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FYRE LAKE PROJECT  
PROPOSED EXPLORATION

N.T.S. 105-G

By:

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DYNASTY EXPLORATIONS LIMITED

January, 1973

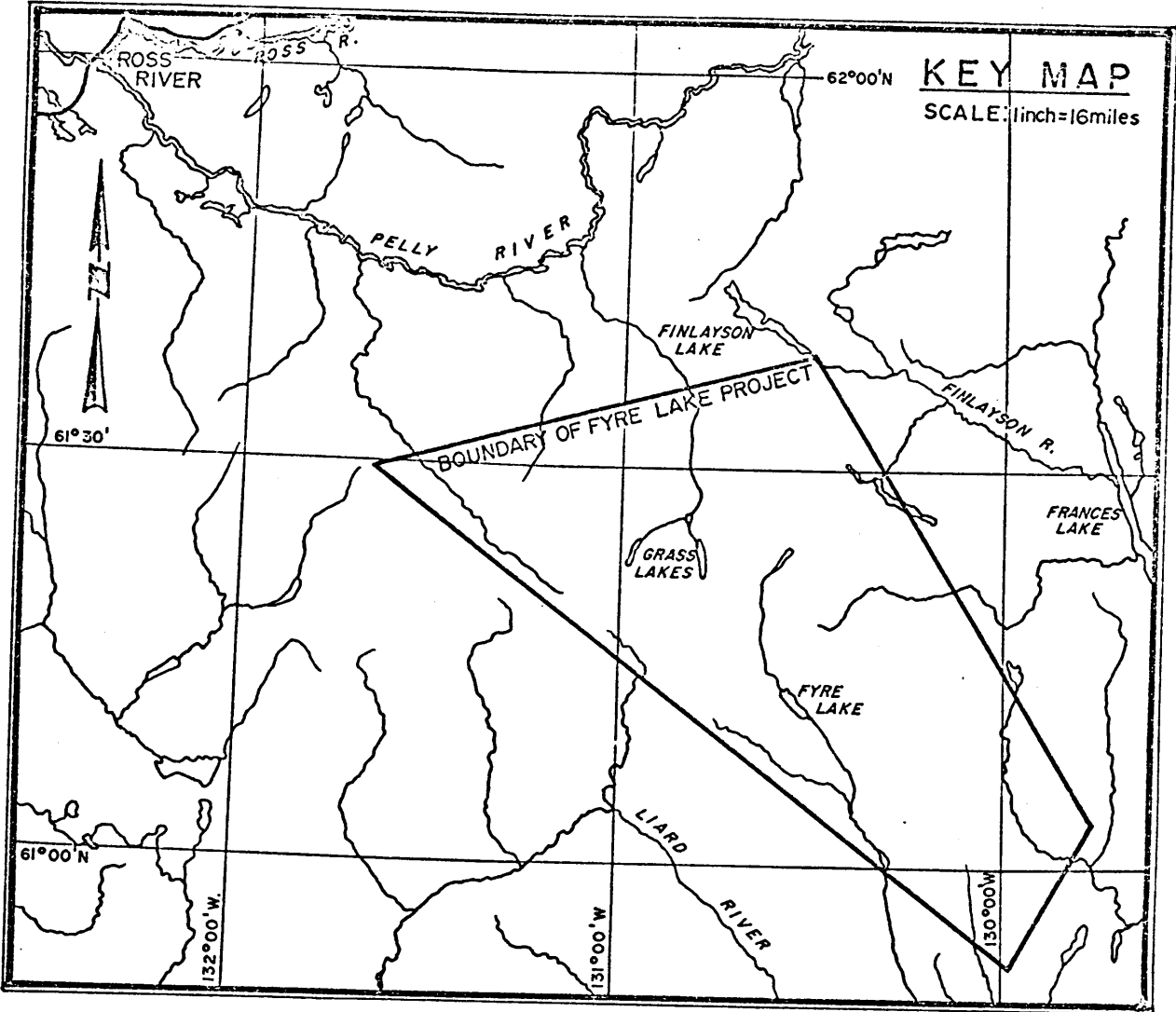
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Figure 2 - Geology of Anvil Range - Fyre Lake  
Metamorphic Belt - 1"= 4 miles

Figure 3 - Compilation Map - 1"= 1 mile

FIGURE I



# DYNASTY EXPLORATIONS LIMITED

330 MARINE BUILDING  
355 BURRARD STREET  
VANCOUVER, B. C.

## PROPOSED EXPLORATION FYRE LAKE PROJECT

### INTRODUCTION

The Fyre Lake Project area covers the southeastern portion of a belt of Proterozoic rocks 25 miles wide and 200 miles long (Figure 2). Exploration work in this metamorphic terrain has resulted in the discovery of several major base metal deposits of the stratiform, pyritic, massive sulphide type. These include the Faro, Vangorda, and Swim Lakes lead-zinc deposits in the northwestern part of the belt, the Hoho, Gee and Gyp lead-zinc-copper prospects about the middle of the belt, and the Grass Lakes, North Lakes and Fyre Lake copper-zinc deposits in the southern part of the belt. All of these deposits are lens-like in shape, are conformable to the schistosity in their host rocks, and are composed predominantly of iron sulphides. The northern part of the belt in the Anvil Range has received a great deal of prospecting attention during the past few years, but the remainder of the belt has been relatively neglected. The Fyre Lake area in particular contains all the geologic criteria typical of major massive sulphide mining camps elsewhere, and the potential for discovery of economic orebodies of that type is excellent.

This report outlines a very low-budget exploration program which is designed primarily to evaluate a few of the most outstanding geochemical and geological targets within the Fyre Lake area. It is hoped that this preliminary prospecting program during 1973 will lay the groundwork for a major exploration effort in the area during the 1974 season.

Dynasty and Atlas Explorations have done work in the Fyre Lake area previously during the years 1966 to 1969. During this time about 20 percent of the area was mapped at a scale of 1 inch to 1 mile, most of the area was covered by regional siltsampling, some selected areas were prospected, and about 10 percent of the area was covered by aeromagnetic and airborne-electromagnetic surveys. In addition, detailed work including diamond drilling was carried out on the Fyre Lake property. Several other claim groups staked on the basis of the airborne geophysical surveys were explored in a preliminary way by soil sampling and ground geophysical methods. The information accumulated during this previous work has been compiled and evaluated. The follow-up areas chosen for further work during the 1973 season have been selected mainly on the basis of geochemistry and geology.

## REGIONAL GEOLOGY

The belt of Proterozoic rocks trends northwest, and is bordered on the south by the Tintina Trench, a zone of major transcurrent dislocation continuous with the Rocky Mountain Trench System. The Tintina Trench and subsidiary faults related to it may have played an important role in the metallogeny of the region. On the north side the Precambrian rocks are overlain unconformably by volcanics and sediments of Mississippian age. Intrusions of granodiorite up to 25 miles long occur along the full length of the belt, as do smaller intrusive bodies of gabbroic or ultra-basic composition. Some of the granitic bodies have gneissic textures and are probably metamorphic in origin. This flows of Tertiary basalt overly the older rocks near the mid-point of the belt.

The metamorphic grade of the Proterozoic rocks increases to the southeast from predominantly phyllites in the Anvil Range, through schist and gneisses, to gneisses and metamorphic granites at the southern end of the belt, where it disappears under Mississippian cover. This change in metamorphic grade is accompanied by a change in mineralogy of the mineral deposits from pyritic lead-zinc orebodies in the Anvil Range, to pyrrhotite-rich copper-zinc deposits in the Fyre Lake and North Lakes area. The predominance of pyrrhotite over pyrite in the southern part of the belt may be a direct result of the higher metamorphic grade of the enclosing rocks. The change from lead-zinc to copper-zinc suggests some sort of regional zoning which may be related to the age of the host rocks or to their depositional environment. Paul Gilmour (1971) proposes a "strata-bound, massive, pyritic sulphide series" for base metal deposits of this sort, and suggests that they vary continuously from a pyrite-sphalerite galena end member in predominantly sedimentary rocks, to a pyrite-pyrrhotite-chalcopyrite-sphalerite end member in predominantly volcanic rocks. A zoning model such as this may explain the variable mineralogy of the deposits in the Anvil Range - Fyre Lake Belt.

The Proterozoic terrain in the Fyre Lake Project area includes a great variety of different rock types, ranging in composition from limestones to andesite meta-volcanics to sericite schists and quartzites. The metamorphic grade also may vary, since chlorite-sericite schists, quartz-biotite schists, augen gneisses and metamorphic granites are all represented, however, the composition of these rocks may play a role in determining their apparent metamorphic grade. The Proterozoic rocks throughout the belt have been intensely deformed, and the development of a strong penetrative axial plane cleavage associated with isoclinal folding has destroyed all evidence of original sedimentary or volcanic fabric. On the basis of the compositions present, the original rock types probably included volcanics of andesitic to rhyolitic composition as well as a variety of sedimentary rocks. The major mineral deposits in the area occur within quartzose sericite or chlorite schists and gneisses which originally could have been acid volcanics or shaly sediments.

## MINERAL DEPOSITS

There are 12 known mineral deposits in the Anvil Range - Fyre Lake belt which fit into the stratiform, pyritic, massive sulphide model. These range in size from the Anvil Mine ore-bodies, which contain approximately 65 million tons of 10 percent combined lead and zinc ore, to the Gee claims prospect, which is a sulphide lens 6 feet thick and 50 feet long. At present only the Anvil ore body is economic. In addition to these main deposits, there are numerous small showings and float occurrences throughout the belt, and some of these may also be of the massive sulphide type.

For the purposes of this report, the following criteria are considered to be diagnostic of stratabound, massive pyritic sulphide deposits:

1. They are conformable in shape and structure to the bedding or metamorphic fabric of the enclosing rocks.
2. The mineralogy is simple; galena, sphalerite and chalcopryrite may be present in various ratios, along with abundant iron sulphides.
3. They occur in quartz-rich sedimentary or volcanic rocks, or their metamorphic equivalents.
4. Structural and chemical relationships with the enclosing rocks indicate a syngenetic or very early epigenetic origin for the sulphides.

Deposits that fit into this classification range in age from Pleistocene to Archean. There are several other features common to the environments of many of these deposits which can be useful in exploration. These include:

1. Barite gangue is commonly associated with deposits of this type and, in some cases, unmineralized barite beds extend well beyond the limit of economic sulphides.
2. The deposits frequently have an underlying zone of chlorite alteration with some disseminated chalcopyrite and pyrite. Jasperoid alteration may also be present and tends to be peripheral to, and more widespread than, the chlorite alteration. Sericite alteration envelopes are present in some cases.
3. The orebodies often are stratigraphically equivalent to extensive but narrow beds of ferruginous chert or siliceous iron formation. These iron-silica bands may be an excellent marker bed for the favourable stratigraphic horizon. The stratigraphically equivalent chert horizon and the jasperoid alteration zone sometimes completely enclose the sulphides in a widespread silica envelope.
4. Intrusive rocks of granitic and ultrabasic composition are often present in close proximity to these deposits. What genetic relation, if any, there may be between these intrusive rocks and the stratabound massive sulphide deposits is not known, but their common spatial association makes them of interest as a possible exploration parameter. It is probable that the common co-existence of the ore bodies and intrusive rocks is simply coincidence; the eugeosynclinal environment in which these ore bodies are formed also generates ultrabasic and granitic intrusives during its later stages.

#### Mineral Occurrences in Fyre Lake Area (Refer to Figure 3)

##### 1. Fyre Lake Deposit

Staked originally by Cassiar, who explored the deposit with 35 small diameter drill holes. Restaked in 1966 by Atlas Explorations, who drilled an additional 6 diamond drill

holes and carried out extensive geophysical and geochemical surveys. The sulphide body is a flat-lying lens about 25 feet thick, 150 feet wide, and possibly 1600 feet long. Grades indicated by the Atlas drilling are 0.4% to 2.0% copper over 20 to 40 foot widths, along with minor zinc, gold and silver. The economic sulphides occur at the base of a pyritized zone 50 feet thick. The sulphide deposit as a whole lies within a quartzite layer in quartz-chlorite schists. An ultrabasic body lies one mile to the northeast and granitic rocks outcrop within one mile to the northwest and to the east. The schists and gneisses in the area of the mineralization could be either metamorphosed sediments or metamorphosed intermediate volcanics.

2. North Lake Deposit

Staked by Conwest, who drilled two holes in the deposit in August, 1961. The sulphides occur as a conformable lens of pyrrhotite with chalcopyrite and sphalerite values up to 1.8% copper and 4% zinc over narrow widths.

The lens is from 1 to 30 feet thick, has been traced along strike for at least 500 feet, and occurs at a contact between schist and quartzite.

3. Archer & Cathro Hoho Prospect

As yet, little is known about this occurrence of stratiform lead-zinc mineralization which was discovered by Archer & Cathro during the 1972 season. The galena and sphalerite occur within a quartz-biotite-sericite schist. Grades of 6% zinc over significant widths have been rumoured and the known showings are associated with a large geochemical anomaly. Trenching and diamond drilling is planned for the property during 1973.

4. Gyp Prospect

Galena, sphalerite and chalcopryrite occur with pyrrhotite in a silicified zone 4 feet thick and at least 100 feet long, within flat-lying sericite schist.

5. Gee Prospect

A lens of sulphides including galena, sphalerite and chalcopryrite 6 feet thick and 50 feet long occurs in gneissic host rocks.

6. Dub Prospect

Float containing up to 2% copper was discovered by Cassiar Asbestos in 1960. The mineralization resembles that at the Fyre Lake Deposit, 4 miles to the north, and the underlying rocks are at the same stratigraphic level. Drilling of 3 holes by Atlas Explorations in 1967 failed to locate the source of the float.

7. Sanders Prospect

Small lenses of galena, sphalerite and chalcopryrite occur in schist associated with pyritic chert.

8. Hoo Prospect

Interest in the area was originally aroused by the discovery of lead-zinc float which may have originated from the Archer & Cathro showings 2 miles to the north. Drilling by North Lake Mines Limited in 1966 encountered minor pyrrhotite and chalcopryrite mineralization within a sequence of graphitic chloritic and sericitic schists.

9. Riley Prospect

Conformable bands of disseminated chalcopryrite occur in schists.

10. Rob Prospect

Float occurrence of massive pyrrhotite-chalcopyrite mineralization in an area underlain by mica schist. Both ultrabasic rocks and granites occur in the near vicinity.

11. Grass Lakes Showing

Massive pyrrhotite with minor chalcopyrite and sphalerite occurs within schistose rocks close to the contact of an intrusive stock.

The following known mineral occurrences in the Fyre Lake Area are not of the massive sulphide type:

12. Silver-lead-zinc veins.
13. Small pyrrhotite-chalcopyrite skarns in limestone.
14. Galena in quartz veins.
15. Galena in quartz veins.
16. Silver-lead veins.
17. Galena in quartz veins.
18. Pyrite and molybdenite in quartz veins.
19. Chalcopyrite in hornblende granite.

FOLLOW-UP AREAS (Figure 3)

Area #1

This large area includes several creek drainages with interesting geology and geochemistry. In creek (a) a barite bed occurs close to the contact of quartzite with quartz-mica schists. Geochem values in soil samples from the drainage range up to 950 ppm Pb and 15,000 ppm Zn. Massive magnetite-pyrite float occurs in the creek but was not located in place. In creek (d) geochem values in silts of up to 1975 ppm Cu and 745 ppm Zn are located in close proximity to a large gossan. In creek (h) silt sample values range up to 920 ppm Cu, 163 ppm Pb and 1240 ppm Zn. Galena and sphalerite float which was found by a silt sampler in a creek drainage in the southern part of the area has never been followed up. Small sulphide showings of potential significance and anomalous geochem samples also occur in other places within Area #1.

Area #2

This area straddles the contact zone between the Proterozoic rocks and rocks of Mississippian age. The area is largely overburden covered and the details of the geology are not known. Anomalous copper and zinc values occur in all drainages off a ridge in the western part of the area; values range up to 1560 ppm Cu and 1800 ppm Zn. A large transported gossan occurs in one of the creeks. Strong jasperoid alteration was seen in volcanic rocks in the area by the author in 1969, and zones of silicification in green-schist have been noted by other Atlas personnel as well. A few soil sample lines run across the area in 1969 failed to locate the source of the anomalous geochem values in the creeks.

Area #3

Weak lead and zinc geochem anomalies in silt and soil samples occur close to a large ultrabasic body. Small pyrite magnetite and fluorite showings are known in the vicinity.

Area #4

A zinc geochem value of 3450 ppm occurred in the headwaters of a creek in this area. Follow-up prospecting in 1970 failed to locate the source of the anomalous geochem, which is coming from gneissic rocks close to the Tintina Trench.

Area #5

Area #5 covers a belt of Proterozoic schists and gneisses with some quartz-rich members. A few widely dispersed zinc or zinc-lead anomalies occur in silt samples. The North Lakes showing lies just south of this area.

Area #6

This area lies 3 miles to the southeast of the North Lakes showing, and covers similar metamorphic, granitic, and ultrabasic rocks as those around the Fyre Lake showings 6 miles to the south. Several silt samples anomalous in copper, lead and zinc occur within the drainage. Several small chalcopyrite-pyrrhotite showings in the north part of Area #6 warrant re-examination.

Area #7

This area of high copper geochem values in schists was prospected briefly during 1970 and one small chalcopyrite-pyrite-pyrrhotite showing was discovered. This one showing cannot adequately explain all the anomalous geochem samples in the area. The rock types in this area are similar to those around the Fyre Lake and North Lakes showings.

Area #8

Anomalous lead geochemistry in silt samples, gossans, favourable rock types and proximity to both the Tintina Trench and the Fyre Lake Fault make this area favourable for further prospecting. Prospecting during 1970 failed to locate the source of the lead geochemistry.

Area #9

This area lies 20 miles east of the main Proterozoic metamorphic belt and is probably underlain by rocks of Mississippian age. However, the copper and copper-zinc geochem values that have been obtained in the main creek drainage are of such high magnitude that follow-up work is warranted in spite of the geologic environment possibly being different from the Fyre Lake area. Soil sampling during 1970 resulted in samples containing up to 2600 ppm copper and 9500 ppm zinc in a creek drainage underlain by shales, argillites, chlorite and quartz-chlorite schists and minor quartzites.

PROPOSED EXPLORATION

Exploration work proposed for the Fyre Lake Area during 1973 will emphasize careful prospecting, detailed mapping at a scale of 1 inch to 1320 feet of favourable quartz-rich stratigraphic horizons and soil sampling on contour lines or on "pace and compass" grid lines. Re-examination of some of the known mineral occurrences will be done to see if they fit the "pyritic massive sulphide" model. Geochemical analysis will be done on any beds of chert, quartzite or iron formation discovered, since these rock types may contain anomalous concentrations of copper, lead and zinc when associated with stratiform ore bodies.

Work on Area #1 will require about one month to complete and will consist of detailed mapping of all barite and quartzite occurrences, re-examination of small showings, additional contour soil sampling and very careful prospecting of float in all creeks. Staking of the most favourable geochemical anomalies and geology should be considered if there is any competition in the area. This area has the highest priority for follow-up work.

The potential source area of the gossans in Area #2 should be soil sampled in detail. Areas of silicification should be prospected carefully for any trace of sulphides and, if outcrop is adequate, should be mapped in sufficient detail to discover any zonal pattern in the alteration. Geochemical analysis of rock samples from alteration zones should be done to detect any mineralization not readily visible.

Work in Areas #3 to #8 will emphasize prospecting, with intensive rock breaking of float in creeks. Any float occurrences of chert, iron formation or quartzite will be located in place if possible. Contour soil sample lines will be run in creek drainages with anomalous silt samples.

Area #9 will only be examined this year if time and budget permit. Work in this area will mainly consist of further soil sampling to track down the source areas of the high copper and zinc values obtained previously. Some rock geochemical analysis will be done to determine if any of the rock types in the area have high background copper and zinc contents, and close attention will be paid to the ground conditions in the vicinity of the highly anomalous sample sites.

In addition to these follow-up areas, preliminary silt sampling still remains to be done on many creeks in the Fyre Lake belt. Some of these creeks can be sampled best by chopper-hopping, while others could possibly be sampled using canoe traverses down some of the major streams in the area, such as the Hoole River and the North River. These rivers lie in broad flat valleys and should have gentle enough gradients to be easily passable by canoe. The silt sampling should be accompanied by intensive rock breaking of float from each creek drainage. This work should be done in the middle of the season when the creeks are low so good silt samples can be obtained and abundant rocks are exposed on gravel bars. Two or three weeks of canoe traverses would accomplish the silt sampling and float prospecting in the most important areas.

CREW REQUIREMENTS

Duties

Project Geologist

Duties will consist of mapping, evaluation of showings, prospecting and supervision.

Geological Field Assistant

Duties will include prospecting, some mapping and geochem if required.

Geochemical Field Assistant

Two students will be required for soil sampling, silt sampling and possibly some prospecting.

Cook

An able-bodied cook would be an asset during the work on the follow-up areas but is not essential. A cook will only be hired if we can find one who can cope with spartan fly-camping conditions.

BUDGET

1. Geology:

(a) Wages: Geologist - 5 months @\$1200/month	6,000	
Geol. Assistant - 3½ months @\$700/month	2,450	
(b) Supplies	100	
(c) Assays	<u>200</u>	\$ 8,750

2. Geochem:

(a) Wages: 2 Field Assistants 3½ months @\$600/month	4,200	
(b) Supplies	200	
(c) Analysis - 300 samples x \$3/sample	<u>9,000</u>	\$13,400

3. Camp Support

(a) Wages: cook - 3 months @\$700/mo.	2,100	
(b) Supplies - 4 men x \$8/day x 100 days	3,200	
(c) Equipment	<u>500</u>	\$ 5,800

4. Transportation

(a) Beaver: 10 trips from Ross River- 200 miles x 10 trips x \$1.00/mile	2,000	
(b) Chopper: 1 trip/week from Ross River - 4 hrs. x 15 trips x \$160	9,600	
(c) Air fares from Vancouver - 5 returns x \$200	<u>1,000</u>	\$12,600

BUDGET (Continued)

5. Claim Staking:

100 claims @ \$40/claim \$ 4,000

6. Administration and Expediting at 10% \$ 4,450

TOTAL \$49,000

Say - \$ 50,000

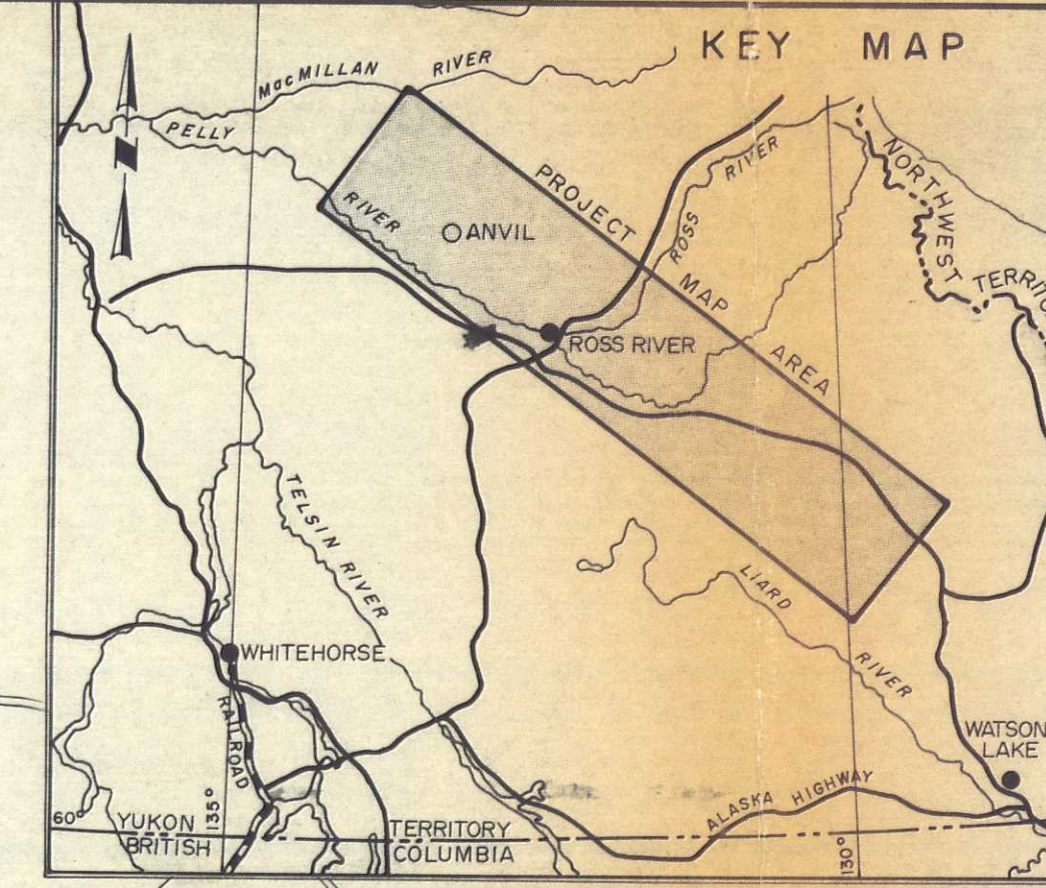
Respectfully submitted,

Peter Dean,  
Geologist

January, 1973

**DYNASTY EXPLORATIONS LIMITED**  
**GEOLOGY OF ANVIL RANGE-  
 FYRE LAKE METAMORPHIC BELT**

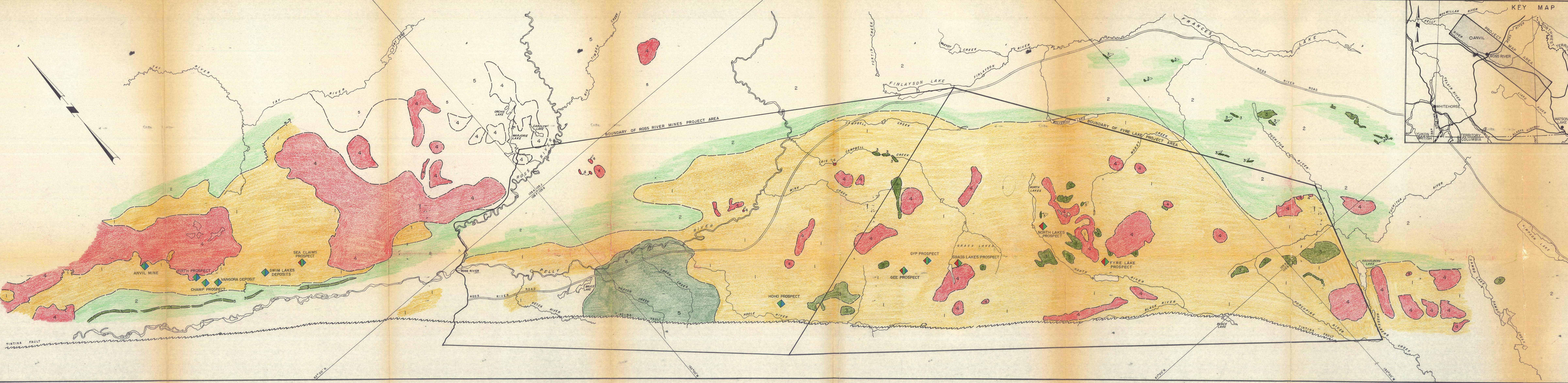
GEOLOGY BASED ON G.S.C. AND ATLAS/DYNASTY FIELD WORK  
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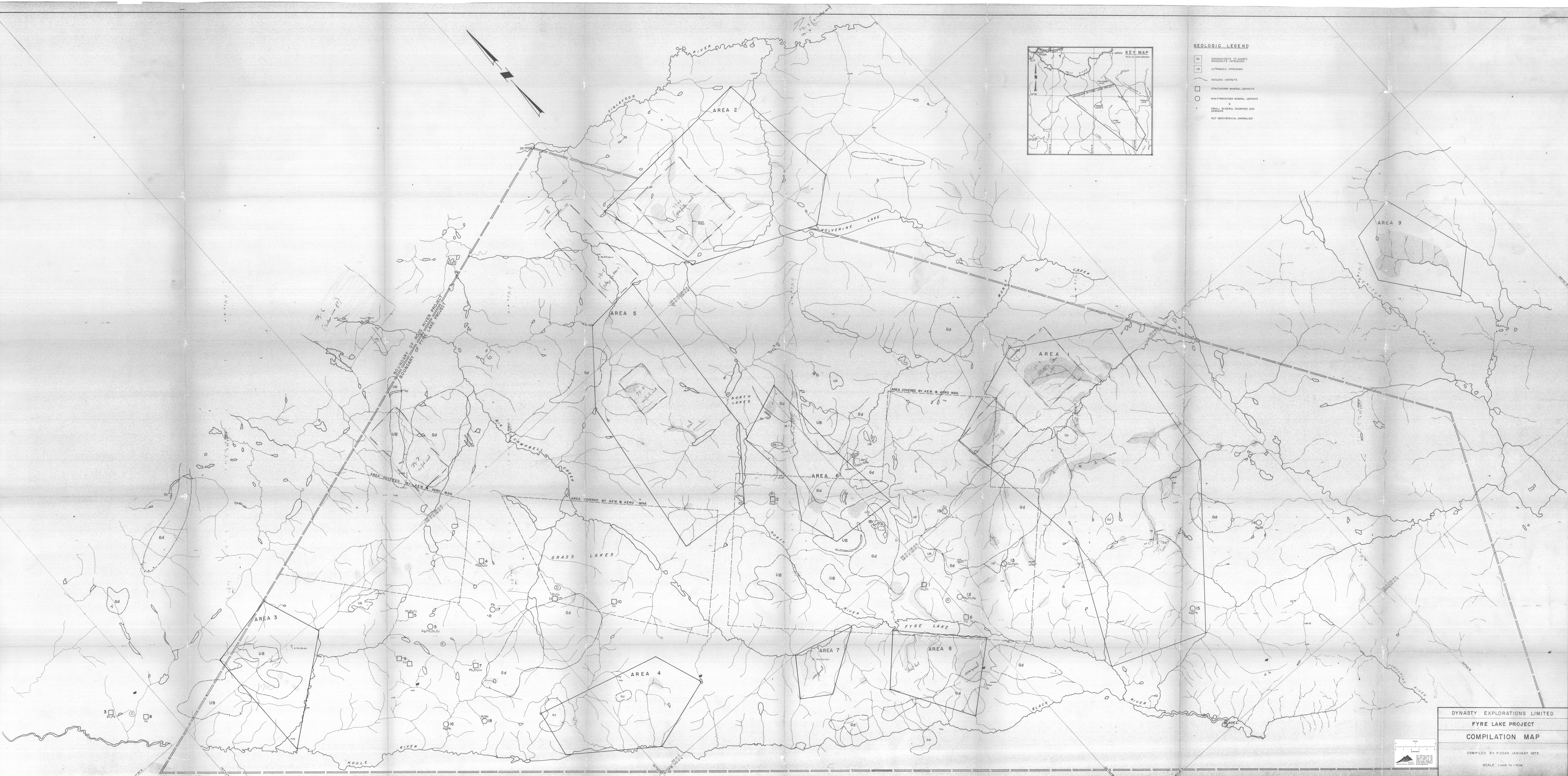


**GEOLOGIC LEGEND**

- |             |   |   |
|-------------|---|---|
| CENOZOIC    | 5 | TERTIARY  |
|             | 5 | BASALT FLOWS  |
| MESOZOIC    | 4 | JURASSIC AND/OR CRETACEOUS  |
|             | 4 | GRANODIORITE AND QUARTZ MONZONITE.  |
| PROTEROZOIC | 3 | AGE UNKNOWN   |
|             | 3 | PERIDOTITE AND GABBRO   |
| PROTEROZOIC | 2 | MISSISSIPPIAN   |
|             | 2 | PARTLY ALTERED ANDESITIC VOLCANICS, SEDIMENTS, AND MINOR LIMESTONE.                                 |
| PROTEROZOIC | 1 | QUARTZ-CHLORITE-MICA SCHIST AND PHYLITES, AUGEN GNEISS, MINOR AMPHIBOLITE, QUARTZITE AND LIMESTONE. |
|             | 1 |   |

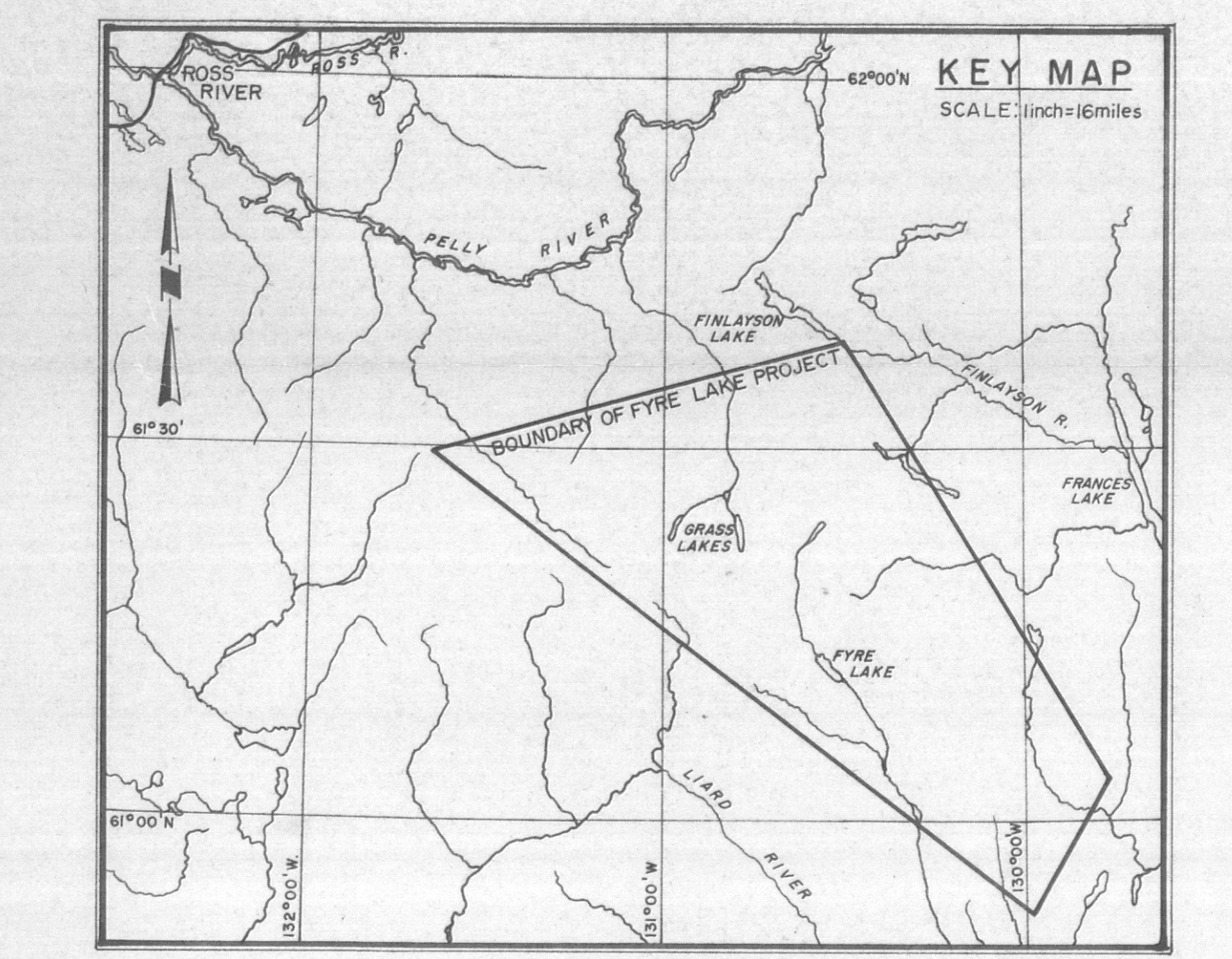
- FAULT  
 --- CONTACT  
 ■ STRATIFORM, MASSIVE, PYRITIC SULPHIDE DEPOSITS.  
 ● Zn  
 ● Pb  
 ● Cu





**GEOLOGIC LEGEND**

- GRANODIORITE TO QUARTZ MONZONITE INTRUSIONS
- ▭ ULTRABASIC INTRUSIONS
- GEOLGIC CONTACTS
- STRATIFORM MINERAL DEPOSITS
- NON-STRATIFORM MINERAL DEPOSITS
- SMALL MINERAL SHOWINGS AND GOSSETTS
- SILT GEOCHEMICAL ANOMALIES



DYNASTY EXPLORATIONS LIMITED  
 FYRE LAKE PROJECT  
 COMPILATION MAP  
 COMPILED BY P. DEAN JANUARY 1973.  
 SCALE: 1 INCH TO 1 MILE