

OPEN FILE

PART I

641001



**PORT OF LAUNCESTON
AUTHORITY**

BLUE METAL INDUSTRIES LIMITED

MIDDLE ARM MINING AND RECLAMATION

BEACONSFIELD

ENVIRONMENTAL IMPACT STUDY

OF DREDGING AND RECLAMATION

AUGUST, 1975

PORT OF LAUNCESTON AUTHORITY
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C O N T E N T S

1. INTRODUCTION
2. THE OPERATION
3. ENVIRONMENTAL EFFECTS
4. CONCLUSIONS

OPEN FILE

APPENDICES:

- I - Statement of Environmental Factors.
- II - Turbidity Tests.
- III - Drawings -
 - (i) Locality Plan.
 - (ii) General Site Plan and Sample Collection Points. Dwg.No. D271-7.
 - (iii) Boundaries of Mining Lease.
 - (iv) Method of Tailings Recovery Dwg. No. P271-8.
- ~~IV - Feasibility Study.~~

An environmental impact study for the removal and treatment of tailings from the bed and shores of Middle Arm for the recovery of gold, by B.M.I. Mining Pty.Ltd., P.O. Box 42, Wentworthville, N.S.W. 2145.

DREDGING AND RECLAMATION

1. INTRODUCTION

This part of the study refers to the excavation of tailings from the bed of Middle Arm and their subsequent return after treatment to the Western foreshore of the Arm as reclamation.

Full details of investigations made and alternative proposals considered are outlined in the "Feasibility Study" submitted as Appendix IV. Proposal 3 as described on pages A-4 and B-3 of that Study has been adopted as being the one which -

- (i) provides the least cost operation,
 - (ii) involves the minimum of disturbance to the environment with the least uncertainties in its effects;
- and (iii) when carried out under responsible supervision will clean up what is currently an unsightly area and create considerable aesthetic improvement upon completion.

2. THE OPERATION -

It is proposed that surface silt and tailings from the bed of Middle Arm in the area indicated in yellow on Drawing No.D271-7 be excavated by a Sauerman Scraper type operation operated from the Western shore with excavated tailings stockpiled in that area prior to treatment for the extraction of gold. After treatment the waste material will be pumped from the treatment plant to previously constructed bunded areas along the foreshore as reclamation. Adequate settling time will be provided by a system of settling and drainage ponds as dictated by the conditions existing. The actual treatment process is described in another part of this environmental impact study.

It is anticipated that the grading and grain size of the waste material will be substantially the same as that of the tailings as originally excavated from the river bed.

After natural drainage and consolidation the reclaimed area of about 4.8 ha will be graded to form a foreshore beach and potential recreation area along some 550 m of the Western foreshore.

During the excavation work the main Middle Arm creek channel will be maintained as close to the Eastern shoreline as possible.

In view of the relatively high level of the mud flats in the vicinity of the mining operation a large proportion of the excavation will be undertaken "in the dry" during the lower half of the tidal cycle and consequently will produce little or no effect on the waters of the Arm.

3. ENVIRONMENTAL EFFECTS

After completion of the works the aesthetics of the area will be significantly better than presently existing.

During the progress of the work excavation of the river bed will cause some disturbance of the waters of the Arm in the immediate vicinity of the work, but the results of turbidity tests (Appendix II) and our experience of dredging and reclamation operations in salt water conditions indicates that rapid settlement of suspended material will occur but obvious turbidity will not normally extend beyond 100 to 200 m of the work site. Proper management of the reclamation areas will enable almost complete settlement of solids and return of effluent to the river of a standard little different from the river water itself.

The effect on fish and other marine life will be limited to the area actually being worked, which represents less than 10% of the total area of Middle Arm. On completion of the work with the tailings removed, the original bed of the river will be exposed and re-established by natural processes and we are advised will provide a suitable habitat for the return of fish and marine life.

4. CONCLUSION -

With careful management of the operation it is believed that no significant environmental problems will be created during the progress of the work but in the longer term considerable aesthetic benefits will result from the general clean up and improvement of the existing unsightly area.



(J.K. EDWARDS) F.I.E. AUST.
GENERAL MANAGER & CHIEF ENGINEER

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STATEMENT OF ENVIRONMENTAL FACTORSPART ADESCRIPTION OF PROJECT AND EXISTING ENVIRONMENT1. NAME AND ADDRESS OF APPLICANT:

B.M.I. Mining Pty.Ltd.
P.O. Box 42,
Wentworthville, New South Wales 2145.

2. LOCATION AND BOUNDARIES OF PROJECT:

The upstream area of Middle Arm from Scotchman's Point to the road bridge over Middle Arm Creek. (Refer Appendix III, drawing No. D271-7.)

3. DESCRIPTION OF PROJECT:

- (a) The recovery of tailings from the bed of Middle Arm by a Sauerman Scraper type operation.
- (b) Reclamation of an area of 4.5 ha approx. on the Western foreshore of Middle Arm using the treated tailings (treatment forms a separate study).

4. COMMUNICATIONS:

- (a) Access to the project will be by existing road.
- (b) Telephone, if required, from Beaconsfield, a distance of 2 km.

5. POWER TRANSMISSION SYSTEMS:

Electric power requirements will be met from existing H.E.C. supply at Beaconsfield, a distance of 2 km.

6. WATER SUPPLIES:

Any water required during the recovery and reclamation will be taken from the Arm and returned in a clean state.

7. WASTE PRODUCTS:

Tailings after treatment will be used for reclamation.

8. DATE SCHEDULED FOR COMPLETION OF PROJECT:

Two years from commencement.

9. EXISTING LAND USE CLASSIFICATION:

Agricultural with a 100 ft. Crown Reserve from high water mark.

10. PROPOSED LAND USE CLASSIFICATION:

Land will revert to its existing classification.

11. DESCRIPTION OF EXISTING SITE:

Sparsely timbered undulating farm land and mud flats between high and low water marks.

12. EXISTING WILDLIFE HABITATS:

Refer Appendix IV of "Feasibility Study" attached as Appendix IV.

13. DESCRIPTION OF REGION SURROUNDING THE SITE:

The area is largely undeveloped bush and partially developed farm land.

14. BUILDINGS, MONUMENTS OF FEATURES OF HISTORIC INTEREST ON EXISTING SITE.

No buildings, monuments or features of interest existing on the site or in the vicinity.

*old home
Kiln F.
bank*

15. FEATURES OF SCIENTIFIC INTEREST ON EXISTING SITE:

Some fish life. Refer Appendix IV "Feasibility Study" attached as Appendix IV.

16. FEATURES OF SCENIC OR RECREATIONAL VALUE ON EXISTING SITE:

At present there is little of scenic value in the operating area, and no current recreational activities.

17. ANY OTHER RELEVANT FEATURES:

The site is presently a derelict and unsightly one.

PART B.

EFFECTS OF PROJECT ON ENVIRONMENT

18. DISTURBANCE TO PRESENT OCCUPIERS:

- (a) As the surrounding area is rural with no building or residences within sight of the project there will be no anticipated interference.
- (b) Upon completion the area will be left in an improved condition with some possibilities for recreational development.

19. PHYSICAL CHANGES TO TOPOGRAPHY:

4.5 ha of land will be reclaimed on the Western bank of the Arm, and some deepening of the river channel up to Middle Arm Creek.

20. CHANGES TO EXISTING VEGETATION:

There will be no removal of trees or scrub on the Eastern bank and minimal disturbance on the Western Bank where there is very little scrub of very poor quality.

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21. EFFECTS ON WILDLIFE:

Wildlife will not be effected. Advice indicates that fish and marine life will quickly return to normal.

22. EFFECTS ON WATER QUALITY:

No change in the chemical quality of the water will be made, although slight turbidity will occur in the immediate vicinity of the excavation during the removal of tailings.

23. CHANGES TO HISTORIC FEATURES:

None.

24. EFFECTS ON SCIENTIFIC FEATURES:

None.

25. EFFECTS ON SCENIC OR RECREATIONAL ASPECTS:

This area currently has only a limited scenic value and no recreational value. Both will be greatly improved upon completion of the project.

26. VISUAL EFFECT OF PROJECT:

Apart from a mobile dragline and service store no building will be constructed. Stockpiles of dredged tailings will be visible.

27. ESTIMATED NOISE LEVELS AT BOUNDARY OF PROJECT WHEN COMPLETED:

None.

28. VIBRATION EFFECTS AT BOUNDARY RESULTING FROM BLASTING OR MACHINERY OPERATION ON PROJECT SITE:

None.

29. NATURE AND VOLUME OF TRAFFIC GENERATED BY PROJECT:

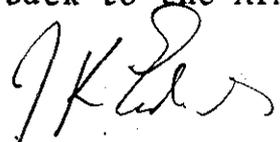
Resulting from fuel supplies and personnel transport only.

30. IMPROVED ACCESS TO SURROUNDING REGION:

Limited access by small craft at high water, otherwise none.

PART C.ENVIRONMENT PROTECTION MEASURES

A programme of excavation for minimum water disturbance and turbidity and careful management of reclamation procedures to ensure settlement of all solids before discharge of waste water back to the Arm.


(J.K. EDWARDS) F.I.E. AUST.

20th August, 1975.

GENERAL MANAGER & CHIEF ENGINEER

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TURBIDITY TESTSB.M.I. PROJECT - MIDDLE ARMFORMAT OF TESTING

- (a) Aim - To study settlement characteristics of material being dredged.
- (b) Sample collection points - Samples collected at water level at mid tide as shown on Fig. I.
- (c) Water - Water used during testing was taken from the sample area in order to account for salt water effects.
- (d) Procedure -
- (i) Place a measured volume of sample together with water sample in a 1000 ml graduated conical measuring cylinder (concentration of soil sample approximately 8% by volume).
 - (ii) Thoroughly mix the sample by tilting and shaking.
 - (iii) Record the volume of sample settled at specific times.
 - (iv) Calculate the percentage of sample settled and draw settlement versus time curves.

SAMPLE NO. 1 Depth 0.6 - 0.7 m.

Solid concentration 6.8% (by volume).

TIME Min.Sec.	VOL.SETTLED SOLIDS	% SETTLED	REMARKS
0.05	35 ml	51.3	Tailings
0.15	50	73.3	"
0.30	56	82.1	"
1.00	60	88.0	"
1.30	62.2	91.2	"
2.00	63.8	93.5	Fine Silt
3.00	64.5	94.6	" "
4.00	65.8	96.5	" "
5.00	66.0	96.8	" "
10.00	67.0	98.2	" "
20.00	68.2	100.0	" "
60.00	68.2	100.0	" "
120.00	68.2	100.0	" "

SAMPLE NO. 3. Depth 0.6 - 0.75 m

641009

Solid concentration 7.1%

TIME Min.Sec.	VOL. SETTLED SOLIDS	% SETTLED	REMARKS
0.05	50 ml	70.4	Tailings
0.10	58	81.6	"
0.20	60	84.5	"
0.30	60.8	85.6	"
0.60	62.0	87.3	"
1.30	63.0	88.7	"
2.00	64.0	90.1	"
3.00	64.2	90.4	"
4.00	65.0	91.5	Fine Silt
5.00	66.0	93.0	" "
10.00	68.0	95.8	" "
20.00	71.0	100.0	" "
30.00	71.0	100.0	" "
60.00	71.0	100.0	" "

N.B. Similar characteristics to Sample No. 1

SAMPLE NO. 5. Depth 0.6 - 0.75 m

Solid concentration 9.5%

Sample contained large quantities of silt/clay.

TIME Min.Sec.	VOL. SETTLED SOLIDS	% SETTLED	REMARKS
0.05	25 ml	26.3	Tailings
0.10	44	46.3	"
0.20	49	51.6	"
0.30	50	52.6	"
0.60	51	53.7	"
2.00	58	61.1	"
3.00	64	67.4	"
4.00	68	71.6	"
5.00	72	75.8	"
10.00	84	88.4	"
20.00	88	92.6	"
30.00	90	94.7	"
60.00	95	100.0	"
120.00	95	100.0	"

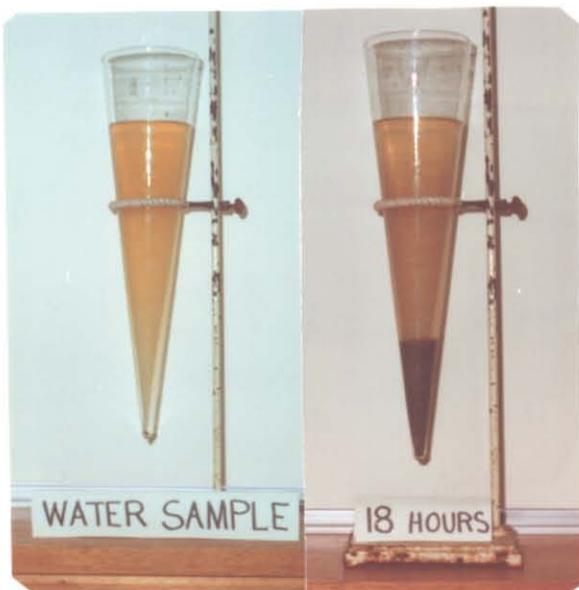
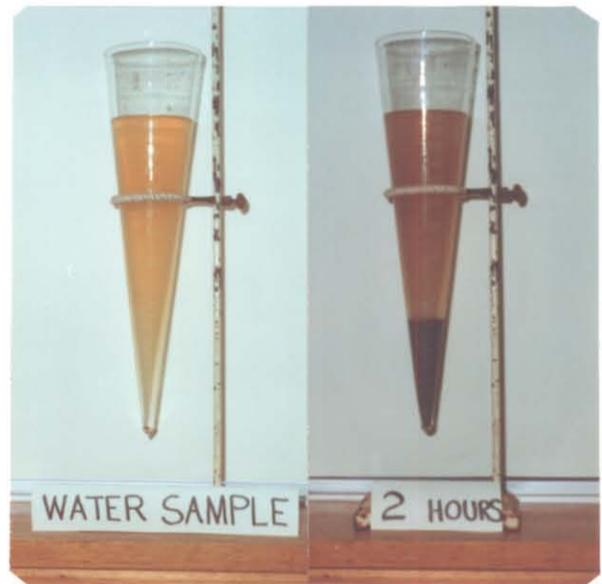
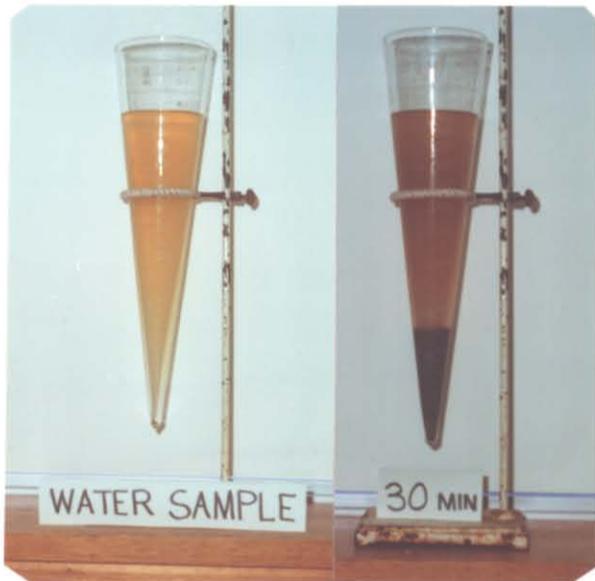
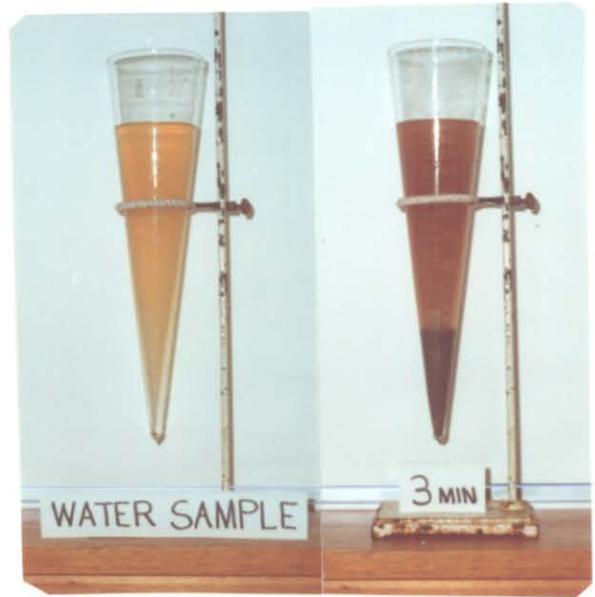
↑
 Suspended layer of
 silt/clay material
 settling or
 compacting
 ↓

N.B. Due to sample being taken well into the Arm (i.e. lower concentration of tailings) it contained a large percentage of silt/clay. This gave very cloudy water for a period of approximately 5 - 10 mins. This suspended material slowly settled in a uniform layer.

CONCLUSIONS -

- Samples Nos. 2 and 4 appeared identical to samples Nos. 1 and 3 and were not separately tested.
- Figs. I and II show that the time of total settlement increased with distance from the Middle Arm Creek Bridge. This is considered to be due to the concentration of the tailings decreasing with distance from the bridge and a larger percentage of silt which remained suspended for a longer period.
- Samples taken from areas with a reasonable concentration of tailings (i.e. samples 1 to 4) contained approximately 6% to 8% of fine silt. 90% of the material settled within 2 minutes and total settlement occurred within 20 minutes.
- Samples taken from areas with low concentration of tailings contained approximately 20% to 25% of fine silt. 75% of the material settled within 5 minutes and total settlement occurred within 60 minutes.

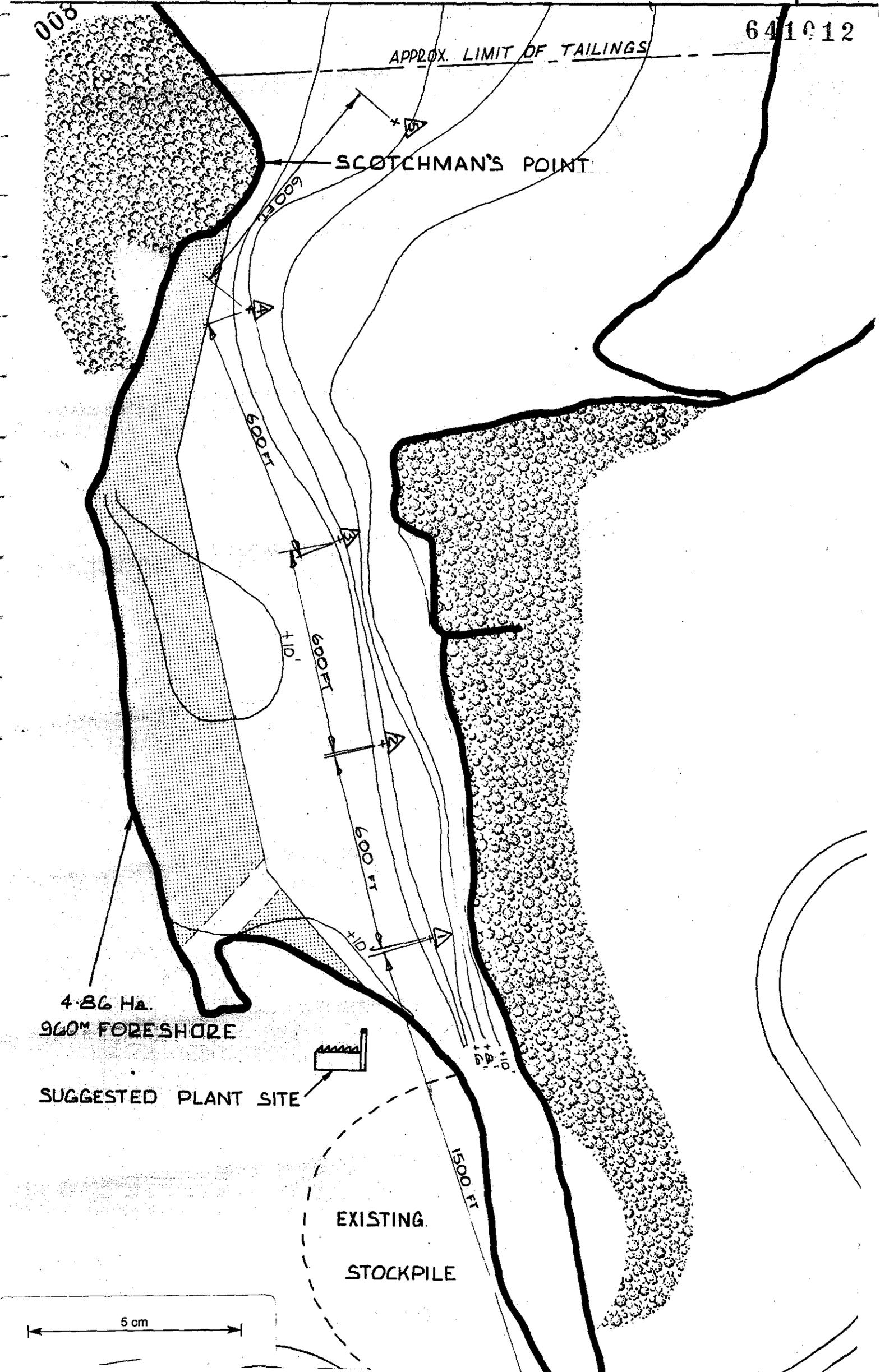
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Sample Station No. 3

Comparison of disturbed sample against undisturbed water as existing at settlement times of 3 minutes, 30 minutes, 2 hours and 18 hours.

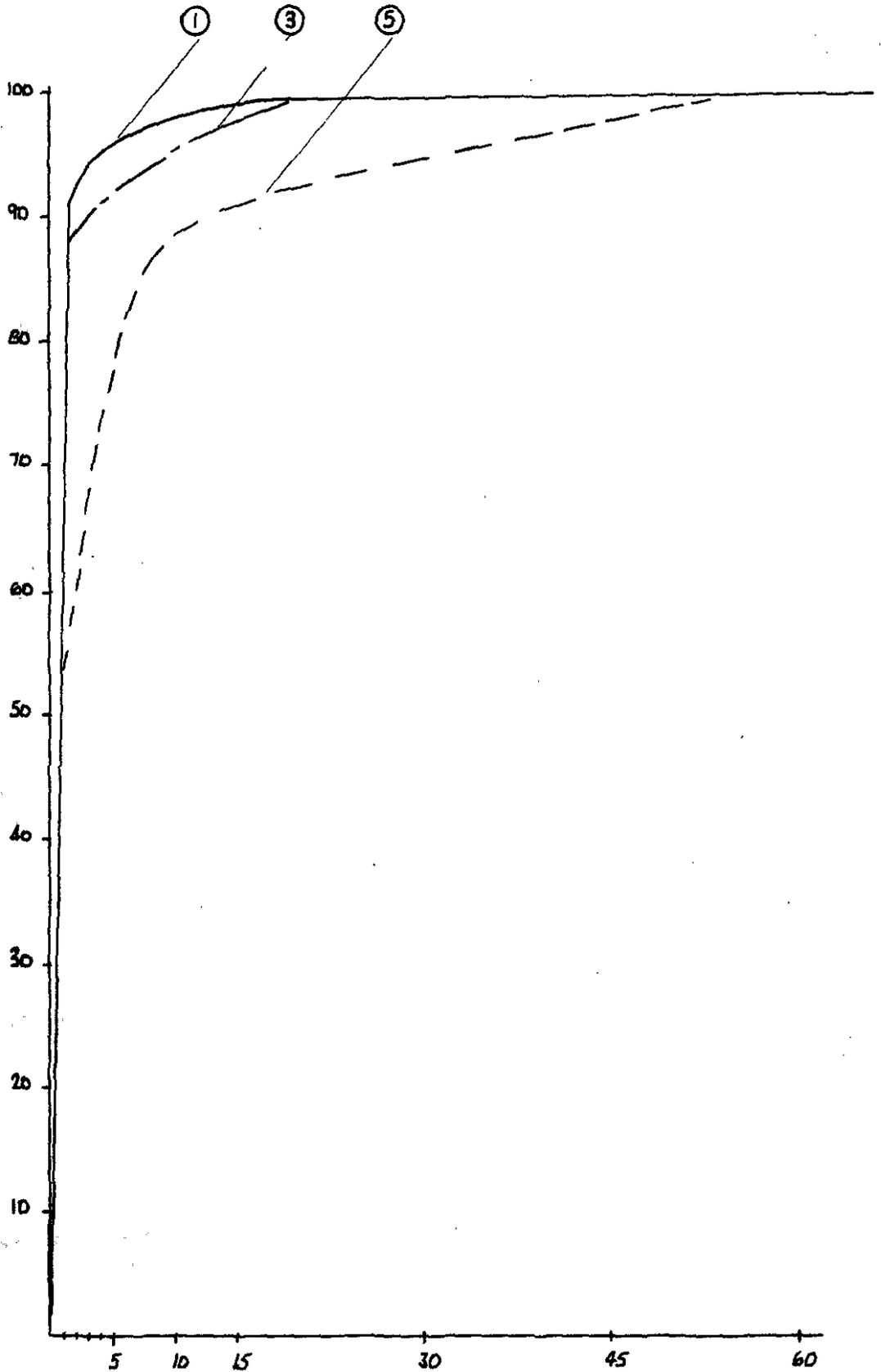
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009

PORT OF LAUNCESTON AUTHORITY	SETTLEMENT / TIME CURVES		SCALE	DTLD. BY B.K.B.	SHEET No.
			DATE 23-7-75	CHECKED BY J.C.	P FIG. II

% SETTLED

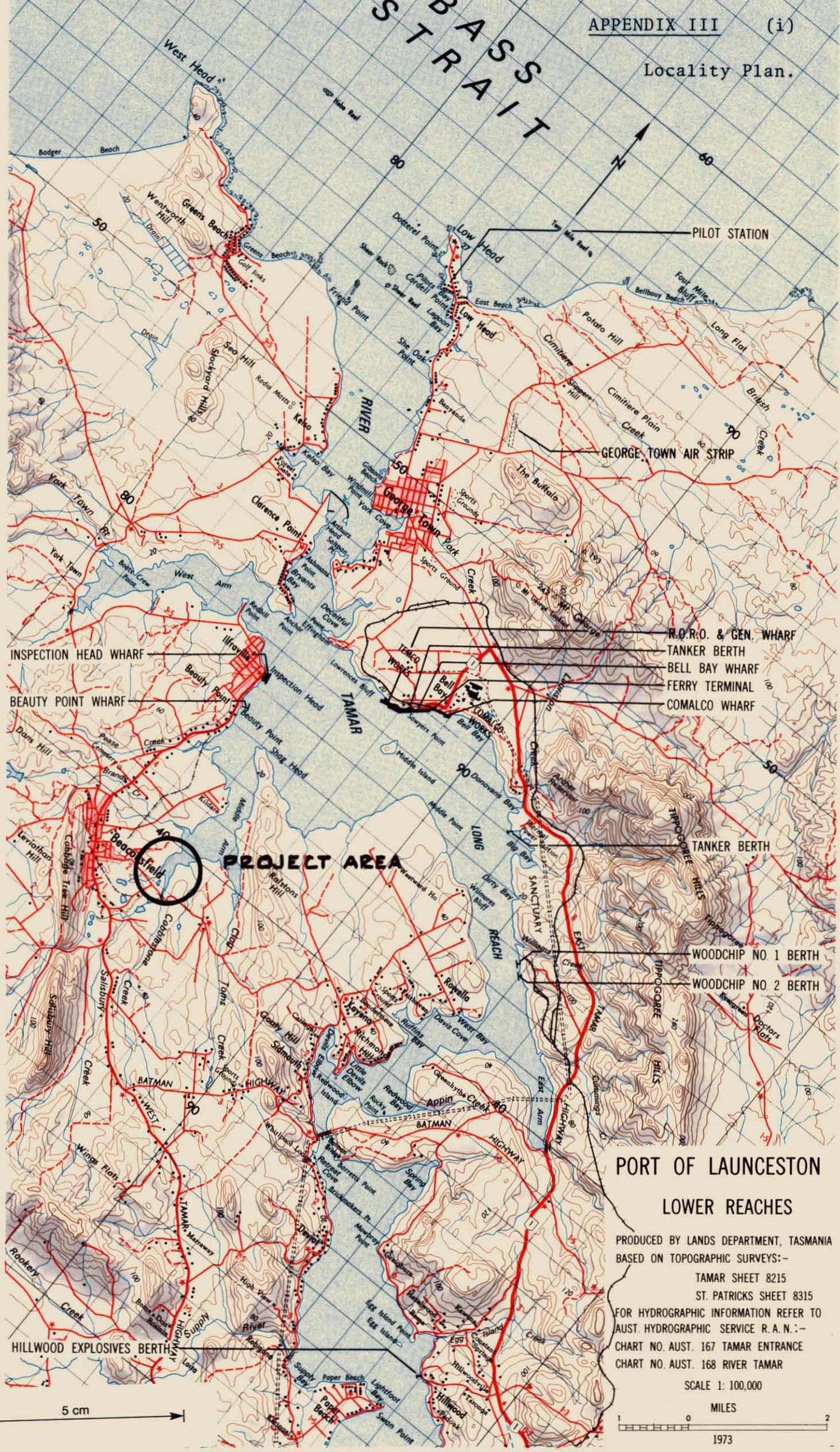


TIME (MIN)

011

641014

STRAITS



INSPECTION HEAD WHARF
 BEAUTY POINT WHARF

R.O.R.O. & GEN. WHARF
 TANKER BERTH
 BELL BAY WHARF
 FERRY TERMINAL
 COMALCO WHARF

PROJECT AREA

TANKER BERTH
 WOODCHIP NO. 1 BERTH
 WOODCHIP NO. 2 BERTH

PORT OF LAUNCESTON LOWER REACHES

PRODUCED BY LANDS DEPARTMENT, TASMANIA
 BASED ON TOPOGRAPHIC SURVEYS:-
 TAMAR SHEET 8215
 ST. PATRICKS SHEET 8315
 FOR HYDROGRAPHIC INFORMATION REFER TO
 AUST. HYDROGRAPHIC SERVICE R.A.N.:-
 CHART NO. AUST. 167 TAMAR ENTRANCE
 CHART NO. AUST. 168 RIVER TAMAR

SCALE 1: 100,000

5 cm



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GENERAL SITE PLAN AND SAMPLE COLLECTION POINTS

DATE
14-7-75

DTLD BY
G.M.D.

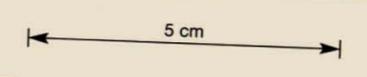
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MIDDLE ARM — SETTLEMENT TESTS

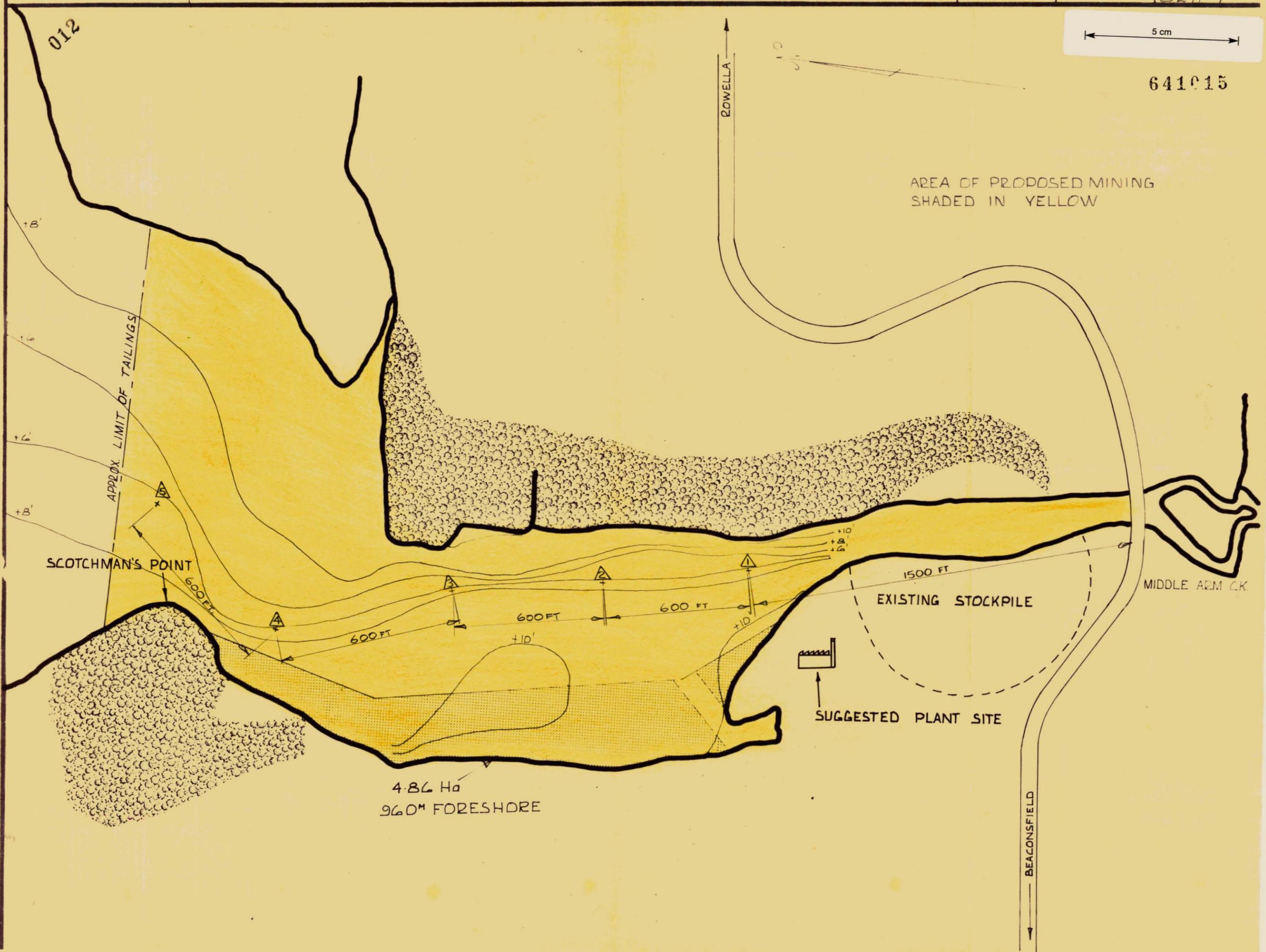
SCALE
1"=300'

CHECKED BY

FIG I
D271-7



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641016

013

E.L. 21/72 500 AC.
B.M.I. MINING P/L.

0 0

7 12 73

Bowen

1164 M TO H.W.M.

Pur.

r to scale
N to scale

80ac

62 ac

GM 40

80AC

1000 0 0
Located to
Cavin Ralston

7 0 0

A. Douglas

Pur.

WALKER

DATUM

C.D. Wilson
Sold Set

of
109 0 0

D. White

Pur.

31 12
E. J. Ke b
Lessee

G. J. A. WALKER

52M 49 20

100 0 0

G. Blyth

Pur.

C. D. Wilson

50 0 0
R. Newey Pur.

ESTATE of P. J. MANION - P. D. MANION

50 0 0
R. W. Butler Pur.

187P 21

78ac

J. Williamson

Lot 2340 99ac

E. Dally

E.L. 21/72

500 AC.

B.M.I. MINING P/L

7 8 73

E. Dally

Pur.

Lot 516 80.2 0

5 cm

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B.M.I. MINING — MIDDLE ARM DEVELOPMENT.
METHOD OF TAILINGS RECOVERY.

SCALE
NOT TO SCALE
DATE
1-8-75

DTLD. BY
G.M.C.D.
CHECKED BY

SHEET No.
P271-8

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