

# REPORT ON THE SIXTY MILE PROPERTY 2010 GEOLOGICAL, GEOCHEMICAL, GEOPHYSICAL & AUGER, RAB and DIAMOND DRILLING

(Work Performed: June 7 – Sept 19, 2010)

Claim_Name*			Claim_Name*			Claim_Name*		
Kurt	1	- 4	BK	138	-	UNI	2	-
Jed	1	- 16	BK	149	- 181	UNI	4	-
Vance	1	- 5	BK	231	- 232	UNI	6	-
SMF	1	- 18	BK	236	- 254	UNI	10	-
Paul	1	- 10	BK	256	- 258	UNI	12	-
Toni	1	- 32	BK	260	- 269	UNI	22	- 28
Rod	1	- 8	Bo	1	- 46	UNI	38	-
Jess	1	- 4	Bud	1	- 24	UNI	40	-
Mary	17	- 30	Cache	1	- 66	UNI	46	- 47
Mike	1	- 20	CHOL	1	- 24	UNI	49	-
ALI	1	- 76	CICI	3	- 6	UNI	54	-
Andrea	1	- 24	CICI	14	- 16	UNI	56	-
BK	1	- 8	CICI	18	-	UNI	58	-
BK	10	- 20	CICI	25	-	UNI	60	- 65
BK	22	- 39	CICI	27	-	Glac	1	- 8
BK	41	- 50	CICI	44	-	Mill	1	- 2
BK	74	- 84	CICI	46	- 47	Gabr	1	- 13
BK	87	- 112	Creek	1	- 2	Gabr	16	- 39
BK	114	- 117	Creek	7	- 14	Stella	1	- 18
BK	119	- 129	Creek	19	- 26	WAM	1	- 52
BK	131	- 135	Creek	31	- 38			

\*See Appendix A for Grant Numbers and Registered Owners

## DAWSON MINING DISTRICT, YUKON TERRITORY NTS: 116C/02 & 115N/15

Latitude 64° 02' 00" N  
Longitude 140° 50' 00" W

Owner and Operator:  
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February 28, 2011

## SUMMARY

The purpose of this report is to fulfill assessment requirements on 765 claims that make up a portion of the Sixty Mile Project (total of 916 claims as of February 28, 2011). They cover most of the Sixty Mile placer gold district approximately 75 km west of Dawson City, Yukon, adjacent to the Yukon-Alaska border. Collectively, the claims cover an area of approximately 18,700 hectares and are comprised of Yukon two-post Quartz claims held directly by Radius Gold Inc. or through option agreements. Access to the property is by the posted 15-kilometre-long Sixty Mile Road, from the Top of the World Highway.

The 2010 exploration program from June 7 – September 19, 2010 consisted of geological mapping, geochemical sampling, an airborne aeromagnetic and radiometric survey, mechanized trenching (13 trenches, 1134 linear meters), auger (349 holes), rotary air blast (RAB) drilling (84 holes totaling 3326.56 m) and diamond drilling (5 holes and 1442 m to September 19, 2010 although later results from DDH10-06 & 07 are included herein for completeness).

The Sixty Mile placer district has produced approximately 435,000 crude ounces of gold since 1892 (LeBarge, 2006). The bedrock sources for most of the placer gold is unknown although both orogenic (mesothermal) and epithermal types of veining have been found in a number of areas on the property. Orogenic auriferous quartz-sulfide veins are hosted by Permian to Mississippian metasedimentary rocks. A primary target hosted by these rocks is the Melange Zone, an 8km long by 250 – 800 m wide linear belt disrupted by thrust faults. This belt of rocks was tested by RAB drilling across three sections and a fourth zone, the Kennecott Trench Zone, was trenched and tested by 4 diamond drill holes. The best intercept was 414 ppb gold over 40.78m from DDH10-02.

Claims in the eastern side of the property are underlain by Late Cretaceous calc-alkaline volcanics of the Carmacks Group. Altered and variably mineralized andesities in the Sixty Mile River valley are preserved in a northeast trending half graben over a distance of approximately eight kilometers. The bounding Sixty Mile Fault juxtaposes the volcanics with older metasedimentary and metaigneous rocks to the east.

Three mineralized areas in the volcanics have been located to date: the Per and Glasmacher occurrences and the Toni Zone. Mineralization at the occurrences, including a 7.1 g/t gold over 12 m diamond drill intersection at the Per in 1988, is thought to be 'hanging wall' epithermal mineralization above the northwesterly(?) dipping Sixty Mile Fault, the main controlling structure. The Toni Zone, a 300 m by 800 m gold in soil anomaly, located along the fault was drill tested in 2010 with DDH10-06 returning 327 ppb over 74.68 m.

Additional diamond drilling is recommended at the Toni Zone below the intersection in DDH10-06. A geophysical survey, type to be determined in consultation with a geophysicist, is recommended over the altered volcanics in the overburden covered Sixty Mile River valley for epithermal precious metal deposits. Geophysical experimentation is recommended over the Melange Zone, in particular the Kennecott Trench zone area, where there is diamond drill control. The goal of the geophysical survey(s) is to find a method, or by a combination of methods, that will locate economic concentrations of auriferous orogenic quartz veins. Promising targets should be drill tested.

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## 1.0 INTRODUCTION

The purpose of this report is to describe the June 7, 2010 – September 19, 2010 interval of the 2010 work program to fulfill assessment requirements on 765 quartz claims. These claims are part of the larger Sixty Mile property, 916 claims in total, a mix of wholly owned and claims optioned by Radius Gold Inc. The road accessible property covers most of the Sixtymile placer gold district, which is estimated to have produced in excess of 435,000 crude ounces since 1892. The claims cover a number of different mineral occurrences including epithermal vein type, orogenic gold bearing quartz +/- sulfide veins, skarn or replacement occurrences and a placer cinnabar occurrence.

Although the district has been explored for lode gold deposits since 1896 most exploration has been of limited duration and piecemeal. Records for only two drill campaigns prior to 2010 have been located: in 1988 and 1989 totaling 1176 m in 14 holes.

Work from June 1, 2010 to September 19, 2010 consisted of testing bedrock by 5 diamond drill holes, 84 rotary air blast (RAB) and 352 auger drill holes. A total of 1934 soil samples were collected, 1053 rock samples and 1.1 linear km of excavator trenching in 12 trenches were also completed in 2010. A low level aeromagnetic and radiometric survey totaling 1902 kilometers was flown between July 12 to 25, 2010. Geological mapping was carried out by Dr. Fabrizio Colombo of Totem Pole Consulting Ltd.

The purpose of the 2010 work program was to follow up on gold-in-soil and rock samples identified by Kennecott Exploration in 1999 (Hulstein and Zuran, 1999) and to examine and test areas identified by other workers including the Per mineral occurrence area, where diamond drill hole DDH D4/88-02 returned an average of 8.76 gpt gold over 10.5m from 3m – 13.5m, a nearby trench that reportedly contained visible gold, silver values up to 2303 gpt from trenches at the Cholach occurrence (Cholach, 1981a, 1981b), the area of the Glasmacher occurrence where rock samples reportedly contained up to 12 gpt gold (Yukon MINFILE), soil samples on the Toni claims that contained up to 1287 ppb Au and the Layfield Zone that Layfield Resources trenched and drilled in 1988 and 1989.

Since the last integrated exploration program carried out in 1999 by Kennecott two significant discoveries, the Livengood deposit by International Tower Hill and the White Gold deposit by Underworld Resources, provide new exploration models for lode gold deposits that can be applied at the Sixty Mile placer district.

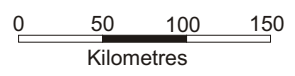
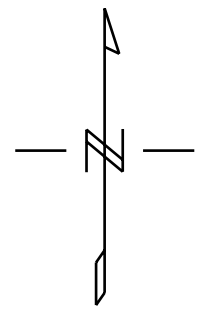
The report also describes the location, access, history, geological setting, known mineralization of the property and outlines a proposed exploration program to further explore the property for gold-silver bearing epithermal vein type mineralization.

## **1.1 Location and Access**

The claims are located in the Sixty Mile placer district and cover a portion of the valley bottom occupied by the northeast flowing Sixty Mile River near the mouth of tributary Miller Creek. The property is located on map sheet NTS 116C/02 and 115N/15 (Figure 1).

The property is located approximately 75 km due west of Dawson. Access to the project area is via the posted Sixty Mile Road that turns south off the Top of the World Highway (Hwy 11) at approximately kilometer 87. The north side of the claims are reached about 2.5 km from the turn off and the 2010 camp on Glacier Creek at about 11 km. Numerous roads built, maintained and changed as needed by the local placer miners access the northwest side of the claim group. The southeast side of the claim group is accessed by foot from roads in the valley bottom; this includes fording the Sixty Mile River. The roads are generally usable by 2WD truck from early June to late September. The Top of the World Highway is not maintained during winter months and the George Black ferry crossing the Yukon River at Dawson City operates between mid-late May and mid-October.

Daily plane service can be gained in Dawson City to Whitehorse, where there is daily jet airplane service to Vancouver, British Columbia and other points south.



Radius Gold Inc.
Sixty Mile Project Location Map
Figure 1
<i>Date:</i> April 16, 2010
<i>Drawn By:</i> Scott Turton

## 1.2 Topography, Vegetation and Climate

Topography in the region is typical of an incised peneplain with steep hillsides and rounded crests. The area was beyond the limits of the last two continental glacial events and minor evidence of glaciations in the region is a result of localized alpine glaciers. Alluvium in the valleys is mostly locally derived. Hillsides are covered with a veneer of colluvium also locally derived. Elevation ranges from 2,100 feet (640 m) in the Sixty Mile valley to approximately 3,800 feet (1160 m) on nearby ridges. In the valley bottoms permafrost is not a consideration except near the well vegetated hillsides. On the hillsides and ridge spurs, particularly northerly facing slopes and poorly drained areas, permafrost (often as frozen black muck) is a serious hindrance to exploration.

Rock outcrop in the area is restricted to ridges, small cliffs, creek bottoms and along road and trench cuts. The Per occurrence, located in the Sixty Mile River valley, has been exposed in the past by placer miners but is now covered by placer mined gravel tailings, ponds and waste piles. These placer tailings are estimated to be <5 m-8 m thick. Often bedrock type can be determined by angular boulders, of consistent type, piled (by placer miner activity) on top of the more typical rounded mixed lithologies of river gravel and boulders.

Vegetation in the valley bottoms consists of alder, dwarf birch, balsam fir, white and black spruce. Ground cover in areas of thin tree cover consists of alpine plants, 'buckbrush' (alder), dwarf willow and moss. Beaver dams in the numerous side channels and placer drainages result in many ponds that restrict and hinder access. Hillsides and ridges are covered with pine, spruce, birch and poplar on well-drained slopes and stunted black spruce in areas of permafrost. Treeline is at approximately 3,500 feet (1070 m). Vegetation is generally more abundant on east and south facing slopes. Grizzly and black bears as well as moose frequent the valley bottom, attracted by young vegetation on the placer tailings.

Climate is characterized by low precipitation and a wide temperature range. Winters are cold and temperatures of  $-30^{\circ}\text{C}$  to  $-45^{\circ}\text{C}$  are common. Summers are moderately cool with daily highs of  $10^{\circ}\text{C}$  to  $25^{\circ}\text{C}$ . Thunders showers are a common occurrence. Smoke from forest fires can be thick at certain times. The seasonal window for prospecting is from late May to mid-September.

The summer of 2010 was characterized by heavier-than-usual rainfall, with a 20 year flooding of the Sixtymile River that significantly altered its course through the valley in several locations, and washed out existing fords.

## 1.3 History

The Sixty Mile district has been worked for placer gold since the discovery of gold on Miller Creek in 1892. Placer gold production likely exceeds the recorded figure of

435,109 ounces won from the creeks during the period 1892-2005 (LeBarge, 2006). The bulk of the placer gold was mined from Miller, Glacier, Bedrock, Little Gold, Big Gold Creeks and the Sixty Mile River.

Along with the placer activity, lode prospecting of the district has occurred since the first hard rock claims were staked over the nearby Miller galena occurrence in 1896 (Yukon MINFILE 116C 019).

Ulrich Glasmacher reported on the paragenesis and characterization of mineralization found in the Sixty Mile area in his 1984 Master's dissertation (Glasmacher, 1984). He was also responsible for other studies in the Sixty Mile River area (Glasmacher and Freidrich, 1992) including overseeing the diamond drilling on the Per auriferous vein occurrence (Yukon MINFILE 115N 041) for Klondike Gold Mining Corporation in 1988 (Glasmacher, 1988).

Kennecott Canada Exploration Inc. staked and optioned most of the ground between Miller and Glacier Creeks and Sixty Mile River in 1998 (Hulstein and Zuran, 1999). Kennecott compiled the previous data and carried out a property mapping, property stream and soil geochemistry program, a gravity survey and a helicopter airborne magnetic survey.

In 2003 Roger Hulstein staked the Paul 1-10 and Toni 1-8 claims and vended them to North American Gold Inc. (now Northland Resources Inc.). North American Gold Inc. carried out a small trenching program in 2003 in an effort to locate the vein structure intersected in 1988 by Klondike Gold Mining Corporation (Hulstein, 2004). In 2005 and 2006 Hulstein staked the Toni 9-28 claims and in 2008 the Toni 29-32 claims.

In 2009 Radius Gold optioned the Paul 1-10, Toni 1-8, Kurt 1-4, Vance 1-5, Mike 11-13, Jess 1-4, Andrea 1-4, SMF 3,5,8,13,14, Toni 22 and 24 claims and staked the BK 257 claim.

The following is a summary from Yukon MINFILE, in chronological order, of significant work and events carried out in Sixty Mile valley and nearby area since 1892.

1892: Placer gold discovered in the Sixty Mile River area by C. Miller.

1896: Claims staked over the Miller galena occurrence located near the headwaters of Miller Creek.

Early 1900's: Placer miners found coal in Tertiary sediments

1915-1916: North American Trading and Transportation Co. dredged near the mouth of Miller Creek.

1920: (or prior), placer miners find galena, sphalerite and arsenopyrite veining discovered in Sixty Mile valley (Per occurrence – Yukon Minfile).

1929-1941: The dredge was refurbished by the Holbrook Dredging Co. which mined in the Sixty Mile Valley.

- 1947-1959: A new dredge was constructed by Yukon Exploration and Yukon Placer Mining Co. which mined the lower reaches of Glacier and Big Gold Creeks and part of Sixty Mile River.
- 1965: Per occurrence in Sixty Mile Valley, near mouth of Miller Creek, trenched and tested by 2 short drill holes. Northern Exploration Limited bulldozer trenched in WY gulch area.
- 1981: W. Yaremico staked WY claims. Fred Chudy (Chumar Placers Ltd., later Klondike Sand and Gravel Co. Ltd. and Klondike Underground Mining Ltd.) commenced underground placer operations on Miller Creek (upper adit). Lower adit completed later and U/G mining ended 1990.
- 1984: The Glasmacher occurrence (Minfile No. 116C 153) was staked by Noranda.
- 1985: Erwin Kreft restaked Per occurrence and area. Jon Millhouse trenched Vance claims. Noranda soil, stream sediment and rock sampled their claims.
- 1986: Erwin Kreft trenched Per occurrence, Esso Minerals Canada Limited tied onto Erwin Kreft's claims in Sixty Mile Valley.
- 1987: Esso mapped and sampled, Erwin Kreft trenched.
- 1988: Klondike Gold Mining Corporation optioned Per occurrence from Erwin Kreft and drilled 7 holes (765m) and intersected 8.76 gpt Au over 10.5 m in DDH D4/88-02. The option was subsequently dropped and no follow-up was carried out.
- 1989: Homestake Mineral Development Co. Ltd. optioned Esso's ground, then mapped and sampled it.
- 1990: Sixty Mile Placers Ltd. (G. Hakonson) auger drilled 205 holes from mouth of Big Gold Creek to 1.2 km below Five Mile Creek.
- 1998: Kennecott Canada Exploration Inc. staked and optioned most of the ground between Miller and Glacier Creeks and Sixty Mile River. Kennecott carried out a property mapping, property stream and soil geochemistry program, a gravity survey and a helicopter airborne magnetic survey. Trenching was carried out on the ridge southwest of Miller Creek and a few test pits in the Sixty Mile River valley.
- 2003-2004: Roger Hulstein restaked the ground previously held by Kennecott and others as the Paul 1-10 and Toni 1-8 claims and vended them to North American Gold Inc. (now Northland Resources Inc.). North American Gold Inc. carried out a small trenching program in 2003 in an effort to locate the vein structure intersected in 1988 by Klondike Gold Mining Corporation (Hulstein, 2004). In 2004 North American Gold Inc. optioned the Vance 1-5 claims from the estate of prospector Jon Millhouse.
- 2005 - 2008: Roger Hulstein staked the Toni 9-14 claims and carried out a reconnaissance program in 2006, staked the Toni 15-28 claims and in 2008 the Toni 29-32 claims.

2009: Radius Gold Inc. acquired all of the claims that cover the Sixty Mile River valley and acquired by optioning and staking most of the ground that makes up the Sixty Mile placer district.

#### **1.4 2010 Work Program**

The 2010 exploration program initially focused on testing, by auger drilling, the Per mineral occurrence area as claim assessment work on 46 claims had to be completed by June 6, 2010. For full details on this portion of the program please refer to the 2010 assessment report (Hulstein, 2010). This report focuses on the work carried out between June 7, 2010 and September 19, 2010 on epithermal gold targets in the Sixty Mile River valley and areas located to the west underlain by metasedimentary rocks. Although analytical results from DDH10-06 and 10-07 are discussed in this report, diamond drill logs from the final two holes, will be submitted as part of assessment requirements at a later date.

All work was carried out of a 15 person tent and trailer camp located near the mouth of Glacier Creek. The camp site, cook and dining trailer, water supply system and 40 kw generator were rented from K-1 Mining and Services (operated by placer miner Mr. Mike McDougall). Three Ford pickup trucks were rented from Enterprise Rent-A-Car out of Prince George for vehicle requirements. Four Bombardier ATV's were rented from Rical Mining to access work areas. Camp was opened on May 24, 2010 and closed on September 30, 2010. An FM VHF repeater was rented from Total North Communications and installed on a ridge high point north of Glacier Creek (see Figure 4).

Work consisted of an integrated program of geological mapping by Radius staff and Dr. Fabrizio Colombo of Totem Pole Consulting, geochemical soil sampling, excavator trenching, auger drilling, rotary air blast (RAB) drilling, diamond drilling, airborne magnetic and radiometric survey, a HLEM MaxMin test survey. Work was also assisted by visits from the University of British Columbia's Mineral Deposit Research Unit (MDRU) researchers: Dr. Jim Mortensen, Dr. Rob Chapman and Dr. Murray Allan, and graduate students Mr. David Cox and Mr. Tim Wrighton.

Auger drilling was carried out by Mr. Sylvain Fleurant, owner and operator of an auger drill business based in Dawson City. A total of 398 holes were drilled between June 1, 2010 and July 29, 2010, including 13 drilled for Mike McDougall (placer miner) and sampled by Radius Gold Inc.

A rotary air blast (RAB) drilling program was carried out between July 28, 2010 and Sept. 28, 2010. Mr. Stan Wolarek of Whitehorse, owner and operator, was contracted to drill 84 holes totaling 3326.56 m.

Mechanized trenching was carried out on the Kennecott Trench Zone, over a small outcropping of weathered and oxidized vein in the Sixty Mile River valley, and on the

Toni soil geochemistry anomaly. An old preexisting trench (Tr10-12) in Glacier Creek was also mapped and sampled. Trench maps are included in Appendix M and geochemical rock sample results in Appendix H. A total of 13 trenches, with a total linear length of 1134 m were excavated.

Trenches Tr10-1 to Tr10-3 were excavated by Miller Creek Mining Company Ltd. (placer miner Jayce Murtagh) June 23 – 25, 2010 with a Hitachi 300 excavator. Trenches Tr10-4 to Tr10-11 and Tr10-13 were excavated by H. Coyne and Sons Ltd., based out of Whitehorse, between July 15, 2010 and August 16, 2010 utilizing a Caterpillar 225 excavator. Trenches averaged between 1.25 m and 1.5 m wide and varied in depth between 1 – 2 m. Prior to trenching, the organic and topsoil layer was pulled to one side, the first 0.3 m stripped to allow the excavator passage and then a 1 to 1.5 m trench excavated. All trenches were reclaimed at the end of the season with the topsoil and organics placed on top of the backfilled trenches.

Precision GeoSurveys Inc. carried out a low level (average <30 m sensor height) helicopter airborne survey over the property between July 12 and July 25, 2010, for a total of 1902 line km. Lines were flown north – south, spaced 200m, with selected areas having lines spaced 100 m. The full report by Precision on the survey is enclosed in Appendix D.

Kluane Diamond Drilling Ltd, based in Whitehorse, Yukon, was contracted to drill 7 NTW size (5.6 mm) diamond drill holes totaling 1607.81 m. Three areas were tested; the Kennecott Trench Zone area, the Walker Fork and Toni gold in soil geochemical anomaly (Figures 5a and 5b). Drill logs with selected geochemical results are included as Appendix F and G respectively.

Dr. Fabrizio Colombo (Totem Pole Geological Consulting Ltd.) of Vancouver, BC, carried out a geological mapping program with an assistant between June 11 – 27, 2010 and August 9 – 16, 2010. His full report is included as Appendix B.

Aurora Geosciences Ltd., out of Whitehorse carried out an 8 line Max-Min survey in the Sixty Mile River Valley over the Per occurrence and 1988 diamond drill area from August 27-30, 2010, for a total of 4.0 line km. The full report is included as Appendix E.

Geochemical soil sampling, totaling 1934 samples, was carried out by Radius personnel between early June and early September. Sample sites are shown on Figures 6a and 6b, merged sample descriptions and selected geochemistry is included in Appendix H for rock samples and in Appendix I for soil samples.

Access trails for diamond drilling at KEX trenches were constructed by H. Coyne and Sons Ltd., utilizing a Caterpillar D6 bulldozer and a Caterpillar 225 excavator. The same equipment also reclaimed most of the trails, trenches and drill pads at the end of the season in September.

Information on locating the 1988 diamond drill hole collars at the Per Occurrence was provided by Mr. Mike McDougall (K-1 Mining and Services), who owns placer claims in the Sixty Mile River valley and mined up Glacier Creek in 2010. Assistance was also provided by Mr. Frank Hawker and Mrs. Karen Hawker who mined in the Sixty Mile River valley in 1988. Mr. Frank Hawker also pointed out the approximate location of the 'VG' Zone located near the suspected location of DDH D4/88-02.

Hand-held GPS receivers (Garmin GPSmap 60CSx) were used to plot locations of rock and soil samples, access routes, claim posts and other features (approximate +/-5m accuracy). All geochemical samples were shipped to Acme Analytical Laboratories Ltd. in Whitehorse, Yukon for analysis.

## 1.5 Claim Status

The Sixty Mile property consists of 916 full and fractional size claims (listed in Appendix A) that cover an area of approximately 18,810 hectares and consist of unsurveyed contiguous two-post Yukon 'Quartz' claims (Figure 2). This report describes work carried out on the property from June 7 to Sept. 19, 2010. This work was applied to a total of 786 of the claims as listed in summary Table 1.

All claims were staked according to the Yukon Quartz Mining Act and are located in the Dawson Mining District. They are shown on claim sheet 115N/15 and 116C/2 and are available for viewing at the Dawson Mining Recorders Office. All the claims, as listed in Appendix A, which include those listed in Table 1 are held by Radius Gold Inc. directly or through various option agreements. See Appendix A for a full claim list including grant numbers, expiry dates (subject to acceptance of this report) and registered owners.

**Table 1. List of Claims**

Claim_Name*	Claim_Name*	Claim_Name*
Kurt 1 - 4	BK 138 -	UNI 2 -
Jed 1 - 16	BK 149 - 181	UNI 4 -
Vance 1 - 5	BK 231 - 232	UNI 6 -
SMF 1 - 18	BK 236 - 254	UNI 10 -
Paul 1 - 10	BK 256 - 258	UNI 12 -
Toni 1 - 32	BK 260 - 269	UNI 22 - 28
Rod 1 - 8	Bo 1 - 46	UNI 38 -
Jess 1 - 4	Bud 1 - 24	UNI 40 -
Mary 17 - 30	Cache 1 - 66	UNI 46 - 47
Mike 1 - 20	CHOL 1 - 24	UNI 49 -
ALI 1 - 76	CICI 3 - 6	UNI 54 -
Andrea 1 - 24	CICI 14 - 16	UNI 56 -
BK 1 - 8	CICI 18 -	UNI 58 -
BK 10 - 20	CICI 25 -	UNI 60 - 65
BK 22 - 39	CICI 27 -	Glac 1 - 8
BK 41 - 50	CICI 44 -	Mill 1 - 2
BK 74 - 84	CICI 46 - 47	Gabr 1 - 13
BK 87 - 112	Creek 1 - 2	Gabr 16 - 39
BK 114 - 117	Creek 7 - 14	Stella 1 - 18
BK 119 - 129	Creek 19 - 26	WAM 1 - 52
BK 131 - 135	Creek 31 - 38	

Some of the claims shown on Figure 2 were drawn following the results of a preliminary and partial claim survey carried out by handheld GPS receivers (Garmin GPSmap 60CSx, approximate +/-5m accuracy). Notably the Vance 1-5 claims have moved significantly when compared to the current map provided by the Dawson mining recorder.

## 2.0 REGIONAL GEOLOGY AND METALLOGENY

The first geological investigation of the Sixty Mile River area was by J. E. Spurr in 1896-97 (Spurr and Goodrich, 1898), followed by Cockfield in 1917 (Cockfield, 1921). More recently the area was mapped at 1:250,000 scale by Tempelman-Kluit in 1970-1972 (Tempelman-Kluit, 1973), Green in 1961 (Green, 1972) and Mortenson (1988, 1996).

The property lies between the Tintina and Denali Faults within the Ominica Belt (Wheeler and McFeely, 1991, Gordy and Makepeace, 2001). The area is underlain by two distinct lithotectonic (pre-accretion) assemblages: 1) medium to high grade, polydeformed metasedimentary and meta-igneous rocks of the Yukon-Tanana Terrane (YTNA and YTKS); and 2), deformed and metamorphosed rocks of the Slide Mountain Terrane (YTa) (Mortenson, 1988, 1996) (Figure 3). Both are mainly Paleozoic in age and were juxtaposed by regional scale thrust faults in early Mesozoic time, a period of terrane accretion that affected much of the northern Cordillera.

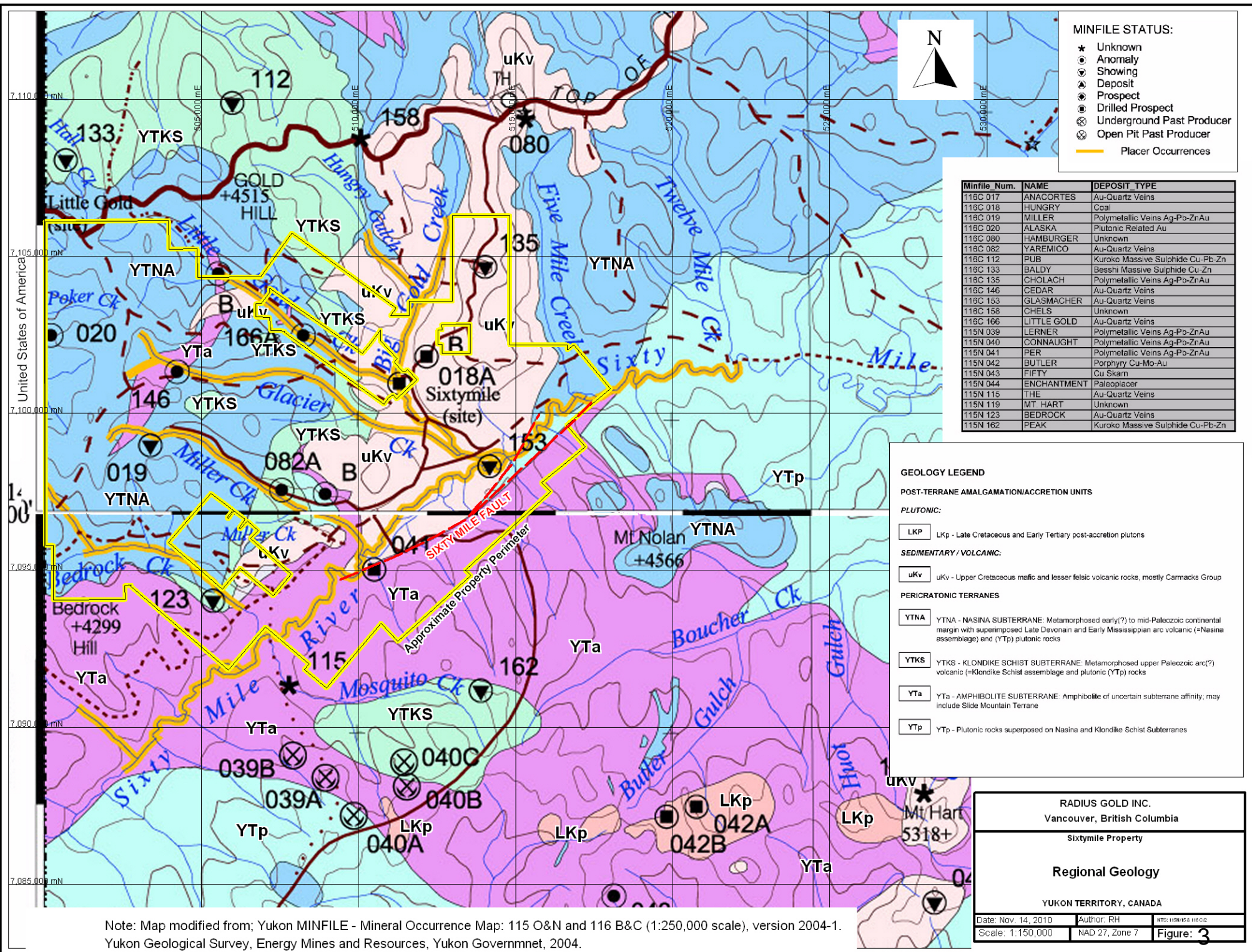
Locally, the Yukon Tanana Terrane consists of two main assemblages of supracrustal rocks, the Late Devonian (?) to mid-Mississippian Nasina assemblage (YTNA) and the mid-Permian Klondike Schist assemblage (YTKS) (Mortenson, 1996) and three distinct suites of metaplutonic rocks (YTp). The Nasina consists of metamorphosed psammites, mainly quartz-muscovite-chlorite schist and quartzite, +/- carbonaceous material, interlayered mafic schist and amphibolite and volumetrically minor amounts of marble, conglomerate and felsic schist. The Klondike Schist assemblage is comprised mainly of a variety of felsic schists interlayered with non-carbonaceous fine grained micaceous quartzite and quartz-feldspar-muscovite-biotite (+/- chlorite) schist. Local layers of chlorite schist, metagabbro, and rare bands of marble and carbonaceous quartz-muscovite schist are found within the felsic schists.

The Klondike placer camp, with approximately 20,000,000 million ounces of placer gold produced (Government of Yukon, 2007), is underlain predominantly by units of the Klondike Schist assemblage.

According to Mortenson (1996) three distinct suites of metaplutonic rocks (unit YTp) found within the Yukon Tanana Terrane are:

- 1) Devonian – Mississippian feldspar and quartz-feldspar augen schist interpreted to be meta-porphyry sills and/or transposed dykes
- 2) Early Mississippian granitic orthogneiss, e.g. the Fiftymile batholith located in the Sixty Mile River area.
- 3) mid-Permian quartz monzonite gneiss and quartz (+/-feldspar) augen schist (Sulphur Creek orthogneiss).

Rocks of the Paleozoic Slide Mountain Terrane (YTa) include massive greenstone and



- MINFILE STATUS:**
- ★ Unknown
  - Anomaly
  - ◐ Showing
  - ▲ Deposit
  - ◑ Prospect
  - ◒ Drilled Prospect
  - ⊗ Underground Past Producer
  - ⊙ Open Pit Past Producer
  - Placer Occurrences

Minfile Num.	NAME	DEPOSIT TYPE
118C 017	ANACORTES	Au-Quartz Veins
118C 018	HUNGRY	Cgal
118C 019	MILLER	Polymetallic Veins Ag-Pb-ZnAu
118C 020	ALASKA	Plutonic Related Au
118C 080	HAMBURGER	Unknown
118C 082	YAREMICO	Au-Quartz Veins
118C 112	PUB	Kuroko Massive Sulphide Cu-Pb-Zn
118C 133	BALDY	Besshi Massive Sulphide Cu-Zn
118C 135	CHOLACH	Polymetallic Veins Ag-Pb-ZnAu
118C 146	CEDAR	Au-Quartz Veins
118C 153	GLASMACHER	Au-Quartz Veins
118C 158	CHELS	Unknown
118C 166	LITTLE GOLD	Au-Quartz Veins
115N 039	LERNER	Polymetallic Veins Ag-Pb-ZnAu
115N 040	CONNAUGHT	Polymetallic Veins Ag-Pb-ZnAu
115N 041	PER	Polymetallic Veins Ag-Pb-ZnAu
115N 042	BUTLER	Porphyry Cu-Mo-Au
115N 043	FIFTY	Cu Skarn
115N 044	ENCHANTMENT	Paleoplacer
115N 115	THE	Au-Quartz Veins
115N 119	MT HART	Unknown
115N 123	BEDROCK	Au-Quartz Veins
115N 162	PEAK	Kuroko Massive Sulphide Cu-Pb-Zn

**GEOLOGY LEGEND**

- POST-TERRANE AMALGAMATION/ACCRETION UNITS**
- PLUTONIC:**
- LKp LKp - Late Cretaceous and Early Tertiary post-accretion plutons
- SEDIMENTARY / VOLCANIC:**
- uKv uKv - Upper Cretaceous mafic and lesser felsic volcanic rocks, mostly Carmacks Group
- PERICRATONIC TERRANES**
- YTNA YTNA - NASINA SUBTERRANE: Metamorphosed early(?) to mid-Paleozoic continental margin with superimposed Late Devonian and Early Mississippian arc volcanic (+Nasina assemblage) and (YTp) plutonic rocks
  - YTKS YTKS - KLONDIKE SCHIST SUBTERRANE: Metamorphosed upper Paleozoic arc(?) volcanic (=Klondike Schist assemblage and plutonic (YTp) rocks
  - YTa YTa - AMPHIBOLITE SUBTERRANE: Amphibolite of uncertain subterrane affinity; may include Slide Mountain Terrane
  - YTp YTp - Plutonic rocks superposed on Nasina and Klondike Schist Subterrane

**RADIUS GOLD INC.**  
 Vancouver, British Columbia

Sixtymile Property

**Regional Geology**

YUKON TERRITORY, CANADA

Date: Nov. 14, 2010    Author: RH    MTS: 118/115, 116/C

Scale: 1:150,000    NAD 27, Zone 7    Figure: 3

Note: Map modified from; Yukon MINFILE - Mineral Occurrence Map: 115 O&N and 116 B&C (1:250,000 scale), version 2004-1. Yukon Geological Survey, Energy Mines and Resources, Yukon Government, 2004.

a variety of altered ultramafic rocks. The ultramafic rocks commonly denote thrust (and normal?) faults, are partially to wholly serpentized and locally exhibit quartz-carbonate alteration. The mined out Clinton Creek asbestos deposit, located approximately 40 km to the north of the project area, is hosted by units of Slide Mountain Terrane.

Jurassic quartz monzonite bodies intrude the Yukon Tanana Terrane and Mortenson (1996) noted that field relationships indicate that they intruded prior to both Early (?) Jurassic regional thrust imbrication and Early Cretaceous normal faulting.

Post accretion units unconformably overly rocks of the Tanana Terrane and Slide Mountain Terrane. These units consist of a sequence of unmetamorphosed sedimentary and volcanic rocks of middle (?) and Late Cretaceous age (unit uKv) (Mortenson, 1996). The lower part of the unit typically consists of sandstone and pebble to cobble conglomerate that is overlain by massive andesitic flows and breccias that are correlated with the (68-76Ma) Carmacks Group.

Rare outcrops exposed in the Sixty Mile River valley and granitoid bodies (LKP) exposed to the southeast of the valley of fine to medium grained, equigranular biotite-hornblende quartz monzonite and granodiorite are thought to be co-magmatic with the Late Cretaceous Carmacks group volcanics.

Volumetrically minor amounts of Miocene aged quartz pebble conglomerate, sandstone, shale minor tuffs and olivine basalt are preserved in the Sixty Mile valley.

Units of the Nasina and Klondike Schist assemblage and the three associated orthogneiss units show the effects of penetrative ductile deformation and metamorphism at middle greenschist to lower amphibolite facies (Mortenson, 1996). Rocks of the Slide Mountain Terrane generally only display evidence of brittle shearing and open folding. Units of the Slide Mountain and Yukon Tanana terranes are juxtaposed along mainly shallowly to moderately dipping fault zones that are interpreted as thrust faults. Low angle normal faults are also interpreted between the Fiftymile Batholith and overlying rocks.

Middle and Late Cretaceous sedimentary and volcanic rocks are generally undeformed although they have been at least locally folded (Mortenson, 1996). The Tintina and Denali faults found to the northeast and southwest of the property, respectively, trend northwest and are major crustal-scale transcurrent dextral faults of Tertiary (?) age.

The Sixty Mile Fault, a major northeast trending fault structure lying on a lineament that extends to Tok, Alaska, underlies the east side of the Sixty Mile River valley. In the Sixty Mile placer district, the valley follows a (half?) graben structure that down drops Cretaceous Carmacks Group rocks, on the northwest side, against Nasina and Klondike Schist Assemblage rock to the southeast. Other northwest, north to northeast trending fault structures are suspected to underlie prominent lineaments and locally form the contacts of the Carmacks Group volcanic rocks.

## Regional Metallogeny

Regionally, the calc-alkaline Carmacks Group (70 Ma) volcanics are a widespread igneous event with spatially- and temporally-related mineralization found throughout the west central Yukon (Smuk, 1999). Mineralization and mineral deposits associated with this event include the Casino copper porphyry deposit (Selby and Nesbitt, 1998). There are a number of mineral occurrences along the trace of the Sixty Mile fault which extends to the southwest and can be traced to near Tok, Alaska.

The Carmacks Group, composed primarily of andesites, occupies the Sixty Mile Valley and is preserved due to down dropping in a block faulting environment. The region SE of the Sixty Mile fault has been uplifted with vertical movement possibly in the order of kilometers (Mortenson, pers. comm. 2007). This block faulting may be due to the intrusion of a granitoid body and subsequent uplift of overlying rocks.

The polymetallic vein occurrences, granitoid bodies, and the main placer gold creeks (Bedrock, Miller, Glacier and Sixty Mile River between the mouth of Little Gold and Miller Creek) are encompassed by or on the margins of the gravity low anomaly (Hulstein and Zuran, 1999). This gravity low may represent an unexposed granitoid batholith. Small granitoid (LKP) bodies south of Mosquito and Boucher Creeks, within the uplifted fault block, may be exposed apophyses of the larger buried granitoid body. Numerous polymetallic veins (Connaught, Yukon MINFILE 115N 040, etc.) are spatially associated with these granitoid bodies. These veins and others located even further east (~20km ESE of the project area), along with magnetite skarns and minor porphyry copper style mineralization are related to Cretaceous (?) (Carmacks ?) age granodiorite intrusions aligned in an approximate E-W direction. These polymetallic veins may be the 'roots' of eroded epithermal vein systems.

In the late 1990's Madrona Mining Limited acquired ground in the Sixty Mile area at the head of Glacier Creek for potential volcanic massive sulphide deposits similar to those found in the Yukon Tanana Terrane in the Finlayson Lake area (Marchand, 1997). To date only minor showings of sphalerite and galena (Yukon MINFILE 116C 112 & 116C 133) have been found in the Sixty Mile area.

Placer gold, with an estimated production of 435,109 crude ounces, has been mined extensively in the Sixty Mile River valley, Miller, Glacier, Poker (US side), Little Gold and Bedrock Creeks in the vicinity of the Toni 9-32 claims (LeBarge, 2006). The source of most of this gold is unknown but according to Mortenson et al. (2006) is likely derived from metamorphogenic rather than epithermal veins. While a possible metamorphogenic source occurrence has been identified on the Rod claims, bedrock epithermal veins, such as the Per and Glasmacher occurrences, in the Sixty Mile valley have also been identified. Although they themselves may not be a significant source of placer gold they hint at possible undiscovered gold bearing resources. The epithermal quartz, carbonate and pyrite veining is hosted by propylitic to argillic altered andesites, analogous to that of weak or distal porphyry style alteration and mineralization.

## 2.1 Surficial Geology

The Sixty Mile placer district lies within the Klondike Plateau (Duk-Rodkin, 1996). Dendritic 'V' shaped valleys dissect the plateau reflecting its largely unglaciated state. An exception is the Sixty Mile River valley which has been glaciated as shown by the presence of small lateral moraines.

The surficial geology is best summarized by Hughes, et al. (1986) as follows.

Quaternary deposits of the Sixty Mile river drainage basin include valley bottom alluvial plains and terraces, gulch alluvium, colluvial veneers and blankets, and scattered debris flows. The youngest Quaternary deposits include active colluvium, valley bottom gulch alluvium and the broad alluvial plain in the Sixty Mile River valley. Older alluvial deposits include the higher terrace levels in the upper reaches of Miller and Glacier Creeks, the second terrace in the lower reaches of Miller Creek, and the broad terrace found on the north side of the Sixty Mile River valley, both upstream and downstream from Miller Creek.

Colluvium veneer, the most common cover on the hillsides, averages 1-2m thick while colluvium blanket material averages >3m thick. Colluvium conforms to bedrock topography and is composed of diamicton, rubble, and organic-rich silt and sand derived from bedrock sources by a variety of slope processes.

Valleys are filled with alluvium and locally form terraces up to 20m thick. The alluvium plain in the Sixty Mile Valley averages only <5m – 8m thick and forms a uniform sheet across the valley. Most of the claims in the Sixty Mile River valley are underlain by the above alluvium that has mostly been processed by placer miners. A surficial geology map, of the property, by Farrell Andersen is included in the assessment report by Hulstein and Zuran (1999)

### 3.0 PROPERTY GEOLOGY

The Sixty Mile property is largely underlain by metasedimentary rocks of the Late (?) Devonian to Early Mississippian Nasina Schist Assemblage (YTNA), metasedimentary rocks of the Middle to Late Permian Klondike Schist Assemblage (YTKS), units of the amphibolite subterrane (YTa) that may include ultramafic rocks of the Slide Mountain Terrane, plutonic rocks (YTp) superimposed on Nasina and Klondike Schist Subterrane, Cretaceous Carmacks Group volcanic rocks (uKv) and intrusions (LKp), and minor units of younger clastic sedimentary, mafic flows and tuffaceous (?) rocks of Paleocene to Eocene age (Figures 3 and 4).

Nasina and Klondike Assemblages underlie approximately 60% of the property; Carmacks Group, predominantly volcanic rocks, 30%; intrusive, hypabyssal and miscellaneous units underlie less than 10% of the property. Spatially most of the Nasina and Klondike Assemblage lie on the western side of the property and the Carmacks Group rocks on the eastern side of the property.

Dr. Fabrizio Colombo geologically mapped portions of the property on June 11-27, 2011 and August 9-16, 2011 and his report is concluded as Appendix B. Personnel including Dr. Murray Alan, Dr. Jim Mortensen and Dr. Rob Chapman with the Mineral Deposit Research Unit (MDRU) of the University of British Columbia also visited the property during the 2010 field season. A memo reporting their preliminary findings is included as Appendix C. The following is summarized largely from Dr. F. Colombo's report. In his report the metasedimentary rocks are broken down into three units as described below.

Nasina Subterrane (YTNA) rocks, composed of a quartz-white mica (+/-graphite+/-chlorite) schist and quartzite. As described by Dr. F. Colombo;

This unit displays all the compositional and structural variations between massive quartz rich layers, locally further silicified and infilled by quartz veins and the schistose polydeformed quartz white mica schist. Graphite occurs frequently and was observed either along the foliation or along veinlets or veins cutting through the metamorphic foliation. Folding is a common feature and at least three different deformation events have been recognized within the quartz white mica schist. Quartz-rich schist and quartzite prevails in outcrop as the schist tends to recede so that fewer outcrops of folded quartz-white mica schist have been observed. The composition of the schist is interpreted here as a primary feature, however the deformation occurred during the tectonometamorphic events might have caused a relative enrichment in mica along some particularly high strained layers. Quartz lenses, locally boudinaged are quite common. Evidences of compressional deformation (see section 5 on structure) have been observed in this unit. It is very difficult to distinguish in the field the sheared schist belonging to this unit from the white mica-quartz schist due to their compositional and mesostructural similarities.

Nasina Subterrane and possible Amphibolite Subterrane (YTNA and YTa?) rocks, a white mica (+/- amphibolites +/-chlorite) quartz schist, as described by Dr. F. Colombo;

The white mica-quartz schist is showing a marked increase in the amount of white mica and locally to chlorite. Also this lithology includes quartz lenses variably boudinaged and aligned along the foliation. Intense deformation and megascale deformation is evidenced by abundant crenulation, S/C planes, parasitic folds and local inverse faulting. Locally amphibole-rich lenses and lithons have been observed and the amphibole is replaced by biotite and/or chlorite, white mica and opaque and oxidized minerals. When the amphibole is abundant the quantity of quartz drastically decreases, suggesting a probable derivation from a mafic protholith for the white mica amphibole schist, however a mafic protholith cannot be ruled out in absence of further information. A boudin of calc silicate rock (0.5 x 2 m in size), wrapped in a quartzofeldspatic gneiss was observed on the higher part of the Miller Creek/Bedrock Creek divide. The attribution of this unit is indeed debatable; however the available data suggest that this unit represents a highly deformed horizon, compressional in nature at least during its ductile deformational evolution. Petrography or microchemistry could improve the understanding of this unit, especially if in the future the white quartz mica quartz schist will become an important geological host for the mineralization. Mapping has evidenced the spatial correspondence between some of the placer operations and the occurrence of the schist. The schist, because highly deformed it might have been a preferential pathway for the mineralization by quartz veining during its metamorphic evolution.

Possibly Klondike Schist Subterranean rocks (YTKS?) described as a "Tectonic melange" by Dr. F. Colombo;

The main lithology of this unit is a white quartz schist, lesser amphibole-bearing chlorite schist, small outcrops of quartzofeldspatic gneiss, leucogneiss, serpentized ultramafic rocks, one outcrop of marble (nearby the Layfield Trenches) white mica-carbonate-quartz schist. The white mica-carbonate-quartz schist is believed to be the result of metasomatic transformation of an ultramafic protolith (Mortensen pers. comm.) and is generally referred in the previous maps as "listwenite" *Auct.* The tectonic melange is interpreted here to be a tectonic sliver of different lithologies juxtaposed by thrusting. A thrust fault has been observed in the 2010 trenches (Radius 2010 Trenches 1, 2 and 3) on the southern slope of Miller Creek valley and at the entrance of the collapsed adit in Miller Creek.

Outcropping and variably altered granitoid (LKp) rocks are found at Glacier Creek about 2 km west-northwest of the 2010 Radius camp and at Miller Creek about 1.5 km northwest of the collapsed adit. Due to intense weathering the rock is now reduced to a crumbly aggregate with relict fragments of granitoids with minor biotite and relict granitic texture defined by quartz and weathered feldspar.

A medium to coarse grained isotropic alkali feldspar granite was mapped on the western slope of the hill located adjacent to the 'Toni anomaly' about 4.1 km southeast of the 2010 Radius Camp. The deeply altered granitoid outcropping adjacent to the northeast trending Sixtymile Fault at the Toni anomaly can be interpreted as an altered version of the fresher alkali granite outcropping on the southeastern side of the fault.

Various units of the Carmacks Group, composed predominantly of andesitic volcanic (uKv), underlie the Sixty Mile River valley and the northeast side of the property. Two intrusions of porphyritic andesite (uKv) of presumably belonging to the Carmacks group are found in the northwest side of the property. They have also been intersected in drill holes (reported as porphyritic andesite and granodiorite) in the Sixtymile Valley at the Per Occurrence (Glasmacher, 1988).

Intrusions of porphyritic andesite found in the northwest side of the property define two distinct bodies. The porphyritic andesite is mainly made up of subhedral phenocrysts of plagioclase (2-8 mm in size) and amphibole, mainly hornblende, (sub-millimeter to 4 mm in size), hosted in a fine grained groundmass. Magnetite is present in the larger intrusion as an accessory mineral. The smaller intrusion is poorly exposed, weathered and oxidized. Petrographic examination by Dr. F. Colombo found that both the plagioclase and amphibole are still fresh with only minor alteration on their margins implying the absence of post-magmatic alteration.

A small Carmacks Group granitoid has been mapped on the access road at the Cholach mineral occurrence. It is also poorly exposed, weathered and oxidized with relict granitic texture.

At the base of the Carmacks Group volcanic is a conglomerate (uKv) made up of well-rounded cobbles and pebbles of quartz and quartzite. It is generally clast-supported and has a silicified and locally (fault gouge?) clay rich and quartz cement. The type section for this unit on the property is close to the road leading to the Kennecott Trench Zone, south of Miller Creek.

Carmacks Group andesites (uKv) is composed of a variety of andesitic rock types ranging from fine grained, slightly porphyritic andesite, to flow banded andesite, to andesite breccia with subangular fragments of clay altered andesite and a groundmass of fine grained equigranular andesite. Fragments in the breccia range from millimetre to pluri-decimeter. Mapping by Dr. F. Colombo in the Layfield trench area places the andesite non-conformably over both the Carmacks Group conglomerate and the metamorphic basement. The absence of outcrops showing the andesite – 'tectonic melange' contact means that the presence of local faulting at the contact cannot be ruled out.

Where exposed on the hillsides to the northeast of the Sixty Mile River valley the Late Cretaceous Carmacks Group volcanic rocks are comprised of: blocky to sub-blocky, grey, rusty brown and purplish weathering porphyritic andesite and rare dacite (?); massive irregular, rusty brown weathering, pyroclastic monolithic block flow porphyritic

andesite; and irregular grey brown weathering andesitic crystal tuff (?). Mineralogy consists of medium to coarse-grained phenocrysts of plagioclase, lesser hornblende, in a fine-grained groundmass. Andesite blocks within the pyroclastic andesites are sub-angular and average 20cm across in size. The andesite may contain euhedral to subhedral pyrite although the unaltered andesitic crystal tuff is very magnetic. Most pyrite appears to be replacing primary magnetite.

Altered and faulted volcanic flow andesites and rarer breccias are exposed sporadically within abandoned and active placer pits in the Sixty Mile River valley.

### 3.1 Structure

The prominent structural element in the area of the Per occurrence is the Sixty Mile Fault, or lineament, in the Sixty Mile River valley (Figure 3). Structures parallel to the Sixty Mile Fault found to the northwest of the Sixty Mile Fault are interpreted to be a series of normal faults. These normal faults in turn are believed to have been displaced by Tintina-related (?) northwest trending faults and associated Riedel (?) faults (Hulstein and Zuran, 1999). They describe a disjointed 'Miller Structural Corridor' that may be a more prominent Tintina-related structure cutting through relatively more brittle siliceous metasedimentary rocks. The trace of the NE trending Sixty Mile Fault, is derived from Mortenson (1996, pers. comm. 2010), field mapping and interpretation from the Kennecott aeromagnetic survey (Hulstein and Zuran, 1999).

The NE trending faults that comprise the Sixty Mile lineament are believed to be related to stress transfer between the NW striking Denali and Tintina transcurrent fault systems (Lowe and Cassidy, 1995). The extensional tectonics that formed the graben, allowing the preservation of the Carmacks Group in the Sixty Mile valley, is likely due to right-handed step-overs across dextral strike-slip fault systems (Lowe and Cassidy, 1995). Carmacks Group rocks are not foliated and are only deformed by late stage brittle faulting and fracturing.

The bounding Sixty Mile fault juxtaposes the down dropped and preserved Carmacks volcanics on the northwest side against the metamorphic rocks of the Nasina Assemblage to the southeast (Figure 3). These quartz-feldspar gneissic rocks and similar gneissic to schistose rocks found adjacent to the projected Sixty Mile fault differ from the more biotite-muscovite rich schists found further to the southeast. Small outcroppings and float of quartz pebble conglomerate and white sandstone (unit Kst) found on or very near the projected trace of the Sixty Mile Fault are believed to be preserved basal remnants of the Carmacks Group (Hulstein, 2009). Slivers of the Carmacks Group conglomerate, argillic altered andesite, fault gouge and altered, pyritized and argillic altered orthogneiss over 10's of meters in DDH10-6 indicate that the Sixty Mile fault is a significant regional structure and a fluid conduit. Significant vertical displacement on the Sixty Mile fault, in the order of 100's of m, is suspected. Complications to this simplified scenario are indicated by outcropping siliciclastic gneissic rocks on the northeast side of the fault and aeromagnetic patterns that cross the projected trace of the fault.

In addition to the above Dr. Fabrizio found that faults on the property are grouped around two main systems, both subvertical: NNE and NW trending. Both are, according to his field observations, late normal faults crosscutting the metamorphic folds and foliation. Low angle thrust faults were identified, as in trenches 10-1 to 10-3, trend NE and dip shallowly to the southeast. The joint measurements possibly reflect the conjugate fracturing consequent to the faulting. Quartz veins tend to be sub parallel either to the foliation or to the NNE sub vertical faults.

Glasmacher (1992) describes how both the Per and Glasmacher occurrences are structurally controlled and are found at the junction of three major fault systems: the ENE-WSW trending Sixty Mile Fault zone, a NW-SE trending fault zone and a NE – SW trending fault zone. He states that between these two occurrences, small NE-SW trending quartz-(carbonate)-sulphide veinlets crosscut the Carmacks volcanic rocks that underlie the Sixty Mile River valley.

Mapping of the metamorphic rocks and structural measurements of the foliation by Dr. F. Colombo points towards a cylindrical style of folding on most of the property. The foliation in the 2010 trenches at the Kennecott Trench Zone may be interpreted as a tight style of folding such as chevron folding. Petrographic observations defined an older deformation event that was not observed in the field. The first deformation event (D1) is recorded is the quartz-white mica-graphite schist as fold hinges of biotite+white mica now wrapped by the foliation (D2) defined by quartz and white mica, later cross cut by S/C planes (D3). The crenulation observed and measured in the field was generated by this folding event. The S/C planes are probably coeval with the thrusts observed in the field and if so must have occurred during the greenschist facies metamorphic event. The collapse of the structure likely generated the normal faulting (D4) with a well-defined brittle style of deformation.

Mapping by MRDU personnel revealed isoclinal folding of pre-existing metamorphic fabrics, suggesting that at least two phases of ductile deformation affected the metamorphic rocks.

### **3.2 Alteration**

Generally alteration includes: greenschist to amphibolites, hydrothermal and thermal metamorphism. Greenschist to amphibolite metamorphism occurred prior to the Cretaceous and is restricted to the Nasina and Klondike Assemblages. Alteration is characterized by the presence of fine grained muscovite, chlorite and quartz. Dr. F. Colombo believes the various metamorphic rocks underwent amphibolite facies metamorphism and then greenschist facies retrograde metamorphism.

Alteration associated with hydrothermal activity is assumed to have taken place during Jurassic (?) and Cretaceous intrusive events. Hydrothermal alteration of the metamorphic rocks is primarily of silicification, bleaching and development of sericite – white mica. This alteration is most evident in the more siliceous, massive rocks, which underwent brittle fracturing. Ultramafic rocks, commonly lenses or thin layers, are bleached and altered to a listwanite assemblage with Ca-Mg-Fe carbonate minerals (calcite, ankerite, dolomite) +/- silica and the green chromium mica, fuchsite.

Alteration of the andesite volcanics ranges from weak to strong propylitic alteration (magnetite destruction, pyritization and interstitial calcite) to argillic (bleached, +/-

pyrite, clay minerals). Propylitic alteration often includes development of significant Ca-Mg-Fe carbonate minerals (calcite, ankerite, dolomite), up to 5% coarse grained pyrite, increased chlorite and local epidote.

Thermal metamorphism and associated alteration is restricted to the calc-silicate rocks found south of the hypabyssal intrusion (uKv) in the northeast part of the property. These rocks also contain variable but generally minor amounts of actinolite, calcite and magnetite.

### **3.3 Mineralization**

There are a number of mineralizing events in the Sixty Mile area and according to M. Allen et al. (see Appendix C) possibly range in age from Late Permian, Late Permian to Late Cretaceous (Jurassic?), and Mesozoic to Late Cretaceous to Tertiary. Mineralization ranges from orogenic veins (mesothermal in older literature) to high level low sulphidation epithermal veins and breccias.

Glasmacher (1992a) defined two types of epithermal gold mineralization in the Sixty Mile River valley at the Per and Glasmacher mineral occurrences hosted by Late Cretaceous Carmacks Group volcanics. Glasmacher (1992b) reported north-northeast trending mesothermal quartz-carbonate veins hosted by metamorphic rocks with a concentration along the approximate trend of the 'Melange Zone'. In the underground placer mine on Miller Creek he reports quartz-carbonate veins are found on the same structures as the Carmacks Group volcanic rocks. This implies a Late Cretaceous age for at least some of the mesothermal veins.

Historically and at present placer gold mining has been the most important mining activity in the Sixty Mile district. Placer gold production likely exceeds the recorded figure of 435,109 ounces won from the creeks during the period 1892-2005 (LeBarge, 2006). The bulk of the placer gold was mined from Miller, Glacier, Bedrock, Little Gold, Big Gold Creeks and the Sixty Mile River.

#### Veins in Metamorphic Rocks

Several styles of veining have been observed in the metamorphic rocks including typical orogenic quartz+/-carbonate (minor carbonate) veins containing minor amounts of pyrite, +/-arsenopyrite, +/-galena, +/-sphalerite, +/-scheelite and rarely trace amounts of visible gold. Also cutting the metamorphic rocks are typical epithermal low sulphidation style veins with cockscomb textures and angular breccias. Of less interest are early stage foliaform cloudy to milky quartz veins, often boudinaged and as rootless fold hinges. The most significant orogenic veining found to date has been at the Kennecott Trench Zone, Layfield and Walker Zones.

The epithermal veining is assumed to be related to the Carmacks magmatic – hydrothermal event. Although epithermal quartz-chalcedony veining has been observed

in the same zones its importance is minimal. Epithermal veining has also been observed at the head of Glacier Creek, including fluorite veining (Hulstein and Zuran, 1999), and quartz +/-barite veining in upper Glacier Creek and lower Miller Creek. Placer miners have recovered cinnabar vein float from Wy Gulch near the mouth of Miller Creek but the source has not been located to date.

### Sixty Mile River Valley

Alteration and mineralization has been found in the Sixty Mile River valley in the area of the Per and Glasmacher mineral occurrences and in drill holes at the Toni Zone. It was first exposed in bedrock by placer miners in the 1920's at the Per occurrence, rediscovered in 1985 and tested by trenching and diamond drilling in 1988 (Glasmacher, 1988). Due to alluvial cover (now consisting mostly of placer tailings and ponds), alteration and mineralization in the Sixty Mile River valley is poorly exposed and as a result poorly understood.

Argillic-altered andesite is found locally in the Sixty Mile River valley and the placer miners have noted 'extensive' clay rich bedrock areas that hindered placer mining (Frank Hawker and Mike McDougall, pers. comm., 2003). Mineralization consists of disseminated and thin veinlets of quartz, carbonate and pyrite cutting propylitic and argillic altered andesite. Locally up to 5% disseminated pyrite cubes associated with chalcedony, ankerite, dolomite, calcite veinlets +/- trace galena, sphalerite and molybdenite are found.

The alteration of the Carmacks Group andesitic volcanics in the valley, associated with hydrothermal activity and mineralization, is assumed to have taken place during the 70 Ma Cretaceous intrusive event. Hydrothermal alteration is comprised of two styles: 1), silicification (includes both quartz-carbonate-kaolinite and quartz-phengite-adularia zones of Glasmacher and Freidrich (1992) and 2), carbonate-pyrite altered volcanic rocks. Mineralogy of silicification type is commonly manifested by clay minerals, sericite, bleaching, and silica flooding (quartz). Alteration appears to be more intense where the andesites have been brecciated, although it has not been determined at present if brecciation is due to hydrothermal or volcanic processes or both. Angular bleached clasts of psammites – quartzites have been noted within silicified vein-breccia material. The carbonate alteration consists of Ca-Mg-Fe carbonate minerals (calcite, ankerite and dolomite) +/- quartz and up to 5% coarse grained pyrite. Propylitic alteration (increased chlorite, rare epidote) is often coincident with the iron carbonate alteration.

Glasmacher and Freidrich (1992) note that the mineralization drilled by Klondike Gold Corporation on the Per occurrence and found about 4km to the northeast at the Glasmacher occurrence, formed in the upper parts of the same fossil geothermal system, likely associated with the Late Cretaceous magmatism. They also postulated that the differences between the two occurrences (Per has more sulfides) is due to different mixing environments of two fluid types: a near surface low temperature groundwater (150<sup>0</sup>C) fluid and a high temperature alkaline-chloride (260<sup>0</sup>C) fluid.

Glasmacher and Freidrich (1992) noted four stages of mineral enrichment, due in part, to the mixing of the two fluid types, boiling of the fluids (boiling more important at the Glasmacher occurrence) and fluid wall rock interactions. Glasmacher and Freidrich (1992) classify both occurrences as gold-bearing epithermal volcanic-hosted occurrences of the quartz-adularia type, typical of areas with calc-alkaline volcanic rocks of andesitic to dacitic composition. Mineralization and alteration at the Toni Zone is very similar to that reported from the Per and Glasmacher occurrences and observed elsewhere in the Sixty Mile River valley.

The Per occurrence is described as a northeast trending, 8 cm to 60 cm wide, galena-sphalerite-arsenopyrite vein with a strike length of 61 m. Drilling on the Per intersected mineralized quartz veining that contained 11.52 g/t gold over 4.5 m (including 42.16 g/t over 1.5m) within a larger interval of 7.1 g/t gold over 12 m (Yukon MINFILE 115N 041).

## 4.0 GEOCHEMISTRY

A total of 1053 rock samples were collected in 2010; 412 from the 352 auger drill holes, 491 from trenches, 150 during mapping and prospecting (Figures 5a to 6b). A total of 1154 diamond drill core samples (not including checks, duplicates and blanks) were also submitted along with 1292 rock samples (not including blanks and checks) from the RAB drill program. All the above samples were delivered to Acme Analytical Laboratories Ltd. in Whitehorse and following sample preparation samples were forwarded to Acme Analytical Laboratories (Vancouver) Ltd. for geochemical analysis. Samples were pulverized, a 30 gram sub sample fire assayed and a gold determination made by ICP-ES. An additional 0.5 gram subsample underwent aqua regia digestion followed by ICP-ES analysis. The analytical certificates are presented in Appendix L and rock and drill sample descriptions and analytical results in Appendix G, H and K. Analytical results are discussed under “7.0 EXPLORATION RESULTS”.

Drill core samples consisted of half core (NTW size, 5.6 cm), sawn by a thin kerf diamond saw. Blank material consisting of crushed granite, bought from Acme Analytical, was inserted every 30 samples. Standards, procured from CDN Resource laboratories Ltd. were inserted every 30 samples and Acme Analytical was requested to prepare a coarse sample duplicate every 30 samples. These coarse sample duplicates were analyzed by ALS Laboratory Group located in Whitehorse for gold analysis to confirm the findings by Acme Analytical.

A total of 1934 soil samples were collected in 2010. All samples were collected by hand using a ‘Dutch’ soil auger. All the above samples were delivered to Acme Analytical Laboratories Ltd. in Whitehorse and following sample preparation samples were forwarded to Acme Analytical Laboratories (Vancouver) Ltd. for geochemical analysis. Samples were dried at 60 degrees centigrade, 100 grams sieved to -80 mesh and 15 grams digested by aqua regia analyzed by ultratrace ICP-MS analysis for gold and an additional 52 elements. The analytical certificates are presented in Appendix L and sample descriptions and analytical results in Appendix I.

Geochemical thresholds for gold and arsenic in soil samples were established visually after calculating and comparing thresholds by percentiles and natural breaks using ESRI ArcGIS software. Results for gold and arsenic in soil are shown on Figures 7 and 8 respectively. Sample results include the 2010 soil samples merged with the 1999 Kennecott-Madrona samples (digitized from Hulstein and Zuran, 1999) and samples collected by Hulstein between 2003 and 2009.

## **5.0 2010 DRILL PROGRAMS**

### 2010 Auger Drilling

Auger drilling was carried out by Sylvain Fleurant of Dawson City between June 1, 2010 and July 29, 2010 utilizing a bombardier-mounted 15 cm (6 inch) diameter auger drill. Work initially focused on Per Occurrence over the suspected location of mineralization found in DDH D4/88-02, the 'VG' Zone and the 5000 oz placer cut area. Results from the first 46 holes are reported in an assessment report by Hulstein (2010).

Drill logs prepared by Mr.Sylvain Fleurant are included in Appendix J.

The auger drill is mounted on a Bombardier and is capable of drilling a 15 cm (6 inch) hole quite easily through overburden to a depth of at least 15 m (50 feet) in 2-3 hours. Bedrock samples were collected from the auger flights after the auger had penetrated bedrock to a depth of 1.5 m (5 feet) or more. Bulk samples of the lower placer gravels were also collected for the placer claim holder when the drill hole tested virgin ground. A geological technician or geologist was on site with the auger drill at all times and logged the recovered sample plus collected a 1-2 kilo sample for geochemical analysis.

A total footage of 7728 feet (2355 m) was drilled with an average depth of 19 feet (6 m). The deepest hole was 68 ft (21 m). Overburden varied between 3-8 m on average but near the Sixty Mile Fault on the southeast side of the property it was up to 53 ft (16 m).

### 2010 Rotary Air Blast (RAB) Drilling

A rotary air blast (RAB) drilling program was carried out between July 28, 2010 and Sept. 28, 2010. Mr. Stan Wolarek of Whitehorse, owner and operator, was contracted to drill 84 holes totaling 3326.56 m (collar locations shown on Figures 5a and 5b).

The RAB drill can reach depths close to 400 ft (122 m) when ground conditions permit. Groundwater unfortunately hindered most drilling and most holes were terminated well short of the planned nominal 300 ft (91.5 m) target depths. The mast of the drill is fixed for -60 degree holes assuming a level base for the drill skids. The RAB drill consists of a skid mounted air powered Atlas Copco BBE5700 series percussion drill, a separate skid mounted 750 cfm Ingersoll Rand compressor, with both being towed, usually in tandem, by a bulldozer. A D8K Caterpillar with ripper, supplied by H. Coyne & Sons Ltd. of Whitehorse was utilized for this program. A bulldozer with winch would have been more advantageous.

The RAB drill uses a 2.0 inch (5.08 cm) outer diameter tungsten carbide button percussion drill bit. Drill cuttings consist of rock chips and rock dust blown up to surface between the drill rods and borehole wall. Chips are collected at surface in a pan,

halved, with half being collected for a geochemical analysis and the other half for geological logging every five feet (1.52 m). The sample weight is approximately 5 kg in normal ground conditions. At present the sample half kept for geological logging is stored at the 2010 camp site.

Analytical results are shown on diagrammatically on cross sections, Figures 9a to 9k, and are listed in Appendix K. Significant results are described below in section “7.0 EXPLORATION RESULTS”.

### 2010 Diamond Drilling

Kluane Drilling Ltd., of Whitehorse, Yukon, was contracted to diamond drill a minimum of 1500 m NTW size (5.6 cm diameter) diamond drill core. Including mobilization and demobilization, drilling took place from August 20 – September 29, 2010. A KDHT 600 machine was utilized. A total of 7 holes were drilled with holes DDH10-1 to 10-4 drilled in a skid mounted configuration and the drill moved by D6 CAT. For drill holes DDH10-5 to 10-7 the same drill was used, but it was moved by helicopter and holes were drilled from timber drill pads. Drill holes DDH10-1 to 10-3 tested the area trenched by Kennecott Trench 99-6 and by Radius Trenches 10-1 to 10-3. Nearby drill hole DDH10-4 tested the gully structure and allowing for lateral offset, the area up-section (based on foliation) of DDH10-1 to DDH10-3.

Drill hole DDH10-5 tested the Walker Fork gold in soil anomaly, a large area underlain by quartz veined quartzite cut by structures visible on the Ikonos satellite image and by quartz-galena veining.

Drill hole DDH10-6 tested the Toni gold in soil anomaly and the bounding Sixty Mile Fault. This hole was stopped early due to bad ground and drilling difficulties. Drill hole DDH10-7 also tested the Toni gold in soil anomaly close to right angles to DDH10-6 with the end of DDH10-7 below the collar of DDH10-6.

Table 2. Diamond Drill Hole data.

Hole Number	East (NAD83)	North (NAD83)	Elevation (m)	Dip (deg)	Azimuth (deg)	Date Started	Date Completed	Length (m)
DDH10-01	506687	7097093	1016	-45	290	Aug. 21, 2010	Aug. 25, 2010	214.88
DDH10-02	506734	7097073	1009	-45	290	Aug. 25, 2010	Aug. 30, 2010	287.73
DDH10-03	506779	7097167	1006	-45	287	Aug. 31, 2010	Sept. 5, 2010	334.37
DDH10-04	506088	7097148	1106	-50	290	Sept. 5, 2010	Sept. 11, 2010	306.32
DDH10-05	501280	7100455	1311	-47	310	Sept. 12, 2010	Sept. 19, 2010	298.70
DDH10-06	514130	7097850	735	-45	125	Sept. 19, 2010	Sept. 23, 2010	139.90
DDH10-07	514086	7097785	762	-46	40	Sept. 23, 2010	Sept. 28, 2010	240.79
<b>Total (m)</b>								<b>1607.81</b>

The core is stored on the property at the 2010 camp site.

## 6.0 GEOPHYSICS

Precision GeoSurveys Inc. of Vancouver, BC was contracted to fly a helicopter magnetic and radiometric survey over the property. A total of 1902 line km were flown over the entire property between July 12 and 25, 2010. Lines were flown north – south, spaced 200 m, with selected areas having lines spaced 100 m. Tielines were flown north-south at a spacing of 1000m. The Melange Zone, Sixty Mile Valley and bounding Sixty Mile Fault were flown at a spacing of 100 m. The Cholach Occurrence area was also flown at 100 m line spacing. Sensor height was approximately 30 m. The full report by Precision on the survey is enclosed in Appendix D.

The 2010 airborne survey was slightly larger than the 1999 survey but in spite of lower sensor elevations (30 m versus 60 m above ground in 1999) the results are similar to that reported by Hulstein and Zuran (1999).

A number of magnetic features are readily apparent (Figure 11) although overall the magnetic variation is small. Areas underlain by Carmacks Group volcanics appear as a mottled magnetic high-low pattern on the east side of the property while the hypabyssal porphyritic andesite in the northwest side of the property has a high-low signature. The termination of the mottled texture on the southeast side of the property is thought to mark the Sixty Mile Fault. A number of discrete magnetic highs are also found in the Walker Fork and upper Miller Creek drainage.

The helicopter borne radiometric survey measured the radiation (total count) emanated by the radioactive elements potassium (K), uranium (U) and thorium (Th). Results from the helicopter borne radiometric survey (Figure 12) also appear to reproduce the results from the 1999 survey. The Melange Zone can be picked out as can a weaker northeast trending band near the headwaters of Miller and Glacier Creeks. The Melange Zone is most clearly identified on maps of K/Th, where it is clearly and sharply delineated.

## 7.0 EXPLORATION RESULTS

Seven areas were the focus of exploration in 2010: the Miller, Cholach, Per and Glasmacher mineral occurrences and the Toni, Walker Fork and Melange Zones. The Melange Zone includes the Kennecott Trench and Layfield Zones, both of which lie within the Miller Creek gold and arsenic soil anomaly.

### Melange Zone

The north east trending Melange Zone, defined by the tectonic melange unit associated with a thrust or possibly a detachment fault zone within a package of schists and quartzites, extends from at least Little Gold Creek to Bedrock Creek, a minimum strike length of eight kilometers (Figure 4). This structural zone strikes through the Sixty Mile placer district, cross cutting the major gold bearing creeks. It varies in width from 250 m in the north to over 800 w in the south. It is bounded to the southeast (a nonconformity or fault contact?) by younger Carmacks Group andesite volcanic. The melange unit is also mapped as underlying the mouth of Miller Creek. The high-resolution airborne magnetic and radiometric survey completed over the property defines a subtle but sharply bounded K/Th radiometric anomaly coincident with the structural zone.

Soil sampling by hand-held and mechanized auger has shown, where sampling was possible, that the unit is locally strongly anomalous in gold and arsenic. The Melange Zone was tested by auger drill testing on the 'High Road' northeast of Glacier Creek and followed by RAB drilling. The auger drilling returned rock and soil samples anomalous in arsenic and weakly anomalous in gold (Figure 7 and 8). The RAB drilling also returned samples weakly anomalous in arsenic and weakly anomalous in gold (Figure 9e) in holes RAB10-19 to RAB10-26, a width of approximately 350 m. Although soil sampling over the melange unit north of the Layfield Zone was hampered by frozen ground, scattered samples did return anomalous values for gold and arsenic.

### Layfield Trench Zone

The Layfield Trench Zone lies north of Miller Creek and is underlain by the tectonic melange unit. Layfield Resources explored the area in 1988 and 1989 with soil sampling, mapping, prospecting, bulldozer trenching and 7 short NQ size diamond drill holes totaling 410.7 m. In 2010 the area was hand auger soil sampled (Figure 7), auger drilled and tested by RAB drilling (Figure 9f). Both the soil sampling and auger drilling yielded coherent and coincident northeasterly trending gold and arsenic anomalies. Results from the RAB program returned 6 consecutive holes over a distance of approximately 400 m, anomalous in arsenic (RAB10-43 to 48) with two holes, RAB10-47 and 48 returning 1795 ppb gold over 1.52 m and 2259 ppb gold over 1.52 m respectively.

## Kennecott Trench Zone

The Kennecott Trench Zone lies south of Miller Creek like the Layfield Trench Zone on trend about 1.5 km to the northeast is underlain by the tectonic melange unit. Like the Layfield Trench Zone it is within the Miller Creek gold-arsenic in soil anomaly. In 1999 Kennecott trenched (Tr99-6) on an anomalous gold sample and rock sampling returned 1.6 gpt Au over 13.0m (Hulstein and Zuran). Work in 2010 focused on this area with the excavation of parallel trenches 25m on either side of Tr99-6 (Tr10-01 and Tr10-02) and additional trenches on strike to the northeast and across suspected structure(s) to the west (Tr10-10 and Tr10-11). Trench maps are included in Appendix M and significant values are included in the table below. Most anomalous gold values are accompanied by anomalous arsenic values and are associated with bleached, siliceous, or silicified quartz rich schists to quartzite bands but by narrow orogenic quartz veins.

Trench No.	From (m)	To (m)	Interval (m)	Au (ppb)
TR10-01	2	4	2	1308
TR10-01	36	42	6	419
TR10-01S	8	28	20	106
TR10-02	42	44	2	623
TR10-02	53	54	1	617
TR10-02	58	68	10	1605
TR10-02	76	86	10	855
TR10-02	98	102	4	308
TR10-03	6	40	36	136
TR10-03	76	84	8	1097
TR10-09	96	102	6	784
TR10-10	26	38	12	148
TR10-11	24	30	6	125

Rock and soil samples collected by auger drill yielded anomalous gold and arsenic values that are on the same approximate north northeast trend as the foliation and the trend of the melange zone.

Three diamond drill holes (DDH10-01 to 10-03) targeted the anomalous northeast striking, southeast dipping, mineralized quartzite or more quartzose units exposed in trenches Tr10-01 to 10-3. Gold values returned from the upper part all three holes confirmed the grades and widths down dip of the mineralized intervals sampled in Trench10-01 - 03. The lower part of diamond drill holes DDH10-01, DDH10-02 and DDH10-03 intersected mineralized intervals, similar looking but located structurally well below the mineralized intervals exposed in the trenches.

Trenches Tr10-10 and 10-11 and diamond drill hole DDH10-04 targeted the suspected bounding structure that underlies the drainage gully and the northwest contact of the melange zone as defined by the radiometric K/Th anomaly. Sampling of the trenches

was hampered by rain and slumping walls but weakly anomalous gold values were returned. Sampling by auger drill across the same target area, about 100 m to the south of Tr10-11 returned <100 ppb gold. Drill hole DDH10-04 returned two intervals of anomalous gold at depth that appear to lie structurally below the interval of weak gold mineralization sampled in the trenches. Mineralized quartz veining in DDH10-04 is similar to the veining intersected in DDH10-01 to 10-03.

The drill holes generally cut the foliation at high angles, the orogenic quartz veins, on the other hand, were usually cut at low angles to core axis as they occupied fractures also at low angles to the core axis. To get a better intersection with the mineralized quartz veins it will be necessary to drill down the dip of the foliation in the more quartzose units, the better mineralized lithology.

Hole #	From (m)	To (m)	Length (m)	Gold (ppb)
DDH10-01	10.02	32.00	21.98	346
including	10.67	12.74	2.07	1587
DDH10-01	194.46	195.79	1.33	2363
DDH10-02	35.65	76.43	40.78	414
including	35.65	43.28	7.63	1065
DDH10-02	109.77	111.25	1.48	1283
DDH10-02	223.6	249.94	26.34	342
including	241.4	243.00	1.60	2907
DDH10-03	35.05	45.72	10.67	461
DDH10-03	85.34	92.96	7.62	269
DDH10-03	203.84	208.79	4.95	313
DDH10-03	243.82	323.09	79.27	160
including	243.82	251.46	7.64	544
DDH10-04	193.55	201.19	7.64	325
DDH10-04	286.18	288.96	2.78	285

Between the Kennecott Trench and Layfield Zones a line of RAB drill holes tested bedrock on the road next to Miller Creek (Figure 9h). Results from this drilling indicate that the mineralization continues between the two zones as holes RAB10-62, 10-64 and 10-65 returned several samples >1000 ppm arsenic (high of 1829 ppm) and a high gold value of 869 ppm from RAB10-62.

## Per Occurrence

The Per occurrence is described in the Minfile summary (Yukon MINFILE 115N 041), by Kreft (1986) and Glasmacher (1988) and was the primary focus at the start of the auger drill program and the MaxMin electromagnetic survey. Trenching by Kreft in 1985 tested a 91 m wide zone of altered andesite containing massive pyrite lenses, quartz stockworks, and disseminated chalcopyrite and galena. Specimens from the trenches assayed up to 26 g/t Au and 42.5 g/t Ag. Yukon MINFILE describes the zone as a northeast trending, 8 cm to 60 cm wide, galena-sphalerite-arsenopyrite vein with a strike length of 61 m. Klondike Gold Mining Corporation drilled seven diamond drill holes totaling 765m, tested alteration and mineralization exposed by Kreft's trenching and excavations by the placer miners. The most significant result was from DDH D4/88-02 which returned an average of 8.76 gpt gold over 10.5m from 3m – 13.5m including one sample grading 42.17 gpt gold over 1.5m from 4.5m to 6.0m (Glasmacher, 1988). Mineralization is described as silicified porphyritic andesite cut by narrow pyrite-carbonate-quartz veinlets. Result from auger drill holes ADH10-1 to 10-46 in the Per occurrence area were previously reported by Hulstein (2010).

A northwest trending silver-bearing manganese – iron oxide – pyrite, quartz vein, located in Trench 10-4, is approximately 0.3 wide, and trends towards the main Per occurrence area. A 0.3 m chip sample returned 193 ppb Au, 187 ppm Ag and 3463 ppm Zn. Trench 10-5 about 50 m to the southeast could not be entered safely due to depth and water but veining was not observed in the spoil pile.

The 'VG' zone, part of the Per occurrence, was identified by Mr. B. Kreft with excavator trenching. This work located a clay rich zone in the altered andesitic volcanic rock that reportedly contained small colors of visible gold. Also near DDH D4/88-02, within 100 m, is a placer cut that yielded approximately 5000 oz gold (M. McDougall, pers. Comm. 2010). All of these target areas are located within an aeromagnetic low in an area of otherwise magnetic highs, presumably associated with fresher magnetite bearing andesitic volcanics.

All auger drill holes in the Per Occurrence area intersected variably altered and mineralized andesite. Most samples contained trace to 8% disseminated pyrite and pyrite veinlets. Less common were chalcedonic quartz veinlets and pervasive silicification. Most of the feldspar phenocrysts were altered to clay. At present alteration and mineralization cannot be correlated with anomalous gold, copper and zinc values.

Rock samples from the auger drill holes returned up to 490 ppb Au, from hole ADH10-35 (sample I028590). Although the outside of the sample on the auger flights was cleaned off, material from the placer gravels scrapped off, the possibility of placer gold contamination exists. Evidence that anomalous Au values (established at >100 ppb) are not due to placer gold is provided by coincident anomalous values for Ag, As, Cu, Pb and Zn.

Samples (I028571, 573, 574) from ADH10-18, 20 and 21 containing anomalous values for Au (162 ppb), Cu, Pb and Zn from the 'VG' Zone area indicate possible bedrock mineralization. Sample I028567 from hole ADH10-013 in the same area contained the highest copper value from the program at 596 ppm. Rock float sample I029051 of bleached carbonate pyritized altered andesite cross cut by quartz molybdenite veinlets contains 1832 ppm Mo.

Although the exact collar location of diamond drill hole D4/88-02 is not known, samples from ADH10-35 & 37 (I028590 & 592) from the approximate location contain anomalous gold values (490 ppb and 128 ppb respectively).

### Toni Zone

Soil sampling has defined a strong gold-in-soil anomaly (values up to 1 gpt Au) on the southeastern bank of the Sixty Mile River valley. The anomaly, which measures 800m by 300 m is defined by strongly anomalous gold and pathfinder elements (As-Sb-Cu-Pb-Zn) associated with altered metasedimentary and andesitic volcanic rocks. The soil anomaly is bounded to the southeast by the Sixtymile fault, and to the north, south and west by low lying wet, frozen or overburden covered areas which preclude sampling. The anomaly is thought to represent mineralization associated with the northeast-trending Sixty Mile graben fault zone and possible splays off that fault.

Grab samples of the limited bedrock outcrops in the area have returned values from trace up to 5 g/t Au. Two short trenches Tr10-6 and 10-7 were excavated with a CAT 225 excavator but difficulties were encountered with frozen ground and steep slopes restricting trenching to the ridge top. A poor quality sample of altered andesite over 3 m from Tr10-6 returned 2133 ppb gold and 3.5 ppm Ag. Within the anomalous interval from Tr10-07, numerous samples returned anomalous values for silver (<3.4 ppm), arsenic (<236), bismuth (<6 ppm), copper (<170 ppm), manganese (<2319 ppm), molybdenum (<4 ppm), lead (<932 ppm) and zinc (<1385 ppm).

<b>Trench No.</b>	<b>From (m)</b>	<b>To (m)</b>	<b>Interval (m)</b>	<b>Au ppb</b>
TR10-06	22	25	3	2133
TR10-06	16	22	6	363
TR10-07	1	10.4	9.4	167

Two drill holes tested the Toni soil anomaly and suspected structures. Drill hole DDH10-6 tested the Sixty Mile Fault and the drill hole was terminated early due to difficult drilling conditions. Drill hole DDH10-7 tested for northwesterly mineralized structures, significant gold values are shown in the table below. Drill hole DDH10-6

intersected propylitic altered andesites cross cut by thin quartz, pyrite and carbonate veins and minor breccia and clay gouge zones. Gold values were essentially anomalous (most samples >100 ppb gold and >250 ppm arsenic) from 7.12 m to 99.40 m, the fault contact with gneissic metamorphic rocks. The sheared and faulted metamorphic rocks contain lower gold and arsenic values but gold values are well above detection limits, iron ranges between 4-6%, lead, zinc and copper values are elevated.

<b>DDH Hole #</b>	<b>From (m)</b>	<b>To (m)</b>	<b>Length (m)</b>	<b>Gold (ppb)</b>
DDH10-06	12.19	86.87	74.68	327
including	49.84	56.39	6.55	1645
DDH10-07	88.39	146.67	58.28	329
including	120.4	127.26	6.86	887
DDH10-07	206.6	208.07	1.47	4458

Drill hole DDH10-07 intersected altered and veined andesite similar to DDH10-06 from 7.94 m to 146.67 m where it intersected a 5.8 m transition unit of sheared, faulted, brecciated andesite and quartz-chert pebble conglomerate followed by the conglomerate to 164.46 m. From 164.9 m to 178.12 m the hole cut a variably altered orthoschist of biotite-plagioclase-feldspar-quartz followed by quartz-chert pebble conglomerate to 199.3 m followed by a quartz-biotite-chlorite schist unit to 238.5 m. The final unit from 238.5 m to end of hole at 240.79 m consisted of a bleached argillic altered volcanic. The juxtaposing of the above units, large amount of faulting with attendant alteration including pyritization and variable mineralization indicates a structurally complex environment that is part of a fossil hydrothermal system.

### Per and Glasmacher Occurrence

The Glasmacher mineral occurrence is located about 500 m to the north of the Toni Zone and about 3 km northeast of the Per mineral occurrence. The Glasmacher occurrence is at present covered by placer mined alluvium and has been described as a gold-bearing quartz-pyrite-arsenopyrite occurrence with rock samples grading up to 12 gpt gold (Yukon MINFILE 116C 153, Glasmacher and Freidrich, 1992). Mineralization is described as gold and silver bearing sulphides; as disseminations, in stockwork and as vein type sulphides, all hosted by altered Carmacks Group volcanic rocks.

Glasmacher and Freidrich (1992) note that the mineralization intersected by diamond drill holes on the Per occurrence (Yukon MINFILE 115N 041) and mineralization found at the Glasmacher occurrence, was formed in the upper parts of the same fossil geothermal system, likely associated with Late Cretaceous Carmacks Group magmatism. They also postulated that the differences between the two occurrences (Per has more sulfides) is due to different mixing environments of two fluid types; a near surface low temperature groundwater (150°C) fluid and a high temperature alkaline-chloride (260°C) fluid.

The alteration and mineralization found at the Per and Glasmacher occurrences and in the altered area between them, is hosted by altered Carmacks Group volcanics. This alteration and mineralization is thought to be 'hanging wall' epithermal mineralization above the northwesterly(?) dipping Sixty Mile fault, the main controlling structure. Therefore it is postulated that the main epithermal gold target therefore resides along the Sixty Mile fault and not in the upper portion of the hanging wall of the controlling structure.

Auger drilling in 2010 over the suspected area of the Glasmacher occurrence returned low gold values (<100 ppb). Auger drilling over the Per occurrence, reported by Hulstein (2010) returned a number of anomalies for gold (up to 1+ gpt Au), silver, copper, lead and zinc.

### Walker Fork Zone

Walker Fork zone is defined by a gold-in-soil anomaly, quartzite outcrop cut by a number of northeast trending lineaments (presumably fault structures) and a number of galena-bearing quartz veins in quartzite scree. Drill hole DDH10-05 tested the anomaly and projected intersections with the suspected fault structures. Although the drill hole intersected strongly quartz veined and locally pyritized quartzite, samples returned less than 50 ppb gold.

### Cholach Occurrence

The Cholach mineral occurrence was discovered in the early 1980's (Cholach, 1981a, 1981b) on the access road to the Sixtymile district. The occurrence consists of approximately 500 m roughly circular (?) light reddish weathering Carmacks Group granitoid surrounded by grey Carmacks Group volcanic. The granitoid is cross cut by quartz-galena and pyrite veinlets and veins exposed by trenching in 1980 and 1981. Samples over narrow widths from sulfide veining in the trenches returned up to 75.0% Pb with 2,303.9 g/t Ag and 14.1% Pb with 1,155.4 g/t Ag.

Soil sampling in 2010 defined an approximate 400 m by 200 m gold, silver, arsenic, copper, lead, and zinc soil anomaly. Cholach (1981b) interpreted a northwest trending zone (330 degrees) approximately 425m wide.

A section of eight RAB holes (RAB10-77 to 10-84) tested the granitoid along the north-northeast access road (Figures 9i, 9j, 9k). Although the holes were mostly shallow (<60m long) with significant gaps between the holes, anomalous values for silver (up to 25 ppm), lead (up to 3094 ppm), zinc (up to 8818 ppm) and arsenic (up to 586 ppm) were returned for holes RAB10-76 to 80. Gold values were less than 100 ppb.

### Miller Creek Occurrence

The Miller occurrence was first staked in May 1896 (Yukon, MINFILE) and as such is one of the first mineral occurrences discovered in the Yukon. It consists of minor amounts of galena and sphalerite in (foliaform?) quartz lenses that cut marble units (limy sections) within weakly graphitic Nasina assemblage schist of the Yukon Tanana Terrane. A sample of the better mineralized material assayed 3.6% Pb, 4.4% Zn, 48.0 g/t Ag and trace Au (Yukon, MINFILE). According to Yukon MINFILE a silicified, dolomitized carbonate layer containing variable scorodite forms a persistent marker which extends northwesterly across the area. This horizon can be identified as a weak ternary K-Th-U radiometric anomaly.

A soil grid located immediately east of the occurrence and soil lines over the occurrence in 2010 followed up on work carried out by prospector Ed Lilly. While numerous samples were anomalous in arsenic only a few samples were anomalous in gold. Further sampling and geological mapping is required in the area to determine the significance of the arsenic and weak gold anomaly and its relationship to the mineralization at the Miller occurrence.

### Alaska Occurrence

The Alaska occurrence located in the Poker Creek drainage in the northeast of the property near the Alaska property is poorly defined in Yukon MINFILE. A stream sediment sampling program by the Alaska Department of National Resources returned anomalous copper (50-180 ppm) and zinc (450-550 ppm) values from streams originating on the Yukon side of the border.

Mapping indicates that the occurrence is underlain by Nasina assemblage rocks consisting of quartz carbonaceous and quartz muscovite schist (quartzite). Madrona Mining Ltd. explored the area for massive sulfide deposits in the 1990's without success. Work by both Madrona and Kennecott Exploration Inc. in the area located a number of geochemical soil anomalies for gold, arsenic, silver, copper, lead and or

zinc. Rock samples collected by Kennecott consisted of quartz vein breccias, epithermal in appearance, cutting silicified quartzite with trace disseminated pyrite and clay alteration and contained up to 270 ppb gold and 203 ppm arsenic.

Work in 2010 consisted of one short traverse in the Poker Creek drainage which located, near the Alaska border, quartz veining and breccia in a yellow limonitic weathering marble horizon containing up to 0.5% arsenopyrite –pyrite mineralization. A rock grab sample of mineralized material contained 2 ppb gold and 3887 ppm arsenic. A 250 m line of soil samples and soil and rock samples collected by auger drill near the headwaters of the creek returned anomalous values for gold including a sample >500ppb in rock. Two RAB holes, RAB10-02 and 03, tested the area and returned sporadic anomalous gold and arsenic anomalous values from both holes, up to 44 ppb, 644 ppm respectively. RAB10-02 also returned numerous samples containing between 150 – 250 ppm zinc (highest 335 pm zinc) and four samples with between 55-253 ppm lead.

RAB and auger drill testing east of the Alaska occurrence tested suspected northerly trending structures. Analytical results included anomalous arsenic values and background to weakly anomalous gold values.

## 8.0 CONCLUSIONS AND RECOMMENDATIONS

The 2010 program defined two separate gold exploration targets on the property. An orogenic vein type hosted by an 8 km long belt of deformed metasedimentary rocks on the western side and an epithermal system hosted by Late Cretaceous volcanics on the eastern side of the property.

To date the most significant target in the Permian to Mississippian metasedimentary rock package is the 250 m to 800 m wide Melange Zone that trends northeast across the district for a minimum of eight kilometers. The zone, defined by geological mapping as a unit of tectonic melange, associated with a thrust fault zone, and visible as a linear ternary K-Th-U radiometric anomaly, links a number of geochemical anomalies. Four areas of the Melange Zone were tested by Rotary Air Blast (RAB) or diamond drilling in 2010. Of these three areas, the Layfield, Kennecott Trench and a drill section along Miller Creek returned encouraging gold values for gold. The fourth area, a drill section along the 'High Road' on the north east side of the Melange Zone returned samples with anomalous arsenic values but low gold values.

RAB drilling across the Layfield Zone followed up on gold-arsenic anomalies identified by soil and auger drill sampling. RAB drilling located a 400 m wide arsenic anomaly and returned some intriguing gold values: 1795 ppb over 1.52 m in hole 10-47 and 2259 ppb over 1.52 m in hole 10-48.

The RAB section along Miller Creek is also intriguing with holes RAB10-62 to 10-65 returning a number of significant gold (high of 869 ppb) and arsenic anomalies in spite of drilling difficulties that resulted in short, <30m long, drill holes.

Kennecott Trench Zone returned low grade Au anomalies from excavator trenches, auger drill samples, and diamond drill holes that could be correlated between drill holes and trenches. Samples from Trench Tr10-02 returned a 10 m interval that contained 1605 ppb gold. Of the three drill holes that tested below the mineralization trench zone, DDH10-02 intersected 1065 ppb gold over 7.63 m (35.65 m – 43.28 m). A second deeper mineralized interval was intersected in both DDH10-02 and 10-03 with the best intersection from DDH10-02 of 342 ppb gold over 26.34 m (223.6 m - 249.94 m) including one sample grading 2907 ppb over 1.6 m.

Drill hole DDH10-4 tested a suspected structure within a depression near the west side of the melange unit. Samples returned a high of 752 ppb gold, >1% arsenic and a weighted average of 325 ppb gold over 7.64 m from 193.55 – 201.19 m.

The drill holes at the Kennecott Trench Zone (DDH10-01 – 10-04) generally cut the foliation at high angles, the orogenic quartz veins on the other hand were usually cut at low angles to core axis. To get a better intersection with the mineralized quartz veins it will be necessary to drill down the dip of the foliation in the more quartzose units, the better mineralized lithology.

The Per and Glasmacher Occurrences and the Toni Zone are all underlain by Carmacks Group andesites. The two occurrences, located in the Sixty Mile Valley are presently covered by placer tailings. They are described as low sulphidation epithermal gold – silver occurrences hosted by propylitic to argillic altered andesites. The 1988 diamond drill hole intersection of quartz-sulphide veining that contained 11.52 g/t gold over 4.5 m (including 42.16 g/t over 1.5m) within a larger interval of 7.1 g/t gold over 12 m should be kept in mind. Auger drilling over the Per occurrence returned a number of samples with anomalous values for gold, silver, copper, arsenic, lead and zinc (Hulstein, 2010). Samples from auger drilling over the Glasmacher occurrence returned low values for gold (<100 ppb).

The (300 m by 800 m) Toni Zone soil anomaly is located on the northwest side of the Sixty Mile Fault. The Sixty Mile Fault appears to be a major hydrothermal conduit based on amount of faulting, gouge, and alteration including extensive pyritization observed in drill holes DDH10-6 and 10-7. The two intersections of 327 ppb over 74.68 m in DDH10-06 and 329 ppb Au over 58.28 m in DDH10-07 indicate the permissiveness of the area to host epithermal gold deposits.

The Cholach occurrence, while an interesting granite hosted precious metal target, is of secondary interest at this time. It has a small surface expression as defined by anomalous soil samples (for Au, As, Ag, Pb, Zn) and samples from RAB drilling didn't return highly anomalous gold values. Samples from RAB10-080 returned a high value of 25.4 ppm Ag and RAB10-077 and RAB10-078 each returned a sample with greater than 11.0 ppm Ag.

Miller and Alaska occurrence areas are of secondary interest. Both have scattered gold and arsenic anomalies in soil but no coincident coherent target identified to date that requires immediate follow-up. Both occurrences are similar in that they have a mineralized marble unit with a package of quartz rich (quartzites) metasediments nearby cut by quartz veinlets. The smallish coincident gold-arsenic anomaly tested by RAB10-02 and 03 at the Alaska occurrence needs to be understood better as this may have ramifications elsewhere on the property.

RAB and auger drilling techniques were successful in allowing quick and rapid sampling follow-up of anomalous soil samples and testing geological targets.

Based on the 2010 results and exploration by previous workers, additional work is warranted and recommended.

As the Per and Glasmacher occurrences and the strike extensions of the Toni Zone are covered by placer mined tailings and overburden, geophysical methods such as magnetics, electromagnetics, induced polarization and or CS-AMT are recommended. Work should be directed towards defining quartz rich epithermal gold targets for a future diamond drill program. Anomalous areas (magnetic lows, conductors, resistivity highs, etc.) should then be tested by trenching, auger drilling or diamond drilling,

depending on the location. A geophysicist should be consulted in the planning stages of the next geophysical program to determine the optimum technique and approach.

The Melange Zone is a significant target given the drilling results to date from the Layfield, Kennecott Trench Zone and along Miller Creek. Like the epithermal target in the Sixty Mile River valley a variety of geophysical methods should be considered and tried out in consultation with a geophysicist to better define potential ore grade targets within the zone. The drill holes at the Kennecott Trench Zone can be used for subsurface control for geophysical 'experiments' across the zone. Geochemical studies (i.e. clay mineralogy, geochemical zoning) should also be undertaken. Targets that show promise should be drill tested.

## 9.0 STATEMENT OF COSTS

The following costs were incurred during the time periods noted.

<b>Sixty Mile Project</b>				
2010 Expenditures for work filed Sept 10, 2010 (Group HD03112)				
	<u>Total feet</u>	<u>\$/foot</u>	<u>\$Subtotal</u>	<u>Totals</u>
Auger Drilling (S. Fleurant) June 7-17, 2010				
Auger Holes 10-50 to 10-112	1208	\$13.00	\$15,704.00	
Jeff Burke, Geo. Assist., June 7-18, 2010	11 days	\$300.00	\$3,300.00	
				<b>\$19,004.00</b>
<b>Sixty Mile Project</b>				
2010 Expenditures for work filed Sept 9, 2010				
<u>Geochemistry</u>	<u>No.</u>	<u>\$/Sample</u>	<u>\$Subtotal</u>	
Soil Samples	1558	\$31.08	\$48,422.64	
Rock Samples	1053	\$25.00	\$26,325.00	
<u>Contractors</u>				
Precision GeoSurveys Inc. (July 12-25)			\$78,049.00	
Miller Creek Mining Company Limited (Trench10-1-3)			\$7,672.00	
Totem Pole Geological Consulting Ltd.				
June 11-27, 2010	17	\$840.00	\$14,280.00	
Aug. 8-17, 2010	10	\$840.00	\$8,400.00	
Stan Wolarek (RAB Drilling)				
July 27-Aug 12, 2010			\$49,727.00	
Aug. 13-Aug. 31, 2010			\$65,566.40	
Kluane Drilling Ltd. (Heavy Equip)				
Trenching,etc, July 13-29, 2011			\$32,296.41	
Trenching,etc, Aug 1-31, 2011			\$35,399.50	
Kluane Drilling Ltd. (Diamond Drilling)				
DDH10-01, 02 and partial 03 (Aug 21-31, 2010)			\$68,402.46	
Sylvain Fleurant (Auger Drilling)				
June 18-July 29, 2010 (ADH10-50 to 10-112)	feet 1840	\$/foot \$13.00	\$23,920.00	
<u>Personnel</u>				
	<u>No. Days</u>	<u>\$/Day</u>		
R. Hulstein, B.Sc., P.Geo.				
June 7-August, 2011	42	\$500.00	\$21,000.00	
D. Clark, M.Sc.				
June 7-August, 2011	51	\$450.00	\$22,950.00	
J. Burke, geo assistant				
June 19-August, 2011	28	\$300.00	\$8,400.00	
K. Johnston, cook & First Aid				
June 7-July 31, 2010	46	\$400.00	\$18,400.00	
C. Kallio, camp and geo. assistant				
June 7-July 31, 2010	46	\$300.00	\$13,800.00	
V. Etzel, geo. assistant				
June 7-July 31, 2011	40	\$275.00	\$11,000.00	
				<b>\$554,010.41</b>
<b>Sixty Mile Project</b>				
2010 Expenditures for work filed Nov. 26, 2010 (Group HD03141)				
Kluane Drilling Ltd. (Diamond Drilling Sept. 1-19)				
DDH10-03(partial), 04 and partial 05			\$93,026.00	
Fireweed Helicopters (Sept. 1-19)			\$51,450.00	
Stan Wolarek (RAB Drilling)				
Sept 9-19, 2010			\$29,691.50	
				<b>\$174,167.50</b>

## 10.0 STATEMENT OF QUALIFICATIONS

I, Roger W. Hulstein, of:

106 Wilson Drive  
Whitehorse, Yukon Territory  
Y1A 0C9,

do hereby certify that:

1. I am a mineral exploration geologist with over 25 years of experience working in the Yukon.
2. I am a graduate of Saint Mary's University, Halifax, with a degree in geology (B.Sc., 1981) and have been involved in geology and mineral exploration continuously since 1978.
3. I am a fellow of the Geological Association of Canada (F3572).
4. I am registered as a professional geoscientist (No. 19127) with the Association of Professional Engineers and Geoscientists of the Province of British Columbia.
5. I am the author of this report on the exploration program on the Sixty Mile Property in the Dawson Mining District, Yukon. The report is based on personal examination of the ground on various dates, with the last work carried out on June 7<sup>th</sup> – September 19<sup>th</sup>, 2010 and on referenced sources.

Roger Hulstein, B.Sc., FGAC, P.Geo.

February 28, 2011

I, David Clark, of:

402-2336 York Avenue  
Vancouver, British Columbia  
V6K 1C7

do hereby certify that:

1. I am a geologist having worked in mineral exploration since 1999.
2. I am a graduate of McGill University, Montreal, Quebec, with degrees in planetary science (B.Sc. Hons 2002) and geology (M.Sc. 2006)
4. I possess the necessary academic qualifications and professional experience to register as a Professional Geoscientist with the Association of Professional Engineers and Geoscientists of the Province of British Columbia, and have begun the application process.
5. I am a co-author of this report on the exploration program on the Sixty Mile Property in the Dawson Mining District, Yukon. The report is based on personal examination of the ground on various dates, with the last work carried out on June 7<sup>th</sup> – September 19<sup>th</sup>, 2010 and on referenced sources.



David Clark, M.Sc.

February 28, 2011

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