

**FINAL REPORT ON**

**YMEP 2020-083**

**on**

**SULPHUR CREEK PLACER PROPERTY**

By

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and

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Geoplacer Exploration Ltd.

For

Grim Estates Ltd.

Location of centre of property: 63°42'11"N; 138°47'20"W

NTS map sheet: 115O/10

Mining District: Dawson

Date: January 12, 2021

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## Executive Summary

The following is the final report for grant YMEP2020-083 on the Sulphur Creek placer property, for Grim Estates Ltd. The property is located in the main valley of Sulphur Creek, 8 km upstream of its confluence with the Indian River. Access to the property can be gained by summer road from Dawson City via Hunker Creek and Sulphur Creek, a total distance from Dawson City of approximately 72 kilometres.

Sulphur Creek has been mined since the beginning of the Klondike Gold Rush in 1898. Gold production from many sources shows a total of over 355,000 ounces produced from Sulphur Creek between 1940 and 2019. YCGC conducted placer drilling programs on Sulphur Creek between 1935 and 1955, and their results which overlap the project area show that there are several areas outside of the dredge limits where there may be potentially economic remnant placer gold deposits.

The 2018 placer exploration program consisted of 4 resistivity lines totalling 654 m, and 45 auger drill holes totalling 1453 ft. (443 m), as well as a large test mining cut. Two pits were mined in 2019. One pit was stripped and mined on the left limit upstream of the 2018 mining pit, and one pit was mined on the downstream right limit bench. Some significant gold values were found beneath thawed dredge tailings and underlying the bypass drainage channel, which appeared to be constructed on top of unmined virgin pay gravels.

In both 2019 and 2020, Tusk Exploration Ltd., under the direction of Pete Wright, partnered to undertake stream channel restoration and environmental clean-up activities with international NGO Resolve, under their Salmon Gold initiative. The Salmon Gold initiative supports concurrent, symbiotic gold mining and environmental reclamation of mine tailings at qualified mine operations. Ethically-recovered gold is sold to prominent companies such as Tiffany's and Apple Computer. With the support of the Salmon Gold initiative, highly-disturbed sections of the Sulphur Creek channel was restored to higher environmental standards.

YMEP-funded exploration in 2020 on the property claims consisted of drill road construction, claim location surveys, two drone surveys, two RAB drill holes (67 ft.) and nine auger holes (360 ft.).

The claim location surveys appear to show that the claims (posts on the ground) are shifted nearly one full claim upstream compared to the Government maps. This has implications for both the true locations of the historic YCGC drill holes and shafts, and any future mining of the property. It is therefore recommended that a legal survey or official mine inspection be conducted on the project area.

The RAB and auger drill programs gave encouraging gold results, and it appears that the drill holes encountered a zone of virgin pay gravels and poorly-dredged bedrock. Given the promising results it is recommended that a series of cross-valley test pits should be excavated in both upstream and downstream directions. Test pit planning would be facilitated by concurrent geophysical resistivity surveys. The stratigraphy of the test pits should be noted especially where it appears there is virgin gravels present. If sufficient pay material is delineated, full-scale mining of the area should be initiated.

## **Introduction**

The following is the final report for grant YMEP2020-083 on the Sulphur Creek placer property, for Grim Estates Ltd. This property previously received support from the YMEP program in the form of Grant #YMEP18-010, in 2018.

## **Location and Access**

Sulphur Creek is a right limit tributary of the Indian River, located in central Yukon approximately 60 km by air south of Dawson City, Yukon (Figure 1). The Sulphur Creek Placer Property is located in the main valley of Sulphur Creek, approximately 8 km upstream of its confluence with the Indian River.

The centre of the property is 63°42'11"N and 138°47'20"W, on NTS map sheet 1150/10, in the Dawson Mining District (Figure 2).

Access to the property can be gained by summer road from Dawson City. The usual route runs from Dawson City along the Klondike Highway, then along Hunker Creek to King Solomon Dome, and down Sulphur Creek to near its confluence with Indian River (approximately 72 kilometres).

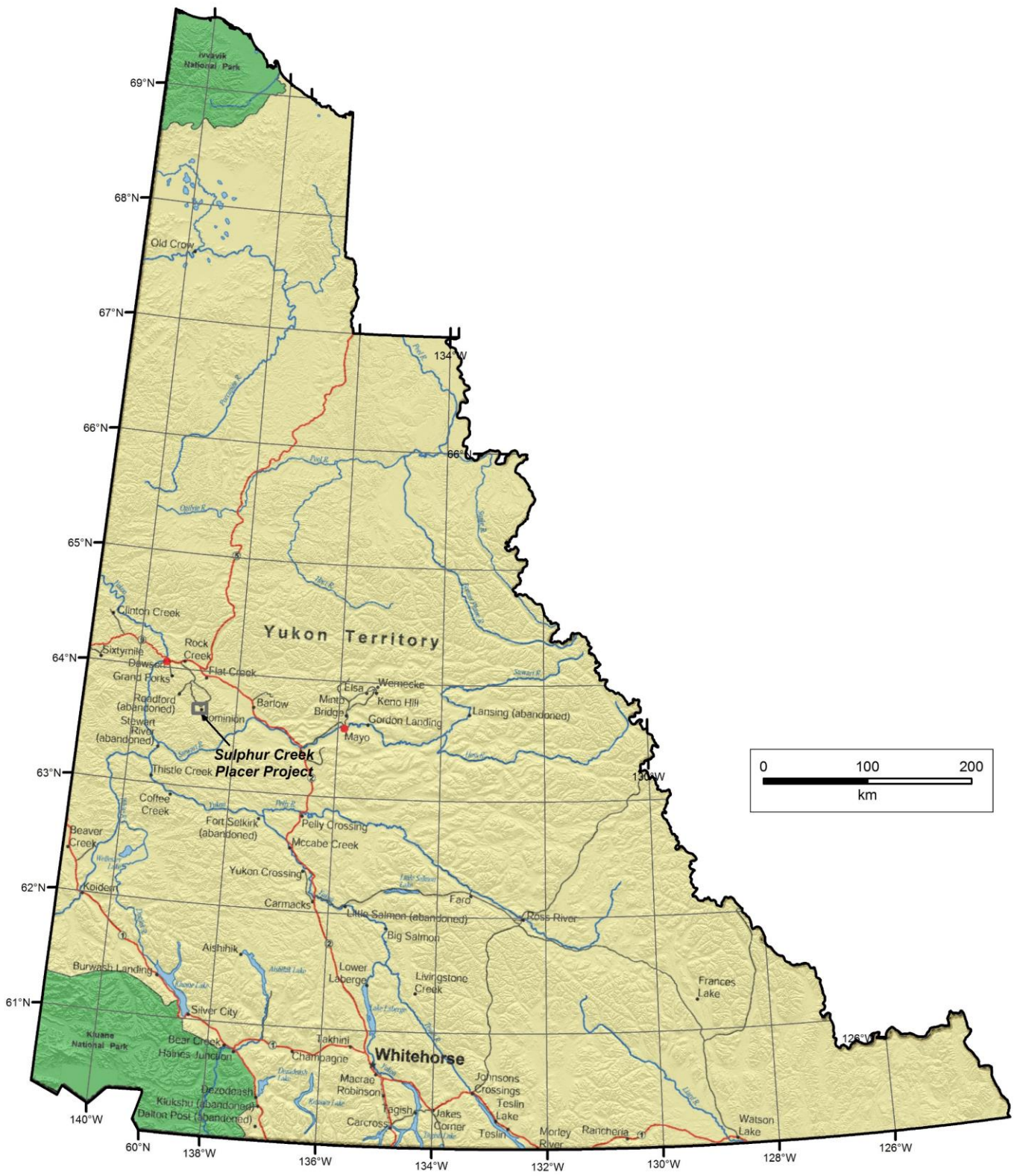


Figure 1 - Location of Sulphur Creek Project, Yukon.

## Placer Tenure

Table 1 shows a summary of the current status for placer claims on Sulphur Creek held by Grim Estates Ltd.

Table 1 - Claim status, Sulphur Creek Placer Property.

GRANT NUMBER	STATUS	CLAIM NAME	OWNER NAME	STAKING DATE	RECORDED DATE	EXPIRY DATE	EXCESS CREDITS
P 00499	Active	Claim 1	Grim Estates Ltd. - 100%	8/21/1975	8/22/1975	10/1/2031	32
P 08202	Active	Claim 1	Grim Estates Ltd. - 100%	10/1/1979	10/4/1979	10/1/2031	32
P 00500	Active	Claim 2	Grim Estates Ltd. - 100%	8/21/1975	8/22/1975	10/1/2031	32
P 08203	Active	Claim 2	Grim Estates Ltd. - 100%	10/1/1979	10/4/1979	10/1/2031	32
P 00501	Active	Claim 3	Grim Estates Ltd. - 100%	8/21/1975	8/22/1975	10/1/2031	32
P 08204	Active	Claim 3	Grim Estates Ltd. - 100%	10/1/1979	10/4/1979	10/1/2031	32
P 00502	Active	Claim 4	Grim Estates Ltd. - 100%	8/21/1975	8/22/1975	10/1/2031	32
P 08205	Active	Claim 4	Grim Estates Ltd. - 100%	10/1/1979	10/4/1979	10/1/2031	32
P 00503	Active	Claim 5	Grim Estates Ltd. - 100%	8/21/1975	8/22/1975	10/1/2031	32
P 08206	Active	Claim 5	Grim Estates Ltd. - 100%	10/1/1979	10/4/1979	10/1/2031	32
P 00504	Active	Claim 6	Grim Estates Ltd. - 100%	8/21/1975	8/22/1975	10/1/2031	32
P 08207	Active	Claim 6	Grim Estates Ltd. - 100%	10/1/1979	10/4/1979	10/1/2031	32
P 08208	Active	Claim 7	Grim Estates Ltd. - 100%	10/1/1979	10/4/1979	10/1/2031	32
P 08209	Active	Claim 8	Grim Estates Ltd. - 100%	10/1/1979	10/4/1979	10/1/2031	32
P 08210	Active	Claim 9	Grim Estates Ltd. - 100%	10/1/1979	10/4/1979	10/1/2031	32
P 08211	Active	Claim 10	Grim Estates Ltd. - 100%	10/1/1979	10/4/1979	10/1/2031	32
P 08212	Active	Claim 11	Grim Estates Ltd. - 100%	10/1/1979	10/4/1979	10/1/2031	32
P 00416	Active	Discovery	Grim Estates Ltd. - 100%	8/1/1975	8/4/1975	10/1/2031	33
P 09234	Active	Fractional	Grim Estates Ltd. - 100%	6/12/1980	6/13/1980	10/1/2031	32

## Permitting

Water license PM14-027 and Class 4 Placer land use permit AP14027 are held by Tusk Exploration Ltd. on the claims held by Grim Estates Ltd. The permits were issued on September 15, 2014 and are valid until September 3, 2024.



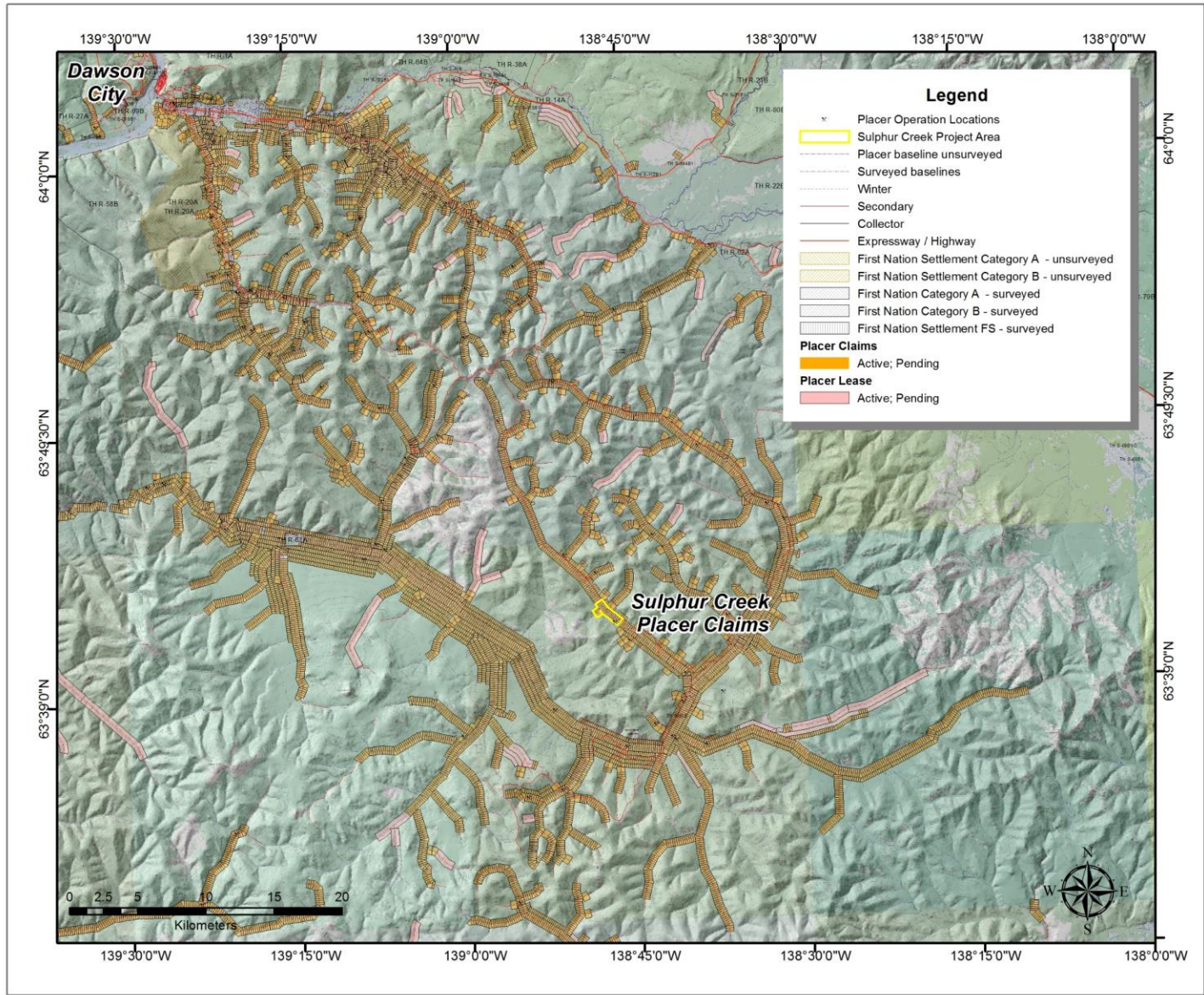


Figure 2 – Location of Sulphur Creek Placer Project and Dawson region placer tenures. The property lies 72 km by road from Dawson City.

## History of Exploration and Mining – Sulphur Creek

Sulphur Creek has been mined since the beginning of the Klondike Gold Rush in 1898, first by hand methods, and then by dredging. Green (1977) notes that three dredges mined on Sulphur Creek beginning in 1936. YCGC (Yukon Consolidated Gold Corporation) Dredge #6 mined 148,000 ounces between 1936 and 1966; YCGC Dredge #8 mined 212,000 ounces between 1937 and 1966 and YCGC Dredge #9 mined 113,000 ounces between 1938 and 1966.

Mechanical mining replaced the dredges after 1966 and dozens of operations have mined on Sulphur Creek from then up to the present day. Much of the activity is documented in LeBarge (2007) with more recent mining documented in LeBarge and Welsh (2007), LeBarge and Nordling (2011), and van Loon and Bond (2014). Gold production from these sources and Yukon Government royalty records shows a total of over 355,000 ounces produced from Sulphur Creek between 1940 and 2019. This does not include the hand mining from the 40+ years previous.

The centre of the Grim Estates placer project is comprised of the claims formerly owned by Mr. Henry Kruger. The Kruger placer mining operation was active beginning in the mid 1970's. Mr. Kruger's equipment over the years included a Caterpillar 225 excavator, Caterpillar D7 bulldozer, Caterpillar D9 bulldozer, Caterpillar 955K loader, two Hough 120C loaders, and a Koehring 605 dragline. Water was supplied at 1500 to 2000 igpm with an 8 by 8" Murphy pump powered by a 671 Detroit engine, allowing the wash plant to process 50 loose cubic yards (38 m<sup>3</sup>) of gravel per hour. In 2010, Coulee Resources leased some of the property and mined a cut on the left limit.

In 2014, Tusk Exploration Ltd. under the management of Gary Crawford, established an agreement with Mr. Kruger (Bond and van Loon, 2018). Heavy equipment located onsite in 2017 included a John Deere 330 excavator, a Caterpillar 245 excavator, a Caterpillar 980 wheel loader and a Caterpillar D10N bulldozer. A custom-built trommel processed material at a rate of 80 loose yd<sup>3</sup> (61 m<sup>3</sup>)/hr.

In 2018, the nearby Karen and Mary placer claims were purchased from 536225 Yukon Inc. by Yukon Alpine Heliski Ltd., who conducted a small program of resistivity geophysical surveys on the claims.

In 2018, Tusk Exploration Ltd. was acquired by long-time Klondike and Atlin placer miner Peter Wright, in partnership with Randy Reifel. They mined a pit on the left limit just downstream of the Karen and Mary placer claims.

In 2019, most of the claims which were part of the original Kruger property were transferred from Tusk Exploration Ltd. to Grim Estates Ltd., and additional mining cuts were taken out of the upstream left limit, and downstream right limits.

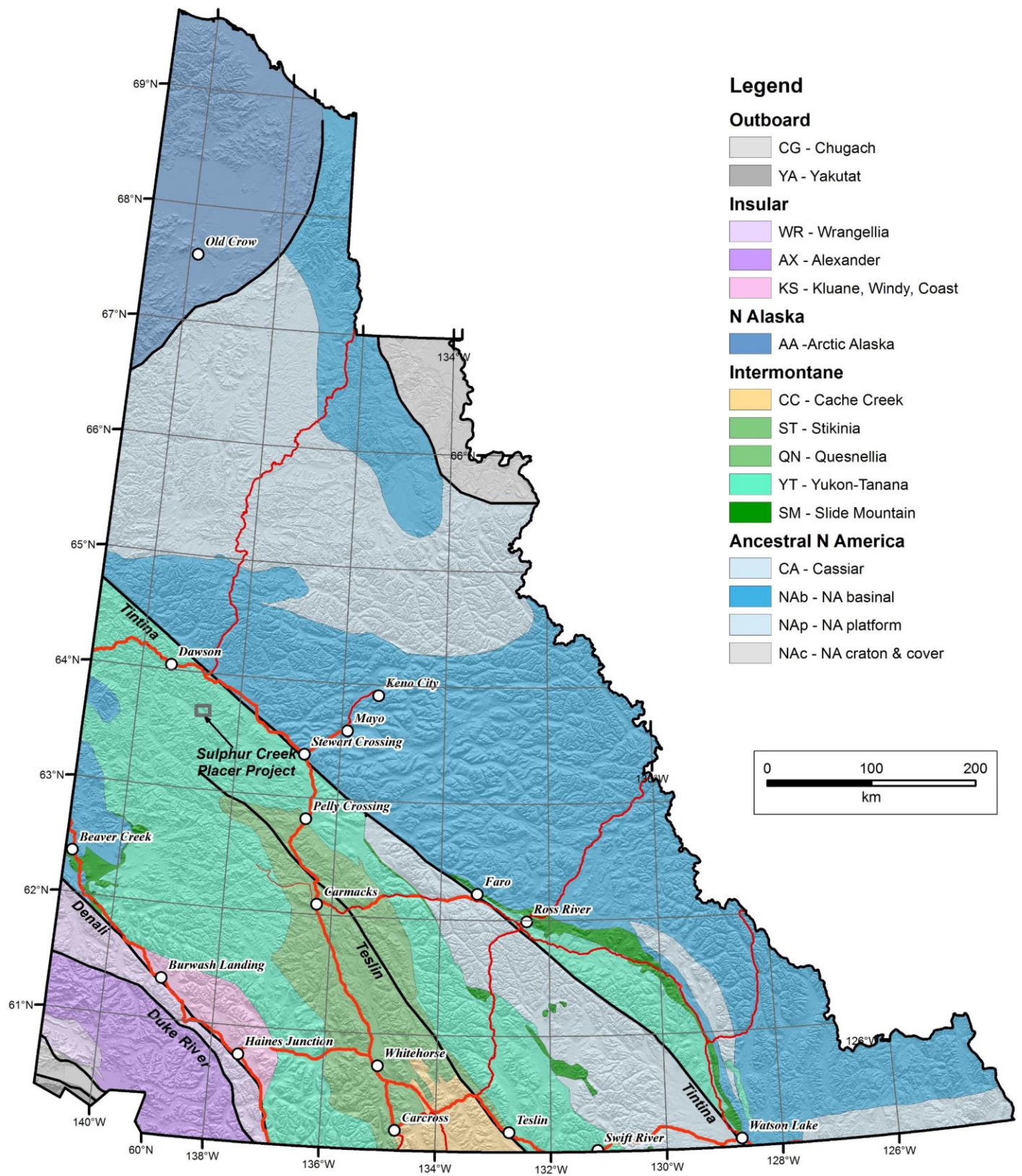


Figure 3 - Terrane map of Yukon, showing location of the Sulphur Creek placer property. After Yukon Geological Survey (2018).

## Regional Bedrock Geology

The project area is situated within the Yukon-Tanana terrane (Figure 3), an accreted pericratonic sequence that covers a large part of the northern Cordillera from northern British Columbia to east-central Alaska (Gordey and Ryan, 2005; Colpron and Nelson, 2006). The Yukon Tanana Terrane consists of Paleozoic schist and gneiss that were deformed and metamorphosed in the late Paleozoic, and intruded by several suites of Mesozoic intrusions that range in age from Jurassic to Eocene (Colpron and Nelson, 2006). The Paleozoic rocks are pervasively foliated with at least two overprinting fabrics (MacKenzie and Craw, 2010; MacKenzie et al, 2008). During Late Permian to Early Jurassic time these rocks were tectonically-stacked along thrust faults which were parallel to regional foliation. Later tensional-extensional tectonics occurred during the mid-Cretaceous, and this resulted in brittle fracture of the Paleozoic rocks, which is likely responsible for structurally-controlled gold mineralization in the south Klondike area including the White Gold exploration camp (MacKenzie et al, 2008; MacKenzie and Craw, 2010; MacKenzie and Craw, 2012).

Major units in the Klondike area include: the Snowcap (Nasina) Assemblage, the Klondike Series, the Slide Mountain (Moosehide) Assemblage, upper Cretaceous Carmacks Group volcanics/volcanoclastics, and Eocene intrusives (Figure 3). The basement unit is the Snowcap (Nasina) Series, consisting of metamorphosed schist and quartzite. It is overlain by the Klondike Series, a dominantly quartzofeldspathic schist of Early Permian (280 m.y.) age. Mid-Permian Sulphur Creek orthogneiss cuts the Klondike Schist extensively along Sulphur Creek. In the south and west Klondike, the Klondike Series is in contact with Late Devonian to Mississippian Simpson Range orthogneiss. Structurally overlying the Klondike and Nasina Series are greenstone and altered ultramafic of the Slide Mountain (Moosehide) Assemblage. In the east and south Klondike, upper Cretaceous andesitic volcanics and clastic sediments occur. These units are intruded by Eocene age rhyolite and diorite dykes and sills. Significant lode gold has been found throughout the Klondike and south Dawson areas (Chapman et. al., 2011 and others). The precise relationship between lode gold sources and local placer gold deposits is enigmatic and has been the subject of many scientific studies.

## Local Bedrock Geology and Mineral Occurrences

Figure 4 shows the bedrock underlying the property and throughout most of lower Sulphur Creek as Sulphur Creek orthogneiss (map unit PqS). Immediately to the east and west of this central unit, the bedrock consists of Klondike Schist (map units PK1 and PK2). Farther to the east lies Snowcap (Nasina) assemblage quartzite and schist (map unit PDS1).

There are two known mineral occurrences near the Sulphur Creek property. The first is Minfile #1150 132 (DEVINE), which is a 2.4 m wide quartz vein (also known as the Kentucky Lode) which was first discovered in 1901 (YGS, 2018). It is hosted in Snowcap (Nasina) assemblage quartzite and schist. Historical values of 7.9 g/t gold with traces of silver and copper have been reported. Minfile #1150 133 (SULPHUR) lies downstream and is hosted in the same bedrock. Little is known about this occurrence although the area was drilled extensively in the mid 1980's.



## Quaternary History

Most of the Klondike region has not been glaciated (Duk-Rodkin, 1999; Jackson et al., 2001). However, the marginal effects of a pre-Reid glaciation deposited glaciofluvial gravel along Australia Creek and Indian River. These were sourced from meltwater channels which breached the divide in the headwaters to the east. There is no evidence that glacial ice advanced into the drainage, although the pre-Reid glaciofluvial terraces covered pre-existing Tertiary White Channel gravels. These are especially evident in downstream reaches above Indian River (Froese and Jackson, 2005). The Sulphur Creek drainage, upstream of Indian River, escaped glaciation altogether. However, climatic influences and base level changes brought on by regional glaciations would have had significant effects on the weathering and erosion of local bedrock, as well as the deposition of the alluvial and colluvial materials into the local valleys.

## Surficial Geology

The surficial geology of the project area was mapped by Froese and Jackson (2005). Along Sulphur Creek lie surficial units of several ages and types, shown in Figure 5. These include: CEaP/AtT (Pleistocene colluvial-aeolian sediments overlying Tertiary alluvial terrace sediments), CEaP (Pleistocene colluvial-aeolian sediments), AtP (Pleistocene alluvial terrace), ACxP (Pleistocene alluvial/colluvial complex), Ax (alluvial complex), Cx (colluvial complex), Cl (landslide) and Cb-v (colluvial blanket-veneer). In general, the AtT (Tertiary alluvial terrace) units are more prevalent downstream, whereas upstream reaches are dominated by ACxP (Pleistocene alluvial/colluvial complex) and Cx (colluvial complex). The Kruger Property is mapped as M (made land - mined) and Ax (Alluvial Complex) in the valley centre, flanked by Cx (colluvial complex).

## Placer Geology

Placer gravels in Dominion Creek and its tributaries (Gold Run and Sulphur) can be characterized by 5 types of deposits: Pliocene White Channel gravel; Pleistocene terraces; early Pleistocene incised-valley gravel (Ross gravel); Pleistocene Dominion Creek gravel; and creek and gulch deposits (Froese et al., 2001). LeBarge (2007) describes the gravel section mined in 2006 as 5 m (16.4 ft.) of frozen black muck overlying 5 to 6 m (15 to 20 ft.) of various gravel layers. These gravel units had 'White Channel' rocks, oxidized rounded rocks and flat slide rocks, and were comprised of a 4-foot (1 m) rusty layer, a 4-foot (1 m) yellow layer and a 4-foot (1 m) grey layer on bedrock. From 5 to 6 m (15 to 20 feet) of gravel were sluiced along with 1/2 to 1 foot (0.2 to 0.3 m) of bedrock. The stratigraphy of a right limit section on the Kruger property is described by van Loon and Bond (2014) as 5 to 6 m (16.4 to 19.7 ft.) of gravel overlain by 5 m (16.4 ft.) of frozen black muck. All of the gravel was sluiced as well as 0.1 to 0.3 m (0.5 to 1.0 ft.) of bedrock. Placer gold was described as fine-grained and bright yellow, with a bulk fineness ranging from 790 to 820. The bedrock beneath the gravel was described as a decomposed schist. Bond and van Loon (2018) describe the stratigraphy on a right limit cut in 2017 as consisting 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.



## 2018 Placer Exploration Program

### Overview

The 2018 placer exploration program within the current project area consisted of 4 resistivity lines totalling 654m, and 45 auger drill holes totalling 1453 ft. (443 m), as well as a large test mining cut. The areas where placer exploration was conducted in 2018 are shown on Figure 6, 7, 8 and 17. Figure 6 is a compilation map of the Sulphur Creek property including surficial geology, YCGC drill results, and known or inferred paystreaks (after van Loon, 2017).

### Auger Drilling

Between May and October 2018, 45 six-inch diameter auger drill holes were drilled in the project area, for a total of 1453 ft. (443 metres). The driller was Jeff Dubois, and the drill unit was mounted on a Nodwell tracked vehicle. Table 2 lists the coordinates, claim details and calculated grades of the 2018 drill holes which lie within the planned 2020 project area.

Table 2 – 2018 Auger Drill Hole Locations, Depths and Gold Grade Results, Sulphur Creek.

Drill Hole Name	Claim Name Location	Grant Number	Depth_ft	Depth_m	Grade \$ /yd <sup>3</sup>	Latitude	Longitude
1	Claim 5	P 00503	37	11.2776	\$0.00	63.709517	-138.795272
2	Claim 5	P 00503	48	14.6304	\$33.00	63.709563	-138.795094
3	Claim 5	P 00503	48	14.6304	\$815.22	63.709592	-138.794862
4	Claim 5	P 00503	58	17.6784	\$10.31	63.710399	-138.795984
5	Claim 5	P 00503	57	17.3736	\$0.00	63.71043	-138.795881
6	Claim 5	P 00503	32	9.7536	\$0.00	63.710511	-138.795571
7	Claim 6	P 00504	58	17.6784	\$9.63	63.710897	-138.79713
8	Claim 6	P 00504	54	16.4592	\$0.00	63.710971	-138.796867
9	Claim 6	P 00504	37	11.2776	\$0.00	63.711141	-138.795929
A	Claim 4	P 00502	39	11.8872	\$0.00	63.709256	-138.794723
B	Claim 4	P 00502	43	13.1064	\$33.59	63.70921	-138.794883
C	Claim 4	P 00502	43	13.1064	\$0.00	63.709179	-138.795032
D	Claim 4	P 00502	42	12.8016	\$0.00	63.709084	-138.794636
E	Claim 4	P 00502	34	10.3632	\$0.00	63.709066	-138.794793
F	Claim 4	P 00502	38	11.5824	\$22.00	63.709055	-138.794922
G	Claim 4	P 00502	28	8.5344	\$4.66	63.708864	-138.794396
H	Claim 4	P 00502	28	8.5344	\$15.29	63.708831	-138.794637
I	Claim 4	P 00502	26	7.9248	\$94.30	63.708749	-138.794882
LL 1	Claim 5	P 00503	47	14.3256	\$0.00	63.710031	-138.79539
LL 2	Claim 5	P 00503	46	14.0208	\$0.00	63.70997	-138.795536
LL 3	Claim 5	P 00503	48	14.6304	\$9.68	63.710031	-138.79539
LL 4	Claim 5	P 00503	53	16.1544	\$0.00	63.710083	-138.795325



Drill Hole Name	Claim Name Location	Grant Number	Depth_ft	Depth_m	Grade \$ /yd <sup>3</sup>	Latitude	Longitude
<b>BRL 1</b>	Claim 8	P 08209	12	3.6576	\$30.58	63.698202	-138.779064
<b>BRL 2</b>	Claim 8	P 08209	15	4.572	\$14.02	63.698195	-138.779344
<b>BRL 3</b>	Claim 8	P 08209	18	5.4864	\$24.21	63.69814	-138.779742
<b>BRL 4</b>	Claim 8	P 08209	22	6.7056	\$0.00	63.697891	-138.780216
<b>BRL 5</b>	Claim 7	P 08208	25	7.62	\$7.65	63.699249	-138.78161
<b>BRL 6</b>	Claim 7	P 08208	25	7.62	\$10.19	63.699141	-138.781908
<b>BRL 7</b>	Claim 6	P 08207	26	7.9248	\$0.00	63.699035	-138.782277
<b>BRL 8</b>	Claim 5	P 08206	22	6.7056	\$7.65	63.700189	-138.783637
<b>BRL 9</b>	Claim 5	P 08206	24	7.3152	\$8.50	63.700041	-138.783982
<b>BRL 10</b>	Claim 5	P 08206	28	8.5344	\$31.43	63.699984	-138.784157
<b>BRL 11</b>	Claim 4	P 08205	16	4.8768	\$33.13	63.701018	-138.785864
<b>BRL 12</b>	Claim 4	P 08205	23	7.0104	\$2.04	63.700899	-138.78611
<b>BRL 13</b>	Claim 4	P 08205	27	8.2296	\$2.55	63.700788	-138.786506
<b>BRL 14</b>	Claim 2	P 08203	23	7.0104	\$9.56	63.702179	-138.789592
<b>BRL 15</b>	Claim 2	P 08203	24	7.3152	\$11.89	63.702038	-138.789998
<b>BRL 16</b>	Claim 2	P 08203	22	6.7056	\$8.66	63.701913	-138.790376
<b>BRL 17</b>	Claim 3	P 08204	22	6.7056	\$9.56	63.701511	-138.787777
<b>BRL 18</b>	Claim 3	P 08204	20	6.096	\$17.84	63.701404	-138.787983
<b>BRL 19</b>	Claim 2	P 08203	23	7.0104	\$7.65	63.702186	-138.789865
<b>BRL 23</b>	Claim 8	P 08209	20	6.096	\$1.91	63.698419	-138.780063
<b>BRL 24</b>	Claim 8	P 08209	27	8.2296	\$2.55	63.698282	-138.780459
<b>BRL 25</b>	Claim 7	P 08208	22	6.7056	\$2.55	63.698661	-138.780571
<b>BRL 26</b>	Claim 7	P 08209	23	7.0104	\$2.55	63.69854	-138.780904

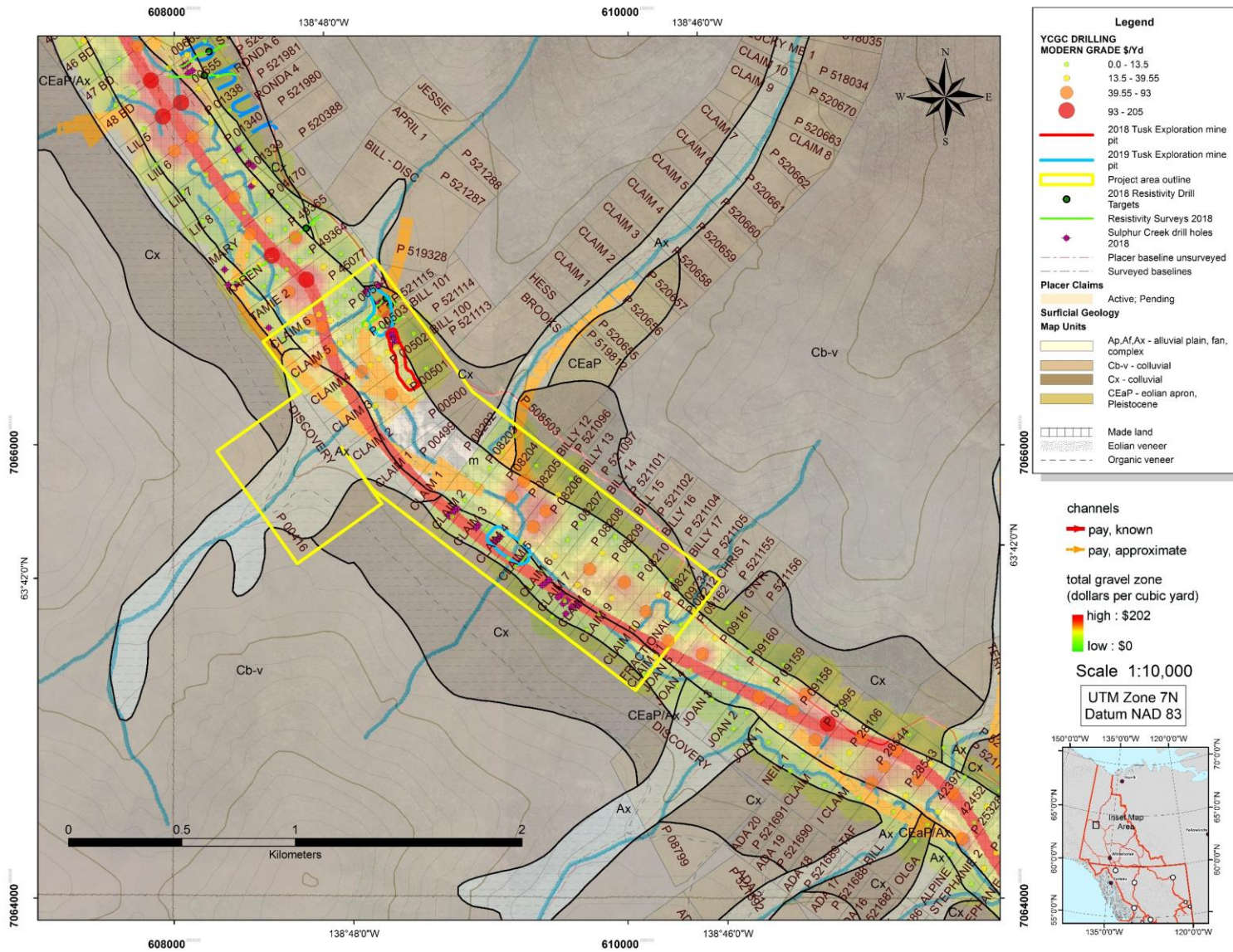


Figure 6 – Grim Estates Ltd. Sulphur Creek property showing areas of 2018 and 2019 mining and exploration along with surficial geology (after Froese and Jackson, 2005), YCGC drill holes, inferred and known paystreaks and modern values per cubic yard (after van Loon, 2017). A figure of \$1400 CDN per fine ounce was used to calculate the modern grade in \$/yard.

## Resistivity Surveys

### *Introduction*

Within the current project area, a total of 4 resistivity lines totalling 654 metres were conducted and interpreted for Tusk Exploration Ltd. by Selena Magel and William LeBarge of Geoplacer Exploration Ltd. The surveys were conducted between May 15, 2018 and October 19, 2018.

### *Methodology*

The Lippmann 4-Point Light Resistivity System was used to conduct the surveys. The resistivity technique injects an electrical current into the subsurface through stainless steel spikes and then measures the remaining voltage at various distances away from the injection point. Ground materials have different resistances to the current, and give data points in a cross section of the subsurface. With the data points, a tomogram or pseudo section can be created representing changes of resistivity in the ground. Data was collected using Geotest software, while the inversion and data filtering was completed with RES2DINV software. Data points with poor contact resistance were exterminated and noisy data was filtered statistically with root mean squared data trimming. Two-dimensional tomograms were produced using least squares damped inversion parameters to display the resistivity properties and to display potential contacts.

The two-dimensional images are used for preliminary interpretations of bedrock structure. The images were interpreted by William LeBarge and Selena Magel.

General principles and assumptions of electrical resistivity are:

1. Low resistivity can indicate thawed and water saturated areas, as well as fine-grained material.
2. Very high resistivity values can be due to ice rich material and frozen or highly disturbed ground.
3. Dry gravels, cobbles and boulders generally have high resistivity values.
4. The contrasts between values is more important in determining contacts than the absolute values found with resistivity data.

### *Limitations and Disclaimer*

The interpreted sections provide an estimate of the conditions beneath the surface to the depths conducted and are within the accuracy of the system and methods. The data becomes more uncertain with depth and are more accurate toward the surface and is further complicated if there is permafrost present in the region. The materials are interpreted based upon local geology observed, as well as geologic knowledge of the area. Certain materials may be similar in composition and result in uncertain results. The accuracy of the information presented is not guaranteed and all mine development is the client's responsibility. William LeBarge and Selena Magel of Geoplacer Exploration Ltd. accept no liability for any use or application of these data by any and all authorized or unauthorized parties.

## Results

The presence of permafrost throughout the survey areas increased the uncertainty of the interpreted results. Permafrost was continuous on north and east-facing slopes, and discontinuous on portions of south and west-facing slopes. Parts of the valleys which had been mined or disturbed were usually thawed and associated with high water saturation. In these areas, contrasts between low and high resistivity values were likely partially or wholly a reflection of varying groundwater and permafrost conditions, rather than strictly lithological boundaries.

The geographic coordinates of the endpoints of the surveyed lines are shown in Table 3, and the lines are plotted on Figures 7, 8 and 17. The interpreted profiles are shown as Figures 9 to 12.

Table 3 – 2018 resistivity survey lengths, grant number locations and endpoint geographic coordinates, Sulphur Creek.

Survey Name	Grant Number	Start Point		End Point		Length (m)
		Latitude	Longitude	Latitude	Longitude	
<b>RES18-CLAIM 5-01</b>	P 00503	63.7104756	-138.794325	63.709393	-138.79703	196
<b>RES18-CLAIM 5-02</b>	P 00503	63.7107134	-138.794692	63.7095348	-138.79751	223
<b>RES18-CLAIM 5-03</b>	P 00503	63.7098623	-138.794021	63.7092104	-138.7965	151
<b>RES18-CLAIM 5-01 (lower)</b>	P 08206	63.7002589	-138.783596	63.6997622	-138.78466	84

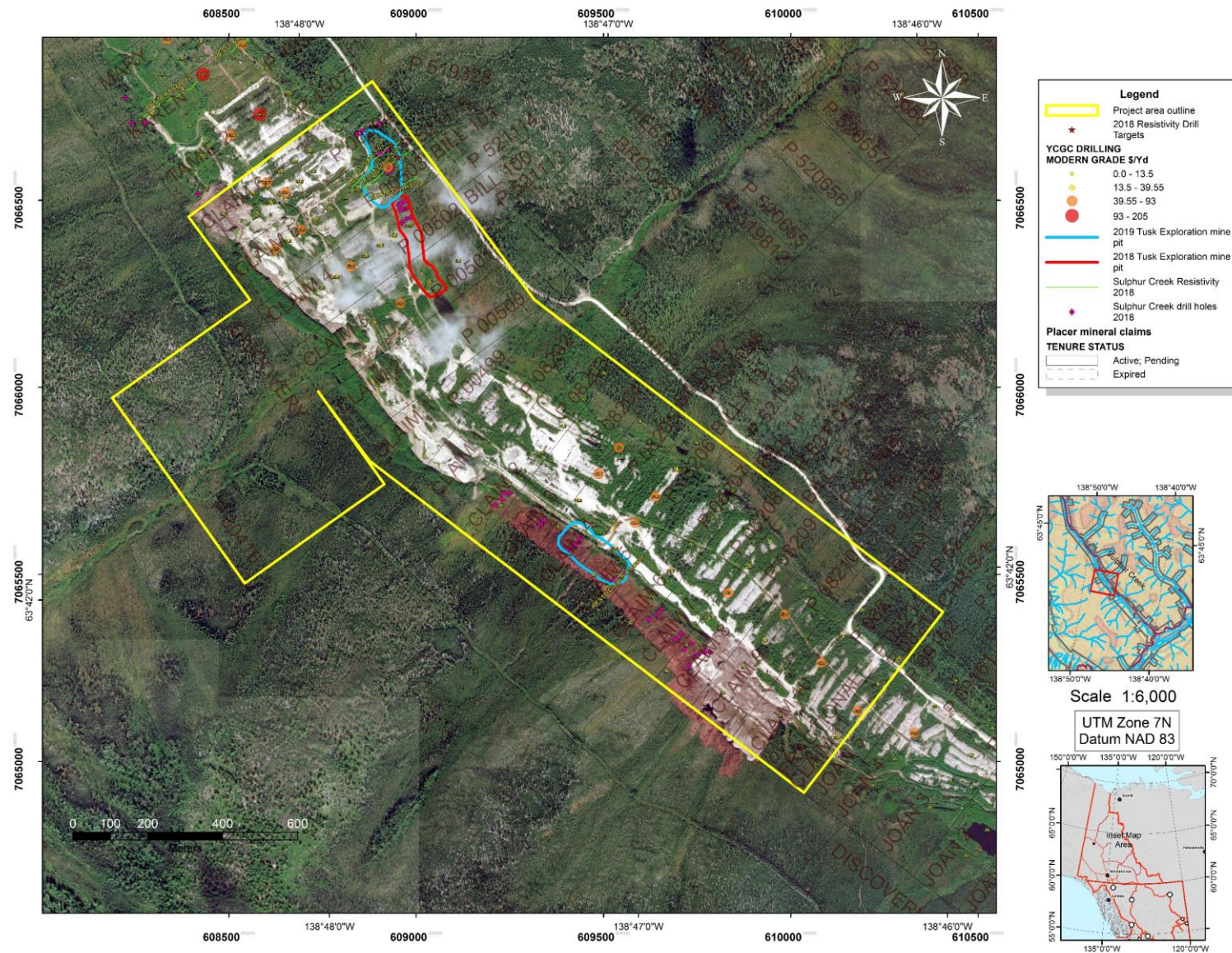


Figure 7 – Satellite map of the project area claims showing YCGC historic drill holes, 2018 and 2019 mining pits, and 2018 resistivity surveys.

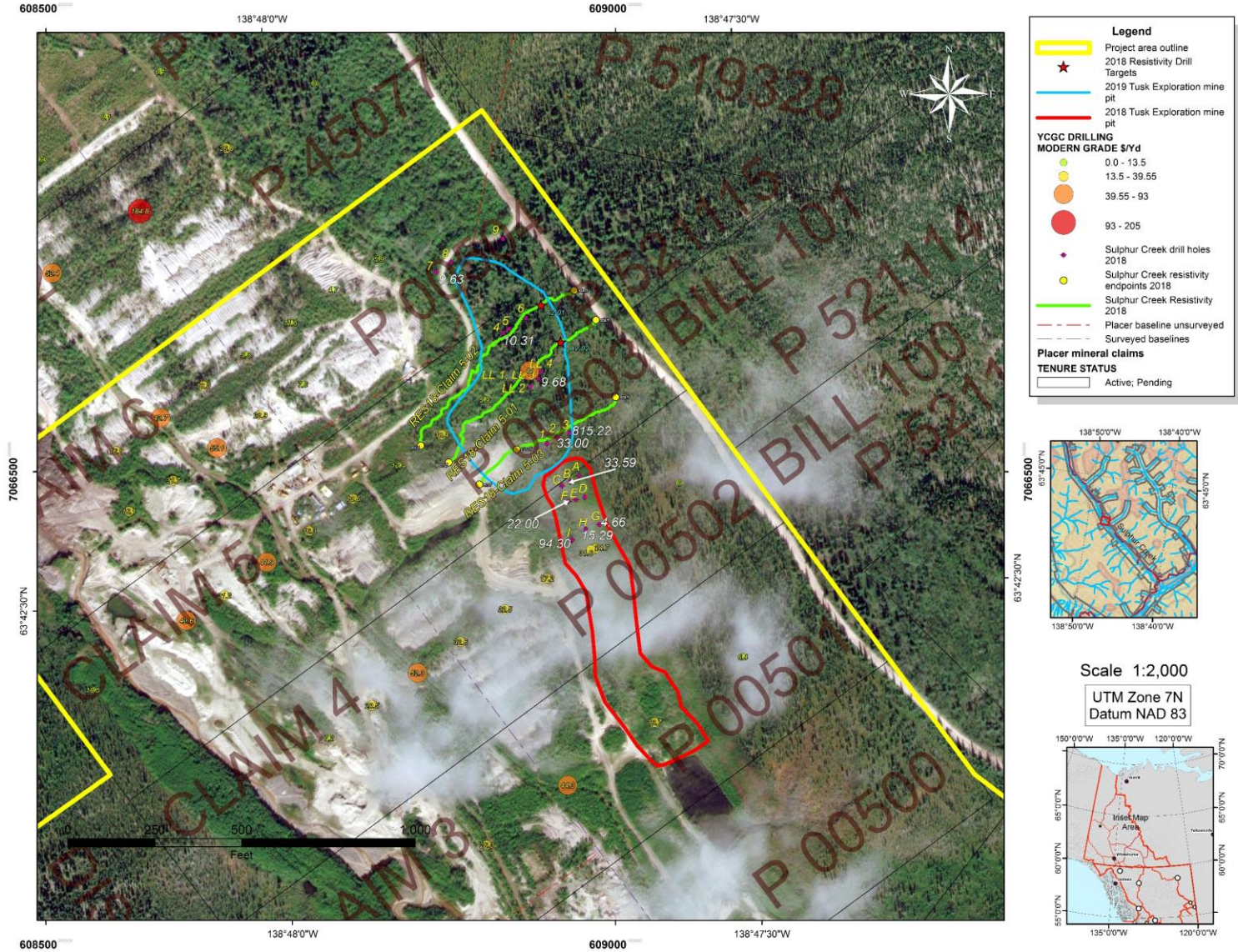


Figure 8 - Satellite map of the north part of the project area showing YCGC historic drill holes, 2018 and 2019 mining pits, 2018 resistivity surveys, and 2018 auger drill holes. Drill hole numbers shown in yellow and drill hole grades are shown in white. Mine pit outlines are approximate.

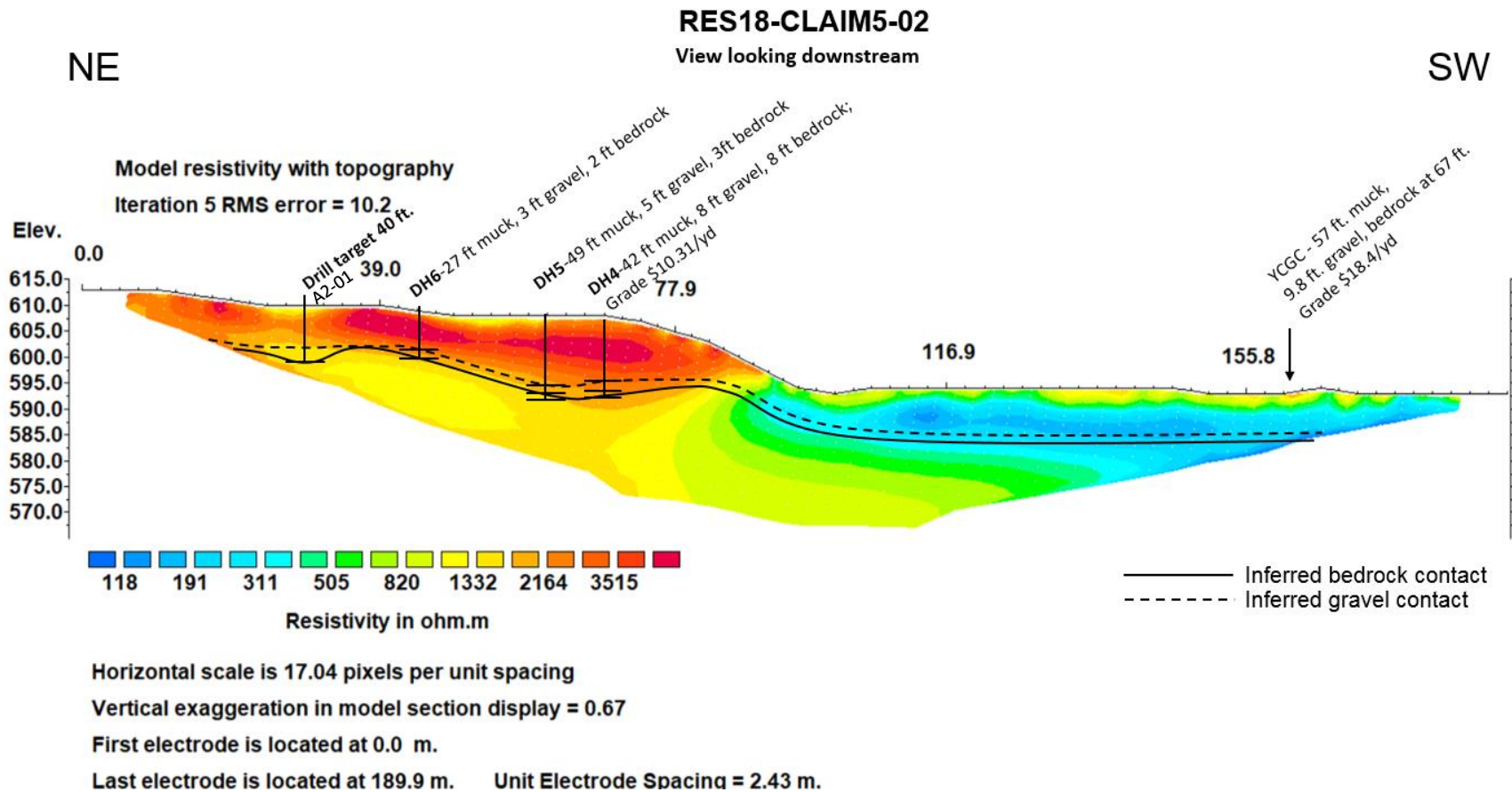


Figure 9 - RES18-CLAIM5-02 was surveyed across 3 drill holes, DH4, DH5, and DH6. The drill holes assisted in interpreting a bedrock contact, which appears slightly undulating on the left limit bench and relatively flat in the creek valley. The bench bedrock undulations may indicate a side channel with placer gold potential, shown by DH4 which had a gold grade of \$10.31/yd<sup>3</sup>. The bedrock undulations resemble the bedrock displayed in downstream profile RES18-CLAIM5-01.

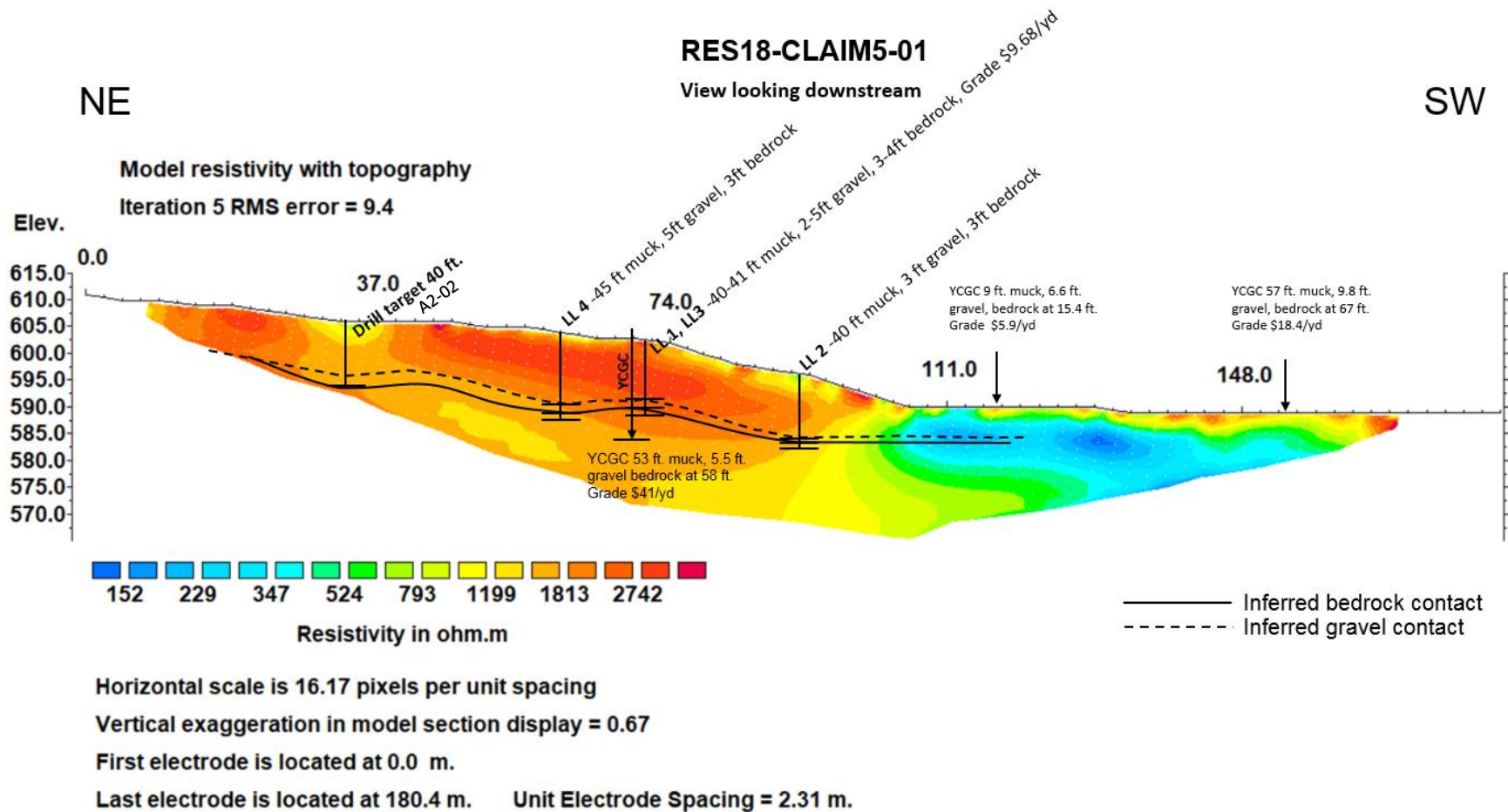


Figure 10 - RES18-CLAIM5-01 was surveyed on the left limit bench across 3 historic YCGC drill holes, and across auger drill holes LL1, LL2, LL3 and LL4. The YCGC gold grades are displayed in the image. The bedrock is interpreted with some undulations on the left limit which could indicate a channel with placer gold potential, demonstrated by auger drill hole LL3 which had a gold grade of \$9.68/yd<sup>3</sup>.



NE

### RES18-CLAIM5-03

View looking downstream

SW

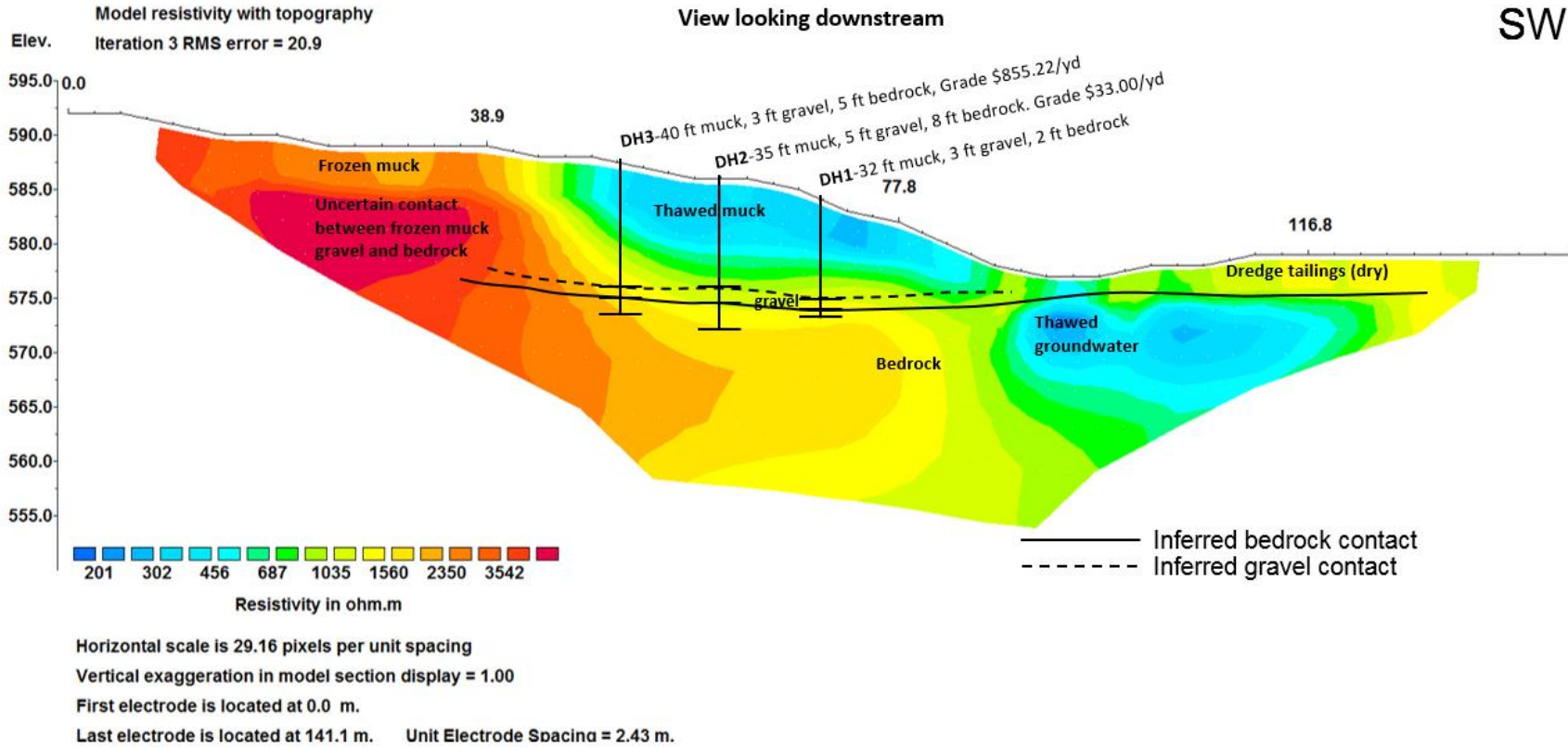


Figure 11 - RES18-CLAIM5-03 was surveyed on the left limit bench across auger drill holes DH1, DH2 and DH3, which intersected a layer of gravel between 3 and 5 ft. thick. The 2018 auger drill holes had high values from \$33 to \$815.22/yd<sup>3</sup>. However, due in part to the presence of the active mining pit immediately downstream, part of the profile was thawed and part of it was frozen. This lateral variation in physical characteristics resulted in a large resistivity contrast which overprinted most of the vertical stratigraphic and lithological transitions which would usually be evident.

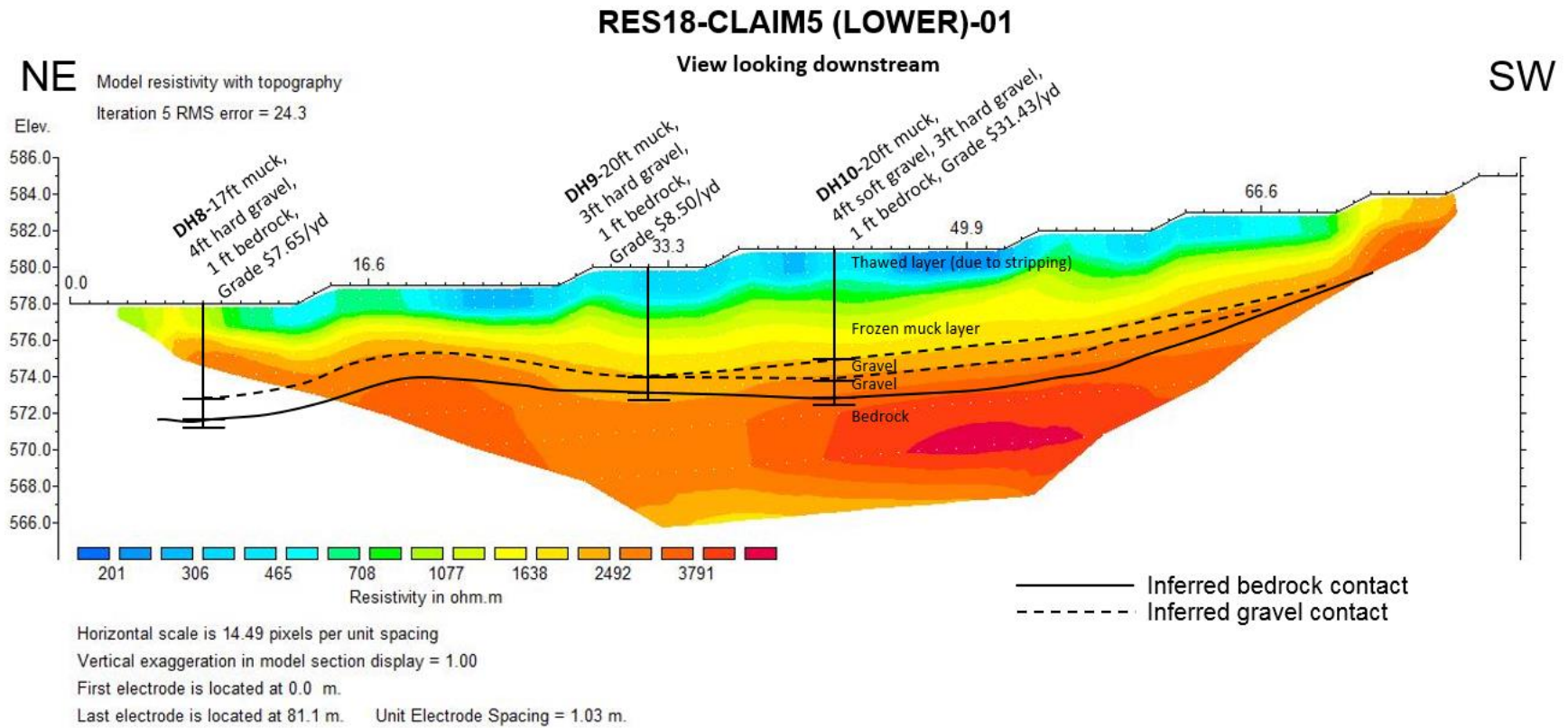


Figure 12 - RES18-CLAIM5 (Lower)-01 was surveyed on the right limit bench across three auger drill holes, DH8, DH9 and DH10. The drill results show a layer of gravel under black muck and the bedrock is interpreted as slightly undulating and dipping with topography. Gold grades in the auger holes were as high as \$31.43/yd<sup>3</sup>.

## 2018 Test Pit

Figures 7 and 8 show the extent of the test mining pit excavated on the left limit of the property, and a photo of the 2018 pit is shown as Figure 13. Several 2018 auger drill holes and some historic YCGC drill holes were mined through by this pit during the 2018 exploration program.

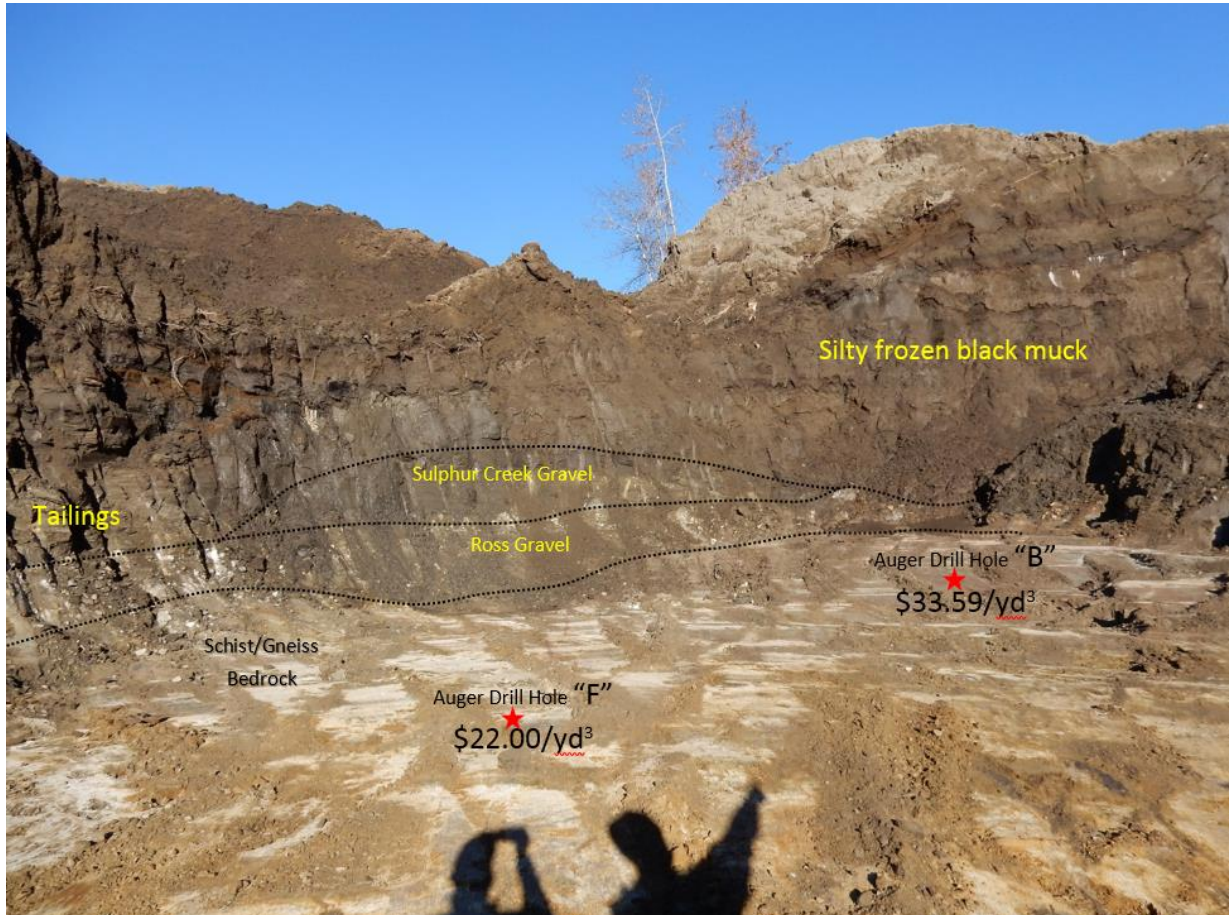


Figure 13 - View looking north of the most upstream exposure of the active mining pit on Sept 28, 2018. The stratigraphy consisted of a variably-decomposed quartz-feldspar gneiss bedrock overlain by 2 to 5 ft. of grey-white cobble pebble gravel, overlain by 30 to 40 feet of silty frozen black muck. The basal gravel here is likely the 780,000 year old "Ross Gravel" described by Froese et. al. (2001). This gravel appears to be incised by and overlain in places by the younger Sulphur Creek gravel. Towards the centre of the valley (left side of the photo) dredge tailings and slickens abut against the virgin gravels of the pit.

## Conclusions and Recommendations, 2018 Program

Resistivity surveys just north of the active 2018 mining pit outlined two drill targets, which are shown on Figure 7 and 8 and plotted on the profiles in Figures 9 and 10. The coordinates and depths of these targets are shown in Table 4, below.

Table 4 - Drill Targets identified from 2018 resistivity surveys, Sulphur Creek.

Name	Resistivity Line	Latitude	Longitude	Target Depth ft.	Target Depth m
A2-01	RES18-CLAIM5-02	63.710608	-138.795293	40	12
A2-02	RES18-CLAIM5-01	63.710312	-138.794967	40	12

Many of the high-value 2018 auger drill holes (e.g. holes B, F, G, H, I - see Table 2) and historic YCGC drill holes were coincident with economic mining values subsequently mined in the pit (Figure 8). Geophysical surveys which were conducted in the frozen ground some distance upstream of the active pit showed distinctive contacts which were correlative with the bedrock contacts encountered in the auger drill holes. Auger drill holes DH2, DH3, DH4 and LIL 3 in the area upstream of the test mining pit had some very significant results, including a high of \$855.22/yd<sup>3</sup> in DH3. In addition, a historic YCGC drill hole with a value of \$41/yd<sup>3</sup> is located in this area.

A downstream right limit area which had been previously partially-stripped was the focus of one line of geophysics (Figure 12) and additional auger drilling (BRL drill holes 1-26, see Table 2). Twenty-three auger drill holes were drilled in this area, and many showed promising grades, including highs of \$33.13/yd<sup>3</sup> in drill hole BRL 11 and \$31.43/yd<sup>3</sup> in BRL 10. The single geophysical survey was correlative with bedrock depths encountered in the nearby auger drill holes.

## 2019 Placer Exploration, Mining and Reclamation

In 2019, Tusk Exploration Ltd., under the direction of Pete Wright, partnered to undertake stream channel restoration and environmental clean-up activities with international NGO Resolve, under their Salmon Gold initiative. The Salmon Gold initiative supports concurrent, symbiotic gold mining and environmental reclamation of mine tailings at qualified mine operations, in return for financial support. Ethically-recovered gold is sold to prominent companies such as Tiffany's and Apple Computer. Under this program, a highly-disturbed section of Sulphur Creek was restored to higher environmental standards which included pools and riffles in the stream channel which are vital for fish habitat. This program was continued in 2020.

Two pits were mined in 2019. One pit was stripped and mined on the left limit upstream of the 2018 mining pit, and one pit was mined on the downstream right limit bench, in the area of the BRL-series of auger drill holes. In the upstream pit (approximate outline shown on Figure 8), mining results in 2019 were somewhat lower than expected, due to the presence of thawed ground and more dredge tailings than seemed to be indicated by the 2018 auger drilling and resistivity geophysical surveys. However, in the downstream right-limit pit (approximate outline shown in Figure 17), mining results were more favourable. A 1000 ft long pit was mined approximately between the BRL 8-10 drill holes and the BRL 11-13 drill holes. The high grade holes BRL 10 (\$31.43/yd<sup>3</sup>) and BRL 11 (\$33.13/yd<sup>3</sup>) proved to be good indicators of the values subsequently encountered during mining.



Figure 14 - View looking upstream of the 2019 mining pit on the right limit. Traffic cone indicates approximate location of 2018 auger drill hole BRL-10, with a grade of \$31.43/yd<sup>3</sup>.

## Rationale for 2020 Placer Exploration Program

Sulphur Creek has consistently been one of the top ten producing creeks annually in the Yukon since placer mining began early in Klondike history. Green (1977) notes that three dredges mined on Sulphur Creek beginning in 1936. YCGC (Yukon Consolidated Gold Corporation) Dredge #6 mined 148,000 ounces between 1936 and 1966; YCGC Dredge #8 mined 212,000 ounces between 1937 and 1966, and YCGC Dredge #9 mined 113,000 ounces between 1938 and 1966.

Mechanical mining replaced the dredges after 1966, and dozens of operations have mined on Sulphur Creek from then up to the present day. Gold production from numerous sources and Yukon Government royalty records shows a total of over 355,000 ounces produced from Sulphur Creek between 1940 and 2019. This does not include the hand mining from the 40+ years previous. Since 1978, Sulphur Creek has produced approximately 132,000 oz. of placer gold (Yukon Government royalty records; van Loon, 2017). Although recent production has diminished, in 2019 Sulphur Creek continued to be a significant producer of placer gold with over 1400 crude ounces recorded in royalties.

YCGC conducted placer drilling programs throughout the Klondike, including on Sulphur Creek between 1935 and 1955. The results of these drilling programs were well-documented in map and text files, however it was not easily available, as most of the files were held in Ottawa at the National Archives. Although it was known for many years that several placer miners had visited Ottawa to acquire this data on their own claims, efforts to send a Government representative to Ottawa to gather this information were not successful until 2013.

Presently however, much of this data has now been compiled, digitized and georeferenced by the Yukon Geological Survey, and is available publicly (van Loon, 2017).

Comparison of the georeferenced YCGC drill hole data with modern satellite imagery (Figures 6, 7, 8), shows that some high-grade historic YCGC drill holes were never subsequently mined, on the both the left and the right limits.

Additionally, exploration and mining activity in 2018 and 2019 has proven that there are extensive unmined or partially-mined areas on the property with economic placer gold values. Many prospective areas are thawed and lie beneath dredge tailings. During the mining of the 2019 pit on the downstream right-limit bench, some significant gold values were found beneath dredge tailings and underlying the bypass drainage channel, which appeared to be constructed on top of unmined virgin pay gravels. Other prospective areas are outside of the dredge limits, and are mostly frozen.

## 2020 Placer Exploration Program

### Overview

YMEP-funded exploration in 2020 on the property claims consisted of drill road construction, claim location surveys, two drone surveys, two RAB drill holes (67 ft.) and nine auger holes (360 ft.)

### Drill Road Construction

Several drill roads were constructed over areas of dredge tailings on the property. The two RAB drill holes and the nine auger drill holes made use of these drill roads in October, 2020.

### Claim Location Surveys

An effort to locate claim posts on the ground to resolve boundary issues was conducted in October, 2020. Several posts were located and GPS'd, and the new claim boundaries were then drawn up and compared to the Government maps. The new boundaries are drawn on Figure 15, and appear to show that the actual claims on the ground are shifted almost a full claim length upstream of the current Government boundaries. Some effort was made by the author to compare old airphotos, old government claim maps and the trace of the YCGC pit outlines to determine which of the data is accurate. Although conclusive proof could not be found, most evidence points towards the YCGC drill hole data and shaft locations as digitized by Van Loon (2017) as being relatively accurate when compared to the historic actual claim locations, and it seems like the claim posts currently used on the ground on this part of Sulphur Creek have shifted upstream between the time of the YCGC dredging/drill program, and the present day. Legally, of course, the posts on the ground are the actual boundaries.

### Drone Surveys

Two drone surveys were flown over the property, one on July 5, 2020 which covered the whole claim group and one on October 4, 2020 which covered the upstream boundary of the claims. The surveys were useful in accurately locating areas of historic tailings and dredge pits, and the new drill roads constructed in October, 2020. The October drone imagery is used as a base map in Figure 15, and the July 5, 2020 imagery is included as Appendix A.

### Drill Programs

Two RAB drill holes (20-7 and 20-8) were drilled within the actual boundaries of the claim group (on Claim #6) in early October 2020. The coordinates, depths and details are shown in Table 5 and plotted on Figure 15.

Table 5 and Figure 16 show that the gold sampling results of the two RAB holes were promising, and it is likely that some virgin gravels and poorly-dredged bedrock was encountered in these holes.

A decision was made to expand the drilling program a short distance downstream, so later in October an auger drill program was conducted just downstream of holes 20-7 and 20-8. The nine auger drill holes were marked on the ground but not GPS'd as of the time of writing this report. The general area of this drilling is on Claim #6, and is shown on Figure 15.

The gold sampling results of the expanded program were even more encouraging, as shown by the results in Table 6 and Figures 17-22.

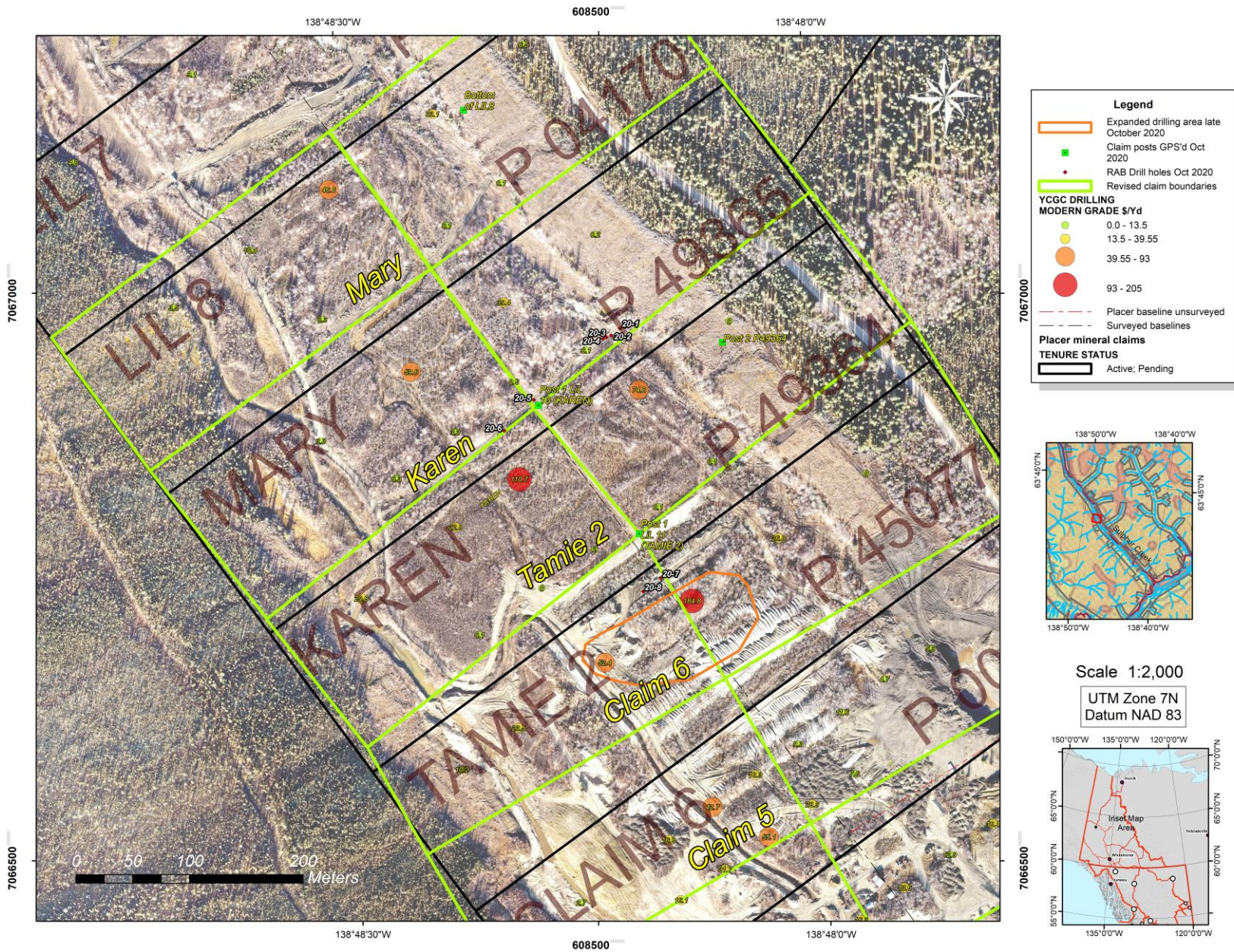


Figure 15 - Map of the project area claims on Sulphur Creek, showing 2020 RAB drill holes, revised claim boundaries and historic YCGC drill holes.



Table 5 - RAB drill holes conducted on the Sulphur Creek property, October 2020.

Sulphur Creek RAB Drilling October 2020							Coordinates	
							Zone 7N	
Drill hole #	Depth to Bedrock (ft)	Drill info	Depth of sample (ft)	Volume (L)	Material Description	Gold and Concentrate Description	UTM E	UTM N
20-7	35	25-27 gravel tailings, 27-30 frozen silt, 30-35 sand gravel	16-27	45	dredge sand	magnetite, pyrite	7066749	608555
			27-30	10	silt	magnetite, pyrite		
			30-35	50	some silt, gravel with sand and bedrock	2 Coarse colours, 2 medium colours, 1 very fine colour, garnet and black sand		
			35-45	85	bedrock chips (Klondike schist)	1 fine colour		
20-8	32	27-30 : silt, 30-32: sand and gravel, 32-35: soft bedrock	27-32	35	Muddy silty sand	1 fine angular colour	7066737	608539
			32-35	25	gravely sand and bedrock	1 very fine, magnetite		

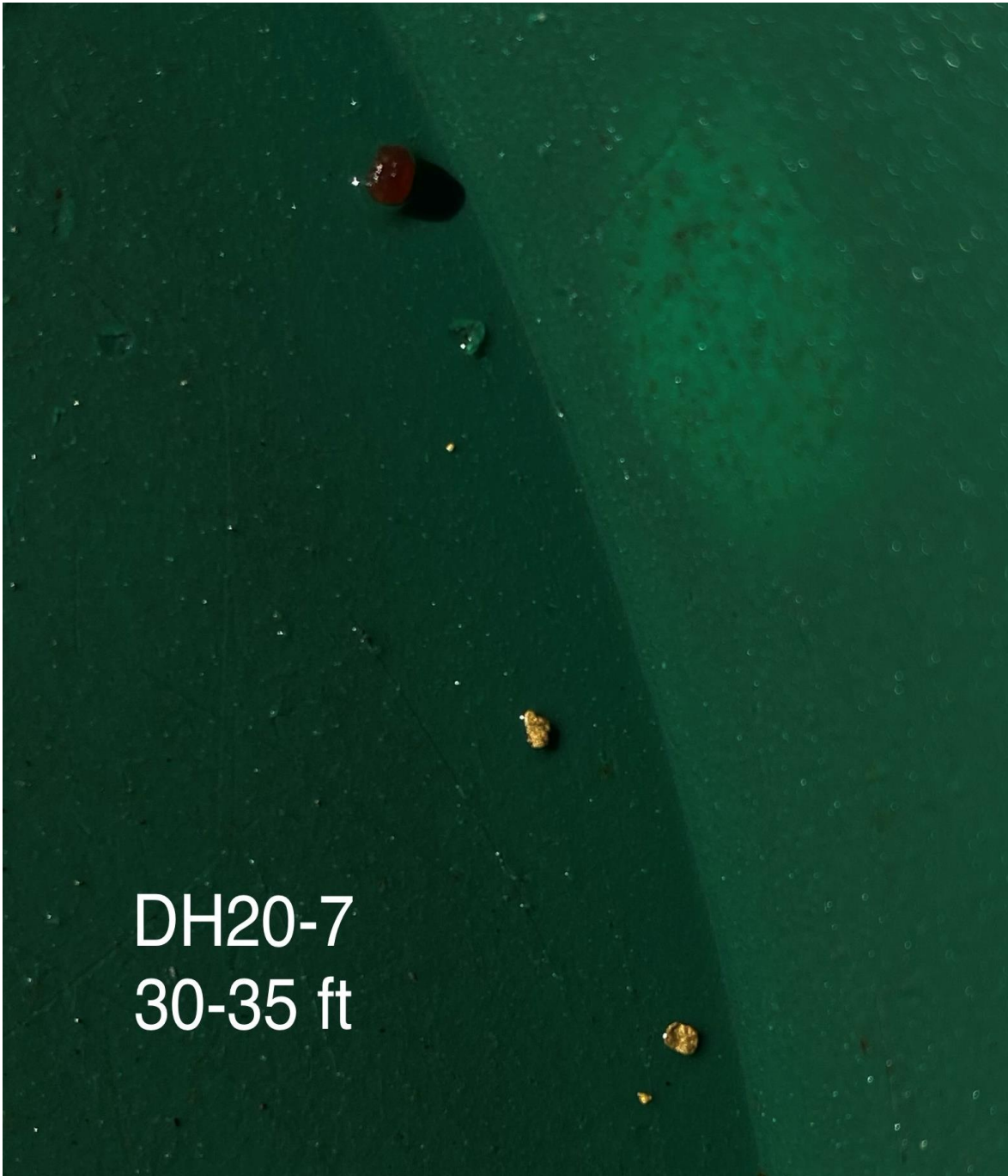


Figure 16 - Photo of gold from drill sample DH20-7. Several coarse colours were recovered from 30-35 feet at the bedrock contact.

Table 6 – Gold results from late October drilling program, Claim #6, Sulphur Creek property.

Sulphur Creek Drilling October 2020				
Drill hole Name	Depth (ft)	Volume (L)	Description of material	Description of gold CC – coarse colour MC – medium colour FC – fine colour VFC – very fine colour
#10	25-35	35	Clay and sand	3FC, 4VFC
	35-40	55	sandy silt (dredge sand) and bedrock	1CC, 9MC, 17FC
#11	35-40	15	silty gravel	6MC, 4FC, 4VFC
	40-45	40	sand with silt and fine sand, small amount of bedrock	
A1	25-30	45	silty sand (dredge sand) lots of quartz sand	3FC, 5VFC
	30-35	55	silty sand with small gravel and small bedrock pieces	2MC, 13FC, 8VFC
A2	30-35	15	silty sand (dredge sand) lots of sand and quartz	1MC
	35-45	30	silty sand (dredge sand) lots of sand and quartz	1CC
	45-50	15	schist bedrock pieces	
A3	15-20	15	muddy small gravel	3CC, 12MC, 10FC, 4VFC
	20-35	60	tan silty sand (dredge sand)	
	35-40	12	bedrock pieces	no gold
A4	20-25	30	sandy silt (dredge sand)	1CC, 11MC, 20FC
	25-35	45	sandy silt (dredge sand) and bedrock	
A5	10-20	40	silty sand and dredge sand	1MC, 3FC
	30-35	35	sand with silt and bedrock	
	35-40	30	sand with silt and bedrock	1FC
A6	25-30	15	silty sand (dredge sand) a bit of clay	1CC, 20MC, 40FC, 10VFC
	30-35	40	sandy dredge tailings (small amount of bedrock)	
A7	25-40	30	brown silt with gravel	2FC, rusty pyrite, black rocks

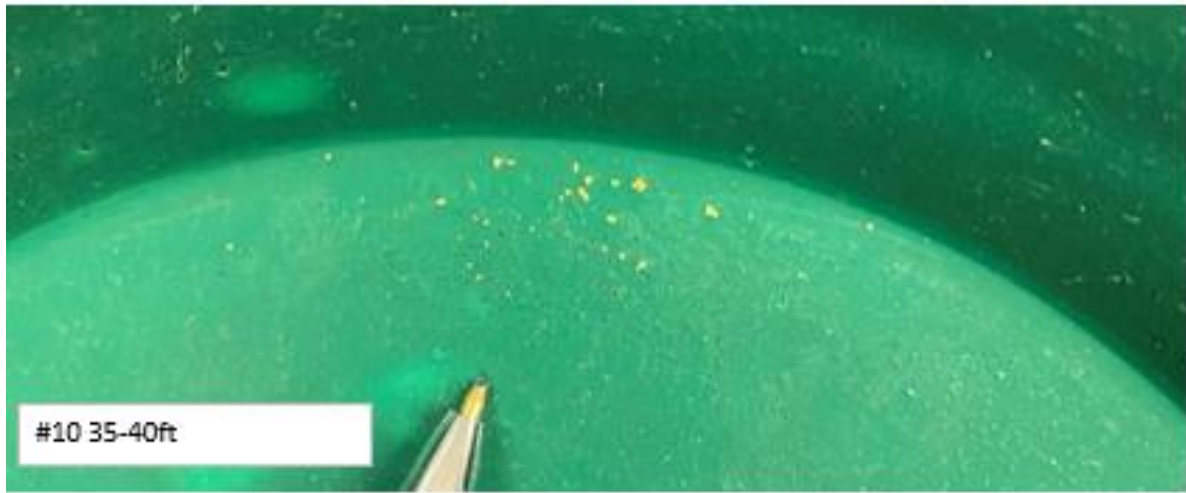
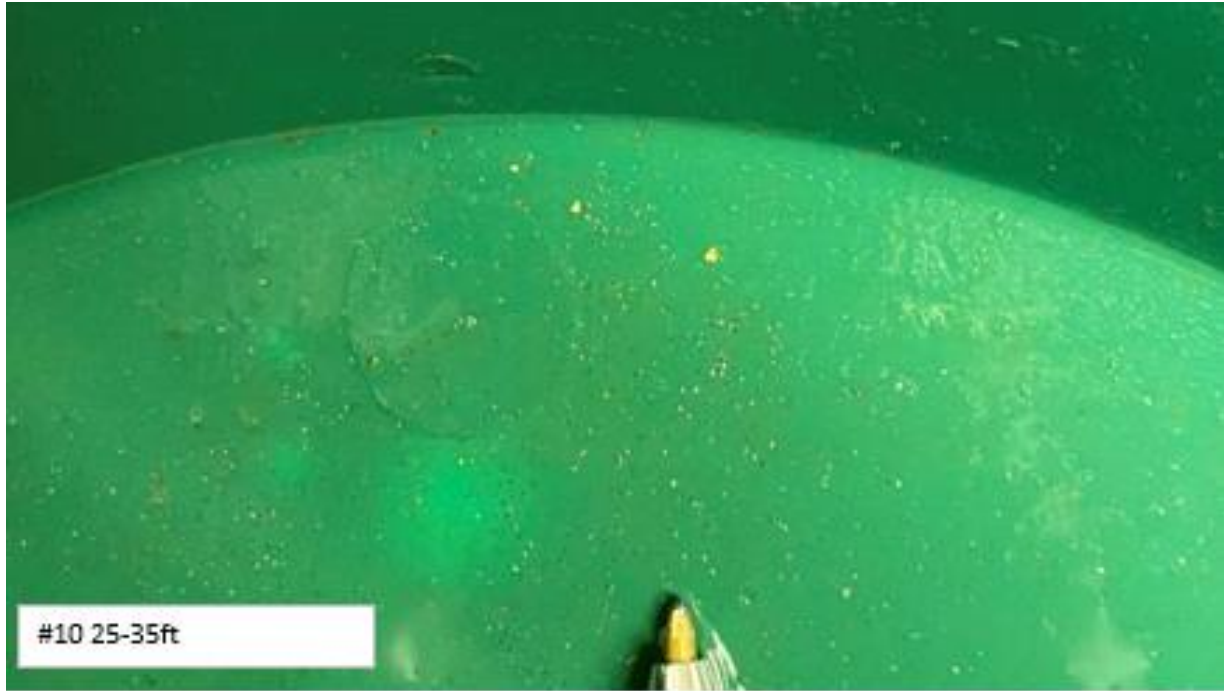


Figure 17 - Gold from drillhole #10, 25-35 ft. and 35-40 ft.

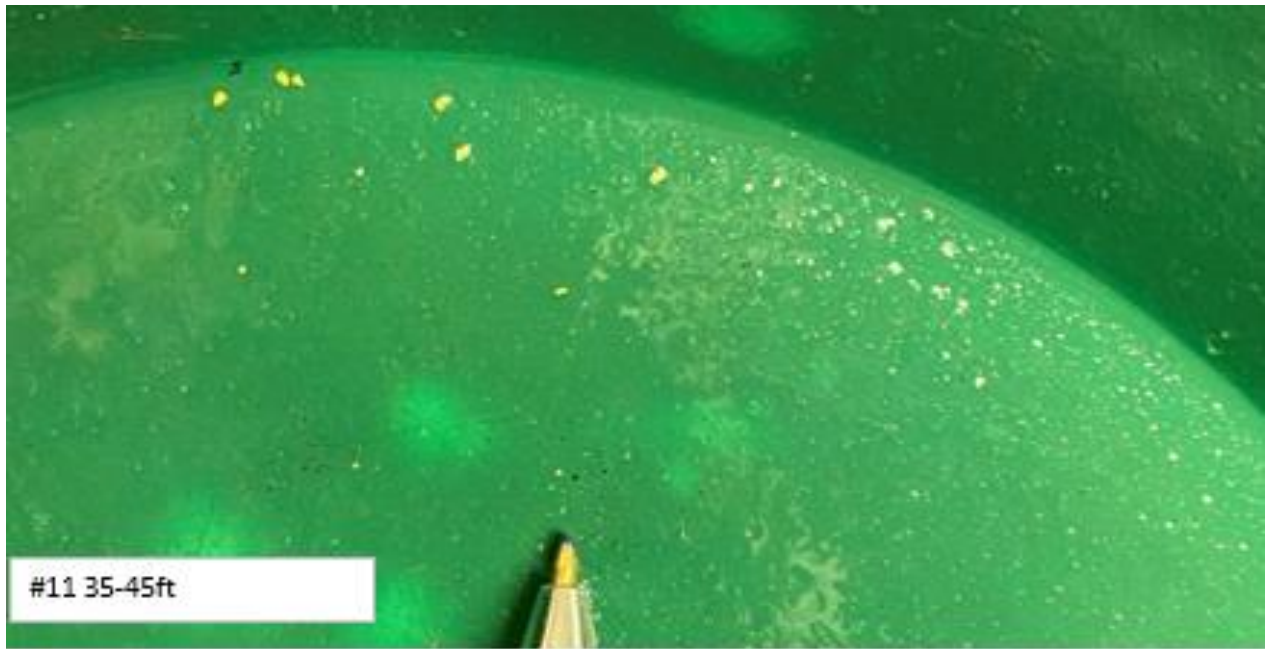


Figure 18 – Gold recovered from drillhole #11, 35-45 ft.

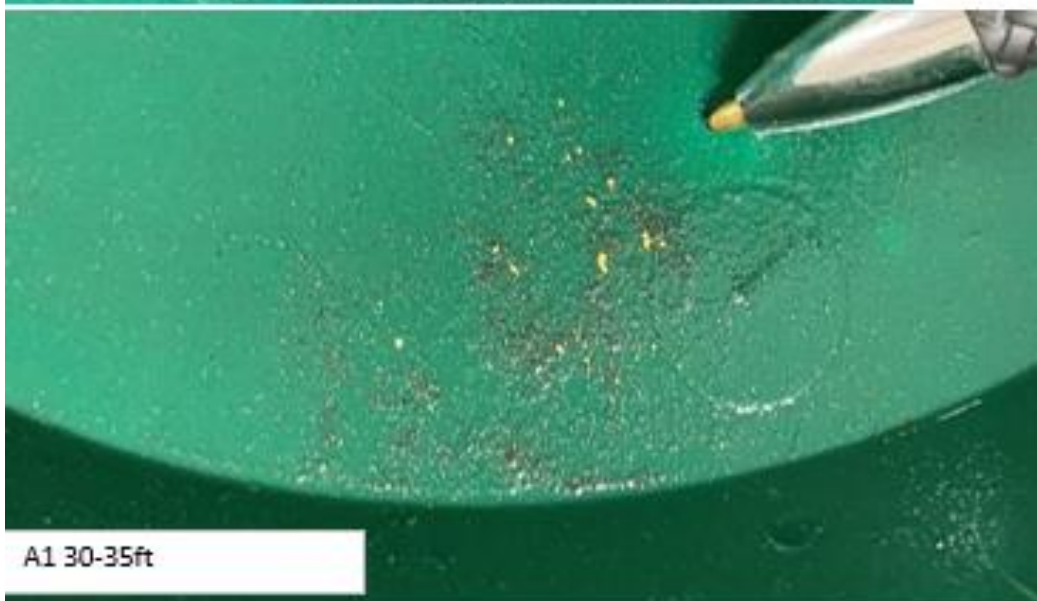


Figure 19 - Gold from drillhole A1, 25-30 ft. and 30-35 ft.



Figure 20 - Gold recovered from drillhole A2, 30-35 ft. and 35-50 ft.

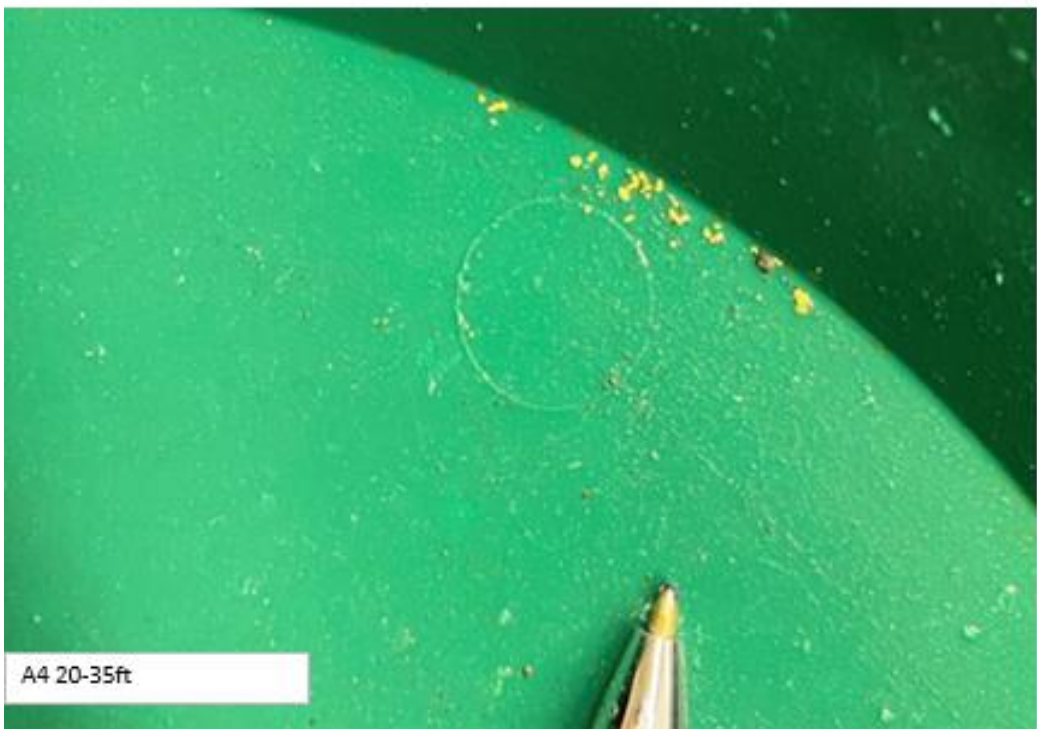
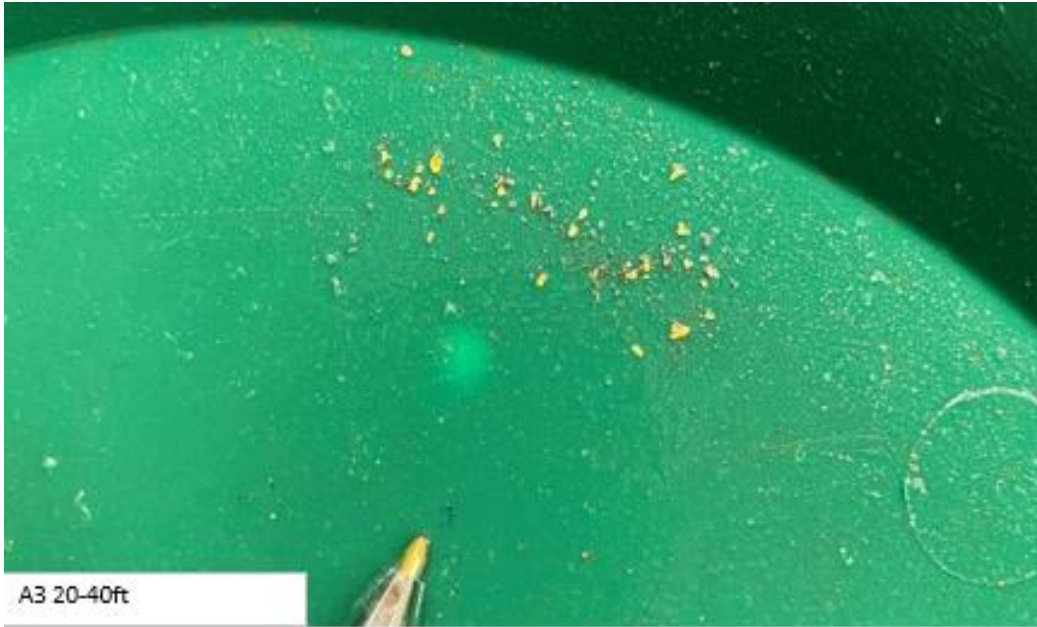


Figure 21 - Gold recovered from drillholes A3, 20-40 ft. and A4, 20-35 ft.



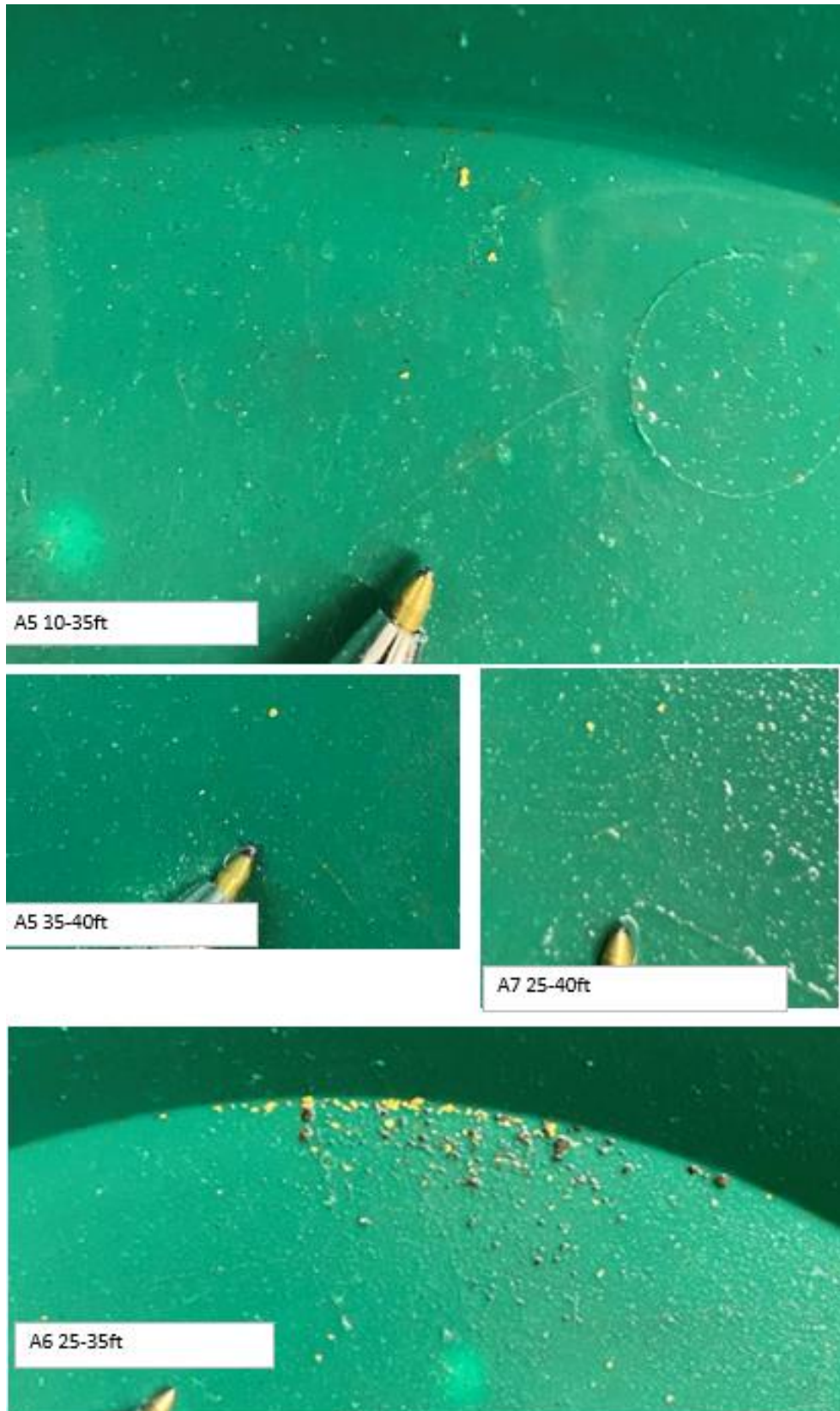


Figure 22 - Gold recovered from drillholes A5, A6 and A7.

## Conclusions and Recommendations

The drone surveys showed areas of historic workings at high resolution as well as the new drill roads which were constructed in October 2020. The imagery will also enable accurate locations of new activity for future exploration programs.

The claim location surveys appear to show that the claims (posts on the ground) on the northern boundary are shifted nearly one full claim upstream compared to the Government maps. This has implications for both the true locations of the historic YCGC drill holes and shafts, and any future mining of the property. It is therefore recommended that a legal survey or official mine inspection be conducted on the project area.

The RAB and auger drill programs gave encouraging gold results, and it appears that the drill holes encountered a zone of virgin pay gravels and poorly-dredged bedrock.

Given the promising results it is recommended that a series of cross-valley test pits should be excavated, initially centred on the promising drilled area and expanding in both upstream and downstream directions. Test pit planning would be facilitated by the use of concurrent geophysical resistivity surveys. The stratigraphy of the test pits should be noted especially where it appears there is virgin gravels present. If sufficient pay material is delineated, full-scale mining of the area should be initiated.

## Statements of Qualifications

### William LeBarge

I, William LeBarge, of 13 Tigereye Crescent, Whitehorse, Yukon, Canada, DO HEREBY CERTIFY THAT:

1. I am a Consulting Geologist with current address at 13 Tigereye Crescent, Whitehorse, Yukon, Canada, Y1A 6G6.
2. I am a graduate of the University of Alberta (B.Sc., 1985, Geology) and the University of Calgary (M.Sc., 1993, Geology – Sedimentology)
3. I am a Practicing Member in Good Standing (#37932) of the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC).
4. I have practiced my Profession as a Geologist continuously since 1985.
5. I am President and sole shareholder of Geoplacer Exploration Ltd., a Yukon Registered Company.

Dated this 11<sup>th</sup> day of January, 2021

William LeBarge, P. Geo.



### Selena Magel

I, Selena Magel, of 80B - 18 Azure Road, Whitehorse, Yukon, Canada, DO HEREBY CERTIFY THAT:

1. I am a Geologist in Training, registered with APEGA with current address at 80B - 18 Azure Road, Whitehorse, YT, Y1A 0L2
2. I am a graduate of the University of Calgary (B.Sc., 2017, Geology).
3. I have practiced Geology since May 2017.
4. I have conducted and interpreted over 100 km of resistivity surveys since the summer of 2017.

Dated this 11<sup>th</sup> day of January, 2021

Selena Magel, G. I. T.



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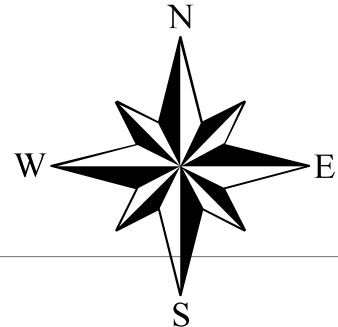
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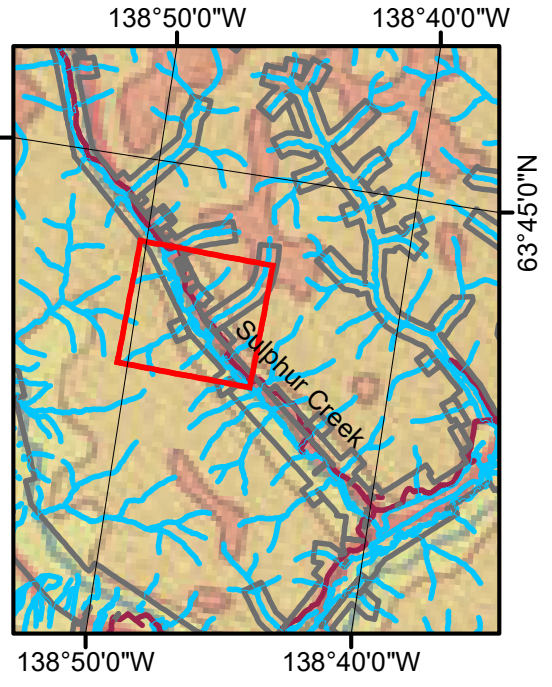
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# Appendix A - Drone Survey

607000 607500 608000 608500 609000 609500 610000 610500 611000  
138°50'0"W 138°49'30"W 138°49'0"W 138°48'30"W 138°48'0"W 138°47'30"W 138°47'0"W 138°46'30"W 138°46'0"W 138°45'30"W



63°43'30"N 7068000  
63°43'0"N 7067500  
63°42'30"N 7067000  
63°42'0"N 7066500  
63°41'30"N 7066000  
63°41'0"N 7065500  
63°40'30"N 7065000  
63°40'0"N 7064500



Scale 1:10,000  
UTM Zone 7N  
Datum NAD 83



607000 607500 608000 608500 609000 609500 610000 610500 611000  
138°50'0"W 138°49'30"W 138°49'0"W 138°48'30"W 138°48'0"W 138°47'30"W 138°47'0"W 138°46'30"W 138°46'0"W 138°45'30"W