ENG. DEPT.

93.1::JWP/bak

23rd December 1996

Jan Bimrose,
Executive Director,
Project and Investment Development Division,
Department of Economic Development and Trade,
P.O. Box 168,
Brisbane Albert Street Q 4002

Dear Madam,

RE: Port Hinchinbrook - Trubidity Control Plan
Your Ref: E292/039

I refer to your letter dated **26th November, 1996,** submitting the above Turbidity Control Plan for Council's approval, in accordance with 7.1 of the Tripartite Deed.

Council considered the matter at its Town Planning and Health Committee meeting held on **19th December, 1996,** and approved the components of the Turbidity Control Plan for the Port Hinchinbrook Resort, as submitted, and dated 19th November, 1996.

Yours faithfully,

G.T. KING
Chief Executive Officer

ENG. DEPT.

~T1077 TOWN PLANNING - MARC ROWELL (MEMBER FOR HINCHINBROOK) & DENIS COLE (RAGING THUNDER) - OUTSTANDING SEWERAGE HEADWORKS CHARGES - TEMPORARY ABLUTION BLOCK - TULLY RAILWAY STATION - RAGING THUNDER PTY. LTD.:

Cr. G. Scuderi moved - Cr. B. Bobbermein seconded

"That Council adopt the recommendations of the Director, Engineering Services, Mr. A. Raiti, in his Report dated 11th December, 1996, and that Council advise Mr. Cole, Raging Thunder Pty. Ltd., that in relation to the outstanding sewerage headworks charges of $10,400 for the temporary ablution block on the Tully Railway Station land, Council requires the following compliance:-

1. Payment of all outstanding charges of $10,400, plus interest calculated at 10% p.a. that has accumulated since 1st January, 1996."

CARRIED

11:08a.m. - The Director, Engineering Services and the Manager, Environmental Health Services, both left the meeting.

~T1078 PORT HINCHINBROOK - DEPARTMENT OF ECONOMIC DEVELOPMENT AND TRADE - TURBIDITY CONTROL PLAN:

Cr. A.D. McLeod moved - Cr. V.A. Rick seconded

"That Council adopt the recommendations of the Deputy Director, Engineering Services, Mr. J.W. Pettigrew, in his Report dated 11th December, 1996, and that the Department of Economic Development and Trade be advised Council approves the components of the Turbidity Control Plan for the Port Hinchinbrook Resort, dated 19th November, 1996."

CARRIED

~T1079 TOWN PLANNING CONSENT - RECONSIDERATION OF CONDITION OF APPROVAL - PROPOSED ENVIRONMENTAL INTERPRETATIVE CENTRE - L.C. & K.W. BAGLEY - BRUCE HIGHWAY, RUNGOO:

Cr. J.P. Nicolson moved - Cr. V.A. Rick seconded

"That Council adopt the recommendations of the Planning Officer, Mr. R.J. Milne, his Report dated 12th December, 1996, and Council delete condition (6) of the Town Planning Consent approval for L.C. & K.W. Bagley on land described as Lot 8 on RP897197, Parish of Pitt, situated at Bruce Highway, Rungoo, for the purpose of Environmental Interpretation Centre, Dwelling & Tea House, and that the applicants be advised accordingly."

CARRIED

~T1080 INWARD CORRESPONDENCE - TO BE RECEIVED - FOR COUNCILLORS' INFORMATION ONLY:

It was RESOLVED to Receive the Inward Correspondence for Councillors' Information Only, as listed Items 1 to 5.

No. 7

TO: Mayor and Councillors
Town Planning and Health Committee

FROM: Deputy Director, Engineering Services

RE: Department of Economic Development and Trade - Port Hinchinbrook - Turbidity Control Plan
<File 93-1 - Received 28.11.96 >

MEETING DATE: 19th December 1996

COMMENTS:

The proposal submits a Turbidity Control Plan for Council approval in accordance with 7.1 of the Tripartite Deed.

Components covered include:-

a) **Marina Dewatering**
b) **Operation of Spoil Ponds**
c) **Stabilisation of Development Site**
d) **Management of Stormwater**

and

e) **Channel Dredging**

All components of the Plan are generally in accordance with previous discussion and advices, and generally does not appear to present any problem to Council. The document is available for perusal by any interested Councillors.

RECOMMENDATION:

That the Department of Economic Development and Trade be advised Council approves the components of the Turbidity Control Plan for the Port Hinchinbrook Resort (dated 19th November, 1996).

December 11, 1996

J.W. PETTIGREW
Deputy Director,
Engineering Services

CONFIRMATION

QUEENSLAND GOVERNMENT

TPE Health

Department of Economic Development and Trade

FILE	93
PROPERTY	
CED	
DCDS	
MOF	
MR	
CDS	✓
CHO	
DATE	29.11.96

Please quote
Ref: E292/039

Mr Graham King
Chief Executive Officer
Cardwell Shire Council
PO Box 401
TULLY Q 4854

Dear Mr King Graham

Port Hinchinbrook - Turbidity Control Plan

I refer to previous correspondence in relation to the Turbidity Control Plan required for the Port Hinchinbrook project and Council's approval (by letter dated 28 August 1996) of various components of the Plan namely the plans dealing with dredging, re-circulation of the dredge spoil water and management of acid sulphate soil.

I now enclose for Council's approval a compiled Turbidity Control Plan dated 19 November 1996 submitted by Cardwell Properties Pty Ltd. The primary component of the compiled Plan for which Council's approval is required is the plan dealing with the stabilisation of the Development Site prepared in accordance with clause 7.1(iii) of the Deed. This updated Plan addresses the stabilisation of the site following the completion of the major earthworks anticipated to occur around the end of November 1996.

Given that some components of the Plan were approved in 1994 and that there are a number of amended procedures identified in this compiled Plan, it may be appropriate for Council to consider the Turbidity Control Plan in its entirety.

The developer has indicated his intention to commence dredging of the access channel as soon as possible, and as the Deed requires the approval of the Turbidity Control Plan prior to the commencement of dredging, your assistance is sought in considering the Plan expeditiously.

Thank you for your assistance in this matter.

Yours sincerely

Jan Bimrose

Jan Bimrose
Executive Director
Project and Investment Development Division

RECEIVED
2 8 NOV 1996
CARDWELL SHIRE COUNCIL

Executive Building
100 George Street

PO Box 168
Brisbane Albert Street Q 4002 Australia

Phone: +61 7 3224 2111
Facsimile: +61 7 3229 2990

Port Hinchinbrook
Resort-Cardwell, Far North Queensland

Suite 5, Fishermans Wharf
94 Seaworld Drive, Main Beach,
Queensland 4217 Australia
Phone (07) 5591 2020 Fax (07) 5591 2616

TOTAL PAGES: 24

PORT HINCHINBROOK

KW/ls

Tuesday, 19th November, 1996.

Project & Investment Development Division,
Project Co-Ordination Office,
Department of Economic Development & Trade,
Post Office Box 168,
BRISBANE ALBERT STREET. QLD. 4002.

Attention: Miss. Claire Single.

RE: AMENDED TURBIDITY CONTROL PLAN - SECTION II.

Dear Miss. Single,

Further to our telephone conversation on Monday of this week and your subsequent fax which was received at 4.15pm the same afternoon I now answer your queries in the form of an amended Turbidity Control Plan - Section II which covers your queries both individually and collectively.

Please note that I will be forwarding by mail a bound document containing these plans and drawings relevant to this amended Turbidity Control Plan - Section II.

Since your questions relate to Clause 7.1 of the Deed (Turbidity Control Plan) I have provided Deed references to each individual component of the all inclusive Plan.

Yours faithfully,

KEITH WILLIAMS.

Attached: Plans dealing with Clause 7.1 of the Deed:

CLAUSE NO.

7.1 (a)(i) - Marina De-Watering;
7.1 (a)(ii) - Operation of Spoil Ponds;
7.1 (a)(iii) - Stabilisation of the Development Site (including use of Natural Channels);
7.1 (a)(iv) - Management of Stormwater;
7.1 (a)(v) - Channel Dredging;

"P O R T H I N C H I N B R O O K"

TURBIDITY CONTROL PLAN - SECTION II (AMENDED)

(ORIGINAL DATED 30/07/96 - AMENDED 19/11/96)

****

RELEVANT TO ISSUES CONTAINED IN THE DEED - CLAUSE 7.1

C O N T E N T S

DETAILED PLANS DEALING WITH:

DATE OF DOCUMENT : 19 NOVEMBER 1996

19/11/96

"PORT HINCHINBROOK"

TURBIDITY CONTROL PLAN - SECTION II

ORIGINAL DATED 30/07/96 - AMENDED AS AT 19/11/96

IN COMPLIANCE WITH CLAUSE 7.1 OF THE DEED

AMENDMENT REQUIREMENT.

Unexpected delay due to legal action, combined with experience gained during the early stages of earthworks, has caused this company to review its Operational Plan and, as a consequence, its Turbidity Control Plan. This amendment will provide the best possible result in compliance with the Deed.

NOTE: Reference will be made to the attached plan titled: "BUNDS RELEVANT TO CANAL AND MARINA ACCESS CHANNEL - 15/11/96 - **"THE PLAN"**.

MARINA DE-WATERING - REFERENCE CLAUSE 7.1(a)(i)

Recently there appears to have been some confusion in regard to de-watering of the marina and to clarify the situation I state that de-watering as referred to at the time when the Deed was being compiled was clearly meant to be:

"PUMPING ALL WATER FROM THE MARINA BASIN SO THAT EXCAVATION IN THE DRY COULD PROCEED".

It was clearly understood that the turbidity level of the water being discharged would have to be equal to the receiving water even though provision was made to allow for brief periods when this water may be slightly more turbid than the receiving water.

Since the Federal Government became a party to the Deed both turbidity and water quality (Ph) are defined. Turbidity being equal to the receiving water (within reasonable parameters - clause 7.1 (b)(i)) and Ph discharge being required to meet a standard between Ph 6 and Ph 9 when measured 50 metres downstream from the point of discharge.

Although we have continued to comply with the Ph specifications I believe that they are impractical because water flowing into our property, via creeks which orginate on the western side of the Bruce Highway, has registered Ph readings in the low 5's. The Environmental Site Supervisor will attest to this claim.

In view of the above and other evidence which has come to hand re both turbidity and water quality I foreshadow a request for a review of the standards with which we are required to comply.

AMENDED PROCEDURES ADOPTED AND TO BE ADOPTED.

A) The bund wall which isolates the marina basin from the creek (Bund 1A) has been strengthened and the steel pipes which run through this bund wall are fitted with flap valves so that we can control the flow of water both in and out of the marina;

B) Since 4/09/96 we have had a comparatively small dredge operating in the marina basin and discharging to the pre-prepared settlement ponds. Initially ponds "B" and "C". The dredge spoil in slurry form will be conveyed from the dredge to the settlement ponds via a 250mm pipe;

C) The purpose in using this small dredge is to remove fine silt and mud which has built up in the marina during the eight year period between cessation of work by Tekin Australia Limited and the start of dredging on the date referred to above;

D) Assuming we are successful in removing the referred to mud and silt we will then fully de-water the marina and after a relatively brief drying out period we will proceed to excavate the remainder of the marina basin by the use of excavators and trucks;

E) If it meets quality standards, material won from the marina basin by excavation in the dry will be used for filling on the resort site;

F) If the material is unsuitable for filling or has an acid sulphate content it will be transported for use or treatment in accordance with the Sinclair Knight Merz Acid Sulphate Soil Management Plan as submitted on 10/10/96;

G) Water entering the marina basin as a result of seepage or rain will be discharged in accordance with Deed specifications (refer paragraph "J" hereunder);

H) If we find that excavation in the dry is impractical then we will revert to dredging and re-establish the required water level for such dredging by allowing sea water to flow back into the marina via Stony Creek and our flap valved pipes;

I) Throughout the dredging programme we do not envisage that there will be any need to discharge water from the marina basin because top up water will need to be diverted into the marina to keep the dredge at an appropriate working level.

J) When dredging or excavation in the dry has been completed we will continue to de-water the marina to remove seepage and rain water;

If such water meets the required quality specifications then we will discharge it into Stony Creek;

K) If the water does not meet discharge specifications then it will be pumped to our settlement ponds and treated accordingly until such time as it does meet specifications;

L) TURBIDITY AND WATER QUALITY CURRENTLY BEING ACHIEVED.

In order to confirm turbidity and water quality levels being achieved at the present time after dredging from the marina to the settlement ponds, I provide hereunder the results of tests carried out on Wednesday afternoon, 13th November, 1996 at 1600 hours.

TEST SITE	PH	TURBIDITY
Hinchinbrook Channel - 100 metres offshore from the entrance to Stony Creek	7.81	290 - 334
Dredge Spoil Settlement Pond "B"	7.98	1.2 - 3.6

NOTES:

1) The above discloses that suspended sediment in the sea water is 130 times greater than that contained in the settlement pond water;

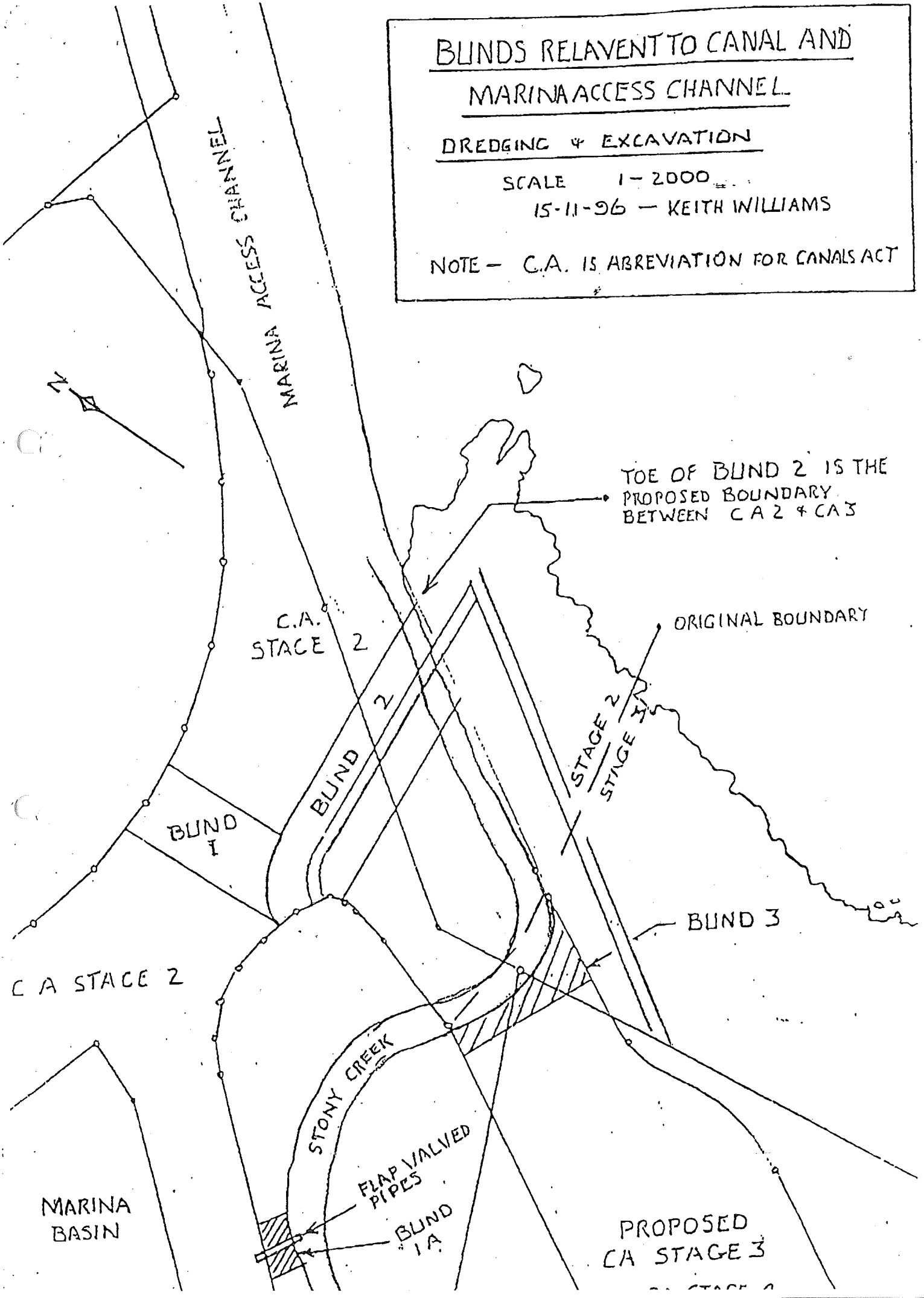
2) In regard to Ph the settlement pond water is slightly more alkaline than the sea water.

DE-WATERING OF CANAL.

Although not specifically referred to in the Deed we will apply the same procedures and standards to de-watering of the southern canal if this should become necessary.

Since excavation work recommenced on the 6th September, 1996 we have been successful in excavating the southern canal in the dry and the small volume of seepage being encountered is being treated as per clause "J" above.

Attached: A4 size plan - BUNDS RELEVANT TO CANAL & MARINA ACCESS CHANNEL - 15/11/96


BUNDS RELAVENT TO CANAL AND
MARINA ACCESS CHANNEL
DREDGING & EXCAVATION
SCALE 1 - 2000
15-11-96 — KEITH WILLIAMS
NOTE — C.A. IS ABREVIATION FOR CANALS ACT
MARINA ACCESS CHANNEL
N
TOE OF BUND 2 IS THE PROPOSED BOUNDARY BETWEEN C A 2 & CA 3
ORIGINAL BOUNDARY
C.A. STACE 2
BUND 2
BUND 1
STAGE 2
STIGE 3
BUND 3
C A STACE 2
STONY CREEK
FLAP VALVED PIPES
BUND 1A
MARINA BASIN
PROPOSED CA STAGE 3

19/11/96

"PORT HINCHINBROOK"

OPERATION OF SPOIL PONDS

DEED REFERENCE - CLAUSE 7.1(a) (ii)

OPERATION OF SPOIL PONDS.

(a) The operation of the spoil ponds in regard to capital dredging of the marina and its access channel and maintenance dredging of the access channel, marina basin and canal is detailed hereunder.

(b) All dredge spoil will be pumped from the dredge to the settlement ponds via a metal or polythene pipe sized in diameter to match the dredge.

(c) The runoff water from the dredge spoil settlement ponds will be disposed of in accordance with its quality and the following alternatives may be applied:

(i) Water meeting both turbidity and water quality (Ph) specifications will be discharged into Stony Creek, the main canal which will replace Stony Creek or into the natural channel which is indicated on Cardno and Davies plan 1706/1-48. Location is towards the northern extremity of pond "C" in Lot 17;

(ii) If the water will not meet turbidity specifications then it will be retained in the settlement pond system until it does;

(iii) If the water does not meet the Ph criteria for discharge then it will be directed to the acid sulphate treatment pond or to the marina basin where it will be diluted until it does meet the discharge criteria.

NOTE: This latter alternative of returning water to the marina is in compliance with the closed circuit system which can be applied to dredging from the marina basin. Refer to document - "DREDGING PROCEDURES - (A) (iii)".

LOCATION OF SPOIL PONDS (DREDGE SPOIL SETTLEMENT PONDS)
DEED REFERENCE - CLAUSE 7.1 (b) (ii)

(a) In accordance with our initial proposal the location of the dredge spoil settlement ponds as referred to above was detailed initially in Cardno and Davies plan no. 1706/1-48 attached hereto.

NOTES: (i) Dredge spoil resulting from construction (capital) dredging will be directed to the settlement ponds in Lot 17 where there is adequate provision for expansion;

(ii) Dredge spoil resulting from maintenance dredging will be directed to the dedicated pond (compartmented) on Lot 3 - refer (c) hereunder.

(b) Because of our reluctance to disturb, at this point in time, the mullock heaps deposited by Tekin Australia Limited in 1987/88 on Lot 3 on plan C10413 (refer Cardno & Davies plan no. 1706/1-48) we have reshaped the major settlement pond in the south-western section of Lot 3 and it is now termed Settlement Pond "B".

(c) When appropriate we will use a percentage of the ex Tekin mullock heap to construct the permanent settlement pond (compartmented) which will be dedicated to accepting spoil from maintenance dredging. In accordance with Clause 7.6 of the Deed the site on which this pond is constructed will be transferred to the Cardwell Shire Council at no cost to the Cardwell Shire Council. The transfer is to occur after completion of the marina access channel.

cl. 7.6 of the Deed

(d) After a sufficient drying and settlement period it is planned that spoil from maintenance dredging will be removed and disposed of as clean fill so that the pond or a compartment of the pond will be ready to accept material from the next scheduled maintenance dredging operation. Before sale or transfer to Lot 17 it will be treated, if necessary, to achieve the required specifications.

(e) Settlement Pond "C" has been constructed in Lot 17 on RP 732868 and construction is well underway with Pond "D". Ponds "C" and "D" are roughly in the position of the "Construction Settlement Ponds" as indicated on Cardno and Davies plan 1706/1-48 however in making minor changes to size and location it must be accepted that the size and layout of these ponds was always intended to be flexible and in accordance with the quantity of material to be discharged to these ponds.

(f) The changes in no way impair the efficiency of the ponds or the principle of operation however, as soon as practical, we will re-survey the entire settlement pond area with a view to indicating the precise location of the ponds as constructed and also the location of further ponds which we are proposing to construct.

19/11/96

"PORT HINCHINBROOK"

STABILISATION OF DEVELOPMENT SITE

DEED REFERENCES - CLAUSES 7.1(a) (iii) AND 7.1(b) (iii)

A Site Stabilisation Plan was prepared by Cardno and Davies and submitted to the Co-Ordinator General's Department on the 15th December, 1994. The main thrust of this Plan was to address management of the site following cessation of works immediately after the proclamations made by Senator Faulkner.

The subject Plan also deals with stormwater run off and the catchment basins and calculations are as relevant today as they were when the Plan was submitted. Refer "MANAGEMENT OF STORMWATER" as contained in this amended Turbidity Control Plan.

Since the subject Plan was submitted, with little or no assistance, abundant revegetation has occurred naturally over the resort site area where extensive clearing and filling had occurred.

Stormwater drained to the marina basin and at no time since the cessation of work on the 15th November, 1994 has there been any incidence of excessive turbidity or any other form of damage to the resort site, Stony Creek, Lots 3 and 17, the foreshore or to World Heritage Areas.

****

STABILISATION PLAN - DEVELOPMENT SITE (AS NOW PROPOSED)

a) By the end of January 1997 we are hopeful that the majority of bulk earthworks on the resort site will be complete and that contouring and grading will also be complete.

b) As the access roads and the relevant areas which they service are completed top dressing will be placed and grass will be planted. Initially some blocks may be turfed in order to gain an immediate and aesthetically pleasing effect.

c) Tree planting and landscaping of the resort site will be carried out in parallel with the above referred to top soiling however more intense landscaping will be deferred until such time as our building programme is well underway. Re tree planting - refer "OPERATIONAL PLAN" - Clause 4 of the Deed.

d) Within the designated resort area most of the stormwater runoff will be directed either to the marina basin or to the southern canal and in either event the prevailing winds, which are from the east, will retain floating litter in the referred to areas where it can be easily collected. This will further minimise the remote possibility of such litter entering the Hinchinbrook Channel.

e) All drains directing stormwater into the marina basin or canal will be fitted with traps in order to minimise the possibility of litter entering the marina and canal.

(f) There will be a far less chance of litter entering the Hinchinbrook Channel via "PORT HINCHINBROOK" than there is of litter entering the Hinchinbrook Channel or World Heritage Areas from any coastal township including Cardwell.

****

STABILISATION OF THE AREA SOUTH AND WEST OF THE MAIN CANAL

LOT 3, LOT 17 AND EX SPECIAL LEASE 26/29175

(a) In this document under the heading "SITE STABILISATION AND REHABILITATION OF AREAS USED FOR SOIL DISPOSAL" we have already detailed how this comparatively large portion of the above referred to land will be rehabilitated and made to be visually attractive.

(b) Apart from those areas of the above referred to land which have been used for settlement ponds there has been very little disturbance and certainly nothing that would prevent natural revegetation.

(c) The only acid soil mullock heap created by this company which is on Lot 17 is presently being buried and the high quality material being won from the burial hole is being used as fill on the resort site.

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19/11/96

"PORT HINCHINBROOK"

SITE STABILISATION AND REHABILITATION OF AREAS USED FOR SPOIL DISPOSAL
DEED REFERENCE - CLAUSE 7.1 (b) (ii)

USE OF NATURAL CHANNELS TO RETURN WATER TO THE HINCHINBROOK CHANNEL
DEED REFERENCE - CLAUSE 7.1 (b) (ii)

(a) Until such time as the further development or use of Lot 17 has been determined the spoil will remain in the settlement ponds at least until such time as the material has completely dried out and settled.

(b) When appropriate (as soon as practical after the drying out process) the outer sides of the bund walls which form the settlement ponds will be graded to a contour which will be appropriate to the planting of grass of a similar species to that which presently predominates in Lot 17.

(c) When viewed from the Bruce Highway this mound, which will vary between one and four metres above the natural terrain, will not be obvious because it will blend in with the foreground.

(d) Again, depending on the final use of Lot 17, this material may ultimately be used for landscape contouring and if this is the case lime treatment will be applied to any of this material which has an unacceptable acid content.

(e) If after the drying out process there is an indication of acid leachate from these settlement pond mounds then moats or drains will be build around the perimeters of such mounds so that any acid sulphate runoff can be directed to the existing acid sulphate treatment pond or any suitably sited replacement for same. Although mentioned in previous reports (refer letter to Qld. Department of Environment dated 10th October, 1996) all material used, or to be used, in constructing the outer surfaces of the outer bund walls was, or will be, selected from fill which has no acid sulphate contaminate.

(f) If, with the passage of time, we find that we have no viable use for the material held in the mounds (ex dredge spoil ponds) then we will endeavour to market same as clean fill.

As a fall back position we will leave the material on site and over a period of time raise the level of the entire Lot 17 for which we have no planned use at this time.

On an estimated maximum of 40,000 cubic metres of maintenance dredging annually it would take 15 years to raise the level of the site by one metre.

USE OF NATURAL CHANNELS TO RETURN WATER TO THE HINCHINBROOK CHANNEL

DEED REFERENCE - CLAUSE 7.1 (b) (ii)

(a) All water being discharged from the spoil ponds is required to meet the standards as detailed in the Deed in regard to both turbidity and water quality.

(b) If, after drying out of the ponds, there is an indication of acid leachate then this will be dealt with as per clause 3(e) above.

(c) The surplus water ex the settlement ponds, which meets the relevant criteria, will be discharged via the existing non tidal water course located near the north-eastern extremity of the construction settlement ponds on Lot 17 and as identified under the title "EXISTING NON TIDAL WATER COURSE" on Cardno and Davies plan 1706/1-48.

(d) The alternative to discharging through this water course will be to discharge from the settlement ponds to the Hinchinbrook Channel via Stony Creek or the main canal which will replace Stony Creek.

NOTE: Reference to the Cardno and Davies plan 1706/1-48 can be made by consulting the drawings attached to this document.

19/11/96

"PORT HINCHINBROOK"

MANAGEMENT OF STORMWATER

DEED REFERENCE - CLAUSE 7.1 (a) (iv)

Management of stormwater was comprehensively addressed in the Drainage Stabilisation Plan prepared by Cardno and Davies and submitted to the Co-Ordinator General's Department in December 1994. The Plan is dated the 15th December, 1994.

The Plan is briefly referred to in this amended Turbidity Control Plan under the heading "STABILISATION OF DEVELOPMENT SITE".

Although the Plan was submitted almost two years ago the stormwater runoff and catchment basin calculations are as relevant today as they were when the Plan was submitted and, accordingly, I now re-submit that Plan and detail hereunder the construction situation as it is today when compared to that Plan.

BUND WALL ISOLATING MARINA BASIN FROM STONY CREEK.

The bund wall has been further reinforced and the level has been raised to in excess of RL 4 metres A.H.D.

The 2 x 300mm diameter pipes, built into the bund wall, now have flap valves on either end so that we can control the flow of water both into and out of the marina basin. This became necessary because there will be a need to allow sea water into the basin so that an appropriate water level can be maintained for dredging purposes.

CLEARING OF ALMOST THE ENTIRE CATCHMENT AREA "A" - MARINA BASIN AREA.

Clearing and filling has occurred almost throughout this entire area but in carrying out such work we have taken care to ensure that the foreshore from Oyster Point to the northern extremity of our beach frontage has been raised to RL 4.2 so that stormwater run off will be diverted to the marina.

CATCHMENT "B" - ENTRANCE CHANNEL.

There has been no change to the drainage procedure in this area.

CATCHMENT "C" - BEACH FORESHORE.

This area has now been cleared and filled and, as mentioned in reference to catchment "A" such filling has been brought to a level of RL 4.2 thereby improving the retention of water within the catchment area and returning it to the marina basin.

CATCHMENT "D" - NORTH-WEST REGION.

Apart from the beach front, which is filled to RL 4.2, the balance of the area has been filled to a minimum of RL 3.5 and drainage has been directed to the north as per the Cardno and Davies plan.

CATCHMENT "E" - SOUTH OF THE MARINA BASIN - NORTH OF ONE MILE CR.

Storm run off in this area remains unchanged at the present time however when Stony Creek is diverted to the main canal such drainage will become more efficient because the 10/15 metre wide creek will be diverted into a 100 metre wide channel.

A side benefit to this diversion will automatically occur because changing velocities will bring about a situation where sand and silt, carried into the property by Stony Creek, will be deposited in the canal and thus, under flood conditions, there will be less turbidity at the mouth of Stony Creek.

CATCHMENT "F" - SOUTH OF STONY CREEK (LOTS 3 AND 17).

The partly excavated southern canal, referred to in the subject Cardno and Davies Report, is now well on the way to be completed and, additionally, dredge spoil settlement ponds have been created. Details are contained in this amended Turbidity Control Plan under the heading "LOCATION OF SPOIL PONDS - DEED REFERENCE 7.1 (b)(ii)".

When dredging and earthworks have been completed this entire area will quickly revegetate itself as it has done in the past and in addition to this we will be assisting revegetation on the embankments of the dredge spoil ponds.

Cardno and Davies draw attention to the fact that the area is very flat and comprises mostly of sandy loam which is fairly permeable.

CREEKS.

The occurrence of infilling in Stony Creek was corrected immediately after the report was prepared and, as referred to previously, the entire creek situation in reference to stormwater run off will be improved immediately with a diversion into the main canal.

EXTERNAL CATCHMENT AND CONCLUSION.

These two paragraphs in the Cardno and Davies Report are self explanatory.

NOTE: Drawing No. 1706/05-56, as attached to the Cardno and Davies Drainage Stabilisation Plan, is out of date in regard to the main channel only but this does not adversely affect the provision for stormwater and drainage.

The variation will be apparent by referring to Cardno and Davies most recent drawing number 1706/1-48 which is also included with this document.

ATTACHED: COPY OF CARDNO AND DAVIES "DRAINAGE STABILISATION PLAN" DATED 15/12/94.

19/11/96

"PORT HINCHINBROOK"

DREDGING PROCEDURES

DEED REFERENCE - CLAUSE 7.1 (a) (v)

A. DREDGING OR EXCAVATION OF THE MARINA BASIN
B. DREDGING OF MARINA ACCESS CHANNEL
C. MAINTENANCE DREDGING

A. DREDGING OR EXCAVATION OF THE MARINA BASIN.

(i) The quantity of material remaining to be dredged or excavated from the marina basin during the period when this is isolated from the marina access channel will be approximately 300,000 cubic metres;

(ii) Full details of our proposed method of dredging or excavating in the marina basin is contained in this document under the heading - "MARINA DE-WATERING".

(iii) In the original Turbidity Control Plan - Section 11 we referred to the possible use of a closed circuit system re possible recirculation of dredge spoil water whereby surplus water from the dredge spoil ponds would be pumped or directed back to the marina basin.

Experience indicates that under normal circumstances the quality and Ph of our dredge spoil water is so high that there is no need to apply this system unless unpredictable and unforeseen conditions make utilisation of such system necessary.

B. DREDGING OF MARINA ACCESS CHANNEL

In regard to dredging the marina access channel we propose to use best practice engineering methods as described hereunder and as extracted from the Sinclair Knight Merz Report dated April 1996 which formed part of my consent application.

By conforming with best engineering practice our target will be to achieve an insignificant plume (comparable with background turbidity) at a distance of 200 metres from the dredge. Reference to the "Turbidity Plume Assessment" (SKM Report) reveals that in a cormix plume dispersion model using a worst case (uncontrolled) dredging scenario the plume would be largely dispersed within 200 metres from the dredge. To achieve our target within acceptable parameters we will use an effective combination comprised of any or all of the diciplines detailed hereunder in sub clauses B (iii) to B (vii) inclusive and C (iii) to C (v) inclusive.

i) The quantity of material to be dredged in establishing the marina access channel will be approx. 90,000 cubic metres;

ii) The duration of the dredging period will be dependent on:

(a) size of dredge (Reference is to dredging capacity);
(b) prevailing weather conditions;
(c) operating hours as agreed to by the relevant authorities;

Estimated period - 10 to 20 days (based on 2 x 10 hour shifts per day, 7 days in every week);

iii) Cutter head speed will be regulated in accordance with plume generation and its acceptability with regard to the background receiving water conditions. Subject always to the decision of the Environmental Site Supervisor;

iv) Slewing speed - as per conditions applicable to (iii) above;

v) A silt shroud will be fitted over the dredge cutter head so as to minimise any loss of suspended sediment. This is a new innovation as designed by Neumann Dredging and fully illustrated in drawings produced for assessment by the State Government and members of the Federal Minister's staff;

vi) Silt curtains will be positioned as required and will be of 75 micron configuration and they will extend from sea level to seabed level regardless of tide;

NOTE: Sample of 75 micron silt curtain material attached.

vii) Silt curtains will be moored independent of the dredge except in regard to maintenance dredging.

C. MAINTENANCE DREDGING

i) Maintenance dredging will be carried out as required however our specialist coastal engineers estimate that at maximum this will be annually. Dependent on the size of the dredge and quantity of silt to be removed the dredging operation would take between 10 and 20 days. In the event of a cyclone or exceptionally heavy rain additional maintenance dredging may be required.

ii) The type of dredge to be used will be dependent on availability however there is a strong possibility that I will acquire a purpose built or modified dredge of a straight suction type. During maintenance we will only be removing relatively loose silt and, accordingly, a cutter head is unnecessary.

iii) Cutter head and slewing speed will be regulated as per capital dredging.

iv) Silt curtains will be of 75 micron configuration and they will extend from sea level to seabed level regardless of tide.

v) Because we will be unable to close the full width of the channel to shipping it will be necessary to use a full circle silt curtain which will be secured to the dredge.

BEST ENGINEERING SYSTEMS DEVELOPED BY NEUMANN DREDGING.

(i) This system was illustrated diagramatically to senior representatives of GBRMPA and the World Heritage Unit at a meeting in the Qld Govt Office of Major Projects on 14/09/95. Mr. Jamie Oliver of GBRMPA and Barbara Curnow of the World Heritage Unit indicated satisfaction with the principle.

Statement by Mr. Jamie Oliver, "Show us clean dredging and all other problems disappear".

Interim working drawings were then developed by Neumann Dredging and submitted for assessment to the State Government and members of the Federal Minister's staff.

NOTE: COPIES OF THE NEUMANN DRAWINGS ARE ENCLOSED HEREWITH

Reference: Drg No R - 271
R - 273
R - 279

ATTACHED: SAMPLE OF 75 MICRON SILT CURTAIN MATERIAL

DRAINAGE STABILISATION PLAN

PORT HINCHINBROOK, CARDWELL

FOR

CARDWELL PROPERTIES PTY LTD

Cardno & Davies

Prepared by: Cardno & Davies
Queensland Pty Ltd
Commercial Centre
Isle of Capri Qld 4217

Date: 15 December 1994

Cardno & Davies

15/12/94
1706/1

CARDWELL PROPERTIES PTY LTD
DRAINAGE STABILISATION PLAN

1. INTRODUCTION

The Port Hinchinbrook Development at Cardwell currently exists as a partially constructed earthwork site.

The majority of the site north of One Mile Creek has been disturbed by earthworks operations. The bulk of the earthworks was carried out by the previous developer 5 - 6 years ago. Since that time, earthworks and clearing have been carried out by Cardwell Properties including reinstatement of haul roads and reinstatement of the marina basin bund wall.

Work on the site has ceased and will not be restarted on a full scale basis until after the wet season in 1995.

The purpose of this report is to identify the stability of the site against erosion from stormwater until construction recommences.

2. CATCHMENT AREAS

The various catchment areas that currently exist on the site are shown on Drg. No. 1706/1-56. The majority of the site drains to the bunded marina basin with smaller catchments draining north to a beach outlet, directly to the beach, and into Stoney Creek. A description of each catchment follows.

Catchment areas have been determined from recent topographic surveys by Rowlands Surveys. The areas are basically unchanged from those that have existed for the past 5 - 6 years.

Catchment 'A' - Marina Basin Area

This catchment has been affected by the clearing of the area to the south of the marina basin and excavating and stockpiling of sand in this area, clearing of regrowth on the northern bank of the marina basin and the reinstatement of the bund wall and haul roads. Most insitu material within disturbed areas is sand and sandy loam.

All other areas within the catchment have remained virtually untouched since earthworks operations carried out 5 - 6 years ago and have experienced extensive regrowth of vegetative cover. About one third of the area between the northern shoreline of the marina was graded in preparation for further filling but prior to grading it supported very little growth. Runoff from the area will be into the marina basin as it has been for the past 5 - 6 years.

The bund to the marina basin has been reinstated to a minimum crest level of RL 3.77m AHD. Two 300mm dia pipes with tidal flaps to exclude water have been included in the bund wall at an invert level of RL -0.23mm AHD. The outlet pipes will allow flow out of the basin at low tide establishing a base water level in the basin of RL -0.23m AHD.

Catchment 'D' - North West Region

The catchment has remained largely untouched apart from partial burning off of patchy tufts of grass in preparation for filling and since the burn off it has experienced extensive regrowth of vegetative cover.

This area drains via surface drains to an ocean outlet to the north of the development site as it has done for the last 5 - 6 years and no adverse impacts are expected. Peak flows from this area for a Q50 storm are estimated at 1.7m^3/s.

Catchment 'E' - South of the Marina Basin, North of One Mile Creek

This catchment is bounded by the marina basin and One Mile Creek. Selective clearing of this area has taken place in preparation of further work and to secure a stockpile of sandy loam for eventual topdressing of the site. The area is all sandy loam and the minimal runoff that will enter One Mile Creek will be free from suspended clay particles.

Catchment 'F' - South of Stoney Creek (Lots 3 & 17)

Some works have been carried out on Lot 3 including the construction of haul roads, and partial excavation of the southern canal. On Lot 17 very little work has been done other than dumping of material from the marina which is unsuitable for fill. It has been placed so that it will form part of the settlement pond bunding.

The area is very flat and comprises mostly of a sandy loam which is fairly permeable. Runoff to Hinchinbrook Channel is via sheet flow and a sandy dry bed creek. All earthworks materials have been removed from the creek to allow flow in its natural state.

On Lots 3 and 17 soil which has been excavated and stockpiled appears to have a high seed bank content and with the exception of the deep cut southern canal revegetation is vigorous and extensive.

The partly excavated southern canal exists as an open hole which following rainfall will fill with water. Overflow from the excavation (if any) will be via sheet flow over a broad area into Stoney Creek. Under these conditions and with no external catchment entering the excavation scouring will not occur.

3. CREEKS

Stoney Creek has experienced one occurrence of infilling due to undercutting of the marine clay creek bank along the outside of a bend immediately downstream of the reinstated bund. This infilling was exaggerated by the operations of earthworks machinery while reinstating the bund.

5. CONCLUSION

Large scale work on the site will cease during the wet season. The bund wall has been reinstated to the marina basin which accepts the bulk of stormwater runoff from earthwork affected areas. The marina basin can accept all flows entering from its catchment without over-topping and the two 300mm dia culverts will discharge the stormwater within a few days.

The remainder of the site is largely unchanged from its previous condition. Rapid regrowth of earthwork affected areas is occurring due to the hot and wet conditions.

The site as it stands is in a stable condition for storm runoff. The site has been improved from its condition of the past 5 - 6 years and turbid runoff has been reduced.

per **D.W. KNOBEL**
for **CARDNO & DAVIES Queensland Pty. Ltd.**

Cardno & Davies
Queensland Pty. Ltd.
ACN 051 074 992

CARDWELL PROPERTIES PTY. LTD.

PORT HINCHINBROOK - CARDWELL

DATE 9 December 1994

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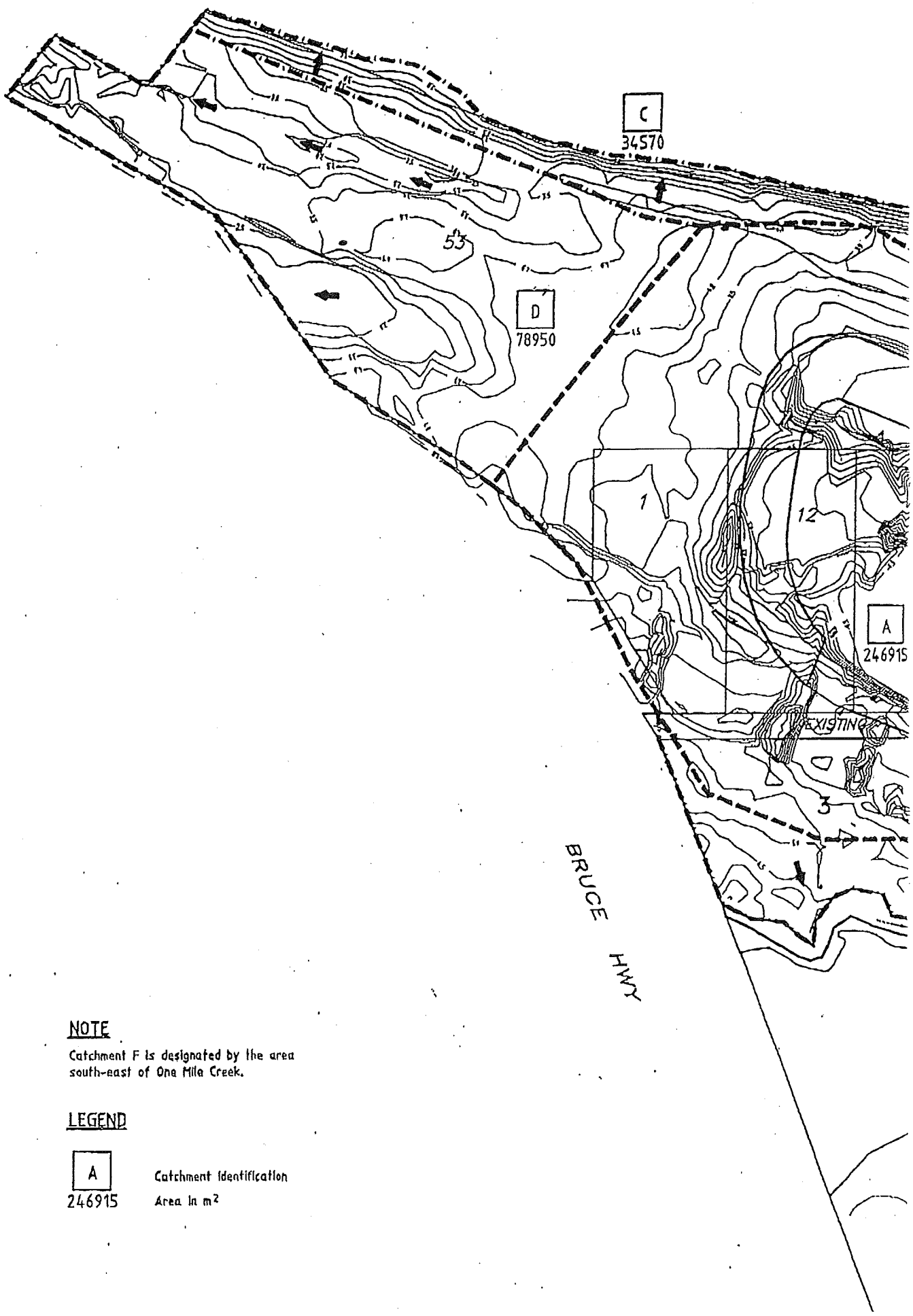

NOTE

Catchment F is designated by the area south-east of One Mile Creek.

LEGEND

A — Catchment Identification

246915 — Area in m^2

CAD FILE NAME : 17060156.DWG

DESIGNED	A1	DATUM A.H.D.
DRAWN		
CHECKED		
RECOMMENDED: PROJ. MGR.	APPROVED: PROJ. DIR.	

During the inspection by Mr W. Nicholls and party on the 22 November 1994 this infilling was noted and the parties attention was also drawn to a large and immiment infill on the southern bank of the creek (on the outside of the bend) in an area where there has been no machinery working.

Two temporary creek crossings originally constructed by the previous developer have been rebuilt and will be removed for the wet season.

The developer has advised that the creek infilling and temporary creek crossings will be removed once approval to proceed with all works is obtained.

4. EXTERNAL CATCHMENT

The external catchment feeding into Stoney Creek comprises of an area of 12 km^2 and Q50 flows for this area are estimated as approximately 175 m^3/s. This flow would not be contained within the Stoney Creek Channel and would be spread across the southern part of the site in sheet flow. The marina basin area will be protected against flooding by the bund which has a minimum level of RL 3.77m AHD. The impacts of the flooding of Stoney Creek are no different from those which have been present for the last 5 - 6 years.

5. CONCLUSION

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