3287

GEOLOGICAL SURVEY

ACE CLAIM GROUP

situated
ninety-three miles southeast of Golden
in the
Golden Mining Division

50° 116° S.E.
N.T.S. 82K/1

Report by:	D. E. Mackenzie
Supervised by:	R. G. Gifford, P. Eng.
Work by:	Texas Gulf Sulphur Company
Field Work:	July 4 - July 31, 1971

August 26, 1971 Vancouver, B.C.

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APPENDIX - Statement of Expenditure, 1971
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ACCOMPANYING MAPS

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2	Figure 2	General Geology, 1" = 500 feet	in pocket
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PERSONNEL

The following list gives the category and time distribution for personnel employed in the Ace field programme during the period July 4 - 31, 1971:

Supervision	R. G. Gifford	5 days
Geologist	D. E. MacKenzie	22 days
Assistant	R. J. Berdusco	22 days
Assistant	J. R. Plommer	6 days
Assistant	T. C. R. Edwards	6 days

PROPERTY and OWNERSHIP

The property totals 36 claims, named Ace. All the claims were recorded August 26, 1970. All are wholly owned by Texas Gulf Sulphur Company.

LOCATION and ACCESS

The Ace claim group is in the Golden Mining Division at latitude 50°02', longitude 116°12' and N.T.S. 82K/1; Figure 1. The elevation on the property ranges from 6,000 feet in the Doctor Creek valley to 9,000 feet on the ridge tops. Doctor Creek flows centrally through the property and Echo Lake lies adjacent to the southern boundary. Water resources are plentiful. Timber is limited to the valley floor area.

Major air, rail and trucking services as well as natural gas and hydroelectric power are available 60 miles to the south at Cranbrook which, with a population of 12,000, is the principal supply centre.

Access to the prospect is gained by 25 miles of gravel road from Highway 95 near the community of Canal Flats.

GEOLOGICAL SURVEY

ACE CLAIM GROUP

Golden Mining Division, 50° 116° S.E.

INTRODUCTION

The Ace mineral claims were staked in 1970 to cover a base-metal prospect in southeastern British Columbia. The property covers the geologic possibility of massive sulphide mineralization contained in clastic rocks of Precambrian age.

This report details the results of a geological survey that was undertaken on the claim group to assist in evaluating the economic potential of the prospect. The work was carried out by Texas Gulf Sulphur Company in the period from July 4 to July 31, 1971.

The survey was conducted by Mr. D. E. MacKenzie under the supervision of Mr. R. G. Gifford, P. Eng.

PHYSICAL FEATURES

The property lies on the eastern flanks of the rugged Purcell Mountains. The dominant land form in the claim area is a valley with an elevation of approximately 6,000 feet at its lower end and 7,600 feet at its head. The average annual precipitation is 30 inches.

Cirques, hanging valleys, tarn lakes and sharp, well defined continuous ridges characterize the margins of the property. Doctor Creek drains the valley portion of the claim area. It is a relatively straight and fast flowing stream. Five tarn lakes ranging in length from 300 feet to 2,000 feet are present on or adjacent to the property boundary. These lakes are generally oval in shape and shallow in depth.

A distinct contrast in the visual form of the rock type is readily apparent. The Moyie intrusions appear to be very massive and sheet-like in appearance while the sediments are well defined and uniform in their appearance.

GEOLOGY

General Statement

Geological mapping of the 36 claim property was done on topographic base maps and photo mosaics at a scale of 1" = 500'; Figure 2. The maps and mosaics were compiled from vertical air photographs, specially prepared for the Ace property by McElhanney Surveying and Engineering Limited, Vancouver, B.C.; Figures 3, 4.

Outcrop is abundant on the northernmost, southernmost and westernmost parts of the claim group. The average depth of overburden

in the covered areas, is estimated at one to twenty feet as seen at several points in stream gulleys. Bedrock is exposed on about sixty percent of the surface area of the property.

The general geology of the 36 claim property consists of gently dipping Proterozoic sediments and generally conformable intrusive bodies. The structural pattern is relatively simple although localized areas exhibit evidence of tectonic deformation. Folding and tilting have been the main types of deformation that have occurred in the area. One unconformity was observed.

The structural orientation of the various sedimentary units on the property appear to be genetically and spatially related to the gross structural picture of the surrounding area. Upon inspection of the Findlay Creek map, Geological Survey of Canada, it can be seen that a series of parallel anticlines and synclines trend in a northwest direction in the area west and north of the property. The trend of anticlinal traces on the property conforms with this regional picture. The average strike of the sedimentary beds is 060^{o} with a dip of 25^{o} to the northwest.

The presence of the acidic White Creek Batholith on the northeast boundary of the claim area does not appear to have greatly affected either the structural or compositional character of the adjacent Proterozoic sediments.

The rocks of the area have been subjected to low grade regional dymamothermal metamorphism.

LAYERED ROCKS

Sedimentary rocks of the Lower and Middle Division of the Aldridge Formation are evident in the claim area. The presence of basic rocks of the Moyie Intrusive phase indicates that igneous activity

has occurred.

No evidence of the stratigraphically younger sediments of the Creston, Kitchener and Siyeh Formations was found.

Both the Lower and Middle Divisions are composed of conformable interbedded clastic rock units that vary in true thickness from less than a foot to six feet. They are Proterozoic in age and their subdivision is based solely on lithology. The existence of a conglomerate bed near the top of the Lower Division has been used as field criteria for separating the two divisions. The lithologic character of the conglomerate and the laminated sediments was investigated at two sites by short-hole, small-diameter diamond drilling.

Rocks of the Lower Division include rusty weathering quartzites, silt-stones, argillites and a conglomerate unit. Sporadic outcropping of this division are present in the southern regions of the property. These rocks, with the exception of the conglomerate unit are fine-grained and are generally well sorted. Distinct laminations are characteristic of the argillites and quartzites in this division. A phyllitic sheen or schistosity is frequently present in the more carbonaceous rocks of the Lower Division. Occasionally shallow water structures such as mudcracks and ripplemarks can be seen.

The conglomerate unit can be recognized by its massive form and rusty-brown weathering nature. The siltite and argillite clasts are subangular to subrounded in shape and generally range from 2mm to 10 mm in length. The matrix is an argillaceous material which can easily be scratched with a penknife. The true thickness of the

unit could not be determined. The density and size of the clasts vary from outcrop to outcrop. Minor metacrysts of pyrite, pyrrhotite and magnetite are present.

Rocks of the Middle Division include buff-grey weathering quartzites, siltstones and argillites. Extensive outcroppings of this division are present in the northern and western regions of the property. Narrow-spaced bedding planes and pervassive laminations characterize rocks of this division. Limonitic and sericitic alteration is evident, Quartz veins transecting bedding are frequently seen. Minor metacrypts of pyrite, pyrrhotite, magnetite and occasionally hematite are present.

Conformable contacts are evident in both divisions of the Aldridge. Beds of quartzite are seen to lie conformably on siltstone beds which in turn lie conformably on argillite beds. This parallel and unbroken order of the strata indicates that no disturbance or denudation occurred while deposition was going on.

A gradational contact is present between the Lower and Middle Adridge Divisions in the western region of the property. The transitional distance is approximately 600 feet. The main diagnostic variation across the transition zone is colour. The Lower Aldridge section has a very distinct rusty weathering while the upper portion has a buff-grey weathering.

INTRUSIVE ROCKS

Igneous activity has occurred in the form of an acidic batholith and as meta-diorite intrusions. Intrusive dykes and sills occur in both divisions of the Aldridge. Extensive intrusive outcropping of meta-diorite is evident in the southern and western portion of the claim area.

The meta-diorite intrusions that occur as sills were injected into Lower and Middle Aldridge Strata. Their contacts with the sediments are conformable with the bedding. The majority of the meta-diorites appear to be sill-like in nature. Two very small dykes are present along the ridge that delineates the northern margin of the claim group.

The individual sill thicknesses range from approximately 20 - 80 feet on the northern property margin to hundreds of feet on the southern margin. The meta-diorite exposed in gulleys on the northern boundary appears to extend the length of the property and has a dip conformable with the adjacent sediments. The massive, individual, meta-diorite outcropping in the southern and western regions appear to be genetically and spatially related. That is, they comprised the same sill before tectonic and erosional effects occured. These intrusives disappear beneath the overburden of the valley floor.

The composition and texture of the sills is generally uniform, the compositional mode being: plagioclase 50%, hornblende 48%, muscovite 1% and opaques 1%. The texture varies between fine and medium grained panidiomorphic crystals. It appears as though most of the original pyroxene has been replaced by hornblende. The composition of the small dykes varies considerably from that of the sills. The meta-diorite dykes are vesicular and rich in biotite, possibly a result of a chemical reaction with the surrounding sediments.

The magnetic susceptibility of the meta-diorites varies considerably. The magnetite in the meta-diorites occurs in disseminated form and also as veins along hairline fractures. The magnetic susceptibility of disseminated magnetite varies from being non-existent

to slightly weak and moderate. The susceptibility of the veined magnetite is positive. Magnetite in disseminated form is considerably more prevalent than the vein type.

The meta-diorite has been subjected to low grade metamorphism. Field evidence supporting this is the fine to medium grained nature of the rock and the preferred orientation of the hornblende crystals. No sign of epidote veining was seen along fractures in the meta-diorite. However, some chlorite and quartz veining was observed.

The White Creek Batholith is present in the area adjacent to the southeastern corner of the claim area. In the vicinity of the claims the batholith has a hornblende-biotite granodiorite composition. The rock is very coarse grained and porphyritic in texture. The White Creek Batholith is of probable Mesozoic or Cenozic age.

STRUCTURE

Deformation in the northern and western regions of the Ace property has been minimal. Northeasterly striking strata with shallow dips to the northwest are characteristic of this area. Structural interpretation of the southern region of the claim area is difficult because of the existence of thick massive outcroppings of dioritic sill material. However, minor folds trending northwesterly and plunging gently in the same direction can be seen in the sediments to the southeast of Echo Lake. These folds appear to be nearly symmetrical with gently dipping limbs. Further evidence for folding in this region can be attributed to the attitudes of exposed Aldridge sediments. Also the presence of small drag folds suggest folding on a larger scale. It appears as though a series of parallel anticlines and synclines trending

northwesterly occur through this area. These anticlines and synclines do not appear to be strongly reflected in the strata directly north, that is, across the valley. However, warping and cremulation effects can be seen in this area. No evidence of isoclinal or multiple phase folding was seen.

Faulting was not evidenced on the property.

Fracturing varies from being minor to prominent in different regions of the claim area. One fracture lineation that is prevalent throughout the length of the ridge paralleling the northern boundary has a strike of 055^{o} and a dip of 60^{o} to the southeast.

Secondary foliation is present in the form of cleavage and schistosity. Fracture clearage is evident in the competent quartzite beds of both the Lower and Middle Aldridge Divisions. This type of fracturing is probably related to regional tectonism.

Although fracturing is prevalent throughout the property it appears to have little significance. The amount of fracturing does not have any effect on the degree of mineralization. It is secondary in that it generally reflects an adjustment to stresses generated by tectonism.

ALTERATION

Regional dynamothermal metamorphism has affected both the sedimentary and meta-diorite intrusive rock types in the claim area. The region has been subjected to low temperatures and intermediate pressures of deformation, probably in the Lower Greenschist Facies (quartz-albite-muscovite-chlorite subfacies).

Recrystalization is pervassive with the development of sericite, chlorite and muscovite from clastic clay material. The

abundant sericite present has given a phyllitic or schistose sheen to the metamorphosed orgillaceous rocks. Granulated phyllities were observed on the western limits of the property.

A metamorphic aureole in the sediments immediately adjacent to the White Creek Batholith margin is probably present although it was not observed in the field. Granulated phyllites and phyllitic quartzites might suggest contact metamorphism. An absence of schists and hornfels were noted in the field.

MINERALIZATION

Evidence of copper-zinc mineralization was found in both the sedimentary and the meta-diorite rock types present in the claim area. Mineralization is minor and of no apparent economic importance.

Mineralization occurs in the Lower and Middle Aldridge Divisions in disseminated and vein form. Minerals occuring in disseminated form are: pyrite, pyrrhotite, magnetite and hematite. Minerals present in vein form are: pyrite, pyrrhotite, chalcopyrite, magnetite, goethite and sphalerite. Minor amounts of pyrite, pyrrhotite, magnetite, goethite, sphalerite and chalcopyrite occur in both disseminated and vein form in the meta-diorites.

An old pit, on a dip slope near the western margin of the property was examined. It was worked by an unknown party or parties a number of years ago. No appreciable amount of mineralization was seen. The pit is in overburden and can be easily spotted by the rusty colour of its talus.

It is approximately 15 feet in length and 8 feet in width. No bedrock is associated with the pit. Minor amounts of arsenopyrite and pyrite were present in the talus material. Four soil samples and a rock chip sample from the trenched area gave only weak values in copper, lead

and zinc.

CONCLUSIONS

The existence of a conglomerate unit in the southwest corner of the property can be used in stratigraphic correlation on both a local and regional scale. As this unit occurs near the top of the Lower Aldridge Division it can be used as an indicator for the Lower and Middle Aldridge contact.

No economic importance can be attached to the mineralization observed in outcrop on the property.

August 26, 1971

Report by: D.E. MacKenzie

Supervised by: R. G. Gifford, P.Eng.

Statement of Expenditures, 1971
Ace Claim Group. Golden M.D.

PERSONNEL

R.G. Gifford, P.Eng.; supervision, 5 days @ $80	$ 400.
D.E. MacKenzie; geologist 22 days @ $35	770.
R.J. Berdusco; assistant, 22 days @ $25	550.
J.R. Plommer; assistant, 6 days @ $25	150.
T.C.R. Edwards; assistant, 6 days @ $25	150.

SUPPORT

Lodging: 5 men, 61 man-days @ $10/man-day	610.
Vehicle: four-wheel drive, 1 month @ $350/mo.	350.
Helicopter: 204B, 10 hrs.30 min. @ $250/hr.	2,625.
Radio: Spilsbury Tindall SSB, 60 watt, 1 mo. @ $75/mo.	75.

EQUIPMENT AND MATERIALS

Topographic Base Map: scale 1"=500', for 2,500 acres by McElhanney Surveying & Engineering Ltd., Vancouver	475.

ANALYSIS

4 soil samples: preparation plus total copper-lead-zinc analysis @ $2.20/sample	9.
1 rock sample @ $12 for copper-lead-zinc-silver-gold analysis	12.

Total Expenditures, Ace Claims for July 4-July 31, 1971. $6,176.

Declared before me at the City of Vancouver, in the Province of British Columbia, this 27 day of Sept 1971, A.D.

R.G. Gifford

R.G. Gifford, P.Eng.

A Commissioner for taking Affidavits within British Columbia

Sub-mining Recorder

Statement of Qualifications

D. E. MacKENZIE

Mr. D. E. MacKenzie was responsible for conducting the geological survey described herein. He is a graduate geologist of the University of British Columbia (B.Sc. 1971) and has been employed in geological field work since 1964.

I consider Mr. MacKenzie to be a competent and experience geologist.

August 26, 1971

R. G. Gifford, P. Eng.

C E R T I F I C A T I O N

I, Robert G. Gifford certify that:

1. I am a practising geological engineer with residence at 1256 Alderside Road, Port Moody, B.C.

2. I am a graduate of the University of British Columbia with a degree of Bachelor of Applied Science.

3. I am a member of the Association of Professional Engineers of British Columbia, and have been engaged continuously in mining and exploration geology for thirteen years.

4. I supervised the evaluation programme for the Ace Claim Group, Golden Mining Division near Cranbrook, British Columbia in the period from July 4th to July 31st, 1971.

August 26, 1971

R. G. Gifford, P.Eng.

geologists • geochemists • analysts

BONDAR-CLEGG & COMPANY LTD.

1500 PEMBERTON AVENUE, NORTH VANCOUVER, B.C.
PHONE 988-5315

Date Rec'd.- August 16, 1971

GEOCHEMICAL LAB REPORT

No: 21-580

Extraction: Au, Hot Aqua Regia
Cu,Pb,Zn,Ag, Hot Aqua Regia
Cu,Pb,Zn,Ag, Atomic Absorption

From: Texas Gulf Sulphur Co.

Method: Au, Fire Assay, & Atomic Absorption

Date: August 24 19 71

Fraction Used: -80 Mesh.

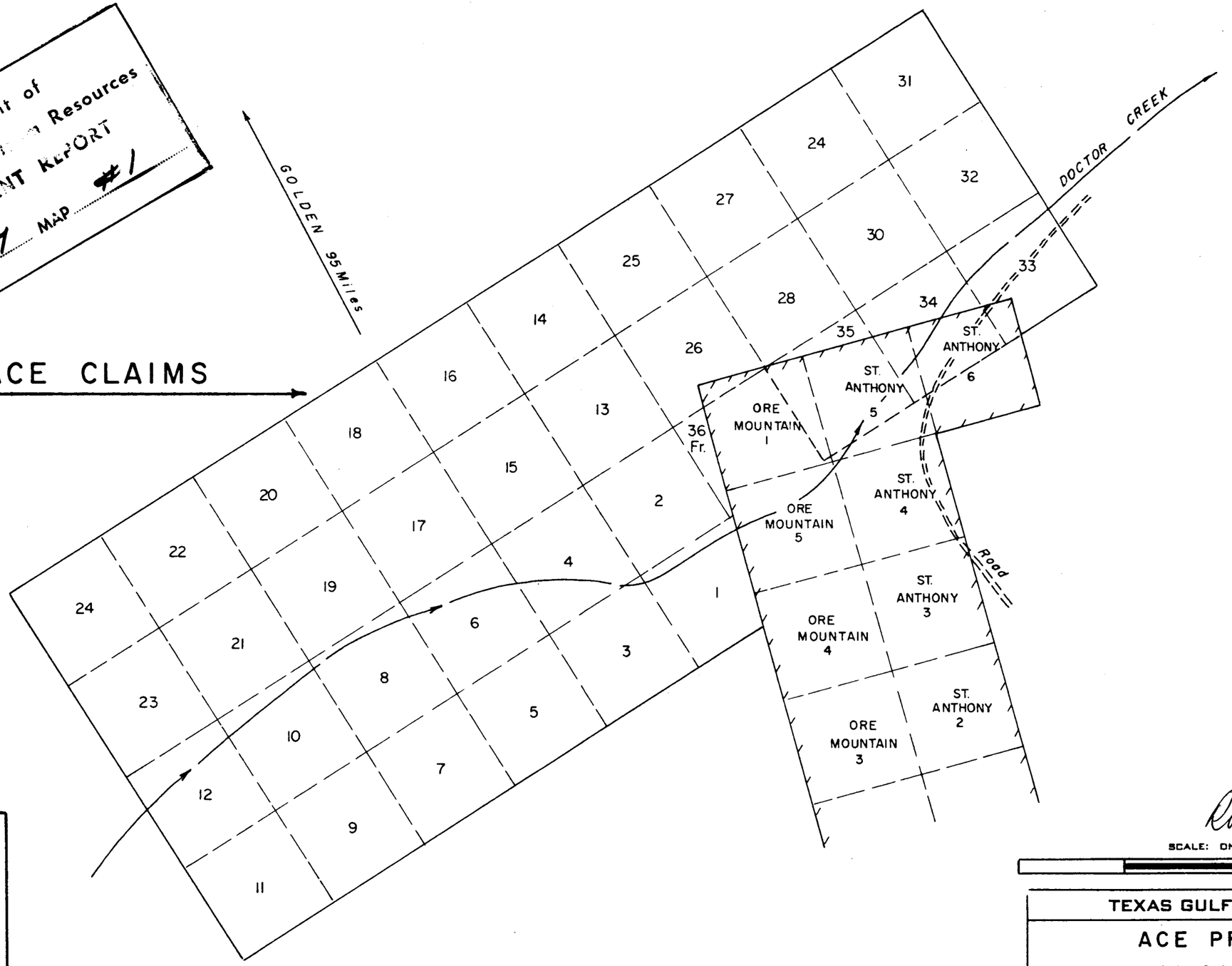
Analyst: K. B.

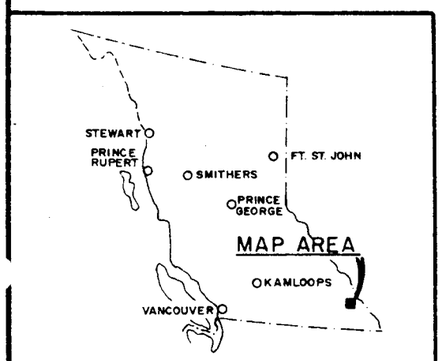
SAMPLE NO.	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Au ppb			REMARKS
F 1690	34	40	72					
1691	22	30	52					
1692	38	48	92					
1693	22	30	60					
2007	13	17	24					
4483 Rock	16	15	50	0.8	L5			L means less than.

Samples received from and cc to R. Gifford, Cranbrook, B. C.

GOLDEN 95 Miles

ACE CLAIMS





BRITISH COLUMBIA

N

SCALE: ONE INCH = 1500'

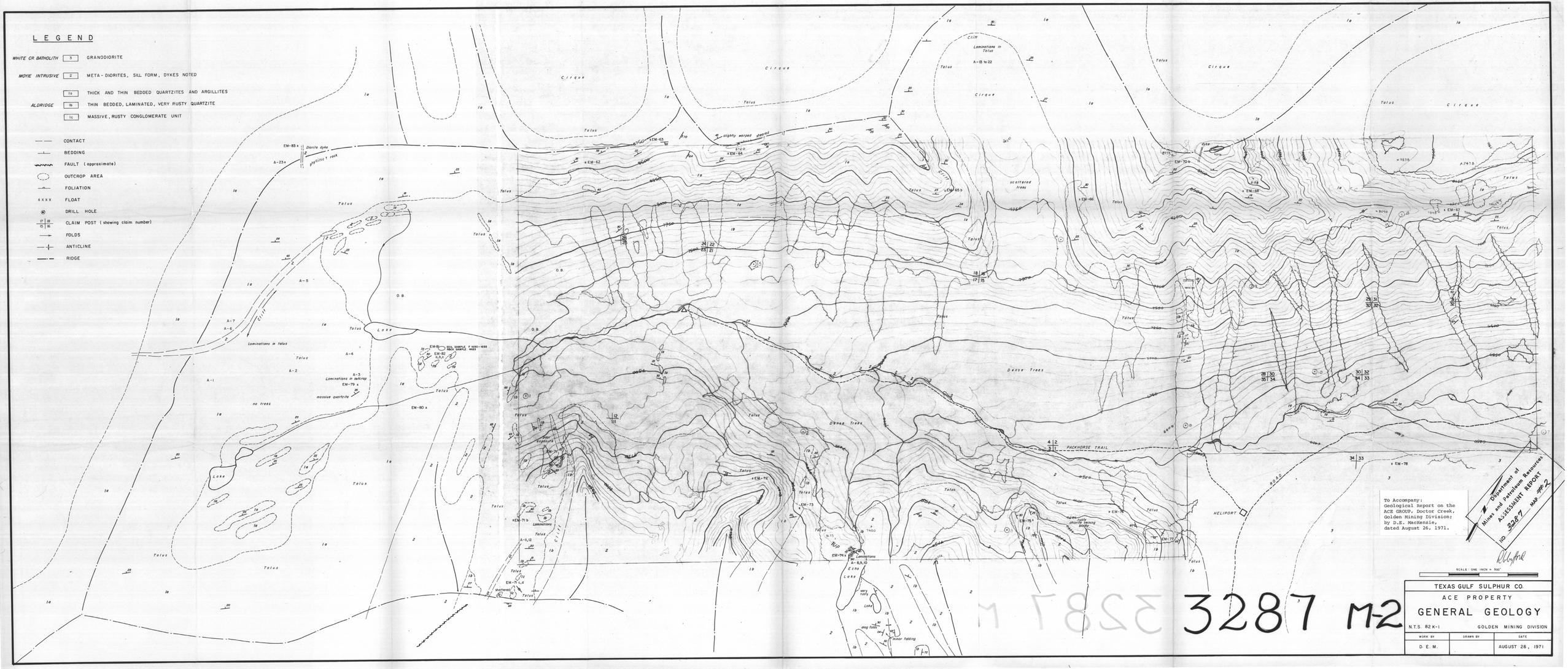
TEXAS GULF SULPHUR CO.

ACE PROPERTY

CLAIM MAP

NTS 82 K-1 GOLDEN MINING DIVISION

WORK BY	DRAWN BY	DATE
D. E. M.		AUGUST 28, 1971



To Accompany:
Geological Report on the
ACE GROUP, Doctor Creek,
Golden Mining Division;
by D.E. MacKenzie,
dated August 26, 1971.

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3287 MAP #2

SCALE ONE INCH = 500'

TEXAS GULF SULPHUR CO.

ACE PROPERTY

GENERAL GEOLOGY

N.T.S. 82 K-1 GOLDEN MINING DIVISION

WORK BY	DRAWN BY	DATE
D. E. M.		AUGUST 28, 1971

3287 M-2

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3287 MAP #3

To Accompany:
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dated August 26, 1971.

TEXAS GULF SULPHUR CO.

ACE GROUP

PRELIMINARY RECONNAISSANCE TYPE MAPPING

Compiled by
McELHANNEY SURVEYING & ENGINEERING LTD.
1200 West Pender St. Vancouver, B.C.

SCALE	CONTOUR INTERVAL	DATE	JOB NO.	SHEET NO.
1" TO 500'	50'	FEB. 19, 1971	05628 - 0	1 OF 1

SCALE AND ELEVATION DATUM BASED ON LIMITED GROUND CONTROL RESULTING IN GOOD RELATIVE, BUT UNCERTAIN ABSOLUTE MAP ACCURACY

COMPILED FROM AERIAL PHOTOGRAPHY AT AN APPROXIMATE SCALE OF 1 INCH EQUALS ±3000 FEET FLOWN IN 1969 (JULY 27)

ACE GROUP

(APPROX)

SCALE-1" to 500'(APPROX)

Rbbifford

Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 3287 MAP #4

M.S.E.L. REF. NO. 05628-0