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TENEMENT: S.M.L. 681 - Mount Mitchell/Glenloth.

TENEMENT HOLDER: Abadon Holdings N.L.

REPORT: Progress Report Period 9th Sept. To 9th Dec. Pgs. 3-19
1972.

PLANS: Regional Geol. 2072-1
Detailed Geology Mt. Mitchell Tin Deposit. 2072-2

PROGRESS REPORT ON SML 681

FOR THE PERIOD OF

September 9th to December 9th, 1972.

FOR

ABADON HOLDINGS NL

JANUARY, 1973.

F. HOLCAPEK.

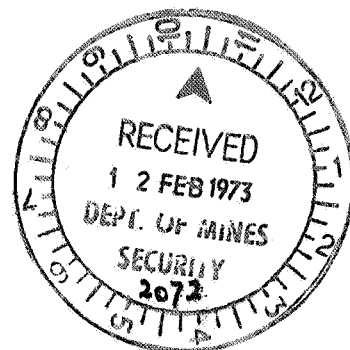


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Maps:

Lake Harris, Geology

1" = 60 chains

PROGRESS REPORT ON SML 681

FOR

Abadon Holdings NL

INTRODUCTION:

Special Mining Lease 681 was acquired by Abadon Holdings on March 9, 1972 and cover the Glenloth gold mining area and Mt. Mitchell Tin Prospect.

During 1971 the area was geologically mapped, although it was not part of SML 436 held by Abadon Holdings. The purpose of the mapping program at that time was to clarify the regional geological setting.

After acquiring SML 681 in March 1972, time was spent evaluating the Mt. Mitchell Tin Prospect. Knowledge gained from this program made it necessary to remap the whole lease with special emphasis on the relationship between the Glenloth Metamorphic Complex, gold mineralization and location of the post metamorphic granites.

The area was remapped at a scale of 1" = 60 chain and data was plotted in the field on Department of Mines base maps. Air photographs of the same scale were used to locate possible outcrop areas in the field. All old mines were checked for rock types, and vicinity to contacts, alteration zones, quartz reefs and basic dykes.

Rocks were differentiated in the field with the aid of a handlens and all rock names applied are field names only. Thin section descriptions available from the earlier mapping program were used for correlation and possible interpretation.

Location and Access:

SML 681, encompassing an area of 86 square miles lies approximately 30 miles west of Kingoonya.

Access to the lease area is by paved road to Port Augusta and from there by gravel road to Kingoonya. The Yerda Outstation Track traverses the northern part of the lease.

Numerous old tracks traverse the area and make access to any point within the lease area easy.

GENERAL STATEMENT:

The mapped area can be divided into three geological provinces, each underlain by rocks of a specific tectonic event. The central part of the lease is complex due to the mixing and interfingering of two distinct rock units and the presence of minor remnants of Tarcoola Quartzites. Structural information is difficult to obtain, as several stages of folding are indicated but can not be separated.

LOWER PROTEROZOIC:

GLENLOTH METAMORPHICS COMPLEX:

The main outcrop area of this unit is in the central part of the lease. The unit consists of gneissic granites to granitic gneisses, foliated with well developed discontinuous metamorphic banding. Individual bands vary from granitic to dioritic in composition. Migmatitic injections parallel to the banding are common. They are usually expressed as irregular, elongated masses in part cross-cutting the metamorphic banding. Pegmatitic zones seldom wider than 6 inches are common.

The metamorphic banding outlines complex fold patterns but is too discontinuous to be traced for any distance.

The preferred northerly arrangement of outcrop areas separated by strongly kaolinized zones or fine to medium grained fresh granite suggest a structural control for the outcrop pattern.

In the southern most part of the lease area, coarse grained porphyritic biotite granite similar to the Cooladin Rock Granite crops out. Small, well rounded fine grained gneissic xenoliths are abundant and suggest that the metamorphics have been incorporated into a later intrusive.

MIDDLE CARPENTARIAN:

COOLADIN ROCK GRANITE EQUIVALENT:

Coritta Hill, south of the lease area and several smaller outcrops along Lake Harris and along a south trending fence along the western lease boundary are correlated with this unit.

The granites are very coarse grained at Coritta Hill, rich in biotite and contain feldspar phenocrysts up to 1 inch in size. Numerous fine grained

gneissic xenoliths occur within the granite. No preferred alignment of the xenoliths was recognizable.

This unit intrudes the metamorphic complex and is in turn intruded by the younger fine grained red granites.

Middle to Upper Carpentarian:

In the northern part of the lease, at New Year Hill, north west of Mt. Mitchell, east of the Fabian Mine and along the shore of Lake Harris, strongly brecciated and rehealed quartz zones have been found. In the field the quartz zones exhibit ghost bedding within the larger breccia fragments. Thin sections from several of these zones suggest that the original Tarcoola Bed Quartzite has been brecciated and rehealed by a stock work of quartz veinlets in part completely obliterating the primary sedimentary structures. In all cases these zones are surrounded by granitic intrusions.

UPPER CARPENTARIAN:

GAWLER RANGE FELDSPAR PORPHYRY:

In the northern part, from Tomato Rock along the shore of Lake Harris, an extensive sheet of gently dipping rhyolite porphyry trends westerly. The relationship to the older rocks can not be observed.

North of Mt. Mitchell within the silcrete covered area isolated porphyry outcrops have been found. These rocks show well developed flow banding. Along the Kingoonya road several samples of kaolinized rocks have been thin-sectioned. These rocks are essentially Gawler Range Tuffs. Small quartz reefs have been found in this area. The kaolinization can be traced southwards to the Mt. Mitchell Tin Prospect. A gradational change from strong to intermediate to poor kaolinization is present. This gradational change is also observable within the quartz reefs. The reefs change from quartz on the strongly kaolinized areas to quartz - greisen in the poorly, to greisen in the fresh granites.

West of the kaolinized tuffs, granites are exposed as small discontinuous outcrops or as float material. These granites intrude the Tarcoola Quartzites. The basic basal flows of the volcanics have not been found in the area.

Granites:

The fine grained, micro graphic to graphic granites in part slightly foliated outcrop in the northern and central part of the lease area.

Within the central part, this rock unit south trending follows topographic lows between ridges under lain by the metamorphic complex. All old mines can be related to the contact zone between the units. The contact is seldom exposed, but the granite distribution shows that a wide zone of interfingering and mixing exists.

* Within the old workings the granite is strongly altered and cut by quartz reefs and basic dykes. The alteration zone can be up to 150 feet wide as observed in several places.

In the extreme north west the granites are intruding the Tarcoola Beds (Quartzite remnants). The Gawler Range volcanics appear also to be affected by contact phenomena. This is implied by the gradational kaolinization along Mt. Mitchell.

Dolerite Dykes and Quartz Reefs:

Dolerite dykes have been found to cut all rock units. They trend generally north and can be up to 20 feet wide. They are usually associated with gold bearing quartz reefs. Quartz reefs are abundant but in general poorly exposed. In the past these reefs have been investigated or mined for gold.

The Mt. Mitchell Tin Prospect has been mapped in detail during the early part of 1972 and the reader is referred to the Report "Detailed Geological Report on SML 681 Mt. Mitchell - Tin Deposit for Abadon Holdings N.L. August, 1972".

Discussion:

The latest mapping showed that future work on this special mining lease should be concentrated on a.) the gold potential of the alteration zones within the granite and b.) further investigation of the tin occurrences at Mt. Mitchell.

The first can be best done by detail mapping of the old workings and extensive sampling. The results of this program will decide on any further approach.

The potential of discovering a high grade gold deposit associated with the quartz reefs is slim, but the possibility of a large low grade gold deposit related to the alteration zones in the granite exist.

Conclusions:

x Remapping of the area shows that the geology of SML 681 is complex. The area is underlain by Lower Proterozoic metamorphics which have been intruded by Middle Carpentarian granites in the south. During the Middle to Upper Carpentarian the inter oratonic basin occupied by the Tarcoola Beds extended to the Glenloth Region. This period of sedimentation was followed by folding, expulsion of rhyolitic feldspar porphyry and followed by intrusion of granites during the Upper Carpentarian time. Quartz reefs carrying gold and tin, and associated with greisen and dolerite dykes were the last emplaced. The Tin deposit of Mt. Mitchell warrants further work. The quartz reefs carrying gold are not considered to be extensive enough to be of economic interest, but the alteration zones within the granites and associated with the reefs warrant further investigation to enable evaluation of the potential for low grade large tonnage gold deposits.

Respectfully Submitted


F. Holcapek, Geologist

DETAILED GEOLOGICAL REPORT

on

S.M.L. 681**MT. MITCHELL - TIN DEPOSIT**

for

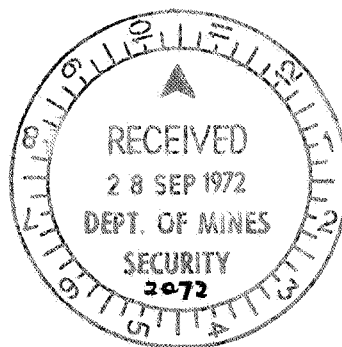
ABADON HOLDINGS N.L.**AUGUST, 1972**

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MAPS:

Geology of SML 681

scale: 1 inch - 100 feet.

area from Lake Harris to Earea Dam has been mapped at a scale 1 inch = $\frac{1}{2}$ mile.

GENERAL GEOLOGY:

The geological setting of the area is highly complex, all units mapped will be discussed separately.

Upper Carpentarian - Gawler Range Porphyry:

A large mass of flatly lying reddish coloured Rhyolite Porphyry with flow structure outcrops at Tomato Rock. From this point a series of smaller outcrops of the same unit can be followed westerly and north westerly to Renton Hill. The intervening area is covered by sand or duricrust. Kaolinized rocks underlay the major part of the duricrust. Several thin sections cut from samples taken from Mt. Mitchell and along the break away country north east of Mt. Mitchell, in the middle of the kaolinized area show that the underlaying rocks are Gawler Range Rhyolitic Porphyry or Crystal Tuffs more or less completely kaolinized, changing in vicinity of the Mt. Mitchell tin deposits to kaolinized Granite, which in turn grades into fresh Granite.

Along the western limits of the kaolinized rocks, along a north south fence, lenses of strongly fractured and rehealed Quartzites (Tarcoola Beds) are exposed.

UPPER TO MIDDLE CARPENTARIAN: Tarcoola Quartzites:

At New Year Hill several lenses of Quartzites completely surrounded by Granite crop out. Faint bedding observable in hand specimens, led to the microscopic study of this rocktype. In thin section, it consists of well rounded Quartz grains with mica filling the interstitial openings. No evidence of regional metamorphic could be recognized. Small veinlets of Quartz containing fluid inclusion have been observed. In the field the unit is strongly fractured and rehealed by secondary Quartz. The Quartzite occurs as several isolated outcrops, and reaching easterly from New Years Hill. From strike and dip measurements, where obtainable, a synclinal structure is indicated.

Similar outcrops of Quartzites have been found to the east south east of Heylens Mine. At this locality it is intruded by a micro pegmatite along the eastern margin and by Granite (?) to the west.

Other possible Quartzitic outcrops are located along the shore line of Lake Harris, but no detail studies of these outcrops have been made and they are too isolated to be correlated on basis of similarities in hand specimens only.

UPPER CARPENTARIAN (?) :

Two large Granitic outcrops and several smaller ones have been mapped in the area.

The main Granite outcrop is located to the south of and in the vicinity of Heylens Mine. The Granite is in general fine grained, fractured and variable in composition. From microscopic studies it is a hybrid Granite. The Granite intrudes the Glenloth Metamorphic Complex, and apparently the Tarcoola Beds as indicated along the eastern outcrop margin.

The relationship between this Granite and the Gawler Range Porphyry is not clear.

The second largest outcrop is located just south of Mt. Mitchell. Along the southern outcrop limited, the appearance is similar to the first outcrop, but it changes to the north to a micrographic Granite. Here the Granite is slightly kaolinized. The intensity of kaolinization increases to the north and is a maximum in the Greisenized-Quartz reef area.

Several small Granitic areas approximately 1 to 2 miles north-north east of Mt. Mitchell are indicated by rubble and acacia *tarculensis* within the kaolinized Gawler Range Tuffs and Porphyry.

LOWER PROTEROZOIC - Glenloth Metamorphic Complex:

These units consist of the oldest Rocks in the region. Granitic gneisses and migmatites make up the bulk of outcrops. Foliation trends vary from northwest to northeast. More detailed geological mapping will be necessary to obtain structural information, and extent of this unit.

This unit is cut by numerous dolerite dykes and Quartz veins carrying gold. Individual trains of outcrop trend general north westerly, separated by low sand covered areas, with kaolinization evident in creek cut or open cuts.

DETAIL GEOLOGY :Field Procedure :

Detail mapping was carried out over the Mt. Mitchell area, the purpose was to check on results obtained from Australian Development Co. and to formulate an approach to thoroughly evaluate the known cassiterite bearing Quartz and Greisen zones. Diamond drill holes completed by the previous operator were relocated where possible, and re-evaluated.

Ground control was obtained by a 100 by 100 foot pegged grid.

Geology:

The mapped area is essentially underlain by gneiss types slightly foliated

Granite which can be differentiated into three distinctive types namely:

1. Fresh to slightly Kaolinized Granite cut by greisen and minor Quartz.
2. Strongly Kaolinized Granite.
3. Strongly Kaolinized and Greisenized Granite cut by Quartz and Greisen zone.

The first is mainly restricted to the southern part of the grid, between 5+00 S to the limit and can be followed well south of the gridded area.

The main area of Greisenized, Kaolinized Granite is located between 3+00 W and 0+ 50 E, disappearing under silcrete at about 4+00 N.

Greisenization is expressed as an increase of mica within the Kaolinized Granite as small Greisen veinlets varying in thickness from several feet to a fine coating along joint planes or fracture planes.

The large Greisen veins change in colour from a dark nearly blackish green to a light colour. The colour change is also associated with an increase of Quartz present or a complete change of part of the Greisen veins to Quartz reefs. This change takes place in a northerly direction and appear to be associated with the increase of kaolinization in the same direction.

A second less defined, because of poor exposure, Greisenized, kaolinized zone is exposed at 12 + 00 N, 7 + 00 E. At this locality Greisen has been found as small narrow veinlets along joint planes or associated with Quartz reefs.

Thin section of three samples taken of the kaolinized Granite at Mt. Mitchell and approximately 1 to 2 miles north-north east of Mt. Mitchell indicate that:

1. The kaolinization could be of hydrothermal origin.
2. That the sample from the northern locality are essentially Gawler Range Crystal Tuff or Porphyry completely kaolinized.

Since the Greisenization and presence of Quartz reefs and Greisen veins give evidence of hydrothermal activity, it is thought that the Granite is the source of the tin mineralization.

The hydrothermal kaolinization of the Gawler Range members suggests that the Granites are younger than the former. This implies that the erosion of the Tarcoola Beds, represented as remnants only, was far advanced before the extrusion of the Gawler Range Volcanics, and an appreciable thickness of the volcanic was present when intruded by the Granites.

Economic Potential:

Surface sampling by Australian Development, consisting of channel and bulk

samples taken from the main Quartz reef give an indicated grade of 1.2% Sn (bulk sample) for the main, 12 foot wide Quartz reef. Samples from the other reefs vary from 0.01% to 0.3% SN.

Assay of Greisen samples give an average grade of 0.2 % Sn.

Check samples taken during the course of the mapping returned values well below the above levels. Although most of the samples were grab or chip samples the difference is too large to be explained by poor sampling only. The highest values obtained, was of a sample taken returning 1.2% Sn., the sample assayed 800 ppm Sn.

Three of the six diamond drill holes put in by Australian Development, were relocated namely DDH 1, 3, and D.D.B. 4. According to the logs obtained, none of these holes intersected the main Quartz reef. Assay results are surprisingly high, considering that only small Quartz reef or Greisen veins were cut and the bulk of the assayed core was kaolinized Granite. If these assays are considered to be valid, then tin mineralization has to be associated with the small Greisen veinlets following joint planes and within the kaolinized Granite itself.

For assay results see sheets appended.

More detailed sampling and drilling will be necessary to clarify the difference in assay results.

The tin bearing zone can be traced for a total length of approximately 1300 feet and has an indicated width, assuming that more Quartz and Greisen veins occur between the two zones, of 250 feet.

The northern extension is covered by Silcrete.

A third Quartz-Greisen zone is indicated at 12 N, 8 E is a possible extension of the Greisen veins outcropping at 8S 3E. This is substantiated by large areas of Quartz float material in the intervening area. Further geochemical sampling by the former operator indicates a tin anomaly in this area.

Conclusion and Recommendation:

1. The area map is underlain by Granite which exhibits definite strong kaolinization increasing in intensity to the north.
2. A definite Quartz reef and Greisen zone is associated with the most intense kaolinization.
3. Three zones, carrying tin values are indicated.
4. Sampling done by Australian Development returned high assay results which have not been duplicated by samples by the writer.
5. Assay results, obtained from drill holes, by the former operator are also high.

6. To check the discrepancy between the assay result the following program is recommended:
 - a. Cleaning of all trenches and opencuts.
 - b. Detailed channel sampling.
 - c. Obtain bulk sample from main Quartz reef.
 - d. Check drilling across the whole width of known zone.
7. If the results from the above are favourable then a detail exploration program to evaluate all Quartz reefs in the area, trenching and prospecting to located further possible tin bearing zones will be necessary.

Respectfully submitted,

F. HOLCAPEK, Geologist.



A P P E N D I X

Diamond drill core assay from bulked core samples, by Australian Development N.L.

DDH No.	Footage	Sample description	% Sn.
1	2.5 - 25 ft.	Kaolinized Granite	0.17
1	30 - 48 ft.	Greisen	0.20
3	0 - 43 ft.	Kaolinized Granite	0.26
3	43 - 47 ft.	Greisen	0.27
4	0 - 26 ft.	Kaolinized Granite	0.28
4	26 - 35 ft.	Greisen	0.24

DETAILED GEOLOGICAL REPORT

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MT. MITCHELL - TIN DEPOSIT

for

ABADON HOLDINGS N.L.

INTRODUCTION:

SML 681, located in the Glenloth Area was taken out by Abadon Holdings N.L. during March 1972.

Regional mapping of the area, completed in 1971, indicated that the possibility of finding further tin bearing Quartz-Greisen veins exists.

The purpose of this report is to elucidate the geological structure and setting of the Mt. Mitchell tin prospect and to recommend an exploration program for the area.

LOCATION AND ACCESS:

SML 681, encompassing an area of 86 square miles, lies approximately 30 miles west of Kingoonya along the western shore line of Lake Harris.

Access to the lease from Adelaide is via sealed Highway to Port Augusta and from there via the Sturt Highway to Kingoonya, a distance of 450 miles.

From Kingoonya the Yerda outstation track passes through the middle of the lease area, a distance of approximately 30 miles.

Numerous old tracks traverse the area and make access by four wheel drive vehicle easy to any point within the lease.

HISTORY:

At the turn of the century gold has been found in the Glenloth region and the first claims were pegged in the area. Mining commenced shortly on narrow Quartz reefs cutting the Granite. Numerous open cuts, shaft and underground workings in the area date back to this period.

Total gold production from this region was small.

Australian Development took out a lease during the middle sixties and investigated the tin occurrences on Mt. Mitchell and South Lakes. The work conducted consisted mainly of soil sampling, scintolometer survey, opencutting and 6 short diamond drill holes. During this period the whole

MINERALOGICAL REPORT

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ROCKS FROM KINGOONYA

Sample G2. - in contact
stressed-sericitised graphic pegmatite.

Large optically continuous orthoclase grains are intergrown in graphic fashion with elongate, parallel-oriented and commonly optically continuous quartz individuals. There are small amounts of muscovite, but essentially this is a pegmatite with a eutectic (graphic) texture.

The manifestations of stress are in the optical strain within the quartz, and in the widespread sericite within the orthoclase.

Sample M1. - Mt. Mitchell
kaolinized granite

This is an example of fine-medium grained potassic granite which has been completely kaolinized.

All of the orthoclase was converted to fine crystalline aggregates of kaolin throughout which the original intergranular quartz, and the muscovite, are still distributed at their original sites.

The muscovite was only partly altered to sericite. The strain phenomenon in the quartz indicates that the original granite was somewhat stressed.

There is no evidence that mineralisation was incident with the kaolinization.

Sample M2. - Road to Kingoonya
kaolinized porphyry or acid tuff?

The texture of this rock contrasts strongly with that of M1. The main mass of the rock is microcrystalline kaolin amongst which there are minute relic chloritised micas and quartz, as well as sparse, relatively large embayed quartz euhedra, and the amorphous brown masses referred to below. The large quartz grains appear to have been phenocrysts in a former microcrystalline felspar-rich, quartz-mica-bearing groundmass. These textures are thus suggestive of kaolinized porphyry.

However, considering also the amorphous masses, the broad aspect of the rock structure is indicative of acid tuff which was in part vitric. Irregularly elongate, and variably lobulate masses of darker coloured, slightly brown, amorphous clay-like material are dispersed with some degree of common stratification through the microcrystalline kaolin. These masses have the appearance of kaolinized devitrified glass fragments, and since some contain

MINERALOGICAL REPORT (CONT.)

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significant amounts of microlitic opaque mineral, the conclusion is that they may represent former shredded or shard-like bodies of volcanic glass.

The latter conclusion is further supported by the shard-like form of much of the finer quartz which is distributed amongst the microcrystalline kaolin. The occasional large quartz euhedra would on this basis be regarded as stray crystal fragments incorporated in the tuff.

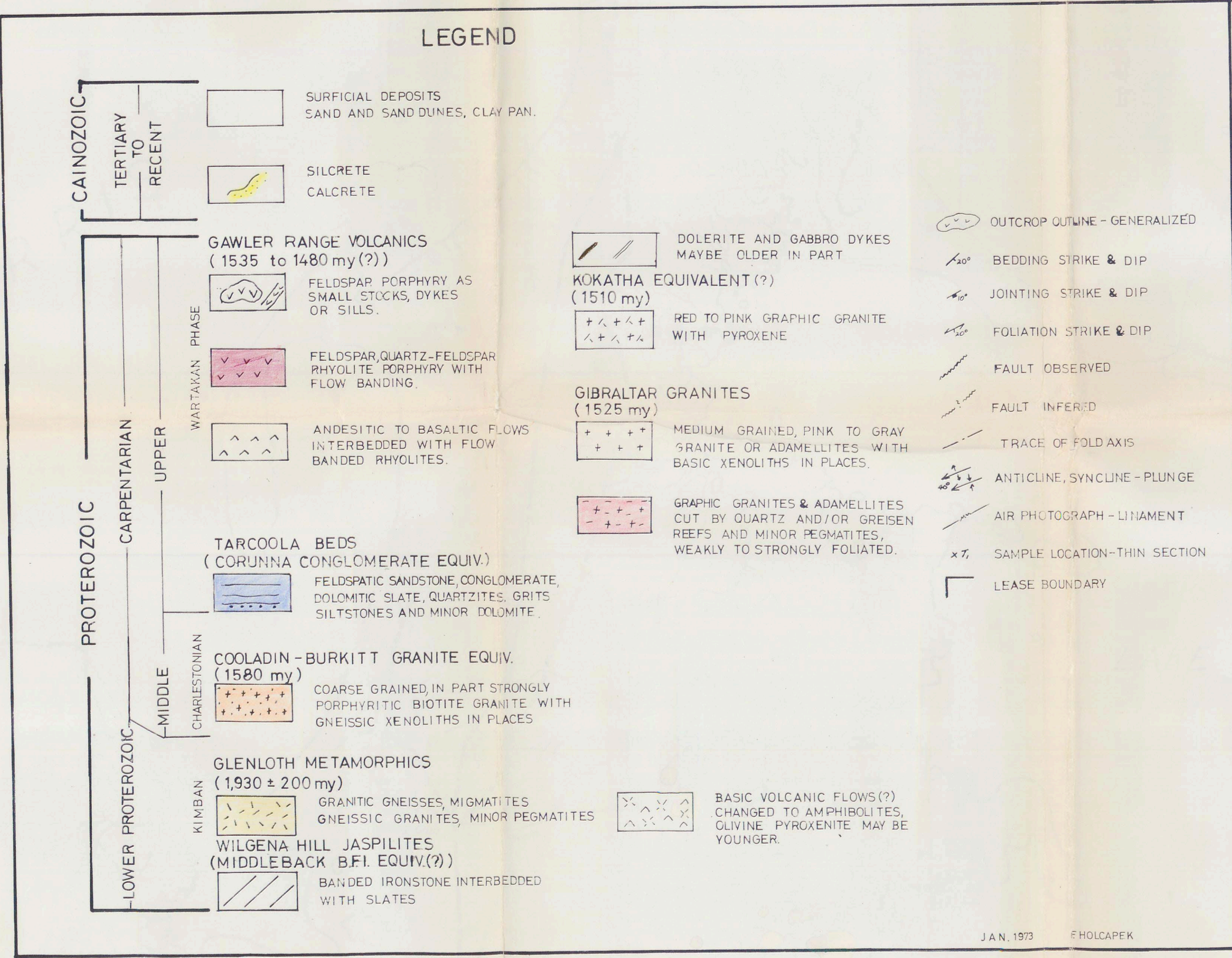
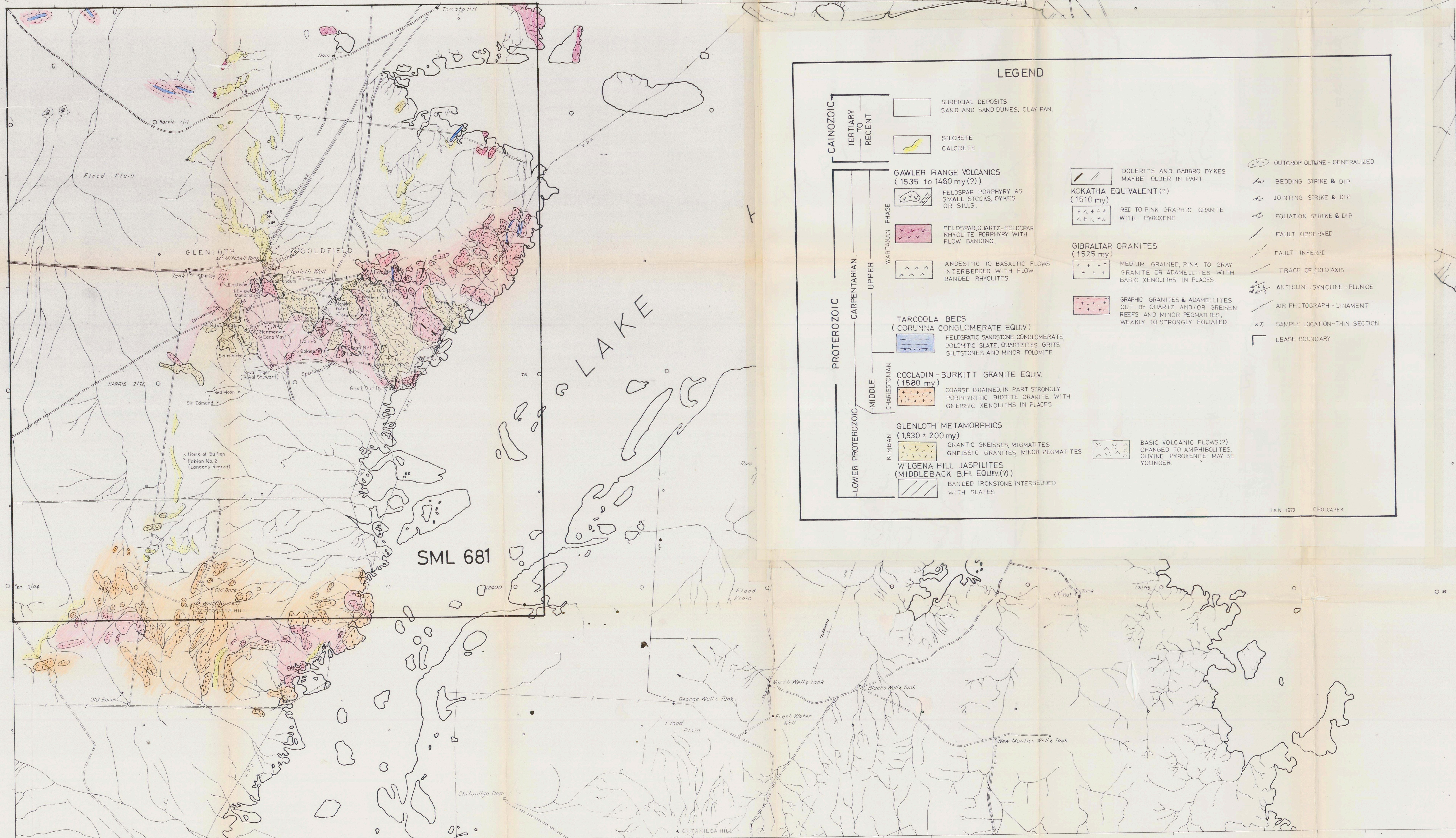
It should be noted that the so-called Gawler Range Porphyry has been shown to include both porphyries and tuffs.

Sample M3. - Road to Kingoonya
kaolinized acid tuff

The appearance of this sample in hand specimen is similar to that of M2. This is also a better example of kaolinized part-vitric tuff since it lacks the presence of stray crystal fragments.

In other respects the rock is essentially similar to M2, i.e. it contains altered brownish devitrified glass as well as numerous small shard-like quartz fragments within the microcrystalline kaolin medium.

KINGOONYA

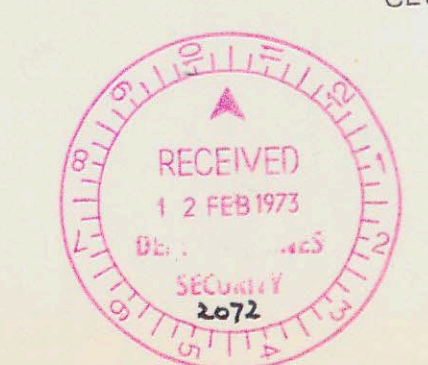


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ABADON HOLDINGS N.L.
REGIONAL GEOLOGY

GEOLOGY BY: F.H. DRAFTED BY: F.H.
DECEMBER 1972

KOKATHA



HARRIS

60 CHAINS TO 1 INCH.

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ENV 2072-1

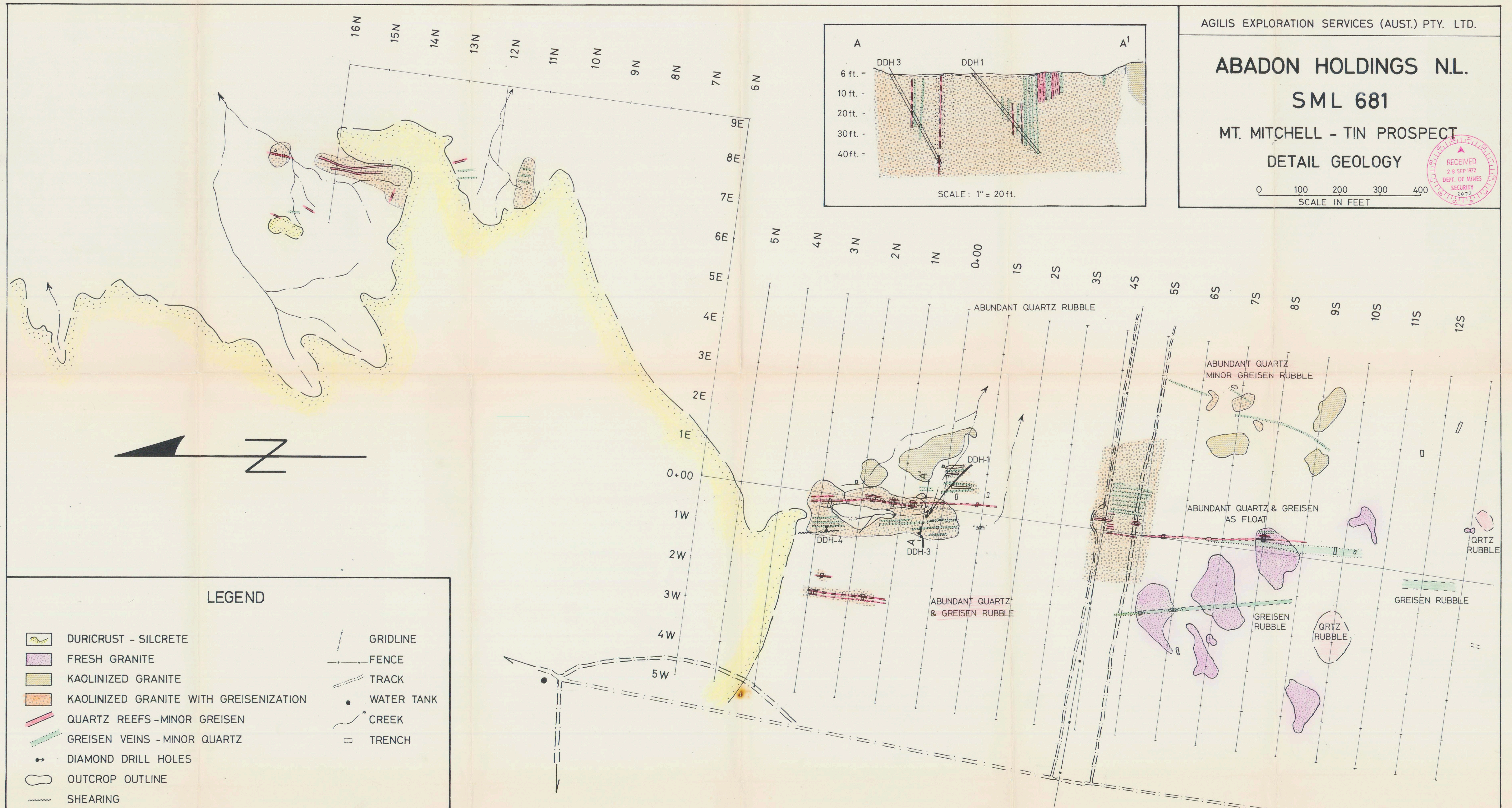
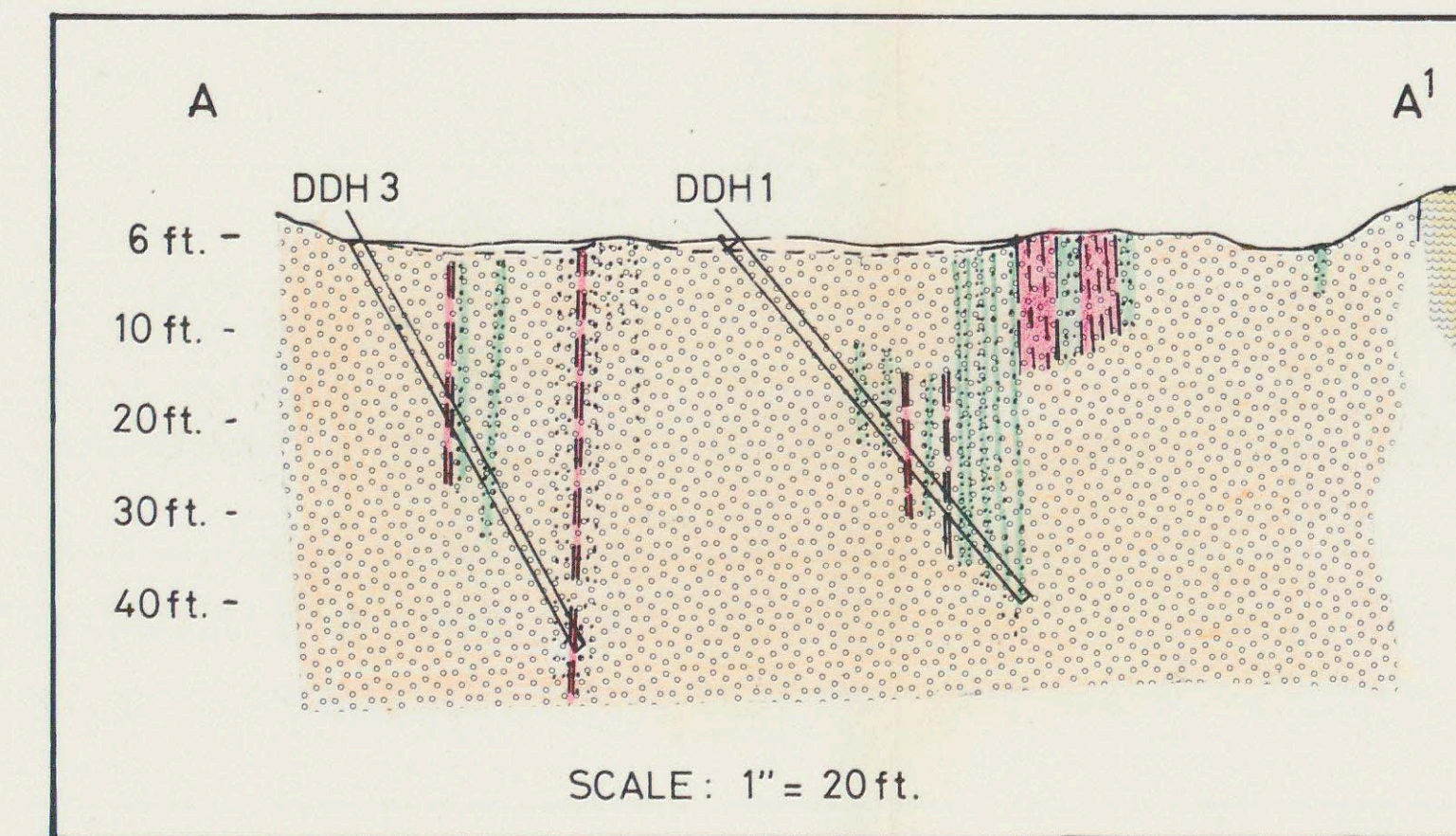
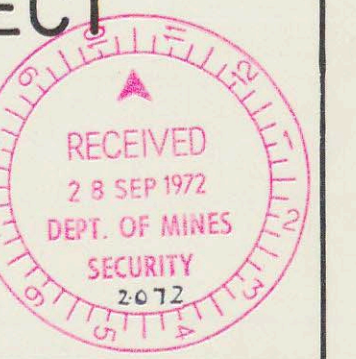
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SML 681

MT. MITCHELL - TIN PROSPECT

DETAIL GEOLOGY

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SCALE IN FEET



LEGEND

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|--|----------------------------------------|--|------------|
| | DURICRUST - SILCRETE | | GRIDLINE |
| | FRESH GRANITE | | FENCE |
| | KAOLINIZED GRANITE | | TRACK |
| | KAOLINIZED GRANITE WITH GREISENIZATION | | WATER TANK |
| | QUARTZ REEFS - MINOR GREISEN | | CREEK |
| | GREISEN VEINS - MINOR QUARTZ | | TRENCH |
| | DIAMOND DRILL HOLES | | |
| | OUTCROP OUTLINE | | |
| | SHEARING | | |

ENV 2072-2