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DEPARTMENT OF MINES.

South Australia

NORTH-EAST URANIUM EXPLORATION

EXPLANATORY NOTES

TO ACCOMPANY

MINERAL MAP OF THE CROCKER WELL AREA.

By

D. KING
GEOLOGIST.

REPORT No. C.W. 15
G.S. 11

S.R. 11/1/70.

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FOREWORD.

Uranium occurrences have now been found over extensive areas of outcropping Archean granitoid rocks and migmatites in the Crocker Well area, approximately 40 miles north-west of Olary in the north-east of South Australia. The South Australian Government Mines Department commenced mineral exploration in this area in December, 1951, following the discovery of uraniferous deposits by air-borne scintillometer survey, and since that time the interest in the area as a source of uranium and rare earth minerals has gradually expanded. An extensive ground prospecting survey of the district surrounding the original Crocker Well deposit was initiated in October, 1953.

This report contains a complete record of the mineral occurrences found up to 2/2/'54 during a period of about three months field work. It also contains notes on the nature of uranium mineralisation in the area.

ACKNOWLEDGMENTS:

Geological survey parties supported by prospectors, undertaking systematic regional and detailed exploration work, have been responsible for the finding of a large number of uranium occurrences. The regional geological work has been the responsibility of Dr. B. Campana and the detailed mineral studies of the writer. The Departmental prospectors, J. Johnson, T. Antmanis and H.E. Campana, under geological guidance have been responsible for a large number of the discoveries made in the area.

Mineralogical reports included in the text were prepared by the Departmental Petrologist (A.J. Whittle), and the project as a whole is supervised by L.W. Parkin, Senior Geologist of the Uranium Section.

PLANS:

The mineral map accompanying this report (US - 272) was prepared from enlarged aerial photographs covering Plumbago and Glenorchy Military Sheets which were also used in the field as base locality maps. Reference letters and numerals have been allotted to each mineral occurrence for recording purposes, and indicate the prospector's initials and serial number of the mineral locality and sample. The letter L indicates mineral localities from which no samples were collected. Areas with sufficient mineral concentration to warrant further investigation are listed separately under the title of prospects.

Other plans referred to in this report are available from the Security Registry.

TYPES OF MINERAL DEPOSITS:

The Archean rocks of the Crocker Well Province consist of boldly outcropping granite intruding metamorphosed and granitised sediments. They have been sub-divided by Campana (S.R. 11/2/58) into the Central Facies of massive granite - embracing the batholothic core or mobilised granite, the Marginal Facies of migmatite, granitic sills and pegmatites, and the metasediments of the Kalabity Series.

Mineralisation is widespread, particularly in regard to uranium and rare earth minerals, and copper, and is generally confined to the Marginal Facies or migmatite zones in the Archean rocks. The deposits are mostly small, with a sporadic distribution, and in all cases appear to have been syngenetic with granite emplacement.

The uranium and rare earth minerals are of late magmatic or migmatic origin, occurring mainly as segregations in pegmatite and as fracture fillings in the parent rocks. They are dominantly oxides, which are characteristic of high temperature formation, and are now exposed as the result of deep dissection of the Archean rocks. Except for apatite-$Ca_4(CaF)(PO4)_3$ - and fluorite - CaF_2 -, there is a notable deficiency in minerals rich in volatiles such as tourmaline or beryl. The deposits lack regular localisation controls, and in many respects the type of mineralisation resembles that of cassiterite in granitic rocks, both having formed at a late stage of magmatic cooling in pegmatites and fissures when the parent rock was largely consolidated.

A remarkable variety of minerals have been identified (see Table I) but in a general way they fall within two distinct paragenetic associations characterised by the presence of either of the highly titaniferous minerals davidite or absite.+ Both are widely distributed - particularly davidite - but they rarely occur in association.

Davidite mineralisation is found almost exclusively as coarse pseudo-crystalline aggregates in pegmatite or pegmatitic quartz veins along with magnetite and rare earth minerals including fergusonite, polymignite, xenotime, euxenite and orthite. These are normal pegmatite deposits, and probably formed at temperatures between 600°C and 800°C.

\+ A new mineral species resembling brannerite.

CROCKER WELL URANIUM FIELD

TABLE I

URANIUM AND RARE EARTH MINERALS

MINERAL	COMPOSITION	% U_3O_8
Absite	Uranium, titanium, rare earth oxides	32
Betafite	Uranium columbate	15.27
Britholite	Silicate and phosphate of cerium and calcium	0.1
Brannerite	Uranium titanium oxide	40.45
Davidite	Iron, titanium, uranium oxide, with rare earths.	4.10
Fergusonite	Rare earth columbate	0.8
Gummite	Chiefly uranium oxide	40.80
Euxenite	Rare earth titanium columbate	1.20
Monazite	Cerium and rare earth phosphate	0.1
Orthite (Allanite)	Silicate of aluminium, calcium and iron, with rare earths.	0.1
Polymignite	Niobate and titanate of cerium, iron	0.1
Samarskite	Rare earth columbate	9.18
Samiresite	Niobate and titanate of uranium	22
Torbernite	Phosphate of copper and uranium	60
Uraninite	Uranium oxide	65.85
Uranophane	Calcium uranium silicate	65
Xenotime	Yttrium phosphate	trace
Yttrocrasite	Titanate of yttrium and thorium	trace

Absite mineralisation is essentially in the form of disseminated fracture fillings found only in a leucocratic phase (adamellite) of the granitoid rocks. Absite usually occurs in intergrowth with granular rutile and in association with biotite, apatite and blue opalescent quartz, and the paragenetic sequence in all observed exposures is clearly biotite-apatite followed by quartz and rutile-absite.

The sporadic distribution of the absite in tight discontinuous fractures indicates the extreme mobility of the mineralising solutions or gases, and these deposits are regarded as of pneumatolytic or hypothermal origin (400° C. - 600° C).

Copper mineralisation is developed along some major shear zones formed during granite emplacement, and in places (Mt. Victoria Mines) appears to be genetically related to basic rocks intrusive into these structures. In the Ethiudna mining area, mineralisation is localised by the presence of calc-Silicate metasediments in deposits which are clearly of pyrometasomatic origin. Fluorspar is common to each of the cupiferous lodes, and gold, copper, graphite and scheelite are locally found in association with copper.

Present evidence does not indicate any close relationship in the distribution of copper and uranium minerals, although they are both believed to be syngenetic with the granite, and of Archean age on account of their absence in overlying Proterozoic Adelaide System rocks.

I. THE GRANITOID ROCKS AND THEIR SIGNIFICANCE IN MINERALISATION CONTROL

The role of the granitoid rocks as the primary source of the uranium and copper mineralisation in the Crocker Well Field is apparent from the pegmatitic and pyrometasomatic nature of the deposits. The knowledge of this relationship serves as a useful guide in regional-scale planning of areas worthy of detailed prospecting, but is of limited significance in regard to the localisation of economically important deposits. The most important aspect in this connection is the restriction of certain types of mineralisation to particular phases of the granites.

The granitoid members of the Complex vary considerably throughout the area. Three distinctive facies of the intrusive rocks have been identified on the basis of field appearance and petrographic data, and each appear to be characterised by different mineral associations. There is positive evidence in some places of successive intrusions, but generally changes in the granitoid rocks are gradational and it is tentatively assumed that they are each phases of the one period of granite emplacement.

Present knowledge concerning the varieties of the granitoid rocks and their respective importance in relation to mineral localisation is outlined below. They are discussed in probable chronological order:-

(a) Grey Mafic Granodiorites

Type Locality - Crocker Well East (Plan US-207). Also exposed at Crocker Well workings, and near Mt. Victoria Mine camp.

Petrographic Description - Rock sample 1592. Crocker Well East. Granodiorite, consisting of albite-oligoclase, quartz, biotite, microcline and magnetite. Accessory apatite, zircon and ilmenite.

These rocks occur in close association with basic metasediments and migmatites, into which they are often transitional.

They are commonly found as xenoliths in adamellite, and at Crockers East an extensive elongated body of mafic granodiorite is intruded by dykes of adamellite. (Coords. 4760N, 4930E). Foliation due to ENE shearing is usually intense.

There are no known uraniferous minerals associated with the mafic granodiorites.

(b) Adamellites

Type Locality - Crocker Well Workings and Crocker Well East. (Plan US-120, & US-207). Regional distribution throughout the Plumbago-Glenorchy Archean complex, but particularly extensive near Crocker Well.

Petrographic Description - The main mineral contituents are potash felspar and sodic plagioclase, in equal proportions, abundant pale blue quartz, and unusually small amounts of biotite.

This group consists of medium-grained light-coloured rocks of uniform macroscopic features, and which were named adamellite by the Departmental Petrologist on the basis of their composition. They are normally considerably broken due to the combined effects of close jointing and a persistent NE - SW shear foliation, and characteristically form low and deeply weathered outcrops.

The adamellites are consistently the host rocks for the widespread biotite-absite fracture fillings peculiar to the Crocker Well Field. Recent new discoveries of this form of mineralisation have confirmed the original hypotheses (Report C.W.5) that the most extensive absite deposits are developed in fractured or brecciated adamellite near or within defined NE - SW shear zones, and that sporadic small scale absite mineralisation in fractures of varied origin is a feature common only to this group of rocks. The absite occurs frequently in association with pegmatitic veinlets of the adamellite, described in previous reports as albite pegmatite (Report C.W.5) and the evidence appears conclusive that the

mineralisation was a late stage introduction of volatiles rich in rare earths immediately following emplacement, cooling and fracturing of the main mass of adamellite.

Apart from the close affinities of adamellites and uraniferous mineralisation described above, other prospects in the Glenorchy area has indicated similar genetic relationships of these rocks to a wider variety of uranium minerals.

At the Windamerta Hill South prospect (Map US-248) Samiresite is localised in small fissures along a narrow belt of fractured and sheared migmatites, which are intimately associated with and intruded by adamellite. The abnormally radioactive zone is directed at an oblique angle to the bedding foliation of the migmatites, and is intersected by an elongated body of porphyritic granite of regional type. The porphyritic granite is clearly of post-mineralisation age, and the uranium is therefore considered to have been introduced during a late stage in the emplacement of the older adamellite intrusives.

The Spring Hill Prospect (Map US-267) consists of davidite-ilmenite and quartz veins of a pegmatitic nature occurring sporadically throughout highly fractured migmatite. Granitoid rocks which intrude the migmatites are exclusively of the adamellite type.

(c) <u>Regional Porphyritic Granites</u>

<u>Type Locality</u> - Ethiudna Hill and foothills. Also exposed at Crocker West Davidite Prospect (Plan US-227) and Windamerta Hill South Prospect (US-248), and is generally widespread throughout the region.

<u>Petrographic Description</u> - Sample from adjacent shear zone south of well. A coarse-grained massive rock with phenocrysts of orthoclase, microcline-perthite, and occasionally plagioclase. There is abundant biotite showing weak parallel lineation, and strained interstitial quartz.

The term regional porphyritic granites is applied to the granites of the Central Facies of Campana (Report S.R. 11/2/58) which outcrop boldly to form the most prominent hills in the district, including Ethiudna Hill and Mr. Victoria. The exposures are massive, and weathering has produced distinctive types of outcrop characterised by bare-exfoliated surfaces and tor structures.

At Windamerta Hill (Map U3-248), an elongated body of porphyritic regional type granite intersects mineralised adamellite.

No uraniferous or rare earth mineralisation has been isolated in the massive outcrops of regional type granite, although it has been noted that they normally show a consistently higher background radioactivity than the surrounding country rocks. Pegmatites at the periphery of large masses of regional type granite commonly carry rare minerals of which davidite is most typical. These pegmatites are regarded as marginal and exterior apophyses of the regional porphyritic granite which were extruded at a late stage of consolidation. They are described in the succeeding section.

(d) Pegmatites

Pegmatite dykes and segregations are widespread throughout the Archean Complex. Most are composed entirely of feldspar and quartz, others carry considerable amounts of rutile and magnetite, and a minority contain segregations of a variety of uraniferous and rare earth minerals.

At this stage the pegmatites have not been studied in any detail, but it is generally true that they are all similar in texture, and composition of their major constituents, and characteristically occupy fractures caused by shearing or jointing throughout the major rock units of the complex. They post-dated consolidation of the major phases of the granite and are probably of the one generation representing late magmatic segregations of the regional porphyritic granite.

The common mineralogy of the uranium and rare earth bearing pegmatites indicate that they are certainly of the one class genetically. The following list of mineral occurrences is representative of those commonly found in this environment.

Locality Reference	Description
JJ 13	Fergusonite, polymignite and apatite.
TA 4	Davidite, fergusonite, xenotime, orthite.
JJ 14	Polymignite, xenotime, monazite, orthite.
JJ 21	Davidite, xenotime.
JJ 25	Polymignite, monazite, xenotime.

2. STRUCTURAL FEATURES IN RELATION TO MINERALISATION CONTROL:

The uranium minerals do not occur as true accessory constituents of the granites, but either in pegmatitic apophyses or disseminations in fissures of a variety of types within the granite or adjacent country rock. There are locally concentrations of fracture infillings in favourable structural environments such as shatter zones, and although the controlling structural features are irregular in nature and distribution, they have an important bearing on the localisation of commercially interesting uranium deposits in the area. This applies particularly to zones of regular fissuring caused by shearing.

The shear systems in the Crocker Well district have been mapped in considerable detail (Plan US-272) and has been found to consist of the following major components:-

(a) A general shear foliation in a W.S.W. - E.N.E. direction throughout the adamellites, grey granodiorites and migmatites of the complex generally. The stress effects are widespread, but inconsistent in intensity due to variations in the competency of the rocks affected.

(b) A set of narrow defined shear zones intersecting all

(b) cont. the main types of granitoid rocks in a W..W. - E.S.E. direction. (Some are nearer N.W. - S.E.). These include the main Crocker Well Shear, along which the access road to the camp is constructed.

(c) A complementary set of shear zones to those described under heading (b), which are directed N.E. - S.W.

Present evidence indicates that the general shear foliation (a) was syngenetic with the emplacement and cooling of the adamellite granites, and played an important role in controlling the distribution of absite mineralisation. On the other hand, the 2 sets of defined shear zones (b) and (c) are not known to bear any relation to uranium mineralisation - although they are important in localising copper and gold deposits - and may be of younger generation, and perhaps a consequence of the emplacement of the last phase of intrusion by regional porphyritic granites.

(a) <u>Crocker Well Field - Absite Mineralisation</u>

The local concentration of absite in breccia and fractures zones in adamellite was first recognised from the results of detailed mapping of the original Crocker Well field (Report C.W. 1). At this deposit the adamellites in and adjacent to the radioactive area show shearing in a E.N.E. and N.E. direction, and several narrow zones of intense shearing intersect the otherwise massive outcrops at the north and north-eastern margin. Towards the central mineralised zone, these shears become less regular in orientation and gradually merge into an area of irregularly shattered and brecciated adamellite. The absite is largely confined to the interstices of the brecciated rocks, and smaller amounts of sporadic mineralisation are found throughout the more extensive area of partly fractured adamellite surrounding the breccia.

The concentration of uraniferous values in the brecciated rock at this deposit was proven by diamond drilling operations.

At Crocker Well East, exploration work completed to date has indicated that the absite occurs as fracture fillings within stressed adamellites. The greatest concentrations appear to be localised at the eastern termination of strong E.N.E. shear zones, where the absite is found in interstices between shear foliation planes, and in strongly developed close joints directed N.N.W. - S.S.E. This jointing at right angles to the shear foliation is common throughout the area, and appears to be due to tensional effects complementary to the shearing.

Broadly speaking, the absite deposits are lenticular in shape, and directed E.N.E. parallel to the regional shear foliation. They are arranged en echelon along an E - W. zone extending for several miles, in which the granitoid rocks are almost exclusively stressed adamellites.

(b) Windamerta Hill South (Plan US-248)

Davidite mineralisation is developed sporadically in fractures along a linear structure trending E.N.E. This direction is parallel to the general strike of the shear foliation in the adamellite and migmatite country rock, and is oblique to the bedding foliation of the metasediments and migmatites.

(c) Spring Hill Prospect (Plan US-267)

Coarse davidite - ilmenite occurs as irregular pegmatitic veins in strongly fractured and highly decomposed granitoid rocks. The fractured and mineralised area is irregular in shape, and has no particular orientation. The country rock is adamellite and migmatite, in which the shear foliation is consistently E.N.E. to N.E.

(d) Copper, Cobalt and Gold Mines

There are three old mining areas in the district, namely the Mt. Victoria copper-gold mines, the Ethiudna cobalt-copper mines, and the Plumbago fluorspar (copper) mines. Each are lode type deposits occupying faults or shear zones in the Archean rocks, and mineralogical features common to each - particularly a close association of copper and fluorite - are sufficient to consider them as members of the same metallogenetic province.

The Mt. Victoria Mines are located along 2 major intersecting shear zones cutting massive granitoid rocks. The shears are orientated N.W. - S.E. and N.E. - S.W., parallel to the major shear systems of the complex generally. The lode minerals are copper (Chalcopyrite, cuprite, malachite, azurite and boleite (?)), gold, hematite, magnetite, pyrites, and tremolite, calcite and rutile.

Ethiudna Cobalt - Copper Mines - The lodes in this area are found in quartzite and granite, in close proximity to a highly metamorphosed calcareous sedimentary horizon (altered limestone?) consisting mainly of calcite, tremolite, scapolite, and small amounts of scheelite. Faulting in the vicinity of the workings is directed E.N.E.

The main lode minerals are copper (chrysocolla, cuprous asbolane (?) chalcopyrite azurite, malachite), pyrites, colourless fluorite, graphite, apatite, orthoclase, cobaltite, smaltite, erythrite and traces of nickel, calcite and calc-silicates garnet, scapolite, tremolite, diopside and idocrase.

Plumbago Fluorspar - Copper Mines - The mineralisation is restricted to 2 sets of intersecting faults trending N.W. - S.E. and E. - W., carrying purple and colourless fluorspar in close association with copper sulphides and shear quartz.

Except for a local anomaly in the main lode at the Ethiudna workings, the cupriferous lodes are not usually abnormally radioactive, and do not appear to be related genetically to the uranium mineralisation of the area.

3. SEDIMENTARY ROCKS IN RELATION TO MINERALISATION CONTROL.

In his previous reports (S.R. 11/2/56 and 11/2/58) Dr. Campana has suggested an important role of metasediments in controlling mineral localisation. Substantial evidence has been put forward to indicate that in the adjecent area of the Kalabity Military Sheet, a persistent epidote-quartzite horizon provides a favourable host rock for copper mineralisation. This association is real, suggesting that these ore bodies are localised by chemical affinities, but may be one arising from the relative competency of the particular sedimentary beds, and the consequent development of fissures during folding and faulting which were suitable for access by mineralised solutions.

The cupriferous deposits of the Crocker Well area are essentially of the fracture-fill type, and there is no evidence of any sedimentary horizon being common to all of the deposits. At the Ethiudna cobalt-copper mines, however, certain of the lodes are found to closely follow a calc-silicate metasedimentary horizon which has obviously played an important role in precipitating the ore minerals as a pyrometasomatic deposit, and local dissemination deposits of primary copper and cobalt minerals are present as

replacements in the calc-silicate rocks - for example, at the newly discovered Ethiudna East cobalt prospect.

D. King

(D. KING)

GEOLOGIST.

DK:BK
4/2/54.

L.1.	Absite	In coarse granite (adamellite) See TA 14 for locality sketch.
L.2.	Davidite(?)	Floaters and pink pegmatite. High counts. See TA 14 for locality sketch.
L.3	Absite	Single crystal in adamellite.
L.4	Absite Biotite	Joints 80° W. of N., dip 80°S, in massive adamellite. Absite-biotite clot in joint
L.5.	Absite	Crystals of accessory absite in massive adamellite.
L.6.	Absite	Crystals of accessory absite in massive adamellite.
L.7.	Absite	Alluvial absite in shear zone. See T.A. 12 for sketch.
L.8.	Absite	Absite in fractured adamellite, with biotite Schist. See T.A. 12 for sketch.
L.9.	Absite	Alluvial absite. See T.A. 12 for sketch.
L.10	Absite	Alluvial absite amongst massive adamellite.
L.11.	Absite	Absite in adamellite with clusters of black rutile and thin white quartz veins at 35° E. of N.
L.12.	Absite	Absite in adamellite with quartz veins together with veins and clots of biotite. Slight shear, approx. 30° E. of N.

Absite-biotite mineralisation in fractured adamellite.

L.13.	Absite	Slight crack 4" long with absite clot in massive adamellite.
L.14.	Rutile Absite	In cracks as clots in massive adamellite.

L.15.	Absite	Coarse bronze biotite (radioactive) adjacent massive adamellite.
L.16.	(?)	Radioactive detrital. Small amount associated with adamellite and abundant biotite clots and rutile.
L.17.	Absite	Detrital. Small quantity.
L.18.	Absite	In adamellite within 150 yards of east line of Crocker Well - east grid.
L.19.	Absite	Detrital. Alluvial absite in soil and crystals of absite in large float boulders of adamellite. Mainly on western slopes of gully.
L.20.	Absite	Hole dug and absite found in rock - located 46 yards bearing 30° to 4400N : 3400W. Rocks in this spot are very much out of phase. It is a partly digested fine banded metasediment as xenoliths in leuco-adamellite. Banding in xenoliths shows no common orientation.
L.21.	(?)	Hole dug in alluvium near adamellite. Located 20 yds. south of fence running E.W. In broken zone of outcrop. Radio-activity high but mineral not seen as it is too difficult to dislodge boulders.
L.22.	(?)	Mineral unknown. Counts up to 200 c.p.s. on face of an adamellite outcrop. May be edge of a pegmatite. No specimen.
L.23.	(?)	In 6" wide pegmatite. The mineral is small and is situated in a weathered hole in the rock and is therefore impossible to obtain as a specimen for identification purposes. 200-500 c.p.s. Pegmatite trends S.W. - N.E. and is penetrating regional type granite.
L.24.	Apatite	
L.25.		
L.26.	Monazite	Several detrital small pieces.
L.27.	(?)	In pegmatite. Black highly radioactive with off scale readings. Pegmatite in a massive migmatite outcrop. Direction of pegmatite is parallel to bands of migmatite and trending 250°. No specimen.
L.28.	(?)	Xenocryst in adamellite. Located 70 yds. 50°E. of N. from 4000N : 4200W - Crocker Well East extended base line. Green translucent mineral, non radio-active, hardness approx. 3-4.

L. 29.	Davidite	In quartz in adamellite. Showed green-yellow alteration coat on splitting. Radioactivity low. Located 60 yds. to east of T.A. 18.
L. 30	Ilmenite Davidite	Detrital ilmenite in large pieces. Davidite in adamellite, biotite migmatite gneiss. Located 100 yds. west of L. 31.
L. 31.	Davidite Monazite (?)	In pegmatite rubble. Probably not monazite because of a greenish yellow alteration on surface.
L. 32.	(?)	T.A. reports massive adamellite showing radioactivity. Not checked.
L. 33.		Meta-igneous rock.
L. 34.	Fergusonite Apatite	In a N-S pegmatite which has fragments of dark brown, lustrous mineral (similar to L.35.) embedded in a mass of pale green apatite. A few yards away in a N-S pegmatite another piece of fergusonite type mineral occurs with 1" halo-radioactivity 1000 c.p.s. Apatite is common in pegmatites hereabouts.
L. 35.	Fergusonite	Small pegmatite in migmatite carrying a tabular crystal of a dark brown, lustrous, highly radioactive mineral.
L. 36.	Absite (?) Monazite	Sample L.36/1: Pegmatite with magnetic clot, contains granules of greenish mineral resembling absite but radio-activity only 200 c.p.s. Sample L.36/2: Quartz rich pegmatite near L.36/1 has shed a quantity of coarse monazite (sampled)
L. 37.	(?)	In pegmatite and detrital from pegmatite. The pegmatite has sharp boundaries 3"-6" and in regional granite. Granite in the vicinity gives counts above normal. Samples taken.
L. 38.	(?)	In pegmatite. Small crystal, radio-active (not high). Pegmatite is in adamellite (?). Mineral is embedded in feldspar of border zone. Pegmatite varies in width from 6"-24". North edge of pegmatite shows trace of old sediment. No specimen.
L. 39.	(?)	In small pegmatitic segregation. Country rock is regional granite. Pegmatite contains very small crystals of radio-active minerals. Slightly west and uphill is very large pegmatite now mainly as detrital. This pegmatite contains radioactive biotite clots, which are probably close to wall zone. Large abundant pieces of ilmenite.

L.40.	Radioactive biotite	In regional granite. Biotite centres give 200-300 c.p.s.
L.41.	Euxenite	In pegmatite which is poorly outcropping. Apparently two fairly highly radioactive minerals, one with a lustrous fracture and unaltered, the other alters to a yellow coating. Regional granite. No duplicate sample. Mineral Report: (2/54) Euxenite.
L.42.	Calcio samarskite	In pegmatite. Highly radioactive, brown, lustrous, altering yellow mineral. Tabular habit. Detrital and in situ. No duplicate sample. Mineral Report: (2/54) Calcio samarskite.
L.43.	Allanite	Detrital, (apparently from granite). Columnar structure, conchoidal fracture. 150 c.p.s. Mineral Report: (2/54) Allanite.
L.44.	(?)	Quartz pegmatite with coarse biotite on one side which gave up to 400 c.p.s. Not visited.
L.45.	(?)	Small pegmatite in migmatite. Contains fragments of greenish mineral, radioactivity only 200 c.p.s. Not visited.
L.46.	Copper	Malachite stains in sheared quartz. Strike 210°, dip steep S.E.
L.47.		Dolerite from dyke near Ethiudna Hill. Strike 330°.
L.48.	Ilmenite.	In pegmatite in form of clots. Readings vary from 100-600 c.p.s.
L.49.	Absite (?)	In pegmatite - radioactivity 800 c.p.s.
L. 50.	Monazite (?)	Pegmatite containing granules of a dull brown mineral probably monazite - 200 c.p.s. Sample taken.
L. 51.	Brannerite (?)	Migmatite band, highly folded. Strike E.W., dip steep N. Band contains 6" pegmatite with brown lustrous uranium mineral, brannerite?
L. 52.	(?)	Along joints in regional type granite are small concretions like masses of black silicate mineral. Radioactivity of 200 c.p.s. Counts of 150 c.p.s. are obtained to the S.W.
L. 53.	(?)	Regional type granite (biotised) containing crystals of black thorium silicate with rusty outer coating. Radioactivity of 300 c.p.s.
L. 54.	(?)	Small pegmatite seams in migmatitic granite, contain few fragments of uranium mineral. 1000 c.p.s.
L. 55.	Fergusonite	Very small grains of fergusonite in migmatite close to junction of migmatite

		and massive granite. Pegmatite. Granites show abnormal background at contact.
L. 56.	Fergusonite	Narrow N-S pegmatite in E-W migmatite carrying small crystals 3-4 cms. long of fergusonite. Another pegmatite 200 yds. to east carries very coarse biotite and apatite. One good specimen.

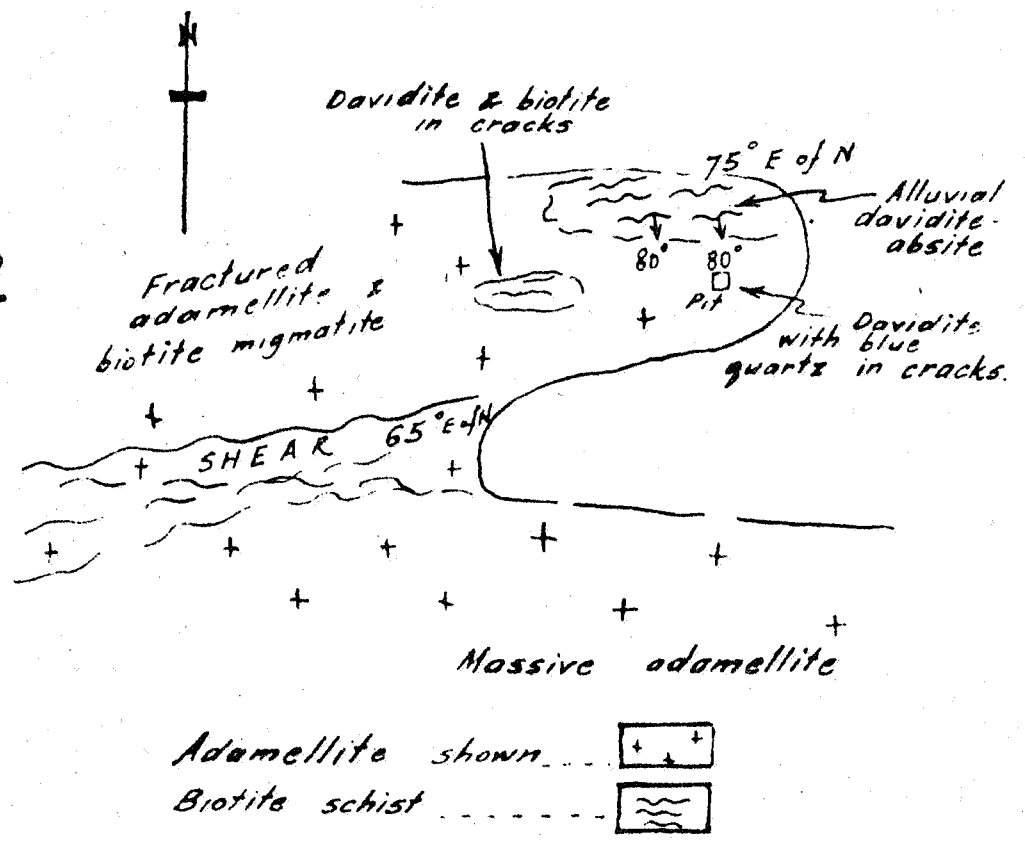
LOCALITY REF.	MINERAL	OCCURRENCE.
B.C. 1	Davidite	Migmatites strike E.W. with numerous parallel pegmatite dykes. Coarse davidite common as crystals in pegmatite and as loose detrital lumps. Stressed granite and migmatite has shear foliation of 65° and usually the pegmatites are intruded along this direction.
B.C. 2.	Davidite	An easterly continuation across flat of B.C. 1. Also pegmatites extend in a belt N. of E. for a few hundred yards to the north on crest of ridge.
B.C. 3	Davidite Uranophane Absite	Across flat west of main Billeroo Prospect, iron formation crops out on same E-W strike. Pegmatite across flat has count of 1000 c.p.s. and is stained by uranophane. Further up rise davidite is found as grains in red aplitic banded meta-sediment, as detritus, and as coarse crystals in pegmatites in granite. See J.J. 22, J.J. 23. Sample Bil. 3 Ex. No. 1: Uranophane in pegmatite Sample Bil. 3 Ex. No. 2: Davidite grains in red aplitic well banded metasediment.
B.C. 4	Davidite	Pegmatite cutting granite with xenolithic streaks of mica schist. Pegmatite carries davidite for its whole length of 120 yards and also in its granite walls. Some davidite is very coarse and much of it contains small masses of highly radioactive absitic mineral. The uranium minerals seem to be concentrated in dark schistose patches where the pegmatite has absorbed xenoliths. Sample Bil. 4 No. 1: Granite walls Sample Bil. 4 No. 2: Coarse davidite Sample Bil. 4 No. 3: Absitic mineral Mineral Report:

LOCALITY REF.	MINERAL	OCCURRENCE
D.K. 1	Davidite Absite(?)	In cracks with biotite and blue quartz

Mineral Report No. 27/53: The dull submetallic black mineral with a subconchoidal fracture consists largely of davidite containing numerous and irregular inclusions of rutile.

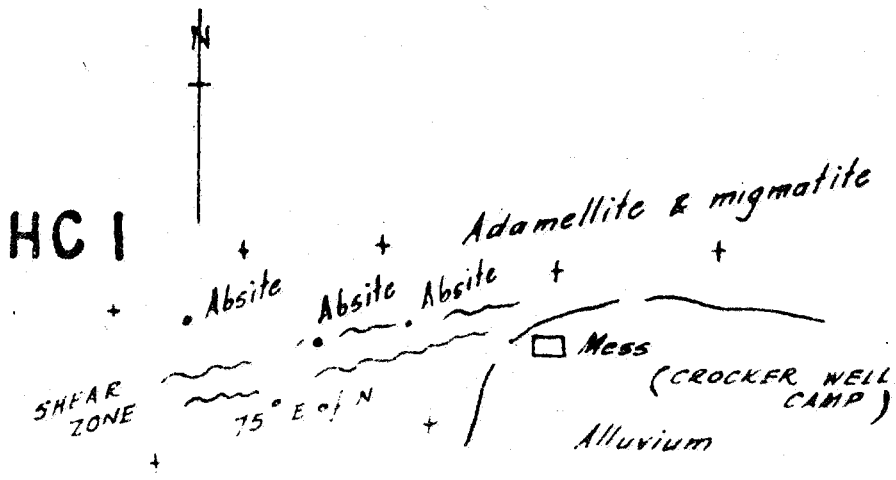
Rad. Assay: 1465 cpm/B9

DK 2



D.K. 2.	Davidite	In coarse biotite from small excavation. White quartz outcrops adjacent and to the west. Fairly massive adamellite boulders also outcropping nearby.
D.K. 3.	Daviditic-ilmenite	See Spring Hill Prospect.

LOCALITY REF.	MINERAL	OCCURRENCE
H.C. 1	Absite	Sheared adamellite in migmatitic zone. Shearing and biotite streaks running 75° W. of S. Absite in cracks (photo). Shears slightly east and running towards camp.



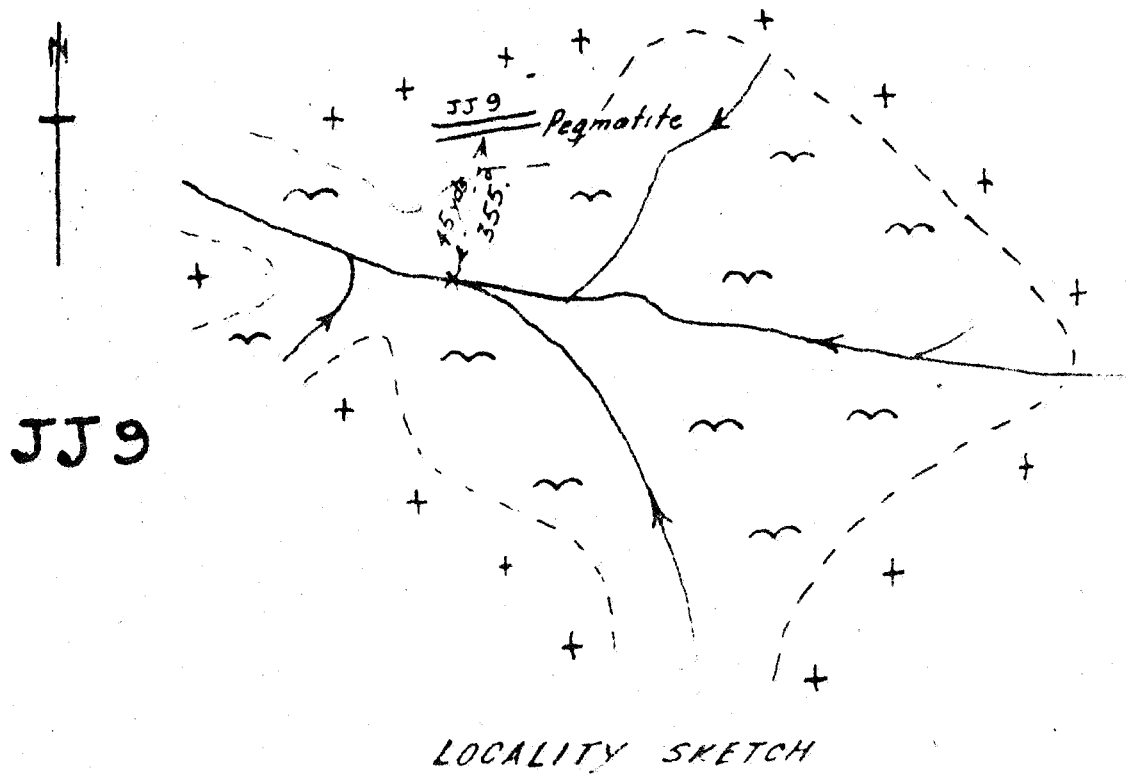
Scale: 200 ft to 1 inch

H.C. 2		Locally highly radioactive point in weathered pothole in granite. Pet. Report No. 128/53 on containing rock. Soda-clase granodiorite, fine-grained. Contains potassic and sodic feldspar, quartz, 5% biotite, accessory magnetite, apatite and zircon. Located at radioactive spot 8000 ft. east of 5000 N, 5000 E.
H.C. 3	(?)	Small xenolith 1' x 1' of hematite. Black rock in regional type granite. Radioactivity up to 200 c.p.s. Sample H.C. 3/1: Radioactive rock
H.C. 4.		See Windamerta South Prospect.
H.C. 5		See Windamerta Hill N.W. Prospect.
H.C. 6	(?)	Radioactivity of 300 c.p.s. in 3 inch biotite band in hybrid gneiss. Cu stained schist float nearby.
H.C. 7	Monazite	Narrow siliceous pegmatite in granite. Radioactivity of up to 1000 c.p.s, due to brown grains of monazite in quartz and in apatite.

LOCALITY REF.	MINERAL	OCCURRENCE
H.C. 8	Torbernite	Massive granite, along wall of pegmatite radioactivity is 1000 c.p.s. Fracturing rock exposes pale green scaley torbernite. Another high of 700 c.p.s. occurs in granite rocks 80 yds. N.
H.C. 9	Fluorite	Found as detritus in rabbit warren excavated in gneissic leuco-granites. Purple and black, non-fluorescent. One small sample.
H.C. 10	Davidite Absite (?)	Mineral submitted by S. B. Dickinson for identification?
H.C. 11	(?)	Pegmatite with radioactive mineral.
H.C. 12	Uranophane	Found by Campana and submitted for examination. 1000 c.p.s.

LOCALITY REF.	MINERAL	OCCURRENCE
H.C. 30	Davidite	A number of coarse detrital davidite fragments.
H.C. 31	Davidite	Detrital davidite.

LOCALITY REF.	MINERAL	OCCURRENCE
J.J. 1	Hornblende (?)	Near Emery's hut, Boolcoomatta (not shown on Mineral Map).
J.J. 2	Magnetite-quartz	Occurs in small segregations just east of camp.
J.J. 3	Davidite	Detrital. Crocker Well East. Map U.S. 207
J.J. 4	Monazite	Detrital. One brown crystal only.
J.J. 5	Davidite-ilmenite	Fine grained mixture of the two. Not highly radioactive, but off scale readings from several detrital pieces. Not checked.
J.J. 6	Davidite	Detrital. Two small detrital fragments associated with large and small veins of radioactive ilmenite, One vein several feet wide.
J.J. 7	Absite Ilmenite	Accessory in pink adamellite (?) Not checked.
J.J. 8	Vesuvianite (?)	In a calc-silicate rock, epidote quartzite. Dark brown. Formed by contact with regional type granite to the south. Mineral report:
J.J. 9	Absite	In pegmatite which also carries magnetite. Pegmatite trends 250°. Downhill is migmatite and grey granite, while uphill is pink granite (showing gneissosity) and regional type granite.

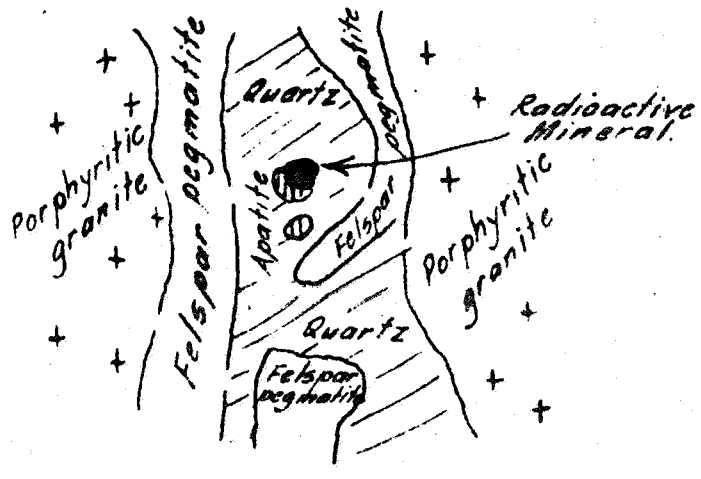


LOCALITY SKETCH

J.J. 10	Absite	Position located accurately on air photo. Specimen from most southern occurrence. Three points show absite in adamellite and these points roughly line up to trend 50°-60° W. of N to line up with J.J. 9. Marked radial

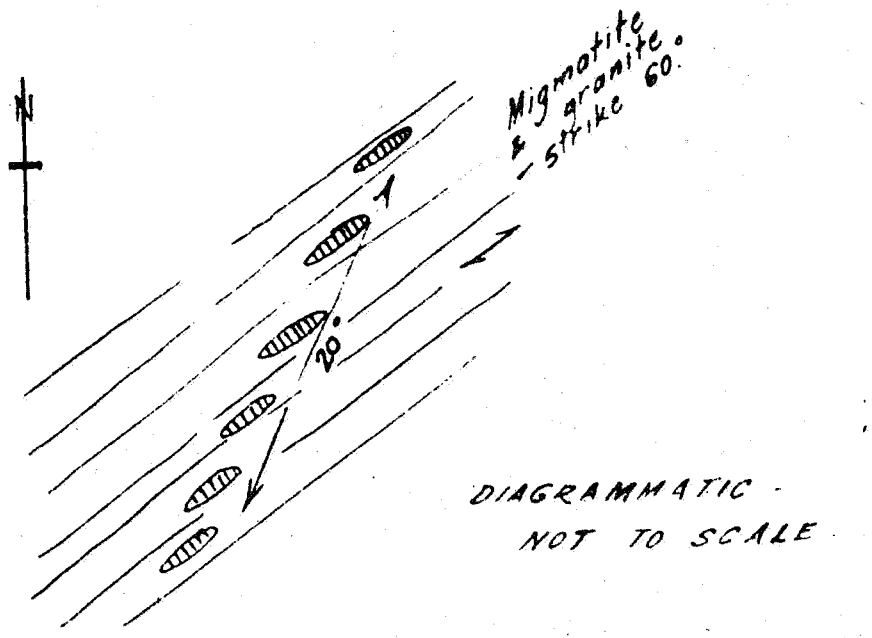
LOCALITY REF.	MINERAL	OCCURRENCE.
		fractures in country rock due to absite. Slightly to the east is a valley, possibly pointing out a shear, which has the same direction i.e. 50^0-60^0 W. of N. Migmatite, quartz veins and pegmatites trend 55^0 E. of N. and evidence for directional movement along shear was seen in change of strike of a migmatite band.
		Other minerals in pegmatites were magnetite and rutile. At the 2nd point from the N.W., the absite is in pegmatite which trends approx. 55^0.
J.J. 11	Absite	In leuco adamellite. Specimen obtained has most of the visible absite.
J. J. 12	(?)	<u>Sample 12/1</u>: Ferruginous quartz carrying radioactive mineral. Vein (?) is roughly parallel to country but seen to cut shear direction and banding. Looks like iron ore. Radioactivity not very high. Small floats of similar material uphill and to the N.E. of J.J. 12.
		<u>Sample 12/2</u>: In slightly ferruginous quartz vein (?) which is centre zone of a pegmatite. Black, dull mineral, irridescent on some fracture surfaces, heavy, similar appearance to clinker, (not magnetite, hematite, ilmenite) grey-green streak. Apatite surrounds the 3" black lump. Country rock is plagioclase porphyritic granite and abundant pegmatites.
		<u>Mineral Report 2/54</u>: Specimen submitted for X-Ray No duplicate sample.

JJ 12 (2)



Scale :- 4 ft. to 1 inch.

LOCALITY REF.	MINERAL	OCCURRENCE
J.J. 13	Fergusonite Xenotime Polymignite	Pegmatite outcrops bearing 20° in a discontinuous manner and Strike 60° N.E. across general country rock. Between pegmatite outcrops is solid migmatite country and the structure is shown in sketch.



JJ 13

Pegmatite bearing uraniferous mineral shown ....

Sample J.J. 13/1: Fergusonite (c xenotime)

Mineral Report 37/53: This rock carries grains of fergusonite of up to 1 cm. size. The fergusonite is an isotropic brown variety.with Yellow mineral dispersed through rock is an altered form of fergusonite. Some monazite is present in the rock.

Sample J.J. 13/2: ilmenite and fergusonite.

Mineral Report 24/53: This mineral aggregate is reminiscent of the rock from Radium Ridge, Mt. Painter. It consists mainly of finer or coarser granular aggregates of intergrown rutile and ilmenite, the latter containing ex-solution lamellae of hematite. These granular aggregates are replaced along individual mineral grain contacts by fergusonite in a general way throughout the rock. In many places the replacement is extensive and results in fergusonite grains 1-2 cms. in size.

The yellow-brown earthy mineral disseminated through the rock in large quantities is an indeterminable mineral of high refraction, in part isotropic and completely metamictized. From its association with fergusonite and from study in polished section, it appears probable that it may represent some breakdown product of fergusonite.

Fergusonite contains subordinate uranium, usually less than 5%,

LOCALITY REF.	MINERAL	OCCURRENCE
		and the rare earths yttrium (20.3%) and erbium (10%) Sample J.J. 13/3: Biotite Sample J.J. 13/4: Orthite Mineral Report 2/54: Orthite Sample J.J. 13/5: staining in quartz from uranite(?). At this place a quartzose pegmatite has pitted surface structure, and all fractures are covered with a yellow stain. These are radial structures around some pits. Radioactivity is high, even off scale, and suggested primary mineral was uraninite. This point is 150 yds. N.E. of J.J. 13/1. Sample J.J. 13/6: Apatite Sample J.J. 13/7: Mineral Reports 37/53 and 2/54 Polymignite and intergrown xenotime in orthoclase pegmatite. Mineral Report 2/54: This mineral is polymignite in the form of clusters of 1-2 cm. Crystals enclosed in orthoclase pegmatite. Black in colour, with submetallic lustre, conchoidal fracture, prismatic cleavages. In transmitted light it is greenish brown. It is isotropic. Polymignite associated with feldspars.
J.J. 14	Xenotime Polymignite	Series of 3 pegmatites parallel to E.W. migmatites. Pegmatites have absorbed some metasediment forming a greenish-black quartz with schist xenoliths. Rare minerals common, coarsely crystallised. Sample J.J. 14/1: Xenotime. Coarse crystalline lumps. Sample J.J. 14/2: Polymignite. Small crystals. Sample J.J. 14/3: Black, heavy, weakly radioactive mineral, 6 sided distorted orthorhombic prisms. Mineral Report:

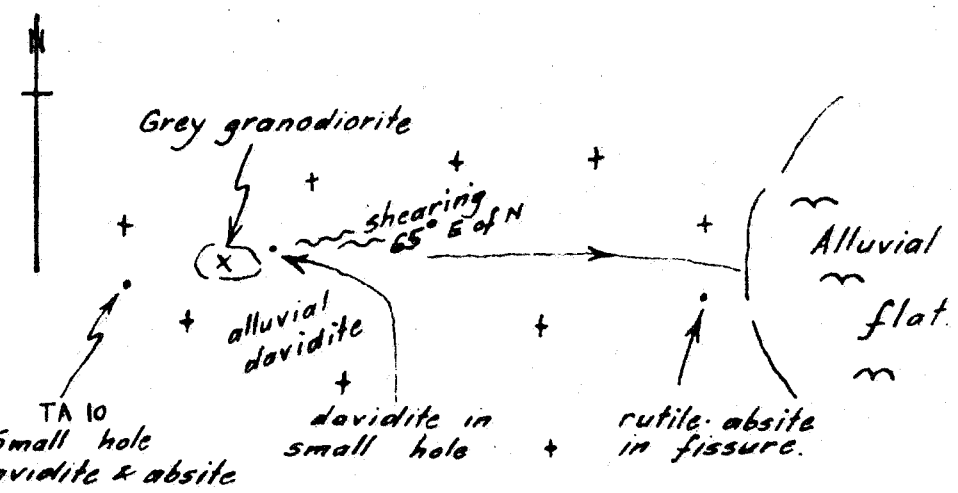
LOCALITY REF.	MINERAL	OCCURRENCE.
		Sample J.J. 14/4: Black, heavy, medium radioactive, tabular crystals. Mineral Report:
		Sample J.J. 14/5: Very highly radioactive. Dull grey with chalky outer crust. Crystals with lozenge shaped cross section. Mineral Report:
J.J. 15		Adamellite granite, 125 c.p.s. Probably continuation of J.J. 17. One sample.
J.J. 16		Biotitic migmatite, strike 80°, dip S. 70°. Contains parallel dykes of pegmatite with streaks of absorbed biotite. 150 c.p.s. Between J.J. 16 and J.J. 17 get long pegmatites with apatite.
J.J. 17	Absite	Adamellite granite with minor absite. Mass gave 65 c.p.s. but locally 150 c.p.s. One sample of adamellite.
J.J. 18		Biotitic migmatite as xenolithic lenses in normal granite. Sketch incorporates J.J. 16, J.J. 17, J.J. 18. One general rock sample of migmatite taken.
J.J. 19	Rutile Davidite (?)	Quartz reef with multiple twinned rutile and minor davidite, 60 c.p.s. Also black detrital tabular mineral Sample J.J. 19/1: Rutile Sample J.J. 19/2: Davidite Sample J.J. 19/3: Black detrital tabular mineral Rad. Assay: 1000 c.p.s.

LOCALITY REF:	MINERAL	OCCURRENCE
J.J. 20	Davidite	Detrital. No sample.
J.J. 21	Davidite Xenotime	Davidite in siliceous pegmatite and detrital davidite and xenotime. One alluvial davidite sample.
J.J. 22	Davidite	Low rise on flat. Schist strikes 95°, dip N. 85°. Just on north edge red aplitic rock contains davidite and absite (?) as accessories and in joints. One Sample.
J.J. 23	Davidite	Coarse pegmatite dyke, walls lined by davidite crystals, cutting massive biotite granite. No sample.
J.J. 24	Davidite (?)	Migmatite streak in massive granite. Strike 265°, dip 45°N. Biotitised granite nearby contains iron grey grains, radioactive with 100 c.p.s. The eastern continuation of the migmatite cuts the plain and would be a good water site. One sample.
J.J. 25	Polymignite Monazite Xenotime	Mostly as detritus from prominent E.W. pegmatite with unusually coarse feldspar. Sample 25/1: Polymignite " 25/2: Monazite

LOCALITY REF.	MINERAL	OCCURRENCE
J.J. 40	Fergusonite	A single fergusonite crystal in a thin pegmatite in granite.
J.J. 41.	Davidite	A single davidite fragment in detritus.

T.A. 1.	Davidite	Occurs with biotite in cracks of coarse massive red granite of regional type (?). The cracks are probably joints. Trend 75°W. of N. No obvious shearing. Adamellite outcrops 50' S. Mineral Report: (27/53). Biotite granite containing small grains of absite, completely altered grains of thorite and grains of davidite up to 1 cm. in size. Also some sphene and magnetite. Min. Report 33/53: Thorite. Rad. Assay: 1134 c.p.m/B9.
T.A. 2.	Allanite	Radioactive floaters, resembles tourmaline and hornblende. Mineral Report: (27/53). The black mineral is metamict allanite. It has brown green pleochroism and variable optical properties. Min. Report 33/53: Altered allanite. Rad. Assay: 100 c.p.m./B9. See TA 14 for locality sketch.
T.A. 3.	Absite	Accessory to adamellite. No relation to cracks.
T.A. 4.		See Crocker West davidite prospect.
T.A. 5.		Float from pegmatite. Specimen dug out of shallow hole among poorly outcropping quartz and pegmatite. Surrounded by adamellite granite. Mineral is brown, lustrous, glassy, and coated with greenish yellow alteration product. Radioactivity apparently stronger than davidite but weaker than absite. An associating mineral is dull brown with good cleavage. Mineral Report:
T.A. 6.	Allanite	Detrital from pegmatite (?). Weakly radioactive mineral resembling hornblende. Contains yellow metallic chalcopyrite (?), and small red crystals. Mineral Report 33/53: Metamict allanite.
T.A. 7.	Rutile.	Weakly radioactive in vicinity.

T.A. 8.	Absite Biotite	Not checked
T.A. 9.	Monazite	Float. Not checked. Mineral Report 33/53: Monazite.
T.A. 10.	Davidite Monazite Absite Orthite	In adamellite. Mineral Report 33/53: Chief minerals in the heavy fraction are rutile, hematite, ilmenite, davidite, absite, orthite, monazite, zircon.

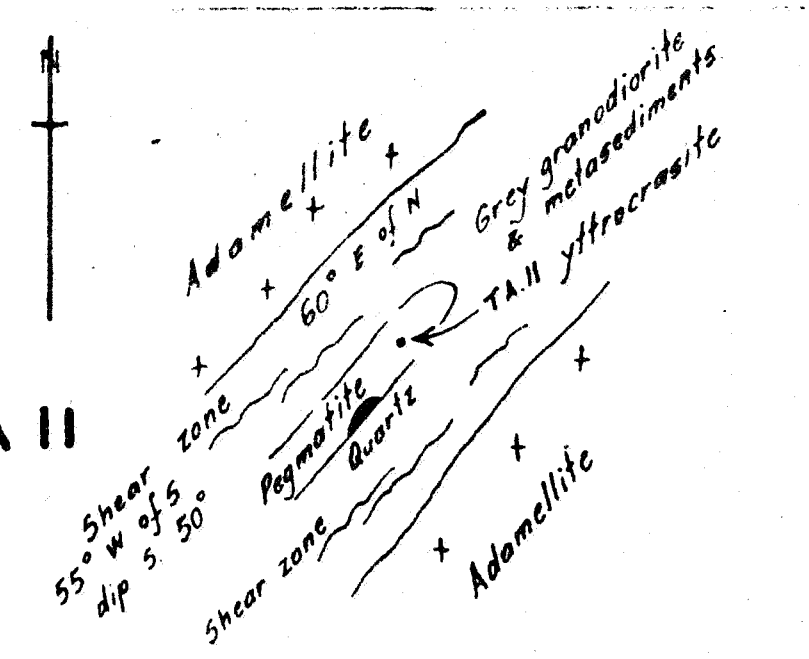


TA 10

Adamellite shown ___ + + +

Scale :- 200 ft. to 1 in.

T.A. 11. Yttrocrasite — In pegmatite.
Mineral Report 33/53: Yttrocrasite.

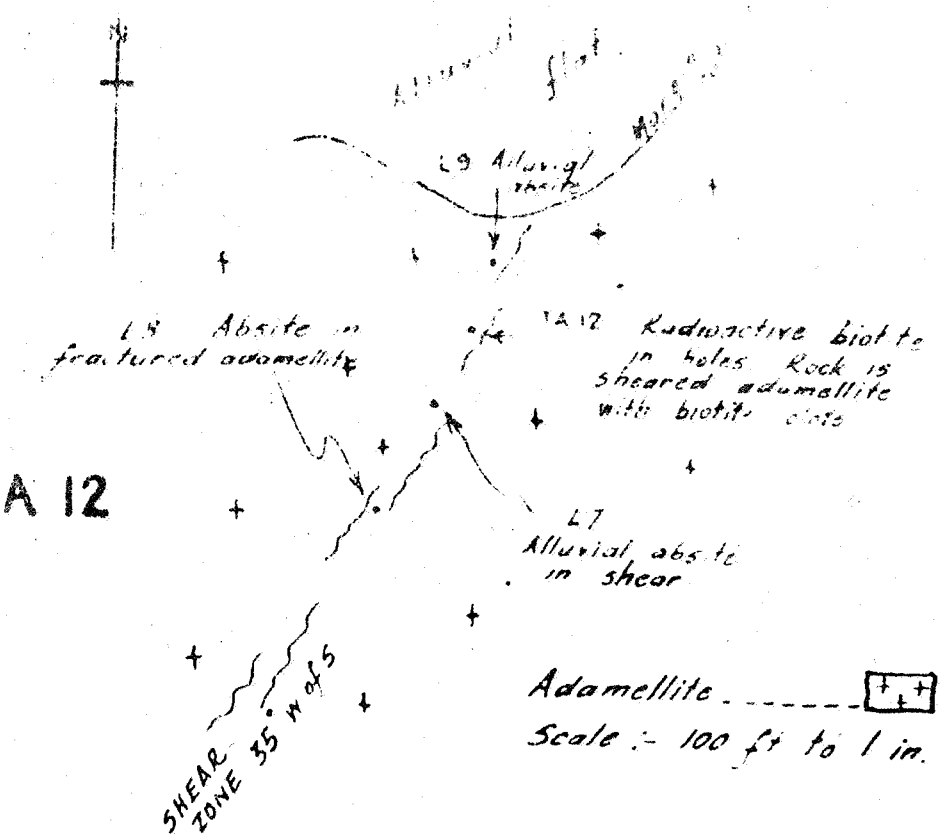


TA 11

Scale :- 50 feet to 1 inch

T.A. 12. Absite

Example of mineralisation only along shear. Massive adamellite on either side.



T.A. 13. Absite

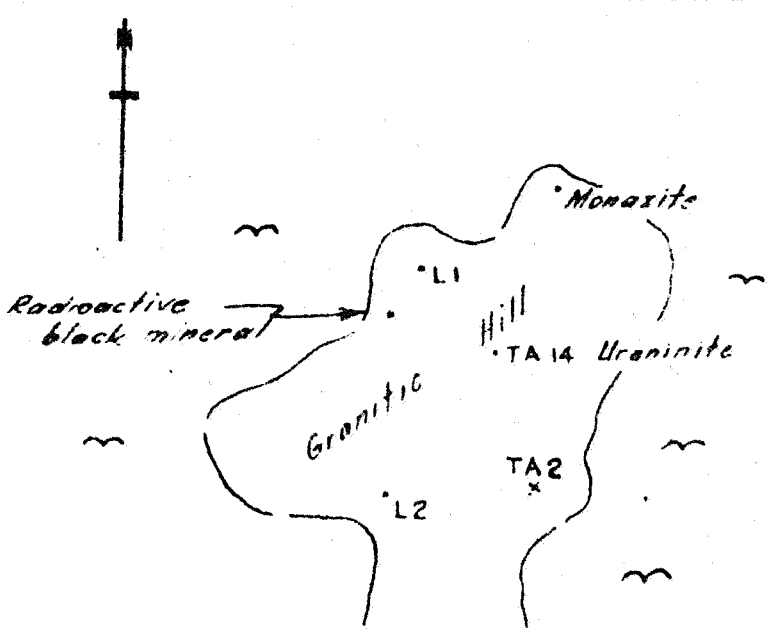
In adamellite pegmatite (?). Margin of strong shear zone at south.

T.A. 14. Uraninite. Fergusonite

Small quartz-feldspar veins at edge of very massive pink granite, carries considerable ilmenite-hematite, Regional type granite. Small clots pitchblende or uraninite.

Mineral Report 33/53: Uraninite, fergusonite.

Notes on sketch: At A, monazite is present on N. tip of granite in thin quartz pegmatite. C, just N. of A is an adamellite containing black radioactive clots and lumps. D, 150' S. of L 1, is highly radioactive black mineral altering to yellow material similar to L1. It may be the result of breakdown of davidite, uranite or fergusonite. B, massive slab of granite with various hot spots generally associated with pegmatitic segregations (up to 400 c.p.s. on 1st scale). Pegs 10-20° N. of E.



GENERAL LOCATION SKETCH
Scale :- 300 ft to 1 in

T.A. 15. Samarskite

In pegmatite adjacent to quartz segregations. Pegmatite strikes N-S, and at margin of major shear. Country rock is regional type granite. Located at Mt. Victoria Mine Camp site.

Mineral Report 2/54: Samarskite.

T.A. 16. Samarskite

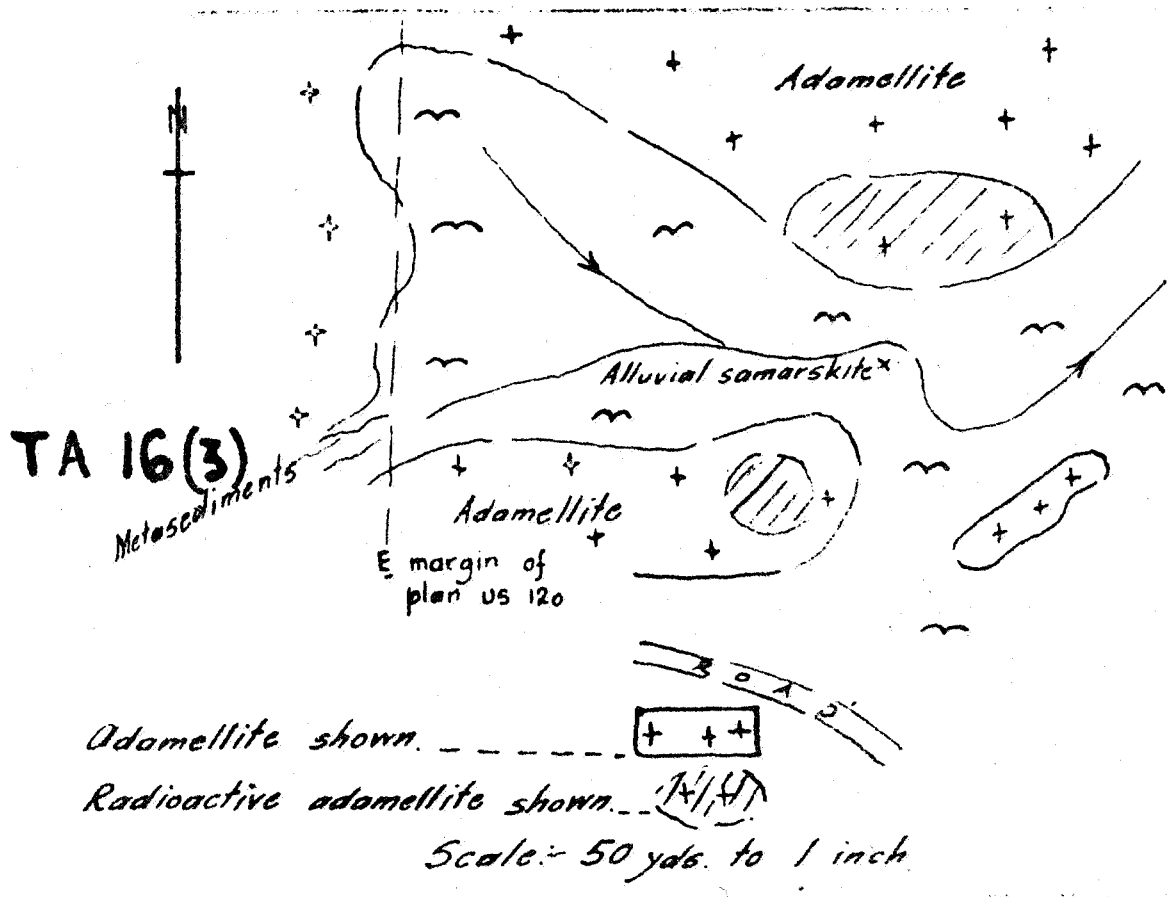
Accessory in adamellite. Occurs as brown radioactive mineral with alteration halo. Not seen in field.
Sample T.A. 16/1: Occurs in situ in highly decomposed adamellite. Highly radioactive with davidite and biotite in the vicinity. Alluvium reads high locally.

Mineral Report 2/54: Altered samarskite.

Sample T.A. 16/2:

Sample T.A. 16/3: Detrital in situ in adamellite.

Mineral Report 2/54: Altered samarskite (green brown) and intergrown rutile and ilmenite (black)



T.A. 17.

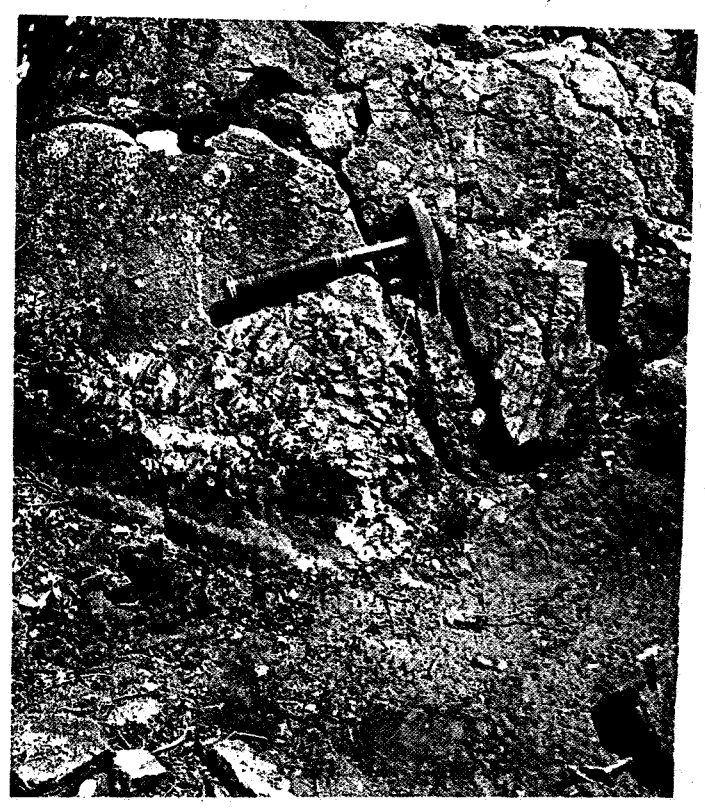
T.A. 18. Davidite

In small quartz stringer in adamellite. A larger quartz vein (1' across) occurs 2' to the east of this stringer, and bears 125°. Location is 191° to Ethiudna and 86° to East Crocker Hill. No specimen.

T.A. 19.

Detrital biotite. Radioactivity quite high, up to 500 c.p.s.
No specimen.

Photo: Shear quartz with davidite.



T.A. 20 Euxenite

In pegmatite carrying very small amount of radioactive mineral(s). Highly radioactive.
Mineral Report 2/54: Euxenite.

T.A. 21 (?)

In pegmatite. Brown, highly radioactive crystals. Country rock is intermediate - basic rock type, gabbro(?).

Mineral Report:

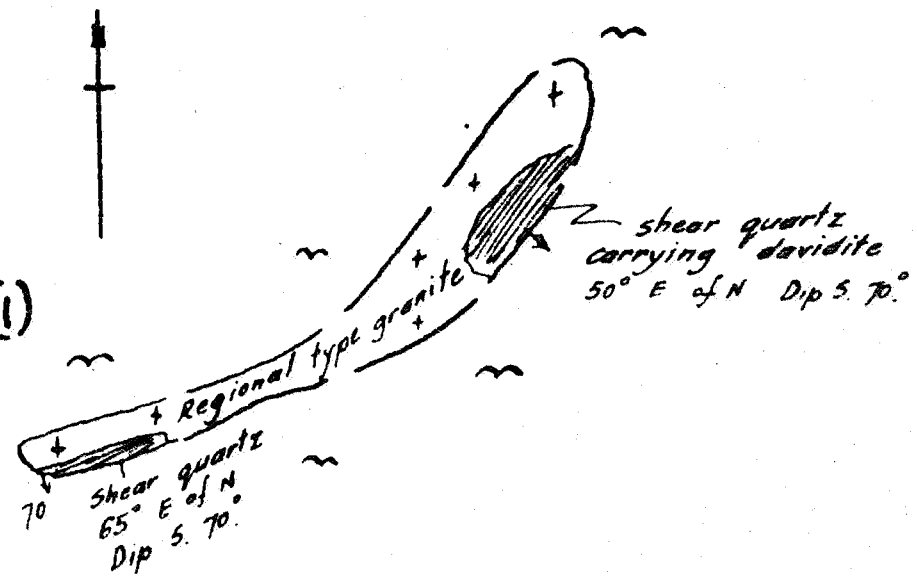
T.A. 22 Monazite (?)

In adamellite, red, not highly radioactive.

T.A. 23. Davidilic-ilmenite

Sample T.A. 23/1: Much alluvial davidite over area of several acres on flat near top of granite hill. One exposure of sheared quartz containing davidite at northern extremity among regional type granite outcrops. Similar veinlets must occur beneath alluvium to south as davidite is not eroded. An example of mineralised shear fracture. Regional type granite. (photos Nos. 3,4.)

TA 23 (1)

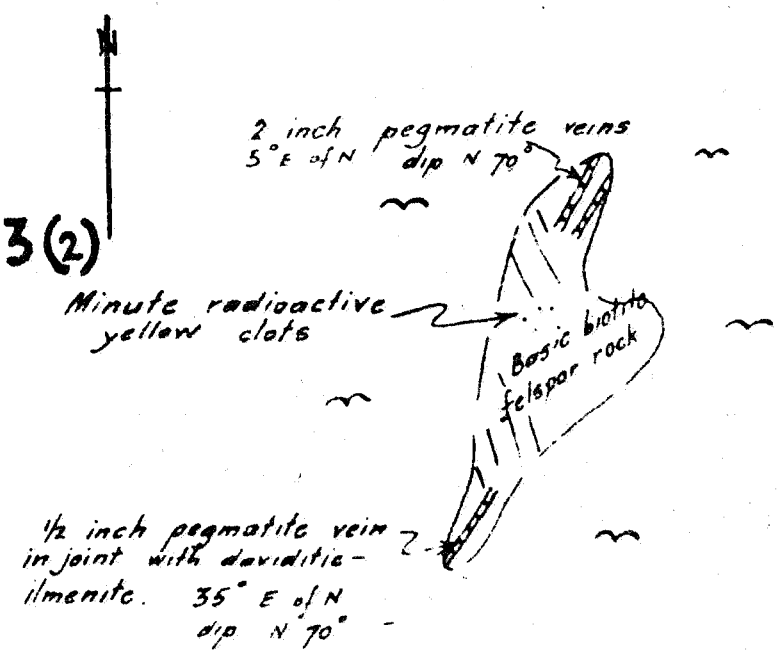


Scale :- 4 ft. to 1 inch.

Sample T.A. 23/2: Crystals of davidilic-ilmenite (slightly lower radioactivity than davidite), in narrow quartzose feldspar pegmatitic veins. Cuts small exposure of basic biotite feldspar carrying minute radioactive yellow clots. Poor outcrop in this area.

Sketch:

TA 23 (2)



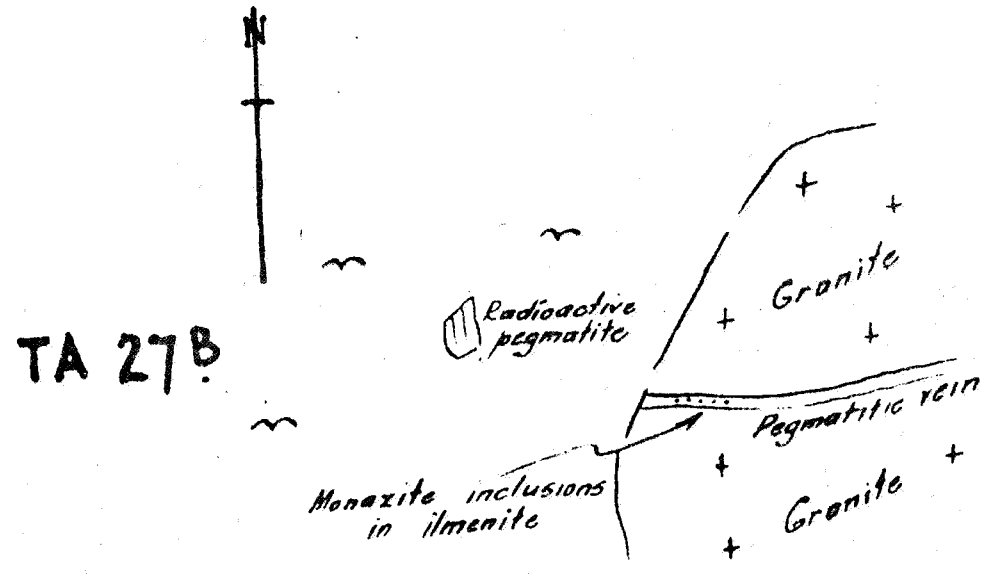
Scale :- 10 ft. to 1 inch.

T.A. 24.	Euxenite	Coarse pegmatitic segregation in migmatites and regional type granite. Brown lustrous small mineral surrounded by dark-coloured mineral. Yellowish alteration around radioactive mineral. Located at Mt. Victoria Mine S.W. On opposite side of shear get radioactive peg but no mineral identified.
T.A. 25.	Gummite (?) Copper stains	Black hornblende-ilmenite rock resembling dyke. Cu stains and epidote. Strike 35° E. of S.
T.A. 26.	Monazite (?)	Similar to T.A. 27. Not examined.
T.A. 27.	Monazite.	Small pegmatitic veins and segregations carrying ilmenite(?) with disseminated monazite (?). Cuts medium grained pink biotite granite of regional type. Rock resembling adamellite nearby.

Sample T.A. 27/1: 4" pegmatite cutting medium grained pink regional type granite. Pegmatite bears 135°.

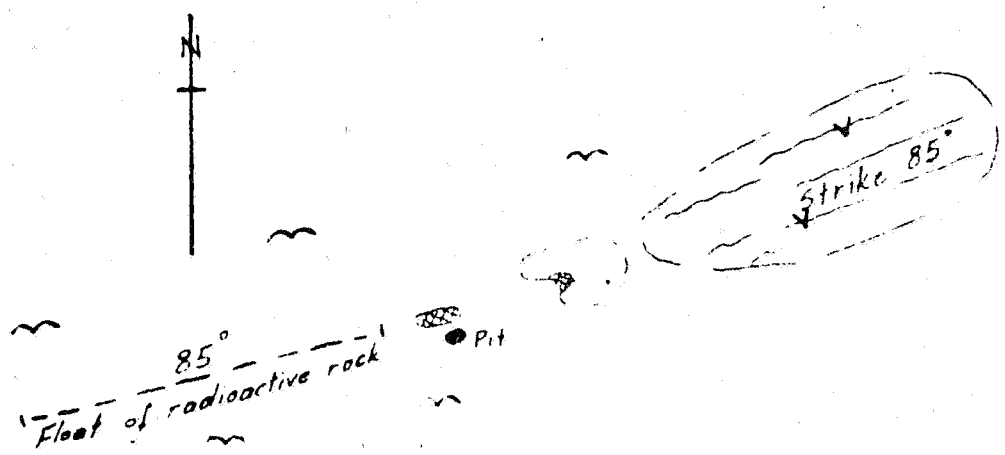
Photo: Pegmatite bearing monazite

Sample T.A. 27/2: Monazite occurs as inclusions in ilmenite in narrow pegmatitic veins and pegmatite. Local shearing 355°.



T.A. 28 — Pegmatite. Not visited.

T.A. 29 — Davidite(?) — Dark biotite rich basic rock carrying small pieces of davidite. Coarse grained grey feldspar rock excavated from adjacent pit. Odd floaters of radioactive dark rock to west for 50 yds., and float of quartz dolerite shear rock. (Photo 2)



TA 29

Scale:- 100 ft to 1 inch.

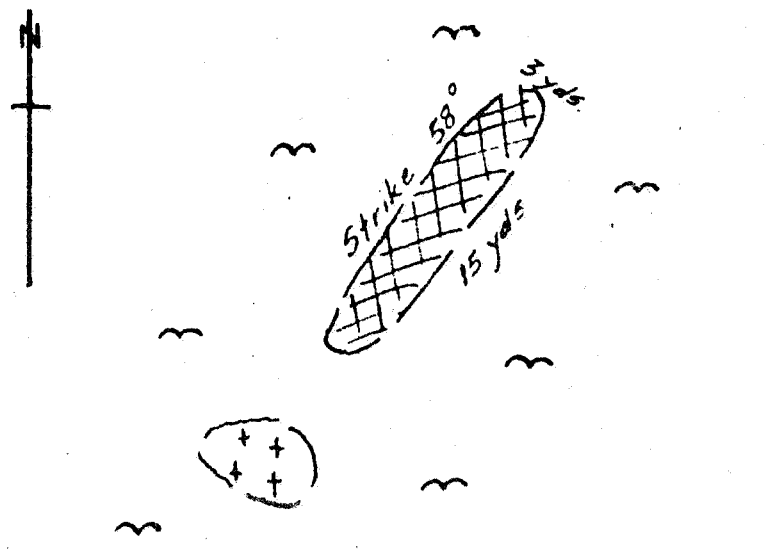
Micaceous & talcose schist ----
Dark biotite rich basic rock carrying davidite ---
Coarse felspar " " ----

Sample T.A. 29/1: Small outcrop of radioactive basic type rock on margin of alluvium

T.A. 30 (?) — Basic metasediment or amphibolite 15 yards long and 2-3 yards wide. Strike 58°, moderately radioactive.
Sample T.A. 30/1: Coarse mafic granite

Sample T.A. 30/2: Radioactive basic rock.

Sample T.A. 30/3: Weakly radioactive, fine grained, mafic.



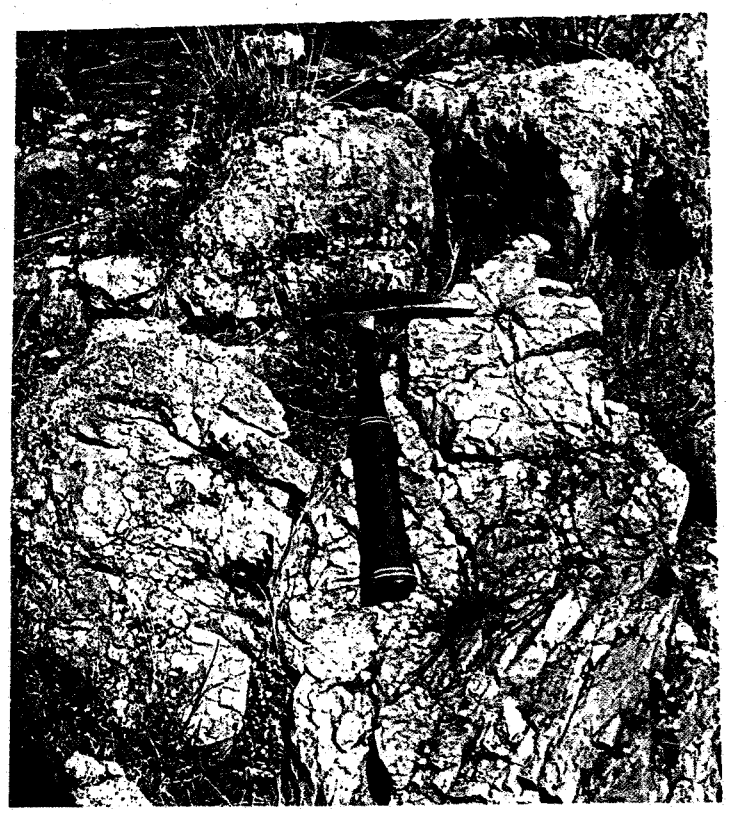
TA 30

Radioactive finegrained mafic granite --
" basic rock ----------
Alluvium ----------

T.A. 31 Xenotime

Very coarse pegmatite cutting shear zone. Radial cracks around xenotime which is perfectly crystalline. Also black radioactive alluvial minerals.

Photo:



T.A. 31 Xenotime in pegmatite.

T.A. 32

T.A. 33 (?) Similar to T.A. 29 and T.A. 30, but less radioactive. Same direction as T.A. 29. Reef both sides of gully.

T.A. 34 Davidite-ilmenite Located near Spring Hill Prospect. View exposed in small hole running N.E. and alluvial davidite downhill. Coarse biotite plentiful.

BILLEROO DAVIDITE PROSPECT.

Map Reference:

MINERALS: Davidite, absite.

OCCURRENCE:

Epidote quartzite intruded by granite and pegmatite. Davidite abundant as crystals in feeder cross-fissures as grains formed by replacement along bedding planes of quartzite and as large crystals in pegmatitic quartz. Malachite stains noted rarely along bedding of quartzite. Where most highly metamorphosed, the quartzite becomes an aplitic rock with bedding indistinct and contains black hornblende as radial fibrous masses and also sporadic granules of absite as well as davidite.

SAMPLES: Aplitic rock carrying accessory davidite - resembles that from TA 4 - and also grains of absite.

MINERAL REPORTS:

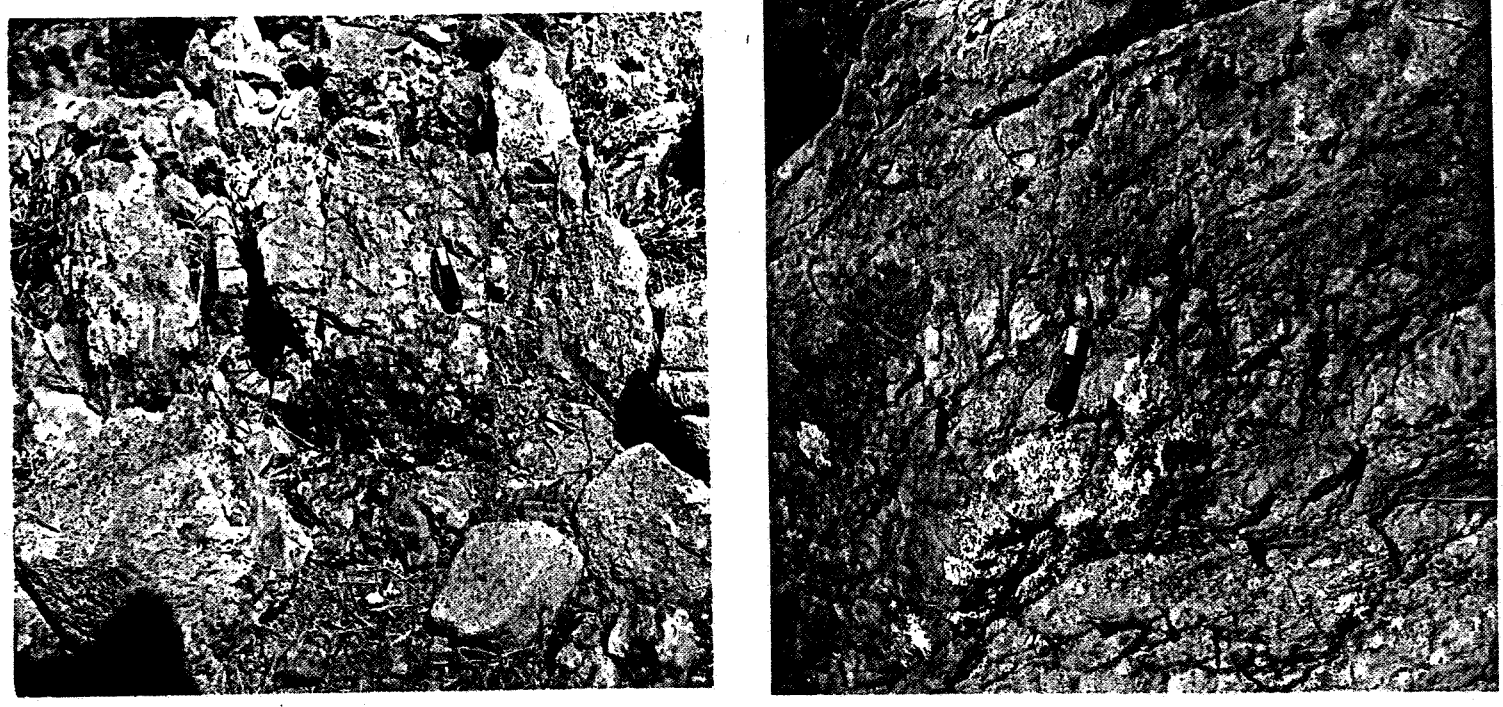
Mineral Report ( ): calcio-samarskite and davidite.

DIAMOND DRILLING:

ASSAYS:

REFERENCES:

BILLEROO DAVIDITE PROSPECT



Davidite in pegmatitic quartz vein.
Photos by Dr. Miles.

Felspar-quartz pegmatite carrying clusters of coarse davidite.

Photos by Dr. Miles.

CROCKER EAST PROSPECT.

Map Reference	U.S. 207	1000' x 800' at 40' = 1 inch
	U.S. 260	1000' x 800' at 40' = 1 inch
	U.S. 261	1000' x 800' at 40' = 1 inch
	U.S. 268	Detailed geological plan at 100' = 1 inch.

MINERALS:

OCCURRENCE:

SAMPLES:
(1) Alluvial sample, 0-10'. Grey granite bottom
5000N : 1060E

(2) " " 0-3'9". Granite bottom.
4700N : 1300E

(3) " " 0-5'6", 5'6"-9'0". Granite bottom
5150N : 3650E

(4) " " 0-2'. Granite bottom.
5250N : 3750E

(5) " " 0-4'3", 4'3"-5'3". Granite bottom.
5150N : 3750E

(6) " " 0-3'6". Metasediment bottom.
5350N : 4250E

(7) " " 0-6'3". Granite bottom.
5450N : 3680E

(8) " " 0-5'6". Granite bottom.
5350N : 3650E.

MINERAL REPORTS:

Rock Sample 1 (1589): Petrological Report No. 128/53

Adamellite adjacent absite vein. Leucogranodiorite with albite, oligoclase, quartz, biotite, microline, accessory apatite, monazite, magnetite and zircon.
Grid 5270N : 4850E

Rock Sample 3. (1590): Petrological Report No. 128/53

Adamellite - slightly gneissic granodiorite, with albite-oligoclase, quartz, microline, accessory apatite, magnetite and zircon.
Grid 5320N : 4872E.

MINERAL REPORTS: (Contd.)

Rock Sample 4. (1591): Petrological Report 128/53

Adamellite (carries absite surrounded by brown halo) - granodioritic aplite, with albite-oligoclase, quartz, microline, biotite, muscovite, accessory magnetite, rutile, ilmenite, leucoxene, zircon and apatite. (rutile and ilmenite are intergrown)
Grid 4950N : 1710E.

Rock Sample 5. (1592): Petrological Report 128/53

Grey granodiorite with albite-oligoclase, quartz, biotite, microline, magnetite, accessory apatite, zircon and ilmenite.
Grid 5020N : 4650E.

Heavy sand sample.

Located at 5200N : 3600E. Min. Report 33/53 (next page).

Heavy sand sample S 7. Mineral Report 128/53

Contains opaque magnetite, absite, biotite, apatite, zircon, rutile, hornblende, actinolite, titanite, tourmaline, epidote, monazite, highly weathered polycrase.
Located at 5320N : 4300E.

Rock Sample 9. Petrological Report

Quartz-mica-magnetite rock with accessory apatite, rutile, magnetite, and fluorescent zircon.
Grid 4770N : 4040E.

Rock Sample 8. Petrological Report

Leucogranite. Predominantly matrix of feldspar and quartz - Microcline, orthoclase, quartz and albite-oligoclase. Accessory muscovite, biotite, magnetite, rutile, monazite, apatite and absite.
Grid 4790N : 3600E.

Rock Sample 10. Petrological Report

Quartz-mica-magnetite vein with accessory minerals as for sample 9.
Grid 4795N : 4145E.

Rock Sample 13
Adamellite
Grid 4700N : 4410E

Rock sample 14
Regional type granite
Located 40 yds. S.E. of Crocker Well East.

Rock Sample 15.
Grey granodiorite (porphyritic feldspar)
Grid 4000N : 2350E.

MINERAL REPORTS:

Alluvium samples: vide Petrological Report 34/53.

Mineral Report 33/53.

5200N : 3600E. Heavy sand sample from Mineralogical Report: Heavy fraction contains hematite, martite, magnetite, zircon, rutile, apatite, hornblende, biotite, sphene, epidote, tourmaline, garnet, monazite.

ASSAYS:

REFERENCES:

PHOTOS:

Crocker East: Biotite-absite mineralisation (clots) in fractured adamellite (4600N : 1300E)

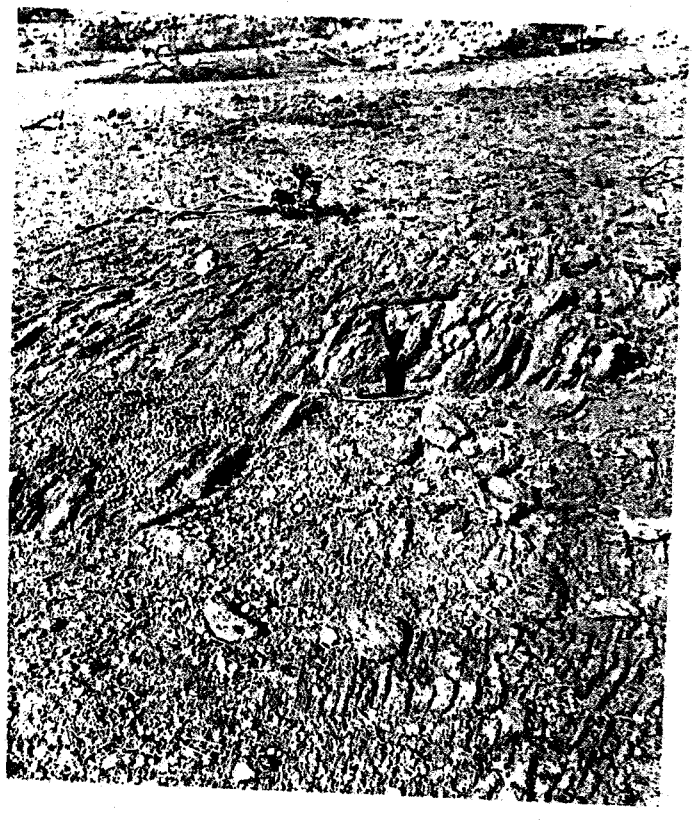
Close up ~~General~~ view of shear foliation in granodiorite. (5100N : 2600E)

Crocker East: General view of shear foliation in adamellite - looking S.W.

Biotite-absite clots in fractured adamellite. (4600N : 1300E)

Crocker East: Close up of sheared adamellite - looking S.W.

General view of main mineralised area with boring plant in rear.



Crocker East: Shear foliation and cross joints in granodiorite ~~close-up.~~ general view. (approx. 5100N : 2600E)

CROCKER WEST DAVIDITE PROSPECT.

T. A. 4

Map Reference: U.S. 227 (mapped in detail)
Scale 1" = 20'.

MINERALS: Xenotime, fergusonite, orthite, davidite.

OCCURRENCE:

Pegmatitic.

SAMPLES:

(1)	Migmatite basic gneiss	B 130, A 20
(2)	Basic gneiss.	B 170, A 100
(3)	Fine grained red granite	B 142, A 97
(4)	Adamellite	B 190, A 95
(5)	Mineral in quartz	B 52, A 83
(6)	Magnetite in adamellite	B 70, A 104
(7)	Adamellite	B 60, A 91
(8)	Coarse davidite	B 30, A 45
(9)	Magnetite-quartz	B 20, A 45
(10)	Daviditic granite	B 20, A 50
(11)	Daviditic granite	B 40, A 25
(12)	Basic gneiss	B 100, A 200
(13)	Adamellite	B 78, A 100
(14)	Fine grained red granite	B 161, A 203
(15)	Magnetite davidite	B 193, A 168
(16)	Grey granitic rock	B 197, A 190
(17)	Davidite granite	B 192, A 173
(18)	Daviditic granite float	B 250, A 139
(19)	Coarse daviditic rock	B 220, A 135
(20)	Epidote rock floater	B 185, A 253
(21)	Regional type granite	40 yds. S. of B 100, A 300
(22)	Basic gneiss	B 90, A 250
(23)	Coarse davidite (float)	Various localities
(24)	Daviditic granite and coarse davidite	B 120, A 235
(25)	Daviditic granite	B 120, A 235
(26)	Yellow brown mineral with davidite	
(27)	Coarse ore sample	A 20, B 120
(28)	Bulk grab sample from area of highest radioactivity.	Co-ords A250 : B125.

MINERAL REPORTS:

Sample T.A. 4/5
Pale green mineral associated with quartz is apatite

Petrological Report 33/53
Sample T.A. 4/10 and T.A. 4/25.
Similar albitites, but T.A. 4/25 is coarse grained.
Predominantly albite-oligoclase, small % of microline.
Accessories are biotite, muscovite, zircon, rutile and sphene. Impure davidite approx. 5% of both rocks.

Sample T.A. 4/14.
Leuco granitic gneiss. Albite, oligoclase, microline, quartz, biotite laths. Accessory magnetite, rutile, apatite and muscovite.

Sample (26): Mineral Report 33/53.
A mixture of xenotime, fergusonite and orthite intergrown.

MINERAL REPORTS:

Sample (27): Mineral Report No. 27/53.
The rock which is apparently pegmatite, contains large forms of davidite up to several inches in size. The davidite is a particularly pure variety and practically free from inclusions. It is comparable with davidite from Mozambique.

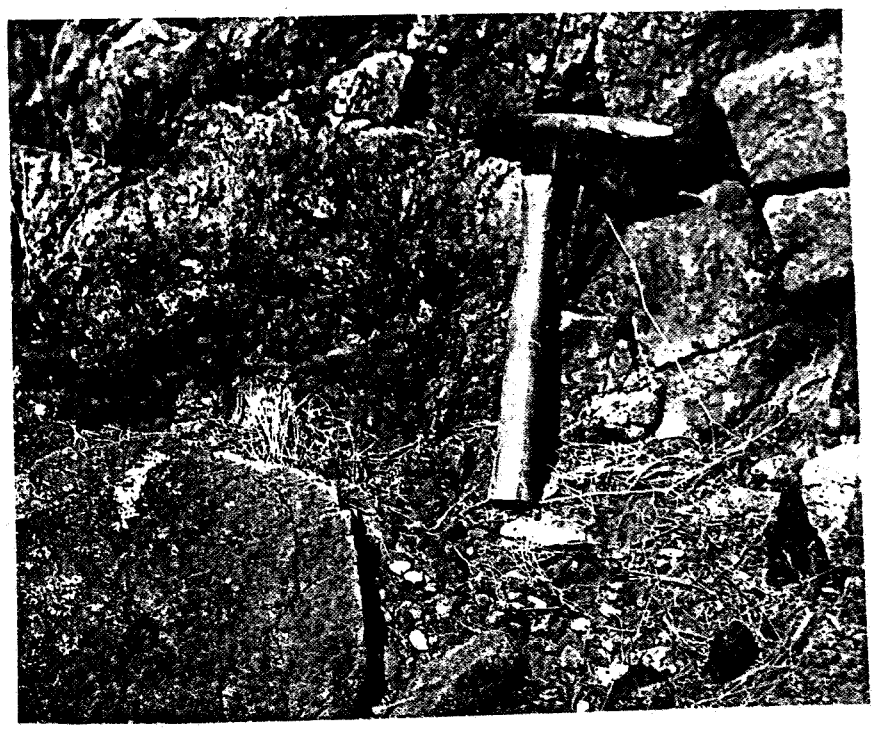
Mineral Report 37/53
Polished sections exhibit strong resemblance to davidite. Contains wispy inclusions of hematite, but otherwise pure. It is coarsely intergrown with quartz.

DIAMOND DRILLING:

ASSAYS: Sample (27) : Rad. Assay : 1026 c.p.m./Bg.
" (28) : " " : 1.1 lb. U_3O_8 /long ton
No. U4/1395.

REFERENCES:

PHOTOS:



Crocker West: Showing cluster of davidite crystals on margin of pegmatite.

ETHIUDNA EAST COBALT PROSPECT.

Map Reference. Preliminary Detailed Geological Map.
20' = 1 inch.

SAMPLES:

(18) Andradite - Min. Report 252/53.

(19) Cobaltite-erythrite ore - usually in siliceous gangue. Opened up in small pit. Min Report 252/53.

(20) Smaltite 100 feet N.E. of pit.

MINERAL REPORTS:

Mineral Report 252/53. Sample Ethiudna 18 is composed largely of massive light greenish andradite. The mineral has anomalous properties in that it is twinned and in part anisotropic. Areas of black chert and white encrustations of chalcedony occur with the andradite.

Mineral Report 252/53. Sample Ethiudna 19 is stained pink with erythrite. Cobaltite and glaucodot (sulpharsenide of cobalt and iron) are intergrown in veinlets which traverse the rock in abundance. Chalcopyrites occur in small amounts intergrown with glaucodot.

These minerals occur in quartzitic host rock containing jeffersonite, colourless garnet, titanite and apatite.

MINDAMEREEKA PROSPECT.

Map Reference U.S. 259 (mapped in detail)

U.S. 266

MINERALS: Davidite, Torbernite, Uranophane.

OCCURRENCE:

See Report C. W. 13.

SAMPLES: (1) Torbernite in biotitic pegmatite - non fluorescent

(2) Carnotite or uranophane - fluorescese strongly green.

MINERAL REPORTS:

Petrological Report No. 41/53 with illustrations.

Mineral Report ( ) Sample (1): meta-torbernite

DIAMOND DRILLING:

Bore hole P.P.I completed

ASSAYS: See Report C.W. 13.

REFERENCES:

Discovery: Report S.R. 11/2/58 (Campana) 21/8/53)

Boring: Report C.W. 13 (D. King, 20/1/54)

PHOTOS:

Mindamereeka Hill: Boring plant at site P.P.I in massive granite and pegmatite. Peg

SPRING HILL PROSPECT

D.K. 3.

Map Reference U.S. 267 — 300' x 250' at 20' = 1 inch.

MINERALS: Davidític-ilmenite.

OCCURRENCE:

SAMPLES:

(1) fine medium grained leucogranite, resembles adamellite (200N : 200W)

(2) Davidític ilmenite ore from prospecting pit. (310N : 390W)

(3) 2 bags of average grade ore (one repeat sample) taken across outcrop from 350N : 275W to 370N : 240W.

(4) High grade ore (decomposed). 350N : 230W.

(5) High grade ore (?).

MINERAL REPORTS:

DIAMOND DRILLING:

ASSAYS: Sample (2): Chemical assay

Sample (3): Rad. Assay

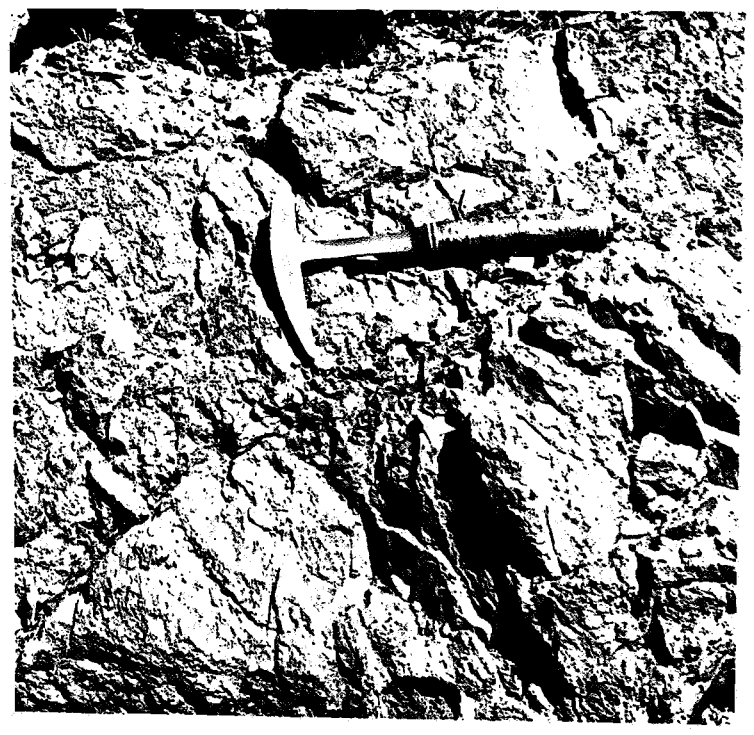
(a) 10.1 lbs/ton U_3O_8

(b) 3.9 lbs/ton U_3O_8

REFERENCES:

PHOTOS:

SPRING HILL: General view to S.E. of main ore body.



SPRING HILL: Close up of breccia with davidite-ilmenite vein.

TALBOT GUM CREEK PROSPECT

Map Reference:

MINERALS: Samiresite (?), uranophane, autunite, davidite.

OCCURRENCE:

SAMPLES:

T.G.C. No. 1. In metasediments intruded by granite. The uranium is mainly in lenticles of granodiorite injected lit-par-lit into meta-sediments. One of these lenses gives a reading of 300 c.p.s. over an area of 5' x 1', and a second lens gives 600 c.p.s. over 3' x 1' and 100-200 c.p.s. over 15' x 1'. This ore shows resin yellow grains of samiresite (?) in fair quantity.

T.G.C. No. 2. A band of brecciated granite showing stains of uranophane and autunite and gave 1000 c.p.s. over a length of 1½ chs. except for 12' in centre where it was only 600 c.p.s. and 6' wide. Count rises from 100 c.p.s. on borders to 1000 c.p.s. in centre. A second lens of brecciated granite, 15' to the S, gave a count of 1000 c.p.s. over a length of 6'.

T.G.C. No. 3. In granite with streaks of granodiorite giving count of 100 c.p.s. and in one place 300 c.p.s.

T.G.C. No. 4. A lenticular mass 8' x 4' of shattered granite stained by uranophane gave 1000 c.p.s. over all. Counts of 200 c.p.s. obtained in surrounding granite. An outcropping of a red aplitic rock, 15' W. of the main lens gave 150 C.p.s. and contains autunite flakes and iron grey grains of davidite.

T.G.C. No. 5. A patch 2' square in a granodiorite re-action zone between granite and meta-sediments. Count of 1000 c.p.s.

T.G.C. No. 6. Similar to T.G.C. 5.

T.G.C. No. 7. A 6" wide zone of brecciated granite showing stains of uranophane with count of 1000 c.p.s. over length of 12', height of 6', and 6" wide.

SAMPLES: (Contd.)

T.G.C. No. 8. A zone of dark brecciated granite 36' long and 6' to 8' wide. It shows uranophane stains and gives readings of 1000 c.p.s. discontinuously but frequently over the whole area.

WINDAMERTA HILL N.E. PROSPECT.

H. C. 5.

Map Reference:

MINERALS: Uranophane, Samiresite

OCCURRENCE:

SAMPLES: G 106. Black Schist.
Mineral Report 24/53
This rock carries bright yellow encrustations along schistosity surfaces which consist of finely fibrous masses of uranophane. The mineral exhibits aggregate polarisation in its finely fibrous form and has an average refraction of 1.68. It is soft, exhibits green fluorescence and was found to be a silicate.

G 101. Black Schist.
Mineral Report 24/53.
The highly radioactive areas contained in this rock are due to the presence of minute grains of samiresite which is a golden yellow mineral of the betafite group. It is a titanite of uranium, calcium, tantalum, columbium etc., with 22% U_3O_8.

G 105. Granite.
Mineral Report 24/53.
This rock is encrusted at the surface along fractures with uranophane similar to that of G 106.

MINERAL REPORTS:

Petrological Report No. 24/53.

DIAMOND DRILLING:

ASSAYS: Rad. Assay: Ore sample from W. outcrop (grab sample), 4.1 lb/ton U_3O_8 or 0.185%.

REFERENCES:

Discovery - S.R. 11/2/58 (B. R. Campana, 2/4/53)

Report by B. R. Campana.

WINDAMERTA SOUTH PROSPECT

(H. C. 4)

Map Reference U.S. 248 — 700' x 400' at 40' = 1 inch.

MINERALS: Uranotil (related to uranophane)

OCCURRENCE:

SAMPLES:

(1) fine grained pink grey leuco granite (400N : 110W) with disseminated small biotite

(2) Banded gneiss with bedding foliations (440N : 130W)

(3) Dark schist - sheared metasediment (300N : 160W)

(4) Coarse pink porphyritic granite (500N : 340W)

(5) " " " " (800W : 100N)

(6) High grade ore (250N : 790W)

(7) Average grade sample (grab). (340N : 350W)

(8) Average grade sample (grab), (250N : 780W)

MINERAL REPORTS:

Sample No. (5): Petrological Report No. P 252/53

Composition: Biotite granite of normal potash rich composition. Microline and perthite (with poikilitic quartz), albite, aggregates of biotite, muscovite, pleochroic zircon.

Sample No. (6): Petrological Report No. P252/53

Composition: The host rock is fine grained quartz feldspar biotite schist. Numerous minute grains of limonitic opaque minerals which may be altered primary uranium minerals. The radio active mineral present is related to uranophane viz. beta uranotil and occurs as minute grains and fibrous clusters.

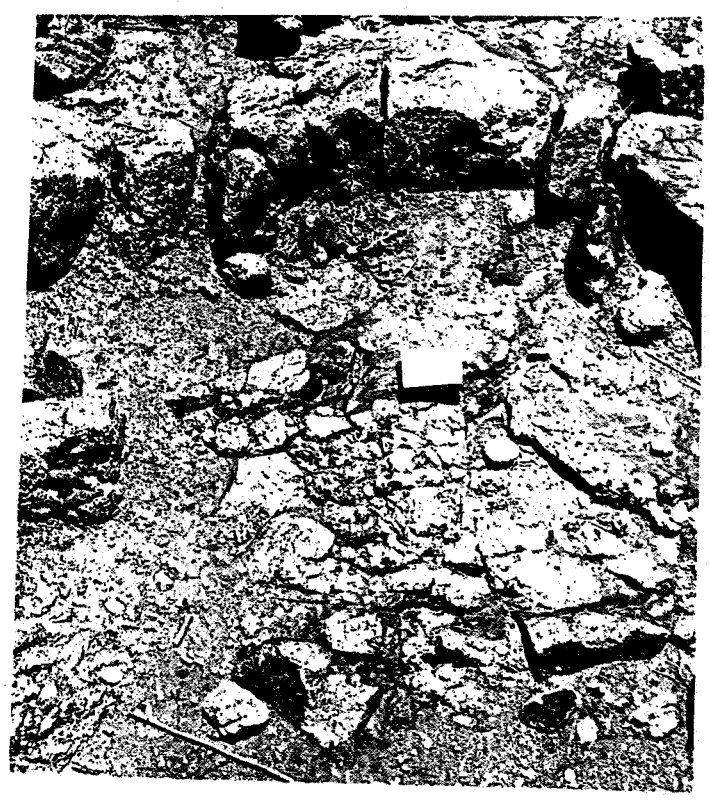
DIAMOND DRILLING:

ASSAYS: Sample No. (7): 1.2 lbs/ton U_3O_8

Sample No. (8): 7.2 lbs/ton U_3O_8

REFERENCES:

PHOTOS:



Windamerta Hill: Close up of fractured migmatite in radioactive area.

Windamerta Hill: Close up of fractured migmatite in radioactive area.

MT. VICTORIA COPPER-GOLD MINING FIELD.

MINERALS: Gold, copper magnetite, tremolite, calcite, pyrite, rutile, britholite, chalcopyrite, malachite, azurite, cuprite, siderite, micaceous hematite, boleite? (blue secondary copper mineral), purple fluorite.

SAMPLES:

(1) See TA 15.

(2) See TA 15.

(3) Cuprite, copper, gold - best grade copper ore.

(4) Brown translucent silicate mineral resembling sphene. Min. Report 2/54 Britholite (silicate and phosphate of cerium and calcium).

(5) Blue cubic copper mineral - boleite? Min. Reports 37/53 and 2/54. Azurite.

(6) Rutile in calcite, and fluorite.

(7) Octahedral magnetite.

(8) Siderite and cubes of magnetite

(9) Tremolite, fluorite and calcite.

(10) Siderite.

(11) Colourless mineral fluorescing blue.

MINERAL REPORTS:

Mineral Report 2/54. Sample 4. Brown mineral resembling sphene is Britholite (silicate and phosphate of cerium and calcium).

Mineral Reports 37/53 and 2/54. Sample 5 - copper ore - consists of azurite, malachite, specularite, magnetite and chalcedony.

SAMPLES:

(22) Gneissic granite and contact with metasedimentary gneisses. Fresh specimen from Main Shaft.

(23) Garnet-quartz rock with copper stains. 20 ft. W. of Main Shaft.

(24) Green-brown mineral with copper stains from pothole 100 ft. S.W. of Main Shaft. Massive Vesuvianite. Min. Report 252/53.

(25) Amphibolite from shear zone across narrow neck east of Lookout Hill. Appears to be intrusive, and faulted in places.

MINERAL REPORTS:

Min. Report 252/53. Sample 24 is massive vesuvianite.

ETHIUDNA COBALT-COPPER MINING FIELD.

(Also named New Year Gift).

MINERALS: Chrysocalla, cuprous asbolane, azurite, malachite, pyrites, chalcopyrites, iron sulphate?, tremolite, calcite, diopside, garnet.

SAMPLES:

(1) Radioactive sample - cupriferous - 200 c.p.s. - pothole 20' S. of Main Shaft.

(2) Radioactive sample - cupriferous - 50-75 c.p.s. - Main N.W. Shaft.

(3) Chrysocalla.

(4) Cuprous asbolane. Main Shaft.

(5) Tremolite with pyrites. 50 ft. east of main lode.

(6) Tremolite and interstitial vesuvianite?. 50 ft. E. of Main lode.

(7) Diopside in calcite - Open cut 50' south of Main Shaft.

(8) Brown garnet in calcite - open cut 50' South of Main Shaft.

(9) Radioactive sample of copper ore. 150 c.p.s. 10' depth in main Shaft on underlie.

(10) Iron sulphate? - Jarosite (?) - yellow amorphous mineral. Main Shaft.

(11) Colourless grains calcite, fluoresce green. In granular tremolite wall.rock 50 yards E. of Main Shaft. Min. Report 252/53.

(12) Colourless fluorite (?), fluoresces blue, in quartz-garnet rock. Open cut, main lode.

(13) Graphite and associated copper from Ethiudna South Prospecting Pits - See Plumbago Graphite

(14) Scapolite, feldspar, psilomelane, apatite prisms from Piper's Shaft. Min. Report 252/53.

(15) Grey quartzite with minute fluorite, fluorescing blue, from small workings west of Lookout Hill.

(16) Tremolite - green apatite rock, with quartz carrying minute grains of sulpharsenide, and tremolite with sulpharsenide. Narrow neck of outcrops south of main workings.

(17) Black porous material from Piper's Shaft - Psilomelane. Min. Report 252/53.

(18, 19, 20) See Ethiudna East Cobalt

(21) See Plumbago Graphite.

(22, 23, 24, 25) See Lookout Hill.

MINERAL REPORTS:

P 252/53	Sample 11 is calcite.
P 252/53	Sample 14 consists mainly of scapolite, feldspar, psilomelane, and apatite.
P 252/53.	Sample 17 is psilomelane.

CROCKER WELL URANIUM FIELD

REFERENCE LIST OF GEOLOGICAL REPORTS

Sprigg R.C. & Seedsman K.	Crocker Well Uranium Occurrence. (Original detailed report on prospect) 8/11/51.
King D.	Exploration of Crocker Well Uranium Deposit. Sampling by bulldozer & scintillometer survey. 12/2/52. D.M. 987/51.
Parkin L.W. & King D.	Crocker Well Uranium Prospect - C.W.1. Full report on surface sampling and evaluation. 13/3/52. D.M. 1413/51.
King D.	Summary of Progress reports for month ending 23/5/52. Shaft sinking at Crocker Well and results of ground surveys of air borne anomalies. 28/5/52.
Parkin L. W.	Crocker Well Uranium Prospect - C.W. 2. Recommending assay of bulk sample from shafts, and further deepening of shafts. 20/6/52. D.M. 1413/51.
Parkin L. W.	Progress report. - C.W.3. Shaft sinking, geological map US120. 11/7/52. D.M. 1413/51.
King D.	Examination of rare earth Pegmatite near Wiperaminga Hill, Old Boolcoomatta US. Florencite, luggenite, dufrenite, gummit e. Mining review. 13/11/52. D.M. 730/52.
Parkin L. W.	Exploration Progress Summary - C.W.4. Summary of development. 14/11/52 D.M. 1413/51.
Radoslovich E. W.	X-ray Analysis of a Uranium Mineral (Absite) from the S.A. Mines Dept.
King D. & Whittle A.W.	Geology of the Crocker Well Uranium Deposit - C.W.5. General Geology of original Crocker Well absite deposit to be published in Uranium Bulletin. 2/2/53.
Parkin L. W.	Proposed Boring Programme Crocker Well - C.W.6 Location of D.D. and Wagon drill sites. 13/3/53.
Parkin L.W.	Crocker Well - Progress statement - C.W. 7. and recommendation. Diamond drilling results, assays, recommendation for 5 more holes to complete project. 19/6/53.

Parkin L. W.	Progress Appraisal to 17/8/53 - C.W.8. Shaft sampling, drilling, assays, and overall grade. 17/8/53.
Campana B.	Mineralisation controls in the Olary-Cockburn-Kalabity Plumbago M.S. areas, with Reference to the discovery of New Radioactive Deposits near Plumbago H.S. and Easterly of Crocker Well. General on mineralisation, and mentions broader features of Crocker East Prospect and Mundamereeka Hill Project (map US199). 21/8/53. D.M. 1597/53 S.R. 11/2/56.
Parkin L. W.	General Exploration, Crocker Well District C.W.9. Transfer of drilling to Crocker East. Reference to Mundamereeka (Plumbago) Prospect. 16/9/53. S.R. 11/2/56.
Parkin L. W.	Prospecting in the Crocker Well Area. Brief reference to Crocker east suggesting trenching Plumbago Prospect (Mindamereeka Prospect) Crocker west Davidite. Other prospects. 29/10/53 S.R. 11/2/35.
Campana B.	Geological report on the Uranium Occurrences at Windamerta Hill. With Further Notes on Mineralisation Control in the Plumbago-Glenorchy Area. Progress of regional, mapping, and broad descriptions of Windamerta Prospect with sections. 2/11/53. S.R. 11/2/58.
Parkin L. W.	Progress Report - C.W. 11 Brief references to Crocker Well Crocker east Plumbago Prospect (Mundamereeka Hill). Davidite Prospect - Crocker West. Windamerta Prospect 16/11/53. S.R. 11/2/35.
Harris J.	Radioactive survey at Crocker Well East 23/11/53.
Parkin L. W.	Comments on Uranium Mineralisation Control in the Plumbago-Glenorchy Area. Comments on reports bynB. Campana 11/2/56 & 11/2/58. 26/11/53. S.R. 11/2/58.
Parkin L. W.	The Crocker Well Uranium Prospect - C.W.12 Report on Completion of Exploration. Summarises boring results etc at original Crocker Well absite occurrence. 27/11/53.

Miles K. R.	A new find of Radioactive Minerals near Wiperaminga Hill, Kalabity M.S. Reporting discovery of davidite. Plan US258 23/12/53.
King D.	Report on Mindamereeka Hill Prospect - C.W.13. Final report on detailed examination, boring and assays. 11/1/54. S.R.
King D.	Progress report to 15th January, 1954.- C.W.14. General resume of field prospecting, mapping and diamond drilling. 21/1/54. S.R.

CROCKER WELL URANIUM FIELD

REFERENCE LIST OF PETROLOGY LABORATORY REPORTS

Report No. 2/53	Petrologic Examination of Raw Material ex Crockers Well. (Describes composition and degree of locking of heavy mineral fraction of material from shafts). A. W. Whittle 25/2/53. S.R. 26/4/17.
Report No. 4/53	Sized Ore-Crocker Well. (Composition of heavy and light fractions). A. W. Whittle 27/3/53. S.R. 26/4/17 D.M. 418/53
Report No. 16/53	Mill Products. A. W. Whittle. S.R. 26/4/17.
Report No. 24/53	Mineral reports on - G101 G106 Black schist - Windamerta G101 fine grained granite-Windamerta JJ13/7 Fergusonite rock N. of Mt. Victoria Hut. A.W. Whittle 29/10/53 S.R. 26/4/17.
Report No. 27/53	Mineral reports on DK1, TA1, TA2, TA4. A. W. Whittle 14/10/53 S.R. 26/4/17
Report No. 33/53	Mineral reports on - RA1, TA2, TA4-26; TA4/5 TA6, TA9, TA10, TA11, TA14/8 heavy sand from 5200N-3600E Pet. reports on - TA4-25 and TA4-10. A. W. Whittle S.R. 26/4/17.
Report No. 34/53	Concentrates from Crocker Well. Source was alluvial samples from Crocker East. Only one grain of absite in heavy fractions. S.R. 26/4/17.
Report No. 37/53	Prospectors Samples. Mineral Reports on - JJ13/7, Mt. Victoria Mines No. 5, JJ13/1, TA4, graftonite W. of Cockburn. A.W. Whittle 20/11/53 S.R. 26/4/17.
Report No. 41/53	Petrographic Report on Drill Hole No. PPI, Crocker Well. Description of soil types and davidite minera with photos. A. W. Whittle 4/12/53. S.R. 26/4/17.
Report No. 128/53	Pet. reports on - Crocker east rock samples 1,3,4,5 HC2 rock sample. Heavy sand from Crocker East - S7.
Report No.	Pet. reports on - Rock 8 3600E-4790N) Rock 9 4040E-4770N) Rock 10 4145E-4795N) Crocker East

Report No. 252/53	Pet. reports on - Windamerta Hill Nos. 5 & 6. Mineral reports on - Ethiudna Nos, 11, 14, 17, 18, 19, 24. A. W. Whittle 7/1/54
Report No. 2/54	Mineral reports on - L43, L42, L41, JJ13/7, JJ13/4, JJ12/2, TA20, TA16/3, TA16/1, TA15/1. Mt. Victoria Mines Nos. 4 & 5. A. W. Whittle. S.R. 26/4/17. S.R. 26/4/20.

CROCKER WELL URANIUM FIELD

REFERENCE LIST OF GEOLOGICAL MAPS

US.77 Aerial Scintillometer Survey of Military Sheet Outalpa - Map C. Gross.

US.78 The relation of radioactive anomalies to geology over Outalpa M.S. - Maps C1. Gross.

US.79 Aerial Scintillometer Survey of Military Sheets Outalpa-Kalabity-Map D. Gross.

US.80 The relation of radioactive anomalies to geology of areas Outalpa-Kalabity M.S. Map D1. Gross.

US.81 Aerial Scintillometer survey of Military Sheet Plumbago, - Map E. Gross.

US.82 Graph showing Radioactive anomaly of Run 13, M.S. Plumbago-Glenorchy Gross.

US.90 Crocker Well Area showing surface Channel Sample. Sprigg 4/10/51.

US.91 Aerial Radioactive Survey of N.S. Plumbago and Glenorchy (western portion) - Map F. Gross 2/8/51.

US.92 Aerial Radioactive Survey of M.S. Plumbago and Glenorchy (eastern portion) Map F, Gross.

US.93 Crockers Well Uranium Deposits. Locality Plan. Sprigg 23/10/51.

US.101 Crocker Well Plan ? Sprigg

US.102 Crockers Well. Surface Plan showing largest of tracks, wells, and proposed tracks and wells. 1" = 5000' Sprigg 24/10/51.

US.103 Crockers Well. Locality Plan showing tracks, Crockers Well, and proposed boring sites 1" = 1200' Sprigg 1/11/51.

US.104 Reconnaissance Geological Map of Plumbago Batholith 1" = 60 chains. Sprigg 1/11/51.

US.105 Crocker Well Uranium Deposit. Regional Radioactivity Distributor 1" = 2 miles, Sprigg, 1/11/51.

US.106 Crocker Well. Detailed geological relationships of the principle Uranium occurrences 1"=40' Sprigg 1/11/51.

US.107 Crockers Well U_3O_8 Deposit. Scintillometer survey showing Gamma Count Contours. 1" = 40' Sprigg 1/11/51.

US.108 Crocker Well U_3O_8 Deposit. Assay & Geological plan of Costeans A-B,C,D,E,F,G, & K. 1" = 10' Sprigg 1/11/51.

US.109 Crockers Well. Plan showing position of chip samples. 1" = 100' Sprigg 1/11/51.

US.110 Crocker Well, U_3O_8 Deposit. Plan & hypothetical vertical sections. 1" = 100'. Sprigg 1/11/51.

US.111 Crockers Well U_3O_8 Deposit. "Mean Isorad Plan". 1" = 40' D. King 25/2/52.

US.112 Crockers Well Geological Plan. 1" = 40' D. King 26/2/52.

US.113 Assay plan (?)

US.120 Crockers Well U_3O_8 Deposit. Detailed Geological Plan. 1" = 40' D. King 11/9/52.

US.121 Crockers Well. Geological Detail of shaft walls 1" = 20' D. King 16/7/52.

US.124 Crockers Well. Diagrammatic Sketch:- Rock types and structure in relation to ore distribution 1" = 200' D. King 16/7/52.

US.125 Crockers Well:- Shaft assay plan: Block diagram of Shafts B & C. 1" = 4' D. King 16/7/52.

US.127 Crocker Well U_3O_8 Deposit Regional Geological Map D. King 22/7/52.

US.139 South of Crockers Well. Reported U_3O_8 Occurrence. 1" = 80 chains D. King 20/8/52.

US.150 Scintillometer traverse by D. King of U_3O_8 prospect near Kalabity station. 1" = 1 mile D. King 14/11/52.

US.152 Crocker Well Area:- Near Isorad Plan:- Reduction from 48' plan US711 to 200' plan. 1" = 200' D. King 2/1/52.

US.153 Crockers Well Area:- Generalised Geological section of shafts B & C (Associate of plan US121) 1" = 4' D. King 5/1/52.

US.166 Crockers Well U_3O_8 Deposit:- Proposed bore sites drafted from Plan US120. 1" = 40' Parkin L.W. 11/3/50

US.169 Crockers Well:- Radiometric Bore logging of D.D. hole No. 1. Graphs D. McPh. 31/3/53.

US.170 Crockers Well:- Radiometric core logging of D.D. hole No. 2 Graph. D. McPh. 31/3/53.

US.171 Crockers Well:- Radiometric core logging of D.D. hole No. 3 Graph D. McPh. 31/3/53.

US.174 Crockers Well Radiometric bore hole logging of D.D. hole No. 4 Graphs C.K. Grant 5/5/53.

US.178 Crockers Well. Surface drilling programme (this plan super-sedes US166) 1" = 40' J.C.A. 7/5/53.

US.179 Crockers Well. Radiometric bore hole logging of D.D. hole 100N: 36W. Graphs C.K.G. 20/5/53.

US.180 Crocker Well:- Radioactive bore hole logging of D.D. hole No. 6. (100 N:35W). Graphs C. Kerr Grant 20/5/53.

US.181 Crockers Well:- Radiometric bore hole logging of D.D. hole No. 5. 150N:3375W. Graphs C.K.G. 20/5/53.

US.182 Crockers Well:- Radiometric bore hole logging of Wagon drill hole 50N:32W. Graphs C.K.G. 20/5/53

US.183 Crockers Well:- Radiometric bore hole logging of Wagon drill hole. Graph C.K.G. 20/5/53.

US.186 Portion of Glenorchy Military Sheet, showing Radioactivity area surrounding Glenorchy Station 1" = 1 mile C.K.G. 24/6/53.

US.199 Geological sketch plan of radioactive deposit 2 miles N.E. of Plumbago Station. 8" = 1 mile D. Campana 25/8/53.

US.200 Preliminary geological sketch plan of Plumbago H. station, Crockers Well area showing distribution amphibolitic epidote formation and mineralisation. 1" = 40 chains. Dr. Campana 25/8/53.

US.207 Crockers Well east geological plan Map sheet I 1" = 40' D. King 16/9/53.

US.211 Crocker Well area:- Radioactive mineral occurrences 1" = 800' D. King 16/10/53.

US.225 Crockers Well east Isorad Plan 1" = 40' J. Harris 5/11/53.

US.226 Crockers Well west Davidite Prospects Isorad Plan 1" = 40' J. Harris 5/11/53.

US.227 Crockers Well west Davidite Prospect geological plan 1" = 20' D. King 5/11/53.

US.228 Plumbago, Crockers Well nd Glenorchy area:- General Geological 2" = 1 mile Dr. Campana 6/11/53.

US.229 Glenorchy - Crockers Well area:- Preliminary geological map showing distribution of uraniferous bodies. 2" = 1 mile Dr. Campana 6/11/53.

US.230 Windamerta Uraniferous fields: Geological cross section in central portion of main lense. 1" = 6' Dr. Campana 6/11/53.

US.231 Windamerta Uraniferous fields:- Figs 2 & 3 geological sections 1" = 6' Dr. Campana 6/11/53.

US.232 Windamerta Uraniferous fields:- Figs 4,5, & 6 geological sections 1" = 6' Dr. Campana 6/11/53.

US.233 Mt. Victoria Hut area:- Uraniferous pegmatite and quartz veins figs, 7, 8 & 9. 1" = 6' Dr. Campana 6/11/53.

US.234 Windamerta Uraniferous field: Preliminary geological plan. 1" = 8 ch. Dr. Campana 6/11/53.

US.235 Windamerta Uraniferous field:- Geological cross section. 1" = 40 yds. Dr. Campana 6/11/53.

US.244 Redraft of Crockers Well geological plan US120 for report by L. Parkin. 1" = 100' D. King 23/11/53.

US.245 Crocker Well U_3O_8 Deposit: cross section on co-ord 3000W. 1" = 40' D. King 24/11/53.

US.246 Crockers Well U_3O_8 Deposit: cross section on co-ord 3100W 1" = 40' D. King 24/11/53.

US.247 Crocker Well U_3O_8 Deposit: cross section on co-ord 3200W. 1" = 40' D. King 24/11/53.

US.248 Windamerta U_3O_8 Prospect: Geological plan 1" = 40' D. King 30/11/53.

US.258 Wiperaminga Hill (near Kalabity): location of new find of radioactive material. 1" = 40 ch. Dr Miles 22/12/53.

US.259 Mindamereeka Hill Prospect: Crockers Well area: Detailed geological plan: 1" = 20' D. King 23/12/53.

US.260 East Crockers U_3O_8 Prospect. Detailed geological Plan. Map sheet 2. 1" = 40' D. King 5/1/54.

US.261 East Crockers U_3O_8 Prospect. Detailed geological plan. Map sheet 3. 1" = 40' D. King 5/1/54.

US.262 Mindamereeka Hill. Locality Plan. 1" = 32' D. King 5/1/54.

US.266 Mindamereeka Hill. Cross section along bore hole PP1. 1" = 20' D. King 13/1/54.

US.267 Crockers Well Uranium Field. Spring Hill prospect (Glenorchy Station) 1" = 20' D. King 14/1/54.

US.268 Crockers Well east. Composite detailed geological plan. 1" = 100' D. King 20/1/54.