

Lot 2 and lot 3 RP 863054

Write a description for your map.

Legend

- 38-112 ANZAC Avenue CHAMBERS FLAT (3/RP863054)
- Feature 1

33-87 ANZAC Avenue CHAMBERS FLAT (2/RP863054)

AC Avenue CHAMBERS FLAT (3/RP863054)

Google earth

Christopher Doig
(07) 3227 7983
TU:rlc-46/0365300000.0000
901567

17 June, 1996

The Chief Executive Officer
Beauresert Shire Council
PO Box 25
BEAUDESERT QLD 4285
Attention: Mr Troy Uren

Dear Troy

Re: **Former Cattle Dip**
Road Reserve bordered by Lots (2) Irrelevant 3 on RP863054 and Logan River
Chambers Flat, Queensland

The Site Validation Report and additional information prepared for the above site has been reviewed by the Department of Environment (DoE), Hazardous Wastes and Contaminated Sites Section. Due to the fact that the cattle dip is located on a road reserve, a Site Contamination Report will not be issued. Based on the information provided, DoE considers that the site is suitable for any use. If you have any queries, please contact Christopher Doig on (07) 3227 7983.

Yours sincerely

CTPI 49-Sch4 - Signature

David N Miles
Director, Waste Management Branch
Division of Environment

File Ref: 73(2) Irrelevant

CTPI 49-Sch4 - Signature CTPI 49-Sch4 - Signature

18.6.96

Chris

David has sent some
remarks. Please take
note. Perhaps you
can point out this
view during the
Scientific Advisory mtg

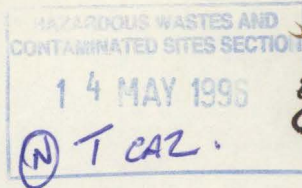
CTPI 49-Sch4 - Signature

20/6/96

Chris Doig
I have signed this but
perhaps we could have said
well in future that road reserves
do not have R.P.s delimiting the
affected area (as the area subject
to the investigation). We could also
indicate when GIS available we will
research on that - why can't we do
that now?

CTPI 49-Sch4 - Signature

901567



ALL COMMUNICATIONS TO
BE ADDRESSED TO THE
"CHIEF EXECUTIVE OFFICER"

BEAUDESERT SHIRE COUNCIL

COUNCIL CHAMBERS,
82 BRISBANE STREET,
BEAUDESERT QLD 4285
P.O. BOX 25

IN REPLY PLEASE QUOTE

TU

-46/0365300000.0000
196041900008

WHEN CONTACTING COUNCIL,
TEL: (07) 5540 5111
PLEASE ASK FOR
FAX: (07) 5540 5103
HEALTH FAX: (07) 5541 4135
Mr T. Uren
(07) 5540 5360

8th May, 1996

Mr C Doig
Senior Environmental Officer
Waste Management Branch
Department Of Environment
PO Box 155
BRISBANE ALBERT STREET QLD 4285



Dear Mr Doig

Re: Former Cattle Dip, Reference 901567

96/07410

Council is in receipt of your letter with respect to the above mentioned Validation Report and queries regarding it.

With respect to the first point:

Excavations in this area were also extended laterally in the vicinity of samples 9, 13, 14 and 15. In this instance excavation of the site came to within 800mm of the previous samples h and i. In this case the samples h and i were intended as validation samples. With respect to validation in the vicinity of assessment sample f the excavation was taken to this site. This information was inadvertently omitted from the initial report.

With respect to the second point:

Based on the condition of the dip at the time of excavation it is considered unlikely that contamination of the site would have originated from any source other than surface contamination from spillage and from leakage of the dip. At the time of remediation the dip was intact and held a quantity of water.

It is considered that contamination is limited to the top strata of soil in this case. Below this first layer is a clay layer with a very high plasticity. This layer of soil is believed to effectively contain the arsenic contamination. Based on these observations it is believed that contamination of the site has been removed to below Department of Environment threshold levels.

.../2

Mr C Doig
Senior Environmental Officer
Waste Management Branch
Department of Environment

8th May, 1996

With respect to the third point:

No chain of custody forms were utilised in the delivery of the samples to Analabs. Sample receipts have been obtained from Analabs which state the samples were received intact in the correct sample containers. Samples obtained were collected in containers provided by Analabs. Samples were obtained using a hand auger which was cleaned between the collection of each sample by washing in distilled water and a phosphate free detergent. Samples were handled with disposable latex gloves which were discarded between each sample. All samples were delivered to Analabs via Council's courier on the day of collection. No preservation techniques were used due to the short time of delivery and the instruction from the analyst of the absence of need of preservation.

If you have any further questions with respect to this matter please contact the above referenced officer for assistance.

Yours Faithfully

CTPI 49-Sch4 - Signature

G.W. Day
CHIEF EXECUTIVE OFFICER

CTPI 49-Sch4 - Signature

Version/ Issue 1/2

Date of Issue 09/10/95

ANALABS ENVIRONMENTAL - SAMPLE RECEIPT ADVICE

ANALABS Job No:	3561	No. of Samples:	10
Client:	Beaudesert Shire Council		
Client Contact:	-		
Client Reference:	Order G09837	Date Received:	14/12
Date Due:	27/12	Date Faxed:	20/12
Chain of Custody Received:	NO	Samples as per Reference:	Yes
Samples Received in Appropriately Pretreated/Preserved Containers:			Yes
Date Final Report:	21/12	Date Mailed:	31/12
Invoiced Amount:	52-02250 22/12 \$280		
NATA Report:	YES	✓	NO
Comments:			

Sample No.	Sample ID	Sample Type	Sample No.	Sample ID	Sample Type
1.	21	Soil	16.		
2.	22	"	17.		
3.	23	"	18.		
4.	24	"	19.		
5.	25	"	20.		
6.	26	"	21.		
7.	27	"	22.		
8.	28	"	23.		
9.	29	"	24.		
10.	30	"	25.		
11.			26.		
12.			27.		
13.			28.		
14.			29.		
15.			30.		

RECEIVED

24 APR 1996

BEAUDESERT SHIRE COUNCIL

- (i) Please direct any turnaround queries to Karyn Drahm or Andrew Hoxey
(ii) Please direct any technical queries to Khokan Bagchi.
(iii) Please direct any queries relating to sample condition to Andrew Hoxey

PRC-3407.3215.

0 | 1

Version/ Issue 1/2
Date of Issue 09/10/95

ANALABS ENVIRONMENTAL - SAMPLE RECEIPT ADVICE

ANALABS Job No:	3424	No. of Samples:	20
Client:	Baudesert Shire Council		
Client Contact:	-		
Client Reference:	Order 609809	Date Received:	03/11
Date Due:	29/11	Date Faxed:	5/11
Chain of Custody Received:	NO	Samples as per Reference:	Yes
Samples Received in Appropriately Pretreated/Preserved Containers:			Yes
Date Final Report:	6/11	Date Mailed:	14/12 / 14/2
Invoiced Amount:	52-02156.	12/12	\$498
NATA Report:	YES		NO
Comments:			

Sample No.	Sample ID	Sample Type	Sample No.	Sample ID	Sample Type
1.	Sample 1		16.	Sample 16	
2.	" 2	-	17.	" 17	
3.	" 3		18.	" 18	
4.	" 4		19.	" 19	
5.	" 5		20.	" 20	
6.	" 6		21.		
7.	" 7		22.		
8.	" 8		23.		
9.	" 9		24.		
10.	" 10		25.		
11.	" 11		26.		
12.	" 12		27.		
13.	" 13		28.		
14.	" 14		29.		
15.	" 15		30.		

- (i) Please direct any turnaround queries to Karyn Drahm or Andrew Hoxey.
- (ii) Please direct any technical queries to Khokan Bagchi.
- (iii) Please direct any queries relating to sample condition to Andrew Hoxey

PRO-3A07.3R1.S.

0 1



QUEENSLAND GOVERNMENT

Department of Environment

160 Ann Street • Brisbane Queensland • PO Box 155 • BRISBANE ALBERT STREET QLD 4002
Telephone (07) 3227 7111 • Facsimile (07) 3227 6534

File

Enquiries to Christopher Doig
Telephone (07) 3227 7983
Your reference TU:rl-46/0365300000.0000
Our reference 901567

16 April, 1996

The Chief Executive Officer
Beaudesert Shire Council
PO Box 25
BEAUDESERT QLD 4285
Attention: Miss Janelle Bancroft

Dear Janelle

Re: Former Cattle Dip
Road Reserve bordered by Lots 13 (2) Irrelevant 3 on RP863054 and Logan River
Chambers Flat, Queensland

The Site Validation Report prepared for the above site has been reviewed by the Department of Environment, Hazardous Wastes and Contaminated Sites Section. The following information is required before your application for a letter of clearance can be progressed:

- In the vicinity of samples 9, 13, 14 and 15 it is understood that excavations were extended vertically to remove arsenic contaminated soil. Were excavations extended laterally in these areas. Please explain how samples collected to date validate the lateral extent of excavation. Are samples h, i and f considered as validation samples of surface soils in these areas.
- In the vicinity of samples 1 to 5, a significant excavation wall exists. It is considered that there may be potential for contamination of the excavation wall between the depth of 0.5 and 3.0 metres, please comment on this with relation to dip structure, and soil strata observed in the excavation walls. Based on dip structure is there any potential for contamination not sourced from leakage from the base of the dip or splash and overflow from the surface.
- Please provide chain of custody for transfer of all soil samples to the laboratory. If chain of custody were not used, please provide a written statement relating to all handling of soil samples. Include details of sample collection protocols, preservation, storage and transport. The laboratory should also provide a sample receipt advice detailing the condition of the samples at the time of receipt by the laboratory.

If you have any queries, please contact me on (07) 3227 7983.

Yours sincerely

CTPI 49-Sch4 - Signature

Christopher Doig
Senior Environmental Officer
Hazardous Wastes and Contaminated Sites Section
Waste Management Branch

File Ref: f:\contaml\doig\csiworks\90156712.doc



QUEENSLAND GOVERNMENT

Department of Environment

160 Ann Street • Brisbane Queensland • PO Box 155 • BRISBANE ALBERT STREET QLD 4002
Telephone (07) 3227 7111 • Facsimile (07) 3227 6534

Enquiries to Christopher Doig
Telephone (07) 3227 7983
Your reference TU:rl-46/0365300000.0000
Our reference 901567

27 March, 1996

The Chief Executive Officer
Beaudesert Shire Council
PO Box 25
BEAUDESERT QLD 4285
Attention: Mr Troy Uren

Dear Troy

Re: Former Cattle Dip
Road Reserve bordered by Lots 3 on RP863054 and Logan River
Chambers Flat, Queensland 73(2)Irrelevant

The Site Validation Report prepared for the above site has been reviewed by the Department of Environment, Hazardous Wastes and Contaminated Sites Section. The following information is required before your application for a letter of clearance can be progressed:

- In the vicinity of samples 9, 13, 14 and 15 it is understood that excavations were extended vertically to remove arsenic contaminated soil. Were excavations extended laterally in these areas. Please explain how samples collected to date validate the lateral extent of excavation. Are samples h, i and f considered as validation samples of surface soils in these areas.
- In the vicinity of samples 1 to 5, a significant excavation wall exists. It is considered that there may be potential for contamination of the excavation wall between the depth of 0.5 and 3.0 metres, please comment on this with relation to dip structure, and soil strata observed in the excavation walls. Based on dip structure is there any potential for contamination not sourced from leakage from the base of the dip or splash and overflow from the surface.
- Please provide chain of custody for transfer of all soil samples to the laboratory. If chain of custody were not used, please provide a written statement relating to all handling of soil samples. Include details of sample collection protocols, preservation, storage and transport. The laboratory should also provide a sample receipt advice detailing the condition of the samples at the time of receipt by the laboratory.

If you have any queries, please contact me on (07) 3227 7983.

Yours sincerely

Christopher Doig
Senior Environmental Officer
Hazardous Wastes and Contaminated Sites Section
Waste Management Branch

73(2)Irrelevant

Memorandum

To the Date:
From CHRISTOPHER DOUG:
Subject Review - Site Validation Report
Remediation & Validation of Road Reserve
Part of RPS63054, Chambers Flat.

File reference 27/3/96
Date 901567
Notes

73(2)Irrelevant

Preliminary report confirms history, & arsenic contamination - ditch not used for ~35 years - arsenic only contaminant.

Remediation Program.

~ 340m³ OF SOIL EXCAVATED - STOCKPILED ON SITE → 22 NOVEMBER 1995
MAX AS CONC AFTER MIXING 320ppm
EXCAVATIONS COVERED 530m².
CANT MOVE SOIL ECONOMICALLY UNTIL AFTER BRIDGE OPENS

ADDITIONAL EXCAVATION → 14 DECEMBER 1995

BASED ON 7 OF 17 VALIDATION SAMPLES - HOT
→ 0.5 TO 0.8m FURTHER - TO CLAY!
APPROX 60m extra excavated.

All soil still stockpiled on site.
Represented by samples 18, 19 & 20
VALIDATION SAMPLING PROGRAM

See contour map for extent of excavation
See sampling maps for location
depth & results.

7 samples of 17 hot first pass.
excavations extended beyond.
10 new samples collected to validate.

Is this final contours.
Yes. ? Based on depths of samples

Went deeper but did they go wider.

Excavations validated by depth
No surface validation to NW & South.
Samples originally collected in these areas

OK.
mahl shows
hairs & e
Scale
map showing all
old samples that are
used to validate surface
lateral extent.

Memorandum

To F Note
File reference 901567
From Ego
Subject Rev review
Date 17.6.96
Notes 1/4

Plunge dip.

Site bounded on E side by Logan River

Dam to W - overflow from dip (?) - cattle prevented from drinking due to lotter

History

Dip ~ 90 years

Suspected only AS used. (not used since 1960)

Chem storage at homestead on adj site

Small drainage pond.

Description

Topo: drains to W → gully (dammed in overflow)

Hydro: closest borehole 20m away → river.

expected at 2-18m depth

Geo: Wagoner Sub-grp

Soil type: sandy silty, clay.

Sampling

2 depths AS contamin^d area defined.
(base of dip not sampled).

Planned = plan provided - soil to landfill

- 1/20 → contamin^d area for evap.

* Further sampling req^d during valid^d - end of dip etc

NB/entire NOTE in
CFR AS: 7100mg/kg
at homestead.

~~these are the~~

SLR 6228-1640924
Memorandum

To _____ File reference 901567
From _____
Subject _____ Date 17.6.76
Notes 2/4

Valid Report

Contaminated soil stockpiled on site
Stockpile AS conc = 320 mg/kg

blume of s'pile?
N° of samples?

Excav = to ~ 3m beneath sump → grading
out to 2m distance on downslope side.

22nd Nov 95 Sampling ~ 5⁻¹⁰ m grid.

7 samples on downslope side > EIT

drainage yard
not sampled.

14 Dec 95 Sampling

further excav = - doesn't actually state - to what depth?
- vertical only?

400m² soil stockpiled ⇒ indicates a further
20m² excav?

* Not sufficient info to determine if lateral
extent of contam = validated.

} also req depth
samples on upslope
side of dip

CFC / SRA?

(only surface valid?).

Memorandum

To

File reference

901567

From

Subject

Date

Notes

3/4

Further info:

* Excav = at 13, 14, ~~23~~ wall extended laterally to 800mm of h and i

h and i 0 - 0.25 and 0.25 - 0.6m.
26 and 27 1m and 0.8m resp.

Excav = at 15 extended to f.

f. 0 - 0.25m
15 0 - 0.5m, contain^{ment}? $\Rightarrow \checkmark$
28 0.8m.

* Condition of dip at decommissioning considered good (intact / held water)
 $\Rightarrow$ contain^{ment} only of top strata - over spill etc

* Comment RE: sample protocols etc / SEA $\checkmark$

No comment

RE: sample 9 area
 $\Rightarrow$ was concrete in good condⁿ?
(no, no contain^{ment} of base).

Memorandum

To

File reference

901567

From

Subject

Date

Notes

4/4

Chris,

* Lot 3 RP 863054 remains on CSR - but I think a comment RE: 7100mg/kg sample is anecdotal evidence of buried As needs to be added to comments on the CSR listing

* I would like further clarification of the sampling of the drainage pond - sample 0 showed > EIT As yet valid sampling has only bordered this area (or so it seems from the figures provided!).

* No comment regarding the extent of further excavation - validation into area of sample 9 is included in the letter. Sample 9 shows > EIT at 0.0.5m although sample 21 shows < EIT at 0.5m, this doesn't necessarily validate the lateral extent of surface contamination in this area.

* I would like the Council to clearly state that the concrete of the dip walls was in good condition with no cracking etc.

See photo 3b reheat 1.?

Validation of hot spot (sample 0) ideal however since excav to dm and site to become a road, consider any residual contamination unlikely to present a hazard to human health or environment -

Queensland Department of Environment and Heritage

RTI-16-038
FM267 March 1995

Agreed with draft letter

Page 13 of 180

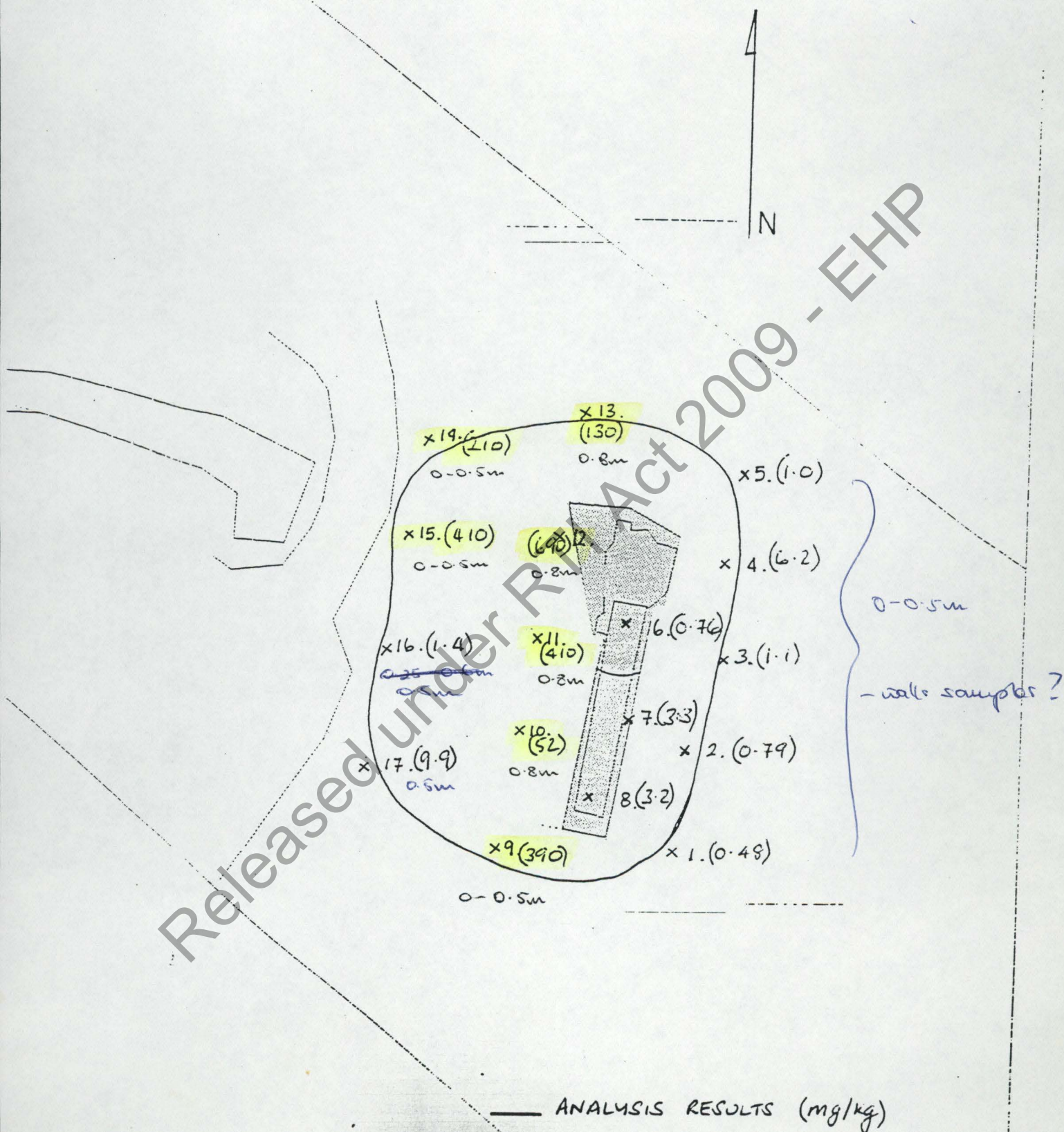
vertical vicinity of disturbed soil around site

Agreed
Given depth of exci in this region I think # 6 near enough to validate.

Robert Frost
Validation Reheat indicates sample 9 at 0.5 rather than 0.0.5 + 21 at 0.5. Given that this is ditch ingress, I'm not overly concerned about this location.

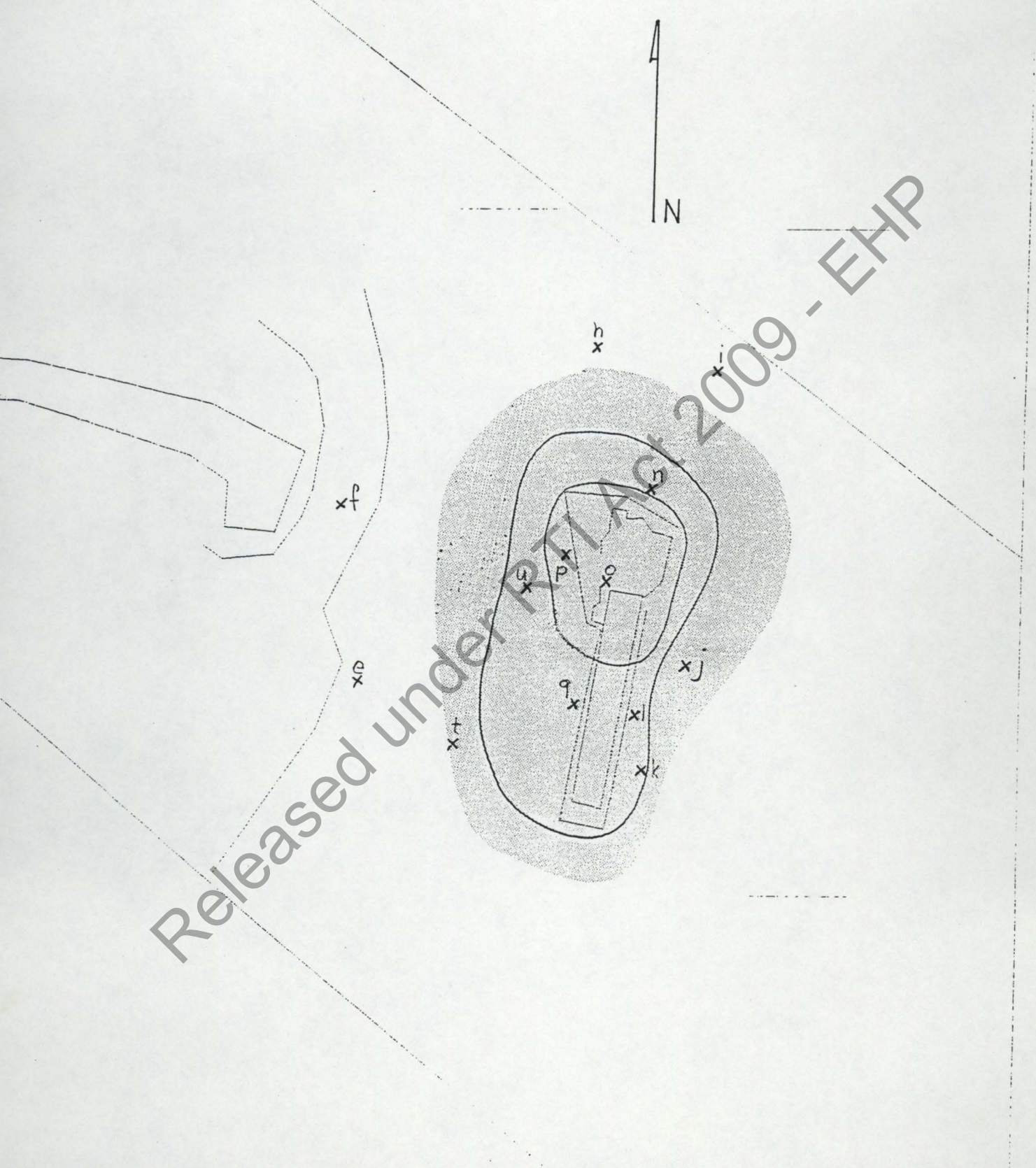
Agreed
Given that Council believe other contamination other than surface spillage & leakage unlikely & that they have based this on condition of dip at time, I am satisfied (also given gravity & likelihood of contamination to migrate vertically in vicinity of disturbed soil around site)

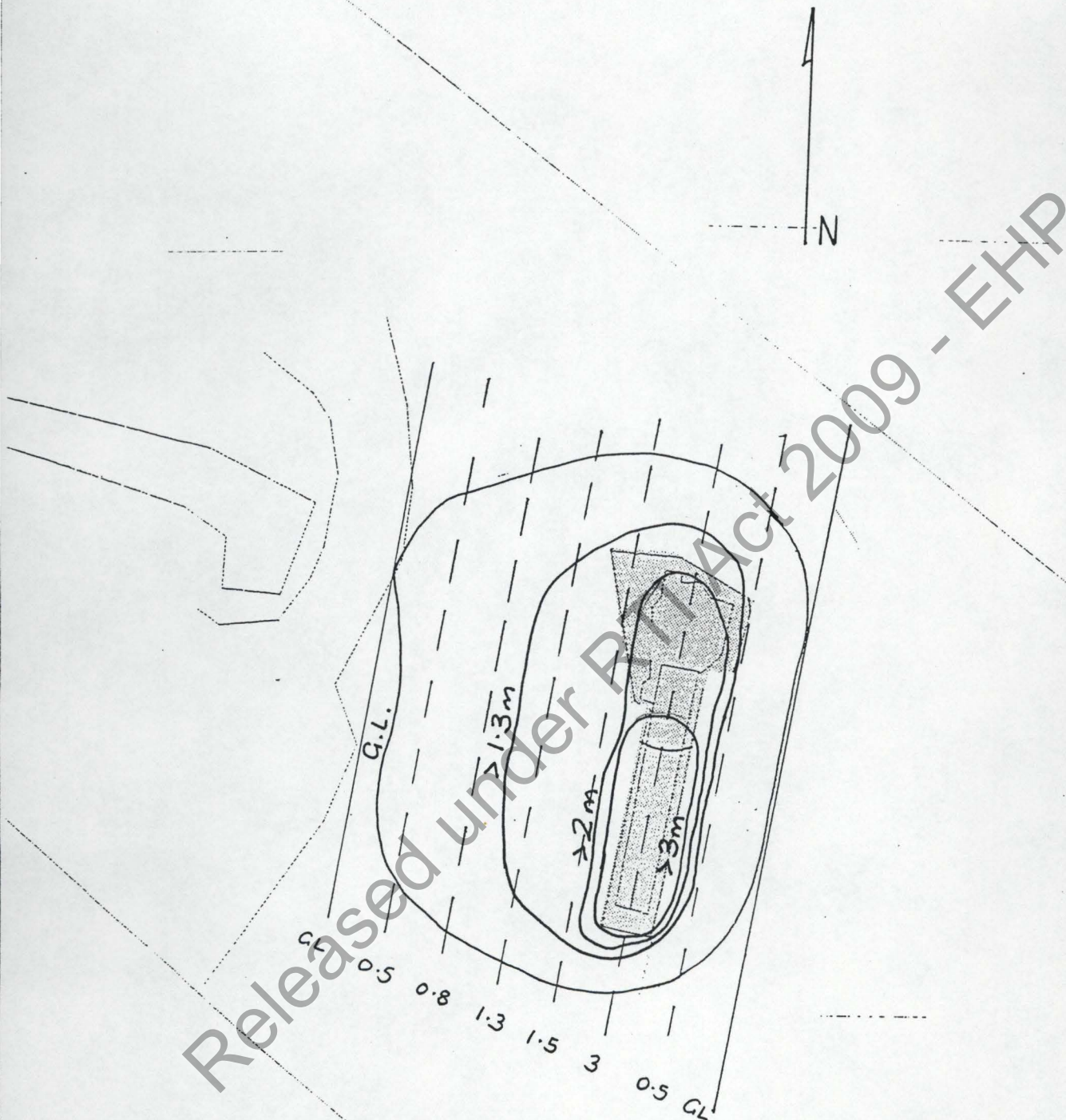
VILLAGE - BRIDGE SITE



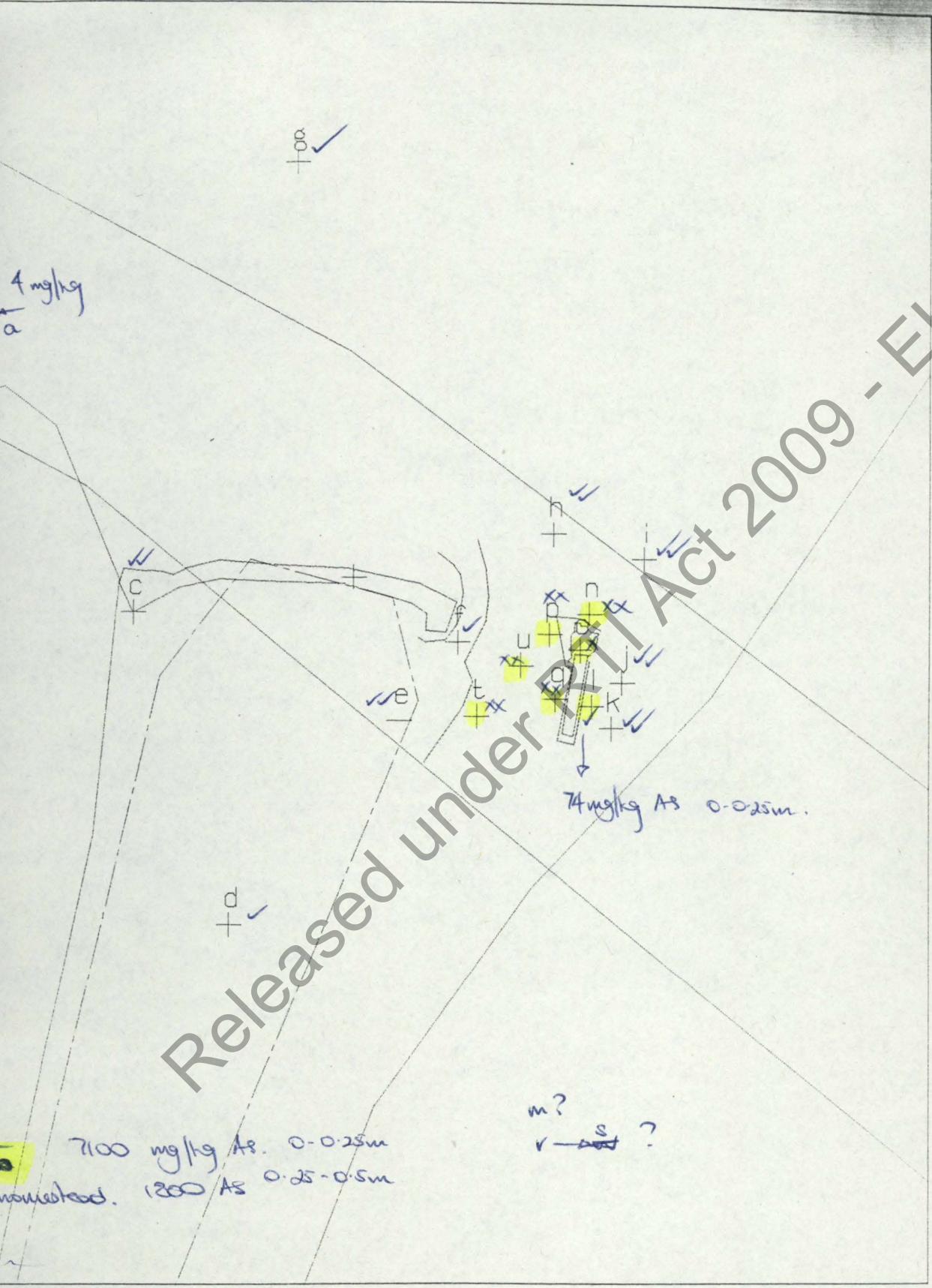
Scale 1:250

09/06/95



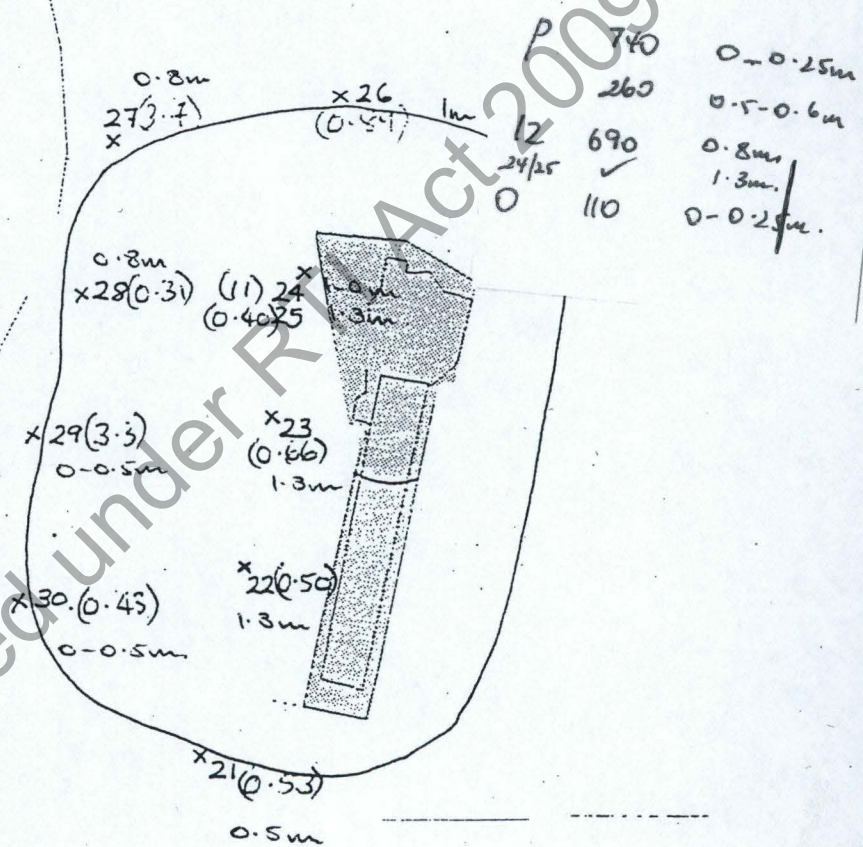


BRIDGE SITE



Released under E.O. 13526, Act 2009 - EHP

GE SITE



ANALYSIS RESULTS — (mg/kg)

09/06/95

HAZARDOUS WASTES AND
CONTAMINATED SITES SECTION

25 MAR 1996



Site Validation Report

REMEDICATION AND VALIDATION OF ROAD RESERVE
PART OF R.D. 863054

Kirk Road, Chambers Flat

Prepared By
Beaudesert Shire Council

IN REPLY PLEASE QUOTE

TU

-46/0365300000.0000

WHEN CONTACTING COUNCIL,
PLEASE ASK FOR

Mr T. Uren
(07) 5541 9260

14th February, 1996

Dear Sir/Madam,

Re: **Site Validation Report, Part of RP863054 Parish Mackenzie**

This report is submitted by M/s Janelle Bancroft, Environmental Health Officer of Beaudesert Shire Council. Janelle Bancroft is a Member of the Australian Institute of environmental Health, a person of prescribed professional standing authorised under the Contaminated Land Act 1991.

Contained within this report is the Validation of the above mentioned parcel of land. This report is to be read in context with the previously submitted Site Assessment Report; Kirk Road, Chambers Flat.

Yours faithfully,

CTPI 49-Sch4 - Signature

Janelle Bancroft
ENVIRONMENTAL HEALTH OFFICER
M.A.I.E.H.



Site Validation Report

i

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Figure 2	Depths of Remediation Excavation
Figure 3	Validation Sample Points 22nd November, 1995
Figure 4	Validation Sample Points 14th December, 1995



Site Validation Report

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List of Plates

- | | |
|--------|---|
| 1 a, b | Removal of Dip Structure |
| 2 a | Excavation below dip sump |
| 2 b | Excavation at draining yard |
| 3 a, b | Excavation downhill from dip |
| 4 a | Excavation downhill |
| 4 b | Excavation downhill |
| | Bucket shows intermediate line of sampling. |
| 5 a | Excavation uphill from dip |
| 5 b | Excavation downhill |

List of Appendices

Appendix A Analysis Report

Released under RTI Act 2009 - EHP



Site Validation Report

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EXECUTIVE SUMMARY

Preliminary work conducted on a disused cattle dip revealed the site was contaminated with arsenic from its use as a dip. Management of the site included the provision of a site assessment report, remediation of the site and subsequent validation.

Remediation and validation was carried out on two (2) occasions. This was required due to the contaminant leaching further than would be expected.

Further remediation and sampling were conducted with all results being below Department of Environment and Heritage threshold levels.

Contaminated materials are at present stored on-site and will be transported to the approved disposal site once the bridge under construction is trafficable.



Site Validation Report

1.0 INTRODUCTION

This report is submitted in order to validate the remediation of an arsenic contaminated dip site situated on road reserve, part of R.P. 863054 Parish Mackenzie, Chambers Flat.

Following the submission of a site assessment report a remediation and validation management program has been implemented to allow for the safe handling, transport and disposal of contaminated materials from the site.

2.0 BACKGROUND

The site was a plunge type cattle dip contaminated by arsenic. Preliminary investigation of the site consisted of site inspection, history review and analysis of samples taken on the site. Sites of preliminary soil samples and the expected zone of contamination are shown in Figure 1. Analysis results are also included.

Twelve of the twenty-nine samples taken at this time revealed contamination above Department of Environment Heritage threshold levels. Contamination was concentrated on the downhill side of the dip to within twelve (12) metres. Approximately 340m³ of soil was estimated to require removal.



Site Validation Report

2

3.0 REMEDIATION

Remediation of the site included the off-site disposal of contaminated material and validation of the work.

3.1 REMOVAL OF DIP STRUCTURE

Materials from which the dip was constructed were treated as contaminated and have been kept separate from the remainder of the contaminated material.

The dip structure is to be covered immediately upon disposal at the approved disposal site.

3.2 REMOVAL OF SOIL

The contaminated material is currently stock-piled on site. The material has been mixed and will be removed once the bridge is trafficable, be used as cover at the approved disposal site. Results of analysis of mixed soil samples are contained in table 4.1.

The maximum arsenic concentration obtained for the mixed soil was 320 mg/kg. This level is slightly over the accepted level of 300 mg/kg for use as daily cover. It can be reasonably expected that these levels will drop a considerable amount following further mixing and the addition of the soil remediated on the second occasion.

Contaminated material was removed to a depth of around three (3) metres below ground level at the dip sump. Excavation depths are shown in Figure 2 which inclined at gradient to around 0.5 metres



Site Validation Report

at the outer limits of the excavation. Material was removed from an area 2.5 metres from the uphill side, 12 metres from the downhill side, 2.5 metres from the entrance end and 4 metres from the exit end, covering an area of around 530m².

3.3 TRANSPORT/DISPOSAL OF MATERIAL

Contaminated material is currently stored on-site to be removed once the bridge under construction is trafficable. This decision was made due to the final use of the site and the logistics of transporting the material before the bridge is opened.

All contaminated materials will be removed to the approved disposal site, Logan Village Landfill where soil will be used as daily cover and the dip structure will be covered directly.



Site Validation Report

4.0 VALIDATION SURVEY

Sample collection for validation of remedial works was undertaken in two stages. The samples were collected based on a grid sampling system.

Sampling was first conducted on 22nd November, 1995 with seventeen samples taken from the site and three from the mixed soil stockpile. Sample sites can be seen in Figure 3. Sample details can be found in Table 3.1.

Results of preliminary validation analysis revealed the need for further remedial work, which was conducted on 14th December, 1995. On this occasion a further ten samples were collected to validate remedial work on those areas still exhibiting levels above Department of Environment and Heritage threshold levels. All validation results are shown in Table 4.1. Sample sites can be seen in figure 4.

All samples were analysed for arsenic only conducted by Analabs. Analabs are NATA registered and familiar with the procedures required. The same Analabs laboratory conducted analysis for samples obtained for the site assessment.



Site Validation Report

TABLE 3.1**Details of Soil Samples**

Sample	Depth (m)	Lithology
1	0-0.5	Sandy Silt Brown, moist
2	0-0.5	"
3	0-0.5	"
4	0-0.5	"
5	0-0.5	"
6	3m	Sandy Clay Grey/orange High Plasticity
7	3m	Clayey Sand Brown
8	2m	Sandy Clay Grey/orange High Plasticity
9	0.5	Sandy Silt Grey/brown
10	0.8m	Sandy Clay Grey/orange High Plasticity
11	0.8m	Clayey Sand Brown
12	0.8m	Sandy Clay Grey/orange High Plasticity
13	0.8m	Sandy Clay Grey/orange High Plasticity
14	0-0.5	Clayey Sand Brown



Site Validation Report

15	0.5	Clayey Sand Brown
16	0.5	Clayey Sand Brown
17	0.5	Clayey Sand Brown
18	Mixed Soil	Sandy Silt
19	Mixed Soil	Sandy Silt
20	Mixed Soil	Clayey Sand
21	0.8	Sandy Clay Grey High Plasticity
22	1.3	"
23	1.3	"
24	1.0	"
25	1.3	"
26	1.0	"
27	0.8	"
28	0.8	"
29	0-0.5	"
30	0-0.5	"



Site Validation Report

7

5.0 RESULTS

Reported laboratory results for the analysis of samples are presented in Table 4.1. Full laboratory reports can be found in Appendix A. All analysis results for arsenic were reported on a dry weight basis allowing for direct correlation to Department of Environment and Heritage threshold levels.

Preliminary sample points are shown in Figure 3.

TABLE 4.1

Summary of Analysis Results

Analysis		Department of Environment and Heritage Guideline	
Units			
Environmental Threshold	20		
Health Based Threshold	100		
Background Levels	0.2-30		
Date	Sample Number	Concentration mg/kg	Location
22.11.95	1	0.48	Validation
22.11.95	2	0.79	Validation



Site Validation Report

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22.11.95	3	1.1	Validation
22.11.95	4	6.2	Validation
22.11.95	5	1.0	Validation
22.11.95	6	0.76	Validation
22.11.95	7	3.3	Validation
22.11.95	8	3.2	Validation
22.11.95	9	390	Validation
22.11.95	10	52	Validation
22.11.95	11	410	Validation
22.11.95	12	690	Validation
22.11.95	13	130	Validation
22.11.95	14	210	Validation
22.11.95	15	410	Validation
22.11.95	16	1.4	Validation
22.11.95	17	9.9	Validation
22.11.95	18	240	Mixed Soil
22.11.95	19	270	Mixed Soil
22.11.95	20	320	Mixed Soil
14.12.95	21	0.53	Validation



Site Validation Report

9

14.12.95	22	0.50	Validation
14.12.95	23	0.66	Validation
14.12.95	24	11	Validation
14.12.95	25	0.40	Validation
14.12.95	26	0.89	Validation
14.12.95	27	3.7	Validation
14.12.95	28	0.31	Validation
14.12.95	29	3.3	Validation
14.12.95	30	0.43	Validation



Site Validation Report

6.0 DISCUSSION

Validation of remedial works revealed that seven of the seventeen sample sites required further work.

This area was focused to the downhill side of the dip.

The depth of remedial work in this area varied from 0.5 to 0.8 metres. It is felt that the arsenic leached further than expected in this circumstance due to the sandy-alluvial nature of the top soil having a greater leachability for arsenic. This layer however is underlain by clay whereby it is evident the arsenic was sorbed and contained.

Remediation of this area on the second occasion was validated by ten soil samples all results below Department of Environment and Heritage threshold levels. The second series of validity samples were obtained from Ground level to 1.3 metres below the original surface level.

The area was remediated to within 12 metres of the downhill side, covering an area of around 530m².



Site Validation Report

11

7.0 CONCLUSION/RECOMMENDATIONS

Remediation has been carried out on the subject site. Approximately 400m² of contaminated soil has been stockpiled for future removal. Soil was removed to around 3 metres beneath the dip sump.

Secondary remediation and validation have revealed that the site has been remediated to exhibit arsenic concentrations below Department of Environment and Heritage threshold levels:

This material will now be removed once the bridge is open. From the preliminary assessment of the contaminated site and its subsequent remediation and validation it can be concluded that the site has been adequately remediated to levels acceptable to the Department of Environment and Heritage.

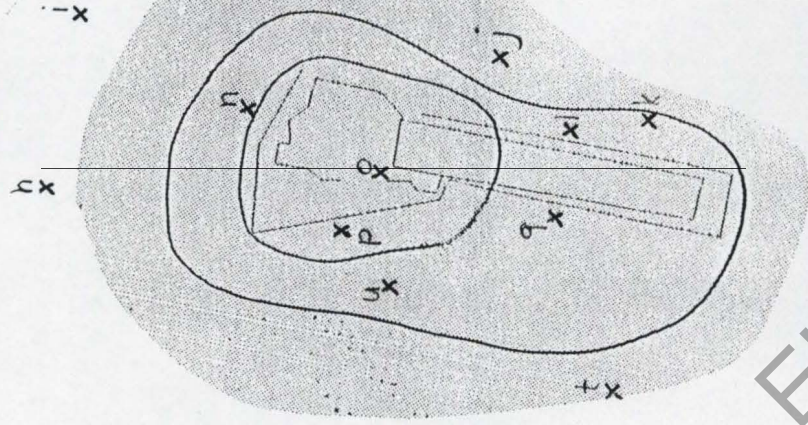
It is recommended that the site described as road reserve part of R.P. 863054 be reclassified under the Contaminated Land Act 1994 to a former site.

Figure 1

Preliminary Sample Sites &
Expected Zone of
Contamination

LOGAN VILLAGE - BRIDGE SITE

A
N



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09/06/95

Scale 1:250

ESC Map Sys (Crown Copyright Reserved)



SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT

b	3	0.25-0.5m	1800	
c	4	0-0.25m	9	
c	5	0.25-0.5m	3	
d	6	0-0.25m	< 4	
e	7	0-0.25m	< 4	
e	8	0.25-0.5m	6	
f	9	0-0.25m	13	
g	10	0-0.25m	14	
h	11	0-0.25m	10	
h	12	0.25-0.6m	10	
i	13	0-0.25m	12	
i	14	0.25-0.6m	4	
j	15	0-0.25m	4	
j	16	0.25-0.6m	< 4	
k	17	0-0.25m	4	
k	18	0.25-0.6m	< 4	
l	19	0-0.25m	74	
l	20	0.5-0.6m	16	
m	21	0-0.25m		< 0.1
m	22	0.5-0.6m		< 0.1
n	23	0-0.25m	230	
n	24	0.5-0.6m	130	
o	25	0-0.25m	1100	



SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT

p	26	0-0.25m	740	
p	27	0.5-0.6m	260	
q	28	0-0.25m	130	
q	29	0.5-0.6m	210	
s	32	0-0.25m		< 0.1
s	33	0.5-0.6m		< 0.1
t	34	0-0.25m	490	
t	35	0.5-0.6	240	
u	36	0-0.25	78	
u	37	0.5-0.6	180	

TABLE 5.2

Summary of TCLP Leachate Analysis

Analyte	Sample Site	Leachate Value mg/L	Acceptable Concentration mg/L
Arsenic	r - 30 (0-0.25m)	0.92	5.0
Arsenic	r - 31 (0.5 - 0.6m)	0.56	5.0

N.B. 1. Acceptable concentration = 100 x recommended guideline value
(refer text Section 5.1)

Figure 2

Depths of Remediation Excavation

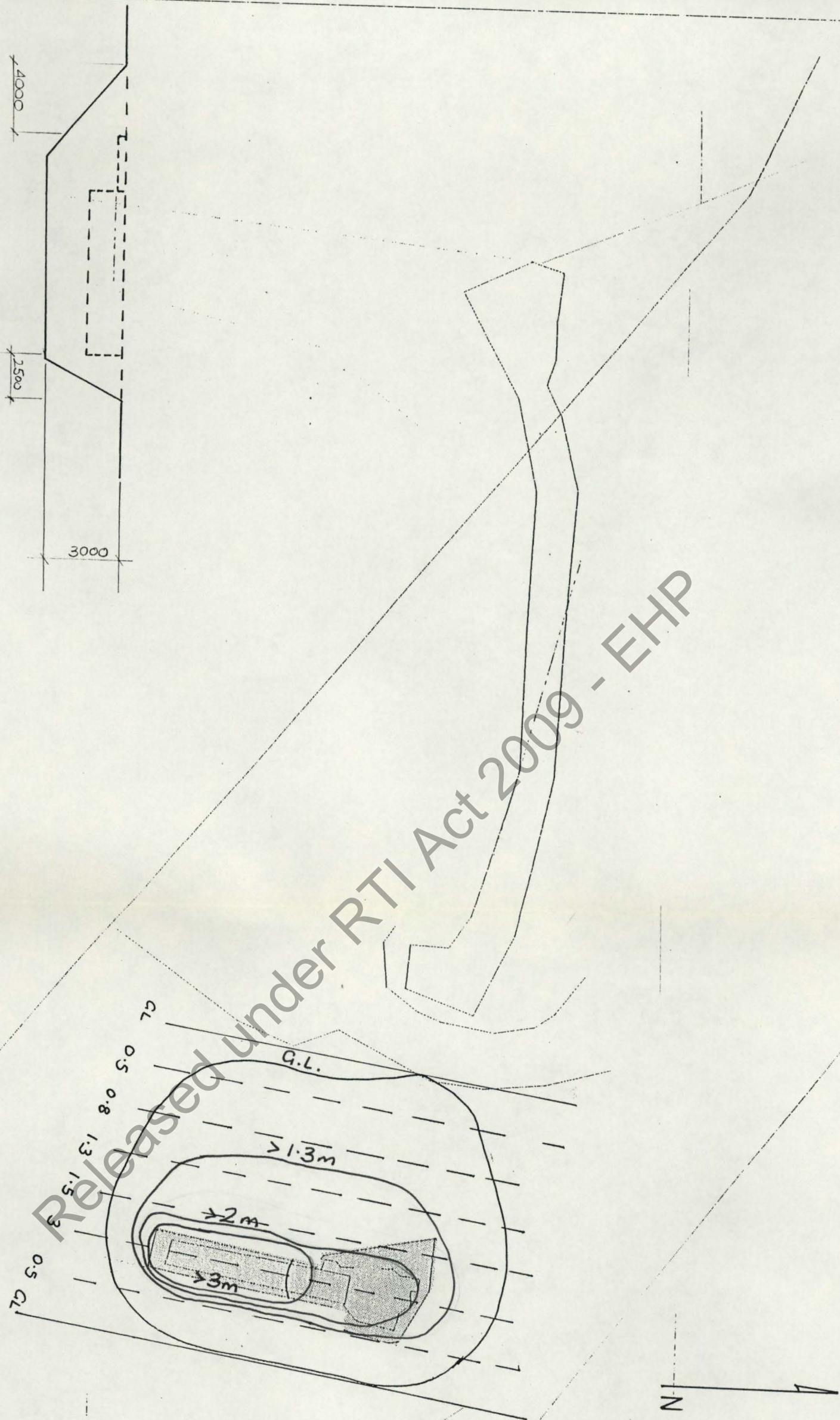
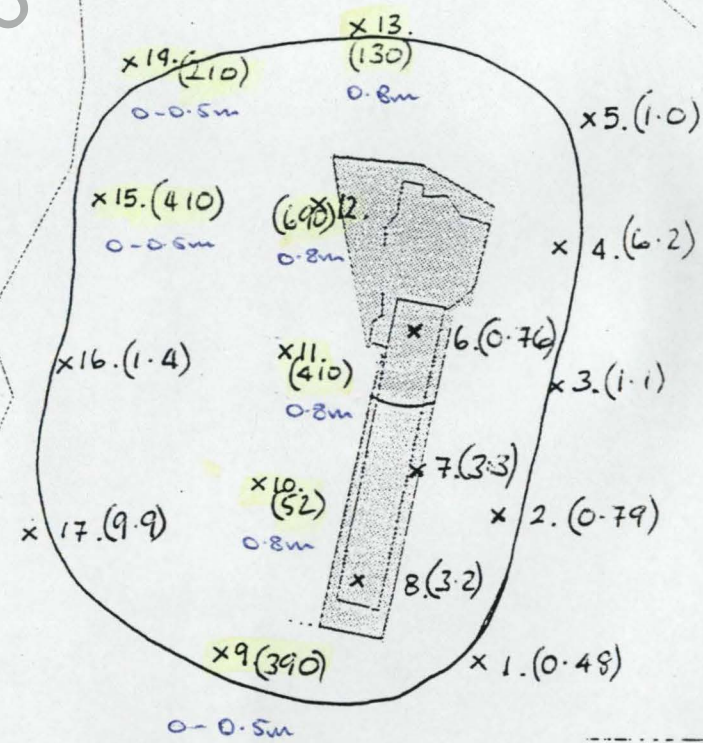


Figure 3

Validation Sample Points 22nd
November, 1995

LOGAN VILLAGE - BRIDGE SITE

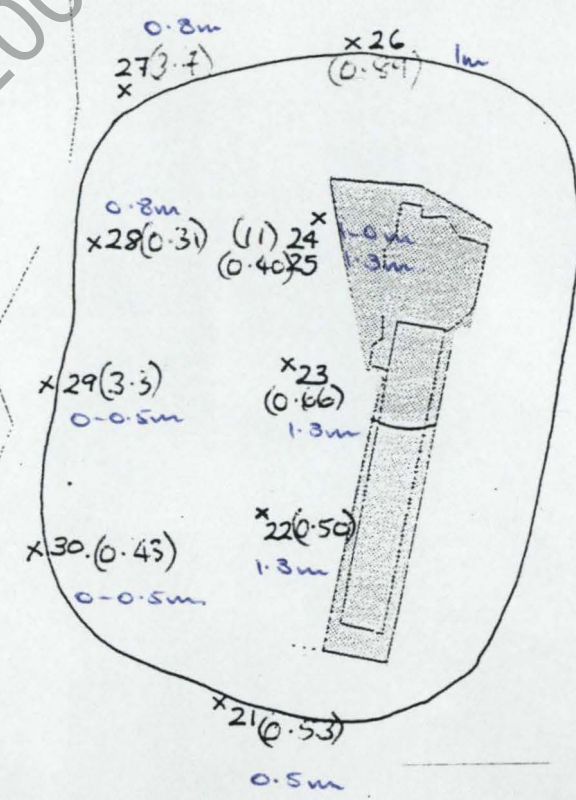


ANALYSIS RESULTS (mg/kg)

Figure 4

Validation Sample Points 14th
December, 1995

LOGAN VILLAGE - BRIDGE SITE



ANALYSIS RESULTS - (mg/kg)

List of Plates

- 1a, b Removal of Dip Structure
- 2a Excavation below dip sump
- 2b Excavation at draining yard
- 3a, b Excavation downhill from dip
- 4a Excavation downhill
- 4b Excavation downhill
Bucket shows intermediate line of
sampling.
- 5a Excavation uphill from dip
- 5b Excavation downhill

Removal of dip structure

1a



1b



2a



2b



3a



3b



4a



4b



5a

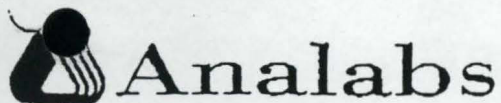


5b



Appendix A

Analysis Report



Analabs Pty. Ltd.
ACN 004 591 664
51 Dover Street Albion
Queensland 4010.
P.O. Box 591, Albion, Qld 4010
Telephone: (07) 262 1588
Facsimile: (07) 256 0568

6 December 1995

Beaudesert Shire Council
PO Box 25
Beaudesert
QUEENSLAND 4285

ORIGINAL POSTED File Copy	
Signed:	CTPI 49-Sch4 - Signature
Dated:	14/12

Your Reference: Purchase order 09809
Our Reference: 3424

Attention: Troy Uren

Dear Sir

We received twenty (20) soil samples from you on 23 November 1995. The samples were analysed according to your Purchase Order No. 09809 and the results are contained in this report.

Preliminary results were faxed to you on 5 December 1995.

Yours faithfully
ANALABS PTY LTD

CTPI 49-Sch4 - Signature

MICHAEL MOWLE
MANAGER - BUSINESS SYSTEMS

CTPI 49-Sch4 - Signature

ANDREW HOXEY
MANAGER - REPORTING SYSTEMS

Report 3424



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Page 1 of 4

METHODOLOGY

Arsenic was analysed in accordance with Analabs Methods SP/SOIL.2, SP/METS.2 and IN/META.3.

All results are expressed on an a dry weight basis.

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Report 3424



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Page 2 of 4

QUALITY CONTROL

Our Reference	3424.1	3424.1	3424.11	3424.11	Blank	Spike
	Reported	Repeated	Reported	Repeated		
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%
Arsenic	0.48	0.46	410	430	<0.05	101

Report 3424



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Page 4 of 4

21 December 1995

Beautesert Shire Council
PO Box 25
Beautesert
QUEENSLAND 4285

Your Reference: **Purchase order G09837**
Our Reference: **3561**

Attention: **Troy Uren**

Dear Sir

We received ten (10) soil samples from you on 14 December 1995. The samples were analysed according to your Purchase Order No. G09837 and the results are contained in this report.

Preliminary results were faxed to you on 20 December 1995.

Yours faithfully
ANALABS PTY LTD

CTPI 49-Sch4 - Signature

ANDREW HOXEY
MANAGER - REPORTING SYSTEMS

CTPI 49-Sch4 - Signature

MICHAEL MOWLE
MANAGER - BUSINESS SYSTEMS

Report 3561



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Page 1 of 4

METHODOLOGY

Arsenic was analysed in accordance with Analabs Methods SP/SOIL.2, SP/METS.2 and IN/META.3.

All results are expressed on an a dry weight basis.

Released under RTI Act 2009 - EHP



RESULTS

Our Reference	Your Reference	Arsenic mg/kg
3561.1	Sample 21	0.53
3561.2	Sample 22	0.50
3561.3	Sample 23	0.66
3561.4	Sample 24	11
3561.5	Sample 25	0.40
3561.6	Sample 26	0.89
3561.7	Sample 27	3.7
3561.8	Sample 28	0.31
3561.9	Sample 29	3.3
3561.10	Sample 30	0.43



QUALITY CONTROL

Our Reference	3561.1	3561.1	Blank
	Reported	Repeated	
Units	mg/kg	mg/kg	mg/kg
Arsenic	0.53	0.59	<0.05

Released under RTI Act 2009 - EHP



HAZARDOUS WASTES AND
CONTAMINATED SITES SECTION

25 MAR 1996



CONT. SITES

COUNCIL CHAMBERS,
82 BRISBANE STREET,
BEAUCESERT QLD 4285
P.O. BOX 25

TEL: (07) 5540 5111
FAX: (07) 5540 5103
HEALTH FAX: (07) 5541 4135

BEAUCESERT SHIRE COUNCIL

IN REPLY PLEASE QUOTE

TU:rl

-46/0365300000.0000

WHEN CONTACTING COUNCIL,
PLEASE ASK FOR

Mr T. Uren
(07) 5540 5260

21st March, 1996

96/04663

The Director,
Contaminated Land Unit,
Department of Environment and Heritage,
P.O. Box 155,
BRISBANE ALBERT STREET QLD 4002

Department of Environment

CTPI 49-Sch4 - Signature

Attention: Christopher Doig

Dear Mr Doig,

Re: Validation Report, Kirk Road

Please find enclosed the Site Validation Report, part of RP863054 Parish Mackenzie,
Trusting this report meets your requirements.

If you have any further questions please contact the above mentioned officer.

Yours faithfully,

CTPI 49-Sch4 - Signature

G. W. Day
CHIEF EXECUTIVE OFFICER

CTPI 49-Sch4 - Signature

Christopher Doig
(07) 3227 7983
TU:rlc
901567

25 September 1995

The Chief Executive Officer
Beaudesert Shire Council
PO Box 25
BEAUDESERT QLD 4285

Attention: Mr Troy Uren

Dear Troy

REMEDIATION AND VALIDATION PROGRAM

**Re: Former Cattle Dip
Road Reserve (Part of RP863054)
Chambers Flat, Queensland
(road reserve bordered by Lots 3(2) Irrelevant on RP863054 and Logan River)**

Please find attached approval for off-site disposal of arsenic contaminated soil from the above site. As requested the following advice is given regarding remediation and validation of the site and the submission of a validation report.

The remediation strategy proposed is acceptable to the Hazardous Wastes and Contaminated Sites Section. With regards to validation it is recommended that excavation walls as well as base be sampled to prove that the lateral and vertical extent of contaminated soil has been removed. This is especially important in the immediate vicinity of the dip structure. Some areas around the dip have not yet been addressed by samples (ie. between locations q & l; h,n,p & f; l, n & j), particular attention should be paid to the validation of excavations in these areas.

The vertical extent of contamination beneath the dip is very important. In the event that extensive contamination is encountered beneath the dip, Beaudesert Shire Council should consider groundwater sampling. It is also recommended that the dip structure be treated as contaminated material and be buried at a secure location in the landfill.

With regards to the remediation and validation report, the following information may be included to assist the expedient review and issuance of a letter of clearance:

- full written details of remediation and validation works.
- a number of maps of the same scale and showing:
 - original sample locations with relation to excavations and landmarks/boundaries,
 - excavation depths and extents,
 - validation sample locations with relation to excavations and landmarks/boundaries,
 - results of analyses on maps.

Please ensure that maps are of a scale to show all appropriate sampling locations on one plan, and mark all appropriate sample points on (ie. if a location has two names eg. r & q - as in the first report, mark the location with r & q rather than just q). In the first report there is also some confusion about the location of samples analysed for OC's. Please show the location of these samples on a plan to clarify this.

- photographs of the remediation works (locations of removed landmarks {dip} and soil samples may be pegged to provide visual references).
- tabulated results, laboratory analytical reports, chain of custody documentation.

These details are provided as suggestions only and any information that Beaudesert Shire Council considers pertinent may also assist report review. If you have any queries concerning the approval for off-site disposal of contaminated soil or the contents of this letter please contact me on (07) 3227 7983. If you have any queries during the course of remediation works I will be happy to discuss the site with you.

Yours sincerely

Christopher Doig
Senior Environmental Officer
Hazardous Wastes and Contaminated Sites Section
Waste Management Branch

73(2) Irrelevant



Queensland Department of Environment and Heritage

160 Ann Street • Brisbane Queensland • PO Box 155 • BRISBANE ALBERT STREET QLD 4002
Telephone (07) 3227 7111 • Facsimile (07) 3227 6534

Enquiries to
Telephone
Your reference
Our reference

Christopher Doig
(07) 3227 7983
TU:rl
901567

25 September 1995

The Chief Executive Officer
Beaudesert Shire Council
PO Box 25
BEAUDESERT QLD 4285

Attention: Mr Troy Uren

Dear Troy

APPROVAL FOR OFF-SITE DISPOSAL OF CONTAMINATED SOIL OR MATERIALS

**Re: Former Cattle Dip
Road Reserve (Part of RP863054)
Chambers Flat, Queensland
(road reserve bordered by Lots 8(2) Irrelevant 3 on RP863054 and Logan River)**

Under Section 14 of the Contaminated Land Act 1991 approval is given for removal of approximately 340m³ of soil contaminated with arsenic from the above site as described in your correspondence of 11 September 1995 and 1 August 1995. The soil is to be transported to the Beaudesert Shire Council administered landfill at Logan Village.

Yours sincerely

CTPI 49-Sch4 - Signature

Dr Dagogo Ibiebele
Manager
Hazardous Wastes and Contaminated Sites Section
Waste Management Branch

73(2) Irrelevant

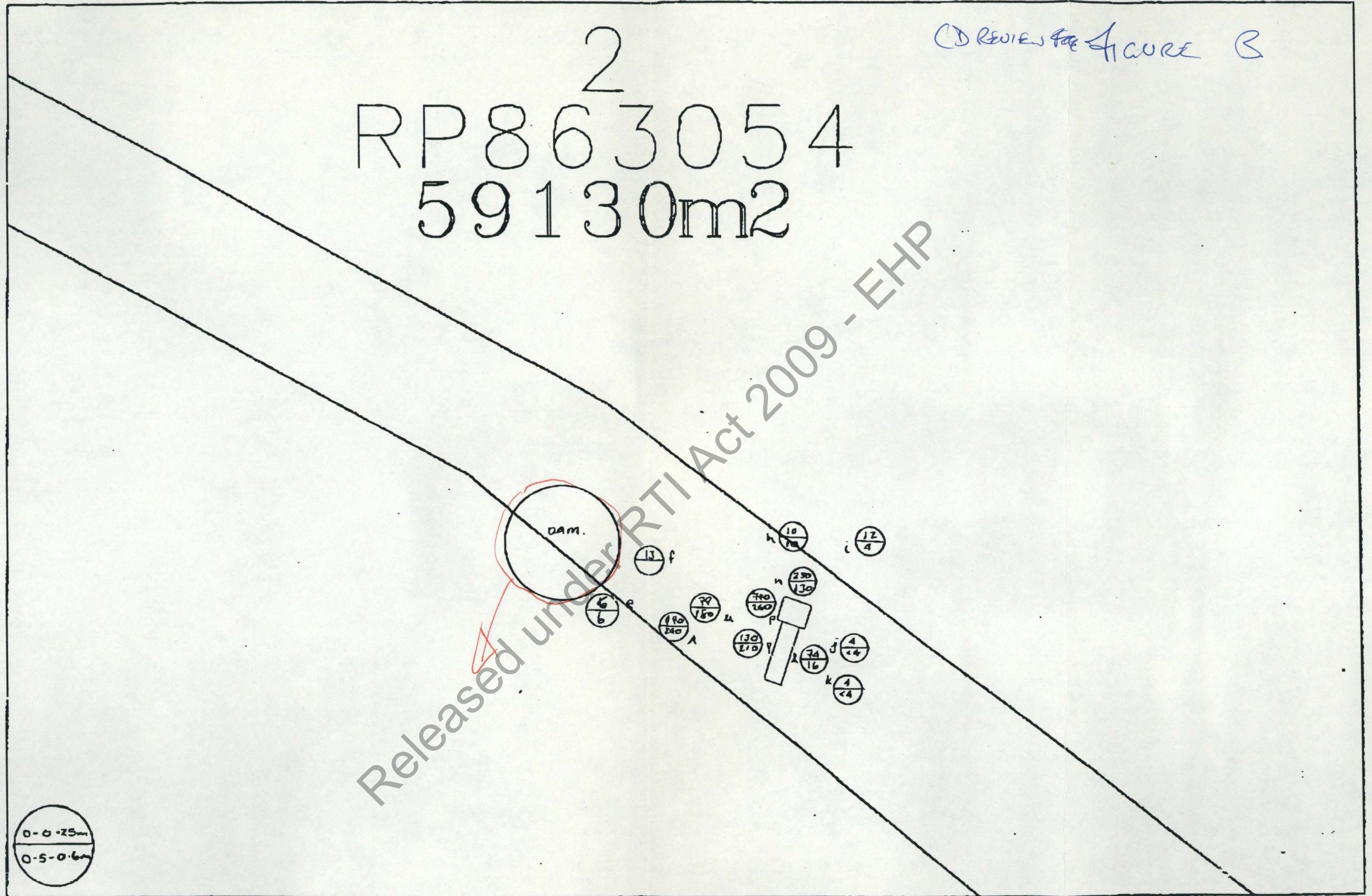
CTPI 49-Sch4 - Signature

28-AUG-1995 09:39 FROM BEAUD SHIRE HLTH&TWN PLAN TO 0732278341 P.03

KIRK RD

CD REVIEW FOR FIGURE B

2
RP863054
59130m2



0-0-25m
0-5-0.6m

Beauresert Shire Council's Mapping System 1:1500

25/08/95

0 t



BEAUDESERT SHIRE COUNCIL

FACSIMILE TRANSMISSION

TO:	DEH. Contaminated Land Unit.
ATTENTION:	TONI CROVES.
FAX NO.:	(07) 3227 8341
FROM:	Health Department
DATE:	28/08/95.
NUMBER OF PAGES: (Including this page)	3 A
SUBJECT:	SAR. KIRK. Rd.
ORIGINAL WILL/WILL NOT BE POSTED	
MESSAGE	
<p>please find enclosed sample collection points.</p> <p>Thank You.</p>	
<div style="border: 1px solid red; padding: 5px; text-align: center;">CTPI 49-Sch4 - Signature</div>	

Address Correspondence To:



Chief Executive Officer
Council Chambers
82 Brisbane Street
Beaudesert Qld Australia 4285
P.O. Box 25

Telephone: (075) 419258 Facsimile: (075) 414135

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If the accompanying documents contain authorisations or other important information they should be copied to good quality paper before filing or otherwise storing.

ALL COMMUNICATIONS TO
BE ADDRESSED TO THE
"CHIEF EXECUTIVE OFFICER"



COUNCIL CHAMBERS,
82 BRISBANE STREET,
BEAUDESERT QLD 4285
P.O. BOX 25

TEL: (07) 5541 9258
FAX: (07) 5541 4135

Cont Sites
901567
CD

BEAUDESERT SHIRE COUNCIL

IN REPLY PLEASE QUOTE
TU:tg
-46/365300000



WHEN CONTACTING COUNCIL,
PLEASE ASK FOR

Mr T. Uren
07 5541 9260

11th September, 1995

The Director,
Contaminated Land Section,
Waste Management Branch,
Department of Environmental Health,
PO Box 155,
BRISBANE QLD 4002



Dear Sir,

Re: Off-site disposal of Contaminated Soil Road Reserve - Kirk Road Chambers Flat

Under the provisions of Section 14 of the Contaminated Land Act 1991, Council requests permission to dispose of contaminated soil at Council's Landfill, Waterford - Tamborine Road, Logan Village.

All details are contained within a Site Assessment Report being processed by M/s Toni Groves of your Department. Approximately 340 m³ of soil contaminated with arsenic is proposed to be disposed of. The diluted concentration will be less than 300 ppm and it is proposed to use the material as daily cover.

Could you please determine this application at your earliest convenience as the removal of the soil delays the construction of a road by other Departments.

Should you have any queries feel free to contact the above mentioned officer.

Yours faithfully,

CTPI 49-Sch4 - Signature

G. W. Day
CHIEF EXECUTIVE OFFICER

CTPI 49-Sch4 - Signature

**BEAUDESERT SHIRE COUNCIL****FACSIMILE TRANSMISSION**

TO:	Contaminated Land Section, Waste Management Branch
ATTENTION:	David Ward
FAX NO.:	07 3227 8341
FROM:	Health Department
DATE:	11th September, 1995
NUMBER OF PAGES: (Including this page)	Two (2)
SUBJECT:	Disposal of Contaminated Soil
ORIGINAL WILL BE POSTED	
MESSAGE	

Address Correspondence To:



Chief Executive Officer
Council Chambers
82 Brisbane Street
Beaudesert Qld Australia 4285
P.O. Box 25

Telephone: (07) 5541 9111 Facsimile: (07) 5541 4135

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ALL COMMUNICATIONS TO
BE ADDRESSED TO THE
CHIEF EXECUTIVE OFFICER*

COUNCIL CHAMBERS,
82 BRISBANE STREET,
BEAUDESERT QLD 4286
P.O. BOX 25

TEL: (07) 5541 9258
FAX: (07) 5541 4135



BEAUDESERT SHIRE COUNCIL

IN REPLY PLEASE QUOTE

TU:tg

-46/365300000

WHEN CONTACTING COUNCIL,
PLEASE ASK FOR

Mr T. Uren
07 5541 9260

11th September, 1995

The Director,
Contaminated Land Section,
Waste Management Branch,
Department of Environmental Health,
PO Box 155,
BRISBANE QLD 4002

Dear Sir,

Re: Off-site disposal of Contaminated Soil Road Reserve - Kirk Road Chambers Flat

Under the provisions of Section 14 of the Contaminated Land Act 1991, Council requests permission to dispose of contaminated soil at Council's Landfill, Waterford - Tamborine Road, Logan Village.

All details are contained within a Site Assessment Report being processed by M/s Toni Groves of your Department. Approximately 340 m³ of soil contaminated with arsenic is proposed to be disposed of. The diluted concentration will be less than 300 ppm and it is proposed to use the material as daily cover.

Could you please determine this application at your earliest convenience as the removal of the soil delays the construction of a road by other Departments.

Should you have any queries feel free to contact the above mentioned officer.

Yours faithfully,

CTPI 49-Sch4 - Signature

G. W. Day
CHIEF EXECUTIVE OFFICER

CTPI 49-Sch4 - Signature



CONT SITE

COUNCIL CHAMBERS,
82 BRISBANE STREET,
BEAUDESERT QLD 42
P.O. BOX 25

TEL: (07) 5541 9258
FAX: (07) 5541 4135

901867

BEAUDESERT SHIRE COUNCIL

IN REPLY PLEASE QUOTE
TU:rlc

WHEN CONTACTING COUNCIL,
PLEASE ASK FOR

Mr T. Uren
07 5541 9258

1st August, 1995

The Director,
Contaminated Land Unit,
160 Ann Street,
BRISBANE QLD 4000



95/12718

Dear Sir/Madam,

Re: Stage 1 and 2 Site Assessment of Road Reserve, bounded by
Parish Mackenzie

83 054
73(2) Irrelevant

Please find enclosed one copy of a Beaudesert Shire Council report regarding the above.

A cheque of \$400 has been forwarded and received by your accounts department,
receipt number 87429.

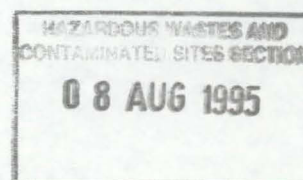
If you have any questions please contact Mr Troy Uren of Council's Health Department.

Yours faithfully,

CTPI 49-Sch4 - Signature

G. W. Day
CHIEF EXECUTIVE OFFICER

CTPI 49-Sch4 - Signature



QUEENSLAND

901567

Date 27/07/95

DEPARTMENT OF ENVIRONMENT & HERITAGE

Receipt No. 87429

Received From .. BEAUDESERT SHIRE CCL

Amount....

400.00

Cheque Details

Bank..... WBC

Place..... BEAUDESERT

Particulars..... CONTAM SITE ASSESS

4SRWM176 EH210

400.00

HAZARDOUS WASTES AND
CONTAMINATED SITES SECTION

- 3 AUG 1995

Chq. No.....

86596

Cashier.... ISG Per Authorised Accounting Officer .. CTPI 49-Sch4 - Signature

Cheques or other negotiable instruments accepted subject to clearance

REMITTANCE & CHEQUE

BEAUDESERT SHIRE COUNCIL



DEPT OF ENV & HERITAGE
CONTAMINATED LAND UNIT
160 ANN STREET
BRISBANE ALBERT STREET QLD 4000

COUNCIL REFERENCE

90058

DATE

18/07/95

086596

82 Brisbane Street
(P.O. Box 25)
Beaudesert, Qld., 4285
Telephone: (075) 41 9129
Fax: (075) 41 9103

DATE	REFERENCE	PARTICULARS	INVOICES AND CREDIT NOTES	BALANCE
13/07/95	2331	SITE ASSESSMENT REPORT FEE	400.00	400.00

87429

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27 JUL 1995

QUEENSLAND



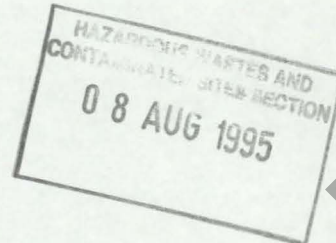
BEAUDESERT SHIRE COUNCIL

IN REPLY PLEASE QUOTE
TU:re

WHEN CONTACTING COUNCIL,
PLEASE ASK FOR

Mr T. Uren
07 5541 9258

18th July, 1995



Dear Sir/Madam,

Re: **Stage 1 and 2 Site Assessment, Part of RP863054 Parish Mackenzie**

This report is submitted by the Director - Environmental Health of Beaudesert Shire Council, Mr Mark Lohmann. Mark Lohmann is a Member of the Australian Institute of Environmental Health, a person of prescribed professional standing authorised under the Contaminated Land Act 1991.

Contained within this report is Stage 1 and 2 Site Assessment of road reserve bounded by L2, 3 RP863054 Parish Mackenzie.

Yours faithfully,

CTPI 49-Sch4 - Signature

R. M. Lohmann
DIRECTOR - ENVIRONMENTAL HEALTH
M.A.I.E.H.

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List of References

- Reference 1 Extract from Chem Unit. Guidelines for the Assessment of Contaminated Land in Queensland.
- Reference 2 ANZECC Australian Water Quality Guidelines for Fresh and Marine Waters



EXECUTIVE SUMMARY

Beautesert Shire Council has undertaken a site contamination assessment of a parcel of land, namely 89 Kirk Road, Chambers Flat.

The purpose of this work is to provide information regarding the extent of potential contamination of the site.

The subject site is contained in the contaminated lands register as a probable site due to its former use as a cattle dip.

The site has been acquired by the Beautesert Shire Council for construction of a sealed road.

Assessment of the site included site inspection and a site history review. Analysis of samples taken as a result of preliminary work revealed the site had been contaminated by Arsenic.

Twelve of the 29 soil samples conducted within the vicinity of the dip showed levels above Department of Environment and Heritage thresholds. The highest level being 1100 mg/kg.

Approximately 340m³ of soil will require remediation covering an area of around 528m².

The average concentration of Arsenic in the excavated area is expected to be approximately 205 mg/kg.

Excavation is proposed to be conducted at four depths corresponding to different levels of contamination and areas, i.e. under the dip sump.



**SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT**

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Contaminated soil will be held on-site to enable validation analysis and approval to transport the contaminated material. It is proposed to re-locate the soil to Council's Logan Village Refuse Facility, to be used as daily cover. This facility has been chosen due to its possession of a suitable clay base.

A validation report containing validation survey information will be furnished on the Department of Environment and Heritage for information with regards to Council obtaining a Site Contamination Report.

Receiving a classification of former or released site the excavated area will be filled with clean soil and constructed to form a sealed road.



1.0 INTRODUCTION

The Beaudesert Shire Council has compiled this site assessment report on part of the Road Reserve adjoining Lots 2 & 3 RP863054 to ascertain the extent of contamination of the site.

The site is to be redeveloped and form the approach to the proposed Logan Village Bridge.

Site assessment included a background review of the site and a walkover inspection which provided information for the development of a sampling strategy. The water table is expected to be quite deep and therefore no groundwater sampling and analysis has been carried out at this stage.



2.0 SCOPE OF ASSESSMENT

The assessment of this site comprised:-

- A review of aerial, topographical , geological and other maps covering the area.
- Reference to the Department of Environment and Heritage "Guidelines to the Assessment of Contaminated Land in Queensland - January 1992".
- A walk-over inspection of the site.
- Discussion with previous owners of the site, and others knowledgeable in relation to the site to establish site history.
- Conduct of a soil sampling strategy based on background information and judgemental decisions about the site.
- Laboratory analysis of samples for selected chemical contamination, based on suspected contaminants.
- Review of current Department of Environment and Heritage threshold levels with respect to results of sample analysis.
- Reporting.



3.0 SITE BACKGROUND REVIEW

3.1 SITE LOCATION AND DESCRIPTION

Applicant

Name: Beautesert Shire Council
Address: Brisbane Street
P.O. Box 25
BEAUTESERT QLD 4285

Property Identification

Address: Road Reserve, 89 Kirk Road
Chambers Flat Qld 4133

Real Property Description: Road Reserve. Logan Village Bridge Approach
Bounded by L2 & 3 RP863054 Parish Mackenzie
Area:- 2.283 Hectares.

Previous Title: 73(2)Irrelevant

Local Government Authority: Beautesert Shire Council

Current Zoning: Rural

Current Owner: Beautesert Shire Council

Previous Use: Cattle Dip

Proposed Use: Bridge Approach



3.2 PROPERTY DESCRIPTION

The subject site is land acquired by the Beaudesert Shire Council as road reserve for the purpose of a bridge approach to the proposed Logan Village Bridge.

The subject parcel was formed via the subdivision of 73(2)Irrelevant it forms the road reserve of RP863054.

The road reserve is bounded to the north by 73(2)Irrelevant to the south by L3 RP863054 and to the east by the Logan River.

The remains of a disused plunge type cattle dip are situated wholly within the road reserve. To the west of the dip is a dam, to which it appears may have received any overflow from the dip.

The dip sump is still intact open and has accumulated a volume of water within. The sump and a small draining yard are constructed of concrete. Only remnants of the timber yards remain.

Upon a visual inspection of the site there was no physical evidence of contamination through distressed vegetation or surface straining. The dam easily supported plant life but no aquatic life was visually detected (It could also be noted that timber in the vicinity showed no visual signs of attack by white ant).



3.3 AVAILABLE INFORMATION

The following maps and surveys were examined in the assessment of this site.

- Registered Plan 863054
- Logan Village Bridge approaches.
Plan and Longitudinal Section A1 - 9742
A1 - 9743
A1 - 9746
- Orthophoto 1:10000 Beenleigh Sheet 9543 - 341
- Topographic 1:25000 Beenleigh Sheet 9542 - 111
9542 - 34
- Beaudesert Shire Council
Strategic Land Use Planning Policies 1976
Land Use Planning Series No. 9
 - Figure 2.4 Soil Type
 - Figure 2.1 Geology
- Department of Mines
Geological Survey of Qld
Record Series 1975/27
Geological Information for Planning Purposes of Beaudesert Shire
Council, Industrial Rock and Mineral Resources
J.E. Martin



3.4 SITE HISTORY AND LAND USE

A site history has been compiled via information obtained from Council records, and through local residents. The information gathered from various residents, was consistent with each source.

CTPI 49-Sch4

The dip is in the vicinity of 90 years old. The Nevell's never used the dip and the roof was not intact over the dip when purchased by them in 1960.

The property was purchased in 1959 by

CTPI 49-Sch4

CTPI 49-Sch4 can not be located but residents who worked the property say the dip was not used during this period.

The dip is suspected to only ever be charged with Arsenic. There is no information in relation to disposal of dip contents. A dam, however, near the dip has been fenced due to loss of stock from drinking the water.

Information related to the storage of chemical point to the storage at an old homestead on L3 RP863054.

Approximately 150 cattle would have been dipped at a time. There is a small draining yard to accommodate 6 - 7 cattle. It is not known how efficiently this yard was utilised.

Floods in 1974 would have seen the dip inundated with water. This is likely to have carried an extent of the contamination away from the site.



**SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT**

Owner	Date of Purchase	Use
CTPI 49-Sch4	25th April, 1888	Rural
	5th October, 1933	Rural
	10th July, 1959	Rural
	23rd September, 1960	Rural
Beaudesert Shire Council	Resumed 1994	Sealed Road

3.5 TOPOGRAPHY AND HYDROLOGY

The site of the dip is approximately 18 metres above sea level. The dip site drains to the west to a gully, at an approximate 1.13 metre gradient over 20 metres. The gully is dammed but has an overflow. The gully drains north to the Logan River.

3.6 GROUNDWATER

Information with regards to groundwater in the area of the dip was obtained via Queensland Transport R1910. The closest borehole to the dip site from this report is situated approximately 120 metres away toward the Logan River.

From this document groundwater is situated at the approximate level of the river. At Abutment B groundwater is at a depth of about 18 metres. Although no groundwater sampling was undertaken at the dip site, to level is expected to be 8 - 18 metres below groundlevel in consistence with information received via Queensland Transport R 1910.



3.7 GEOLOGY

Sampling conducted by Beautesert Shire Council within the area collected samples to a depth of 1100mm. Analysis of these samples was conducted by a NATA registered laboratory which revealed yellow brown sandy silty Clay. These results can be found in Appendix A (at chainage 700).

Queensland Transport have also drilled boreholes to determine bearing capacity for the bridge, see Appendix B. The closest relevance to the contaminated site would be pair 4 and abutment B. This shows sandy Clay at these points, varying in depth from 8 to 15 metres.

Reference to the Beautesert Shire Council Land Use Planning Scheme No. 9 indicates the soil type to be recent alluvium of the streams. This is underlain by clays and sandy clays in the area with a thickness of 3.7 metres to 5.5 metres in thickness.

Although Clays were not found around the dip site due to overlaying soil. It should be noted, however that at the homestead (not subject to inundation) the soil is clay with a high plasticity.

This overlays triassic-Jurassic age Woogaroo Sub-Group.



4.0 SITE INVESTIGATION STRATEGY

4.1 SOIL SAMPLING STRATEGY

A soil sampling strategy (refer Appendix E) was determined via the assessment of information obtained.

Remediation work will only be conducted within the road reserve, therefore the samples were not extensive outside this area.

A Judgemental system of sampling was engaged to accommodate the limited area to be remediated, and the usual known structure of contamination of dip sites.

Thirty-seven soil samples were obtained from twenty-one sites, at differing depths. Two of the samples have been disregarded, with respect to the dip, these are from the suspected storage site on an adjoining property.

4.2 SAMPLING PROCEDURES

4.2.1 SOIL

Samples were taken from 0 to 0.25 metres at all twenty-one sites, with further samples from 0.25 metres to 0.6 metres at various points, according to the site and expected contamination.

A hand auger was used to obtain the samples. The auger was washed in a phosphate-free detergent and rinsed in distilled water after each location to avoid cross-contamination of samples.



**SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT**

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Disposable latex gloves were used to handle the soil samples, which were disposed of after each site and a new pair used. Samples were contained in 250ml glass acid washed jars provided by the Laboratory.

4.2.2 WATER

The sump of the dip and the dam on site both contain water. One sample of water for Arsenic analysis was obtained from each. These were collected in 500ml plastic acid wash bottles provided by the laboratory.

4.3 LABORATORY ANALYSIS

Samples were sent to Analab Pty Ltd, Albion. Analab laboratory in Melbourne performed the analysis. Analab in Melbourne are NATA registered and are familiar with the procedures required.

Samples were analysed for one of the following parameters depending on sample location.

- Arsenic
- Organochlorine pesticides
- TCLP leachate for Arsenic

From the site history Arsenic was considered to be the most likely contaminant. Organochlorines were tested for, to ensure that any further contaminants were not overlooked. These contaminants are considered "indicators" of contamination at former cattle dips. Water was tested for Arsenic only.



**SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT**

TABLE 4.1

DETAILS OF SOIL SAMPLES				
Sample Site	Sample No.	Depth	Lithology	Analytical Parameters
a	1	0-0.25m	Sandy loam, brown, dry	As
b	2	0-0.25m	Brown, Clayish, medium plasticity.	As
	3	0.25-0.5m	Brown, clay, moist, high plasticity	As
c	4	0-0.25m	Sandy loam, light Brown/grey, low plasticity	As
	5	0.25-0.5m	Sandy loam, Brown/grey, dry	As
d	6	0-0.25m	Sandy loam, Brown/grey, dry	As
e	7	0-0.25m	Sandy loam, dry	As
	8	0.25-0.5m	Clayish Sand, Brown to orange tinge. Moist medium plasticity	As
f	9	0-0.25m	Sandy loam, brown/grey, Orange clayish tinge. Low to medium plasticity.	As
g	10	0-0.25m	Sandy loam, Brown dry	As



SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT

DETAILS OF SOIL SAMPLES				
Sample Site	Sample No.	Depth	Lithology	Analytical Parameters
h	11	0-0.25m	Sandy loam, Brown/grey, dry	As
	12	0.5-0.6m	Sandy loam, Brown/grey moist. Low to medium plasticity.	As
i	13	0-0.25m	Sandy loam. Brown/grey. Dry	As
	14	0.5-0.6m	Sandy loam. Brown/grey. Moist.	As
j	15	0-0.25m	Sandy loam. Brown/grey. Low Plasticity	As
	16	0.5-0.6m	Sandy loam. Brown/grey. Moist	As
k	17	0-0.25m	Sandy loam. Brown/grey. Slightly moist.	As
	18	0.5-0.6m	Sandy loam. Brown/grey. moist	As
l	19	0-0.25m	Sandy loam. Brown/grey.	As
	20	0.5-0.6m	Sandy loam. Brown/grey. Moist	As



SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT

DETAILS OF SOIL SAMPLES				
Sample Site	Sample No.	Depth	Lithology	Analytical Parameters
m	21	0-0.25m	Sandy loam. Brown/grey. Slightly Moist.	OC Pesticides
	22	0.5-0.6m	Sandy loam. Brown/grey. Moist	OC Pesticides
n	23	0-0.25m	Sandy loam. Brown/grey. Slightly moist.	As
	24	0.5-0.6m	Sandy loam. Brown/grey. Moist	As
o	25	0-0.25m	Sandy loam. Brown. Very organic. Moist	As
p	26	0-0.25m	Sandy loam. Brown/grey. Slightly moist.	As
	27	0.5-0.6m	Sandy loam. Brown/grey. Moist	As
q	28	0-0.25m	Sandy loam. Brown/grey. Slightly moist.	As
	29	0.5-0.6m	Sandy loam. Brown/grey. Moist	As



**SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT**

	DETAILS OF SOIL SAMPLES			
Sample Site	Sample No.	Depth	Lithology	Analytical Parameters
r	30	0-0.25m	Sandy loam. Brown/grey. Slightly Moist.	TCLP leachate - As
	31	0.5-0.6m	Sandy loam. Brown/grey. Moist	TCLP leachate - As
s	32	0-0.25m	Sandy loam. Brown/grey. Slightly Moist.	OC Pesticides
	33	0.5-0.6m	Sandy loam. Brown/grey. Moist	OC Pesticides
t	34	0-0.25m	Sandy loam. Brown/grey. Slightly Moist.	As
	35	0.5-0.6m	Sandy loam. Brown/grey. Moist	As
u	36	0-0.25m	Sandy loam. Brown/grey. Slightly Moist.	As
	37	0.5-0.6m	Sandy loam. Brown/grey. Moist	As
v	38	H ₂ O	Dam	As
w	39	H ₂ O	Dip	As



5.0 RESULTS

A summary of soil samples collected for analysis is presented in Table 4.1. Reported laboratory results for the analysis of these samples are presented in Table 5.1. The full laboratory reports can be found in Appendix F.

All samples for Arsenic were reported on a dry weight basis. This allows the direct correlation of samples received, with Department of Environment and Heritage threshold levels for Arsenic contained in reference 1. Results of TCLP leachate tests are summarised in Table 5.2.

Results for water analysis are summarised in table 5.3

TABLE 5.1
Summary of Analysis Results

Analysis	Arsenic	OC
Units	mg/kg	mg/kg
DEH Guidelines		
Environmental Threshold	20	0.2 (Dieldrin)
Health Based Threshold	100	20 ¹
Background Levels	0.2-30	< 0.001-0.05 Aldrin < 0.005-0.05 Dieldrin < 0.001 - 0.97 DDT
Sample Locations		
a 1 0-0.25m	4	
b 2 0-0.25m	7100	



SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT

b	3	0.25-0.5m	1800	
c	4	0-0.25m	9	
c	5	0.25-0.5m	3	
d	6	0-0.25m	< 4	
e	7	0-0.25m	< 4	
e	8	0.25-0.5m	6	
f	9	0-0.25m	13	
g	10	0-0.25m	14	
h	11	0-0.25m	10	
h	12	0.25-0.6m	10	
i	13	0-0.25m	12	
i	14	0.25-0.6m	4	
j	15	0-0.25m	4	
j	16	0.25-0.6m	< 4	
k	17	0-0.25m	4	
k	18	0.25-0.6m	< 4	
l	19	0-0.25m	74	
l	20	0.5-0.6m	16	
m	21	0-0.25m		< 0.1
m	22	0.5-0.6m		< 0.1
n	23	0-0.25m	230	
n	24	0.5-0.6m	130	
O	25	0-0.25m	1100	



SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT

p	26	0-0.25m	740	
p	27	0.5-0.6m	260	
q	28	0-0.25m	130	
q	29	0.5-0.6m	210	
s	32	0-0.25m		< 0.1
s	33	0.5-0.6m		< 0.1
t	34	0-0.25m	490	
t	35	0.5-0.6	240	
u	36	0-0.25	78	
u	37	0.5-0.6	180	

TABLE 5.2

Summary of TCLP Leachate Analysis

Analyte	Sample Site	Leachate Value mg/L	Acceptable Concentration mg/L
Arsenic	r - 30 (0-0.25m)	0.92	5.0
Arsenic	r - 31 (0.5 - 0.6m)	0.56	5.0

N.B. 1. Acceptable concentration = 100 x recommended guideline value
(refer text Section 5.1)



SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT

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TABLE 5.3
Summary of Laboratory Analytical Results for Water

Analyte	Sample Site	Result mg/L
Arsenic	V - 38	0.003
Arsenic	W - 39	2.1



5.1 DISCUSSION

5.1.1 SOIL

Upon conducting a site assessment program it can be confirmed that the former dip site situated within the road reserve on Registered Plan 856053 is contaminated by Arsenic. Of the seventeen surface samples, a total of seven exhibited levels of arsenic in excess of current Department of Environment and Heritage (DEH) environmental threshold levels.

Five samples out of twelve taken at a depth of greater than 0.25m, exhibited levels of arsenic above Department of Environment and Heritage environmental threshold levels. It should be noted that samples b2 and b3 taken from site b have not been included in these calculations.

Figure 3 shows the resulting zone of contamination, based on Department of Environment and Heritage guide threshold levels. Figure 3 also shows three zones of contamination to which the sites will be excavated to 0.35 metres in area one, 0.7 metres in area two and to 1.1 metres in area 3. The site will be excavated to in excess of 0.8 m under the sump. Appendix E indicates the approximate positions from which samples were obtained.

Arsenic concentrations within the direct vicinity of the dip, range from < 4 mg/kg to 1100 mg/kg. Area one consists of around 64m^3 of soil. This area includes the transitional zone between areas that are above 20 mg/kg Arsenic and areas that are below 20 mg/kg. No sample sites are situated within this zone so the concentration is assumed to be the health-based threshold level of 100 mg/kg arsenic.

Area two consists of 197m^3 with average contamination of 178 mg/kg. Area three contains around 69m^3 of contaminated soil with an average concentration of 378 mg/kg arsenic. The total volume of soil exhibits an average level of arsenic around 205 mg/kg.



SITE ASSESSMENT REPORT
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The contaminated zone covers an area of approximately 528m² and effects approximately 340m³ of soil. Contamination is limited to within 12m of the dip. Figure 4 shows Arsenic concentration against distance.

Samples b2 and b3 showed extremely high levels of contamination at both surface and sub-surface levels. The area in which these samples were taken, corresponds to a suspected hot-spot, due to the burial of a box of arsenic approximately twenty years previously. This information was received as hearsay from Mr Ivan Wendt.

To determine background levels and the validity of the report, samples taken from this area were analysed. No physical evidence of the contamination was noted. The exact location of the burial has not been determined but it would be expected to show even higher levels of arsenic. It should be noted that this site is not subject to remediation within this project. Formal notification will be made to the Department of Environment and Heritage under the Contaminated Land Act 1991 as to the status of L3 RP863054.

Analysis for detection of Organochlorines showed no evidence with respect to the contamination of the site by OC pesticides.

A TCLP leachate test was carried out on site r.(q). Total arsenic for these samples were not analysed as the expected contamination of the area was not expected to change drastically with this area. The results of TCLP analysis are presented in Table 5.2.

As a general guideline, the TCLP results for contaminated material are considered acceptable if the concentration of any contaminant in the test leachate is less than 100 times the relevant water quality standard (Reference 2). The value of 100 times is selected on the grounds that in practice the concentration of the substance in any leachate would be reduced by absorption onto soil and by dilution with other waters.



This 100 times factor has been adopted by the US EPA, the N.S.W. EPA and the Victorian EPA and is used for classifying wastes containing heavy metals.

The water quality standard for application of the 100 times factor is taken from the ANZECC "Australian Water Quality Guidelines for Fresh and Marine Waters" (Reference 2). In that document, table 2.1 entitled "Summary Guidelines for the Protection of Aquatic Ecosystems" lists Criteria which are the concentrations of toxicants in marine and fresh waters which are considered will protect the most sensitive aquatic organisms from toxic effects under conditions of chronic exposure. The Environmental Guideline listed in Table 5.2 is derived by multiplying the Guideline levels listed in Table 2.1 of the ANZECC document by the 100 times factor.

The result of leachate testing reported a leachate value below the acceptable concentration of 5.0 mg/l.

All results of analysis were reported on a dry-weight basis to allow comparison with relevant standards and threshold levels.

5.2 WATER

Results of analysis of water samples from the dam and dip sump can be found in Table 5.3.

Levels of arsenic found in the dip sump and dam are not considered to be excessive. Levels in the dam could be expected in environmental waters. Arsenic levels in the dip sump are minor compared to levels in soils surrounding the dip site. It is proposed that this water be pumped onto the site, while the dam water be pumped to irrigation, so as not to saturate the soil. Evapouration should be allowed to dominate. This will have the effect of minimizing arsenic contamination of the water while the arsenic binds to soils to be remediated in the future.



6.0 SITE REMEDIATION PLAN

It is proposed that contaminated soil from the site be disposed of at one of Council's Refuse Landfill facilities. Levels of arsenic contamination surrounding the dip, coupled with results from TCLP leachate analysis indicate that the contaminated material would be suitable for disposal in this method.

Following assessment of the site there is approximately 340m³ of contaminated material exhibiting an average arsenic level of 205 mg/kg. Council's Logan Village refuse landfill facility is at present proposed for the disposal of this material as daily cover. This site is underlain by clay to contain the contaminant.

Site management is proposed to include:-

- * Obtaining approval for transport and disposal of the contaminated material.
- * Remediation of the subject area.
- * Validation of remedial action.
- * Site validation report furnished to the DEH in the aim of providing information toward obtaining a Site Contaminated Report.

6.0.1 DISPOSAL OF WATER

The water contained in the dam exhibited levels of arsenic at 0.003 mg/L these levels can be found in normal water. It is proposed, therefore, that this water be used as dust suppression for the purpose of road construction.

Levels of arsenic reported in the dip race were 2.1 mg/L. This level is below the 100 times factor used for leachate and the same principles apply. It is therefore proposed that this water be pumped onto the contaminated area and allowed to evaporate.



SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT

6.1 PROJECT PLANNING

In order to carry out remedial works, arrangements for the transport and disposal of contaminated materials will need to be made. The Department of Environment and Heritage will need to be satisfied as to the proposed methods and provide approval and/or conditions for the disposal and transport of contaminated material.

The preparation of a site specific Health and Safety plan will be compiled in accordance with current regulatory requirements.

6.2 REMEDIATION OF THE AREA

All materials that have exhibited contamination will be stockpiled on-site. Contaminated soil will be mixed to dilute contaminant levels. Excavation in area one will be to 0.35m where the contamination is of a surface nature. Area two and three both exhibit higher concentrations of arsenic and will therefore be remediation to depths of 0.7m and 1.1m respectively. Soil under the dip sump will be removed to a depth in excess of 0.8m.

The remediated site will be filled with clean fill and covered with a sealed road. Approximately 0.8m of fill will cover the original ground-level providing cover of up to 2.5m in some areas.

6.3 VALIDATION SURVEY

A validation survey will be conducted to inform the Department of Environment and Heritage of the position of remediation. Soil Samples taken from the excavated site will be provided to verify remedial action.



6.4 TRANSPORT AND DISPOSAL

Upon receiving approval from the Department of Environment and Heritage, with respect to the final disposal of the material, it will be transported to the Logan Village Refuse Landfill for use as daily cover in the operation of the facility.

6.5 SITE VALIDATION REPORT

A Site Validation Report will be made available to the Department of Environment and Heritage to support site remediation. Information contained within this report will include the remediation/validation work completed, as well as results of soil analysis and final information as to the transport/disposal of the material.

This report would be submitted for review by the Department of Environment and Heritage to provide information to allow a decision to be made regarding the reclassification of the site.



7.0 CONCLUSION/RECOMMENDATIONS

As the result of site assessment work the following has been concluded.

The site is contaminated with arsenic. Approximately 340m³ of material will need to be removed. Contamination is confined to an area within 12m of the dip. The depth of contamination varies from surface to sub-surface. Soil will be removed to a depth in excess of 0.8m below the sump bottom.

As a result of TCLP leachate analysis, it was determined the material would be suitable for use as daily cover at Logan Village refuse landfill.

It is recommended that the site assessment and remediation plan be submitted to the Department of Environment and Heritage with the aim of obtaining further regulatory approval.

Appendix A

*Beautesert Shire Council:
Results of Soil Type Analysis
N.B. Chainage 700*

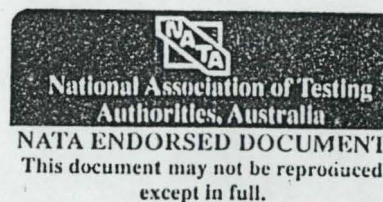
Lab No.	Chainage	Formation	Existing Pavement Gravel Depth & Type	SUBGRADE PROFILE (00 is Subgrade Level)	D/C CBR		Cover Req'd Curve:- D	Remarks
					Depth	C.B.R.		
24229	100	N/S	nil	0-400 Brown clayey silty SAND. m.c. = 19.9% 400-700mm.+ Yellow brown sandy silty CLAY. m.c. = 26.6%	00-434mm. 434-640mm. 640-855mm.	1.5 3.5 23.0	700mm. 465mm. 205mm.	
24212	700	0.67m. cut	nil	00-400mm. Brown clayey silty SAND. m.c. = 3.6% 400-800mm. Yellow brown sandy silty CLAY. m.c. = 10.4% 800-1150mm.+ Yellow brown sandy silty CLAY (deco. sandstone).	-	-	-	CBR sample Lab. ref.2422
24213	800	0.63m. cut	nil	00-300mm. Brown clayey silty SAND. m.c. = 4.5% 300-700mm. Yellow brown sandy silty CLAY. m.c. = 11.6% 700-1100mm.+ Yellow brown sandy silty CLAY (deco. sandstone). m.c. = 9.7%	-	-	-	CBR sample Lab. ref.2322 CBR sample Lab. ref.2322
24214	900	0.76m. cut	nil	00-300mm. Brown clayey silty SAND. m.c. = 8.7% 300-1600mm.+ Yellow brown sandy silty CLAY. m.c. = 24.5%	-	-	-	
24215	1000	0.23m. fill	nil	00-350mm. Brown clayey silty SAND. m.c. = 9.2% 350-1100mm.+ Yellow brown sandy silty CLAY. m.c. = 17.9%	00-392mm. 392-855mm.	27.0 17.0	205mm. 205mm.	
24216	1100	0.25m. fill	nil	00-1200mm.+ Yellow brown sandy silty CLAY. m.c. = 16.5%	00-855mm.	18.0	205mm.	
24217	1200	0.45m. fill	nil	00-450mm. Brown clayey silty SAND. m.c. = 3.5% 450-1050mm.+ Yellow brown sandy silty CLAY. m.c. = 15.9%	00-579mm. 579-840mm.	13.0 29.0	215mm. 205mm.	
24218	1300	N/S	15mm. Logan Reserve Pit type.	00-800mm.+ Yellow brown sandy silty CLAY. m.c. = 26.7%	00-258mm. 258-870mm.	15.0 9.0	205mm. 270mm.	
24219	1400	N/S	10mm. Logan Reserve Pit type.	00-150mm. Brown clayey silty SAND. m.c. = 8.1% 150-950mm.+ Yellow brown sandy silty CLAY. m.c. = 20.6%	00-182mm. 182-586mm. 586-885mm.	16.0 10.0 6.5	205mm. 255mm. 330mm.	
24220	1500	N/S	10mm. Logan Reserve Pit type.	00-270mm. Brown clayey silty SAND. m.c. = 7.3% 270-970mm.+ Yellow brown sandy silty CLAY. m.c. = 13.7%	00-250mm. 250-538mm. 538-870mm.	42.0 24.0 13.0	205mm. 205mm. 215mm.	
24221	1600	N/S	nil	00-1000mm. Brown clayey silty SAND. m.c. = 3.0% 1000-1100mm.+ Yellow brown sandy silty CLAY.	00-214mm. 214-440mm. 440-800mm.	36.0 >60.0 38.0	205mm. 205mm. 205mm.	
24222	1700	N/S	nil	00-1000mm.+ Brown clayey silty SAND. m.c. = 2.1%	-	-	-	
24223	1800	N/S	nil	Red brown weathered SANDSTONE. m.c. = 6.5%	-	-	-	
24224	1900	N/S	nil	00-800mm.+ Brown clayey silty SAND. m.c. = 2.9%	-	-	-	

Sign

CTPI 49-Sch4 - Signature

Date 17/2/95

Report No. 95051



Appendix B

Extract from Queensland Transport

R1910 May 1994

- 4.1.4 The investigation has determined that the river is migrating in a south easterly direction with the Abutment A bank comprising mainly weathered bedrock while the Abutment B bank comprises bedded alluvium.

Both banks are covered in a veneer of silty sand ('loamy' material) to depths of 3 metres. This material is very unstable with extensive slumping observed - probably the result of drawdown after flooding.

4.2 Alluvium

- 4.2.1 The alluvium at the site is Quaternary in age and can be subdivided into 3 basic units viz.

- Unit 1 - The fine grained, loose, silty sand surface cover found on both banks. This unit is between 2.5 and 3.5 metres in thickness and highly unstable. It is present at Pier 1, Pier 4 and Abutment B.
- Unit 2 - The underlying stiff sandy clay to moderately dense clayey sand strata in the Abutment B bank. This unit varies in thickness from 8 to 15 metres and extends down to RL - 2.00 approximately. It is present at Pier 4 and Abutment B.
- Unit 3 - The widespread basal sand and gravel bed occurring directly above bedrock and extending from Pier 2 to Abutment B. This unit also forms the river bed deposits and varies in thickness from 4.5 m at Pier 2 to 11.5 m at Abutment B. It comprises mainly medium to coarse grained sand containing minor gravel mainly to a maximum size of 30 mm, - although occasional cobbles to 100 mm diameter might also be expected. The gravel increases in frequency towards the base of the unit - especially between Pier 4 and Abutment B.

SPT-N values indicate the sand is generally loose. When the gravel content was high (as at Pier 4 and Abutment B) the SPT values generally exceeded 60 blows indicating dense strata. However these high values may be misleading.

4.4 Groundwater

- 4.4.1 At the bridgesite water depths in the Logan River were a maximum of 2 metres. The site is tidal with a tidal range of less than 1 metre. High tide level at the time of drilling was approximately RL 1.0 m.
- 4.4.2 The groundwater level in the alluvium corresponds to the river level. This results in the basal sand and gravel strata (Unit 3) being fully saturated.
- 4.4.3 Monitoring in BH 9 and BH 10 at Abutment A and Pier 1 indicated no groundwater was present in the Sandstone bedrock (at least down to RL 0.20 m) at the time of monitoring.

ENGINEERING BORELOG

FOR GEOTECHNICAL TERMS AND
SYMBOLS REFER FORM F873 NOV/87

BOREHOLE No : 7
SHEET : 1 OF 3
REFERENCE No : H7389

PROJECT : LOGAN RIVER BRIDESITE AT LOGAN VILLAGE
LOCATION : Pier 4, Ch. 442 - 4m right of centreline
PROJECT No : MG0254 SURFACE R.L. : 9.74 DRILLER : R&D DRILLING
JOB No : DATUM : AHD DATE DRILLED : 11/2/94

DEPTH (m)	R.L. (m)	AUGER CORE DRILLING OTHER	RQD (%) CORE REC%	CORE LOSS	MATERIAL DESCRIPTION	USC WEATHERING EH VH VM V	INTACT STRENGTH	DEFECT SPACING (mm) 20 60 200 600 2000	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
0	9.74				SILTY SAND Brown, loose becoming moderately dense, dry, fine grained alluvium.						
1						SM				2,2,2 N=6	SPT
2										5,7,7 N=17	SPT
3	7.24				CLAYEY SAND Brown, loose, moist, alluvium. Fine to medium grained.	SC				4,4,9 N=13	SPT
4										3,4,4 N=8	SPT
5	5.24				SANDY CLAY Dark brown, fine, stiff, alluvium. Black organics throughout.	CL				3,2,4 N=6	SPT
6					SAND Brown, moderately dense, moist alluvium. Fine to medium grained.	SW				4,5,6 N=11	SPT
7										4,4,8 N=12	SPT
8	1.74				SANDY CLAY Brown to grey, stiff, moist alluvium. Soft and wet at 9 metres.					6,6,8 N=14	SPT
9	0.74					CL			11/2/94	2,1,2 N=3	SPT
10	-0.26										

REMARKS :

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ENGINEERING BORELOG

[FOR GEOTECHNICAL TERMS AND
SYMBOLS REFER FORM F873 NOV/87]

BOREHOLE No : 7
SHEET : 2 OF 3
REFERENCE No : H7389

PROJECT : LOGAN RIVER BRIDESITE AT LOGAN VILLAGE
LOCATION : Pier 4, Ch. 442 - 4m right of centreline
PROJECT No : MG0254 SURFACE R.L. : 9.74 DRILLER : R&D DRILLING
JOB No : DATUM : AHD DATE DRILLED : 11/2/94

DEPTH (m)	R.L. (m)	ALGER CORE DRILLING CASING OTHER	RQD (%) CORE REC%	CORE LOSS	MATERIAL DESCRIPTION	USC WEATHERING EH VH H M L	INTACT STRENGTH	DEFECT SPACING (mm) 20 60 200 600 2000	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
10	-0.26				SANDY CLAY (Cont.)	CL				4,6,8 N=14	SPT
11	-0.76				SAND Grey, moderately dense, wet alluvium. Medium grained.	SW				6,7,9 N=16	SPT
12										3,5,6 N=11	SPT
13	-3.26				SANDY CLAY Grey to blue, very stiff, moist alluvium					5,7,9 N=16	SPT
14						CL				5,6,15 N=31	SPT
15										4,6,13 N=19	SPT
16	-6.26				SANDY GRAVEL Grey, dense, fine to medium grained (max 20mm) wet, alluvium.					11,16,25 N=41	SPT
17										10,19,30/99 N>60	SPT
18						GW				30/125 N>60	SPT
19											
20	-10.26										

REMARKS :

RTI-16-038

File A

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ENGINEERING BORELOG

FOR GEOTECHNICAL TERMS AND
SYMBOLS REFER FORM F873 NOV/87

BOREHOLE No : 7
SHEET : 3 OF 3
REFERENCE No : H7389

PROJECT : LOGAN RIVER BRIDESITE AT LOGAN VILLAGE
LOCATION : Pier 4, Ch. 442 - 4m right of centreline
PROJECT No : MG0254 SURFACE R.L. : 9.74 DRILLER : R&D DRILLING
JOB No : DATUM : AHD DATE DRILLED : 11/2/94

DEPTH (m)	R.L. (m)	AUGER CORE DRILLING CORE DRILLING CASING OTHER	RQD (%) CORE REC%	CORE LOSS	MATERIAL DESCRIPTION	USC WEATHERING	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
20	-10.26										
21			100		SHALE DARK GREY, FINE GRAINED, BEDDED SEDIMENTARY ROCK. Bedding dips at 10°, frequent thin (<5mm) fine to medium grained sandstone interbeds throughout. Most defects are along bedding planes and probably drilling induced. Other defects dip at 80° with thin clay coatings on defect planes.	SW				Is(50)=0.51MPa Is(50)=0.27MPa	o o
22											
23	-13.06		100		END OF HOLE						
24											
25											
26											
27											
28											
29											
30											

REMARKS :

RTI-16-038

File A

CTPI 49-Sch4 - Signature
Page 109 of 180

PROJECT :	LOGAN RIVER BRIDGESITE AT LOGAN VILLAGE		
LOCATION :	Abutment B - Ch. 471.75 - 4m left of centreline		
PROJECT No :	MGO254	SURFACE R.L. :	16.15
		DRILLER :	R&D DRILLING
JOB No :		DATUM :	AHD
		DATE DRILLED :	10/2/94

[illegible]



ENGINEERING BORELOG

[FOR GEOTECHNICAL TERMS AND
SYMBOLS REFER FORM F873 NOV/87]

BOREHOLE No : 8
SHEET : 2 OF 4
REFERENCE No : H7390

PROJECT : LOGAN RIVER BRIDGESITE AT LOGAN VILLAGE
LOCATION : Abutment 8 - Ch. 471.75 - 4m left of centreline
PROJECT No : MG0254 SURFACE R.L. : 16.15 DRILLER : R&D DRILLING
JOB No : DATUM : AHD DATE DRILLED : 10/2/94

DEPTH (m)	R.L. (m)	AUGER CORE DRILLING CASING OTHER	RQD (%) CORE REC%	CORE LOSS	MATERIAL DESCRIPTION	USC WEATHERING	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
10	6.15				SANDY CLAY (Cont.)	CL				6,11,13 N=24	SPT
11	5.65				SLIGHTLY CLAYEY SAND Brown, moderately dense, moist, fine to medium grained alluvium.					6,8,11 N=19	SPT
12										6,9,10 N=19	SPT
13										4,8,12 N=20	SPT
14						SW				6,10,10 N=20	SPT
15										4,6,5 N=11	SPT
16										8,9,12 N=21	SPT
17										6,7,6 N=13	SPT
18										9,9,12 N=21	SPT
19	-2.35				SAND Grey, dense, wet coarse grained alluvium	SW				5,19,19 N=38	SPT
20	-3.85										

REMARKS : RTI-16-038 File A

LOGGED BY
Page 111 of 180

ENGINEERING BORELOG

[FOR GEOTECHNICAL TERMS AND
SYMBOLS REFER FORM F873 NOV/87]

BOREHOLE No : 8
SHEET : 3 OF 4
REFERENCE No : H7390

PROJECT : LOGAN RIVER BRIDGESITE AT LOGAN VILLAGE
LOCATION : Abutment B - Ch. 471.75 - 4m left of centreline
PROJECT No : MG0254 SURFACE R.L. : 16.15 DRILLER : R&D DRILLING
JOB No : DATUM : AHD DATE DRILLED : 10/2/94

DEPTH (m)	R.L. (m)	AUGER CORE DRILLING Casing OTHER	RQD (%) CORE REC%	CORE LOSS	MATERIAL DESCRIPTION	USC WEATHERING EH VH M L	INTACT STRENGTH	DEFECT SPACING (mm) 20 60 200 600 2000	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
20	-3.85				SAND (Cont.)					6,10,12 N=22	SPT
21										11,18,19 N=37	SPT
22										9,16,17 N=33	SPT
23						SW				5,10,17 N=27	SPT
24					Contains minor gravel to 15mm diameter below 24 metres.					6,12,25 N=37	SPT
25					SANDY GRAVEL Grey, dense, wet alluvium gravel fine to medium (max 20mm diam.)					30/150 N>60	SPT
26										24,26,28 N=54	SPT
27										23,24,20 N=44	SPT
28						GW				17,30/110 N>60	SPT
29										30/135 N>60	SPT
30	-13.85									30/70 N>60	SPT

REMARKS : RTI-16-038 File A

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ENGINEERING BORELOG

FOR GEOTECHNICAL TERMS AND
SYMBOLS REFER FORM F873 NOV/87

BOREHOLE No : 8
SHEET : 4 OF 4
REFERENCE No : H7390

PROJECT : LOGAN RIVER BRIDGESITE AT LOGAN VILLAGE
LOCATION : Abutment B - Ch. 471.75 - 4m left of centreline
PROJECT No : MG0254 SURFACE R.L. : 16.15 DRILLER : R&D DRILLING
JOB No : DATUM : AHD DATE DRILLED : 10/2/94

DEPTH (m)	R.L. (m)	AUGER CORE DRILLING CORE DRILLING CASING OTHER	RQD (%) CORE REC%	CORE LOSS	MATERIAL DESCRIPTION	USC WEATHERING EH VH H M L VL	INTACT STRENGTH	DEFECT SPACING (mm) 20 60 200 600 2000	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
30	-13.85										
31	-15.30		83		SHALE DARK GREY, FINE GRAINED, BEDDED SEDIMENTARY ROCK. Bedding dips at 10°. Frequent thin (<5mm) fine to medium grained sandstone interbeds throughout. Most defects are along bedding and probably drilling induced. Other defects dip at 45° with thin clay coatings on defect planes.	SW				sandstone bed-high strength Is(50)=0.2 MPa	o
32					END OF HOLE						
33											
34											
35											
36											
37											
38											
39											
40											

Appendix C

*Logan Village Bridge Approach:
Plan and Longitudinal Section*

RADIUS = 250.000
ARC LENGTH = 39.150
TANGENT LENGTH = 19.615
SECANT LENGTH = 0.768
= 18°54'21"

FRL EXISTING DAM
AS DIRECTED

650.00
630.00
610.00
590.00

LOT3
RP863054

LOT2
RP863054

LOT1
RP863053

LOT1
RP863052

LOT2
RP145174

RADIUS = 211.000
ARC LENGTH = 161.841
TANGENT LENGTH = 85.646
SECANT LENGTH = 17.566
= 44°21'50"

RADIUS = 120.000
ARC LENGTH = 137.079
TANGENT LENGTH = 77.110
SECANT LENGTH = 22.641
= 65°27'02"

CENTRE LINE COORDINATES

Chainage	Easting	Northing
-40.000	1037.588	986.319
0.000	1000.000	1000.000
218.442	794.732	1074.712
250.764	765.157	1087.696
619.947	437.414	1257.637
863.690	207.297	1337.568
1025.531	89.579	1442.145
1137.489	41.908	1543.446
1274.568	-60.035	1612.343
1508.283	-301.735	1609.685
1571.062	-358.529	1632.435
1948.820	-623.113	1890.730
2003.598	-647.222	1946.958
2142.751	-648.990	2086.101

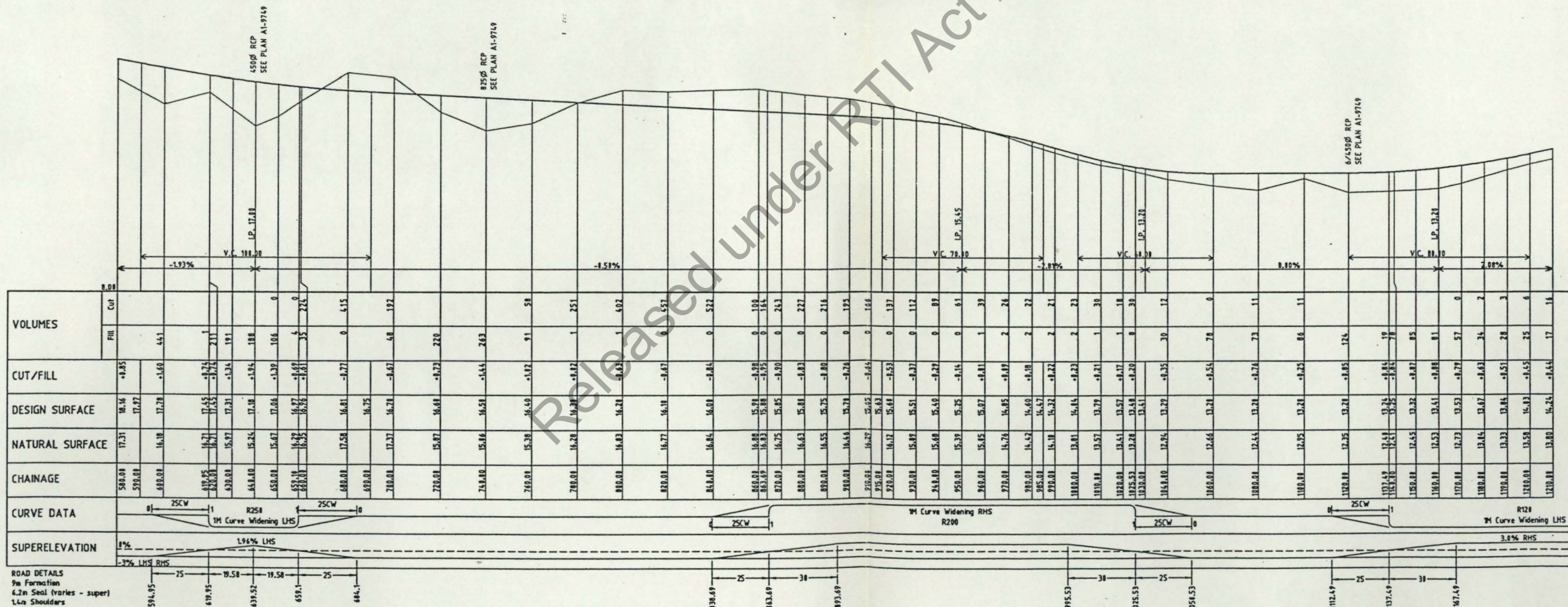
NOTES:

1. All services to be located prior to commencement of construction.
2. All driveways and crossovers to be reinstated in accordance with B.S.C. A3-6134B, location to be determined on site.
3. Clearing to be as directed.
4. Table drains to be turfed, batters to be seeded in accordance to B.S.C. subdivision specifications.
5. All boundaries to be fenced in accordance with DOT's standards.

CONSULT PLAN A3-7844 FOR PAVEMENT CONSTRUCTION DETAILS
PAVEMENT MATERIALS TO BE IN ACCORDANCE WITH QUEENSLAND
TRANSPORT SPECIFICATION No. 11.85 (LATEST REVISION)
BASE COURSE (TOP) 180mm TYPE 2.2
SUBBASE COURSE (BOTTOM) 180mm - TYPE 2.4
SHOULDERS 200mm - TYPE 2.5 (MINIMUM P.I. OF 5)
SUB-GRADE REPLACEMENT 300mm - TYPE 2.5

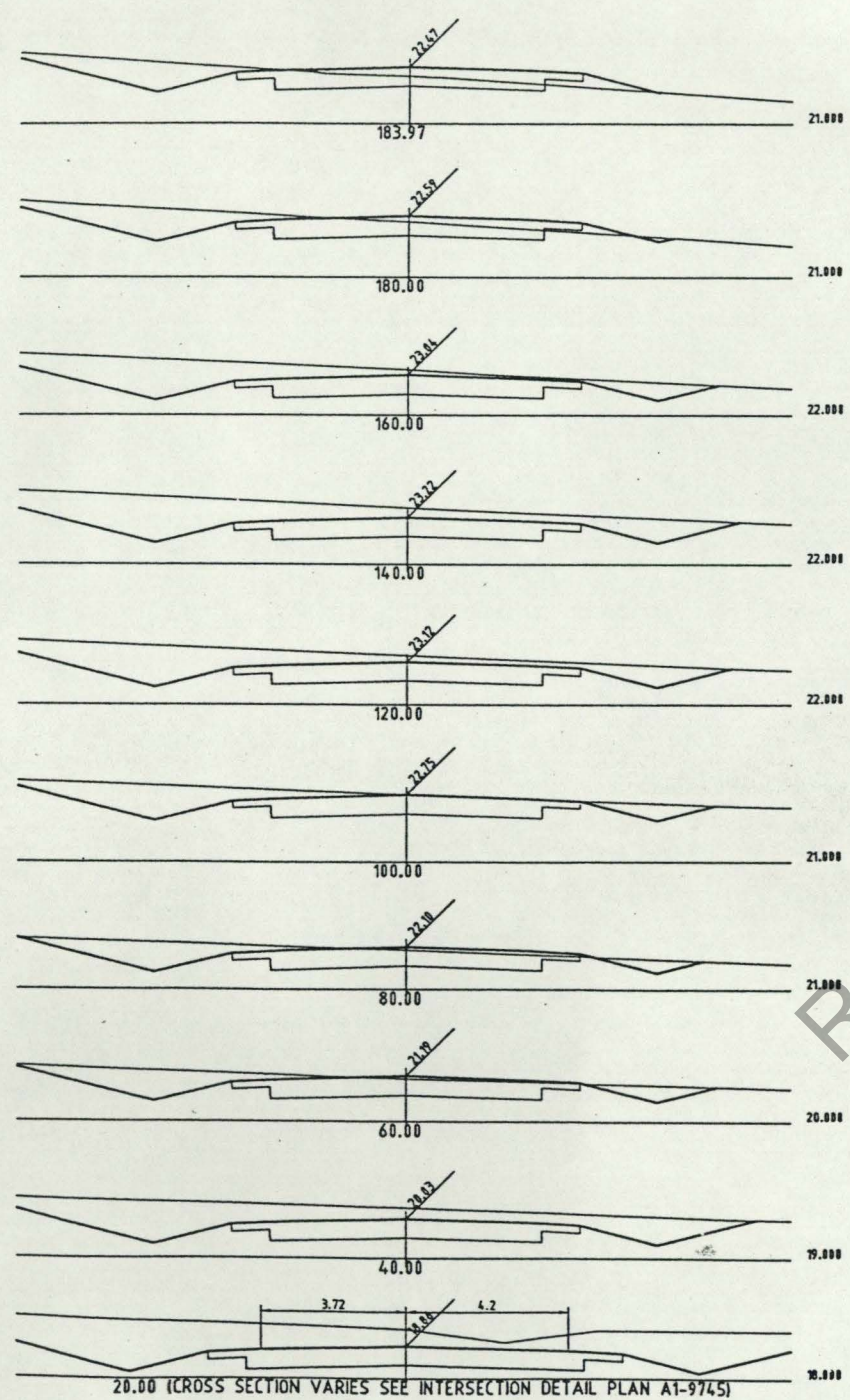
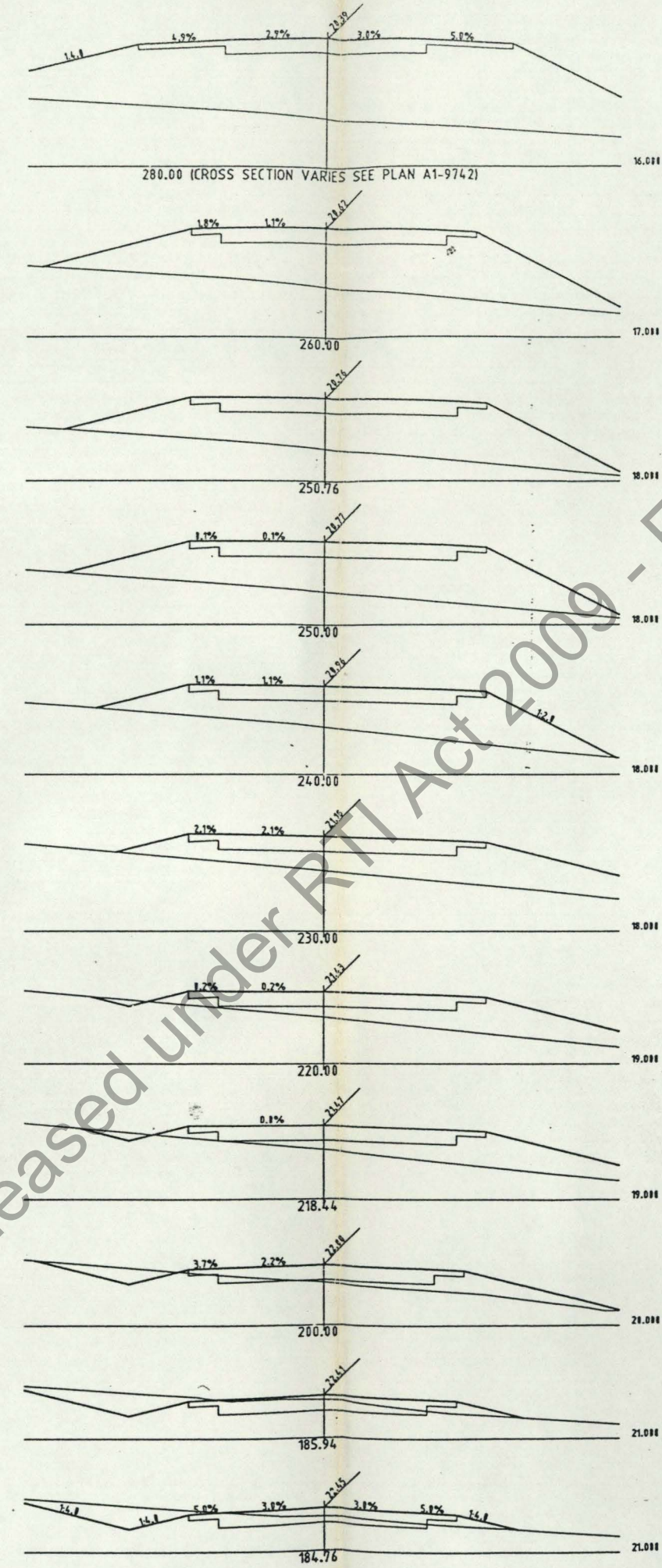
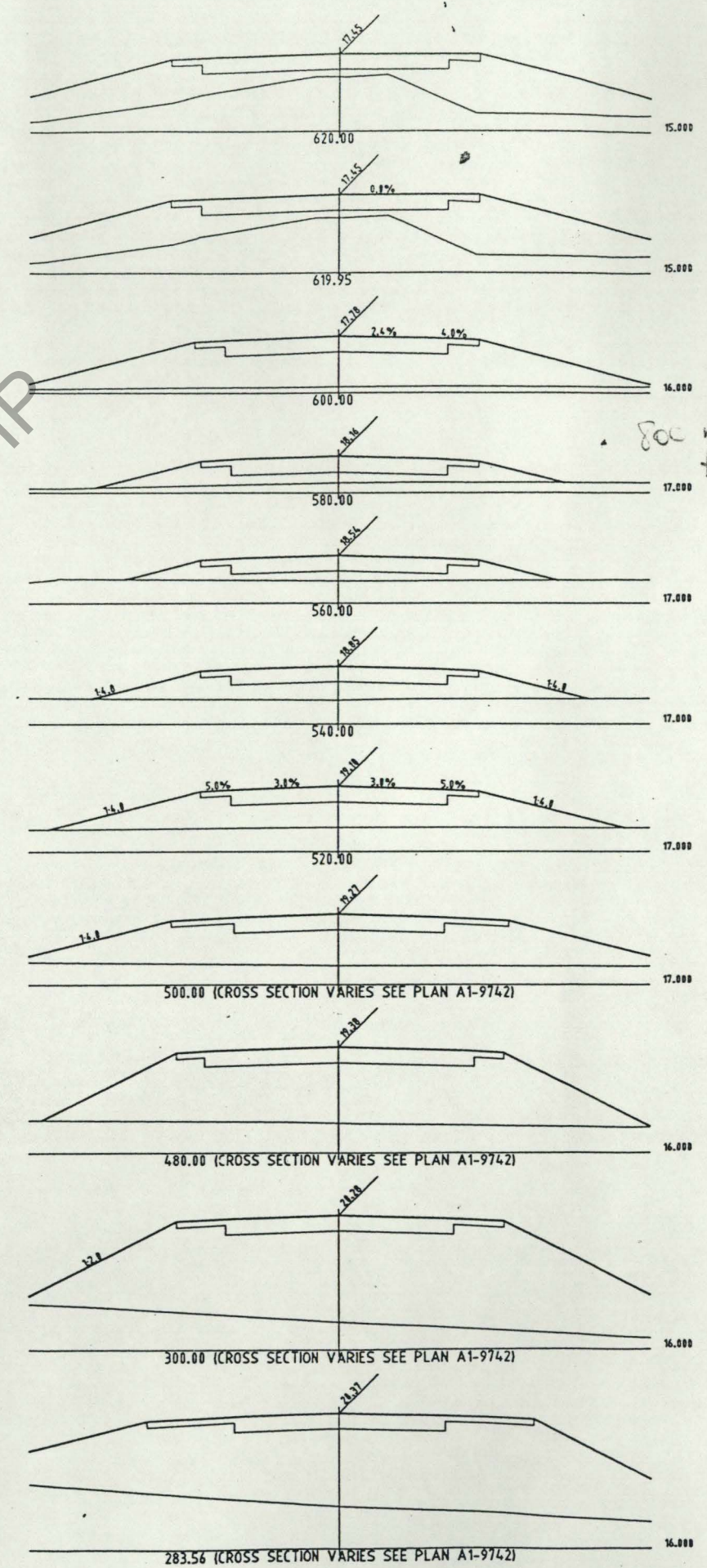
FURTHER TESTING TO BE DONE AT SUB-GRADE DEPTH.
SUB-GRADE MAY NEED 25mm STABILIZATION.

LOCATION OF SIGNS
RLT.SJ



Amendments	Issue Date	Initials	Microfilm	Drawing Schedule	Legend	Benchmarks	Station Details	Job No.	BEAUDESERT SHIRE COUNCIL	LOGAN VILLAGE BRIDGE APPROACHES
				BSC A3-6134B			SEE COMPUTER REF.	See Job Estimate	PLAN & LONGITUDINAL SECTION	
				COMPUTER REF.				LEVEL DATUM AND AZIMUTH DATUM	PEGGED CHAINAGE 580.0 -> 1210.0	
				Crad5 LOGANBRG				SURVEY	DESIGNED	NO. 2 OF 8 PLANS
				Acad13 LOGANBRG				DRAWN	CHECKED	PLAN No.
Original Issue								E. P. 2/95	RECOMMENDED	A1- 9743
									APPROVED	SHIRE ENGINEER
									ENGINEER	Original Issue

SEE PLAN A3-7844 FOR PAVEMENT CONSTRUCTION DETAILS



800 mm of fill over.

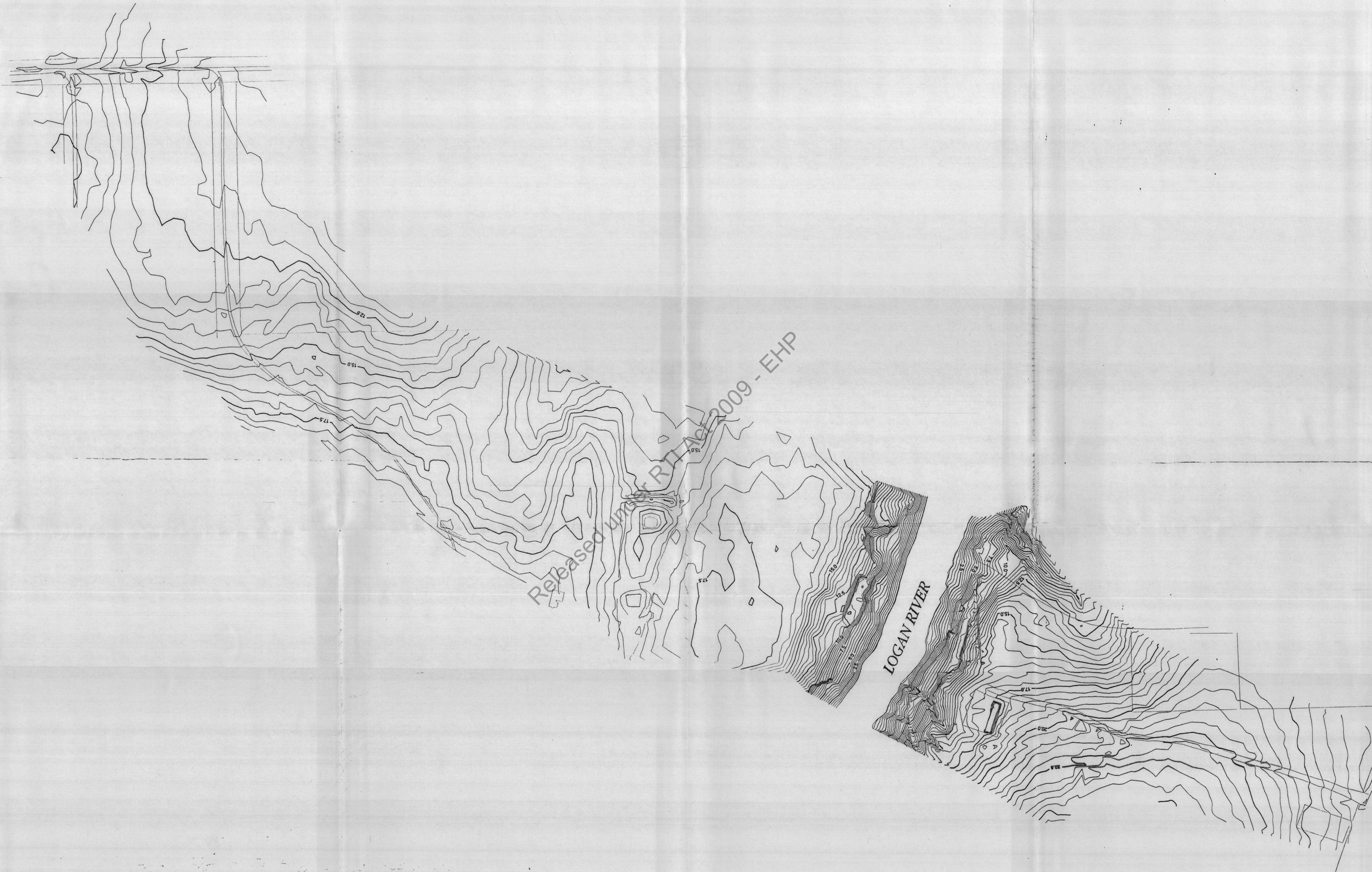
SEE CONSTRUCTION TABLES FOR ROAD WIDTHS, LEVELS & PROFILES

AMENDMENTS	<p>Scale A (m)</p>	DESIGNED E. Pardon 2/95 CHECKED	RECOMMENDED ENGINEER	APPROVED S.E. M.J.E. Aust. SHIRE ENGINEER	No. 5 OF 8 PLANS JOB No. See Job Estimate	BEAUDESERT SHIRE COUNCIL LOGAN VILLAGE BRIDGE APPROACHES CROSS SECTIONS PEGGED CHAINAGE 0.0 -> 620.0	PLAN No. A1- 9746
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Appendix D

Site Plan:

Contours of Road Reserve



Released under RTI Act 2009 - EHP



Pacific CAMTECH
Computer Aided Mapping Technology

Suite 3, 60 Nerang Street NERANG QLD 4211
Phone 075 962 536 Facsimile 075 960808

Prepared for,

Beaudesert Shire Council

82 Brisbane Street
Beaudesert QLD 4285

File A	AMENDMENT	BY	DATE

Contours are indicative only.

BAR SCALES

1:1500

AERIAL PHOTOGRAPHY & CAD/DRAWING

Logan River Bridge Site

Map Data August 29 1994

DATE

Aug 94

Page 119 of 180

SHEET

Appendix E

Approximate Soil Sample Collection Points



SITE ASSESSMENT REPORT
KIRK ROAD, CHAMBERS FLAT

Sample Site	Approximate Point
a	Near I.S.P. = 60m from dip
b	At old homestead
c	4m from dam fence (far side from dip)
d	11.9m from dam fence (gully, house side)
e	19.5m from dip toward dam
f	14.4m from sump end of dip (gully in dam wall)
g	30m from dam wall in gully
h	11m from draining yard (dam side)
i	11m from draining yard (river side)
j	5m from dip (river side)
k	3m from dip (river side)
l	1 m from dip (river side)
m	3m from exit of draining yard
n	3m from exit of draining yard
o	1m past hole near drain
p	0.5m from draining yard (dam side)
q	0.5 from dip race (dam side)
r	0.5 from dip race (dam side)
s	0.5 from dip race (dam side)
t	3m from dip race (entrance end, dam side)
u	6.5m from dip (exit end, dam side)
v	Water sample from dam
w	Water sample from dip race

LOGAN VILLAGE - BRIDGE SITE



BSC Map Sys (Crown Copyright Reserved)

Scale 1:700

09/06/95

Appendix F

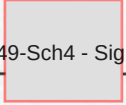
Analysis Report

Released under RTI Act 2009 - EHP

BEAUDESERT SHIRE COUNCIL

Our Reference	11131-1	11131-1 RPT	11131-2	11131-3	11131-4	11131-5	11131-6
Your Reference	Sample-1	Sample-1	Sample-2	Sample-3	Sample-4	Sample-5	Sample-6
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic, As	4	4	7100	1800	8	3	<4

Methods: MEP-001, MEP-020, MEM-010, MEP-003

CHECKED:  GTP/ 49-Sch4 - Signature

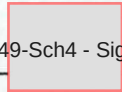


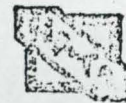
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BEAUDESERT SHIRE COUNCIL

Our Reference	11131-7	11131-8	11131-9	11131-10	11131-11	11131-12	11131-13
Your Reference	Sample-7	Sample-8	Sample-9	Sample-10	Sample-11	Sample-12	Sample-13
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic, As	<4	6	13	14	10	10	12

Methods: MEP-001, MEP-020, MEM-010, MEP-003

CHECKED:  STPI 49-Sch4 - Signature

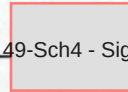


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Our Reference	11131-14	11131-15	11131-16	11131-17	11131-18	11131-19	11131-20
Your Reference	Sample-14	Sample-15	Sample-16	Sample-17	Sample-18	Sample-19	Sample-20
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic, As	4	4	<4	4	<4	74	16

Methods: MEP-001, MEP-020, MEM-010, MEP-003

CHECKED  CTP149-Sch4 - Signature

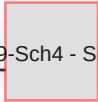


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Our Reference	11131-23	11131-24	11131-25	11131-26	11131-27	11131-28	11131-29
Your Reference	Sample-23	Sample-24	Sample-25	Sample-26	Sample-27	Sample-28	Sample-29
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Arsenic, As	230	130	1100	740	260	130	210

Methods: MEP-001, MEP-020, MEM-010, MEP-003

CHECKED:  TPI 49-Sch4 - Signature

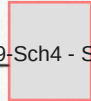


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BEAUDESERT SHIRE COUNCIL

Our Reference	11131-30	11131-30 RPT	11131-31	11131-34	11131-35	11131-36
Your Reference	Sample-30	Sample-30	Sample-31	Sample-34	Sample-35	Sample-36
Sample Type	TCLP EXTRACT	TCLP EXTRACT	TCLP EXTRACT	SOIL	SOIL	SOIL
Units	mg/l	mg/l	mg/l	mg/kg	mg/kg	mg/kg
Arsenic, As	0.92	0.84	0.56	490	240	78

Methods: MEP-001, MEP-020, MEM-010, MEP-003

CHECKED:  TPI 49-Sch4 - Signature



This Laboratory is registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full.

BEAUDESERT SHIRE COUNCIL

Our Reference	11131-37	11131-38	11131-38 RPT	11131-39	RECOVERY
Your Reference	Sample-37	Sample-38	Sample-38	Sample-39	-
Sample Type	SOIL	WATER	WATER	WATER	-
Units	mg/kg	mg/L	mg/L	mg/L	%
Arsenic, As	180	0.003	0.003	2.1	100

Methods: MEP-001, MEP-020, MEM-010, MEP-003

CHECKED: TPI 49-Sch4 - Signature



This Laboratory is registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of reference. This document shall not be reproduced except in full.

BEAUDESERT SHIRE COUNCIL

Our Reference	11075-1	11075-2	11075-3	11075-4	11075-4 RPT	BLANK
Your Reference	Sample-21	Sample-22	Sample-32	Sample-33	Sample-33	-
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	-
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
α BHC	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Oxychlordane	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
α -Endo-Sulfan	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
DDE	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
B-Endo Sulfan	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
DDD	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
DDT	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chlordane	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Method: MEO-005



This Laboratory is registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full.

CHECKED: 49-Sch4 - Signature

Appendix G

Title Information

50823

CERTIFICATE OF TITLE

ENTERED

Dealing Nos.

73(2)Irrelevant

Vol. 7019 Fol. 92

QUEENSLAND

VOL: 7019 FOLIO:092



17019092

(Page 1)

Previous Titles:

73(2)Irrelevant



Issued: 9 April, 1987

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such easements encumbrances and interests as are shown in the Second Schedule

Witness: CTPI 49-Sch4 - Signature

CTPI 49-Sch4 - Signature



Acting Registrar of Titles.

CTPI 49-Sch4 - Signature

ESTATE AND LAND

Estate in Fee Simple in
of Mackenzie
Containing 25.4952 hectares

73(2)Irrelevant

County of Stanley Parish

FIRST SCHEDULEMOYA MARY NEVELLSECOND SCHEDULE

1. Rights and interests reserved to the Crown by Deed of Grant No. 6076 (Por 79).

CTPI 49-Sch4 - Signature

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR OF TITLES ARE CANCELLED
PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

[illegible][illegible]

* Dealings with this Lease will be Registered on the Original Lease only instead of on this Certificate of Title.

ONE UNDIVIDED FOURTH

Certificate of Title.

Vol. S 3341 fol. 92



13341092

(C)

Reference to Previous
Volume | Folio.

CTPI 49-Sch4

QUEENSLAND.



FULLY No. CANG 98352

Register Book, Vol. 3341 Folio 92

b No. 79990

CTPI 49-Sch4

of _____ pursuant to Memorandum
of Conveyance No. CTPI 49-Sch4 produced the third day of August 19 60,
registered the twenty third day of September 19 60, is now seized of an Estate in Fee-simple, as tenant
in common with others in one undivided fourth part or
share, subject nevertheless to such encumbrances, liens, and interests as are by memorandum notified hereon, in All that
piece of Land situated in the County of Stanley Parish of Mackenzie
City of _____ containing One hundred and thirty five acres

_____ more or less, as shown on the Plan hereon, and therein edged red,
Being Portion 80 and subdivisions 1 and 2 of Portion 79

on Plan Cat. No. CTPI 49-Sch4 deposited in the Office of the Registrar of Titles, Brisbane,
which said piece of Land is part of the portion marked 79 delineated in the Public Map
of the said parish deposited in the Office of the Surveyor-General, originally granted by Deed ^s of Grant
No. 6 CTPI 49-Sch4

Saving Always to the Crown all the rights and interests reserved to it by the said Deeds of Grant.

CTPI 49-Sch4 - Signature
In Witness whereof, I have hereunto signed my name and affixed my seal, this twentieth
day of October One thousand nine hundred and sixty

Signed, Sealed, and Delivered, the 20th
day of October 1960, in presence of

CTPI 49-Sch4 - Signature

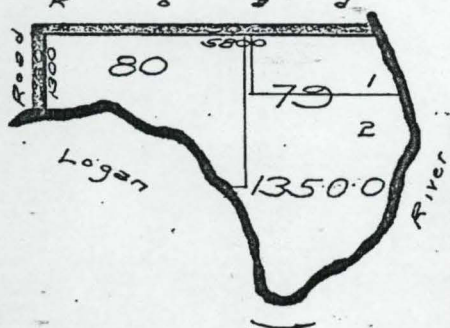
CTPI 49-Sch4 - Signature

Parish of Mackenzie

REGISTRAR OF TITLES

CTPI 49-Sch4 - Signature

CTPI 49-Sch4 - Signature



Scale 20 chains per inch.

No. 8761742 BILL OF MORTGAGE produced 3 Aug
1960 at 2.00pm. Registered 24 Oct 1960
from CTPI 49-Sch4 to _____
BANK OF NEW SOUTH WALES
to secure the payment of the mortgage and interest therein referred to
CTPI 49-Sch4 - Signature
REGISTRAR OF TITLES
QUEENSLAND

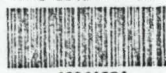
73(2)Irrelevant

Released under RTI Act 2009 - EHP

ONE UNDIVIDED FOURTH

Certificate of Title.

VOL. 3341 FOL. 94



13341094

QUEENSLAND



No. 698354

(C)

Reference to Previous
Volume | Folio.

CTPI 49-Sch4

Register Book, Vol. 3341 Folio 94

CTPI 49-Sch4

As Trustee

of Trustees of Conveyance No. CTPI 49-Sch4 produced the third day of August 1960, Is now seized of an Estate in Fee-simple, as tenant in common with others in one undivided fourth part or share, subject nevertheless to such encumbrances, liens, and interests as are by memorandum notified hereon, in All that piece of Land situated in the County of Stanley Parish of Mackenzie City of containing One hundred and thirty five acres

more or less, as shown on the Plan hereon, and therein edged red, Being Portion 80 and subdivisions 1 and 2 of Portion 79

on Plan Cat. No. CTPI 49-Sch4 deposited in the Office of the Registrar of Titles, Brisbane, the whole of the portion marked 80 and which said piece of Land is part of the portion marked 79 delineated in the Public Map of the said parish deposited in the Office of the Surveyor-General, originally granted by Deed of Grant No. CTPI 49-Sch4

Saving Always to the Crown all the rights and interests reserved to it by the said Deed of Grant.

CTPI 49-Sch4 - Signature In Witness whereof, I have hereunto signed my name and affixed my seal, this twentieth day of October One thousand nine hundred and sixty

Signed, Sealed, and Delivered, this 20th day of October 1960 in presence of

CTPI 49-Sch4 - Signature

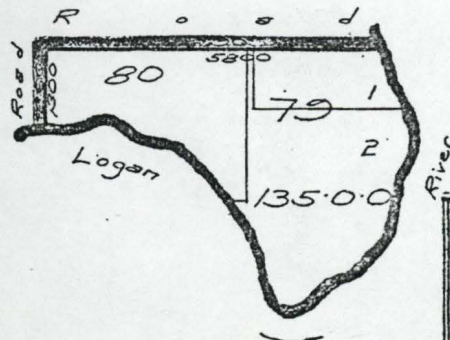
CTPI 49-Sch4 - Signature

Parish of Mackenzie

REGISTRAR OF TITLES

CTPI 49-Sch4 - Signature

CTPI 49-Sch4 - Signature



Scale 20 chains per inch.

The above-mentioned registered proprietors hold the within land subject to the trusts contained in NOMINATION OF TRUSTEES No. B761744 produced 3 Aug 1960 at 9.30 am registered 23 Sep 1960

CTPI 49-Sch4 - Signature



REGISTRAR OF TITLES

File A

Trust
Stamp
Mtg
B761744

73(2)Irrelevant

Released under RTI Act 2009 - EHP

ONE UNDIVIDED FOURTH

Certificate of Title.

VOL. S 3341 FOL. 96



13341096

No. 698356

(C)

Reference to Previous
Volume | Folio.

CTPI 49-Sch4

QUEENSLAND.



Register Book, Vol.

3341

Folio 96

As Trustee

of Trustees of Conveyance No. CTPI 49-Sch4 produced the third day of August 19 60 registered the twenty third day of September 19 60, is now seized of an Estate in Fee-simple, as tenant in common with others in one undivided fourth part or share, subject nevertheless to such encumbrances, liens, and interests as are by memorandum notified hereon, in All that piece of Land situated in the County of Stanley Parish of Mackenzie City of containing One hundred and thirty five acres

more or less, as shown on the Plan hereon, and therein edged red,
Being Portion 80 and subdivisions 1 and 2 of Portion 79

on Plan Cat. No. CTPI 49-Sch4 deposited in the Office of the Registrar of Titles, Brisbane, which said piece of Land is part of the portion marked 79 delineated in the Public Map of the said parish deposited in the Office of the Surveyor-General, originally granted by Deed of Grant No. CTPI 49-Sch4

Saving Always to the Crown all the rights and interests reserved to it by the said Deed of Grant.

In Witness whereof, I have hereunto signed my name and affixed my seal, this twentieth day of October One thousand nine hundred and sixty

Signed, Sealed, and Delivered, the 20th day of October 19 60 in presence of

CTPI 49-Sch4 - Signature

CTPI 49-Sch4 - Signature

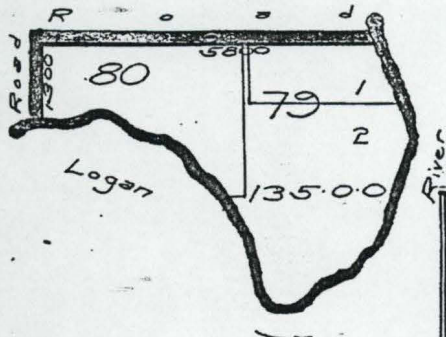
Parish of Mackenzie

REGISTRAR OF TITLES

CTPI 49-Sch4 - Signature

CTPI 49-Sch4

Scale 20 chains per inch.



The above-mentioned registered proprietors hold the within land subject to the trusts contained in NOMINATION OF TRUSTEES No. CTPI 49-Sch4 produced 3 Aug 1960 at 9.30am registered 23 Sep 1960

CTPI 49-Sch4 - Signature

REGISTRAR OF TITLES



73(2)Irrelevant

Released under RTI Act 2009 - EHP

QUEENSLAND

CERTIFICATE OF TITLE

Original
Deed of Grant

Register

CTPI 49-Sch4

Vol. 6222 Fol. 204

ONE UNDIVIDED FOURTH

(Page 1)



Dealing No.. G497735

Reference to previous

Vol. CTPI 49-Sch4

Issued: 12 January, 1982

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such easements encumbrances and interests as are shown in the Second Schedule.

Witness CTPI 49-Sch4 - Signature

CTPI 49-Sch4 - Signature

Registrar of Titles.



Estate and Land Referred To

Estate in Fee Simple in Subdivisions 1 and 2 of portion 79 on registered Plan No. 25896
County of Stanley Parish of Mackenzie
Containing 35.6123 hectares

FIRST SCHEDULE

CTPI 49-Sch4

~~as tenant in common in a one undivided fourth part or share~~

SECOND SCHEDULE

Rights and interests reserved to the Crown by the Deed of Grant above referred to.

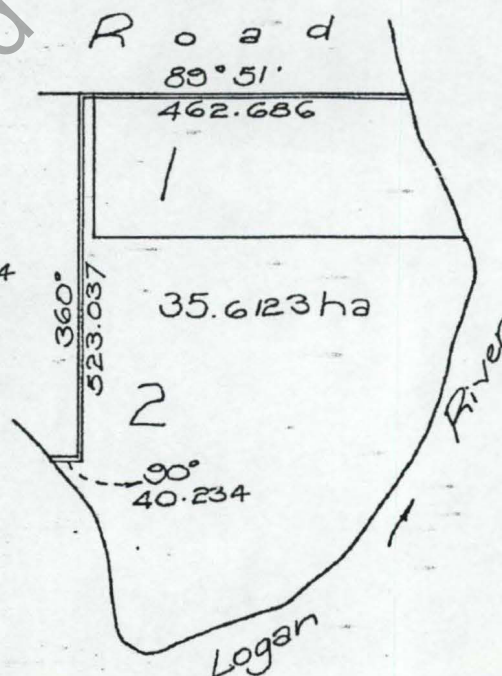
CTPI 49-Sch4 - Signature

VOL: 6222 FOLIO: 204



16222204

PLAN OF LAND



Scale 1:8000

NOTE: Entries filed through and authenticated by the Seal of the Registrar of Titles are cancelled.

RTI-16-038

File A

Page 140 of 180

FIRST SCHEDULE (continued) -

[illegible]

SECOND SCHEDULE (continued)

[illegible]

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR OF TITLES ARE CANCELLED.

* Dealings with this Lease will be Registered on the Original Lease only instead of on this Certificate of Title.

REGISTERED PROPRIETOR

73(2)Irrelevant

[illegible]

CTPI 49-Sch4 - Signature

CTPI 49-Sch4 - Signature

INSTRUMENT

NATURE	NUMBER	PRODUCED
--------	--------	----------

PARTICULARS

REGISTERED

Signature of
Registrar of Titles

CANCELLATION

INSTRUMENT			
NATURE	NUMBER	PRODUCED	REGISTERED

Signature of
Registrar of Titles

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR OF TITLES ARE CANCELLED.

* Dealings with this Lease will be Registered on the Original Lease only instead of on this Certificate of Title.

75384/5/79—35M—P/L—Govt. Printer, Old.

Page 142 of 180

ONE UNDIVIDED FOURTH

Certificate of Title.

VOL. S 3341 FOL. 88



13341098

(C)

QUEENSLAND.

No. 698358

Reference to Previous
Volume | Folio.

CTPI 49-Sch4

3341 98

Register Book, Vol. Folio.

CTPI 49-Sch4

As Trustee.

Nomination of
Trustees of Conveyance No. CTPI 49-Sch4 produced the third day of August 1960, registered the twenty third day of September 1960, is now seized of an Estate in Fee-simple, as tenant in common with others in one undivided fourth part or share, subject nevertheless to such encumbrances, liens, and interests as are by memorandum notified hereon, in All that piece of Land situated in the County of Stanley Parish of Mackenzie City of containing One hundred and thirty five acres more or less, as shown on the Plan hereon, and therein edged red, Being Portion 80 and subdivisions land 2 of Portion 79

on Plan Cat. No. CTPI 49-Sch4 the whole of the portion marked 80 and which said piece of Land is part of the portion marked 79 delineated in the Public Map of the said parish deposited in the Office of the Surveyor-General, originally granted by Deed of Grant No. CTPI 49-Sch4

Saving Always to the Crown all the rights and interests reserved to it by the said Deed of Grant.

Witness whereof, I have hereunto signed my name and affixed my seal, this twentieth day of October One thousand nine hundred and sixty

Signed, Sealed, and Delivered, the day of October 1960, in presence of

CTPI 49-Sch4 - Signature

CTPI 49-Sch4 - Signature

Parish of Mackenzie

REGISTRAR OF TITLES

CTPI 49-Sch4 - Signature

CTPI 49-Sch4

Scale 20 chains per inch.

The above-mentioned registered proprietors hold the within land subject to the trusts contained in NOMINATION OF TRUSTEES N. CTPI 49-Sch4 produced 3 Aug 1960 at 9.30 am registered 23 Sep 1960

CTPI 49-Sch4 - Signature



REGISTRAR OF TITLES

73(2)Irrelevant

Released under RTI Act 2009 - EHP

FULLY CANCELLED

QUEENSLAND

CERTIFICATE OF TITLE

Original
Deed of Grant

Register

Vol. 6213 Fol. 53

ONE UNDIVIDED FOURTH

FULLY CANCELLED

(Page 1)



Issued: 16 December, 1981

A 46092

CTPI 49-Sch4

Dealing No.. G497733

Reference to previous

Vol. CTPI 49-Sch4

No.

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such easements encumbrances and interests as are shown in the Second Schedule.

Witness CTPI 49-Sch4 - Signature

CTPI 49-Sch4 - Signature

Registrar of Titles.



CTPI 49-Sch4 - Signature

Estate and Land Referred To

Estate in Fee Simple in Subdivisions 1 and 2 of portion 79 on registered Plan No. 25896
County of Stanley Parish of Mackenzie
Containing 35.6123 hectares

FIRST SCHEDULE

CTPI 49-Sch4

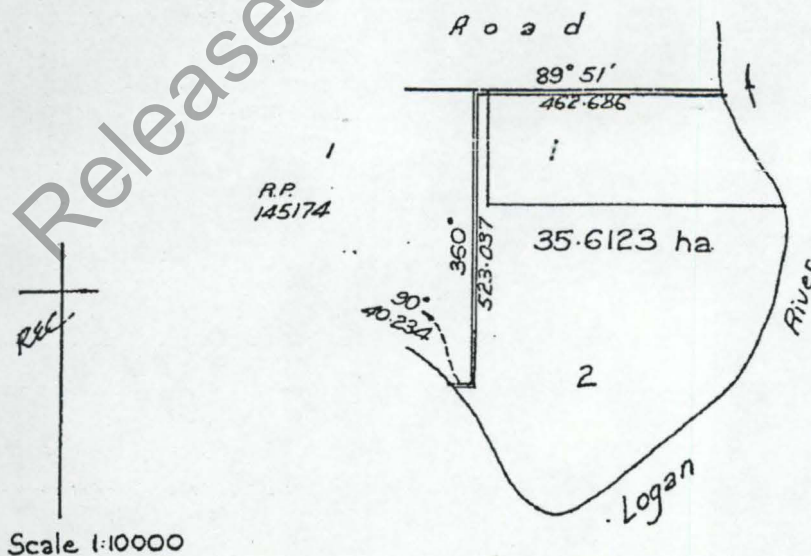
~~as tenant in common in one undivided fourth part or share~~SECOND SCHEDULE

CTPI 49-Sch4 Rights and interests reserved to the Crown by the Deed of Grant above referred to.

VOL: 6213 FOLIO: 53



16213053

PLAN OF LAND

Scale 1:10000

NOTE: Entries ruled through and authenticated by the Seal of the Registrar of Titles are cancelled.

RTI-16-038

File A

Page 145 of 180

REGISTERED PROPRIETOR

THE DESCRIPTION OF THE WITHIN LAND IS CONVERTED TO LOTS 1 and 2 ON REGISTERED PLAN NO. 25896

73(2)Irrelevant

INSTRUMENT			REGISTERED	Signature of Registrar of Titles
NATURE	NUMBER	PRODUCED		
Transfer	G497737	10SEP1981	17 DEC 1981 - 7 APR 1987	[Redacted Signature Area]
Tfr	J16603	2DEC1986	- 7 APR 1987	
Req N/T	J16605	2DEC1986	- 7 JAN 1988	

INSTRUMENT

[illegible]

75384/5/79—35M—P/L—Govt. Printer, Qld.

* Dealings with this Lease will be Registered on the Original Lease only instead of on this Certificate of Title.

FULLY CANCELLED

Certificate of Title.

Vol. S 3328 Fol. 2



13328002

QUEENSLAND.



No. 695262

(C)

Reference to Previous
Volume, Folio

CTPI 49-Sch4

Register Book, Vol. 3328 Folio 2

CTPI 49-Sch4

of _____ pursuant to Memorandum
of Request No. CTPI 49-Sch4 received the third day of August 1960 is
now seized _____ of an Estate in Fee-simple, subject nevertheless to such encumbrances,
liens, and interests as are by memorandum notified hereon, in All that piece of Land situated in the County
of Stanley Parish of Mackenzie City of _____
containing One hundred and thirty five acres

more or less, as shown on the Plan hereon, and therein edged red, Being Portion 80 and subdivisions 1 and 2
of Portion 79

on Plan Cat. No. CTPI 49-Sch4 deposited in the Office of the Registrar of Titles, Brisbane,
which said piece of Land is part of the portion marked 79 delineated in the Public Map
of the said parish deposited in the Office of the Surveyor-General, originally granted by Deed s of Grant
No. s CTPI 49-Sch4

Saving Always to the Crown all the rights and interests reserved to it by the said Deed s of Grant.

CTPI 49-Sch4 - Signature Witness whereof, I have hereunto signed my name and affixed my seal, this fifteenth
day of September One thousand nine hundred and sixty

Signed, Sealed, and Delivered, the 15th
day of September 1960 in presence of

CTPI 49-Sch4 - Signature

CTPI 49-Sch4 - Signature

FOR DIAGRAM
SEE
ABOVE PLAN

REGISTRAR OF TITLES

CTPI 49-Sch4 - Signature

No. CTPI 49-Sch4 NOMINATION OF TRUSTEES, produced
3 Aug 1960 at 9 30a m., registered
23 Sep 1960 from _____
to CTPI 49-Sch4
Mrs Mary Nevell wife of
John Nevell
as Trustee so far as relates to one undivided
fourth of the whole of the land
CTPI 49-Sch4 - Signature
Cancelled as above
CTPI 49-Sch4

No. CTPI 49-Sch4 NOMINATION OF TRUSTEES, produced
3 Aug 1960 at 9 30a m., registered
23 Sep 1960 from _____
to CTPI 49-Sch4
Mrs Mary Nevell wife of
John Nevell
as Trustee so far as relates to one undivided
fourth of the whole of the land
CTPI 49-Sch4 - Signature
Cancelled as above
CTPI 49-Sch4

Scale, _____ chains per inch.

73(2)Irrelevant

Released under RTI Act 2009 - EHP

No. 6677
(C)

QUEENSLAND

No. 112.199

No. of PREVIOUS Deeds of Grant 6076

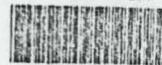
Register Book, Vol.

720 Folio 189



CERTIFICATE OF TITLE.

VOL. 5 720 FOL. 189



18726133

CTPI 49-Sch4

of Transmission by Deeds
pursuant to Memorandum of Request No. CTPI 49-Sch4 received the Twenty fifth day of April A.D. 1888, is now seized of an Estate in Fee Simple, subject nevertheless to such encumbrances, liens, and interests, as are by memorandum notified hereon, in All that piece of Land situated in the County of Stanley Parish of MacKenzie being subdivision two of Portion Twenty nine containing by admeasurement Sixty three acres more or less, commencing at the North-east corner of Portion eight and hundred three on the North by a road bearing 89° 51' arc chain, on the East by subdivisions one bearing 180° two chains and thirty five links again on the North by subdivisions one bearing 90° 26' and thirty links to the Logan River again from the point of commencement on the West by portion eight bearing 180° twenty six chains thence by a line bearing 270° two chains to the Logan River and on the South and East by that River down to the South boundary of subdivisions one

which said piece of Land is part of the Portion marked 19 delineated in the Public Map of the said Parish deposited in the Office of the Surveyor-General, originally granted the first day of August 1863 by Deed of Grant, No. CTPI 49-Sch4 under the Seal of the Colony of Queensland and the Hand of Sir George Ferguson Bowen by L. M. G. Governor of the said Colony, to CTPI 49-Sch4

Saving Always to the Crown all the rights and interests reserved to it by the said Deed of Grant.

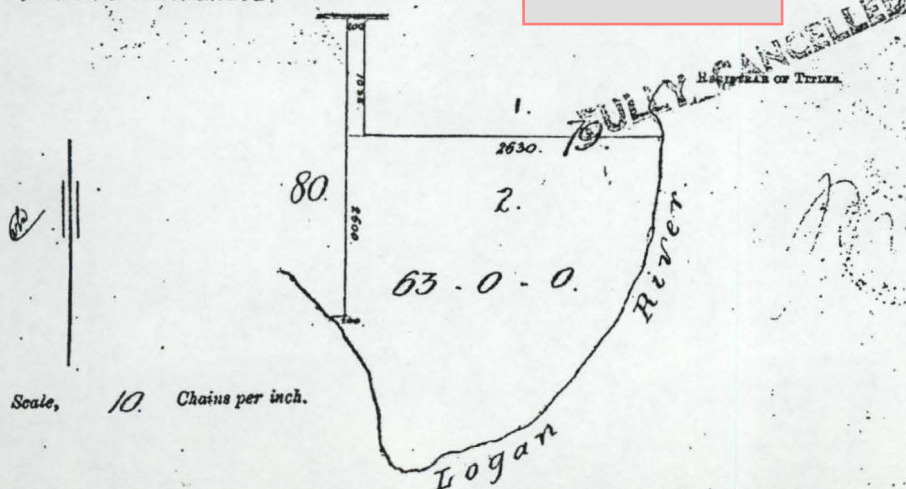
CTPI 49-Sch4 In WITNESS whereof, I have hereunto signed my name and affixed my seal this Nineteenth day of September One thousand eight hundred and eighty eight

Signed, Sealed, and Delivered, the 19 day of September 1888, in presence of

CTPI 49-Sch4 - Signature

CTPI 49-Sch4 - Signature

PARISH OF MACKENZIE



73(2)Irrelevant

Released under RTI Act 2009 - EHP

No. 6678
(C)

QUEENSLAND

No. 112,200.

No. of PREVIOUS Deed of Grant 6076

Register Book, Vol. 720 Folio 190.

VOL. S 720 FOL. 190



10720190

CERTIFICATE OF TITLE.

CTPI 49-Sch4

of Hammond by Deed pursuant to Memorandum of Request No. CTPI 49-Sch4 received the Twenty fifth day of April A.D. 1888, is now seized of an Estate in Fee Simple, subject nevertheless to such encumbrances, liens, and interests, as are by memorandum notified hereon, in all that piece of Land situated in the County of Stanley Parish of Mackenzie Being a subdivision one of Portion Seventy nine containing by admeasurement Twenty five acres more or less, commencing at a point bearing 89° 51' and distant one chain from the North-west corner of the portion and bounded thence on the North by a road bearing 89° 51' twenty two chains to the Logan River again from the point of commencement on the West by subdivision line bearing 180° ten chains and thirty five links on the South by part of subdivision line bearing 90° twenty one chains thirty links to the Logan River and on the East by that river downwards to the Northern boundary of the subdivision

which said piece of Land is part of the Portion marked 79 delineated in the Public Map of the said Parish deposited in the Office of the Surveyor-General, originally granted the first day of August 1868 by Deed of Grant, No. 6076 under the Seal of the Colony of Queensland and the Hand of Sir George Ferguson Bowen G. C. B. M. G. Governor of the said Colony, to CTPI 49-Sch4

Saving Always to the Crown all the rights and interests reserved to it by the said Deed of Grant.

CTPI 49-Sch4 - Signature

In WITNESS whereof, I have hereunto signed my name and affixed my seal this twentieth day of September One thousand eight hundred and eighty eight

Signed, Sealed, and Delivered, the 19 day of September 1888, in presence of

CTPI 49-Sch4 - Signature

CTPI 49-Sch4 - Signature

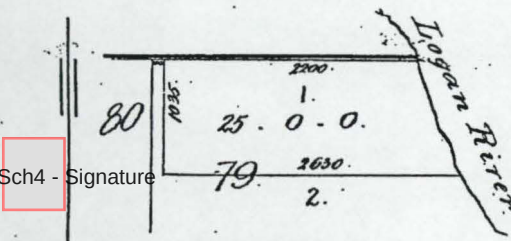
CTPI 49-Sch4 - Signature

PARISH OF MACKENZIE.

FULLY CANCELLED
REGISTRAR OF TITLES



CTPI 49-Sch4 - Signature



Scale, 10 Chains per inch.

TITLE No. 64249^a
GRANT to Memo of TRANSFER No. 248323 Produced
30 September 1891 at 2.20 pm Recd. 3 Oct 1891
CTPI 49-Sch4 - Signature
OF Logan Village is now SEIZED of an Estate IN FEL
SIMPLE in the WHOLE of the within land.

CTPI 49-Sch4 - Signature

CTPI 49-Sch4 - Signature

73(2)Irrelevant

Released under RTI Act 2009 - EHP

N. 22253
County *of Stanley*
Parish *of Mackenzie*

QUEENSLAND.

A. LAND PURCHASE.

13
VOL. 5 172 FOL. 13
10172013

Date of Purchase *2 Sept 1870*
Area *47 acres*

VICTORIA, by the Grace of God, of the United Kingdom of Great Britain and Ireland, Queen, Defender of the Faith, and so forth:—

TO ALL to whom these Presents shall come, Greeting:—

WHEREAS, in conformity with the Regulations now in force for the Sale of Crown Lands in Our Territory of Queensland,

CTPI 49-Sch4

of *McLennan*

h^{as} become the Purchaser of the Land hereinafter described, for the Sum of

thirty five pounds five shillings

—Sterling.

Now Know Ye, That for and in consideration of the said Sum, for and on Our behalf well and truly paid into the Colonial Treasury of Our said Territory, before these Presents are issued, And in further consideration of the Quit-Rent hereinafter reserved, We, with the advice of Our Executive Council of Queensland, have granted, and for Us, Our Heirs and Successors, do hereby Grant unto the said

CTPI 49-Sch4

h^{as} Heirs and Assigns, subject to the several and

respective reservations hereinafter mentioned, All that Piece or Parcel of Land in Our said Territory, containing by Admeasurement

thirty seven acres

be the same more or less, situated in the County of

Stanley

and Parish of *Mackenzie Portion Eighty*

Commencing on the left bank of the Logan River at the southerly termination thereof of a road one chain wide separating this land from portion eighty one and bounded thence on the west by that road bearing North thirteen chains to another road one chain wide on the North by that road bearing East thirty five chains on the East by a line bearing South twenty six chains thence by a line bearing West two chains to the Logan River and thence by that river upwards to the point of Commencement

Being the land proclaimed as Lot 9 on the 14th July 1870 and selected by the said John Maddock Hughes under the 97th Clause of the Crown Lands Alienation Act of 1868

To Hold unto the said

CTPI 49-Sch4

all the Rights and Appurtenances whatsoever belonging thereto:

h^{as} Heirs and Assigns for ever, Yielding and paying therefor Yearly unto Us, Our Heirs and Successors, the Quit-Rent of One Peppercorn for ever, if demanded: Provided Nevertheless, and We do hereby Reserve unto Us, Our Heirs and Successors, all such parts and so much of the said Land as may hereafter be required for making Public Ways, Canals, or Railroads, in, over, and through the same, to be set out by Our Governor for the time being of Our said Territory, or some person by him authorised in that respect; And also all Sand, Clay, Stone, Gravel, and Indigenous Timber, and all other Materials, the natural produce of the said Land, which may be required at any time or times hereafter for the construction and repair of any Public Ways, Bridges, Canals, and Railroads, or any Fences, Embankments, Dams, Sewers, or Drains, necessary for the same, together with the right of taking and removing all such Materials; And We do hereby further Reserve unto Us, Our Heirs and Successors, the right of full and free ingress, egress, and regress, into, out of, and upon the said Land, for the several purposes aforesaid: In Testimony Whereof We have caused this Our Grant to be Sealed with the Seal of Our said Territory.

CTPI 49-Sch4

WITNESS Our Trusty and Well-beloved *John Maddock Hughes* Governor of the Colony of Queensland, and its Dependencies, at Government House, Brisbane, in QUEENSLAND aforesaid, this *twentieth* day of *February* in the *thirty fourth* Year of Our Reign; and in the Year of Our Lord One Thousand Eight Hundred and *seventy one*.

CTPI 49-Sch4 - Signature

[L.S.] Signed

CTPI 49-Sch4 - Signature

ENTERED in the Register Book Vol. 172, Folio 13, this *twenty third* day of *February* 1871.

CTPI 49-Sch4 - Signature

CTPI 49-Sch4 - Signature

JOINT-REGISTRAR

73(2)Irrelevant

Figure 1a Kirk Road Site: 5m Contour

Figure 1b Orthophoto 9542-341

Figure 1c Topographic 9542-111

Figure 2 Registered Plan 863054

Figure 3 Zone of Contamination

Figure 4 Arsenic Concentration vs Distance

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Figure 1a

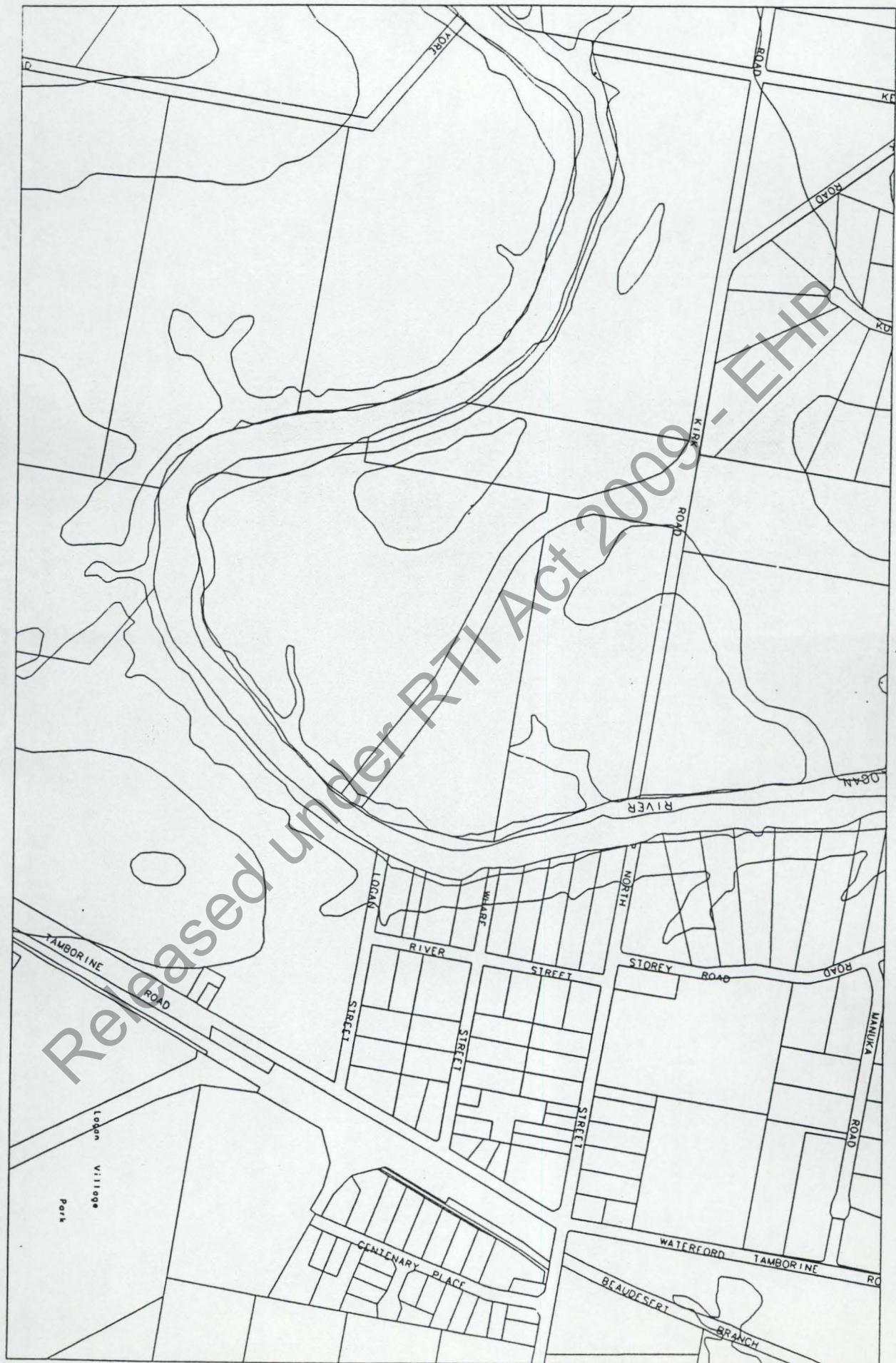


Figure 1b

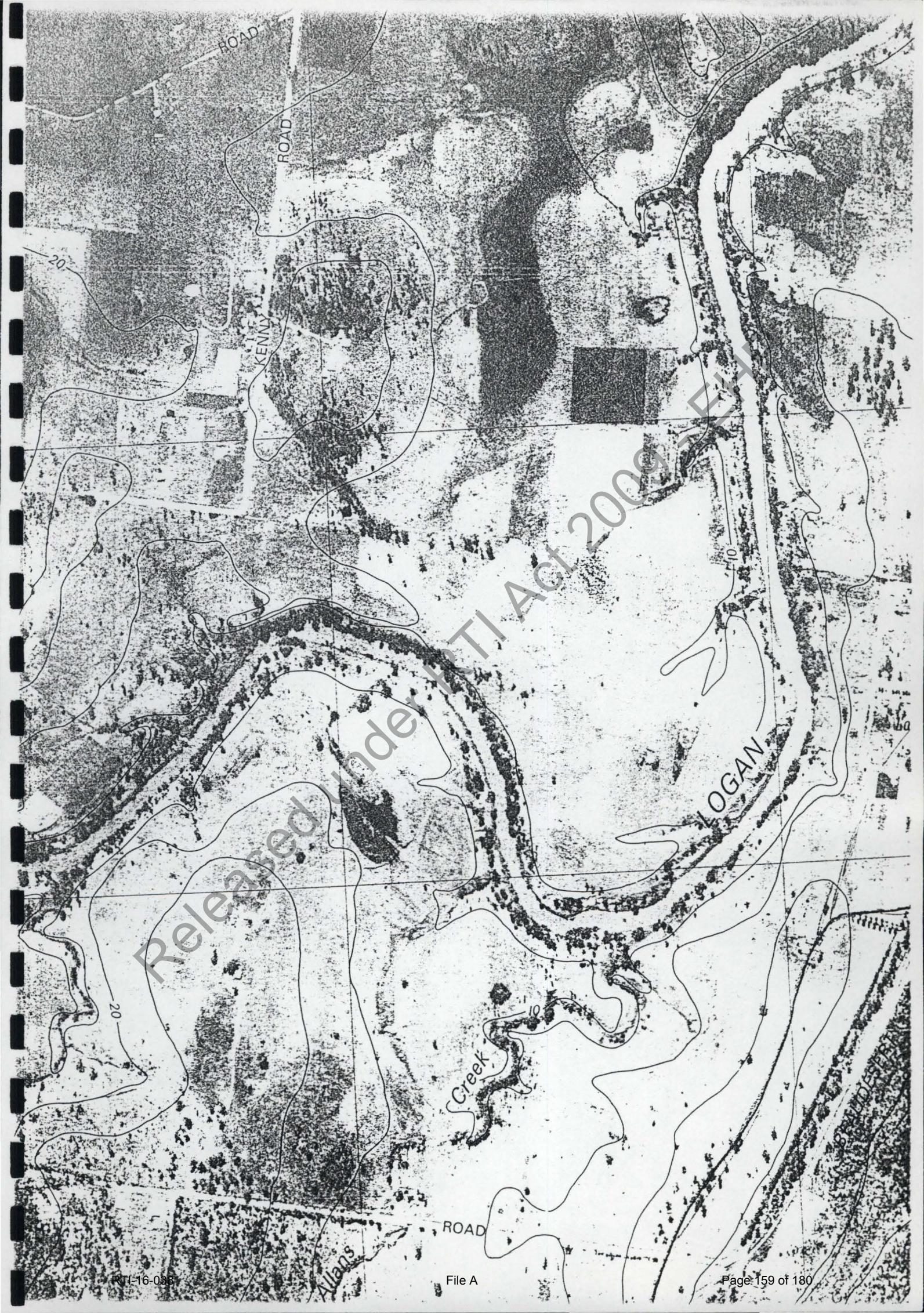


Figure 1c

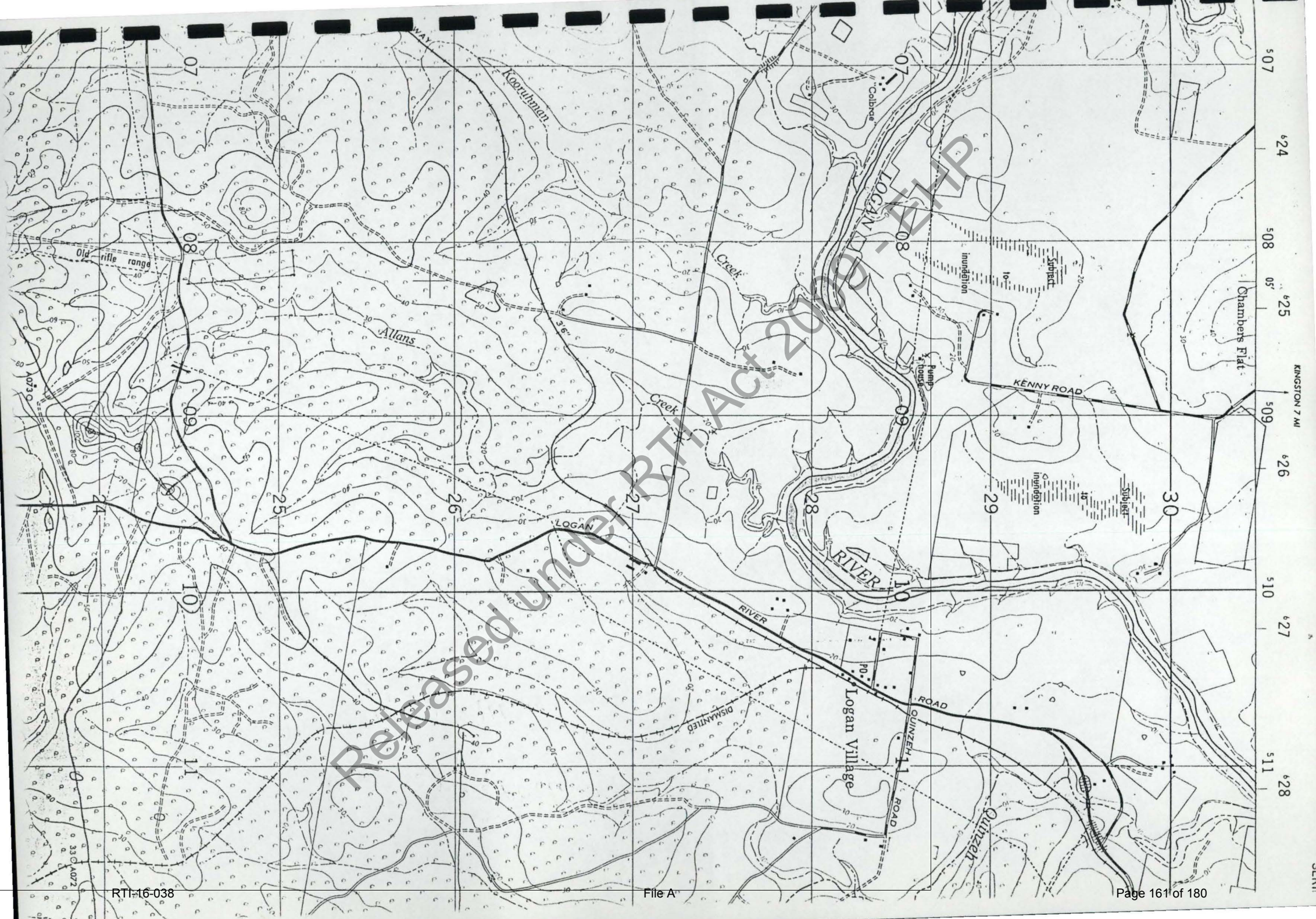


Figure 2

Original information compiled from
RP25896 & RP145174 in the Dept
of Land.

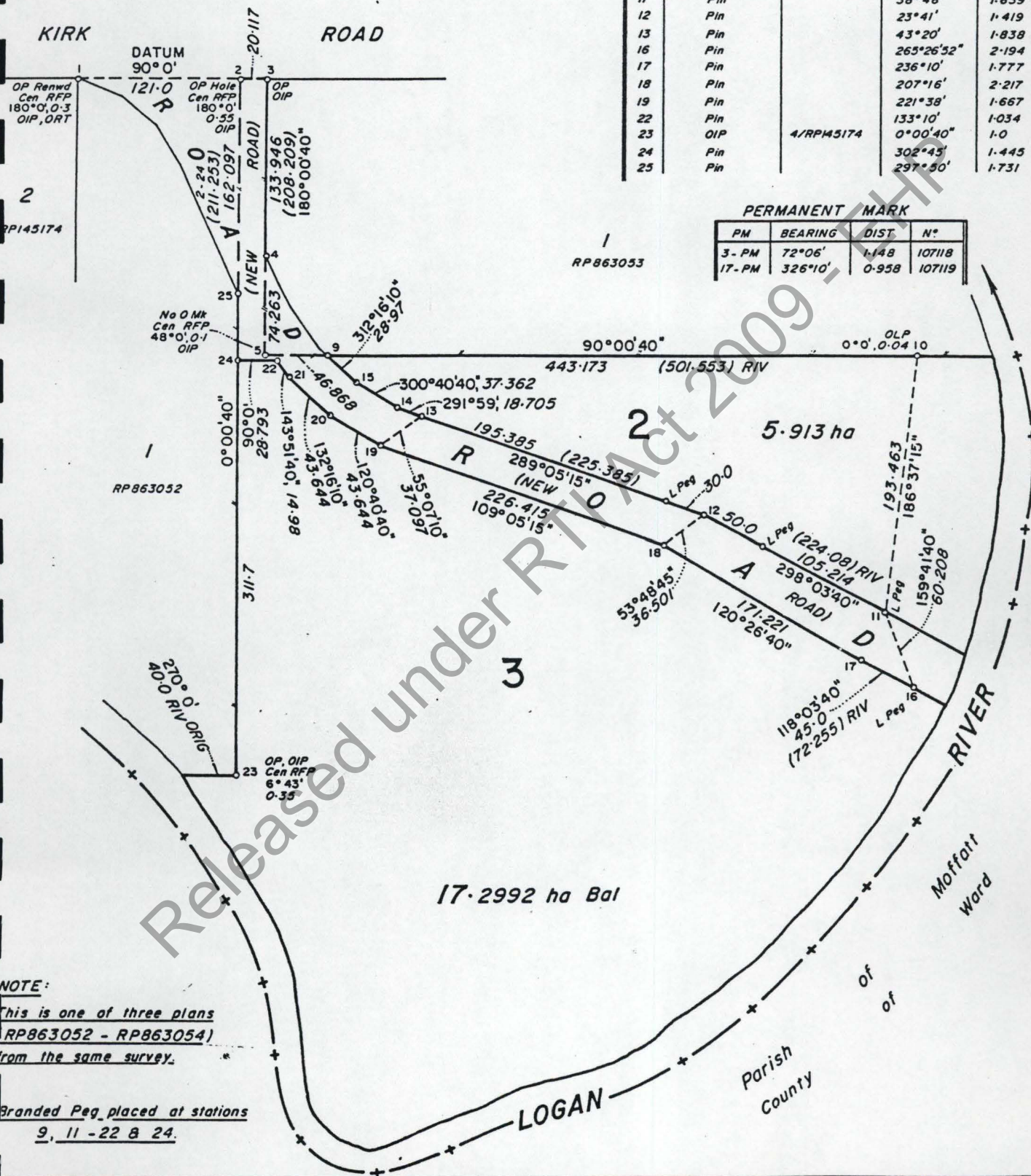
AREA OF NEW ROAD

2.283 ha

REFERENCE		MARKS		
STN	TO	ORIGIN	BEARING	DIST
1	OIP	2/1S26316	0° 0'	1.014
1	O Ironbark	2/RP145174	240° 45'	20.62
2	OIP Dist in Unstable Ground	3/1S26316	180° 08'	1.041
3	OIP	4/1S26316	0° 0'	1.0
4	Pin		33° 40'	1.2
5	OIP Diff (N.B.C)	5/1S26316	178° 57'	1.069
9	Pin		108° 52'	1.069
10	Pin		137° 30'	1.953
11	Pin		38° 46'	1.639
12	Pin		23° 41'	1.419
13	Pin		43° 20'	1.838
16	Pin		265° 26' 52"	2.194
17	Pin		236° 10'	1.777
18	Pin		207° 16'	2.217
19	Pin		221° 38'	1.667
22	Pin		133° 10'	1.034
23	OIP	4/RP145174	0° 00' 40"	1.0
24	Pin		302° 45'	1.445
25	Pin		297° 50'	1.731

PERMANENT MARK

PM	BEARING	DIST	N°
3 - PM	72° 06'	1.448	107118
17 - PM	326° 10'	0.958	107119



NOTE:

This is one of three plans
(RP863052 - RP863054)
from the same survey.

Branded Peg placed at stations
9, 11 - 22 & 24.

Craig Anthony WALTON
hereby certify that I/the Company have surveyed the
land comprised in this plan either personally or by

whose work the Company accept responsibility.
I certify that the plan is accurate, that the said survey was
formed in accordance with the Surveyors Act and
the Surveyors Regulations and that the said survey
was completed on 26-4-1994

Licensed Surveyor

RTI 6-038

CTPI 49-Sch4 - Signature

PLAN OF LOTS 2 & 3

Cancelling Lot 2 on RP25896

ORIGINAL

POR 79

YES SURVEY RECORDS DEPOSITED

MERIDIAN
OF

MAP REF
9542 - 34113
9542-341

SCALE
1:3000

File REF

ENDORSED

REGISTERING DIST
BRISBANE

MINING FIELD

PARISH MACKENZIE
COUNTY Stanley
TOWN/LOCALITY
LOCAL AUTHORITY BEAUDESERT S. C.
LAND AGENTS/MINING DISTRICT BRISBANE

Page 163 of 180

PLAN 863054

863054

PLAN MUST BE DRAWN WITHIN BLACK LINES

863054

920-46

[illegible]

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Figure 3

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LOGAN VILLAGE - BRIDGE SITE

LEGEND
Area One- Hatched
Area Two- 
Area Three- 

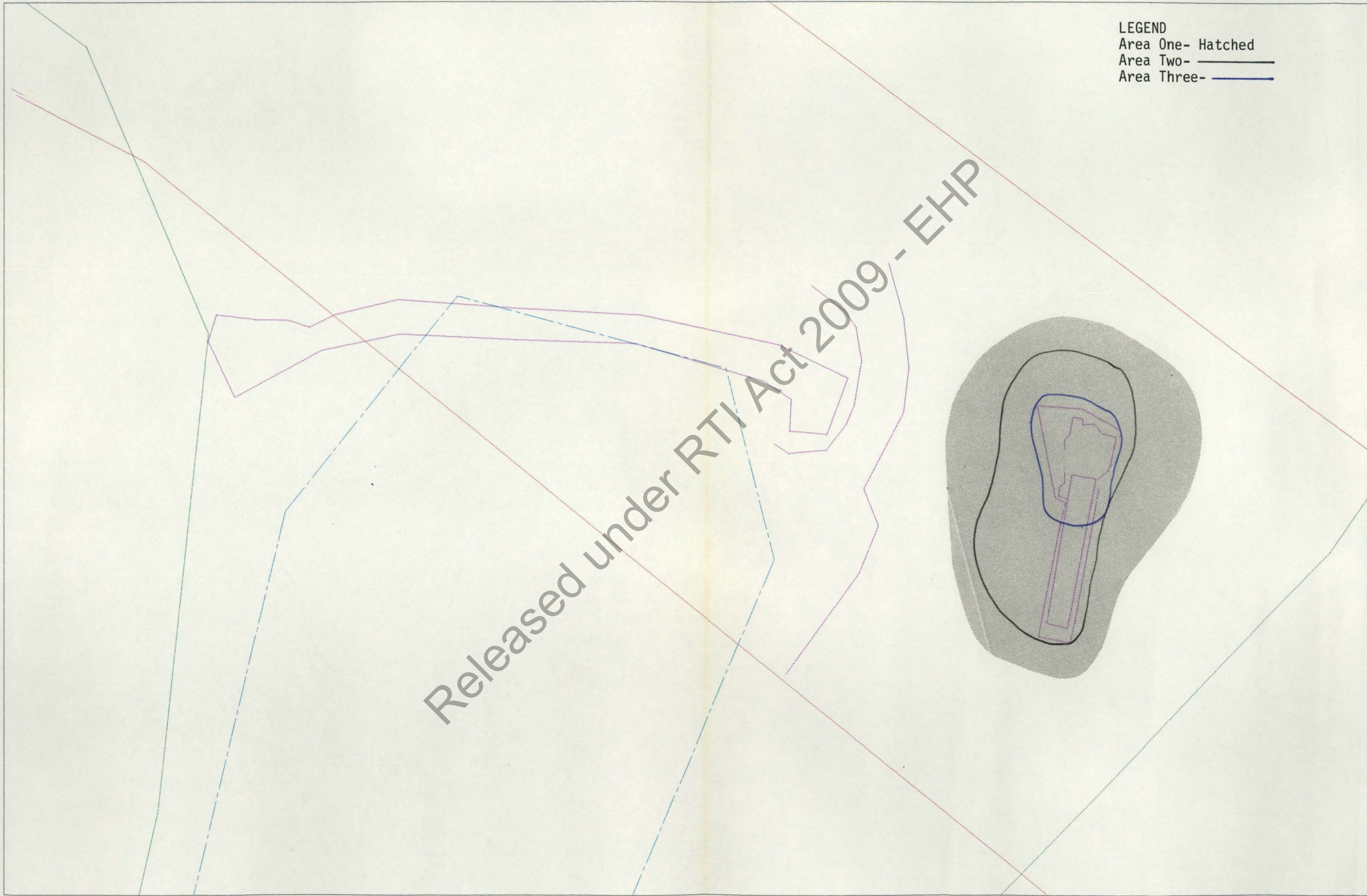
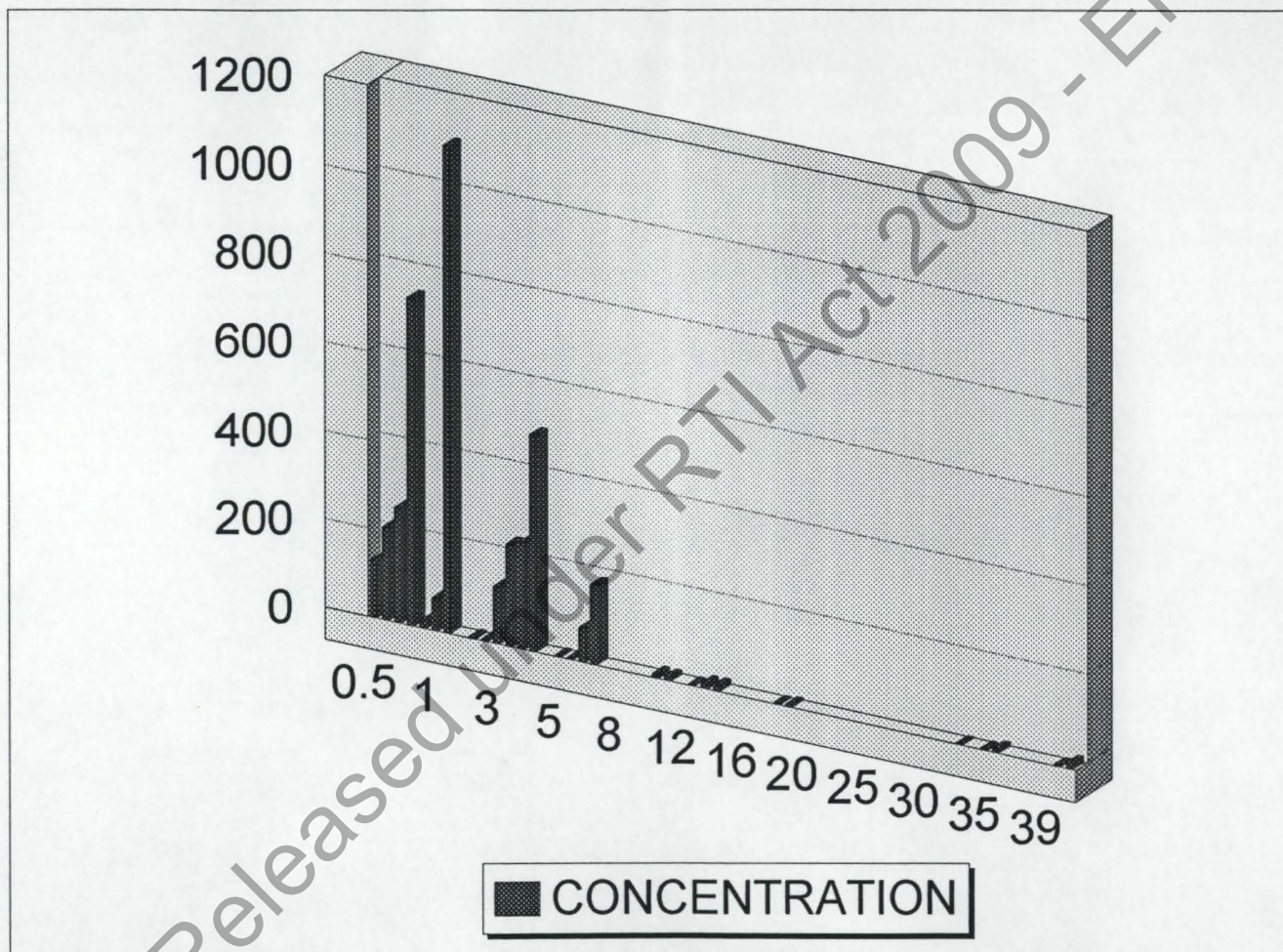


Figure 4

As CONCENTRATION - DISTANCE



As IN mg/kg

- Plate 1* *Orthophoto 1:15000*
Kirk Road and Surrounds
- Plate 2* *Overflow of gulley*
- Plate 3a* *Road Reserve (peg to car)*
Fenced dam on right
- Plate 3b* *Dip race, from exit*
- Plate 4a* *Dip race, view of holding yard*
- Plate 4b* *Dip race, view from holding yard*
- Plate 5a* *Dam and dip from road survey peg*
- Plate 5b* *Dam and dip from road survey peg*
- Plate 6a* *Dip race, dam, gulley, to Logan River*
- Plate 6b* *Dip race from entrance*



76

21,246 ha

18,009 ha

Mar. 61.9

13,152 ha

1,046 ha

1,001 ha

1,021 ha

1,422 ha

1,336 ha

1,144 ha

1,066 ha

1,006 ha

1,599 ha

1,120.1

1,120.1

13,29 ha

RP 145174

79

Mar. 61.9

183

Mar. 61.18

RP 135229

592 ha

ar. 61.18

145

146

Mar. 61.18

25

01 ha

18



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PLATE 3a

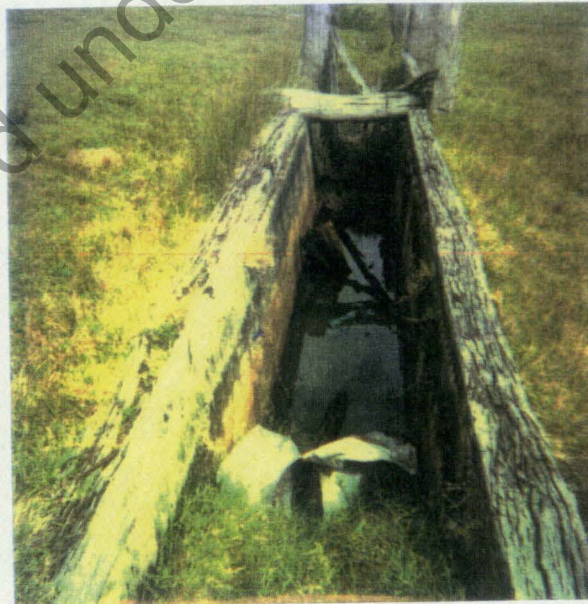


PLATE 3b



PLATE 4a



PLATE 4b



PLATE 5a



PLATE 5b



PLATE 6a



PLATE 6b

Reference 1

INVESTIGATION THRESHOLDS FOR CONTAMINANTS IN SOILS

BACKGROUND (mg/kg)	THRESHOLDS (mg/kg)	
	Environmental Investigation	Health based Investigation
<u>Heavy Metals</u>		
Antimony Sb 4-44	20	-
Arsenic As 0.2-30	20	100
Barium Ba 20-200	-	-
Cadmium Cd 0.04-2	3	20
Chromium Cr 0.5-110	50	-
Cobalt Co 2-170	-	-
Copper Cu 1-190	60	-
Lead Pb <2-200	300	300
Manganese Mn 4-12,600	500	-
Mercury Hg 0.001-0.1	1	-
Molybdenum Mo <1-20	-	-
Nickel Ni 2-400	60	-
Tin Sn 1-25	50	-
Zinc Zn 2-180	200	-
<u>Mineral Pollutants</u>		
Boron B 1-75	-	-
<u>Phenolic Compounds</u>		
Phenols 0.03-0.5	-	-
<u>Monocyclic Aromatic Hydrocarbons (MAH)</u>		
Benzene 0.05-1	1	-
Toluene 0.1-1	-	-
<u>Polycyclic Aromatic Hydrocarbons (PAH)</u>		
PAH (total) 0.95-5	-	20
<u>Chlorinated Hydrocarbons</u>		
PCB (total) 0.02-0.1	1	-
<u>Pesticides</u>		
Aldrin <0.001-<0.05	-	-
Dieldrin <0.005-<0.05	0.2	-
DDT <0.001-0.97	-	-
<u>Other Chemicals</u>		
Sulphate 35-1000	2000	-
pH 6-8	-	-

OTHER SUBSTANCES

Unlisted, potentially hazardous chemicals which are suspected, or have been identified on a site, should be referred to the CHEM Unit for assessment.

FOOTNOTES

- Site-specific assessments will be made
This table giving investigation thresholds is intended only as an indication of when detailed assessments and remediation are likely to be required. Levels of contaminants above the investigation thresholds will require site-specific assessment and consideration of the level of risk in the particular circumstances.
- Investigation Thresholds - If samples show levels below the investigation thresholds, the site may be regarded as uncontaminated and investigations beyond Stage 1 could be unnecessary if adequate sampling has been undertaken.

Source: Draft Australian and New Zealand Guidelines for Assessment and Management of Contaminated Sites, January 1992 (ANZECC/NHMRC).

Reference 2

Table 2.1: Summary guidelines for protection of aquatic ecosystems

Indicator	Units	Fresh waters	Marine waters
<i>Biological</i>		It is premature to recommend specific values for these indicators. The need for biological evaluation is recognised, and these indicators are identified as important characteristics of ecosystem function (Section 2.2)	
<i>Physico-chemical</i>			
Colour & clarity		< 10% change in euphotic depth ¹	< 10% change in euphotic depth
Dissolved oxygen ²	mg/L	> 6 (> 80-90% saturation)	> 6 (> 80-90% saturation)
Nutrients/nuisance growths		(Section 2.3.3)	(Section 2.3.3)
pH		6.5-9.0	< 0.2 pH unit change
Salinity	mg/L	< 1000 (about 1,500 μ S/cm)	
Suspended particulate matter/turbidity		< 10% change seasonal mean concentration (see also colour & clarity)	< 10% change seasonal mean concentration (see also colour & clarity)
Temperature ³		< 2°C increase	< 2°C increase
<i>Toxicants</i>			
Inorganic toxicants	all μ g/L		
Aluminium		< 5.0 (if pH < 6.5) < 100.0 (if pH > 6.5)	NR
Ammonia		20.0-30.0 (Table 2.3)	NR
Antimony		30.0	500.0
Arsenic		50.0	50.0
Beryllium		4.0 ⁴	NR
Cadmium		0.2-2.0 ⁵	2.0
Chromium		10.0	50.0
Copper		2.0-5.0 ⁵	5.0
Cyanide		5.0	5.0
Iron		1,000.0 ⁶	NR
Lead		1.0-5.0 ⁵	5.0
Mercury		0.1	0.1
Nickel		15.0-150.0 ⁵	15.0
Selenium		5.0	70.0
Silver		0.1	1.0
Sulfide		2.0	2.0
Thallium		4.0	20.0
Tin (tributyltin)		0.008	0.002
Zinc		5.0-50.0 ⁶	50.0
Organic toxicants			
Acrylonitrile		NR	NR
Benzidine		NR	NR
Dichlorobenzidine		NR	NR
Diphenylhydrazine		NR	NR
Halogenated aliphatic compounds			
Hexachlorobutadiene		0.1	0.3