

Yukon Placer Mining Exploration and Development Overview 2015

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Yukon Geological Survey

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INTRODUCTION

Placer gold development across all of Yukon's placer districts remained healthy in 2015. The decline in the price of gold had little effect on the industry due to the offset of a lower Canadian dollar and a lower diesel price. The Canada-US exchange rate added 25% for an ounce of gold in Canadian dollars; whereas bulk fuel prices were 20-30% lower than in 2014. This is a significant saving since fuel consumption accounts for approximately 30% of mining costs.

Placer exploration was vibrant in all districts. Fifteen projects received funding through the Yukon Mining Exploration Program (YMEP). YMEP investment into placer in 2015 totalled \$417 000 and leveraged an estimated \$1.25 million dollars in spending in Yukon communities.

CLIMATE FOR MINING

The 2015 mining season got an early start with unseasonably warm weather. In Dawson City, the average maximum daily temperature during May was 21.6°C and the average minimum temperature was 2.6°C. The average maximum temperature remained unchanged through June and July for Dawson City. Late season sluicing near Dawson City got off to a cold start with temperatures dropping below -7°C during the first week of October. Fortunately, minimum temperatures improved between October 9th and 26th with the average low equalling -1°C. Early season snow and cold had a greater effect on higher elevation mines located in Kluane and Keno City.

Precipitation was in short supply at the start of the season due to the warm temperatures. This primarily impacted mines drawing from small catchments. For the months of May and June a total of 15 mm of precipitation was measured in Carmacks, which severely limited stream flows in the Nansen district and limited early season production. Precipitation increased in all districts during the month of July.

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GOLD PRODUCTION SUMMARY

Yukon placer gold production for the reporting period of May 1st to December 15th, 2015 was 59,830 crude ounces for a value of CDN \$70.3 million (Fig. 1). This is the highest reported number of ounces recovered in the last 8 years, and when adjusted for inflation, the highest value since 1989. The total number of active operations in 2015 was 163; down slightly from 171 operations in 2014.

REGIONAL PRODUCTION SUMMARIES

The regional summaries provide a production overview (Fig. 2) from the various drainages and districts throughout Yukon. Production is reported in crude ounces from royalty figures from May 1st to December 15th, 2015.

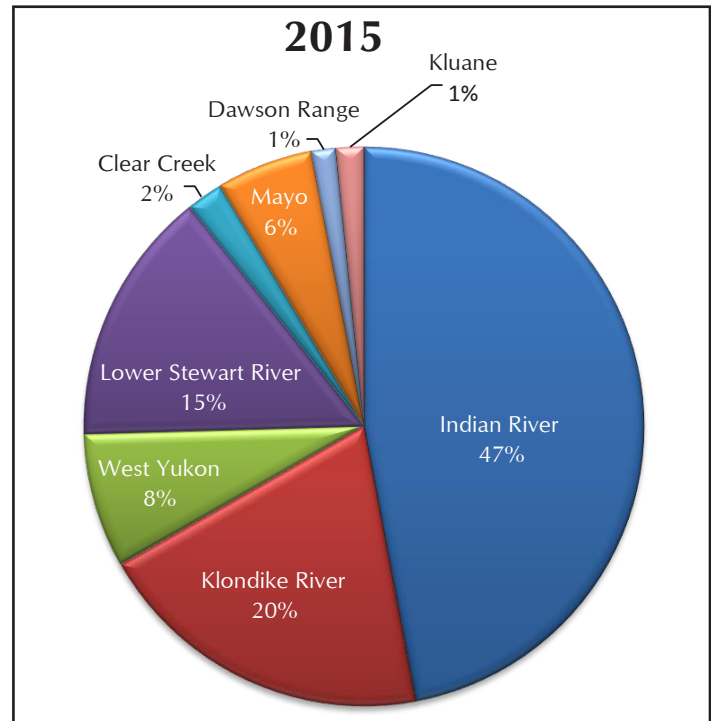


Figure 2. A pie chart illustrating production from the various regional placer districts in Yukon. Unglaciated districts account for 90% of the placer gold production and include Indian River, Klondike River, West Yukon and Lower Stewart River.

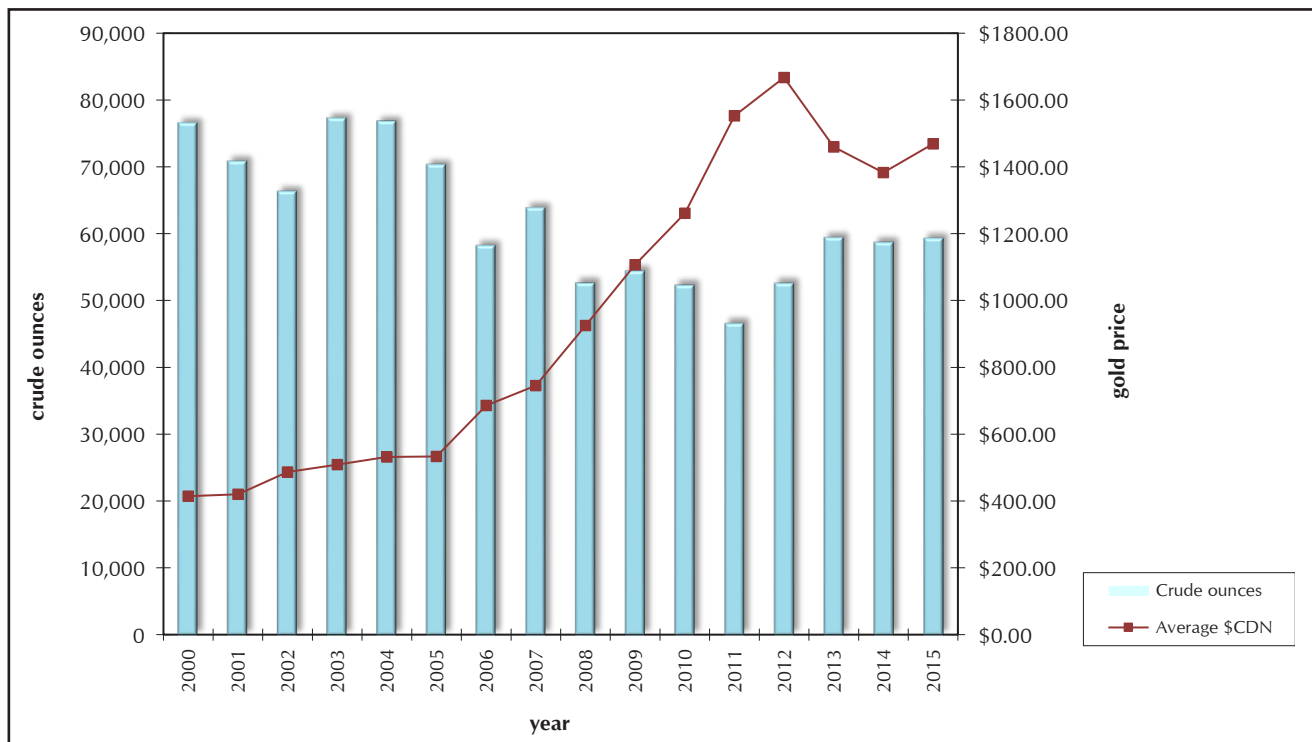


Figure 1. A chart illustrating both Yukon placer gold production and gold price in Canadian dollars for the past 15 years. The recent upswing in the gold price is attributed to the decline in the Canadian dollar relative to the US dollar. Production in 2015 is expected to exceed 60,000 crude ounces as the winter royalty reporting season continues.

INDIAN RIVER

Production of placer gold from the Indian River drainage totalled 26,129 ounces in 2015 and accounted for 47% of the total production in Yukon (Fig. 2). Increase in production occurred in the Indian River and Eureka Creek, whereas production decreases were noted from Quartz and Gold Run creeks. More than 10,000 ounces was produced from the Indian River (excluding tributaries), which was the highest production value for all Yukon placer streams in 2015.

Fine Gold Resources claimed the honour of having the highest production from a single property in 2015. Their operation on Eureka Creek exploited numerous targets including confluence zones with the Indian River, right-limit valley bottom side pay, gulch-like settings at the headwaters of Eureka Creek and a left limit bench deposit. Two large cuts were mined on the left limit bench, confirming geophysical interpretations of a 5 km-long buried channel deposit (Fig. 3). This deposit represents one of the largest unmined targets in the Klondike.

The renewal of dredging operations by Tamarack Inc. on the Indian River was a significant highlight in 2015 (Fig. 4). The dredge operated on the Indian River below Eureka Creek and processed 100 cubic yards for every 10 gallons of fuel per hour, making it one of the most efficient placer operations in Yukon.

An unusual deposit was exploited on Gold Run Creek in 2015. T.D. Oilfield mined a floodplain deposit under a rockslide of unknown age. Old timers had previously mined underground to access the deposit and an estimated 70% of the gold had been recovered. The landslide toe was mined by stripping off the weathered rock overburden to reach the buried floodplain. The placer gold grains were reported to be more round and smooth in the buried floodplain deposit compared to the modern active channel.

Production began on June 1st at M2 Gold's property located on the incised meanders of the lower Indian River. Out-of-stream mining occurs on modern point bars and paleo-point bars preserved as terraces. The first strip mined along the edge of the point bar in 2015 measured 46 by 1219 m (150 by 4000 ft).



Figure 3. View of Fine Gold Resources 2015 pit on the left limit bench channel of Eureka Creek. The cut consists of 16.5 m (54 ft) of gravel overlain by 9 m (30 ft) of silt (loess). Both units are frozen. The bedrock surface continues to dip into the face and the full width of the channel has not been exposed.



Figure 4. An aerial view of the former Queenstake dredge now operating on the Indian River by Tamarack Inc. Dredging is regarded as one of the more environmentally friendly mining methods, specifically pertaining to fuel consumption, sediment discharge and on-going reclamation.

KLONDIKE RIVER

Production from the Klondike River drainage dropped slightly from 12,184 crude ounces in 2014 to 10,988 crude ounces in 2015. Klondike River production accounted for 20% of the total Yukon production (Fig. 2). The top producing drainage from the Klondike River was Last Chance Creek where 2,850 crude ounces was reported. This included contributions from a variety of geological settings such as a left limit intermediate-level terrace, colluvial deposits on the rim of Dago Hill and valley bottom deposits. Bonanza Creek had the second highest production with 2,165 crude ounces produced from 18 separate mines. Production from Adams Gulch was reported separately and totalled more than 500 ounces, which is twice the production from 2014. Production from Hunker Creek was strong and more than 2,000 ounces were produced from high-level bench deposits and 1,500 ounces produced from valley bottom claims (Fig. 5). This included Tatra Ventures operation near the mouth of Last Chance Creek that successfully demonstrated the potential of re-mining dredged ground (Fig. 6).

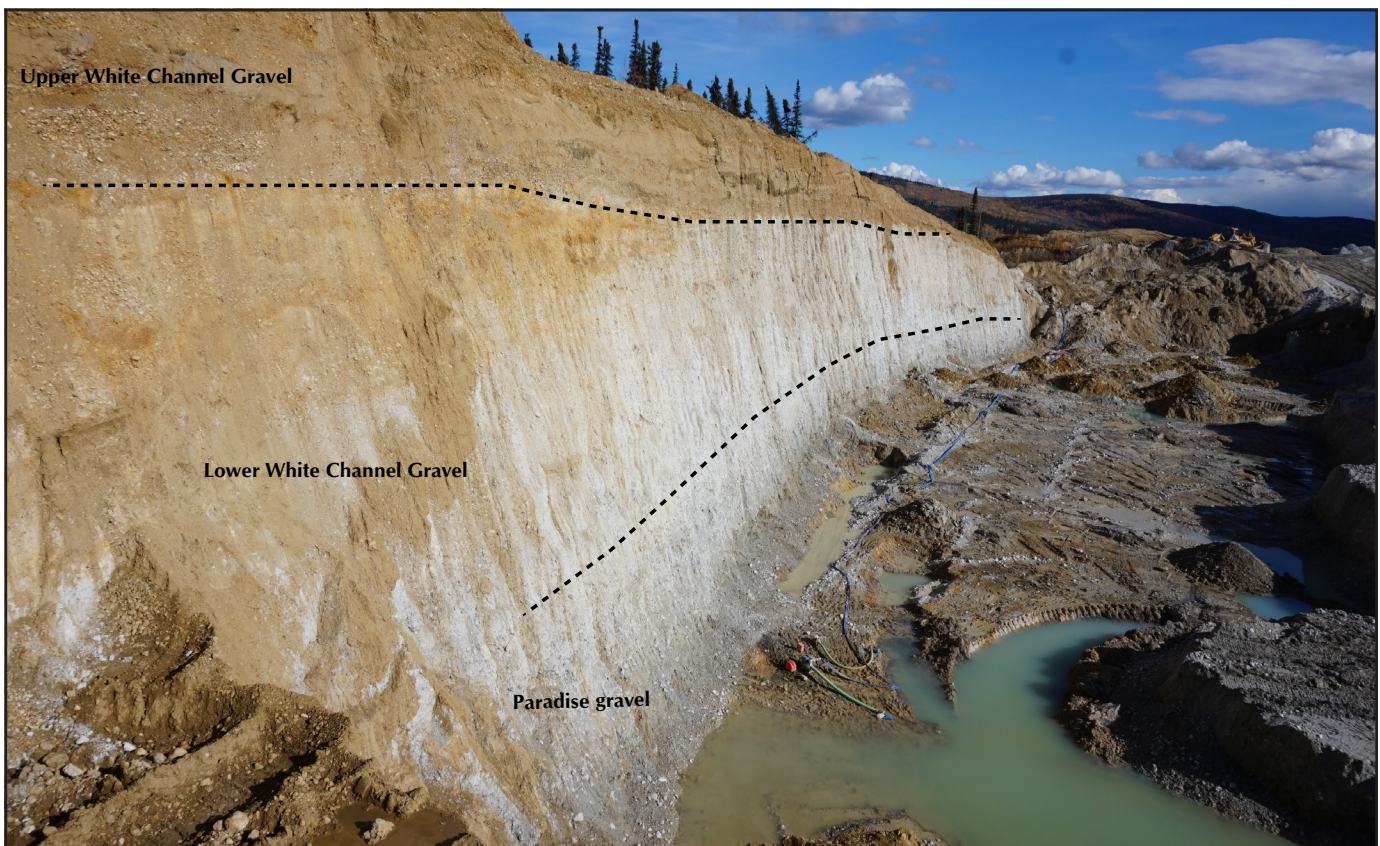


Figure 5. A view to the east of the bench gravel deposit on Preido Hill that is mined by Moonlight Mining. The section measures 21 m (69 ft) in height. The general stratigraphy consists of Paradise Gravel at the base that is overlain by lower White Channel and upper White Channel gravel. Only the Paradise Gravel and top of bedrock is processed for placer gold.



Figure 6. A view of virgin Hunker creek gravel preserved under the tailings stacker of Dredge 11 at the mouth of Last Chance Creek. Tatra Ventures was successful in discovering significant areas of virgin gravel on bedrock in an area that appeared to have been mined out. Their program highlights the potential of working within the dredge limits elsewhere in the Klondike.

LOWER STEWART RIVER

Mining operations in the vicinity of the lower Stewart River produced 8,195 crude ounces in 2015, for a total of 15% of the Yukon production (Fig. 2); this is up by 1,600 crude ounces from 2014. Black Hills Creek continued to produce the most gold in the area with a total of 2,460 crude ounces reported from 6 operations. Production also increased in Henderson Creek, Maisey May and Scroggie creeks, whereas production decreased slightly from Kirkman and Thistle creeks. Schmidt Mining wrapped up work on Thistle Creek in 2015 and in mid-season moved their operation over to Barker Creek near the Dixie Bench (Fig. 7).



Figure 7. An aerial view of Schmidt Mining's operation on Barker Creek near the mouth of Dixie Creek. Their 2015 cut is located upstream of the old-timer workings on Dixie Bench. The processing plant is located between the mine cut and settling pond.

WEST YUKON-FORTY MILE, SIXTY MILE AND MOOSEHORN

Gold production from placer operations west of the Yukon River increased slightly in 2015 to 4,318 crude ounces for a total of 8% of Yukon production. This remains below the 2010 to 2013 values that ranged between 5,500 and 7,000 crude ounces. Most of the production occurred from low terraces on the Sixty Mile River where Hawk Mining was active. Consistent production was noted from the Miller Creek left limit bench (Miller Creek Mining) and Kate and Kenyon creeks in the Moosehorn Range (Moosehorn Exploration). Production decreases were noted from Matson Creek where the operation shut down and on Ten Mile Creek. Mining on Cheryl Creek, a tributary to 50 Mile Creek, moved past the exploration stage and into development (Fig. 8).

CLEAR CREEK AND MAYO

Placer gold production from the Clear Creek area was consistent with previous years at 1,170 crude ounces reported in 2015. A highlight from Clear Creek was the re-opening of the Barlow Creek mine after a two year hiatus in production.

Placer mining in the Mayo district increased by 30% in 2015 to 3,109 crude ounces and accounted for 6% of the total production in Yukon. This is the highest production value since 1998. A large part of the boost in production is attributed to a new discovery on Granite Creek in the Gustavus Range southeast of Keno City. In this alpine setting, gold is mined from a re-concentrated McConnell end moraine (Fig. 9). Production was also strong from Davidson Creek where Coulee Resources continued to mine above the bedrock canyon. Mining resumed on Seattle Creek, a tributary to the south McQuesten River, after the property changed hands and miners formerly operating in the Caribou District of BC re-established camp, cleaned up the site and initiated production.



Figure 8. An aerial view to the southeast over P. Joseph's operation on Cheryl Creek. The placer gold is contained within a boulder-rich gravel containing magnetite. In general, the right-limit of the creek contains more gold than the left-limit in this area of the valley.



Figure 9. An aerial view to the west of Granite Creek in the Gustavus Range near Keno City. Mining is focused immediately downstream of an end moraine deposited from an alpine glacier during the McConnell glaciation (dashed line marks the base of the moraine ridge). The deposit consists of outwash gravel derived from reworking the end moraine and recessional moraines farther up-valley. Photo courtesy of William Leary.

DAWSON RANGE

Dawson Range activity includes mines in the Freegold Mountain, Mount Nansen and Casino areas. Production from this area decreased by nearly 50% in 2015. This is mainly attributed to a decrease from Guder Creek, Nansen Creek and Klaza River. After following up on a 2014 auger drilling program A-1 Cats did significant development work on Back Creek. The focus of the 2015 project was to test for a pre-glacial target under the Pleistocene morainal sediment. Remnants of the pre-glacial channel were intersected; however, production focused on a younger, post-glacial gravel (Fig. 10). Activity on Canadian Creek has been reinitiated by L. Olynyk and is expected to be in production for 2016.

KLUANE

Placer Gold production increased from the Kluane district largely due to reinitiated production on Gladstone Creek. In 2015, 880 crude ounces of placer gold is reported to have been mined from the district, which is up by 300 crude ounces from 2014. Mining on Gladstone Creek by Tic Exploration focused on left-limit side pay where a coarse boulder-rich gravel overlies a false-bedrock of consolidated till.



Figure 10. A view to the east over Back Creek in the Mount Nansen mining district. Initial excavations by A-1 Cats in 2015 focused on the left limit searching for a pre-glacial gravel on bedrock under a layer of early Pleistocene till. Remnants of the pre-glacial gravel were discovered closer to the valley center-line and a post-glacial gravel became the mining focus later in the season.

EXPLORATION HIGHLIGHTS

DOMINION CREEK - GIMLEX

Gimlex completed an auger drilling program on Dominion Creek near Granville in 2015. Utilizing an 8-inch diameter auger, a total of 65 holes were drilled on the left limit of Dominion Creek near the south edge of the miners ditch. Drilling successfully outlined a placer gold deposit measuring 79 by 762 m (260 by 2500 ft), which could be mined over 2 to 3 seasons. Depth to bedrock ranges from 7.5 to 16 m (25-52 ft) and averages about 9 m (30 ft). Gravel thickness ranges from 3.6 to 12 m (12-40 ft) and averages about 6 m (20 ft). Gold recovered is mainly fine-grained but several small nuggets were found. Additional drilling is planned to further understand the distribution of gold in the gravel section and to potentially increase the mineable area. This program was supported through YMEP.

AUSTRALIA CREEK – BILL HARRIS

Exploration continued in 2015 in Australia Creek, a tributary to Indian River. This large property consists of 60 creek claims, two 5-mile creek leases and two 5-mile bench leases. Well-defined benches border the left limit of the creek and these together with the valley bottom floodplain were the focus of exploration (Fig. 11). Following a drill program in 2014, exploration during the 2015 season focused on excavator trenching and mini-bulk sampling on the left limit near a bedrock exposure. Additional exploration trenching is planned for the 2015-2016 winter season.



Figure 11. A view looking east up Australia Creek from an intermediate level terrace. The valley bottom is visible in the distance. Thawed outwash gravel is present on the surface of the terrace. This coarse gravel was deposited when runoff from the early Pleistocene Cordilleran Ice Sheet flowed into the drainage from the Stewart River. During this process the outwash reworked pre-glacial gravel. It represents one of many placer targets in this broad valley.

BIG ALEX BENCH – WOLFHEAD MINING AND DISCOVERY

Wolfhead Mining and Discovery continued exploring the Big Alex Bench near the Klondike Highway and Clear Creek (Fig. 12). This program was the largest placer exploration program in Yukon and included sonic drilling, resistivity geophysics, road construction and staking of 119 hardrock claims. Mud Bay Drilling, using a Boart-Longyear tracked sonic drill, completed 914 m (3000 ft) of reconnaissance drilling in 17 holes ranging in depth from 12 to 107 m (40 to 350 ft). The geological interpretation and sampling were overseen by W. LeBarge of Geoplacer Exploration.



Figure 12. Dave Johnson, Bill LeBarge and Rod Hunt (L to R) of Wolfhead Mining and Discovery sample and describe the stratigraphic units contained within their sonic drill core.

LOWER CLEAR CREEK – YUKON EXPLORATION GREEN GOLD INC.

Exploration on lower Clear Creek focused on investigating both high-level and valley bottom targets (Fig. 13). The 2015 project consisted of excavator test pitting, auger drilling and sampling above the Clear Creek bridge. This program was funded with assistance from YMEP.

TRIBUTARIES TO 60 MILE RIVER – YUKON EXPLORATION GREEN GOLD INC.

Exploration on California Creek and an unnamed left limit tributary to the Sixty Mile River consisted of test pitting and drilling. Coarse gold was recovered on both properties and as a result initiated work to submit water license applications.

SEYMOUR CREEK – DEREK DODGE

Derek Dodge shifted his focus from Guder Creek to Seymour Creek in 2015 with the purpose of mining a relatively shallow right-limit cut and exploring for the deep channel. A refurbished Bucyrus-Erie cable tool rig was used to drill a series of holes testing a resistivity target (Fig. 14). The location of the channel was verified at a depth between 27 and 30 m (90-100 ft) and the cable tool rig allowed for accurate sampling of the pay interval. Additional drilling, using a Boart-Longyear sonic drill, is planned for 2016. This program was supported by YMEP.



Figure 13. Sandro Frizzi of Yukon Exploration Green Gold Inc. surveys lower Clear Creek from high benches bordering the valley.

STEAMBOAT BAR – GARY LEE

A program of shallow shafting and sample processing was completed on Steamboat Bar, Stewart River. The property encompasses ground that was previously dredged (Fig. 15) in the early 1900’s by William Ogilvie. Evidence of old-timer shafting and a drain, possibly dating to the late 1800s, are also present on the property.



Figure 14. A view of Derek Dodge’s refurbished 1950s-vintage cable tool rig on Seymour Creek. Drilling the 6” cased holes was slow (5-7 days per hole), but was able to accurately delineate a channel at approximately 27 m (90 ft) depth. The rig was also able to sample the pay zone in 30 cm (1 ft) intervals helping to define the gold distribution.



Figure 15. Gary Lee surveys William Ogilvie's dredge tailings on Steamboat bar on the Stewart River. Investigations suggest two different dredges operated on the margin of the point bar in the early 1900s following successful hand-mining in the late 1800s. One of the dredges was later moved to Hight Creek in the Mayo District in 1919.

