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Statement of Qualification

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Map No. 1

Location Map

1" = 4 mi.

Map No. 2

Mess Creek Group Geology

1" = 500'.

1046/2w

Department of  
Mines and Petroleum Resources  
ASSESSMENT REPORT

NO. 590 MAP.....

23 December 1964

GEOLOGICAL REPORT

on

MINERAL CLAIMS BIK 161 - 196, INCLUSIVE

57° 130° S.W.

INTRODUCTION

A program of preliminary geologic mapping was carried out on the Mess Creek Group (BIK 161-196 M.C. incl.) as part of a "Scud Venture" arrangement with Silver Standard Mines Limited. Object of the work was to appraise the mineral occurrences on the property and to determine the local geologic setting. This report describes the fieldwork and the results of the program.

LOCATION AND ACCESS

The property lies between elevations of 3500' and 7000' at the headwaters of Cap Creek, a strong, glacier-fed tributary of Mess Creek, some 28 air miles in an easterly direction from the confluence of Anuk and Stikine Rivers in northwestern British Columbia. The junction of these rivers is 70 flying miles up-river from Wrangell, Alaska, and Wrangell in turn is 180 flying miles northwest along the coast from Prince Rupert, B.C. Both Wrangell and Prince Rupert are supply centers for the area. Telegraph Creek, B.C., a small community lying 49 miles north of the property is accessible at times by poor road from the north. The connecting link of the Stewart-Cassiar road, now mired deep in politics, will someday pass along Iskut River Valley some 30 miles to the east of the claims. Map 1 (frontpiece) which is a portion of the Telegraph Creek sheet gives a more detailed location picture and shows the relationship of other Scud Venture projects.

Present access to the area is by chartered float aircraft from either of the supply centers to the mouth of the Anuk River which is presently the supply depot of Midwest Diamond Drilling Company. Access from the Anuk to the claims is by

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helicopter. In the summer freight can be shipped into the district by shallow draught river boat and barge which ascend the Stikine River as far as Telegraph Creek. In winter, flat gravel bars on Mess Creek provide good landing sites for ski equipped aircraft.

#### PROPERTY AND HISTORY

The property consists of 36 mineral claims, BIK 161 to 196 inclusive, which are called the Mess Creek Group. These claims were staked on February 27, 1964, by A.R.C. Potter, agent for Silver Standard Mines Ltd., from a single location line along the upper reaches of Cap Creek Valley. All of the claims except those 12 adjoining the location line were staked by witness post. Five of the seven posts were found and plotted on Map 2, attached, to give an approximate picture of the lay of the claims. Two large gaps in the coverage are evident, and others are possible.

The property lies largely above timber line, but a portion of Cap Creek Valley on the eastern edge of the claims supports a stand of timber which is fringed by growths of willow and stunted conifer. Otherwise, the mountain slopes are quite clear and outcrops are abundant. The actual bed of Cap Creek is a flat gravel flood plain with a grade of about 4½%. Off the map area to the east, the creek passes through a narrow, rock-walled gorge before spilling out on to the flat valley of Mess Creek. Immediately to the west lies the broad expanse of Hickman snowfield.

Copper showings on the ground were reported several years ago by prospectors doing regional work for BIK Syndicate (Silver Standard, McIntyre Porcupine, Kerr Addison) but no follow-up work was done at that time. The ground was staked as an exploration bet in 1964 following rumours of important mineral developments 18 miles to the west on Galore Creek. In the course of work during 1964 several additional occurrences of copper minerals were found on the property and in the vicinity.

#### PERSONNEL AND PROGRAM

The field party consisted of C.A.R. Lamale, geologist,

and R.E. Hague, student-assistant, both of Asarco; and A.R.C. Potter, prospector, and Bud Thompson, assistant prospector, both of Silver Standard. All the work was carried on out of fly-camp on Cap Creek with frequent helicopter service from Scud Venture's base camp on the East Fork of Galore Creek.

Lammle and Hague spent 8 days (Aug. 14-21) on the property, one of which was lost due to heavy rain. During this time the known showing was closely examined, and the property was mapped on a preliminary scale. Control for the mapping was 1" to 500' topographic maps with 50' contours prepared by V. Zay Smith Associates from available government photography. Elevations in the field were determined by pocket aneroid barometer.

Potter and Thompson, the two prospectors, camped a total of 18 days (Aug. 13 - Sept. 1) on the property during which time they prospected on and for some distance around the claims.

#### REGIONAL GEOLOGY

The regional geology of the district has been described elsewhere and no more than background remarks are required here. In gross aspects the geology can be thought of as a very large pendant-like mass of deformed and faulted Paleozoic-Mesozoic rocks set into the eastern flank of the Coast Intrusions. The older rocks are pre-Permian in age and consist of buff coloured limestone, phyllite, slate, argillite and related rocks. Overlying is the distinctive Permian assemblage of quite pure, white limestone which contains minor amounts of chert, argillite and slate. Overlying the Permian, in turn, is the Triassic which consists of flow breccias, basalts and tuffs with some related sediments. In places Jurassic sediments unconformably overlie the Triassic rocks. All of the above rock units have been disrupted and intruded during several periods of tectonic activity. Cenozoic volcanic rocks overlie large areas to the east.

The claim group lies near the northeast corner of this pendant-like mass of rock where a large arm of the older rock extends northerly along Schaft and Mess Creeks. In this arm the older rocks consist of badly disrupted and complexly associated blocks of volcanic, sedimentary, metamorphic and

intrusive rock ranging in age from the pre-Permian to the Jurassic. The Coast Intrusions are exposed a couple of miles to the west of the property where they form the Mt. Hickman massif, and also a few miles to the east where they form part of Tahltan Highland. On the highland the granitic rocks are partially covered by Cenozoic volcanics.

#### LOCAL GEOLOGY

On the Mess Creek Group (c.f. Map 2), a sill-like granitic mass separates pre-Permian metamorphic rock on the south-east from a thick assemblage of Triassic volcanics on the north-west. Conglomerates and sandstones of Jurassic age unconformably overlie the volcanics on the western part of the property. Small dykes of various types cut all of the above rocks.

The pre-Permian and Triassic rocks strike northeasterly and dip at angles in the order of 60° or so to the northwest, the "sill" being more or less concordant. The Jurassic rocks strike northwest and dip 25-30° to the southwest. The volcanics on the north part of the property are cut by a spray of faults on which the relative movement was left handed.

Portions of all of the Triassic volcanic rocks, particularly on the steep slopes west and north from the property, have suffered considerable degrees of alteration due to ancient weathering. Where this weathering is strongest, irregular patches and veins of carbonate minerals, and a little quartz, have developed. Elsewhere, it has imparted a distinctive dull, hematite red to many of the outcrops. At lower elevations, the volcanics are quite fresh but contain small amounts of epidote, chlorite and pyrite alterations.

Small amounts of copper minerals can be found here and there in most of the rocks. The original showing is on BIK 194 and consists of argentiferous tetrahedrite. Several additional occurrences consisting mostly of small amounts and specks of chalcopyrite were found.

The local geology is discussed in more detail under the appropriate subheading below:

## Lithology

### Pre-Permian Rocks

These metamorphic rocks are subdivided into four units - phyllite, greywacke and andesite, limestone, and chert -- which can be correlated with those described on the "Operation Stikine" map (G.S.C. Map 9, 1957) where they are assigned a pre-Middle Permian age.

The phyllites are finely foliated, crumpled, green to gray, chlorite and micaceous rocks which weather to rounded outcrops.

The unit of greywacke and andesite consists of dark gray, green, and dull purple rocks with textures varying from sub-schistose to massive. Much of the rock has a general sheared character.

The limestone unit is distinctive because of the geothite - colour of its weathered surface. The fresh surface is light gray, however, and finely crystalline as a rule. The unit contains thin layers of nearly translucent quartz and small streaks of limonite and, in places, an abundance of silicified rugose corals and bryozoa which are well preserved and may be of stratigraphic value. On BIK 194 the rock is quite massive but there is a slight suggestion of bedding in the form of layers of quartz and silicified fossiliferous material. To the south of BIK 184 the rock is more distinctly bedded, containing some thin beds of greywacke. A bed 15' thick of similar limestone outcrops on BIK 196.

A small outcrop of thin bedded chert with a little pyritic argillite occurs at the toe of a small glacier on BIK 194.

### Triassic Rocks

These volcanic rocks have been tentatively grouped with the Triassic because of their lithology. They have been subdivided into three units -- massive andesites, porphyritic basalts, and flow breccias and tuffs.

The andesites are dense dark green to dark gray rocks which are porphyritic and/or trachytic in places due to phenocrysts of hornblende. The rock generally carries a small amount of fine authigenic pyrite. Epidote, hematite and chlorite also occur in very small amounts.

The porphyritic basalts are hard, black to purple rocks composed of altered, green, plagioclase (20%) and stubby black augite (15%) set in a dense, dark matrix. They contain a small proportion of magnetite as indicated by a pencil magnet.

The flow breccias and tuffs are gray, green and red fragmental rocks with an overall andesitic composition. The amounts and sizes of the fragments vary greatly over short distances, but they are comparable in composition to the fine grained feldspathic matrix. The fragments are largest on the south side of the Cap Glacier, having maximum dimensions of about 12", and constituting an unusual high percentage of the rock, perhaps 80%. On the mountain to the north, however, the fragments become smaller and decrease in number to the point where, in some tuffaceous horizons, no fragments can be detected at all.

### Jurassic Rocks

The very steep slopes near the western part of the property are composed of conglomerate and sandstone which unconformably overlie the previously described unit. These rocks have been dated as Lower to Middle Jurassic by the G.S.C. and they can

be best correlated with rocks of Unit 11 on the "Operation Stikine" map.

The conglomerate consists of a large amount of dull red, weathered boulders and cobbles of Triassic volcanic rock, and of smaller amounts of gray granitic rock, all weakly cemented in a brown, sandy matrix. Above the conglomerate is a sequence of thick bedded, brown calcareous sandstone and alternating thin beds of sandstone and shale. The sandstones contain conspicuous amounts of carbonized wood remains.

#### Intrusive Rocks

The sill-like mass of granitic rock separating the Triassic and pre-Permian is an intrusive complex of several different rock types. These have been subdivided into diorite, syenite and aplite, but the relationships and differences in the types is more complex than this simple subdivision suggests. The sill is undoubtedly continuous with intrusive rock (mapped by the G.S.C.) to the northeast, and to the southwest as well, and with these extensions its length would be greater than 5 miles, its average width about 1/2 mile.

The dioritic phase forming the bulk of the intrusive unit has several compositional and textural variations. An outcrop in a stream bed east of the claims consists of a fresh, light gray medium grained, hornblende diorite, the hornblende accounting for about 10% of the volume. Larger outcrops forming steep bluffs on BIK 186 consist of fresh, fine grained hornblende-augite diorite, the mafic minerals making about 50% of the rock. The large outcrop southwards up to the mountain on BIK 188 is a closely fractured, chloritized and epidotized, metamorphosed diorite. On the ridge further to the south are fresh diorites in which hornblende makes up about 30% of the rock. Vague leuco-dioritic dykes were noted on the mountain side north of Cap Creek.



The western portion of the intrusive unit consists of an altered, reddish brown syenite with an arkosic appearance. This rock deteriorates to a granular feldspathic soil. Its contacts are not well exposed and its age relationship with the diorites is not clear.

The youngest of the intrusive rocks are irregular masses and dykes of a fresh, pale orange aplite composed largely of orthoclase with very little quartz, plagioclase or mafic minerals. This rock might be correlated with the alaskites described in the descriptive notes of the "Operation Stikine" sheet.

#### Dykes

In addition to the aplitic dykes described above, two other more mafic types occur. These are lamprophyres and porphyritic andesite, the lamprophyres occurring near the granitic rocks, and the porphyritic andesites in the volcanics. The lamprophyres are dark gray, chilled dykes with widths from 10 to 20'. About 15% of the rock consists of small hornblende phenocrysts set in a felted matrix of feldspar and more hornblende with an occasional grain of magnetite and specularite. The porphyritic andesite dykes are soft, light gray, feldspathic rocks with fine grained to porphyritic textures. One such dyke, a very soft and unusually persistent one, consists of glomeroporphyritic aggregates of pink orthoclase set in a fine grained, "salt and pepper" matrix. It strikes north-south and dips at about 10° to the west, and maintains a remarkably uniform width of about 10' for a strike length of nearly 2 miles, or perhaps further, for both ends are covered by snow. A similar gently dipping, but more porphyritic and somewhat cleaved dyke occurs on the ridge north of BIK 185 where it clearly "caps" the volcanics. A similar rock occurs in a corresponding position on BIK 190.

### Structure

The principal structure on the property is the northeast trending intrusive rock. The deflection in the traces of its contacts as they cross topographic features, and the corresponding trends for some distance in the enclosing rocks strongly suggest a sill-like form for the rock. Locally on the Mess Creek Group, a single attitude in ribbon cherts, and the apparent planimetric deflection support this interpretation. The dip of the sill would be about 50-60° to the west, and the strike is NNE, which parallels the contact of the Mt. Hickman pluton, and which when projected to the north, passes down into and along Mess Creek Valley. One might conclude that the sill-like intrusive occurs along an unconformable contact between pre-Permian and Triassic rock, or alternatively, one might speculate that it occupies an ancient faulted contact between these two rock units.

A structural feature of equal importance is the angular unconformity between the Triassic and Jurassic rocks. The main unconformity is interpreted to lie between the NW striking conglomerates (thought to be basal conglomerates of the Jurassic) and the NE striking andesites and basalts. The actual surface of the unconformity is obscured by rubble and the underlying rocks are extremely weathered and decomposed. Higher up on the inaccessible cliffs is a small but clearly defined erosional surface which separates the conglomerates and sandstones. The relief on this surface is about 100' and its strike is roughly parallel to the trend of the sandstones and conglomerates. Hence, it is interpreted as being a local, paraconformity in the Jurassic.

Faulting on the property is of secondary importance. North of Cap Creek a system of north-westerly faults gives apparent left-handed displacement to the volcanics. These faults dip about 60° to the north. A steep, northeasterly system in the

same area is probably related. At the northwest corner of BIK 167, a granitic dyke is emplaced along one of the faults. Elsewhere the markings along the faults are crushed zones, pyritic alteration, and light coloured carbonate alteration.

The diverse and conflicting trends in the foliation of the metamorphic rocks is evidence of their complex deformation. Locally, weak joint systems have allowed strong carbonate alteration.

### Mineralization

Small amounts of copper minerals can be found here and there in most of the rock types on the property, and in addition with a little searching, copper bearing float can be found in the drift and alluvium along the valley floor.

The principal and original showing is near the center of a large, conspicuous outcrop of silicified, fossiliferous limestone on BIK 194. Here thin sheets and irregular nodular blebs up to 4" in maximum dimension (though usually much smaller) of a soft massive charcoal gray, malachite stained mineral -- probably tetrahedrite -- is associated irregularly with translucent quartz along a very weak system of flat joints in the limestone. A few specks of these same minerals occur along a vertical, northeasterly fracture at the northern part of the outcrop. Also, a few irregular 1/4" chunks or fragments of the mineral occur along the well exposed eastern face of the outcrop where there is a vague suggestion of bedding. There is no suggestion that the weak mineralization is related to the bedding, however, nor is there any suggestion that the mineralization improves or persists with depth. A small specimen had been selected from a piece of float near this outcrop and assayed for mineralogical purposes prior to this examination. The results were: Au- Tr, Ag - 23.9 oz/ton, Cu - 13.0%, Zn- 2.8%, and Pb - 0.2%.

The next best showing observed near the ground occurs in carbonatized and silicified basalts

near 10.3 E, 14.8 N of the arbitrary reference grid (coordinates given in thousands of feet). Here weak chalcopryite over an area of 10' by 30' is associated with brown weathering carbonate minerals in the weathered basalt. A 5' chip sample of the best mineralization assayed traces in gold and silver, and 0.66% in copper. About 500' south of this location traces of malachite were found in similarly altered rock near a diorite dyke. Several other areas of this alteration were noted and are described in more detail below. Mineralization in them, however, is the exception rather than the rule.

West of the property near 4.0 E, 8.5 N, a porous bed of carbonate material in gently dipping bedded rocks bears a little chalcopryite, and from this showing a 5' chip sample (true width about 3') of the best mineralization yielded traces in gold and silver, and 0.30% in copper. A hundred feet north of the sample site two 6" streaks of malachite in conglomerate were observed running a short distance (15' - 20'?) down the face of the cliff.

On and a little east from BIK 175, a little tetrahedrite (?) and chalcopryite occur in a carbonatized fracture zone in massive andesite. Here several coalescing, easterly fractures have localized stringers and veins of carbonate-quartz material with which the copper minerals are associated. The maximum width of fracture zone was 2' and it could be traced over covered intervals for 300'. It was not deemed worthy of sampling. (This showing is exaggerated on the map.) A similar but negligible occurrence was found to the south on BIK 176. Although several other veins of carbonate-quartz rock were found, only a few had copper minerals associated.

Several other occurrences are of only academic interest but their description serves to show their rock and mineral associations. At 6.6 E, 15.0 N, a few specimens containing specks and small wiry barbs of native copper occur in a 6" seam of epidote-quartz rock filling a fracture in tuffs. On

BIK 188, along the western edge of the large outcrop of meta-diorite, two spots showing chalcopyrite associated with chlorite and epidote were noted. Also, on this claim several specks of chalcopyrite were found in fresh aplite cutting the diorite, and a few more specks were found in the same rock at 15.4 E, 12.4 N, and at 11.3 E, 5.4 N. Traces of chalcopyrite occur near a diorite dyke cutting andesite on BIK 193. The prospectors discovered on BIK 196 several specimens of limestone containing a few 1/4" sized aggregates of black sphalerite.

Among the boulder gravels of the valley floor is a small number of sub-rounded volcanic float containing seams of carbonate - quartz material which, exceptionally, bears a little chalcopyrite, and at times a little sphalerite and galena. About an equal number of rusty cobbles, when broken open, show pyritized, granitic textured rock. The float are slightly more numerous along the South Fork of Cap Creek than along the main stream. Perhaps the area of most abundant float is southeast of the forks directly downstope from a showing, but no where does this float occur in sufficient amounts, and no where does it bear enough copper to suggest the presence of any large scale, economic concentrations.

On the Mess Creek Group the source of the sulphides associated with the intrusive rock are the intrusive rocks themselves. The mineralization associated with carbonate-quartz alteration is believed to have been derived by weathering and leaching from the Triassic volcanics, and to have been laterally transported near an old erosional surface (described below) until deposited in favourable places along with other products of weathering.

#### Alteration

The strongest and widest spread type of alteration on the property is carbonatization which affects Triassic volcanic rocks principally,

particularly near the unconformable contact with the Jurassic sediments. The massive andesites on and between BIK 175 and BIK 185, especially at the higher elevations, are extensively altered to buff weathering carbonate minerals with some quartz. Some fractures have been filled, or have allowed complete replacement, by veins of these minerals, and some of these as mentioned earlier, contain some tetrahedrite and/or chalcopyrite. At the lower elevations the andesites are hard and fresh and the original textures are clear.

The porphyritic basalts near the unconformity are reduced to a dull red crumbly soil and vestiges of the original texture can be found only in portions of the outcrop. Veins of the carbonate-quartz rock are common. On BIK 173 large outcrops of the same rock are fresh and black, and only the plagioclase phenocrysts are slightly altered, but further up the hill to the north they are extensively weathered. On the ridge, the overlying capping of porphyritic andesite on the ridge is unaffected.

Flow breccias along the toe of Cap Glacier are weathered dull red. Tuffaceous (?) rocks near BIK 161 are extensively altered to a granular carbonate-quartz rock, but a short distance to the north at the 5300' contour, these rocks are unaffected.

From the distribution of these extensively weathered areas it would seem that a trough of Jurassic rocks, which trended northeasterly (parallel to the Triassic) and which plunged to the southwest, has been eroded through by Cap Creek to expose the heavily weathered Triassic rocks. Presumably the fresh volcanic outcrop at the lower elevations were deep enough below the old erosional surface to escape the weathering.

RECONNAISSANCE STREAM SEDIMENTS

Twenty-four sediment samples were taken from the Mess Creek property during the course of Scud Venture's reconnaissance stream sediment survey. The analyses and locations of these samples are shown on Map 2. No important mineralization is indicated on the property.

The average copper concentration is low (43 p.p.m.) and compares closely with the regional background (45 p.p.m.). One sample taken near a showing showed 200 p.p.m. in copper. A higher average concentration was anticipated because of the showings and mineralized float. The lower amounts are probably due, in part, to the limy environment which would reduce the geochemical mobility of the metal.

None of the zinc analyses were anomalous. The average concentration of 16 p.p.m. compares with the regional background of 17 p.p.m..

Five samples showed a content of lead, and one of these was anomalous. These reflect small amount of galena which was found in float.

Five samples showed anomalous molybdenum. Two of these were apparently associated with copper. Three others came from an area underlain by granitic rock. No molybdenum mineralization is known on the property.

One sample showed nickel, and another cobalt, but neither metal can be readily accounted for.

Respectfully submitted,

*Chas. A. R. Lammle*

Chas. A.R. Lammle.

CARL: sm

12 February 1965

**TO ACCOMPANY**            **Geological Report on Mineral Claims**  
                                 **BIK 161 to BIK 196 inclusive, herein**  
**called the Mess Creek Group, Liard Mining Division,**  
**British Columbia.**

**By:            Charles A.R. Lammle**  
**Dated:       23 December 1965**

**QUALIFICATIONS OF AUTHOR**

Charles A.R. Lammle is a graduate of the University of British Columbia (B.A.Sc. in Geological Engineering, 1962) and has been employed by the Vancouver Exploration Office of American Smelting and Refining for the past thirty-three months.

*Keith Whiting*  
\_\_\_\_\_  
**Keith Whiting, P. Eng.**  
**(B.C. Reg. No. 4284)**  
**Supervisor.**





EVIDENCE OF EXPENDITURES INCURRED

SALARIES

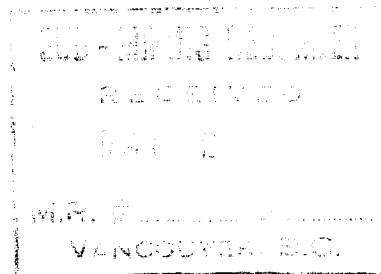
C.A.R. Lammie	8 days @ \$525.00/Mo.	\$ 140.00
R.E. Hague	8 days @ \$425.00/Mo.	113.00
P.I. Conley	2 days @ \$ 35.00/day	70.00
W. Dunn	2 days @ \$ 35.00/day	70.00

TOTAL SALARIES \$ 393.00

LIVING EXPENSES 177.00

HELICOPTER 11 hrs. @ \$130.00/hr 1,430.00

TOTAL EXPENDITURES \$ 2,000.00



Declared before me at the

city of Vancouver in the  
province of British Columbia,

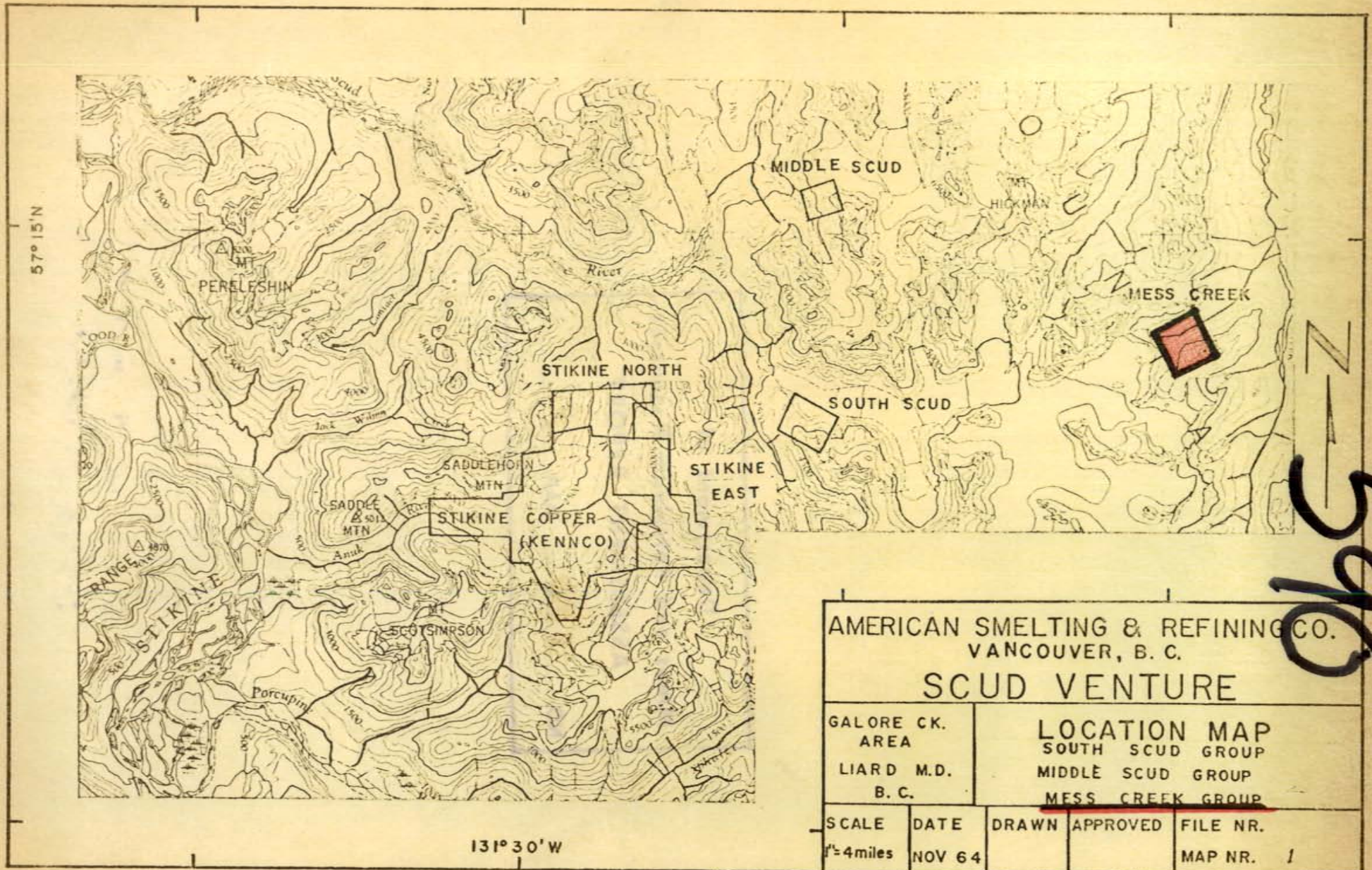
this 2nd of March, A.D.

1965

*Graeme T. McKee*

*W. St. C. Dunn*

W. St.C. Dunn



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AMERICAN SMELTING & REFINING CO.  
VANCOUVER, B. C.  
**SCUD VENTURE**

GALORE CK. AREA	<b>LOCATION MAP</b>
LIARD M.D. B. C.	SOUTH SCUD GROUP
	MIDDLE SCUD GROUP
	<u>MESS CREEK GROUP</u>

SCALE	DATE	DRAWN	APPROVED	FILE NR.
1" = 4 miles	NOV 64			MAP NR. 1