

MEMORANDUM

Subject: Survey Control for Re-establishment of Patented Mineral Survey Claims and Parcels Thereof

Date: May 9, 1966

This Memorandum is written in anticipation that it will be of value to Engineers and Surveyors succeeding the author, whom will be involved in relocations of Company owned mining claims. Opinions expressed, suggestions, field conditions and conflicts described are based on the writer's experience and research of the Company records, mainly field and calculations books.

There is much to be desired in adequate ground control on the various creeks for accurate re-establishment of the mineral survey corners.

1. There are many conflicts between common lines and corners. These conflicts normally occur in two patterns.

- a. Between the old and more recent surveys
- b. Between different surveyors
- c. There are a few instances where a mineral surveyor has made a conflict on a common line between claims, both of which he surveyed.
- d. The Mineral Surveys calculated for closure from the official plats on file show closures within reasonable limits with a few exceptions. These exceptions were checked against the copy of the surveyor's field notes for errors, in those instances where copies of the field notes of the original survey were in the Company files. No discrepancies were found.

2. Theoretically each individual survey is possible to relocate from a tie to a B.L.M. Land Monument or to a Mineral Survey or Land Monument in the case of the early surveys made before the establishment of the section grid on the ground. Practically it is normally a major survey problem beyond the limitations of time and manpower at our disposal for the following reasons.

- a. All original corners both mineral survey and B.L.M. are no longer in existence in the stripped and dredged areas.
- b. The original mineral survey corners were originally 4 x 4 cedar posts, and with the exception of the more recent surveys, are no longer in existence.

c. The corner posts still remaining from the recent surveys are in various states of decomposition, some are rotted off and lying on the ground or if still standing are leaning. Very good success was made in the Gold Hill area in the spring of 1964 in relocating corners of surveys which were dated from 1936 to 1940 by clearing lines with a D-8 bulldozer. The procedure followed was to obtain a starting point for line by transit from a mineral survey corner still standing with a tie to a quarter corner standing in fair condition. The bulldozer was kept in line by setting pickets on line with the transit and followup with rough chaining. When the bulldozer neared the corner location the operator was usually able to spot all of the standing corners. Chaining was stopped and a new transit station established by eyeball to the estimated center of the post had it been plumb. The same procedure was followed from one corner post to the next. When corner posts were not in evidence the bulldozer was stopped fifty feet short and a search for the post was conducted on foot. If this failed to locate the original corner, clearing was continued on to the location and then by taking light cuts over the ground with the blade at the spot chained, the corner was located by the four inch square of rotten wood left in the ground when the post had fallen over. All corners searched for in this manner were found with the exception of a few along the old Fairbanks-Ester Road which were obviously obliterated by excavation. All corners located in this manner have been replaced with permanent type monuments consisting of brass caps mounted on old 1-1/4" thaw pipe with cross bars welded to the lower end to reduce frost heaving action and to make them more difficult for vandals to molest in the field.

d. The existence of the various mineral and land monuments referred to in the early surveys and outside of the section grid such as Fairbanks and Fish Creeks is not known to this writer. The later ones established on Fairbanks and Fish Creeks could probably be found.

e. The section and quarter corners still in outside of the stripped and dredged ground are unreliable for a transit station in areas of swamp, hillside and permafrost. They are usually found heaved up to the vegetation cover and leaning out of plumb. In order to re-establish control from these references points would require the services of a B.L.M. Cadastral Engineer to relocate the corners lost in mining and to re-habilitate those still standing.

3. The United States Smelting Refining and Mining Company's coordinate grid offers the best solution in those areas where too few corners remain standing. Coordinates for the claim corners were calculated and tabulated, Data used in this work was random corners picked up on chain surveys and in some cases stadia. Coordinates for corners not located by actual survey were calculated from the mineral survey descriptions. In checking metes and bounds calculated from the coordinated against mineral surveys, as a rule, will show interior angles with an appreciable amount of difference.

The difference in actual areas is usually insignificant. In the summer of 1965 this writer made a thorough study and comparison of the claim corner coordinates in the Cleary-Chatanika, Pedro-Goldstream-Engineer and Ester-Gold Hill-Cripple areas. Discrepancies were found in coordinates for common corners, also metes and bounds calculated from coordinates of corners of claims intersecting a common boundary of an older claim invariably would not be a straight line. All of the metes and bounds for the claims in the areas mentioned were calculated from the given coordinates and adjustments were made to the coordinates to meet the requirements of common lines and common corners. Changes have not been made in the old coordinate books but when working with these areas revised coordinates can be found readily by referring to the "Index to Land Calculations".

4. The ground control for the coordinate grid as known to this writer is reviewed as follows.

a. Cleary, Chatanika, Goldstream, Gilmore and Engineer . An excellent control was established on each of these areas in the first years of Company operation. Long base lines were accurately measured, chains were kept calibrated to temperature changes, distances were checked and rechecked, stations were set by triangulation on both limits of the various creeks at strategic visible points, usually on the crest of a ridge extending to the valley floor. Well constructed wooden tripods with flat white horizontal boards to identify the station in large letters facing both up and down the creek were secured high on the legs. The fact that the majority of these tripods were placed as far back as 1928 and are still standing testifies to their construction. However, the legs are rotting off at ground level and most of them are now out of plumb and are not accurate as backsights, or as triangulation stations. These old tripods should be replaced as early as possible, as each year they are more difficult to locate and are in worse condition or gone. A tripod using the 1-1/4" thaw pipe was designed in 1964 and six sets made up in the shop. One was set up at Chatanika replacing the old 12 mile station below the camp area. The setup reaches high enough for the target to show above the normal growth of brush and trees on the slopes. A few exceptions will be found on south facing slopes where poplar has made substantial growths since the stations were installed.

The majority of these triangulation stations are located on hillsides and quite inaccessible for hauling material in. Some could be reached with a D-2 tractor. The weight of the material involved coupled with the rough terrain would make back packing to the various sites impractical. I suggest when the project can be undertaken, sufficient tripod packages be made up in advance and hauled to a strategic point on each creek. Then, with the services of a helicopter, each package could be delivered to the proper location without waste of time and effort. A ground crew could then follow up with transit and hand tools to complete the erection. The stations known to be in condition for locating and rehabilitation, by Creeks, follows

Chatanika and Cleary

On left Limit - Ruby, Gacy, Cora, Cora Bluff

Hill, A. C

On Right Limit - 12 Mile, Mon, Y, X, W

Goldstream Valley

On Left Limit - Gal, Loop, EFC, WFC, Alpha

On Right Limit - McPike, Gil, Tank, Field, Extra Mon,  
Bla, Sil, Sec

b. The ground control for the other mining areas in the Fairbanks District was established by chained surveys, bench marks established generally consisted of a pipe 3/4" to 1-1/4" in diameter, set in the ground with a pipe cap, center punched for point and labeled with a piece of galvanized sheeting, rolled on one end to fit the pipe and secured with stove bolts. These markers were stamped with appropriate description to identify the station, usually name or number of station elevation, and backsight to one or more stations.

These bench marks were never marked with tripods and are becoming quite difficult to use because of the extensive growth of brush and trees even if they can be located. Backsights are no longer visible from one station to the next, and many of the old U.S.G.S. triangulation stations in the respective areas which were frequently used for backsights are no longer visible. Many of these bench marks fell within the mining limits and were destroyed in operations. Most of the ones outside of the mining limits are still in place but usually require considerable ground search to locate. The bench marks which have been seen and/or used by the writer in the last years of dredge operation and since, are tabulated by creeks as follows.

Ester and GoldHill

BMs 1, 2, 22, 38 and 39

Gripple

BMs A, B, Dump, Layup, the latter two were triangulated from A and B (B is now submerged)

Sheep and Lower Goldstream

BMs 105 and 107

Dome

BM 12, 1/4 corners between Sec. 4 & 5, and 5 & 6 T2N, R1E, F.M

Little Eldorado - Not known

Pedro

BMs P, A2, A5, A10, A12, A13, A14, A15, A19 and A26

**Fairbanks**

EMs Birch (probably gone over bank now)  
Triangulation Station Fish

**Upper Fish**

EMs 11, 12, 17, 18, and 19  
Triangulation Station E

**Gilmore, Lower Pedro and Engineer**

These areas were in the triangulation system of Goldstream. The condition of any of the stations is not known with the exception of Alpha on Engineer Creek and Gil on Gilmore, tabulated under Goldstream Valley.

In addition to the stations tabulated I am confident many more could be located by ground search should they be required.

**5. Conclusions**

a. Acreage sold in parcels of, or entire mining claims must be described in terms to conform to the original mineral survey thereof. Description to meet the requirement has been written, indexed and bound in a loose leaf folder labeled "Land Descriptions", for all parcels of land marked off for sale to date. These parcels lie in the Goldstream Valley, Lower Pedro and Lower Gilmore Creeks, Gold Hill and the Left Limit of Ester Creek.

b. Sub-division and area calculations have been made for each parcel from the mineral survey plats thereof, and all calculation books labeled and indexed in the folder labeled "Index to Land Calculation Books". Cloth prints were made of the 200 scale operation maps of each area and the metes and bounds and area of each parcel inked thereon, together with the book and page no. where the calculation was made.


c. Sub-division calculations have been made for the same parcels to conform to the coordinate data for ground survey location in those areas where insufficient mineral survey ground control exists. Cloth prints were made of the same 200 scale maps and the metes and bounds to conform to the coordinate grid inked thereon together with the book and page no. where the calculation was made.

d. Ground locations can best be made in the Goldstream Valley area from the coordinate datum, and in the Gold Hill and Left Limit of Ester Creek area from the mineral survey datum.

e. Ground location control for the areas outside of the areas mentioned can best be determined at the time they are marked for sub-division and sale. At the present time it appears the Chatanika and

Clear area could be located better from the coordinate grid, and the remaining creek claims from the mineral survey datum. A ground search for control would be in order, namely land monuments and corner posts for mineral survey control versus coordinated bench marks and coordinated B.L.M. monuments for coordinate control.

f. A supply of approximately 300 surplus brass caps was obtained from the local U.S.G.S. office in 1964. The practice since that time has been to use them for monuments at all claim corners re-established, with 3/4 inch pipe being used as markers for intermediate corners on divided claims. The supply of brass caps on hand will not last through the 1966 season. The original source of supply was depleted as we acquired their stock on hand when they changed from brass to aluminum markers as a weight factor because most of their work now is done from helicopters. An estimate of 500 more will be required to mark the corners of the land marked for sale to date, based on usage as outlined above, with an additional 250 if used on intermediate corners.

  
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Original to Index to Land Calculations folder

cc:JDC  
WAG  
DE  
RJP