

WATER RESOURCES COMMISSION



ROCKHAMPTON FLOOD MANAGEMENT STUDY

PHASE 2 REPORT

**VOLUME 3
APPENDICES**



**CAMP SCOTT FURPHY PTY LTD
ACN 004 939 548**

NOVEMBER 1992

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WATER RESOURCES COMMISSION

ROCKHAMPTON FLOOD MANAGEMENT STUDY

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**VOLUME 3
APPENDICES**



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ROCKHAMPTON FLOOD MANAGEMENT STUDY

PHASE 2 REPORT

VOLUME 1 EXECUTIVE SUMMARY

VOLUME 2 REPORT

VOLUME 3 APPENDICES

ROCKHAMPTON FLOOD MANAGEMENT STUDY

PHASE 2

VOLUME 3 – APPENDICES

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NOTE: Appendices unchanged from Phase 1 not included.

APPENDIX B

APPENDIX B

COMMUNITY CONSULTATION

B5 Agenda and Notes from Public Meetings May 1992 (Phase 2)

B5 Agenda and Notes from
Public Meetings May 1992
(Phase 2)

ROCKHAMPTON FLOOD MANAGEMENT STUDY

PUBLIC MEETINGS MAY 1992

AGENDA

- 1. Introduction and Summary of Phase 1 Report and Recommendations**
- 2. Discussion of Measures for Immediate Implementation**
 - Bruce Highway at Alligator Creek
 - Upgrading of flood warning system
 - Flood warning dissemination
 - Improving flood preparedness
 - Counter Disaster Planning and Operations
- 3. Discussion of Flood Mitigation Options Recommended for Consideration in Phase 2**
 - Yeppen Crossing
 - Levees
 - Flood Mapping/Planning Controls
- 4. Discussion of Discounted Flood Mitigation Options**
 - Flood Mitigation Storage
 - Major Diversions
 - River Channel Enlargements
- 5. Discussion of other Identified Issues**
 - Probable Maximum Flood
 - Scrubby Creek Diversion
 - Pilot Study re floodproofing commercial premises
 - Erosion/siltation in Lower Fitzroy River
 - Flood forecasting model
 - GIS for counter disaster planning
 - Leachate investigation
- 6. Any other Business**

ROCKHAMPTON FLOOD MANAGEMENT STUDY

PUBLIC CONSULTATION MAY 1992

Notes from Public Meeting

The Caves Hall 7.30 pm 5 May 1992

6 attendees (+ 5 apologies for absence)

2. Measures for Immediate Implementation

There was discussion regarding the adequacy of DOT proposals for the Alligator Creek crossing upgrade. Residents understood that the design would increase flood level in Alligator Creek by 0.1 m. DS stated he did not have full design information but understood this to be based on 50 year ARI flow in Alligator Creek, but unaware of tailwater conditions assumed. DS undertook to request details from DOT in regard to design assumptions, design criteria, bridge length, embankment height.

Proposals for flood warning upgrade, recorded message service, flood markers were well received. The following suggestions were made (Peter Baggett) in regard to giving a good service in this regard:

- recording service to include Tartarus, Riverslea, The Gap, Yaamba and Rockhampton to be useful to communities u/s of Rockhampton;
- the information should be run continuously, so that if missed first time round, a caller can wait and get a repeat;
- the information should be updated as frequently as necessary depending on conditions according to as classification system (eg. 3 levels of alert).

The central control of all river functions was raised – DS referred to discussion regarding better coordination of functions in the report. Peter Baggett suggested that each November 1st, that a stockpile of sand and sandbags be brought in to a central location – for subsequent flood use if necessary – if not required could be used up over remainder of year for other purposes.

3. Items for consideration in Phase 2

General discussion regarding Yeppen crossing and need to upgrade was expressed.

Levees were not discussed in detail as they did not affect Livingstone Shire residents directly.

The question of source material was raised, and one suggestion was made that material dredged from the river may be suitable. DS suggested this may be too low strength, but this would be looked into.

DS pointed out whilst flood maps would be prepared for urban area, this would not be possible for the rural area as there were no contour plans available on which to base maps. However, the hydraulic model would now be extended to Yaamba, enabling estimated flood levels for a range of flood magnitudes to be given.

4. Discounted Options

General agreement that these were not worth pursuing.

5. Other Issues

No points raised.

6. Other Business

Mr Baggett requested a longer period to read display material/report prior to meetings, and that the Executive Summary at least, be made more widely available.

Glenda Mather in summing up stated the necessity of taking a long term view in formulating proposals, as that part of what was now required was to put right past mistakes.

ROCKHAMPTON FLOOD MANAGEMENT STUDY

PUBLIC CONSULTATION MAY 1992

Notes from Public Meeting

Rockhampton City Hall 7.30 pm 6 May 1992

16 attendees

2. Discussion on Measures for Immediate Implementation

Bruce Highway upgrade at Alligator Creek supported.

Upgrading of flood warning system, flood markers, flood preparedness leaflets etc. well received. In response to a question that these would include the area upstream of the barrage, DS said they would. Regarding density of marking, DS suggested 4 per city block in urban area, probably less in rural residential areas.

Yeppen crossing - DS explained need to both increase bridge length and height and explained funding situation.

Mr Bailey suggested that costs may be reduced by using pipe-jacking or other techniques to increase waterway area to avoid need for total reconstruction.

3. Discussion on Flood Mitigation Options to be considered in detail in Phase 2

There was considerable discussion regarding levees-

landowners who may be affected were concerned re stock access and stock watering.

Resumption needs to be addressed, DS & Mr Carpenter agreed there was a possibility that easements would be used to reduce need for resumptions.

DS stressed that alignments not fixed - discussions will be held with those landowners who may be affected.

The problems of local drainage within levees was raised and it was agreed this could be a problem - siting levees away from developed areas to allow for some storage, and pumping if necessary were discussed.

The source of levee material was raised - DS stated this is part of Phase 2 studies.

Comments were made in regard to high velocity of flow in Port Curtis area d/s of Yeppen bridge, so levee in this area would need considerable protection.

The same connect applies along the river - DS said that retaining wall may be required as part of system along river bank when space was limited and/or velocities high.

The necessity to ramp both the highway and railway over levee near Jellicoe Street

was discussed and it was agreed that this would be required.

The need for a flood gate on the main drain and flap valves on storm water outfalls was discussed.

Ms Dawson raised the possibility of using prisoners for levee construction as a means of reducing costs. DS said cost estimates would be based on typical contract rates, but this possibility could be explored by the community at the appropriate time.

The effect of the levees on flow distribution, flood levels and velocities was discussed by a number of persons. DS stated that this was one of the major parts of the Phase 2 study, and these effects would be studied in detail by using the hydraulic model currently being set up. The question of the High Bank (Pink Lily) was raised – DS stated that stabilisation was recommended, model would be used to set control level.

The effect of increasing the height of the levees and the airport would also be studied, as would the effect of the proposed runway extension. The rebuilding of levees to their pre-flood condition was raised and Mr Carpenter pointed out that this was done using National Disaster Relief Funds which are not available for any purpose other than for reinstatement of damaged works.

The positive effect of levee protection in raising property values was discussed, as was the possibility of re-zoning and relocation of planning controls behind the levee. DS pointed out that residents protected by a levee need to be aware of the levee of protection afforded and not lulled into a false sense of security.

The need for upgrading Yeppen Crossing to reduce indirect losses was stressed by a number of persons, and it was pointed out that business losses were, in part, passed on to individuals in loss of earnings etc. This was seen as the top priority by at least some of the attendees.

In discussing the Yeppen Crossing, it was asked whose responsibility it was. DS stated that he believed DOT to be the responsible authority.

The flood mapping proposal was explained and did not receive any adverse comment.

4. Discounted Flood Mitigation Options

Mr Bailey disagreed with the discounting of the major Pink Lily – Yeppen – Midgee floodway. DS outlined large size of channel which would be required. Mr Bailey was invited to submit his proposals to DS who undertook to further look into this.

No reaction to other discounted options.

5. Other Identified Issues

There was some discussion regarding Scrubby Creek – DS pointed out that the Phase 1 report makes a number of suggestions in this regard, but cannot be done within current study.

6. Other Business

Ms Dawson asked if it would be possible to get input from the public, say a few nominated persons, when results of model studies are known. DS stated that this had been suggested to the Steering Committee early in Phase 1 but had not been taken up. DS suggested Ms Dawson write to Mr McKenna as Chairman of the Steering Committee in this regard.

DS outlined timetable for remainder of study – there would be a further round of public meetings once Phase 2 had been completed – prior to completion of the final report.

In response to a question, DS outlined the possibility for funding under FWRAP; the likely lead time; the need to compete with other Federal State priorities; and that the initiation of any such application for funding would have to come from Council.

Mr Carpenter was asked for feedback on Councils response. Mr Carpenter replied that Council was awaiting the Final Report before proceeding.

ROCKHAMPTON FLOOD MANAGEMENT STUDY

PUBLIC CONSULTATION MAY 1992

Notes from Public Meeting

Gracemere Community Centre 7.30 pm 7 May 1992

31 attendees

2. Discussion on Measures for Immediate Implementation

Mr Besch asked for flood warning station at Yaamba to be upgraded to telephone telemetry and incorporated into recorded message system.

3. Flood Mitigation Options to be considered in detail in Phase 2

A request was made to include consideration of the impact of the Capricorn Highway on flood levels as well as Yeppen Crossing. DS agreed that model studies would look at this. A number of points were raised in regard to the Capricorn Highway.

- it was pointed out that closure of the Capricorn Highway between Gracemere and the Bruce Highway was not so critical as the Bruce Highway Crossing as there is an alternative access route;
- the question was raised that if the Capricorn Highway was designed as a low level crossing subject to flooding, why is it raised above the surrounding ground level. Several speakers suggested that either adequate cross drainage (culvert) capacity be installed, or the road be lowered;
- several speakers believed that this section of the Capricorn Highway caused flood levels to increase on the upstream side;
- one speaker noted that the Capricorn Highway may be widened to 4 lane and that the existing road reserve accommodates this.

In regard to Yeppen Crossing, there appeared to be a general view that increasing bridge length to lessen the impact on flood levels would be beneficial. DS explained that if this is recommended, it will require a combination of additional waterway area and increased road height, and that hydraulic model studies will determine the requirements.

Following a discussion of costs and possible funding for the above, Bill Johnson asked whether it was possible that the Department of Defence would contribute to funding. DS said he would follow this up.

There was a general discussion regarding the possible levees around Port Curtis, Depot Hill etc. Some speakers questioned the cost effectiveness of this. Others were concerned that this would further worsen flood levels in the Fairybower/Gracemere area. DS said that this was one of the things to be investigated using the hydraulic model.

Steve Merchin pointed out that Fairybower/Gracemere residents had been disadvantaged, in terms of impact on flood levels by previous developments eg. barrage, Bruce Highway/Capricorn Highway and would not support any scheme which further worsened their situation and would not wish to have to contribute to the cost of any such scheme. On a show of hands, this view was unanimous.

One speaker commented that he understood that land values in Depot Hill had increased since the 1991 flood whereas those in the floodplain has decreased.

A similar discussion was held in regard to the airport levee. DS stated that hydraulic model studies would investigate the impact of levees around the existing airport and also the proposed runway extension.

Concern was expressed in regard to the effect of increased levee height on flow distribution in the floodway, in particular in regard to the Nine Mile Road area.

One speaker suggested that the airport be relocated out of the floodplain. DS stated that this issue was outside the scope of the present study.

In summary on the issue of the various levee proposals, Gracemere area residents would not support any such schemes which would cause further detriment to themselves.

4. Discounted Flood Mitigation Options

There was general agreement that it was correct not to consider these schemes further.

5. Other Identified Issues

PMF - DS explained why it was decided not to do formal PMF estimation as part of the study.

Scrubby Creek - DS advised that report contains a number of recommendations/suggestions but that further work is required. Mr Clewley (WRC) stated that agreement between WRC and RCC regarding responsibility was nearing conclusion. As there is strong local feeling regarding this issue, DS suggested that community pressure be brought to bear in regard to further studies required.

6. Other Business

Bill Johnson, in summing up his view of the report and meeting said:

- there is a general consensus of opinion from those attending the meeting that the proposals (levees) will have an adverse impact on people in the Fairbower area;
- he regarded the Phase 1 report as unsatisfactory in that it did not mention problems caused by the Capricorn Highway, that Scrubby Creek was not going to be further investigated, and that there was insufficient emphasis regarding the Fairbower/Gracemere area. On a show of hands 4 persons agreed with this view.

APPENDIX G

APPENDIX G
COST ESTIMATES

FLOOD MITIGATION OPTION A1
 LEVEE DEPOT HILL & LOWER CBD
 DESIGN CRITERIA – 100yr ARI + 0.6m freeboard

SEPTEMBER 1992

COST ESTIMATE

ITEM DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
1.0 CLEARING AND GRUBBING	ha	19.5	1000.00	19500
2.0 STRIP TOPSOIL 150 mm TO STOCKPILE WITHIN 500 m	m3	20600	3.00	61800
3.0 BASE PREPARATION	m2	137230	0.70	96061
4.0 EXCAVATE FROM BORROW PIT AND DEPOSIT AS FILL WITHIN 5 km INCLUDING COMPACTION	m3	208000	8.00	1664000
5.0 TRIMMING	m2	140750	1.00	140750
6.0 SPREAD TOPSOIL FROM STOCKPILE WITHIN 500 m	m3	20600	3.50	72100
7.0 GRASSING	m2	140750	0.30	42225
8.0 EASEMENT ACQUISITION (PROV.)	ha	19.5	7500.00	146250
9.0 ROADWORKS				
9.1 Major crossings	No.	1	100000.00	100000
9.2 Minor crossings	No.	4	25000.00	100000
10.0 RAILWAY CROSSINGS	Item			220000
11.0 FLOOD GATE (MAIN DRAIN)	Item			100000
12.0 RETAINING WALL				
12.1 Reinforced concrete wall	m2	1500	200.00	300000
12.2 Reinforced concrete footing	m	500	140.00	70000
13.0 STORMWATER DRAINAGE (PROV.)	Item			500000
14.0 TRAFFIC AND RAIL DISRUPTION (PROV.)	Item			200000
15.0 SPILLWAYS (PROV.)	Item			500000
SUBTOTAL				4332686
PRELIMINARIES 10%				433269
ENGINEERING 10%				433269
SUBTOTAL				5199223
CONTINGENCY 10%				519922
TOTAL				5719146

FLOOD MITIGATION OPTION A1
 LEVEE DEPOT HILL & LOWER CBD
 DESIGN CRITERIA - 1000yr ARI + 0.6m freeboard

SEPTEMBER 1992

COST ESTIMATE

ITEM DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
1.0 CLEARING AND GRUBBING	ha	27	1000.00	27000
2.0 STRIP TOPSOIL 150 mm TO STOCKPILE WITHIN 500 m	m3	30110	3.00	90330
3.0 BASE PREPARATION	m2	200730	0.70	140511
4.0 EXCAVATE FROM BORROW PIT AND DEPOSIT AS FILL WITHIN 5 km INCLUDING COMPACTION	m3	391900	8.00	3135200
5.0 TRIMMING	m2	206055	1.00	206055
6.0 SPREAD TOPSOIL FROM STOCKPILE WITHIN 500 m	m3	30110	3.50	105385
7.0 GRASSING	m2	206055	0.30	61816.5
8.0 EASEMENT ACQUISITION (PROV.)	ha	27	7500.00	202500
9.0 ROADWORKS				
9.1 Major crossings	No.	1	150000.00	150000
9.2 Minor crossings	No.	4	50000.00	200000
10.0 RAILWAY CROSSINGS	Item			300000
11.0 FLOOD GATE (MAIN DRAIN)	Item			125000
12.0 RETAINING WALL				
12.1 Reinforced concrete wall	m2	2800	200.00	560000
12.2 Reinforced concrete footing	m	1500	140.00	210000
13.0 STORMWATER DRAINAGE (PROV.)	Item			500000
14.0 TRAFFIC AND RAIL DISRUPTION (PROV.)	Item			200000
15.0 SPILLWAYS (PROV.)	Item			600000
SUBTOTAL				6813798
PRELIMINARIES 10%				681380
ENGINEERING 10%				681380
SUBTOTAL				8176557
CONTINGENCY 10%				817656
TOTAL				8994213

FLOOD MITIGATION OPTION A2
 LEVEE PORT CURTIS, DEPOT HILL & LOWER CBD
 DESIGN CRITERIA - 100yr ARI + 0.6m freeboard

SEPTEMBER 1992

COST ESTIMATE

ITEM DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
1.0 CLEARING AND GRUBBING	ha	26.5	1000.00	26500
2.0 STRIP TOPSOIL 150 mm TO STOCKPILE WITHIN 500 m	m3	28320	3.00	84960
3.0 BASE PREPARATION	m2	188750	0.70	132125
4.0 EXCAVATE FROM BORROW PIT AND DEPOSIT AS FILL WITHIN 5 km INCLUDING COMPACTION	m3	294800	8.00	2358400
5.0 TRIMMING	m2	193620	1.00	193620
6.0 SPREAD TOPSOIL FROM STOCKPILE WITHIN 500 m	m3	28320	3.50	99120
7.0 GRASSING	m2	193620	0.30	58086
8.0 EASEMENT ACQUISITION (PROV.)	ha	26.5	7500.00	198750
9.0 ROADWORKS				
9.1 Major crossings	No.	1	100000.00	100000
9.2 Minor crossings	No.	4	25000.00	100000
10.0 RAILWAY CROSSINGS	Item			220000
11.0 FLOOD GATE (MAIN DRAIN)	Item			100000
12.0 RETAINING WALL				
12.1 Reinforced concrete wall	m2	1500	200.00	300000
12.2 Reinforced concrete footing	m	500	140.00	70000
13.0 STORMWATER DRAINAGE (PROV.)	Item			500000
14.0 TRAFFIC AND RAIL DISRUPTION (PROV.)	Item			200000
15.0 SPILLWAYS (PROV.)	Item			500000
SUBTOTAL				5241561
PRELIMINARIES 10%				524156
ENGINEERING 10%				524156
SUBTOTAL				6289873
CONTINGENCY 10%				628987
TOTAL				6918861

SEPTEMBER 1992

COST ESTIMATE

ITEM DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
1.0 CLEARING AND GRUBBING	ha	29.4	1000.00	29400
2.0 STRIP TOPSOIL 150 mm TO STOCKPILE WITHIN 500 m	m3	32260	3.00	96780
3.0 BASE PREPARATION	m2	215040	0.70	150528
4.0 EXCAVATE FROM BORROW PIT AND DEPOSIT AS FILL WITHIN 5 km INCLUDING COMPACTION	m3	378750	8.00	3030000
5.0 TRIMMING	m2	220700	1.00	220700
6.0 SPREAD TOPSOIL FROM STOCKPILE WITHIN 500 m	m3	32260	3.50	112910
7.0 GRASSING	m2	220700	0.30	66210
8.0 EASEMENT ACQUISITION (PROV.)	ha	29.4	7500.00	220500
9.0 ROADWORKS				
9.1 Major crossings	No.	1	110000.00	110000
9.2 Minor crossings	No.	4	30000.00	120000
10.0 RAILWAY CROSSINGS	Item			300000
11.0 FLOOD GATE (MAIN DRAIN)	Item			125000
12.0 RETAINING WALL				
12.1 Reinforced concrete wall	m2	1650	200.00	330000
12.2 Reinforced concrete footing	m	1500	140.00	210000
13.0 STORMWATER DRAINAGE (PROV.)	Item			500000
14.0 TRAFFIC AND RAIL DISRUPTION (PROV.)	Item			200000
15.0 SPILLWAYS (PROV.)	Item			500000
SUBTOTAL				6322028
PRELIMINARIES 10%				632203
ENGINEERING 10%				632203
SUBTOTAL				7586434
CONTINGENCY 10%				758643
TOTAL				8345077

FLOOD MITIGATION OPTION A2
 LEVEE PORT CURTIS, DEPOT HILL & LOWER CBD
 DESIGN CRITERIA - 500yr ARI + 0.6m freeboard

SEPTEMBER 1992

COST ESTIMATE

ITEM DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
1.0 CLEARING AND GRUBBING	ha	32.5	1000.00	32500
2.0 STRIP TOPSOIL 150 mm TO STOCKPILE WITHIN 500 m	m3	36900	3.00	110700
3.0 BASE PREPARATION	m2	246010	0.70	172207
4.0 EXCAVATE FROM BORROW PIT AND DEPOSIT AS FILL WITHIN 5 km INCLUDING COMPACTION	m3	495280	8.00	3962240
5.0 TRIMMING	m2	252615	1.00	252615
6.0 SPREAD TOPSOIL FROM STOCKPILE WITHIN 500 m	m3	36900	3.50	129150
7.0 GRASSING	m2	252615	0.30	75784.5
8.0 EASEMENT ACQUISITION (PROV.)	ha	32.5	7500.00	243750
9.0 ROADWORKS				
9.1 Major crossings	No.	1	140000.00	140000
9.2 Minor crossings	No.	4	40000.00	160000
10.0 RAILWAY CROSSINGS	Item			300000
11.0 FLOOD GATE (MAIN DRAIN)	Item			125000
12.0 RETAINING WALL				
12.1 Reinforced concrete wall	m2	2300	200.00	460000
12.2 Reinforced concrete footing	m	1500	140.00	210000
13.0 STORMWATER DRAINAGE (PROV.)	Item			500000
14.0 TRAFFIC AND RAIL DISRUPTION (PROV.)	Item			200000
15.0 SPILLWAYS (PROV.)	Item			600000
SUBTOTAL				7673947
PRELIMINARIES 10%				767395
ENGINEERING 10%				767395
SUBTOTAL				9208736
CONTINGENCY 10%				920874
TOTAL				10129609

FLOOD MITIGATION OPTION A2
 LEVEE PORT CURTIS, DEPOT HILL & LOWER CBD
 DESIGN CRITERIA - 1000yr ARI + 0.6m freeboard

SEPTEMBER 1992

COST ESTIMATE

ITEM DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
1.0 CLEARING AND GRUBBING	ha	35.8	1000.00	35800
2.0 STRIP TOPSOIL 150 mm TO STOCKPILE WITHIN 500 m	m3	40415	3.00	121245
3.0 BASE PREPARATION	m2	269450	0.70	188615
4.0 EXCAVATE FROM BORROW PIT AND DEPOSIT AS FILL WITHIN 5 km INCLUDING COMPACTION	m3	548320	8.00	4386560
5.0 TRIMMING	m2	276635	1.00	276635
6.0 SPREAD TOPSOIL FROM STOCKPILE WITHIN 500 m	m3	40415	3.50	141452.5
7.0 GRASSING	m2	276635	0.30	82990.5
8.0 EASEMENT ACQUISITION (PROV.)	ha	35.8	7500.00	268500
9.0 ROADWORKS				
9.1 Major crossings	No.	1	150000.00	150000
9.2 Minor crossings	No.	4	50000.00	200000
10.0 RAILWAY CROSSINGS	Item			300000
11.0 FLOOD GATE (MAIN DRAIN)	Item			125000
12.0 RETAINING WALL				
12.1 Reinforced concrete wall	m2	2800	200.00	560000
12.2 Reinforced concrete footing	m	1500	140.00	210000
13.0 STORMWATER DRAINAGE (PROV.)	Item			500000
14.0 TRAFFIC AND RAIL DISRUPTION (PROV.)	Item			200000
15.0 SPILLWAYS (PROV.)	Item			600000
SUBTOTAL				8346798
PRELIMINARIES 10%				834680
ENGINEERING 10%				834680
SUBTOTAL				10016158
CONTINGENCY 10%				1001616
TOTAL				11017773

FLOOD MITIGATION OPTION A3
 LEVEE ROCKHAMPTON AIRPORT
 DESIGN CRITERIA - 100yr ARI + 0.6m freeboard

SEPTEMBER 1992

COST ESTIMATE

ITEM DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
1.0 CLEARING AND GRUBBING	ha	25.5	1000.00	25500
2.0 STRIP TOPSOIL 150 mm TO STOCKPILE WITHIN 500 m	m3	26835	3.00	80505
3.0 BASE PREPARATION	m2	178900	0.70	125230
4.0 EXCAVATE FROM BORROW PIT AND DEPOSIT AS FILL WITHIN 5 km INCLUDING COMPACTION	m3	273380	8.00	2187040
5.0 TRIMMING	m2	183500	1.00	183500
6.0 SPREAD TOPSOIL FROM STOCKPILE WITHIN 500 m	m3	26835	3.50	93922.5
7.0 GRASSING	m2	183500	0.30	55050
8.0 EASEMENT ACQUISITION (PROV.)	ha	25.5	7500.00	191250
9.0 ROADWORKS				
9.1 Major crossings	No.	-	100000.00	-
9.2 Minor crossings	No.	1	25000.00	25000
10.0 RAILWAY CROSSINGS	Item			-
11.0 FLOOD GATE	Item			-
12.0 RETAINING WALL				
12.1 Reinforced concrete wall	m2	-	200.00	-
12.2 Reinforced concrete footing	m	-	140.00	-
13.0 STORMWATER DRAINAGE (PROV.)	Item			-
14.0 TRAFFIC AND RAIL DISRUPTION (PROV.)	Item			-
15.0 RAISE EXISTING HOUSES (PROV.)	No.	10	20000.00	200000
16.0 SPILLWAYS (PROV.)	Item			100000
SUBTOTAL				3266998
PRELIMINARIES 10%				326700
ENGINEERING 10%				326700
SUBTOTAL				3920397
CONTINGENCY 10%				392040
TOTAL				4312437

FLOOD MITIGATION OPTION A3
 LEVEE ROCKHAMPTON AIRPORT
 DESIGN CRITERIA – 200yr ARI + 0.6m freeboard

SEPTEMBER 1992

COST ESTIMATE

ITEM	DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
1.0	CLEARING AND GRUBBING	ha	28.9	1000.00	28900
2.0	STRIP TOPSOIL 150 mm TO STOCKPILE WITHIN 500 m	m3	31805	3.00	95415
3.0	BASE PREPARATION	m2	212030	0.70	148421
4.0	EXCAVATE FROM BORROW PIT AND DEPOSIT AS FILL WITHIN 5 km INCLUDING COMPACTION	m3	377280	8.00	3018240
5.0	TRIMMING	m2	217605	1.00	217605
6.0	SPREAD TOPSOIL FROM STOCKPILE WITHIN 500 m	m3	31805	3.50	111317.5
7.0	GRASSING	m2	217605	0.30	65281.5
8.0	EASEMENT ACQUISITION (PROV.)	ha	28.9	7500.00	216750
9.0	ROADWORKS				
9.1	Major crossings	No.	–	110000.00	–
9.2	Minor crossings	No.	1	30000.00	30000
10.0	RAILWAY CROSSINGS	Item			–
11.0	FLOOD GATE	Item			–
12.0	RETAINING WALL				
12.1	Reinforced concrete wall	m2	–	200.00	–
12.2	Reinforced concrete footing	m	–	140.00	–
13.0	STORMWATER DRAINAGE (PROV.)	Item			–
14.0	TRAFFIC AND RAIL DISRUPTION (PROV.)	Item			–
15.0	RAISE EXISTING HOUSES (PROV.)	No.	10	21000.00	210000
16.0	SPILLWAYS (PROV.)	Item			105000
SUBTOTAL					4246930
PRELIMINARIES 10%					424693
ENGINEERING 10%					424693
SUBTOTAL					5096316
CONTINGENCY 10%					509632
TOTAL					5605948

FLOOD MITIGATION OPTION A3
 LEVEE ROCKHAMPTON AIRPORT
 DESIGN CRITERIA – 500yr ARI + 0.6m freeboard

SEPTEMBER 1992

COST ESTIMATE

ITEM DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
1.0 CLEARING AND GRUBBING	ha	32.8	1000.00	32800
2.0 STRIP TOPSOIL 150 mm TO STOCKPILE WITHIN 500 m	m3	37575	3.00	112725
3.0 BASE PREPARATION	m2	250485	0.70	175339.5
4.0 EXCAVATE FROM BORROW PIT AND DEPOSIT AS FILL WITHIN 5 km INCLUDING COMPACTION	m3	521100	8.00	4168800
5.0 TRIMMING	m2	257250	1.00	257250
6.0 SPREAD TOPSOIL FROM STOCKPILE WITHIN 500 m	m3	37575	3.50	131512.5
7.0 GRASSING	m2	257250	0.30	77175
8.0 EASEMENT ACQUISITION (PROV.)	ha	32.8	7500.00	246000
9.0 ROADWORKS				
9.1 Major crossings	No.	–	140000.00	–
9.2 Minor crossings	No.	1	40000.00	40000
10.0 RAILWAY CROSSINGS	Item			–
11.0 FLOOD GATE	Item			–
12.0 RETAINING WALL				
12.1 Reinforced concrete wall	m2	–	200.00	–
12.2 Reinforced concrete footing	m	–	140.00	–
13.0 STORMWATER DRAINAGE (PROV.)	Item			–
14.0 TRAFFIC AND RAIL DISRUPTION (PROV.)	Item			–
15.0 RAISE EXISTING HOUSES (PROV.)	No.	10	24000.00	240000
16.0 SPILLWAYS (PROV.)	Item			120000
SUBTOTAL				5601602
PRELIMINARIES 10%				560160
ENGINEERING 10%				560160
SUBTOTAL				6721922
CONTINGENCY 10%				672192
TOTAL				7394115

FLOOD MITIGATION OPTION A3
 LEVEE ROCKHAMPTON AIRPORT
 DESIGN CRITERIA - 1000yr ARI + 0.6m freeboard

SEPTEMBER 1992

COST ESTIMATE

ITEM DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
1.0 CLEARING AND GRUBBING	ha	34.2	1000.00	34200
2.0 STRIP TOPSOIL 150 mm TO STOCKPILE WITHIN 500 m	m3	39730	3.00	119190
3.0 BASE PREPARATION	m2	264850	0.70	185395
4.0 EXCAVATE FROM BORROW PIT AND DEPOSIT AS FILL WITHIN 5 km INCLUDING COMPACTION	m3	580000	8.00	4640000
5.0 TRIMMING	m2	272040	1.00	272040
6.0 SPREAD TOPSOIL FROM STOCKPILE WITHIN 500 m	m3	37930	3.50	132755
7.0 GRASSING	m2	272040	0.30	81612
8.0 EASEMENT ACQUISITION (PROV.)	ha	34.2	7500.00	256500
9.0 ROADWORKS				
9.1 Major crossings	No.	—	150000.00	—
9.2 Minor crossings	No.	1	50000.00	50000
10.0 RAILWAY CROSSINGS	Item			—
11.0 FLOOD GATE	Item			—
12.0 RETAINING WALL				
12.1 Reinforced concrete wall	m2	—	200.00	—
12.2 Reinforced concrete footing	m	—	140.00	—
13.0 STORMWATER DRAINAGE (PROV.)	Item			—
14.0 TRAFFIC AND RAIL DISRUPTION (PROV.)	Item			—
15.0 RAISE EXISTING HOUSES (PROV.)	No.	10	25000.00	250000
16.0 SPILLWAYS (PROV.)	Item			120000
SUBTOTAL				6141692
PRELIMINARIES 10%				614169
ENGINEERING 10%				614169
SUBTOTAL				7370030
CONTINGENCY 10%				737003
TOTAL				8107033

COST ESTIMATE

ITEM DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
1.0 CLEARING AND GRUBBING	ha	2.4	1000.00	2400
2.0 STRIP TOPSOIL 150 mm TO STOCKPILE WITHIN 500 m	m3	1720	3.00	5160
3.0 BASE PREPARATION	m2	11430	0.70	8001
4.0 EXCAVATE FROM BORROW PIT AND DEPOSIT AS FILL WITHIN 5 km INCLUDING COMPACTION	m3	6600	8.00	52800
5.0 TRIMMING	m2	11620	1.00	11620
6.0 SPREAD TOPSOIL FROM STOCKPILE WITHIN 500 m	m3	1720	3.50	6020
7.0 GRASSING	m2	11620	0.30	3486
8.0 EASEMENT ACQUISITION (PROV.)	ha	2.4	7500.00	18000
9.0 ROADWORKS				
9.1 Major crossings	No.	-	100000.00	-
9.2 Minor crossings	No.	-	25000.00	-
10.0 RAILWAY CROSSINGS	Item			-
11.0 FLOOD GATE	Item			-
12.0 RETAINING WALL				
12.1 Reinforced concrete wall	m2	-	200.00	-
12.2 Reinforced concrete footing	m	-	140.00	-
13.0 STORMWATER DRAINAGE (PROV.)	Item			-
14.0 TRAFFIC AND RAIL DISRUPTION (PROV.)	Item			-
SUBTOTAL				107487
PRELIMINARIES 10%				10749
ENGINEERING 10%				10749
SUBTOTAL				128984
CONTINGENCY 10%				12898
TOTAL				141883

FLOOD MITIGATION OPTION A5
 LEVEE SPLITTERS CREEK
 DESIGN CRITERIA - 1000yr ARI + 0.6m freeboard

SEPTEMBER 1992

COST ESTIMATE

ITEM DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
1.0 CLEARING AND GRUBBING	ha	6.4	1000.00	6400
2.0 STRIP TOPSOIL 150 mm TO STOCKPILE WITHIN 500 m	m3	5750	3.00	17250
3.0 BASE PREPARATION	m2	38350	0.70	26845
4.0 EXCAVATE FROM BORROW PIT AND DEPOSIT AS FILL WITHIN 5 km INCLUDING COMPACTION	m3	38630	8.00	309040
5.0 TRIMMING	m2	39210	1.00	39210
6.0 SPREAD TOPSOIL FROM STOCKPILE WITHIN 500 m	m3	5750	3.50	20125
7.0 GRASSING	m2	39210	0.30	11763
8.0 EASEMENT ACQUISITION (PROV.)	ha	6.4	7500.00	48000
9.0 ROADWORKS				
9.1 Major crossings	No.	-	100000.00	-
9.2 Minor crossings	No.	-	25000.00	-
10.0 RAILWAY CROSSINGS	Item			-
11.0 FLOOD GATE	Item			-
12.0 RETAINING WALL				
12.1 Reinforced concrete wall	m2	-	200.00	-
12.2 Reinforced concrete footing	m	-	140.00	-
13.0 STORMWATER DRAINAGE (PROV.)	Item			-
14.0 TRAFFIC AND RAIL DISRUPTION (PROV.)	Item			-
SUBTOTAL				478633
PRELIMINARIES 10%				47863
ENGINEERING 10%				47863
SUBTOTAL				574360
CONTINGENCY 10%				57436
TOTAL				631796

FLOOD MITIGATION OPTION A1
LEVEE DEPOT HILL & LOWER CBD

Top Width (m): 4
 Side Slope (1 in H): 4
 Design Criteria: 1000yr ARI + 0.6m freeboard
 Date: 11-09-92

Chainage (m)	Distance (m)	Existing Level (mAHD)	Design Level (mAHD)	Height (m)	Fill Area (m2)	Fill Volume (m3)	Grassed Area (m)	Grassed Area (m2)	Clearing & grubbing (m)	Clearing & grubbing (m2)	Stripping (m)	Stripping (m2)
0		13.00	10.82	0.00	0.0		0.0		0.00		0.00	
	100					2088.6		1342.1		1808.0		1308.0
100		8.00	10.77	2.77	41.8		26.8		36.16		26.16	
	100					7488.3		3488.2		4396.0		3396.0
200		6.00	10.72	4.72	108.0		42.9		51.76		41.76	
	200					21021.9		8469.0		10240.0		8240.0
400		6.00	10.58	4.58	102.2		41.8		50.64		40.64	
	2600					209071.2		95517.4		118976.0		92976.0
3000		6.00	9.36	3.36	58.6		31.7		40.88		30.88	
	1400					82037.8		44390.2		57232.0		43232.0
4400		6.00	9.36	3.36	58.6		31.7		40.88		30.88	
	950					47304.7		27693.4		36480.0		26980.0
5350		7.00	9.74	2.74	41.0		26.6		35.92		25.92	
	250					7507.6		5617.9		7980.0		5480.0
5600		8.00	9.74	1.74	19.1		18.3		27.92		17.92	
	400					5390.2		6102.4		9968.0		5968.0
6000		9.00	9.99	0.99	7.9		12.2		21.92		11.92	
	300					2364.1		3649.1		6576.0		3576.0
6300		9.00	9.99	0.99	7.9		12.2		21.92		11.92	
	700					7623.0		9784.5		16576.0		9576.0
7000		9.00	10.43	1.43	13.9		15.8		25.44		15.44	
TOTAL						391897		206054		270232		200732

FLOOD MITIGATION OPTION A2
LEVEE PORT CURTIS, DEPOT HILL & LOWER CBD

Top Width (m): 4
 Side Slope (1 in H): 4
 Design Criteria: 1000yr ARI + 0.6m freeboard
 Date: 11-09-92

Chainage (m)	Distance (m)	Existing Level (mAHD)	Design Level (mAHD)	Height (m)	Fill Area (m2)	Fill Volume (m3)	Grassed Area (m)	Grassed Area (m2)	Clearing & grubbing (m)	Clearing & grubbing (m2)	Stripping (m)	Stripping (m2)
400		13.00	10.82	0.00	0.0		0.0		0.00		0.00	
	100					2154.5		1362.7		1828.0		1328.0
500		8.00	10.82	2.82	43.1		27.3		36.56		26.56	
	160					12423.9		5680.1		7129.6		5529.6
660		6.00	10.82	4.82	112.2		43.7		52.56		42.56	
	100					11010.2		4333.4		5216.0		4216.0
760		6.00	10.72	4.72	108.0		42.9		51.76		41.76	
	220					23124.1		9315.9		11264.0		9064.0
980		6.00	10.58	4.58	102.2		41.8		50.64		40.64	
	4320					347379.8		158705.8		197683.2		154483.2
5300		6.00	9.36	3.36	58.6		31.7		40.88		30.88	
	1400					82037.8		44390.2		57232.0		43232.0
6700		6.00	9.36	3.36	58.6		31.7		40.88		30.88	
	950					47304.7		27693.4		36480.0		26980.0
7650		7.00	9.74	2.74	41.0		26.6		35.92		25.92	
	250					7507.6		5617.9		7980.0		5480.0
7900		8.00	9.74	1.74	19.1		18.3		27.92		17.92	
	400					5390.2		6102.4		9968.0		5968.0
8300		9.00	9.99	0.99	7.9		12.2		21.92		11.92	
	300					2364.1		3649.1		6576.0		3576.0
8600		9.00	9.99	0.99	7.9		12.2		21.92		11.92	
	700					7623.0		9784.5		16576.0		9576.0
9300		9.00	10.43	1.43	13.9		15.8		25.44		15.44	
TOTAL						548320		276635		357933		269433

FLOOD MITIGATION OPTION A2
LEVEE PORT CURTIS, DEPOT HILL & LOWER CBD

Top Width (m): 4
 Side Slope (1 in H): 4
 Design Criteria: 100yr ARI + 0.6m freeboard
 Date: 11-09-92

Chainage (m)	Distance (m)	Existing Level (mAHD)	Design Level (mAHD)	Height (m)	Fill Area (m2)	Fill Volume (m3)	Grassed Area (m)	Grassed Area (m2)	Clearing & grubbing (m)	Clearing & grubbing (m2)	Stripping (m)	Stripping (m2)
400		13.00	9.77	0.00	0.0		0.0		0.00		0.00	
500	100	8.00	9.77	1.77	19.6	980.6	18.6	929.8	28.16	1408.0	18.16	908.0
660	160	6.00	9.77	3.77	71.9	7323.5	35.1	4294.7	44.16	5785.6	34.16	4185.6
760	100	6.00	9.53	3.53	64.0	6794.8	33.1	3409.9	42.24	4320.0	32.24	3320.0
980	220	6.00	9.20	3.20	53.8	12949.6	30.4	6984.7	39.60	9002.4	29.60	6802.4
5300	4320	6.00	8.46	2.46	34.0	189661.8	24.3	118094.9	33.68	158284.8	23.68	115084.8
6700	1400	6.00	8.46	2.46	34.0	47665.0	24.3	34000.0	33.68	47152.0	23.68	33152.0
7650	950	7.00	8.75	1.75	19.3	25315.8	18.4	20290.4	28.00	29298.0	18.00	19798.0
7900	250	8.00	8.75	0.75	5.3	3062.5	10.2	3576.9	20.00	6000.0	10.00	3500.0
8300	400	9.00	8.96	0.00	0.0	1050.0	0.0	2036.9	0.00	4000.0	0.00	2000.0
TOTAL						294803		193618		265251		188751

FLOOD MITIGATION OPTION A3
LEVEE ROCKHAMPTON AIRPORT

Top Width (m): 4
 Side Slope (1 in H): 4
 Design Criteria: 100yr ARI + 0.6m freeboard
 Date: 11-09-92

Chainage (m)	Distance (m)	Existing Level (mAHD)	Design Level (mAHD)	Height (m)	Fill Area (m2)	Fill Volume (m3)	Grassed Area (m)	Grassed Area (m2)	Clearing & grubbing (m)	Clearing & grubbing (m2)	Stripping (m)	Stripping (m2)
0		11.00	10.57	0.00	0.0		0.0		0.00		0.00	
340	340	12.00	10.57	0.00	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.0
840	500	8.00	10.57	2.57	36.7	9174.9	25.2	6298.2	34.56	8640.0	24.56	6140.0
1140	300	7.00	10.82	3.82	73.6	16552.4	35.5	9104.0	44.56	11868.0	34.56	8868.0
1320	180	6.00	10.97	4.97	118.7	17310.0	45.0	7243.6	53.76	8848.8	43.76	7048.8
1600	280	8.00	11.11	3.11	51.1	23773.7	29.6	10448.1	38.88	12969.6	28.88	10169.6
2200	600	8.00	11.30	3.30	56.8	32366.5	31.2	18257.5	40.40	23784.0	30.40	17784.0
2520	320	9.00	11.76	2.76	41.5	15723.3	26.8	9275.5	36.08	12236.8	26.08	9036.8
3170	650	10.00	12.06	2.06	25.2	21685.6	21.0	15517.7	30.48	21632.0	20.48	15132.0
5700	2530	10.50	12.05	1.55	15.8	51895.9	16.8	47777.6	26.40	71953.2	16.40	46653.2
6350	650	8.00	10.76	2.76	41.5	18629.1	26.8	14150.9	36.08	20306.0	26.08	13806.0
6900	550	8.00	10.54	2.54	36.0	21306.1	24.9	14218.9	34.32	19360.0	24.32	13860.0
7600	1250	8.00	10.54	2.54	36.0	44958.0	24.9	31181.7	34.32	42900.0	24.32	30400.0
TOTAL						273375		183474		254498		178898

FLOOD MITIGATION OPTION A2
LEVEE PORT CURTIS, DEPOT HILL & LOWER CBD

Top Width (m): 4
 Side Slope (1 in H): 4
 Design Criteria: 200 yr ARI + 0.6m freeboard
 Date: 11-09-92

Chainage (m)	Distance (m)	Existing Level (mAHD)	Design Level (mAHD)	Height (m)	Fill Area (m2)	Fill Volume (m3)	Grassed Area (m)	Grassed Area (m2)	Clearing & grubbing (m)	Clearing & grubbing (m2)	Stripping (m)	Stripping (m2)
400		13.00	10.18	0.00	0.0				0.00		0.00	
	100					1386.1	0.0	1098.7		1571.8		1071.8
500		8.00	10.18	2.18	27.7		22.0		31.44		21.44	
	160					9145.3		4835.1		6309.9		4709.9
660		6.00	10.18	4.18	86.6		38.5		47.44		37.44	
	100					8290.2		3763.5		4663.0		3663.0
760		6.00	9.98	3.98	79.2		36.8		45.82		35.82	
	220					16361.7		7843.9		9835.9		7635.9
980		6.00	9.70	3.70	69.5		34.5		43.59		33.59	
	4320					243265.1		133398.8		173131.8		129931.8
5300		6.00	8.82	2.82	43.1		27.3		36.56		26.56	
	1400					60325.4		38156.0		51184.0		37184.0
6700		6.00	8.82	2.82	43.1		27.3		36.56		26.56	
	950					33134.7		23188.9		32110.0		22610.0
7650		7.00	9.13	2.13	26.7		21.6		31.04		21.04	
	250					4536.9		4360.3		6760.0		4260.0
7900		8.00	9.13	1.13	9.6		13.3		23.04		13.04	
	400					2303.5		4040.9		7968.0		3968.0
8300		9.00	9.35	0.35	1.9		6.9		16.80		6.80	
TOTAL						378749		220686		293534		215034

FLOOD MITIGATION OPTION A3
LEVEE ROCKHAMPTON AIRPORT

Top Width (m): 4
 Side Slope (1 in H): 4
 Design Criteria: 200 yr ARI + 0.6m freeboard
 Date: 11-09-92

Chainage (m)	Distance (m)	Existing Level (mAHD)	Design Level (mAHD)	Height (m)	Fill Area (m2)	Fill Volume (m3)	Grassed Area (m)	Grassed Area (m2)	Clearing & grubbing (m)	Clearing & grubbing (m2)	Stripping (m)	Stripping (m2)
0		11.00	11.16	0.16	0.7		5.3		15.27		5.27	
	340					125.1		902.6		2596.0		896.0
340		12.00	11.16	0.00	0.0		0.0		0.00		0.00	
	500					13136.8		7512.0		9817.6		7317.6
840		8.00	11.16	3.16	52.5		30.0		39.27		29.27	
	300					22189.9		10560.6		13281.1		10281.1
1140		7.00	11.41	4.41	95.4		40.4		49.27		39.27	
	180					21709.9		8117.5		9696.7		7896.7
1320		6.00	11.56	5.56	145.8		49.8		58.47		48.47	
	280					30149.8		11807.6		14288.5		11488.5
1600		8.00	11.70	3.70	69.5		34.5		43.59		33.59	
	600					43669.8		21170.7		26610.2		20610.2
2200		8.00	11.89	3.89	76.0		36.1		45.11		35.11	
	320					21029.0		10704.8		13623.4		10423.4
2520		9.00	12.25	3.25	55.4		30.8		40.04		30.04	
	650					30248.9		18317.0		24347.7		17847.7
3170		10.00	12.61	2.61	37.7		25.5		34.88		24.88	
	2530					81677.0		59669.4		83490.0		58190.0
5700		10.50	12.64	2.14	26.9		21.6		31.12		21.12	
	650					26207.5		16911.3		22984.0		16484.0
6350		8.00	11.20	3.20	53.8		30.4		39.60		29.60	
	550					27830.4		16214.4		21296.0		15796.0
6900		8.00	10.98	2.98	47.4		28.6		37.84		27.84	
	1250					59302.0		35717.1		47300.0		34800.0
7600		8.00	10.98	2.98	47.4		28.6		37.84		27.84	
TOTAL						377276		217605		289331		212031

FLOOD MITIGATION OPTION A2
LEVEE PORT CURTIS, DEPOT HILL & LOWER CBD

Top Width (m): 4
 Side Slope (1 in H): 4
 Design Criteria: 500 yr ARI + 0.6m freeboard
 Date: 11-09-92

Chainage (m)	Distance (m)	Existing Level (mAHD)	Design Level (mAHD)	Height (m)	Fill Area (m2)	Fill Volume (m3)	Grassed Area (m)	Grassed Area (m2)	Clearing & grubbing (m)	Clearing & grubbing (m2)	Stripping (m)	Stripping (m2)
400		13.00	10.63	0.00	0.0		0.0		0.00		0.00	
	100					1906.4		1283.4		1751.0		1251.0
500		8.00	10.63	2.63	38.1		25.7		35.02		25.02	
	160					11383.7		5426.2		6883.3		5283.3
660		6.00	10.63	4.63	104.2		42.2		51.02		41.02	
	100					10189.7		4169.8		5057.3		4057.3
760		6.00	10.52	4.52	99.6		41.2		50.12		40.12	
	220					21098.2		8900.4		10861.0		8661.0
980		6.00	10.33	4.33	92.2		39.7		48.61		38.61	
	4320					318441.3		152229.4		191400.2		148200.2
5300		6.00	9.25	3.25	55.3		30.8		40.00		30.00	
	1400					77350.0		43120.3		56000.0		42000.0
6700		6.00	9.25	3.25	55.3		30.8		40.00		30.00	
	950					43792.9		26635.8		35454.0		25954.0
7650		7.00	9.58	2.58	36.9		25.3		34.64		24.64	
	250					6656.4		5288.0		7660.0		5160.0
7900		8.00	9.58	1.58	16.3		17.0		26.64		16.64	
	400					4455.0		5558.2		9440.0		5440.0
8300		9.00	9.82	0.82	6.0		10.8		20.56		10.56	
TOTAL						49527.4		252612		324507		246007

FLOOD MITIGATION OPTION A3
LEVEE ROCKHAMPTON AIRPORT

Top Width (m): 4
 Side Slope (1 in H): 4
 Design Criteria: 500 yr ARI + 0.6m freeboard
 Date: 11-09-92

Chainage (m)	Distance (m)	Existing Level (mAHD)	Design Level (mAHD)	Height (m)	Fill Area (m2)	Fill Volume (m3)	Grassed Area (m)	Grassed Area (m2)	Clearing & grubbing (m)	Clearing & grubbing (m2)	Stripping (m)	Stripping (m2)
0		11.00	11.82	0.82	6.0		10.8		20.60		10.60	
	340					1022.7		1835.7		3501.2		1801.2
340		12.00	11.82	0.00	0.0		0.0		0.00		0.00	
	500					18450.4		8884.2		11148.8		8648.8
840		8.00	11.82	3.82	73.8		35.5		44.60		34.60	
	300					29564.6		12207.2		14878.6		11878.6
1140		7.00	12.07	5.07	123.3		45.8		54.60		44.60	
	180					27284.9		9105.5		10655.1		8855.1
1320		6.00	12.22	6.22	179.9		55.3		63.80		53.80	
	280					38292.8		13344.4		15779.5		12979.5
1600		8.00	12.36	4.36	93.6		40.0		48.92		38.92	
	600					58451.2		24463.9		29805.1		23805.1
2200		8.00	12.55	4.55	101.2		41.6		50.44		40.44	
	320					28218.5		12387.2		15255.6		12055.6
2520		9.00	12.86	3.86	75.2		35.9		44.91		34.91	
	650					42389.1		21665.7		27596.4		21096.4
3170		10.00	13.25	3.25	55.3		30.8		40.00		30.00	
	2530					123396.2		73126.0		96544.8		71244.8
5700		10.50	13.29	2.79	42.3		27.0		36.32		26.32	
	650					36902.6		20127.3		26104.0		19604.0
6350		8.00	11.75	3.75	71.3		34.9		44.00		34.00	
	550					37183.7		18708.9		23716.0		18216.0
6900		8.00	11.53	3.53	64.0		33.1		42.24		32.24	
	1250					79954.5		41386.4		52800.0		40300.0
7600		8.00	11.53	3.53	64.0		33.1		42.24		32.24	
TOTAL						521111		257242		327785		250485

**FLOOD MITIGATION OPTION A3
LEVEE ROCKHAMPTON AIRPORT**

Top Width (m): 4
Side Slope (1 in H): 4
Design Criteria: 1000yr ARI + 0.6m freeboard
Date: 11-09-92

Chainage (m)	Distance (m)	Existing Level (mAHD)	Design Level (mAHD)	Height (m)	Fill Area (m2)	Fill Volume (m3)	Grassed Area (m)	Grassed Area (m2)	Clearing & grubbing (m)	Clearing & grubbing (m2)	Stripping (m)	Stripping (m2)
0		11.00	11.83	0.83	6.1		10.8	1843.5	20.64		10.64	
340	340	12.00	11.83	0.00	0.0	1032.9	0.0	18498.9	0.00	3508.8	0.00	1808.8
840	500	8.00	11.83	3.83	74.0	29967.5	35.6	12282.9	44.64	11160.0	34.64	8660.0
1140	300	7.00	12.13	5.13	125.8	27926.3	46.3	9210.3	55.04	14952.0	45.04	11952.0
1320	180	6.00	12.31	6.31	184.5	39578.8	56.0	13576.7	64.48	10756.8	54.48	8956.8
1600	280	8.00	12.48	4.48	98.2	61359.4	40.9	25060.6	49.84	16004.8	39.84	13204.8
2200	600	8.00	12.68	4.68	106.3	30691.1	42.6	12930.2	51.44	30384.0	41.44	24384.0
2520	320	9.00	13.15	4.15	85.5	48467.8	38.2	23155.7	47.20	15782.4	37.20	12582.4
3170	650	10.00	13.52	3.52	63.6	141937.0	33.0	78341.7	42.16	29042.0	32.16	22542.0
5700	2530	10.50	13.52	3.02	48.6	43325.5	28.9	21762.1	38.16	101604.8	28.16	76304.8
6350	650	8.00	12.13	4.13	84.7	43845.3	38.1	20296.3	47.04	27690.0	37.04	21190.0
6900	550	8.00	11.85	3.85	74.7	93362.5	35.7	44684.9	44.80	25256.0	34.80	19756.0
7600	1250	8.00	11.85	3.85	74.7		35.7		44.80	56000.0	34.80	43500.0
TOTAL						579993		272041		342142		264842

**FLOOD MITIGATION OPTION A5
LEVEE SPLITTERS CREEK**

Top Width (m): 4
Side Slope (1 in H): 4
Design Criteria: 1000yr ARI + 0.6m freeboard
Date: 11-09-92

Chainage (m)	Distance (m)	Existing Level (mAHD)	Design Level (mAHD)	Height (m)	Fill Area (m2)	Fill Volume (m3)	Grassed Area (m)	Grassed Area (m2)	Clearing & grubbing (m)	Clearing & grubbing (m2)	Stripping (m)	Stripping (m2)
0		17.80	10.43	0.00	0.0		0.0	0.0	0.00		0.00	
160	160	13.20	10.43	0.00	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.0
480	320	11.47	9.99	0.00	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.0
830	350	10.70	10.59	0.00	0.0	170.6	0.0	820.8	0.00	2162.4	0.00	812.4
1100	270	10.80	11.05	0.25	1.3	1511.4	6.1	2830.8	16.02	5782.2	6.02	2782.2
1400	300	10.50	11.57	1.07	8.8	6341.0	12.8	5193.5	22.53	7770.6	12.53	5070.6
1670	270	9.40	12.03	2.63	38.2	6456.5	25.7	5085.2	35.03	7362.1	25.03	4962.1
1910	240	10.90	12.44	1.54	15.6	3871.8	16.7	4240.3	26.32	6744.7	16.32	4144.7
2170	260	10.90	12.35	1.45	14.1	2308.3	15.9	3164.2	25.56	5599.6	15.56	3099.6
2420	250	11.60	12.25	0.65	4.3	1432.3	9.4	2564.2	19.23	4916.3	9.23	2516.3
2660	240	11.20	12.17	0.97	7.6	1912.6	12.0	2864.0	21.73	5105.9	11.73	2805.9
2890	230	11.00	12.08	1.08	9.0	2874.7	12.9	3511.8	22.66	5835.6	12.66	3435.6
3130	240	10.50	12.00	1.50	14.9	4810.3	16.3	4031.3	25.97	5934.8	15.97	3934.8
3330	200	9.50	11.92	2.42	33.2	6938.2	24.0	4900.7	33.38	6778.3	23.38	4778.3
3530	200	9.30	11.85	2.55	36.2		25.0		34.40		24.40	
TOTAL						38628		39207		63992		38342

FLOOD MITIGATION OPTION B4 + B1
RAISE ROAD/RAIL TO BRIDGE LEVEL + BRIDGE DUPLICATION

SEPTEMBER 1992

COST ESTIMATE

ITEM DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
A. BRUCE HIGHWAY				
1.0 TRAFFIC CONTROL AND DIVERSION WORKS	Item			550000
2.0 SCARIFY EXISTING PAVEMENT	m2	27250	2.00	54500
3.0 EMBANKMENT	m3	33750	8.00	270000
4.0 PAVEMENT 10m WIDE				
4.1 Subbase 100mm thick	m2	27250	4.25	115813
4.2 Base 300mm thick	m2	27250	13.50	367875
4.3 Two coat seal	m2	27250	5.50	149875
5.0 ROAD FURNITURE INCL. LINEMARKING (PROV.)	Item			30000
6.0 LANDSCAPING (PROV.)	Item			20000
7.0 BULK EXCAVATION	m3	22000	6.00	132000
8.0 DUPLICATE BRIDGES	m	420	10000.00	4200000
9.0 RECONSTRUCT ROUNDABOUT AND REGRADE PART CAPRICORN HWY (PROV.)	Item			400000
B. NORTH COAST RAILWAY				
1.0 PROVISION FOR RAIL DIVERSION/ DISRUPTION	Item			500000
2.0 EARTHWORKS TO FORMATION LEVELS	m3	22600	8.00	180800
3.0 BALLAST				
3.1 Remove and stockpile	m3	3320	4.00	13280
3.2 Place stockpiled material	m3	2820	6.00	16920
3.3 Place new material (Provisional)	m3	500	45.00	22500
4.0 SLEEPERS AND RAIL TRACK	m	2730	215.00	586950
5.0 REGRADE RAIL (PROV.)	m	200	100	20000
6.0 ELECTRIFICATION MODIFICATION				
6.1 Raise overhead masts > 600mm	m	2730	30.00	81900
7.0 BULK EXCAVATION	m3	14000	6.00	84000
8.0 DUPLICATE BRIDGES	m	420	10000.00	4200000
9.0 STRENGTHEN PIERS AT YEPPEN2 AND YEPPEN3 BRIDGES	No.	15	30000.00	450000
SUBTOTAL				12446413
PRELIMINARIES 10%				1244641
ENGINEERING 10%				1244641
SUBTOTAL				14935695
CONTINGENCY 10%				1493570
TOTAL				16429265

FLOOD MITIGATION OPTION B4 + B6
 RAISE ROAD/RAIL TO BRIDGE LEVEL + LOWERING WATERWAY INVERT
 SEPTEMBER 1992

COST ESTIMATE

ITEM DESCRIPTION	UNIT	QTY.	RATE	AMOUNT
A. BRUCE HIGHWAY				
1.0 TRAFFIC CONTROL AND DIVERSION WORKS	Item			550000
2.0 SCARIFY EXISTING PAVEMENT	m2	27250	2.00	54500
3.0 EMBANKMENT	m3	33750	8.00	270000
4.0 PAVEMENT 10m WIDE				
4.1 Subbase 100mm thick	m2	27250	4.25	115813
4.2 Base 300mm thick	m2	27250	13.50	367875
4.3 Two coat seal	m2	27250	5.50	149875
5.0 ROAD FURNITURE INCL LINEMARKING (PROV.)	Item			30000
6.0 LANDSCAPING (PROV.)	Item			20000
7.0 BULK EXCAVATION	m3	66000	6.00	396000
8.0 SCOUR PROTECTION (PROV.)	m2	33000	50.00	1650000
9.0 RECONSTRUCT ROUNDABOUT AND REGRADE PART CAPRICORN HWY (PROV.)	Item			400000
B. NORTH COAST RAILWAY				
1.0 PROVISION FOR RAIL DIVERSION/ DISRUPTION	Item			500000
2.0 EARTHWORKS TO FORMATION LEVELS	m3	22600	8.00	180800
3.0 BALLAST				
3.1 Remove and stockpile	m3	3320	4.00	13280
3.2 Place stockpiled material	m3	2820	6.00	16920
3.3 Place new material (Provisional)	m3	500	45.00	22500
4.0 SLEEPERS AND RAIL TRACK	m	2730	215.00	586950
5.0 REGRADE RAIL (PROV.)	m	200	100	20000
8.0 ELECTRIFICATION MODIFICATION				
8.1 Raise overhead masts > 600mm	m	2730	30.00	81900
9.0 BULK EXCAVATION	m3	66000	6.00	396000
10.0 SCOUR PROTECTION (PROV.)	m2	33000	50.00	1650000
11.0 STRENGTHEN PIERS	No.	40	50000.00	2000000
12.0 DRAINAGE OPEN CHANNEL	m	3000	115.00	345000
SUBTOTAL				9817413
PRELIMINARIES 10%				981741
ENGINEERING 10%				981741
SUBTOTAL				11780895
CONTINGENCY 10%				1178090
TOTAL				12958985

TABLE 9-10

Flood Mitigation by Location - Residential (as revised in Phase 2)
(Values in Thousands of Dollars)

Location No	South of River										North of River					TOTAL
	10	11	12	13	14	15	16	17	18	20	21	22	23	24	25	
Location	Crescent Lagoon	Gladstone Road	Port Curtis	Central CBD	Lower CBD	Depot Hill	D/S Barrage	Pink Lily	U/S Barrage	D/S Barrage	D/S Barrage-Watercourse	Splitlers Creek	Moore's Creek	Lakes Ck Road	Lakes Ck Road	
Mean Annual Direct Damage - existing conditions	6.5	5.0	12.1	7.6	32.1	6.5	3.8	10.0	0.3	3.2	2.6	16.8	5.3	14.8	3.0	129
Mean Annual Direct Damage - with flood mitigation																
a) Levees to																
7.84 m AHD (2% AEP)	6.2	3.6	7.0	7.1	24.6	6.0	3.5	4.1	0.3	2.2	1.7	9.0	4.1	14.4	2.8	96.5
8.21 m AHD (1% AEP)	5.6	2.6	5.3	6.7	20.0	4.9	3.1	2.6	0.3	1.6	1.2	6.5	3.6	11.9	2.5	78.5
8.59 m AHD (0.5% AEP)	4.3	2.0	3.7	5.9	14.3	3.5	2.5	1.6	0.3	1.1	1.0	4.7	2.9	9.4	2.2	59.5
9.04 m AHD (0.2% AEP)	2.6	1.3	1.8	4.4	7.7	2.0	1.6	0.8	0.3	0.7	0.7	2.9	1.9	6.8	1.5	37
9.23 m AHD (0.1% AEP)	1.8	1.0	1.0	3.6	4.9	1.3	1.1	0.5	0.3	0.5	0.6	2.1	1.4	5.4	1.2	26.5
Raise all unraised houses by																
2 m	2.0	4.7	11.3	5.6	24.8	6.1	1.5	2.3	0.1	1.1	0.6	4.9	3.3	5.1	0.7	74.3
3 m	1.7	4.6	11.3	5.5	24.4	6.0	1.3	1.6	0.1	1.0	0.5	3.8	3.1	4.5	0.5	70
Raise all houses (including those already raised) by																
1 m	3.1	4.8	9.2	5.5	25.8	6.1	2.0	6.0	0.2	1.6	1.4	10.1	3.7	8.3	1.5	89.3
2 m	1.0	3.0	4.9	3.0	14.1	3.9	0.8	1.8	0.1	0.3	0.5	2.9	1.7	3.5	0.6	42.1
Clear all houses floor level below level of																
2% AEP (number)	5.8	1.5	45	6.5	19.0	5.0	3.0	0.9	0.3	1.3	0.7	5.0	3.1	10.0	2.5	69.4
1% AEP (number)	3.6	1.4	1.8	5.7	9.4	2.1	2.1	0.6	0.3	0.6	0.7	2.7	2.3	6.7	2.0	42.1
	(20)	(10)	(32)	(10)	(100)	(25)	(8)	(16)	(0)	(9)	(4)	(32)	(12)	(48)	(5)	(331)

TABLE 9-11

Flood Mitigation by Location - Commercial (as revised in Phase 2)
(Values in Thousands of Dollars)

Location No	South of River										North of River					TOTAL
	10	11	12	13	14	15	16	17	18	20	21	22	23	24	25	
Location	Crescent Lagoon	Gladstone Road	Port Curtis	Central CBD	Lower CBD	Depot Hill	D/S Barrage	Pink Lily	U/S Barrage	D/S Barrage	D/S Barrage-Watercourse	Splitlers Creek	Moore's Creek	Lakes Ck Road	Lakes Ck Road	
Mean Annual Direct Damage - existing conditions	40.7	233	30.4	84.3	138.4	21.7	7.4	1.5	2.3	13.2	0.1	13.1	27.8	15.1	5.1	634
Mean Annual Direct Damage - with flood mitigation																
a) Levees to																
7.84 m AHD (2% AEP)	38.6	95.6	25.1	81.0	108.5	14.9	2.0	1.0	2.3	9.6	0.1	7.5	15.1	14.4	5.1	421
8.21 m AHD (1% AEP)	34.5	61.8	21.2	72.3	92.6	9.3	1.1	0.7	2.3	7.6	0.1	6.4	9.2	12.6	4.9	336
8.59 m AHD (0.5% AEP)	27.5	37.1	45.3	59.3	72.5	5.1	0.6	0.4	2.0	4.6	0.1	4.0	7.1	10.3	4.2	250
9.04 m AHD (0.2% AEP)	19.0	17.7	7.7	44.5	48.9	2.5	0.2	0.2	1.6	1.8	0.1	2.4	3.6	7.6	2.9	161
9.23 m AHD (0.1% AEP)	13.0	12.5	6.2	38.4	39.8	1.6	0.1	0.1	1.4	1.4	0.1	1.6	2.1	5.6	2.4	126
Clear all properties floor level below level of																
2% AEP (number)	30.0 (52)	11.0 (69)	18.2 (8)	46.1 (10)	64.3 (21)	0.14 (3)	0.2 (1)	0 (1)	2.3 (0)	0 (3)	0.1 (0)	1.8 (1)	2.1 (3)	9.2 (2)	5.1 (0)	191 (64)
1% AEP (number)	20.3 (7)	5.6 (15)	0.2 (9)	41.2 (23)	35.1 (48)	0.14 (3)	0 (2)	0 (1)	1.2 (1)	0 (3)	0.1 (0)	1.2 (2)	1.5 (4)	7.6 (17)	3.1 (4)	117 (139)

APPENDIX J

APPENDIX J
HYDRAULIC MODEL STUDY.
SUMMARY OF RESULTS FOR FLOOD MITIGATION OPTIONS

TABLE J-1

**Summary of Peak Flood Levels for Flood Mitigation Options
Option A1 - Levee Depot Hill - Lower CBD (not Port Curtis)**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.90	0.00
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.85	0.01
	near Water Treatment Works	144.78	10.86	11.32	10.87	0.01	11.33	0.01
	Barrage	149.27	9.49	9.91	9.51	0.02	9.92	0.01
	d/s Barrage	149.47	9.17	9.60	9.18	0.01	9.62	0.02
		150.17	8.55	8.96	8.58	0.03	8.99	0.03
	Railway Bridge	150.67	8.35	8.74	8.38	0.03	8.77	0.03
	Fitzroy Street Bridge	151.57	8.03	8.40	8.06	0.03	8.44	0.04
	City Flood Gauge	152.57	7.84	8.21	7.87	0.03	8.25	0.04
	Gavial Creek	154.27	7.58	7.94	7.62	0.04	7.98	0.04
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.85	0.01
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.04	0.00	11.41	0.00
	Lotus Lagoon	4.56	10.99	11.38	11.00	0.01	11.38	0.00
	Nine Mile Road	6.63	10.55	10.95	10.55	0.00	10.96	0.01
	Start FP SCRUBBY	11.0	9.43	9.89	9.44	0.01	9.90	0.01
	Junction with AP-STH	13.0	9.15	9.60	9.15	0.00	9.61	0.01
	u/s Yeppen Crossing	13.6	8.64	9.00	8.64	0.00	9.01	0.01
	d/s Bruce Highway	13.84	8.39	8.71	8.39	0.00	8.72	0.01
	d/s Yeppen Crossing	14.0	8.10	8.36	8.10	0.00	8.37	0.01
	Old Burnett Highway	15.15	7.96	8.22	7.96	0.00	8.23	0.01
	Old Bruce Highway	16.98	7.18	7.47	7.16	-0.02	7.46	-0.01
	J/w FP GAVIAL	19.04	7.08	7.38	7.06	-0.02	7.37	-0.01
FP SCRUBBY	Start	0	9.43	9.89	9.44	0.01	9.90	0.01
	d/s Capricorn Highway	1.3	9.00	9.46	9.00	0.00	9.47	0.01
	u/s Bruce Highway	4.0	8.63	8.99	8.63	0.00	9.00	0.01
	d/s Railway	4.3	8.10	8.37	8.10	0.00	8.38	0.01
	J/w FP MAIN	5.15	7.96	8.22	7.96	0.00	8.23	0.01
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.64	0.00	9.01	0.05
	Port Curtis Junction	0.91	8.37	8.76	8.47	0.10	8.78	0.02
	Depot Hill	2.1	7.67	8.19	7.75	0.08	8.28	0.09
	Gavial Creek	4.2	7.56	7.91	7.60	0.04	7.96	0.05
FP LION	J/w FP MAIN	0	10.55	10.95	10.55	0.00	10.96	0.01
	J/w AP STH	2.2	10.43	10.90	10.44	0.01	10.91	0.01
	J/w AP NTH	3.35	10.25	10.86	10.25	0.00	10.87	0.01
	Fitzroy River	5.3	9.49	9.91	9.51	0.02	9.92	0.01
Airport North	J/w FP LION	0	10.25	10.86	10.25	0.00	10.87	0.01
	New Terminal	1.54	9.61	10.15	9.62	0.01	10.15	0.00
	J/w AP STH	2.6	9.16	9.61	9.16	0.00	9.62	0.01
Airport South	J/w FP LION	0	10.43	10.90	10.44	0.01	10.91	0.01
	Opposite Terminal	1.3	9.61	10.15	9.62	0.01	10.16	0.01
	J/w AP NTH	2.3	9.16	9.61	9.16	0.00	9.62	0.01
	J/w FP MAIN	3.0	9.15	9.60	9.15	0.00	9.61	0.01
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.06	0.03	8.44	0.04
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.04	0.03	8.42	0.03
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.28	0.02	7.64	0.03
	J/w Fitzroy River	2.93	7.21	7.54	7.24	0.03	7.57	0.03
Gavial Creek	Fitzroy River	0	7.58	7.94	7.62	0.04	7.98	0.04
	J/w FP CURTIS	1.03	7.56	7.92	7.60	0.04	7.96	0.04
	J/w FP MAIN	4.21	7.08	7.38	7.06	-0.02	7.36	-0.02
	Edinda Lane	6.06	6.43	6.65	6.42	-0.01	6.65	0.00
Splitters Creek		1.1	9.51	9.92	9.52	0.01	9.94	0.02
		2.1	9.50	9.91	9.51	0.01	9.93	0.02
Yeppen	Yeppen bridges m ³ /s		2495	2650	2505	10	2650	0
	overflow m ³ /s		1415	2605	1460	45	2625	20
	Time of Submergence days		11.6	12.67	11.1	-0.50	12.67	0

TABLE J-2

**Summary of Peak Flood Levels for Flood Mitigation Options
Option A2 - Levee Port Curtis - Depot Hill - CBD**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.90	0.00
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.84	0.00
	near Water Treatment Works	144.78	10.86	11.32	10.86	0.00	11.32	0.00
	Barrage	149.27	9.49	9.91	9.48	-0.01	9.87	-0.04
	d/s Barrage	149.47	9.17	9.60	9.15	-0.02	9.56	-0.04
		150.17	8.55	8.96	8.53	-0.02	8.90	-0.06
	Railway Bridge	150.67	8.35	8.74	8.33	-0.02	8.67	-0.07
	Fitzroy Street Bridge	151.57	8.03	8.40	7.99	-0.04	8.32	-0.08
	City Flood Gauge	152.57	7.84	8.21	7.80	-0.04	8.12	-0.09
	Gavial Creek	154.27	7.58	7.94	7.54	-0.04	7.83	-0.11
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.84	0.00
	Rockhampton-Ridgetands Road	1.75	11.04	11.41	11.05	0.01	11.42	0.01
	Lotus Lagoon	4.56	10.99	11.38	11.00	0.01	11.39	0.01
	Nine Mile Road	6.63	10.55	10.95	10.57	0.02	11.09	0.14
	Start FP SCRUBBY	11.0	9.43	9.89	9.56	0.13	10.08	0.19
	Junction with AP-STH	13.0	9.15	9.60	9.33	0.18	9.85	0.25
	u/s Yeppen Crossing	13.6	8.64	9.00	8.94	0.30	9.42	0.42
	d/s Bruce Highway	13.84	8.39	8.71	8.83	0.44	9.35	0.64
	d/s Yeppen Crossing	14.0	8.10	8.36	8.71	0.61	9.26	0.90
	Old Burnett Highway	15.15	7.96	8.22	8.53	0.57	9.04	0.82
	Old Bruce Highway	16.98	7.18	7.47	7.33	0.15	7.67	0.20
	J/w FP GAVIAL	19.04	7.08	7.38	7.10	0.02	7.43	0.05
FP SCRUBBY	Start	0	9.43	9.89	9.56	0.13	10.08	0.19
	d/s Capricorn Highway	1.3	9.00	9.46	9.23	0.23	9.77	0.31
	u/s Bruce Highway	4.0	8.63	8.99	8.93	0.30	9.41	0.42
	d/s Railway	4.3	8.10	8.37	8.71	0.61	9.26	0.89
	J/w FP MAIN	5.15	7.96	8.22	8.53	0.57	9.04	0.82
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96				
	Port Curtis Junction	0.91	8.37	8.76				
	Depot Hill	2.1	7.67	8.19				
	Gavial Creek	4.2	7.56	7.91				
FP LION	J/w FP MAIN	0	10.55	10.95	10.56	0.01	11.00	0.05
	J/w AP STH	2.2	10.43	10.90	10.44	0.01	10.95	0.05
	J/w AP NTH	3.35	10.25	10.86	10.25	0.00	10.90	0.04
	Fitzroy River	5.3	9.49	9.91	9.47	-0.02	9.87	-0.04
Airport North	J/w FP LION	0	10.25	10.86	10.25	0.00	10.90	0.04
	New Terminal	1.54	9.61	10.15	9.68	0.07	10.29	0.14
	J/w AP STH	2.6	9.16	9.61	9.28	0.12	9.86	0.25
Airport South	J/w FP LION	0	10.43	10.90	10.44	0.01	10.95	0.05
	Opposite Terminal	1.3	9.61	10.15	9.68	0.07	10.29	0.14
	J/w AP NTH	2.3	9.16	9.61	9.28	0.12	9.86	0.25
	J/w FP MAIN	3.0	9.15	9.60	9.27	0.12	9.85	0.25
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	7.99	-0.04	8.32	-0.08
	Lakes Creek Road (STW)	1.0	8.01	8.39	7.98	-0.03	8.31	-0.08
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.23	-0.03	7.52	-0.09
	J/w Fitzroy River	2.93	7.21	7.54	7.18	-0.03	7.46	-0.08
Gavial Creek	Fitzroy River	0	7.58	7.94	7.54	-0.04	7.83	-0.11
	J/w FP CURTIS	1.03	7.56	7.92	7.452	-0.10	7.81	-0.11
	J/w FP MAIN	4.21	7.08	7.38	7.10	0.02	7.43	0.05
	Edinda Lane	6.06	6.43	6.65	6.44	0.01	6.68	0.03
Yeppen	Time of Submergence days		11.6	12.67	11.05	-0.55	12.25	-0.42

TABLE J-3

Summary of Peak Flood Levels for Flood Mitigation Options
Option A3 - Levees to existing airport

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.28	0.02	12.72	0.03
	start of FP2	139.2	11.48	11.90	11.50	0.02	11.96	0.06
	start of FP Main	140.1	11.42	11.84	11.45	0.03	11.90	0.06
	near Water Treatment Works	144.78	10.86	11.32	10.89	0.03	11.39	0.07
	Barrage	149.27	9.49	9.91	9.53	0.04	9.98	0.07
	d/s Barrage	149.47	9.17	9.60	9.20	0.03	9.67	0.07
		150.17	8.55	8.96	8.58	0.03	9.01	0.05
	Railway Bridge	150.67	8.35	8.74	8.38	0.03	8.79	0.05
	Fitzroy Street Bridge	151.57	8.03	8.40	8.04	0.01	8.43	0.03
	City Flood Gauge	152.57	7.84	8.21	7.85	0.01	8.23	0.02
	Gavial Creek	154.27	7.58	7.94	7.59	0.01	7.95	0.01
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.45	0.03	11.90	0.06
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.09	0.05	11.52	0.11
	Lotus Lagoon	4.56	10.99	11.38	11.05	0.06	11.49	0.11
	Nine Mile Road	6.63	10.55	10.95	10.66	0.11	11.14	0.19
	Start FP SCRUBBY	11.0	9.43	9.89	9.45	0.02	9.88	-0.01
	Junction with AP-STH	13.0	9.15	9.60	9.05	-0.10	9.45	-0.15
	u/s Yeppen Crossing	13.6	8.64	9.00	8.60	-0.04	8.92	-0.08
	d/s Bruce Highway	13.84	8.39	8.71	8.36	-0.03	8.65	-0.06
	d/s Yeppen Crossing	14.0	8.10	8.36	8.07	-0.03	8.32	-0.04
	Old Burnett Highway	15.15	7.96	8.22	8.94	0.98	8.18	-0.04
	Old Bruce Highway	16.98	7.18	7.47	7.17	-0.01	7.46	-0.01
	J/w FP GAVIAL	19.04	7.08	7.38	7.08	0.00	7.37	-0.01
		0	9.43	9.89	9.45	0.02	9.88	-0.01
FP SCRUBBY	Start	0	9.43	9.89	9.45	0.02	9.88	-0.01
	d/s Capricorn Highway	1.3	9.00	9.46	8.99	-0.01	9.43	-0.03
	u/s Bruce Highway	4.0	8.63	8.99	8.59	-0.04	8.93	-0.06
	d/s Railway	4.3	8.10	8.37	8.08	-0.02	8.33	-0.04
	J/w FP MAIN	5.15	7.96	8.22	7.94	-0.02	8.18	-0.04
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.60	-0.04	8.93	-0.03
	Port Curtis Junction	0.91	8.37	8.76	8.51	0.14	8.70	-0.06
	Depot Hill	2.1	7.67	8.19	7.66	-0.01	8.17	-0.02
	Gavial Creek	4.2	7.56	7.91	7.57	0.01	7.93	0.02
FP LION	J/w FP MAIN	0	10.55	10.95	10.66	0.11	11.14	0.19
	J/w AP STH	2.2	10.43	10.90	10.72	0.29	11.45	0.55
	J/w AP NTH	3.35	10.25	10.86	10.62	0.37	11.44	0.58
	Fitzroy River	5.3	9.49	9.91	9.53	0.04	9.98	0.07
Airport North	J/w FP LION	0	10.25	10.86				
	New Terminal	1.54	9.61	10.15				
	J/w AP STH	2.6	9.16	9.61				
Airport South	J/w FP LION	0	10.43	10.90				
	Opposite Terminal	1.3	9.61	10.15				
	J/w AP NTH	2.3	9.16	9.61				
	J/w FP MAIN	3.0	9.15	9.60				
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.04	0.01	8.43	0.03
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.03	0.02	8.42	0.03
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.26	0.00	7.62	0.01
	J/w Fitzroy River	2.93	7.21	7.54	7.22	0.01	7.55	0.01
Gavial Creek	Fitzroy River	0	7.58	7.94	7.59	0.01	7.95	0.01
	J/w FP CURTIS	1.03	7.56	7.92	7.57	0.01	7.93	0.01
	J/w FP MAIN	4.21	7.08	7.38	7.08	0.00	7.37	-0.01
	Edinda Lane	6.06	6.43	6.65	6.43	0.00	6.65	0.00
Splitters Creek		1.1	9.51	9.92			10.00	
		2.1	9.50	9.91			9.99	
Floodplain Flows	Yeppen m³/s		3910	5255	3880	-30	4537	-718
	Lion Creek m³/s		247	356	336	89	560	204

TABLE J-4

**Summary of Peak Flood Levels for Flood Mitigation Options
Option A4 - Airport Levees and extended runway**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.28	0.00	12.73	0.04
	start of FP2	139.2	11.48	11.90	11.50	0.02	11.96	0.06
	start of FP Main	140.1	11.42	11.84	11.45	0.03	11.90	0.06
	near Water Treatment Works	144.78	10.86	11.32	10.89	0.03	11.39	0.07
	Barrage	149.27	9.49	9.91	9.53	0.04	9.98	0.07
	d/s Barrage	149.47	9.17	9.60	9.20	0.03	9.68	0.08
		150.17	8.55	8.96	8.58	0.03	9.01	0.05
	Railway Bridge	150.67	8.35	8.74	8.38	0.03	8.79	0.05
	Fitzroy Street Bridge	151.57	8.03	8.40	8.04	0.01	8.44	0.04
	City Flood Gauge	152.57	7.84	8.21	7.85	0.01	8.23	0.02
	Gavial Creek	154.27	7.58	7.94	7.59	0.01	7.95	0.01
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.45	0.03	11.90	0.06
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.09	0.05	11.52	0.11
	Lotus Lagoon	4.56	10.99	11.38	11.05	0.06	11.49	0.11
	Nine Mile Road	6.63	10.55	10.95	10.66	0.11	11.14	0.19
	Start FP SCRUBBY	11.0	9.43	9.89	9.45	0.02	9.88	-0.01
	Junction with AP-STH	13.0	9.15	9.60	9.05	-0.10	9.45	-0.15
	u/s Yeppen Crossing	13.6	8.64	9.00	8.60	-0.04	8.93	-0.07
	d/s Bruce Highway	13.84	8.39	8.71	8.36	-0.03	8.65	-0.06
	d/s Yeppen Crossing	14.0	8.10	8.36	8.07	-0.03	8.31	-0.05
	Old Burnett Highway	15.15	7.96	8.22	7.94	-0.02	8.18	-0.04
	Old Bruce Highway	16.98	7.18	7.47	7.17	-0.01	7.46	-0.01
	J/w FP GAVIAL	19.04	7.08	7.38	7.08	0.00	7.37	-0.01
FP SCRUBBY	Start	0	9.43	9.89	9.45	0.02	9.88	-0.01
	d/s Capricorn Highway	1.3	9.00	9.46	8.99	-0.01	9.43	-0.03
	u/s Bruce Highway	4.0	8.63	8.99	8.59	-0.04	8.93	-0.06
	d/s Railway	4.3	8.10	8.37	8.08	-0.02	8.32	-0.05
	J/w FP MAIN	5.15	7.96	8.22	7.94	-0.02	8.18	-0.04
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.60	-0.04	8.93	-0.03
	Port Curtis Junction	0.91	8.37	8.76	8.51	0.14	8.70	-0.06
	Depot Hill	2.1	7.67	8.19	7.66	-0.01	8.16	-0.03
	Gavial Creek	4.2	7.56	7.91	7.57	0.01	7.93	0.02
FP LION	J/w FP MAIN	0	10.55	10.95	10.66	0.11	11.14	0.19
	J/w AP STH	2.2	10.43	10.90	10.72	0.29	11.45	0.55
	J/w AP NTH	3.35	10.25	10.86	10.62	0.37	11.44	0.58
	Fitzroy River	5.3	9.49	9.91	9.53	0.04	9.98	0.07
Airport North	J/w FP LION	0	10.25	10.86				
	New Terminal	1.54	9.61	10.15				
	J/w AP STH	2.6	9.16	9.61				
Airport South	J/w FP LION	0	10.43	10.90				
	Opposite Terminal	1.3	9.61	10.15				
	J/w AP NTH	2.3	9.16	9.61				
	J/w FP MAIN	3.0	9.15	9.60				
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.04	0.01	8.44	0.04
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.03	0.02	8.42	0.03
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.26	0.00	7.62	0.01
	J/w Fitzroy River	2.93	7.21	7.54	7.22	0.01	7.55	0.01
Gavial Creek	Fitzroy River	0	7.58	7.94	7.59	0.01	7.95	0.01
	J/w FP CURTIS	1.03	7.56	7.92	7.57	0.01	7.93	0.01
	J/w FP MAIN	4.21	7.08	7.38	7.08	0.00	7.37	-0.01
	Edinda Lane	6.06	6.43	6.65	6.43	0.00	6.65	0.00
Splitters Creek		1.1	9.51	9.92	9.55	0.04	10.00	0.08
		2.1	9.50	9.91	9.54	0.04	9.99	0.08

TABLE J-5

**Summary of Peak Flood Levels for Flood Mitigation Options
Option A5 - Splitters Creek Levee**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.90	0.00
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.85	0.01
	near Water Treatment Works	144.78	10.86	11.32	10.87	0.01	11.33	0.01
	Barrage	149.27	9.49	9.91	9.49	0.00	9.90	-0.01
	d/s Barrage	149.47	9.17	9.60	9.16	-0.01	9.60	0.00
		150.17	8.55	8.96	8.55	0.00	8.96	0.00
	Railway Bridge	150.67	8.35	8.74	8.35	0.00	8.74	0.00
	Fitzroy Street Bridge	151.57	8.03	8.40	8.02	-0.01	8.40	0.00
	City Flood Gauge	152.57	7.84	8.21	7.84	0.00	8.21	0.00
	Gavial Creek	154.27	7.58	7.94	7.58	0.00	7.94	0.00
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.85	0.01
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.04	0.00	11.41	0.00
	Lotus Lagoon	4.56	10.99	11.38	11.00	0.01	11.38	0.00
	Nine Mile Road	6.63	10.55	10.95	10.55	0.00	10.96	0.01
	Start FP SCRUBBY	11.0	9.43	9.89	9.44	0.01	9.89	0.00
	Junction with AP-STH	13.0	9.15	9.60	9.15	0.00	9.60	0.00
	u/s Yeppen Crossing	13.6	8.64	9.00	8.64	0.00	9.00	0.00
	d/s Bruce Highway	13.84	8.39	8.71	8.39	0.00	8.71	0.00
	d/s Yeppen Crossing	14.0	8.10	8.36	8.10	0.00	8.36	0.00
	Old Burnett Highway	15.15	7.96	8.22	7.96	0.00	8.22	0.00
	Old Bruce Highway	16.98	7.18	7.47	7.18	0.00	7.47	0.00
	J/w FP GAVIAL	19.04	7.08	7.38	7.08	0.00	7.38	0.00
FP SCRUBBY	Start	0	9.43	9.89	9.44	0.01	9.89	0.00
	d/s Capricorn Highway	1.3	9.00	9.46	9.00	0.00	9.47	0.01
	u/s Bruce Highway	4.0	8.63	8.99	8.63	0.00	8.99	0.00
	d/s Railway	4.3	8.10	8.37	8.10	0.00	8.37	0.00
	J/w FP MAIN	5.15	7.96	8.22	7.96	0.00	8.22	0.00
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.64	0.00	9.00	0.04
	Port Curtis Junction	0.91	8.37	8.76	8.44	0.07	8.76	0.00
	Depot Hill	2.1	7.67	8.19	7.67	0.00	8.19	0.00
	Gavial Creek	4.2	7.56	7.91	7.56	0.00	7.92	0.01
FP LION	J/w FP MAIN	0	10.55	10.95	10.55	0.00	10.96	0.01
	J/w AP STH	2.2	10.43	10.90	10.44	0.01	10.90	0.00
	J/w AP NTH	3.35	10.25	10.86	10.25	0.00	10.86	0.00
	Fitzroy River	5.3	9.49	9.91	9.49	0.00	9.90	-0.01
Airport North	J/w FP LION	0	10.25	10.86	10.25	0.00	10.86	0.00
	New Terminal	1.54	9.61	10.15	9.62	0.01	10.15	0.00
	J/w AP STH	2.6	9.16	9.61	9.16	0.00	9.61	0.00
Airport South	J/w FP LION	0	10.43	10.90	10.44	0.01	10.90	0.00
	Opposite Terminal	1.3	9.61	10.15	9.62	0.01	10.15	0.00
	J/w AP NTH	2.3	9.16	9.61	9.16	0.00	9.61	0.00
	J/w FP MAIN	3.0	9.15	9.60	9.15	0.00	9.60	0.00
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.02	-0.01	8.40	0.00
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.01	0.00	8.39	0.00
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.26	0.00	7.60	-0.01
	J/w Fitzroy River	2.93	7.21	7.54	7.21	0.00	7.54	0.00
Gavial Creek	Fitzroy River	0	7.58	7.94	7.58	0.00	7.94	0.00
	J/w FP CURTIS	1.03	7.56	7.92	7.56	0.00	7.92	0.00
	J/w FP MAIN	4.21	7.08	7.38	7.08	0.00	7.38	0.00
	Edinda Lane	6.06	6.43	6.65	6.43	0.00	6.65	0.00
Splitters Creek		1.1	9.51	9.92				
		2.1	9.50	9.91				

TABLE J-6

Summary of Peak Flood Levels for Flood Mitigation Options
Option B1 - Yeppen Crossing - double bridge widths

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.89	-0.01
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.84	0.00
	near Water Treatment Works	144.78	10.86	11.32	10.86	0.00	11.32	0.00
	Barrage	149.27	9.49	9.91	9.49	0.00	9.89	-0.02
	d/s Barrage	149.47	9.17	9.60	9.16	-0.01	9.59	-0.01
		150.17	8.55	8.96	8.54	-0.01	8.94	-0.02
		150.67	8.35	8.74	8.34	-0.01	8.73	-0.01
	Railway Bridge	151.57	8.03	8.40	8.01	-0.02	8.38	-0.02
	Fitzroy Street Bridge	152.57	7.84	8.21	7.83	-0.01	8.19	-0.02
	City Flood Gauge	154.27	7.58	7.94	7.57	-0.01	7.92	-0.02
	Gavial Creek	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
	Edinda Lane	173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.84	0.00
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.03	-0.01	11.40	-0.01
	Lotus Lagoon	4.56	10.99	11.38	10.99	0.00	11.36	-0.02
	Nine Mile Road	6.63	10.55	10.95	10.53	-0.02	10.93	-0.02
	Start FP SCRUBBY	11.0	9.43	9.89	9.35	-0.08	9.79	-0.10
	Junction with AP-STH	13.0	9.15	9.60	9.01	-0.14	9.45	-0.15
	u/s Yeppen Crossing	13.6	8.64	9.00	8.37	-0.27	8.71	-0.29
	d/s Bruce Highway	13.84	8.39	8.71	8.26	-0.13	8.57	-0.14
	d/s Yeppen Crossing	14.0	8.10	8.36	8.15	0.05	8.44	0.08
	Old Burnett Highway	15.15	7.96	8.22	8.01	0.05	8.29	0.07
	Old Bruce Highway	16.98	7.18	7.47	7.26	0.08	7.54	0.07
	J/w FP GAVIAL	19.04	7.08	7.38	7.09	0.01	7.39	0.01
FP SCRUBBY	Start	0	9.43	9.89	9.35	-0.08	9.79	-0.10
	d/s Capricorn Highway	1.3	9.00	9.46	8.8	-0.20	9.27	-0.19
	u/s Bruce Highway	4.0	8.63	8.99	8.35	-0.28	8.70	-0.29
	d/s Railway	4.3	8.10	8.37	8.15	0.05	8.45	0.08
	J/w FP MAIN	5.15	7.96	8.22	8.01	0.05	8.29	0.07
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.37	-0.27	8.71	-0.25
	Port Curtis Junction	0.91	8.37	8.76	7.71	-0.66	8.51	-0.25
	Depot Hill	2.1	7.67	8.19	7.61	-0.06	8.09	-0.10
	Gavial Creek	4.2	7.56	7.91	7.55	-0.01	7.90	-0.01
FP LION	J/w FP MAIN	0	10.55	10.95	10.53	-0.02	11.93	0.98
	J/w AP STH	2.2	10.43	10.90	10.42	-0.01	11.87	0.97
	J/w AP NTH	3.35	10.25	10.86	10.23	-0.02	11.83	0.97
	Fitzroy River	5.3	9.49	9.91	9.49	0.00	9.89	-0.02
Airport North	J/w FP LION	0	10.25	10.86	10.23	-0.02	10.83	-0.03
	New Terminal	1.54	9.61	10.15	9.53	-0.08	10.07	-0.08
	J/w AP STH	2.6	9.16	9.61	9.02	-0.14	9.47	-0.14
Airport South	J/w FP LION	0	10.43	10.90	10.42	-0.01	10.87	-0.03
	Opposite Terminal	1.3	9.61	10.15	9.53	-0.08	10.07	-0.08
	J/w AP NTH	2.3	9.16	9.61	9.02	-0.14	9.47	-0.14
	J/w FP MAIN	3.0	9.15	9.60	9.01	-0.14	9.45	-0.15
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.01	-0.02	8.38	-0.02
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.0	-0.01	8.37	-0.02
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.25	-0.01	7.59	-0.02
	J/w Fitzroy River	2.93	7.21	7.54	7.20	-0.01	7.53	-0.01
Gavial Creek	Fitzroy River	0	7.58	7.94	7.57	-0.01	7.92	-0.02
	J/w FP CURTIS	1.03	7.56	7.92	7.55	-0.01	7.90	-0.02
	J/w FP MAIN	4.21	7.08	7.38	7.09	0.01	7.39	0.01
	Edinda Lane	6.06	6.43	6.65	6.43	0.00	6.38	-0.27
Splitters Creek		1.1	9.51	9.92				
		2.1	9.50	9.91				
Floodplain Flows	Yeppen (bridge) m ³ /s		2495	2650	3180	685	3614	964
	(overflow) m ³ /s		1415	2605	735	-680	1710	-895
	Time of Submergence (d)		11.6	12.65	9.75	-1.85	11.95	-0.7

TABLE J-7

Summary of Peak Flood Levels for Flood Mitigation Options
Option B3 – Yeppen Crossing raise road/rail levels by 0.5 m

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Ysamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.9	0.00
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.85	0.01
	near Water Treatment Works	144.78	10.86	11.32	10.87	0.01	11.33	0.01
	Barrage	149.27	9.49	9.91	9.49	0.00	9.90	-0.01
	d/s Barrage	149.47	9.17	9.60	9.16	-0.01	9.59	-0.01
		150.17	8.55	8.96	8.55	0.00	8.94	-0.02
	Railway Bridge	150.67	8.35	8.74	8.35	0.00	8.73	-0.01
	Fitzroy Street Bridge	151.57	8.03	8.40	8.02	-0.01	8.38	-0.02
	City Flood Gauge	152.57	7.84	8.21	7.83	-0.01	8.19	-0.02
	Gavial Creek	154.27	7.58	7.94	7.57	-0.01	7.91	-0.03
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.43	-0.26
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.85	0.01
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.05	0.01	11.42	0.01
	Lotus Lagoon	4.56	10.99	11.38	11.00	0.01	11.39	0.01
	Nine Mile Road	6.63	10.55	10.95	10.57	0.02	11.01	0.06
	Start FP SCRUBBY	11.0	9.43	9.89	9.57	0.14	10.09	0.20
	Junction with AP-STH	13.0	9.15	9.60	9.34	0.19	9.86	0.26
	u/s Yeppen Crossing	13.6	8.64	9.00	8.95	0.31	9.42	0.42
	d/s Bruce Highway	13.84	8.39	8.71	8.58	0.19	8.99	0.28
	d/s Yeppen Crossing	14.0	8.10	8.36	8.14	0.04	8.47	0.11
	Old Burnett Highway	15.15	7.96	8.22	8.0	0.04	8.31	0.09
	Old Bruce Highway	16.98	7.18	7.47	7.26	0.08	7.55	0.08
	J/w FP GAVIAL	19.04	7.08	7.38	7.09	0.01	7.39	0.01
		0	9.43	9.89	9.57	0.14	10.09	0.20
FP SCRUBBY	Start	0	9.43	9.89	9.57	0.14	10.09	0.20
	d/s Capricorn Highway	1.3	9.00	9.46	9.24	0.24	9.78	0.32
	u/s Bruce Highway	4.0	8.63	8.99	8.95	0.32	9.42	0.43
	d/s Railway	4.3	8.10	8.37	8.14	0.04	8.48	0.11
	J/w FP MAIN	5.15	7.96	8.22	8.00	0.04	8.31	0.09
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.95	0.31	9.41	0.45
	Port Curtis Junction	0.91	8.37	8.76	7.99	-0.38	8.25	-0.51
	Depot Hill	2.1	7.67	8.19	7.61	-0.06	8.04	-0.15
	Gavial Creek	4.2	7.56	7.91	7.55	-0.01	7.89	-0.02
FP LION	J/w FP MAIN	0	10.55	10.95	10.57	0.02	11.01	0.06
	J/w AP STH	2.2	10.43	10.90	10.46	0.03	10.96	0.06
	J/w AP NTH	3.35	10.25	10.86	10.27	0.02	10.92	0.06
	Fitzroy River	5.3	9.49	9.91	9.49	0.00	9.90	-0.01
Airport North	J/w FP LION	0	10.25	10.86	10.27	0.02	10.92	0.06
	New Terminal	1.54	9.61	10.15	9.74	0.13	10.30	0.15
	J/w AP STH	2.6	9.16	9.61	9.35	0.19	9.87	0.26
Airport South	J/w FP LION	0	10.43	10.90	10.46	0.03	10.96	0.06
	Opposite Terminal	1.3	9.61	10.15	9.74	0.13	10.30	0.15
	J/w AP NTH	2.3	9.16	9.61	9.35	0.19	9.87	0.26
	J/w FP MAIN	3.0	9.15	9.60	9.34	0.19	9.86	0.26
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.02	-0.01	8.38	-0.02
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.00	-0.01	8.37	-0.02
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.25	-0.01	7.58	-0.03
	J/w Fitzroy River	2.93	7.21	7.54	7.20	-0.01	7.52	-0.02
Gavial Creek	Fitzroy River	0	7.58	7.94	7.57	-0.01	7.91	-0.03
	J/w FP CURTIS	1.03	7.56	7.92	7.55	-0.01	7.89	-0.03
	J/w FP MAIN	4.21	7.08	7.38	7.09	0.01	7.39	0.01
	Edinda Lane	6.06	6.43	6.65	6.43	0.00	6.66	0.01
Splitters Creek		1.1	9.51	9.92	9.51	0.00	9.92	0.00
		2.1	9.50	9.91	9.50	0.00	9.91	0.00
Peak Flows at	Yeppen Bridges m ³ /s		2495	2650	3044	530.00	3235	585.00
	Yeppen Overflow m ³ /s		1415	2605	883	-530.00	1980	-625.00
	Time of Submergence		11.6 d	12.67 d	8.75 d	-2.85 d	11.25 d	-1.4 d

TABLE J-8

Summary of Peak Flood Levels for Flood Mitigation Options
Option B4 – Yeppen Crossing raise to bridge levels

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.90	0.00
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.85	0.01
	near Water Treatment Works	144.78	10.86	11.32	10.87	0.01	11.33	0.01
	Barrage	149.27	9.49	9.91	9.50	0.01	9.91	0.00
	d/s Barrage	149.47	9.17	9.60	9.16	-0.01	9.60	0.00
		150.17	8.55	8.96	8.55	0.00	8.96	0.00
	Railway Bridge	150.67	8.35	8.74	8.35	0.00	8.74	0.00
	Fitzroy Street Bridge	151.57	8.03	8.40	8.02	-0.01	8.40	0.00
	City Flood Gauge	152.57	7.84	8.21	7.83	-0.01	8.20	-0.01
	Gavial Creek	154.27	7.58	7.94	7.57	-0.01	7.93	-0.01
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.85	0.01
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.05	0.01	11.42	0.01
	Lotus Lagoon	4.56	10.99	11.38	11.01	0.02	11.39	0.01
	Nine Mile Road	6.63	10.55	10.95	10.58	0.03	10.99	0.04
	Start FP SCRUBBY	11.0	9.43	9.89	9.60	0.17	10.03	0.14
	Junction with AP-STH	13.0	9.15	9.60	9.39	0.24	9.79	0.19
	u/s Yeppen Crossing	13.6	8.64	9.00	9.02	0.38	9.31	0.31
	d/s Bruce Highway	13.84	8.39	8.71	8.61	0.22	8.89	0.18
	d/s Yeppen Crossing	14.0	8.10	8.36	8.13	0.03	8.40	0.04
	Old Burnett Highway	15.15	7.96	8.22	7.99	0.03	8.25	0.03
	Old Bruce Highway	16.98	7.18	7.47	7.18	0.00	7.48	0.01
	J/w FP GAVIAL	19.04	7.08	7.38	7.09	0.01	7.38	0.00
FP SCRUBBY	Start	0	9.43	9.89	9.60	0.17	10.03	0.14
	d/s Capricorn Highway	1.3	9.00	9.46	9.29	0.29	9.69	0.23
	u/s Bruce Highway	4.0	8.63	8.99	9.01	0.38	9.30	0.31
	d/s Railway	4.3	8.10	8.37	8.13	0.03	8.41	0.04
	J/w FP MAIN	5.15	7.96	8.22	7.99	0.03	8.25	0.03
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	9.02	0.38	9.31	0.35
	Port Curtis Junction	0.91	8.37	8.76	8.02	-0.35	8.52	-0.24
	Depot Hill	2.1	7.67	8.19	7.63	-0.04	8.13	-0.06
	Gavial Creek	4.2	7.56	7.91	7.55	-0.01	7.91	0.00
FP LION	J/w FP MAIN	0	10.55	10.95	10.58	0.03	10.99	0.04
	J/w AP STH	2.2	10.43	10.90	10.47	0.04	10.94	0.04
	J/w AP NTH	3.35	10.25	10.86	10.28	0.03	10.90	0.04
	Fitzroy River	5.3	9.49	9.91	9.50	0.01	9.91	0.00
Airport North	J/w FP LION	0	10.25	10.86	10.28	0.03	10.90	0.04
	New Terminal	1.54	9.61	10.15	9.63	0.02	10.25	0.10
	J/w AP STH	2.6	9.16	9.61	9.39	0.23	9.80	0.19
Airport South	J/w FP LION	0	10.43	10.90	10.47	0.04	10.94	0.04
	Opposite Terminal	1.3	9.61	10.15	9.77	0.16	10.26	0.11
	J/w AP NTH	2.3	9.16	9.61	9.39	0.23	9.80	0.19
	J/w FP MAIN	3.0	9.15	9.60	9.39	0.24	9.79	0.19
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.02	-0.01	8.40	0.00
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.00	-0.01	8.39	0.00
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.25	-0.01	7.60	-0.01
	J/w Fitzroy River	2.93	7.21	7.54	7.21	0.00	7.54	0.00
Gavial Creek	Fitzroy River	0	7.58	7.94	7.57	-0.01	7.93	-0.01
	J/w FP CURTIS	1.03	7.56	7.92	7.55	-0.01	7.91	-0.01
	J/w FP MAIN	4.21	7.08	7.38	7.09	0.01	7.38	0.00
	Edinda Lane	6.06	6.43	6.65	6.43	0.00	6.66	0.01
Splitters Creek		1.1	9.51	9.92	9.51	0.00	9.93	0.01
		2.1	9.50	9.91	9.50	0.00	9.91	0.00
Peak Flows at	Yeppen Bridges m³/s		2495	2650	3170	675.00	3220	570.00
	Yeppen Overflow m³/s		1415	2605	720	-695.00	2030	-575.00
	Time of Submergence		11.6 d	12.67 d	7.67 d	-4 d	9.63 d	-3 d

TABLE J-9

Summary of Peak Flood Levels for Flood Mitigation Options
Option B5 – Yeppen Crossing – combination of options B1 and B4

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.89	-0.01
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.84	0.00
	near Water Treatment Works	144.78	10.86	11.32	10.86	0.00	11.32	0.00
	Barrage	149.27	9.49	9.91	9.49	0.00	9.89	-0.02
	d/s Barrage	149.47	9.17	9.60	9.15	-0.02	9.58	-0.02
		150.17	8.55	8.96	8.54	-0.01	8.94	-0.02
	Railway Bridge	150.67	8.35	8.74	8.34	-0.01	8.72	-0.02
	Fitzroy Street Bridge	151.57	8.03	8.40	8.01	-0.02	8.38	-0.02
	City Flood Gauge	152.57	7.84	8.21	7.82	-0.02	8.18	-0.03
	Gavial Creek	154.27	7.58	7.94	7.56	-0.02	7.91	-0.03
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.84	0.00
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.04	0.00	11.40	-0.01
	Lotus Lagoon	4.56	10.99	11.38	10.99	0.00	11.37	-0.01
	Nine Mile Road	6.63	10.55	10.95	10.53	-0.02	10.95	0.00
	Start FP SCRUBBY	11.0	9.43	9.89	9.38	-0.05	9.87	-0.02
	Junction with AP-STH	13.0	9.15	9.60	9.06	-0.09	9.57	-0.03
	u/s Yeppen Crossing	13.6	8.64	9.00	8.47	-0.17	8.95	-0.05
	d/s Bruce Highway	13.84	8.39	8.71	8.33	-0.06	8.70	-0.01
	d/s Yeppen Crossing	14.0	8.10	8.36	8.16	0.06	8.48	0.12
	Old Burnett Highway	15.15	7.96	8.22	8.02	0.06	8.32	0.10
	Old Bruce Highway	16.98	7.18	7.47	7.19	0.01	7.55	0.08
	J/w FP GAVIAL	19.04	7.08	7.38	7.09	0.01	7.39	0.01
FP SCRUBBY	Start	0	9.43	9.89	9.39	-0.04	9.87	-0.02
	d/s Capricorn Highway	1.3	9.00	9.46	8.88	-0.12	9.43	-0.03
	u/s Bruce Highway	4.0	8.63	8.99	8.46	-0.17	8.95	-0.04
	d/s Railway	4.3	8.10	8.37	8.16	0.06	8.48	0.11
	J/w FP MAIN	5.15	7.96	8.22	8.02	0.06	8.32	0.10
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.47	-0.17	8.95	-0.01
	Port Curtis Junction	0.91	8.37	8.76	7.59	-0.78	8.13	-0.63
	Depot Hill	2.1	7.67	8.19	7.59	-0.08	8.04	-0.15
	Gavial Creek	4.2	7.56	7.91	7.54	-0.02	7.89	-0.02
FP LION	J/w FP MAIN	0	10.55	10.95	10.53	-0.02	10.95	0.00
	J/w AP STH	2.2	10.43	10.90	10.42	-0.01	10.89	-0.01
	J/w AP NTH	3.35	10.25	10.86	10.23	-0.02	10.85	-0.01
	Fitzroy River	5.3	9.49	9.91	9.49	0.00	9.89	-0.02
Airport North	J/w FP LION	0	10.25	10.86	10.23	-0.02	10.85	-0.01
	New Terminal	1.54	9.61	10.15	9.56	-0.05	10.13	-0.02
	J/w AP STH	2.6	9.16	9.61	9.07	-0.09	9.59	-0.02
Airport South	J/w FP LION	0	10.43	10.90	10.42	-0.01	10.89	-0.01
	Opposite Terminal	1.3	9.61	10.15	9.56	-0.05	10.13	-0.02
	J/w AP NTH	2.3	9.16	9.61	9.07	-0.09	9.59	-0.02
	J/w FP MAIN	3.0	9.15	9.60	9.06	-0.09	9.57	-0.03
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.01	-0.02	8.38	-0.02
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.00	-0.01	8.36	-0.03
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.25	-0.01	7.58	-0.03
	J/w Fitzroy River	2.93	7.21	7.54	7.20	-0.01	7.52	-0.02
Gavial Creek	Fitzroy River	0	7.58	7.94	7.56	-0.02	7.91	-0.03
	J/w FP CURTIS	1.03	7.56	7.92	7.54	-0.02	7.89	-0.03
	J/w FP MAIN	4.21	7.08	7.38	7.09	0.01	7.39	0.01
	Edinda Lane	6.06	6.43	6.65	6.43	0.00	6.66	0.01
Splitters Creek		1.1	9.51	9.92	9.50	-0.01	9.91	-0.01
		2.1	9.50	9.91	9.49	-0.01	9.90	-0.01
Peak Flows at	Yeppen Bridges m³/s		2495	2650	3870	1,375.00	4720	2,070.00
	Yeppen Overflow m³/s		1415	2605	0	-1,415.00	520	-2,085.00
	Time of Submergence		11.6 d	12.67 d	0	-11.60 d	6.82 d	-5.85 d

TABLE J-9a

Summary of Peak Flood Levels for Flood Mitigation Options
Option B5a – Yeppen Crossing – combination of options B1, B4 and F3

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.68	-0.01
	start of FP2	139.2	11.48	11.90	11.47	-0.01	11.89	-0.01
	start of FP Main	140.1	11.42	11.84	11.41	-0.01	11.83	-0.01
	near Water Treatment Works	144.78	10.86	11.32	10.85	-0.01	11.31	-0.01
	Barrage	149.27	9.49	9.91	9.47	-0.02	9.88	-0.03
	d/s Barrage	149.47	9.17	9.60	9.14	-0.03	9.57	-0.03
		150.17	8.55	8.96	8.52	-0.03	8.92	-0.04
	Railway Bridge	150.67	8.35	8.74	8.32	-0.03	8.70	-0.04
	Fitzroy Street Bridge	151.57	8.03	8.40	7.99	-0.04	8.35	-0.05
	City Flood Gauge	152.57	7.84	8.21	7.80	-0.04	8.16	-0.05
	Gavial Creek	154.27	7.58	7.94	7.54	-0.04	7.88	-0.06
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.41	-0.01	11.83	-0.01
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.03	-0.01	11.40	-0.01
	Lotus Lagoon	4.56	10.99	11.38	10.98	-0.01	11.36	-0.02
	Nine Mile Road	6.63	10.55	10.95	10.52	-0.03	10.93	-0.02
	Start FP SCRUBBY	11.0	9.43	9.89	9.32	-0.11	9.83	-0.06
	Junction with AP-STH	13.0	9.15	9.60	8.97	-0.18	9.51	-0.09
	u/s Yeppen Crossing	13.6	8.64	9.00	8.28	-0.36	8.84	-0.16
	d/s Bruce Highway	13.84	8.39	8.71	8.12	-0.27	8.56	-0.15
	d/s Yeppen Crossing	14.0	8.10	8.36	7.95	-0.15	8.30	-0.06
	Old Burnett Highway	15.15	7.96	8.22	7.74	-0.22	8.07	-0.15
	Old Bruce Highway	16.98	7.18	7.47	7.24	0.06	7.54	0.07
	J/w FP GAVIAL	19.04	7.08	7.38	7.11	0.03	7.42	0.04
FP SCRUBBY	Start	0	9.43	9.89	9.32	-0.11	9.83	-0.06
	d/s Capricorn Highway	1.3	9.00	9.46	8.73	-0.27	9.35	-0.11
	u/s Bruce Highway	4.0	8.63	8.99	8.25	-0.38	8.83	-0.16
	d/s Railway	4.3	8.10	8.37	7.95	-0.15	8.30	-0.07
	J/w FP MAIN	5.15	7.96	8.22	7.74	-0.22	8.07	-0.15
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.28	-0.36	8.84	-0.12
	Port Curtis Junction	0.91	8.37	8.76	7.54	-0.83	7.98	-0.78
	Depot Hill	2.1	7.67	8.19	7.54	-0.13	7.94	-0.25
	Gavial Creek	4.2	7.56	7.91	7.52	-0.04	7.86	-0.05
FP LION	J/w FP MAIN	0	10.55	10.95	10.52	-0.03	10.93	-0.02
	J/w AP STH	2.2	10.43	10.90	10.41	-0.02	10.88	-0.02
	J/w AP NTH	3.35	10.25	10.86	10.22	-0.03	10.83	-0.03
	Fitzroy River	5.3	9.49	9.91	9.47	-0.02	9.88	-0.03
Airport North	J/w FP LION	0	10.25	10.86	10.22	-0.03	10.83	-0.03
	New Terminal	1.54	9.61	10.15	9.50	-0.11	10.10	-0.05
	J/w AP STH	2.6	9.16	9.61	8.98	-0.18	9.52	-0.09
Airport South	J/w FP LION	0	10.43	10.90	10.41	-0.02	10.88	-0.02
	Opposite Terminal	1.3	9.61	10.15	9.50	-0.11	10.10	-0.05
	J/w AP NTH	2.3	9.16	9.61	8.98	-0.18	9.52	-0.09
	J/w FP MAIN	3.0	9.15	9.60	8.97	-0.18	9.51	-0.09
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	7.99	-0.04	8.35	-0.05
	Lakes Creek Road (STW)	1.0	8.01	8.39	7.97	-0.04	8.34	-0.05
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.23	-0.03	7.55	-0.06
	J/w Fitzroy River	2.93	7.21	7.54	7.18	-0.03	7.50	-0.04
Gavial Creek	Fitzroy River	0	7.58	7.94	7.54	-0.04	7.88	-0.06
	J/w FP CURTIS	1.03	7.56	7.92	7.52	-0.04	7.86	-0.06
	J/w FP MAIN	4.21	7.08	7.38	7.11	0.03	7.41	0.03
	Edinda Lane	6.06	6.43	6.65	6.44	0.01	6.67	0.02
Splitters Creek		1.1	9.51	9.92	9.49	-0.02	9.90	-0.02
		2.1	9.50	9.91	9.48	-0.02	9.89	-0.02
Peak Flows at	Yeppen Bridges m³/s		2495	2650	3905	1,410.00	5065	2,415.00
	Yeppen Overflow m³/s		1415	2605	0	-1,415.00	215	-2,390.00
	Time of Submergence		11.6 d	12.67 d	0	-11.60 d	3.0 d	-9.67 d

TABLE J-10

**Summary of Peak Flood Levels for Flood Mitigation Options
Option B6 – Lower Invert Levels Yeppen bridges by 2 m**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.89	-0.01
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.84	0.00
	near Water Treatment Works	144.78	10.86	11.32	10.86	0.00	11.32	0.00
	Barrage	149.27	9.49	9.91	9.49	0.00	9.90	-0.01
	d/s Barrage	149.47	9.17	9.60	9.16	-0.01	9.59	-0.01
		150.17	8.55	8.96	8.55	0.00	8.95	-0.01
	Railway Bridge	150.67	8.35	8.74	8.35	0.00	8.74	0.00
	Fitzroy Street Bridge	151.57	8.03	8.40	8.02	-0.01	8.40	0.00
	City Flood Gauge	152.57	7.84	8.21	7.84	0.00	8.20	-0.01
	Gavial Creek	154.27	7.58	7.94	7.58	0.00	7.93	-0.01
	Edinda Lane	165.02	6.10	6.38	6.10	0.00	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.84	0.00
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.04	0.00	11.40	-0.01
	Lotus Lagoon	4.56	10.99	11.38	10.99	0.00	11.37	-0.01
	Nine Mile Road	6.63	10.55	10.95	10.53	-0.02	10.94	-0.01
	Start FP SCRUBBY	11.0	9.43	9.89	9.36	-0.07	9.81	-0.08
	Junction with AP-STH	13.0	9.15	9.60	9.04	-0.11	9.49	-0.11
	u/s Yeppen Crossing	13.6	8.64	9.00	8.43	-0.21	8.78	-0.22
	d/s Bruce Highway	13.84	8.39	8.71	8.30	-0.09	8.64	-0.07
	d/s Yeppen Crossing	14.0	8.10	8.36	8.15	0.05	8.39	0.03
	Old Burnett Highway	15.15	7.96	8.22	8.01	0.05	8.24	0.02
	Old Bruce Highway	16.98	7.18	7.47	7.19	0.01	7.48	0.01
	J/w FP GAVIAL	19.04	7.08	7.38	7.09	0.01	7.38	0.00
FP SCRUBBY	Start	0	9.43	9.89	9.36	-0.07	9.81	-0.08
	d/s Capricorn Highway	1.3	9.00	9.46	8.84	-0.16	9.32	-0.14
	u/s Bruce Highway	4.0	8.63	8.99	8.41	-0.22	8.77	-0.22
	d/s Railway	4.3	8.10	8.37	8.15	0.05	8.40	0.03
	J/w FP MAIN	5.15	7.96	8.22	8.01	0.05	8.24	0.02
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.43	-0.21	8.78	-0.18
	Port Curtis Junction	0.91	8.37	8.76	8.15	-0.22	8.58	-0.18
	Depot Hill	2.1	7.67	8.19	7.64	-0.03	8.14	-0.05
	Gavial Creek	4.2	7.56	7.91	7.56	0.00	7.91	0.00
FP LION	J/w FP MAIN	0	10.55	10.95	10.53	-0.02	10.94	-0.01
	J/w AP STH	2.2	10.43	10.90	10.42	-0.01	10.88	-0.02
	J/w AP NTH	3.35	10.25	10.86	10.23	-0.02	10.84	-0.02
	Fitzroy River	5.3	9.49	9.91	9.49	0.00	9.90	-0.01
Airport North	J/w FP LION	0	10.25	10.86	10.23	-0.02	10.84	-0.02
	New Terminal	1.54	9.61	10.15	9.55	-0.06	10.09	-0.06
	J/w AP STH	2.6	9.16	9.61	9.05	-0.11	9.50	-0.11
Airport South	J/w FP LION	0	10.43	10.90	10.42	-0.01	10.88	-0.02
	Opposite Terminal	1.3	9.61	10.15	9.55	-0.06	10.09	-0.06
	J/w AP NTH	2.3	9.16	9.61	9.05	-0.11	9.50	-0.11
	J/w FP MAIN	3.0	9.15	9.60	9.04	-0.11	9.49	-0.11
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.02	-0.01	8.39	-0.01
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.01	0.00	8.38	-0.01
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.25	-0.01	7.60	-0.01
	J/w Fitzroy River	2.93	7.21	7.54	7.21	0.00	7.54	0.00
Gavial Creek	Fitzroy River	0	7.58	7.94	7.58	0.00	7.93	-0.01
	J/w FP CURTIS	1.03	7.56	7.92	7.56	0.00	7.91	-0.01
	J/w FP MAIN	4.21	7.08	7.38	7.09	0.01	7.38	0.00
	Edinda Lane	6.06	6.43	6.65	6.43	0.00	6.66	0.01
Splitters Creek		1.1	9.51	9.92	9.51	0.00	9.91	-0.01
		2.1	9.50	9.91	9.50	0.00	9.90	-0.01
Peak Flows at	Yeppen Bridges m³/s		2495	2650	3075	580	3350	700
	Yeppen Overflow m³/s		1415	2605	955	-460	2070	-535
	Time of Submergence		11.6 d	12.67 d	10.1	-1.5000	11.4 d	-1.27

TABLE J-11

Summary of Peak Flood Levels for Flood Mitigation Options
Option B7 – Yeppen Crossing – combination of options B4 and B6

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.90	0.00
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.84	0.00
	near Water Treatment Works	144.78	10.86	11.32	10.86	0.00	11.32	0.00
	Barrage	149.27	9.49	9.91	9.49	0.00	9.90	-0.01
	d/s Barrage	149.47	9.17	9.60	9.16	-0.01	9.59	-0.01
		150.17	8.55	8.96	8.54	-0.01	8.94	-0.02
	Railway Bridge	150.67	8.35	8.74	8.34	-0.01	8.73	-0.01
	Fitzroy Street Bridge	151.57	8.03	8.40	8.01	-0.02	8.38	-0.02
	City Flood Gauge	152.57	7.84	8.21	7.82	-0.02	8.19	-0.02
	Gavial Creek	154.27	7.58	7.94	7.56	-0.02	7.91	-0.03
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.84	0.00
	Rockhampton-Ridgetands Road	1.75	11.04	11.41	11.04	0.00	11.41	0.00
	Lotus Lagoon	4.56	10.99	11.38	10.99	0.00	11.38	0.00
	Nine Mile Road	6.63	10.55	10.95	10.54	-0.01	10.97	0.02
	Start FP SCRUBBY	11.0	9.43	9.89	9.42	-0.01	9.95	0.06
	Junction with AP-STH	13.0	9.15	9.60	9.13	-0.02	9.68	0.08
	u/s Yeppen Crossing	13.6	8.64	9.00	8.61	-0.03	9.14	0.14
	d/s Bruce Highway	13.84	8.39	8.71	8.40	0.01	8.84	0.13
	d/s Yeppen Crossing	14.0	8.10	8.36	8.16	0.06	8.46	0.10
	Old Burnett Highway	15.15	7.96	8.22	8.02	0.06	8.30	0.08
	Old Bruce Highway	16.98	7.18	7.47	7.27	0.09	7.50	0.03
	J/w FP GAVIAL	19.04	7.08	7.38	7.09	0.01	7.39	0.01
FP SCRUBBY	Start	0	9.43	9.89	9.42	-0.01	9.95	0.06
	d/s Capricorn Highway	1.3	9.00	9.46	8.98	-0.02	9.56	0.10
	u/s Bruce Highway	4.0	8.63	8.99	8.60	-0.03	9.13	0.14
	d/s Railway	4.3	8.10	8.37	8.16	0.06	8.46	0.09
	J/w FP MAIN	5.15	7.96	8.22	8.02	0.06	8.32	0.10
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.61	-0.03	9.14	0.18
	Port Curtis Junction	0.91	8.37	8.76	7.59	-0.78	8.31	-0.45
	Depot Hill	2.1	7.67	8.19	7.59	-0.08	8.07	-0.12
	Gavial Creek	4.2	7.56	7.91	7.54	-0.02	7.89	-0.02
FP LION	J/w FP MAIN	0	10.55	10.95	10.54	-0.01	10.97	0.02
	J/w AP STH	2.2	10.43	10.90	10.43	0.00	10.91	0.01
	J/w AP NTH	3.35	10.25	10.86	10.24	-0.01	10.87	0.01
	Fitzroy River	5.3	9.49	9.91	9.49	0.00	9.90	-0.01
Airport North	J/w FP LION	0	10.25	10.86	10.24	-0.01	10.87	0.01
	New Terminal	1.54	9.61	10.15	9.60	-0.01	10.19	0.04
	J/w AP STH	2.6	9.16	9.61	9.14	-0.02	9.69	0.08
Airport South	J/w FP LION	0	10.43	10.90	10.43	0.00	10.91	0.01
	Opposite Terminal	1.3	9.61	10.15	9.60	-0.01	10.19	0.04
	J/w AP NTH	2.3	9.16	9.61	9.14	-0.02	9.69	0.08
	J/w FP MAIN	3.0	9.15	9.60	9.13	-0.02	9.68	0.08
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.01	-0.02	8.38	-0.02
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.00	-0.01	8.36	-0.03
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.25	-0.01	7.58	-0.03
	J/w Fitzroy River	2.93	7.21	7.54	7.20	-0.01	7.52	-0.02
Gavial Creek	Fitzroy River	0	7.58	7.94	7.56	-0.02	7.91	-0.03
	J/w FP CURTIS	1.03	7.56	7.92	7.54	-0.02	7.89	-0.03
	J/w FP MAIN	4.21	7.08	7.38	7.09	0.01	7.39	0.01
	Edinda Lane	6.06	6.43	6.65	6.43	0.00	6.66	0.01
Splitters Creek		1.1	9.51	9.92	9.50	-0.01	9.92	0.00
		2.1	9.50	9.91	9.49	-0.01	9.90	-0.01
Peak Flows at	Yeppen Bridges m³/s		2495	2650	3865	1,370	4390	1,740
	Yeppen Overflow m³/s		1415	2605	0	-1,415	910	-1,695
	Time of Submergence		11.6 d	12.67 d	0	-11.6 d	8.0d	-4.57 d

TABLE J-12

Summary of Peak Flood Levels for Flood Mitigation Options
Option B8 – B7 + removing Old Burnett Highway Bridge & old railway embankment

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.68	-0.01
	start of FP2	139.2	11.48	11.90	11.47	-0.01	11.88	-0.02
	start of FP Main	140.1	11.42	11.84	11.41	-0.01	11.83	-0.01
	near Water Treatment Works	144.78	10.86	11.32	10.85	-0.01	11.30	-0.02
	Barrage	149.27	9.49	9.91	9.46	-0.03	9.86	-0.05
	d/s Barrage	149.47	9.17	9.60	9.12	-0.05	9.54	-0.06
		150.17	8.55	8.96	8.50	-0.05	8.89	-0.07
	Railway Bridge	150.67	8.35	8.74	8.30	-0.05	8.67	-0.07
	Fitzroy Street Bridge	151.57	8.03	8.40	7.96	-0.07	8.31	-0.09
	City Flood Gauge	152.57	7.84	8.21	7.77	-0.07	8.11	-0.10
	Gavial Creek	154.27	7.58	7.94	7.50	-0.08	7.83	-0.11
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.41	-0.01	11.83	-0.01
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.03	-0.01	11.40	-0.01
	Lotus Lagoon	4.56	10.99	11.38	10.98	-0.01	11.36	-0.02
	Nine Mile Road	6.63	10.55	10.95	10.51	-0.04	10.93	-0.02
	Start FP SCRUBBY	11.0	9.43	9.89	9.29	-0.14	9.84	-0.05
	Junction with AP-STH	13.0	9.15	9.60	8.91	-0.24	9.52	-0.08
	u/s Yeppen Crossing	13.6	8.64	9.00	8.23	-0.41	8.91	-0.09
	d/s Bruce Highway	13.84	8.39	8.71	8.01	-0.38	8.62	-0.09
	d/s Yeppen Crossing	14.0	8.10	8.36	7.76	-0.34	8.11	-0.25
	Old Burnett Highway	15.15	7.96	8.22	7.53	-0.43	7.87	-0.35
	Old Bruce Highway	16.98	7.18	7.47	7.16	-0.02	7.44	-0.03
	J/w FP GAVIAL	19.04	7.08	7.38	7.05	-0.03	7.35	-0.03
FP SCRUBBY	Start	0	9.43	9.89	9.29	-0.14	9.84	-0.05
	d/s Capricorn Highway	1.3	9.00	9.46	8.68	-0.32	9.39	-0.07
	u/s Bruce Highway	4.0	8.63	8.99	8.19	-0.44	8.91	-0.08
	d/s Railway	4.3	8.10	8.37	7.76	-0.34	8.12	-0.25
	J/w FP MAIN	5.15	7.96	8.22	7.53	-0.43	7.87	-0.35
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.23	-0.41	8.91	-0.05
	Port Curtis Junction	0.91	8.37	8.76	7.49	-0.88	8.00	-0.76
	Depot Hill	2.1	7.67	8.19	7.49	-0.18	7.87	-0.32
	Gavial Creek	4.2	7.56	7.91	7.48	-0.08	7.87	-0.04
FP LION	J/w FP MAIN	0	10.55	10.95	10.51	-0.04	10.93	-0.02
	J/w AP STH	2.2	10.43	10.90	10.40	-0.03	10.88	-0.02
	J/w AP NTH	3.35	10.25	10.86	10.21	-0.04	10.83	-0.03
	Fitzroy River	5.3	9.49	9.91	9.46	-0.03	9.86	-0.05
Airport North	J/w FP LION	0	10.25	10.86	10.21	-0.04	10.83	-0.03
	New Terminal	1.54	9.61	10.15	9.46	-0.15	9.90	-0.25
	J/w AP STH	2.6	9.16	9.61	8.92	-0.24	9.53	-0.08
Airport South	J/w FP LION	0	10.43	10.90	10.40	-0.03	10.88	-0.02
	Opposite Terminal	1.3	9.61	10.15	9.46	-0.15	10.10	-0.05
	J/w AP NTH	2.3	9.16	9.61	8.92	-0.24	9.53	-0.08
	J/w FP MAIN	3.0	9.15	9.60	8.91	-0.24	9.52	-0.08
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	7.96	-0.07	8.31	-0.09
	Lakes Creek Road (STW)	1.0	8.01	8.39	7.94	-0.07	8.30	-0.09
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.20	-0.06	7.51	-0.10
	J/w Fitzroy River	2.93	7.21	7.54	7.15	-0.06	7.46	-0.08
Gavial Creek	Fitzroy River	0	7.58	7.94	7.50	-0.08	7.83	-0.11
	J/w FP CURTIS	1.03	7.56	7.92	7.48	-0.08	7.81	-0.11
	J/w FP MAIN	4.21	7.08	7.38	7.05	-0.03	7.35	-0.03
	Edinda Lane	6.06	6.43	6.65	6.46	0.03	6.68	0.03
Splitters Creek		1.1	9.51	9.92	9.47	-0.04		
		2.1	9.50	9.91	9.47	-0.03		
Peak Flows at	Yeppen Bridges m³/s		2495	2650	3860	1,365	4,975	2,325
	Yeppen Overflow m³/s		1415	2605	0	-1,415	855	-1,750
	Time of Submergence		11.6 d	12.67 d	0		3.67d	-9 d

TABLE J-13

Summary of Peak Flood Levels for Flood Mitigation Options
Option B9 – Yeppen Crossing – combination of options B4 and B6 + 200 m wide
channel d/s + removal Old Burnett Highway bridge & old railway embankment

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.25	-0.01	12.68	-0.01
	start of FP2	139.2	11.48	11.90	11.47	-0.01	11.88	-0.02
	start of FP Main	140.1	11.42	11.84	11.41	-0.01	11.83	-0.01
	near Water Treatment Works	144.78	10.86	11.32	10.84	-0.02	11.30	-0.02
	Barrage	149.27	9.49	9.91	9.45	-0.04	9.86	-0.05
	d/s Barrage	149.47	9.17	9.60	9.11	-0.06	9.54	-0.06
		150.17	8.55	8.96	8.48	-0.07	8.88	-0.08
	Railway Bridge	150.67	8.35	8.74	8.28	-0.07	8.66	-0.08
	Fitzroy Street Bridge	151.57	8.03	8.40	7.94	-0.09	8.30	-0.10
	City Flood Gauge	152.57	7.84	8.21	7.75	-0.09	8.10	-0.11
	Gavial Creek	154.27	7.58	7.94	7.49	-0.09	7.82	-0.12
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.41	-0.01	11.83	-0.01
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.02	-0.02	11.39	-0.02
	Lotus Lagoon	4.56	10.99	11.38	10.97	-0.02	11.36	-0.02
	Nine Mile Road	6.63	10.55	10.95	10.51	-0.04	10.93	-0.02
	Start FP SCRUBBY	11.0	9.43	9.89	9.29	-0.14	9.83	-0.06
	Junction with AP-STH	13.0	9.15	9.60	8.90	-0.25	9.51	-0.09
	u/s Yeppen Crossing	13.6	8.64	9.00	8.21	-0.43	8.90	-0.10
	d/s Bruce Highway	13.84	8.39	8.71	7.99	-0.40	8.61	-0.10
	d/s Yeppen Crossing	14.0	8.10	8.36	7.73	-0.37	8.09	-0.27
	Old Burnett Highway	15.15	7.96	8.22	7.50	-0.46	7.85	-0.37
	Old Bruce Highway	16.98	7.18	7.47	7.12	-0.06	7.45	-0.02
	J/w FP GAVIAL	19.04	7.08	7.38	7.01	-0.07	7.32	-0.06
FP SCRUBBY	Start	0	9.43	9.89	9.29	-0.14	9.83	-0.06
	d/s Capricorn Highway	1.3	9.00	9.46	8.66	-0.34	9.38	-0.08
	u/s Bruce Highway	4.0	8.63	8.99	8.16	-0.47	8.90	-0.09
	d/s Railway	4.3	8.10	8.37	7.73	-0.37	8.10	-0.27
	J/w FP MAIN	5.15	7.96	8.22	7.50	-0.46	7.85	-0.37
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.21	-0.43	8.90	-0.06
	Port Curtis Junction	0.91	8.37	8.76	7.47	-0.90	7.98	-0.78
	Depot Hill	2.1	7.67	8.19	7.47	-0.20	7.85	-0.34
	Gavial Creek	4.2	7.56	7.91	7.46	-0.10	7.80	-0.11
FP LION	J/w FP MAIN	0	10.55	10.95	10.51	-0.04	10.93	-0.02
	J/w AP STH	2.2	10.43	10.90	10.40	-0.03	10.87	-0.03
	J/w AP NTH	3.35	10.25	10.86	10.21	-0.04	10.82	-0.04
	Fitzroy River	5.3	9.49	9.91	9.45	-0.04	9.86	-0.05
Airport North	J/w FP LION	0	10.25	10.86	10.21	-0.04	10.82	-0.04
	New Terminal	1.54	9.61	10.15	9.45	-0.16	10.10	-0.05
	J/w AP STH	2.6	9.16	9.61	8.91	-0.25	9.52	-0.09
Airport South	J/w FP LION	0	10.43	10.90	10.40	-0.03	10.87	-0.03
	Opposite Terminal	1.3	9.61	10.15	9.45	-0.16	10.10	-0.05
	J/w AP NTH	2.3	9.16	9.61	8.91	-0.25	9.52	-0.09
	J/w FP MAIN	3.0	9.15	9.60	8.90	-0.25	9.51	-0.09
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	7.94	-0.09	8.30	-0.10
	Lakes Creek Road (STW)	1.0	8.01	8.39	7.93	-0.08	8.29	-0.10
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.19	-0.07	7.50	-0.11
	J/w Fitzroy River	2.93	7.21	7.54	7.14	-0.07	7.45	-0.09
Gavial Creek	Fitzroy River	0	7.58	7.94	7.49	-0.09	7.81	-0.13
	J/w FP CURTIS	1.03	7.56	7.92	7.46	-0.10	7.80	-0.12
	J/w FP MAIN	4.21	7.08	7.38	7.01	-0.07	7.32	-0.06
	Edinda Lane	6.06	6.43	6.65	6.37	-0.06	6.62	-0.03
Splitters Creek		1.1	9.51	9.92	9.50	-0.01	9.88	-0.04
		2.1	9.50	9.91	9.49	-0.01	9.86	-0.05
Peak Flows at	Yeppen Bridges m ³ /s		2495	2650	3855	1,370	5065	2,415
	Yeppen Overflow m ³ /s		1415	2605	0	-1,415	375	-2,230
	Time of Submergence		11.6 d	12.67 d	0	-11.6 d	3.25 d	-9.42 d

TABLE J-14

**Summary of Peak Flood Levels for Flood Mitigation Options
Option D1 – Raise breakout threshold at Pink Lily by 1.0 m**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.96	0.03	18.53	0.01
	u/s Pink Lily	134.0	12.26	12.69	12.59	0.33	12.82	0.13
	start of FP2	139.2	11.48	11.90	12.00	0.52	12.11	0.21
	start of FP Main	140.1	11.42	11.84	11.94	0.52	12.06	0.22
	near Water Treatment Works	144.78	10.86	11.32	11.36	0.50	11.53	0.21
	Barrage	149.27	9.49	9.91	9.81	0.32	10.03	0.12
	d/s Barrage	149.47	9.17	9.60	9.47	0.30	9.72	0.12
		150.17	8.55	8.96	8.77	0.22	9.05	0.09
	Railway Bridge	150.67	8.35	8.74	8.54	0.19	8.82	0.08
	Fitzroy Street Bridge	151.57	8.03	8.40	8.16	0.13	8.46	0.06
	City Flood Gauge	152.57	7.84	8.21	7.94	0.10	8.25	0.04
	Gavial Creek	154.27	7.58	7.94	7.58	0.10	7.96	0.02
	Edinda Lane	165.02	6.10	6.38	6.10	0.00	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.94	0.52	12.06	0.22
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	10.88	-0.16	11.31	-0.10
	Lotus Lagoon	4.56	10.99	11.38	10.78	-0.21	11.27	-0.11
	Nine Mile Road	6.63	10.55	10.95	10.34	-0.21	10.84	-0.11
	Start FP SCRUBBY	11.0	9.43	9.89	9.20	-0.23	9.77	-0.12
	Junction with AP-STH	13.0	9.15	9.60	8.89	-0.26	9.48	-0.12
	u/s Yeppen Crossing	13.6	8.64	9.00	8.42	-0.22	8.91	-0.09
	d/s Bruce Highway	13.84	8.39	8.71	8.19	-0.20	8.63	-0.08
	d/s Yeppen Crossing	14.0	8.10	8.36	7.93	-0.17	8.30	-0.06
	Old Burnett Highway	15.15	7.96	8.22	7.81	-0.15	8.16	-0.06
	Old Bruce Highway	16.98	7.18	7.47	7.14	-0.04	7.46	-0.01
	J/w FP GAVIAL	19.04	7.08	7.38	7.06	-0.02	7.38	0.00
FP SCRUBBY	Start	0	9.43	9.89	9.20	-0.23	9.77	-0.12
	d/s Capricorn Highway	1.3	9.00	9.46	8.74	-0.26	9.34	-0.12
	u/s Bruce Highway	4.0	8.63	8.99	8.41	-0.22	8.90	-0.09
	d/s Railway	4.3	8.10	8.37	7.93	-0.17	8.30	-0.07
	J/w FP MAIN	5.15	7.96	8.22	7.81	-0.15	8.16	-0.06
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.42	-0.22	8.91	-0.05
	Port Curtis Junction	0.91	8.37	8.76	8.17	-0.20	8.68	-0.08
	Depot Hill	2.1	7.67	8.19	7.67	0.00	8.16	-0.03
	Gavial Creek	4.2	7.56	7.91	7.62	0.06	7.94	0.03
FP LION	J/w FP MAIN	0	10.55	10.95	10.34	-0.21	10.84	-0.11
	J/w AP STH	2.2	10.43	10.90	10.24	-0.19	10.77	-0.13
	J/w AP NTH	3.35	10.25	10.86	10.08	-0.17	10.71	-0.15
	Fitzroy River	5.3	9.49	9.91	9.81	0.32	10.03	0.12
Airport North	J/w FP LION	0	10.25	10.86	10.08	-0.17	10.71	-0.15
	New Terminal	1.54	9.61	10.15	9.17	-0.44	10.01	-0.14
	J/w AP STH	2.6	9.16	9.61	8.89	-0.27	9.49	-0.12
Airport South	J/w FP LION	0	10.43	10.90	10.24	-0.19	10.77	-0.13
	Opposite Terminal	1.3	9.61	10.15	9.17	-0.44	10.01	-0.14
	J/w AP NTH	2.3	9.16	9.61	8.89	-0.27	9.49	-0.12
	J/w FP MAIN	3.0	9.15	9.60	8.89	-0.26	9.48	-0.12
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.16	0.13	8.46	0.06
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.15	0.14	8.44	0.05
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.31	0.05	7.63	0.02
	J/w Fitzroy River	2.93	7.21	7.54	7.26	0.05	7.56	0.02
Gavial Creek	Fitzroy River	0	7.58	7.94	7.64	0.06	7.96	0.02
	J/w FP CURTIS	1.03	7.56	7.92	7.62	0.06	7.94	0.02
	J/w FP MAIN	4.21	7.08	7.38	7.06	-0.02	7.37	-0.01
	Edinda Lane	6.06	6.43	6.65	6.42	-0.01	6.38	-0.27
Splitters Creek		1.1	9.51	9.92	9.83	0.32	10.05	0.13
		2.1	9.50	9.91	9.82	0.32	10.03	0.12
Peak Flows at	Barrage m ³ /s		10260	11080	11275	1,015	11525	445
	Floodplain Pink Lily m ³ /s		4130	5605	3670	-560	5230	-375
	Floodplain Yeppen m ³ /s		3910	5255	3350	-560	4860	-395

TABLE J-15

**Summary of Peak Flood Levels for Flood Mitigation Options
Option D2 – Prevent Pink Lily Breakout at 2% AEP**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	18.04	0.11	18.67	0.15
	u/s Pink Lily	134.0	12.26	12.69	13.56	1.30	14.35	1.66
	start of FP2	139.2	11.48	11.90	13.27	1.79	14.09	2.19
	start of FP Main	140.1	11.42	11.84	13.24	1.82	14.06	2.22
	near Water Treatment Works	144.78	10.86	11.32	12.60	1.74	13.40	2.08
	Barrage	149.27	9.49	9.91	10.63	1.14	11.26	1.35
	d/s Barrage	149.47	9.17	9.60	10.31	1.14	10.96	1.36
		150.17	8.55	8.96	9.44	0.89	9.99	1.03
	Railway Bridge	150.67	8.35	8.74	9.11	0.76	9.60	0.86
	Fitzroy Street Bridge	151.57	8.03	8.40	8.62	0.59	9.05	0.65
	City Flood Gauge	152.57	7.84	8.21	8.33	0.49	8.72	0.51
	Gavial Creek	154.27	7.58	7.94	7.89	0.31	8.21	0.27
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.37	-0.01
		173.00	5.43	5.69	5.42	-0.01	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	13.24	1.82	14.06	2.22
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	8.84	-2.20	9.07	-2.34
	Lotus Lagoon	4.56	10.99	11.38	8.84	-2.15	9.07	-2.31
	Nine Mile Road	6.63	10.55	10.95	8.84	-1.71	9.03	-1.92
	Start FP SCRUBBY	11.0	9.43	9.89	7.22	-2.21	7.90	-1.99
	Junction with AP-STH	13.0	9.15	9.60	7.14	-2.01	7.83	-1.77
	u/s Yeppen Crossing	13.6	8.64	9.00	7.07	-1.57	7.71	-1.29
	d/s Bruce Highway	13.84	8.39	8.71	7.02	-1.37	7.57	-1.14
	d/s Yeppen Crossing	14.0	8.10	8.36	6.99	-1.11	7.46	-0.90
	Old Burnett Highway	15.15	7.96	8.22	6.97	-0.99	7.41	-0.81
	Old Bruce Highway	16.98	7.18	7.47	6.91	-0.27	7.25	-0.22
	J/w FP GAVIAL	19.04	7.08	7.38	6.90	-0.18	7.23	-0.15
FP SCRUBBY	Start	0	9.43	9.89	7.22	-2.21	7.90	-1.99
	d/s Capricorn Highway	1.3	9.00	9.46	6.98	-2.02	7.47	-1.99
	u/s Bruce Highway	4.0	8.63	8.99	6.98	-1.65	7.46	-1.53
	d/s Railway	4.3	8.10	8.37	6.98	-1.12	7.45	-0.92
	J/w FP MAIN	5.15	7.96	8.22	6.97	-0.99	7.41	-0.81
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	7.07	-1.57	7.71	-1.25
	Port Curtis Junction	0.91	8.37	8.76	7.83	-0.54	8.11	-0.65
	Depot Hill	2.1	7.67	8.19	7.83	0.16	8.11	-0.08
	Gavial Creek	4.2	7.56	7.91	7.84	0.28	8.14	0.23
FP LION	J/w FP MAIN	0	10.55	10.95	8.84	-1.71	9.03	-1.92
	J/w AP STH	2.2	10.43	10.90	9.38	-1.05	9.57	-1.33
	J/w AP NTH	3.35	10.25	10.86	10.11	-0.14	10.43	-0.43
	Fitzroy River	5.3	9.49	9.91	10.63	1.14	11.26	1.35
Airport North	J/w FP LION	0	10.25	10.86	10.11	-0.14	10.43	-0.43
	New Terminal	1.54	9.61	10.15	7.80	-1.81	8.57	-1.58
	J/w AP STH	2.6	9.16	9.61	7.14	-2.02	7.84	-1.77
Airport South	J/w FP LION	0	10.43	10.90	9.38	-1.05	9.57	-1.33
	Opposite Terminal	1.3	9.61	10.15	7.43	-2.18	8.57	-1.58
	J/w AP NTH	2.3	9.16	9.61	7.14	-2.02	7.84	-1.77
	J/w FP MAIN	3.0	9.15	9.60	7.14	-2.01	7.83	-1.77
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.62	0.59	9.05	0.65
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.60	0.59	9.02	0.63
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.59	0.33	7.99	0.38
	J/w Fitzroy River	2.93	7.21	7.54	7.46	0.25	7.77	0.23
Gavial Creek	Fitzroy River	0	7.58	7.94	7.89	0.31	8.21	0.27
	J/w FP CURTIS	1.03	7.56	7.92	7.84	0.28	8.14	0.22
	J/w FP MAIN	4.21	7.08	7.38	6.90	-0.18	7.23	-0.15
	Edinda Lane	6.06	6.43	6.65	6.33	-0.10	6.37	-0.28
Splitters Creek		1.1	9.51	9.92				
		2.1	9.50	9.91				
Flows at Yeppen m ³ /s			3,910	5,205	245	-3,665	735	-4,470
Time of Submergence			11.6 d	12.7 d	0 d	-11.6 d	0 d	12.7 d

TABLE J-16

**Summary of Peak Flood Levels for Flood Mitigation Options
Option D3 - Raise breakout threshold at Pink Lily by 2.5 m**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	18.00	0.07	18.58	0.06
	u/s Pink Lily	134.0	12.26	12.69	13.09	0.83	13.49	0.80
	start of FP2	139.2	11.48	11.90	12.70	1.22	13.05	1.15
	start of FP Main	140.1	11.42	11.84	12.65	1.23	13.01	1.17
	near Water Treatment Works	144.78	10.86	11.32	11.99	1.13	12.33	1.01
	Barrage	149.27	9.49	9.91	10.20	0.71	10.46	0.55
	d/s Barrage	149.47	9.17	9.60	9.86	0.69	10.15	0.55
		150.17	8.55	8.96	9.08	0.53	9.36	0.40
	Railway Bridge	150.67	8.35	8.74	8.80	0.45	9.08	0.34
	Fitzroy Street Bridge	151.57	8.03	8.40	8.36	0.33	8.65	0.25
	City Flood Gauge	152.57	7.84	8.21	8.11	0.27	8.40	0.19
	Gavial Creek	154.27	7.58	7.94	7.74	0.16	8.03	0.09
	Edinda Lane	165.02	6.10	6.38	6.10	0.00	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	12.65	1.23	13.01	1.17
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	10.13	-0.91	10.91	-0.50
	Lotus Lagoon	4.56	10.99	11.38	9.91	-1.08	10.72	-0.66
	Nine Mile Road	6.63	10.55	10.95	9.57	-0.98	10.33	-0.62
	Start FP SCRUBBY	11.0	9.43	9.89	8.53	-0.90	9.25	-0.64
	Junction with AP-STH	13.0	9.15	9.60	8.25	-0.90	8.98	-0.62
	u/s Yeppen Crossing	13.6	8.64	9.00	7.93	-0.71	8.51	-0.49
	d/s Bruce Highway	13.84	8.39	8.71	7.74	-0.65	8.30	-0.41
	d/s Yeppen Crossing	14.0	8.10	8.36	7.55	-0.55	8.06	-0.30
	Old Burnett Highway	15.15	7.96	8.22	7.47	-0.49	7.95	-0.27
	Old Bruce Highway	16.98	7.18	7.47	7.07	-0.11	7.42	-0.05
	J/w FP GAVIAL	19.04	7.08	7.38	7.00	-0.08	7.33	-0.05
FP SCRUBBY	Start	0	9.43	9.89	8.53	-0.90	9.25	-0.64
	d/s Capricorn Highway	1.3	9.00	9.46	7.84	-1.16	8.82	-0.64
	u/s Bruce Highway	4.0	8.63	8.99	7.69	-0.94	8.50	-0.49
	d/s Railway	4.3	8.10	8.37	7.55	-0.55	8.06	-0.31
	J/w FP MAIN	5.15	7.96	8.22	7.47	-0.49	7.95	-0.27
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	7.93	-0.71	8.51	-0.45
	Port Curtis Junction	0.91	8.37	8.76	7.70	-0.67	8.33	-0.43
	Depot Hill	2.1	7.67	8.19	7.69	0.02	8.04	-0.15
	Gavial Creek	4.2	7.56	7.91	7.70	0.14	8.00	0.09
FP LION	J/w FP MAIN	0	10.55	10.95	9.57	-0.98	10.33	-0.62
	J/w AP STH	2.2	10.43	10.90	9.59	-0.84	10.33	-0.57
	J/w AP NTH	3.35	10.25	10.86	9.94	-0.31	10.38	-0.48
	Fitzroy River	5.3	9.49	9.91	10.20	0.71	10.46	0.55
Airport North	J/w FP LION	0	10.25	10.86	9.94	-0.31	10.38	-0.48
	New Terminal	1.54	9.61	10.15	8.41	-1.20	9.45	-0.70
	J/w AP STH	2.6	9.16	9.61	8.25	-0.91	8.99	-0.62
Airport South	J/w FP LION	0	10.43	10.90	9.59	-0.84	10.33	-0.57
	Opposite Terminal	1.3	9.61	10.15	8.42	-1.19	9.45	-0.70
	J/w AP NTH	2.3	9.16	9.61	8.25	-0.91	8.99	-0.62
	J/w FP MAIN	3.0	9.15	9.60	8.25	-0.90	8.98	-0.62
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.36	0.33	8.65	0.25
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.35	0.34	8.63	0.24
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.42	0.16	7.72	0.11
	J/w Fitzroy River	2.93	7.21	7.54	7.34	0.13	7.62	0.08
Gavial Creek	Fitzroy River	0	7.58	7.94	7.74	0.16	8.03	0.09
	J/w FP CURTIS	1.03	7.56	7.92	7.70	0.14	8.00	0.08
	J/w FP MAIN	4.21	7.08	7.38	7.00	-0.08	7.33	-0.05
	Edinda Lane	6.06	6.43	6.65	6.38	-0.05	6.63	-0.02
Splitters Creek		1.1	9.51	9.92	10.50	0.99	10.80	0.88
		2.1	9.50	9.91	10.26	0.76	10.53	0.62
Peak Flows at	Barrage m ³ /s		10260	11080	12510	2250	12970	1890
	Floodplain Pink Lily m ³ /s		4130	5605	1520	-2610	2945	-2660
	Floodplain Yeppen m ³ /s		3910	5255	1650	-2260	3365	-1890
	Time of Submergence Yeppen		11.6 d	12.6 d	6.5 d	-5.1 d	9.0 d	-3.6 d

TABLE J-17

Summary of Peak Flood Levels for Flood Mitigation Options
Option D4 – Raise breakout threshold at Gavial Creek to 10 m AHD

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yeamba	100.0	17.93	18.52	17.75	-0.18		
	u/s Pink Lily	134.0	12.26	12.69	12.18	-0.08		
	start of FP2	139.2	11.48	11.90	11.44	-0.04		
	start of FP Main	140.1	11.42	11.84	11.39	-0.03		
	near Water Treatment Works	144.78	10.86	11.32	10.89	0.03		
	Barrage	149.27	9.49	9.91	9.72	0.23		
	d/s Barrage	149.47	9.17	9.60	9.48	0.31		
		150.17	8.55	8.96	9.00	0.45		
	Railway Bridge	150.67	8.35	8.74	8.84	0.49		
	Fitzroy Street Bridge	151.57	8.03	8.40	8.60	0.57		
	City Flood Gauge	152.57	7.84	8.21	8.47	0.63		
	Gavial Creek	154.27	7.58	7.94	8.29	0.71		
	Edinda Lane	165.02	6.10	6.38	5.93	-0.17		
		173.00	5.43	5.69	5.22	-0.21		
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.39	-0.03		
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.00	-0.04		
	Lotus Lagoon	4.56	10.99	11.38	10.95	-0.04		
	Nine Mile Road	6.63	10.55	10.95	10.50	-0.05		
	Start FP SCRUBBY	11.0	9.43	9.89	9.37	-0.06		
	Junction with AP-STH	13.0	9.15	9.60	9.08	-0.07		
	u/s Yeppen Crossing	13.6	8.64	9.00	8.56	-0.08		
	d/s Bruce Highway	13.84	8.39	8.71	8.30	-0.09		
	d/s Yeppen Crossing	14.0	8.10	8.36	8.01	-0.09		
	Old Burnett Highway	15.15	7.96	8.22	7.86	-0.10		
	Old Bruce Highway	16.98	7.18	7.47	6.92	-0.26		
	J/w FP GAVIAL	19.04	7.08	7.38	6.46	-0.62		
FP SCRUBBY	Start	0	9.43	9.89	9.37	-0.06		
	d/s Capricorn Highway	1.3	9.00	9.46	8.92	-0.08		
	u/s Bruce Highway	4.0	8.63	8.99	8.55	-0.08		
	d/s Railway	4.3	8.10	8.37	8.01	-0.09		
	J/w FP MAIN	5.15	7.96	8.22	7.86	-0.10		
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.56	-0.08		
	Port Curtis Junction	0.91	8.37	8.76	8.29	-0.08		
	Depot Hill	2.1	7.67	8.19	6.81	-0.86		
	Gavial Creek	4.2	7.56	7.91	6.50	-1.06		
FP LION	J/w FP MAIN	0	10.55	10.95	10.50	-0.05		
	J/w AP STH	2.2	10.43	10.90	10.40	-0.03		
	J/w AP NTH	3.35	10.25	10.86	10.23	-0.02		
	Fitzroy River	5.3	9.49	9.91	9.72	0.23		
Airport North	J/w FP LION	0	10.25	10.86	10.23	-0.02		
	New Terminal	1.54	9.61	10.15	9.53	-0.08		
	J/w AP STH	2.6	9.16	9.61	9.09	-0.07		
Airport South	J/w FP LION	0	10.43	10.90	10.40	-0.03		
	Opposite Terminal	1.3	9.61	10.15	9.53	-0.08		
	J/w AP NTH	2.3	9.16	9.61	9.09	-0.07		
	J/w FP MAIN	3.0	9.15	9.60	9.08	-0.07		
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.60	0.57		
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.59	0.58		
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.82	0.56		
	J/w Fitzroy River	2.93	7.21	7.54	7.75	0.54		
Gavial Creek	Fitzroy River	0	7.58	7.94	8.29	0.71		
	J/w FP CURTIS	1.03	7.56	7.92	6.50	-1.06		
	J/w FP MAIN	4.21	7.08	7.38	6.46	-0.62		
	Edinda Lane	6.06	6.43	6.65	6.06	-0.37		
Splitters Creek		1.1	9.51	9.92	9.74	0.23		
		2.1	9.50	9.91	9.73	0.23		

TABLE J-18a

Summary of Peak Flood Levels for Flood Mitigation Options
Option F3 – Reduce tailwater at Yeppen by removing old railway
embankments and old Burnett Highway Bridge

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.89	-0.01
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.84	0.00
	near Water Treatment Works	144.78	10.86	11.32	11.86	1.00	11.32	0.00
	Barrage	149.27	9.49	9.91	9.48	-0.01	9.89	-0.02
	d/s Barrage	149.47	9.17	9.60	9.15	-0.02	9.58	-0.02
		150.17	8.55	8.96	8.53	-0.02	8.94	-0.02
	Railway Bridge	150.67	8.35	8.74	8.53	0.18	8.72	-0.02
	Fitzroy Street Bridge	151.57	8.03	8.40	8.00	-0.03	8.38	-0.02
	City Flood Gauge	152.57	7.84	8.21	7.81	-0.03	8.18	-0.03
	Gavial Creek	154.27	7.58	7.94	7.55	-0.03	7.91	-0.03
	Edinda Lane	165.02	6.10	6.38	6.10	0.00	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.84	0.00
	Rockhampton-Ridgelands Road	1.75	11.04	11.41	11.04	0.00	11.40	-0.01
	Lotus Lagoon	4.56	10.99	11.38	10.99	0.00	11.37	-0.01
	Nine Mile Road	6.63	10.55	10.95	10.54	-0.01	10.95	0.00
	Start FP SCRUBBY	11.0	9.43	9.89	9.41	-0.02	9.86	-0.03
	Junction with AP-STH	13.0	9.15	9.60	9.11	-0.04	9.56	-0.04
	u/s Yeppen Crossing	13.6	8.64	9.00	8.58	-0.06	8.93	-0.07
	d/s Bruce Highway	13.84	8.39	8.71	8.27	-0.12	8.59	-0.12
	d/s Yeppen Crossing	14.0	8.10	8.36	7.92	-0.18	8.19	-0.17
	Old Burnett Highway	15.15	7.96	8.22	7.72	-0.24	7.99	-0.23
	Old Bruce Highway	16.98	7.18	7.47	7.21	0.03	7.47	0.00
	J/w FP GAVIAL	19.04	7.08	7.38	7.10	0.02	7.35	-0.03
FP SCRUBBY	Start	0	9.43	9.89	9.41	-0.02	9.86	-0.03
	d/s Capricorn Highway	1.3	9.00	9.46	8.95	-0.05	9.42	-0.04
	u/s Bruce Highway	4.0	8.63	8.99	8.57	-0.06	8.93	-0.06
	d/s Railway	4.3	8.10	8.37	7.92	-0.18	8.20	-0.17
	J/w FP MAIN	5.15	7.96	8.22	7.72	-0.24	7.99	-0.23
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.98	8.58	-0.06	8.93	-0.05
	Port Curtis Junction	0.91	8.37	8.76	8.84	0.47	8.68	-0.08
	Depot Hill	2.1	7.67	8.19	7.57	-0.10	8.07	-0.12
	Gavial Creek	4.2	7.56	7.91	7.53	-0.03	7.89	-0.02
FP LION	J/w FP MAIN	0	10.55	10.95	10.54	-0.01	10.95	0.00
	J/w AP STH	2.2	10.43	10.90	10.43	0.00	10.89	-0.01
	J/w AP NTH	3.35	10.25	10.86	10.24	-0.01	10.85	-0.01
	Fitzroy River	5.3	9.49	9.91	9.48	-0.01	9.89	-0.02
Airport North	J/w FP LION	0	10.25	10.86	10.24	-0.01	10.85	-0.01
	New Terminal	1.54	9.61	10.15	9.58	-0.03	10.12	-0.03
	J/w AP STH	2.6	9.16	9.61	9.12	-0.04	9.57	-0.04
Airport South	J/w FP LION	0	10.43	10.90	10.43	0.00	10.89	-0.01
	Opposite Terminal	1.3	9.61	10.15	9.58	-0.03	10.13	-0.02
	J/w AP NTH	2.3	9.16	9.61	9.12	-0.04	9.57	-0.04
	J/w FP MAIN	3.0	9.15	9.60	9.11	-0.04	9.56	-0.04
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.00	-0.03	8.38	-0.02
	Lakes Creek Road (STW)	1.0	8.01	8.39	7.98	-0.03	8.36	-0.03
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.23	-0.03	7.58	-0.03
	J/w Fitzroy River	2.93	7.21	7.54	7.19	-0.02	7.52	-0.02
Gavial Creek	Fitzroy River	0	7.58	7.94	7.55	-0.03	7.91	-0.03
	J/w FP CURTIS	1.03	7.56	7.92	7.53	-0.03	7.89	-0.03
	J/w FP MAIN	4.21	7.08	7.38	7.10	0.02	7.39	0.01
	Edinda Lane	6.06	6.43	6.65	6.44	0.01	6.66	0.01
Splitters Creek		1.1	9.51	9.92	9.50	-0.01	9.91	-0.01
		2.1	9.50	9.91	9.49	-0.01	9.90	-0.01
Flows at Yeppen	Bridges m³/s		2495	2650			2905	255
	Overflow m³/s		1415	2605			2380	-225
	Time of Submergence (days)		11.6 d	12.67 d			12.63 d	-0.04 d

TABLE J-18b

Summary of Peak Flood Levels for Flood Mitigation Options
Option F4 – Enlarge channel d/s Yeppen Crossing

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Ysamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.68	-0.01
	start of FP2	139.2	11.48	11.90	11.47	-0.01	11.89	-0.01
	start of FP Main	140.1	11.42	11.84	11.41	-0.01	11.83	-0.01
	near Water Treatment Works	144.78	10.86	11.32	10.85	-0.01	11.31	-0.01
	Barrage	149.27	9.49	9.91	9.47	-0.02	9.87	-0.04
	d/s Barrage	149.47	9.17	9.60	9.13	-0.04	9.56	-0.04
		150.17	8.55	8.96	8.50	-0.05	8.91	-0.05
	Railway Bridge	150.67	8.35	8.74	8.30	-0.05	8.69	-0.05
	Fitzroy Street Bridge	151.57	8.03	8.40	7.97	-0.06	8.34	-0.06
	City Flood Gauge	152.57	7.84	8.21	7.78	-0.06	8.14	-0.07
	Gavial Creek	154.27	7.58	7.94	7.51	-0.07	7.86	-0.08
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.41	-0.01	11.83	-0.01
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.03	-0.01	11.40	-0.01
	Lotus Lagoon	4.56	10.99	11.38	10.98	-0.01	11.36	-0.02
	Nine Mile Road	6.63	10.55	10.95	10.53	-0.02	10.94	-0.01
	Start FP SCRUBBY	11.0	9.43	9.89	9.39	-0.04	9.85	-0.04
	Junction with AP-STH	13.0	9.15	9.60	9.08	-0.07	9.55	-0.05
	u/s Yeppen Crossing	13.6	8.64	9.00	8.53	-0.11	8.91	-0.09
	d/s Bruce Highway	13.84	8.39	8.71	8.20	-0.19	8.55	-0.16
	d/s Yeppen Crossing	14.0	8.10	8.36	7.82	-0.28	8.13	-0.23
	Old Burnett Highway	15.15	7.96	8.22	7.64	-0.32	7.95	-0.27
	Old Bruce Highway	16.98	7.18	7.47	7.11	-0.07	7.44	-0.03
	J/w FP GAVIAL	19.04	7.08	7.38	7.04	-0.04	7.33	-0.05
FP SCRUBBY	Start	0	9.43	9.89	9.39	-0.04	9.85	-0.04
	d/s Capricorn Highway	1.3	9.00	9.46	8.91	-0.09	9.40	-0.06
	u/s Bruce Highway	4.0	8.63	8.99	8.52	-0.11	8.90	-0.09
	d/s Railway	4.3	8.10	8.37	7.82	-0.28	8.13	-0.24
	J/w FP MAIN	5.15	7.96	8.22	7.64	-0.32	7.95	-0.27
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.53	-0.11	8.91	-0.05
	Port Curtis Junction	0.91	8.37	8.76	7.69	-0.68	8.65	-0.11
	Depot Hill	2.1	7.67	8.19	7.51	-0.16	8.02	-0.17
	Gavial Creek	4.2	7.56	7.91	7.49	-0.07	7.84	-0.07
FP LION	J/w FP MAIN	0	10.55	10.95	10.53	-0.02	10.94	-0.01
	J/w AP STH	2.2	10.43	10.90	10.42	-0.01	10.88	-0.02
	J/w AP NTH	3.35	10.25	10.86	10.23	-0.02	10.84	-0.02
	Fitzroy River	5.3	9.49	9.91	9.47	-0.02	9.87	-0.04
Airport North	J/w FP LION	0	10.25	10.86	10.23	-0.02	10.84	-0.02
	New Terminal	1.54	9.61	10.15	9.56	-0.05	10.11	-0.04
	J/w AP STH	2.6	9.16	9.61	9.09	-0.07	9.56	-0.05
Airport South	J/w FP LION	0	10.43	10.90	10.42	-0.01	10.88	-0.02
	Opposite Terminal	1.3	9.61	10.15	9.56	-0.05	10.11	-0.04
	J/w AP NTH	2.3	9.16	9.61	9.09	-0.07	9.56	-0.05
	J/w FP MAIN	3.0	9.15	9.60	9.08	-0.07	9.55	-0.05
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	7.97	-0.06	8.34	-0.06
	Lakes Creek Road (STW)	1.0	8.01	8.39	7.95	-0.06	8.33	-0.06
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.21	-0.05	7.54	-0.07
	J/w Fitzroy River	2.93	7.21	7.54	7.16	-0.05	7.48	-0.06
Gavial Creek	Fitzroy River	0	7.58	7.94	7.51	-0.07	7.86	-0.08
	J/w FP CURTIS	1.03	7.56	7.92	7.49	-0.07	7.84	-0.08
	J/w FP MAIN	4.21	7.08	7.38	7.04	-0.04	7.33	-0.05
	Edinda Lane	6.06	6.43	6.65	6.45	0.02	6.67	0.02
Splitters Creek		1.1	9.51	9.92	9.48	-0.03	9.89	-0.03
		2.1	9.50	9.91	9.47	-0.03	9.88	-0.03
Flows at Yeppen	Bridges m³/s		2495	2650	2925	430	3005	355
	Overflow m³/s		1415	2605	995	-420	2290	-315
	Time of Submergence		11.6 d	12.67 d	10.8 d	-0.8 d	12.00 d	-0.67 d

TABLE J-19

**Summary of Peak Flood Levels for Flood Mitigation Options
Option E1 - Major Floodway + Levees Pink Lily**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.94	0.01	18.53	0.01
	u/s Pink Lily	134.0	12.26	12.69	12.34	0.08	12.89	0.20
	start of FP2	139.2	11.48	11.90	11.69	0.21	12.29	0.39
	start of FP Main	140.1	11.42	11.84	11.65	0.23	12.26	0.42
	near Water Treatment Works	144.78	10.86	11.32	11.06	0.20	11.68	0.36
	Barrage	149.27	9.49	9.91	9.56	0.07	10.04	0.13
	d/s Barrage	149.47	9.17	9.60	9.22	0.05	9.72	0.12
		150.17	8.55	8.96	8.57	0.02	9.02	0.06
	Railway Bridge	150.67	8.35	8.74	8.36	0.01	8.77	0.03
	Fitzroy Street Bridge	151.57	8.03	8.40	8.01	-0.02	8.39	-0.01
	City Flood Gauge	152.57	7.84	8.21	7.82	-0.02	8.17	-0.04
	Gavial Creek	154.27	7.58	7.94	7.54	-0.04	7.86	-0.08
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
Floodway	J/w Fitzroy River	0.0			11.76		12.34	
		2.5			11.40		11.96	
		5.0			11.05		11.60	
		7.5			10.68		11.21	
		10.0			10.27		10.78	
		12.5			9.81		10.29	
		15.0			9.25		9.69	
	J/w FP GAVIAL	19.0			7.10		7.41	
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.01	-0.02	8.39	-0.01
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.00	-0.01	8.38	-0.01
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.23	-0.03	7.55	-0.06
	J/w Fitzroy River	2.93	7.21	7.54	7.18	-0.03	7.48	-0.06
Gavial Creek	Fitzroy River	0	7.58	7.94	7.54	-0.04	7.86	-0.08
	J/w FP CURTIS	1.03	7.56	7.92	7.51	-0.05	7.83	-0.09
	J/w FP MAIN	4.21	7.08	7.38	7.10	0.02	7.41	0.03
	Edinda Lane	6.06	6.43	6.65	6.44	0.01	6.67	0.02
Splitters Creek		1.1	9.51	9.92	9.56	0.05	10.04	0.12
		2.1	9.50	9.91	9.56	0.06	10.04	0.13
Peak Flow	City Reach m³/s		10,260	11,080	10,560	300	11,740	660
	Floodway m³/s				3,570		4,580	

TABLE J-20

Summary of Peak Flood Levels for Flood Mitigation Options
Option M1 – Max effect of Landfill ie. delete Lakes Creek Flow Path

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.90	0.00
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.84	0.00
	near Water Treatment Works	144.78	10.86	11.32	10.87	0.01	11.33	0.01
	Barrage	149.27	9.49	9.91	9.50	0.01	9.91	0.00
	d/s Barrage	149.47	9.17	9.60	9.17	0.00	9.61	0.01
		150.17	8.55	8.96	8.56	0.01	8.97	0.01
	Railway Bridge	150.67	8.35	8.74	8.36	0.01	8.75	0.01
	Fitzroy Street Bridge	151.57	8.03	8.40	8.03	0.00	8.41	0.01
	City Flood Gauge	152.57	7.84	8.21	7.85	0.01	8.22	0.01
	Gavial Creek	154.27	7.58	7.94	7.59	0.01	7.94	0.00
	Edinda Lane	165.02	6.10	6.38	6.10	0.00	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.84	0.00
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.04	0.00	11.41	0.00
	Lotus Lagoon	4.56	10.99	11.38	10.99	0.00	11.38	0.00
	Nine Mile Road	6.63	10.55	10.95	10.55	0.00	10.95	0.00
	Start FP SCRUBBY	11.0	9.43	9.89	9.43	0.00	9.89	0.00
	Junction with AP-STH	13.0	9.15	9.60	9.15	0.00	9.60	0.00
	u/s Yeppen Crossing	13.6	8.64	9.00	8.64	0.00	9.00	0.00
	d/s Bruce Highway	13.84	8.39	8.71	8.39	0.00	8.71	0.00
	d/s Yeppen Crossing	14.0	8.10	8.36	8.10	0.00	8.36	0.00
	Old Burnett Highway	15.15	7.96	8.22	7.96	0.00	8.22	0.00
	Old Bruce Highway	16.98	7.18	7.47	7.18	0.00	7.47	0.00
	J/w FP GAVIAL	19.04	7.08	7.38	7.08	0.00	7.38	0.00
FP SCRUBBY	Start	0	9.43	9.89	9.43	0.00	9.89	0.00
	d/s Capricorn Highway	1.3	9.00	9.46	9.00	0.00	9.46	0.00
	u/s Bruce Highway	4.0	8.63	8.99	8.63	0.00	8.99	0.00
	d/s Railway	4.3	8.10	8.37	8.10	0.00	8.37	0.00
	J/w FP MAIN	5.15	7.96	8.22	7.96	0.00	8.22	0.00
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.64	0.00	8.96	0.00
	Port Curtis Junction	0.91	8.37	8.76	8.37	0.00	8.76	0.00
	Depot Hill	2.1	7.67	8.19	7.67	0.00	8.19	0.00
	Gavial Creek	4.2	7.56	7.91	7.56	0.00	7.91	0.00
FP LION	J/w FP MAIN	0	10.55	10.95	10.55	0.00	10.95	0.00
	J/w AP STH	2.2	10.43	10.90	10.43	0.00	10.90	0.00
	J/w AP NTH	3.35	10.25	10.86	10.25	0.00	10.86	0.00
	Fitzroy River	5.3	9.49	9.91	9.49	0.00	9.91	0.00
Airport North	J/w FP LION	0	10.25	10.86	10.25	0.00	10.86	0.00
	New Terminal	1.54	9.61	10.15	9.61	0.00	10.15	0.00
	J/w AP STH	2.6	9.16	9.61	9.16	0.00	9.61	0.00
Airport South	J/w FP LION	0	10.43	10.90	10.43	0.00	10.90	0.00
	Opposite Terminal	1.3	9.61	10.15	9.61	0.00	10.15	0.00
	J/w AP NTH	2.3	9.16	9.61	9.16	0.00	9.61	0.00
	J/w FP MAIN	3.0	9.15	9.60	9.15	0.00	9.60	0.00
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40				
	Lakes Creek Road (STW)	1.0	8.01	8.39				
	Lakes Creek Road (Landfill)	2.0	7.26	7.61				
	J/w Fitzroy River	2.93	7.21	7.54				
Gavial Creek	Fitzroy River	0	7.58	7.94	7.58	0.00	7.94	0.00
	J/w FP CURTIS	1.03	7.56	7.92	7.56	0.00	7.92	0.00
	J/w FP MAIN	4.21	7.08	7.38	7.08	0.00	7.38	0.00
	Edinda Lane	6.06	6.43	6.65	6.43	0.00	6.65	0.00
Splitters Creek		1.1	9.51	9.92	9.51	0.00	9.92	0.00
		2.1	9.50	9.91	9.50	0.00	9.91	0.00

TABLE J-22

Summary of Peak Flood Levels for Flood Mitigation Options
Option M3 – Lower Capricorn Highway by 1.0 m

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.90	0.00
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.84	0.00
	near Water Treatment Works	144.78	10.86	11.32	10.86	0.00	11.32	0.00
	Barrage	149.27	9.49	9.91	9.49	0.00	9.90	-0.01
	d/s Barrage	149.47	9.17	9.60	9.16	-0.01	9.60	0.00
		150.17	8.55	8.96	8.55	0.00	8.96	0.00
	Railway Bridge	150.67	8.35	8.74	8.35	0.00	8.74	0.00
	Fitzroy Street Bridge	151.57	8.03	8.40	8.02	-0.01	8.40	0.00
	City Flood Gauge	152.57	7.84	8.21	7.84	0.00	8.21	0.00
	Gavial Creek	154.27	7.58	7.94	7.58	0.00	7.94	0.00
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.84	0.00
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.04	0.00	11.41	0.00
	Lotus Lagoon	4.56	10.99	11.38	10.99	0.00	11.37	-0.01
	Nine Mile Road	6.63	10.55	10.95	10.53	-0.02	10.95	0.00
	Start FP SCRUBBY	11.0	9.43	9.89	9.32	-0.11	9.89	0.00
	Junction with AP-STH	13.0	9.15	9.60	9.08	-0.07	9.60	0.00
	u/s Yeppen Crossing	13.6	8.64	9.00	8.64	0.00	9.00	0.00
	d/s Bruce Highway	13.84	8.39	8.71	8.39	0.00	8.71	0.00
	d/s Yeppen Crossing	14.0	8.10	8.36	8.10	0.00	8.37	0.01
	Old Burnett Highway	15.15	7.96	8.22	7.96	0.00	8.22	0.00
	Old Bruce Highway	16.98	7.18	7.47	7.18	0.00	7.47	0.00
	J/w FP GAVIAL	19.04	7.08	7.38	7.08	0.00	7.38	0.00
FP SCRUBBY	Start	0	9.43	9.89	9.32	-0.11	9.89	0.00
	d/s Capricorn Highway	1.3	9.00	9.46	9.06	0.06	9.47	0.01
	u/s Bruce Highway	4.0	8.63	8.99	8.63	0.00	8.99	0.00
	d/s Railway	4.3	8.10	8.37	8.10	0.00	8.37	0.00
	J/w FP MAIN	5.15	7.96	8.22	7.96	0.00	8.22	0.00
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.64	0.00	8.96	0.00
	Port Curtis Junction	0.91	8.37	8.76	8.37	0.00	8.76	0.00
	Depot Hill	2.1	7.67	8.19	7.67	0.00	8.19	0.00
	Gavial Creek	4.2	7.56	7.91	7.56	0.00	7.91	0.00
FP LION	J/w FP MAIN	0	10.55	10.95	10.53	-0.02	10.95	0.00
	J/w AP STH	2.2	10.43	10.90	10.42	-0.01	10.90	0.00
	J/w AP NTH	3.35	10.25	10.86	10.23	-0.02	10.86	0.00
	Fitzroy River	5.3	9.49	9.91	9.49	0.00	9.91	0.00
Airport North	J/w FP LION	0	10.25	10.86	10.23	-0.02	10.86	0.00
	New Terminal	1.54	9.61	10.15	9.56	-0.05	10.15	0.00
	J/w AP STH	2.6	9.16	9.61	9.08	-0.08	9.61	0.00
Airport South	J/w FP LION	0	10.43	10.90	10.42	-0.01	10.90	0.00
	Opposite Terminal	1.3	9.61	10.15	9.56	-0.05	10.15	0.00
	J/w AP NTH	2.3	9.16	9.61	9.08	-0.08	9.61	0.00
	J/w FP MAIN	3.0	9.15	9.60	9.08	-0.07	9.60	0.00
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.02	-0.01	8.40	0.00
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.01	0.00	8.39	0.00
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.26	0.00	7.61	0.00
	J/w Fitzroy River	2.93	7.21	7.54	7.21	0.00	7.54	0.00
Gavial Creek	Fitzroy River	0	7.58	7.94	7.58	0.00	7.94	0.00
	J/w FP CURTIS	1.03	7.56	7.92	7.56	0.00	7.92	0.00
	J/w FP MAIN	4.21	7.08	7.38	7.08	0.00	7.38	0.00
	Edinda Lane	6.06	6.43	6.65	6.43	0.00	6.65	0.00
Splitters Creek		1.1	9.51	9.92	9.51	0.00	9.92	0.00
		2.1	9.50	9.91	9.50	0.00	9.91	0.00

TABLE J-23

Summary of Peak Flood Levels for Flood Mitigation Options
Option C1 - B8 + A2 (upgrade Yeppen + Port Curtis-CBD Levee)

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.89	-0.01
	start of FP Main	140.1	11.42	11.84	11.41	-0.01	11.84	0.00
	near Water Treatment Works	144.78	10.86	11.32	10.86	0.00	11.31	-0.01
	Barrage	149.27	9.49	9.91	9.48	-0.01	9.87	-0.04
	d/s Barrage	149.47	9.17	9.60	9.14	-0.03	9.55	-0.05
		150.17	8.55	8.96	8.52	-0.03	8.89	-0.07
	Railway Bridge	150.67	8.35	8.74	8.32	-0.03	8.67	-0.07
	Fitzroy Street Bridge	151.57	8.03	8.40	7.99	-0.04	8.32	-0.08
	City Flood Gauge	152.57	7.84	8.21	7.80	-0.04	8.12	-0.09
	Gavial Creek	154.27	7.58	7.94	7.54	-0.04	7.83	-0.11
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.41	-0.01	11.84	0.00
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.04	0.00	11.41	0.00
	Lotus Lagoon	4.56	10.99	11.38	10.99	0.00	11.38	0.00
	Nine Mile Road	6.63	10.55	10.95	10.54	-0.01	10.97	0.02
	Start FP SCRUBBY	11.0	9.43	9.89	9.41	-0.02	9.98	0.09
	Junction with AP-STH	13.0	9.15	9.60	9.10	-0.05	9.71	0.11
	u/s Yeppen Crossing	13.6	8.64	9.00	8.61	-0.03	9.24	0.24
	d/s Bruce Highway	13.84	8.39	8.71	8.41	0.02	9.00	0.29
	d/s Yeppen Crossing	14.0	8.10	8.36	8.17	0.07	8.68	0.32
	Old Burnett Highway	15.15	7.96	8.22	7.90	-0.06	8.36	0.14
	Old Bruce Highway	16.98	7.18	7.47	7.27	0.09	7.63	0.16
	J/w FP GAVIAL	19.04	7.08	7.38	7.11	0.03	7.43	0.05
FP SCRUBBY	Start	0	9.43	9.89	9.41	-0.02	9.98	0.09
	d/s Capricorn Highway	1.3	9.00	9.46	8.97	-0.03	9.62	0.16
	u/s Bruce Highway	4.0	8.63	8.99	8.60	-0.03	9.23	0.24
	d/s Railway	4.3	8.10	8.37	8.16	0.06	8.68	0.31
	J/w FP MAIN	5.15	7.96	8.22	7.90	-0.06	8.36	0.14
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96				
	Port Curtis Junction	0.91	8.37	8.76				
	Depot Hill	2.1	7.67	8.19				
	Gavial Creek	4.2	7.56	7.91				
FP LION	J/w FP MAIN	0	10.55	10.95	10.54	-0.01	10.97	0.02
	J/w AP STH	2.2	10.43	10.90	10.42	-0.01	10.91	0.01
	J/w AP NTH	3.35	10.25	10.86	10.23	-0.02	10.87	0.01
	Fitzroy River	5.3	9.49	9.91	9.48	-0.01	9.87	-0.04
Airport North	J/w FP LION	0	10.25	10.86	10.23	-0.02	10.87	0.01
	New Terminal	1.54	9.61	10.15	9.58	-0.03	10.21	0.06
	J/w AP STH	2.6	9.16	9.61	9.11	-0.05	9.72	0.11
Airport South	J/w FP LION	0	10.43	10.90	10.42	-0.01	10.91	0.01
	Opposite Terminal	1.3	9.61	10.15	9.58	-0.03	10.21	0.06
	J/w AP NTH	2.3	9.16	9.61	9.11	-0.05	9.72	0.11
	J/w FP MAIN	3.0	9.15	9.60	9.10	-0.05	9.71	0.11
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	7.99	-0.04	8.32	-0.08
	Lakes Creek Road (STW)	1.0	8.01	8.39	7.97	-0.04	8.31	-0.08
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.23	-0.03	7.52	-0.09
	J/w Fitzroy River	2.93	7.21	7.54	7.18	-0.03	7.46	-0.08
Gavial Creek	Fitzroy River	0	7.58	7.94	7.54	-0.04	7.83	-0.11
	J/w FP CURTIS	1.03	7.56	7.92	7.52	-0.04	7.81	-0.11
	J/w FP MAIN	4.21	7.08	7.38	7.11	0.03	7.43	0.05
	Edinda Lane	6.06	6.43	6.65	6.44	0.01	6.68	0.03
Splitters Creek		1.1	9.51	9.92	9.49	-0.02	9.89	-0.03
		2.1	9.50	9.91	9.48	-0.02	9.88	-0.03
Peak Flows at	Yeppen Bridges m ³ /s		2495	2650	3860		4,110	
	Yeppen Overflow m ³ /s		1415	2605	0		1,510	
	Time of Submergence		11.6 d	12.67 d	0	-11.6 d	8.0d	-4.67 d

TABLE J-24

**Summary of Peak Flood Levels for Flood Mitigation Options
Option C2 as C1 + Airport Levee + Splitters Creek Levee**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.27	0.01	12.73	0.04
	start of FP2	139.2	11.48	11.90	11.50	0.02	11.96	0.06
	start of FP Main	140.1	11.42	11.84	11.44	0.02	11.91	0.07
	near Water Treatment Works	144.78	10.86	11.32	10.89	0.03	11.39	0.07
	Barrage	149.27	9.49	9.91	9.51	0.02	9.94	0.03
	d/s Barrage	149.47	9.17	9.60	9.17	0.00	9.63	0.03
		150.17	8.55	8.96	8.55	0.00	8.95	-0.01
	Railway Bridge	150.67	8.35	8.74	8.34	-0.01	8.72	-0.02
	Fitzroy Street Bridge	151.57	8.03	8.40	8.01	-0.02	8.36	-0.04
	City Flood Gauge	152.57	7.84	8.21	7.82	-0.02	8.15	-0.06
	Gavial Creek	154.27	7.58	7.94	7.55	-0.03	7.86	-0.08
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.44	0.02	11.91	0.07
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.09	0.05	11.53	0.12
	Lotus Lagoon	4.56	10.99	11.38	11.05	0.06	11.50	0.12
	Nine Mile Road	6.63	10.55	10.95	10.66	0.11	11.16	0.21
	Start FP SCRUBBY	11.0	9.43	9.89	9.43	0.00	9.97	0.08
	Junction with AP-STH	13.0	9.15	9.60	9.0	-0.15	9.58	-0.02
	u/s Yeppen Crossing	13.6	8.64	9.00	8.55	-0.09	9.17	0.17
	d/s Bruce Highway	13.84	8.39	8.71	8.36	-0.03	8.93	0.22
	d/s Yeppen Crossing	14.0	8.10	8.36	8.13	0.03	8.60	0.24
	Old Burnett Highway	15.15	7.96	8.22	7.87	-0.09	8.29	0.07
	Old Bruce Highway	16.98	7.18	7.47	7.25	0.07	7.60	0.13
	J/w FP GAVIAL	19.04	7.08	7.38	7.10	0.02	7.41	0.03
FP SCRUBBY	Start	0	9.43	9.89	9.43	0.00	9.97	0.08
	d/s Capricorn Highway	1.3	9.00	9.46	8.95	-0.05	9.59	0.13
	u/s Bruce Highway	4.0	8.63	8.99	8.54	-0.09	9.17	0.18
	d/s Railway	4.3	8.10	8.37	8.13	0.03	8.60	0.23
	J/w FP MAIN	5.15	7.96	8.22	7.87	-0.09	8.29	0.07
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96				
	Port Curtis Junction	0.91	8.37	8.76				
	Depot Hill	2.1	7.67	8.19				
	Gavial Creek	4.2	7.56	7.91				
FP LION	J/w FP MAIN	0	10.55	10.95	10.66	0.11	11.16	0.21
	J/w AP STH	2.2	10.43	10.90	10.71	0.28	11.46	0.56
	J/w AP NTH	3.35	10.25	10.86	10.61	0.36	11.45	0.59
	Fitzroy River	5.3	9.49	9.91	9.51	0.02	9.94	0.03
Airport North	J/w FP LION	0	10.25	10.86				
	New Terminal	1.54	9.61	10.15				
	J/w AP STH	2.6	9.16	9.61				
Airport South	J/w FP LION	0	10.43	10.90				
	Opposite Terminal	1.3	9.61	10.15				
	J/w AP NTH	2.3	9.16	9.61				
	J/w FP MAIN	3.0	9.15	9.60				
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.01	-0.02	8.36	-0.04
	Lakes Creek Road (STW)	1.0	8.01	8.39	7.99	-0.02	8.34	-0.05
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.23	-0.03	7.54	-0.07
	J/w Fitzroy River	2.93	7.21	7.54	7.19	-0.02	7.48	-0.06
Gavial Creek	Fitzroy River	0	7.58	7.94	7.55	-0.03	7.86	-0.08
	J/w FP CURTIS	1.03	7.56	7.92	7.53	-0.03	7.83	-0.09
	J/w FP MAIN	4.21	7.08	7.38	7.10	0.02	7.41	0.03
	Edinda Lane	6.06	6.43	6.65	6.44	0.01	6.67	0.02
Splitters Creek		1.1	9.51	9.92				-9.92
		2.1	9.50	9.91				-9.91
Peak Flows at	Yeppen Bridges m ³ /s		2495	2650	3760	1,265	4,065	1,415
	Yeppen Overflow m ³ /s		1415	2605	0	-1,415	1,225	-1,380
	Time of Submergence		11.6 d	12.67 d	0	-11.6 d	7.8 d	-4.9 d

TABLE J-25

**Summary of Peak Flood Levels for Flood Mitigation Options
Option C3 – as B8 + Levee Depot Hill – CBD (not Port Curtis)**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.89	-0.01
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.84	0.00
	near Water Treatment Works	144.78	10.86	11.32	10.86	0.00	11.32	0.00
	Barrage	149.27	9.49	9.91	9.49	0.00	9.90	-0.01
	d/s Barrage	149.47	9.17	9.60	9.17	0.00	9.59	-0.01
		150.17	8.55	8.96	8.54	-0.01	8.95	-0.01
	Railway Bridge	150.67	8.35	8.74	8.35	0.00	8.73	-0.01
	Fitzroy Street Bridge	151.57	8.03	8.40	8.02	-0.01	8.39	-0.01
	City Flood Gauge	152.57	7.84	8.21	7.83	-0.01	8.20	-0.01
	Gavial Creek	154.27	7.58	7.94	7.57	-0.01	7.92	-0.02
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.84	0.00
	Rockhampton-Ridgetands Road	1.75	11.04	11.41	11.03	-0.01	11.41	0.00
	Lotus Lagoon	4.56	10.99	11.38	10.98	-0.01	11.37	-0.01
	Nine Mile Road	6.63	10.55	10.95	10.53	-0.02	10.95	0.00
	Start FP SCRUBBY	11.0	9.43	9.89	9.34	-0.09	9.88	-0.01
	Junction with AP-STH	13.0	9.15	9.60	9.00	-0.15	9.58	-0.02
	u/s Yeppen Crossing	13.6	8.64	9.00	8.40	-0.24	9.00	0.00
	d/s Bruce Highway	13.84	8.39	8.71	8.20	-0.19	8.74	0.03
	d/s Yeppen Crossing	14.0	8.10	8.36	7.95	-0.15	8.25	-0.11
	Old Burnett Highway	15.15	7.96	8.22	7.73	-0.23	8.03	-0.19
	Old Bruce Highway	16.98	7.18	7.47	7.23	0.05	7.53	0.06
	J/w FP GAVIAL	19.04	7.08	7.38	7.09	0.01	7.39	0.01
FP SCRUBBY	Start	0	9.43	9.89	9.34	-0.09	9.88	-0.01
	d/s Capricorn Highway	1.3	9.00	9.46	8.82	-0.18	9.46	0.00
	u/s Bruce Highway	4.0	8.63	8.99	8.39	-0.24	9.00	0.01
	d/s Railway	4.3	8.10	8.37	7.95	-0.15	8.26	-0.11
	J/w FP MAIN	5.15	7.96	8.22	7.73	-0.23	8.03	-0.19
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.40	-0.24	9.00	0.04
	Port Curtis Junction	0.91	8.37	8.76	7.57	-0.80	8.17	-0.59
	Depot Hill	2.1	7.67	8.19	7.57	-0.10	8.04	-0.15
	Gavial Creek	4.2	7.56	7.91	7.55	-0.01	7.90	-0.01
FP LION	J/w FP MAIN	0	10.55	10.95	10.53	-0.02	10.95	0.00
	J/w AP STH	2.2	10.43	10.90	10.42	-0.01	10.90	0.00
	J/w AP NTH	3.35	10.25	10.86	10.23	-0.02	10.85	-0.01
	Fitzroy River	5.3	9.49	9.91	9.49	0.00	9.90	-0.01
Airport North	J/w FP LION	0	10.25	10.86	10.23	-0.02	10.85	-0.01
	New Terminal	1.54	9.61	10.15	9.34	-0.27	10.14	-0.01
	J/w AP STH	2.6	9.16	9.61	9.01	-0.15	9.59	-0.02
Airport South	J/w FP LION	0	10.43	10.90	10.42	-0.01	10.90	0.00
	Opposite Terminal	1.3	9.61	10.15	9.52	-0.09	10.14	-0.01
	J/w AP NTH	2.3	9.16	9.61	9.01	-0.15	9.59	-0.02
	J/w FP MAIN	3.0	9.15	9.60	9.00	-0.15	9.58	-0.02
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.02	-0.01	8.39	-0.01
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.00	-0.01	8.38	-0.01
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.25	-0.01	7.59	-0.02
	J/w Fitzroy River	2.93	7.21	7.54	7.20	-0.01	7.53	-0.01
Gavial Creek	Fitzroy River	0	7.58	7.94	7.57	-0.01	7.92	-0.02
	J/w FP CURTIS	1.03	7.56	7.92	7.55	-0.01	7.90	-0.02
	J/w FP MAIN	4.21	7.08	7.38	7.09	0.01	7.38	0.00
	Edinda Lane	6.06	6.43	6.65	6.43	0.00	6.66	0.01
Splitters Creek		1.1	9.51	9.92	9.50	-0.01	9.92	0.00
		2.1	9.50	9.91	9.49	-0.01	9.91	0.00
Peak Flows at	Yeppen Bridges m ³ /s		2495	2650	3865	1,370	4,665	2,015
	Yeppen Overflow m ³ /s		1415	2605	0	-1,415	670	-1,935
	Time of Submergence		11.6 d	12.67 d	0	-11.6 d	7.0 d	-5.67 d

TABLE J-26

Summary of Peak Flood Levels for Flood Mitigation Options
Option C4 - as C3 + levees airport - Splitters Ck

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.28	0.02	12.73	0.04
	start of FP2	139.2	11.48	11.90	11.51	0.03	11.96	0.06
	start of FP Main	140.1	11.42	11.84	11.45	0.03	11.91	0.07
	near Water Treatment Works	144.78	10.86	11.32	10.90	0.04	11.40	0.08
	Barrage	149.27	9.49	9.91	9.52	0.03	9.97	0.06
	d/s Barrage	149.47	9.17	9.60	9.19	0.02	9.66	0.06
		150.17	8.55	8.96	8.57	0.02	9.00	0.04
	Railway Bridge	150.67	8.35	8.74	8.37	0.02	8.78	0.04
	Fitzroy Street Bridge	151.57	8.03	8.40	8.03	0.00	8.42	0.02
	City Flood Gauge	152.57	7.84	8.21	7.85	0.01	8.22	0.01
	Gavial Creek	154.27	7.58	7.94	7.58	0.00	7.94	0.00
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.45	0.03	11.91	0.07
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.09	0.05	11.53	0.12
	Lotus Lagoon	4.56	10.99	11.38	11.04	0.05	11.50	0.12
	Nine Mile Road	6.63	10.55	10.95	10.65	0.10	11.14	0.19
	Start FP SCRUBBY	11.0	9.43	9.89	9.37	-0.06	9.88	-0.01
	Junction with AP-STH	13.0	9.15	9.60	8.88	-0.27	9.43	-0.17
	u/s Yeppen Crossing	13.6	8.64	9.00	8.34	-0.30	8.94	-0.06
	d/s Bruce Highway	13.84	8.39	8.71	8.15	-0.24	8.68	-0.03
	d/s Yeppen Crossing	14.0	8.10	8.36	7.91	-0.19	8.21	-0.15
	Old Burnett Highway	15.15	7.96	8.22	7.70	-0.26	8.00	-0.22
	Old Bruce Highway	16.98	7.18	7.47	7.22	0.04	7.51	0.04
	J/w FP GAVIAL	19.04	7.08	7.38	7.08	0.00	7.38	0.00
FP SCRUBBY	Start	0	9.43	9.89	9.37	-0.06	9.88	-0.01
	d/s Capricorn Highway	1.3	9.00	9.46	8.81	-0.19	9.43	-0.03
	u/s Bruce Highway	4.0	8.63	8.99	8.33	-0.30	8.93	-0.06
	d/s Railway	4.3	8.10	8.37	7.91	-0.19	8.21	-0.16
	J/w FP MAIN	5.15	7.96	8.22	7.70	-0.26	8.00	-0.22
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.34	-0.30	8.94	-0.02
	Port Curtis Junction	0.91	8.37	8.76	7.58	-0.79	8.12	-0.64
	Depot Hill	2.1	7.67	8.19	7.58	-0.09	8.03	-0.16
	Gavial Creek	4.2	7.56	7.91	7.56	0.00	7.91	0.00
FP LION	J/w FP MAIN	0	10.55	10.95	10.65	0.10	11.14	0.19
	J/w AP STH	2.2	10.43	10.90	10.71	0.28	11.46	0.56
	J/w AP NTH	3.35	10.25	10.86	10.61	0.36	10.45	-0.41
	Fitzroy River	5.3	9.49	9.91	9.52	0.03	9.97	0.06
Airport North	J/w FP LION	0	10.25	10.86				
	New Terminal	1.54	9.61	10.15				
	J/w AP STH	2.6	9.16	9.61				
Airport South	J/w FP LION	0	10.43	10.90				
	Opposite Terminal	1.3	9.61	10.15				
	J/w AP NTH	2.3	9.16	9.61				
	J/w FP MAIN	3.0	9.15	9.60				
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.03	0.00	8.42	0.02
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.02	0.01	8.41	0.02
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.26	0.00	7.61	0.00
	J/w Fitzroy River	2.93	7.21	7.54	7.21	0.00	7.54	0.00
Gavial Creek	Fitzroy River	0	7.58	7.94	7.58	0.00	7.94	0.00
	J/w FP CURTIS	1.03	7.56	7.92	7.56	0.00	7.92	0.00
	J/w FP MAIN	4.21	7.08	7.38	7.08	0.00	7.37	-0.01
	Edinda Lane	6.06	6.43	6.65	6.43	0.00	6.65	0.00
Splitters Creek		1.1	9.51	9.92				
		2.1	9.50	9.91				
Peak Flows at	Yeppen Bridges m³/s		2495	2650	3880	1,385	4,610	1,960
	Yeppen Overflow m³/s		1415	2605	0	-1,415	490	-2,115
	Time of Submergence		11.6 d	12.67 d	0		6.5 d	-6.17 d

TABLE J-27

Summary of Peak Flood Levels for Flood Mitigation Options
Option C5 - C2 + Raise breakout control level by 1.25 m

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yeamba	100.0	17.93	18.52	17.95	0.02	18.54	0.02
	u/s Pink Lily	134.0	12.26	12.69	12.57	0.31	12.91	0.22
	start of FP2	139.2	11.48	11.90	11.98	0.50	12.24	0.34
	start of FP Main	140.1	11.42	11.84	11.93	0.51	12.19	0.35
	near Water Treatment Works	144.78	10.86	11.32	11.36	0.50	11.66	0.34
	Barrage	149.27	9.49	9.91	9.81	0.32	10.12	0.21
	d/s Barrage	149.47	9.17	9.60	9.47	0.30	9.90	0.30
		150.17	8.55	8.96	8.78	0.23	9.09	0.13
	Railway Bridge	150.67	8.35	8.74	8.55	0.20	8.94	0.20
	Fitzroy Street Bridge	151.57	8.03	8.40	8.17	0.14	8.45	0.05
	City Flood Gauge	152.57	7.84	8.21	7.96	0.12	8.23	0.02
	Gavial Creek	154.27	7.58	7.94	7.65	0.07	7.91	-0.03
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.93	0.51	12.19	0.35
	Rockhampton-Ridgetands Road	1.75	11.04	11.41	10.80	-0.24	11.36	-0.05
	Lotus Lagoon	4.56	10.99	11.38	10.68	-0.31	11.29	-0.09
	Nine Mile Road	6.63	10.55	10.95	10.27	-0.28	10.95	0.00
	Start FP SCRUBBY	11.0	9.43	9.89	9.03	-0.40	9.76	-0.13
	Junction with AP-STH	13.0	9.15	9.60	8.58	-0.57	9.37	-0.23
	u/s Yeppen Crossing	13.6	8.64	9.00	8.11	-0.53	8.98	-0.02
	d/s Bruce Highway	13.84	8.39	8.71	8.78	-0.41	8.79	0.08
	d/s Yeppen Crossing	14.0	8.10	8.36	7.82	-0.28	8.45	0.09
	Old Burnett Highway	15.15	7.96	8.22	7.62	-0.34	8.17	-0.05
	Old Bruce Highway	16.98	7.18	7.47	7.15	-0.03	7.55	0.08
	J/w FP GAVIAL	19.04	7.08	7.38	7.04	-0.04	7.39	0.01
FP SCRUBBY	Start	0	9.43	9.89	9.03	-0.40	9.76	-0.13
	d/s Capricorn Highway	1.3	9.00	9.46	8.42	-0.58	9.37	-0.09
	u/s Bruce Highway	4.0	8.63	8.99	8.05	-0.58	8.98	-0.01
	d/s Railway	4.3	8.10	8.37	7.62	-0.48	8.44	0.07
	J/w FP MAIN	5.15	7.96	8.22	7.62	-0.34	8.17	-0.05
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96				
	Port Curtis Junction	0.91	8.37	8.76				
	Depot Hill	2.1	7.67	8.19				
	Gavial Creek	4.2	7.56	7.91				
FP LION	J/w FP MAIN	0	10.55	10.95	10.27	-0.28	10.95	0.00
	J/w AP STH	2.2	10.43	10.90	10.27	-0.16	11.25	0.35
	J/w AP NTH	3.35	10.25	10.86	10.09	-0.16	11.24	0.38
	Fitzroy River	5.3	9.49	9.91	9.81	0.32	10.12	0.21
Airport North	J/w FP LION	0	10.25	10.86				
	New Terminal	1.54	9.61	10.15				
	J/w AP STH	2.6	9.16	9.61				
Airport South	J/w FP LION	0	10.43	10.90				
	Opposite Terminal	1.3	9.61	10.15				
	J/w AP NTH	2.3	9.16	9.61				
	J/w FP MAIN	3.0	9.15	9.60				
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.17	0.14	8.45	0.05
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.16	0.15	8.44	0.05
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.32	0.06	7.60	-0.01
	J/w Fitzroy River	2.93	7.21	7.54	7.27	0.06	7.52	-0.02
Gavial Creek	Fitzroy River	0	7.58	7.94	7.65	0.07	7.91	-0.03
	J/w FP CURTIS	1.03	7.56	7.92	7.62	0.06	7.98	0.06
	J/w FP MAIN	4.21	7.08	7.38	7.04	-0.04	7.39	0.01
	Edinda Lane	6.06	6.43	6.65	6.41	-0.02	6.66	0.01
Splitters Creek		1.1	9.51	9.92				
		2.1	9.50	9.91				
Peak Flows at	Yeppen Bridges m³/s		2495	2650	2935	440	3,975	1,325
	Yeppen Overflow m³/s		1415	2605	0	-1,415	555	-2,050
	Time of Submergence		11.6 d	12.6 d	0	-11.6 d	3.9 d	-8.7 d

TABLE J-28

Summary of Peak Flood Levels for Flood Mitigation Options
Option C6 – Yeppen Upgrade as B5 + Levee Depot Hill – CBD (as A1)

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.69	0.00
	start of FP2	139.2	11.48	11.90	11.48	0.00	11.90	0.00
	start of FP Main	140.1	11.42	11.84	11.42	0.00	11.84	0.00
	near Water Treatment Works	144.78	10.86	11.32	10.87	0.01	11.33	0.01
	Barrage	149.27	9.49	9.91	9.50	0.01	9.91	0.00
	d/s Barrage	149.47	9.17	9.60	9.17	0.00	9.61	0.01
		150.17	8.55	8.96	8.56	0.01	8.97	0.01
	Railway Bridge	150.67	8.35	8.74	8.37	0.02	8.76	0.02
	Fitzroy Street Bridge	151.57	8.03	8.40	8.04	0.01	8.42	0.02
	City Flood Gauge	152.57	7.84	8.21	7.86	0.02	8.23	0.02
	Gavial Creek	154.27	7.58	7.94	7.60	0.02	7.96	0.02
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.42	0.00	11.84	0.00
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.04	0.00	11.41	0.00
	Lotus Lagoon	4.56	10.99	11.38	10.99	0.00	11.37	-0.01
	Nine Mile Road	6.63	10.55	10.95	10.54	-0.01	10.95	0.00
	Start FP SCRUBBY	11.0	9.43	9.89	9.38	-0.05	9.87	-0.02
	Junction with AP-STH	13.0	9.15	9.60	9.06	-0.09	9.57	-0.03
	u/s Yeppen Crossing	13.6	8.64	9.00	8.48	-0.16	8.93	-0.07
	d/s Bruce Highway	13.84	8.39	8.71	8.33	-0.06	8.67	-0.04
	d/s Yeppen Crossing	14.0	8.10	8.36	8.16	0.06	8.45	0.09
	Old Burnett Highway	15.15	7.96	8.22	8.02	0.06	8.29	0.07
	Old Bruce Highway	16.98	7.18	7.47	7.18	0.00	7.53	0.06
	J/w FP GAVIAL	19.04	7.08	7.38	7.08	0.00	7.37	-0.01
FP SCRUBBY	Start	0	9.43	9.89	9.38	-0.05	9.87	-0.02
	d/s Capricorn Highway	1.3	9.00	9.46	8.88	-0.12	9.42	-0.04
	u/s Bruce Highway	4.0	8.63	8.99	8.47	-0.16	8.92	-0.07
	d/s Railway	4.3	8.10	8.37	8.16	0.06	8.45	0.08
	J/w FP MAIN	5.15	7.96	8.22	8.02	0.06	8.29	0.07
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.48	-0.16	8.93	-0.03
	Port Curtis Junction	0.91	8.37	8.76	7.64	-0.73	8.22	-0.54
	Depot Hill	2.1	7.67	8.19	7.64	-0.03	8.16	-0.03
	Gavial Creek	4.2	7.56	7.91	7.58	0.02	7.94	0.03
FP LION	J/w FP MAIN	0	10.55	10.95	10.54	-0.01	10.95	0.00
	J/w AP STH	2.2	10.43	10.90	10.43	0.00	10.90	0.00
	J/w AP NTH	3.35	10.25	10.86	10.24	-0.01	10.85	-0.01
	Fitzroy River	5.3	9.49	9.91	9.50	0.01	9.91	0.00
Airport North	J/w FP LION	0	10.25	10.86	10.24	-0.01	10.85	-0.01
	New Terminal	1.54	9.61	10.15	9.56	-0.05	10.13	-0.02
	J/w AP STH	2.6	9.16	9.61	9.07	-0.09	9.58	-0.03
Airport South	J/w FP LION	0	10.43	10.90	10.43	0.00	10.90	0.00
	Opposite Terminal	1.3	9.61	10.15	9.57	-0.04	10.13	-0.02
	J/w AP NTH	2.3	9.16	9.61	9.07	-0.09	9.58	-0.03
	J/w FP MAIN	3.0	9.15	9.60	9.06	-0.09	9.57	-0.03
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.04	0.01	8.42	0.02
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.03	0.02	8.41	0.02
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.27	0.01	7.62	0.01
	J/w Fitzroy River	2.93	7.21	7.54	7.23	0.02	7.56	0.02
Gavial Creek	Fitzroy River	0	7.58	7.94	7.60	0.02	7.95	0.01
	J/w FP CURTIS	1.03	7.56	7.92	7.58	0.02	7.94	0.02
	J/w FP MAIN	4.21	7.08	7.38	7.07	-0.01	7.37	-0.01
	Edinda Lane	6.06	6.43	6.65	6.42	-0.01	6.65	0.00
Splitters Creek		1.1	9.51	9.92	9.51	0.00	9.93	0.01
		2.1	9.50	9.91	9.51	0.01	9.92	0.01
Peak Flows at	Yeppen Bridges m³/s		2495	2650	3885	1,390	4,185	1,535
	Yeppen Overflow m³/s		1415	2605	0	-1,415	455	-2,150
	Time of Submergence		11.6 d	12.67 d	0	-11.6 d	6.9 d	-5.77 d

TABLE J-29

**Summary of Peak Flood Levels for Flood Mitigation Options
Option C7 – as C6 + Airport and Splitters Creek Levees**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.28	0.02	12.73	0.04
	start of FP2	139.2	11.48	11.90	11.51	0.03	11.96	0.06
	start of FP Main	140.1	11.42	11.84	11.45	0.03	11.91	0.07
	near Water Treatment Works	144.78	10.86	11.32	10.90	0.04	11.40	0.08
	Barrage	149.27	9.49	9.91	9.53	0.04	9.99	0.08
	d/s Barrage	149.47	9.17	9.60	9.20	0.03	9.68	0.08
		150.17	8.55	8.96	8.58	0.03	9.02	0.06
	Railway Bridge	150.67	8.35	8.74	8.39	0.04	8.80	0.06
	Fitzroy Street Bridge	151.57	8.03	8.40	8.05	0.02	8.45	0.05
	City Flood Gauge	152.57	7.84	8.21	7.87	0.03	8.25	0.04
	Gavial Creek	154.27	7.58	7.94	7.61	0.03	7.97	0.03
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.45	0.03	11.91	0.07
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.09	0.05	11.52	0.11
	Lotus Lagoon	4.56	10.99	11.38	11.05	0.06	11.50	0.12
	Nine Mile Road	6.63	10.55	10.95	10.66	0.11	11.14	0.19
	Start FP SCRUBBY	11.0	9.43	9.89	9.41	-0.02	9.87	-0.02
	Junction with AP-STH	13.0	9.15	9.60	8.97	-0.18	9.41	-0.19
	u/s Yeppen Crossing	13.6	8.64	9.00	8.44	-0.20	8.87	-0.13
	d/s Bruce Highway	13.84	8.39	8.71	8.29	-0.10	8.62	-0.09
	d/s Yeppen Crossing	14.0	8.10	8.36	8.14	0.04	8.39	0.03
	Old Burnett Highway	15.15	7.96	8.22	8.00	0.04	8.24	0.02
	Old Bruce Highway	16.98	7.18	7.47	7.25	0.07	7.46	-0.01
	J/w FP GAVIAL	19.04	7.08	7.38	7.08	0.00	7.37	-0.01
FP SCRUBBY	Start	0	9.43	9.89	9.41	-0.02	9.87	-0.02
	d/s Capricorn Highway	1.3	9.00	9.46	8.88	-0.12	9.39	-0.07
	u/s Bruce Highway	4.0	8.63	8.99	8.43	-0.20	8.86	-0.13
	d/s Railway	4.3	8.10	8.37	8.14	0.04	8.40	0.03
	J/w FP MAIN	5.15	7.96	8.22	8.00	0.04	8.24	0.02
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96	8.44	-0.20	8.87	-0.09
	Port Curtis Junction	0.91	8.37	8.76	7.64	-0.73	8.17	-0.59
	Depot Hill	2.1	7.67	8.19	7.64	-0.03	8.14	-0.05
	Gavial Creek	4.2	7.56	7.91	7.58	0.02	7.95	0.04
FP LION	J/w FP MAIN	0	10.55	10.95	10.66	0.11	11.14	0.19
	J/w AP STH	2.2	10.43	10.90	10.72	0.29	11.46	0.56
	J/w AP NTH	3.35	10.25	10.86	10.62	0.37	11.45	0.59
	Fitzroy River	5.3	9.49	9.91	9.53	0.04	9.99	0.08
Airport North	J/w FP LION	0	10.25	10.86				
	New Terminal	1.54	9.61	10.15				
	J/w AP STH	2.6	9.16	9.61				
Airport South	J/w FP LION	0	10.43	10.90				
	Opposite Terminal	1.3	9.61	10.15				
	J/w AP NTH	2.3	9.16	9.61				
	J/w FP MAIN	3.0	9.15	9.60				
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.05	0.02	8.45	0.05
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.04	0.03	8.44	0.05
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.27	0.01	7.64	0.03
	J/w Fitzroy River	2.93	7.21	7.54	7.23	0.02	7.57	0.03
Gavial Creek	Fitzroy River	0	7.58	7.94	7.61	0.03	7.97	0.03
	J/w FP CURTIS	1.03	7.56	7.92	7.58	0.02	7.95	0.03
	J/w FP MAIN	4.21	7.08	7.38	7.07	-0.01	7.36	-0.02
	Edinda Lane	6.06	6.43	6.65	6.42	-0.01	6.65	0.00
Splitters Creek		1.1	9.51	9.92				
		2.1	9.50	9.91				
Peak Flows at	Yeppen Bridges m³/s		2495	2650	3780	1,285	4,710	2,060
	Yeppen Overflow m³/s		1415	2605	0	-1,415	285	-2,320
	Time of Submergence		11.6 d	12.67 d	0	-11.6 d	6.4 d	-6.2 d

TABLE J-30

Summary of Peak Flood Levels for Flood Mitigation Options
Option C8 - Upgrade Yeppen (as B5 + F3) + Port Curtis - CBD Levee (as A2)

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.26	0.00	12.68	-0.01
	start of FP2	139.2	11.48	11.90	11.47	-0.01	11.89	-0.01
	start of FP Main	140.1	11.42	11.84	11.41	-0.01	11.83	-0.01
	near Water Treatment Works	144.78	10.86	11.32	10.85	-0.01	11.30	-0.02
	Barrage	149.27	9.49	9.91	9.48	-0.01	9.86	-0.05
	d/s Barrage	149.47	9.17	9.60	9.14	-0.03	9.55	-0.05
		150.17	8.55	8.96	8.52	-0.03	8.89	-0.07
	Railway Bridge	150.67	8.35	8.74	8.32	-0.03	8.67	-0.07
	Fitzroy Street Bridge	151.57	8.03	8.40	7.99	-0.04	8.31	-0.09
	City Flood Gauge	152.57	7.84	8.21	7.80	-0.04	8.11	-0.10
	Gavial Creek	154.27	7.58	7.94	7.54	-0.04	7.83	-0.11
	Edinda Lane	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
		173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.41	-0.01	11.83	-0.01
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.03	-0.01	11.40	-0.01
	Lotus Lagoon	4.56	10.99	11.38	10.98	-0.01	11.36	-0.02
	Nine Mile Road	6.63	10.55	10.95	10.53	-0.02	10.94	-0.01
	Start FP SCRUBBY	11.0	9.43	9.89	9.34	-0.09	9.88	-0.01
	Junction with AP-STH	13.0	9.15	9.60	9.00	-0.15	9.58	-0.02
	u/s Yeppen Crossing	13.6	8.64	9.00	8.36	-0.28	8.98	-0.02
	d/s Bruce Highway	13.84	8.39	8.71	8.21	-0.18	8.74	0.03
	d/s Yeppen Crossing	14.0	8.10	8.36	8.05	-0.05	8.52	0.16
	Old Burnett Highway	15.15	7.96	8.22	7.81	-0.15	8.25	0.03
	Old Bruce Highway	16.98	7.18	7.47	7.24	0.06	7.63	0.16
	J/w FP GAVIAL	19.04	7.08	7.38	7.11	0.03	7.43	0.05
FP SCRUBBY	Start	0	9.43	9.89	9.34	-0.09	9.88	-0.01
	d/s Capricorn Highway	1.3	9.00	9.46	8.80	-0.20	9.45	-0.01
	u/s Bruce Highway	4.0	8.63	8.99	8.34	-0.29	8.97	-0.02
	d/s Railway	4.3	8.10	8.37	8.04	-0.06	8.55	0.18
	J/w FP MAIN	5.15	7.96	8.22	7.81	-0.15	8.25	0.03
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96				
	Port Curtis Junction	0.91	8.37	8.76				
	Depot Hill	2.1	7.67	8.19				
	Gavial Creek	4.2	7.56	7.91				
FP LION	J/w FP MAIN	0	10.55	10.95	10.53	-0.02	10.94	-0.01
	J/w AP STH	2.2	10.43	10.90	10.41	-0.02	10.88	-0.02
	J/w AP NTH	3.35	10.25	10.86	10.23	-0.02	10.84	-0.02
	Fitzroy River	5.3	9.49	9.91	9.48	-0.01	9.86	-0.05
Airport North	J/w FP LION	0	10.25	10.86	10.23	-0.02	10.84	-0.02
	New Terminal	1.54	9.61	10.15	9.52	-0.09	10.13	-0.02
	J/w AP STH	2.6	9.16	9.61	9.01	-0.15	9.60	-0.01
Airport South	J/w FP LION	0	10.43	10.90	10.41	-0.02	10.98	0.08
	Opposite Terminal	1.3	9.61	10.15	9.52	-0.09	10.13	-0.02
	J/w AP NTH	2.3	9.16	9.61	9.01	-0.15	9.60	-0.01
	J/w FP MAIN	3.0	9.15	9.60	9.00	-0.15	9.58	-0.02
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	7.99	-0.04	8.31	-0.09
	Lakes Creek Road (STW)	1.0	8.01	8.39	7.97	-0.04	8.30	-0.09
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.23	-0.03	7.51	-0.10
	J/w Fitzroy River	2.93	7.21	7.54	7.18	-0.03	7.46	-0.08
Gavial Creek	Fitzroy River	0	7.58	7.94	7.53	-0.05	7.83	-0.11
	J/w FP CURTIS	1.03	7.56	7.92	7.52	-0.04	7.81	-0.11
	J/w FP MAIN	4.21	7.08	7.38	7.11	0.03	7.43	0.05
	Edinda Lane	6.06	6.43	6.65	6.44	0.01	6.68	0.03
Splitters Creek		1.1	9.51	9.92	9.49	-0.02		
		2.1	9.50	9.91	9.48	-0.02		
Peak Flows at	Yeppen Bridges m³/s		2495	2650	3870	1,375	4,680	2,030
	Yeppen Overflow m³/s		1415	2605	0	-1,415	550	-2,055
	Time of Submergence		11.6 d	12.6 d	0	-11.6 d	6.5 d	-6.1 d

TABLE J-30a

Summary of Peak Flood Levels for Flood Mitigation Options
Option C8 – Upgrade Yeppen (as B5 + F3) + Port Curtis – CBD Levee (As A2)

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			0.5%	0.2%	0.5%	Difference	0.2%	Difference
Fitzroy River	Yaamba	100.0	19.14	19.88	19.14	0.00	19.88	0.00
	u/s Pink Lily	134.0	13.14	13.72	13.14	0.00	13.73	0.01
	start of FP2	139.2	12.32	12.87	12.31	-0.01	12.88	0.01
	start of FP Main	140.1	12.27	12.82	12.26	-0.01	12.83	0.01
	near Water Treatment Works	144.78	11.77	12.34	11.75	-0.02	12.34	0.00
	Barrage	149.27	10.35	10.90	10.30	-0.05	10.86	-0.04
	d/s Barrage	149.47	10.07	10.65	10.01	-0.06	10.59	-0.06
		150.17	9.39	9.91	9.30	-0.09	9.82	-0.09
		150.67	9.15	9.64	9.06	-0.09	9.53	-0.11
	Railway Bridge	151.57	8.79	9.26	8.68	-0.11	9.13	-0.13
	Fitzroy Street Bridge	152.57	8.59	9.04	8.47	-0.12	8.89	-0.15
	City Flood Gauge	154.27	8.30	8.73	8.16	-0.14	8.56	-0.17
	Gavial Creek	165.02	6.68	7.03	6.68	0.00	7.03	0.00
	Edinda Lane	173.00	5.97	6.30	5.97	0.00	6.30	0.00
FP MAIN	J/w Fitzroy River	0.0	12.27	12.82	12.26	-0.01	12.83	0.01
	Rockhampton-Ridgeland Road	1.75	11.75	12.24	11.75	0.00	12.28	0.04
	Lotus Lagoon	4.56	11.73	12.23	11.74	0.01	12.27	0.04
	Nine Mile Road	6.63	11.39	11.92	11.41	0.02	11.99	0.07
	Start FP SCRUBBY	11.0	10.35	10.87	10.47	0.12	11.08	0.21
	Junction with AP-STH	13.0	10.04	10.54	10.20	0.16	10.80	0.26
	u/s Yeppen Crossing	13.6	9.32	9.67	9.61	0.29	10.16	0.49
	d/s Bruce Highway	13.84	9.06	9.48	9.48	0.42	10.06	0.58
	d/s Yeppen Crossing	14.0	8.75	9.24	9.37	0.62	9.96	0.72
	Old Burnett Highway	15.15	8.60	9.07	9.14	0.54	9.70	0.63
	Old Bruce Highway	16.98	7.83	8.27	8.06	0.23	8.53	0.26
	J/w FP GAVIAL	19.04	7.72	8.13	7.78	0.06	8.21	0.08
FP SCRUBBY	Start	0	10.35	10.87	10.47	0.12	11.08	0.21
	d/s Capricorn Highway	1.3	9.91	10.40	10.10	0.19	10.72	0.32
	u/s Bruce Highway	4.0	9.31	9.66	9.60	0.29	10.15	0.49
	d/s Railway	4.3	8.77	9.27	9.37	0.60	9.97	0.70
	J/w FP MAIN	5.15	8.60	9.07	9.14	0.54	9.70	0.63
FP CURTIS	u/s Bruce Highway	0.69	9.32	9.67				
	Port Curtis Junction	0.91	9.10	9.49				
	Depot Hill	2.1	8.67	9.19				
	Gavial Creek	4.2	8.30	8.74				
FP LION	J/w FP MAIN	0	11.39	11.92	11.41	0.02	11.99	0.07
	J/w AP STH	2.2	11.45	12.09	11.48	0.03	12.14	0.05
	J/w AP NTH	3.35	11.45	12.09	11.48	0.03	12.14	0.05
	Fitzroy River	5.3	10.35	10.90	10.30	-0.05	10.86	-0.04
Airport North	J/w FP LION	0	11.45	12.09	11.48	0.03	12.14	0.05
	New Terminal	1.54	10.64	11.20	10.73	0.09	11.35	0.15
	J/w AP STH	2.6	10.05	10.55	10.21	0.16	10.81	0.26
Airport South	J/w FP LION	0	11.45	12.09	11.48	0.03	12.14	0.05
	Opposite Terminal	1.3	10.65	11.20	10.73	0.08	11.35	0.15
	J/w AP NTH	2.3	10.05	10.55	10.21	0.16	10.81	0.26
	J/w FP MAIN	3.0	10.04	10.54	10.20	0.16	10.80	0.26
Lakes Creek Road	near Fitzroy River Bridge	0	8.79	9.26	8.68	-0.11	9.13	-0.13
	Lakes Creek Road (STW)	1.0	8.77	9.22	8.66	-0.11	9.10	-0.12
	Lakes Creek Road (Landfill)	2.0	7.99	8.48	7.86	-0.13	8.32	-0.16
	J/w Fitzroy River	2.93	7.88	8.29	7.77	-0.11	8.15	-0.14
Gavial Creek	Fitzroy River	0	8.30	8.73	8.16	-0.14	8.56	-0.17
	J/w FP CURTIS	1.03	8.28	8.71	8.13	-0.15	8.53	-0.18
	J/w FP MAIN	4.21	7.72	8.13	7.78	0.06	8.20	0.07
	Edinda Lane	6.06	6.92	7.25	6.95	0.03	7.28	0.03
Splitters Creek		1.1	10.54	11.16				
		2.1	10.38	10.98				

TABLE J-31

**Summary of Peak Flood Levels for Flood Mitigation Options
Option C9 – As C8 + Airport Levee + Splitters Creek Levee**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.93	0.00	18.52	0.00
	u/s Pink Lily	134.0	12.26	12.69	12.27	0.01	12.72	0.03
	start of FP2	139.2	11.48	11.90	11.50	0.02	11.95	0.05
	start of FP Main	140.1	11.42	11.84	11.44	0.02	11.90	0.06
	near Water Treatment Works	144.78	10.86	11.32	10.89	0.03	11.38	0.06
	Barrage	149.27	9.49	9.91	9.51	0.02	9.94	0.03
	d/s Barrage	149.47	9.17	9.60	9.17	0.00	9.62	0.02
		150.17	8.55	8.96	8.55	0.00	8.95	-0.01
		150.67	8.35	8.74	8.35	0.00	8.74	0.00
	Railway Bridge	151.57	8.03	8.40	8.01	-0.02	8.35	-0.05
	Fitzroy Street Bridge	152.57	7.84	8.21	7.82	-0.02	8.15	-0.06
	City Flood Gauge	154.27	7.58	7.94	7.55	-0.03	7.85	-0.09
	Gavial Creek	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
	Edinda Lane	173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.44	0.02	11.90	0.06
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	11.08	0.04	11.53	0.12
	Lotus Lagoon	4.56	10.99	11.38	11.04	0.05	11.49	0.11
	Nine Mile Road	6.63	10.55	10.95	10.65	0.10	11.13	0.18
	Start FP SCRUBBY	11.0	9.43	9.89	9.37	-0.06	9.87	-0.02
	Junction with AP-STH	13.0	9.15	9.60	8.90	-0.25	9.43	-0.17
	u/s Yeppen Crossing	13.6	8.64	9.00	8.31	-0.33	8.91	-0.09
	d/s Bruce Highway	13.84	8.39	8.71	8.17	-0.22	8.67	-0.04
	d/s Yeppen Crossing	14.0	8.10	8.36	8.01	-0.09	8.46	0.10
	Old Burnett Highway	15.15	7.96	8.22	7.79	-0.17	8.20	-0.02
	Old Bruce Highway	16.98	7.18	7.47	7.25	0.07	7.50	0.03
	J/w FP GAVIAL	19.04	7.08	7.38	7.10	0.02	7.41	0.03
FP SCRUBBY	Start	0	9.43	9.89	9.37	-0.06	9.87	-0.02
	d/s Capricorn Highway	1.3	9.00	9.46	8.79	-0.21	9.41	-0.05
	u/s Bruce Highway	4.0	8.63	8.99	8.30	-0.33	8.90	-0.09
	d/s Railway	4.3	8.10	8.37	8.01	-0.09	8.45	0.08
	J/w FP MAIN	5.15	7.96	8.22	7.79	-0.17	8.20	-0.02
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96				
	Port Curtis Junction	0.91	8.37	8.76				
	Depot Hill	2.1	7.67	8.19				
	Gavial Creek	4.2	7.56	7.91				
FP LION	J/w FP MAIN	0	10.55	10.95	10.65	0.10	11.13	0.18
	J/w AP STH	2.2	10.43	10.90	10.70	0.27	11.45	0.55
	J/w AP NTH	3.35	10.25	10.86	10.60	0.35	11.44	0.58
	Fitzroy River	5.3	9.49	9.91	9.51	0.02	9.94	0.03
Airport North	J/w FP LION	0	10.25	10.86				
	New Terminal	1.54	9.61	10.15				
	J/w AP STH	2.6	9.16	9.61				
Airport South	J/w FP LION	0	10.43	10.90				
	Opposite Terminal	1.3	9.61	10.15				
	J/w AP NTH	2.3	9.16	9.61				
	J/w FP MAIN	3.0	9.15	9.60				
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.01	-0.02	8.35	-0.05
	Lakes Creek Road (STW)	1.0	8.01	8.39	7.99	-0.02	8.34	-0.05
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.23	-0.03	7.54	-0.07
	J/w Fitzroy River	2.93	7.21	7.54	7.19	-0.02	7.48	-0.06
Gavial Creek	Fitzroy River	0	7.58	7.94	7.55	-0.03	7.85	-0.09
	J/w FP CURTIS	1.03	7.56	7.92	7.52	-0.04	7.83	-0.09
	J/w FP MAIN	4.21	7.08	7.38	7.10	0.02	7.41	0.03
	Edinda Lane	6.06	6.43	6.65	6.44	0.01	6.67	0.02
Splitters Creek		1.1	9.51	9.92				
		2.1	9.50	9.91				
Peak Flows at	Yeppen Bridges m³/s		2495	2650	3755	1,260	4,635	1,985
	Yeppen Overflow m³/s		1415	2605	0	-1,415	355	-2,250
	Time of Submergence		11.6 d	12.67 d	0	-11.6 d	3.5 d	-9.1 d

TABLE J-31a

**Summary of Peak Flood Levels for Flood Mitigation Options
Option C9 - As C8 + Airport Levee + Splitters Creek Levee**

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			0.5%	0.2%	0.5%	Difference	0.2%	Difference
Fitzroy River	Yaamba	100.0	19.14	19.88	19.15	0.01	19.89	0.01
	u/s Pink Lily	134.0	13.14	13.72	13.24	0.10	13.89	0.17
	start of FP2	139.2	12.32	12.87	12.48	0.16	13.12	0.25
	start of FP Main	140.1	12.27	12.82	12.43	0.16	13.08	0.26
	near Water Treatment Works	144.78	11.77	12.34	11.94	0.17	12.60	0.26
	Barrage	149.27	10.35	10.90	10.42	0.07	11.01	0.11
	d/s Barrage	149.47	10.07	10.65	10.13	0.06	10.75	0.10
		150.17	9.39	9.91	9.39	0.00	9.94	0.03
	Railway Bridge	150.67	9.15	9.64	9.13	-0.02	9.63	-0.01
	Fitzroy Street Bridge	151.57	8.79	9.26	8.74	-0.05	9.21	-0.05
	City Flood Gauge	152.57	8.59	9.04	8.52	-0.07	8.96	-0.08
	Gavial Creek	154.27	8.30	8.73	8.19	-0.11	8.60	-0.13
	Edinda Lane	165.02	6.68	7.03	6.68	0.00	7.03	0.00
		173.00	5.97	6.30	5.97	0.00	6.30	0.00
FP MAIN	J/w Fitzroy River	0.0	12.27	12.82	12.43	0.16	13.08	0.26
	Rockhampton-Ridgeland Road	1.75	11.75	12.24	12.05	0.30	12.69	0.45
	Lotus Lagoon	4.56	11.73	12.23	12.03	0.30	12.67	0.44
	Nine Mile Road	6.63	11.39	11.92	11.67	0.28	12.30	0.38
	Start FP SCRUBBY	11.0	10.35	10.87	10.43	0.08	11.03	0.16
	Junction with AP-STH	13.0	10.04	10.54	10.01	-0.03	10.57	0.03
	u/s Yeppen Crossing	13.6	9.32	9.67	9.51	0.19	10.03	0.36
	d/s Bruce Highway	13.84	9.06	9.48	9.38	0.32	9.93	0.45
	d/s Yeppen Crossing	14.0	8.75	9.24	9.26	0.51	9.84	0.60
	Old Burnett Highway	15.15	8.60	9.07	9.04	0.44	9.59	0.52
	Old Bruce Highway	16.98	7.83	8.27	8.02	0.19	8.48	0.21
	J/w FP GAVIAL	19.04	7.72	8.13	7.76	0.04	8.19	0.06
FP SCRUBBY	Start	0	10.35	10.87	10.43	0.08	11.03	0.16
	d/s Capricorn Highway	1.3	9.91	10.40	10.04	0.13	10.64	0.24
	u/s Bruce Highway	4.0	9.31	9.66	9.51	0.20	10.03	0.37
	d/s Railway	4.3	8.77	9.27	9.26	0.49	9.84	0.57
	J/w FP MAIN	5.15	8.60	9.07	9.04	0.44	9.59	0.52
FP CURTIS	u/s Bruce Highway	0.69	9.32	9.67				
	Port Curtis Junction	0.91	9.10	9.49				
	Depot Hill	2.1	8.67	9.19				
	Gavial Creek	4.2	8.30	8.74				
FP LION	J/w FP MAIN	0	11.39	11.92	11.67	0.28	12.30	0.38
	J/w AP STH	2.2	11.45	12.09	12.02	0.57	12.67	0.58
	J/w AP NTH	3.35	11.45	12.09	12.01	0.56	12.61	0.52
	Fitzroy River	5.3	10.35	10.90	10.42	0.07	11.01	0.11
Airport North	J/w FP LION	0	11.45	12.09				
	New Terminal	1.54	10.64	11.20				
	J/w AP STH	2.6	10.05	10.55				
Airport South	J/w FP LION	0	11.45	12.09				
	Opposite Terminal	1.3	10.65	11.20				
	J/w AP NTH	2.3	10.05	10.55				
	J/w FP MAIN	3.0	10.04	10.54				
Lakes Creek Road	near Fitzroy River Bridge	0	8.79	9.26	8.74	-0.05	9.21	-0.05
	Lakes Creek Road (STW)	1.0	8.77	9.22	8.72	-0.05	9.17	-0.05
	Lakes Creek Road (Landfill)	2.0	7.99	8.48	7.90	-0.09	8.38	-0.10
	J/w Fitzroy River	2.93	7.88	8.29	7.80	-0.08	8.18	-0.11
Gavial Creek	Fitzroy River	0	8.30	8.73	8.19	-0.11	8.60	-0.13
	J/w FP CURTIS	1.03	8.28	8.71	8.16	-0.12	8.56	-0.15
	J/w FP MAIN	4.21	7.72	8.13	7.76	0.04	8.18	0.05
	Edinda Lane	6.06	6.92	7.25	6.68	-0.24	7.27	0.02
Splitters Creek		1.1	10.54	11.16				
		2.1	10.38	10.98				

TABLE J-32

Summary of Peak Flood Levels for Flood Mitigation Options
Option C10 - C9 + raise breakout control level by 1.25 m

Flow Path	Location	Chainage km	Peak Flood Levels (m AHD) for AEP of					
			Existing Conditions		With Option			
			2%	1%	2%	Difference	1%	Difference
Fitzroy River	Yaamba	100.0	17.93	18.52	17.95	0.02	18.53	0.01
	u/s Pink Lily	134.0	12.26	12.69	12.53	0.27	12.85	0.16
	start of FP2	139.2	11.48	11.90	11.92	0.44	12.16	0.26
	start of FP Main	140.1	11.42	11.84	11.87	0.45	12.12	0.28
	near Water Treatment Works	144.78	10.86	11.32	11.30	0.44	11.59	0.27
	Barrage	149.27	9.49	9.91	9.77	0.28	10.07	0.16
	d/s Barrage	149.47	9.17	9.60	9.43	0.26	9.75	0.15
		150.17	8.55	8.96	8.75	0.20	9.05	0.09
		150.67	8.35	8.74	8.52	0.17	8.80	0.06
	Railway Bridge	151.57	8.03	8.40	8.15	0.12	8.42	0.02
	Fitzroy Street Bridge	152.57	7.84	8.21	7.94	0.10	8.21	0.00
	City Flood Gauge	154.27	7.58	7.94	7.64	0.06	7.90	-0.04
	Gavial Creek	165.02	6.10	6.38	6.09	-0.01	6.38	0.00
	Edinda Lane	173.00	5.43	5.69	5.43	0.00	5.69	0.00
FP MAIN	J/w Fitzroy River	0.0	11.42	11.84	11.87	0.45	12.12	0.28
	Rockhampton-Ridgeland Road	1.75	11.04	11.41	10.78	-0.26	11.37	-0.04
	Lotus Lagoon	4.56	10.99	11.38	10.74	-0.25	11.35	-0.03
	Nine Mile Road	6.63	10.55	10.95	10.33	-0.22	11.01	0.06
	Start FP SCRUBBY	11.0	9.43	9.89	9.12	-0.31	9.81	-0.08
	Junction with AP-STH	13.0	9.15	9.60	8.71	-0.44	9.42	-0.18
	u/s Yeppen Crossing	13.6	8.64	9.00	8.24	-0.40	8.99	-0.01
	d/s Bruce Highway	13.84	8.39	8.71	8.14	-0.25	8.81	0.10
	d/s Yeppen Crossing	14.0	8.10	8.36	8.05	-0.05	8.66	0.30
	Old Burnett Highway	15.15	7.96	8.22	7.91	-0.05	8.48	0.26
	Old Bruce Highway	16.98	7.18	7.47	7.21	0.03	7.60	0.13
	J/w FP GAVIAL	19.04	7.08	7.38	7.05	-0.03	7.40	0.02
FP SCRUBBY	Start	0	9.43	9.89	9.12	-0.31	9.81	-0.08
	d/s Capricorn Highway	1.3	9.00	9.46	8.58	-0.42	9.41	-0.05
	u/s Bruce Highway	4.0	8.63	8.99	8.22	-0.41	8.99	0.00
	d/s Railway	4.3	8.10	8.37	8.04	-0.06	8.65	0.28
	J/w FP MAIN	5.15	7.96	8.22	7.91	-0.05	8.65	0.43
FP CURTIS	u/s Bruce Highway	0.69	8.64	8.96				
	Port Curtis Junction	0.91	8.37	8.76				
	Depot Hill	2.1	7.67	8.19				
	Gavial Creek	4.2	7.56	7.91				
FP LION	J/w FP MAIN	0	10.55	10.95	10.33	-0.22	11.01	0.06
	J/w AP STH	2.2	10.43	10.90	10.33	-0.10	11.29	0.39
	J/w AP NTH	3.35	10.25	10.86	10.12	-0.13	11.27	0.41
	Fitzroy River	5.3	9.49	9.91	9.77	0.28	10.07	0.16
Airport North	J/w FP LION	0	10.25	10.86				
	New Terminal	1.54	9.61	10.15				
	J/w AP STH	2.6	9.16	9.61				
Airport South	J/w FP LION	0	10.43	10.90				
	Opposite Terminal	1.3	9.61	10.15				
	J/w AP NTH	2.3	9.16	9.61				
	J/w FP MAIN	3.0	9.15	9.60				
Lakes Creek Road	near Fitzroy River Bridge	0	8.03	8.40	8.15	0.12	8.42	0.02
	Lakes Creek Road (STW)	1.0	8.01	8.39	8.14	0.13	8.41	0.02
	Lakes Creek Road (Landfill)	2.0	7.26	7.61	7.30	0.04	7.58	-0.03
	J/w Fitzroy River	2.93	7.21	7.54	7.26	0.05	7.51	-0.03
Gavial Creek	Fitzroy River	0	7.58	7.94	7.64	0.06	7.90	-0.04
	J/w FP CURTIS	1.03	7.56	7.92	7.61	0.05	7.87	-0.05
	J/w FP MAIN	4.21	7.08	7.38	7.05	-0.03	7.40	0.02
	Edinda Lane	6.06	6.43	6.65	6.41	-0.02	6.65	0.00
Splitters Creek		1.1	9.51	9.92				
		2.1	9.50	9.91				
Peak Flows at	Yeppen Bridges m ³ /s		2495	2650			4,020	1,370
	Yeppen Overflow m ³ /s		1415	2605			580	-2,025
	Time of Submergence		11.6 d	12.67 d			5.4 d	-7.2 d

APPENDIX K

APPENDIX K

FLOOD LIABLE LAND DEVELOPMENT GUIDELINES

Reproduced from the NSW Government Floodplain
Development Manual (1986)

4.5.3 Development Guidelines

The following tables present guidelines to assist councils in the formulation of floodplain management plans, drafting of development conditions and in assessing the suitability of various types of developments with regard to prevailing flood hazard etc. There are six tables, one for each combination of hydraulic and hazard category (refer Figure 5).

FIGURE 5 Index to Development Guidelines

hazard category	hydraulic category		
	flood fringe	flood storage	floodway
low hazard	TABLE 1 low hazard flood fringe	TABLE 2 low hazard flood storage	TABLE 3 low hazard floodway
high hazard	TABLE 4 high hazard flood fringe	TABLE 5 high hazard flood storage	TABLE 6 high hazard floodway

NOTE: table numbers refer to the appropriate guideline tables

TABLE 1 Development Guidelines
Low Hazard — Flood Fringe

		development categories				minor development and minor additions
		infill development	new development	redevelopment	major additions	
land use categories	residential	considerations: 1, 2 and 3				considerations: 1 and 4a
	commercial					
	industrial					
	open space					
	rural/non-urban					
	special use	where necessary this form of development should be sited on flood free land; on flood liable land, considerations: 1 and 2		considerations: 1 and 2		

nature of flooding

- Water depths are less than 0.8m.
- Should it be necessary, people and their possessions can be evacuated by trucks.
- Able-bodied adults would have little difficulty in wading.
- Damage potential would be low.

implications of flooding

- Developments will not have a significant effect on the depth and speed or distribution of floodwaters.
- Most developments are suitable, except for some special use developments which by their nature are sensitive to flooding or where the use is especially necessary in times of flooding.
- It will not be necessary to check the effect of proposed development on flood behaviour.

development considerations

1. Any portion of a building or structure subject to inundation should be built from flood compatible materials.
2. Flood proofing to 0.5m above the standard flood should be required of habitable floors of new residences, including those associated with commercial and industrial development, and of normally occupied floors of special use developments. Whilst this condition would generally apply to major residential extensions, the merits of the case should determine the need.

The need to flood-proof commercial and industrial development should be determined on merit.
3. Special consideration should be given to caravan parks as they are difficult to evacuate, a fact which can be compounded by permanent vans and visitors lacking flood awareness. Also, caravans are easily damaged and can float.
4. (a) The Flood Policy exempts minor development and additions from special controls.

(b) The potential for damage to development or adverse impacts on flood behaviour may need to be considered in specific cases, which should be treated on their merits.

SPECIAL

Nil.

TABLE 2 Development Guidelines
Low Hazard — Flood Storage

		development categories				
		infill development	new development	redevelopment	major additions	minor development and minor additions
land use categories	residential	considerations: 1, 2, 3 and SPECIAL			considerations: 1 and 2	considerations: 1 and 4a
	commercial				considerations: 1, 2 and 3	
	industrial					
	open space	considerations: 1, 2, 3 and SPECIAL where warranted				
	rural/non-urban					
	special use	where necessary this form of development should be sited on flood free land; on flood liable land, considerations: 1, 2 and SPECIAL				

nature of flooding

- Water depths are less than 0.8m.
- Should it be necessary, people and their possessions can be evacuated by trucks.
- Able-bodied adults would have little difficulty in wading.
- Damage potential would be low.

implications of flooding

- The impact of new development on flood storage and therefore flood behaviour needs to be addressed.
- Most developments are compatible, except for some special use developments which by their nature are sensitive to flooding or where the use is especially necessary in times of flooding.

development considerations

1. Any portion of a building or structure subject to inundation should be built from flood compatible materials.
2. Flood proofing to 0.5m above the standard flood should be required of habitable floors of new residences, including those associated with commercial and industrial development, and of normally occupied floors of special use developments. Whilst this condition would generally apply to major residential extensions, the merits of the case should determine the need.

The need to flood-proof commercial and industrial development should be determined on merit.
3. Special consideration should be given to caravan parks as they are difficult to evacuate, a fact which can be compounded by permanent vans and visitors lacking flood awareness. Also, caravans are easily damaged and can float.
4. (a) The Flood Policy exempts minor development and additions from special controls.

(b) The potential for damage to development or adverse impacts on flood behaviour may need to be considered in specific cases, which should be treated on their merits.

SPECIAL

- If a new development in a Flood Storage area is likely to cause a significant reduction in storage capacity, the developer or property owner should be required to demonstrate to the consent authority that the proposal will not significantly increase flood levels. If the development would cause a significant increase in flood levels, the developer or property owner should provide adequate and acceptable compensating works to offset the increase. A detailed report by an appropriate consulting engineer should be required in support of a development or building application.

TABLE 3 Development Guidelines
Low Hazard — Floodway

TABLE 3		development categories				minor development and minor additions
		infill development	new development	redevelopment	major additions	
land use categories	residential	considerations: 1, 2, 3, 5 and SPECIAL				considerations: 1, 4a and 4b
	commercial					
	industrial					
	open space	considerations: 1, 2, 3, 5 and SPECIAL where warranted				
	rural/non-urban					
	special use	where necessary this form of development should be sited on flood free land; on flood liable land, considerations: 1, 2, 5 and SPECIAL				

nature of flooding

- Water depths are less than 0.8m.
- Should it be necessary, people and their possessions can be evacuated by trucks.
- Able-bodied adults would have little difficulty in wading.
- Damage potential would be low.

implications of flooding

- The impact of development on the floodway and therefore flood behaviour needs to be addressed.
- In order to reduce the hazard to existing development, a floodplain management study might be needed to identify appropriate management measures.

development considerations

1. Any portion of a building or structure subject to inundation should be built from flood compatible materials.
2. Flood proofing to 0.5m above the standard flood should be required of habitable floors of new residences, including those associated with commercial and industrial development, and of normally occupied floors of special use developments. Whilst this condition would generally apply to major residential extensions, the merits of the case should determine the need.
5. The developer or property owner should demonstrate that any building or structure can withstand the force of flowing floodwaters, including debris and buoyancy forces as appropriate. A detailed report from an appropriate consulting structural engineer should be required in support of a development or building application.

SPECIAL

- In floodway areas, the property owner or developer should be required to satisfactorily demonstrate to the consent authority that the development will not increase the flood hazard or flood damage to other properties or adversely affect flood behaviour. A detailed report from an appropriate consulting engineer should be required in support of a development or building application.
3. Special consideration should be given to caravan parks as they are difficult to evacuate, a fact which can be compounded by permanent vans and visitors lacking flood awareness. Also, caravans are easily damaged and can float.
 4. (a) The Flood Policy exempts minor development and additions from special controls.
(b) The potential for damage to development or adverse impacts on flood behaviour may need to be considered in specific cases, which should be treated on their merits.

TABLE 4 Development Guidelines
High Hazard — Flood Fringe

		development categories				
		infill development	new development	redevelopment	major additions	minor development and minor additions
land use categories	residential	considerations: 1, 2, 3, 5 and SPECIAL			considerations: 1, 2 and 5	considerations: 1 and 4a
	commercial	considerations: 1, 2, 3, 5 and SPECIAL			considerations: 1, 2, 3 and 5	
	industrial					
	open space	considerations: 1, 2, 3 and 5				
	rural/non-urban					
	special use	where necessary this form of development should be sited on flood free land; on flood liable land, considerations: 1, 2, 5 and SPECIAL				

nature of flooding

- Floodwaters are generally over 1m deep and slowly moving.
- Evacuation routes can be cut early in the flood.
- Many buildings can be inundated.
- Evacuation of people and possessions may be difficult and may need to be by boat or helicopter, often at some risk to the operators.
- Social disruption and financial loss could be high.
- There may be danger to life and limb.

implications of flooding

- Developments will not have a significant effect on the depth and speed or distribution of floodwaters.
- It will not be necessary to check the effect of proposed developments on flood behaviour.
- In order to reduce the hazard to existing development, a floodplain management study should be undertaken to identify the appropriate measures.
- Whilst new development is not generally considered appropriate in a high hazard area, it may be acceptable under special conditions. Such conditions should involve a detailed review of the potential flood hazard to the development itself.

development considerations

- Any portion of a building or structure subject to inundation should be built from flood-compatible materials.
- Flood proofing to 0.5m above the standard flood should be required of habitable floors of new residences, including those associated with commercial and industrial development, and of normally occupied floors of special use developments. Whilst this condition would generally apply to major residential extensions, the merits of the case should determine the need.

The need to flood-proof commercial and industrial development should be determined on merit.
- Special consideration should be given to caravan parks as they are difficult to evacuate, a fact which can be compounded by permanent vans and visitors lacking flood awareness. Also, caravans are easily damaged and can float.
- (a) The Flood Policy exempts minor development and additions from special controls.

(b) The potential for damage to development or adverse impacts on flood behaviour may need to be considered in specific cases, which should be treated on their merits.
- The developer or property owner should demonstrate that any building or structure can withstand the force of

flowing floodwaters, including debris and buoyancy forces as appropriate. A detailed report from an appropriate consulting engineer should be required in support of a development or building application.

SPECIAL

- In high hazard areas, the developer or property owner should be required to satisfactorily demonstrate to the consent authority that permanent, fail-safe, maintenance-free measures are incorporated in the development, to ensure the timely, orderly and safe evacuation of people from that area, should a flood occur. In addition, it should also be demonstrated to the consent authority, that the displacement of these people will not significantly add to the overall cost and community disruption caused by the flood. A detailed report from an appropriate consulting engineer should be required in support of a development or building application.

TABLE 5 Development Guidelines
High Hazard — Flood Storage

land use categories	development categories				
	infill development	new development	redevelopment	major additions	minor development and minor additions
residential	considerations: 1, 2, 3, 5 and SPECIAL				
commercial	considerations: 1, 2, 3, 5 and SPECIAL			considerations: 1, 2, 3 and 5	consideration: 4a
industrial					
open space					
rural/non-urban					
special use	where necessary this form of development should be sited on flood free land; on flood liable land, considerations: 1, 2, 5 and SPECIAL				

nature of flooding

- The depth of floodwaters can be 1m or more.
- The speed of floodwaters is slow, and in effect the floodwaters form a pond.
- Many single storey buildings could be completely inundated and may suffer structural problems due to buoyancy.
- Evacuation of people and possessions may be difficult and may need to be by boat or helicopter, often at some risk to the operators.
- There may be danger to life and limb.
- Social disruption and financial loss could be high.

implications of flooding

- In order to reduce the hazard to existing development, a floodplain management study should be undertaken to identify the appropriate measures.
- The impact of new development on flood storage and therefore on flood behaviour needs to be addressed.
- Whilst new development is not generally considered appropriate in a high hazard area, it may be acceptable under special conditions. Such conditions should involve a detailed review of the impact of the development on flooding and of the potential hazard to the development itself.

development considerations

1. Any portion of a building or structure subject to inundation should be built from flood-compatible materials.
2. Flood proofing to 0.5m above the standard flood should be required of habitable floors of new residences, including those associated with commercial and industrial development, and of normally occupied floors of special use developments. Whilst this condition would generally apply to major residential extensions, the merits of the case should determine the need.

The need to flood-proof commercial and industrial development should be determined on merit.
3. Special consideration should be given to caravan parks as they are difficult to evacuate, a fact which can be compounded by permanent vans and visitors lacking flood awareness. Also, caravans are easily damaged and can float.
4. (a) The Flood Policy exempts minor development and additions from special controls.

(b) The potential for damage to development or adverse impacts on flood behaviour may need to be considered in specific cases, which should be treated on their merits.
5. The developer or property owner should demonstrate that any building or structure can withstand the force of

flowing floodwaters, including debris and buoyancy forces as appropriate. A detailed report from an appropriate consulting engineer should be required in support of a development or building application.

SPECIAL

- In high hazard areas, the developer or property owner should be required to satisfactorily demonstrate to the consent authority that permanent, fail-safe, maintenance-free measures are incorporated in the development, to ensure the timely, orderly and safe evacuation of people from that area, should a flood occur. In addition, it should also be demonstrated to the consent authority, that the displacement of these people will not significantly add to the overall cost and community disruption caused by the flood. A detailed report from an appropriate consulting engineer should be required in support of a development or building application.
- If a new development in a Flood Storage area is likely to cause a significant reduction in storage capacity, the developer or property owner should be required to demonstrate to the consent authority that the proposal will not significantly increase flood levels. If the development would cause a significant increase in flood levels the developer or property owners should provide adequate and acceptable compensating

works to offset the increase. A detailed report by an appropriate consulting engineer should be required in support of a development or building application.

TABLE 6 Development Guidelines
High Hazard — Floodway

		development categories				minor development and minor additions
		infill development	new development	redevelopment	major additions	
land use categories	☐	☐	☐			considerations: 1, 4a and 4b
	☐	☐	☒			
	residential					
	commercial					
	industrial					
	open space					
rural/ non-urban					considerations: 1, 4a and 4b	
special use						

nature of flooding

- The depth and speed of floodwaters are such that buildings could sustain major structural damage and in extreme cases, light framed houses could be washed away.
- There could be major difficulties and dangers in evacuating people and their possessions.
- There may be danger to life and limb.
- Social disruption and financial loss could be very high.

implications of flooding

- The impact of development on the floodway and therefore on flood behaviour needs to be addressed.
- In order to reduce the hazard to existing development, a floodplain management study should be undertaken to identify the appropriate measures.
- Whilst new development is not generally considered appropriate in a high hazard floodway area, it may be acceptable under special conditions. Such conditions should involve a detailed review of the impact of new development on flooding and of the potential hazard to new or existing development.

development considerations

1. Any portion of a building or structure subject to inundation should be built from flood-compatible materials.
2. Flood proofing to 0.5m above the standard flood should be required of habitable floors of new residences, including those associated with commercial and industrial development, and of normally occupied floors of special use developments. Whilst this condition would generally apply to major residential extensions, the merits of the case should determine the need.

The need to flood-proof commercial and industrial development should be determined on merit.

3. Special consideration should be given to caravan parks as they are difficult to evacuate, a fact which can be compounded by permanent vans and visitors lacking flood awareness. Also, caravans are easily damaged and can float.
4. (a) The Flood Policy exempts minor development and additions from special controls.
(b) The potential for damage to development or adverse impacts on flood behaviour may need to be considered in specific cases, which should be treated on their merits.
5. The developer or property owner should demonstrate that any building or structure can withstand the force of

flowing floodwaters, including debris and buoyancy forces as appropriate. A detailed report from an appropriate consulting engineer should be required in support of a development or building application.

SPECIAL

- In high hazard areas, the developer or property owner should be required to satisfactorily demonstrate to the consent authority that permanent, fail-safe, maintenance-free measures are incorporated in the development, to ensure the timely, orderly and safe evacuation of people from that area, should a flood occur. In addition, it should also be demonstrated to the consent authority, that the displacement of these people will not significantly add to the overall cost and community disruption caused by the flood. A detailed report from an appropriate consulting engineer should be required in support of a development or building application.
- In floodway areas, the property owner or developer should be required to satisfactorily demonstrate to the consent authority that the development will not increase the flood hazard or flood damage to other properties or adversely affect flood behaviour. A detailed report by an appropriate consulting engineer should be required in support of a development or building application.

APPENDIX L

APPENDIX L
DEPARTMENT OF TRANSPORT PERSPECTIVE

ROCKHAMPTON FLOOD MANAGEMENT STUDY RECOMMENDATIONS
DEPARTMENT OF TRANSPORT PERSPECTIVE

The Bruce Highway is a National Highway and its construction and maintenance are funded by the Federal Government which also sets standards and approves improvement strategies for such work.

Upgrading needs are determined in accordance with Road Network Strategies which evaluate the condition of the road and its likely future condition against defined standards. These standards include width/traffic volume, pavement condition (strength and roughness), accident history, flood immunity and other factors such as alignment, intersection capacity and bridge strength.

In determining priority for works, the condition deficiencies are evaluated and cost-effective remedial options determined taking into account whole of life costs. Benefit/cost ratios are calculated which take account of vehicle operating and travel time savings, accident reduction, as well as economic and regional development benefits. The benefits of flood immunity improvements are included.

Within available funds, projects on the current National Highway program in Queensland have an average BCR of 2.5. The Bruce Highway component of the National Highway Planning Program gives BCR > 4.5 for major works. Projects with width deficiencies such as the Cooroy bypass and the southern approaches to Cairns have BCR of 3 - 4.

Following the 1991 floods, the problems and upgrading options at Alligator Creek near Yaamba were re-evaluated. The analysis indicated that this had the highest priority for upgrading on a flood immunity basis over the whole National Highway system in Queensland including the Landsborough and Barkly Highways. Its BCR is 4.8 at 7% discount rate.

The project was approved for construction by the Federal Government and work has commenced on the first stage which involves high level bridges over Alligator and Plentiful Creeks on a deviation of the highway adjacent to the North Coast rail line. The second stage involves raising the road at Smith's Gully north of Yaamba. The whole project is estimated to cost \$9.6m and will be completed in late 1993.

At the completion of this work, Rockhampton will no longer be isolated to the north as a result of flooding in the Fitzroy River or in Alligator Creek.

Because of the relatively shorter times of submergence and the higher costs of remedial work, the same priority is not indicated for the Yeppen flood plain. The results of the Rockhampton Flood Management Study show a BCR of 1.1 at 7% discount rate. It is noted that this analysis has included benefits accruing to local business where this information is not normally available to the Department of Transport. Hence the BCR of 1.1, while relatively high in terms of the current study, is inflated when considered in terms of normal Department of Transport analysis.

In summary, from the "Department of Transport Perspective", and where the Federal Government is the funding authority for National Highway projects, the flood immunity works for the Yeppen Flood Plain are of low BCR value and need to compete with other projects with much higher BCRs for priority and funding considerations. It is on this basis that the Yeppen Flood Plain is assessed as being of relatively low priority and behind other projects in terms of width, travel and operating costs, safety, strength and roughness deficiencies.

At present, there are no plans to upgrade the Yeppen Flood Plain from road funding sources at likely future funding levels.

However if funds are available for the Yeppen project through other programs directed toward mitigation of flood effects then obviously there would be no objection from the Department of Transport to accelerating construction of the necessary remedial works.