YUKON MINING INCENTIVES PROGRAM

YMIP PROJECT 00-073

BRUIN CREEK (LOWER REACH)
TARGET EVALUATION
FOR PLACER GOLD

June 1, 2000 - JANUARY 31, 2001

TRANSVERSE MERCATOR PROJECTION CO-ORDINATES
latitude 64^0 21' - longitude 140^0 46'
PLACER CLAIM SHEET 116C-7
Placer Claims P28263-28270

prepared by
Leslie Chapman

Box 460, Dawson City
Yukon, Y0B-1G0

Table of Contents

1. Property Description and Access

I evaluated a placer deposit located in the lower reach of Bruin Creek, a right limit tributary of the Fortymile River. The property is covered by eight placer claims P28263-P28270, located along the Bruin Creek baseline. The area is located in the Dawson mining district. The map co-ordinates for the property are latitude 64°22' and longitude 140°46'. The attached topographic **Map 1** shows the location of the property. **Map 2** is an aerial photograph of the project area, and **Map 3**, a portion of placer claim sheet 116C-7, shows the project location.

There is access to the property via a cat trail into Bruin Creek which takes off from the Clinton Creek Highway, following the ridge separating Bruin and Maiden Creeks, and then dropping into the Bruin Creek valley. Access to the property can also be gained by river; Bruin Creek is approximately 2½ miles downstream of Marten Creek, which is accessible by the Fortymile Access Road. A spur of the Fortymile Access Road terminates at a ford of the Fortymile River, approximately 1 mile upstream of the Bruin Creek. Access to the property is shown on **Map 1** and **Map 3**.

This deposit consists of the auriferous placer gravels located in the bed of the creek, and extending into the bank ground on either side of the creek, and up onto the adjacent low lying terraces. The gravel in the creekbed and adjacent banks is thawed. The terraces are generally permanently frozen with occasional thawed sections, particularly along the rim. Further back from the creek and on the bench ground, the gravel reserves are frozen. The width of the valley varies from 300 feet to 1,000 feet over this one mile section of the lower reach of Bruin Creek.

Bruin Creek drains a large area, approximately 80 square miles. The main stem of the creek is approximately 10 miles long. The headwaters branch with 2 forks, each approximately 5 miles in length. There are numerous feeder creeks and gulches entering into Bruin Creek along its length The creek channel is approximately 50 to 60 feet wide in the lower reach, with a reliable flow of water throughout the summer season.

2. Geology

The bedrock geology of Bruin Creek is typical of the Fortymile; it consists of a metamorphic unit composed mainly of schist. It has been proposed that the metamorphic bedrock is the source of most of the placer gold in the Fortymile. However, in my mining experience I have found gold with quartz adhering to it, indicating that at least some of the gold is derived from the numerous quartz veins and stringers in the bedrock. Quartz veins can be seen in bedrock outcrops along the valley.

The placer gravels consist of rounded to sub-rounded aggregates in the lower reach of the creek. The gravel is coarse, boulders to 12 inches in diameter are common, and larger boulders to 3 feet are encountered occasionally. The gravel is sandy in nature, with little clay content. Depth to bedrock at the confluence of the creek is approximately 16 feet, with approximately 5 ft. of overburden and 10 to 12 ft. of gravel.

The overburden in the banks on the claims being examined, flanking the creek channel on either side, is from 2 to 6 feet deep. It is thawed close to the mouth of the creek with frozen sections

Typical bank ground adjacent to the channel on Bruin Creek. Overburden is 2 to 6 ft deep. Vegetation varies depending on whether the overburden is thawed or frozen.

further upstream in this reach. It is sandy, with the thawed areas supporting growth of willows, poplars, and other vegetation common to flood plains. Vegetation capping the frozen overburden consists of scrub spruce and moss.

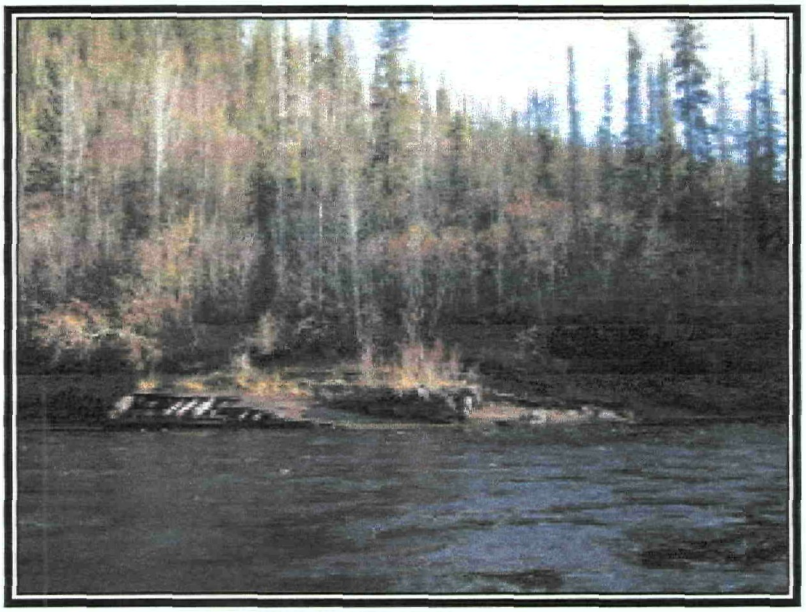
The placer gold found in Bruin Creek consists mainly of fine to medium sized flakes, ranging from less than 100 mesh to approximately 14 mesh. The gold is bright yellow in colour, its purity is .84, typical of gold found in the Fortymile drainage. Reportedly, occasional pockets of coarse gold have been found at bedrock depth.

3. Summary of Previous Relevant Investigations

Bruin Creek was known to be a gold producing creek in the early days. There are numerous pits, shafts, and creek diversions further upstream. There are the remains of several camps and cabins along the creek. A summary of previous work is outlined below:

- From 1886 there were prospectors and miners in the drainage and, while there is still evidence of their old workings, the results of their work is unknown.

- In 1934, a dredging operation was initiated at the confluence of the Fortymile River and Bruin Creek. This venture was operated by Harold Blankman. He was well known in the Yukon as the chief financial controller for the Yukon Consolidated Gold Corporation. The late Fred Caley of Dawson City told me that a significant quantity of gold was taken out of the mouth of the creek by this dredge. (Mr. Caley was familiar with the Fortymile region and had grubstaked some prospecting ventures in the area,



This photograph shows the remains of the Blankman dredge at the mouth of Bruin Creek. It was destroyed by ice in 1935. The winches can be seen on the deck.

including the Clinton Creek asbestos find) Unfortunately the dredge was destroyed by ice and high water the year after it commenced working The remains of the dredge can be seen at the mouth of Bruin Creek its digging ladder is still embedded in the bank This dredging venture was a well organized effort The ground was prospected in advance and two thousand cords of wood were cut up Bruin Creek to provide fuel for the operation A permanent camp with extensive shop facilities was built at the Kink Roadhouse on the Fortymile approximately ½ mile upstream of the mouth of the creek Knowing that Blankman was a seasoned placer mining man and judging from the amount of work which was performed I conclude that his group was confident that the ground would support dredging for some time

- In 1981 I had a hole drilled with a 6 inch diameter Sonic drill at the mouth of the creek From the gold recovered in the drill hole I estimated that the gravel would yield approximately 1 ounce of gold per 100 yards We drilled this hole to test the drill which was brought in to carry out a project on the Fortymile River We brought the Nodwell mounted drill down the access trail which terminates at the mouth of the creek and this was the first location suitable for testing the drill

- In 1993 I carried out an exploration program about 4 miles up the creek from its confluence This project consisted primarily of excavator trenching over a block of 5 claims containing in excess of 1 million cubic yards I concluded that this deposit would be viable at a gold price of US$400 per ounce or better although there are some specific areas which grade higher In 1996 I performed evaluation work in a Bruin Creek tributary Herbert Creek and encountered paying gold values in this area In 1995 the Fortymile Pacific Joint Venture a mining company of which I held a minor interest partner carried out an evaluation of Bruin Creek downstream from Herbert Creek (over a distance of 4½ miles) This project consisted of digging shafts over a length of approximately 4 miles The work showed that most of the gravel contained gold colours with marked concentration and somewhat coarser gold on bedrock A subsequent drop in the price of gold precluded the venture performing further work on the property I knew a miner who was working in the headwaters of the creek on a fork known as Falls Creek (named because of a waterfall near the mouth of the creek) He showed me a tobacco can which was half full of flaky gold (approximately +20 mesh) which he had obtained from one of his cleanups This fork was active for about 5 years in the mid 1980 s

4 Objectives

My objective in this project was to establish the minability of the Bruin Creek gravels over a block of 8 claims in the lower reach particularly from a floater dredging perspective To do this I planned to perform extensive sampling of gravel over the claim block I wanted to establish the following

- the grade of the gravel and nature of the gold present

- the distribution of the gold in the gravel This would allow me to determine if the upper portions of the gravel could be stripped as barren or low grade waste (although with dredging ground the entire gravel section usually is mined)

- the depth to bedrock My intention was to determine if gravel depths would preclude floater

dredging as this method becomes unviable in deeper ground Conversely ground which is too shallow does not allow enough freeboard for a barge to float freely in a dredge pond

- the depth of overburden While the actual creek bed has exposed large gravel bars barren of overburden the thawed dredgeable reserves contained in the bank ground are covered with soil supporting vegetation This would allow me to take into account the costs of stripping overburden in relation to the depth of the gravel which is present for mining

- the volume of gravel available A calculation of reserves would allow for planning both the scale and the duration of a mining project initiated on the claim block

5 Equipment Used

We used the following equipment to carry out the project

- D6C dozer
  12E grader
  920 loader
- service truck including welding equipment and tools
- ATV
  4x4 truck
  16 ft riverboat 30hp motor
- snowmobiles
- snowmobile sled
  sample processing equipment including
  - a long tom sluice 1 ft wide by 4 ft long for processing bulk samples in the field with a 1½ inch Honda pump to supply process water
    a small cleanup sluice 6 inches wide by 2½ ft long for sluicing samples indoors equipped with 3/4 inch submersible electric pump
    spiral gold concentrating wheel
  - various gold pans tubs shovels etc

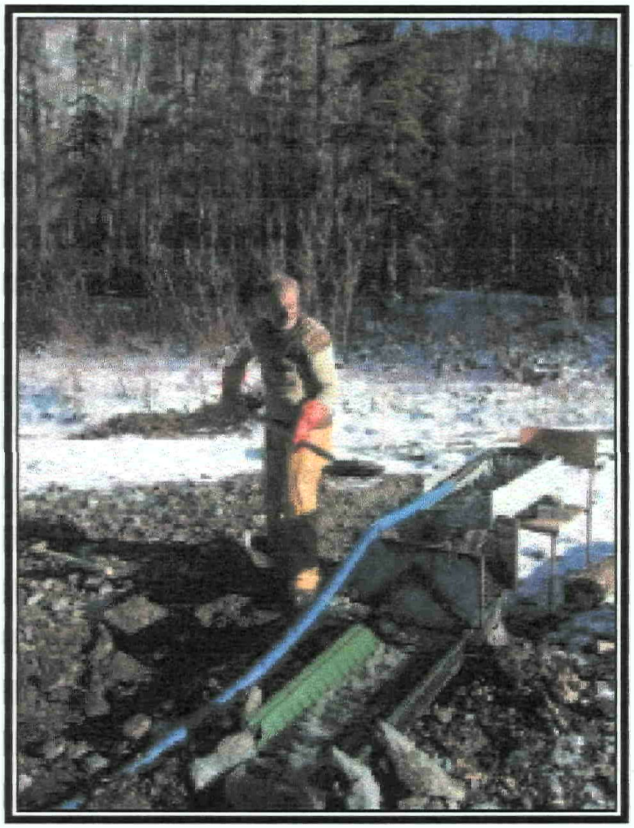
  gold analysis equipment including powder scale sieves magnets etc
  propane fired gravel thawing unit
- chainsaw

6 Work Performed

My initial plan for this exploration program was to drill the property using a 6 auger drill I planned to get the drill into the property by fording the Fortymile River approximately 3 kilometres upstream of Bruin Creek We constructed an access road from the Fortymile Road to the location where we planned to ford We used the right of way from a previous cat trail filling bogs and establishing ditches to provide all weather access We planned to use the road to get fuel and service vehicles as close as possible to the site Because of the wet ground conditions resulting from a heavy snow pack and heavy rain early in the summer we constructed the road early in June to establish drainage and to allow the roadbed to set up in advance of our anticipated use Unfortunately because of continued rain and resulting high water levels in the river I had to modify the project the high water would not allow the drill to ford the river I waited until September

hoping for lower water, but river levels continued to be unprecedentedly high.

My modified plan for the exploration of the property included an extensive evaluation project using hand sluicing to evaluate small bulk samples excavated with pick and shovel. Our approach was to set up a mobile, portable sluicing outfit in areas that were conducive to hand bulk sampling. (i.e. thawed ground where the overburden depths were not prohibitive and, ideally, where bedrock could be reached) We excavated a series of 11 trenches on bars, on adjacent creek banks, and on low lying benches, which allowed us to evaluate the tenor of the placer gravels in these areas. Gravel excavated from the trenches was shovelled into a long tom and washed with water provided by a 1½ inch pump. We cleaned up the box after each trench was complete and concentrates were reduced by panning. We made a rough colour count in the field to help shape the project and saved the concentrates for further processing and more detailed examination later at camp.



Shovelling gravel from a trench excavated on a gravel bar in the channel of Bruin Creek. Gravel was feed into a hopper equipped with a grizzly to remove oversize, and then washed through a sluice box using water supplied by a 1½ inch gasoline powered pump.

Once freeze-up began and the water levels in the creeks were starting to drop, we continued the bulk sampling work. (Dropping water levels allowed access to bars which had been underwater previously.) We deepened (to the new water level) the 5 trenches which we had dug in the gravel bars. We also dug 4 additional trenches on the gravel bars. We were able to quickly thaw down a thin layer of frost which had formed in the excavations, by directing the heat from a propane tiger torch through a simple thawing unit which we constructed. The gravel below this frozen layer, approximately 3 to 4 inches in depth, was thawed and easy to dig. Each day at the end of a sluicing run we rinsed the sluice mats and saved the concentrate in buckets for processing later at camp. My intent was to perform as much work on the property as possible while the weather was favourable. We stockpiled the pails of concentrates at the work locations so that we could retrieve them with snowmachines after freeze-up. By doing this we saved the work of packing samples down the creek to the boat. After the river and creekbed were frozen, we hauled the concentrate samples from Bruin Creek to camp, using the road which we constructed and travelling on the ice of the Fortymile and on the creek.

We used the propane thawing unit to drive drifts into the frozen bank gravel. We found that we

could thaw approximately 4½ inches over a 1½ ft diameter hole in an hour. We worked on two drifts at the same time, alternately thawing a drift, then letting it thaw back further while we moved the equipment to the next drift. We then returned to the first drift and mucked out the thawed gravel. We used fibreglass batt insulation to keep the hole from refreezing overnight. We worked down at an angle to get below the water level of the creek. Ground water problems were eliminated by working in the frost; the water didn't seep into the drift because the frozen gravel around the perimeter of the drift kept it sealed from seepage. Additionally, sloughing which normally occurs with wet, thawed ground was eliminated, allowing us to obtain an effective sample moving far less gravel than we would have had to in thawed material. We completed four drifts as deep as a long handled shovel could effectively reach, an average of 4 to 5 feet. We collected a total of 35 five gallon pails of gravel from the 4 drifts; each pail weighed approximately 100 lbs. We freighted the pails back to camp, using snow machines, and we processed them inside using a small sluice and recirculating the process water. We processed the concentrates from the bulk samples which we sluiced in the creek, and from the material sluiced in camp, using the spiral gold wheel. I evaluated the samples by counting colours obtained, sieving the gold to obtain a grain size analysis, and weighing the gold from each excavation.

Our base camp near the mouth of the creek provided a staging ground for the project.

7. Results and Conclusions

The ground which I tested in both the valley bottom and on the adjacent benches had gold values in all excavations, in varying quantities. The results of the trenching work are given in **Table 1**. Generally, the bench excavations had higher gold values than did the dredging reserves in the valley bottom. This could have been because we did not reach bedrock in most of the creek excavations due to the presence of ground water.

7.a Benches

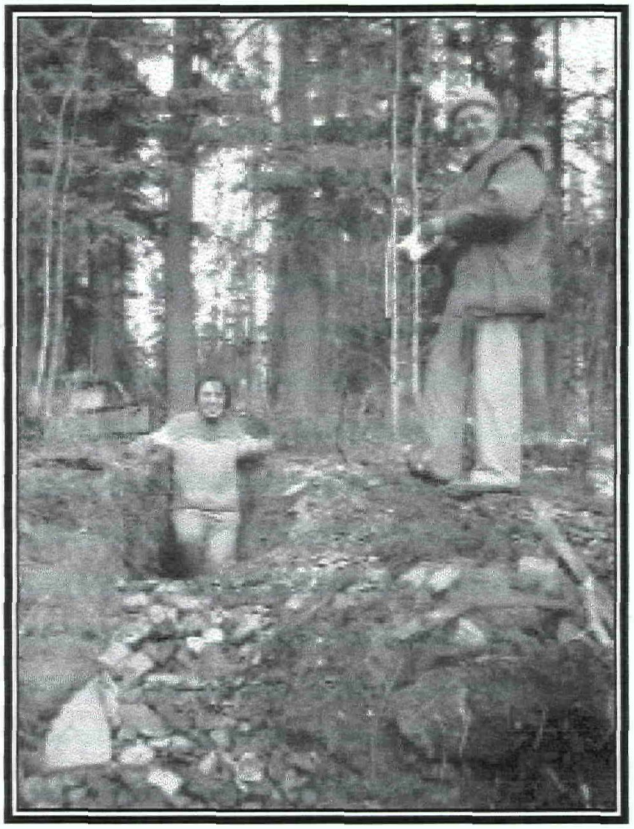
The best excavation on the bench ground showed a value of 1 ounce of gold per 49 bank cubic yards of gravel; this trench was excavated to bedrock depth. The lowest values showed 1 ounce per 625 yards (disregarding the sample which was spilled); grade may have been better had bedrock been reached in this excavation. This shows that while there are enriched sections, there is also nearly barren gravel. Many of the gold colours recovered in the sampling work were quite fine. I did observe that, in the excavations which reached bedrock, there were more coarser colours. I also found that in excavations in which the gravel had a rusty red stain, both the number and size of the colours was greater.

The gravel was sandy and I didn't encounter any over-sized boulders in any of the bench excavations. The gravel appears that it would be easy to wash. However, because of the fine flakey nature of the gold, attention would have to be given to gold recovery; fine screening coupled with low water volume in the sluice runs would be required for efficient gold recovery.

I estimate that a rough preliminary estimate of the volume of the gravel on the bench which I tested in this project to be approximately 47,000 bank yd^3, based on the bench dimensions of approximately 700 ft. long by 200 ft. wide by an average of 9 ft. deep.

7.b. Dredging Reserves

The best excavation in the creek bottom showed a value of 1 ounce of gold per 102 cubic yards of gravel. The lowest values showed 1,101 cubic yards per ounce. Only one of the excavations, #1, reached bedrock, and even in that excavation, bedrock was only encountered in the back end of the trench.

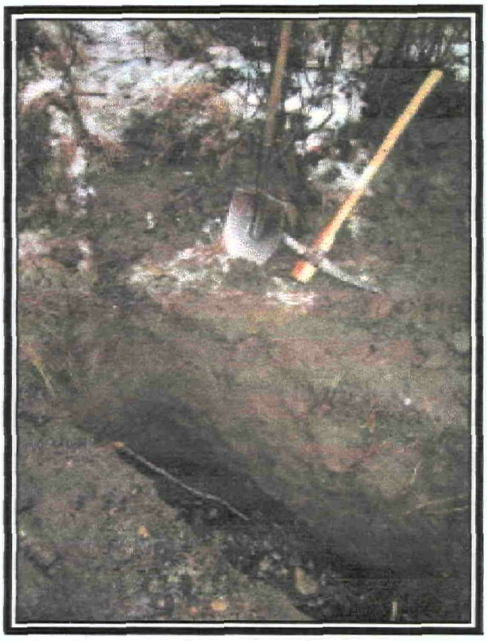


Trench excavated on a bench in the Bruin Creek valley. The best grade figures in this project came from trenches excavated on the benches, possibly because more bedrock contact was exposed. The high water table hampered deepening the excavations on the bars.

The gravel in the creek bottom was somewhat coarser, in some sections, than on the benches, with some 1 foot boulders encountered in pit #3. For the most part, though, the gravel encountered in the bar excavations was of a similar sandy character to that of the benches.

The dredging reserves in the this reach of the creek are contained in two deposits. There is a narrow canyon, where the water runs on bedrock, separating the two deposits. (Although the canyon itself could form a natural trap for placer gold deposition. The volume of deposit A, outlined on **Map 4A**, is approximately 67,000 bank yd^3 (1000 ft long x 300 ft wide x 6 ft deep). Deposit B, also outlined on **Map 4A**, has a volume of approximately 133,000 bank yd^3 (1,500 ft long x 400 ft wide x 6 ft deep). These are rough estimates; I determined the depth of dredgeable gravel by examining the bedrock flanking the creek channel.

All of the gold which I recovered passed through a 20 mesh screen; in excess of 90% passed through a 30 mesh screen as well. The larger pieces of gold consisted of thin flakes. This gold is similar to the gold which is found on the Fortymile River.



A hand excavated trench in the bank adjacent to the creek channel.

Rusty, red stained gravel on both the benches and the bars proved to be an indicator of increased gold values. This project tested mainly the surface gravels, with bedrock encountered only in some of the excavations. The amount of gold which was recovered is encouraging, showing low grade minable values even in the top most gravels. The generally better values where bedrock was encountered, indicate that there would be significant enrichment in the lower gravel layers; this leads me to believe that the gravel should be economic at today's gold price, if an efficient operation was implemented. See **Notes for the Interpretation of Tables 1 and 2** for an analysis of grades based on the trenching which I performed.

8. Recommendations

The hand sampling work established that there are viable values on the bench ground in this claim block, although not enough bedrock was sampled to give definitive grade reserves. I recommend that drilling be performed on the benches. I believe that the drilling should start with a wide pattern, followed by infill drilling around the best holes to delineate high grade sections of the ground for the initial mining cuts.

The dredging reserves have shown that the gravel is probably minable, although further testing to bedrock would be necessary to confirm this. The dredging reserves farther away from the actual creekbed could possibly be drilled using auger drilling if the ground water has not permeated the gravel. Evaluating the wet gravel in and adjacent to the creek could be done efficiently using an excavator to dig pits; indications are that the dredging ground in not deep. My preliminary estimate is that the gravel will average 6 to 8 feet in depth, with some sections as shallow as 2 feet; I don't expect the maximum depth of the gravel to exceed 10 to 12 feet. The shallowness of the ground would facilitate using an excavator to dig pits to bedrock. Small scale bulk sampling used in conjunction with the excavator trenching would help to definitively establish the viability of the ground.

As part of this project, I constructed a road from the main Fortymile Access Road on the north side of the Fortymile River to a good ford on the river. A route from the ford to the claim block on the south side of the river should be investigated. There is presently an old cat trail over the muskeg, but there is likely a better route, using the thawed hillside. If the route looks feasible, a preliminary trail should be established to facilitate moving equipment, fuel, and personnel into the claim block. As work progresses the trail could be upgraded to allweather road status.

It should be recognized that Bruin Creek is classed as a Type II, salmon rearing stream, and the regulations governing development on this class of stream should be taken into account in any work programs planned. Because floater dredging employs water recirculation, the classification of the creek should not present a problem.

Table 1 - Trenching

Trench #	Length in ft.	Width in ft.	Depth in ft. average	Gravel volume in yd^3	# of colours	Weight in grains	Grade in yd^3/oz	Comments
1	10	2	2.7	2	645	5.12	189	trench on bar, colours very small to small, bedrock in one end of trench
2	13	2	3	2.9	160	1.3	1,111	trench on bar, colours very small
3	12	2	2.5	2.2	730	5.8	183	trench on bar, ~30 small flakes, no bedrock, some rock >1 ft diam.
4	total length 5'; length of gravel section 2'	1.5	total depth 3.25'; depth of gravel section 1.25'	.14	178	1.4	49	trench in bench, total trench length 5 ft with gravel showing in back end only, overburden 2 ft to 14", includes 8 flakes, bedrock reached in backend of trench
5	total length 7'; length of section deepened to bedrock 2'	1.25	2.5	.23	90	0.7	159	trench is 75 from creek, started on exposed bedrock, bedrock slopes away, trench deepened in centre - sample calculated from 2' x 1.25' x 2.5' section deepened to bedrock, colours small
6	5	1.7	3	.94	33	.3	1,429*	trench in bench, not a good sample as box fell over and some concentrate lost
7	2	1.75	total depth 3', depth of gravel section 1'	.13	10	.1	625	trench in bench, gravel section overlain by 2 ft of overburden, no bedrock
8	4	1.1	total depth 1.67', depth of gravel section .67'	.11	102	.9	60	trench in bank, gravel section overlain by 1 ft of overburden, rusty red stained gravel, includes 20 flakes
9	5	2	total depth 4.5', depth of gravel section 1.5'	.55	22	.2	1,429	trench in bank, gravel section overlain by 3 ft of overburden, colours are very small
10	8	1.5	total depth 3.25', depth of gravel section 2.25'	1	220	1.8	270	trench on bar in willows, gravel section overlain by 1 ft of overburden, flakey gold, rusty red stain on gravel, no bedrock
11	8	1.5	2	.89	163	1.1	400	trench on bar, no bedrock, small colours , no overburden
12	6	1.5	2	.67	132	1.2	270	trench on bar, no bedrock, rusty stain gravel, no overburden

Table 1 - Trenching (continued)

Trench #	Length in ft.	Width in ft.	Depth in ft, average	Volume in yd^3	# of colours	Weight in grains	Grade in yd^3/oz	Comments
13	9	1	1.5	.5	219	2	122	trench on bar, no bedrock, no overburden, flakey gold
14	5	1.5	2	.55	68	.6	454	trench on bar, no bedrock, fine sandy gravel
15	6	4	1	.89	211	1.3	333	trench on bar, no bedrock

Table 2 - Drifts

Trench #	Length in ft.	Diamtr in ft.	slope	Volume in yd^3	# of colours	Weight in grains	Grade in yd^3/oz	Comments
16	4	2	1:3	.46	148	1.3	169	drift in bank, large garnets
17	4.5	1.5	1:3	.29	154	1.4	102	drift in bank, includes 32 flakes
18	5	1.5	1:2	.32	96	.7	231	drift in bank, small colours
19	3.5	2	1:2	.41	63	.5	397	drift in bank, no bedrock

Notes for Interpretation of Tables 1 and 2:

- results from trench #6 should be disregarded as this was a poor sample; box fell over and unknown quantity of the concentrate was lost

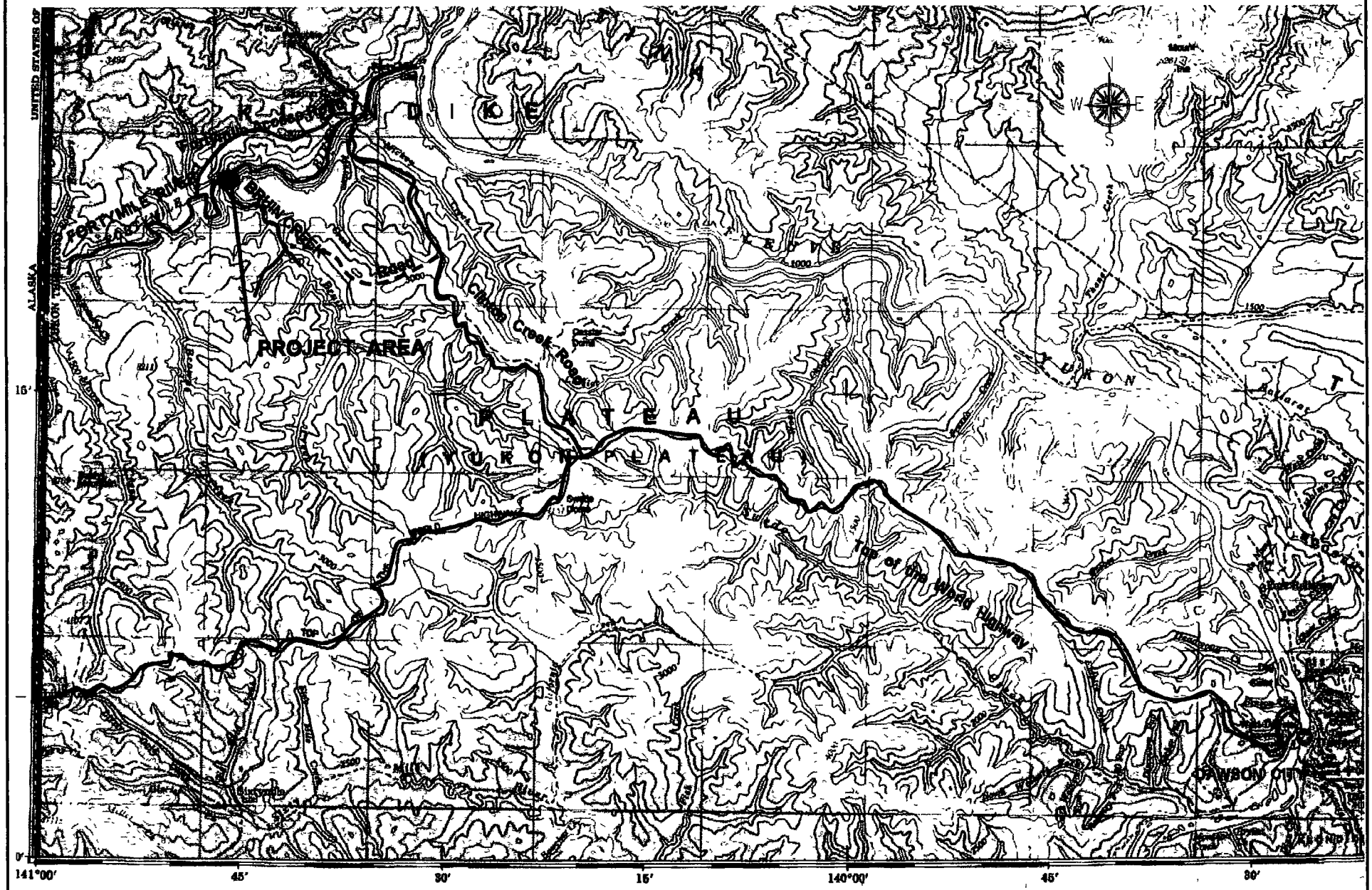
- gold colours were weighed using a powder scale which can weigh to 1/10 of a grain.

- grade has been calculated using the following formula:
  weight of gold in grains ÷ volume in yds^3 = grains per yd^3
  grains per yd^3 ÷ 486 (# of grains per troy ounce) = troy ounces per yd^3
  1 ÷ ounces per yd^3 = yd^3 per troy ounce

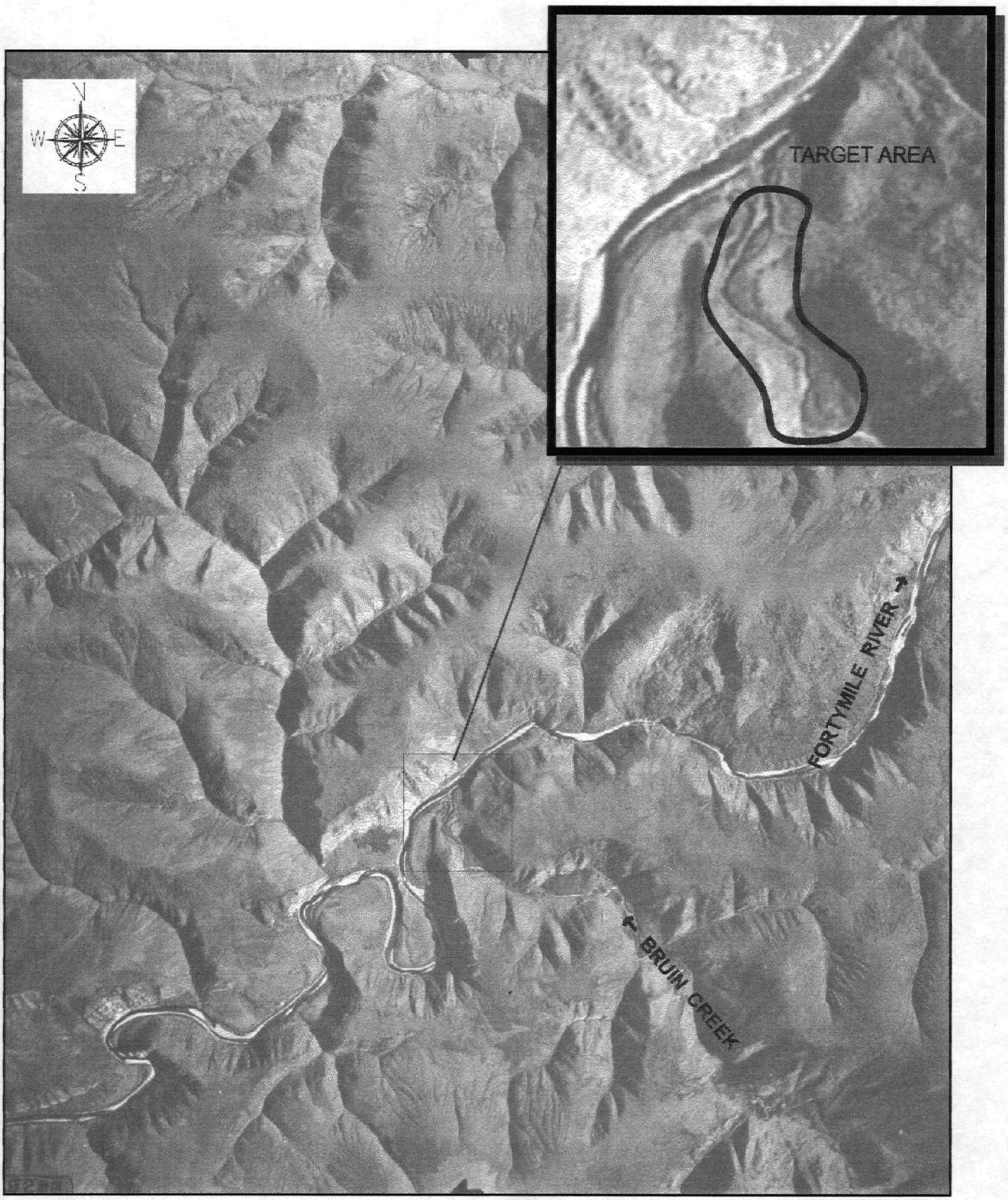
  for example for trench # 1: 5.2 grains ÷ 2 yd^3 = 2.6 grains/yd^3
  2.6 grains/yd^3 ÷ 486 grains/oz = 0.0053 ounces per yd^3
  1 ÷ 0.0053 ounces per yd^3 = 189 yd^3 per ounce

- **Average grade for trenches on bench** (#4, #5, # 7,) is **278 yd^3/oz**. Grade for Trench #6 has been discarded as not meaningful, as some of the concentrate was lost when the box tipped over. (It is unfortunate that this sample was lost, as the small amount of remaining concentrate appeared promising.) If the trench with the lowest grade (#7) is discounted, to compensate for the loss of sample #6, **the average grade is 104 yd^3/oz.**

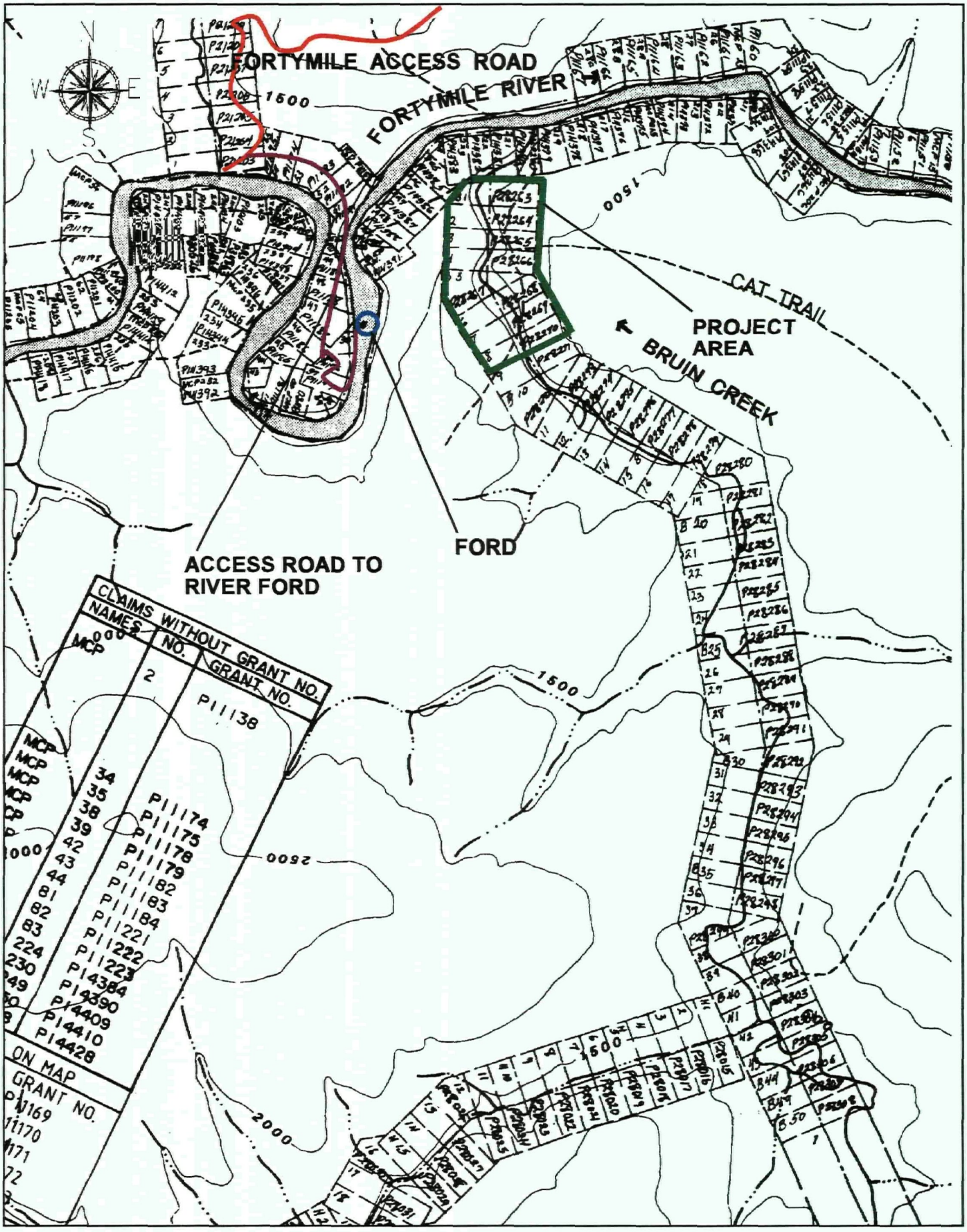
- **Average grade for trenches on bars** (#1, #2, #3,#8, #9 #10, #11, #12, #13, #14, #15, #16, #17, #18,#19) **is 381 yd^3/oz**. All but 2 of the 15 bulk samples obtain showed promising results. If the 2 lowest grade samples are discounted as anomalies, the grade of the gravel sampled is **245 bank yd^3/oz**. This could be considered a breakeven grade. Because the trenches only tested he top gravel layers, and there are indications that the underlying gravel is richer, I expect that this deposit could be considered mineable at today's gold price.



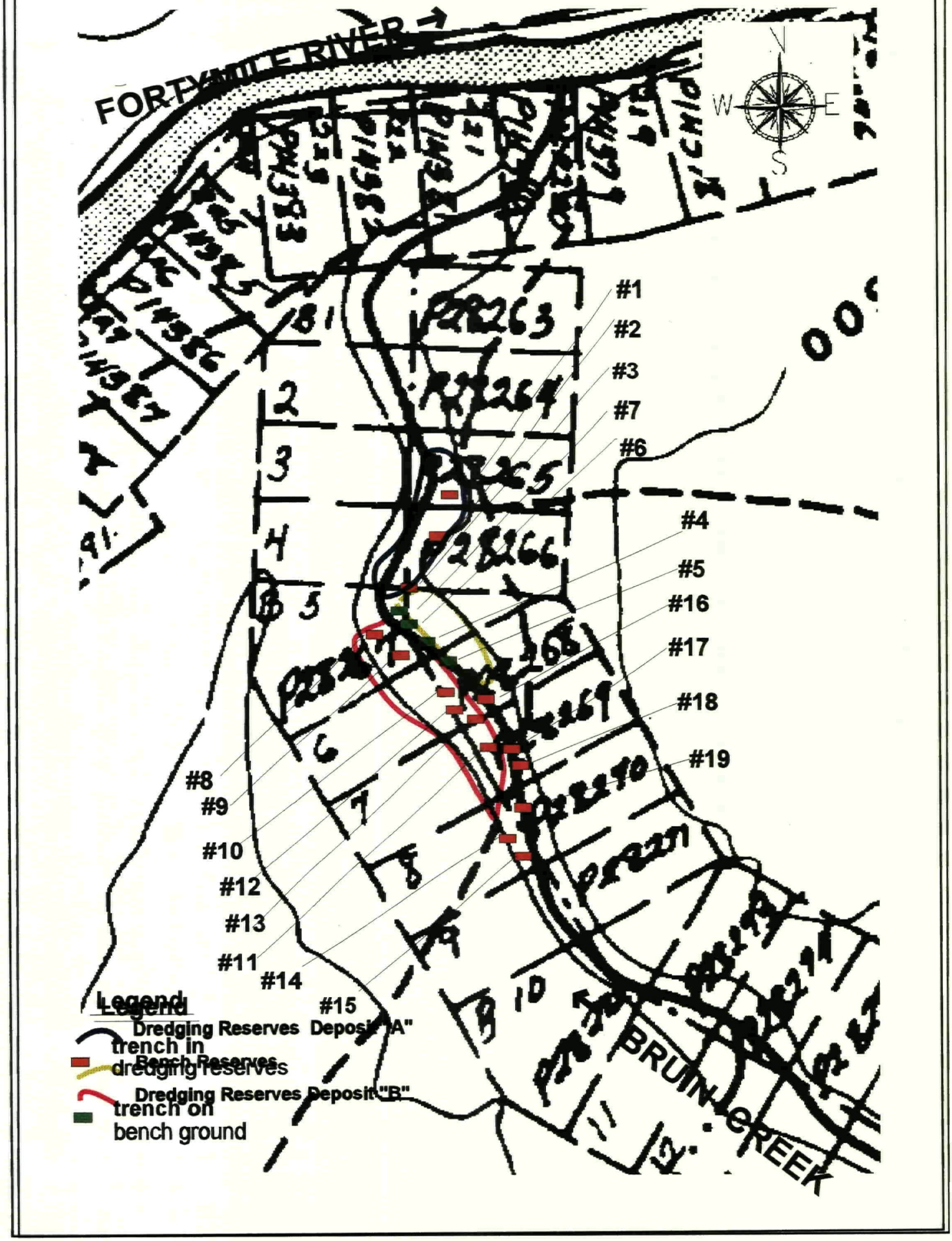
MAP 1 - PROPERTY LOCATION (from "DAWSON" Map Sheet 116B & C scale: 1 cm = 4 km (approx) pg 12



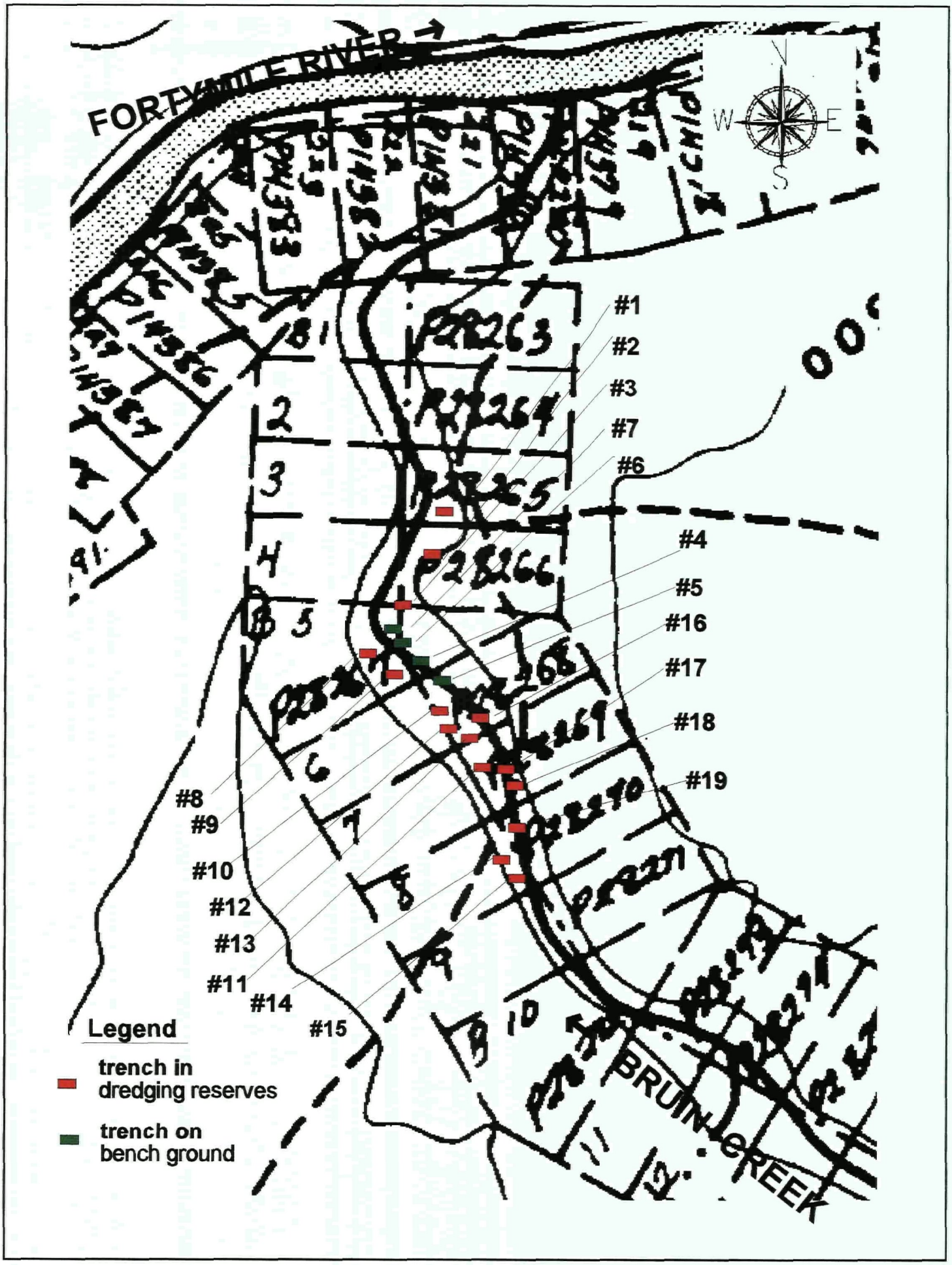
MAP 2 - Aerial Photograph of Project Area in Bruin Creek (inset x 10) pg 13



Map 3 - **Project Location** **(from Placer Claim Sheet 116C-7)** scale: 1 cm = 300 m pg 14



Map 4A - Gravel Deposits (from Claim Sheet 116-7) scale: 1 cm = 100 m



Map 4 - Work Locations (from Claim Sheet 116C-7) scale: 1 cm =100 m pg 16

Additional Information

People who worked on the project

Leslie Chapman	Dawson City
William Claxton	Dawson City
Ron Barrett	Stewart River
Larry Remple	Dawson City
Thomas Claxton	Dawson City

Property investigated

Placer Claims P28263-P28270

Total volume of excavations

The total volume of excavations carried out is 18.5 bank cubic yards.

Report preparation

Leslie Chapman and William Claxton prepared the report in 50 manhours.