YGS, 2017).

**Gold Characteristics** Not reported.

**Eureka, a tributary of Indian**

| | |
|---|---|
| 115O/10 | 2017: 63°35'15"N, 138°51'45"W |
| 115O/10 | 2017: 63°35'29"N, 138°51'27"W |
| 115O/10 | 2017: 63°32'41"N, 138°52'10"W |
| 115O/10 | 2017: 63°36'47"N, 138°47'14"W |
| 115O/10 | 2017: 63°37'14"N, 138°49'05"W |

### Fine Gold Resources Ltd., 2008-2017

Water License: PM17-017 (Active 06/2027)
Water License: PM15-067 (Active 02/2026)
Water License: PM10-001 (Active 06/2020)
Water License: PM06-536 (Expired 06/2017)
Water License: PM05-489 (Expired 11/2015)
Active Producer (2015-2017) **Operation no. 79**

**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 downstream and upstream of Eureka Creek.

**Work History and Mining Cuts** Fine Gold Resources continued to mine multiple locations on Eureka Creek and the Indian River. In 2017, the crew consisted of 42 personnel working two 12-hour shifts daily. In 2015 and 2016, the left limit of the Indian River was mined at two locations. A cut immediately below the mouth of Eureka Creek was targeted and measured 140 by 215 m (460 x 795 ft) on a low-level bench. The cut above the mouth of Eureka Creek measured 24 by 170 m (79 x 558 ft). In 2017, mining on the Indian River focused on the left limit above Eureka Creek where a pit measuring 90 by 160 m (295 x 525 ft) was excavated. On Eureka Creek, mining occurred at four general locations from 2015 to 2017. The left limit bench, one of the largest placer resources remaining in the Klondike, was mined in multiple locations. The goal was to determine the economic viability of the resource both laterally across the bench and longitudinally down the valley. In total, 4 cuts of various sizes have been excavated. The 2015 cuts measured 90 by 90 m (295 x 295 ft) and averaged 20 m (65 ft) in depth. In 2016, a cut measuring 50 by 100 m (164 x 328 ft) was mined. Early in 2017, sonic drill holes were completed along the bench to calibrate previous resistivity surveys and provide gold grade estimates for the bench resource. Also in 2017, two bench cuts were excavated, one at the upper end of the claim block and another near the forks. The upper bench cut measured 83 by 113 m (272 x 371 ft) and only reached bedrock near the bench rim. This pit will be completed in 2018. The pit at the forks measured 43 by 93 m (141 x 305 ft) and was completed in 2017. Near the modern channel of Eureka Creek work continued on the right and left limit 2.3 km up from the mouth. In these locations relatively modern Eureka gravel is overlain by a thick sequence of muck. A smaller mining operation was established on the upper left fork of Eureka Creek in 2015 and remained active through 2017. In 2016, exploration work consisting of geophysics, drilling and test mining was completed on a tributary to the upper left fork of Eureka Creek with the funding assistance from the Yukon Mineral Exploration Program.

**Equipment and Water Treatment** Fine Gold Resources Ltd. operates at a number of mining locations during a given season. In 2017, five operations with different equipment were active on the property. Some equipment, such as the Komatsu HM 400 rock trucks for hauling overburden and pay, is used interchangeably between operations.

On the Indian River left limit bench claims upstream of Eureka Creek, the mining pits were stripped using Komatsu 475A-3 and a 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 a Hitachi ZX350 excavator. Tailings were removed by the same Caterpillar D9H bulldozer and a Komatsu

WA500-1 loader. The sluice plant was upgraded in 2017 to obtain higher throughput volume, from a 2 m (7 ft) trommel to an Elrus shaker deck with a 1.5 by 4.9 m (5 x 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 x 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 140 ft (43 m) 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/hr), which dramatically reduced the cost of stripping.

Two plants operated in the main Eureka Creek valley downstream of the forks. Near the mouth of Eureka Creek, right and left limit side pay was stripped 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 x 12 ft) double screen deck, powered by a 30 hp motor. This plant has a capacity of 150 $yd^3$ (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 x 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 15 m (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 bulldozer for stripping. A John Deere 650D excavator was added to the fleet in 2017 to assist with stripping the 30 m (100 ft) deep paleochannel deposit. The excavator was also used to load pay in a Caterpillar 773b rock truck for transport to the mid-valley plant. This plant is a former 1.8 by 12 m (6 x 40 ft) dredge trommel, which has a throughput capacity of 125 yd³ (96 $m^3$)/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. Oversized material is removed by a 24 m (80 ft) stacking conveyor 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 left limit bench deposit continues up the right fork of Eureka Creek, where the fourth plant was operating. A Komatsu 475 Super bulldozer and a Komatsu 375-6 were used to strip the overburden down to a point where it became necessary to use an Hitachi ZX800 excavator, which was added to the fleet in 2017, and a Caterpillar D550 and a Caterpillar 773B rock truck to remove waste and haul pay to the plant. A Komatsu WA500-1 loader with a 7.5 yd³ bucket was used to load pay into a 20 yd³ capacity feeder, which conveyed the material to a 2 by 6 m (7 x 20 ft) trommel with a capacity of 150 yd³/hr (115 $m^3$). The trommel has 3 m (10 ft) of ¾" punch plate and the oversize material was removed by a 40 ft stacking conveyor and pushed with a Caterpillar D9H bulldozer. The minus ¾" material from the trommel flows through a reverser, a boil box and is divided into three separate sluice runs lined with expanded metal, a second boil box and hydraulic riffles. Water and slurry are settled through two in-stream ponds prior to being recycled back to the plant.

The operation on the upper left fork 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 x 20 ft) trommel sluice plant with a capacity of 75 yd³ (57 $m^3$)/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** The geology descriptions from the various cuts exposed at Fine Gold Resources property are subdivided according to general setting.

### Indian River

Exposures along the left limit of the Indian River near the mouth of Eureka Creek consist of buried low-level terrace deposits. Gravel thicknesses range between 1.5 and 3.6 m (5-12 ft) thick. Near bedrock the gravel has a pebble-cobble texture and fines upward into a dominantly pebble gravel. Paleo-bar tops are present in the upper gravel surface, which results in relief variation of up to 1.5 m (5 ft). Most of the gravel and 0.5 to 1 m (1.6-3.3 ft) of bedrock are processed for placer gold. The bedrock surface also undulates and high points are occasionally present. The surface undulations appear associated with variation in bedrock hardness. According to Fine Gold Resources, scour pools develop around the bedrock highs and contain higher placer gold concentrations. The low-level terrace gravel is overlain by 3 m (10 ft) of river silt containing organics and rooted trees. The loess-rich overburden can increase in thickness to 13 m (43 ft) towards the valley side.

### Eureka Creek Bench

The left limit bench deposit on Eureka Creek is over 5 km long and has an approximate width of 200 m. The bench deposit likely correlates with Pliocene White Channel benches found throughout the Klondike. Exploration and mining occurred in a number of locations between 2015 and 2017. Minor variations in the upper stratigraphic units occur depending on valley side contributions from slopes or small tributaries. The surface morphology of the bench deposit is sloped due to erosion, which means the gravel is thinnest near the bench rim and increases in thickness into the hillside (~28 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.

*A vertical exposure of the mine cut on the left limit of the Indian River upstream from the mouth of Eureka Creek. The Indian River gravel deposit ranges from 0.20 to 3 m (0.6-10 ft) in thickness and is overlain by 13 m (43 ft) of silt-rich muck. The gravel is coarsest at the base and fines upward. Approximately 1.3 m (4.3 ft) of bedrock is sluiced.*

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.

### Lower Eureka Creek valley bottom

In the lower reaches of Eureka Creek, modern valley deposits have been largely mined out. Remaining deposits consist of buried side pay along the left and right limit of the valley. An active mine exposure on the right limit described in 2015 consisted of unit 1, 0 to 1.5 m (0-5 ft) of poorly sorted, compact, cobble-rich gravel; unit 2, 1.5 to 2 m (5-6.5 ft) of oxidized, less compact, pebble-rich gravel that varies in thickness; and unit 3, 2 to 15.8 m (6.5-52 ft) of frozen muck containing massive ice lenses.

*An aerial view to the north of the bench cut on the upper right fork of Eureka Creek. Initial overburden extraction from the bench deposit was trucked to the rim of the bench, which created a platform for stacking pay gravel and an elevated position for the wash plant. Future cuts into the bench deposit can backfill mined zones, which will reduce haul distances and facilitate reclamation.*

**Upper Eureka Creek valley bottom**

Virgin placers in the valley bottom are currently being mined in the upper reaches of the left fork of Eureka Creek. Mining was focused at the confluence of 18 and 13 pups. Old shafts indicate that this area was previously exploited in the early 1900s. The deposits are relatively shallow and are frozen. Unit 1, from 0 to 3.5 m (0-11.5 ft), is a highly oxidized, poorly sorted, cobble-pebble gravel containing angular to subangular clasts. Boulders within the gravel tend to be subround suggesting a greater travel distance. Rare quartz boulders up to 110 cm in length are present. Unit 1 is considered the pay gravel. Unit 2, from 3.5 to 4.5 m (11.5-15 ft), is a bedded, organic-rich silt and sand. Approximately 0.5 to 1 m (1.6-3.2 ft) of bedrock is sluiced. The width of the mine cut is generally about 20 m at this elevation in the valley. Additional side gravel remains in the valley but tends to be thinner near the limits (<1.5 m). Some of the side channel gravel will be mined in 2018, particularly on the right limit of 13 Pup.

*A view to the north (downstream) of the valley bottom cuts in the upper reaches of the left fork of Eureka Creek. An enriched pay zone of locally sourced gold has been located on the right limit (see dotted line).*

*An aerial view to the north of the left limit bench on lower Eureka Creek. Active excavation (and backfilling) is occurring in the pits in the foreground. The bench deposit continues farther into the hillside on the left. Trees and ground cover have been stripped in preparation for another cut into the deposit in 2018.*

**Bedrock Geology** Bedrock is decomposed 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 | 2017: 63°34'59"N, 138°54'47"W |
| 115O/10 | 2017: 63°35'44"N, 138°59'37"W |

### 46205 Yukon Inc., 2012-2017
### 16406 Yukon Inc., 2017

Water License: PM16-077 (Active 07/2027)
Water License: PM11-068 (Active 05/2022)
Water License: PM15-053 (Active 09/2025)
Water License: PM06-525-1 (Expired 11/2016)
Active Producer (2015-2017) **Operation no. 80**

**Location** Left limit bench on the right fork of Eureka Creek, approximately 1.8 km downstream from the headwaters of the right fork.

**Work History and Mining Cuts** Primarily active as a two person operation, 46205 Yukon Inc. sluiced material in 2015 and 2017, but no sluicing occurred in 2016. A large cut on the left limit bench was continually mined upstream, throughout both seasons. The operator performed progressive reclamation and completed historic cuts by filling in and contouring the surface prior to moving upstream. In late 2015 an auger

drilling program was conducted on a prospecting lease on the left limit bench, farther upstream from their main operations. In 2017, Mr. Cahoon moved operations 4.2 km to the west into Steele Creek, a right limit tributary of Montana Creek. He stripped and actively sluiced a cut 2.3 km upstream from the confluence with Montana Creek.

**Equipment and Water Treatment** Machinery utilized at the operation included a Caterpillar D8-K bulldozer, a Caterpillar D9-H bulldozer, a Caterpillar D9-G bulldozer, an Hitachi 220 excavator and an Hitachi 400 excavator. In 2015, a screen deck was used to process material. Water was 100% recycled in a closed system. Clean-ups were conducted using a jig and table.

**Surficial Geology and Stratigraphy** A buried left limit bench deposit on Eureka Creek was the target for 46205 Yukon Inc. from 2015 to 2017. It is a substantial deposit that extends from the mouth of Eureka Creek, up the right fork and possibly carries on farther northwest. Over several years 46205 Yukon Inc. drilled to define the extent of the bench deposit, and determined that the bench stratigraphy consists of 20 m (66 ft) of gravel and up to 4 m (13 ft) of organic-rich loess overburden. The crudely stratified cobble gravel is approximately 5% boulders, 60% cobbles and 35% pebbles, and clasts are subangular with stratified beds of material that appear more subrounded. A sharp contact to the undulating bedrock surface is present and no mixing zone of decomposed bedrock and gravel appears to be present. Beds of fine-grained material are present through the section, with areas of silty-fine-grained sand up to 1 m (3.3 ft) thick. The pay gravel is defined as the lowermost gravel on the bedrock surface and up to 3 m (10 ft) of gravel is sluiced. Depending on the decomposition of the bedrock, up to 2.4 m (8 ft) is sluiced.

*16406 Yukon Inc. sluicing on Steele Creek in 2017. (Photo credit: Jim Leary).*

**Bedrock Geology** Bedrock is decomposed quartz-muscovite-schist.

**Gold Characteristics** Gold is coarse and hackly, as well as smooth, and has an average fineness of 700.

## Indian, a tributary of Yukon

115O/10 2017: 63°36'52"N, 138°45'53"W

### Rical Mining Ltd., 2017

Water License: PM10-031-2 (Active 02/2023)
Active Producer (2017) **Operation no. 81**

**Location** Indian River, left limit, approximately 3 km upstream from the mouth of Eureka Creek.

**Work History and Mining Cuts** Rical Mining Ltd. began operating under Little Flake Mining ULC's water license in spring 2017. A three person crew operated a daily 11-hour shift and completed nine cuts each approximately 32 by 35 m (105 x 115 ft). Throughout the season a total of 21,466 $yd^3$ were sluiced and 32,646 $yd^3$ were stripped. By the end of the 2017 season, a cut measuring 275 by 275 m (900 x 900 ft) had been stripped and was ready for sluicing in 2018.

**Equipment and Water Treatment** Heavy equipment utilized in 2017 included two Hitachi EX450LC excavators, an Hitachi Zaxis 225 excavator, a 37 m (120 ft) long 400 Komatsu conveyor, and two 2" and one 3" pumps used to dewater the cuts. A 1.5 by 3.3 m (5 x 11 ft) oscillating sluice deck with a 12 m (40 ft) tailings stacker was able to process up to 110 loose $yd^3$ (84 $m^3$)/hr. The custom fabricated plant was mounted on an excavator rotax framework to allow the plant to swivel and direct where the tailings were being stacked. Mr. Hollis, an innovative miner on Dominion Creek, drafted the design and fabricated this first version. Double sluice runs, both 2.4 by 2.4 m (8 x 8 ft), consisted of expanded metal. A Lassot live bed screen and live bed sluice run was used for clean-ups.

**Surficial Geology and Stratigraphy** The Indian River valley at the Rical Mining Ltd. property consists of 1.2 m (4.0 ft) of grey cobble-pebble gravel with subrounded to rounded clasts, predominately composed of chert and quartz. It is clast supported with 25% matrix of medium sand and silt, interbedded with discontinuous lenses of granules and silt. The lower grey gravel is

*Northwest view (downstream) of the Indian River valley at Rical Mining Ltd. in 2017.*

overlain by a thin unit, up to 0.6 m (2 ft), of reddish brown pebble gravel with cross-bedding, mud layers and medium sand. The 2017 section is a river fill deposit characterized by its slightly muddy and sand-rich properties. Overburden consists of sand and muck layers and ranges in thickness to a maximum of 3.0 m (10 ft). Up to 0.3 m (1 ft) of bedrock and all red rounded and grey cobble-rich gravel was sluiced, approximately 1.5 to 1.8 m (5-6 ft) in thickness.

**Bedrock Geology** Bedrock is blocky competent quartzite.

**Gold Characteristics** Gold is well-traveled and flat, and is associated with an abundance of garnets. Fineness is 840.

## Wounded Moose, a tributary of Indian

115O/10 2015: 63°37'05"N, 138°41'30"W

### Wounded Moose Mining Company, 2003, 2009-2017

Water License: PM14-036 (Active 02/2025)
Active Producer (2015-2017) **Operation no. 82**

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

**Work History and Mining Cuts** From 2015 to 2017, the only season when sluicing occurred was 2015. A crew of five people operated shifts twenty-four hours a day. Both the left and right limit were mined progressively upstream throughout 2015 and reclamation was completed at the end of the season. Site clean-up and reclamation occurred in 2016 and 2017.

**Equipment and Water Treatment** Equipment utilized for mining in 2015 included an Hitachi EX270LC excavator, a Caterpillar D9H bulldozer and a Caterpillar

966C wheel loader. A 1.5 m (5 ft) diameter by 6.1 m (20 ft) long New Zealand trommel was used to process up to 100 loose yd$^3$ (76 m$^3$)/hr of gravel, depending on the material. The trommel was fed by a custom built feed conveyor. The trommel has two side runs, both 6.1 m (20 ft) long and consisting of Hungarian riffles, a boil box, hydraulic riffles and expanded metal. A jig and gold pans were used for clean-ups.

**Surficial Geology and Stratigraphy** The mouth of Wounded Moose Creek generally consists of 3 m (10 ft) of cobble-pebble gravel containing 60% pebbles and 40% cobbles. An alluvial fan deposit at the mouth of the drainage is derived from material reworked by the Wounded Moose drainage. This auriferous gravel resource is moderately to poorly sorted and is matrix-supported with medium sand. Dominion Creek likely influenced the deposition of the fan deposit, causing a mixing at the mouth between material derived from Wounded Moose Creek and from lower Dominion Creek. The bottom 1.8 m (6 ft) of gravel was sluiced.

**Bedrock Geology** Bedrock varies between blocky quartzite to moderately decomposed schist.

**Gold Characteristics** Two different types of gold are recovered from Wounded Moose Creek; smooth and chunky. The fineness is 845.


*Coarse gold recovered from Wounded Moose Creek by Mr. Abermeth.*

**Indian, a tributary of Yukon**

| | |
|---|---|
| 115O/10 | 2017: 63°37'13"N, 138°41'50"W |
| 115O/10 | 2017: 63°36'49"N, 138°45'35"W |

### Little Flake Mining ULC., 2013-2017

Water License: PM10-031-2 (Active 02/2023)
Active Producer (2015-2017) **Operation no. 83**

**Location** Indian River valley below the confluence of Dominion and Australia Creek.

**Work History and Mining Cuts** In 2017 Mr. Schnabel mined two locations concurrently in the Indian River valley. The first cut, located across the valley from the mouth of Scribner Creek was 170 m (558 ft) wide by 375 m (1,230 ft) long. The second cut is located down valley, approximately 3.8 km upstream from the mouth of Eureka Creek, and measured 220 by 200 m (722 x 656 ft). A 400 by 70 m (1,312 x 230 ft) stripping program was conducted 1.7 km downstream from the mouth of Wounded Moose Creek, on the left limit of the Indian River valley. A crew of 18 people, operating on shifts covering 24 hours a day, sluiced the two locations and stripped throughout 2017.

**Equipment and Water Treatment** Equipment present on site in 2017 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 SD-600 inclined screen deck with pay. It is a 1.8 by 4.3 m (6 x 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.

*Actively sluicing at the main cut in 2017 on the upper Indian River valley.*

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 x 10" pumps. Effluent is settled in a series of four ponds and water is discharged back into the Indian River. A table was used for clean-ups.

**Surficial Geology and Stratigraphy** The upper Indian River cut consists of three units. Unit 1, from 0 to 0.9 m (0-2.9 ft) consists of pebble-cobble gravel with 60% cobbles, 40% pebbles and rare small boulders. It has a 30% matrix of silty, coarse sand, and sections of silt enrichment throughout the gravel. Clasts are subround to round and maximum clast size in the lowermost gravel is 0.2 m (0.7 ft). Pebble layers are predominately believed to be derived from Australia Creek due to the presence of black chert clasts. This chert-rich gravel represents reworked outwash gravel that was deposited by turbulent streams from the Cordilleran ice sheet that crossed the divide into the Indian River from the Stewart River basin (Nelson and Jackson, 2004). Also present in the lower unit are lenses of pebbly quartz-rich gravel that could represent reworked White Channel gravel, or the Ross gravel from Dominion Creek drainage. Unit 2, an overlying gravel from 0.9 to 3.4 m (2.9-11.2 ft), fines upwards with the upper part of the gravel being predominately pebbles with rare cobble-sized clasts. It is a moderately to well-sorted gravel with cross-bedding, is imbricated downstream and also appears to have an influence from Australia Creek. The change in pebble percentage and flow direction in the upper gravel may indicate that the material is largely derived from Australia Creek. Overbank material, woody debris, silty fine sand, and bedded organics present from 3.4 to 4.4 m (11.2 to 14.4 ft) comprise unit 3. Up to 0.6 m (2 ft) of bedrock and 0.6 m (2 ft) of the lowermost gravel is sluiced.

At the second mine site, the total depth to bedrock was 5.2 m (17 ft). The lowermost unit (unit 1), from 0 to 1.2 m (0-4 ft), consists of poorly sorted gravel with a high silt content that fines upward into a bedded silt unit containing organics. The upper half of the unit is oxidized and wood fragments are also present. This unit and 0.6 m (2 ft) of bedrock are considered pay material. The gravel contains 50% clasts consisting of cobble and pebble-size. Rare boulders up to 30 cm in length are present. The matrix component accounts for the remainder of the deposit (50%) and is dominantly a silty sand. Unit 2 from 1.2 to 2.4 m (4-8 ft) is a moderately to well-sorted, oxidized pebble-rich gravel. The lower contact with unit 1 is gradational whereas the upper contact with unit 3 is abrupt. Clasts are imbricated and slightly more angular than those in unit 1. The clast content equals 30% and consists of 70% pebbles and 30% cobbles with a maximum clast size of 16 cm. The matrix content is 70% and consists of medium to coarse sand. Unit 3, from 2.4 to 5.2 m (8-17 ft), is an organic-rich silt. Some organic layers appear to be peaty, forest floor horizons and are overlain by bedded silt. Unit 3 is a deposit that accumulated by siltation (run-off) off the north-facing valley slope. Radiocarbon dating suggests

*Second cut down valley from the main cut, where Little Flake Mining ULC had their second sluice plant in 2017.*

siltation onto the floodplain began 6,000 years ago at the onset of a cooling trend. A cooler climate may have increased permafrost cover and promoted surface runoff rather than percolation. The silt accumulation on the floodplain promoted permafrost growth in the valley bottom and the expansion of fen and bog wetlands.

**Bedrock Geology** Bedrock at the upper Indian River cut is 70% blocky quartzite and competent schist, and 30% decomposed schist. At the second cut down valley, bedrock is quartz-muscovite schist.

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

## Australia, a tributary of Indian

115O/10 2017: 63°36'51"N, 138°38'46"W

### Fry Exploration & Mining Inc., 2017

Water License: PM16-007 (Active 05/2026)
Active Producer (2017) **Operation no. 84**

**Location** Australia Creek.

**Work History and Mining Cuts** The first season of activity for Fry Exploration & Mining Inc. was in 2017. Work consisted of constructing an access road and an extensive resistivity geophysics program.

**Equipment and Water Treatment** Not reported.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is quartzite and quartz mica schist (YGS, 2017).

**Gold Characteristics** Not reported.

## Scribner, a tributary of Indian

115O/10 2017: 63°37'44"N, 138°43'18"W

### Lakeland Vegetation Management Ltd. Yukon Division, 2016-2017

Water License: PM16-038 (Active 12/2026)
Active Producer (2016-2017) **Operation no. 85**

**Location** Scribner Creek, approximately 1 km upstream from its confluence with the Indian River.

**Work History and Mining Cuts** Lakeland Vegetation Management first staked the claims on upper Scribner Creek in the winter of 2015. Throughout 2015 to 2017 activity has been focused on establishing access roads and conducting drill programs, largely focused on the left limit of Scribner Creek.

**Equipment and Water Treatment** Machinery present on site in 2017 included an Hitachi Zaxis 250LC excavator, an Hitachi EX75UR excavator to feed the plant and a small screen deck.

**Surficial Geology and Stratigraphy** Not reported.

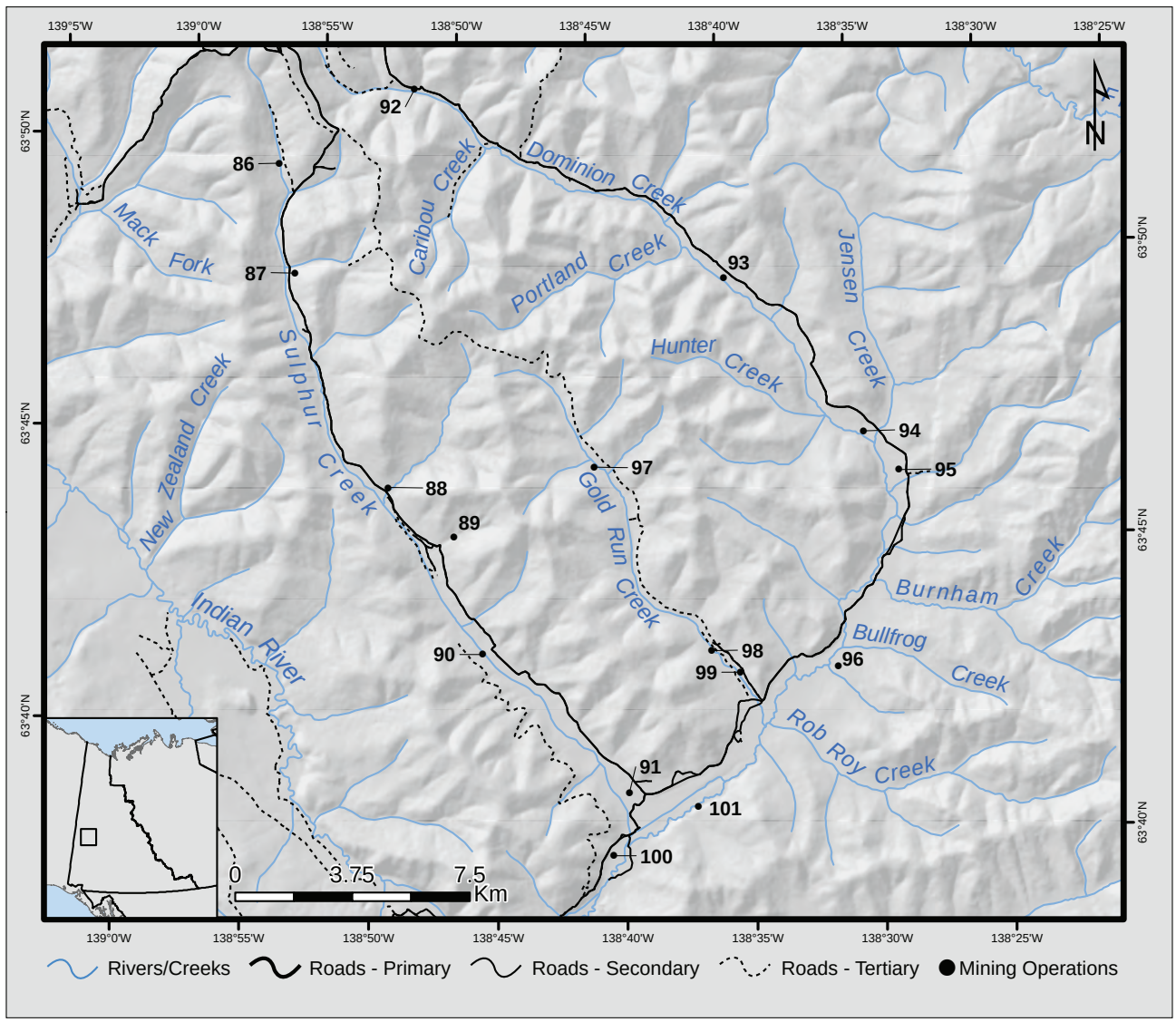
**Bedrock Geology** Bedrock is schist.

**Gold Characteristics** Not reported.


*Actively sluicing on the left limit of mid-Scribner Creek in 2017.*

# DOMINION-SULPHUR
## PLACER AREA

**SITES 86-101**




### LEGEND

86. Tunica Gold Placers
87. D.C. Klippert Exploration
88. Lucky Lady Placers
89. Dassylva, R.
90. Tusk Exploration Ltd.
91. Tatra Ventures Ltd.
92. Second Chance Gold Mines Inc.
93. Ace Placer Mining Ltd.
94. Law, D.
95. Hollis, A.
96. Dominion Gold Resources Ltd.
97. 44467 Yukon Inc.
98. T.D Oilfield Services Ltd.
99. Rical Mining Ltd.
100. Alluvium Gold Mining Inc.
101. Gimlex Enterprises Inc.

## Sulphur, a tributary of Dominion

115O/15 2016: 63°49'52"N, 138°56'24"W

### Tunica Gold Placers, 1987-2017

Water License: PM15-027 (Active 07/2025)
Water License: PM04-444 (Expired 05/2015)
Active Producer (2015-2017) **Operation no. 86**

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

**Work History and Mining Cuts** The Sprokkreeffs have owned and operated their claims located on upper Sulphur Creek for the past 30 years. Their cat mining operation has focused activity approximately 800 m (2,625 ft) upstream from the mouth of Green Gulch. Minimal work occurred in 2015, but activity increased in 2016 and 2017; operations were focused in several locations along the creek within a 500 m (1,640 ft) segment. A main cut has been progressively mined in the upstream direction for the past several years, with additional cuts mined downstream; Future operations will continue in the upstream direction towards the headwaters of Sulphur Creek where virgin areas remain. As a narrow modern valley, ranging from 6 to 8 m (20-26 ft) wide, annual hydraulic stripping is required to remove the frozen black muck to expose and mine the lateral extent of the gravel.

**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 60 loose $yd^3$ (46 $m^3$)/hr. A reservoir pond upstream of the mining cut was utilized to accumulate water and supply the plant using a 10" Gorman-Rupp pump. Effluent is settled in a series of in-stream settling ponds using the Sulphur Creek channel as a conduit.

**Surficial Geology and Stratigraphy** Upper Sulphur Creek is a narrow valley setting where the pay meanders in the valley bottom. The creek deposits have been extensively worked by old timers, and an abundance of shafts and drifts are evident. Frozen black muck overlies the Sulphur Creek fluvial gravel, and gravel thickness varies up to a maximum of 2.0 m (6.5 ft). The gravel is a clast supported pebble-cobble gravel with 30% cobbles and 70% pebbles. The matrix ranges between 10 and 15% and is primarily silt with minor fine to medium sand. Clasts are all subrounded and a cobble enrichment is present in the lower 1.0 m (3.3 ft). Frozen black muck, up to 7.6 m (25 ft), is present on both limits, with organic enrichment present throughout. All gravel was sluiced as well as 0.9 to 1.2 m (3-4 ft) of bedrock.

**Bedrock Geology** Bedrock is muscovite schist with variable weathering.

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

*The Sprokkreeff's operation on upper Sulphur Creek in September 2016.*

## Sulphur, a tributary of Dominion

115O/15 2016: 63°48'00"N, 138°55'42"W

### D.C. Klippert Exploration, 2007-2017

Water License: PM09-657 (Active 07/2020)
Water License: PM06-540 (Expired 05/2017)
Active Producer (2015-2017) **Operation no. 87**

**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 2015 to 2017. A 20 by 165 m (65 x 540 ft) wide left limit cut, approximately 300 m (984 ft) downstream from the mouth of Meadow Gulch, was mined in 2015. It was extended another 200 m (656 ft) upstream the following year and sluiced at the end of the season. Upstream, a left limit cut at the mouth of Meadow Gulch was monitored in 2016 and prepared for sluicing in 2017. Minimal work occurred on site throughout the 2017 mining season. Each year stripping and monitoring work further exposed the lateral extent of the gravel, as well as prepared cuts for the subsequent year.

**Equipment and Water Treatment** Equipment on site includes a John Deere 450D LC excavator, a Caterpillar D8K bulldozer 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, has a ¾" screen, and is capable of processing up to 75 loose $yd^3$ (57 $m^3$)/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) hydraulic riffles and 0.9 (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.

*Monitoring a cut below the mouth of Meadow Gulch, on the left limit, at D.C. Klippert Exploration in 2015.*

**Surficial Geology and Stratigraphy** Two different types of placer deposits are present at the mouth of Meadow Gulch on upper Sulphur Creek and consist of stream gravel and a low-level creek terrace. The stream gravel, unit 1, is up to 2.0 m (6.6 ft) thick, and consists of a subrounded to subangular cobble-pebble gravel with an abundance of quartz clasts. Zones of gold enrichment are present at the bedrock contact, ranging in thickness from 0.9 to 1.8 m (3-6 ft), and identifiable by its slightly coarser grain size. Unit 2, consists of 13 m (43 ft) of loess with 10% massive ice, interbedded lenses of fine sand, tephra, and organics. Closer to the mouth of Meadow Gulch the gravel contains more material derived from Meadow Gulch and an alluvial fan deposit was observed overlying the Sulphur Creek gravel. All gravel was sluiced.

**Exploration Potential** With up to 15 m (49 ft) of black muck overlying the gravel, the potential for buried creek terraces are present in this area and identified through historic YCGC drilling from the 1950s. Historic drill data indicate that the best pay is in the center of the valley, but potential exists in the side pay and in the underexplored prospect of several terrace levels present on left limit of Sulphur Creek.

**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 2017: 63°44'30"N, 138°50'55"W

### Lucky Lady Placers, 1980-2017

Water License: PM14-006 (Active 08/2024)
Active Producer (2015-2017) **Operation no. 88**

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

**Work History and Mining Cuts** Lucky Lady Placers has held ground on mid-Sulphur Creek for nearly 40 years. Mining has been consistent at Lucky Lady Placers for the past three seasons, with the majority of activity occurring on Brimstone Gulch. In 2015, the four person operation focused on the right limit of lower Brimstone Gulch. Throughout the following 2016 season, a three person crew stripped and sluiced on the left limit of Sulphur Creek and also completed a cut on lower Brimstone Gulch. Two locations were mined in 2017 by a one-person operation, the first 300 m (984 ft)

upstream of Brimstone Gulch on the right limit (looking downstream), and a left limit Sulphur Creek cut beside the road. Pay was transported from both cut locations and sluiced in the Sulphur Creek valley bottom.

**Equipment and Water Treatment** Equipment located on site in 2017 included John Deere 370 and 450 excavators, a Caterpillar 980C wheel loader, two Caterpillar D9 bulldozers, and two Terex TA 40 rock trucks. A screen deck was fed with a 46 m (150 ft) conveyor and able to process up to 100 loose $yd^3$ (76 $m^3$)/hr. Two sluice runs, each 6.0 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.

**Surficial Geology and Stratigraphy** The right limit of lower Brimstone Gulch has been extensively worked over the past few years, exposing both Brimstone Gulch gravel and gravel at the mouth of the gulch that was influenced by the Sulphur Creek drainage. A right limit intermediate bench of Brimstone Gulch exposed 0.9 to 1.5 m (2.9-4.9 ft) of gravel and 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.

*An aerial view, looking to the southwest, showing the confluence of Brimstone Gulch and Sulphur Creek. Lucky Lady Placers is mining a right limit bench on lower Brimstone Gulch that likely extends some distance upstream.*

## Unnamed, a tributary of Sulphur

115O/10 2017: 63°43'46"N, 138°48'10"W

### Dassylva, R., 2016-2017

Water License: PM16-063 (Active 04/2027)
Active Producer (2016-2017) **Operation no. 89**

**Location** Unnamed left limit tributary, 6.5 km downstream from 2 Below Pup.

**Work History and Mining Cuts** Mr. Dassylva staked a prospecting lease on the left limit tributary in the spring of 2016, with activity for that first season consisting of ground surveying and panning surface gravel. After converting the lease into claims in the spring of 2017, activity included road building, stripping, and testing on the middle reaches of the tributary. Stripping on the left limit of the tributary occurred 1.2 km upstream, near the lower end of Mr. Dassylva's claims. Future plans for the property include drilling to determine the gravel thickness, and bulk sampling once an excavator is acquired.

**Equipment and Water Treatment** A Caterpillar D6 bulldozer and a screen deck with a 1" screen were utilized in 2017.

**Surficial Geology and Stratigraphy** Minimal exposure existed on the creek in 2017; overburden is expected to exceed 3 m (10 ft) and gravel thickness is unknown.

**Bedrock Geology** Bedrock is mapped as quartzite, gneiss, schist and amphibolite (YGS, 2017).

**Gold Characteristics** Not reported.

## Sulphur, a tributary of Dominion

115O/10 2017: 63°41'48"N, 138°46'37"W
115O/10 2015: 63°42'33"N, 138°47'58"W

### Tusk Exploration Ltd., 2015-2017

Water License: PM14-027 (Active 09/2024)
Active Producer (2015-2017) **Operation no. 90**

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

**Work History and Mining Cuts** Tusk Exploration Ltd. established an agreement in 2014 with the claim owner, Mr. Kruger, to mine his ground. Mr. Kruger first staked the ground in 1971 and mined every season until 2014. Beginning in 2015, Tusk Exploration Ltd. first opened up ground on the claims farthest downstream and have been active in that vicinity for the past three seasons. Two large cuts were mined in 2015, a left limit cut approximately 30 by 182 m (100 x 600 ft), and a right limit cut approximately 30 by 304 m (100 x 1000 ft). In 2016, a right limit cut, approximately 50 by 300 m (164 x 984 ft), situated on a low-level bench was mined. In 2017, mining with a three-person crew operating a 12-hour shift, a right limit cut measuring 60 by 125 m (196 x 410 ft) was completed and another 160 m (524 ft) was stripped upstream.

**Equipment and Water Treatment** Heavy equipment located on site in 2017 included a John Deere 330 excavator, a Caterpillar 245 excavator, a Caterpillar 980 wheel loaders and a Caterpillar D10N bulldozer. A custom built trommel was able to process material at a rate of 80 loose $yd^3$ (61 $m^3$)/hr.

**Surficial Geology and Stratigraphy** The stratigraphy on the right-limit cut consists of four units. Unit 1 is a decomposed quartz-feldspar gneiss, which becomes more competent after a depth of 1.0 m (3.3 ft). Unit 2 is a continuous mixing zone between the weathered gneiss bedrock and the upper gravel unit. The mixing zone undulates and has a thickness ranging between 0.3 and 0.6 m (1.0 & 2.0 ft). The unit consists of medium sand that contains subrounded to rounded pebble and cobble-sized clasts. Overlying the mixing zone is unit 3, a pebble-cobble gravel from 0.6 to 2.4 m (2.0-7.9 ft) thick that contains 60% pebbles and 40% cobbles. It is a light grey gravel known as "Ross gravel" and is matrix-supported with medium sand and minor silt, is fairly loose, and has rare boulders up to 0.3 m (1.0 ft) in length. Ross gravel is an incised-valley gravel and despite its similarity to White Channel gravel, is significantly younger (Froese *et al.*, 2001). Unit 4, from 2.4 to 8.0 m (7.9-26.2 ft), consists of interbedded fine-grained sand and silt, and loess. Up to 1.5 m (5 ft) of gravel and 0.6 m (2 ft) of bedrock was sluiced.


*Excavator feeding the custom fabricated trommel at Tusk Exploration Ltd. on lower Sulphur Creek in 2017.*

**Bedrock Geology** Bedrock is decomposed quartz-feldspar gneiss.

**Gold Characteristics** Not reported.

## Sulphur, a tributary of Dominion

115O/10 2017: 63°39'41"N, 138°40'25"W

### Tatra Ventures Ltd., 2010-2014, 2017

Water License: PM11-017 (Active 09/2021)
Active Producer (2017) **Operation no. 91**

**Location** Sulphur Creek, at its confluence with Dominion Creek.

**Work History and Mining Cuts** The 2017 season was Tatra Ventures Ltd.'s first active year back on lower Dominion Creek since 2013. A crew mined a cut 220 by 250 m (720 x 820 ft), which was an extension of a cut completed in 2013.

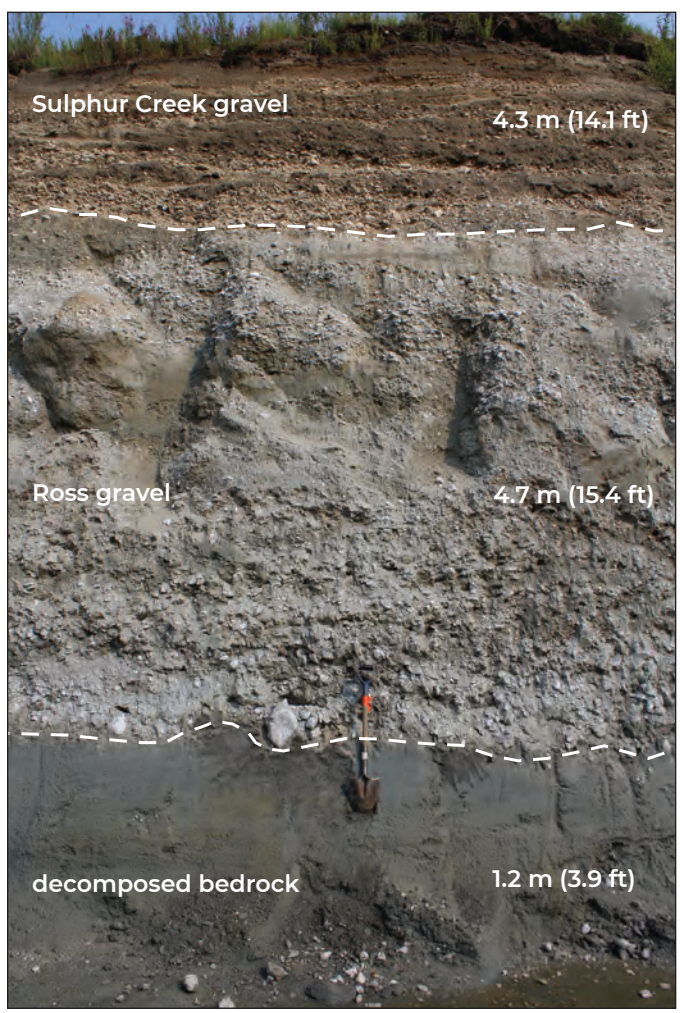
**Equipment and Water Treatment** Equipment on site in 2017 included three John Deere excavators, two Caterpillar D400D rock trucks, a Caterpillar D8H bulldozer and a Volvo L220E wheel loader. A 1.8 by 11.6 m (6 x 38 ft) trommel with ½" punch plate, and one 4.9 m (16 ft) wide run with boil boxes and expanded metal, processed gravel at a rate of 150 loose $yd^3$ (115 $m^3$)/hr. For clean-ups, concentrates were screened to minus ⅜", and then fed through live bottom sluices and a long tom.

**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. A lack of mixing between the weathered bedrock and Ross gravel suggests that bedrock decomposition occurred after burial. 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), 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 beds. 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.

The Ross gravel, an incised valley-fill gravel, hosts the majority of gold on lower Sulphur Creek. Modern stream gravel overlying the floors of lower Sulphur Creek are thick, up to 4 m (13 ft) and could be due to the fluvial fan process 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 fine grained and has a fineness of 840.




*Exposure on the upstream boundary of Tatra Ventures Ltd. cut in 2017 on lower Sulphur Creek. The shovel used for scale is 1 m (3.3 ft).*

## Dominion, a tributary of Indian

115O/15 2016: 63°51'21"N, 138°51'26"W

### Second Chance Gold Mines Inc., 2014-2017

Water License: PM14-043-1 (Active 03/2020)
Active Producer (2015-2017) **Operation no. 92**

**Location** Dominion Creek, 240 m upstream from Remington Pup confluence.

**Work History and Mining Cuts** Second Chance Gold Mines Inc. staked their claim on Dominion Creek in 2014. Mr. Gagne and Mrs. Colgan conducted exploration and testing beginning in 2014, but the first year of sluicing material was in 2015. They processed historic Dredge 12 tailings from the middle of the valley, as well as sluiced material from a mid-level creek terrace on the left limit. Dredge 12 tailings were of interest to the operator due to its small bucket line; a small bucket line increases the likelihood of discovering untouched gravel on bedrock, as well as spillage material from it and the coarse boulder-rich gravel in the upper reaches of Dominion Creek. In 2015, a cut 30 by 17 m (98 x 56 ft), was mined on the left limit bench. An untouched side pay section was the target throughout the 2016 season. Activity in 2017 consisted of drilling the right limit side pay, where they located a channel and wedge of untouched gravel missed by the dredge. Side pay appears to extend the length of the claim and will be further explored in 2018. Minimal sluicing occurred on the property in 2017 as the operators were busy drilling additional properties.

**Equipment and Water Treatment** Equipment in 2015 included an Hitachi UH122 excavator with a 2 $yd^3$ bucket, mini excavator, and a shaker screen deck able to process up to 25 loose $yd^3$ (19 $m^3$)/hr. The plant had a 2.4 by 0.6 m (8 x 2 ft) wide sluice run that varied between expanded metal and riffles. Water was supplied to the plant via a 4" pump, and water was 100% recycled in a closed system. In 2016, a Caterpillar D8 bulldozer was added to the fleet to assist in stripping and moving material towards the wash plant. Clean-ups were conducted with a long tom utilizing a 2" pump and a pan.

**Surficial Geology and Stratigraphy** Left limit exploration resulted in the discovery of several modern creek terrace levels on the left limit of Dominion Creek, preserved between Lombard and Remington Pup. The lowest terrace is at 740 m elevation and two additional tiers extend up to 760 m elevation. Activity in 2015 exploited the initial bench level that consisted of a gravel containing a 40% cobble/60% pebble ratio, 1.6 m (5.2 ft) thick, is loose, and clast-supported. Matrix is approximately 25% and consists of fine to coarse sand. Clasts are subround to subangular, and a boulder enrichment is present on bedrock that contains approximately 10 to 15% quartz. The gravel is imbricated and preserves a down-valley trajectory. Overlying the undulating gravel package is 3 m (10 ft) of loess that has 5% clast enrichment. Gravel thickness on the bench varied between 1.2 and 1.8 m (4 & 6 ft); all gravel was sluiced, and a maximum of 0.2 m (0.5 ft) of bedrock was also processed.

The lateral extents of the benches are unknown. Down-cutting of paleo-Dominion Creek formed the terraces and aggradation could have been influenced by the amount of sediment in the drainage, the stream gradient, and the climate that affected the amount of water flowing in the system at the time. The boulder enrichment on bedrock likely represents a coarse lag that accumulates during reworking. Further investigation of the higher level terraces is suggested.

**Bedrock Geology** Bedrock varies from competent micaceous schist to moderately clay altered schist.

**Gold Characteristics** Gold is all fine, very bright, and fineness ranges from 790 to 800. The largest nugget recovered was 10 g and sluiced out of historic Dredge 12 tailings.

*Excavating the left limit bench of Dominion Creek, upstream from Remington Creek confluence, at Second Chance Gold Mines Inc. in 2015.*

## Dominion, a tributary of Indian

115O/15 2016: 63°48'39"N, 138°38'43"W

### Ace Placer Mining Ltd., 1971-2017

Water License: PM16-067 (Active 04/2027)
Water License: PM14-064 (Active 03/2025)
Water License: PM04-421 (Expired 05/2015)
Active Producer (2015-2017) **Operation no. 93**

**Location** Dominion Creek, between Lemare Gulch and Nevada Creek.

**Work History and Mining Cuts** Mr. A. and Mrs. N Sailer first began mining Dominion Creek in 1971; they have been a prominent operator in the Klondike since. Mining as a family, the Sailers have focused operations in mid to upper Dominion Creek, until the 2017 season when they also mined Hunker Creek, at the mouth of Last Chance Creek.

The mouth of Portland Creek, on the right limit of Dominion Creek, was the focus for Ace Placer Mining Ltd. With the aid of YCGC historical records, they were able to identify a bedrock high, which prohibited the dredge from efficiently mining the gravel section to the bedrock surface. Approximately 187,000 $yd^3$ were sluiced each season in 2016 and 2017. A left limit cut between Robinson Pup and Seventy Two Pup was sluiced. Previously worked by old timers, cat miners and the dredge, it proved economic to sluice the entire gravel section plus 0.3 m (1 ft) of bedrock. Another target, 200 m (656 ft) downstream was a left limit bench cut. A series of four terraces are present on the left limit of Dominion Creek, which has been explored for several seasons by the Sailers.

**Equipment and Water Treatment** Equipment utilized by Ace Placer Mining Ltd. in 2016 included three Caterpillar 235 excavators, a Caterpillar 225 excavator, two Caterpillar D9 bulldozer, a Caterpillar D10 bulldozer, four Caterpillar 980 wheel loaders, and one International 350 Payhauler. A 1.5 by 4.3 m (5 x 14 ft) El Russ double screen deck, with a 16 $yd^3$ hopper and 9.0 m (30 ft) feeding conveyor, was able to process up to 120 loose $yd^3$ (92 $m^3$)/hr. Four sluice runs, 0.8 by 3.0 m (2.5 by 10 ft)

*Wash plant set-up at upstream cut in 2016, where mining occurred both in the valley floor and on a low-level left limit bench (Photo credit: Ross Sailer).*

*Aerial view in 2015 of Ace Placer Mining Ltd. base camp downstream from Nevada Creek, on the left limit of mid-Dominion Creek.*

long were lined with all expanded metal. Water was supplied to the plant via a 10" Dayton-Dowd pump and water was 100% recycled. A jig and wheel were used for clean-ups.

**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 consists of 3.7 m (12 ft) of fine-grained overbank and aeolian material (loess).

The pay streak appears to meander across the lateral extent of the Pleistocene terrace exploited in 2016 and contains cassiterite (tinstone). Gold derived from terraces at both higher and lower elevations appears to be finer, which could be a function of stream hydraulics and the position of the pay streak in the valley at the time of downcutting and terrace evolution.

**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 2017: 63°46'16"N, 138°32'43"W

### Law, D., 2016-2017

Water License: PM17-052 (Active 06/2027)
Active Producer (2016-2017) **Operation no. 94**

**Location** Dominion Creek, left limit, 450 m upstream from the mouth of Jensen Creek.

**Work History and Mining Cuts** Mr. Law purchased the left limit Dominion Creek bench claims in 2016. In 2017 the property was optioned to Mr. Fuerstner who operated a daily 12-hour shift. Stripping and a minor amount of sluicing occurred on the property.

**Equipment and Water Treatment** Equipment present on site in 2017 included two excavators, a bulldozer and wash plant. Water was acquired from Dominion Creek and no discharge occurred as the system was 100% recirculated.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Not reported.

**Gold Characteristics** Not reported.

## Dominion, a tributary of Indian

115O/15 2017: 63°45'40"N, 138°31'12"W

### Hollis, A., 2001-2017

Water License: PM13-010-1 (Active 04/2023)
Active Producer (2015-2017) **Operation no. 95**

**Location** Dominion Creek, left limit, between Jensen Creek and Kentucky Creek.

**Work History and Mining Cuts** Mr. Hollis is an innovative miner who has fabricated several tools that have enabled him to mine more efficiently and economically. The 'Hollis Hauler' is the name given to his track-mounted conveyor design that he utilizes on Dominion Creek and has also built for other operators. Another innovative piece of equipment includes a solar powered pump and an automatic feeding hopper attached to his shaker deck for a steadier feed rate. With the conveyors, he can move material for as little as 20 cents/yd over a distance of 36 m (120 ft), which greatly decreases his operating costs. Starting his career as a driller, Mr. Hollis has been mining on mid-Dominion Creek since 2001. Throughout 2015 no sluicing occurred, as activity focused on stripping and preparing a large cut for sluicing the following season. Approximately 610 m (2000 ft) was stripped in 2015 using custom fabricated 33 and 44 m (110 & 130 ft) conveyors mounted on excavator chassis. In 2016 and 2017, operations were focused on a left limit fluvial terrace, between Jensen Creek and Kentucky Creek, and situated approximately 15 m above the modern creek level. Each season a three-person crew sluiced 50,000 $yd^3$ (38 200 $m^3$) of material. An additional cut, approximately 50 by 120 m (164 x 394 ft), at the mouth of Jensen Creek was sluiced in 2016. A large cut, measuring 60 by 1220 m (200 x 4,000 ft), was completed at the end of the

2017 season. Stripping occurred farther downstream on Dominion Creek, upstream from the Sulphur Creek confluence, under Mr. Hollis' water license PM15-026. Plans for next year include exploiting and exploring additional intermediate terraces on the left limit of Dominion Creek.

**Equipment and Water Treatment** Equipment utilized by Mr. Hollis in 2017 included John Deere 892E LC, 370 and 450 excavators, a Komatsu PC300 excavator, and two conveyors. Mr. Hollis fabricated the excavator chassis mounted conveyors, one 33 m (110 ft) and the other 40 m (130 ft) long. The wash plant consisted of a 1.5 by 3.3 m (5 x 11 ft) oscillating screen deck with $^{7}/_{16}$" screen, and 12 m (40 ft) tailings stacker, and was able to process up to 110 loose $yd^3$ (84 $m^3$)/hr. Adding an excavator chassis to the wash plant, another idea designed and fabricated by Mr. Hollis, allowed the plant and tailing stacker to move effortlessly. The efficiency of the plant was increased by 25% by mounting a hydraulic hopper feeder to the plant tracks. Sluice runs 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 0.6 m (2 ft) of expanded metal at a steeper grade. Water was acquired from Dominion Creek and supplied to the plant

*Aerial view of the large cut on the left limit fluvial terrace, downstream from the mouth of Jensen Creek. The view is looking upstream towards the confluence of Dominion and Jensen Creek.*

*A conveyor efficiently moving material at A. Hollis' operation in 2016 (Photo credit: Adrian Hollis).*

using a 5 by 5" Cornell pump. Pumps used to dewater cuts were powered by an automatic rotating solar panel. Effluent was settled in a series of ponds and by filtering through dredge tailings, prior to returning to Dominion Creek. A wheel was used to conduct the clean-ups.

**Surficial Geology and Stratigraphy** Several operators on Dominion Creek have focused operations on the prominent fluvial terraces preserved on the left limit. Intermediate in elevation, the terraces vary in width and the terrace where Mr. Hollis has mined the past few seasons, is likely influenced by several factors. Down-cutting of the former Dominion Creek floodplain could be the result and combination of base level change and regional tectonics. Evidence of faulting in gravel has been exposed by Mr. Hollis in several locations. At the mouth of Jensen Creek, a large fault structure 20 m (66 ft) wide has been exposed, where the gravel is overlain by a wedge of bedrock.

The fluvial terrace, approximately 15 m above the modern Dominion Creek level, consists of three units. Unit 1, from 0 to 0.6 m (2.0 ft), is a coarse pay gravel with a minor mixing zone up to 0.2 m (0.6 ft) thick of decomposed micaceous-schist bedrock. Unit 2, from 0.6 to 0.8 m (2.0-2.6 ft), is a thin lens of mud up to 0.1 m (0.3 ft) thick and capped by bedded fine-grained sand and silt. Overlying the bedded sand and silt is unit 3, from 0.8 to 1.6 m (2.6-5.2 ft), which consists of pebble-rich gravel. It is loose, contains significant granules and open works sections, and has a 20% matrix comprising medium sand. Unit 1, the coarse gravel on bedrock, could represent the remnants of the former floodplain of Dominion Creek, where fines accumulated on top, and were subsequently buried by pebbly-fan material derived from Jensen Creek. Approximately 0.5 m (1.5 ft) of gravel and 0.3 m (1.0 ft) of bedrock was sluiced.

**Bedrock Geology** Bedrock is a highly fractured and decomposed muscovite schist.

**Gold Characteristics** Gold is both coarse and fine. The percent of coarse gold is approximately 1.5%, except near Jensen Creek, where it increases to 30% coarse. Fineness is 850.

## Dominion, a tributary of Indian

115O/10 2017: 63°42'13"N, 138°32'50"W

### Dominion Gold Resources Ltd., 2013-2017

Water License: PM12-054-2 (Active 03/2023)
Active Producer (2015-2017) **Operation no. 96**

**Location** Dominion Creek, at the mouth of Eagle Creek.

**Work History and Mining Cuts** A cut located between Eagle and Bullfrog creeks was mined throughout 2015. A crew of 15 operated a daily 12-hour shift and mined a total of 932,300 $yd^3$ (712 800 $m^3$). Two locations were mined in 2016; operations ran 24 hr/day by a crew of up to 16 people. A cut measuring 95 by 600 m (312 x 1969 ft) on the right limit of Dominion, 1.2 km upstream from Grant Pup was stripped in 2015 and mined in 2016. The second location mined was a continuation of a cut in 2015 that measured 55 by 55 m (180 x 180 ft), and situated on the left limit of Dominion Creek, 100 m upstream from the mouth of Eagle Creek. A total of 291,300 $yd^3$ (222 700 $m^3$) were processed during the 2016 season. In the spring of 2017, a drilling program consisting of 168 holes, was completed at the mouth of Washington Creek. Drilling was successful in defining the next cut location and delineated whether current cuts could be extended farther northwest towards the right limit of the broad Dominion Creek valley. Stripping at Dominion Gold Resources Ltd. began in March 2017 and operations concluded mid-October, mining 24 hr/day with a crew of up to 20 employees. Main operations focused on extending the large right limit cut towards the mouth of Washington Creek that has been mined the past few seasons. Throughout the 2017 season, 366,300 $yd^3$ (280 000 $m^3$) were sluiced. Progressive reclamation occurs each year, where

*An image captured during a drone flight in May 2016, overlooking a large cut mined in 2016 and 2017 on the right limit of Dominion Creek, between Washington Creek and Grant Pup. (Photo credit: Dean Russell).*

the operator utilizes stripping material and backfills previously mined cuts.

**Equipment and Water Treatment** Heavy machinery utilized on site in 2017 included a Caterpillar 245 excavator, an Hitachi 450 excavator, a John Deere 350 excavator, three Volvo A40D rock trucks, three Caterpillar wheel loaders (980, 988 and 992), and four Caterpillar bulldozers (D8, D9, D10 and D11). In 2017, a custom fabricated 40 m (130 ft) conveyor mounted on an excavator chassis was added to the fleet of equipment.

The wash plant is an 8.0 by 6.0 m (26 x 20 ft) double screen deck with a conveyor and automatic 16 $yd^3$ hopper. Fine and coarse tailings are separated and stacked by different conveyors. The coarse tailings conveyor is 24 m (80 ft) long, while the fine tailings conveyor is 15 m (50 ft) in length. Water was supplied to the screen deck using a 16" pump that allowed the plant to process material at a rate of 300 loose $yd^3$ (230 $m^3$)/hr. 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. 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 which is ground in the Clarkson rod mill. Difficult material is treated on the RP-4 gold recovery shaker table or Miller table.

**Surficial Geology and Stratigraphy** In 2015, at the mouth of Eagle Creek, on the left limit of Dominion Creek, four units were exposed in a section. Unit 1 is a mixing zone, up to 1 m (3.3 ft) thick, of weathered quartz-mica schist bedrock and a matrix-rich fluvial gravel. Unit 2 is the Ross gravel and consists of a crudely stratified, massive and matrix-rich gravel from 1.0 to 3.6 m (3.3-11.8 ft). Ross gravel is described as a quartz-rich pebble dominated gravel that has bleached characteristics due to post-depositional fluid flow (Froese *et al.*, 2001). Sand-rich lenses up to 0.2 m (0.6 ft) thick are present in the upper part of the Ross gravel and have a similar texture to the overlying Dominion Creek gravel. A channel fill, measuring 0.75 m (2.5 ft) thick, is present in the upper part of the Ross gravel, and contains a fining upward sequence from poorly sorted pebble-gravel to bedded granules and sands. This channel fill is an erosion feature and suggests that the Dominion drainage during the late stages of Ross gravel deposition was still a relatively


*Channel fill section 5 m (16 ft) wide by 0.75 m (2.5 ft) thick within the Ross gravel, exposed at the mouth of Eagle Creek in 2015.*

high-energy system that may have had braided characteristics. A paleosol marks the contact between the Ross gravel and overlying Dominion Creek gravel. The soil is discontinuously preserved due to stream erosion and contains fragments of rootlets and woody debris. Unit 3, the Dominion Creek gravel, is a weakly stratified cobble-pebble gravel from 3.6 to 5.6 m (11.8-18.4 ft) thick. Beds within unit 3 have low-angle surfaces that indicate deposition in a meandering stream environment. Unit 4 is loess with reworked overbank and organic material, up to a maximum thickness of 4 m (13 ft). Up to 1.2 m (4 ft) of lower Ross gravel and 0.3 m (1 ft) of bedrock was sluiced.

The main right limit cut mined in 2016 and 2017 between Washington Creek and Grant Pup has a similar stratigraphy to that described at the mouth of Eagle Creek. The main difference is the Ross gravel decreased significantly in thickness from 3.7 m (12 ft) thick at the downstream end of the cut to 0.6 to 0.9 m (2-3 ft) thick near the mouth of Washington Creek. A significant decrease in the thickness of the lowermost gravel could be due to a topographical high or may mark the maximum upstream extent of the Ross gravel.

**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. On the left limit, gold is coarser. Fineness is 830 to 840.

## Gold Run, a tributary of Dominion

115O/15 2017: 63°45'12"N, 138°43'01"W

### 44467 Yukon Inc., 2012-2017

Water License: PM12-018 (Active 07/2022)
Active Producer (2015-2017) **Operation no. 97**

**Location** Gold Run Creek, left limit, 200 m downstream from the mouth of 71 Pup.

**Work History and Mining Cuts** Mammoth Mining has been actively mining each season from 2015 to 2017. Approximately 200 hours were spent sluicing in 2015.

**Equipment and Water Treatment** Equipment present on site included a Samsung 330 excavator, an Hitachi 200 excavator, Caterpillar D5, D8H and D9H bulldozers, and

*Aerial view at 44467 Yukon Inc.'s operation 200 m downstream from 71 Pup in 2016.*

Caterpillar D250E rock truck. A vibrating screen deck with hopper and tailings conveyor was able to process gravel at a rate of 40 loose $yd^3$ (30 $m^3$)/hr. Two hydraulic boil boxes, one normal boil box, and a 1.2 m (4 ft) wide by 1.8 m (6 ft) long upper sluice run with angle iron fed into a lower sluice run measuring 5.2 m (17 ft) wide by 3.0 m (10 ft) long lined with expanded metal. Water was 100% recycled. A jig and custom fabricated table were used for clean-ups.

**Surficial Geology and Stratigraphy** The bottom 1.2 m (4 ft) of gravel, considered the pay unit, consists of cobble-pebble gravel that is clast supported, moderately to pervasively oxidized, with 30% fine-grained sandy matrix and contains an abundance of quartz clasts. All gravel and 0.6 to 1.2 m (2-4 ft) of bedrock was sluiced. Downstream from the mouth of 71 Pup, gravel is 3 m (10 ft) thick with the bottom 1.2 m (4 ft) yielding the best grades.

**Bedrock Geology** Bedrock varies from decomposed to fractured chlorite-muscovite-schist.

**Gold Characteristics** Gold is primarily fine and has a fineness range from 840 to 870.

## Gold Run, a tributary of Dominion

115O/10 2017: 63°42'15"N, 138°37'46"W

### T.D. Oilfield Services Ltd., 2010-2017

Water License: PM08-599 (Active 12/2018)
Active Producer (2015-2017) **Operation no. 98**

**Location** Gold Run Creek, 600 m downstream from 24 Pup and at the mouth of Whitman Gulch.

**Work History and Mining Cuts** In 2015, a crew of ten operated at two different locations on Gold Run Creek. A 60 by 60 m (197 x 197 ft) cut at the mouth of Whitman Gulch and 30 by 91 m (100 x 300 ft) cut below 24 Pup were mined. An additional cut was mined near Laskey Lake on the left limit of Gold Run Creek, beneath landslide debris. The cut at the mouth of 24 Pup was continued upstream in 2016, and another cut at Whitman Gulch measuring 70 by 100 m (230 x 328 ft) was completed by the end of the 2016 season. A crew of up to 17 people operated throughout the season. A substantial stripping program was conducted slightly upstream of Whitman Gulch; approximately 15 m (50 ft) of overburden was stripped and the cut was prepared for sluicing in 2017. A right limit L-shaped cut measuring 27 000 $m^2$ (290,100 $ft^2$), 600 m downstream from the mouth of 24 Pup, was completed in 2017. An additional cut, approximately 45 by 265 m (148 x 870 ft) was completed at the mouth of Whitman Gulch. Throughout 2017, 86,800 $yd^3$ (66 360 $m^3$) was mined by a crew of 15 people.

**Equipment and Water Treatment** Equipment utilized by T.D. Oilfield Services Ltd. in 2017 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, and a Caterpillar 982 wheel loader. 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 screen deck, 1.5 by 4.9 m (5 x 16 ft) with an automatic 7 $yd^3$ hopper, was able to process material at a rate of 120 loose $yd^3$ (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 reverse trommel.

**Surficial Geology and Stratigraphy** An uncommon placer setting that could easily be overlooked was mined in 2015, about 450 m upstream from 34 Pup on the left limit of Gold Run Creek. T.D. Oilfield Services Ltd. last mined this location in 2015, with the target being virgin material buried beneath landslide debris. The source of the slide material is approximately 500 m upslope on the left limit of the valley. Extensive old timer shafts and drifts previously exploited the buried left limit side pay. The toe of the slide was mechanically mined by T.D. Oilfield to expose unmined virgin Gold Run

*T.D. Oilfield Services 27 000 $m^2$ (290,100 $ft^2$) right limit L-shaped cut, located 600 m downstream from the mouth of 24 Pup, mined throughout 2017.*

Creek gravel. The placer gold under the landslide has a smoother, more rounded character compared to the placer gold from the modern stream channel.

In 2017, on the left limit, 200 m downstream from the mouth of Whitman Gulch, a cut consisting of historic dredge tailings was mined. Using historical data, ground that previously contained good values was targeted with the idea that the tailings would contain more gold and the bedrock may contain unmined resources. Due to the decomposed nature of the bedrock and undulations in its surface, pockets of economic gravel remained in *situ*. The area was initially dredged in 1919 by YCGC and subsequently mined in 1923, 1924 and 1925. On average, the stratigraphy of the dredge cuts consist of 7 m (23 ft) of slickens, overbank material and fine-grained material. In 2016, an additional 15 m (50 ft) was stripped off the surface of the cut, which included modern tailings, historic slickens and cat push material. In 2017, the sluice section consisted of up to 0.3 m (1 ft) of material on the bedrock contact and up to 0.9 m (3 ft) of decomposed bedrock. The pay material included the mixing zone between decomposed bedrock and gravel, and the untouched gravel pockets deposited in bedrock undulations.

The stratigraphic section on the right limit of Gold Run Creek, near the mouth of 24 Pup, consists of two units. Unit 1 is a gravel package 1.8 m (6 ft)-thick which is a pebble dominated, matrix-rich, with discontinuous beds of medium to coarse-grained sand. An undulating sand lens separating the coarser pay gravel from the upper pebble gravel varies between 0.3 and 0.6 m (1-2 ft) thick. Maximum clast size is 0.2 m (0.6 ft) and all clasts are subround. Gravel is imbricated downstream and the finer grained upper pebble gravel is moderately to well sorted. This material is likely fan material derived from 24 Pup. Unit 2, up to 10.7 m (35 ft) thick, consists of loess with interbedded sand and discontinuous ice lenses. Up to 0.6 m (2 ft) of gravel on bedrock and 0.6 to 0.9 m (2-3 ft) of bedrock was sluiced.

**Bedrock Geology** Bedrock is interbedded quartzite and decomposed quartz-mica schist. An abundance of pyrite was encountered in 2017.

**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 oz and the fineness ranges from 850 to 860.

*Aerial view of activity at T.D. Oilfield Services Ltd. on mid to lower Gold Run Creek in 2016. The view is looking downstream, towards the southeast.*

## Gold Run, a tributary of Dominion

115O/10 2016: 63°41'56"N, 138°36'35"W

### Rical Mining Ltd., 2012-2016

Water License: PM11-028 (Active 12/2021)
Active Producer (2015-2016) **Operation no. 99**

**Location** Gold Run Creek, left limit, 1.2 km upstream from its confluence with Dominion Creek.

**Work History and Mining Cuts** Three cuts, measuring 15 by 152 m, 12 by 91 m, and 24 by 76 m (50 x 500 ft; 40 x 300 ft; 80 x 250 ft) were mined on the left limit in 2015, amounting to 5300 $m^2$ (57,000 $ft^2$). A drilling program was executed in the fall of 2015 on the left limit to determine the lateral extent of the side pay. A right limit valley cut, 152 m (500 ft) long, targeted side pay and encountered historic dredge tailings and slickens 25 m (82 ft) deep to bedrock. In 2016, the two-person crew mined a cut 305 m (1,000 ft) long, and an additional 20 m (66 ft) was extended on the left limit below a thick sand deposit. Mining on the left limit was completed at the extent of the valley margin, as indicated by steep rising bedrock. Sluicing at the property was completed where rising bedrock marked the valley margin. In 2017, the operator moved to a new location in the Indian River valley.

**Equipment and Water Treatment** Machinery utilized at site in 2016 included Hitachi EX450 LC, Zaxis 225 USR-LC and EX450 excavators, a John Deere 400D rock truck, and a 'Hollis Hauler' 33 m (110 ft) conveyor mounted on a Komatsu 400 excavator chassis. Due to the presence of substantial overburden, large stripping operations were undertaken during each mining season. A conveyor was used to transport sand, increasing the efficiency in moving the material, and transporting up to 600 $yd^3$ (459 $m^3$)/hr. An oscillating 3.3 by 1.5 m (11 by 5 ft) screen deck was utilized in 2015 to sluice pay at a rate of 60 loose $yd^3$ (46 $m^3$)/hr. In 2016, the wash plant consisted of a 1.8 m (6 ft) diameter by 7.3 m (24 ft) long trommel, and was able to process up to 80 loose $yd^3$ (61 $m^3$)/hr. A 6" pump supplied water to the plant and water was 100% recycled. A wheel and Ray Lozzette live bottom concentrator was used for clean-ups.

**Surficial Geology and Stratigraphy** Bedrock exposed on the left limit of Gold Run Creek consisted of hard blocky-weathering or decomposed mafic schist. The placer gold was preferentially trapped in the blocky-weathered bedrock surface. The pay gravel on bedrock consisted of 1.5 m (5 ft) of well-washed pebble-cobble gravel with 60% pebbles and 20% cobbles, and has a fining upward sequence. The matrix-supported gravel contains medium sand and silt matrix. Clasts are predominately subrounded and the gravel contains primarily quartz-clasts. Clast sizes near the bedrock contact are coarser and contains fewer fines than the upper parts of the gravel. Where decomposed bedrock is present, a mixing zone exists between the bedrock surface and gravel and is an important placer target for the operator. The mixing zone varied in thickness up to 0.3 m (1 ft) and included pods of silt and organics

*Rical Mining sluicing material in 2016 on lower Gold Run Creek.*

possibly reworked from side bank material. The presence of eroded organic pods in the gravel could indicate proximity to the limit of side pay in the valley. Overlying and draping the pay gravel is organic-rich silt and fine sand (unit 2) that thickens from 0.1 to 2 m (0.3-6.6 ft) into a loess deposit with a paleo-grassland-like paleosol. The soil deposit is overlain by 1 m (3 ft) of stratified pebbly gravel (unit 3) that has an erosional lower contact and contains 40% clasts consisting of 80% pebbles and 20% cobbles. The matrix consists of a silty medium to coarse-grained sand. This unit grades comformably into a package of fluvial sand with pebble beds (unit 4) that is 6.4 m (21 ft) thick. The sand deposit is planar stratified with cross-stratification occurring where pebbles are present. The unit fines upward and contains relict ice wedge casts, suggesting a possible glacial climate during deposition. Unit 5 consists of a massive to weakly bedded fine sand layer that contains paleo-ground squirrel nests. The substantial volume of sand near the mouth of Gold Run Creek was likely deposited by aeolian (wind) processes during glacial periods and subsequently reworked into the stream deposits. The sand would have likely been sourced from the barren floodplain of Dominion Creek and blown into the Gold Run valley. If blocky green bedrock is present, up to 1 m (3.3 ft) of bedrock is sluiced, otherwise 0.1 m (0.3 ft) of decomposed schist was sluiced. Up to 2 m (6.6 ft) of gravel was sluiced.

*Downstream view of the left limit cut in 2015, where the side pay, preserved beneath the massive sand deposit, was excavated by Rical Mining.*

**Bedrock Geology** Bedrock varies between blocky quartzite and decomposed chlorite-schist.

**Gold Characteristics** Gold is primarily very fine with an angular (wire gold) component. Fineness is 860.

## Dominion, a tributary of Indian

115O/10 2017: 63°38'35"N, 138°40'47"W

**Alluvium Gold Mining Inc., 2017**
**Gatenby Enterprises Ltd., 1998-2016**

Water License: PM14-046 (Active 05/2025)
Water License: PM04-407 (Expired 05/2015)
Active Producer (2015-2017) **Operation no. 100**

**Location** Dominion Creek, 1.7 km downstream from the mouth of Sulphur Creek.

**Work History and Mining Cuts** Reclamation was the primary activity to occur at this operation in 2015, and Mr. Gatenby reclaimed historic cuts, contoured the surface and stabilized berms. An agreement with Mr. Dul was established in 2016 to allow him to operate on Mr. Gatenby's right limit Dominion Creek claims, approximately 2.6 km upstream from Scribner Creek. The two-person operation, only active one season, completed a cut measuring 6 by 15 m (20 x 50 ft) and mined historic tailings and a modern creek terrace several metres off the valley floor. Eight claims were leased the following year to Alluvium Gold Mining Inc. who continued mining where Mr. Dul left off at the end of 2016 as he awaited permitting. Continuing to expose the right limit modern creek terrace, two operators mined a cut measuring 13 by 220 m (43 x 721 ft).

**Equipment and Water Treatment** Equipment located on site in 2016 utilized by Mr. Dul included a Terex O&K 260 excavator, a Caterpillar 966C wheel loader and a 1.2 m (4 ft) trommel. In 2017, Alluvium Gold Mining Inc. utilized an Hitachi 200 excavator, a Kawasaki 95Z3 wheel loader, and a 24 m (80 ft) Edge conveyor to feed the M30 screen deck wash plant fabricated by Gold Watch Project. Screening to ¼", the screen deck is supplied with water by a 4" pump and able to process up to 40 loose $yd^3$ (30 $m^3$)/hr. Sluice runs are 0.9 m (3 ft) wide by 1.8 m (6 ft) long and consist of expanded metal and Hungarian riffles with 3M unbacked matting. Effluent was settled in one pond and water was 100% recycled.

*View of Alluvium Gold Mining Inc. cut, looking upstream along the fluvial terrace, in 2017.*

**Surficial Geology and Stratigraphy** Throughout 2016 and 2017, a low-level terrace was explored on the right limit of Dominion Creek. It is a fluvial terrace containing 1.2 m (4.0 ft) of pebble-cobble gravel, dominated by subrounded, pebble-sized clasts (60-70%). Approximately 15% of the clasts are quartz and the largest clast is 0.15 m (0.5 ft). Primarily a clast-supported gravel, it also contains lenses of a higher energy deposit distinguishable with larger clasts and increased silty-matrix. No distinct imbrication is present and gravel is moderately to pervasively oxidized throughout. Gravel is overlain by up to 6 m (20 ft) of massive sand and loess. All coarse gravel was sluiced.

**Bedrock Geology** Bedrock is fractured orthogneiss.

**Gold Characteristics** Gold is fine, flat, well-traveled 'flour' gold.

## Dominion, a tributary of Indian

115O/10 2017: 63°38'56"N, 138°37'15"W

### Gimlex Enterprises Inc., 2015-2017

Water License: PM15-009 (Active 05/2025)
Active Explorer (2015-2017) **Operation no. 101**

**Location** Dominion Creek, 3 km downstream from the mouth of Gold Run Creek.

**Work History and Mining Cuts** In 2015, Gimlex Enterprises completed a 65 hole drill program, totalling of 793 m (2602.5 ft). The work was conducted on a block of seven claims (17 953 $m^2$; 634,000 $ft^2$) on the right limit of Dominion Creek between Gold Run and Sulphur creeks. A follow up drilling program was completed in 2017 to conduct in-fill drilling, re-drill some sites where bedrock had not been intersected, and expand the investigative area based on new claim boundary information. Thirty-seven holes were drilled using a crew of four personnel in 2017. Both exploration programs were completed with assistance from the Yukon Mineral Exploration Program.

**Equipment and Water Treatment** Equipment used to complete the drilling program included a Mobile B31 8" auger drill mounted on a FN110 Nodwell, a Bombardier Muskeg carrier for transporting crew and samples and a PC60 Komatsu excavator for clearing trails and drill sites. Drill samples were concentrated on a long tom, sieved, then panned and refined using a Miller Table.

**Surficial Geology and Stratigraphy** The exploration program was conducted in the middle of the Dominion Creek valley, south of the miners ditch. The stratigraphy of lower Dominion Creek is described by Froese *et al.* (2000), which provided a framework for understanding the gravel units and distribution of placer gold. The lowermost unit is the quartz-rich Ross gravel that has been the primary target in lower Dominion Creek at neighboring properties. The Ross gravel ranges in thickness from 2 to 4.7 m (7-15.5 ft) whereas the overlying Dominion gravel is 0 to 3.9 m (0-13 ft) on the Gimlex claim block. Muck overburden is widespread across the valley bottom and ranges in thickness from 1.5 to 5 m (5-16 ft). The entire stratigraphic section is frozen and the average total depths to bedrock on the property was 9 m (30 ft). The placer gold distribution according to the drilling results concluded that the northwest side of the property paralleling the miners ditch contained higher grades. Stratigraphic analyses of the gold distribution concluded that 84% is contained in the Ross gravel and 16% in the overlying Dominion gravel.

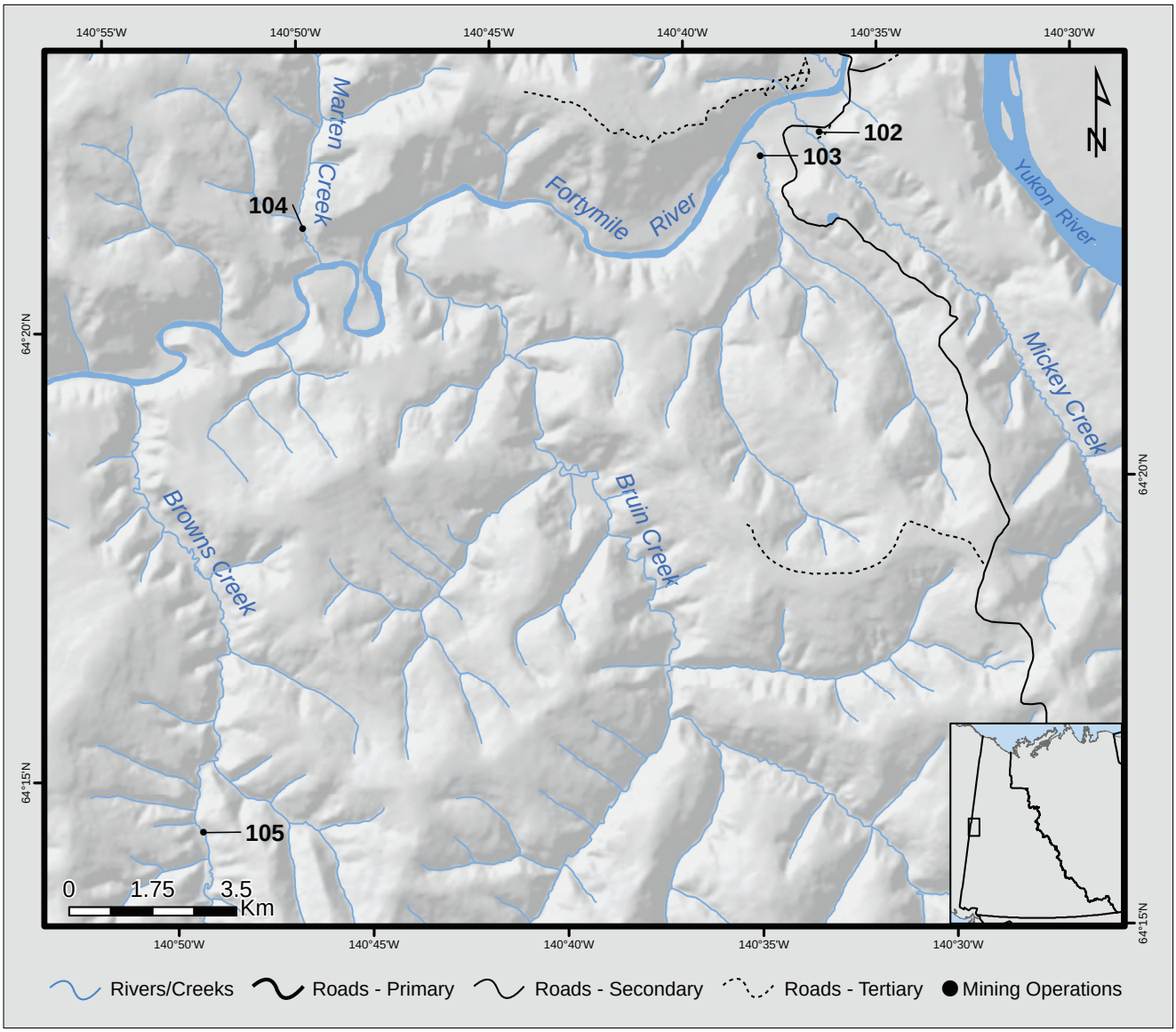
**Bedrock Geology** Bedrock is muscovite and biotite schist of the Klondike Schist assemblage.

**Gold Characteristics** Not reported

*Jim Christie of Gimlex Enterprises Ltd. processing drill samples on their Dominion Creek property.*

# FORTYMILE
## PLACER AREA

**SITES 102-105**




**LEGEND**

102. 41497 Yukon Inc.
103. Groundhog Exploration Co. Ltd.
104. Fortymile Placers
105. 41497 Yukon Inc.

## Mickey, a tributary of Fortymile

116C/07 2017: 64°24'43"N, 140°33'56"W
116C/07 2016: 64°23'22"N, 140°36'18"W

### 41497 Yukon Inc., 2009, 2012-2017

Water License: PM08-603 (Active 09/2018)
Water License: PM10-077 (Active 04/2021)
Active Producer (2015-2017) **Operation no. 102**

**Location** Three locations were active: 850 m upstream on Mickey Creek, a right limit tributary of Fortymile River; the right limit bench of the Fortymile River, approximately 3.8 km downstream from Mickey Creek; and river claims approximately 2.4 km downstream from Mickey Creek.

**Work History and Mining Cuts** In 2015 and 2016, 41497 Yukon Inc. leased ground to Mr. Thomas. He was actively prospecting and recovering fine gold from Mickey Creek, the Fortymile bench, and the Fortymile River claims. Throughout the winter of 2016, additional shafts were completed. Prospecting occurred throughout the summer of 2016, and supplementary shafting and drilling were completed in 2017.

**Equipment and Water Treatment** Prospecting was conducted using pans and by shafting.

**Surficial Geology and Stratigraphy** Gold values are present in the White Channel gravel-equivalent (Pliocene to late Pleistocene in age), that is found in the Mickey Creek drainage and down the Fortymile River. Overburden can range up to 3.6 m (12 ft) thick. (Grant Allan, *pers. comm.*).

**Bedrock Geology** Bedrock is quartzite and quartz-muscovite-chlorite-schist (YGS, 2017).

**Gold Characteristics** Gold is fine.

## Maiden, a tributary of Fortymile

116C/07 2016: 64°23'02"N, 140°37'38"W

### Groundhog Exploration Co. Ltd., 2004-2017

Water License: PM12-067 (Active 05/2018)
Active Producer (2015-2017) **Operation no. 103**

**Location** Maiden Creek, 600 m upstream from its confluence with Fortymile River.

**Work History and Mining Cuts** Mr. Woodsend spent the first couple of seasons in the drainage prospecting for old workings that date back to the 1880s. Once they were located, he focused efforts on tracing the pay streak upstream, which is offset to the left limit of lower Maiden Creek. A Nodwell-mounted auger drill was utilized to locate the old channel that is situated on the low-level left limit terrace. Mining as a one-person operation, he continued to work upstream from 2015 to 2017 excavating the old channel. Future plans include continuing to develop the old channel by increasing the depth of the cut to reach the base.

**Equipment and Water Treatment** Minimal information is known about the equipment on site, aside from an excavator utilized to build roads and strip future mine cuts. The wash plant was a New Zealand-style trommel on skids, which does not float. A series of three out-of-stream ponds were used for settling and recycling water.

**Surficial Geology and Stratigraphy** The left limit cut in 2016 was approximately 24 m (80 ft) from the top of the overburden to the base of the exposed gravel.

**Bedrock Geology** Bedrock is quartzite and quartz-muscovite-chlorite schist (YGS, 2017).

**Gold Characteristics** Not reported.

## Marten, a tributary of Fortymile

116C/07 2017: 64°21'33"N, 140°49'11"W

### Fortymile Placers, 1974-2017

Water License: PM15-045 (Active 07/2025)
Water License: PM07-579 (Active 10/2018)
Water License: PM05-462 (Expired 07/2015)
Active Producer (2015-2017) **Operation no. 104**

**Location** Marten Creek, 850 m upstream from its confluence with Fortymile River.

**Work History and Mining Cuts** Fortymile Placers first started exploring the Fortymile River and its tributaries in 1974. Initial years were spent prospecting and staking, and it was not until 1980 that mechanical mining occurred. The bulk of their mining has focused on the Fortymile River, excavating several levels of terraces. Since 2012, Fortymile Placers has been progressively mining upstream Marten Creek. From 2015 to 2017, a two-person operation sluiced approximately 100 days each season. Throughout the last several seasons, a total cut dimension of 65 by 100 m (213 x 328 ft) was completed. It extended across the valley width, budding up against the steep hillsides.

**Equipment and Water Treatment** Equipment in 2017 included a Hitachi EX200 excavator, an Hitachi UH10 excavator, a Caterpillar 920 wheel loader and a Caterpillar D6 bulldozer. The wash plant consisted of a 1.2 by 3.6 m (4 x 12 ft) floating New Zealand-style trommel with 5/16" screen and 10.4 m (34 ft) conveyor stacker. Each side sluice was 1.8 m (6 ft) wide by 2.4 m (8 ft) long and consisted of a boil box, hydraulic riffles and expanded metal, and was lined with unbacked nomad matting. Water was supplied to the plant by a 4" electric flight pump powered by a 35 kilowatt generator, enabling the plant to process 65 to 75 $yd^3$ (50-57 $m^3$)/hr. Water was acquired from Marten Creek and 100% recycled in a series of three out-of-stream ponds. A clean-up is conducted every 50 hours and a long tom and gold wheel are used to process concentrate.

**Surficial Geology and Stratigraphy** Marten Creek has consistent grades from limit to limit, but also contains a narrow pay streak of coarse gold. As a relatively narrow drainage, 30 m (98 ft) wide at the current mining location, the operation must manage tailings and water efficiently in order to continue mining upstream. Due to historic stripping and a drainage susceptible to flood events, the gravel thickness varies from 1.5 to 4.6 m (5-15 ft). The main gravel unit in Marten Creek is a pebble-cobble gravel consisting of subangular to subrounded clasts. The majority of the subangular clasts are likely reworked bedrock, eroded during high-energy events or from incorporation of colluvium (slide-rock) into the fluvial system. The gravel is clast-supported with a medium-sand matrix, and maximum clast size is up to 0.7 m (2.3 ft). The narrow pay streak containing coarse gold reflects very high-energy fluvial processes with an abundance of boulder-sized clasts. Overburden consists of silt from overbank sedimentation. Placer gold is concentrated in the lowermost 1.8 m (6 ft) of gravel, although the entire section is sluiced due to the mining method of using a floating trommel. Sluiced material includes up to 4.6 m (15 ft) of gravel and 1.2 m (4 ft) of bedrock.

**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 1/4" to 5/16" for the larger fragments. Fineness from Fortymile River is 845 and fineness from Marten Creek is 875.

*Active dredging using a floating New Zealand-style trommel on lower Marten Creek (Photo credit: Leslie Chapman).*

## Browns, a tributary of Fortymile

116C/02 2015: 64°14'41"N, 140°49'42"W

### 41497 Yukon Inc., 2010-2017

Water License: PM13-045 (Active 01/2024)
Active Producer (2015-2017) **Operation no. 105**

**Location** Browns Creek, mid.

**Work History and Mining Cuts** Browns Creek has been intermittently prospected since the Fortymile area was discovered in 1886 (YGS, 2010). In 2015, drilling, shafting and trenching occurred on the middle reaches of Browns Creek to determine the best place to open up a large cut. An auger drill was utilized to test the ground. Prospecting occurred on the property in 2016 and 2017.

**Equipment and Water Treatment** Not reported.

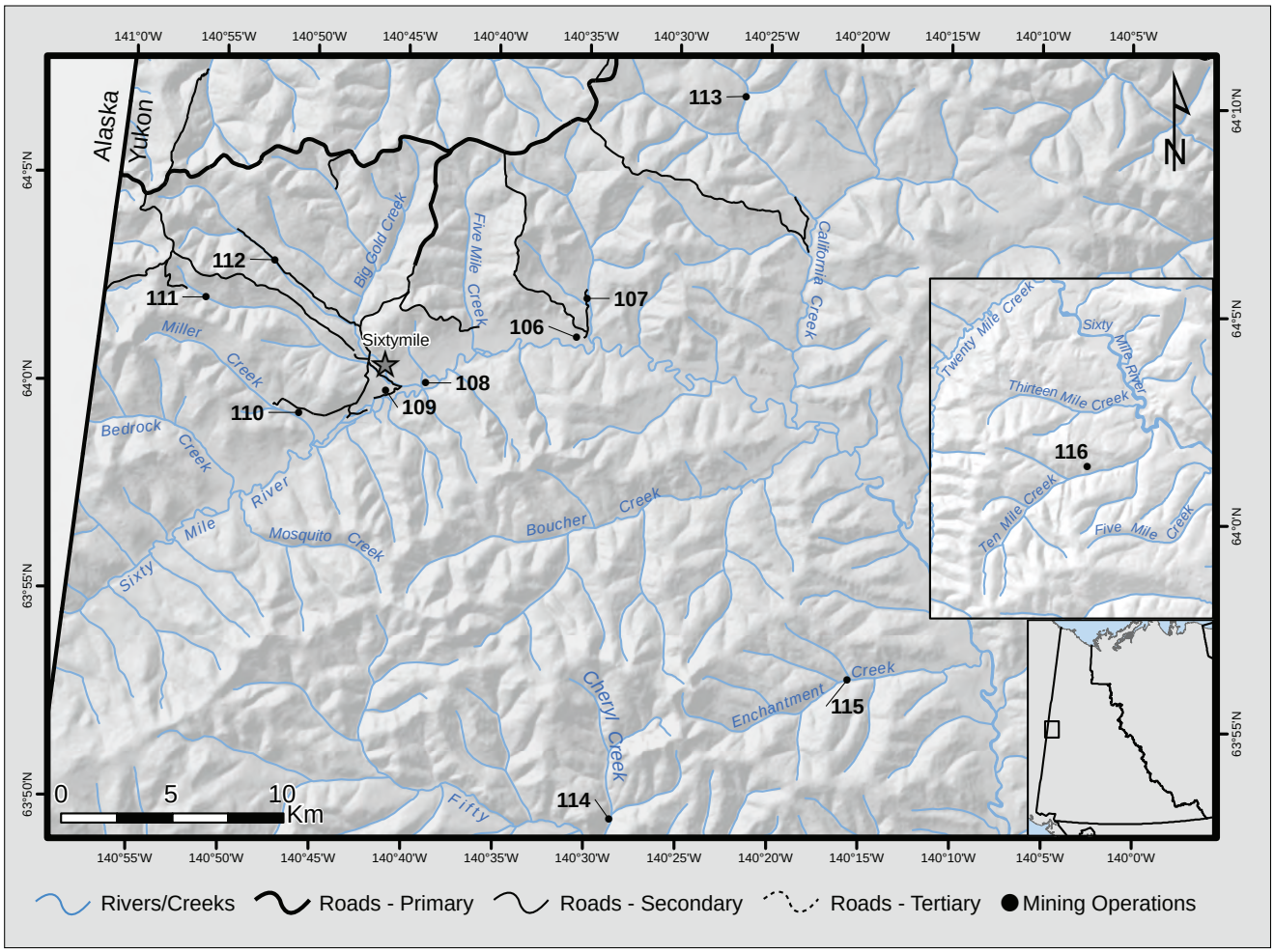
**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is quartzite, graphitic quartzite and quartz-muscovite-calcite schist (YGS, 2017).

**Gold Characteristics** Not reported.

# SIXTYMILE
## PLACER AREA

**SITES 106-116**




### LEGEND

106. M2 Gold Mines Ltd.
107. F.W. Grant and Yukon Exploration Green Gold Inc.
108. Hawk Mining
109. K-1 Mining & Services
110. Miller Creek Mining Company Ltd.
111. Cope, M.W.
112. Trautwein, A.
113. Clayton Contracting and Yukon Exploration Green Gold Inc.
114. 50 Mile Mining Corp.
115. Fellhawk Enterprises Ltd.
116. No Name Resources Inc.

## Sixty Mile, a tributary of Yukon

116C/02 2016: 64°02'39"N, 140°33'49"W

### M2 Gold Mines Ltd., 2016-2017

Water License: PM17-053 (Active 07/2027)
Active Producer (2016-2017) **Operation no. 106**

**Location** Sixty Mile River, near the mouth of Twelve Mile Creek.

**Work History and Mining Cuts** M2 Gold Mines Ltd. optioned claims in 2016 in the Sixty Mile River valley from Sixty Mile Placer Ltd. The 2016 program consisted of stripping and test mining, primarily along the outer edge of a left limit bench that forms a sizeable prospect in the valley. The cut measured 50 by 750 m (164 x 2461 ft) and the bench is 20 m (66 ft) above the modern floodplain. Three personnel plus a cook were employed and mining was conducted during 2 daily shifts. In 2017, a larger plant was moved onto the property and 7 people were employed working 2 daily shifts. Mining continued on the left limit bench, on an intermediate-level bench and along the margins of the modern floodplain. A total of 110,000 yd³ were sluiced in the 2017 mining season.

**Equipment and Water Treatment** Equipment on site in 2016 consisted of an Hitachi Zaxis 240LC excavator for digging pay and feeding the plant, and a Caterpillar 323F excavator for managing tailings. A Caterpillar D9N bulldozer is used for stripping silt and organics. The plant consisted of a 1.2 m (4 ft) diameter by 4.9 m (16 ft) long New Zealand-style trommel with ³/₈" screen openings and a 9 m (30 ft) long conveyor stacker. Sluice-runs on either side of the plant contain angle iron riffles, a boil box, and hydraulic riffles. Water consumption is estimated at 850 US gal/min and the plant can process 70 to 100 yd³ (54-76 $m^3$)/hr. Water is from the Sixty Mile River and settled out-of-stream in formerly mined cuts. In 2017, two excavators were added to the fleet including an Hitachi 330 and a John Deere 270. A larger trommel plant capable of processing 140 yd³ (107 $m^3$)/hr was brought in and screened material to a ½". Water consumption increased to 2600 gal/min and was settled out-of-stream in mine cuts.

**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 1.2 m (2-4 ft) in thickness.

*A view of M2 Gold Mines new operation on the left limit of the Sixtymile River in 2016. The view is looking downstream.*

**Bedrock Geology** Bedrock is Carmacks group basalt, breccia, andesite, porphyry, dacite and trachyte (YGS, 2017).

**Gold Characteristics** Gold is coarser on the modern floodplain and on intermediate-level benches compared to the high-level bench.

## Twelve Mile, a tributary of Sixty Mile

116C/02 2016: 64°03'38"N, 140°33'30"W

### F.W. Grant and Yukon Exploration Green Gold Inc., 2016-2017

Water License: PM15-078-1 (Active 03/2026)
Active Producer (2016-2017) **Operation no. 107**

**Location** Twelve Mile Creek, 1.8 km upstream from its mouth.

**Work History and Mining Cuts** A small test mining operation was initiated on a right limit bench deposit near the confluence with a right limit tributary in 2016. Stripping was also initiated in the valley bottom below the bench and near the mouth of the right limit tributary.

**Equipment and Water Treatment** Equipment on site in 2016 included a John Deere 200C excavator and a Caterpillar bulldozer. The wash plant consisted of a dump box and screen deck feeding an initial single sluice run, which then drops material into a 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 Carmacks group basalt, breccia, andesite, porphyry, dacite and trachyte (YGS, 2017).

**Gold Characteristics** Not reported.

*A view looking downstream on Twelve Mile Creek towards the Sixtymile River. Test mining by Mr. Grant focused on the right limit bench evident in the foreground and distance.*

## Sixty Mile, a tributary of Yukon

116C/02 2016: 64°01'06"N, 140°41'47"W

### Hawk Mining, 1989-2017

Water License: PM14-040 (Active 02/2025)
Active Producer (2015-2017) **Operation no. 108**

**Location** Sixty Mile River, below mouth of Big Gold Creek.

**Work History and Mining Cuts** From 2015 to 2017 mining focused on the left limit of the Sixty Mile River valley immediately below Big Gold Creek. In this area, Sixty Mile River flows close to the south side of the valley bottom and the left limit mining was technically in the middle of the valley. In 2016, a cut measuring 70 by 665 m (230 x 2182 ft) was mined by an 8-person crew working 2 shifts.

**Equipment and Water Treatment** Equipment on site in 2016 consisted of a Volvo EC 480D for excavating pay, a Volvo A35, and Caterpillar 735 haul truck for transporting pay to the plant, a Caterpillar 980 loader for feeding the plant, and a Volvo 250G loader for removing tailings. 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 2016 exposure in the middle of the Sixty Mile River valley consisted of 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 composed of moderately sorted, stratified, pebbles and rare cobbles. A rooted tree and wood fragments were noted near the bedrock contact. The lower unit of gravel was processed for pay. Placer gold distribution is patchy in the middle of the valley, which may be due to streaks coming out of Glacier and Big Gold creeks. In addition, the bedrock hardness varies in the cut, which could further affect the uniformity of the gold distribution. The best pay is located along the left limit of the valley where gold from Glacier Creek, Big Gold Creek and the Sixty Mile River appear to coalesce. As mining has progressed into the middle of the valley the proportion of placer gold from Glacier and Big Gold creeks appears to drop off and only Sixty Mile River gold is present.

**Bedrock Geology** Bedrock is Carmacks group basalt, breccia, andesite, porphyry, dacite and trachyte (YGS, 2017).

**Gold Characteristics** Not reported.

*An aerial view of Hawk Mining's operation on the Sixtymile River. Gravel from the long cut in the middle of the valley is transported by haul truck to a central processing facility in a former mine cut on the left limit.*

## Sixty Mile, a tributary of Yukon
## Glacier, a tributary of Big Gold

| | |
|---|---|
| 116C/02 | 2017: 64°00'48"N, 140°43'56"W |
| 116C/02 | 2017: 64°00'07"N, 140°45'45"W |
| 116C/02 | 2017: 64°00'01"N, 140°45'55"W |
| 116C/02 | 2017: 64°00'05"N, 140°45'00"W |
| 116C/02 | 2016: 64°02'24"N, 140°50'25"W |
| 116C/02 | 2015: 64°01'56"N, 140°48'28"W |

### K-1 Mining & Services, 2008-2017

Water License: PM15-001 (Active 12/2025)
Water License: PM12-073 (Active 03/2023)
Active Producer (2015-2017) **Operation no. 109**

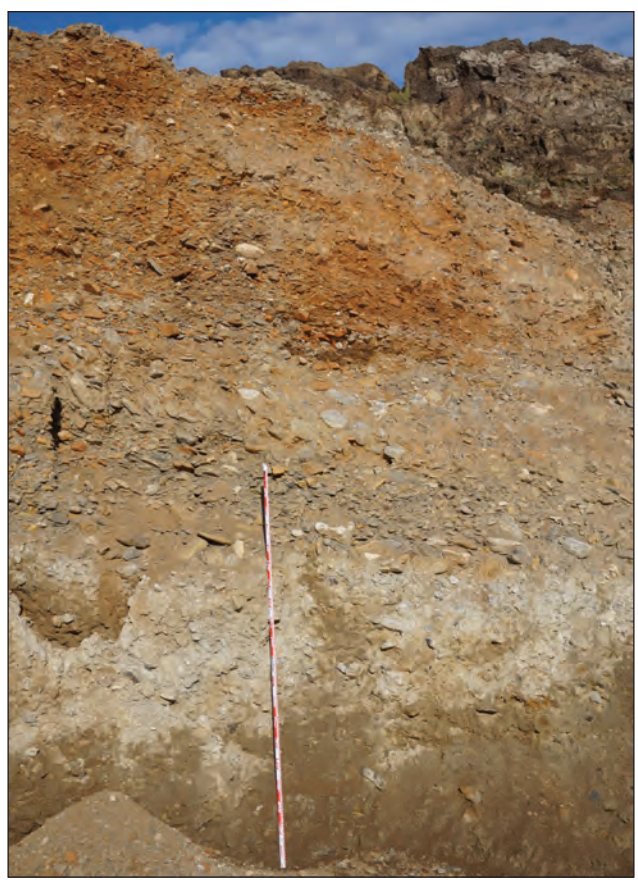
**Location** Sixty Mile River near the mouth of Glacier Creek valley and Glacier Creek.

**Work History and Mining Cuts** K-1 Mining operated at two locations on Glacier Creek in 2015 and 2016. A right limit bench cut, located 2.75 km upstream from the mouth, and a right-limit side-pay cut located 4.5 km upstream from the mouth. The right limit bench cut was first mined by K-1 Mining in 1997 and was revisited in 2015 and 2016 to re-mine the rim and zones too difficult to access with previous equipment. Evidence of old-timers drifts and fires set for thawing ground were found near the front of the bench where better grades were identified. The cut dimensions measured 30 by 140 m (98 x 459 ft) with a gravel thickness of greater than 15 m (49 ft). Farther upstream, the right-limit side-pay cut targeted buried floodplain and low terrace sediment under an apron of colluvium derived from the valley slope. Development of the deposit was limited by the rate of thaw. The cut measured 245 m (804 ft) in length and the total thickness was 16 m (52 ft).

In 2017, operations moved back into the Sixty Mile River valley where four locations were mined. The first was a cut measuring 50 by 130 m (164 x 427 ft) on a left limit bench at the mouth of Big Gold/Glacier Creek valley. The second was a bench cut between Big Gold and Miller creeks. The third location re-mined an old camp cut along a bench margin that the dredge had missed, and the fourth location focused on re-mining dredged ground in the middle of the valley. A total of three miners and one camp staff operated a daily twelve-hour shift.

**Equipment and Water Treatment** Equipment utilized from 2015 to 2017 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 U-blade 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 gravel at a rate of 50 to 65 loose yd³ (38-50 $m^3$)/hr. Water was acquired out of a stream pond on either Glacier Creek or Sixty Mile River, depending upon mining location. Effluent was treated out-of-stream in old mine cuts in a series of three ponds approximately 76 by 46 m (250 x 150 ft). Clean-ups used a two-cell jig, followed by a long tom, and a gold wheel and hand panning for final concentrate.

**Surficial Geology and Stratigraphy** The Pliocene pay streak in Glacier Creek, and its eroded remnant, is known to wander within the valley (McDougall, *pers. comm.*). As a result, portions of the best pay were preserved either on bench surfaces or in the valley bottom. Early mechanical mining in Glacier Creek targeted the shallow valley bottom sediments. More recently, mining efforts have focused on identifying portions of the pay streak missed or avoided due to challenging overburden. The



*The section exposed at K-1 Mining's cut in the Sixtymile River valley at the mouth of Big Gold/Glacier creek valley. The lowermost white cohesive gravel is the target pay and is overlain by oxidized gravel and muck. Both gravel units appear to originate from the north in the Big Gold/Glacier drainage.*

right limit bench of Glacier Creek, which was mined in 2015 and 2016 by K-1 Mining, is a significant landform that extends for at least 2 km along the middle reach of the valley. Farther upstream, the bench is situated on the left limit and was the focus of development work in the past. Gravel deposits on the bench are greater than 15 m (49 ft) thick and thin toward the outer rim. The deposit consists of a homogenous pebble-cobble gravel, with crude stratification and clast imbrication consistent with flows parallel to modern Glacier Creek. Similar gravel deposits are documented on the Miller Creek bench and are described by Hughes *et al.* (1986). Lower parts of the gravel section are more disorganized and, according to K-1 Mining, is very compacted at the base. The primary placer gold streak is distributed close to the bedrock surface and is draped over the rim of the bench in this location. Old-timer workings are largely distributed where the better pay was identified along the outer edge of the bench.

The upstream cut on Glacier Creek targeted right limit side pay buried under colluvium. The paleo-pay streak in Glacier Creek is thought to have crossed the valley from the left limit bench immediately above this location and remained on the right limit margin of the valley. Unit 1, from 0 to 2 m (0-6.6 ft), at the base of the section is a buried Glacier Creek gravel. The gravel is situated on a low terrace of bedrock that rises up to 1.2 m (4 ft) above the modern bedrock level. The unit is a moderately to well-sorted cobble-pebble gravel with some boulders. Clasts show imbrication and clast roundness is subangular and angular. Oxidation is present within the upper layers of the unit. Placer gold within unit 1 is distributed close to the bedrock surface and therefore 50 to 75% of the gravel is stripped. Unit 2, from 2 to 16 m (6.6-52 ft), consists of colluviated angular fragments of bedrock, massive ice, silt-rich beds (colluviated loess) and organics. Both units contain permafrost. The width of the side pay deposit has not been determined, in part due to the permafrost challenges. An old-timer drift has been documented along the bank suggesting additional high grade material may be preserved under the colluvium.

In 2017, a left limit bench was mined on the Sixty Mile River at the right limit mouth of Big Gold/Glacier Creek valley. The cut exposed two gravel units overlain by silt. Unit 1, from 0 to 1 m (0-3.3 ft), at the base of the


*K-1 Mining exposes side pay on the right limit of upper Glacier Creek. The gravel is preserved on a low bedrock terrace and buried by colluvium.*

section is a matrix-supported, cohesive, light greenish coloured, poorly sorted cobble-pebble gravel. Clasts within the unit make up 60% of the deposit and consist predominantly of pebbles (75%) and cobbles (20%). Some clasts are decomposed and the unit has a similar appearance to the lower White Channel gravel, but with fewer quartz clasts. The matrix consists of medium-grained micaceous sand. Imbrication of clasts preserve a paleo-flow direction to the south, supporting an origin from Big Gold/Glacier creek valley. This unit is processed as pay material. In sharp, erosional contact with unit 1 is unit 2 from 1 to 5 m (3.3-16 ft). Unit 2 is a highly oxidized, moderately to well-sorted gravel. Oxidation is more intense in the middle and top of the unit. Clasts within the unit make up 50% of the deposit and consist of 80% pebbles, 18% cobbles and 2% boulders. All clasts are subangular to subround and preserve a paleo-flow imbrication in a southerly direction, similar to unit 1. The matrix is a medium to coarse sand. Unit 3, from 5 to 12 m (16-39 ft), is a muck deposit consisting of resedimented loess and organics.

Preservation of an older gravel (unit 1) in this cut may be significant in terms of understanding placer evolution in Big Gold, Glacier Creek and the Sixty Mile River. Within the confines of the Glacier Creek valley, this older gravel is not preserved and was likely eroded by the equivalent of unit 2 gravel. Preservation of the older gravel only occurs where the tributary sediments became unconfined in the Sixty Mile River valley and therefore less erosive. Development of economic placer concentrations in the Big Gold/Glacier Creek valley appears associated with emplacement of the older gravel and unit 2 only becomes enriched when it erodes and scavenges gold from unit 1. Therefore, the paleo-pay streak distribution in Glacier Creek and the Sixty Mile River may be related to a gravel unit that has been reworked and is no longer visible on most bench surfaces. A similar concept has been proposed for Hunker Creek where an older gravel, termed the Paradise gravel, may have established the paleo-pay streak, which was later reworked (but not spatially destroyed) by the lower White Channel gravel (Bond, 2016). The implications of this concept mean that a gravel deposit can act as a host for previously emplaced placer gold but the host gravel may not inform us about the spatial distribution of the placer gold itself. A pay streak may have an abrupt margin yet the host gravel displays little change sedimentologically. This can confuse miners and emphasizes the need for exploration sampling to inform development decisions in these environments.

**Bedrock Geology** Bedrock is andesite and schist.

**Gold Characteristics** Gold recovered is coarse with a fineness of 860. Up to 15% of the gold is larger than 12 mesh and contains minimal fine gold. Some of the gold is stained black, possibly from manganese. Some nuggets include quartz. Side pay gold on the Glacier Creek bench is fine and flattened with rare nuggets containing quartz.

## Miller, a tributary of Sixty Mile

115N/15 2015: 63°59'59"N, 140°48'32"W

### Miller Creek Mining Company Ltd., 1991-2017

Water License: PM14-004 (Active 06/2024)
Active Producer (2015-2017) **Operation no. 110**

**Location** Miller Creek, 1.1 km upstream from its confluence with the Sixty Mile River.

**Work History and Mining Cuts** The Murtaghs have been mining in the Sixtymile district for more than thirty years. Miller Creek was first discovered in the mid-1890s and has seen extensive work since its initial staking. A dredge was first active in the drainage in 1912 and was active a few seasons prior to being abandoned (YGS, 2010). In subsequent years, dredges and substantial operations have been present throughout the drainage, until more recently when Miller Creek Mining Company Ltd. became the sole operator. From 1887 to 2017, the reported gold production from Miller Creek amounts to more than 108,000 oz (YGS, 2010).

*Left limit bench targeted by Miller Creek Mining Company Ltd. from 2015 to 2017. The massive ice at the bottom of the section is due to the presence of historic shafts and drifts that filled with ground water and froze.*

From 2015 to 2017, the operation progressively mined upstream on the left limit bench of lower Miller Creek, stripping in the fall and extending the cut from the previous year. In 2015, Miller Creek Mining Company operated as a four-person crew.

**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 HM300 haul trucks for transporting overburden and hauling pay gravel to the wash plant. The wash plant was a 1.9 by 10 m (6.4 x 33 ft) trommel with a 2.4 by 2.4 m (8 x 8 ft) hopper, which screened to ¾". Water was supplied to the plant by a 10" pump, which allowed the plant to process material at a rate of 100 $yd^3$ (76 $m^3$)/hr. Two initial sluice runs, each 0.8 by 2.4 m (2.5 x 8 ft), split into six 1.8 m (6 ft) long runs composed of hydraulic riffles. A jig was used for clean-ups and concentrate was completed on a table in town.

**Surficial Geology and Stratigraphy** Gold bearing bench gravel is present on the left limit of lower to mid Miller Creek. This substantial deposit has been the primary placer target for several decades, of which Miller Creek Mining Company continues to exploit. A number of shafts and drifts are present throughout the bench. Water has accumulated and frozen in voids present in the shafts and drifts, creating massive ice, up to several metres thick. This ice is a challenge for the operator when it comes to overburden removal and excavating the lower 3.7 m (12 ft) of pay gravel. The bench consists of three units. Unit 1, from 0 to 3.7 m (0-12 ft), is a poorly sorted cobble-pebble gravel, with a 15 to 20% matrix of medium sand. Overlying the gravel is unit 2, a continuous package of silt from 3.7 to 4.6 m (12-15 ft). Unit 3, from 4.6 to 17.4 m (15-57 ft), consists of a massive, poorly sorted, cobble gravel. Unit 1 is the pay gravel. All of unit 1, along with up to 0.9 m (3 ft) of bedrock, was sluiced.

**Bedrock Geology** Bedrock is weathered, oxidized quartz-muscovite schist. The bedrock surface undulates substantially across the bench, with a relief of up to 6 m (20 ft). Some of these undulations are due to tectonic movement after the gravel was emplaced on the bench.

**Gold Characteristics** Gold is primarily greater than 35 mesh and the fineness is 820.

## Glacier, a tributary of Big Gold

116C/02 2017: 64°02'28"N, 140°54'28"W

**Cope, M.W., 2017**
**Hagen, G., 1983-1984, 1998-2001, 2007-2012**

Water License: PM15-072 (Active 07/2026)
Active Producer (2017) **Operation no. 111**

**Location** Glacier Creek, upper.

**Work History and Mining Cuts** Mr. Cope has a small operation on upper Glacier Creek. In 2017 he was active on a right limit low terrace and in the valley bottom near camp. There is no activity reported for 2015 and 2016.

**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 (YGS, 2017)

**Gold Characteristics** Not reported.

## Little Gold, a tributary of Big Gold

116C/02 2016: 64°03'35"N, 140°50'58"W

**Trautwein, A., 2010-2017**

Water License: PM15-028 (Active 05/2025)
Water License: PM13-021 (Active 08/2023)
Active Producer (2015-2017) **Operation no. 112**

**Location** Little Gold Creek, 7 km upstream from its confluence with Big Gold Creek.

*A view looking down Little Gold Creek from the Trautwein mine site. Mining focused on mid-valley deposits and buried floodplain sediments along the left limit.*

**Work History and Mining Cuts** Mr. Trautwein had a small two-man operation in 2016, located where previous Cat mining had finished. Work focused on the left limit where the better pay is located and a mid-valley cut adjacent to the road was completed.

**Equipment and Water Treatment** Equipment on site in 2016 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 m (4 ft) diameter by 7.6 m (25 ft) long trommel with a ³/₄" openings. The sluice box consists of a single 0.6 m (2 ft) by 3.6 m (12 ft) box 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 stratigraphy was not present. The overall thickness of sediment was 3 m (10 ft).

**Bedrock Geology** Bedrock is quartzite and quartz-muscovite-chlorite-schist (YGS, 2017).

**Gold Characteristics** Gold is coarse.

## Right limit tributary to California, a tributary of Sixty Mile

116C/01 2016: 64°08'58"N, 140°26'09"W

### Clayton Contracting and Yukon Exploration Green Gold Inc., 2016-2017

Water License: PM15-079-2 (Active 03/2026)
Active Producer (2016-2017) **Operation no. 113**

**Location** Unnamed right limit tributary to California Creek, 6.8 km upstream from its confluence with California Creek.

**Work History and Mining Cuts** 2016 was the first year of operation at this new placer locality. Work consisted of upgrading 6 km of access trail into a road suitable for hauling equipment and fuel. Camp was established at a clearing near the Top of the World Highway. A series of three out-of-stream settling ponds were constructed and an access trail was built in the valley bottom to access ground farther upstream. Twelve personnel were employed at the site.

**Equipment and Water Treatment** Equipment on site in 2016 included Caterpillar 328, 329 and 349 excavators for digging pay, stripping and tailings, a Caterpillar 730 articulated haul truck for transporting pay and an Hitachi 200 excavator for feeding the plant. A D8T and a D6 Caterpillar bulldozer were also on site. Two plants were placed side by side and fed with the Hitachi excavator. One plant was a screen deck with ³/₁₆" openings and the second plant was a trommel with ¹/₂" openings. Both plants utilized hydraulic riffles in their sluice boxes. Two 6" Godwin pumps provided water to the plants and effluent was treated in three settling ponds constructed along the right limit of the valley.

**Surficial Geology and Stratigraphy** The 2016 mine cut intersected beds of interbedded marble and shale bedrock that cross cut the valley. The marble bands formed resistant "reefs" of high bedrock with a rough surface and accumulations of large marble boulders. The boulders may have toppled into the steam bed from hillside outcrops or represent fluvially eroded pinnacles of marble that eventually broke off and accumulated in-place. The surface relief with the marble zones varied by 1 to 2 m (3-6 ft) and silt-rich pay gravel was packed into depressions, fractures and void space between bedrock blocks. Cleaning the bedrock surface was challenging and would benefit from hydraulic monitoring to liberate the pay. Conversely, the partially metamorphosed shale beds, were friable, relatively soft, and comparatively smooth. The lowermost gravel from, 0 to 0.6 m (2 ft) thick, is a poorly sorted, silty gravel with cobble to boulder-size clasts. Most of the placer gold is contained within this unit. Overlying the silty gravel is a moderately sorted gravel 0.6 to 2 m (2-6.6 ft) thick and represents the modern creek gravel. The two gravel units are overlain by 0.3 to 2.4 m (1-8 ft) of frozen muck and weathered bedrock colluvium.

*Bands of marble bedrock cross cut the valley mined by Clayton Contracting in the California Creek drainage. These marble beds have a very rough surface and likely act as a hydraulic trap for placer gold.*

**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 2016: 63°51'10"N, 140°28'41"W

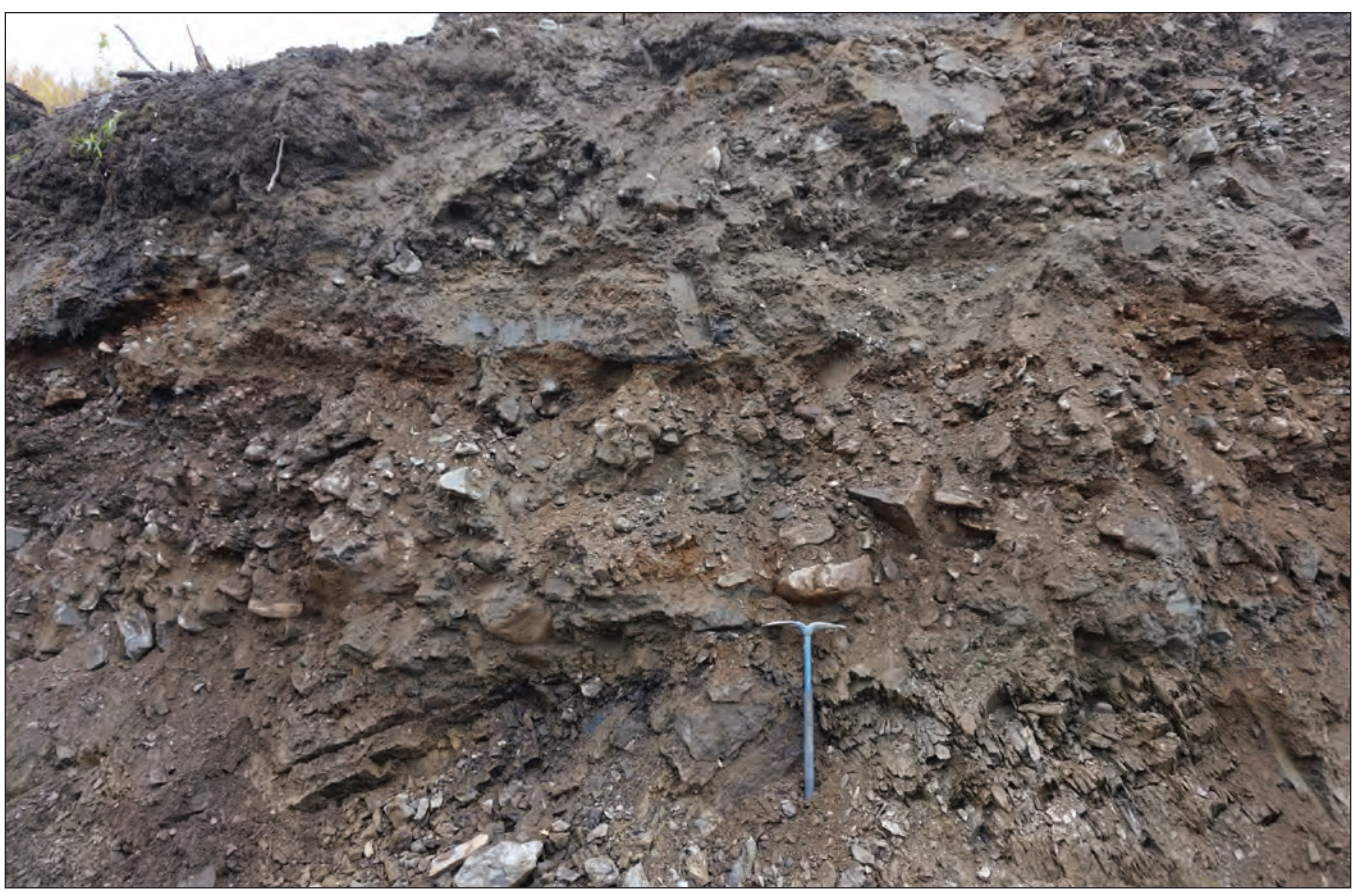
### 50 Mile Mining Corp., 2013-2017

Water License: PM12-022 (Active 07/2022)
Active Producer (2015-2017) **Operation no. 114**

**Location** Cheryl Creek, 1.7 km upstream from its confluence with Fifty Mile Creek.

**Work History and Mining Cuts** Activity on Cheryl Creek transitioned into full-scale mining in 2015 after two seasons of exploration work in 2013 and 2014. The width of mining cuts varied according to the patchy gold concentration. In leaner sections the mine cuts were made narrower and conversely in richer areas. Ground magnetic data has been a useful guide on the creek, however is not in 100% agreement with the gold concentration. Stripping programs were completed a year in advance of mining to thaw the ground. A total of 6 to 8 employees work at the mine.

**Equipment and Water Treatment** Equipment present in 2015 included an Hitachi 200 excavator, a Volvo L220E excavator and an Hitachi Zaxis 450 excavator, all of which were used to strip overburden and excavate gravel. A Caterpillar D8L bulldozer was utilized during stripping operations and to remove washed tailings, and a Caterpillar 235C excavator was used to feed the wash plant. Material was hauled to the sluicing location using a Caterpillar D400D haul truck. The wash plant is a Ty-Roc 900 screen deck that is capable of processing 140 $yd^3$ (107 $m^3$)/hr. The 1.8 by 4.3 m (6 x 14 ft) woven wire screen has ¾" openings and classifies material in two sluice runs that have a 2.4 m (8 ft) width. 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. 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.



*A typical section of gravel in Cheryl Creek. Sluicing commonly targets the lower 1 m (3 ft) of poorly sorted boulder-rich gravel and approximately 1 m (3 ft) of bedrock.*

**Surficial Geology and Stratigraphy** Placer gold in Cheryl Creek is concentrated in a poorly sorted boulder-cobble-rich gravel that has a silty sand matrix. The gravel likely represents flood-like conditions that eroded to bedrock and reworked a pre-existing placer deposit. The total gravel thickness in the valley bottom is 3 to 4 m (10-13 ft) and it is overlain by 1 m (3 ft) of silt. The lower 2 m (6.6 ft) of the gravel section is the most poorly sorted, whereas the upper 1 m (3 ft) is better washed and represents average flow conditions in the valley. Gold concentrations are better on the right limit where nuggets tend to be located. The left limit primarily contains fine gold and about 40% of the overall gold quantity.

**Bedrock Geology** Bedrock is blocky amphibolite 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 890 and 910. The largest nugget recovered was ²/₃ oz.

## Enchantment, a tributary of Sixty Mile

115N/16 2015: 63°55'14"N, 140°16'36"W

### Fellhawk Enterprises Ltd., 2014-2017

Water License: PM10-040 (Active 03/2022)
Active Producer (2015-2017) **Operation no. 115**

**Location** Enchantment Creek, approximately 6.6 km upstream from its confluence with Sixty Mile River.

**Work History and Mining Cuts** Work in 2015 and 2016 primarily focused on improving roads, building an airstrip and stripping ground. A single person stripping operation occurred in 2015 and approximately 10,000 $yd^3$ was processed. Bulk testing was conducted on a bench of California Creek in 2016, with only stripping occurring throughout the season at Enchantment Creek. In 2017, the operator was present on the creek for ten days, focused on mining upstream from camp. With a crew of up to four people, a total of 10,000 $yd^3$ was processed.

**Equipment and Water Treatment** Equipment utilized by Fellhawk Placers in 2015 included a John Deere 450D excavator, a John Deere 270D LC excavator, a Caterpillar

*Screen deck processing material on Enchantment Creek in 2017 (Photo credit: Will Fellers).*

*A view looking up Enchantment Creek at Fellhawk Placers operation in 2015.*

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 x 16) ft double shaker screen deck that was capable of processing 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. Water was supplied to the plant by a Cornell 6RB 8 x 6" pump feeding a ten inch 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 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 amphibolite, quartz-mica-schist, and phyllite (YGS, 2017).

**Gold Characteristics** Gold is all fine, with the largest piece recovered up to 1 g, and has a fineness of 840.

## Ten Mile, a tributary of Sixty Mile

115O/12 2016: 63°31'35"N, 139°58'40"W

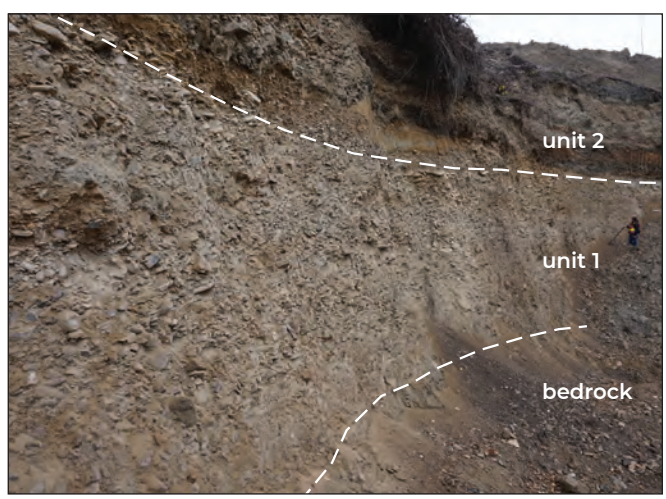
### No Name Resources Inc., 2010-2017

Water License: PM15-012 (Active 06/2025)
Active Producer (2015-2017) **Operation no. 116**

**Location** Ten Mile Creek, 4.3 km upstream from its confluence with Sixty Mile River.

**Work History and Mining Cuts** In 2015, mining focused on Donovan Pup, a right limit tributary to 10 Mile Creek. In 2016 and 2017, operations moved to a high-level left limit bench on 10 Mile Creek, approximately 750 m upstream from camp. Mining progressed from the rim and extended into the bench gravel while also advancing up stream. A total of 40,000 yd$^3$ was processed in 2017. Three miners worked a single daily shift. In 2017, No Name Resources also provided exploration assistance to a new operation starting on 13 Mile Creek.

**Equipment and Water Treatment** Equipment used on the bench cut in 2017 included a Deere 330C excavator for digging pay, a Deere 270C excavator for feeding the plant, and a Caterpillar D9H for stripping. The wash plant consists of a dump box feeding a 2 m (6 ft)-diameter by 8 m (26 ft)-long trommel that classifies to ¾". Sluice runs consisted of two 1.2 m (4 ft) by 6 m (20 ft) runs. The first 2.1 m (7 ft) is slick plate, then a boil box, 1.2 m (5 ft) of hydraulic riffles and 2.4 m (8 ft) of expanded metal. Water was supplied from 10 Mile Creek and settled in the valley bottom. The plant is able to process approximately 120 loose yd$^3$ (92 m$^3$)/hr.




*Exposure of the Pliocene high-level bench gravel in 10 Mile Creek. Two gravel units are present with unit 1 being more coarse-grained and less oxidized compared to unit 2.*

**Surficial Geology and Stratigraphy** The left limit bench on 10 Mile Creek is a continuous landform that extends to the mouth of the drainage. This former floodplain level was likely active during the Pliocene, 3 million years ago, and was abandoned when 10 Mile Creek eroded to a new base level following incision by the Yukon and 60 Mile rivers. Two units of gravel are visible in the stratigraphy of the bench, which is consistent with Pliocene bench deposits documented in the Klondike. Unit 1, from 0 to 4.6 m (0-15 ft), is a poorly to moderately sorted cobble-rich gravel. The clast content equals 65% with 10% boulders, 50% cobbles and 40% pebbles. Most clasts have a subangular shape. The gravel matrix consists of medium to coarse sand. Crude stratification is visible in unit 1 with gravel beds measuring 1 to 2 m (3-6 ft) in thickness. Some low-energy (finer grained) beds were visible on bedrock and a discontinuous high-energy zone was noted near the top of the unit in the 2016 cut. Clast imbrication in the gravel shows paleo-flow directions down-valley and in places, directed obliquely into the hillside, which could inform pay streak orientation. Unit 2, from 4.6 to 10.6 m (15-35 ft), is an oxidized, stratified gravel, containing sand, pebble-gravel and well-sorted cobble-gravel beds. Rare/localized lenses of poorly sorted, angular, clast-rich gravel are also present. Beds of silt are present, which is likely colluviated loess mixing into the fluvial environment. The thickness of unit 2 may increase as mining progresses farther into the bench. Unit 3 is a colluviated loess or muck deposit with variable thickness.

The distribution of placer gold on the 10 Mile Creek bench is just beginning to be understood. Recent mining has confirmed better grades in poorly sorted, clast-supported cobble-gravel on bedrock. The 2017 cut exposed a 1.5 m (5 ft) thick bed of this gravel. Approximately 15 m (50 ft) from the coarse gravel bed was a pebble-gravel on bedrock that contained low concentrations of gold. It is likely that the pay streak will have abrupt edges on the bench, and if it is similar to Pliocene benches in the Klondike, placer gold will concentrated very near the bedrock surface. Detailed stratigraphic testing should be completed to determine the appropriate sluice section and avoid unnecessary dilution of pay.

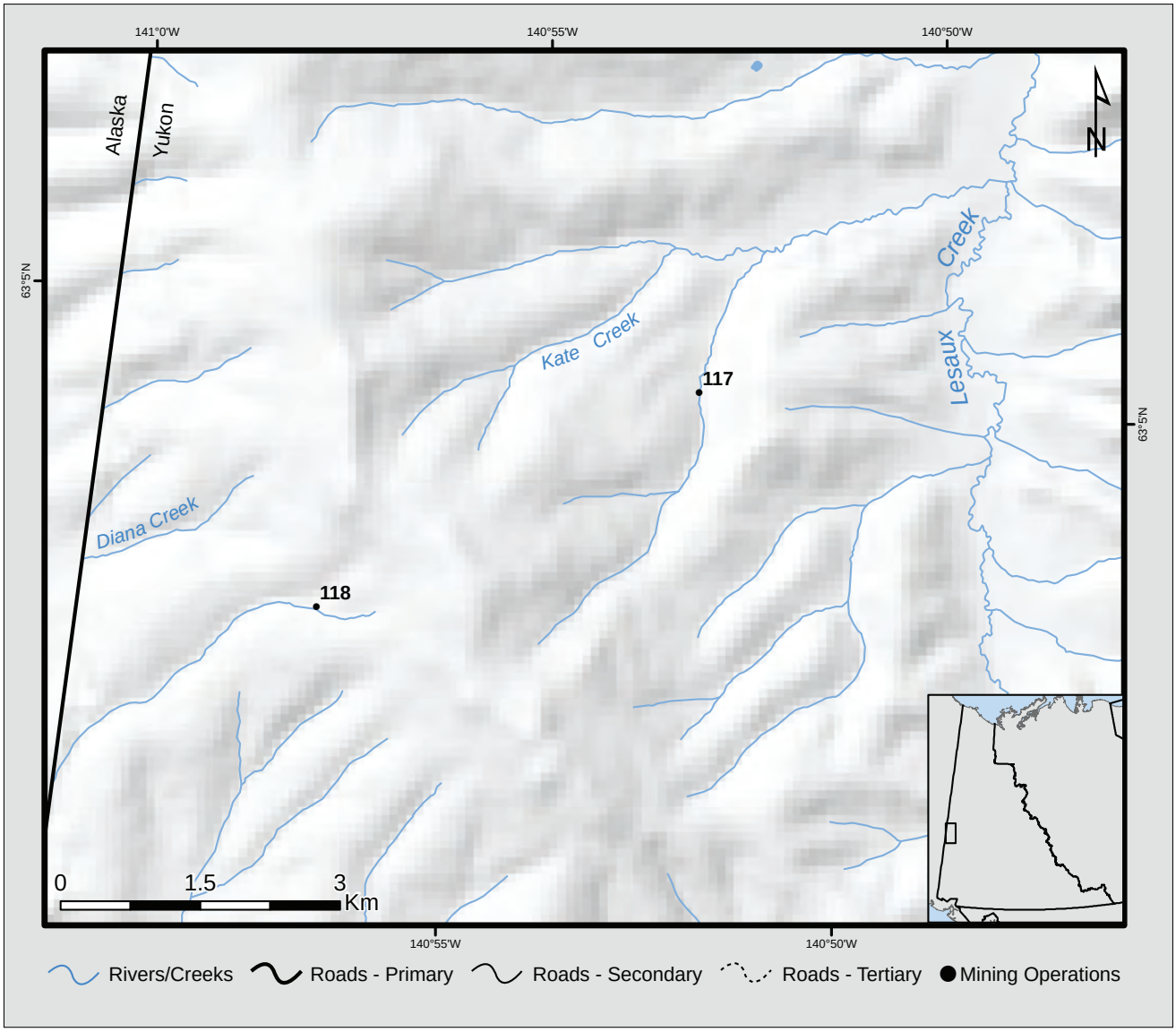
**Bedrock Geology** Bedrock is a brown schist.

**Gold Characteristics** Fineness is 845 on the bench and a nuggety fraction is present. Nuggets vary in shape from round to dendritic and are partially stained by iron oxidation.

*An aerial view looking down 10 Mile Creek toward the left limit bench cuts operated by No Name Resources Inc. The high-level bench represents a significant resource of fluvial sediment in the drainage.*

# MOOSEHORN
## PLACER AREA

**SITES 117-118**




**LEGEND**

117. Moosehorn Exploration Ltd.
118. Moosehorn Exploration Ltd.

## Great Bear, a tributary of Lesaux

115N/02 2015: 63°04'51"N, 140°52'33"W

### Moosehorn Exploration Ltd., 1989-2017

Water License: PM16-022 (Active 05/2027)
Water License: PM08-607 (Active 09/2018)
Active Producer (2015-2017) **Operation no. 117**

**Location** Great Bear Creek, approximately 2.7 km upstream from its confluence with Lesaux Creek.

**Work History and Mining Cuts** The Warrick family have been working in the Moosehorn Range since the late 1970s. As a very remote operation, they are self-sufficient and primarily supply their operation via a 40 km-long winter road that departs from the Alaska Highway north of Beaver Creek. Since the 1970s, activity has occurred on Swamp, Soya, Kenyon, Great Bear, and locally named Kate Creek, with most recent mining focused on Great Bear and Kenyon creeks. In 2015, the middle to lower portion of Great Bear Creek was actively mined and a cut measuring 28 by 71 m (92 x 233 ft) was completed. Approximately 11 hours of sluicing per day was completed. Moosehorn Exploration Ltd.'s second locality, Kenyon Creek, was the primary focus in 2016 where they re-mined ground previously worked in 1975. Mining continued on Kenyon Creek in 2017, and stripping occurred on Great Bear Creek.

**Equipment and Water Treatment** Equipment utilized on Great Bear Creek in 2015 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 x 12 ft) and contains 1" Hungarian riffles with 3½" spacing. The lower run has an initial area of 1.1 by 0.9 m (3.5 x 3 ft) and then splits into three – 1.1 m (3.5 ft) by 3.6 m (12 ft) runs. The lower runs contain 4 lb expanded metal. A 20 by 150 m (66 x 492 ft) settling pond was used to settle effluent and water was 100% recycled. Clean-ups were conducted using a long tom, wheel, rod mill, jig and table.

**Surficial Geology and Stratigraphy** Three units were exposed in the 12 m (39 ft) thick section on the right limit of Great Bear Creek in 2015. Unit 1, from 0 to 4 m (0-13 ft), is a partially decomposed, crudely-bedded, coarse gravel with 20% boulders, 40% cobbles and


*Sluicing on Great Bear Creek in 2015. Moosehorn Exploration Ltd. targeted the coarse side pay preserved on both limits of the drainage.*

40% pebbles. Matrix content varies from 40 to 60% and consists of silty medium sand. Matrix consisting of open-worked, coarse sand to granules is also present. All clasts are subangular and the average clast size is 0.4 m (1.3 ft). Most of the coarse gold is found at the base of unit 1 on the bedrock contact. Approximately ⅔ of the total placer gold is extracted from unit 1. Unit 2, from 4 to 7 m (13-23 ft), is a coarse, boulder-cobble gravel that is crudely imbricated downstream. Approximately 40% of the clasts are boulders, 40% cobbles and 20% pebbles. Up to 0.3 m (1 ft) of medium sand is present near the upper contact. Approximately ⅓ of the placer gold is derived from unit 2 and the gold is finer-grained. Unit 3, from 7 to 12 m (23-39 ft), is a deposit of silt and sand. This unit is stripped. Both units 1 and 2 are sluiced, along with up to 0.3 (1 ft) of bedrock. Better pay values are located along the right limit compared to the left limit.

**Bedrock Geology** Bedrock is granodiorite and varies in degree of decomposition.

**Gold Characteristics** More than half of the gold recovered is 50 mesh and has a fineness of 800.

## Kenyon, a tributary of Scottie

115N/02 2017: 63°03'20"N, 140°57'02"W

### Moosehorn Exploration Ltd., 2015-2017

Water License: PM08-607 (Active 09/2018)
Active Producer (2015-2017) **Operation no. 118**

**Location** Kenyon Creek, 840 m upstream from the Canada-United States border.

**Work History and Mining Cuts** Moosehorn Exploration Ltd. on Kenyon Creek is the westernmost placer operation in Yukon. Upper Kenyon Creek lies in Yukon and flows westward into Alaska before flowing into Ladue River drainage. Historically mined in the mid-1970s, the current operator is targeting Cat push tailings and *in situ* side pay. Original placer gold grades on this reach of upper Kenyon Creek returned 0.5 oz/yd³. The first phase of mechanized mining used a Ross Box for sluicing, which had poor water quality, and therefore, poor recovery. In 2015, ground preparations were made to mine Kenyon Creek and sluicing occurred in 2016 and 2017. A crew of up to three people were active at the mine.

*Moosehorn Exploration Ltd.'s operation on upper Kenyon Creek in 2017. The summit of the Moosehorn Range is the top of the ridge in the background. Gold placers in this environment are extracted from transitional sediments that develop when colluvium is lightly washed in the fluvial environment.*

**Equipment and Water Treatment** In 2017, heavy equipment present on Kenyan Creek 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. A wet dump box with ¾" grizzly was used to process up to 30 $yd^3$ (23 $m^3$)/hr. The sluice run measured 1.2 by 7.0 m (4 x 23 ft), and was configured with Hungarian riffles, angle iron and expanded metal, lined with nomad matting. Water was acquired from a single reservoir pond on Kenyon Creek, with water supplied to the plant using an 8" pump. A 100% recirculated system was in place on Keyon Creek. Clean-ups were conducted using a long tom, wheel, rod mill, jig and table.

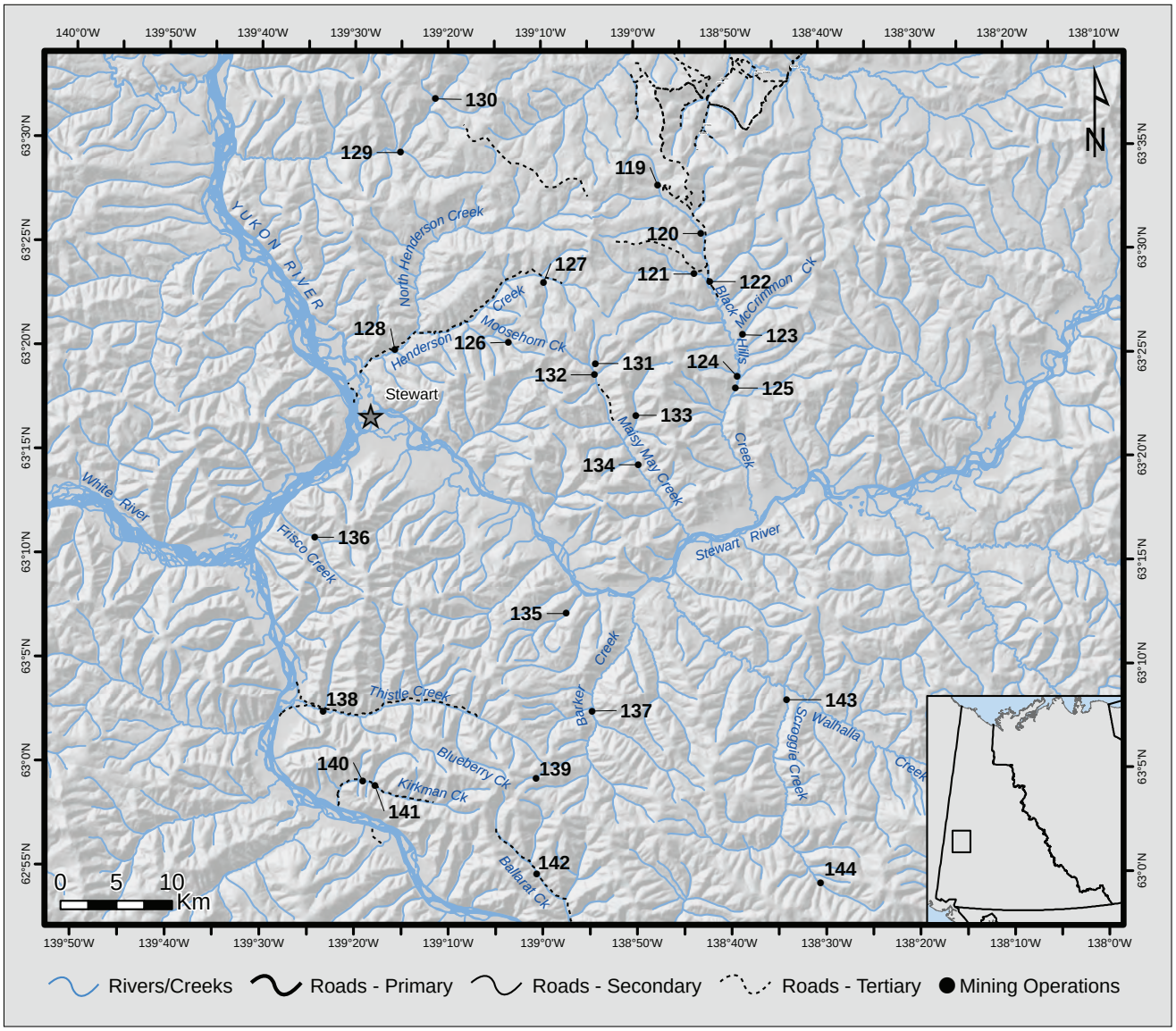
**Surficial Geology and Stratigraphy** The upper Kenyon Creek mine site is located in a high-elevation southwest-facing drainage near the summit of the Moosehorn Range. Surficial sediment at this topographic position consists of transitional sediments between the colluvial and fluvial environment. Colluvial 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 nuggets recovered. Fineness is 830.

# SOUTH KLONDIKE
## PLACER AREA

**SITES 119-144**




### LEGEND

119. R. Smith Placer Mining
120. Paydirt Holdings (1982) Ltd.
121. Weatherly, D.
122. Up & Atter Placers Ltd.
123. Hughes, S.
124. Stuart Placers Ltd.
125. SANDL Mining Ltd.
126. Vincent, M.
127. Atlantia Gold Corp.
128. H.C. Mining Ltd.
129. Paydirt Holdings (1982) Ltd.
130. Hunter Mine Services
131. Christiansen, A.
132. 40419 Yukon Inc.
133. Candace Creek Mining Ltd.
134. Bedrock Mining Company Inc.
135. No. 203 Dynamic Endeavours Inc.
136. Red Dog Resources Ltd.
137. Schmidt Mining Corp.
138. Schmidt Mining Corp.
139. Sager, M.
140. Sager, M. and R.
141. Fellhawk Enterprises Ltd.
142. Weber, B.
143. Ace Mining
144. Bidrman, Z.

## Black Hills, a tributary of Stewart

115O/10 2017: 63°31'51"N, 138°55'48"W

### R. Smith Placer Mining, 1996-2017

Water License: PM16-020 (Active 06/2026)
Water License: PM06-508 (Expired 05/2016)
Active Producer (2015-2017) **Operation no. 119**

**Location** Black Hills Creek, upper, 1.4 km upstream from Mills Creek.

**Work History and Mining Cuts** For more than two decades Mr. Smith has been mining the upper reaches of Black Hills Creek. Throughout 2015, the main focus was to monitor a large section of the left limit bank, approximately 1 km upstream from the major right limit tributary. Three areas were mined in 2016: the first was a 30 by 60 m (98 x 200 ft) cut on the right limit near the unnamed right limit tributary; a second cut was located mid-valley slightly upstream from the first cut; and the third cut continued to excavate the buried left limit bench that was monitored in 2015. In late fall 2016, a drill program was conducted to determine the depth and extent of the buried left limit channel. In 2017, with confirmation of the extent and gold distribution in the buried bench, mining focused solely on exploiting the bench placer. A crew of three people, operating a daily 12-hour shift spent the first half of the season monitoring, and by the end of the season mined a cut measuring 55 by 140 m (180 x 460 ft).

**Equipment and Water Treatment** Equipment utilized in 2017 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 Hitachi 330LC fed the plant while the 966 wheel loader delivered pay and removed tailings. The plant was a 1.2 by 7.6 m (4 x 25 ft) trommel that classifies into three individual sluice runs, each measuring 1.2 by 3.6 m (4 x 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 material at a rate of 60 $yd^3$ (46 $m^3$)/hr. The final stages of clean-up were done using a long tom, gold wheel, pan, and completed on a table in Dawson.

**Surficial Geology and Stratigraphy** Geophysics, drilling and progressively advancing laterally into the left limit has revealed a channel on the left limit bench, of the upper portion of the Black Hill drainage. Extensive historic shafting, likely 1920s era, has occurred along the left limit buried channel, also helping to define its extent. The channel is believed to have a total section depth of 24 m (80 ft) and a width of 46 m (150 ft). Mr. Smith hydraulically mined a cut in 2016, tapping into the rim of the channel, sluicing approximately 2.4 m (8 ft) of gravel and bedrock.

*Excavating the left limit bench at Mr. Smith's operation in 2017. The view is looking upstream towards the headwaters of Black Hills Creek.*

*Mr. Smith washing matting during a clean-up.*

The 2017 mine cut consisted of three units. Unit 1, a prominent mixing zone up to 0.3 m (1 ft) thick, was present at the bedrock contact where the fluvial system has reworked the weathered bedrock. Unit 2 has a maximum thickness of 1.7 m (5.6 ft) and is a cobble-pebble gravel, imbricated downstream and fines upwards. Overlying the bench gravel is unit 3, a 15 m (49 ft) thick deposit of massive ice, loess and organics.

**Bedrock Geology** Bedrock is weathered quartz-muscovite schist.

**Gold Characteristics** Gold has a rusty appearance and grains are either well-rounded or pounded flat.

## Black Hills, a tributary of Stewart

115O/07 2016: 63°28'46"N, 138°50'36"W

### Paydirt Holdings (1982) Ltd., 1983-1984, 1989-2016

Water License: PM14-072 (Active 06/2025)
Water License: PM05-505-1 (Expired 05/2015)
Active Producer (2015-2016) **Operation no. 120**

**Location** Black Hills Creek, 450 m upstream from the locally named left limit tributary 'Oil Gulch'.

**Work History and Mining Cuts** An area along the right limit, downstream from Childs Gulch was mined in 2015. Throughout 2016, Mr. Nixdorf focused on progressively mining upstream near the mouth of Oil Gulch, on the right limit of Black Hills Creek. With a crew of 5 personnel, a cut approximately 65 by 300 m (213 x 984 ft) was completed. The operator was not active on Black Hills during the 2017 season, due to a shift in attention to Rosebute Creek.

**Equipment and Water Treatment** Heavy machinery present on-site in 2016 included a John Deere 650D excavator with a 4 $yd^3$ bucket, an Hitachi 200 excavator, a Caterpillar 235 excavator, a Caterpillar 980H wheel loader, a Caterpillar D9R bulldozer, a Caterpillar D10N bulldozer and a Caterpillar 735 rock truck. A 1.8 by 2.4 m (6 x 8 ft) dump box fed into a 3 m (10 ft) long Derocker over a 12 m (40 ft) long sluice run lined with expanded metal riffles and Nomad matting. The wash plant was able to process up to 110 $yd^3$ (84 $m^3$)/hr, with water supplied by a 10" pump. Water was acquired from an in-stream reservoir and effluent was settled in a series of historic cuts that had been converted to ponds. A pan and gold wheel were used for clean-ups, and a jig for bulk clean-ups.

**Surficial Geology and Stratigraphy** Similarly to the operation upstream, Paydirt Holdings (1982) Ltd. has also defined the presence of a left limit buried channel that is overlain by up to 15 m (49 ft) of muck. Bench ground located on the left limit near base camp is shallow, which could represent the rim of the channel.

*Upstream view of mid-Black Hills with Paydirt Holdings Ltd.'s camp on the left limit.*

Operations to expose and excavate the buried resource are planned for future mining seasons.

The left limit in 2016, near the mouth of Oil Gulch, consists of 0.8 m (2.5 ft) of well-washed cobble-pebble gravel with 40% cobbles and 60% pebbles. It is a clast-supported gravel with matrix consisting of medium sand and minor silt that accounts for 20% of the deposit. No large boulders are present and the maximum clast size is 0.8 m (2.5 ft). An abundance of silty fines are present where large cobble lags are preserved on bedrock. From 0.8 to 1.1 m (2.5-3.5 ft) a fining upward sequence of medium to very fine sand is present. An abundance of woody debris and organics are also present. Although not very continuous, this could represent a contribution derived from Oil Gulch. Overlying the fine-grained sequence is approximately 0.9 m (3 ft) of disturbed material that appears to be historic tailings and/or cat push material. An unknown thickness of overburden was previously stripped prior to mining. Up to 0.9 m (3 ft) of gravel and 0.6 m (2 ft) of bedrock was sluiced.

**Bedrock Geology** Bedrock is highly fractured and blocky quartzite, with zones of pervasive oxidation and clay alteration.

**Gold Characteristics** Gold is mostly fine grained and has a fineness of 760.

*Rock truck hauling pay to the screen deck in 2016, upstream from the mouth of Oil Gulch.*

## Dome, a tributary of Black Hills

115O/07 2016: 63°26'46"N, 138°50'55"W

**Weatherly, D., 2016**
**Armstrong, W., 2002-2012**

Water License: PM16-014 (Active 07/2026)
Water License: PM06-512 (Expired 05/2016)
Active Producer (2016) **Operation no. 121**

**Location** Dome Creek, 1.2 km upstream from its confluence with Black Hills Creek.

**Work History and Mining Cuts** Previously owned by Mr. Armstrong, the property changed ownership in spring 2016. A bulk testing program occurred with a four person crew in 2016, and no activity occurred on site in 2017. Additional ground was staked farther upstream on Dome Creek and the new operators plan to be present on the property in 2018.

**Equipment and Water Treatment** Equipment utilized for the testing program included a John Deere 790 excavator, a Caterpillar 235 excavator, a Caterpillar D8H bulldozer, and a Derocker capable of processing up to 30 $yd^3$ (23 $m^3$)/hr.

**Surficial Geology and Stratigraphy** During the testing program, up to 0.9 m (3 ft) of gravel was encountered. All gravel, and up to 0.2 m (0.5 ft) of bedrock, was sluiced.

**Bedrock Geology** Bedrock is highly fractured schist.

**Gold Characteristics** Gold is wiry and dendritic and up to 80% of it appears to have traveled a few kilometres in the drainage. Color greatly varies with the larger pieces being much brighter.

*Wash plant and area of testing on Dome Creek in 2016. The view is looking upstream. (Photo credit: Jim Leary).*

## Black Hills, a tributary of Stewart

115O/07 2017: 63°26'30"N, 138°49'10"W

### Up & Atter Placers Ltd., 2015-2017

Water License: PM15-023-1 (Active 06/2020)
Active Producer (2015-2017) **Operation no. 122**

**Location** Black Hills Creek, left limit low-level bench, 150 m upstream from Mills Creek.

**Work History and Mining Cuts** Up & Atter Placers Ltd. leased ground from Mr. White on Black Hills Creek from 2015 to 2017. A left limit bench cut measuring 9 by 30 m (30 x 100 ft), 360 m downstream from Mills Creek, was mined in 2015. Activity in 2016 occurred approximately 100 m upstream on the left limit bench, as a continuation of the 2015 cut. In 2017, a crew of three operated a daily 10-hour shift and mined a bench cut that was approximately 23 by 46 m (75 x 150 ft).

**Equipment and Water Treatment** Equipment on site included two Hitachi EX300LC excavators, a Caterpillar 936 wheel loader, a Caterpillar 745 rock truck and a Caterpillar D8K bulldozer. A track mounted oscillating 1.5 by 3.6 m (5 x 12 ft) screen deck with a 6 m (20 ft) tailings stacker was used to process up to 65 $yd^3$ (50 $m^3$)/hr. Water was 100% recycled. A Devin Gold vortex table was used to conduct clean-ups and completed on a table in Dawson.

**Surficial Geology and Stratigraphy** The stratigraphic section on the left limit bench in 2016 consisted of four units overlying bedrock. Bedrock is a decomposed quartz-mica schist with large quartz veins up to 3 m (10 ft) wide. Unit 1, from 0 to 1.8 m (0-5.9 ft), is a mixing zone between the decomposed bedrock and a coarse gravel. The mixing zone is very compact, contains 20% competent clasts and an abundance of medium sand and weathered clasts. A boulder lag is also present on the bedrock surface and contains clasts up to 2 m (6.6 ft). Unit 2, from 1.8 to 7.5 m (5.9-24.6 ft), is a pebble-cobble-boulder gravel that is massive to crudely bedded. It is matrix-supported with fine to medium sand and minor silt. Pebble-rich zones up to 1 m (3.3 ft) thick are interbedded throughout the coarse gravel unit. Unit 3, from 7.5 to 11.4 m (24.6-37.4 ft), is a moderately sorted cobble gravel that fines upwards and is primarily composed of subrounded clasts. Unit 4, from 11.4 to 12.4 m (37.4-40.6 m), is colluvium and


*Sluicing on the left limit of Black Hills at Up & Atter Placers Ltd. in the fall of 2017.*

*Up & Atter Placers Ltd. left limit bench cut in 2016.*

reworked hillslope fine-grained sediment. Placer gold is concentrated in unit 1 and the lower parts of unit 2. Up to 1.5 m (5 ft) of gravel and 0.9 m (3 ft) of bedrock was sluiced.

**Bedrock Geology** Bedrock is highly decomposed quartz-mica schist.

**Gold Characteristics** Placer gold is all fine grained and has a fineness that ranges from 780 to 820.

## McCrimmon, a tributary of Black Hills

115O/07 2017: 63°24'05"N, 138°45'06"W

**Hughes, S., 2008-2017**

Water License: PM08-624 (Active 09/2019)
Active Producer (2015-2017) **Operation no. 123**

**Location** McCrimmon Creek, 1.3 km from its confluence with Black Hills Creek.

**Work History and Mining Cuts** As a one-person operation, Mr. Hughes actively prepared and sluiced material from 2015 to 2017. A large portion of each season was spent assisting a miner farther downstream in the drainage. Stripping was completed periodically throughout the season, and sluicing occurred in the fall. An area 45 by 250 m (150 x 820 ft) was stripped in 2015, including a diversion channel. In 2017, an area 30 by 122 m (100 x 400 ft) was stripped, and sluicing on the right limit occurred until freeze-up.

**Equipment and Water Treatment** Equipment present included a Hitachi EX60 excavator, an Hitachi EX270 LC excavator, and a Caterpillar D8 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 x 8 ft) and contains expanded metal. A 3" gasoline-powered Honda pump supplied enough water 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.

**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.

*A view looking downstream on McCrimmon Creek where Mr. Hughes has been actively mining since 2008.*

Up to 3 m (10 ft) of muck and 0.6 m (2 ft) of upper gravel is stripped off prior to sluicing.

**Bedrock Geology** Bedrock is blocky quartzite and quartz-mica schist.

**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 2017: 63°22'03"N, 138°45'13"W
115O/07 2017: 63°23'22"N, 138°45'53"W

### Stuart Placers Ltd., 2009-2017

Water License: PM11-020 (Active 06/2021)
Water License: PM10-023-3 (Active 03/2020)
Water License: PM12-037 (Active 03/2020)
Active Producer (2015-2017) **Operation no. 124**

**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** Stuart Placers progressively mined upstream towards the mouth of McCrimmon Creek throughout 2015 to 2017. A crew of six operated a daily 12 hour shift in 2015 and mined a cut two claim lengths by 90 m (300 ft) wide. Both limits were mined and stripping was completed upstream near the mouth of Mills Creek. Mining continued up both limits towards the mouth of McCrimmon in 2016. In 2017, two wash plant locations were processing material throughout the season. A right limit bench cut measuring 55 by 150 m (180 x 490 ft) across from the mouth of Kernine Creek was mined. The second location was farther upstream, near the mouth of McCrimmon, and a cut measuring 70 by 180 m (230 x 590 ft) was completed. The bench cut near Kernine Creek was mined several years ago and stripped approximately 5 years prior to the 2017 season. Additional work throughout 2017 included a drill program consisting of 12 holes on the left limit bench, upstream from McCrimmon Creek. Throughout 2017, a crew of up to eight people, working a daily 12-hour shift, sluiced 180,000 $yd^3$ of material.

**Equipment and Water Treatment** Equipment utilized throughout 2017 included two Hitachi Zaxis 450 excavators, an Hitachi EX300 excavator, an Hitachi 330 excavator, a John Deere 450 excavator, a Caterpillar D10R, D9N, two 9H bulldozers, two Caterpillar 985 wheel loader, a Bell 40 ton articulating haul truck and two International Payhauler 350C haul trucks.

At the bench cut near Kernine Creek, a 1.5 by 6.1 m (5 x 20 ft) trommel was utilized to process up to 75 $yd^3$ (57 $m^3$)/hr. The sluice run measured 1.8 by 3.0 m (6 x 10 ft) and was lined with Nomad matting and 2" hydraulic riffles. The second plant located at McCrimmon Creek cut was a Derocker able to process 120 $yd^3$ (92 $m^3$)/hr. Water was acquired from Black Hills Creek and effluent was settled out-of-stream in a pond 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** On the right limit of mid-Black Hills Creek, 3 to 4 intermediate bench levels exist. Targeted in 2017 was an intermediate level bench approximately 5 m (16 ft) above the modern creek. The preserved bench extends farther downstream and is dissected by a small right limit tributary that has contributed an alluvial fan deposit that overlies the pebble-cobble bench gravel. Decomposed bedrock is undulating throughout the section, varying the thickness of gravel up to a maximum of 1.8 m (6 ft). Overlying the decomposed bedrock is a pebble-cobble gravel that it moderately sorted, well-washed and weakly oxidized. Clasts are predominately subrounded and the maximum clast size is 0.7 m (2.3 ft). Gravel is matrix-supported with 30% matrix consisting of medium to coarse sand. The clasts are weakly imbricated down-valley on the bedrock contact, with clasts predominately imbricated across-valley (east), which is likely the reflection of the tributary influence. A maximum of 7 m (23 ft) of overburden overlies the gravel, which consists of interbedded pebble gravel and black muck. Approximately 0.6 m (2 ft) of bedrock was sluiced depending on the degree of decomposition of the bedrock.

In the main valley of Black Hills Creek, towards the mouth of McCrimmon Creek, the surficial geology comprises fluvial gravel overlain by fluvial silt and muck. At the base of the section, from 0 to 1.3 m (4.3 ft), is a cobble pebble gravel with 60% pebbles and 40% cobbles, that fines upwards. It is matrix-supported and is primarily fine-grained sand and silt, and is capped by an undulating lens of sand up to 0.2 m (0.6 ft) thick. Open work structures are present in the gravel. Where the bedrock is more susceptible to chemical decomposition, there is a mixing zone of fluvial gravel and weathered bedrock. This material has the appearance of a diamicton and is cohesive, making it somewhat resistant to erosion.


*A close-up view of the pay units in Black Hills Creek at the Stuart Placers property in 2015. A distinctive mixing zone between bedrock and the fluvial gravel has formed. The mixing zone consists of clay-altered weathered bedrock and fluvial sediment. Placer gold is extracted from all three of these units.*

*Downstream view from the cut at the mouth of McCrimmon Creek in 2017.*

Overlying fluvial gravel is often in sharp contact with the mixing zone diamict. Approximately 4.5 m (14.8 ft) of muck overburden overlies the gravel and mixing zone. The modern floodplain pay streak in Black Hills Creek contains of a tighter gravel that resembles frozen ground when excavating. Flatter gold lies outside of the pay channel whereas heavier, thicker gold is concentrated within the pay channel. Gold distribution is also affected by the competency of the bedrock that crosscuts the valley. In zones of blocky, weathered bedrock there are more nuggets.

**Bedrock Geology** Bedrock varies between gumbo, highly fractured chlorite-schist and pervasively oxidized fractured schist. Quartz veins up to 30 cm wide were observed in the mine cut.

**Gold Characteristics** Gold ranges from flat and flaky to round and nuggety, with a purity of 790 to 830.

## Black Hills, a tributary of Stewart

115O/07 2016: 63°21'29"N, 138°45'16"W

### SANDL Mining Ltd., 2009-2017

Water License: PM10-023-3 (Active 03/2020)
Water License: PM11-021-1 (Active 06/2021)
Active Producer (2015-2017) **Operation no. 125**

**Location** Black Hills Creek, 13 km from the confluence with the Stewart River.

**Work History and Mining Cuts** A crew of eight people operated in 2015 and mined a valley bottom cut on the left limit measuring approximately 91 by 274 m (300 x 900 ft). A right limit cut was also stripped and prepared for sluicing throughout the season. In 2016, a crew of up to seven people mined towards the uppermost boundary of their property. The valley bottom was mined on both left and right limits. A second location consisting of a low-level, right limit bench near camp was also mined in 2016. In 2017, a right limit bench was stripped and prepared for sluicing. A significant reclamation program was completed on the property at the end of the season.

**Equipment and Water Treatment** Equipment present on site in 2017 included two Hitachi Zaxis 350 LC exavators, two Hitachi Zaxis 330 excavators, two Hitachi Zaxis 300 excavators, a Komatsu 400 rock truck, and

*Aerial view of the SANDL Mining Ltd. in 2016.*

Caterpillar D9 and D10 bulldozers. Two track-mounted New Zealand trommels, one 1.8 by 6.1 m (6 x 20 ft) and the other 1.5 by 4.6 m (5 x 15 ft), were both used. The 1.8 m (6 ft) trommel had two side runs measuring 2.4 by 4.9 m (8 x 16 ft) with upper boil boxes and expanded metal and could process up to 120 $yd^3$ (90 $m^3$)/hr. Water was pumped directly from Black Hills Creek, supplied by a 6 by 8" pump, and effluent was settled in a previously mined cut. Clean-ups were conducted using a long tom and wheel.

**Surficial Geology and Stratigraphy** Auriferous gravel resources along the Black Hills Creek drainage are present in the modern valley bottom as well as in low-level terraces. Both deposit types are mined by SANDL Mining Ltd., although the majority of their efforts have been focused on the active floodplain of the modern valley.

A section exposed in the valley bottom cut in 2015 consisted of four units. Unit 1, from 0 to 1.2 m (4 ft), is a mixing zone of weathered bedrock and fluvial gravel. It contains 70% clasts, of which 40% are pebbles, 30% are cobbles and 30% are boulders. Clasts are primarily subround and the matrix is silty sand. Overlying the mixing zone is unit 2, from 1.2 to 1.5 m (4-5 ft), which is a thin basal fluvial unit. Unit 2 is a pebble-cobble gravel that was deposited in a high-energy environment with open work beds and 20% coarse sand matrix. Clasts comprise 80% of the unit and consist of 40% cobbles, 40% pebbles and 20% boulders. Unit 3, from 1.5 to 3.5 m (5-11.5 ft), is a sandy fluvial gravel, which is stripped prior to sluicing. Unit 4, from 3.5 to 5.5 m (11.5-18 ft), is primarily organics with an abundance of woody debris. Up to 1.5 m (5 ft) of gravel, the mixing zone and approximately 0.5 m (1.6 ft) of bedrock were sluiced.

The surficial geology of a low-level, right limit bench, located 1.8 km downstream from the mouth of Kernine Creek was described. The gravel on bedrock consists of a cobble-pebble gravel that is 4.2 m (13.8 ft) thick, is clast-supported, poorly sorted, contains subrounded to subangular clasts and has a fine to medium coarse-sand matrix. Overlying the gravel is an undulating, 0.4 m (1.3 ft) thick, sandy silt bed that is primarily medium to fine-grained sand. Capping the fines is up to 3.5 m (11.5 ft) of fining upward cobble-pebble gravel and overbank material.

**Bedrock Geology** Bedrock is blocky mafic-rich green schist.

**Gold Characteristics** Gold is primarily angular and flat, with flat, coarse gold derived from the bench deposits. Fineness is an average 810.

*Large angular boulders of blocky bedrock are visible in the mine cut at SANDL Mining Ltd.'s operation in 2015.*

## Moosehorn, a tributary of Henderson

115O/06 2017: 63°22'35"N, 139°10'07"W

**Vincent, M., 2008-2017**

Water License: PM09-666 (Active 10/2019)
Active Producer (2015-2017) **Operation no. 126**

**Location** Moosehorn Creek, 4.3 km upstream from its confluence with Henderson Creek.

**Work History and Mining Cuts** Sluicing occurred on the creek in 2015 but no specific work history is known. In 2016, Mr. Vincent continued to mine upstream from the 2015 mine cut. In 2017, activity occurred on both limits and the operator mined progressively upstream. Additionally, a 70 by 30 m (230 x 98 ft) cut was stripped and prepared for sluicing in 2018.

**Equipment and Water Treatment** In 2017, equipment included a Komatsu PC300LC excavator, a John Deere 690B excavator, a Bantam excavator, an Hitachi Zaxis 330 LC excavator and a vibrating single screen deck able to process 30 $yd^3$ (23 $m^3$)/hr. Water was 100% recycled. Clean-ups were conducted using a shaker table.

**Surficial Geology and Stratigraphy** Exposed on the left limit of Moosehorn Creek in 2017 was a high-energy gulch gravel that is typically found in the headwaters of narrow gulch settings in unglaciated terrain. The deposit consists of angular, coarse gravel up to 2.4 m (7.9 ft) thick and is overlain by up to 4 m (13 ft) of overbank material and colluvium. The coarse gravel is boulder-rich with up to 5% boulder and 60% cobble-sized material. It is poorly sorted, has a sandy-silty matrix and contains a significant amount of angular bedrock fragments. All gravel was sluiced.

*View looking upstream Moosehorn Creek towards Mr. Vincent's wash plant and excavator in 2017.*

**Bedrock Geology** Bedrock is quartz-muscovite-schist.

**Gold Characteristics** Gold is flat and has a fineness of 780.

## Russian, a tributary of Henderson

115O/06 2017: 63°25'37"N, 139°07'01"W

**Atlantia Gold Corp., 2016-2017**
**Northern Gold Resources ULC, 2014-2015**

Water License: PM12-025 (Active 08/2022)
Active Producer (2015-2017) **Operation no. 127**

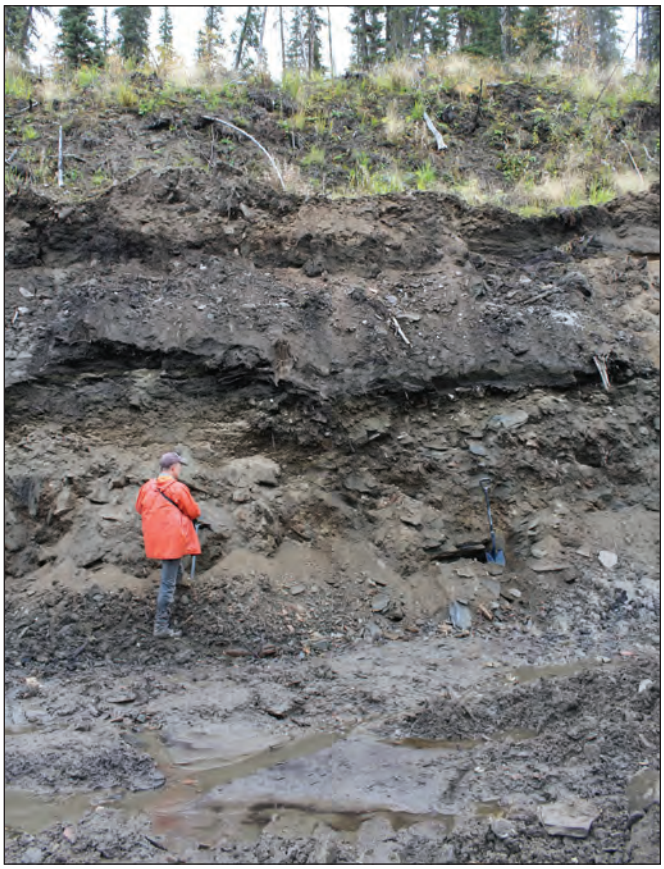
**Location** Russian Gulch, 500 m upstream from its confluence with Henderson Creek.

**Work History and Mining Cuts** Northern Gold Resources ULC mined on Henderson Creek in 2014 and 2015, and sluiced approximately 35,000 $yd^3$ of material. At the beginning of 2016, an agreement to mine Northern Gold Resources ULC claims was established with Atlantia Gold Corp. In 2016, mining occurred on Henderson Creek and at the end of the season, the mouth of Russian Gulch was sluiced. Throughout the season a total of 30,000 $yd^3$ of material was sluiced. Activity in 2017 was focused on lower Russian Gulch, where up to three operators working a ten hour shift progressively mining upstream throughout the season. They mined a total length of 398 m (1,305 ft) and sluiced approximately 25,000 $yd^3$ of material.

**Equipment and Water Treatment** Equipment present at the operation in 2017 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 deck 1.5 by 3.0 m (5 x 10 ft) screen deck 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 x 6 ft) which splits into three runs each measuring 1.2 by 2.4 m (4 x 8 ft). Water was supplied to the plant by 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 two 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** Russian Gulch is a relatively steep, narrow drainage with a maximum width of 40 m (130 ft), and contains a coarse boulder gravel deposit. The boulder gravel is 1.8 m (6 ft) thick


*Atlantia Gold Corp. sluicing 500 m upstream on Russian Gulch in 2017.*



*A coarse, high-energy, locally derived gravel that is a paleo-gulch placer deposit at the mouth of Russian Creek in 2016.*

and is poorly sorted and crudely stratified, with a high boulder content up to 15%. Clasts are locally derived, subangular, and the maximum clast is up to 1.3 m (4.3 ft) in length. Gold enrichment occurs on the bedrock surface in the thalweg of the stream-bed. As a function of the narrow gulch, the gravel section thins rapidly toward the channel limits. Up to 2.4 m (8 ft) of reworked overbank material, muck and organics overlie the coarse gravel. All gravel and up to 1.2 m (4 ft) of bedrock was sluiced.

**Bedrock Geology** Bedrock is blocky, competent mafic 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 2017: 63°21'38"N, 139°22'14"W

### H.C. Mining Ltd., 2004-2017

Water License: PM08-623-1 (Active 08/2019)
Active Producer (2015-2017) **Operation no. 128**

**Location** Henderson Creek, 2.6 km downstream from the confluence of North Henderson Creek and the main stem of Henderson Creek.

**Work History and Mining Cuts** In 2015, substantial sluicing occurred throughout the season on lower Henderson Creek and a cut measuring 2286 by 91 m (7,500 x 300 ft) was stripped. Late in the season a drilling program occurred on Henderson Creek to explore the placer potential of the high-level benches preserved within the drainage. A crew of seven people operated a 22-hour split shift throughout 2016. Activity in 2017 was focused on lower Henderson Creek where H.C. Mining Ltd. continued to progressively mine downstream towards the Yukon River. A cut extending the entire width of the drainage was mined.

**Equipment and Water Treatment** Equipment utilized on site in 2017 included two Hitachi 470 excavators, two Hitachi Zaxis 350LC excavators, two Komatsu 475 bulldozers, three Caterpillar 9L bulldozers, a D9T bulldozer, and a Komatsu HM400-2 rock truck. The wash plant consists of a vibrating 1.5 by 4.3 m (5 x 14 ft) double screen deck with a 3 by 3 m (10 x 10 ft) hopper, able to process up to 250 $yd^3$ (191 $m^3$)/hr. The upper sluice run measures 3.3 by 2.3 m (11 x 7.5 ft) and the two bottom runs measure 2.4 by 4.3 m (8 x 14 ft) and consists of angle iron riffles. Tailings were stacked with a 0.8 by 15.2 m (2.6 x 50 ft) conveyor. Water was 100% recycled.

*H.C. Mining Ltd. systematically mining lower Henderson Creek gravel in 2015. From 2015 to 2017 the operator has been progressively mining downstream towards Yukon River.*

**Surficial Geology and Stratigraphy** On lower Henderson Creek, H.C. Mining Ltd. targeted a 0.7 m (2.3 ft) thick mixing zone of gravel and weathered bedrock. Overlying the mixing zone is a 1.2 m (3.9 ft) thick, poorly sorted, cobble gravel with 30% pebbles, 50% cobbles and up to 20% boulders. The gravel is clast supported and contains a matrix of medium sand and silt. The abundance of boulders and its poorly sorted nature is representative of a hyper-concentrated flood flow, which reworked the underlying mixing zone during deposition. Fines are present capping the gravel, with a soil developed on the surface contact between the lower gravel and the upper fines. All cobble gravel and up to 1.8 m (6.0 ft) of weathered mafic schist bedrock was sluiced.

A lower left limit bench was also exploited as a result of exploration in 2015. The bench contains 12 m (40 ft) of thawed pebble-gravel with consistent grades; this represents a significant continuation of mineable ground remaining on Henderson Creek.

**Bedrock Geology** Bedrock varies between orthogneiss and highly fractured and variably weathered mafic schist.

**Gold Characteristics** Gold is all fine and flat, with fineness ranging from 800 to 810.

## Rosebute, a tributary of Yukon

115O/11 2017: 63°31'08"N, 139°23'56"W

### Paydirt Holdings (1982) Ltd., 2015-2017

Water License: PM16-017 (Active 06/2026)
Active Producer (2015-2017) **Operation no. 129**

**Location** Rosebute Creek, approximately 15.5 km upstream from its confluence with Yukon River.

**Work History and Mining Cuts** Paydirt Holdings (1982) Ltd. actively sluiced mid-Rosebute Creek in 2015, largely focusing on ground that was previously mined by a company that leased the property in 2013 and 2014. The following season in 2016, Paydirt Holdings (1982) Ltd. focused their efforts on their other operation located on Black Hill Creek. In 2017, a substantial stripping program extended a large cut upstream to the mouth of the Rosebute forks. A bench cut was also prepared throughout the season and will be sluiced in 2018.

*View of Paydirt Holdings (1982) Ltd. stripping operation in 2017 on mid-Rosebute Creek (Photo credit: Jim Leary).*

**Equipment and Water Treatment** Equipment known to be utilized at site includes a John Deere excavator and a Caterpillar bulldozer.

**Surficial Geology and Stratigraphy** Placers are present in the modern valley as well as on low-level benches approximately 12 m (40 ft) above the modern creek.

**Bedrock Geology** Bedrock is intermediate to mafic orthogneiss (YGS, 2017).

**Gold Characteristics** Not reported.

## Rosebute, a tributary of Yukon

115O/11 2017: 63°33'53"N, 139°20'47"W

### Hunter Mine Services, 2015-2017

Water License: PM11-033 (Active 02/2022)
Active Producer (2015-2017) **Operation no. 130**

**Location** Left fork Rosebute Creek, approximately 5.8 km upstream from the mouth of the forks.

**Work History and Mining Cuts** A placer land use permit was issued in 2012, with minimal work occurring on site prior to 2015. In 2015 the operator established a camp

*Aerial view looking upstream left fork Rosebute Creek where Hunter Mine Services camp is visible on a small right limit tributary and workings below camp are present on the left fork.*

and transported equipment to the property. Stripping occurred up the left fork throughout the season, approximately 5.8 km upstream from the mouth of the forks. In 2017, a cut was further prepared and will be sluiced during the following season.

**Equipment and Water Treatment** Equipment located on site in 2016 included a Hitachi excavator.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is intermediate to mafic orthogneiss (YGS, 2017).

**Gold Characteristics** Not reported.

## Maisy May, a tributary of Stewart

115O/06 2017: 63°22'0.1"N, 139°00'32"W

**Christiansen, A., 1993-2017**

Water License: PM10-071-1 (Active 09/2021)
Water License: PM09-637A (Active 04/2020)
Active Producer (2015-2017) **Operation no. 131**

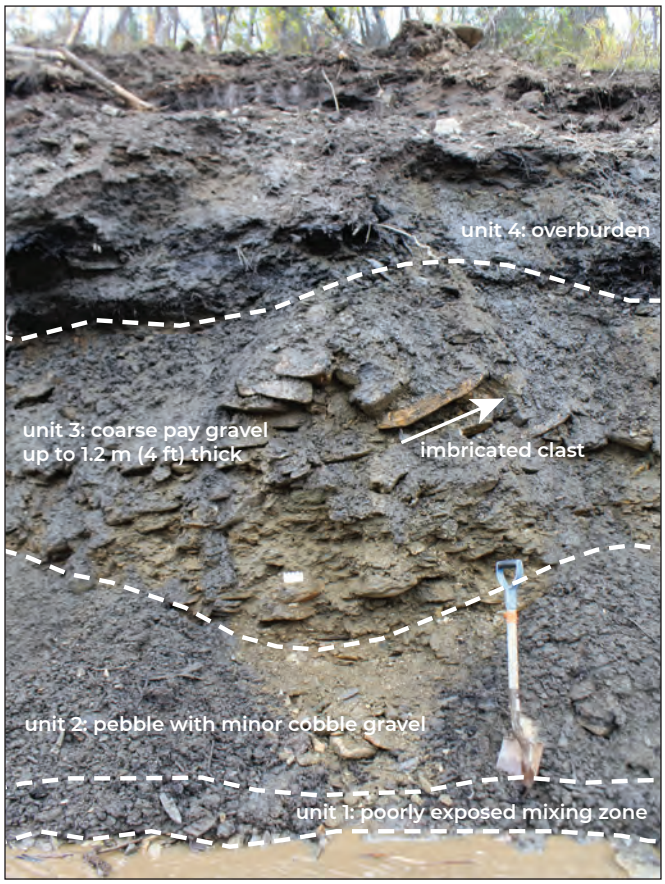
**Location** Maisy May Creek; 900 m upstream an unnamed left limit tributary from its confluence with Maisy May Creek.

**Work History and Mining Cuts** An uppermost left limit tributary of Maisy May was mined by the Christiansen family in 2015. Four personnel mined a cut measuring 25 by 140 m (82 x 500 ft) on the unnamed tributary. In 2017 the operation moved one drainage downstream, where they sluiced a virgin, unnamed left limit tributary. A crew of up to four people mined progressively upstream and completed reclamation.

*Excavator feeding the trommel on the uppermost left limit tributary of Maisy May Creek in 2016 (Photo credit: Jim Leary).*

**Equipment and Water Treatment** Equipment utilized on site in 2017 included an Hitachi EX200 excavator, a Caterpillar D8H bulldozer and a Caterpillar 950 wheel loader. In 2015 and 2016, they processed material with a 1.2 by 7.6 m (4 x 25 ft) trommel. Sluicing occurred with a vibrating screen deck in late 2016 and throughout 2017. An in-stream recycle system was used to settle effluent, with additional in-stream settling ponds downstream. A long tom was used for clean-ups and final concentrate was completed in Dawson.

**Surficial Geology and Stratigraphy** The uppermost left limit tributary in 2016 has a prominent mixing zone of weathered bedrock and gravel, approximately 0.2 m (0.5 ft) thick (unit 1). An undulating contact is present between the mixing zone and unit 2. Unit 2 is a high-energy gravel, present from 0.2 to 4 m (0.5-13 ft) and




*Exposure on the left limit of the unnamed tributary in 2017. A muddier and coarser gravel is present on the left limit compared to the right limit. This could be due to an influence from the tributary upstream or the potential of a left limit buried channel. The shovel used for scale is 1 m (3.3 ft).*

is considered pay. It consists of 40% pebbles, 60% cobbles and 2% boulders. Clasts are primarily angular and the gravel contains an abundance of quartz pebbles and small cobbles integrated throughout (approximately 5%). This presence of quartz could indicate a reworked upper-level quartz-enriched bench equivalent to the White Channel gravel. The section was stripped, but what remained of unit 3, from 4 to 5.4 m (13.1-17.7 ft), is loess and organics.

A left limit exposure on the left limit tributary to Maisy May in 2017 exposed four units. The units are similar to the upstream tributary described above. 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 0.45 to 0.6 m (1.5-2 ft) in thickness is a cobble-pebble gravel that is compact and clast supported. 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.

**Bedrock Geology** Bedrock varies from weathered to blocky mafic schist.

**Gold Characteristics** Gold is mostly fine and the fineness is 765.

## Maisy May, a tributary of Stewart

115O/06 2017: 63°21'26"N, 139°00'33"W

### 40419 Yukon Inc., 2013-2014, 2016-2017

Water License: PM10-022-1-2 (Active 11/2020)
Active Producer (2016-2017) **Operation no. 132**

**Location** Maisy May, upper, 17 km from its confluence with Stewart River.

**Work History and Mining Cuts** The property was inactive in 2015 but Mr. Radford sluiced material in both 2016 and 2017. Prospecting and establishing a cut was the priority in 2016. In 2017, the target was to revisit the missed side pay on both limits.

*Mr. Radford sluicing on upper Maisy May Creek in 2016 (Photo credit: Jim Leary).*

**Equipment and Water Treatment** Equipment located on site in 2016 included a Komatsu PC450LC excavator for liberating pay and feeding the wash plant, and a Caterpillar D8 bulldozer for removing overburden. A trommel was used to process the pay material.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is mapped as quartz-mica schist (YGS, 2017).

**Gold Characteristics** Not reported.

## Candace, a tributary of Maisy May

115O/07 2015: 63°18'46"N, 138°56'13"W

### Candace Creek Mining Ltd., 2012-2015

Water License: PM12-070 (Active 06/2023)
Active Explorer (2015) **Operation no. 133**

**Location** Candace Creek, a left limit tributary of Maisy May Creek.

*The exploration trench excavated by Candace Creek Mining Ltd. in 2015.*

**Work History and Mining Cuts** In 2015, an exploration trenching program was conducted on Candace Creek, approximately 800 m upstream from its confluence with Maisy May Creek. The trench, measuring 8 by 55 m (26 x 180 ft) crosscut the valley bottom with the goal identifying the distribution of pay. Two personnel worked on the program.

**Equipment and Water Treatment** The trenching was completed using a Caterpillar 225 excavator. A small test trommel was used to process samples.

**Surficial Geology and Stratigraphy** The test cut exposed two units in the valley bottom. Unit 1, from 0 to 1.5 m (0-5 ft), is a poorly to moderately sorted boulder-cobble-pebble gravel. The boulders are subangular and were concentrated in channels. Placer gold is suspected to be located in a relatively narrow pay streak in unit 1 and is associated with concentrations of the heavy minerals rutile and garnet. Unit 2, from 1.5 to 4.5 m (5-15 ft), is an organic-rich muck. The entire section was frozen.

**Bedrock Geology** Bedrock is a finely weathered grey schist.

**Gold Characteristics** Not reported.

## Maisy May, a tributary of Stewart

115O/07 2016: 63°17'19"N, 138°54'49"W

### Bedrock Mining Company Inc., 2013-2017

Water License: PM13-052 (Active 03/2024)
Active Producer (2015-2017) **Operation no. 134**

**Location** Maisy May Creek, lower, 7.8 km upstream from its confluence with Stewart River.

**Work History and Mining Cuts** Sluicing and progressive reclamation occurred in 2015 at the Bedrock Mining Company Inc. operation on lower Maisy May. As the farthest downstream operation, they are progressively working downstream towards the Stewart River. In 2016, two cuts were completed, with the main cut measuring 80 by 210 m (262 x 689 ft). A crew of four people operated a continuous 24 hour split-shift throughout the season. Significant reclamation occurred in late 2016 and sluicing and stripping occurred in 2017, but no specific work history is known.

**Equipment and Water Treatment** Equipment present on site included a Caterpillar 345 excavator, a Caterpillar 330 excavator, a Caterpillar 988 loader, Caterpillar D10N and D8R bulldozers, and two Caterpillar 730 articulated dump trucks. The wash plant consisted of


*Sluicing at the Bedrock Mining Company Inc. operation on lower Maisy May Creek in 2016.*

a 6 ft T-600 trommel able to process 180 to 200 yd$^3$ (138-153 m$^3$)/hr. A clean-up was conducted every 2 to 3 days and a small trommel was used to process the concentrate.

**Surficial Geology and Stratigraphy** A drainage ditch exposure in the 2016 cut consisted of 1.2 m (4 ft) of pebble-cobble gravel. The gravel contains 2% boulders, 40% cobbles and 60% pebbles and is matrix-supported with a silty, medium-grained sand and also contains discontinuous lenses of silty-sand up to 5 cm in thickness. Sporadic boulders up to 0.6 m (2 ft) in diameter are present in the section. On average, 3 m (10 ft) of overburden was stripped. 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 blocky and pervasively oxidized schist with massive lenses of sericite alteration.

**Gold Characteristics** Gold is chunkier on the left limit, flat on the right limit, and has a fineness of 790.

## Brewer, a tributary of Stewart

115O/03 2017: 63°09'49"N, 139°00'56"W

### No. 203 Dynamic Endeavours Inc., 2016-2017

Water License: PM15-073 (Active 03/2026)
Active Producer (2015-2017) **Operation no. 135**

**Location** Brewer Creek, 2.3 km upstream from its confluence with Stewart River.

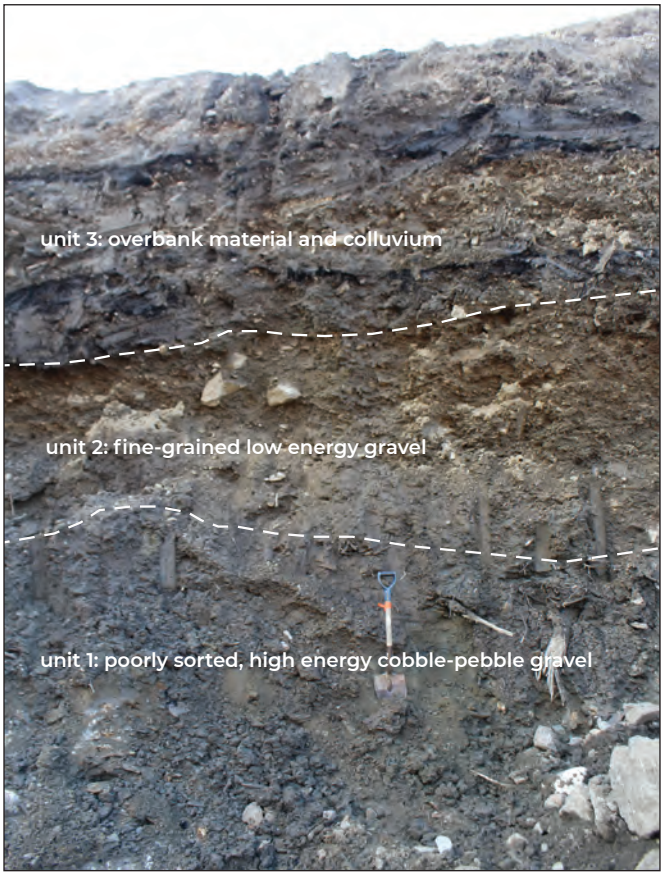
**Work History and Mining Cuts** Equipment was walked into site in the winter of 2016 via the Scroggie Creek winter trail, and by the summer, a four-person operation was sluicing material. Significant stripping programs and strategic mine planning was required to excavate the drainage due to its narrow valley setting (approximately 100 m wide) and steep hillsides. Historic shafts and evidence of old-timer workings led the operator to their current mining location. In 2017, a three-person operation working a daily 12-hour shift continued to mine upstream from the previous year's cut. They mined a cut measuring 30 by 65 m (98 x 213 ft) on the right limit of the drainage, and sluiced approximately 25,000 yd³ throughout the season. In late 2017, a stripping program upstream was conducted to prepare ground for the following season.

**Equipment and Water Treatment** Heavy equipment present in 2017 included two Hitachi Zaxis 330 LC excavators used to throw the overburden two or three times up the slope in order to create a wide enough mining cut. Once stripped, an excavator was also utilized to deliver pay to the plant and the second excavator fed the wash plant. A Caterpillar D9L bulldozer and a secondary smaller Caterpillar bulldozer were utilized for stripping overburden. The wash plant was a 1.1 by 9.1 m (3.5 x 30 ft) trommel with a 2.4 by 2.4 m (8 x 8 ft) hopper with 6" grizzly was able to process up to 25 yd$^3$ (19 m$^3$)/hr. A single sluice run 0.9 by 6.1 m (3 x 20 ft) consisted of expanded metal for 5.2 m (17 ft) and 0.9 m (3 ft) of angle iron at the bottom end. Two 4" pumps were used, with one supplying water to the hopper and the other to the trommel. A long tom and wheel were used for clean-ups and final concentrate was completed on a table in Dawson.

**Surficial Geology and Stratigraphy** Brewer Creek is a narrow valley containing a high energy gravel deposit overlain by a thick package of overburden. The mid-valley cut exposed three units in 2017. Unit 1, from 0 to 2.8 m (0-9.1 ft), is a poorly sorted, cobble-

*A view up Brewer Creek of No. 203 Dynamic Endeavours Inc.'s camp and mine cut in 2017.*

pebble gravel with a significant boulder concentration present at the bedrock contact. Clasts are angular to subangular and the matrix varies from fine to coarse sandy silt. Matrix percent varies in unit 1, from 25 to 35% and the maximum clast size is 1 m (3.3 ft) in diameter. Wood debris is present throughout the lower gravel, which along with the angular and poorly sorted nature of the gravel, indicates a relatively high energy stream flow deposited the unit. The contact between unit 1 and unit 2 is undulating and a concentration of wood and organic material in the upper part of unit 1 indicates the transition to the lower energy gravel of unit 2. Unit 2, from 2.8 to 5.0 m (9.1-16.4 ft), is a fine-grained pebble gravel similar to unit 1, except the matrix percent increases and ranges from 30 to 40%. Angular cobble-sized clasts are present throughout, amounting to approximately 5%. Minimal woody debris is present. Unit 3, from 5.0 to 6.0 m (16.4-19.7 ft), is overbank material containing silt lenses. The overburden can be up to 6.1 m (20 ft) thick and consists of loess with angular clasts and wood debris throughout. The sluice section includes up to 2.1 m (7 ft) of gravel and 1.5 m (5 ft) of bedrock.




*Stratigraphy exposed on Brewer Creek in 2017. The lower 2.1 m of unit 1 and 1.5 m of bedrock is considered pay material.*

**Bedrock Geology** Bedrock is competent blocky quartzite.

**Gold Characteristics** Gold is bright and flat, with the largest nugget recovered weighing 26 g. The fineness is 850.

## Frisco, a tributary of Yukon

115O/03 2017: 63°12'13"N, 139°28'37"W

**Red Dog Resources Ltd., 2016-2017**
**New Age Mining Inc., 2012-2015**

Water License: PM10-043-3 (Active 09/2020)
Active Producer (2015-2017) **Operation no. 136**

**Location** Frisco Creek, 3.8 km upstream from its confluence with Yukon River.

**Work History and Mining Cuts** New Age Mining Inc.'s operation on Frisco Creek undertook new ownership in 2016. Red Dog Resources Ltd. spent the 2016 season stripping on the right limit of the lower half of the drainage. Work history is unknown for 2017.

**Equipment and Water Treatment** Not reported.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is a blocky weathering quartz-mica schist.

**Gold Characteristics** Gold from Frisco Creek has a fineness of 880.

*Red Dog Resources Ltd.'s mining location and camp in 2017. The view is downstream looking towards the Yukon River.*

## Barker, a tributary of Stewart

115O/02 2016: 63°05'17"N, 138°57'05"W

### Schmidt Mining Corp., 2004-2017

Water License: PM15-076 (Active 04/2026)
Water License: PM06-523-1 (Expired 03/2016)
Active Producer (2015-2017) **Operation no. 137**

**Location** Barker Creek, approximately 11 km upstream from its confluence with Stewart River.

**Work History and Mining Cuts** From 2015 to 2017, work focused on mining the valley bottom of Barker Creek upstream of Dixie Bench and past the mouth of Iron Creek. Excavations focused on the left limit of the valley. In 2015, a center cut measuring 60 by 320 m (197 x 1,050 ft) was processed. In 2016, a similar cut was mined below the left limit bench, opposite the mouth of Iron Creek. The majority of mining in 2017 focused on valley bottom pay and a low-level bench was intersected on the left limit. A significant stripping program was completed in 2017, continuing upstream toward the Graham Bench. Two 12-hour shifts are operated by six crew members.

**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 x 20 ft) El Russ screen deck with 6.1 m (20 ft) of total sluice run width was capable of processing 250 $yd^3$ (191 $m^3$)/hr.

**Surficial Geology and Stratigraphy** The pay streak in Barker Creek likely had a meandering course along the left limit side of the valley in the Pliocene. With base level change in the Stewart River, initiated 2.6 million years ago, Barker Creek responded and also incised its base. Prominent benches, remnant of the Pliocene floodplain developed, particularly along the left limit side of the valley. The pay streak was variably eroded into the modern valley bottom and as a result, is described as wandering on and off the bench. The width of the pay streak is as wide as 60 m (200 ft) and as narrow as 30 m (100 ft). In 2016, mining focused in the valley bottom immediately below the left limit bench. In this location the pay streak may have been partially preserved on the bench. Approximately 2 m (6 ft) of gravel and up to 2 m (6 ft) of bedrock was sluiced.

**Bedrock Geology** Bedrock is quartzite and quartz-mica schist (YGS, 2017).

**Gold Characteristics** The pay streak on Barker Creek produces coarse gold with 50% greater than 12 mesh. When off the pay streak there is primarily fine gold. More angular gold and gold with quartz off the paystreak.


*Screen deck processing up to 250 $yd^3$ (191 $m^3$)/hr on Barker Creek at Schmidt Mining Corp.*

## Thistle, a tributary of Yukon

115O/03 2014: 63°03'53"N, 139°25'39"W

**Schmidt, S., 1993-2015**

Water License: PM11-053 (Active 07/2022)
Water License: PM06-513 (Expired 03/2012)
Active Producer (2015) **Operation no. 138**

**Location** Thistle Creek, lower, at the mouth of Green Gulch.

**Work History and Mining Cuts** Mining was completed on Thistle Creek in 2014. In 2015, reclamation consisting of contouring and channel engineering was completed.

**Equipment and Water Treatment** Not reported.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is quartzite and quartz-mica schist.

**Gold Characteristics** The fineness of the gold varies between 820 and 860.

## Thistle, a tributary of Yukon

115O/03 2015: 63°01'46"N, 139°02'19"W

**Sager, M., 2014-2015**

Water License: PM11-036 (Active 03/2023)
Active Producer (2015) **Operation no. 139**

**Location** Thistle Creek, 2.4 km downstream from the summit of Thistle Mountain.

**Work History and Mining Cuts** In 2015, a cut measuring 18 by 55 m (59 x 180 ft) was mined with an additional 86 m (282 ft) stripped upstream. Operation status and work history is unknown for 2016 and 2017.

**Equipment and Water Treatment** In 2015 equipment present on upper Thistle Creek included a Volvo 210CL excavator, a John Deere 450LC excavator and a Volvo A35C rock truck. A screen deck was utilized to process material and consisted of an initial 1.2 by 1.8 m (4 x 6 ft) run that feeds into two 0.6 by 3.0 m (2 x 10 ft) runs with half expanded metal and half angle iron.

**Surficial Geology and Stratigraphy** The mine cut in upper Thistle Creek is located in a narrow valley setting. A pingo is located in the center of the drainage, immediately above the mine cut. A right limit exposure below the pingo consisted of three units. Unit 1, from 0 to 1.5 m (0-5 ft), is an unsorted, oxidized, clast-supported, diamicton with wood and silty organic beds. Clasts account for 60% of the unit and consist of 40% boulders, 40% cobbles and 20% pebbles. The matrix is a silty sand and the entire unit is densely packed. Weathered bedrock zones are thrusted and entrained into unit 1. Based on the sedimentology and entrained bedrock, unit 1 is interpreted to be a debris-flow deposit or hyper-concentrated flood flow. Unit 2, from 1.5 to 2.8 m (5-9 ft), is interbedded sandy silt with organics and moderately sorted pebble-cobble gravel. Unit 3, from 2.8 to 3.8 m (9-12.5 ft), is an angular clast-supported gravel consisting of 75% clasts (50% cobbles and 50% pebbles) and 25% silty matrix. Unit 3 is interpreted to be colluviated weathered bedrock (slide rock) that has moved into the valley from the slope above.


*A view looking down upper Thistle Creek at M. Sager's operation. The mine cut is located immediately below a pingo that has formed in the center of the drainage.*

*Right limit mine cut exposure on upper Thistle Creek. The gravel units are very disorganized and reflect high-energy depositional environments typical of gulch settings.*

**Bedrock Geology** Bedrock is mapped as quartz-mica gneiss and schist (YGS, 2017).

**Gold Characteristics** Not reported.

## Kirkman, a tributary of Yukon

115O/03 2017: 63°00'46"N, 139°20'11"W

**Sager, M. and R., 1993-2017**

Water License: PM10-015 (Active 09/2020)
Active Producer (2015-2017) **Operation no. 140**

**Location** Kirkman Creek, lower, 3.9 km upstream from its confluence with Yukon River.

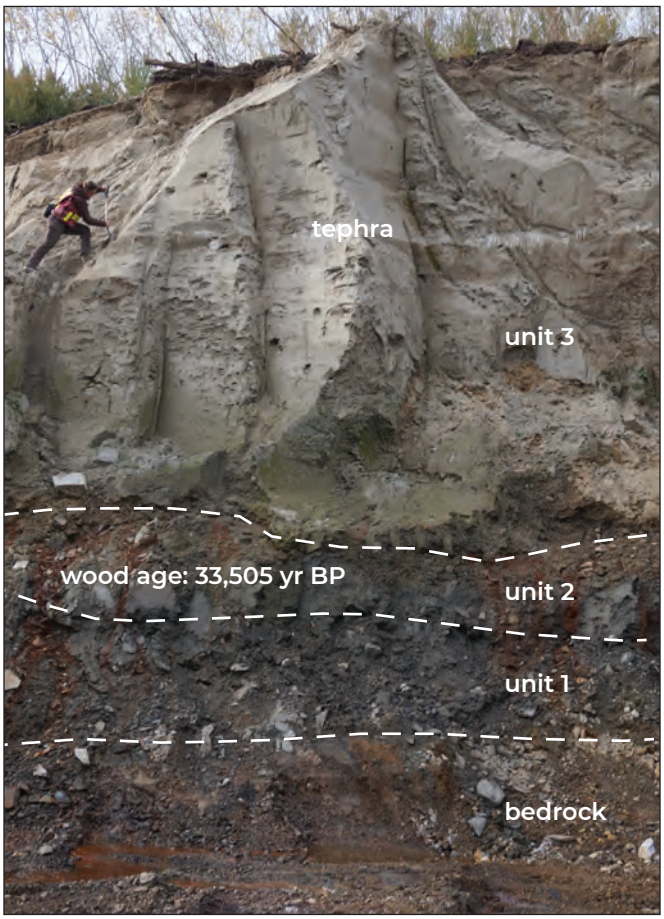
**Work History and Mining Cuts** The Sager family has been present in the South Klondike for nearly thirty years. Kirkman has remained the focus for the operator for the past decade or more. In 2015, the Sagers spent 600 hours sluicing, and from 2015 to 2017 progressively mined and extended their cut upstream towards the mouth of Discovery Pup. In 2017, the mine cut focused on the right limit and tested the economics of mining side pay under thicker overburden. A crew of four mined a daily ten-hour shift.

**Equipment and Water Treatment** Equipment utilized in 2017 included an Hitachi 350 excavator, an Hitachi Zaxis 450 LC excavator, a Volvo 210 excavator, a Dressta D135 bulldozer, two Volvo 35 ton rock trucks, and two Fiat bulldozers - a FD40 and HD31. The wash plant was 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 able to process 150 to 180 $yd^3$ (115-138 $m^3$)/hr.

**Surficial Geology and Stratigraphy** In 2017, the right limit cut exposed fluvial deposits in both the centre of the valley bottom and side pay along the valley margin. The stratigraphy of these two environments is described below.

The central valley cut mined 1 m (3 ft) into a variably weathered quartzite bedrock. Overlying the bedrock is unit 1, from 0 to 1.5 m (0-5 ft), and consists of a variably sorted gravel. The lower 0.5 m (1.6 ft) is poorly sorted and contains boulders that are concentrated near the bedrock surface. The upper 1 m (3 ft) is finer grained, moderately sorted, contains channels of silty gravel and is oxidized where the matrix is sandier. Unit 2, from 1.5 to 3.3 m (5-11 ft), is primarily organic silt with lenses of pebbly gravel. All of unit 1 is processed for placer gold.

The right limit side pay cut consists of three units. Unit 1, from 0 to 1 m (0-3 ft), is a moderately sorted, oxidized, imbricated, matrix-supported fluvial gravel with 50% clasts (10% boulders, 45% cobbles and 45% pebbles) and 50% medium to coarse sand matrix. The bedrock surface rises gently toward the hillside and as a result, the gravel becomes progressively thinner. Unit 2, from 1 to 1.7 m (3-5.6 ft), is a grey silt with woody fragments. Planar bedding is visible within the silt suggesting it was likely deposited as an overbank flood deposit in a backwater environment on the margin of the floodplain. A radiocarbon date from wood in the silt returned an age of 33,505 years before present. Unit 3, from 1.7 to 10.7 m (5.6-35 ft), is silt in gradational contact with unit 2. Some weathered bedrock fragments are mixed into the silt in the lower 3 m (10 ft). This deposit is interpreted as an accumulation of colluviated loess (wind-blown silt). Within the loess deposit is a prominent tephra found 5 m (16 ft) above the contact with unit 2. The tephra is 10 to 15 cm thick.




*The stratigraphy of the side pay cut on the right limit of Kirkman Creek in 2017. Unit 1 is Kirkman Creek gravel, unit 2 is a fluvial silt containing wood and unit 3 is colluviated loess containing tephra (volcanic ash). The geology indicates that the margins of Kirkman Creek floodplain became buried with the onset of the last glacial climate that resulted in increased dust storms, likely off the nearby Yukon River.*

*A view looking upstream of the Sager's property on Kirkman Creek. Mining is focused on the right limit (left side of photo). An apron of silty colluvium has buried the floodplain along the margins of the valley.*

The stratigraphy exposed within the right limit side pay indicates that the Kirkman Creek floodplain was much wider and not confined by colluvium or loess immediately prior to the last glaciation. As the climate cooled, and became increasingly drier during the McConnell glaciation, loess sedimentation increased. The loess likely originated locally off the Yukon River floodplain as dust storms, which settled onto the surrounding landscape. With a change to grassland environments during the glacial period, the loess was readily washed off the surrounding hillslopes and accumulated in the valley bottoms. The rate of loess colluviation into the valley bottom is estimated to average 1 mm/year, but likely accumulated in pulses during rainfall events. The result was that loess accumulation exceeded the fluvial erosion capacity of Kirkman Creek, and the floodplain became buried along the margins of the valley. The tephra has not been positively identified within the loess but is presumed to be the Dawson tephra that has an age of 27,000 years before present (Froese et *al*., 2002). The tephra's age and the 5 m of loess that separates it from the 33,000 year old wood provided the estimate for the loess accumulation rate.

**Bedrock Geology** Bedrock is grey schist with quartz veins and fault zones crosscutting the valley.

**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 2017: 63°00'35"N, 139°19'17"W
115J/14 2015: 62°59'59"N, 139°11'36"W

### Fellhawk Enterprises Ltd., 1990-1992, 1998-1999, 2003-2010, 2013-2017

Water License: PM09-630-1 (Active 12/2019)
Active Producer (2015-2017) **Operation no. 141**

**Location** Kirkman Creek, at the mouth of Discovery Pup.

**Work History and Mining Cuts** The 2015 season was spent excavating a cut 42 by 85 m (138 x 279 ft) on upper Kirkman Creek, at the confluence of its forks. Operations were relocated farther downstream in 2016 to explore the right limit bench immediately downstream of Discovery Pup. The bench cut measured 50 by 77 m (164 x 253 ft). Fellhawk Enterprises Ltd. also completed

a cut at the mouth of Discovery Pup throughout the season, and a continuation of the cut was completed upstream the following season. A total of 125,000 yd³ was sluiced in 2016. In 2017, a cut measuring 65 by 315 m (213 x 1033 ft) was mined. A crew of five personnel operated a daily 12-hour shift throughout 2017 and approximately 150,000 yd³ were processed.

**Equipment and Water Treatment** Equipment utilized by Fellhawk Enterprises Ltd. includes a John Deere 450D excavator, an Hitachi Zaxis 330 excavator, an Hitachi Zaxis 450 excavator, a Caterpillar D8L, D9L and D7 bulldozers, and two Caterpillar D300E rock trucks. The wash plant consisted of a trailer mounted screen deck with an 2.4 by 3.0 m (8 x 10 ft) hopper and a 9.1 m (30 ft) tailings stacker. Sluice runs consisted of a 1.2 by 1.8 m (4 x 6 ft) long initial run with expanded metal and angle iron, which fed two 1.2 by 3.6 m (4 x 12 ft) runs with a mix of expanded metal and angle iron, all lined with nomad matting, with a nugget trap at the bottom. 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 2015 stratigraphy exposed at the confluence of the forks on upper Kirkman Creek consisted of three units. Unit 1, from 0 to 4.4 m (14.4 ft), is a poorly sorted boulder-cobble gravel comprising 15% boulders, 55% cobbles and 30% pebbles. The matrix is medium to coarse sand with minor silty-sand. Clasts are subround to subangular with minor bedrock fragments incorporated into the gravel at the bedrock contact. Manganese staining is patchy throughout the unit. Unit 2 is an iron-rich zone from 4.4 to 4.9 m (14.4-16.1 ft), and consists of a boulder-cobble gravel which lacks a matrix, but instead is infilled with an iron-rich silt. Clasts are subround with the maximum clast size of 0.6 m (2.0 ft). Unit 2 is discontinuous downstream and the iron deposition is likely a groundwater affect. Overlying unit 1 and 2 is interbedded silt, organics and colluvium. This unit is present from 4.9 to 15.3 m (16.1-50.2 ft), and contains massive ice in the upper portion.

*A view looking up Kirkman Creek at Fellhawk's wash plant located at the mouth of Discovery Pup in 2017.*

The stratigraphy of the valley bottom cut near Discovery Pup consisted of 2 m (7 ft) of organic silt overlying 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, hyper-concentrated flood flow environment. The pay streak in the valley is characterized as wandering.

**Bedrock Geology** Bedrock is moderately oxidized quartz-mica schist and blocky quartzite.

**Gold Characteristics** Gold is mostly coarse (largest nugget was 1 oz) 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 2017: 62°57'10"N, 139°01'14"W

### Weber, B., 2008-2017

Water License: PM11-055 (Active 09/2022)
Active Producer (2015-2017) **Operation no. 142**

**Location** Ballarat Creek, approximately 8 km upstream from its confluence with Yukon River.

**Work History and Mining Cuts** Mr. Weber has been continually mining the middle reaches of Ballarat Creek since 2008. From 2015 to 2017 he focused operations in the center of the valley and a cut approximately 15 by 30 m (50 x 100 ft) was mined in 2017.

**Equipment and Water Treatment** Equipment present on site in 2017 was a John Deere 330LC excavator, an Hitachi EX200LC excavator and a screen deck for processing pay material.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is amphibolite, mica-schist and phyllite (YGS, 2017).

**Gold Characteristics** Not reported.

*Aerial view in 2017 of Mr. Weber's operation on mid-Ballarat Creek. Stationed in the cut was two excavators and a wash plant. The view is looking upstream the drainage, northwest towards Thistle Mountain.*

## Scroggie, a tributary of Stewart

115O/02 2016: 63°06'43"N, 138°36'32"W

### Ace Mining, 2015-2017

Water License: PM16-006 (Active 08/2026)
Active Producer (2015-2017) **Operation no. 143**

**Location** Scroggie Creek, 1.3 km from its confluence with Walhalla Creek.

**Work History and Mining Cuts** Ace Mining's first mining season on mid-Scroggie Creek was in 2015. The two-person operation, including one camp personnel and two kids, mined approximately 10,000 yd³ in their first season. Activity was focused on the left limit and at the end of the season the operator stripped farther upstream to expose a cut for 2016. In 2016, a four-person crew plus a cook continued mining upstream, where cuts were mined on both limits of the drainage.

Two cuts were mined, the first on the right limit was 37 by 229 m (120 x 750 ft) and the second cut on the left limit was 46 by 229 m (150 x 750 ft). Total yardage sluiced in 2016 was 50,000 yd³. In 2017, a cut measuring 91 by 229 m (300 x 750 ft) was mined, which amounted to a total of 60,000 yd³ sluiced. This isolated mine site requires fuel to be hauled in by air at 1000 L per trip.

**Equipment and Water Treatment** Equipment in 2016 included a Caterpillar 330D excavator for stripping overburden and stockpiling pay, a Kobelco SK250LC excavator for feeding the wash plant, a Caterpillar D6 bulldozer for stripping overburden, a Caterpillar 9L bulldozer for stripping and pushing pay, and a WA450 wheel loader for moving tailings. A shaker plant, screening to 1" and 5/16" was utilized to process between 70 to 80 yd³ (54-61 m³)/hr. The initial sluice run was 1.8 by 3.6 m (6 x 12 ft) with a 0.9 m (3 ft) bank of hydraulic riffles at the top end and 0.6 m (2 ft) of expanded metal, which led to a secondary sluice 0.3 by 3.6 m (1 x 12 ft) containing a slick plate, angle iron and two nugget traps. A larger screen deck was built in spring 2017 and began sluicing material in late July. It is a 1.5 by 4.3 m (5 x 14 ft) Allis Chalmers screen deck that classifies material to 1/2". The initial sluice runs, which are 1.8 by 4.9 m (6 x 16 ft), contain of 0.6 m (2 ft) of expanded metal, 0.9 m (3 ft) of hydraulic riffles and 3.3 m (11 ft) of expanded metal. A secondary screen classifies material to 1/4" and feeds into another sluice measuring 0.6 by 3.0 (2 x 10 ft) and configured with conventional riffles. A jig was used for clean-ups. 50% of the water is recirculated.

**Surficial Geology and Stratigraphy** Lower Scroggie Creek is a narrow valley containing coarse, high-energy gravel deposits. Bedrock is often weathered in the drainage resulting in a mixing zone between the soft bedrock and the high-energy stream gravel. The mixing zone thickness is variable due to the undulations in the bedrock and ranges between a few cm to 0.3 m (1 ft) thick. Unit 1 ranges in thickness from 2 to 3 m (6-9 ft) and is a compact and poorly sorted near the bedrock contact. It consists of 65% clasts (10% boulders, 50% cobbles and 40% pebbles) and 35% coarse sand matrix. The gravel is moderately to well-sorted in the upper


*Stratigraphy of the right limit of Scroggie Creek in 2016. The total thickness of unit 1, a high energy pebble-cobble gravel, is 2.1 m (7 ft), with the largest clast in the middle of the photo 1.5 m (5 ft) in diameter. Unit 2, the overburden, has been largely stripped off, but can range up to 4.0 m (13 ft) thick.*

*Ace Mining's operation on Scroggie Creek near its confluence with Walhalla Creek in 2016.*

half of the unit and it contains open work structures, and silty gravel lenses. Clasts are subround with some angular clasts eroded from the bedrock surface in the valley, or derived from the hillsides as colluvium becomes reworked into the system. Significant boulders are present in the drainage, with the maximum clast size up to 1.5 m (5 ft) in diameter. Unit 2 consists of up to 4.0 m (13 ft) of muck (loess) overburden.

Bedrock fractures contain higher concentrations of placer gold and the operator can reliably identify grade increases based on bedrock characteristics. The bedrock surface also undulates which results in a natural riffle effect. This reach of Scroggie Creek is described as an incised meandering stream, whereby ridges of bedrock deflect the flow of water. Placer gold is better concentrated downstream of the bedrock ridges and leaner on the outside edges of the channel where high stream flow velocities occur. In 2015, up to 0.9 m (3 ft) of gravel and 0.9 m (3 ft) of bedrock were sluiced. The pay zone was more defined in 2016, where the operator sluiced up to 0.6 m (2 ft) of gravel and 0.9 m (3 ft) of bedrock.

**Bedrock Geology** Bedrock is weathered quartzite.

**Gold Characteristics** Both coarse and fine gold is recovered, and all is described as smooth. The fineness is 900.

## Mariposa, a tributary of Scroggie

115J/16 2016: 62°59'39"N, 138°27'25"W
115J/15 2015: 62°58'08"N, 138°31'09"W

### Bidrman, Z., 1989-2017

Water License: PM14-038 (Active 04/2025)
Water License: PM04-360 (Expired 04/2015)
Active Producer (2015-2017) **Operation no. 144**

**Location** Mariposa Creek, 5.4 km upstream from its confluence with Scroggie Creek, and Scroggie Creek.

**Work History and Mining Cuts** Mr. Bidrman was active on upper Scroggie Creek in 2015, several kilometres upstream of the confluence with Mariposa Creek. The uppermost cut measured 50 by 230 m (164 x 755 ft) and a second cut lower in the drainage was also mined.

One or two operators assisted throughout the mining season, with plans to relocate operations to Mariposa Creek in 2016. A two person crew mined two different locations along Mariposa Creek in 2016. A lower cut, near the confluence with Scroggie Creek was mined and a second cut was 5.4 km upstream from the mouth. Mr. Bidrman was active in 2017 but no work history is known.

**Equipment and Water Treatment** Equipment utilized in 2016 included a Komatsu 400 excavator and Komatsu 375A bulldozer which were used to strip and excavate pay, a John Deere 330LC excavator was used to feed the wash plant, and a Komatsu WA500 wheel loader removed tailings. The wash plant consisted of a single screen deck with 1" bars and a 1.2 by 4.9 m (4 x 16 ft) sluice run with expanded metal that splits into three 3 m (10 ft) long runs of expanded metal and angle iron, all lined with nomad matting. A 10" pump supplied enough water to process 120 $yd^3$ (92 $m^3$)/hr.

**Surficial Geology and Stratigraphy** The 2015 cut from Scroggie Creek was excavated in the center of the valley and the stratigraphy consisted of three units. Unit 1, from 0 to 0.8 m (0-2.6 ft), consisted of a mixed zone of weathered bedrock, gravel and minor organic-rich silt. Unit 2, from 0.8 to 2.2 m (2.6-7.2 ft), is a coarse, clast-supported, cobble-rich gravel that fines upward into a sand. The gravelly component consists of 80% clasts and 20% matrix. Unit 3, from 2.2 to 4.1 m (7.2-13.5 ft), is a silty organic sediment. The better pay at this location is closer to the right limit.

The 2016 cut on Mariposa Creek was located at the confluence with a tributary in the upper reaches of the drainage. The section contained five units. Unit 1, from 0 to 0.7 m (0-2.3 ft), is a matrix-supported, sandy boulder-pebble gravel. This unit is quite loose due to the high sand content and consists of 30% clasts (20% boulders, 20% cobbles and 60% pebbles) and 60% sand matrix. Unit 2, from 0.7 to 1.3 m (2.3-4.3 ft), is a coarse, boulder-cobble gravel with a silty sand matrix. The gravel is poorly sorted and was likely deposited during a high-energy stream flow event. Unit 3, from 1.3 to 2.3 m (4.3-7.5 ft), is a grey silt with lenses of oxidized fluvial gravel. Unit 4, from 2.3 to 3.3 m (7.5-10.8 ft), is an angular boulder-pebble gravel. Unit 5, from 3.3 to 4.4 m (10.8-14.4 ft), is silt

*An aerial view of upper Mariposa Creek where Mr. Bidrman was mining in 2016 at the mouth of an unnamed right limit tributary.*

and sand with gravel lenses. Units 1 through 3 are interpreted to originate from Mariposa Creek whereas units 4 and 5 may originate from the tributary. The lower 1.3 m (4.2 ft) of gravel and 0.5 m (1.6 ft) of bedrock are processed for placer gold.

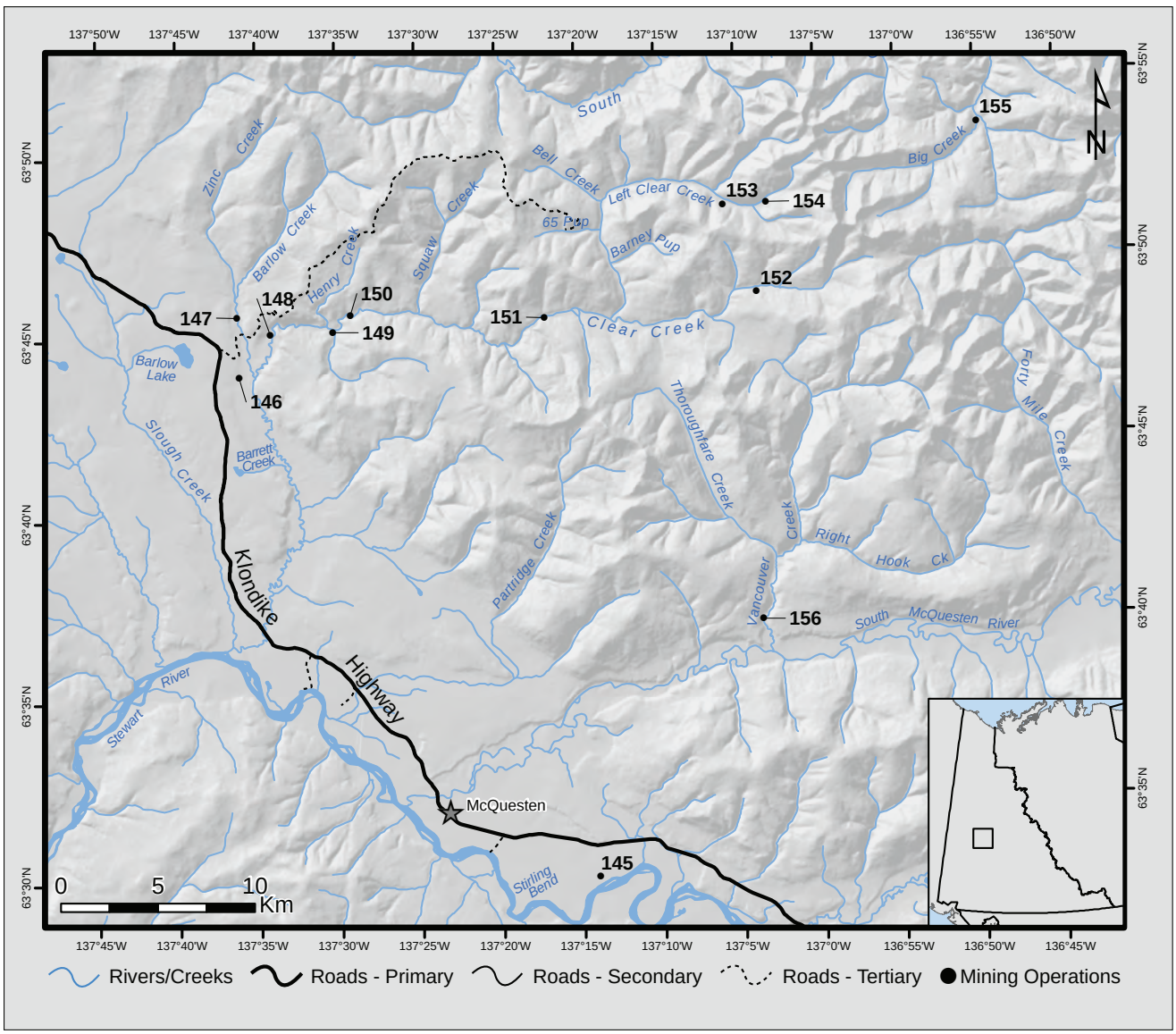
**Bedrock Geology** Bedrock is a gneiss containing quartz veins, that varies from competent to decomposed as mining progresses upstream.

**Gold Characteristics** Gold from the 2015 Scroggie Creek cut contained nuggets up to 2 oz and "balls" of gold. Gold from lower Mariposa Creek tends to be coarser than the upper portion of the drainage.

*Upper Scroggie Creek where Mr. Bidrman was active in 2015. The view is looking upstream towards the headwaters.*

# CLEAR CREEK-MCQUESTEN
## PLACER AREA

**SITES 145-156**




### LEGEND

145. Stirling, R.
146. Wolf Head Discovery & Mining LLC
147. Storm Structures
148. Wasylenko, W.
149. Hollingsworth, M.
150. Kowalski Trucking Ltd.
151. Scott and Son Mining
152. Phillips, P.
153. Blackstone Placer Mining Ltd.
154. Marcel Hebert Resources Ltd.
155. Schmidt Mining and Yukon Exploration Green Gold Inc.
156. Wesley, G.

## Stewart, a tributary of Yukon

115P/11 2017: 63°31'34"N, 137°14'20"W

### Stirling, R., 2015

Class 3: LP01135 (Active 11/2026)
Active Explorer (2015) **Operation no. 145**

**Location** Stewart River bars at McQuesten airstrip and New Crossing in Tintina Trench.

**Work History and Mining Cuts** The 2015 prospecting program focused on two claim blocks on the right limit of the Stewart River. Work consisted of ground penetrating radar, drone imagery, prospecting, mechanized trenching, hand sampling and trail brushing. Four trenches and one test pit were excavated on the New Crossing property and included processing of 163 samples. 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. This program was completed in partnership with the Yukon Mineral Exploration Program.

**Equipment and Water Treatment** Test pits were completed using a Kubota KX41 excavator. Hand samples were processed with 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 and river meander history converge. The highest gold concentrations are found in silty gravel deposits that lie near the head of former meander bends.

*Shallow trench sampling on the Stewart River bars by R. Stirling (Photo credit: R. Stirling).*

**Bedrock Geology** Bedrock does not outcrop in the vicinity of the claims although it is mapped as mid-Cretaceous porphyritic rocks (YGS, 2017).

**Gold Characteristics** Placer gold is very fine whereby it is estimated that 500,000 colours are needed to equal 1 oz.

## Clear, a tributary of Stewart

115P/12 2017: 63°44'30"N, 137°39'16"W

### Wolf Head Discovery and Mining LLC, 2014-2017

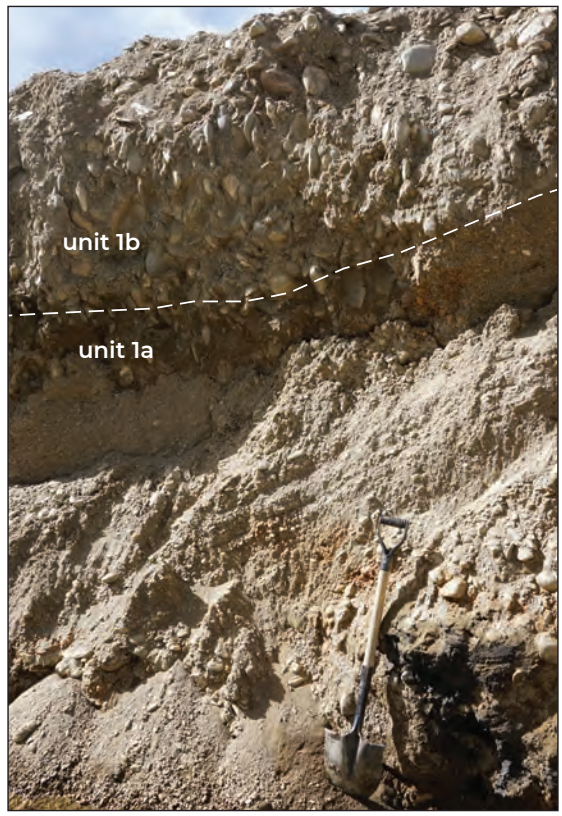
Water License: PM14-009 (Active 05/2024)
Active Explorer (2015-2017) **Operation no. 146**

**Location** Clear Creek, right limit bench (Big Alex bench) downstream from Barlow Creek.

**Work History and Mining Cuts** From 2015 to 2017, exploration drilling, test pitting and bulk testing was completed on the Big Alex bench and adjoining Clear Creek floodplain. In 2015, a total of 17 sonic drill holes were completed on the property for a total combined depth of 2979 ft. Technical support for the project was provided by Geoplacer Exploration. Seven employees worked at the site, including three drillers. Based on the 2015 drilling, test pit targets were identified on the property. In 2016, test pitting focused on the Clear Creek floodplain and identified a zone of shallow ground near the active channel of Clear Creek. In 2017, operations were scaled up to a bulk testing phase to prove the feasibility of mining the shallow ground. A cut measuring 80 by 150 m (262 x 492 ft) was test mined in 2017.

**Equipment and Water Treatment** Equipment on site in 2017 during the test mining program included a Doesan DX225 excavator for digging pay and testing, a Doesan DL300 loader with a 4 yd³ bucket for hauling pay, feeding the plant and removing tailings, and a Caterpillar D8K bulldozer for levelling tailings and reclamation. The front end of the wash plant consists of a 12 yd³ Elrus hopper with a 4" grizzly, and an Elrus M6394 12 m (40 ft) long conveyor. The screen deck is a Tycan 660 T-class equipped with ¼" wire mesh screen. The sluice run is 2.4 m (8 ft) wide by 4.8 m (16 ft) long. The upper 1.2 m (4 ft) section has a boil box and hydraulic riffles, whereas the lower 3.6 m (12 ft) section is lined with expanded metal and slick plates. The plant is electrically powered by a Wacker Neuson 38 KW generator. Water is supplied from Clear Creek and treated out-of-stream on the right limit of Clear Creek below the mine cut.

**Surficial Geology and Stratigraphy** The stratigraphy of the Clear Creek floodplain near the active channel consisted of three units for combined thickness of 5.9 m (19 ft). Unit 1a, from 0 to 1.3 m (4.3 ft), is a cohesive, moderately sorted, boulder-cobble-pebble gravel with cross-bedded pebbly beds and discontinuous silty organic material. The paleo-flow direction of the gravel is parallel to the modern drainage of Clear Creek. Quartz boulders are present in the unit, similar to those observed in Barlow Creek. Unit 1b, from 1.3 to 1.9 m (4.3-6.2 ft), is sedimentologically part of unit 1a, however has been affected by past cryoturbation. Clasts within unit 1b have their long axis oriented vertically, which occurs when past freeze-thaw cycles modify clasts orientations. In addition, unit 1b contains a higher percentage of sand matrix than unit 1a, which reflects inputs from aeolian (wind) sources, likely during a past cold, dry period. Unit 1b is interpreted as the former floodplain surface of Clear Creek during a periglacial period, perhaps during the last glaciation. Unit 2, from 1.9 to 4.9 m (6.2-16 ft), is the modern Clear Creek fluvial gravel. It is less cohesive than the underlying units and contains a moderately to well-sorted gravel. Unit 3, from 4.9 to 5.9 m (16-19 ft), is a silty sand that was likely deposited as overbank flood sedimentation by the modern creek. The lower 2.2 m (7 ft) of gravel on bedrock or a false bedrock of sand is processed for placer gold.




*The pay gravel section on Clear Creek at Wolf Head Mining and Discovery's cut in 2017. The vertically oriented clasts in unit 1b reflect freeze-thaw action possibly during the last glacial climate. This unit marks the upper contact of the pay gravel. Units 2 and 3 have been stripped off.*

*An aerial view looking northwest over Wolf Head Discovery and Mining's plant and test cut on Clear Creek in 2017.*

**Bedrock Geology** Bedrock is granite and quartz monzonite (YGS, 2017).

**Gold Characteristics** The gold grains are typically 0.5 to 1 mm (35 to 18 mesh), can be up to 7 mm long and are very flat.

## Barlow, a tributary of Clear

115P/13 2016: 63°46'09"N, 137°39'43"W

### Storm Structures, 2015-2017
### Caw Mining and Exploration Ltd., 2008-2014

Water License: PM14-073 (Active 04/2025)
Active Producer (2015-2017) **Operation no. 147**

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**Location** Barlow Creek, 3 km upstream from the mouth.

**Work History and Mining Cuts** Storm Structures in collaboration with Caw Mining and Exploration Ltd. scaled-up operations on Barlow Creek. In 2016, they operated two 11-hour shifts and processed 120,000 $yd^3$ for the year. Cut widths varied due to slide material originating off the left limit hill side that has pinched the floodplain. Typical cuts range in width from 90 to 250 m (295-820 ft).

**Equipment and Water Treatment** Equipment on site in 2016 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 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.

**Surficial Geology and Stratigraphy** In lower Barlow Creek, placer mining occurs on the margin of the Tintina Trench. As a result, limited bedrock is exposed in the cuts and tends to be only intersected near the left limit of the floodplain against the bedrock hillside. The right limit of lower Barlow Creek is cut into Pleistocene glacial sediment that forms much of the Tintina Trench fill. The placer deposit is relatively shallow and overlies a false-bedrock of variably oxidized quartz-rich sand. Results from drilling in 2014 indicate that the sand thickness is 12 m (40 ft) and overlies gravel. The stratigraphy of the 2016 cut overlying the false-bedrock of sand consisted of three units. Unit 1a, from 0 to 1 m (3.3 ft), is a poorly to moderately sorted boulder-cobble-pebble gravel with imbrication reflecting down-valley flow. The matrix consists of a silty coarse sand, and quartz boulders within the unit are common and have a maximum length of 60 cm (2 ft). The quartz boulders provide a good indicator of channels within the pay that have higher

*The feeder and wash plant used by Storm Structures operation on Barlow Creek.*

concentrations of placer gold. Unit 1b, from 1 to 2 m (3.3-6.6 ft), marks a consolidated layer of cryoturbated gravel. Clasts within unit 1b are oriented vertically and the matrix content is higher giving the gravel a diamict-like appearance. This unit marks the former floodplain surface of Barlow Creek perhaps during the last glacial climate. A similar stratigraphy is present in Clear Creek below the confluence with Barlow Creek. Unit 2, from 2 to 5.2 m (6.6-17 ft), is a moderately sorted, imbricated, cobble-pebble gravel with rare small boulders. This unit is not as coarse as the underlying unit 1 gravel. Unit 3 is a layer of organics and silty sand (muck) that had been stripped. The muck unit is generally thicker on the left limit side of the valley.

**Bedrock Geology** Bedrock is phyllite, shale, sandstone, conglomerate and limestone (YGS, 2017).

**Gold Characteristics** Gold recovered is mostly fine and flat and has a purity of 830. Silver comprises the remainder of the precious metal content.

## Clear, a tributary of Stewart

115P/13 2017: 63°45'46"N, 137°37'32"W

### Wasylenko, W., 1993-2017

Water License: PM12-078 (Active 05/2023)
Active Producer (2015-2017) **Operation no. 148**

**Location** Clear Creek, 2.5 km upstream from the mouth of Barlow Creek.

**Work History and Mining Cuts** Mr. Wasylenko completed a diversion channel in 2015 and test mined a small cut near the end of the season. In 2016 and 2017, mining operations resumed and focused on the right limit near camp. Two personnel were employed during mining activities.

**Equipment and Water Treatment** Not reported.

**Bedrock Geology** Bedrock varies from phyllite, shale, sandstone and conglomerate, to granite and quartz monzonite (YGS, 2017).

**Gold Characteristics** Not reported.


*The section exposed on Barlow Creek in 2016. Unit 1b is a former floodplain soil surface that was affected by cryoturbation and had loess (silt) inputs. It forms a cohesive, widespread layer and marks the top of the pay gravel.*

## Wally, a tributary of Clear

115P/13 2017: 63°45'58"N, 137°33'38"W

**Hollingsworth, M., 2014-2017**
**Wilson, K., 2008-2009, 2011, 2013**

Water License: PM07-586-3 (Active 05/2018)
Active Producer (2015-2017) **Operation no. 149**

**Location** Wally Creek, left limit tributary to Clear Creek.

**Work History and Mining Cuts** In 2017, mining focused on the left limit of Wally Creek near the mouth of the creek below camp. Four personnel were employed at the mine.

**Equipment and Water Treatment** Equipment on site in 2017 included a John Deere 450LC excavator, an Hitachi EX450LC excavator, a Hyundai HL760 loader and a Caterpillar articulated haul truck. The wash plant consists of a grizzly feeder, a 9 m (30 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. Water is obtained from Wally Creek and settled out-of-stream in a 60 by 60 m (197 x 197 ft) settling pond.

**Surficial Geology and Stratigraphy** Mining at the mouth of Wally Creek has exposed a fluvial fan gravel sequence. Unit 1 at the base of the section from 0 to 3 m (0-10 ft) consists of a poorly sorted, coarse gravel. Evidence of cryoturbation at the upper contact of the unit has reoriented clasts in a vertical direction. Unit 2, from 3 to 3.4 m (10-11 ft), is an organic-rich silt. Unit 3, from 3.4 to 5.9 m (11-19 ft), is a stratified, medium to coarse sand with silty gravel beds. All material exposed in the fan sequence appears to originate from the Wally Creek drainage as opposed to the left limit of Clear Creek.

**Bedrock Geology** Bedrock is granite and quartz monzonite (YGS, 2017).

**Gold Characteristics** Not reported.

*The feeder and wash plant used on Wally Creek.*

## Clear, a tributary of Stewart

115P/13 2017: 63°46'29"N, 137°32'37"W

**Kowalski Trucking Ltd., 2015-2017**
**Kosuta, D., 1995-1996, 2003, 2006, 2008-2013**

Water License: PM14-044 (Active 05/2025)
Active Producer (2015-2017) **Operation no. 150**

**Location** Clear Creek, about 3 km downstream of the confluence with Squaw Creek.

**Work History and Mining Cuts** Limited work history is available for the Kowalski Trucking operation. A right limit pit appeared to be active in 2017.

**Equipment and Water Treatment** Equipment included a Komatsu PC 200-2 excavator, a Koehring 466 excavator, a Caterpillar 920 and 930 loader and a Caterpillar D7 bulldozer. The wash plant consists of a shaker deck.

**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 wavey. 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 possibly loess.

**Bedrock Geology** Bedrock is granite and quartz monzonite (YGS, 2017).

**Gold Characteristics** Not reported.

*The section exposed on the right limit of Clear Creek at the Kowalski Trucking operation. Decomposed bedrock is exposed near the base of the pick and the side pay gravel deposit is 3.2 m (10.5 ft) thick.*

## Clear, a tributary of Stewart

115P/14 2017: 63°46'51"N, 137°20'30"W

### Scott and Son Mining, 1998-2017

Water License: PM11-037 (Active 10/2021)
Active Producer (2015-2017) **Operation no. 151**

**Location** Clear Creek, approximately 3 km downstream from the mouth of Left Clear Creek.

**Work History and Mining Cuts** Gordon Scott is a third generation miner on Clear Creek whose family has been active in the area since the 1980s. In 2017, they focused on reworking previously mined ground that had inadequately cleaned bedrock. A diversion was established that moved the creek to the right limit side of the valley and enabled them to mine the former creek channel. Two miners and one camp personnel operated a single daily shift.

**Equipment and Water Treatment** Equipment utilized in 2017 included a John Deere 450LC excavator for digging pay, an Hitachi 270 excavator for feeding the wash plant, a Caterpillar 980B loader for managing tailings and a Caterpillar D9H bulldozer. The wash plant consists of a screen deck on air bags that classifies to ¾". The sluice consists of two runs. The upper run is 1 by 1.2 m (3 x 4 ft) and the lower run is 1.2 by 4.8 m (4 x 16 ft). Both runs are lined with hydraulic riffles. The wash plant is supplied by a 6" pump from Clear Creek and waste water is settled out-of-stream on the left limit.

**Surficial Geology and Stratigraphy** According to Mr. Scott, the original floodplain gravel in this area of Clear Creek was 1.8 m (6 ft) thick and included what has been termed the "red gravel". This reach of Clear Creek is immediately upstream of the bedrock canyon that coincides with the surface outcrop of a Late Cretaceous granite and quartz monzonite pluton. Outcrops of Hyland group sedimentary rocks are also present on the right limit of the valley immediately upstream from the granite. Hyland Group bedrock in the vicinity of the mine cut undulates, which results in steps and pockets that naturally sort the placer gold. Nuggets are typically found near bedrock highs and progressively smaller gold grain sizes will be dispersed downstream. In addition, higher concentrations and coarser gold are found on the right limit below a laterally extensive bench.

**Bedrock Geology** Bedrock consists of Hyland Group sedimentary rocks (YGS, 2017).

**Gold Characteristics** Two types of gold are present in this area of Clear Creek. Type 1 has a fineness of 770 and size distribution of 80% <30 mesh and 20% >30 mesh. Type 2 gold is coarser, more crystalline, has a fineness of 870 and a size distribution of 80% >14 mesh and 20% <14 mesh.

*A view looking down Clear Creek over the Scott and Son operation. The creek was diverted to the right limit in order to access pay in the former active channel. Previously mined ground is also being reworked in the middle of the valley.*

## Clear, a tributary of Stewart

115P/14 2017: 63°48'02"N, 137°07'22"W

### Phillips, P., 2005-2017

Water License: PM13-050 (Active 02/2024)
Active Producer (2015-2017) **Operation no. 152**

**Location** Clear Creek, upper.

**Work History and Mining Cuts** Mr. Phillips acquired upper Clear Creek in 2005 and 2016 was his first year sluicing on the property. Activity is occurring in areas marginal to the central channel that was mined by the Queenstake dredge. In 2016, a cut measuring 62 by 320 m (203 x 1050 ft) was mined on the left limit. In 2017, a right limit cut measuring 22 by 55 m (72 x 180 ft) was mined. Up to three miners operated a single daily shift.

**Equipment and Water Treatment** Equipment on site in 2016 included a Komatsu PC400 excavator digging pay, a Caterpillar D300B haul truck transporting pay, an Hitachi EX300LC excavator, and a Caterpillar 980G and Komatsu 380 wheel 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 x 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** A full stratigraphic section was not present within the cut due to surface disturbance. Unit 1, from 0 to 2.5 m (0-8 ft), is an imbricated, poorly to moderately sorted, clast-supported gravel. The clasts component equals 70% (5% boulders, 45% cobbles and 50% boulders) and 30% silty sand matrix. A siltier gravel was observed on the lee-side of a bedrock high that was not evident elsewhere in the cut. Gravel deposits thin to 0.6 m (2 ft) on bedrock highs. Unit 2 is an apron of silt that thickens toward the hillside.

**Bedrock Geology** Bedrock is a dark grey schist with quartz veins.

**Gold Characteristics** The fineness of placer gold is 720 and increases to 840 downstream.

## Left Clear, a tributary of Clear

115P/14 2017: 63°50'21"N, 137°09'52"W

### Blackstone Placer Mining Ltd., 1978-1997, 2004-2011, 2014-2017

Water License: PM08-604 (Active 05/2019)
Active Producer (2015-2017) **Operation no. 153**

**Location** Left Clear Creek, upper reaches.

**Work History and Mining Cuts** Activity from 2015 to 2017 focused on mining left limit side pay in Left Clear Creek below camp. Five personnel operated a single daily shift.

*A view looking up Clear Creek on the Phillips' property in 2016.*

**Equipment and Water Treatment** Equipment on site in 2017 included a Caterpillar 235 excavator to mine and stock pile pay, a Hough 90E loader to feed the wash plant and remove tailings, and two Caterpillar D8 bulldozers 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 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.

**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 phyllite, shale, sandstone, conglomerate and limestone (YGS, 2017).

**Gold Characteristics** The placer gold is a mixture of fine and coarse gold with some nuggets. The fineness is 820.

## Left Clear, a tributary of Clear

115P/14 2017: 63°50'31"N, 137°07'10"W

### Marcel Hebert Resources Ltd., 2015-2017

Water License: PM15-071 (Active 12/2025)
Active Producer (2015-2017) **Operation no. 154**

**Location** Left Clear Creek, upper reaches.

**Work History and Mining Cuts** Activity documented in 2017 focused on mining left limit side pay in Left Clear Creek. Two miners operated a single daily shift.

**Equipment and Water Treatment** Equipment on site in 2017 included a John Deere 330 excavator and a Case 135 excavator. The wash plant consists of a screen deck that classifies to ¾" and can process 15 $yd^3$ (11 $m^3$)/hr. The sluice run has been modified to feed three horizontal centrifuges.

*Blackstone Placer Mining's cut on the left limit of Left Clear Creek. The gravel section is 2.5 m (8 ft) thick.*

*Horizontal centrifuges are being experimented with on upper Left Clear Creek at Mr. Hebert's operation.*

**Surficial Geology and Stratigraphy** The 2017 cut was located in a previously disturbed area and the stratigraphic exposure was poor. An oxidized gravel containing large boulders (10% of gravel) is located on bedrock. The gravel thickness was approximately 2 m (6 ft).

**Bedrock Geology** Bedrock is phyllite, shale, sandstone, conglomerate and limestone (YGS, 2017).

**Gold Characteristics** Not reported.

## Big, a tributary of Little South Klondike

115P/15 2016: 63°53'10"N, 136°54'21"W

### Schmidt Mining and Yukon Exploration Green Gold Inc., 2015-2017

Water License: PM14-010-1 (Active 07/2024)
Active Producer (2015-2017) **Operation no. 155**

**Location** Confluence of Big and Granite creeks.

**Work History and Mining Cuts** Schmidt Mining optioned this property in 2015 from Yukon Exploration Green Gold Inc. In 2015 and 2016, work focused on building a new road over West Ridge to access the property and begin camp construction. In 2016, test mining was initiated near camp at the confluence of Big and Granite creeks. A no-name north flowing tributary to Granite Creek was also targeted. The stripped and processed area measured 40 by 450 m (131 x 1476 ft) on the right limit of the valley and was completed by two miners. In 2017, test mining moved downstream on Big Creek to evaluate the potential of a deeper channel.

**Equipment and Water Treatment** Equipment on site included a Deere 4500 excavator and a Caterpillar D9L and D10N bulldozer. 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 the plant and it is capable of processing 100 $yd^3$ (76 $m^3$)/hr. Water was settled out-of-stream on the right limit of Big Creek.

**Surficial Geology and Stratigraphy** Big Creek drains eastward from West Ridge before turning northward toward the Little South Klondike River. Much of the local plateau surface is unglaciated although alpine glaciers

formed on higher summits and the Cordilleran Ice Sheet glaciated the Little South Klondike River valley. Big Creek valley was glaciated during the Pleistocene by alpine ice that accumulated in cirques at the headwater on West Ridge. During the last (McConnell) glaciation, ice was limited and advanced 2 km from the headwall. During the Reid and pre-Reid glaciations ice advanced approximately 7 km and 11 km respectively. In addition, ice from the Ogilvie Mountains, that was part of the Cordilleran Ice Sheet, glaciated the Little South Klondike River and advanced an unknown distance up Big Creek valley, possibly forming a temporary glacial lake during the early Pleistocene. Deposits of early Pleistocene alpine till were observed on the hill slopes above the 2016 mining cut. Since these glaciations occurred, Big Creek has been affected by changes in base level causing valley incision and aggradation to occur. A buried deep channel reported on lower Big Creek supports this complex fluvial history. Placer gold in Big Creek is likely remnant from pre-glacial deposits and from recently liberated gold during Pleistocene glacial erosion. Multiple zones of placer gold enrichment may occur in Big Creek and its tributaries. Relatively shallow surfaces along the margins of Big Creek valley were targeted in 2016 and a deeper channel of reworked gold in the central part of the valley bottom was discovered in 2017.

**Bedrock Geology** Bedrock is phyllite, shale, sandstone, conglomerate and limestone (YGS, 2017).

**Gold Characteristics** Gold is relatively coarse and has a purity of 80%.

## Vancouver, a tributary of McQuesten

115P/11 2017: 63°39'00"N, 137°05'23"W

**Wesley, G., 2015-2017**

Water License: PM15-033-1 (Active 05/2025)
Active Producer (2015-2017) **Operation no. 156**

**Location** Vancouver Creek, lower.

**Work History and Mining Cuts** Not reported.

**Equipment and Water Treatment** Equipment listed on site includes Daewoo 280LC and 300 LCV excavators, a John Deere 992 excavator, a John Deere 744E loader, a Caterpillar D8N bulldozer and a Caterpillar 518 skidder. The plant consists of a shaker deck that is capable of processing 50 $yd^3$ (38 $m^3$)/hr.

**Surficial Geology and Stratigraphy** Not reported.

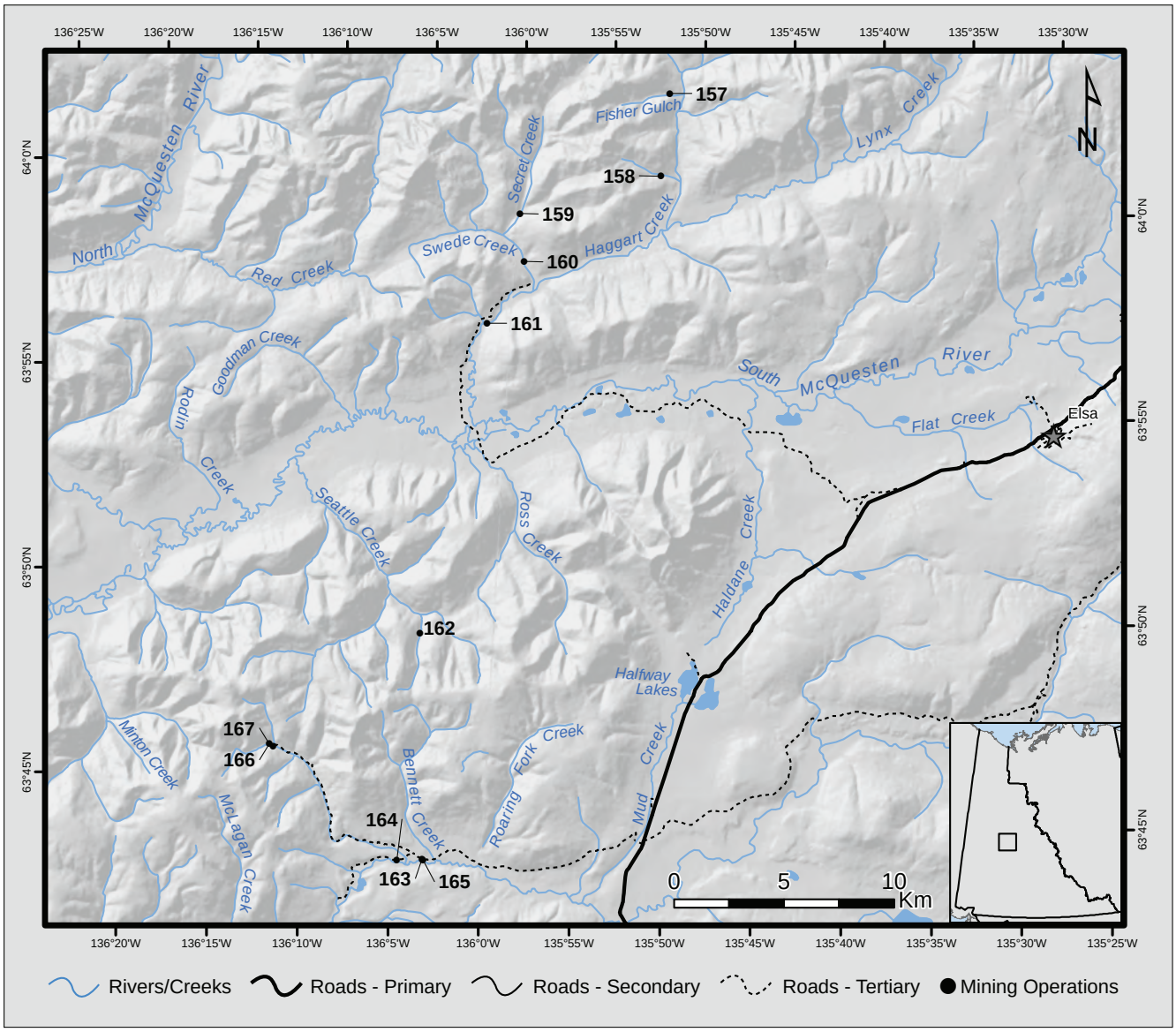
**Bedrock Geology** Bedrock is Hyland Group phyllite, shale, sandstone, conglomerate, and limestone (YGS, 2017).

**Gold Characteristics** Not reported.

*A view looking southwest over Schmidt Mining's cut on a Granite Creek, a right limit tributary to Big Creek. Big Creek valley is visible on the right side of the photo. Pleistocene alpine glaciers developed on West Ridge, visible in the distance at the headwaters of Big Creek.*

# MAYO
## PLACER AREA

**SITES 157-167**




### LEGEND

157. O.H. Transport Inc.
158. Dye, K. and B.
159. Evans, V.
160. Plut, F.
161. 532 Placer Mining
162. Reno Contracting Ltd.
163. Chasen, S., Buzzell, L. and Miller, S.
164. Jardine, E.
165. Wilson, K.
166. Lone, H. and B.
167. Steppler Mining Co.

## Fisher, a tributary of Haggart

106D/04 2015: 64°02'27"N, 135°51'53"W

### O.H. Transport Inc., 2009-2016

Water License: PM14-007 (Active 06/2024)
Active Producer (2015-2017) **Operation no. 157**

**Location** Fisher Gulch, right limit tributary of upper Haggart Creek.

**Work History and Mining Cuts** Not reported.

**Equipment and Water Treatment** Not reported.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is highly fractured phyllite and quartzite.

**Gold Characteristics** Gold is mostly +12 mesh with the fines -30 mesh.

## Fifteen, a tributary of Haggart

106D/04 2015: 64°00'25"N, 135°52'07"W

### Dye, K. and B., 2015

Water License: PM15-09301 (Active 03/2021)
Water License: PM10-067 (Expired 04/2016)
Active Producer (2015) **Operation no. 158**

**Location** Fifteen Pup, 0.8 km upstream from its confluence with Haggart Creek.

**Work History and Mining Cuts** Keith and Betty Dye operated at a small scale in 2015. In 2016, they sold the property.

**Equipment and Water Treatment** Equipment on-site in 2015 included a Case 580 backhoe, an Allis-Chalmers HD6 bulldozer and a Caterpillar 955L bulldozer. The wash plant consisted of a trommel measuring 1.2 m (4 ft) in diameter and 6 m (20 ft) in length, with a 1" screen, able to process 35 yd³ (27 $m^3$)/hr. The sluice run was 0.75 m wide by 2.4 m long (2.5 x 8 ft) and consisted of a punch plate and angle iron. Water was 100% recycled in a series of four ponds. Clean-ups were conducted using a table and wheel.

**Surficial Geology and Stratigraphy** The right limit section in 2015 consists of two units. Unit 1, from 0 to 3.5 m (0-11.5 ft), is a cobble dominated gravel with a boulder lag near the base. Angular pieces of bedrock are also incorporated into the gravel in the lower 2 m (6.5 ft). Beds of silty, organic-rich colluvium are present in unit 1 and represent mixing of slope wash and floodplain sedimentation on the right limit of the valley. The coarse gravel beds of unit 1 are overlain by 0.6 m (2 ft) of matrix-rich colluviated Reid till (Unit 2).

*The pay gravel on Fifteen Pup consists of a poorly sorted, cobble and boulder-rich gravel with fragments of angular bedrock. On the valley margins these deposits are often overlain by colluviated till.*

**Bedrock Geology** Bedrock is highly fractured quartzite to decomposed phyllite.

**Gold Characteristics** Gold is all flat, and is a maximum of pea-sized.

## Secret, a tributary of Haggart

105M/13 2017: 63°59'19"N, 135°59'52"W

### Evans, V., 2005-2017

Water License: PM11-052 (Active 03/2022)
Active Producer (2015-2017) **Operation no. 159**

**Location** Secret Creek, approximately 1.2 km upstream from its confluence with Swede Creek.

**Work History and Mining Cuts** Mr. Evans operated a daily shift on Secret Creek from 2015 to 2017. Mining focused in one large left limit cut immediately upstream of camp. Limited mining has occurred on the property since 2014.

**Equipment and Water Treatment** Equipment on site in 2017 included a Hy-hoe excavator, a Caterpillar D7F bulldozer and a Kenworth dump truck. The wash plant consists of a dump box connected to a single run sluice. No classification or screening was present.

**Surficial Geology and Stratigraphy** The base of the left limit cut was poorly exposed but consisted of a boulder-rich gravel measuring approximately 1.5 m (5 ft) in thickness (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 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 consisted of 5.8 m (19 ft) of gravel and 1 m (3 ft) of overbank flood silts. The lower 2.8 m (9.2 ft) of the gravel section is coarser, more poorly sorted and siltier compared to the upper 3 m (10 ft).

**Bedrock Geology** Bedrock is fractured to decomposed phyllite.

**Gold Characteristics** Gold recovered is of various shapes and sizes, 95% fine and 5% coarse with a fineness of 899 to 902.

## Swede, a tributary of Haggart

105M/13 2016: 63°58'09"N, 135°59'29"W

**Plut, F., 2005-2010, 2012-2016**

Water License: PM15-038 (Active 08/2025)

Active Producer (2015-2016) **Operation no. 160**

**Location** Swede Creek, 1 km from its confluence with Haggart Creek.

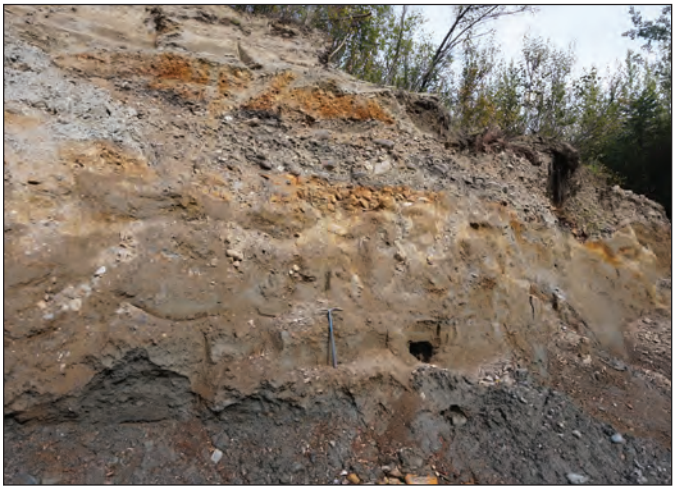
**Work History and Mining Cuts** In 2016, a small crosscut excavation (and drain) was tested on the left limit in the valley bottom. No work was reported in 2017.

**Equipment and Water Treatment** The mine was not active during the site visit but the following equipment was documented: a UH07 Hitachi excavator, Deere 380C excavator and a John Deere 755 bulldozer with a loader bucket. The wash plant consisted of a 1.2 by 1.8 m (4 x 6 ft) screen deck feeding two sluice runs. Each run has two components, an upper section measuring 0.6 by 1.2 m (2 x 4 ft) and a lower section measuring 1 by 3.6 m (3 x 12 ft). Angle iron and expanded metal riffles are used.

**Surficial Geology and Stratigraphy** The crosscut trench contained three units and no bedrock was exposed. Unit 1, from 0 to 3.1 m (0-10 ft), is a crudely stratified unit that is laterally variable consisting of well-sorted bedded sand and poorly sorted grey pebbly-silty sand to oxidized cobbly gravel. The gravel beds are more common near the base of the section and towards the center of the valley. The sand beds with gravel lens are concentrated near the top of the unit and appear contorted, possibly due to past cryoturbation. The water table was exposed at the base of the pit and iron-staining was prevalent in the ground water. Based on the sedimentological variability, this unit is interpreted as glaciofluvial outwash, possibly from the Reid Glaciation 120,000 year ago. Unit 2, from 3.1 to 4.9 m (10-16 ft), is in erosional (sharp) contact with unit 1 and consists of a moderately to well-sorted imbricated pebble-cobble gravel. It is generally coarser at the base of the section. The gravel is oxidized and manganese stained and interpreted to be Swede Creek fluvial gravel. Unit 1 acts as a false bedrock for this gravel. Unit 3, from 4.9 to 5.9 m (16-19 ft), at the top of the section is a well-sorted bedded sand that is interpreted to be a fine-grained fluvial deposit.

**Bedrock Geology** Bedrock is phyllite, shale, sandstone, conglomerate and limestone (YGS, 2017).

**Gold Characteristics** Not reported.



*The section exposed on the left limit of Swede Creek approximately 1 km upstream from its confluence with Haggart Creek.*

## Murphy, a tributary of Haggart

115P/16 2017: 63°56'35"N, 136°01'23"W

### 532 Placer Mining, 2011-2017

Water License: PM17-049 (Active 10/2027)
Water License: PM07-558 (Expired 10/2017)
Active Producer (2015-2017) **Operation no. 161**

**Location** Murphy's Pup, at the confluence with Haggart Creek.

**Work History and Mining Cuts** Two miners worked on 532 Placer Mining's operation from 2015 to 2017, with activity focused at the mouth of Murphy's Pup and its confluence with Haggart Creek. Pay dirt from the lower cut was hauled upstream to the wash plant. Activity focused on the left limit of Murphy's Pup.

**Equipment and Water Treatment** Equipment consisted of a Caterpillar 322 excavator, John Deere 710 D backhoe and dump truck. The wash plant consisted of 1.2 by 7.3 m (4 x 24 ft) trommel that screens to ¾" into a 1 by 3 m (3 x 10 ft) single run sluice. They operated a closed-cell settling facility with a full recycle pumping system. Clean-ups were conducted using a pan and wheel.

**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 (0-3 ft), is a coarse channel gravel containing boulders that originate from Murphy's Pup. These deposits form during high-energy flows 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 to remove.

**Bedrock Geology** Bedrock is decomposed blue schist.

**Gold Characteristics** Gold is all fine with no nuggets and has a fineness of 850 to 860.

*Left-limit cut on lower Murphy's Pup in 2017.*

*A view upstream of Murphy's Pup showing 532 Placer Mining's operation in 2017.*

## Seattle, tributary to the South McQuesten

115P/16 2016: 63°48'56"N, 136°04'08"W

### Reno Contracting Ltd., 2015-2017

Water License: PM17-073 (Active 01/2028)
Active Producer (2015-2017) **Operation no. 162**

**Location** Dan's Pup, 800 m from the confluence with Seattle Creek.

**Work History and Mining Cuts** In 2015 the property was purchased by Mr. and Mrs. Williams from D. Klippert. Initial work focused on cleaning the former camp and preparing the cut where previous mining had finished. Mining commenced later in the season with a crew of four on site working in camp and at the cut in Dan's Pup. In 2016, access road and stream crossing improvements were completed and mining shifted to an unnamed left limit tributary upstream on Seattle Creek from Dan's Pup.

**Equipment and Water Treatment** Equipment on site in 2015 included a Caterpillar D6D dozer for stripping, an Hitachi 270 excavator for digging pay and stripping, a Caterpillar 950G loader for hauling pay to the plant, and an Hitachi 270 excavator for feeding the plant. In 2016, a rock truck was added to the operation. The 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 45-50 $yd^3$ (34-38 $m^3$)/hr.

**Surficial Geology and Stratigraphy** The mine cut on Dan's Pup exposed 7 to 9 m (23-29 ft) of poorly sorted gulch gravel deposits. Unit 1, the lower 1.5 m (5 ft), consisted of a poorly sorted greenish silty gulch gravel containing subangular to subrounded boulders. This is overlain by unit 2 that has thicknesses ranging between 1.5 to 3 m (5-10 ft) and consists of moderately sorted, imbricated, oxidized gravel with a discontinuous ferricrete (iron oxide duricrust) cap. Unit 3 consists of 3 to 4 m (10-13 ft) of moderately sorted pebble gravel, and poorly sorted angular weathered bedrock colluvium.

Gold within the section is coarse and erratically dispersed within unit 1 and the lower portions of unit 2. The origin of unit 1 in Dan's Pup is likely associated with post-glacial downcutting following the Reid Glaciation. The deposit reflects high energy, rapid deposition (poorly sorted), which may explain why the coarse placer gold is erratically distributed and not always situated directly on the bedrock surface. Unit 2 reflects a long period of fluvial activity potentially initiated from the onset of the last interglacial (100,000 years ago). The ferricrete layer represents a former prolonged streambed surface. Unit 3 increases in thickness near the valley margins and consists of mixed fluvial and colluvial sediment likely dating from the last 30,000 years to present.

*A right limit exposure on Dan's Pup in 2016, a tributary to Seattle Creek at the Williams' mine.*

Due to the erratic distribution of gold in gulches and the nugget-effect associated with coarse placer gold deposits it can be challenging to predict the location of the main pay streak. This has been the case in Dan's Pup and it generally requires bulk testing to evaluate the gold concentration as opposed to drilling.

**Bedrock Geology** The property is underlain by metamorphosed clastic rocks of the Neoproterozoic to lower Cambrian Hyland Group. Rocks can vary between hard, blocky-weathering meta-quartzite to soft, fine-weathering phyllite. Variations in the distribution of vein quartz within the Hyland Group rocks may be an important control on placer distribution. These lithological changes also affect bed roughness on the

bedrock surface, which can trap placer gold. Previous soil geochemistry surveys in Dan's Pup highlight anomalous gold and arsenic values in the upper reaches of the drainage, in particular on the left fork, which may point to one source for the placer gold (Klippert, 2000).

**Gold Characteristics** Gold in Dan's Pup is coarse with 60-75% greater than 4 mesh. One gram to one ounce nuggets were common in 2015. In 2016, the gold became more crystalline and fineness changed to 760.

## Minto, a tributary of Mayo

115P/09 2013: 63°43'25"N, 136°03'20"W

**Chasen, S., Buzzell, L. and Miller, S. 2014-2016**

Class 3 Permit: LP00768 and LP01113 (Active 2021)
Active Producer (2015-2016) **Operation no. 163**

**Location** Minto Creek, 2.2 km downstream from Minto Lake.

**Work History and Mining Cuts** Ms. Chasen and Mr. Buzzell staked a claim on Minto Creek in 2014 and conducted exploratory hand prospecting. In 2015, they were joined by Mr. Miller who staked the adjoining claim downstream. All work consisted of hand-mining and evaluating various deposits on left limit benches of the property. In 2016, they tested tailings and hand-mined virgin deposits near the rim of a previously mined bench. High banker tailings were discharged off the bench onto a disturbed area at a lower elevation.

**Equipment and Water Treatment** Equipment on the site included ATVs for local transportation and small water pumps. Vortex long tom sluices were used to process pay. Sluice water was absorbed into tailings and no discharge occurred into Minto Creek.

**Surficial Geology and Stratigraphy** The bench deposits in upper Minto Creek host a coarse boulder-cobble gravel on bedrock. These gravel deposits are associated with glaciofluvial outwash flow that originated off a melting ice sheet in lower Minto Creek. The paleo-flow direction is opposite to the course of modern Minto Creek. The boulder-rich gravel contains rounded clasts and is poorly sorted. Evidence of old-timer hand test pitting is present on a bench near the mouth of McIntyre Creek.

**Bedrock Geology** Bedrock is phyllite, shale, sandstone, grit, conglomerate and limestone (YGS, 2017).

**Gold Characteristics** Generally fine-grained and flat.

*Hand mining left limit bench gravel on Minto Creek in 2016.*

## Minto, a tributary of Mayo

115P/09 2015: 63°43'21"N, 136°04'43"W

### Jardine, E., 2015-2016

Water License: PM14-001 (Active 08/2019)
Active Producer (2015-2016) **Operation no. 164**

**Location** Minto Creek, 4.6 km downstream from Minto Lake.

**Work History and Mining Cuts** Mr. Jardine operated a 1-man crew.

**Equipment and Water Treatment** Equipment on the site included an Hitachi 143 excavator. The wash plant consisted of a 1.2 by 1.8 m (4 x 6 ft) shaker deck screening to 0.5" and fed by a 4" pump. The plant is capable of processing 20-25 yd³ (15-19 m³)/hr.

**Surficial Geology and Stratigraphy** A near surface high-energy gravel is being mined on a low-level terrace on the left limit of Minto Creek. The paleo-flow direction of the gravel is to the west, suggesting it is an outwash gravel derived from the Cordilleran Ice Sheet that flowed up lower Minto Creek during the last glaciation. The gravel unit is 2.4 to 3.6 m (8-12 ft) thick and consists of 60% clasts (mainly cobbles and pebbles) and 40% sandy matrix. Approximately 10% of the unit consists of rounded boulders up to 40 cm (1.3 ft) in length that are primarily concentrated near the upper contact. This indicates that some incision followed deposition of the pay gravel causing a boulder lag to accumulate on the surface, which may mark a zone of gold enrichment. The gravel unit is buried under 1.5 m (5 ft) of sand. Underlying the pay gravel is a false-bedrock of fine gravel and silt of unknown thickness. Testing of the upper parts of this false-bedrock unit indicate that it does not contain gold.

**Bedrock Geology** Bedrock is phyllite, shale, sandstone, grit, conglomerate and limestone (YGS, 2017).

**Gold Characteristics** Gold is fine, 40-50% is less the 50 microns and the largest fraction is 5 mm.

## Minto, a tributary of Mayo

115P/09 2015: 63°43'24"N, 136°03'17"W

### Wilson, K., 2013-2017

Water License: PM16-079 (Active 07/2023)
Active Producer (2015-2017) **Operation no. 165**

**Location** Minto and Bennett creeks, 6.5 km downstream from Minto Lake.

**Work History and Mining Cuts** Between 2015 and 2017, Mr. Wilson operated on the left limit of Minto Creek, approximately 1 km below the mouth Highet Creek. In 2015, he processed 35,000 yd³ from a cut measuring 60 by 160 m (200 x 525 ft). In 2016, surface testing was completed on a right-limit bench of Bennett Creek approximately 600 m northwest of their Minto Creek operation. In 2017, the miners operated a daily 12-hour shift and focused on the left limit of Minto Creek.

**Equipment and Water Treatment** Equipment on the site included two Caterpillar D9 bulldozers for stripping, a Liebherr 350 excavator, a Samsung 350 excavator, a Case 470B excavator, a Caterpillar D300E rock truck and two Hyundai 770 loaders. The mining operation recycled water obtained from Minto Creek. The wash plant consists of an oscillating screen deck with ½" openings suitable for fine gold and the high sand content. The sluice runs consist of two 1.2 m wide (4 ft) runs consisting of expanded metal and high strand (1 cm) matting. The plant is capable of 80-90 yd³ (61-69 m³)/hr.

**Surficial Geology and Stratigraphy** On Minto Creek Mr. Wilson is mining a near surface, moderately to poorly sorted, coarse, cobbly gravel with some rounded diorite boulders. The unit varies from 1.6 to 3 m (6-10 ft) in thickness and increases in thickness to the north or away from the modern creek. The gravel has an even distribution of gold, although the texture of the deposit is coarser near the base. The upper 1 m (3 ft) of the deposit contains more pebbles and a higher sand matrix content. Approximately 1.8 m (6 ft) of the upper sandy pebbly gravel is stripped to expose the coarser beds. Underlying the pay gravel is a false-bedrock of well-sorted pebble and sandy-pebble gravel. Imbrication of the pay gravel suggests the water flow was similar to modern day Minto Creek and may have been influenced by contributions from Highet Creek.


*K. Wilson's operation on the left limit of Minto Creek in 2017.*

On Bennett Creek, exploration bulk sampling targeted coarse surface gravel units on a bench approximately 40 m in elevation above Minto Creek. The bench likely dates from the Reid Glaciation (~130,000 years ago). The stratigraphy of the site from the base of the exposure consists of four units. Unit 1, from 0 to 1 m (0-3 ft), is made up of convoluted beds of silt likely related to a glacial lake forming in Minto Creek valley during the Reid Glaciation. Much of the bench likely consists of unit 1 sediment. Unit 2, from 1 to 2 m (3-6.5 ft), is in erosional contact with the underlying silt and consists of a clast-supported, boulder, cobble, pebble gravel. A paleo-flow direction could not be determined for this unit. The gravel clasts are oriented vertically and mixed with silt at the upper contact. The vertically oriented clasts are related to post-depositional cryoturbation or frost heaving during an intense cold period, possibly during the McConnell (last) glaciation. The increase in silt content near the upper contact is related to loess deposition during this cold period. Unit 3, from 2 to 3 m (9.5-10 ft), is a poorly to moderately sorted clast-supported gravel containing abundant small boulders. This high-energy gravel has less silt matrix compared to the underlying gravel and has a paleo-flow direction from Bennett Creek. Unit 4, from 3 to 4 m (10-13 ft), is a veneer of aeolian (wind blown) sand.

**Bedrock Geology** Bedrock is phyllite, shale, sandstone, grit, conglomerate and limestone (YGS, 2017).

**Gold Characteristics** Gold is fine with 50% less than 50 mesh. The fineness equals 840. No information on the gold characteristics from the Bennett Creek bench was obtained.

## Highet, a tributary of Minto

115P/16 2016: 63°45'58"N, 136°11'54"W

### Lone, H. and B., 1999-2017

Water License: PM14-032 (Active 01/2025)
Active Producer (2015-2017) **Operation no. 166**

**Location** Highet Creek, upper, at the mouth of Rudolph Gulch.

**Work History and Mining Cuts** In 2016, Mr. and Mrs. Lone were mining on the right limit of Highet Creek across from the mouth of Rudolph Gulch. Four personnel were employed during the mining season. Side pay was being excavated at an elevation 16 m (52 ft) above the plant.

*A view looking down Highet Creek valley from the right-limit exposure at the Lone's 2016 mine cut.*

**Equipment and Water Treatment** The equipment in 2016 included a D8H Caterpillar dozer for pushing pay to the plant, a Caterpillar 330B excavator was used for feeding the plant, and a Trojan loader managed tailings. The wash plant consisted of ½" punch plate over a 1 m wide by 5 m long (3.5 x 17 ft) sluice run containing flat iron riffles and matting. A 6" pump supplied water to the plant enabling it to process 50 to 60 loose $yd^3$ (38 to 46 $m^3$)/hr. A long tom was used for clean-ups and completed on a table.

**Surficial Geology and Stratigraphy** The exposure on Highet Creek consisted of three units that form a bench on the right limit opposite the mouth of Rudolph Gulch. Unit 1 at the base of the section was poorly exposed, at least 4 m (13 ft) thick, and consisted of a cobble-pebble sand near the upper contact. The fine-grained character of this unit suggests it may have glacial origins related to up-valley ice flow during the Reid Glaciation approximately 130,000 years ago. Unit 2 is a clast supported, 1 m (3 ft) thick, coarse, oxidized gravel containing boulders up to 0.8 m (2.6 ft) in length. Clasts within the gravel are locally derived, have a subangular shape and show imbrication consistent with a down-valley paleo-flow direction. This unit is considered the pay gravel and is in erosional contact with unit 1. Unit 2 is interpreted to be a post-glacial or interglacial Highet Creek gravel. Its lateral extent into the hillside is uncertain but estimated to be 10 m (33 ft). Unit 3, the uppermost unit, is a 4 m-thick (13 ft) layer of dark grey silty gravel containing angular clasts. This unit is interpreted to be colluvium (slide rock) derived from the south slope of the Highet Creek valley.

**Bedrock Geology** Bedrock is quartzite and biotite schist.

**Gold Characteristics** Gold has a fineness of 830 to 840.

## Highet, a tributary of Minto

115P/16 2016: 63°46'01"N, 136°12'07"W

**Steppler Mining Co., 2016-2017**
**Graham, B., 2012-2013**
**Erl Enterprises, 1961-2011**

Water License: PM15-092 (Active 06/2026)
Active Producer (2016-2017) **Operation no. 167**

**Location** Highet Creek, upper.

**Work History and Mining Cuts** Craig Steppler acquired Frank Erl's ground and started mining in 2016. Work focused on mining virgin ground under the old camp buildings and reworking previously mined ground in the valley bottom. Remnants of bench ground were encountered on the right limit. Two people ran the operation.

**Equipment and Water Treatment** The equipment documented on site in 2016 included a Caterpillar D8 bulldozer, a Caterpillar 988 loader, a Doosan 225 excavator and a 14 yd³ haul truck. The sluice plant consisted of a 1.2 m wide by 7.3 m long (4 x 24 ft) trommel that classified to ¾" and processed 70 yd³ (54 m³)/hr. The sluice run consisted of a boil box, expanded metal and riffles.

**Surficial Geology and Stratigraphy** No exposures of virgin deposits were visible in 2016.

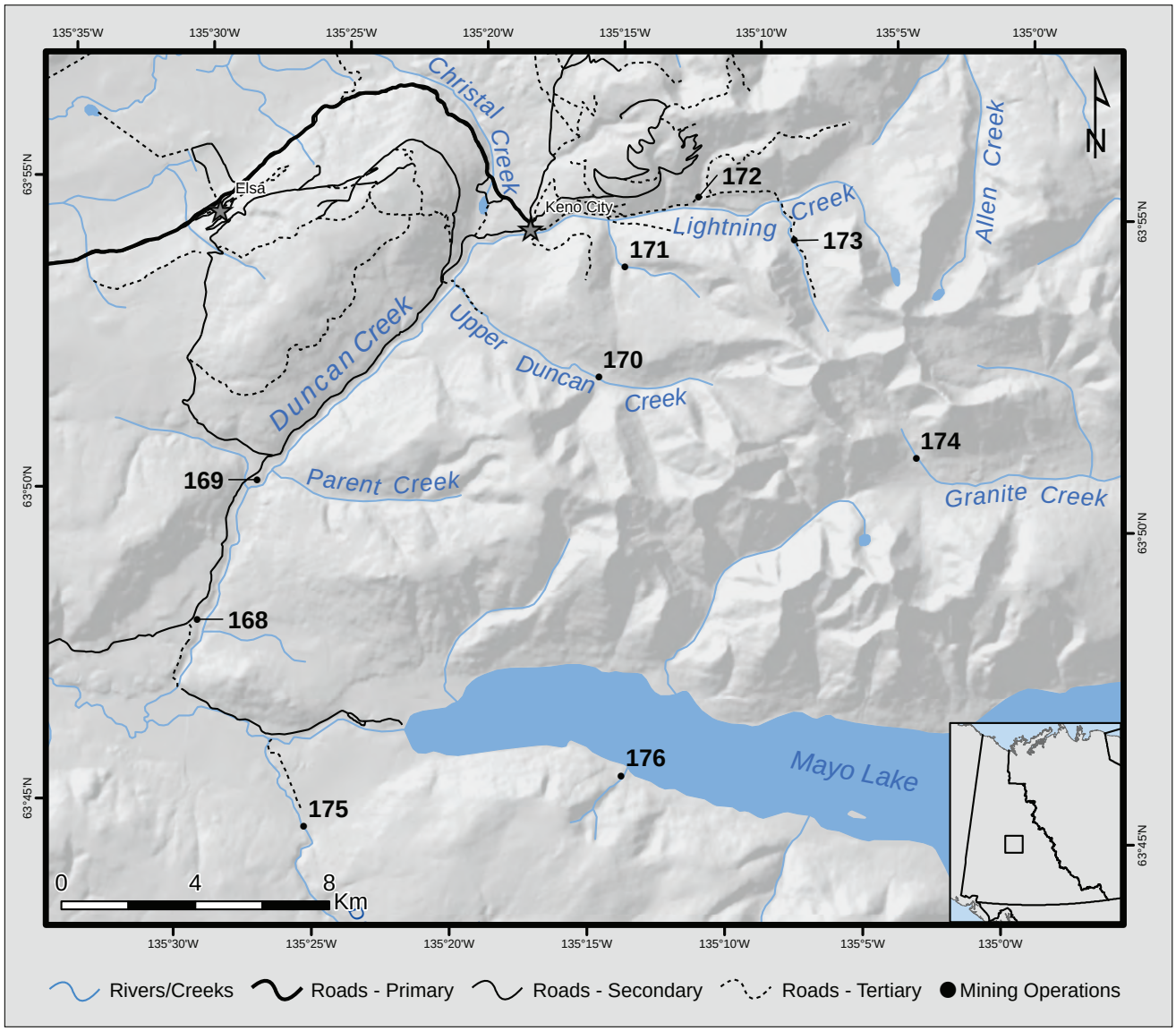
**Bedrock Geology** Bedrock is biotite schist and quartzite.

**Gold Characteristics** Gold is coarse grained.


*A view looking up Highet Creek valley of C. Steppler's mine cut in Highet Creek.*

# KENO
## PLACER AREA

**SITES 168-176**




**LEGEND**

168. Duncan Creek Golddusters Ltd.
169. Zeiler, M.
170. Earth & Iron Inc.
171. Bardusan Placers Ltd.
172. Roy, L.
173. Gimlex Enterprises Ltd.
174. Davies, J.
175. Rivest, P.
176. 1745888 Alberta Ltd.

## Duncan, a tributary of Mayo

105M/14 2016: 63°48'02"N, 135°29'36"W
105M/14 2015: 63°47'59"N, 135°29'40"W

### Duncan Creek Golddusters Ltd., 1975-2017

Water License: PM14-066 (Active 04/2025)
Water License: PM94-093 (Expired 03/2015)
Active Producer (2015-2017) **Operation no. 168**

**Location** Duncan Creek, approximately 3.8 km upstream from its confluence with Mayo River.

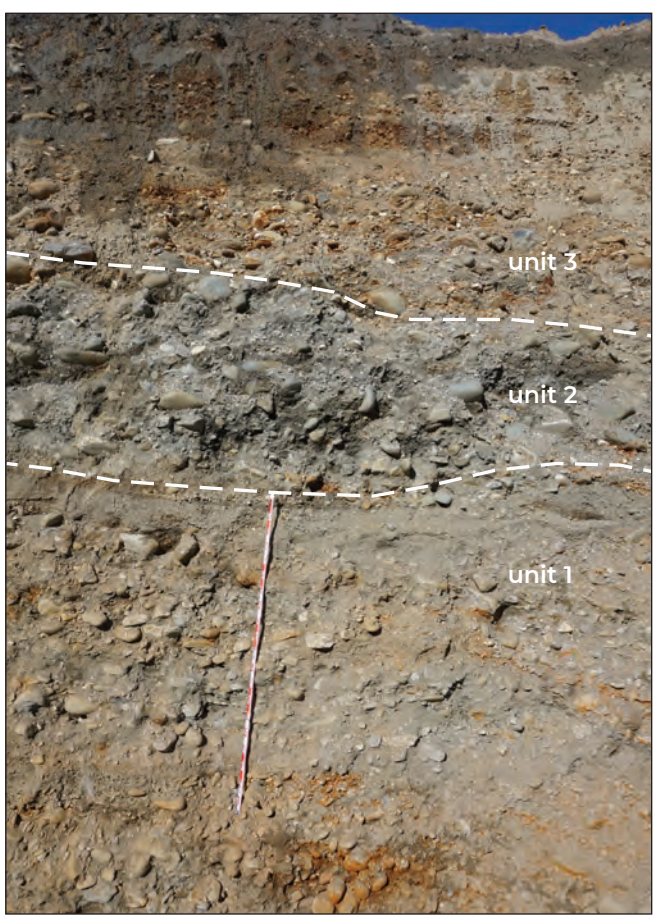
**Work History and Mining Cuts** From 2015 to 2017, two miners and one camp personnel operated one daily 12-hour shift at the Taylor's operation on Duncan Creek. Mining focused on the right-limit near Art Chamber's old cabin that dates back to the 1930s. In 2015, a drain was constructed through the 2002 mine area below the west bank in order to continue mining along the right limit. In 2016, mining progressed upstream on the right limit below camp. An exploration program was conducted in 2015 and used a dual rotary rig to map the distribution of coarse pay gravel between the Duncan Creek road and the west escarpment.

**Equipment and Water Treatment** Equipment on site included a Caterpillar 330BL excavator with a 2 $yd^3$ bucket, a Caterpillar 330DL excavator with a 2 $yd^3$ 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 x 17 ft) deck containing 0.7 by 1.2" holes and a 1.8 by 3 m (6 x 10 ft) prewash. Sluice runs include a 1.8 by 2.7 m (6 x 9 ft) run with 1" angle iron riffles, and 3.6 by 2.7 m (12 x 9 ft) run with expanded metal riffles and nomad matting. A 6" Gorman Rupp trash pump powered by a Deutz generator supplied water to the wash plant at 1200 igpm, allowing the plant to process gravel at a rate of 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 x 150 x 9 ft). Clean-ups were conducted using a two-cell jig with a long tom.

**Surficial Geology and Stratigraphy** In 2015, drain construction and mining exposed a former interglacial lake deposit (grey silt/clay and marl) that was encased in gravel deposits. Gravel characteristics and placer gold content varied near the lake sediment suggesting variations in genesis of the gravel units. Overlying, and adjacent to the lake sediment, is a highly oxidized, moderately to well-sorted, boulder-cobble gravel with a non-compact sandy matrix. This gravel contains woody debris, including logs with bark, and likely represents an interstadial fluvial deposit that immediately preceded the last glaciation (ca. 30 ka). This gravel unit extends upstream into the 2016 cut and was exposed on the downstream flank of a bedrock knob. Placer gold content is poor in this gravel and it is generally stripped out of the pit. Favourable gravel was encountered beneath the lake sediment, however this was challenging to recover due to the density of the silt.

*Duncan Creek Golddusters Ltd.'s operation on Duncan Creek in 2015.*

In 2016, mining continued immediately upstream from the lake sediment and the stratigraphic relationships of the different gravel units became clearer. The section thickness measured 27 m (89 ft) and consisted of six units. Unit 1, from 0 to 5 m (0-16 ft), was deposited on the bedrock surface that slopes to the west or into the hillside. This unit is economic near the bedrock contact and consists of planar stratified and cross-bedded, well-sorted, cobble-pebble gravel with sandy beds. This unit was not directly dated; however, it is interpreted to be advance outwash from alpine glaciers in the headwaters (upper Duncan and Lightning creeks) during the Gladstone glaciation about 70,000 years ago. Overlying unit 1 is unit 2, from 5 to 7 m (16-23 ft), and consists of a compact, poorly sorted, boulder-cobble-pebble gravel with a silty sand matrix. This unit provided the best pay during the 2016 season and is interpreted to be a full glacial outwash gravel from alpine glaciers in the headwaters during the Gladstone glaciation. The Cordilleran Ice Sheet did not reach Duncan Creek at this time so only alpine glacier processes (meltwater) are evident in the stratigraphic record. Deglaciation of the Gladstone alpine glaciers is recorded in unit 3 from 7 to 11 m (23-36 ft) with the deposition of planar stratified boulder-rich outwash gravel. This unit also contained economic placer gold concentrations. A phase of fluvial down-cutting likely ensued, following the Gladstone glaciation approximately 45,000 years ago. At this time, the Gladstone outwash deposits (units 1-3) would have formed a low terrace adjacent to Duncan Creek. The lake sediment (unit 4) outcrops at the lower end of the mine cut and overlies unit 3. Unit 4 represents a small pond that formed on the margins of the Duncan Creek floodplain adjacent to the Gladstone outwash terrace and perhaps dammed behind a gravel levee at the edge of the active channel. Unit 5, from 11 to 16 m (36-52 ft), is the coarse, weakly consolidated, oxidized gravel encountered in 2015 that contains woody debris. This gravel was deposited in an aggrading non-glacial fluvial setting and generally contains uneconomic placer concentrations. Unit 6, from 16 to 27 m (52-89 ft), consists of contorted beds of sand and gravel likely deposited in a glacial lake by the Cordilleran Ice Sheet as it advanced past Duncan Creek down the Mayo River valley during the last glaciation. The ice sheet eventually buried the current mine site location as it advanced up Duncan Creek and till is visible at higher levels in exposures downstream from the 2016 cut.




*Gravel stratigraphy exposed in the Taylor's 2016 cut on lower Duncan Creek. The highest grade gravel is the siltier, more poorly sorted gravel (unit 2) that was deposited by outwash from glaciers forming in the headwaters of the valley.*

The stratigraphy of lower Duncan Creek reflects a complex history of fluvial and glaciofluvial processes. Sediment and placer gold reworking is common within the confined floodplain environment and appears associated with broad fluctuations in climate. Glaciofluvial deposits that are more poorly sorted (higher energy) and contain a higher silt content in the matrix tend to contain more placer gold. Conversely, interglacial fluvial gravel that is well-washed and contains little silt matrix has a lower placer gold content and is often highly oxidized due to its porosity. Proximity to resistant surfaces, like bedrock, increases placer gold concentration in Duncan Creek, but like other glaciated settings is not always required for economic accumulations. Regular panning is a recommended procedure to differentiate pay from waste in otherwise similar looking gravel.

**Bedrock Geology** Bedrock is muscovite-schist, in varying degrees of decomposition.

**Gold Characteristics** Gold recovered is typically smooth and flat with some rough and rounded pieces. The majority is smaller than screen size 18. Nuggets are typically smooth and rarely includes quartz. The fineness of gold is 780.

## Duncan, a tributary of Mayo

105M/14 2017: 63°50'16"N, 135°27'43"W

### Zeiler, M., 2003-2011, 2013-2017

Water License: PM14-037 (Active 02/2025)
Active explorer (2015-2017) **Operation no. 169**

**Location** Duncan Creek, including tributaries Williams and Parent creeks.

**Work History and Mining Cuts** For the past three years Mr. Zeiler has focused on exploration drilling to delineate the deep channel on Duncan Creek. This included approximately 20 to 25 auger drill holes. Additional work included settling pond construction and stripping on Parent Creek.

**Equipment and Water Treatment** Equipment included a Caterpillar D7 bulldozer for constructing access roads and stripping. For the drilling program, a Mobile B53 auger drill mounted on a 5-ton Ford truck was used. For drilling deeper holes, a 6" flight diameter was utilized.

**Surficial Geology and Stratigraphy** Using the auger drill, the top of the deep channel gravel on Duncan Creek has been mapped at 27 m (90 ft) deep. Overburden sediment largely consists of a dense, frozen, blue-clay. Shallower gravel units have been identified on the limits of Duncan Creek and are closer to 15 m (50 ft) in depth.

**Bedrock Geology** Bedrock is interbedded quartzite and muscovite-schist, in varying degrees of decomposition.

**Gold Characteristics** Gold recovered from near surface gravel in Duncan Creek is flat and primarily very fine.

## Upper Duncan, a tributary of Mayo

105M/14 2016: 63°52'10"N, 135°15' 26"W

### Earth & Iron Inc., 2016-2017

Water License: PM16-015-2 (Active 06/2026)
Active Producer (2016-2017) **Operation no. 170**

**Location** Upper Duncan Creek, 5 km upstream from its mouth.

**Work History and Mining Cuts** Earth & Iron Inc. purchased their Upper Duncan Creek claims in 2015 and proceeded to acquire a water license in 2016. Work on the property in 2016 included upgrading the access road off the Duncan Creek road, camp construction and tailing pond construction. Additional claims were staked in neighboring tributaries to upper Duncan Creek and in nearby streams such as McMillan Gulch, Allen, Faith and Granite creeks. In 2016, test mining occurred on a near surface fluvial/glaciofluvial fan deposit on the right limit of Upper Duncan Creek. In 2017, testing occurred in numerous locations in Upper Duncan Creek and a cut measuring 200 by 200 m (656 x 656 ft) and 30 m (98 ft) deep was excavated near the upper fork. During the second half of the season, equipment and personnel were contracted to mine on J. Davies ground on Granite Creek.

**Equipment and Water Treatment** Equipment on site in 2016 included Caterpillar 330, 365B and 345B excavators, a JS 220-JCB excavator, an Hitachi Zaxis 330 LC excavator, a Caterpillar 740 articulated truck for hauling pay and waste, and two Caterpillar 980G loaders. In 2016, the wash plant consisted of a conveyor fed gravity Derocker measuring 6 m (20 ft) long by 2.4 m (8 ft) wide. The Derocker fed three sluice runs measuring 0.6 m (2 ft) wide by 5 m (17 ft) long.

*A view of the coarse-grained glaciofluvial fan deposit mined by Earth and Iron Inc. on the right limit of Upper Duncan Creek in 2016.*

**Surficial Geology and Stratigraphy** The fan deposit mined on the right limit of upper Duncan Creek had a complex origin associated with glaciofluvial sedimentation during the Reid glaciation and subsequent fluvial sedimentation. During the Reid glaciation, the Cordilleran Ice Sheet advanced up Thunder Gulch to the north, 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 30 m (98 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.

**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 extracted from the lower parts of the glaciofluvial fan deposit includes fine gold with a crystalline or pristine character, and fine to medium-grained moderately travelled pieces with rare nuggets up to 1/3 oz. Placer gold from the upper forks pit was fine with some crystalline pieces.

## Thunder, a tributary of Lightning

105M/14 2015: 63°53'57" N, 135°14'39"W

### Bardusan Placers Ltd., 1991-1992, 1998-2012, 2014-2017

Water License: PM13-055 (Active 04/2024)
Active Producer (2015-2017) **Operation no. 171**

**Location** Thunder Gulch, 1.8 km upstream from its confluence with Lightning Creek.

**Work History and Mining Cuts** From 2015 to 2017, Bardusan Placers Ltd. operated one daily eight to ten-hour shift with three miners. In 2015, they were active on lower Thunder Gulch where they re-mined a section of blocky bedrock that had been incompletely exploited by Cat mining in the 1970s. In 2016, they moved upstream to the middle reaches of Thunder Gulch and mined a cut measuring 106 m (350 ft) in length.

*A close-up view of unit 1 till (pay) at the base of the 2016 cut on Thunder Gulch. A 60 cm-long pick is visible for scale at the base of the exposure.*

**Equipment and Water Treatment** Equipment present on site included an Hitachi 450 excavator to strip and stock pile pay, a UH20 excavator for stripping, a Caterpillar 980C front end loader to feed 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 x 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 yd³ (53 $m^3$)/hr. In 2016, water was acquired from Thunder Gulch and gravity fed to the wash plant through a system of recycled vintage pipes, eliminating pumping costs. Water was discharged through an area of coarse tailings measuring roughly 20 by 300 m (66 x 984 ft) and then into a primary pond that measured 40 by 22 by 1 m (131 x 72 x 3.3 ft). A secondary pond 40 by 20 by 2 m (131 x 66 x 6.6 ft) was used 0.5 km downstream on the left limit of Lightning Creek. 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 2016, the right-limit bank of Thunder Gulch was well exposed in the active mine cut. The stratigraphy consisted of four units that measured a total of 24 m (79 ft) in thickness. Unit 1, from 0 to 5 m (0-16 ft), is a matrix-supported boulder-rich till that contains the highest concentrations of placer gold. The texture consists of 70% clasts (50% boulders, 40% cobbles and 10% pebbles) and 30% matrix (sandy silt). The boulders have a subround shape and have a paleo-flow imbrication in the down valley direction. Unit 2, from 5 to 9.5 m (16-31 ft), is a cobble-boulder till containing angular clasts. The gold in this unit has a more angular shape and it is also processed for gold, but is regarded as a secondary pay unit. Unit 3, from 9.5 to 11.5 m (31-38 ft), is an oxidized cobble-pebble gravel with sand lenses. This unit is stripped. Unit 4, from 11.5 to 24.8 m (38-79 ft), is an angular colluvium (slide-rock) that is considered overburden and stripped. At the downstream end of the cut, a matrix-supported dark grey till is preserved and directly overlies unit 1.

Units 1 and 2 are thought to be pre-Reid (early to mid-Pleistocene) tills that were deposited by an alpine glacier in Thunder Gulch. The high gold concentration in the till (units 1 and 2) may be the result of reworking a placer gold-rich fluvial gravel that preceded the first period of alpine glaciation. The increase in angularity of the placer gold in unit 2 may have two explanations: 1) the placer gold is relatively youthful and only recently eroded from the bedrock source, suggesting it has undergone fewer episodes of reworking; and/or 2) the mine is close to a bedrock source that may not have been present during development of the primary pay unit on bedrock. The matrix-supported dark grey till was likely deposited when the Cordilleran Ice Sheet advanced up Thunder Gulch during the Reid or Gladstone glaciation.

**Bedrock Geology** Bedrock varies between shale, quartzite and schist.

**Gold Characteristics** Gold recovered 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.

*A view upstream of the Bardusan Placers Ltd.'s cut on Thunder Gulch in 2016. The gravity-fed wash plant is visible at the bottom of the photo. For reference, Unit 3 the oxidized gravel, is visible in the middle part of the exposure.*

## Hope, a tributary of Lightning

105M/14 2016: 63°55'07"N, 135°12'05"W

### Roy, L., 2008-2017

Water License: PM07-564 (Active 03/2018)
Active Producer (2015-2017) **Operation no. 172**

**Location** Hope Gulch, 0.3 km from its confluence with Lightning Creek.

**Work History and Mining Cuts** In 2016, Mr. Roy leased his ground and a small-scale operation commenced near the Lightning Creek road.

**Equipment and Water Treatment** Equipment present on site included a Caterpillar 225LC excavator and a small sluice box.

**Surficial Geology and Stratigraphy** The exposure on the left limit consists of 0 to 0.70 m (2.3 ft) of stratified, fining upward, pebble-cobble gravel, with 60% silty, sand matrix (unit 1). From 0.70 to 5.5 m (2.3-18.0 ft) is a clast-supported, poorly sorted, massive gravel with boulders up to 1 m (3.3 ft; unit 2). At this elevation on Hope Gulch, the stream dissects Lightning Creek alpine glacier morainal deposits, which are visible on the left limit as unit 2. The morainal sediment is partially composed of material from McNeil Gulch, which is known to contain low concentrations of placer gold. The placer gold in Hope Gulch may in part be derived from reworking the Lightning Creek morainal sediment.

**Bedrock Geology** Bedrock is primarily Keno Hill quartzite.

**Gold Characteristics** Not reported.

*A view looking up Hope Gulch in 2016.*

## McNeill, a tributary of Lightning

105M/14 2017: 63°54'29"N, 135°08'31"W

### Gimlex Enterprises Ltd., 2015-2017

Water License: PM14-059 (Active 04/2025)
Active Producer (2015-2017) **Operation no. 173**

**Location** McNeill Gulch, lower, 1.3 km from the confluence with Lightning Creek.

**Work History and Mining Cuts** In 2016, Gimlex Enterprises Ltd. in partnership with Kluane Drilling completed a seismic geophysical program to help delineate depth to bedrock in McNeill Gulch and upper Lightning Creek. The program consisted of six lines, three in McNeill Gulch and three in Lightning Creek. In 2017, follow-up exploration work consisted of six reverse circulation drill holes. Five of the drill holes were completed in McNeill Gulch upstream of the end moraine and the sixth hole was completed near the confluence of McNeill Gulch and Lightning Creek. Both programs were completed with the assistance of the Yukon Mineral Exploration Program.

*MDM Contracting's reverse circulation rig drilling on McNeill Gulch in 2017.*

**Equipment and Water Treatment** A reverse circulation drill rig was used to conduct the exploration program.

**Surficial Geology and Stratigraphy** McNeill Gulch is a north-trending glaciated valley in the Gustavus Range. A well-developed cirque lies at the headwaters of the drainage that has been the accumulation zone for alpine glaciers during past glaciations. During the McConnell (last) glaciation ice advanced to the mouth of the drainage and constructed a large end moraine that pushed into and constricted the Lightning Creek valley. The end moraine sediment is likely an accumulation of debris originating from multiple glaciations. A channel was cut through the moraine in Lightning Creek during the last glaciation by meltwater draining off the Cordilleran Ice Sheet that terminated to the east in upper Lighting Creek near the mouth of McMillan Gulch. Erosion of this channel through the moraine also triggered McNeill Creek to cut into the moraine, which now forms a narrow valley through the morainal sediment. Previous placer mining by K. Klippert focused in this area of McNeill Gulch and never reached bedrock. These placer gold deposits are likely related to concentrating the low grade morainal sediment. Recent exploration efforts by Gimlex Enterprises and Kluane Drilling aimed to identify a deep channel on the bedrock surface, primarily upstream of the moraine and along Lightning Creek. Reverse circulation drilling was utilized due to the anticipated depth and abundance of Keno Hill quartzite boulders. Depths to bedrock ranged between 21 to 41 m (70-135 ft) in McNeill Gulch and 44 m (145 ft) in Lightning Creek.

**Bedrock Geology** Drilling intersected phyllite in the valley bottom.

**Gold Characteristics** The character of some of the gold recovered was coarse.

## Granite, a tributary of Roop Lakes

105M/14 2016: 63°51'04"N, 135°03'44"W

**Davies, J., 2014-2017**

Water License: PM12-012-3 (Active 07/2022)
Active Producer (2015-2017) **Operation no. 174**

**Location** Granite Creek, headwaters.

**Work History and Mining Cuts** In 2015 Mr. Davies advanced his mining cut into the alpine glacier end moraine focused primarily on the west side (right limit) of Granite Creek. In 2016, 8 crew were employed actively mining 5 days/week. The cut was expanded to the west, and continued to advance upstream. A short haul road connects the mine cut to the wash plant. In 2017, Earth and Iron Inc. was contracted to strip and haul pay.

**Equipment and Water Treatment** Equipment present is 2016 included a John Deere 450 for excavating overburden and pay, with a John Deere 270 excavator used as a spare. A Caterpillar D7G bulldozer is utilized for stripping. Pay was hauled from the cut to the wash plant using a 30-ton Terex rock truck. A Caterpillar 966C loader is used for feeding the wash plant and removing tailings. The wash plant consists of a Derocker screening to 1¼" and sluice runs contain hydraulic riffles, Hungarian riffles and expanded metal. A 10" pump feeds that the plant, which uses 1200 gal/min and can process 45 to 50 $yd^3$ (34-38 $m^3$)/hr. Settling facilities are located out-of-stream, immediately downstream from the wash plant and consist of a series of three settling ponds. In 2017, a Caterpillar 330 excavator was used for digging pay and three Caterpillar 740 haul trucks were used to transport overburden and pay. A Caterpillar D10R bulldozer was used for reclamation and road work.

**Surficial Geology and Stratigraphy** During the last glaciation, local alpine glaciers formed on the east side of Mount Hinton at the headwaters of Granite Creek. The glacier advanced to the confluence with the main valley that drains eastward out of the Gustavus Range and formed a succession of large end moraines. Following the glaciation, the end moraines were dissected by Granite Creek, but it did not erode to bedrock. Mining has exposed an older glacial deposit under the end

*Jim Davies' cut on upper Granite Creek. The oxidized gold-bearing till is visible at the base of the section underlying grey end moraine sediment from the McConnell (last) glaciation.*

*Jim Davies' mining operation on upper Granite Creek. Mining is focused at the limit of alpine glaciation. End moraines are visible in the photograph and in 2017 mining was focused immediately upstream from the McConnell alpine terminal moraine.*

moraine of the last glaciation. This older glacial deposit is a till and is placer gold-bearing. The stratigraphy of the 2016 mine cut consists of:

Unit 1, from 0 to 2.5 m (0-8.2 ft), consists of a matrix-supported brown (oxidized) diamict. Elongated clasts within the diamict are oriented parallel with upper Granite Creek suggesting the deposit is a basal till derived from an alpine glacier that formed in the headwaters. The till is composed of 30% clasts including rounded boulders and 70% silty sand matrix. Near the upper contact is a discontinuous sheet of fractured (glacially thrusted?) bedrock about 1 m (3 ft) thick. The placer gold content is greatest within this unit, and the largest nuggets are associated with the thrusted bedrock layer.

Unit 2, from 2.5 to 6.5 m (8.2-21 ft), is a second oxidized diamict. This unit is also interpreted as an alpine basal till based on the clast fabric orientation and presence of faceted clasts. It is not known whether this unit represents another glaciation or is a glacial re-advance associated with the underlying till. The till has a coarser texture compared to the underlying till with 50% clasts and 50% silty coarse sand matrix. The long-axis clast imbrication is dipping up-valley. The concentrations of placer gold in this unit tend to be lower that the underlying till, however the overall grain-size of the gold is larger. This unit is also considered pay.

Unit 3, from 6.5 to 9.0 m (21-29.5 ft), is a grey diamict with a similar texture (50% clasts and 50% matrix) to the underlying oxidized till. Boulders within the diamict are generally more angular. This unit is interpreted to be a McConnell basal till deposited by an alpine glacier in upper Granite Creek. Near the middle of the valley this unit has partially eroded and reworked unit 2 and has incorporated its placer gold making it economic to process.

Unit 4, from 9.0 to 30.5 m (29.5-100 ft), is McConnell end moraine sediment. It is crudely stratified with bedding parallel to the slope of the moraine surface. The sediment is clast supported and much less cohesive than the underlying basal tills. Clasts are angular and comprise 70% of the sediment. Placer gold is reported in the end moraine sediment however not at economic grades.

Economic placer deposits in till are uncommon, however the Granite Creek setting indicates that it is possible for alpine till to retain fluvial-like concentrations. The gold concentrations in units 1 and 2 likely formed when the alpine glacier eroded and reworked a pre-existing gold-rich stream gravel. The rounded boulders in unit 1 are likely remnant from that gravel. Glacial transport of the gold was contained in the upper basin of Granite Creek, which is less than 2.5 km in length. Much of the placer gold has an angular to subangular shape, also supporting short transport in both the fluvial and glacial environment. A portion of the placer gold in the till was likely eroded directly from a hard rock source and did not undergo a period of fluvial transport. The sheet of thrusted bedrock between units 1 and 2 may provide clues to a local source. The thrusted bedrock is consistent with glacial tectonism, whereby the glacier toe freezes to the bedrock surface and with continued glacier movement plucks the bedrock and thrusts it overtop of preexisting sediment. At the time of thrusting, the glacier toe was positioned immediately upstream of the end moraine, which provides a likely target area for a hard rock source. Many of the larger nuggets are contained within the zone of thrusted bedrock, which may also inform gold character within the hard rock environment.

**Bedrock Geology** Bedrock is shale and quartzite (YGS, 2017).

**Gold Characteristics** Gold shape is pristine to re-shaped. Gold grain-size distribution is 60% -4 mesh and 40% +4 mesh.

## Davidson, a tributary of Mayo

105M/11 2015: 63°43'14"N, 135°24'06"W

### Rivest, P., 2003-2010, 2012-2016

Water License: PM14-005 (Active 05/2024)
Active Producer (2015-2016) **Operation no. 175**

**Location** Davidson Creek, approximately 6 km upstream from its confluence with Mayo River.

**Work History and Mining Cuts** Coulee Resources optioned Davidson Creek from Mr. Rivest in 2015 and 2016. Mining focused upstream of the canyon in the center of the valley bottom and five miners were employed at the mine. Pay was hauled downstream to the wash plant situated 1 km above the canyon on the left limit. Work progressed upstream to a section of creek where the pay channel became difficult to follow.

**Equipment and Water Treatment** Equipment in 2015 included Hitachi UH30 and John Deere 330LC excavators used for digging and loading pay, an Hitachi Zaxis 350 excavator for stripping overburden, and a Haulpak rock truck for transporting pay to the wash plant. A Daewoo 220 excavator was used for feeding the plant, and a Toolcarrier loader removed the tailings. A Caterpillar D9H bulldozer was also used for stripping. The wash plant consisted of a Derocker capable of processing 50 yd³ (38 $m^3$)/hr. In-stream settling facilities are constructed below the canyon.

**Surficial Geology and Stratigraphy** Davidson Creek has been glaciated multiple times by ice moving perpendicular to the drainage down the Mayo River valley. Blockage of Davidson Creek valley by the ice sheet caused a small glacial lake to form in the valley. Well-sorted beds of pebbly gravel deposited by meltwater filling the glacial

*In preparation for mining, the active channel of Davidson Creek is drained revealing a natural rip rap of large boulders. Depth to bedrock under this layer of boulders is approximately 2 m, however is challenging to access due to the coarseness of the clasts derived from reworking morainal sediment.*

*A view looking downstream of Coulee Resources operation on Davidson Creek.*

lake are preserved in mining cuts, and on the channel margin, are in direct contact with the bedrock surface. This suggests that a pre-McConnell interglacial gold-bearing gravel in the main channel was relatively thin and polished bedrock outcrops were exposed along the creek bed prior to the lake forming. The pay gravel (unit 1) on bedrock consists of a matrix-supported cobble-rich gravel with an olive brown to orange colour. This unit is 1.5 to 3.0 m (5-10 ft) thick, pinches out towards the channel margin and becomes increasingly oxidized toward the upper contact. Its overall width may not greatly exceed the width of the modern creek floodplain, although some pay is found under thicker overburden on the valley sides. Under the modern floodplain of Davidson Creek, unit 1 is overlain by a 1 m (3 ft) thick poorly sorted boulder-rich "rip rap-like" layer (unit 2) that probably developed when Davidson Creek eroded through glacial moraine sediment deposited by the last glaciation. This unit consists of 70% boulders, some measuring up to 2 m (6.6 ft) in length, and would have presented an impediment to early exploration trying to excavate through to unit 1 and the bedrock contact. This unit is only present where modern Davidson Creek has reworked overburden in the valley bottom. On the margins of the floodplain, unit 1 can be quite oxidized and is overlain by a greenish diamicton or matrix-rich gravel (unit 3) with imbricated clasts showing similar stream flow as the modern drainage. This unit contains angular bedrock fragments and placer gold and likely represents a high-energy debris-flow deposit that eroded bedrock and placer gold from upstream. Its genesis may be associated with post-glacial flood-related downcutting. Unit 4 is a 1.5 m (5 ft) thick layer of colluviated till containing organic-rich silt. Capping the section is 4 m (13 ft) of matrix dominated greenish coloured till, containing striated clasts. Unit 4 may also be colluviated.

**Bedrock Geology** Bedrock is buff-weathering, flaggy grey schist with rare 1 cm-wide quartz veins.

**Gold Characteristics** Not reported.

## Dawn, a tributary of Mayo Lake

105M/14 2017: 63°45'47"N, 135°13'59"W

### 1745888 Alberta Ltd., 2016-2017

Water License: PM09-638-1 (Active 12/2018)
Active Producer (2016-2017) **Operation no. 176**

**Location** Dawson Gulch, approximately 250 m upstream from its confluence with Mayo Lake.

**Work History and Mining Cuts** Not reported.

**Equipment and Water Treatment** Not reported.

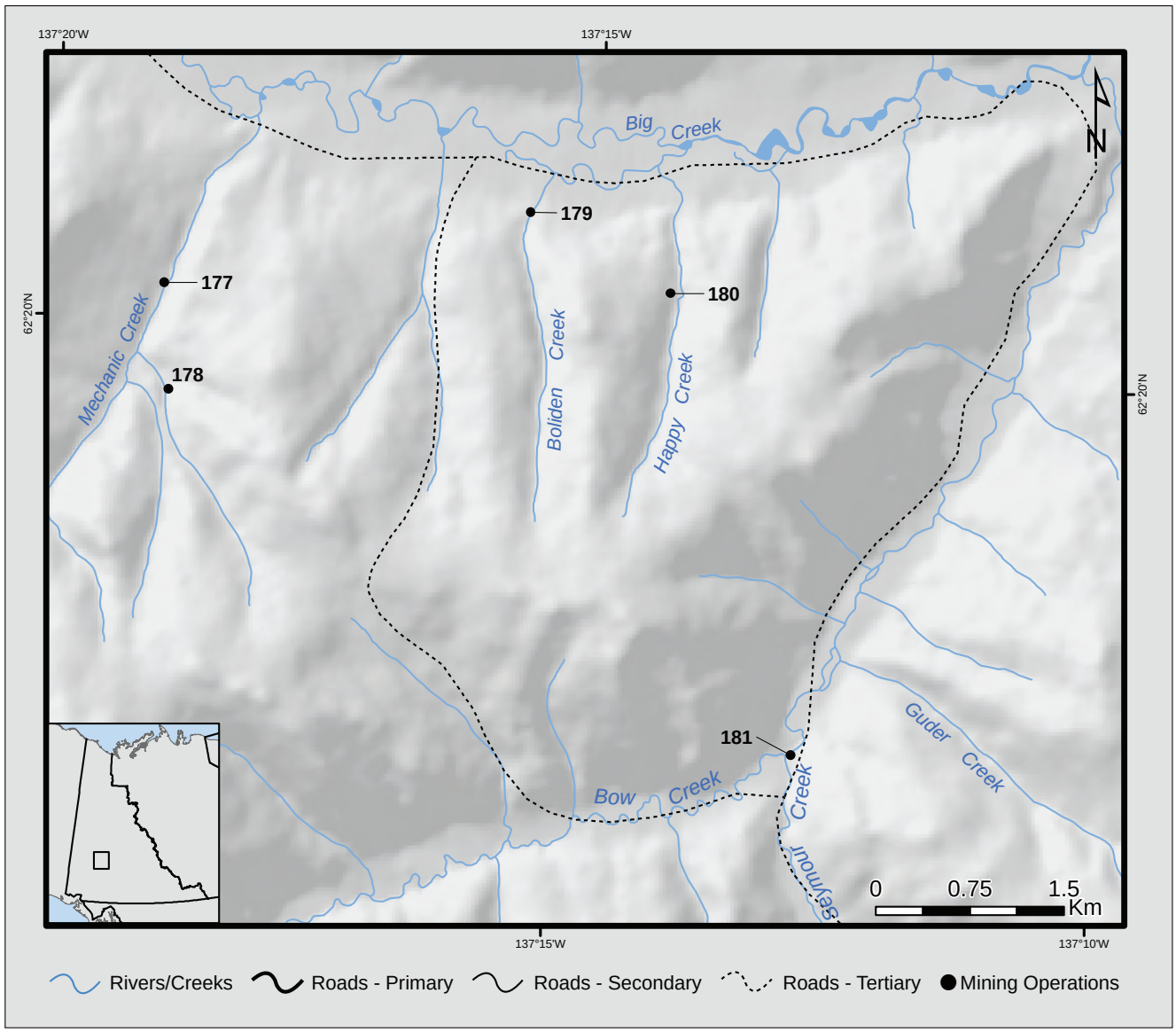
**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is phyllite, shale, sandstone, grit, conglomerate and limestone (YGS, 2017).

**Gold Characteristics** Not reported.

# BIG CREEK
## PLACER AREA

**SITES 177-181**




**LEGEND**

177. Right Fork Mining
178. Darling, W.
179. Warde, M.
180. 641166 Alberta Ltd.
181. Dodge and Schlidt

## Mechanic, a tributary of Big

115I/06 2017: 62°20'10"N, 137°18'54"W

### Right Fork Mining, 2000-2017

Water License: PM14-008 (Active 07/2024)
Active Producer (2015-2017) **Operation no. 177**

**Location** Mechanic Creek, lower, 1.5 km upstream from its confluence with Big Creek.

**Work History and Mining Cuts** Right Fork Mining progressively mined upstream on their uppermost Mechanic Creek claims from 2015 to 2017. In 2015, they processed an estimated 25,000 to 30,000 yd³. The mining cuts typically span bank-to-bank in the valley bottom, although better gold concentrations are noted on the right limit. Hydraulic monitors are utilized where thicker packages of frozen muck are encountered against the margins of the valley. In 2017, they finished mining their uppermost claim and prepared to move to the mouth of the valley where in 2018 they will explore the fluvial fan. Three miners plus one camp personnel are employed.

**Equipment and Water Treatment** Equipment utilized on site in 2017 included an Hitachi UH09-7LC excavator for stripping, digging pay and constructing drains, a Caterpillar D9L bulldozer for pushing pay to the plant, a Caterpillar D7 bulldozer on standby, an Hitachi UH172 excavator for feeding the plant and a Caterpillar loader for managing tailings. The wash plant consists of a multi-layered vibrating screen deck with an initial 4" screen followed by a 2" screen and a ⅝" screen. 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 parts of the sluice runs that have an increased slope angle to manage the larger clast size. The sluice runs are lined with 2" flat iron riffles, which have increased settling space for heavies compared to angle iron riffles. The wash plant uses 1000 gal/min and is supplied by an 8 by 10" pump powered by a 471 Detroit engine. A series of seven settling ponds occupying former mine cuts are used to treat effluent, and water is recirculated back to the plant from the distal end of the second pond, a distance of 180 m (590 ft) from the plant. A jig and table are used for clean-ups.

*A view looking upstream of Right Fork Mining's operation on Mechanic Creek in 2017.*

**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 places, the placer gold is elevated off the bedrock surface by 6 to 8", which 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. Gravel in the valley bottom is typically 1 to 2 m (3-6 ft) thick, poorly sorted, and 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.

*A close-up view of the pay gravel on Mechanic Creek.*

## Unnamed right limit tributary to Mechanic, a tributary of Big

115I/06 2015: 62°19'43"N, 137°18'48"W

### Darling, W., 2010-2015

Water License: PM10-14 (Active 07/2020)
Active Producer (2015) **Operation no. 178**

**Location** Located 2.5 km up Mechanic Creek on the right limit.

**Work History and Mining Cuts** During the 2015 season Mr. Darling sluiced 1600 yd³ and the cut width measured 14 m (45 ft). Also in 2015, work focused on stripping a cut measuring 9 by 61 m (30 x 200 ft).

**Equipment and Water Treatment** Equipment on site included a Caterpillar D6 bulldozer, a Caterpillar 235 excavator, and a TD25 International bulldozer. The wash plant consists of a 1.2 m (4 ft) diameter by 9 m (30 ft) long trommel with a 1.5 m (5 ft) wide sluice run. The plant is capable of processing 40 yd³ (31 $m^3$)/hr.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is early Jurassic syenite and Mississippian orthogneiss (YGS, 2017).

**Gold Characteristics** Not reported.

## Boliden, a tributary of Big

115I/06 2015: 62°20'35"N, 137°15'34"W

### Warde, M., 1999-2017

Water License: PM15-049 (Active 09/2025)
Water License: PM04-391 (Expired 04/2015)
Active Producer (2015-2017) **Operation no. 179**

**Location** Boliden Creek, a tributary of Big Creek located between Revenue and Happy creeks.

**Work History and Mining Cuts** Mr. Warde has been present on Boliden Creek from 2015 to 2017, mining his own claims sporadically as he is primarily assisting another operator. In 2015, a cut situated close to the camp was reclaimed. No history of work was reported in 2016 or 2017.

**Equipment and Water Treatment** Not reported.

**Surficial Geology and Stratigraphy** The surficial geology in 2009 consisted of 0.6 to 3 m (2-10 ft) of muck and colluvium (slide rock) overlying 0.6 to 3 m (2-10 ft) of mixed angular and rounded gravel. All of the gravel and 30 cm (1 ft) of bedrock was mined.

**Bedrock Geology** Bedrock is amphibolite, quartz-mica-schist and phyllite (YGS, 2017).

**Gold Characteristics** Not reported.

## Happy, a tributary of Big

115I/06 2017: 62°20'17"N, 137°14'14"W

**641166 Alberta Ltd., 2017**
**Acker, D., 1998-2003, 2005-2006, 2008-2013**

Water License: PM17-026 (Active 04/2027)
Active Producer (2017) **Operation no. 180**

**Location** Happy Creek, a tributary of Big Creek.

**Work History and Mining Cuts** Mr. von Hartens bought the claims on Happy Creek and began his first year of mining in 2017. Initial activity included building camp infrastructure and constructing two ponds. Mining efforts focused on re-mining ground on the left limit of the drainage by taking more bedrock and widening the cut.

**Equipment and Water Treatment** Equipment utilized on site in 2017 included a Deere 230LC excavator, a Caterpillar 225 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 plant is capable of processing 25 to 30 $yd^3$ (19-23 $m^3$)/hr.

**Surficial Geology and Stratigraphy** The re-mining effort focused on the lower claims below the pingo that abruptly rises in the middle of the drainage on placer claim P 42058.

**Bedrock Geology** Bedrock consists of granite and decomposed schist.

**Gold Characteristics** Not reported.

*A view looking down Happy Creek in the Mt. Freegold area. New ownership was actively preparing the site for mining in July, 2017.*

**Seymour, a tributary of Big**

115I/06 2017: 62°18'21"N, 137°12'49"W
115I/06 2016: 62°17'38"N, 137°12'19"W

### Dodge and Schlidt, 2015-2017

Water License: PM14-075-1 (Active 05/2025)
Active Producer (2015-2017) **Operation no. 181**

**Location** Seymour Creek, at the confluence with Bow Creek.

**Work History and Mining Cuts** In 2015, Mr. Dodge moved his operation from Guder Creek to Seymour Creek, upstream from the confluence with Bow Creek. A mine cut was excavated on the right limit of Seymour Creek targeting side pay. In addition, a Yukon Mineral Exploration Program consisting of 6 cable tool drill holes to help define the deep channel on Seymour Creek was completed. The channel was delineated to a depth of 27 m (90 ft). In 2016, Mr. Dodge partnered with R. Schlidt and an investment was made in large equipment and personnel to evaluate and mine the deep channel. During the first half of the season, 10 employees were hired to mine the deep channel; groundwater issues suspended mining temporarily. For the latter half of the season operations were scaled back to focus on re-mining bedrock on previously mined ground. Delineation of this remnant pay also benefited from the use of the sonic drill. In 2017, operations shifted downstream near the mouth of Bow Creek to target right limit pay in an area of shallow ground. Four personnel were active throughout the 2017 season.

**Equipment and Water Treatment** Equipment used in the 2016 season included a Boart Longyear track mounted mini sonic LS250 drill, a Komatsu PC228 excavator used for servicing the drill, 2 Volvo EC700CL excavators for digging overburden and pay, 4 Volvo A40G haul trucks for transporting overburden and pay from the pit, a Caterpillar D8L bulldozer for pushing pay and removing tailings, and a Komatsu 328 excavator for feeding the plant. Two 6" pumps were used for dewatering the pit. The wash plant consisted of a Derocker with 2" openings that fed two sluice runs lined with expanded metal and angle iron riffles that fed a 0.9 by 4.0 m (3 x 13 ft) sluice run with angle iron riffles aimed at targeting coarse gold. This initial sluice run then fed a 3/16" overhead concentric screen deck that split the flow into two 0.9 by 7.6 m (3 x 25 ft) sluice runs containing three configurations of expanded metal and two types of carpet. The oversized material off the screen deck was stacked with a 12 m (40 ft) J&M conveyor. The plant capacity is 70 $yd^3$ (54 $m^3$)/hr and has water requirements of 600 to 700 igpm.

In 2017, the wash plant was simplified and only the Derocker was used to classify material, which fed two 1 by 7.6 m (3 x 25 ft) sluice runs with expanded metal and angle iron riffles. The operation was scaled back in the shallower ground below the confluence with Bow Creek and one Volvo excavator and one Volvo truck were utilized to dig and haul pay. Pay was trucked approximately 400 m upstream from the cut to a processing area. A Volvo L180E loader with a 7 $yd^3$ bucket was used to the feed the Derocker plant and manage tailings. A total of 36,000 loose $yd^3$ was processed over 600 sluicing hours. Water was treated in an out-of-stream settling pond with 90 m (300 ft) of total length.

**Surficial Geology and Stratigraphy** Seymour Creek was last glaciated during pre-Reid glaciations when the Cordilleran ice sheet flowed westward from the Yukon River valley and entered Seymour Creek drainage at its headwaters. During more recent glaciations (Reid, Gladstone and McConnell) the ice sheet repeated this pattern of ice flow, however, the ice stopped at the headwaters and only meltwater flowed into Seymour Creek. Surficial deposits in Seymour Creek, above its confluence with Bow Creek, primarily consist of fluvial and glaciofluvial gravel in the valley bottom. Colluvial apron and fan sediments bury the fluvial sediments along the margins of the valley bottom. There are two placer targets in this area of Seymour Creek. The shallow target, and focus of previous placer mining activity, is a gravel deposit approximately 6 m (20 ft) in thickness situated on a fractured granodiorite bedrock surface. Placer gold distribution is concentrated on the bedrock surface and in fractures of the bedrock. This deposit comprises the majority of the placers previously extracted in this area of Seymour Creek. The second placer target is a deep channel or canyon incised into the shallow bedrock surface and measures approximately 24 m (80 ft) in depth from the modern surface and wanders within the valley bottom. The channel width varies from 30 to 90 m (100-300 ft) and becomes shallower below the confluence with Bow Creek. Exploration and exploitation of the deep channel in 2016 has revealed at least two incision events that have eroded into the channel, including the first incision event that was likely responsible for development of the channel. Erosion of the channel likely occurred during a recent glaciation (e.g., Reid glaciation – approximately 120,000 to 180,000 years ago) when a high-energy meltwater flow entered Seymour Creek at its headwaters. The high-energy flow cut into the bedrock surface in the valley bottom and established a new,

lower base level. Deposits from this event are reflected by the presence of a coarse, boulder-rich gravel at the base of the channel. Gold distribution at the base of the channel is not fully understood, however there appears to be enriched areas where the channel widens and lean areas where the channel becomes narrow. A sandy silt deposit with organics that contain the Old Crow tephra (volcanic ash) overlie the coarse gravel. This eruption that produced the tephra occurred 124,000 years ago from a volcano in the eastern Aleutian arc at the transition from the Reid glaciation to the last interglaciation (Preece *et al.*, 2011). A boulder-rich gravel cut into the sandy silt deposit immediately above the lowermost boulder gravel reflects a second incision event into the channel, perhaps during the last glaciation 18,000 years ago or during the Gladstone glaciation 60,000 years ago. Placer gold was also extracted off the sloped bedrock surface of the channel wall.


*A view of the Boart Longyear mini sonic drilling rig used to define the deep channel on Seymour Creek.*

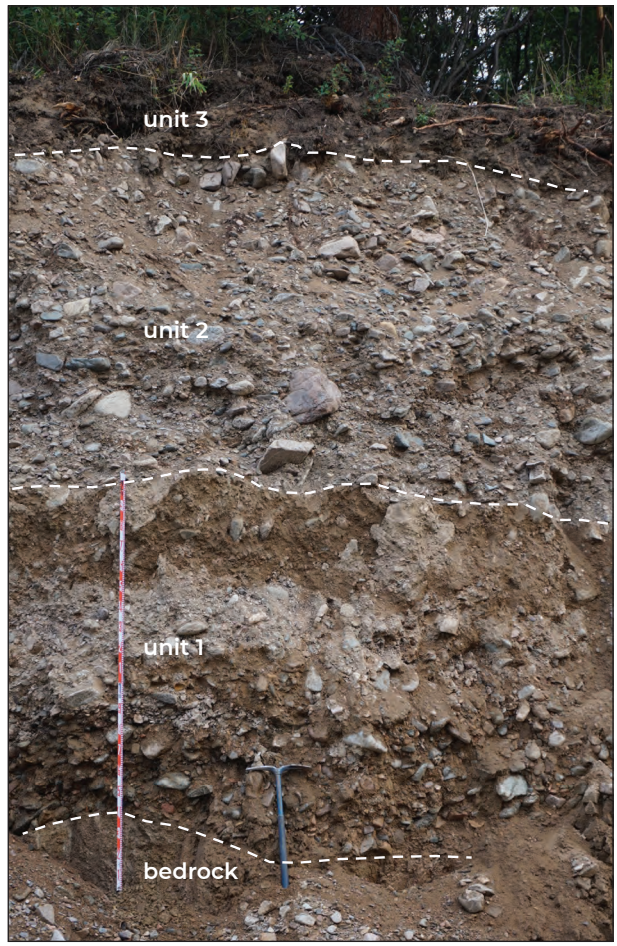
In 2017, the surficial geology changed considerably with the shift to shallower ground on the right limit of Seymour Creek below its confluence with Bow Creek. Bedrock in the cut consists of a fractured granodiorite with minor faulting. Bedrock weathering is brittle and blocky except near faults where it is softer and decomposed. Three units were exposed in the western wall of the mining cut. Unit 1, from 0 to 1.7 m (0-5.6 ft), is a poorly to moderately sorted sandy gravel that contains 70% clasts (10% boulders, 45% cobbles and 45% pebbles) and 30% coarse sand matrix. The gravel is coarser on bedrock and poorly sorted, and becomes better sorted in the middle of the unit where it is pebble dominated (80% pebbles and 20% cobbles). Past cryoturbation and inputs of sand affect the upper ⅓ of the unit. As a result, unit 1 near its upper contact has a cohesive, massive, poorly sorted structure with some vertically oriented clasts. This type of clast orientation occurs when a surface is exposed to repeated, intense freeze-thaw cycles, typically during glacial periods in areas that lie outside the influence of the actual glaciers.


*The Volvo EC700 excavating a glaciofluvial gravel in the deep channel of Seymour Creek. This gravel was not on bedrock at the base of the channel, and formed during a second incision event after the bedrock channel was formed. The bedrock surface of the channel wall is visible on the left hand side of the photo. Approximately 1 m (3 ft) of fractured bedrock was excavated for sluicing.*

The sand input is also consistent with a glacial climate when the landscape has less vegetation cover resulting in more exposed mineral soil available for erosion. This buried surface is interpreted as the floodplain surface from the last glacial period between 12,000 and 24,000 years ago. Unit 2, from 1.7 to 3.5 m (5.6-11.5 ft), is the modern Seymour Creek gravel and is in erosional (sharp) contact with unit 1. Unit 2 is a moderately sorted, boulder-cobble-pebble gravel with 60% clasts and 40% coarse sand matrix. The boulders are larger on the lower contact but occur scattered throughout the unit. Cross-bedding and former meander bar forms are preserved in the unit, which are consistent with the fluvial geomorphology of modern Seymour Creek. Unit 3, from 3.5 to 3.8 m (11.5-12.5 ft), is a bedded medium-grained sand and the modern forest floor organics. All of unit 1 and the lower portion of unit 2 are processed for placer gold.

**Bedrock Geology** Bedrock is middle Cretaceous granodiorite (YGS, 2017).

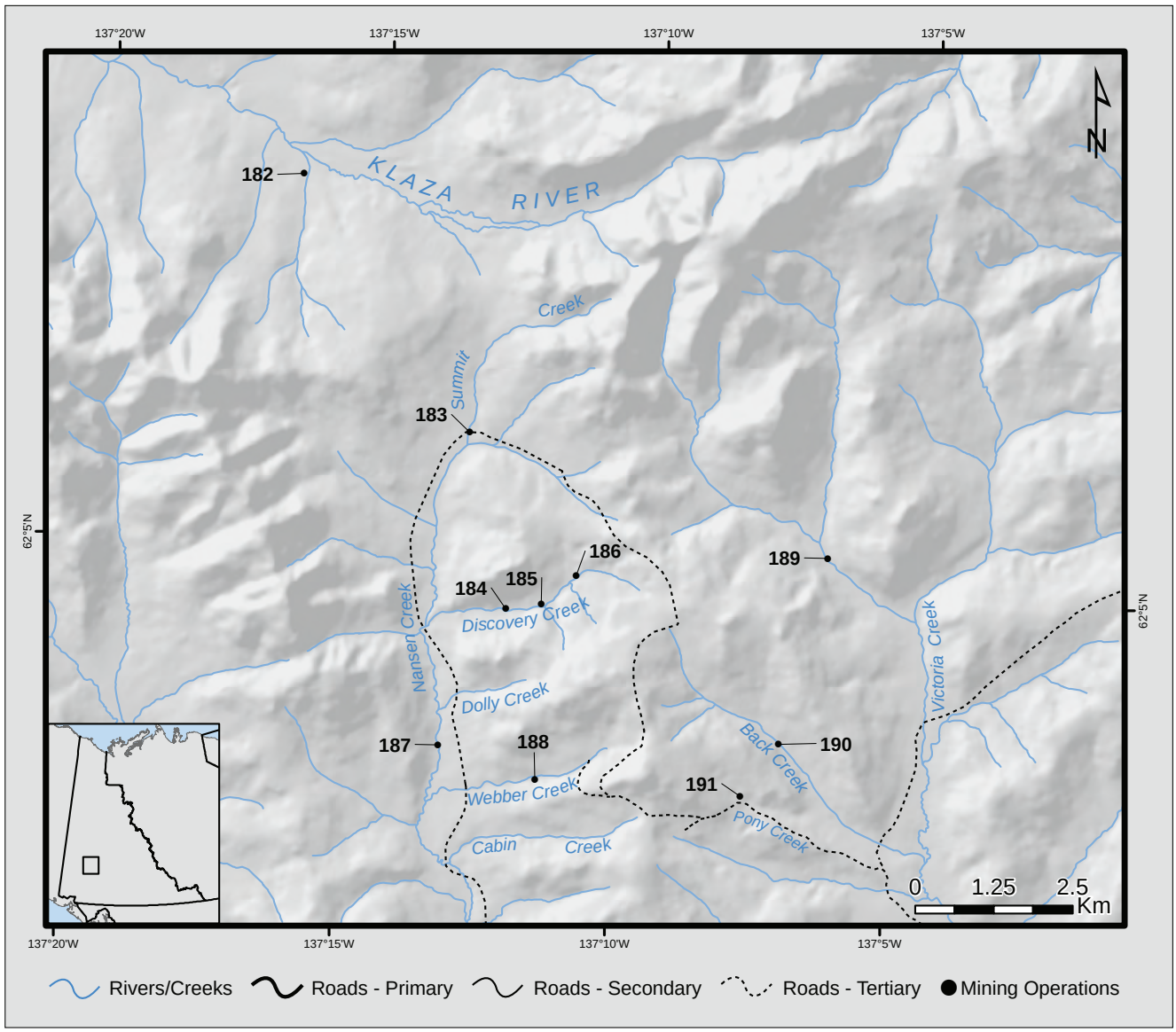
**Gold Characteristics** Two populations of gold were noticed in the 2017 cut: a coarser, subangular to subrounded population characteristic of Seymour Creek; and a fine and flat population likely originating from Bow Creek. Gold concentrations are higher over brittle fractured bedrock versus bedrock that is softer and decomposed in proximity to valley perpendicular fault zones.




*A close up of the 2017 cut on Seymour Creek. Unit 1 is interpreted as a gravel that formed approximately 18,000 years ago during the last glaciation. Evidence of cold, periglacial, conditions is preserved in the sand-rich zone near the upper contact. Unit 2 represents the modern Holocene gravel. The best pay is located at the base of unit 1 in areas of brittle fracturing in the bedrock.*

# NANSEN
## PLACER AREA

**SITES 182-191**




### LEGEND

182. Canaan Gold Resources Inc.
183. Pishon Gold Resources Inc. and Okanagan Contracting Services
184. Grey and Metcalfe
185. Wang, X.
186. Lintner, G.
187. Chaschin, K.
188. A-1 Cats
189. Harasimiuk, S.
190. A-1 Cats
191. Ladouceur, J.

## Unnamed Left Limit, a tributary of Klaza

115I/03 2015: 62°08'13"N, 137°16'29"W

**Canaan Gold Resources Inc., 2009-2017**

Water License: PM09-665 (Active 12/2019)
Active Producer (2015-2017) **Operation no. 182**

**Location** Unnamed left limit tributary (Canaan Creek) in the headwaters of Klaza River.

**Work History and Mining Cuts** In 2015, there were five miners employed at the operation. Early in the season work focused on finishing the 2014 cut near the mouth of Canaan Creek. This cut is located approximately 250 m downstream from where the work focused from 2010 to 2013. The pit measured 37 by 128 m (121 x 420 ft) and was oriented parallel to Canaan Creek. Pay was transported to the wash plant by pushing it with a Caterpillar D9H bulldozer. In 2016, a drilling program was completed west of the 2015 cut. Depths to bedrock ranged between 15 and 30 m (49 & 98 ft). A new cut was opened up in this location. In 2017, there were seven miners employed, and camp was moved out of Canaan Creek and into the Klaza River valley.

**Equipment and Water Treatment** Equipment on site included Komatsu PC360 and PC240 excavators, three JCM 921D excavators, a Volvo L220E loader, a Caterpillar D9H bulldozer, and an reverse circulation drilling rig capable of drilling to depths of 40 m (130 ft). The wash plant consists of a 4.5 m (15 ft) dump box, shaker screen deck classifying to ¾" and a single sluice run measuring 1 m wide by 6 m in length (3.5 x 20 ft). The sluice is lined with expanded metal, angle iron riffles and Nomad matting. Water was acquired from Canaan creek and 90% was recycled from a settling pond measuring 40 by 70 m (131 x 230 ft). The plant is capable of processing 80 $yd^3$ (61 $m^3$)/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.

At Canaan Creek, the 2015 pit was located near the mouth of the valley and contained a mix of fluvial and diamict-like sediments from Canaan Creek and possibly the Klaza River. The bedrock surface was not visible at the time of the visit so only a partial exposure of the lowest unit was described. Unit 1, from 0 to 2.3 m

*An aerial perspective of the Canaan Creek mine located below the Klaza hard rock exploration property.*

*A view to south of the 2015 pit near the mouth of Canaan Creek. The sharp contact visible in the exposure near the left hand side of the photo marks the depth where past cryoturbation (and loess) affected the fan gravel emanating from Canaan Creek valley.*

(0-7.5 ft), at the base was poorly exposed but consists of a clast dominated, pebble-cobble gravel with a coarse sand matrix. The gravel appears to get coarser with depth. This unit may be a left limit Klaza River terrace gravel with potential origins as an outwash gravel based on its coarse texture. Unit 2, from 2.3 to 5.7 m (7.5-18.7 ft), is a crudely stratified gravel containing a variable matrix content. Beds with a silty, coarse sand matrix contain 70% clasts whereas beds with a coarse sand matrix contain 90% clasts, including boulders. Crude imbrication of clasts indicate a flow from the south. Most clasts have a subangular shape. Unit 2 also contains lenses of silt containing thin layers of organic material. This unit is interpreted as interbedded fluvial and debris-flow deposits originating from Canaan Creek. Unit 3, from 5.7 to 6.9 m (18.7-22.6 ft), is a moderately cohesive diamicton with a sharp lower contact with unit 2. This unit consists of 60% clasts and 40% silty sand matrix. Many clasts have their long axis oriented vertically suggesting past cryoturbation has affected the deposit. Sand lenses containing wood are also present. This unit is interpreted as a periglacial gravel that had significant loess inputs during a time of intense cryoturbation, probably during a glacial climate. Unit 4, from 6.9 to 7.4 m (22.6-24.3 ft), is a discontinuous layer of oxidized, moderately sorted fluvial gravel that has a wavy lower contact and in places appears cryoturbated into unit 3. Imbrication of the clasts suggests the paleo-flow direction was from the south or similar to Canaan Creek. Unit 5, from 7.4 to 9.4 m (24.3-31 ft) is a variably thick, poorly sorted gravel. The unit consists of 70% clasts and 30% silty coarse sand matrix. Manganese staining is abundant, especially near the lower contact. This unit is interpreted as Canaan Creek gravel.

The stratigraphy indicates a possible fluvial fan deposit from Canaan Creek. Periods of stabilization on the fan surface are indicated by cryoturbation and incorporation of loess into fluvial gravel. The mixing of loess into the gravel gives the deposit a diamict appearance. This would have occurred during glacial periods, possibly during the Late Pleistocene glaciations. The presence of a potential Klaza River terrace gravel at the base of the section has not been confirmed but should be considered as mining approaches the confluence of Canaan Creek and Klaza River valleys.

**Bedrock Geology** Bedrock is granodiorite and quartz diorite (YGS, 2017).

**Gold Characteristics** Gold fineness is reported at 750. Silver fineness is between 200 and 230.

## Summit, a tributary of Nansen

115I/03 2015: 62°06'07"N, 137°13'07"W

### Pishon Gold Resources Inc. and Okanagan Contracting Services, 2005-2017

Water License: PM16-074 (Active 05/2027)
Active Producer (2015-2017) **Operation no. 183**

**Location** Summit Creek near the confluence with upper Nansen Creek.

**Work History and Mining Cuts** Between 2015 and 2016 Pishon Gold focused on mining the lower right limit of Summit Creek. The mine personnel consisted of six crew members including the camp cook. In 2015, mining commenced later in June due to equipment repairs. Testing focused on identifying the distribution of pay in the near surface units. A sizeable stripping program was completed that increased the width of the mine cut and indicated a source from an unnamed tributary draining the Klaza gold-silver hard rock deposit to the north-northwest. In 2016, the screen deck was replaced with a trommel to help liberate the fine gold from the silt and clay-rich pay. A total of 12,000 $yd^3$ was processed. In 2017, mining increased substantially when Pishon Gold Resources partnered with Bill and Sandy McKay, placer miners from the Caribou district in BC. Production increased to 100,000 $yd^3$ and 12 personnel were employed at the mine working a daily 13-hour shift. Considerable effort was made in 2017 to clean-up waste metal on the site and commence a program of progressive reclamation.

**Equipment and Water Treatment** In 2017, equipment on site included Hitachi 270 and 330 excavators used for stripping and digging pay, two 40 ton Caterpillar D400D rock trucks for hauling pay and tailings, a Volvo 110 loader equipped with a 4 yd³ bucket for feeding the plant, a Caterpillar 988 loader for managing coarse and fine tailings, and a Caterpillar D8L bulldozer used for stripping and reclamation. An elaborate wash plant was introduced to the property by the McKay's in 2017 that specializes in fine gold recovery. Pay is delivered into a 4 yd³ apron feeder hopper connected to an oscillating grizzly with 4" back and 6" front bar spacing. The 4" minus is delivered to a conveyor that feeds a screen deck with a 2" upper deck, 1¼" middle deck and a ½" bottom deck. Water supply to the screen deck is provided with a 10 by 4" line. Oversize from the screen deck is stacked with a conveyor and undersize feeds a sand screw. The sand screw delivers the ½" minus material to a 4 m (13 ft) wide by 5.2 m (17 ft) long sluice. The sluice is fitted with an initial slick plate and fins that allows the sediment to disperse from the sand screw across the width of the sluice deck. The runs contain a nugget trap, 1.2 m (4 ft) of expanded metal and matting, 0.9 m (3 ft) of New Zealand-style hydraulic riffles and 3 m (10 ft) of expanded metal and nomad matting with backing. Sluice tailings are captured in a basin fitted with a sand screw and overflow conduits that direct waste-water towards a series of seven settling ponds. The coarse fraction from the sluice tailings is delivered by the sand screw to a conveyor and stacked in a convenient location for the tailings loader, where it is used for road surfacing and reclamation. Nearly 100% water recycling is achieved apart from a 10 to 15% loss due to evaporation. The plant has an optimum capacity of 120 yd³ (92 $m^3$)/hr; it was processing 1500 yd³/day on a 13-hour shift. Clean-up was completed using an initial tank where the mats were washed in warm water, which facilitates malleability for mats with backing. Concentrate was processed with a high banker, wave table and micron processor (mini long tom).

**Surficial Geology and Stratigraphy** Considerable panning and testing has identified an economic pay concentration in a near surface light brown, poorly sorted, silty gravel with lenses of better sorted or washed sediment. Angular to subangular clasts are

*A view from Summit Creek looking down upper Nansen Creek where Pishon Gold Resources and the Okanagan Contracting Services are mining. Their plant is well suited for recovering fine gold derived from colluvial deposits.*

common in the pay gravel and it is overlain by an organic-rich silty sand. The origins of the silt-rich pay gravel appears to be from colluviation and minor alluvial reworking (proluvial setting) of weathered bedrock off the Klaza gold-silver hard rock deposit immediately upslope to the northwest. A section measured in 2017, closer to the floodplain of Summit Creek, exposed three units above a false bedrock. Unit 1, from 0 to 2 m (0-6.6 ft), is a matrix-supported grey 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 2 to 2.5 m (6.6-8.2 ft), is an oxidized fluvial pebble gravel with 40% silty sand matrix and 60% subangular clasts made up of 80% pebbles and 20% cobbles. Unit 3 is a partially stripped, thin layer of organic material.

**Bedrock Geology** Bedrock is granodiorite and quartz diorite (YGS, 2017).

**Gold Characteristics** The gold on the right limit of Summit Creek is very fine with abundant colours in the 0.02 to 0.1 mm size range. Coarser pieces are 0.3 to 0.4 mm in width. The gold grains have a dendritic shape, especially on the right limit cut. These characteristics support a colluvial or proluvial origin as opposed to having any significant fluvial history. The gold fineness is 800 to 820.

## Nansen and Discovery, a tributary of Nisling

115I/03 2017: 62°04'38"N, 137°12'13"W
115I/03 2015: 62°04'07"N, 137°13'24"W

### Grey and Metcalfe, 2017
### Johnson Exploration, 1994-2016

Water License: PM15-002 (Active 07/2025)
Active Producer (2015-2017) **Operation no. 184**

**Location** Left limit of Nansen Creek, between Discovery and Dollis creeks, and on lower Discovery Creek.

**Work History and Mining Cuts** In 2015 and 2016, the Johnson brothers finished mining their central valley pay deposit and shifted their focus to mining ground they had missed in previous years. In 2015, they focused on mining a strip of left limit side pay in Nansen Creek that measured 21 by 243 m (70 x 800 ft). The project processed approximately 10 000 $m^3$ of pay material. A Caterpillar D9N bulldozer was used to push overburden from the left limit cut into the valley center to expose the underlying pay gravel. Once exposed, the pay gravel was hauled to the plant using a Caterpillar 988B loader. In 2017, the mine was sold to Grey and Metcalfe and four miners were employed throughout the season. Mining focused on the right limit of lower Discovery Creek where a cut measuring 24 by 90 m (79 x 295 ft) was excavated and expanded towards the middle of the valley later in the season.

**Equipment and Water Treatment** In 2015 and 2016, the Johnsons operated a two-man crew using two Caterpillar excavators (a 245 with a 4 $yd^3$ bucket and a Cat 235B with a 3 $yd^3$ bucket) for stripping and stockpiling pay. A Caterpillar 988B loader with a 9 $yd^3$ bucket delivered pay to the sluice plant and a Caterpillar 980C loader with a 6 $yd^3$ bucket removed tailings. 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 x 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 Corman Rupp pump, capable of moving 1000 igpm, is powered by a Cummins diesel generator and supplied enough water to process 90 to 100 loose $yd^3$ (68.8-76.5 $m^3$)/hr. Water for sluicing was acquired from Nansen Creek, settled out of stream in a 40 by 73 m (131 x 240 ft) settling pond and discharged to Nansen Creek without recycling. In 2017, a Volvo A40D rock truck, and Caterpillar D9N and D9H bulldozers were added to the fleet.

**Surficial Geology and Stratigraphy** The Johnsons side pay deposit on the left limit of Nansen Creek, between Discovery and Dolly creeks, is a Nansen Creek gravel that is overlain by deposits of well-sorted sand and weathered bedrock colluvium. The pay material is

*A view looking down Discovery Creek of the right limit cut excavated by Grey and Metcalfe.*

situated on a false-bedrock of pre-Reid till. A section measured in 2015 consisted of four units. Unit 1, from 0 to 1.7 m (0-5.6 ft), is an imbricated cobble-pebble gravel that is poorly to moderately sorted and contains 70% angular to subangular clasts and 30% sandy matrix. This unit is considered pay gravel and represents a floodplain deposit of Nansen Creek. Unit 2, from 1.7 to 2.7 m (5.6-8.8 ft), is a poorly sorted and weakly imbricated gravel containing 90% clasts and 10% sandy matrix. Unit 3, from 2.7 to 5.7 m (8.8-18.7 ft), is a bedded sand deposit containing organics and minor angular pebbles and cobbles. The sand deposits originated as aeolian deposition likely during a recent glaciation. The aeolian sand was subsequently reworked into valley bottoms by fluvial erosion. Sand thickness increases near the outlets of tributary valleys where fan deposits are preserved. Unit 4, from 5.7 to 5.9 m (18.7-19.4 ft) is the modern soil containing White River tephra.

In 2017, a pit was excavated on the right limit of Discovery Creek. The valley bottom deposits are 8 m (26 ft) thick and four units were described. Unit 1, from 0 to 1 m (0-3.3 ft), is a matrix-supported diamict on bedrock. This unit resembles a till, which may have been deposited when an early Pleistocene glacier advanced up the drainage from Nansen Creek. It would have reworked a pre-existing gravel and any placer gold contained within it. Unit 2, from 1 to 4 m (3.3-13 ft), is an oxidized, poorly sorted, silty sand and gravel deposit with minor subrounded glacial boulders. Unit 3, from 4 to 7 m (13-23 ft), is a dry, poorly sorted, oxidized sandy gravel. Grey silty sand beds are also present in this unit and likely represent quiet water sedimentation associated with stream flow. Unit 4, from 7 to 8 m (23-26 ft), is the modern Discovery Creek gravel, which consists of a highly oxidized sandy gravel. The lower 4 m (13 ft) of gravel and till, and a maximum of 2 m (6.6 ft) of bedrock, were processed for placer gold.

**Bedrock Geology** Bedrock is andesite, dacite, breccia, tuffs, rhyolite and porphyry (YGS, 2017).

**Gold Characteristics** The gold was 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 Nansen Creek valley, gold grains are commonly 50 to 60 mesh. The fineness averaged 800 to 810.

*The left limit exposure on Nansen Creek in 2015. The pay gravel is located near the shovel.*

## Discovery, a tributary of Nansen

115I/03 2017: 62°04'42"N, 137°11'35"W
115I/03 2015: 62°04'42"N, 137°11'29"W

**Wang, X., 2016-2017**
**Smith, G., 2014-2015**
**Frizzell, D., 2002-2013**

Water License: PM07-569 (Active 12/2018)
Active Producer (2015-2017) **Operation no. 185**

**Location** 1.8 km upstream from the mouth of Discovery Creek, a left-limit tributary to Nansen Creek.

**Work History and Mining Cuts** In 2014, the property was purchased by G. Smith and their first year of mining was 2015. Mining focused at the confluence of Discovery Creek and Discovery Pup. The pit located at the toe of the Discovery Pup fan measured 7 by 24 m (23 x 79 ft). Five miners were employed for the season. In 2016, there was little activity on the property and it was sold to X. Wang. In 2017, Mr. Wang advanced mining up the fluvial fan of Discovery Pup.

**Equipment and Water Treatment** Equipment on site in 2015 included a Caterpillar 235 excavator with a 1.5 $yd^3$ bucket used for digging and loading pay, a Volvo 860TL rock truck for hauling pay, and a Caterpillar loader used for feeding the plant. Caterpillar D7 and D8 bulldozers were used for stripping. The plant consisted of a 4" grizzly feeding a 1.2 by 4.8 m (4 x 16 ft) trommel fitted with 1.8 m (6 ft) of ¾" screen. A 6 m (20 ft) stacker stockpiled the coarse tailings and the fines passed through an initial 1 m (3 ft) sluice containing a nugget trap, which then split into two 0.75 by 3 m (2.5 x 10 ft) runs containing angle iron riffles and expanded metal. The plant processed material at a rate of 40 to 50 $yd^3$ (30-38 $m^3$)/hr using 1000 gal/min from an 8" pump powered by a Detroit engine. Waste water was managed in two out-of-stream settling ponds.

In 2017, additional equipment was added including a Komatsu PC270 excavator used for stripping and a Volvo A30C haul truck for transporting pay. A new trommel plant was present with a 1.5 by 7.3 m (5 x 24 ft) barrel fitted with ⅜" screen in the lower 2.4 m (8 ft). A 6 m (20 ft) tailings stacker handled the oversize. At the time of the visit there were two sluice runs measuring 1.2 by 11 m (4 x 36 ft) containing angle iron riffles in the first 4.8 m (16 ft) and no riffles in the lower 6 m (20 ft). Water was treated and recirculated from two out-of-stream settling ponds.


*A view to the west looking down Discovery Creek at G. Smith's operation in 2015. A fan deposit from Discovery Pup overlies side pay from Discovery Creek. Both units were processed for placer gold.*

**Surficial Geology and Stratigraphy** In 2015, a section was measured at the toe of the Discovery Pup fluvial fan. Unit 1, from 0 to 1.1 m (0-3.6 ft), is a poorly sorted, cobble-pebble gravel with minor boulders. The gravel is oxidized and manganese stained, and is interpreted as the left limit edge of the Discovery Creek gravel. Unit 2, from 1.1 to 1.5 m (3.6-5 ft), is a laminated silt with an abrupt lower contact and wavy upper contact. This unit is interpreted as a quiet water, overbank flood deposit associated with unit 1. Unit 3, from 1.5 to 6.2 m (5-20 ft), is a crudely stratified, moderately sorted, boulder-cobble-pebble gravel with beds dipping north. Sand lenses, pebble beds and coarse, cobble-boulder channel facies are also present. All clasts are angular and have an imbrication indicative of north-flowing water. This deposit is interpreted as a fluvial fan from Discovery Pup.

**Bedrock Geology** Bedrock is andesite, dacite, breccia, tuffs, rhyolite and porphyry (YGS, 2017).

**Gold Characteristics** Gold is primarily rough with slightly rounded edges. Fine gold has a purity of 84.25% whereas the coarse gold is darker, oxidized and has a purity of 87%.

## Discovery, a tributary of Nansen

115I/03 2015: 62°04'58"N, 137°10'59"W

**Lintner, G., 2015-2016**

Water License: PM15-041 (Active 07/2025)
Active Producer (2015-2016) **Operation no. 186**

**Location** Upper Discovery Creek, a left-limit tributary to Nansen Creek.

**Work History and Mining Cuts** In 2015, Mr. Lintner mined under Mr. Tricker's license. Activity occurred on the left limit under tailings from previous mining that targeted the center of the valley. Two personnel were employed at the mine. He was also active in 2016, but the work history is unknown.

**Equipment and Water Treatment** A Caterpillar 235 excavator and a Bobcat with a hoe attachment were used for testing and mining. The plant has a 3 $yd^3$ hopper that feeds a 1 by 4.3 m (3 x 14 ft) trommel with a 1" screen. The trommel classifies into three runs with a total width of 2 m (6.5 ft) and length of 3.3 m (11 ft). The runs contain an initial nugget trap, angle iron and expanded metal riffles with matting. The plant can process 45 to 55 $yd^3$ (34-42 $m^3$)/hr.

**Surficial Geology and Stratigraphy** The primary target at this mine is side pay that had been buried by tailings from previous mining activity. Approximately 1 m (3.3 ft) of virgin side pay was exposed consisting of poorly sorted, highly oxidized, angular gravel mixed with dark grey organic silt lenses. The oxidized gravel is overlain by approximately 4 m (13 ft) of colluvium and mine tailings.

**Bedrock Geology** Bedrock is quartz-monzonite, granite, alaskite and granodiorite (YGS, 2017).

**Gold Characteristics** Not reported.

*A section exposed on the left limit of upper Discovery Creek showing virgin oxidized side pay gravel buried under tailings from a previous operation.*

## Nansen, a tributary of Nisling

115I/03 2016: 62°03'26"N, 137°13'16"W

**Chaschin, K., 2014-2017**
**Quilala, H., 2009, 2011-2013**

Water License: PM08-596 (Active 06/2018)
Active Producer (2015-2017) **Operation no. 187**

**Location** Nansen Creek, between Dolly and Webber creeks.

**Work History and Mining Cuts** From 2015 to 2017, Mr. Chaschin mined Nansen Creek with a crew of four personnel working one daily shift at the mine. A stripping program was also completed on the right limit of Nansen Creek.

**Equipment and Water Treatment** Equipment used in the 2016 season included a Komatsu PC 200LC excavator, a Daewoo 280 excavator, a Halla 380 loader with a 5.5 $yd^3$ bucket and a Komatsu 85 bulldozer. The wash

plant consisted of a 2.4 by 3.2 m (8 x 10.5 ft) grizzly with 9" spacing that fed a 1.8 by 6 m (6 x 20 ft) non-chain driven spiral trommel that classified to ¾" and processed 50 loose yd³ (38 m³)/hr. The spirals allow for a 100 ft of travel within the trommel. Tailings off the trommel were distributed using a 7.6 m (25 ft) conveyor stacker. The sluice consisted of two 2 by 3.6 m (7 x 12 ft) runs with hydraulic, vibrating riffles.

**Surficial Geology and Stratigraphy** Mining occurs in near surface gravel that are deposited on a false bedrock of boulder-clay. The left limit cut is eroded into a sandy fluvial fan deposit, and as a result, sand lenses are common in the gravel sequence. The gravel thickness is approximately 4 m (13 ft) thick and overlies a false bedrock of early Pleistocene matrix-supported till.

**Bedrock Geology** Bedrock is calcite-biotite-schist, amphibolite, gneiss, schist, phyllite, quartzite and ultramafic rocks (YGS, 2017).

**Gold Characteristics** Gold is 90% fine, with some nuggets up to ¼" in size.

## Webber, a tributary of Nansen

115I/03 2016: 62°03'12"N, 137°11'28"W

### A-1 Cats, 2015-2017
### Orotec International Ltd., 2009, 2010

Water License: PM07-589 (Active 06/2018)
Active Producer (2015-2017) **Operation no. 188**

**Location** Webber Creek, 1.8 km upstream from its confluence with Nansen Creek.

**Work History and Mining Cuts** In 2015, A-1 Cats optioned Webber Creek from Orotec International Ltd. In August of that year trails were constructed on the property and a drilling program commenced. An 8" auger drill was used to drill 37 holes for a total of 513 m (1684 ft) on roughly seven drill fences. Drill hole depths ranged between 7 and 24 m (23 & 80 ft). Based on the 2015 drilling, an exploration test pit for bulk sampling was initiated in 2016 with the assistance of a grant from the Yukon Mineral and Exploration Program. A pit measuring 30 by 50 m (98 x 164 ft) was excavated down to 9 m (30 ft). Due to unseasonably wet weather that hampered excavation, the pit did not reach bedrock and was delayed until 2017. A total of 3000 m³ was excavated in 2016.


*The left limit section on Nansen Creek at K. Chaschin's mine. Modern floodplain gravel is the main target and is constrained on the left limit by a large fluvial fan consisting of resedimented sand from Webber Creek.*

**Equipment and Water Treatment** A Caterpillar D9 dozer was used for trail construction, excavation and moving the drill. An excavator was used for digging the exploration test pit.

**Surficial Geology and Stratigraphy** The 2015 drill program identified two deep channels on the property with the most encouraging results obtained near Freddy Mack's historic shaft. At this location bedrock was encountered at 8.8 m (29 ft) depth. Approximately 2 m (7 ft) of pay gravel, overlying bedrock, was sampled. Overlying the pay gravel is 4.5 m (15 ft) of brownish silt or clay that becomes increasingly saturated at depth. A 2 m (7 ft) thick modern surface gravel caps the section. Overburden deposits of sand were also encountered on the south side of the valley.

**Bedrock Geology** Bedrock is calcite-biotite-schist, amphibolite, gneiss, schist, phyllite, quartzite and ultramafic rocks (YGS, 2017).

**Gold Characteristics** Not reported.

## Victoria, a tributary of Nisling

115I/03 2015: 62°05'16"N, 137°06'26"W

**Harasimiuk, S., 2012-2017**
**Spring Cove Enterprises Ltd., 2007-2012**

Water License: PM06-524-1 (Expired 04/2017)
Water License: PM07-565 (Expired 04/2017)
Active Explorer (2015-2017) **Operation no. 189**

**Location** Upper left fork of Victoria Creek.

**Work History and Mining Cuts** For the past three seasons work has focused on exploring Victoria Creek for a deep channel. This included two lines of resistivity geophysics, auger drill holes and test pits. Up to six personnel have been involved with the exploration project.

**Equipment and Water Treatment** Drilling was completed using a Bombardier Muskeg 6" auger drill and samples were processed in a Goldenboy reverse helix test trommel. Test pitting was completed using a Komatsu PC-400LC6 or an Hitachi EX-400LC3 excavator, and samples were processed using a Golden Boy Gold Rotary separator.

**Surficial Geology and Stratigraphy** Exploration is targeting the potential for a deep channel buried under early Pleistocene till. 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). Test pits focused on evaluating near surface sediment up to 4 m (13 ft) thick.

**Bedrock Geology** Bedrock is granodiorite and quartz diorite (YGS, 2017).

**Gold Characteristics** The gold is generally fine with a few nuggets.

*Exploration drilling conducted on Victoria Creek using a Bombardier Muskeg auger drill in 2017. (Photo credit: Steve Harasimiuk).*

## Back, a tributary of Victoria

115I/03 2015: 62°03'39"N, 137°07'05"W

**A-1 Cats, 2014-2017**
**38857 Yukon Inc., 2006-2013**

Water License: PM10-019 (Active 08/2020)
Active Producer (2015-2017) **Operation no. 190**

**Location** Back Creek, approximately 3 km upstream from its confluence with Victoria Creek.

**Work History and Mining Cuts** In 2015, work began early on a large left limit cut on Back Creek to evaluate deeper ground in the drainage. The cut, measuring 90 by 134 m (295 x 439 ft), was excavated below where the previous owner, Mr. Hearn, had finished mining. Total depth to bedrock in the deep cut measured 25 m (82 ft). Later in the season, mining shifted toward the right limit where shallower and higher grade pay was located. In 2016, stripping and mining continued along the right limit before shifting across to a left limit area defined by drill results. No site visits were completed in 2017.

**Equipment and Water Treatment** Equipment on site in 2015 included a Caterpillar 245B excavator digging pay, two Caterpillar D400E rock trucks delivering pay, a Caterpillar 345C excavator feeding the plant, and a Caterpillar D9N bulldozer pushing tailings and pay. Due to low water volumes in upper Back Creek, a holding pond is constructed; it is also used for tailings. Water is 100% recycled and any loss is replenished by groundwater. The wash plant is a shaker deck fed by a hopper and conveyor system.

**Surficial Geology and Stratigraphy** Stratigraphic evidence from Back Creek suggests it has been glaciated twice during the Pleistocene advances of the Cordilleran Ice Sheet. Based on the degree of landform preservation and glacial limit mapping in the Mount Nansen area we are confident this occurred during early to middle Pleistocene glaciations. It is uncertain exactly when these occurred but it is estimated to be at least 1,000,000 years ago. During these glaciations, the Cordilleran Ice Sheet advanced up Back Creek and reached the top of the drainage, possibly overtopping the drainage divide into Discovery Creek. The effect of glaciation on pre-glacial placer deposits in Back Creek was not documented until the 2015 and 2016 mining season when A-1 Cats opened significant exposures in the drainage. These exposures were studied by the Yukon Geological Survey and geologists from Simon Fraser University and concluded that the up-valley flowing glaciers did erode to bedrock in many places but the depth of erosion was not consistent (Englehardt *et al.*, 2016). Possible undulations in the bedrock topography allowed pre-glacial gravel and importantly, the pre-glacial weathered bedrock interface containing placer gold to be intermittently preserved. The best examples of this preservation occurred in a bedrock gutter that escaped vigorous glacial erosion. In 2016, mining continued downstream and focused on a post-glacial grey gravel that was situated on yellow clay-rich till. The clay-rich till was in direct contact with the bedrock surface in this area. The grey gravel was buried under frozen muck and contained economic placer concentrations. Farther downstream in the same mine cut, the clay-rich till disappeared on the bedrock

*Aerial view of A-1 Cats operation on Back Creek in 2015. Completed mine cuts are used as settling and water recirculation ponds.*

surface and was replaced by a red oxidized gravel. This stratigraphy indicates that the clay-rich till has been reworked during subsequent fluvial activity. Any placer gold that had been incorporated into the clay-rich till would then be incorporated into the oxidized gravel on the bedrock surface. Furthermore, the overall pay volume likely increased. Reasons why the clay-rich till was eroded in this section of valley are not clear, but may be due to the increase in valley gradient enabling more vigorous fluvial erosion. Modeling changes in bedrock gradient may be an important consideration for understanding distribution of till and thicker pay sequences in Back Creek. Finally, identification of economic placer gold concentrations in the post-glacial grey gravel is encouraging. This indicates that there has been enough time since the early Pleistocene glaciation for new placers to develop, presumably from recent erosion of bedrock sources and the reworking of placer gold in till.

**Bedrock Geology** Bedrock at this site is andesite and orthogneiss (YGS, 2017).

**Gold Characteristics** The fineness of gold is 815 to 820.

## Pony, a tributary of Back

115I/03 2015: 62°03'11"N, 137°07'43"W

**Ladouceur, J., 2014-2017**
**Tulk, G., 2013**

Water License: PM11-022 (Active 04/2023)
Active Producer (2015-2017) **Operation no. 191**

**Location** Pony Creek, upper.

**Work History and Mining Cuts** Mr. Ladouceur optioned upper Pony Creek from G. Tulk and started mining in 2015. During that season, work focused on stripping frozen organic-rich overburden and testing bedrock in the middle of the narrow valley. A similar program was completed in 2016 and progressively mined downstream.

**Equipment and Water Treatment** Equipment on site in 2015 included a Hitachi 200PC Zaxis excavator used for stripping and feeding the plant. The wash plant consisted of a grizzly with 3" openings, a shaker deck that classified to 1 ¾" and ⅝". The sluice run measured 1.2 by 4.5 m (4 x 15 ft).

**Surficial Geology and Stratigraphy** Not reported.

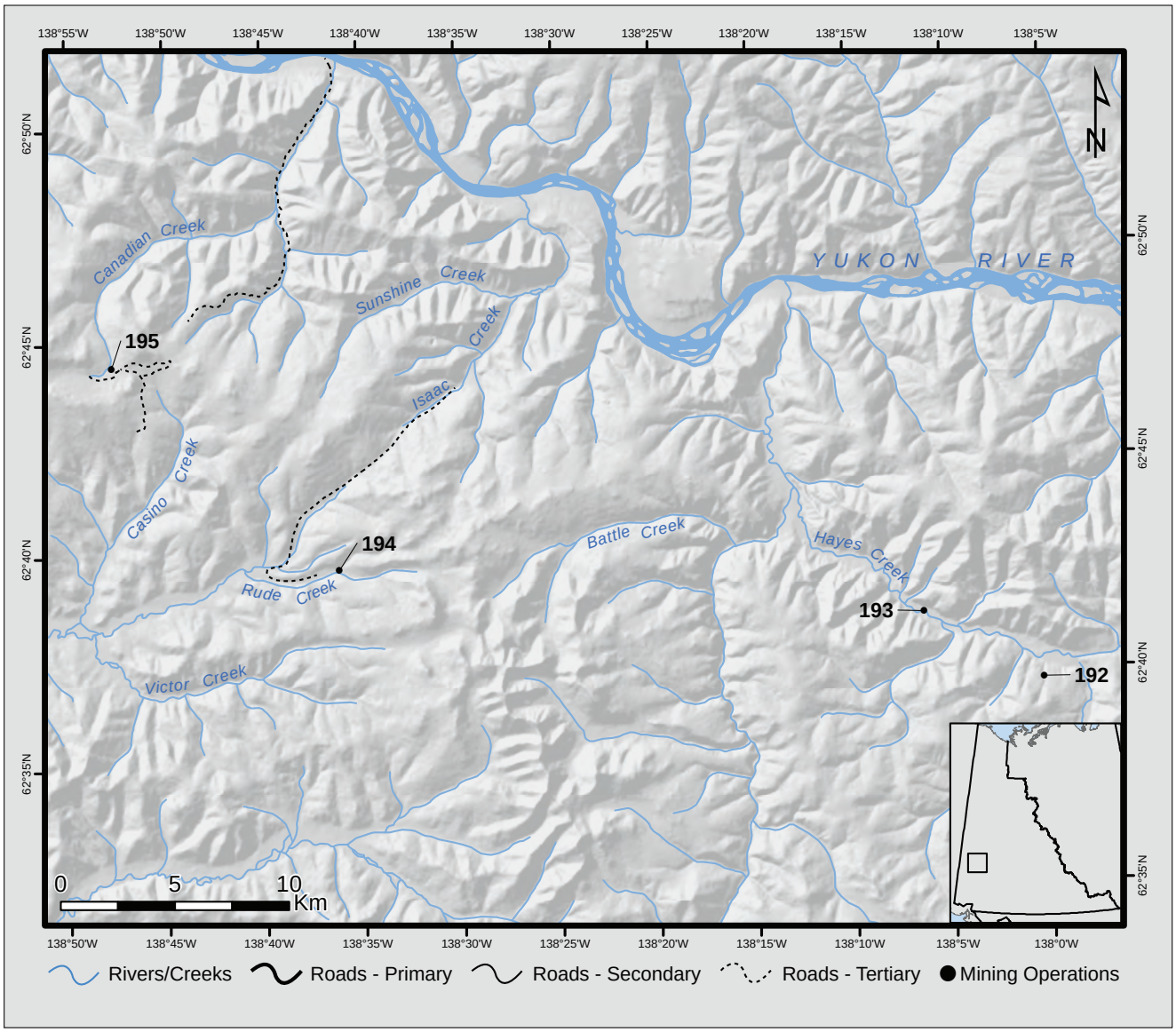
**Bedrock Geology** Bedrock is calcite-biotite-schist, amphibolite, phyllite and quartzite (YGS, 2017).

**Gold Characteristics** Not reported.

*A close-up view of the oxidized pay gravel on bedrock in Back Creek in 2016.*

# HAYES-RUDE-CANADIAN
## PLACER AREA

**SITES 192-195**




**LEGEND**

192. Wilson, G.
193. Pure Exploration Inc.
194. Fournier, A.
195. 2001 Yukon Ltd.

## Sonora, a tributary of Hayes

115J/09 2017: 62°39'32"N, 138°01'43"W

### Wilson, G., 2000-2017

Water License: PM15-005 (Active 06/2025)
Active Producer (2015-2017) **Operation no. 192**

**Location** Sonora Gulch, 900 m upstream from its confluence with Hayes Creek.

**Work History and Mining Cuts** Actively mining Sonora Gulch for nearly two decades, Mr. Wilson recommenced sluicing in 2017, after two previous seasons solely spent stripping and prospecting. A large right limit cut on upper Sonora Gulch was stripped in 2016 and an adit was completed in winter 2017 to prospect for the buried meandering pay channel. Mr. Wilson operates as a one-person mine and plans to sluice the gravel in upper Sonora Gulch in future years.

**Equipment and Water Treatment** Equipment present in 2017 included a Caterpillar EL300 excavator, a Caterpillar 988 wheel loader, an International TD-21 bulldozer and a Fiat-Allis bulldozer. A 1¾" screen deck with a 10" grizzly was able to process 10 to 15 $yd^3$ (8-11 $m^3$)/hr. The sluice runs consisted of coarse riffles, boil box, and sluice deck with expanded metal and angle iron riffles. A 4" pump supplied water to the plant and water was 100% recirculated. A long tom was used for clean-ups.


*Aerial view in 2017 looking downstream Sonora Gulch.*

**Surficial Geology and Stratigraphy** Sonora Gulch is a narrow gulch setting that lies near the pre-Reid glacial limit in the Hayes Creek drainage. In 2017, the main target was to continue exploiting the enriched, 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. 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, which 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 oz and the fineness ranges from 850 to 880.

*Locally derived, coarse and angular Sonora Gulch gravel mined in 2017. Shovel, for scale, is 1 m (3.3 ft).*

## Hayes, a tributary of Selwyn

115J/09 2017: 62°40'48"N, 138°08'10"W

### Pure Exploration Inc., 2010-2017

Water License: PM15-091 (Active 07/2026)
Water License: PM11-004 (Expired 07/2016)
Active Producer (2015-2017) **Operation no. 193**

**Location** Hayes Creek, approximately 9 km upstream from its confluence with Selwyn River.

**Work History and Mining Cuts** Pure Exploration Inc. has worked on Hayes Creek since 2012, and have subsequently completed extensive drilling, geophysical surveys and bulk samples in the drainage. This includes up to 60 drill holes in the valley bottom and on the left limit benches. A drilling and bulk sampling program was executed in 2016 using a track mounted 12" Nodwell drill rig. The first season of sluicing commenced in 2017 where a cut measuring 90 by 110 m (295 x 360 ft) in the valley bottom was completed. A total of 20,000 $yd^3$ was sluiced by a crew of up to four personnel. The plan for 2018 is to strip the overburden from the left limit bench near camp and complete a large cut.

**Equipment and Water Treatment** Equipment in 2017 included a John Deere 200 excavator and a Komatsu 355A bulldozer for exposing and excavating pay, a Caterpillar D6 bulldozer for stripping, and two Caterpillar 980 wheel loaders for loading pay and feeding the sluice plant. A 1.8 by 7.3 m (6 x 24 ft) trommel with a 2.4 m (8 ft) screen and an automatic 12.5 $yd^3$ hopper with no grizzly, was able to process up to 40 $yd^3$ (30 $m^3$)/hr. The initial screen is ½" and changes to ¾" prior to reaching the sluice runs. Initial runs are 1.2 m (4 ft) wide by 2.4 m (8 ft) long, with a slick plate in the upper part and jig riffles, and feeds into a final 0.6 m (2 ft) wide by 3.6 m (12 ft) long run with expanded metal. A small trommel test plant was also utilized, which could process up to 15 $yd^3$ (11 $m^3$)/hr. Water is supplied to the larger plant using a 6" pump and effluent is settled in a series of three ponds. Clean-ups were conducted using a long tom, wheel, jig, power screens and magnets.

**Surficial Geology and Stratigraphy** Placer gold was discovered in the Hayes Creek drainage in 1898. The discovery occurred on Klines Gulch, a left limit tributary 11 km upstream from Pure Exploration Inc.'s current mining location (YGS, 2010). By the spring of 1899, 150 claims had been staked on Hayes Creek


*Aerial view looking downstream of Pure Exploration Inc. operation on Hayes Creek in 2017. The approximate bench extent and potential Hayes Creek paleo-channel trajectory are shown. Approximate maximum ice extent from the most extensive pre-Reid glaciation is also shown.*

and subsequently a large community gathered on the drainage (YGS, 2010). Extensive historic workings, including up to fifty shafts and numerous trenches, are present where Pure Exploration Inc. is currently active.

Pure Exploration Inc. has been focused on mining in the unglaciated terrain near the all-time limit of glaciation in Yukon. The pre-Reid glacial limit is located less than 1 km to the east and the pre-Reid glaciation deposited a thick package of a glaciofluvial outwash gravel in lower Hayes Creek. The outwash is a clast-supported, pebble gravel consisting of 50-60% pebbles, 30% cobbles and less than 5% boulders. The gravel has a minor silt enrichment and a 25-30% medium sand matrix composition. Outwash up to 1.5 m (5 ft) thick is present in a low-level left limit bench that is approximately 30 m (100 ft) in width and several kilometres in length.

Pure Exploration Inc. focused their 2017 operations on the left limit of the valley bottom. The valley bottom stratigraphy consists of 2 m (6.6 ft) of outwash gravel. From 0 to 0.9 m (3 ft) interbedded medium and coarse sand, pebble gravel and pebble-cobble gravel are present. Medium-grained sand beds are up to 10 cm thick. Clasts in the lower gravel are strongly imbricated with a down valley flow. From 0.9 to 1.1 m (3-3.6 ft), the outwash is more coarse with 5% boulders, 40% cobbles and 55% pebbles. The medium to coarse sand matrix varies from 30 to 40%, with the presence of open work structures in the finer grained units. A deep Hayes Creek paleo-channel was discovered in 2017. The channel appears to crosscut the valley from the right limit at a ~45° angle and has a potential width of up to 46 m (150 ft). The channel was identified when the bedrock surface dropped off in the valley bottom cut, and the gravel appears more oxidized and with a higher matrix percent. Placer gold recovered from the channel is 80% fine gold. Minimal overburden was stripped prior to sluicing. The lowermost 0.6 m (2 ft) of gravel on bedrock and up to 1.2 m (4 ft) of weathered bedrock was sluiced.

*Stratigraphic section from Hayes Creek of the outwash gravel in the valley bottom cut. The shovel, used for scale, is 1 m (3.3 ft) long.*

**Bedrock Geology** The bedrock surface undulates with a relief of up to 0.5 m (1.6 ft). Bedrock is weathered mafic schist and competent blocky quartzite.

**Gold Characteristics** Gold derived from the bench is coarse grained. The valley bottom cut yields 50 to 60% nuggets, whereas the gold from the deep channel in the valley bottom is 80% fine gold below 8 mesh, and very bright. Fineness ranges from 830 to 860 in both bench and valley bottom placer settings.

## Rude, a tributary of Dip

115J/10 2016: 62°40'06"N, 138°41'06"W

### Fournier, A., 2004, 2010-2016

Water License: PM15-083 (Active 03/2026)
Water License: PM04-386 (Expired 11/2015)
Active Producer (2015-2016) **Operation no. 194**

**Location** Rude Creek, 4.4 km upstream from its confluence with Dip Creek.

**Work History and Mining Cuts** The focus of activity has been between Trombley Creek and Jens Creek, both left limit tributaries of Rude Creek. In 2015, Mr. Fournier mined the left limit of the middle reach of Rude Creek. Stripping on the right limit and sluicing occurred throughout 2016. No activity occurred in 2017.

**Equipment and Water Treatment** Not reported.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is granodiorite, granite, diorite and quartz diorite (YGS, 2017).

**Gold Characteristics** Not reported.

## Canadian, a tributary of Britannia

115J/10 2017: 62°44'38"N, 138°50'52"W

### 2001 Yukon Ltd., 2016-2017

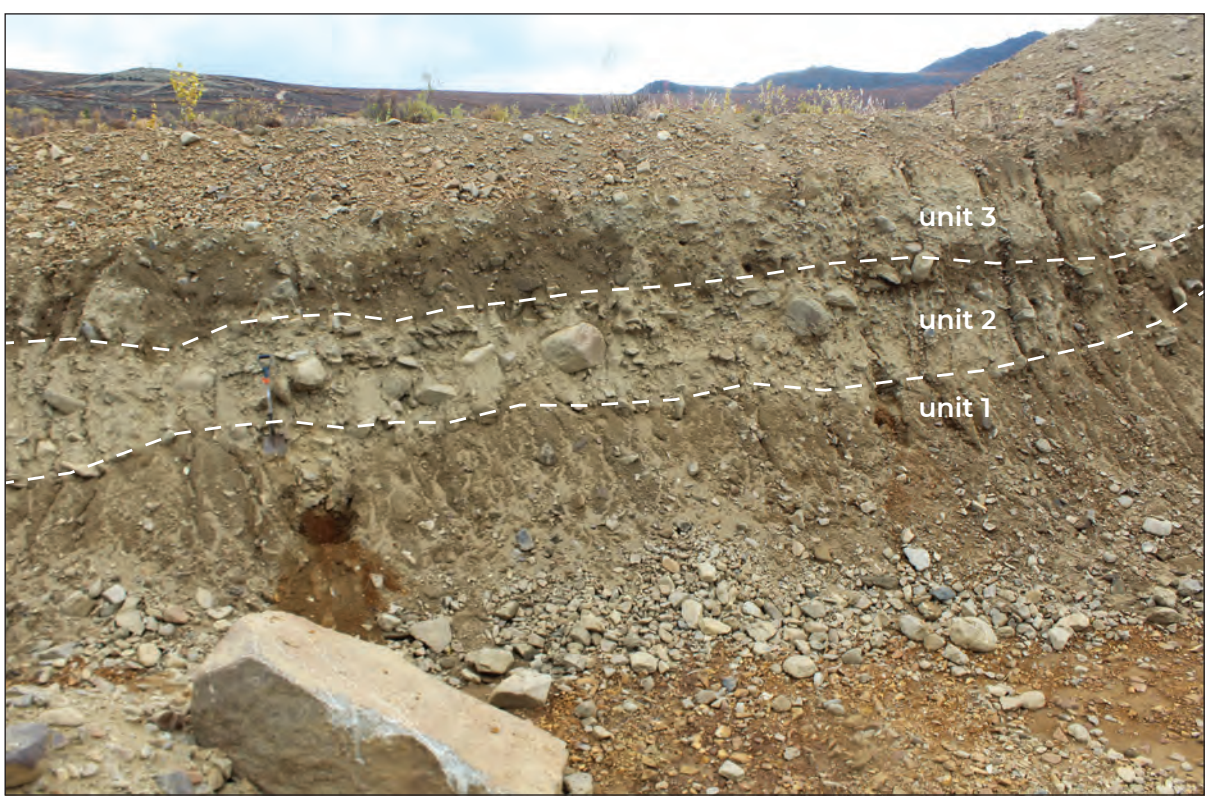
Water License: PM16-037 (Active 09/2026)
Active Producer (2016-2017) **Operation no. 195**

**Location** Canadian Creek, 3 km downstream from its headwaters.

**Work History and Mining Cuts** 2001 Yukon Inc. is a placer operator mining at high elevation (1200 m) in the Canadian Creek drainage. In 2015, a cut measuring 6 by 36 m (20 x 120 ft) on Canadian Creek was mined, which was immediately upstream of the Patton Gulch confluence. The 2017 season included prospecting by hand, but no use of heavy equipment. Prospecting was conducted predominately on lower Canadian Creek and its tributaries in the lower reaches.

**Equipment and Water Treatment** Equipment located at site in 2017 included a Komatsu PC200 excavator and a 0.9 by 7.6 m (3 x 25 ft) trommel. The initial sluice run is 0.6 by 1.2 m (2.1 x 4 ft) consisting of angle iron which feeds into two side runs each 0.6 by 2.3 m (2 x 7.5 ft). A 6 by 6" Godwin pump supplied water to the trommel, which enabled it to process up to 25 $yd^3$ (19 $m^3$). Effluent was settled in one settling pond and returned to Canadian Creek. Clean-ups were conducted using a 1.2 m (4 ft) long tom and the final concentrate was panned.

**Surficial Geology and Stratigraphy** Canadian Creek is situated in unglaciated terrain and as a result, the placer deposits are composed of locally derived gravel that exhibits a high energy depositional environment. Three units are present in the upper Canadian Creek drainage, upstream from its confluence with Patton Gulch. The first unit, situated on bedrock, is 1.4 m (5.0 ft) of a very compact pebble-cobble gravel with 10% boulders, 40% cobbles and 50% pebbles. It is clast supported with subangular to subrounded clasts and a 20% matrix consisting of fine to medium-grained sand. Unit 1 has varying moderate to pervasive oxidation and manganese alteration. The largest clast size is 1.5 m (4.9 ft) in diameter. An undulating contact between unit 1 and unit 2 is present. Unit 2, from 1.4 to 2.5 m (5.0-8.2 ft), is a boulder-enriched gravel




*Stratigraphic section in the 2016 cut, immediately upstream of Patton Gulch confluence. The section is 5.1 m (16.7 ft) in height.*

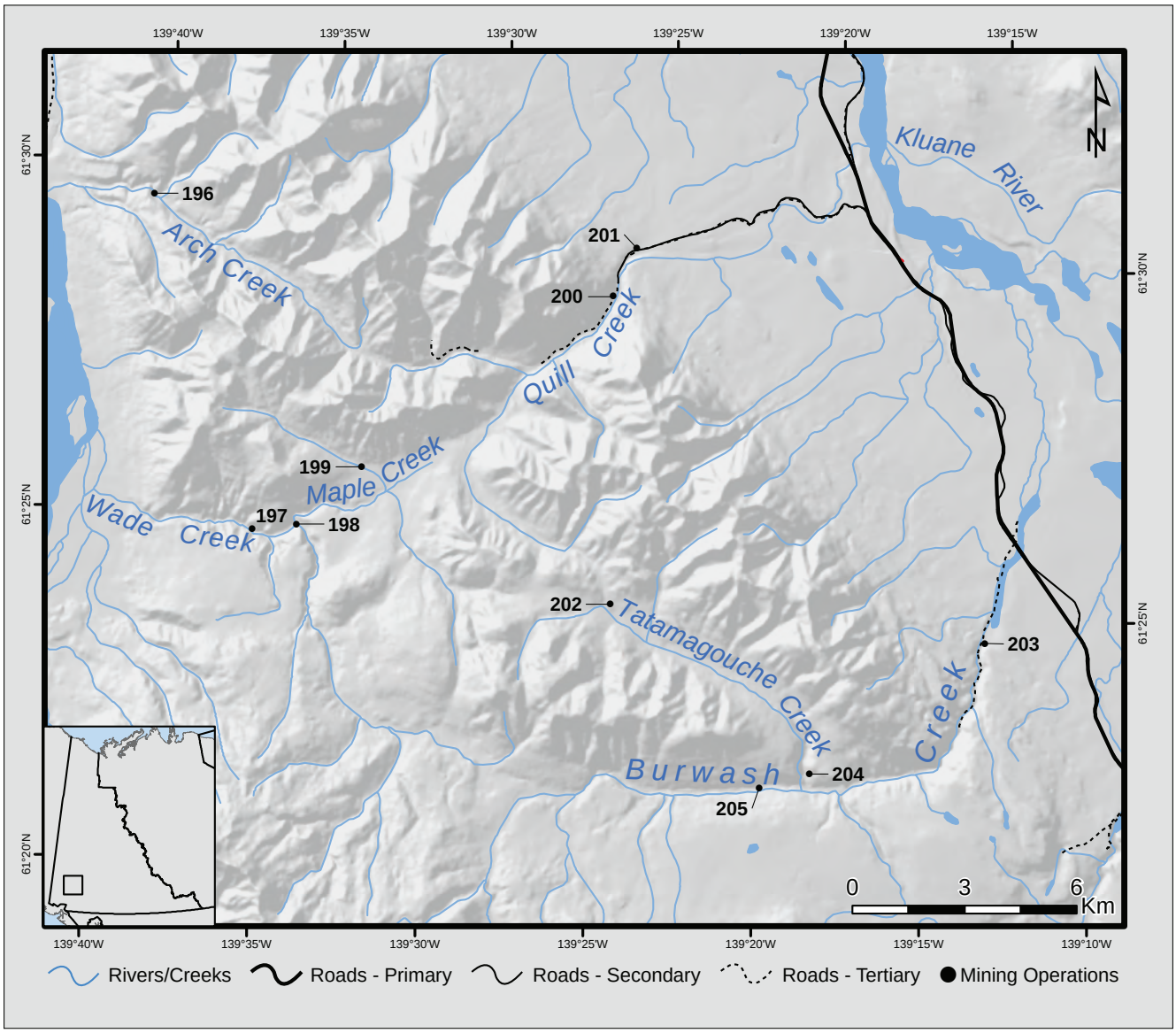
with boulders having an average diameter of 0.4 m (1.3 ft). Overlying the coarse gravel is unit 3, from 2.5 to 5.1 m (8.2-16.7 ft), which is similar to the gravel of unit 1. No distinct imbrication is present in the gravel. Placer gold is recovered from the uppermost gravel (unit 3) and the lower 0.5 m (1.6 ft) of unit 1 situated at the bedrock contact. An enrichment in concentration is also present in the coarse boulder lens, in the middle of the section.

**Bedrock Geology** Bedrock is granodiorite, granite, diorite and quartz diorite (YGS, 2017).

**Gold Characteristics** Gold is predominantly fine grained, with 5 to 10% coarse gold recovered. Larger pieces were flat and the largest nugget recovered was dime sized. Fineness is 876.

# KLUANE
## PLACER AREA

**SITES 196-205**




**LEGEND**

196. Nelson, R.
197. Fedell, J.
198. Farrington, K.
199. Courtright, T.
200. Lombardi, G. and Cecchinato, D.
201. Quill Creek Placers
202. Star Mountain Resources
203. Johnson, S. Jr.
204. Johnson, S.L.
205. Aurem Alliance Ltd.

## Arch, a tributary of Donjek

115G/05 2016: 61°29'38"N, 139°40'13"W

### Nelson, R., 2010-2017

Water License: PM13-028 (Active 11/2023)
Water License: PM15-020 (Active 06/2025)
Water License: PM09-658 (Expired 05/2015)
Active Producer (2015-2017) **Operation no. 196**

**Location** Arch Creek, upstream of the second canyon, approximately 3.6 km upstream from its confluence with Donjek River.

**Work History and Mining Cuts** Mr. Nelson and a crew of up to three people operated throughout 2015, upstream of the second canyon. A two-man operation was active in 2016, and activity focused on the right limit upstream of the second canyon, where they mined a cut 60 by 30 m (197 x 98 ft). Mining continued progressively upstream towards the mouth of Serpentine Creek and various testing was done farther upstream. In 2017, the right limit cut from 2016 was completed and reclaimed, and activity focused on the left limit just upstream from the second canyon.

**Equipment and Water Treatment** Equipment utilized from 2015 to 2016 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 x 24 ft) sluice runs with 2" riffles, and unbacked miners moss. A 10" Cornell pump supplied water to the plant, which processed up to 100 loose $yd^3$ (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** In 2016, a 3.6 m (11.8 ft) exposure on the right limit consisted of three units. The lower unit is 0.5 m (1.6 ft) thick and consists of a 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 weak planar, downstream-dipping stratification; and unit 3 is a coarse, angular, pebble-cobble-boulder gravel with a coarse sand matrix and has a thickness of up to 1.6 m (5 ft). Unit 3 appears to have a weakly formed boulder lag deposit in the lower 0.5 m (1.6 ft) of the unit, and unit 2 is moderately cemented. Up to 5 m (16.4 ft) of colluvial slope material overlies the gravel, and blankets the margins of the creek and covers low terraces on both the left and right limits. Further literature on the investigations of placer gold settings in Arch Creek is available in the Yukon Exploration and Geology 2016 publication (Kennedy and van Loon, 2017).

**Bedrock Geology** Bedrock is mapped as volcanic breccia (YGS, 2017).

**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 from Arch Creek.

*Mr. Nelson's operation in 2016 upstream from the second canyon.*

## Wade, a tributary of Donjek

115G/05 2016: 61°24'59"N, 139°36'10"W

### Fedell, J., 2011-2012, 2015-2017

Water License: PM09-655 (Active 10/2020)
Active Producer (2015-2017) **Operation no. 197**

**Location** Wade Creek, 1.3 km downstream from the mouth of Maple Creek.

**Work History and Mining Cuts** Mr. Fedell operated throughout 2015 and 2016, primarily conducting exploration with test holes and several small cuts.

**Equipment and Water Treatment** In 2016, a John Deere 450C excavator and grizzly wash plant were located on site.

**Surficial Geology and Stratigraphy** Wade Creek is a narrow, canyon constrained, floodplain placer deposit. Mining appears to be in the modern high-energy creek gravel that is a very coarse, boulder gravel with boulders up to 2 m (7 ft) in diameter.

**Bedrock Geology** Bedrock is mapped as granodiorite, quartz diorite, quartz monzonite and diorite (YGS, 2017).

**Gold Characteristics** Not reported.

*Mr. Fedell's camp and operation location on Wade Creek in 2016.*

## Wade, a tributary of Donjek

115G/05 2015: 61°25'08"N, 139°34'51"W

### Farrington, K., 2013-2016

Water License: PM12-063-1 (Active 05/2018)
Active Producer (2015-2016) **Operation no. 198**

**Location** Wade Creek, at the confluence with Maple Creek.

**Work History and Mining Cuts** Activity occurred on site in 2015 and 2016 but no specific work history is known. Most recent workings in 2016 are located upstream of the Maple Creek confluence.

**Equipment and Water Treatment** Located on site in 2016 was a Caterpillar 300B excavator and a 1.2 m (4 ft) diameter by 6.7 m (22 ft) long trommel with three sluice runs measuring 0.8 by 3.0 m (2.5 x 10 ft) with a 2 ft nugget trap in the feed chute.

**Surficial Geology and Stratigraphy** Mining is located on the modern floodplain at the confluence of Wade and Maple Creek. At this location, the creeks are deeply incised and bound by cliffs of bedrock and surficial sediment. No stratigraphic exposure was visible, but

*Mr. Farrington's operation in 2016 on Wade Creek, at the confluence with Maple Creek.*

mining appears to target the modern, coarse boulder-rich gravel on the floodplain.

**Bedrock Geology** Bedrock is mapped as granodiorite, quartz diorite, quartz monzonite and diorite (YGS, 2017).

**Gold Characteristics** Not reported.

## Maple, a tributary of Wade

115G/05 2015: 61°26'02"N, 139°33'06"W

### Courtright, T., 2015-2017

Water License: PM11-062 (Active 05/2022)
Active Producer (2015-2017) **Operation no. 199**

**Location** Maple Creek and an unnamed right limit tributary to Maple Creek.

**Work History and Mining Cuts** Unspecified work occurred in 2015. In 2016, Mr. Courtright dug one test pit with an excavator, and reclaimed it. Throughout 2017, several test pits were excavated on the west limit of Maple Creek.

**Equipment and Water Treatment** A Doosan excavator, wheel loader and a single screen deck wash plant were stationed on the claims in 2017.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock is mapped as basalt (YGS, 2017).

**Gold Characteristics** Not reported.

## Quill, a tributary of Kluane

115G/06 2017: 61°28'53"N, 139°26'08"W

### Lombardi, G. and Cecchinato, D., 2013-2015, 2017

Water License: PM12-052 (Expired 08/2017)
Active Producer (2015, 2017) **Operation no. 200**

**Location** Quill Creek, approximately 1 km upstream from the mouth of the lowermost canyon.

**Work History and Mining Cuts** As a small-scale operation, Mr. Lombardi and Mr. Cecchinato conducted minor testing in 2015 and 2017, sluicing up to 1 week per season. No reported activity occurred in 2016. Activity in 2017 was limited but the operators were present on the property in July.

**Equipment and Water Treatment** Equipment present on site included a Caterpillar 320L excavator with a 1 $yd^3$ bucket and a single screen deck. Clean-ups were conducted using a gold pan.


*Mr. Lombardi and Mr. Cecchinato active on Quill Creek in 2014.*

**Surficial Geology and Stratigraphy** Modern Quill Creek gravel was the target for Mr. Lombardi and Mr. Cecchinato.

**Bedrock Geology** Bedrock is mapped as muscovite-biotite schist (YGS, 2017).

**Gold Characteristics** Gold is fine and flakey, and minimal coarse grains are recovered.

## Quill, a tributary of Kluane

115G/06 2016: 61°29'37"N, 139°25'36"W

### Quill Creek Placers, 2000-2017

Water License: PM16-064 (Active 06/2022)
Water License: PM06-511 (Expired 11/2016)
Active Producer (2015-2017) **Operation no. 201**

**Location** Quill Creek, approximately 0.5 km downstream from the mouth of the lowermost canyon.

**Work History and Mining Cuts** After purchasing the ground in 2000, the one-person operation has been active every year, with some years only consisting of a few weeks. In 2015, activity focused on a right limit low-lying bench, with a continuation of the cut occurring in 2016. A section on the bench, measuring 28 by 40 m (92 x 131 ft), was stripped in 2016, with the intent to process the exposed gravel in 2017. Another location downstream of the bench was mined, in a cut approximately 45 by 15 m (148 x 50 ft). Extensive contouring reclamation occurred across the site in 2016. Minimal activity occurred in 2017.

**Equipment and Water Treatment** In 2016, Mr. Nichols utilized an Hitachi UH172 excavator, a P&H excavator, a Caterpillar D8K bulldozer, a Case 850 bulldozer and a Caterpillar 966C wheel loader. The wash plant consisted of a 1.2 by 2.4 m (4 x 8 ft) grizzly with a spray bar, over a single 0.9 by 3.6 m (3 x 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 wheel.

**Surficial Geology and Stratigraphy** The stratigraphy of the right limit bench is 1.5 m (5 ft) of a crudely bedded gravel with 10% boulders, 40% cobbles and 50% pebbles. The matrix is 40% medium-grained sand. The upper 1.5 m (5 ft) consists of interbedded fine sand, organics, clay rich silt, minor pebbles, and 0.2 m (0.6 ft) of White River ash near surface. All gravel, and up to 0.9 m (3 ft) of bedrock, is sluiced.

Downstream from the bench, the left limit cut in the modern valley consists of a subrounded boulder-cobble gravel with 30% matrix, and maximum clast of 1 m (3.3 ft). Only the top 1.2 m (4 ft) of gravel was sluiced, so the thickness of gravel is unknown. Mr. Nichols is trying to connect the extent of the main pay channel from its known location downstream, using the indication of coarser material, which defines the best pay zone (Joe Nichols, *pers. comm.*).

**Bedrock Geology** Bedrock is muscovite schist.

**Gold Characteristics** Gold is mostly fine with the odd nuggets up to 1 ounce. Fineness is 870.

*Left limit modern valley cut where Quill Creek Placers tested the economics of the top gravel.*

## Tatamagouche, a tributary of Burwash

115G/06 2016: 61°24'00"N, 139°23'21"W
115G/06 2017: 61°24'29"N, 139°25'14"W

### Star Mountain Resources, 2016-2017

Water License: Class 3 - LP01130 (Active 08/2026)
Active Producer (2016-2017) **Operation no. 202**

**Location** Tatamagouche Creek, approximately 7.5 km upstream from its confluence with Burwash Creek.

**Work History and Mining Cuts** In 2015, claims were staked on upper and middle Tatamagouche Creek and in 2016, a class 3 license was permitted. Excavations on the left limit in 2016 included three test pits measuring 6 by 6 m (20 x 20 ft). In 2017, sluicing commenced on July 12th on the modern floodplain of upper Tatamagouche Creek. Three personnel worked a daily 10-hour shift.

**Equipment and Water Treatment** Equipment utilized during the 2017 season included an Hitachi EX200 excavator for excavating pay, a Komatsu WA380 loader for hauling pay to the plant and an Hitachi Furukawa EX60 excavator with a ½ yd bucket for feeding pay into the plant. The plant consists of a 1 m (3.3 ft) by 4.2 m (14 ft) trommel with a 1" screen capable of processing 60 $yd^3$ (46 $m^3$)/hr. The sluice run consists of a 1.2 m (4 ft) wide run and a 0.6 m (2 ft) run positioned side by side. The 1.2 m (4 ft) wide run contains a boil box, hydraulic riffles, angle iron riffles, expanded metal and blue miners moss. The 0.6 m (2 ft) wide run contains angle iron riffles and miners moss.

*A view looking down upper Tatamagouche Creek at Star Mountain Resources operation. Thin floodplain deposits are targeted where the creek has incised through morainal sediment and into bedrock.*

**Surficial Geology and Stratigraphy** The 2016 test pits consisted of pebble-cobble gravel with a sandy matrix. The maximum clast size is 0.6 m (2 ft) and lenses of silty fine-grained sand measure up to 0.1 m (0.5 ft) thick. Mining in 2017 focused on an area adjacent to the active creek, due to class 3 restrictions. Mining commenced at the outlet of a canyon and progressed upstream through the canyon where they had previously test pitted. Bedrock and thick morainal deposits comprise the canyon walls. The floodplain stratigraphy, from 0 to 1 m (0-3.3 ft), is a poorly sorted boulder-cobble-pebble gravel with a silty sand matrix. Clasts are largely subangular in shape, apart from the boulders that are subround in shape and likely reworked from morainal material. The boulders are up to 1 m (3.3 ft) in diameter. Overlying the gravel is 1 m (3.3 ft) of fine gravel and organics. The overlying fine gravel and organics are stripped, and all the coarse gravel plus 0.6 m (2 ft) of bedrock was sluiced. The bedrock is variably decomposed.

**Bedrock Geology** Bedrock is a variably weathered, steeply dipping, interbedded buff-weathering limestone and shale.

**Gold Characteristics** Not reported.

*Star Mountain Resources 1 by 4.2 m (3.3 x 14 ft) trommel processing pay on Tatamagouche Creek in 2017.*

## Burwash, a tributary of Kluane

115G/06 2015: 61°24'30"N, 139°13'56"W

### Johnson, S. Jr., 2005-2009, 2011-2017

Water License: PM15-037 (Active 08/2025)
Water License: PM11-012 (Expired 08/2015)
Active Producer (2015-2017) **Operation no. 203**

**Location** Burwash Creek, downstream of the lowermost canyon. The operation was not on claims, but was located between the downstream post of P03598 and the upstream post of P03915, on Kluane First Nation (KFN) Category A settlement land (R1A). Mr. Johnson has written permission from KFN to operate here.

**Work History and Mining Cuts** Throughout 2015 to 2017, activity occurred on a fan deposit and a low level, right limit bench of Burwash Creek. The fan was progressively mined upstream towards the mouth of the canyon and cuts farther upslope of the bench were excavated to investigate the potential meltwater channel contributions.

**Equipment and Water Treatment** In 2015, equipment utilized at Mr. Johnson's property included an Hitachi 200 excavator, a Koehring 666 excavator, a Caterpillar C966B wheel loader and a Caterpillar D7 bulldozer. The wash plant, from 2015 to 2017, was a 1.2 by 6.1 m (4 x 20 ft), track-mounted trommel with a 1¼" screen. It has a 2.1 by 2.1 m (7 x 7 ft) hopper, a single sluice run measuring 1.2 by 6.1 m (4 x 20 ft) 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 using a jig and finished on a wheel.

**Surficial Geology and Stratigraphy** Throughout 2015 to 2017, Mr. Johnson focused on excavating the right limit immediately downstream from the mouth of the lowermost canyon on Burwash Creek. A meltwater channel intersects the modern course of Burwash Creek downstream of the canyon, and is the most recent target for the operator. This deposit consists of 5 m (16.4 ft) of a crudely stratified, poorly sorted, pebble-cobble gravel. It contains 10% boulders, 50% cobbles and 40% pebbles, and has a coarse sand matrix. All gravel was sluiced.

**Bedrock Geology** Bedrock is weathered biotite schist.

**Gold Characteristics** Gold has a fineness of 850 to 860. The largest nugget recovered is 1.5 oz.

*Trommel and cut on the right limit of Burwash Creek in 2015, at S. Johnson Jr.'s operation.*

## Burwash, a tributary of Kluane

115G/06 2017: 61°22'21"N, 139°18'43"W
115G/06 2015: 61°22'21"N, 139°17'18"W

**Johnson, S.L., 1993-2002, 2004-2017**

Water License: PM17-001 (Active 06/2027)
Water License: PM11-061 (Expired 06/2017)
Active Producer (2015-2017) **Operation no. 204**

**Location** Burwash Creek, downstream from the mouth of Tatamagouche Creek, and lower Tatamagouche Creek.

**Work History and Mining Cuts** Mining took place at two separate locations and placer settings from 2015 through 2016. The first location was downstream from camp where they re-mined tailings. A second location, approximately 1.5 km downstream from the mouth of Tatamagouche, was mined. Both the left and right limit were excavated, but they primarily focused on the right limit low-level terrace deposit. In 2017, activity focused on the left limit of lower Tatamagouche Creek.

**Equipment and Water Treatment** Equipment utilized 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 different wash plants were used to process pay throughout 2015 to 2017: 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 loose $yd^3$ (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 6 ft wheel.

**Surficial Geology and Stratigraphy** S.L. Johnson is exploring in two different placer settings. Proven economic deposits include re-mining historic tailings of the Burwash Mining Company Limited, who actively mined the lower-most canyon to the mouth of Tatamagouche Creek from 1945 to 1977 (YGS, 2010), as well as low terrace deposits occurring ~16 m above the active stream channel along the right limit. The terrace deposits are characterized by pay channels consisting of yellow boulder gravel that may have been deposited by large flood events causing bank-to-bank flows in Burwash Creek.

A series of semi-parallel northwest-southeast oriented meltwater channels cross the Burwash Upland and intersect the modern course of Burwash Creek at a number of places between the first and third canyons. Miners on Burwash Creek report increases in gold immediately downstream of these meltwater intersections which suggests glaciofluvial transport was effective at redistributing gold in this region.

**Bedrock Geology** Bedrock is mapped as muscovite/biotite schist (YGS, 2017).

*S.L. Johnson's New Zealand style floating plant downstream from the mouth of Tatamagouche Creek in 2015.*

**Gold Characteristics** Gold recovered in the terrace deposits varies from flat to coarse, with some nuggets and has a fineness of 867.

## Burwash, a tributary of Kluane

115G/06 2016: 61°22'05"N, 139°20'12"W

### Aurem Alliance Ltd., 2006-2017

Water License: PM10-007 (Active 07/2020)
Water License: PM13-030 (Active 07/2023)
Active Producer (2015-2017) **Operation no. 205**

**Location** Burwash Creek, 1.2 km upstream from the mouth of Tatamagouche Creek.

**Work History and Mining Cuts** Aurem Alliance holds two water licenses; no activity occurred under PM13-030 on lower Burwash Creek, and mining focused upstream of Tatamagouche Creek under PM10-007. Throughout 2015 to 2017, a crew of three to four people focused on a discontinuous right limit terrace. In 2016, Aurem Alliance investigated their prospecting lease in the headwaters of Burwash Creek using a rubber tired backhoe.

**Equipment and Water Treatment** Equipment present on site from 2015 to 2017 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 excavators, a John Deere 310G loader backhoe and a rock truck. A Derocker was used to process material and classify it to minus 2". The wash plant could process up to 100 $yd^3$ (76 $m^3$)/hr. An 8" pump provided water to the wash plant. Sluice runs were 1.5 by 9.1 m (5 x 30 ft) long and consisted of boil boxes, hydraulic riffles, and expanded metal, all lined with unbacked miner's moss. Water is acquired from Burwash Creek and effluent is settled in a series of four settling ponds prior to discharge back into Burwash Creek.

**Surficial Geology and Stratigraphy** Aurem Alliance Ltd. mines a discontinuous right limit terrace, where the characteristics of the pay channel include coarse clasts on bedrock and a dark brown muddy gravel matrix. The right limit terrace comprises three units. Unit 1 is a coarse sandy matrix cobble-boulder gravel ranging from 1.5 to 3.0 m (4.9-9.8 ft) thick and overlies an undulating bedrock surface. Unit 2, 2.0 m (6.6 ft) thick, is interbedded medium to coarse sand and pebble-gravel,

*Equipment stationed on the right limit terrace that Aurem Alliance Ltd. mined through 2015 to 2017.*

with organic beds 5 to 10 cm thick. The uppermost unit, unit 3, is up to 4 m (13 ft) thick and consists of ice-rich muck with minor sand and woody debris. Sluiced material included 3.0 to 6.1 m (10-20 ft) of gravel and 0.6 to 0.9 m (2-3 ft) of bedrock, including all of unit 1 and most of unit 2 gravel.

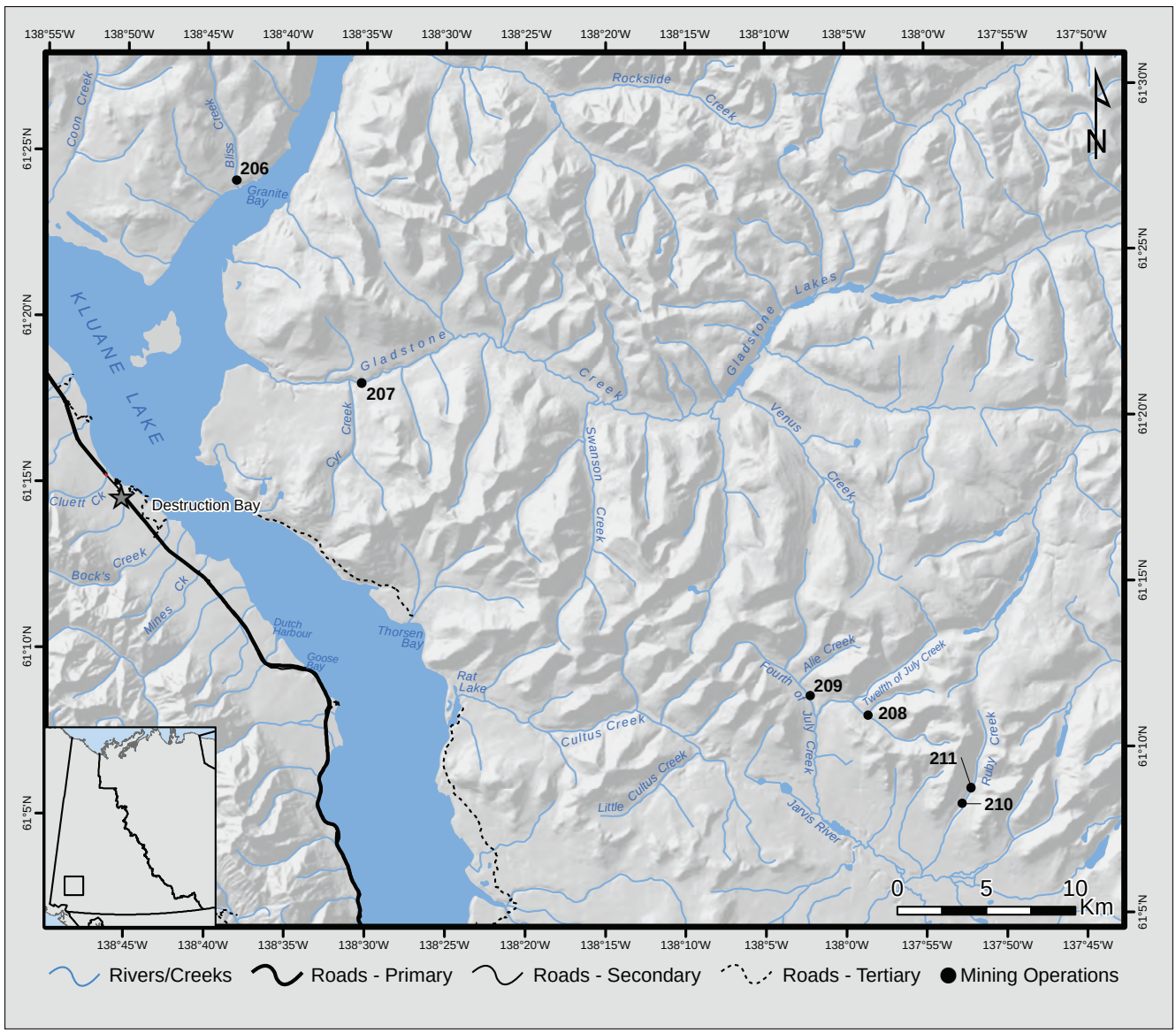
A publication pertaining to the surficial geology in the northern Kluane Range is available in the Yukon Exploration and Geology 2017 publication (Kennedy, 2018).

**Bedrock Geology** Bedrock is highly fractured chert.

**Gold Characteristics** Gold greatly varies in size and shape from flat to coarse, with some nuggets. Fineness is 867.

# RUBY RANGE
## PLACER AREA

**SITES 206-211**




### LEGEND

206. Jabberwocky Exploration Ltd.
207. Tic Exploration Ltd.
208. FTG Placers
209. Canyon Mining Ltd.
210. Brewster, D.
211. MacKinnon, B.,

## Bliss, a tributary of Kluane Lake

115G/07 2017: 61°24'37"N, 138°42'26"W

### Jabberwocky Exploration Ltd., 2013-2017

Water License: PM15-046 (Active 12/2025)
Water License: PM05-499 (Expired 12/2016)
Active Producer (2015-2017) **Operation no. 206**

**Location** Unnamed tributary (informally named Bliss Creek) on the west side of Talbot Arm, Kluane Lake, near Granite Bay.

**Work History and Mining Cuts** During the first year of mining, in 2016, work focused on building settling ponds and testing the modern creek gravel at the upper end of the canyon. In 2017, mining moved upstream where the floodplain increased in width and the valley gradient decreased. Three miners worked single daily shifts, and an estimated 75,000 loose yd³ were processed in 2017. In 2017, activity occurred 550 m upstream on the drainage from the shore of Kluane Lake.

**Equipment and Water Treatment** Equipment used to mine in 2017 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 plant is a model 100 Gold Machine powered by a 50kW plant. The electrical system also powers a 4" submersible pump to supply water to the Gold Machine. Water is settled out–of-stream and clean-ups are completed using a Goldtron jig, 12-mesh screen and wave table.

**Surficial Geology and Stratigraphy** The mining is in a narrow valley setting with exposed granodiorite bedrock on the left limit and a package of gravelly sediment on the right limit. The target sediment for mining is the modern fluvial gravel along the floodplain of the valley. The thickness of the modern gravel varies from 1.2 to 4.8 m (4-16 ft) and is controlled by undulations in the bedrock surface. Unit 1, from 0 to 3 m (0-10 ft), is a moderately sorted, sandy gravel with 60% clasts and 40% coarse sand matrix. Clasts are imbricated within this unit and the boulder content is approximately 10%. Unit 2, from 3 to 4.8 m (10-16 ft), is a poorly to moderately sorted gravel with 80% clasts and 20% coarse sand matrix. The boulder content in unit 2 is 30%. The lower contact of unit 2 is erosional, which supports its high energy, coarse textured appearance. Unit 2 becomes sandier near the upper contact. The majority of the gold is found in unit 1.


*Jabberwocky Explorations mining operation on Bliss Creek.*

*A view of the right limit gravel exposure on Bliss Creek. The lower gravel (unit 1) is sandier and contains more fine gold.*

**Bedrock Geology** Bedrock is a granodiorite and is decomposed in the mining cut.

**Gold Characteristics** Most gold is around the 12 mesh size. Coarser gold tends to be rougher and less travelled whereas the finer gold is flatter and more travelled. The fineness ranges between 830 and 860.

## Gladstone, a tributary of Kluane Lake

115G/07 2017: 61°18'53"N, 138°33'22"W
115G/07 2016: 61°18'54"N, 138°34'33"W

### Tic Exploration Ltd., 1992-2010, 2012-2013, 2015-2017

Water License: PM15-068 (Active 03/2026)
Active Producer (2015-2017) **Operation no. 207**

**Location** Lower Gladstone Creek.

**Work History and Mining Cuts** Tic Exploration mined on lower Gladstone Creek from 2015 to 2017. During each season, two wash plants were operational on the left and right-limits of the creek. Nine crew were employed during each season, including eight miners and one cook. The mine cuts on the left limit tend to be larger and targeted side pay under colluvium, whereas mining on the right limit is constrained by thicker surficial sediments. In 2015, the total length of mining measured 457 m (1500 ft). Mobile trommel wash plants are employed at each site, which reduces transport costs associated with hauling pay. Pay transport is achieved through one or more excavator lifts to the wash plant. In 2017, mining focused on the left limit. One plant operated at the mouth of Cyr Creek on a bedrock high. The second plant operated approximately 300 m upstream on Gladstone Creek and targeted a low-level left limit terrace.

**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 located on either side of Gladstone Creek: a 1.5 m (5 ft) diameter trommel with 1.8 by 1.8 m (6 x 6 ft) sluice run and a 30" wide tailings conveyor; and a 1.8 m (6 ft) diameter trommel with a 2.7 by 1.8 m (9 x 6 ft) sluice run and a 0.9 m (3 ft) wide tailings conveyor. In 2017, a typical cut would use a Caterpillar 365C excavator for stripping, a Caterpillar 350L for digging pay and a Caterpillar 350L for feeding the plant with a 2¾ yd bucket. A Caterpillar D10N bulldozer is used to manage tailings, roads and leveling waste piles.

*A view looking downstream along the right limit of Gladstone Creek at the base of a thick Quaternary section. A consolidated till forms a false bedrock in the cut and is overlain by a silty gravel that is processed for pay. The pay gravel is exposed just above the waterline in the photo. Pay gravel is relayed to the plant using excavators.*

**Surficial Geology and Stratigraphy** The placer stratigraphy on lower Gladstone Creek reflects multiple periods of glaciation, glaciofluvial sedimentation and interglacial reworking. Up to 115 m of erosion into glacial and interglacial sediments has occurred since the McConnell (last) glaciation 14,000 years ago. Placer deposits are widespread in the valley bottom from fluvial reworking and exposure of older paleo-deposits by the Holocene fluvial erosion. Most placer deposits are contained within coarse, imbricated boulder-cobble gravel situated on a false bedrock of very compact matrix-rich grey till. The till false-bedrock contains 40% clasts (cobble-pebble) and 60% matrix (sandy silt), and has faceted clasts that are predominantly Kluane schist. This till is interpreted as a basal lodgement till deposited by a valley glacier originating in the Gladstone Creek drainage during a pre-McConnell glaciation. A thin layer of brown sandy till is sometimes preserved overlying the lodgement till, which is likely ablation moraine deposited during retreat of the same valley glacier.

Placer deposits on the left limit and near the centre of the valley are typically 3 m (9.8 ft) thick, contain imbricated boulders and likely originate from Holocene erosion and sedimentation by Gladstone Creek. Overburden on the left limit exposure consists of colluviated organics (muck) and reworked glacial sediment that is 7 m (23 ft) thick. In the centre of the valley the overburden is thinner and in one location 2 to 3 m (6.6-10 ft) of mud and gravel debris from a landslide off the north bank (right limit) had buried Holocene pay gravel. Near the mouth of Cyr Creek, bedrock appears to rise and outcrops in placer cuts. The placer gold is generally coarser on the left limit, which has led to some speculation about a source coming from Cyr Creek or Kluane schist bedrock on the south side of the valley.

Placer deposits at the base of the thick Quaternary sediment package on the right limit have a more varied origin. Deposits of glaciofluvial gravel overlying the compact till were mined during the 2016 season. The pay gravel on the till consisted of 2.5 m (8.2 ft) of imbricated,


*Tic Exploration's operation in 2017 immediately below the Gladstone Creek canyon. Pay is extracted from both a coarse gravel on the till false bedrock surface and from an intermediate level pay zone consisting of a silty, coarse gravel.*

moderately to poorly sorted, grey boulder-cobble gravel. It is interpreted as an ice proximal glaciofluvial gravel associated with a Gladstone valley glacier. This outwash is overlain by 10 m (33 ft) of yellow glaciofluvial gravel containing cobbles, boulders, sand lenses and interbeds of glaciolacustrine sediment. Only the lowermost grey glaciofluvial deposit is processed for placer gold. The glaciofluvial deposits appear to extend into the bank but are overlain by 12 m (39 ft) of glaciolacustrine silt and sand, and 6 m (20 ft) of till.

In 2017, mining focused on low-level terrace deposits on the left limit of Gladstone Creek. At the mouth of Cyr Creek there is a rise in the bedrock surface where a thin deposit of coarse gravel is processed and approximately 1 m (3 ft) of bedrock is ripped and sluiced. The bedrock surface dips gently to the north and drops off more sharply in the upstream and downstream direction. The second cut, located 300 m upstream from the bedrock rise, targets coarse gravel deposits on a false bedrock of consolidated grey till. Not all gravel deposits pay equally within the stratigraphic column or laterally across the terrace section. In general, values are favourable on the till surface and a channel was noted in the till where placer concentrations increased. This pay zone was poorly exposed but estimated to be 1 to 2 m (3-6 ft) in thickness. Above the pay zone on the till the gravel becomes sandier and is not economic. This sandy gravel is 3 m (9 ft) thick and is overlain by a thin, poorly sorted, silty gravel layer (40 cm thick) that transitions abruptly into a boulder gravel. This unit, in particular the silty gravel, contains good placer gold concentrations. The entire upper coarse gravel unit and silty gravel, 2 to 3 m (6.6-9.8 ft) thickness, are processed for pay. The silty gravel appears to pinch out laterally into the terrace and gold grades within the gravel become less economic. This lateral change in gold concentration is suspected to be related to cut-and-fill processes whereby the silty gravel forms during an incision event (hyper-concentrated flood flow) and erodes into low-grade gravel. The incision event would concentrate existing gold within the low-grade gravel and also introduce new placer gold from upstream. The silt component within the flood gravel would act as a binder suitable for trapping gold grains.

**Bedrock Geology** Late Cretaceous Kluane schist underlies lower Gladstone Creek, while the upper reaches are underlain by the Paleocene Ruby Range batholith (YGS, 2017).

**Gold Characteristics** Gold varies between rough, smooth, and flat, and has a fineness of 830.

## Rabbit, a tributary of Larose

115H/04 2016: 61°10'16"N, 137°59'47"W

### FTG Placers, 2016-2017

Water License: PM16-025 (Active 07/2026)
Active Producer (2016-2017) **Operation no. 208**

**Location** Rabbit Creek, at the mouth.

**Work History and Mining Cuts** FTG Placers first season of production on Rabbit Creek occurred in 2016. In previous years exploration occurred in the drainage, including a Yukon Mineral Exploration Program project. In 2016, the first half of the season consisted of camp construction, equipment hauling and settling pond construction. Mining commenced in early August and included a six-person crew operating a single 12-hour shift. Mining was focused at the mouth of Rabbit Creek. In 2017, mining continued on lower Rabbit Creek near its confluence with Larose Creek. This included 300 hours of sluicing. Upon completion of the Rabbit Creek cut, operations moved into Larose Creek where a 500 hours of sluicing was completed above the confluence with Rabbit Creek.

**Equipment and Water Treatment** Equipment included a Caterpillar 330D excavator for digging pay, a Caterpillar 980G loader for hauling pay and coarse tailings, an Hitachi EX200 excavator for feeding the plant and a Caterpillar 518 skidder for hauling fuel and equipment to site. The sluice plant is a T-400 by Macon Industries that includes a 1.2 by 4.8 m (4 x 16 ft) trommel with 5/8" openings. The sluice consists of three 1 by 2.4 m (3 x 8 ft) runs of expanded metal and miners moss. The three runs converge into a 2 by 2 m (6 x 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.

**Surficial Geology and Stratigraphy** In 2016, mining near the mouth of Rabbit Creek exposed a false bedrock (unit 1) with variable characteristics that consisted of bedded pebbly sand or diamicton. These may represent glaciolacustrine or till deposits. Bedrock outcrops in the southeastern corner of the pit. The pay gravel consisted of 2.5 m (8.2 ft) of moderately to poorly sorted boulder-cobble gravel with a sand matrix. Clasts are imbricated showing a flow direction consistent with the modern drainage. High-energy channel deposits within the unit have overall larger clast sizes and are generally poorly sorted. Sand wedges are present in unit 1 indicating periglacial conditions during deposition. This unit may represent a post-McConnell (last glaciation) fluvial fan deposit. The pay unit is overlain by 2 m (6.5 ft) of coarse

*FTG placers operation at the confluence of Rabbit and Larose creeks. Pay was extracted from a cut below camp in lower Rabbit Creek, and transported upstream on Larose Creek to the plant and settling facilities.*

cobble gravel (unit 2) and 0.5 m (1.6 ft) of modern organics. In Larose Creek, excavation depths reached 6 m (20 ft) and did not reach bedrock. Placer gold concentrations were found to be highest in the near surface gravel, which tends to contain coarser sediment and is packed tight.

**Bedrock Geology** Kluane schist and Hayden Lake granodiorite (YGS, 2017).

**Gold Characteristics** Gold consists of a mix of pristine and reshaped to flattened grains. The largest fraction is up to 1 cm in diameter. Gold derived from Larose Creek had a similar shape and grain size as Rabbit Creek gold.

## Fourth of July, a tributary of Jarvis

115G/01 2017: 61°10'42"N, 138°03'31"W

### Canyon Mining Ltd., 2017

Water License: PM17-015 (Active 06/2027)
Active Producer (2017) **Operation no. 209**

**Location** Fourth of July Creek. 950 m downstream from Alie Creek confluence.

**Work History and Mining Cuts** Purchased in 2016 by Canyon Mining Ltd., they began operations on main valley claims in 2017.

**Equipment and Water Treatment** Not reported.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Not reported.

**Gold Characteristics** Not reported.

## Ruby, a tributary of Jarvis

115H/04 2015: 61°07'51"N, 137°53'27"W

### Brewster, D., 1998-2017

Water License: PM11-046 (Active 03/2022)
Active Producer (2015-2017) **Operation no. 210**

**Location** Ruby Creek, upper.

**Work History and Mining Cuts** Mr. Brewster and Mr. Bjork continued to partner on Ruby Creek working primarily in the middle of the modern valley bottom. In 2015 they were active immediately upstream from Mr. MacKinnon's operation.

**Equipment and Water Treatment** Equipment present on site in 2015 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 x 6 ft) Clemro vibrating grizzly wash plant with ¾" screen, a 3 m (10 ft) run of punch plate and a 16" by 3 ft riffle run. The wash plant processed 40 loose $yd^3$ (30 $m^3$)/hr, using 600 gpm from a 6" pump that acquired water from Ruby Creek and settled through a series of three ponds downstream. Clean-ups are conducted using a long tom.

**Surficial Geology and Stratigraphy** The exposure in 2015 consisted of 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 (3 ft) thick cobble-pebble gravel with a silty sand matrix. This unit is also described as a muddy gravel and is the target pay material. Test pans in this unit typically contain from 5-35 colours. Unit 3, 2.5 m (8.2 ft) 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 clast composition consists of 40% boulders, 40% cobbles and 20% pebbles. Most of the clasts are subangular to subrounded with numerous disk-shaped schist clasts present. The maximum clast size is 1.4 m. The matrix consists of a coarse sand.


*Brewster and Bjork's mining operation on Ruby Creek. Mining focuses on modern gravel along the floodplain of Ruby Creek.*

Unit 2 is a high-energy gravel that was likely deposited in an erosive fluvial environment. At this location the boulder gravel did not erode through the finer gravel (unit 1) and therefore incorporate the richer placer concentration. The important aspect of this site is the position of the placer enrichment on or near the till surface and that the gravel containing the placer enrichment can probably vary depending on the depth of reworking during these high energy events.

**Bedrock Geology** Bedrock is mapped as Late Cretaceous Kluane muscovite schist (Israel *et al.*, 2011; YGS Open File 2011-2). Bedrock outcropped in the creek near the right limit cut described above, and was encountered much deeper on the left limit.

**Gold Characteristics** Gold is shiny and primarily flour-sized, with a fineness of 820. In 2015, a 22 g nugget was found that was rounded and worn with holes. This size of gold was new this year.

**Exploration Potential** Pre-glacial Ruby Creek gravel may underlie the till false bedrock. In addition, side pay prospects on both the left and right limit have not been exploited in Ruby Creek valley.

## Ruby, a tributary of Jarvis

115H/04 2017: 61°08'21"N, 137°52'59"W

### MacKinnon, B., 1998-2017

Water License: PM10-002-1 (Active 05/2020)
Active Producer (2015-2017) **Operation no. 211**

**Location** Ruby Creek, mid and upper reaches.

**Work History and Mining Cuts** In 2015, Mr. MacKinnon's activity was focused on the middle reaches of Ruby Creek and operated a one to two-personnel camp. During this time, his mining efforts were focused near his camp on the left limit where thicker gravel and higher grades were encountered. In 2017, mining was focused on the right limit of the Discovery claim.

**Equipment and Water Treatment** Equipment present on site in 2015 included a John Deere 790-LC 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 x 6 ft) sluice run lined with two boil boxes, expanded metal and hydraulic riffles.

**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 (2-3 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 gravel extracted from the base of the unit. The clay unit acts as a false bedrock surface, so no mining occurred below it. Some testing of gravel below the till has occurred, but has not returned favourable results.

Mining upstream on the discovery claim in 2017 targeted a deposit that had not been previously recognized in Ruby Creek. The right limit bank exposes 7.5 m (25 ft) of poorly sorted, weakly imbricated, silty gravel that is overlain by colluviated till. The bottom contact of the gravel was not exposed in the cut and is more oxidized with depth. The better pay was located higher in the section above the zone of oxidation. The gravel consists of 60% clasts (45% pebbles, 45% cobbles, and 10% boulders) and contains abundant subangular Kluane schist fragments. The matrix of the gravel consists of a silty coarse sand. Coarser gold was found in association with the larger boulders. The pay gravel is interpreted as a proglacial outwash gravel, potentially derived from reworking morainal sediment off a small alpine glacier that flowed out of Little Ruby Creek cirque. The poorly sorted nature of the sediment and high silt content suggests that the deposit may in part be morainal in origin.

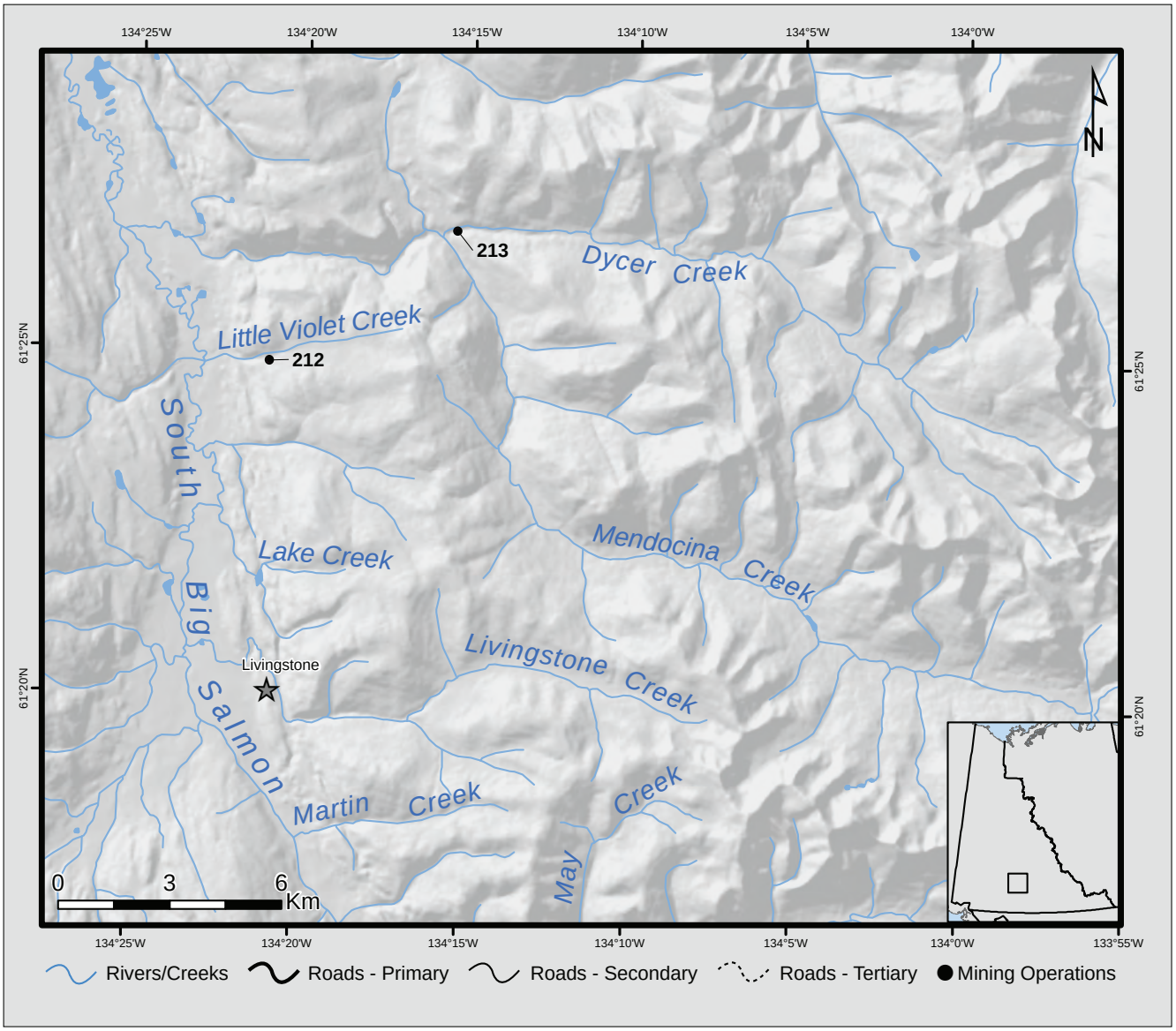
**Bedrock Geology** Bedrock is mapped as Late Cretaceous Kluane muscovite schist (YGS, 2017) and outcrops along the valley side and in the creek in several locations.

**Gold Characteristics** 5% jewelry gold was recovered with rare nuggets that averaged 5 to 6 g. The 2017 cut produced more nuggets than average (30%) and did not contain the magnetite content normally observed farther downstream. The average fineness was 845.

*A close-up view of the right limit back exposure on upper Ruby Creek. This poorly sorted, silty pay gravel may be associated with former alpine glaciation in the drainage.*

# LIVINGSTONE
## PLACER AREA

**SITES 212-213**




**LEGEND**

212. Agamemnon Fishing Co. Ltd.

213. Swaim, S.

## Little Violet, a tributary of South Big Salmon

105E/08 2008: 61°24'51"N, 134°20'60"W

**Agamemnon Fishing Co. Ltd., 1998-2009, 2010-2013**

Water License: PM08-609 (Active 01/2019)
Currently Inactive **Operation no. 212**

**Location** Little Violet Creek.

**Work History and Mining Cuts** No activity has occurred on site since 2013.

**Equipment and Water Treatment** Not reported.

**Surficial Geology and Stratigraphy** The stratigraphic section consists of 9.1 m (30 ft) of till overlying 30.5 m (100 ft) of variable sand and gravel. The lower unit grades from alternating beds of sand and gravel lower down in the drainage to poorly sorted boulder gravel farther up the placer cut. Both deposits are likely associated with ice proximal sedimentation during the last glaciation. The pay gravel included the bottom 3.0 m (10 ft) of gravel and up to 0.6 m (2 ft) of bedrock. Preservation of pre-last glaciation pay gravel in Little Violet Creek is the result of fortuitous glacial history. The Cordilleran Ice Sheet flowed northward down the south Big Salmon River valley and initially dammed Little Violet Creek valley. This resulted in the deposition of glacial lake silt, sand and coarse glacigenic gravel onto the pre-glacial gravel. As the ice thickened and glaciated the entire landscape the pre-glacial pay gravel was protected under the lake sediment from sub-glacial erosion. This is a common general stratigraphy in the Livingstone Creek area. A piece of wood recovered from oxidized sand 55 cm below the McConnell till at the upper end of the placer cut had a non-finite radiocarbon age. This implies that the wood, and interglacial unit it is contained in, is >52,000 years old and likely dates to the last interglacial 100,000 years ago.

**Bedrock Geology** Bedrock is calcite-biotite-schist, amphibolite, gneiss, actinolite-paragonite-calcite-biotite-schist, phyllite, quartzite and ultramafic rocks (YGS, 2017).

**Gold Characteristics** Not reported.

## Dycer, a tributary of Mendocina

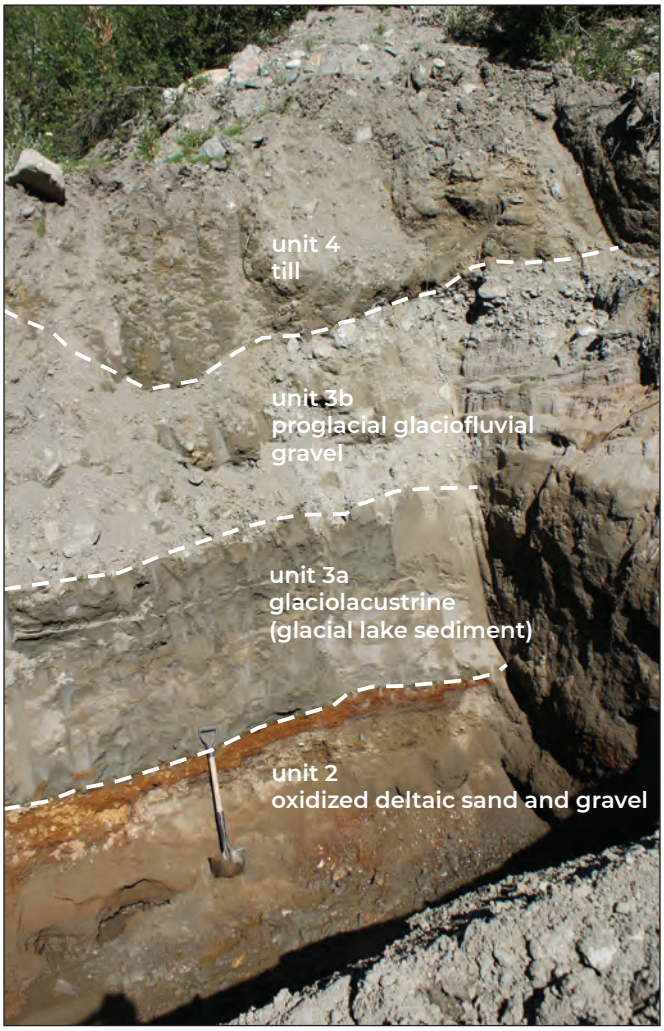
105E/08 2017: 61°26'46"N, 134°15'25"W

**Swaim, S., 1993-2017**

Water License: PM05-497 (Active 10/2018)
Active Producer (2015-2017) **Operation no. 213**

**Location** Dycer Creek, 480 m upstream from its confluence with Mendocina Creek.

**Work History and Mining Cuts** Mr. Swaim has held the property on Dycer and Mendocina Creek since 1993, with 2017 being his first season sluicing material and excavating pay on the right limit of lower Dycer Creek. In 2015, testing occurred farther upstream Dycer Creek, while throughout 2016 a total of 1,000 $yd^3$ was bulk sampled from the lower right limit. Primarily active as a one-person operation, Mr. Swaim employed a second person to assist in opening up ground and sluice material




*Stratigraphic section in a test pit on the right limit of Dycer Creek in a 2017. Units associated with the last glaciation are visible including deltaic sand and gravel, glaciolacustrine and mixed till and proglacial outwash. Pay gravel is preserved under these sediments and in the modern creek gravel.*

during the 2017 season. They focused operations on the lowermost bedrock canyon on Dycer Creek, where the width of the drainage narrows to 25 m (82 ft).

**Equipment and Water Treatment** Equipment utilized in 2017 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. For the testing programs, a juniper box with a ¾" screen and a single sluice run were used to process the gravel at a rate of 12 to 15 $yd^3$ (9-11 $m^3$)/hr. The large wash plant was a screen deck with a hopper able to process up to 30 $yd^3$/hr (23 $m^3$)/hr. Effluent is settled in a series of two ponds and water is 100% recycled.

**Surficial Geology and Stratigraphy** A 10 by 6 m (33 x 20 ft) test pit, on the right limit of lower Dycer Creek consists of five units. Unit 1, at the base of the pit near water level, is a poorly exposed, oxidized, pre-last glaciation gravel that is matrix rich. Unit 2, from 0 to 1 m (3 ft), is a coarsening upward sequence of sand and oxidized pebbly gravel. This unit is interpreted to have formed during the initial stages of ice blockage in the South Big Salmon River valley and may represent a Dycer Creek delta deposit building into a glacial lake in the Mendocina Creek valley. Unit 3a, from 1 to 1.6 m (3-5 ft), is a bedded silt and fine sand that lies in sharp contact with unit 2. This unit is interpreted as a glaciolacustrine deposit that formed when the Cordilleran Ice Sheet blocked Dycer Creek valley to form a glacial lake. As the ice front advanced up Dycer Creek proglacial gravel (unit 3b) was shed off the ice sheet into the lake. Unit 4, from 1.6 to 2.3 m (5-7.5 ft), is an olive-grey basal till that is a cohesive, matrix-supported sandy-silt deposit with 80% matrix and 20% clasts. Clasts are up to 0.5 m (1.6 ft) in diameter. The till lies in erosional contact with the underlying glaciolacustrine unit. Unit 5, from 2.3 to 3.1 m (7.5-10 ft), is a matrix-supported colluvium consisting coarse, angular rock fragments and organic-rich silt. Unit 6 is the modern Dycer Creek gravel that has incised into units 2 to 5. The gravel is clast-supported, poorly sorted, has a coarse

*Drone image looking down Dycer Creek valley towards its confluence with Mendocina Creek in 2017. The excavator on the right limit is the location where Mr. Swaim focused operations. The upper 10 by 6 m (33 x 20 ft) test pit (bottom of the photo) contained the stratigraphy described above.*

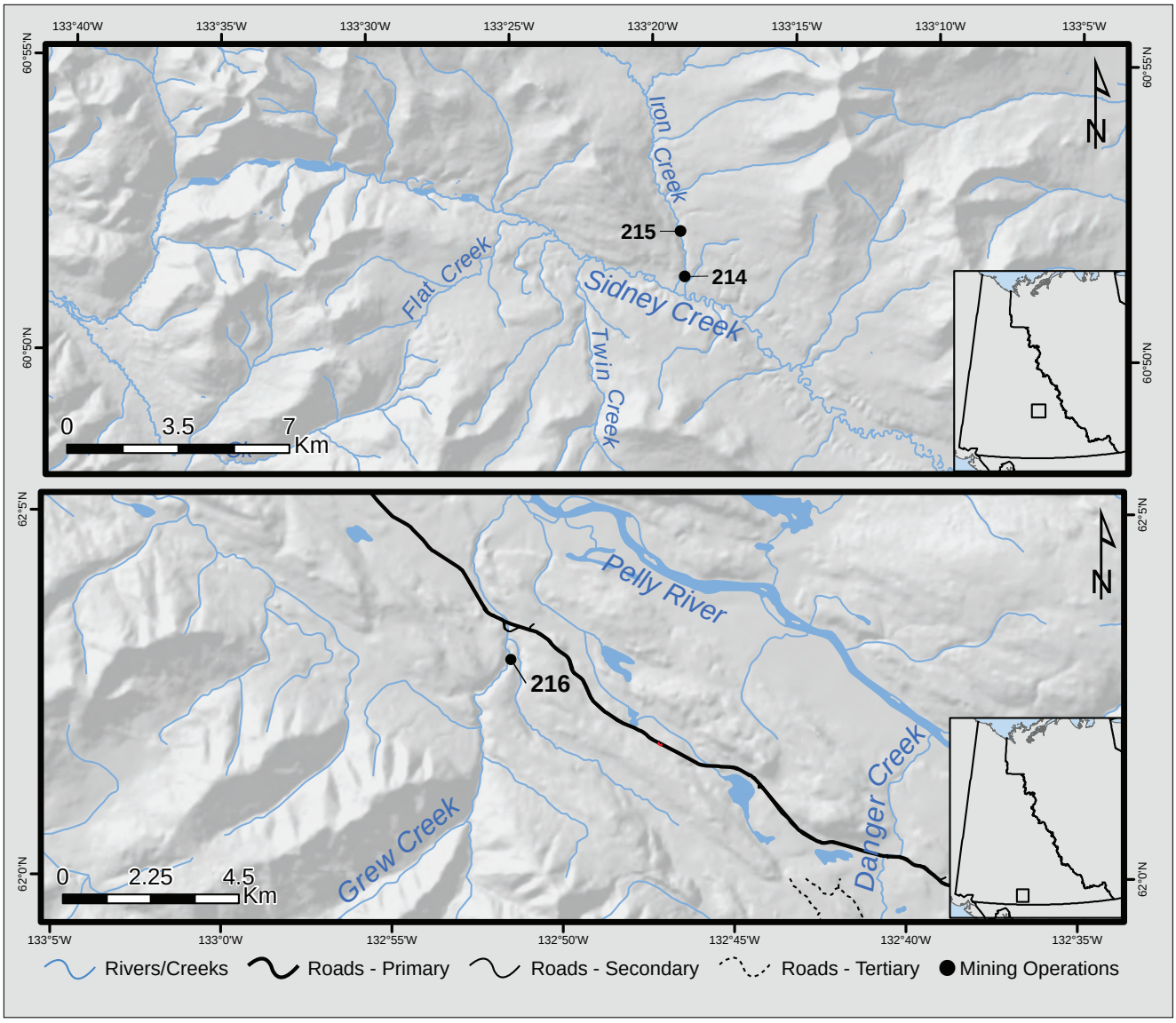
texture with abundant boulders, up to 1.5 m (5 ft) in diameter, and a matrix of coarse to medium sand. The modern gravel represents flood-like conditions in Dycer Creek and was likely highly erosional. Placers have been recovered from both units 1 and 6, the oxidized gravel that preceded the last glaciation and the modern Dycer Creek gravel.

**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. It has a purity of 860. The largest piece of gold recovered by Mr. Swaim in the drainage was 5.5 oz.

# NISUTLIN-PELLY
## PLACER AREA

**SITES 214-216**




**LEGEND**

214. Hrehirchek, D. and Cook, C.
215. Cartwheel Mining
216. Maltby, T. and T.

## Sidney and Iron, a tributary of Nisutlin

105C/14 2017: 60°51'22"N, 133°18'47"W

### Hrehirchek, D. and Cook, C., 2011-2017

Water License: PM07-577 (Active 06/2018)
Water License: PM15-057 (Active 11/2025)
Active Producer (2015-2017) **Operation no. 214**

**Location** Sidney and Iron creeks.

**Work History and Mining Cuts** Mining has occurred primarily on lower Iron Creek, approximately 600 m upstream from its confluence with Sidney Creek. The location targeted for the past few years is an alluvial fan located below the waterfall on the Iron Creek drainage. With up to three operators, Mr. Hrehirchek and Mr. Cook sluice up to 1,000 yd³ of material per season. Exploration has occurred throughout the property, both bulk sampling Sidney Creek and test pitting their upper claims on Iron Creek.

**Equipment and Water Treatment** Heavy equipment utilized at site in 2017 included a Caterpillar 322BL excavator, a Caterpillar D6 bulldozer, a grader, and a double screen deck. The screen deck is 1.5 by 4.2 m (5 x 14 ft) and has 1.5 m (5 ft) wide sluice runs with a boil box, 0.6 m (2 ft) of hydraulic riffles, and 0.9 m (3 ft) of expanded metal. A series of two settlings ponds are used to settle the effluent and there is zero discharge into Sydney Creek. A 6" pump supplies water to the wash plant that can process up to 40 yd³ (30 m³)/hr. A long tom and gold wheel are used for clean-up.

**Surficial Geology and Stratigraphy** At the current mining location on Iron Creek, below the waterfall, an alluvial fan is present. It consists of interbedded lenses of cobble-boulder gravel, sand and pebbly sand, in which the sand lens acts as a false bedrock. Boulders up to 0.6 m (2 ft) are common throughout the lenses of cobble-boulder gravel. In 2017, the uppermost exposed gravel consisted of 5 m (16 ft) of a boulder-cobble gravel having a medium sand matrix. Below the gravel, a substantial lens of silt and fine-grained sand was present. The operator dug another 6 m (20 ft) below the uppermost gravel, but bedrock was not reached. The sluice section focuses on the upper 2 m (6.6 ft) of gravel.

**Bedrock Geology** Bedrock is biotite-schist, amphibolite and gneiss (YGS, 2017).

**Gold Characteristics** Gold is flat and primarily fine, and has a fineness of 850. Below the falls on Iron Creek the gold is fine whereas more nuggets are recovered above the falls.

*Top gravel of the alluvial fan on Iron Creek, located below the falls.*

## Iron, a tributary of Sidney

105C/14 2017: 60°52'08"N, 133°18'57"W

### Cartwheel Mining, 2013-2014, 2016-2017

Water License: PM16-050 (Active 05/2027)
Active Producer (2016-2017) **Operation no. 215**

**Location** Iron Creek, 2 km upstream from its confluence with Sidney Creek.

**Work History and Mining Cuts** In 2013, Mr. Dunne purchased the first claim above the falls on lower Iron Creek. With no work occurring in 2015, a block of four claims were purchased in 2016 and the season was primarily spent establishing access, along with some assessment work conducted on the right limit of the drainage. A water license was issued in the spring of 2017 on lower Iron Creek to Mr. Dunne. Work commenced that spring with ground preparation, and throughout the season, an L-shaped cut 50 m (164 ft)

*Screen deck present on lower Iron Creek in 2017.*


*Mr. Dunne sluicing at his operation on lower Iron Creek in 2017 (Photo credit: S. Dunne).*

long by 8 m (26 ft) wide was mined. Mr. Dunne worked as a one-person operation, and continued to test on both the left and right limits.

**Equipment and Water Treatment** In 2017, equipment utilized on site included a Caterpillar 320C excavator and a vibrating screen deck with a sluice run 0.6 m (2 ft) wide by 4.9 m (16 ft) long. It has a ¾" punch plate and the run configuration consisted of 2.4 m (8 ft) of expanded metal and 2.4 m (8 ft) of angle iron. A 4" pump was utilized to supply the plant with water, which was able to process up to 15 $yd^3$ (11 $m^3$)/hr. Water was 100% recycled. Clean-ups were conducted using a long tom and gold wheel.

**Surficial Geology and Stratigraphy** Lower Iron Creek gravel is a modern creek gravel that has reworked till, either from farther upstream or from preserved benches. The very coarse well-rounded gravel consists of 15-20% boulders, 55% cobbles and 30% pebbles, with the largest clasts up to 1 m (3.3 ft) in diameter. The gravel package is up to 1.2 m (4 ft) thick and is capped by a maximum of 0.9 m (3 ft) of organics and silt.

**Bedrock Geology** Bedrock is quartzite and quartz-muscovite-schist (YGS, 2017).

**Gold Characteristics** Gold is rough and bright, with 60% of it fine and 40% of it coarse. Fineness is 850.


*Section exposing the coarse modern creek gravel of Iron Creek, which have reworked a till (Photo credit: S. Dunne).*

## Grew, a tributary of Pelly

105K/02 2016: 62°02'58.9"N, 132°51'33.4"W

### Maltby, T. and T., 2015-2017

Water License: PM12-060 (Active 12/2022)
Active Producer (2015-2017) **Operation no. 216**

**Location** Grew Creek, approximately 5 km upstream from its confluence with Pelly River.

**Work History and Mining Cuts** The Maltbys purchased the ground from Mr. McCurdy and Mr. Kimpinski in August 2015. For the remainder of the 2015 season they conducted test pitting and set up their operation. Operations in 2016 focused on the right limit bench upstream from their camp location. In 2017 sluicing and stripping on the right limit bench was completed.

**Equipment and Water Treatment** Equipment present in 2016 included a small backhoe and 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** The intermediate bench where mining in 2016 was focused has a thickness of 4.3 m (14 ft), in which all material was sluiced.

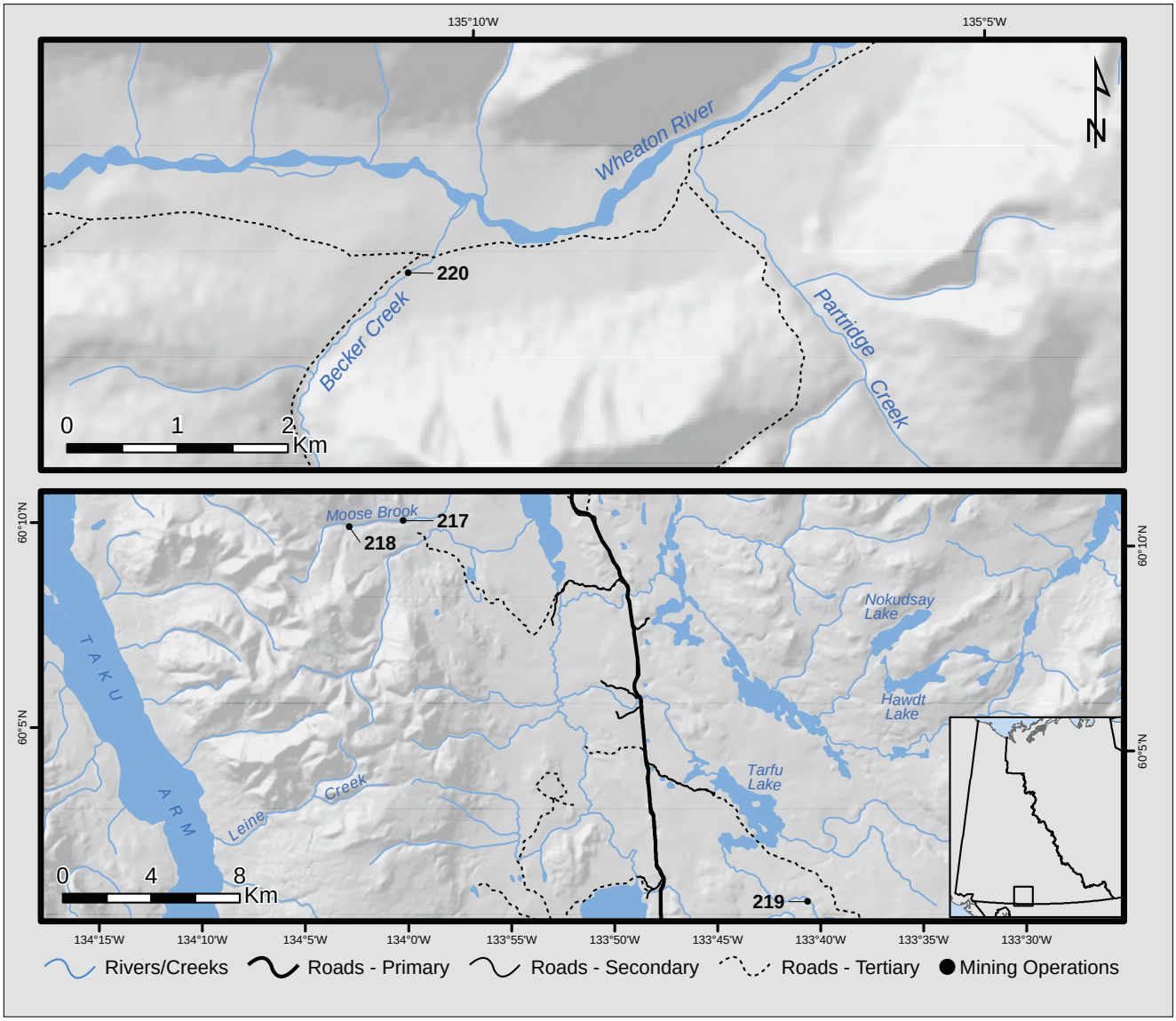
**Bedrock Geology** Bedrock is conglomerate, shale and coal (YGS, 2017).

**Gold Characteristics** Gold recovered is flat and flakey, and has a fineness of 920.


*Stripping that occurred in 2017 on the right limit bench on Grew Creek. The Maltby's plan to extend their current cut on the bench in the following season (Photo credit: Sevn Bohnet).*

# WHITEHORSE SOUTH
## PLACER AREA

**SITES 217-220**




### LEGEND

217. 46007 Yukon Inc.
218. Kabanak, T.
219. Black Mountain Mining
220. Wold, B.

## Moose Brook, a tributary of Little Atlin

105D/01 2015: 60°10'17"N, 134°00'44"W

### 46007 Yukon Inc., 2015

Water License: PM15-018 (Active 07/2025)
Active Producer (2015) **Operation no. 217**

**Location** Moose Brook Creek, southeastern side of Jubilee Mountain, tributary of Little Atlin Lake.

**Work History and Mining Cuts** A new license and mining land use approval was issued to 46007 Yukon Inc. in 2015. They conducted testing and sluiced material throughout the season, but specific work history is unknown. No mining occurred in 2016 and the operation was listed for sale.

**Equipment and Water Treatment** Not reported.

**Surficial Geology and Stratigraphy** Moose Brook Creek is a deeply incised drainage with a width of up to 135 m (443 ft). Sections present near the mouth of the drainage are up to 21 m (69 ft) in thickness.

**Bedrock Geology** Bedrock is breccia and limestone (YGS, 2017).

**Gold Characteristics** Not reported.

## Moose Brook, a tributary of Little Atlin

105D/01 2015: 60°10'06"N, 134°03'21"W

### Kabanak, T., 2013-2017

Water License: PM12-019 (Active 08/2023)
Active Producer (2015-2017) **Operation no. 218**

**Location** Moose Brook Creek, upper; tributary of Little Atlin Lake.

**Work History and Mining Cuts** Mr. Kabanak has been actively mining on upper Moose Brook Creek since 2013, and in 2015 he continued stripping and preparing cuts for sluicing. Activity in 2016 and 2017 included test pitting, drilling and cut preparation. Activity occurred on his lowermost claim, which is located 1.3 km downstream from the confluence of the upper forks of Moose Brook Creek.

**Equipment and Water Treatment** Equipment present on site in 2016 included a small backhoe, bulldozer, small sluice and a Derocker wash plant. Effluent is settled using a natural depression in the creek valley.

**Surficial Geology and Stratigraphy** Not reported.

**Bedrock Geology** Bedrock mapped as breccia and limestone (YGS, 2017).

**Gold Characteristics** Not reported.

*46007 Yukon Inc.'s inactive property on Lower Moose Brook Creek. The view is looking downstream towards the east.*

## Unnamed, a tributary of Tarfu Lake

105C/04 2017: 60°01'11"N, 133°40'38"W

### Black Mountain Mining, 2010-2017

Water License: Class 1 (P 509708)
Active Producer (2015-2017) **Operation no. 219**

**Location** Unnamed tributary south of Tarfu Lake; 5.2 km from the unnamed tributary confluence with Tarfu Lake.

**Work History and Mining Cuts** Permitted as a class 1 operation, Mr. Guidolin has focused on exploration throughout 2015 to 2107. In 2016 and 2017, a drilling program was conducted on the left limit of the drainage to determine the extent of the gravel in relationship to a bedrock outcrop.

**Equipment and Water Treatment** Equipment utilized at the operation included a Caterpillar 304 excavator, which was 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 measured 1.2 by 2.1 m (4 x 7 ft) with ¾" riffles, and with a two-run secondary sluice, each 0.6 m (2 ft) wide by 3.0 m (10 ft) long. Sluice configuration in the secondary run consisted of ¾" riffles, expanded metal and nomad matting. A new wash plant was being fabricated in 2017. Water was obtained from the drainage using 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** Black Mountain Mining has been exploring the placer potential of the unnamed tributary of Tarfu Lake, which is situated in a glaciofluvial meltwater channel. Investigations of the drainage has included bulk sampling several locations, including in areas where the channel widens and along bar deposits. The bar deposit formed where meltwater flow becomes unconfined near the mouth of a canyon. The sedimentology of the bar consists of near surface, massive and crudely-bedded gravel up to 4 m (13 ft) thick. All gravel is sluiced.

**Bedrock Geology** Bedrock is chert-siltstone.

**Gold Characteristics** Gold varies from subround to subangular and between 40 to 60 mesh. Rare larger pieces are up to 6 and 8 mesh.

*Test pit in the glaciofluvial bar deposit exposed in 2017.*

## Becker, a tributary of Wheaton

105D/03 2015: 60°13'28"N, 135°10'32"W

### Wold, B., 2010-2017

Water License: Class 1 (P 50592)
Active Producer (2015-2017) **Operation no. 220**

**Location** Becker Creek, 900 m upstream from its confluence with Wheaton River.

**Work History and Mining Cuts** Mr. Wold holds two claims on lower Becker Creek, which is a right limit tributary to the Wheaton River. He has been actively exploring the lower reaches of the drainage under his Class 1 mining land use permit since 2010. The majority of activity has occurred on the lowermost claim, where test pits are worked in an alluvial fan deposit. As a one-person operation, Mr. Wold hand-sluices material

into his custom-built screen deck. A large test pit, measuring 2.6 by 3.8 m (8.5 x 12.5 ft), was completed in 2015. In 2016 and 2017, prospecting occurred which included several test holes measuring 0.6 by 0.6 by 0.6 m (2 x 2 x 2 ft). A Minelab Gold Monster 1000 metal detector was purchased in 2017 to further execute exploration on Becker Creek. Minimal activity occurred on the creek in 2016 and 2017.

**Equipment and Water Treatment** As a grassroots exploration program, small-scale mining equipment was present on site in 2017. A pick and shovel were used to excavate the test holes and remove the sluiceable material. Gravel was sluiced in a custom fabricated zig-zag screen plant with two sluice runs. A mucking bin fed a 1" screen, then ¼" screen; material between 1" and ¼" was processed in a 0.2 by 0.9 m (0.6 x 3 ft) side sluice with 0.5 m (1.6 ft) of 1½" expanded metal and nomad matting. Material smaller than ¼" was sluiced in a 0.3 by 2.4 m (1 x 8 ft) sluice run with 1.9 m (6.2 ft) of 1" expanded metal on nomad matting, reducing to a Keen A52 hand sluice with factory riffles on nomad matting. The wash plant was able to process 0.5 $yd^3$ (0.4 $m^3$)/hr, supplied with water at 114 igpm with a 2" Honda 120 4HP pump powered by a gasoline engine. Water was acquired from Becker Creek and settled out of stream in a series of two ponds prior to being returned to Becker Creek. A gold bowl/Vortex concentrator and gold pan were used for clean-ups.

**Surficial Geology and Stratigraphy** The placer deposit tested by Mr. Wold on Becker Creek is an alluvial fan. Due to the limitations of hand-mining, the depth to bedrock is unknown. All fine gold is derived from the toe of the fan whereas coarser gold is derived from the fan apex. Fan terraces are also present near the apex that contain coarser gold.

Close to the toe of the fan, the gravel is matrix-supported, moderately sorted, compact, and consists of 10% boulders, 50% cobbles and 40% pebbles. The coarse gravel contains medium to coarse sand matrix. Clasts are subround, and boulder and large cobble enrichment is present on the bedrock contact. The largest clast is approximately 0.5 m (1.6 ft) in diameter. All gravel was sluiced. In the current area of activity, there is an abundance of black sand, which could indicate the targeted gravel is a higher energy gravel that was deposited in a flood environment, and cut into the fan deposit.

**Bedrock Geology** Bedrock is biotite-muscovite-quartz-schist, garnet-quartzite, and calcite-biotite-orthogneiss (YGS, 2017).

**Gold Characteristics** Gold is very fine.

*Mr. Wold excavating his 2.6 by 3.8 m (8.5 x 12.5 ft) test pit in the Becker Creek alluvial fan in 2015.*

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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 |

## Fineness of yukon placer gold

| 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<br>= 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<br>= 3 ft |
| 1 mile | = 1.609 km<br>= 1760 yd |

| AREA | |
|---|---|
| 1 hectare | = 2.471 acres |
| 1 acre | = 0.405 hectare<br>= 4,840 $yd^2$ |
| 1 square yard | = 0.836 $m^2$ |

| VOLUME | |
|---|---|
| 1 litre (l) | = 1 000 millilitres (ml)<br>= 1 000 litres<br>= 0.21998 gallon (Imp.)<br>= 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<br>= 20 pennyweights<br>= 480 grains |
| 1 pennyweight | = 24 grains |
| 1 grain | = 0.06479 g |
| 1 gram (g) | = 15.43 grains |
| 1 avoirdupois pound | = 16 avoirdupois ounces<br>= 0.454 kg |
| 1 avoirdupois ounce | = 28.35 g |
| 1 kilogram (kg) | = 32.15 troy ounce<br>= 1 000 g<br>= 2.205 pounds (lbs) |
| 1 long ton | = 2,240 lbs |
| 1 short ton | = 2,000 lbs |
| 1 tonne | = 1.102 short tons<br>= 2,204.62 lbs |

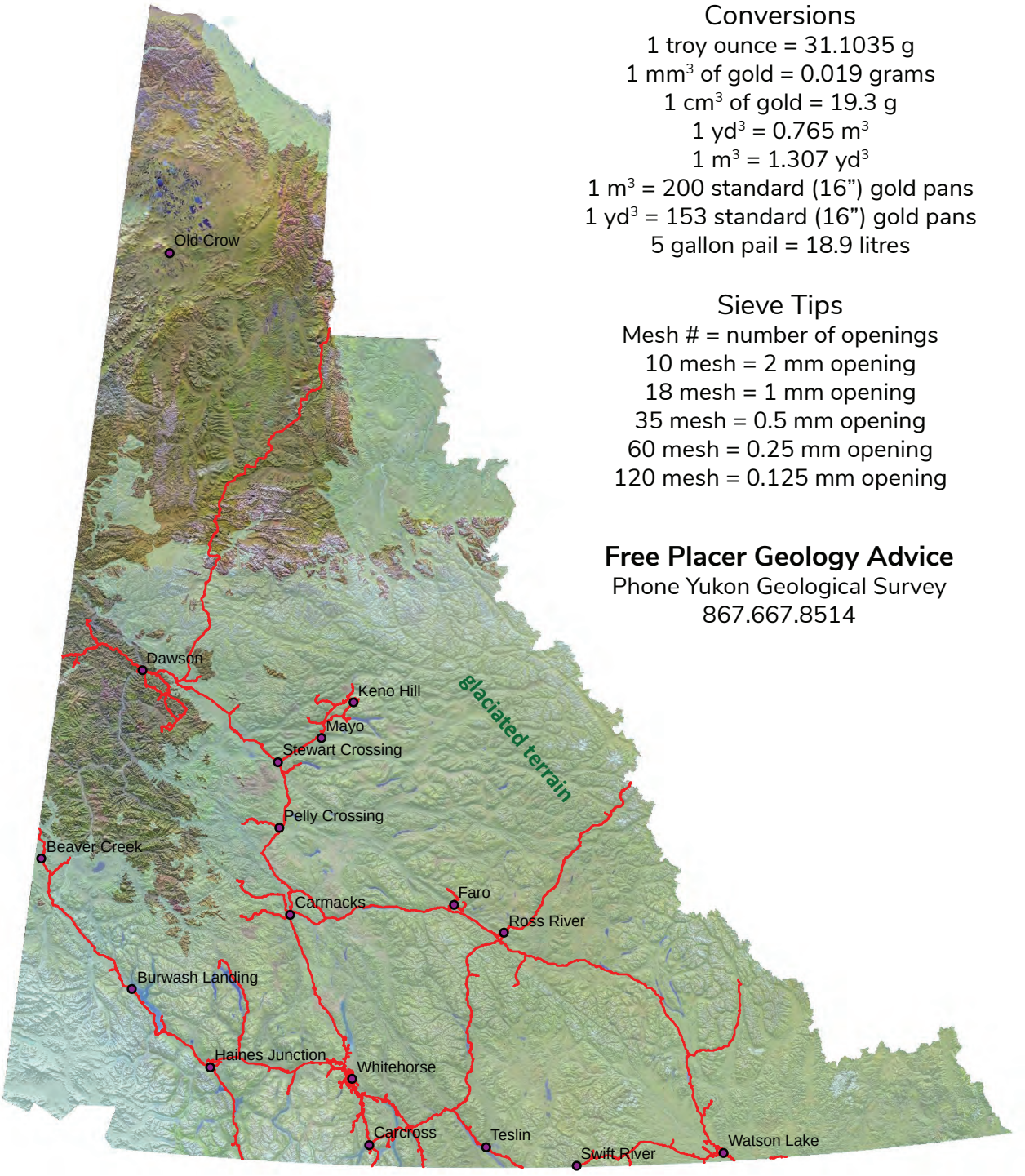
| WEIGHT PER VOLUME CONVERSION | |
|---|---|
| 1 ounce/cubic yard | = 40.68 $g/m^3$ |
| 1 ounce/ton | = 34.2848 g/tonne |

| 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<br>= 10 inch diameter bottom<br>= 2.5 inch depth<br>holds 0.007 $yd^3$ or 0.005 $m^3$<br>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<br>garnet<br>magnetite<br>pyrite<br>quartz | = 15.6 to 19.3<br>= 3.56 to 4.32<br>= 4.9 to 5.2<br>= 4.0 to 5.2<br>= 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 |




## Conversions

1 troy ounce = 31.1035 g
1 $mm^3$ of gold = 0.019 grams
1 $cm^3$ of gold = 19.3 g
1 $yd^3$ = 0.765 $m^3$
1 $m^3$ = 1.307 $yd^3$
1 $m^3$ = 200 standard (16") gold pans
1 $yd^3$ = 153 standard (16") gold pans
5 gallon pail = 18.9 litres

## Sieve Tips

Mesh # = number of openings
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