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Metals Exploration Ltd.

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74-1012.

COX BIGHT ALLUVIAL TIN PROSPECT

SOUTH EAST TASMANIA

REPORT ON PRELIMINARY DRILLING PROGRAMME - FEBRUARY-MARCH, 1974

and

NEW EXPLORATION AND BUDGET PROPOSAL STAGES I AND II

by

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AMG REFERENCE POINTS ADDED

CONTENTS

SUMMARY

Results of a preliminary drilling, sampling and mapping programme carried out at Freney Lagoon near Cox Bight indicate that considerable potential exists for locating buried channels of wash containing alluvial cassiterite. Much of the plains on either side of Point Eric are possibly underlain by granite, thus enhancing the prospects of tin accumulation in the area.

At Melaleuca, alluvial cassiterite could occur in narrow buried valleys following mineralised fault lines.

A new Stage I budget of $55,000 is proposed to the alluvials at Cox Bight and a Stage II budget of $37,000 is proposed to further test the Cox Bight areas in detail and to test the areas at Melaleuca.

INTRODUCTION

Ludbrooks Ltd. are the holders of Exploration Licence No. 18/71 of 131 square miles in south-west Tasmania. The area holds good potential for locating alluvial tin deposits which could be mined by dredging or sluicing operations.

On the 1st November, 1973, Metals Exploration Ltd. signed an Option and Joint Venture Agreement with Ludbrooks where M. E. L. had until the 30th June, 1974, to expend $25,000 on the area. At this time, M. E. L. would then have the right to earn a 51% interest in the area by a further expenditure of $300,000 before May 1st, 1976. Metals Exploration Ltd. have now expended the sum of $25,000 on the area and this report is a summary of the work carried out in the area during February and March, 1974, when cable tool drilling, mapping and sampling were carried out. The aim of the programme was to determine if an alluvial tin dredging prospect could be located in the Melaleuca or Cox Bight valleys by drilling a minimum of 5 holes in each valley.

TENEMENTS

Ludbrooks Ltd. are the holders of Exploration Licence No. 18/71 covering 167 square miles. The expiry date is 24th April, 1974, and reviews for renewal are made each 6 months. Ludbrooks Ltd. also hold the following Mineral Lease Applications at Melaleuca - Nos. 27/72 to 31/72 inclusive; 27/72 and 28/72 - 80 acres each; 29/72, 30/72 and 31/72 - 40 acres each.

LOCATION AND ACCESS

The area is located in the extreme south-western corner of Tasmania at latitude 43°24' South, longitude 146°15' East. It lies 80 miles west south-west of Hobart and can be reached by light aircraft or by boat from Hobart. An airstrip 1,000 feet long at Melaleuca Inlet can only accommodate small, single engine Cessna aircraft or a landing can be made on the beach at Cox Bight. Bathurst Harbour provides an excellent harbour for ocean-going craft, but only small jetties are available in Melaleuca Inlet for fishing vessels. A light bulldozer can be transported via fishing vessel to Melaleuca, but calm seas are essential for the trip which takes about 12 hours from Hobart. Access in the area is restricted to tracked vehicles which can negotiate the swampy button grass plains, but bridges are required to cross the numerous sharply incised creeks. The J5 Bombardier used on the project proved to be adequate for the job, but a larger version, with a bigger pay load, would be much more useful in the next exploration stage.

NOTE NO PAGE 2.

REGIONAL GEOLOGY

The predominant rock types in the south-western area of Tasmania are Upper Pre-Cambrian sediments which have been metamorphosed to quartzite, quartz mica schists and phyllites. The area forms part of the meridianal trending Tyenna Geanticline. Devonian porphyritic biotite granite intrudes the metamorphic series and outcrops in two small areas at Cox Bight and South West Cape and represents a relatively small area of source rock for tin mineralisation.

Both the metamorphic rocks and the granites contain quartz veins, many of which are mineralised with cassiterite, pyrite and chalcopyrite. Wolframite, sphalerite and antimony are also reported to occur in quartz veins. Although granite is not widespread in the Cox Bight-Bathurst Harbour area, tin mineralisation is very common, indicating that granite underlies much of the area at a shallow depth.

Cassiterite is also found in alluvials at Wilson Bight, New Harbour, Hannant Inlet and Horseshoe Inlet. To date, tin mineralisation has been found over an area of 25 x 20 kilometres.

The tin deposits occur in broad, flat valleys with steep sides which are most likely of glacial origin.

WORK CARRIED OUT

1. DRILLING

Five holes, totalling 68.98 metres, were drilled with a Cable Tool percussion rig using 15 cm (6 inch) water bore casing. The holes were all drilled on one traverse in the Cox Bight valley.

2. MAPPING

Fact geological mapping, using aerial photographs at 1 : 8000 and 1 : 39, 200 scales, was carried out over 100 square kilometres and photo interpretation was carried out over an additional 80 square kilometres.

3. SAMPLING

Channel sampling was carried out in old workings in the region and material was panned on site. Tin concentrates were dried and weighed in camp. Reconnaissance sampling for cassiterite was carried out in all streams draining into Cox Bight and all streams draining into the valley between Cox Bight and Melaleuca Inlet.

SUMMARY AND DISCUSSION OF RESULTS

A. DRILLING

(See plan for location of drill holes and see Appendix for drill logs).

Drill Hole No.	Final Depth	Basement Rock	WASH DETAILS (metres)		
			Depth	Int.	Concentrate Grade (70% Sn)
1	6.10	Weathered quartzite	4.57- 6.1	1.53	$< \frac{1}{2}$ lb/yd^3 0.25kg/m^3
2	7.62	Weathered quartzite	4.57- 6.1	1.53	Trace
3	16.77	Decomposed granite	-	-	Nil
4	19.82	Decomposed granite	15.25-16.77	1.52	0.10
			16.77-18.30	1.53	1.73 $\simeq$ 3lb/yd^3
			18.30-19.82	1.52	0.03
5	18.67	Decomposed quartzite	0- 1.52	1.52	Trace
			9.81-11.24	1.43	Trace
			11.24-12.67	1.43	0.32 $\simeq \frac{1}{2}$ lb/yd^3
			12.67-17.15	4.48	Trace

Bores 2, 3, 4 and 5 intersected probable marine gravels overlying fluviatile sand and gravels. The tin values in holes 4 and 5 were in the fluviatile section.

Drilling rates were very slow and averaged 3.8 metres per 10 hour shift. The main problems came with slow penetration in tightly packed fine quartz sand and slow pumping or sample recovery in gravelly material. Jacking of casing was also difficult and time-consuming due to unfirm ground (peat) near the surface which allowed jack bed planks to sink several feet into the ground.

B. LOCAL GEOLOGY

1. Basement Rocks

The Pre-Cambrian quartzite formations have suffered a high degree of folding and have been transected by a major fault complex. The faults appear to have controlled the localisation of the granitic stock at Cox Bight and possibly acted as channels for quartz veins carrying cassiterite and sulphide mineralisation. Reconnaissance mapping of stream sediments strongly suggests a relationship between fault planes and cassiterite occurrences and the possibility of major mineralised faults buried beneath valley alluvials should not be excluded.

The granite at Cox Bight carries cassiterite in contact greisens and quartz veins. Quartz veins invade the quartzites for approximately 100 metres from the contact. Individual lodes are too small to be of economic importance. The granite outcrops over an area of 1 square kilometre, but, as drilling results have shown, the granite probably extends for about 1 kilometre west under the main valley and may also extend 1 kilometre east under a broad, flat plain to link up with a greisenised granite outcrop in Cox Creek. Alluvial tin was found overlying this isolated outcrop and thus the extent of granite basement in the area is probably much greater than previously recognised.

The hills to the east of Cox Bight are composed of quartz sericite schists. These were tested for tin mineralisation but appear to be barren.

2. Tertiary-Cainozoic Detrital Deposits

The major valleys were probably glacier-carved along major fault trends, but no glacial detritis or glacial pavements have been noted. Post-glaciation fluviatile deposits of gravels and peat were followed by a marine transgression and a series of wave cut platforms are preserved on the valley sides up to approximately 40 metres above sea level. Fluviatile deposition resumed following marine regression which is still continuing.

Cassiterite in the Cox Bight area has been shed into alluvials from greisen and quartz lodes within the granite stock and from quartz

veins in the adjacent quartzites. At Melaleuca, the source of cassiterite is probably from a stockwork of quartz veins in the valley floor which are controlled by the postulated fault pattern.

Near Point Eric in Cox Bight, partially re-worked marine gravels on a wave cut platform have been ground sluiced to produce the 200 tons of tin won from the area. Work appears to have ceased when overburden thickness exceeded 2 metres. Small quantities of gravels in alluvial fans on creeks debouching from the granite were sluiced north-west of Point Eric.

In the Melaleuca area, sand and peat overburden, less than 1 metre thick, overlies partially re-worked marine gravels on former wave-cut platforms. At King's workings, wash thickness is approximately 1 metre and grades are generally less than 2 kg./m^3. Small quantities of gold are also being recovered by King. On Ludbrooks' claims, 202,000 cubic metres of wash, averaging 0.4 m thick, containing 0.48 kilograms of cassiterite per cubic metre, is overlain by 161,000 cubic metres of overburden, averaging 0.3 m thick.

POTENTIAL

A. Valley Alluvials

(1) FRENEY LAGOON, COX BIGHT

The drilling to date by M.E.L. has indicated that the overall grade of the valley detrital deposits could be too low to support a large capacity dredging operation. However, the intersection of stanniferous gravels with a high sulphide content overlying decomposed granite basement in Bore 4 suggests the possibility of a high grade deep lead following the granite-quartzite contact. Bores 3 and 5 are spaced 200 and 300 metres respectively from Bore 4 and further drilling is required to verify the existence of a deep lead. Approximately 1 square kilometre of granite, with its associated 3 kilometres of contact, is covered by valley alluvials. The deep lead system in the valley could therefore be extensive.

Potential	:	Say, 3 km long x 200 m. wide.
Wash	:	at 1.5 m. thick = 900,000 cubic metres.
Overburden	:	at 15 m. thick = 9,000,000 cubic metres.

(2) MELALEUCA

At Melaleuca, outcrops of quartzite have been located under a thin cover of alluvial material in a central position within what was considered to be potential dredging ground. The alluvial filled valley in this area is therefore more narrow than expected. From Ludbrooks' bores the valley is plus 40 feet deep and it is possible that holes Nos. 3, 4 and 5 did not reach bottom, but rather encountered fine compact marine quartz sands similar to those that greatly impeded the rate of drilling in M.E.L's bores 3, 4 and 5.

If Ludbrooks' bores reached bottom, the potential of deep alluvials at Melaleuca is limited. There may, however, be narrow, rich leads following old mineralised faults in the main valley and further drilling is required to check this possibility. Total potential could be, say, 3 kilometres of lead length by 200 m. wide. Wash and overburden thickness are as yet untested.

B. Terrace Alluvials Point Eric

Overlying the granite at Point Eric in Cox Bight, are cassiterite-bearing alluvials which cover an area of approximately 1 million square metres. These alluvials have been shown to date to contain tin near Point Eric and at their eastern extremity in Cox Creek. Various attempts have been made (in the 1920's) to test these deposits, which are elevated about 10 metres above sea level, but water inflows into the pits have probably prevented them reaching bottom.

The gravels are probably underlain by granite as at Freney Lagoon and it could be expected that as the contacts of the buried granite are approached, wash grades and thicknesses would increase. The tin mined to date from Point Eric would have been derived from the more barren erosion-resistant granite core.

Sampling to date indicates:-

Overburden thickness	:	0.5 m to, say, 8 metres Say, average 4 metres
Wash thickness	:	0.7 to plus 2 metres Say, average 1.5 metres
Wash Grade	:	0.47 to 1.4 kg/m^3 Say, average plus 1.2 kg/m^3.

11

21b/fol 3

POTENTIAL -

Overburden Volume	:	4,000,000 cubic metres
Wash Volume	:	1,500,000 " "
Concentrate	:	1.8 million kilograms
		or 1,800 tons 70% Sn

CONCLUSIONS

1. The drilling carried out to date in the valley at Cox Bight indicates that rich gutters of alluvial tin could be associated with the buried granite contact near Freney and Miller's Lagoons. A potential 200,000 cubic metres of wash of unknown grade could occur beneath 9,000,000 cubic metres of overburden.

2. To the east of Point Eric a raised terrace containing a possible 1,500,000 cubic metres of wash grading, say, 1.2 kg/m^3 is overlain by 4,000,000 cubic metres of overburden.

3. At Melaleuca, narrow deep leads following old mineralised fault zones could contain rich alluvial tin. At least 3 kilometres of lead are indicated.

It is strongly recommended that the above 3 possibilities be tested by further drilling. An exploration programme and budget is therefore proposed to carry out this work.

EXPLORATION PROPOSAL

A. ACCESS

Bombardier vehicles are the only means of transport in the area unless road-making machinery is brought in. It is proposed that we continue to use Bombardiers, but use a larger machine than the ~~14~~ 15 so that bigger loads can be carried. A return trip with the ~~14~~ 15 and trailer from Cox Bight to Melaleuca takes about 4 hours, but if limited bridge-work were carried out on several creek crossings, the time interval would be about 3 hours.

For the next work stage, transport to Melaleuca from Hobart should be by fishing vessel, but if a landing barge could be obtained, all equipment could be landed at Cox Bight in one quick action. The latter would be the better mode of transport. The possibility of forming a small breakwater and landing jetty in the eastern portion of Cox Bight is premature at present.

Access to the area by air is by single engine aircraft which land on a 1,000 feet long airstrip at Melaleuca, which does not meet D.C.A. requirements for length. A 3,500 feet strip could be built at right angles to the existing strip to accommodate twin engine aircraft. A $1\frac{1}{2}$ yard rubber-tyred loader (King's) and a $1\frac{1}{2}$ yard traxcavator (Ludbrooks) are on site and could be hired to carry out this work which might take from 4 to 6 weeks to form a basic strip. No other suitable site exists closer to Cox Bight.

Moves are afoot to locate an airstrip in the South West suitable for twin engine aircraft and, apparently, an amount of $25,000 could be available from the government's tourist body for this development.

B. CAMP

The tent camp used in the summer programme was adequate due to the unusually dry weather experienced. It is recommended that corrugated iron huts, or similar basic structures, be built for the next programme so that accommodation would be adequate for wet days and could be used for the winter period if work continues past the 1974-75 summer.

C. DRILLING PROPOSAL

The cable tool percussion drill used in the preliminary drilling programme does not appear to have a competitor when the sampling of boulder beds in swampy ground is required. Although cable tool drilling is very slow, the flow of results could be speeded up by using several drills. A considerable saving in shifting time could be gained by using the M. E. L. special jacks and jacking base which were not available for the preliminary drilling programme and resulted in 35 metres of casing being left in holes 4 and 5.

1. Freney Lagoon

It is proposed to drill 3 holes 100 metres apart between holes 3 and 5 on the existing drill line, A, and continue the same line westwards from Bore 5 with 2 holes 200 metres apart. A further two lines, B and C, approximately 500 metres apart, are proposed to the south of the existing line. Holes on each line would be 200 metres apart, with areas of interest (in gullies or near the granite contact) drilled at 100 metres spacings.

A further drill line, D, is proposed 500 metres north of line A to test for possible deep leads associated with mineralised faults underlying the valley floor. Holes should be spaced 200 metres apart.

Total proposed holes - 25.

2. Point Eric - Eastern Side.

Two lines, E and F, are proposed 800 metres apart with holes spaced at 200 metres. Drill line E crosses the perched alluvial section and drill line F crosses the alluvials near current sea level. Line F would have to be drilled, while line E could probably be sampled by bulldozer cutting large costeans to basement.

Total proposed holes - 15.

3. Melaleuca

Three drill lines, G, H and I are proposed approximately 2 kilometres apart to test for possible deep leads associated

with mineralised faults underlying the valley floor. Holes to be spaced at 200 metre intervals. It is proposed to continue drilling on line J (Ludbrooks' line) with 3 holes, 200 metres apart, east of the previous drill holes.

Total proposed holes - 15.

D. GEOPHYSICS

Resistivity surveys across possible buried deep leads are recommended before Stage II drilling commences. The aim of this work is to locate the sulphides associated with the cassiterite in the basal wash which has been shown to occur in tin concentrates at Cox Bight and at Melaleuca. A trial survey could be carried out over drill line A at Freyney Lagoon where approximately 2% (by weight) sulphides occur in two metres of wash in bore 4. If successful, traverses across possible buried leads could be carried out before drilling so that holes could be located directly over leads and thus save on drilling costs for unnecessary holes.

BUDGET

The work programme is divided into two stages with 3 drills operating at Freyney Lagoon and Point Eric in Stage I. Stage II is a continuation of Stage I with one drill moving up to Melaleuca while the other two complete drilling at Cox Bight.

STAGE I

Duration

Drill and Camp Establishment	4 weeks
Drilling Period	6 weeks
Total -	10

Capital Items

Muskeg Carrier (Bombardier with 3-ton payload)	$15,000	
Shed 20' x 40' with partitioned rooms and wooden floor	5,000	$20,000

Exploration Expenditure

Technical Services	12,400
Labour	1,550
Travelling and Accommodation	2,080
Camp and Messing	2,040
Freight and Charter	4,080
Assaying	500
Consumables	1,500
Fuel and Lubricants	500
Repairs and Maintenance	250
Contract Drilling -	
260 metres x $25/m.	6,500
Casing losses (say)	800
	$52,200
Contingencies	2,800
	$55,000

Stage II ....

STAGE II

Duration

9 weeks drilling
1 week camp dismantlement - Total 10 weeks.

Technical Services	$12,000
Labour	3,600
Travelling and Accommodation	1,600
Camp and Messing	2,400
Freight and Charter	1,500
Assaying	500
Consumables	500
Fuel and Lubricants	500
Repairs and Maintenance	200
Contract Drilling	10,500
Geophysics (resistivity)	4,000
	$37,300
Contingency	1,700
	$39,000

TOTAL STAGES I AND II - $94,000

APPENDIX

DRILL LOGS

BORE 1

0 - 3. 0 metres	Peat and fine sand.
3. 0 - 5. 8	Sand and fluviatile gravels
5. 8 - 6. 1	Decomposed quartzite basement

Interval 4.57 - 6.1 metres, grade 0.25 kg/m^3

BORE 2

0 - 1.50 metres	Peat and sand, minor fine gravel
1.50 - 4.00	Sand and minor gravel
4.00 - 4.10	Peat, carbonized wood and sand
4.10 - 7.17	White sand and gravel - mine
7.17 - 7.62	Decomposed quartzite basement

Interval 4.57 - 6.10 metres, grade trace cassiterite

BORE 3

0 - 1.50 metres	Sand - minor fine gravel
1.50 - 10.00	Sand, gravel and boulders, marine
10.00 - 11.50	Coarse sand and carbonized wood
11.50 - 13.80	Sand and gravel, peat stained
13.80 - 15.20	Coarse sand and muscovite
15.20 - 16.00	Coarse sand, muscovite and decomposed granite boulders
16.00 - 16.77 metres	Decomposed granite

BORE 4

0 - 4.57 metres	Peat, sand, carbonized timber
4.57 - 15.25	Marine sands and gravel
15.25 - 18.30	Fluviatile sand and gravel
18.30 - 19.82	Decomposed granite basement.

Intervals

15.25 - 16.77 metres, grade 0.01 kg/m^3
16.77 - 18.30 metres, grade 1.73 kg/m^3
18.30 - 19.82 metres, grade 0.03 kg/m^3

BORE 5

0 - 3.05 metres	Sand and peat
3.05 - 9.81	Marine sands and gravel
9.81 - 17.15	Peat stained sands and gravels
17.15 - 18.67	Decomposed sheared quartzite basement with sericite veinlets

Intervals

0 - 1.52 metres, grade - trace
9.81 -11.24 metres, grade - trace
11.24 -12.67 metres, grade 0.32 kg/m^3
12.67 -17.15 metres, grade - trace

Reconnaissance Sampling

(See map for locations) - Sample Volume $\frac{1}{50}$ m^3

No. 1 Dump of former test pit - marine gravels and boulders - Grade 0.065 kilograms/$metre^3$

Pit failed to reach basement.

No. 2 Exposure in bank of Cox Creek.

0 - 0.5 metres	Sandy loan - trace cassiterite
0.5 - 1.5 metres	Sand and gravels - grade 0.98 kg/m^3

Decomposed greisenized granite basement.

No. 3 Bed of Pender Creek, adjacent to quartzite basement.

Grade 0.7 kg/$metre^3$

No. 4 Section exposed by old workings on Knight's Creek.

0 - 3 metres	Peat stained gravels and boulders. No basement.
0 - 1 metre	Grade 0.13 kg/m^3
1 - 2 metres	Grade 0.35 kg/m_3
2 - 3 metres	Grade 1.65 kg/m^3

No. 5 Dump of former test shaft. Gravel and boulders.

Grade 0.1 kg/$metre^3$. Pit failed to reach basement.

Reconnaissance Sampling (contd.)

No. 6 Section exposed in disused race.

0 - 2 metres Gravels and sand

No basement.

Grade - Trace.

No. 7 Section exposed by old workings on Going Creek

0 - 3 metres Peat stained gravels

Intervals

0 - 2 metres Trace
2 - 3 metres 0.47 kg/metre^3

Decomposed greisenized granite basement.

No. 8 Section exposed by old workings on Going Creek

0 - 3 metres Gravel and boulders - marine?

No basement.

Intervals

0 - 1 metre Trace
1 - 2 metres 0.85 kg/m^3
2 - 3 metres 1.4 kg/m^3

No. 9 Section exposed by old workings on Going Creek.

0 - 1.5 metres Sand, gravel and boulders - peat stained

Intervals

0 - 0.5 metres Trace
0.5 - 1.5 metres 1.05 kg/m^3

Decomposed greisenized granite basement.

No. 10 Section exposed by old workings on Going Creek

0 - 1.3 metres Peat, sand, minor gravel. Grade - trace
1.3 - 2.0 metres Sand and gravel. Grade 1.6 kg/m^3

Decomposed granite basement.

PLATE No.
POCKET No.
REPORT No.

BATHURST HARBOUR

Melaleuca Inlet

Loaparte Cove

Fulton Cove

Moulters Inlet

MOULTER'S GAP

Melaleuca Lagoon

Melaleuca Creek

Alexander Ck

Pandora Creek

Hidden Valley

Race Creek

Bell Cox Creek

Guardian Creek

RAY RIVER

BATHURST RANGE

BLACK CLIFF HILLS

Freney Lagoon

Miller Lagoon

Point Eric

New Falls Creek

George Creek

Pender Creek

New Harbour

New Harbour Point

NEW HARBOUR RANGE

COX BIGHT

Cox Bluff

KING'S KNOB 89 m

HALF-WOODY HILL 163 m

MT. COUNSEL 800 m

469 m

AMG 431479mE, 5190101mN

AMG 438782mE, 5183686mN

Areas test pitted by Ludbrooks

Marine gravels at shallow depths

Mined by Ludbrooks

King's workings

LUDBROOKS BORES

PROPOSED DRILL LINE

PROPOSED DRILL LINES

REVERSE FAULT

METALS EXPLORATION LTD. BORES

Sheared Quartzite basement

Granite basement

Reworked Marine Gravels Exposed in old workings

Isoclinal folding

Highly folded Quartzite and Quartz/sericite veinlets

Greisenised Granite outcrop

Quartz/Sulphide veins

Quartz/sericite veinlets

Quartz/Arsenopyride veinlets

Abundant heavy minerals on beach No SnO_2

Indurated Gravels

Low Grades

Strong Trace

Trace Fine

Trace

Barren

TRUE NORTH

MAGNETIC NORTH

15°

LEGEND

CAINOZOIC	Cs	Sand, sand and peat
	Cgf	Gravels – fluviatile, subangular
	Cgm	Gravels – marine, rounded
DEVONIAN	Dg	Granite – porphyritic, Biotite
PRE-CAMBRIAN	Pqb	Quartzite – bedded
	Pqc	Quartzite – crenulated
	Pqs	Quartz/sericite Schist

F —— —— F Fault – interpreted

Ancestral drainage channel – inferred

(8) Location referred to in report

Escarpment – wave cut platforms

AMG REFERENCE POINTS ADDED

0 1 2 3 Kilometres

5 cm

597019
74-1012.

METALS EXPLORATION LTD.

COX BIGHT – TASMANIA
ALLUVIAL TIN PROJECT
GEOLOGICAL PLAN
WITH DRILLHOLE AND SAMPLE LOCATIONS

BASE DRAWN	DATE
PREPARED P.A. Burger	DATE April 1974
DRAWN A. Sullivan	DATE 9-5-1974
SCALE 1:39,200 approx. (Air photo scale)	
DRAWING No. 74-035 018	