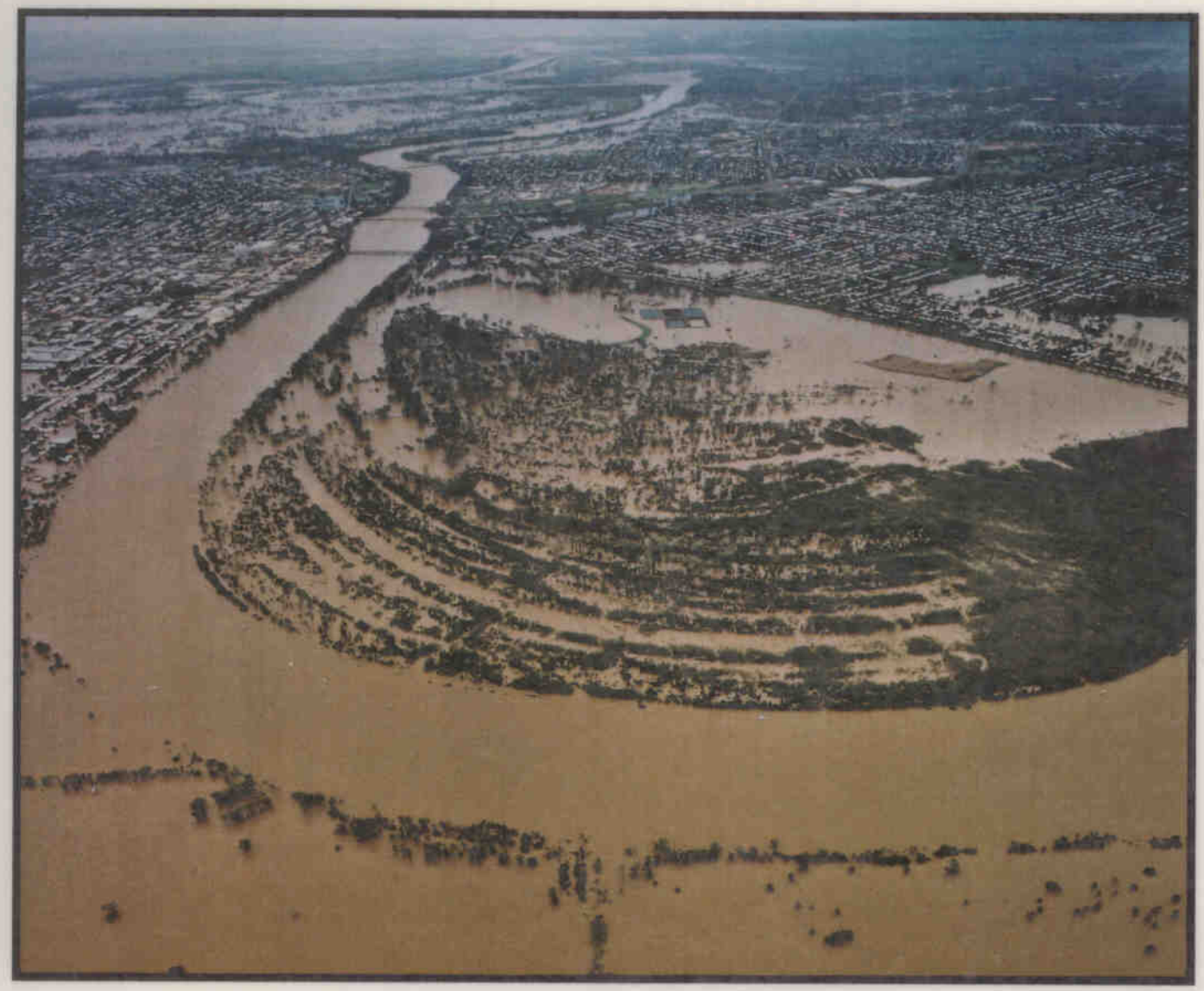
WATER RESOURCES COMMISSION



ROCKHAMPTON FLOOD MANAGEMENT STUDY

PHASE 1 REPORT

VOLUME 3
APPENDICES

CAMP SCOTT FURPHY PTY LTD
ACN 004 939 548

APRIL 1992

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PHASE 1 REPORT

VOLUME 1 EXECUTIVE SUMMARY

VOLUME 2 REPORT

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ROCKHAMPTON FLOOD MANAGEMENT STUDY

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APPENDIX A

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WATER RESOURCES COMMISSION

ROCKHAMPTON FLOOD MANAGEMENT STUDY

CONSULTANTS BRIEF

JUNE 1991

1. INTRODUCTION
ROCKHAMPTON AND THE FITZROY RIVER

Rockhampton is the largest urban centre in Central Queensland with a district population of over 60 000. The city is built on the banks of the Fitzroy River just north of the Tropic of Capricorn and some 55 to 60 kilometres from the Fitzroy's mouth.

With a catchment area above Rockhampton of 140 000 square kilometres, the Fitzroy basin is the largest on the east coast of Australia. This basin experiences heavy rainfall from a range of synoptic weather patterns and atmospheric conditions that influence the eastern Australia land mass. Much of the large volume flood flows through Rockhampton though are due to cyclonic/monsoonal activity. This activity can result in very heavy rainfalls over much of the Fitzroy basin, particularly in the upper sections of the Isaac-Connors River sub-catchment, inland from Sarina.

Moderate flood flows in the Fitzroy River result in higher than normal river levels and associated minor flood breakouts in the Rockhampton area. These moderate floods have disrupted life to a minor degree in Rockhampton many times since the city was founded. The city's growth and services have basically developed in areas which avoid any real impact from this level of flooding and for most residents such flooding has little real consequence.

Major flood flows in the Fitzroy River, however, have a very significant economic and social impact, not only on Rockhampton but also on North Queensland. Such floods are the result of very heavy rainfall events, or a series of events, over much of the Fitzroy River catchment. The resultant very large volumes of flood runoff then take a considerable time to discharge to the sea via the Fitzroy River system. Rockhampton has experienced the impact of three such floods in the Fitzroy River system this century, in 1918, 1954 and now 1991.

2. IMPACTS OF MAJOR FLOODING

The principal impacts on Rockhampton of these major Fitzroy River system floods are:-

2.1 the inundation and isolation of a large number of residential and commercial buildings in Rockhampton, with associated effects on residents health and safety and physical damage to the buildings and their contents.

2.2 the isolation of local communities and businesses in and around Rockhampton by flooding of all access roads for extended periods, with resulting loss of business trade and severe restrictions on residents access to goods and services.

2.3 the isolation of Rockhampton itself by flooding of all the rail and roads links out of the city and flooding of the airport, which greatly limits the movement of people and goods into and out of Rockhampton and indeed along the entire east coast of Queensland.

This severing of the main Queensland coastal road and rail links for extended periods of time due to flooding in the Rockhampton area has major direct and indirect impacts much further afield than Rockhampton itself.

3. STUDY EXTENT AND AREA

This Study is to focus on the possible flood management options which may reduce the economic, social and environment impact that Fitzroy River flooding at Rockhampton has. The Study is to be undertaken in two distinct phases. The first phase will address the aspects as given in Sections 5 and 6 below, while Phase 2 will require detailed investigation of preferred options.

The actual area subject to detailed investigation and recommendations concerning its specific flood impacts in this Study should be determined by the Consultant. As well as the whole City of Rockhampton area, the area investigated should also include a number of local townships and localities in the neighbouring Shires which are directly affected by Fitzroy River flooding. These include Gracemere and Alton Downs in the Fitzroy Shire and Yaamba, Parkhurst and Nerimbera in the Livingstone Shire.

The direct and indirect impacts associated with the severing of the Bruce Highway and North Coast Railway due to Fitzroy River flooding in the Rockhampton area are to be included in this Study, along with options to improve the flood immunity of these links.

4. TERMS OF REFERENCE

The terms of reference for the Study can be summarised as -

4.1 an evaluation of the current floodplain situation, including an appreciation of constraints and limitations placed by the existing structures and flood management measures in place on the floodplain.

4.2 the identification of areas of continuing potential for flood losses, the assessment of their significance (economic, social and environmental) and the evaluation of practicable mitigation measures;

4.3 the recommendation of a program of short and long term proposals which conform to an overall flood plain management policy, together with the following information:-

- a description of measures, preliminary estimates of capital and operating costs including the identification of private costs where applicable; and

- estimates of economic, social, environmental and other benefits and their distribution.

4.4 the identification of areas where further data is required and any possible constraints which may exist relative to the proposals recommended.

The outcome of the Study is not to be just the development of a philosophy for floodplain management in the Rockhampton area. The Study must also define a program of individual works and measures, together with cost estimates and detailed quantitative estimates of their economic, social and environmental benefit.

The Study is required to be of a standard and extent suitable for direct submission to the State and Commonwealth Governments in support of applications for financial assistance.

5. SCOPE OF STUDY

5.1 PHASE 1

In meeting the above broad terms of reference, the Study is to include both the aspects indicated below and those specific areas of concern listed in Section 6 as Phase 1 of the Study.

5.1.1 Study of Fitzroy River Flood Characteristics:

- General description of sequence of flooding
- Summary of January 1991 flood, including a plan showing flooded areas and depths of flooding
- Evaluation of frequency of 1991 flood
- The magnitude and frequency of the 1918 flood and areas inundated
- Development of flood frequency relationships for the Fitzroy River, with a plan of the Rockhampton area likely to be inundated for various frequency floods.

5.1.2 Flood Damage Assessment:

- Collection and compilation of data on the costs of January 1991 flooding
- Development of flood damage versus flood height/flood duration/ frequency relationship for the area
- Evaluation of flood damages (identification of significant damages)
- Assessment of average annual damages

The damage assessment should include:

. Direct damage to residential, commercial and industrial properties.

. Damage to services.

. Indirect damages eg. disruptions to transport, loss of production and trade.

. Social and environmental losses.

Strong recognition should be given in the damage assessment to the regional and state wide impact of Rockhampton flooding, as well as the impacts in the Rockhampton area.

The data on damages should be detailed enough to allow damages to be determined for smaller discrete areas, so that the benefits of individual works or measures can be assessed.

5.1.3 Appraisal of Options for Flood Management

- Identify and appraise options including for those specific areas of concern listed in Section 6, those raised in a call for public submission (planned for early in the Study) and the general options listed below.

General structural measures include:-

- flood mitigation storages
- channel works and modifications
- raising of rail and road access
- levee banks and flood gates
- development of stable floodways
- flood proofing of buildings
- removal of local runoff during a major flood
- raising of buildings
- acquisition/relocation of buildings/services

General non-structural measures include -

- flood mapping and delineation of floodways
- land use planning controls
- flood forecasting, flood warning
- public information and education
- changes to existing land use
- strategies for minimizing transport and industrial disruptions
- co-ordination of emergency services during flood events

5.1.4 Recommendations on Implementation of Flood Management Measures

For those options which can be implemented without further investigation, detailed description of the option together with a suggested strategy for its implementation are required.

Formulate a preliminary policy in relation to development, redevelopment and use of flood prone land having regard to such factors as hazard, risk, uncertainty and the cost of future flood damage and the cost of mitigation measures.

Should the policy include the adoption of a flood standard, the basis for the selection of the standard is required.

5.1.5 Recommendations on Further Investigation of Flood Mitigation Measures

List the options warranting further detailed analysis, with a ranking of the options according to their potential benefits and benefit/cost estimates. For each option an outline of the type and extent of the investigation is required.

5.1.6 Future Management of Fitzroy River and Floodplain

The management of the Fitzroy River and its floodplain is currently the responsibility of a number of agencies. The Consultant shall recommend on how this river and floodplain can best be managed to overcome both the present problems and future issues as they arise.

5.1.7 Liaison and Community Consultation

Liaison with other State and Federal Government Departments, authorities, private organisations or individuals relative to any future works or measures proposed by these bodies which could have an effect on the pattern or impact of flooding, or affect works proposed to mitigate flooding is required and comments documented.

Consultation is also required with the general community, initially to receive public submission on possible flood mitigation options and later to advise interested parties on the progress of the Study.

5.2 PHASE 2

Detailed investigation of selected options will be carried out according to the suggested plan in Phase 1 (modified as necessary by the Steering Committee).

6. SPECIFIC AREAS OF CONCERN

As a result of the recent 1991 flooding, there are a number of specific areas of concern which are to be addressed to some degree in this Study, subject to the direction of the Steering Committee.

The following list is not intended to be an exhaustive list of these areas of concern, nor to indicate any support whatsoever from either the Water Resources Commission or the other organizations represented on the Steering Committee for the validity of these specific areas of concern. The following issues have nevertheless already been raised as issues, often by the public and the media, following the January 1991 flooding.

6.1 Water storage dams, including at The Gap site on the Fitzroy River and Gin's Leap on the Connors River - for flood mitigation purposes.

6.2 Truncation of Pirate Point on lower reaches of Fitzroy River.

6.3 Possible diversion of the flood flow in part of the Fitzroy's upper catchment, say the Connors River, direct to the sea.

6.4 Levee banks around Rockhampton, including:

- Raising of exising levee banks around Rockhampton Airport.
- Around Callaghan Park Racecourse.
- Raising Lakes Creek Road above flood levels and so act as a levee bank.
- Along Quay Street, Depot Hill and railway yards.
- Along Lower Dawson Road/Port Curtis Junction area.

6.5 Floodgates where local creeks and drains in the Rockhampton area outlet to the Fitzroy River, including:

- Moores Creek,
- Frenchmans Creek,
- Thozet Creek,

- Splitters Creek,

- Limestone Creek,

- Lion Creek,

- Storm water outlets.

6.6 The Fitzroy Barrage has raised the flood levels experienced upstream and review of the operating rules for the Barrage is required.

6.7 Siltation in the Fitzroy Barrage storage has raised flood levels.

6.8 General bank stability along the Fitzroy River.

6.9 Extensive bank instability has occurred at the Pink Lily bend on the lower Fitzroy Barrage storage, adjacent to a major sand dredging operation. Further bank collapse here could undermine the adjacent Ridgelands Road, requiring the construction of a new road route.

6.10 The long history of bank collapses at Pink Lily bend are progressively lowering the control level for this major flood breakout. This could lead to the development of distinct flood channels through the Pink Lily/Yeppen floodway and eventually result in partial diversion of the Fitzroy River.

6.11 The existing Bruce Highway and North Coast Railway crossings over the Yeppen floodplain have raised flood levels and caused problems for upstream landholders.

6.12 Raising of the Bruce Highway and North Coast Railway crossings over both the Yeppen floodplain south of Rockhampton and at Alligator Creek north of Rockhampton to above flood levels.

6.13 The diversion of Scrubby Creek created a high energy flow path for floodwaters adjacent to the Yeppen floodway. This has resulted in severe erosion of this diversion channel which now requires stabilisation.

6.14 Consequences of existing landfills in Pink Lily/Yeppen floodway and desirable controls on future landfills.

6.15 Improve access during floods from Rockhampton to:

- Gracemere
- Stanwell Powerstation
- Depot Hill
- Alton Downs
- Nerimbera
- Abattoirs
- Port Curtis Junction

6.16 Problems with having the Rockhampton City's dump in the floodplain (health and environmental issues, lack of access, raising floodwater levels).

6.17 Problems associated with Rockhampton City's three sewerage plants being isolated by floodwaters and infiltration/surcharge of the sewerage system.

6.18 Problems which high flood levels may cause to Rockhampton City's Glenmore water treatment plant and distribution system (ie. burst mains in flooded areas).

6.19 Problems with backflow up Rockhampton City's drainage system.

6.20 Raising floor levels of dwelling houses in floodprone areas.

6.21 Existence of schools at Depot Hill and Port Curtis Junction in flood affected areas.

6.22 Effects of stock fencing in floodways.

6.23 Lack of real time data for forecasting anticipated flood levels other than at designated flood gauges.

It is anticipated that a further number of such areas of concern will arise as a result of a call for public submissions once the Study is underway.

7. DATA AVAILABLE

A considerable amount of data exists which may be relevant to this Study. The Consultant should peruse this material to ascertain its value to this Study. The purpose of providing this information in this brief is to assist consultants in the preliminary stages with regard to known available data, and what additional data may be required.

7.1 Stream-Flow Data

The Water Resources Commission has collected stream flow data at quite a number of sites in the overall Fitzroy River catchment over many years, including the following sites:-

Fitzroy River at Yaamba	1914 - 73
Fitzroy River at Riverslea	1922 - 91
Fitzroy River at The Gap	1964 - 91
MacKenzie River at St Aubins	1919 - 60
MacKenzie River at Bingegang	1971 - 91
MacKenzie River at Carnangarra	1967 - 91
Nogoa River at Raymond	1949 - 91
Dawson River at Taroom	1911 - 91
Dawson River at Theodore	1924 - 91
Dawson River at Beckers	1964 - 91
Don River at Rannes	1924 - 91
Dee River at Wura	1971 - 91
Isaac River at Yatton	1962 - 91
Isaac River at Deverill	1968 - 91
Connors River at Gins Leap	1965 - 91
Funnel Creek at Main Road	1965 - 91
Comet River at Comet Weir	1919 - 73
Comet River at 17.2 km	1971 - 91
Neerkol Creek at Capricorn Highway	1987 - 91

The Water Resources Commission's stream flow data is under constant revision and the Consultant should ensure that the latest data is used in any analysis.

7.2 Flood Levels

The Rockhampton City Council has surveyed the flood levels experienced in selected areas of the City for the 1918, 1954 and 1991 floods.

The Water Resources Commission has also recorded flood levels along sections of the Fitzroy River and floodplain for the 1988 and 1991 floods.

7.3 Survey Information

The only published topographical maps of the area are the 1:100 000 series. The three Councils should have some level and contour information available also.

A series of contour plans of the Fitzroy flood plain were produced by the Department of Local Government in 1960 for the physical hydraulic model of the Fitzroy Barrage undertaken by the University of Queensland (now held by Water Resources Commission). The Water Resources Commission has recent cross section information on the lower Fitzroy Barrage storage.

An extensive series of surveys were undertaken by the Department of Transport in 1974 for the physical (and computer) hydraulic model of the Yeppen floodplain undertaken by the University College of Central Queensland.

The Department of Lands has a network of level bench marks on Australian Height Datum established in the Rockhampton area. Aerial photography showing the 1978, 1983, 1988 and 1991 floods around Rockhampton is also available.

7.4 Previous Reports

Previous reports, studies and other known publications concerning the Fitzroy River and its floodplain are appended to this brief. This list gives the location of these reports and a contact person familar with this information.

7.5 Other Information

A number of authorities and organizations are believed to have collected data on both the public and/or private losses caused by the 1991 Fitzroy River flooding. These include:

- Capricorn Tourism and Development Organization,
- Department of Administrative Services,
- Department of Family Services,
- Queensland Confederation of Industry,
- Queensland Electricity Commission (Stanwell Project),
- Rockhampton City Council (Flood Relief Fund),
- Treasury Department (Disaster Relief),
- University College of Central Queensland.

The Police and the State Emergency Services may be able to provide the costs of their operation during the 1991 flooding.

The Rockhampton City Council, both the Fitzroy and Livingstone Shire Councils and the Department of Transport should be able to provide the damage costs of their respective assets due to the 1991 flooding.

8. SUBMISSION OF PROPOSALS

Consultants interested in being considered for the award of the brief for the Rockhampton Flood Management Study are requested to submit a proposal indicating:-

8.1 General nature, scope and description of aspects to be undertaken and investigated to achieve the objectives of the Study;

8.2 Timings of the Study including a program covering major items, phases and events with estimated dates of commencement and completion;

8.3 Names and credentials of senior staff to be engaged on the Study;

8.4 Names and credentials of sub-consultants proposed to be engaged, and the aspects which they will cover;

8.5 Details of similar, relevant studies previously undertaken by the consultants and sub-consultants proposed to be engaged and the staff engaged in these previous studies;

8.6 Estimated cost of the Study, dissected in Phase 1 and Phase 2 costs and itemised, for example:

- major aspects to be undertaken,
- details of unit charges for staff time,
- sub-consultant fee estimates,
- report costs,
- the cash flow of likely fees based on timings above.

A fixed sum fee is to be submitted for Phase 1 of the Study, subject to possible egotiation on the addition or deletion of the actual features to be covered in this Phase. Phase 2 costs should be submitted on the basis of unit charges for staff and sub-consultants time;

8.7 Estimated time for the Study to reach the draft final report, and the time to complete the final report following approval of the draft;

8.8 The methods to be employed in assessment of flood damages, determination of flood frequency, and estimation of flood levels. Any hydrologic and hydraulic models intended to be used should be briefly described; and

8.9 A suggested program of firstly public meetings to receive public submissions and later, to advise interested parties in the general community on the progess of the Study.

Consultants may wish to visit Rockhampton and confer with officers from the various organizations involved with this Study in Rockhampton, to familiarise themselves with the area and the information available. Inquiries in this regard can be directed to:

Mr M McKenna,
Regional Engineer, Central Region
Water Resources Commission
PO Box 736
ROCKHAMPTON QLD 4700
(Telephone 079 319600).

9. RECEIPT OF PROPOSAL

Interested consultants are invited to submit twelve (12) copies of their proposal covering this Study for consideration by 5pm on 8th July 1991.

Proposals should be delivered to:

Regional Engineer
Water Resources Commission
1st Floor, Suncorp Building
212 Quay Street
ROCKHAMPTON QLD 4700
or PO Box 736
ROCKHAMPTON QLD 4700

10. SELECTION OF CONSULTANT

Merit and "value for money" will be the primary determining factors in the selection of the Consultant to undertake the Study.

Following consideration of the proposals submitted and the appointment of a consultant with the necessary expertise and experience to carry out the work, the matter of costs may be subject to further negotiation to enable the objectives of the Study to be met within the limit of funds available.

It may be that few, if any consulting firm will employ on their staff all the specialists required for this Study. The engagement of sub-consultants to provide these specialist requirements will be the responsibility of the main consultant. In submitting a proposal for the Study, consultants must indicate what other bodies will be engaged and the personnel involved for consideration by the Steering Committee.

11. TERMS OF ENGAGEMENT AND PAYMENT

The Consultant will be required to enter into an agreement in accordance with the attached Queensland Public Sector Consultancy Agreement.In providing the details required under Section 8 of this brief, consultants should be aware of the information required by the Schedule of the Consultancy Agreement.

Progressive payment of fees will be made by the Principal on the basis of detailed accounts submitted monthly in association with reports to the Steering Committee.

It is anticipated that this Study will be completed and the final report issued by the end of May 1992.

12. MANAGEMENT OF THE STUDY

The Principal for this Study shall be the Water Resources Commission.

A Steering Committee has been appointed to generally advise on the course and conduct of the Study. The selected Consultant will be required to report to the Steering Committee on the progress of the work. These reports will be supplied as written statements at monthly intervals and will define:-

. Progress of the Study to that date and any amendments to the program;

. Any problems which have arisen which are proving difficult to solve;

. An estimate of expenditure to that date and payments claimed.

Periodically, the Consultant will meet with the Steering Committee in Rockhampton to discuss the progress and findings of the Study. While these meetings need not be held each and every month, they are still considered essential to ensure that the correct perspective of the Study is being maintained.
The timing of these meetings will be subject to discussion with the Consultant, but it is suggested that the Consultant considers this aspect and nominates in his proposal approximate timings relative to critical phases of the work when such meetings would be advantageous.

13. STEERING COMMITTEE

The Steering Committee referred to Section 12 above will be comprised of the following people:-

Mr M McKenna, Regional Engineer, Water Resources Commission, Rockhampton (Chairman)

Mr G Hausler, Executive Engineer, Water Resources Assessment Division, Water Resources Commission, Brisbane

Cr L Taylor, Mayor, Rockhampton City

Mr K Carpenter, City Engineer, Rockhampton City

Mr P Hielscher, Deputy City Engineer, Rockhampton City

Cr I Besch, Chairman, Fitzroy Shire Council

Mr N Drews, Shire Engineer, Fitzroy Shire Council

Mr P Murphy, Shire Engineer, Livingstone Shire Council

Mr D Muir, Regional Director (Central Queensland), Queensland Department of Transport, Rockhampton

Mr B Luttrell, District Engineer, Queensland Department of Transport, Rockhampton

Mr W Johnson, Acting Group Manager Infrastructure, Queensland Railways, Rockhampton

Mr P Handscombe, Commonwealth Department of Primary Industries and Energy, Canberra

14. MEDIA STATEMENTS AND ANNOUNCEMENT OF CONSULTANCY

The Consultant is not to make any statements to the media without the prior authorisation of the Steering Committee and the agreement of the relevant organization. Any information of a non-public nature obtained in liaising with the various organizations shall be treated confidentially.

If necessary, the Water Resources Commission, as Principal, will make arrangements to advise other Government Departments and private bodies, if requested by the Consultant, of the following:-

14.1 that the Consultant has been engaged by the Principal;

14.2 the purpose and nature of the Study being undertaken by the Consultant on behalf of the Principal;

14.3 the name of the Consultant's officers likely to be making contact;

14.4 the type and nature of data the Consultant wishes to obtain;

14.5 any other matter of relevance to the investigation for which data are required.

15. STUDY REPORT

Submission of twelve (12) copies of a draft report for evaluation and comment will be required, and productions of a final report will await discussion and approval of the draft by the Steering Committee.

A total of a hundred (100) copies of the final report will be required. The report will be presented on A4 size paper and plans shall be sized to suit that format.

16. OWNERSHIP OF DATA AND MATERIALS

All data, information, plans, maps, the originals of drawings and other documents acquired or created for this Study shall be the property of the Water Resources Commission, as Principal, and shall be handed over to the Commission if requested, at the completion of the Study.

17. FURTHER WORK

The selection of a consultant for this initial Study shall not be taken as necessarily indicating any commitment by the Principal, or the organizations represented on the Steering Committee, to engage the same consultant on any works or further investigations arising as a result of this Study. The Principal and other organizations represented on the Steering Committee will reserve their right to undertake any such works with their own staff or with the assistance of such consultants as they may select from time to time.

Appendix

DATA AVAILABLE

Title and Location of Known Reports, Plans, Surveys and Other Information Possibly Relevant to Rockhampton Flood Management Study

Rockhampton City Council (Contact Mr K Carpenter or Mr P Hielscher on (079) 311311)

REPORTS

Fitzroy River Barrage Effect on Tide Heights, Department of Civil Eng. Report CH2/64 University of Queensland, July 1964.

Fitzroy River Barrage Hydraulic Model, Department of Civil Eng. University of Queensland, 1963.

Report on Fitzroy River Barrage, Rockhampton Water Supply Job No. 2220, Department of Local Government Queensland, October 1964.

Extract Re: Flooding, Rockhampton Airport Local Ownership Study, Gutteridge, Haskings & Davey, Rockhampton City Council, May 1983.

Extract Re: Flooding, Rockhampton Airport Local Ownership Study, Summary Report, Gutteridge, Haskings & Davey, Rockhampton City Council, June 1985.

Extract Re: Flooding, Rockhampton Airport Redevelopment, Master Plan, Gutteridge, Hastings & Davey, Rockhampton City Council, December 1987.

Rockhampton Flood Study, Warnings and Damages, D. Smith, J. Handmer and M. Greenway, for Bureau of Meteorology by Centre for Resource and Environmental Studies, Australian National University, November 1988.

Fitzroy River Flood Warning System, Bureau of Meteorology Brisbane, October 1986.

April 1990 Floods Inland Queensland, Bureau of Meteorology Brisbane, June 1990.

Fitzroy River Flood Warning System, Bureau of Meteorology Brisbane, August 1990.

Rockhampton Flooding May 1983, P.J. Lamont Department of Aviation Rockhampton, November 1983.

Description of the Record Flood at Rockhampton February 1918, The Capricornian, April 6, 1918.

Main Roads Department Report on Southern Approaches to Rockhampton, File No: 147/10E/104, Cameron, McNamara & Partners Consulting Engineers, November 1971.

Bureau of Meteorology Queensland Regional Office, Floods Associated with Severe Tropical Cyclone Joy, December 1990 - January 1991.

1918 Flood Fitzroy River Report, City Engineer, August 1939.

The Water Resources of the Fitzroy River Basin and their Development, D.W. Beattie, Commissioner of Water Resources, September 1980.

Rockhampton Southern Approaches by Road and Rail, Environmental Impact Statement, Main Roads Department Queensland - Queensland Railways, August 1978.

The Yeppen Model, Department of Civil Eng. Capricornia Institute of Advanced Education, Report No. CE77/001, Main Roads Department - Queensland Railways, August 1977.

Fitzroy River Floodplain Model, Final Report, W.L. Grigg, Department of Civil Eng. Capricornia Institute of Advanced Education, Rockhampton City Council, December 1987.

An Investigation of the Sedimentation Characteristics of the Fitzroy River During the Flood of March 1988, J.P. Walsh Capricornia Institute of Advanced Education, November 1988.

PLANS

River Bank Erosion - Pink Lily Area - Rockhampton City Council - SY 214

Various Floods: Flood Levels and Flood Line - Rockhampton City Council - FD 12-27

General Flood Maps 1918, 1954, 1991 - Rockhampton City Council

Flood Maps 1954 - Rockhampton City Council - DS 95-608

Monthly Rainfall Statistics 1871 - 1991

Schedule Peak Flood Heights 1859 - 1991

Schedule of Flood Rise Features for Fitzroy River at Rockhampton

Correlation of Fitzroy River Gauge and A.H.D. Yeppen Flood Plain Levels - Department of Transport

Two Schedules of Rising Flood Heights March, 1988 Flood
Fitzroy River Map of Watershed - Morning Bulleting 1948

Alligator Creek and Limestone Creek Catchment Area - Rockhampton City Council

DATA

Rising Flood Heights at Airport - Rockhampton City Council - 1991

Queensland Department of Transport, Rockhampton (Contact Mr P Griffin on (079) 311500)

REPORTS

Report on Rockhampton Flooding, I.D. Rose, Dec 1973 - Jan 1974

Rockhampton: Southern road and rail approaches, Environmental Study Advice, January 1978.

Velocity measurements - Rockhampton Flood, January 1978

Flood inundation of Yeppen Flood Plain, A.J. Sims, May 1978.

Fitzroy River Flooding, Rockhampton area observations, February 1978 - H.B. Carseldine.

Flood Gauging on Yeppen Flood Plain, Rockhampton (QWRC) March 1988.

Planning Report - Alligator Ck - Yaamba - Smiths Gully, April 1991.

PLANS

Rise and Fall curves at various sites around Rockhampton, February/March 1954, Plan No. 207007.

Time of Submergence Graph, Fitzroy River, Old Harbour Board Gauge, Pre 1954, Plan No. 207008.

Time of Submergence, Fitzroy River, New Harbour Board Gauge, up to and including 1954, Plan No. 207009.

Time of Submergence, Fitzroy River at Yaamba, up to and including 1956, Plan No. 207010.

Flood Index Board, Railway Levels, Fitzroy River (Rockhampton), Dawson, Comet, Nogoa Rivers, Theresa Ck, Plan No. 207011.

Rise and Fall Curves, Fitzroy River, Yeppen Crossing, Gavial Creek (Roopes Bridge) Scrubby Creek Flooding (at Hastings Deering), December 1973/January 1974, Plan No. 207020.

Rise and Fall Curves, Fitzroy River Breakover at Pink Lily, 1898-1929, Plan No. 207022.

Time of Submergence Graph, Fitzroy River at Yaamba, Up to and including 1954, Plan No. 207023 (See also Plan No. 207010).

Fitzroy River watershed, Plan No. 207048.

Hydrographs including Yaamba, Plentiful/Alligator, Riverslea, Lion Creek, Fairy Bower, Yeppen, Gavial Creek and Rockhampton Gauge, January 1991, Plan No. 232512.

Hydrographs including Rockhampton Guage, Plentiful/Alligator, Yeppen, Scrubby Creek, Little Thozets, Frenchmans, Vesty Street, Deep Creek, Lion Creek and Blacks Creek, March 1988, (Booklet).

SURVEYS

Working Survey, Egans Hill, G. Burton, February 1972.

Flood Plain, L Landis, December 1973

Contours Yeppen Flood Study, D Misso, November 1974.

Drainage investigation Bessie Sue Lagoon, G Fisher, May 1977.

Bridge Site - Yeppen Lagoon, R Hewitt, January 1978.

Flood Levels Yeppen Crossing, M Cuskelly, March 1978.

Working Survey, M Cuskelly, present route across Yeppen Flood Plain - to Gracemere, November 1978.

Construction Traverse, M Cuskelly, present route across Yeppen Flood Plain, May 1979.

Bridge Site - Yeppen Crossing M Cuskelly, May 1979.

Construction Traverse, M Cuskelly, present route across Yeppen Flood Plain (South), July 1979.

Flood water monitor, A Blinco, various sites, March 1988.

Flood Levels, District Survey Personnel, various sites, January 1991.

AERIAL PHOTOGRAPHS

Rockhampton Flood 1978 (1:12000 & 1:6000) 10/11th February 1978.

Rockhampton Flood 1983 (1:10000 & 1:6000) 12th May 1983.

Fitzroy River Flood, High Level (1:24900, Colour) 9/10th March 1988 (Available from Department of Lands).

Fitzroy River Flood, Low Level (1:19900, Colour) 9/10th March 1988.

Rockhampton Flood (1:19900, Colour) 9/10th March 1988.

Rockhampton Floods January 1991 (1:13500 approx, Colour) 14th January 1991.

Queensland Railways, Rockhampton (Contact Mr P Augustine, (079) 0289)

- record of flooding as it affected the railway in relation to river height during the January 1991 floods.

Water Resources Commission, Rockhampton (Contact Mr M. Keane on 079 319 583)

REPORTS

Fitzroy River Dam Sites 143.6 and 141.2km at the Gap Reach, Feasibility Study, Internal Water Resources Commission Report, Project Planning Branch, June 1977.

Fitzroy River Erosion in the Pink Lily Area, Report for Water Resources Commission by Cameron McNamara, April 1981.

Design Flood Levels - Fitzroy River at Stanwell Pump Station Site, Internal Memo 14/03/90, Water Resources Commission.

PLANS

Rockhampton Water Supply - Barrage - Contours, River Cross Sections, 1954 Flood Hydrographs, Flood Model Results and Barrage Site Survey Details (Job No 2220).

Fitzroy River Dam Site 143.6km, Reservoir Area, Contour Plan (Drawing No 24173).

Fitzroy River, Erosion Investigation at Pink Lily Lagoon Area (Drawing No CQ 5606).

Fitzroy River, Pink Lily, Sand and Gravel Investigations, Cross Sections etc. (Drawing No CQ 5713 - 5727).

Fitzroy River, State Gas Pipeline, River Crossing.

APPENDIX B

APPENDIX B

COMMUNITY CONSULTATION

B1 Extract from Inception Report (Camp Scott Furphy September 1991)

B2 Advertisement re Public Meetings and Submissions

B3 List of Written Submissions

B4 Notes from Public Meetings

B1 Extract from Inception Report

6. COMMUNITY PARTICIPATION

6.1 INTRODUCTION

Community participation in the Study to date has comprised:

- four public meetings;
- invitation to make written submissions;
- follow up meeting with residents.

Notification of the public meetings and the invitation to make written submissions was made by advertisement in the Morning Bulletin on Saturday 31st August 1991. A copy of the advertisement is given in Appendix B. The following paragraphs summarise the community response to date together with provisional suggestions for the next round of community participation.

6.2 PUBLIC MEETINGS

A total of 92 residents attended the four public meetings. The meetings were chaired by the Project Manager, David Sargent. Officers of the authorities represented on the Steering Committee attended each meeting. The Study Team Sociologist Mr. M. O'Connor attended the second meeting.

Date	Venue	No. of Attendees
5th Sept.1991	Rockhampton City Hall (for N. Rockhampton residents)	3
6th Sept.1991	Rockhampton City Hall (for S. Rockhampton residents)	26
9th Sept.1991	The Caves Hall (for Livingstone Shire Residents)	33
10th Sept.1991	Gracemere Community Hall (for Fitzroy Shire & Fairybower Residents)	30

A summary of issues raised is given in a subsequent paragraph. Notes taken at each meeting as compiled by Mr. M. Keane of the Water Resources Commission are given in Appendix B.

6.3 WRITTEN SUBMISSIONS

The nominated deadline for written submissions was 20th September 1991. A small number of persons have indicated their desire to make written submissions but requesting an extension of time. This extension has been granted in all cases.

By the 20th September a total of 5 written submissions have been received. These are included in Appendix B.

A list of submissions received is given below:

Mrs. Y. Dawson, Principal Port Curtis State School, with regard to Port Curtis area.

Mr. L. G. Duthie, Duthie Holdings Pty. Ltd., with regard to floodplain encroachment.

Mr. H. S. Spence, with regard to flood mitigation dams.

North Rockhampton Bowls Club, regarding protection of bowls club.

Mr. C. Newman, Fairybower Road, Gracemere regarding the Scrubby Creek diversion.

6.4 SUMMARY OF ISSUES RAISED

The following is a summary of the issues raised in the public meetings and the written submissions. Many of the same issues were raised at more than one meeting, so all issues have been condensed into a single list. Notes taken at the individual meetings are given in Appendix B.

The relevant authorities represented on the Steering Committee are requested to consider the above comments and to provide the Consultant with any further data relevant to enable us to comment on these issues.

Yeppen Floodplain Crossing

The Bruce Highway and North Coast Railway crossing of the Yeppen Floodway and the associated Capricorn Highway reconstruction was the issue raised most at the meetings, being raised at each meeting and usually several times.

Persons living upstream from the Yeppen floodway, particularly in the Fairybower, Nine Mile Road and Pink Lily areas and even those in the Belmont/Yaamba areas believe that the reconstructed highway/railway crossings have worsened flood levels in the area and perceive that waterway

areas provided in these crossings are inadequate.

In particular, the following points were made:

- reports on physical model studies recommended total waterway width of 1260 m but actual width provided about 500 m causing greater afflux - evidenced by considerable erosion under bridges in 1991 flood;
- the location of the Yeppen no 1 bridge was originally recommended to be built across the widest part of the Yeppen lagoon but was subsequently moved to the downstream end of the lagoon to reduce bridge length;
- the old railway embankment was to have been removed but little of this was done - further embankment removal since the 1991 flood;
- flow characteristics across Yeppen floodplain are now different compared to earlier floods;
- Capricorn Highway from Yeppen roundabout to Gracemere raised flood levels as there is very little provision for floodwaters to pass under it (i.e. culverts are for local drainage only);
- A Pink Lily resident perceived higher flood water in floodplain at lower total flows since the road/rail reconstruction;
- the Yeppen floodway is the most constricted part of the floodplain (3–4 km width) and this has been further constricted by the road/rail reconstruction;
- the recent flood scoured holes about 6 m deep under the Yeppen bridges which have since been refilled - the scour under the railway crossing has been filled with rock - this is seen to increase scour resistance in future floods leading to increased afflux;
- suggestion to move Yeppen crossing nearer to old highway route;
- criticism of period required for safety checking prior to highway being reopened when flood waters subsided;
- residents in Fairybower area took precautions by raising farm equipment to above 1954 level but 1991 flood about 0.5 m higher here, so still suffered damage;
- flood levels in the Airport area were perceived to be up to 1 metre higher than 1954 (subsequent information from 2 persons who were living in the same location in 1954 discount this).

Scrubby Creek Diversion

- Landowners adjacent to Scrubby Creek are concerned that the failure of the diversion structure originally constructed in the 1950's to divert excess water during floods has resulted in all water in Scrubby Creek now passing down the diversion channel. Riparian landowners downstream of the diversion are disadvantaged and their ground water recharge is adversely affected;

- Also severe erosion has taken place along the diversion channel. One of the adjacent landowners suggested during a later site inspection this was exacerbated by stock access to the channel and suggested that channel be fenced and banks re-vegetated;

- Flow and erosion this year so severe, 100 year old trees have been washed out;

- Local runoff in Scrubby Creek was substantial resulting in failure of the diversion structure by erosion and undermining/uplift failure. The Scrubby Creek flow is understood to have receded by the time the river flooding of the Yeppen floodplain occurred;

- Flow in the creek will become permanent with release of blow down water from Stanwell power station, so re-establishment of low flow path needs to be sorted out;

- Problems have been taken up with the State Ombudsman.

Bruce Highway at Yaamba

Yaamba residents appeared generally to be against the proposed realignment fearing that this would dam back floodwaters more than at present leading to increased depth of flooding and duration of highway closure.

CSF were asked to pass on the residents concerns to DOT and request that residents be consulted before plans are finalised for this realignment.

Other concerns and suggestions in regard to road/rail closures in the Yaamba/Alligator Creek section were:

- criticism of the time taken to re-open the highway after flow receded;

- request for the railway bridge to be open to road vehicles when road bridge closed;

- road flood depth markers need to be extended in some areas due to depth which can occur, and are not present between Alligator Creek and Yaamba;

- flood level predictions given on the radio related to Rockhampton only not to Yaamba;

- radio reports misleading e.g. RACQ quoted road as being open when the road was closed and over 200 cars were isolated. Bundaberg RACQ were praised for telephoning service station to obtain up to date information regarding the ongoing situation.

Fitzroy River Barrage

A number of residents perceive that the barrage has increased flood levels upstream. In particular the following observations were made:

- RCC too slow in opening barrage gates during 1991 flood and closed gates too soon afterwards worsening flood levels in Yaamba/Belmont area (the barrage log books were obtained after this issue was first raised and a subsequent meeting told that operation records did not support this);

- some gates were said to have remained closed during the recent flood;

- a householder on the northern bank of Fitzroy River downstream of the barrage (Gough St) believes that the barrage has resulted in redistribution of flow such that fast flowing water now strikes the bank causing erosion. RCC has placed some rock benching to king tide level but erosion is occurring at higher level during flood.

Pink Lily Meander

The following points were made in regard to conditions at the major breakout location at the Pink Lily Meander:

- erosion of about 2 m per annum occurring;

- overflow through Birkbeck's property - in 1991 flow faster than previous floods;

- flood level at Pink Lily (at steep bank) continued to rise although town gauge was steady;

- a flood gauge should be set up near the breakout;

- access road to Pink Lily Sands has been built up restricting filling of Pink Lily Lagoon. Road acts as levee bank having no drainage provision;

- breakout threshold level reducing with each flood.

RCC Dump

The RCC dump is situated in the floodplain of the Fitzroy River adjacent to Lakes Creek Road. The following comments were made in this regard:

- dump may impact on some residents due to increase in water levels and pollution;
- could affect flood levels for East St. residents;
- 64 drums of sodium zanthanate carried away by floodwaters and only 16 recovered. Recommendations needed on the storage of hazardous chemicals in areas affected by flooding.

House Raising

Ald. Col Brown suggested that ways of financing raising of houses above flood level be investigated, quoting damage cost of $6000 in 1991 flood compared to house raising cost of $15,000.

Policing

Sight-seers and potential looters were raised as a problem in the Yaamba, Depot Hill and Port Curtis areas. Issues raised were:

- sight-seers including water skiers caused bow-waves adding to problems of residents with water levels close to floor board level/electricity board level - a resident from Depot Hill mentioned 300 boats per day with bow waves of up to 3 ft;
- sight-seers in Port Curtis and Yeppen floodplain areas were unaware of fences just under water, hence were a potential damage to themselves;
- Police reported as saying they were unable to act;
- sight-seers in cars in rural areas causing problems where cattle had been herded on roads and causing structural damage to wet roads;
- disaster co-ordinator/Police should have power to ban boats in flooded areas except as required for access and there should be increased Police presence to deter looters;
- wave damage to banks, fences.

Flood Warning System

The following comments were made in regard to the existing flood warning system. The next paragraph deals with dissemination of flood warning information:

- a flood gauge should be set up near the Pink Lily breakout as Rockhampton town gauge readings are not relevant to those upstream of the barrage and upstream readings don't give current situation;

- recording stations are needed on Alligator Creek (including the army area);

- flood warnings required for other local tributaries such as Scrubby Creek as this has a large catchment area of its own.

Dissemination of Flood Warnings

The following comments were made in regard to the dissemination of flood warning to the public:

- information given related to Rockhampton town gauge only, information on Riverslea and Yaamba not available, and Rockhampton data not relevant to those upstream;

- there should be only one authority giving the flood warnings and radio and television stations should repeat only information from this source;

- radio reports often out of date;

- RACQ road reports often misleading and sometimes incorrect;

- radio reports should be given at stated times not at random times;

- some residents confirmed their inability to relate quoted flood levels to levels at their property. Tapes put up by RCC to show 1954 flood levels helped. General agreement that permanent markers of this type would be useful;

- Port Curtis residents were reliant on prior local flood experience. Formal warnings related to Rockhampton gauge being of little relevance;

- one resident suggested that instructions regarding obtaining flood warning information be given in the telephone book in the same way as for cyclone warnings.

Response of Counter Disaster Organisation/Emergency Services

The following comments were made in regard to the Local Counter Disaster Organisation and/or State Emergency Services:

- clean up crews too early;

- Fitzroy Shire and 'greenies' praised;

- for residents requiring food drops, reference points needed to locate houses, properties etc. It was pointed out that a recommendation regarding plaques with latitude-longitude to be placed near telephones was believed to have been taken up by one of the Service groups;

- when food drops of basic items only (less than $80) were requested at Port Curtis, the first thing asked was who was going to pay for the goods;

- residents in Belmont did not see SES personnel until 4 days after flood started to recede. Perceive that SES activity has little relevance to them;

- evacuation from Port Curtis area difficult due to remoteness and age of many residents and fear of looting if evacuated - suggestion that rail cars be used (railway partly above flood level) for the storage of belongings and the evacuation of residents.

Provision of Community Based SES Services

- Mrs. Dawson in her written submission suggests that a local Port Curtis SES be established as they received little SES help during flood. The Port Curtis residents see themselves a separate community with good local knowledge and the ability to manage the local situation provided basic equipment is provided (boats, food needs, communication equipment);

- when this was raised at the relevant public meeting the Depot Hill residents agreed they would like to see something along these lines;

- Belmont residents said current SES activity has little relevance to them as didn't see anyone until flood was receding;

- SES group being formed at Yaamba after 1991 flood - this provides local facilities and worker's compensation cover;

- A local SES group has been suggested for Gracemere. Good local community spirit.

Perception of Flood Levels

- Householder in Belmont reported that he had constructed his house 1.9 m above 1983 flood level which he believed would put it above 1918 flood level. However, the house was flooded by 600 mm in 1991 with high damages. As a result he can no longer obtain flood insurance;

- At Depot Hill 1991 flood levels lower than 1954 but faster flowing (about 200 mm lower);

- At Fairybower/Nine Mile Road flood levels perceived as being up to 1 m above 1954 level;
- Yaamba completely isolated;
- River level at Belmont similar rises to Rockhampton flood gauge for levels of up to 8.5 m but above that rose 300 mm to each 100 mm rise at Rockhampton gauge;
- 150 yards above Fitzroy River/Alligator Creek confluence, level in creek was 9" higher than in river;
- Hedlow Creek landowners say wide floodplain floods every year and is affected by operation of Fitzroy River barrage – would any proposed works worsen their situation?

Local Drainage

Although not part of the Study, local drainage at a number of points has been raised. These include:

- various points in Livingstone Shire (e.g. Dawson Rd);
- Port Curtis.

Other Points

A number of other points were raised by one or more residents. These included the following:

- The Gap dam;
- Pirate Point truncation;
- Levee bank around Rockhampton airport is a problem;
- Levels at Midgee lower than in 1954 and significant scour has taken place;
- Worst scenario is an extreme flood over the whole catchment which would cut a new river course bypassing the town reach;
- If the Study shows Yeppen floodplain to have increased flood levels, who do residents look to for compensation?
- Basic mapping and sign posting inadequate in Port Curtis.

6.5 DISCUSSIONS WITH RESIDENTS

Resulting from the public meetings, a number of residents offered to assist the Consultant by pointing out flood levels reached, discussing problems, etc. A number of such follow up contacts have been made and this is ongoing. This will provide some additional factual material but mostly additional insight into public perception of the flooding issues.

6.6 ISSUES ARISING FROM COMMUNITY CONSULTATION

The major issues arising from the community consultation program which need to be considered by the Study are summarised below:

A) Structural

- The extent to which the Yeppen floodplain crossing increases flood levels in the floodplain upstream and whether the waterway area should be increased to both mitigate the above effect and also to reduce indirect flood damage by reducing the incidence of the road/rail links being closed by floodwaters;
- the adequacy of the proposals for re-alignment of the Alligator Creek highway crossing;
- Scrubby Creek diversion - It is proposed to limit this to engineering considerations only;
- the effects of the Fitzroy River barrage and its operation;
- the effects of the RCC dump on flood levels and on pollution;
- conditions at Pink Lily;
- house raising in frequently flooded areas.

B) Non-Structural

- Flood warnings - augmentations to system to provide flood warning information in regard to local creek flooding and on Fitzroy River at points intermediate between Yaamba and Rockhampton;
- Dissemination of flood warnings - the possibility of a single point of contact in regard to flood warnings, their timely and accurate dissemination to the public, including minimising mis-information from the media;

- The issue of relating broadcast warnings to flood levels at individual properties/residences (permanent markers probably well accepted);

- Counter-disaster organisation. SES too centralised in Rockhampton - Persons in outlying areas including Depot Hill, Port Curtis, Pink Lily, Gracemere/Fairybower and Yaamba felt they were not adequately provided for. There was a general feeling that community based local SES groups would be an advantage;

- Who bears the cost of emergency relief e.g. food drops?

6.7 FUTURE CONSULTATION

In response to questions during the public meetings, it was agreed that displays of draft study proposals and recommendations, as contained within the Phase 1 report, would be put on public display early during Phase 2 (probably January 1992) at the same venue used for the public meetings, and that copies of the draft reports would be made available at the Public Libraries of the City Council and Shire Councils. The Steering Committee's agreement to this action is sought.

It is assumed that similar displays would be mounted at the end of Phase 2.

B2 Advertisement re Public Meeting and Submissions

Your Invitation to Comment on

FLOODING

in Rockhampton, Fitzroy and Livingstone Shires

ROCKHAMPTON FLOOD MANAGEMENT STUDY

The Water Resources Commission is co-ordinating the Rockhampton Flood Management on behalf of local Councils, State and Federal Government.

Consultant **Camp Scott Furphy Pty. Ltd.** has been appointed to undertake the Study and to prepare a detailed report on options for flood mitigation and management, in order that the impact of future flooding may be reduced.

Aspects to be examined include:

- the public perception of flood problems principally resulting from flooding of the Fitzroy River, together with perceived solutions;
- the estimation of flood damages and indirect losses resulting from the January 1991 flood;
- consideration of a wide range of structural and non-structural flood mitigation options together with their associated environmental, economic and social impact;
- formulation of a flood management plan including a programme of work.

Community involvement in the Study, which has just commenced, is encouraged. To this end the following are proposed:

- an initial call for submissions from the general public, community and business groups;
- direct contact with a sample of flood affected householders and business operators, and with community and business groups;
- later in the Study public displays of options considered and recommendations made will be prepared together with public meetings if desired.

To initiate this process, the public and interested groups are invited to make submissions, preferably in writing, to the Consultants, or the Commission at the addresses given below. Submissions are invited on the following:

- perception of problems caused by flooding in the Fitzroy River and its tributaries and proposed solutions;
- flood damages and indirect flood losses sustained during the January 1991 flood.

All written submissions will be treated in the strictest confidence.

In addition, a series of public meetings will be held to provide a further opportunity for members and the public to put forward their views and comments.

These meetings have been arranged as follows:

For residents of the Park Avenue, North Rockhampton, Lakes Creek and Nerimbera areas, at 7pm on Thursday 5th September, 1991 at the Rockhampton City Hall.

For residents of Southside areas of Rockhampton including the Depot Hill, Port Curtis and Pink Lily areas at 7pm on Friday 6th September, 1991 at the Rockhampton City Hall.

For residents of the Fitzroy Shire including Gracemere and Alton Downs areas at 7pm Tuesday September 10, 1991 at Gracemere Community Hall.

For residents of the Livingstone Shire including Yaamba, The Caves and Belmont areas at 7.30pm on Monday September 9, 1991 at the Caves Hall.

Any resident unable to attend their closest meeting are welcome to attend any other meeting.

All views put forward at the public meeting, together with the written submissions, will be taken into account by the Consultants in their development of possible mitigation options.

Written submissions and offers to provide information regarding flood losses should be addressed by 20th September 1991, to

Camp Scott Furphy Pty. Ltd. P.O. Box 1391, Rockhampton. Qld. 4700. Attention: Mr. D.M. Sargent Project Manager. Tel 275199 or (07) 3682522.

or

The Water Resources Commission, P.O. Box 736. Rockhampton. Qld. 4700. Attention: Mr. M. McKenna Regional Engineer. Tel 319600.

8STB0800

B3 List of Written Submissions

LIST OF WRITTEN SUBMISSIONS

Written submissions by the following are acknowledged:

1. Y. M. Dawson (2/9/91)
   Port Curtis Road State School
   Rockhampton

2. L. G. Duthie (10/9/91)
   Duthie Holdings Pty Ltd
   Denham Street
   Rockhampton

3. H. S. Spence (6/9/91)
   Ross Street
   Rockhampton

4. W. Quealy (11/9/91)
   North Rockhampton Bowls Club
   Glenmore Road
   North Rockhampton

5. C. E. Newman
   Fairy Bower Road
   Gracemere

6. J. McCabe (September 1991)
   Capricorn Conservation Council Inc.

7. C. Broughton (27/2/91)
   Gillinder Street
   Rockhampton

8. C. Head (September 1991)
   Rockhampton

9. S. Parle (7/10/91)
   Brothers League Club
   Rockhampton

10. W. R. Johnson (18/9/91)
    Fairy Bower Road
    Gracemere

11. B. George (24/11/92)
    St Kilda
    Victoria 3182

B4 Notes from Public Meetings

ROCKHAMPTON FLOOD MANAGEMENT STUDY

INITIAL SERIES OF MEETINGS FOR PUBLIC VIEWS AND COMMENTS

SUMMARY OF ISSUES RAISED

1. ROCKHAMPTON CITY HALL

Thursday 5th September 1991 at 7.00 pm
for residents of North Rockhampton
(include the Park Avenue, Lakes Creek and Nerimbera areas)

Public attendance: 3

Consultant and Authority employee attendance: 6

- A householder from Belmont area
  - had house flooded in 1991 flood, $50,000 damages,
  - had 600mm of flood water over floor,
  - slab on ground house built on mound.
  - House built 1986, knew level of 1983 flood there and allowed for 1.9 m above this level for 1918 flood level. (Height difference in Rockhampton of 1918 flood over 1983 flood).

  The 1988 flood level was similar level to 1983 flood level but 1991 flood level was much higher than anticipated there. What happens at Belmont if have another 1918 flood?

  Had flood insurance and was paid out on 1991 flood damages but flood insurance clause now cancelled.

  If had known the behaviour of floods larger than 1983 and 1988 floods, could have built on higher mound. Have 5000 m^3 of fill in existing mound.

  Have a number of neighbours whose houses suffered a similar fate in 1991 floods. Some of these also had insurance against flooding.

  Householder blames flooding of his house on the Rail/Road Crossings at Yeppen floodway, which consist mostly of an embankment and have only 300 m of bridges. It was also rumoured that the Fitzroy Barrage gates were shut for too long.

- A householder on northern bank of Fitzroy River, below the barrage in Gough Street, North Rockhampton. Told that floodwaters were 2 steps up the house in 1918 flood, and house was since raised.

  1954 flood – caused no problems

  1991 flood – had waves over 1 foot high breaking over yard and causing bank erosion and slumping.

  Says barrage has resulted in fast flowing currents on northern side of River. The main fast river current was previously only on southern side of Fitzroy River here (before Barrage constructed).

  RCC has placed rocks along Fitzroy River banks here up to the king tide levels, but the flood levels are higher and need rocks up to flood levels to stop bank erosion.

  RCC placed piling and retaining wall on opposite (southern) bank near Pilbeam Theatre downstream which restricted flows there.

2. **ROCKHAMPTON CITY HALL**

   Friday 6th September 1991 at 7.00 pm
   for residents of South Rockhampton
   (includes the Depot Hill, Port Curtis and Pink Lily areas)

Public attendance: 26

Consultants and Authority employee attendance: 5

- A Mr. Bleney – is affected by Scrubby Creek diversion. This was originally constructed by RCC. The diversion has a long history of major erosion and instability. Mr. Bleney has taken up this matter with the Ombudsman.

- A Fairy Bower Road resident, said that in 1974 flood (1954?) had 5 acres flooded, while in 1991 flood, had 10 acres flooded. Resident blames the Rail/Road Crossings over Yeppen floodway for increase in flooding on property.

- – in 1988 Yeppen floodplain was dry before flooding (no local rain), while in 1991 Yeppen was full (heavy local rain before flood).

  – in 1991 had 3 flood peaks on Yeppen floodplain
  – 1st from local runoff,
  – then two flood peaks from overflow of Fitzroy River through floodway.

- A Mr. Edwards has property on Nine Mile Road

  - two aspects to flooding in his area
  1. local flooding (from local catchment), and
  2. bank overflow from Fitzroy River.

  He believes the Yeppen Rail/Road Crossing should be fully bridged.

- in Depot Hill and Port Curtis areas
  - residents should be allowed to manage themselves during flood if proper resources were provided,
  - SES didn't help.

- Ald. Col Brown (RCC Alderman forWard covering Depot Hill/Port Curtis areas) –
  - floodwaters through Port Curtis/Depot Hill areas were faster flowing in 1991 compared with 1954 floods.

- At Pink Lily area, have marked difference in flooding since the Yeppen Crossings were raised.

- At Depot Hill, the 1991 flood levels were less than in 1954 flood. But at Fairy Bower, flood levels in 1991 up to 1 m higher than 1954. Fairy Bower residents consider this was due to Yeppen Rail/Road Crossings.

  The EIS report recommended 1260 m of bridges but only 500 m was installed.

  The EIS also recommended that abandoned railway embankments across floodway should be removed, but some of these embankments have only been removed since the 1991 flood.

  Washouts and scours at bridges on Yeppen Rail/Road crossing due to 1991 floods have since been filled in.

- At Depot Hill and Port Curtis, 1991 flood levels were lower than in 1954 flood.

  About 8 inches lower under houses at Depot Hill.

- John McCabe (a local Conservationalist)

  Yeppen Crossing is at narrowest section of Fitzroy River floodplain.

  Fill in RCC dump along Lakes Creek Road may also impact on some residents.

- Where Fitzroy River breaks banks at Pink Lily, takes 6 feet off the bank a year.

  - river overflow cuts through Birkbeck's property, in 1991 flood ran faster through here.

  - a flood gauge should be set up at Pink Lily breakout, as Riverslea flood

gauge readings are often 12 or 24 hours old and the Rockhampton town gauge readings are not relevant to those above Barrage.

- up-to-date flood level information on Riverslea/Yaamba is not available.

- Ald. Col Brown - the RCC dump along Lakes Creek Road should be looked at. It could affect flood levels for East Street (Rockhampton) residents.

- Pink Lily Sands (a sand and gravel extraction company) have built up their access road, such that Fitzroy River flood overflow now cannot fill up the Pink Lily Lagoon as did previously. Overflow from Pink Lily Lagoon then used to run through Edwards property and into Lion Creek.

  Pink Lily Sands access road has no pipe culverts under it and so acts as a levee bank.

  D. Sargent raised idea of local community based SES and there appeared to be agreement to this.

Response of Emergency Services

- The clean-up crews came too early. Residents still had water under houses when the clean-up crews came through.

  - first had prisoners, then army, doing these clean-ups.

  - the pick up of flood damage furnishings etc, came too soon, as still hadn't decided on what to throw out.

  - the "Greenies" (conservationists) did best clean-up job.

  - Fitzroy Shire Council - would give a hand with clean-up.

- Ald. Col Brown - a way is needed to finance the raising of houses above flood level.

  - a house in East Street had $6,000 damages but would cost $15,000 to raise the house level above flood levels.

- the 1991 flood and 1954 flood were mostly from Isaac River catchment,

  - if rainfall was more general over the total Fitzroy River catchment, would have a much bigger flood.

  - after 1974 Brisbane Floods, the PMF (Probable Maximum Floods) was looked at. Will Consultant look at PMF for Rockhampton.

  David Sargent: PMF is not in Study Brief, and would need to derive from probable maximum rainfall - this would take time.

- Fairy Bower resident – had 2 1/2 feet of water over paddock in 1991 flood,

  – this was 2 feet above 1954 levels, based on MRD survey levels.

- Sightseers were a problem at Depot Hill, as had up to 300 boats going up the streets there a day, causing 3 feet bow waves. These included jet skis and ski boats.

  – Police said that there was nothing they could do about sightseers.

  – Boats were going through fences across Yeppen floodplain.

- During 1991 floods, had incident with hazardous chemicals.

  – 64 drums of Sodium Zanthanate were carried away by flood waters and only 16 drums recovered. Recommendations needed on the storage of such hazardous chemicals in areas affected by flooding.

3. THE CAVES HALL

Monday 9th September 1991 at 7.30 pm
for residents of Livingstone Shire
(including Yaamba, The Caves and Belmont areas)

Public attendance: **33**

Consultant and Authority employee attendance: **7**

Comments on Physical Flooding Issues

- RCC should open their Barrage gates before floodwaters get to Rockhampton.

- Recording stations are needed on Alligator Creek catchment, including Army area, as a lot of floodwater came down Alligator Creek this time.

- Need only <u>one</u> authority giving the flood warnings and radio stations only repeat information only from this source.

- In 1991 floods had more backup water along Fitzroy River than 1954 floods. The water can't get away as readily now.

- The RACQ road reports are often misleading and occasionally wrong.

  – i.e. at Alligator Creek, when there was 1.2m of water over the Bruce Highway there. The ABC radio said the Highway was open and 200 plus cars drove down from Mackay to Yaamba trying to get through to

Rockhampton.

- The river heights given in flood warnings pertain only to Rockhampton.

  - Yaamba flood heights are more relevant to residents in Livingstone Shire areas along the Fitzroy River.

- For residents requiring food drops, reference points are needed to locate houses, properties, etc. It is difficult to give directions when much of area, including roads, is under flood waters.

- With the flood warning heights given for Riverslea, The Gap and Yaamba gauges, at one stage said The Gap recording was falling while it was actually rising.

  Also referred to flood levels at Yaamba Weir (no weir exists at Yaamba).

- Fitzroy Barrage gates were said to be closed while the Fitzroy River was flooding upstream, and after second flood peak the gates were going down.

  - gates were raised too late and put down too soon.

- When Barrage first filled, the barrage storage rose at 18 inches/hour.

- Yaamba was completely isolated in 1991 flood. The Fitzroy River and Alligator Creek joined north of Yaamba and, south of Yaamba, also cut the Bruce Highway cut by backwater at Alligator Creek.

  - Railway line has been built up and water behind it couldn't get away.

  - Fitzroy River flowing over Highway north of Yaamba.

  - Resident has a photograph taken 2 days after flood peak showing the Railway line holding back water.

- Flood levels at Alligator Creek have been recorded on a Coolabah Tree just north of road bridge - levels taken by LSC and MRD.

- A lot of floodwater comes down Alligator Creek from its catchment and any new road profile here will require a major waterway opening to take this flow.

- Residents in The Caves/Yaamba area believe both the Barrage and Yeppen Rail/Road Crossings have increased the flood levels up the river.

  Three hydraulic models were carried out to establish the effects of these works:

  Physical model for Barrage by U of Q
  Physical model for Yeppen Crossing by CAIE (now UCQ)
  Mathematical model for Yeppen Crossing by CAIE (now UCQ)

- Belmont residents believe Yeppen Crossing is a dam.

  - After 1991 flood, holes scoured by flood near railway line across Yeppen were up to 6 m deep. Railways has since filled these holes and is going to rock them (to prevent future scour).

  - MRD has reinforced road with concrete where eroded in 1991 flood.

- Yeppen Crossing was to consist of 1.3km of bridge, but installed only 300 m of bridge.

  25,000 m^3 of embankment fill at Yeppen
  11,000 m^3 of fill under bridges.

- Fitzroy River at Belmont has similar order of rises to Rockhampton Flood Gauge up to 8.5 m at Rockhampton gauge, but above that point river levels rose 300 mm at Belmont to each 100 mm rise at Rockhampton gauge.

- In 1991 flood, water was raging (out of Alligator Creek?)

  - going up Alligator Creek there were 3 definite steps in water profile, each 6 to 8 inches high.

  Water level in Alligator Creek some 150 yards above junction with Fitzroy River was 9 inches higher than water level in Fitzroy River.

- Road to Rossmoya, over Hedlow Creek floodplain, gets flooded every year, when floodwaters spread over this 3 mile wide floodplain. Landholders at Rossmoya worried if any mitigation works affected this flooding:

  should make provision for not increasing flooding problem across Hedlow Creek floodplain. Access across flooded Hedlow Creek to Rossmoya is already a problem, particularly with transport of milk from the dairy farmers there and taking children to and from school each day. They presently have to arrange for transport over this flooded area for up to 6 weeks at a time.

  Landholders say that flooding of Hedlow Creek floodplain is already affected by the operation of Fitzroy Barrage gates now.

- For many residents along river, the main problem with Fitzroy River flooding is lack of access (due to flooded roads), not inundation of houses. This backwater is not fast flowing. The SES provides little assistance for these areas, who Belmont residents only saw 4 days after the flood started going down. Much of the SES's activity is wasted and serves no purpose.

  David Sargent asked whether a local emergency service group required in this area.

Comments

- A SES group now formed at Yaamba since 1991 floods
- many people have their own boat, as had up to 5 weeks of no access by road
- not allowed to use bridges immediately flood waters go down, have to wait until bridge is cleared by MRD
- Police stop people from crossing bridges when floodwater go down. Residents are then anxious to travel after having been isolated for long periods
- MRD should test roads quicker once floods recede
- road reports are often incorrect, this happens each flood
- better communication required on actual road flooding situation
- Cap Elec brought fully equipped vehicle to Yaamba before flood.

- The Gap dam and Pirate Point truncation were discussed.
- Local access is a problem, dips get cut quickly, Belmont Road bridge over Belmont Creek was cut on Thursday after Christmas (1990), started raining on Tuesday.
  - LSC should build up road level at creeks
  - Dawson Road should be upgraded as this would allow 30 houses access to the Bruce Highway in floodtime.
- Residents upstream have no control on what happens downstream.
- Some residents don't want Bruce Highway built up at Yaamba unless it has major bridge openings. An embankment here would cause water to backup behind any raised road.
- Would have a much bigger flood in Fitzroy River if all the rivers, including the Dawson and Mackenzie Rivers, flooded together.
- The effect of Rockhampton City's dump on Lakes Creek Road should be considered.

Comments of Pat Murphy (Livingstone Shire Engineer) and Mike Paine (LSC Engineer) following discussion on residents use of Shire equipment when area is isolated by floodwaters: The Shire has concerns over residents using Shire equipment during a flood. Have major difficulty with workers compensation and

liability issues if an accident occurs. This liability problem extends to Shire's road signing, which, says, warns of road flooding ahead.

- Have thousands of sightseers in floodtimes.
  - have cows on roads
  - have problems with too many cars
  - should restrict access to residents only as too much traffic wrecks wet roads.
- Liaison required between flood co-ordinator and Harbours and Marine Department on banning boats in flooded area. Waves from boats damage unstable banks, fences, etc.

4. GRACEMERE COMMUNITY HALL

Tuesday 10th September 1991 at 7.00 pm
for residents of Fitzroy Shire
(including Gracemere and Alton Downs)

Public attendance: 30

Consultant and Authority employee attendance: 4

- Bill Johnson - most people at this meeting are Fairy Bower area residents.
- 1991 flooding was higher than before, said to be (by some) considerably higher than 1954 flood.
  - 1 foot of difference in waterlevels over (Capricorn) Highway
- At Fogarty Road, water level was 1.2 m below floor in 1987 (1998?) flood, water level was 1.5 m higher in 1991 flood, so had 0.3 m over floor.
  - so can't go on Rockhampton town flood gauge readings for increase in flood levels elsewhere.
  - floodwaters flowing much faster in Yeppen floodplain in 1991 flood than 1988 flood.
- Residents blame the Rail/Road Crossings over Yeppen floodplain, and barrage, for increasing flood heights upstream in Fairy Bower area.
  - rumoured that water level dropped 2 m over Railway crossing.

- A landholder has (Scrubby Creek) Drainage Reserve through property, diversion wall collapsed during this flood.

  - can get large flows in Scrubby Creek.

  - with initial rain (after Christmas) the creek upstream (Neerkol?) was said to rise 10 m in 1 hour at Stanwell Power Station.

  - water came up 8 feet overnight, on Wednesday night after Christmas, at Fairy Bower.

- Scrubby Creek has a large catchment. This enters River system this (Gracemere) side of Highway. It is physically impossible for the volume of water to fit into creek here.

  - the peak overflow of Fitzroy River results in much greater flows in Yeppen floodplain. Water flowed back up (Scrubby) Creek from Fitzroy River overflow.

- One resident tried to get high tide mark (flood marks?). Proved difficult to obtain.

  - difficult to educate residents now

  - need readily available maps to educate people, particularly newcomers.

- Was there a Study done by CAIE (UCQ) on flooding.

  D. Sargent - yes - U of Q for Barrage in 1960's - physical model
  CAIE for Yeppen Crossing in 1970's - physical model
  + CAIE for Yeppen Crossing in 1980's - mathematical model.

- One resident - has read report on (Yeppen) physical model.

  - says 12% less water was used than should have been in this modelling.

- Campbell Bennett - why didn't these other studies solve the problems?

- When were barrage gates opened?

- Appears that with the previous studies carried out before the recommendations have been ignored.

  - will the recommendations (from this Rockhampton Flood Management Study) also be ignored?

- How long for this Study - timing?

  David Sargent: by Christmas - Phase 1 finished.

- Has this Study been given priorities.

  - this appears to have been done in past studies.

  - extra bridges were recommended but recommendations ignored and flooding of residents properties has occurred by construction of an embankment over floodplain.

Flood Warnings

- Flood warnings don't help people in Yeppen floodplain.

  - nature doesn't give warning of heavy rainfall overnight (for local catchment runoff)

  - get plenty of warning from Fitzroy River system, but can't relate these flood heights since construction of Yeppen Rail/Road Crossings

  - all of these crossings should be dozed away.

- Big hollows in Yeppen floodplain were filled in with Yeppen/Rail Road Crossings embankment earthworks.

  - crossings should be bridged at Rockhampton end and then embankments run parallel with current

  - major loss of revenue to landholders and business in town from flooding of Highway, compared with cost of maintenance of road

  - flooding of Highway also risks lives in flood time, with many boat crossings of floodplain.

- Earnie Johnson - old resident - says in areas of Fairy Bower - there was more water in 1991 than 1918 flood.

- In aftermath of flood, when road out of water, the roads were closed by order of bureaucrats, until repaired.

  - old (Capricorn) Highway had only one pot hole while new (Capricorn) Highway had major damage.

Emergency Services

- Only one ambulance in Gracemere.

- An SES group has been suggested for Gracemere. People helped each other in this area and they didn't have deep water like Depot Hill.

- Washouts around Yeppen Rail and Road Crossings – have been filled in since 1991 flooding.

- Fitzroy River bank of Six Mile – always looses ground and each time this happens the bank is at a lower level, so overflow occurs at lower level of flooding.

  - will loose Ridgelands Road soon

  - water takes longer to get away now

- Scrubby Creek has silted up, the creek is shallow.

  - RCC closed natural diversion channel and created new diversion

  - the natural diversion channel used to be deep in 1954

  - flow in this creek system will become permanent with release of blowdown water from Stanwell Power Station

  - the Scrubby Creek diversion has been fixed two times since 1954

  - diversion was 8 feet wide by 5 feet deep – now much larger

  - Scrubby Creek diversion is a "big can of worms"

  - could do "white water rafting" down diversion in high flows

  - diversion has washed out 100 year old trees

  - diversion on curve in creek

  - when dry, couldn't imagine the force of water that comes down Scrubby Creek in flood times.

- Two problems in Fairy Bower area.

  1. Scrubby Creek diversion channel – needs fixing, and

  2. General flooding of area.

     - 1954 type flood, can expect every 30/40 years

     - can take action to prevent worst affects at this flooding, by building on highest area of farm, on mound or high set house

Now have problem of built-up of Rail/Road Crossings over Yeppen floodplain.

- Told that flood levels in Rockhampton were to be similar to 1954.
  - but water levels came up another 0.5 m than should have in Gracemere/Fairy Bower area
  - ruined a great deal of equipment
  - residents have taken all the possible actions they could to mitigate the effects of flooding
  - residents want to find out how much extra water they had in 1991 flooding
  - aerial photographs by Piccolo Aviation show water breaking over Rail and Road Crossing over Yeppen floodplain.
- Residents at Midgee say water levels in 1991 flood were lower (than for 1954 flood).
- Depot Hill/Port Curtis area gets flooded regularly but Fairy Bower area only has occasional flooding.
- This Study must look at effects of flooding in the next 30/50 years, not just the short term effects.
  - must look at effects of erosion at Pink Lily bend of Fitzroy River.
- Worst scenario of Pink Lily bend erosion.
  - scour of Gavial Creek lowers flood water level at Midgee
  - Fitzroy River scours new course through Lagoons and into Gavial Creek
  - diversion empties Barrage.
- If this Study shows increased flooding problems caused by Rail/Road Crossings at Yeppen floodplain.
  - who do residents look to for compensation?
  - if this proven, what options for fixing problem?
- Increasing the height of Rail/Road Crossings of Yeppen floodplain has benefits for the majority but has cost the minority who now suffer increased flooding - compensation required.

- the EIS for Yeppen Crossings say the Crossings will increase water levels upstream of the Rail/Road Crossing

- there are already restrictions (under Town Plan) on land use in Yeppen floodplain i.e. restrictions on buildings, subdivision, etc.

- Water flows observed through gravels in road course of Capricorn Highway some 300 m from roundabout.

APPENDIX C

APPENDIX C

ACKNOWLEDGMENTS AND STUDY TEAM

C1 Acknowledgments

C2 Study Team

C1 Acknowledgments

ACKNOWLEDGMENTS

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Water Resources Commission	Mr M. McKenna, Rockhampton Mr M. Keane, Rockhampton Mr M. Clewley, Rockhampton Mr P. Cannell, Rockhampton Mr N. Kelly, Rockhampton Mr G. Hausler, Brisbane
Rockhampton City Council	Mr K. Carpenter Mr P. Hielscher Mr C. Guy Mr H. Johnston Mr T. McLaughlin Mr M. Wilkinson Mr K. Barry Mr R. Wiley Mr G. Merry Mr D. Press Mr A. Poole Mr G. Donaldson Ms J. Cook
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Livingstone Shire Council	Mr P. Murphy Mr M. Payne
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Dept of Transport Railways	Mr B. Greening, Townsville Mr P. Augustine, Rockhampton
Bureau of Meterology	Mr P. Baddiley, Brisbane
State Emergency Services	Mr W. Barchard, Brisbane Mr P. Trump, Rockhampton

Queensland Police Service	Superintendent G. Hohenhaus Snr Sergeant L. Steadman Inspector R. Beer
Queensland Confederation of Industry	Mr G. Bloxham, Rockhampton Ms C. Garbo, Brisbane
Queensland Electricity Commission	Mr S. Durrington, Brisbane Mr R. Hartigan, Brisbane
Department of Lands	Mr O. Lane, Brisbane
Department of Administrative Services Australian Centre for Remote Sensing	Mrs M. Clark, Canberra
Queensland National Parks and Wildlife Service	Mr G. Byron Mr P. O'Neill
Capricorn Tourism and Development Corporation	Mr D. Kirkland
Rockhampton Area Residents	Mr N. Blaney Mr W. Johnson Ms T. Stafford Ald C. Brown Ald G. Mather Ald C. Bennett Mrs C. Piccolo Mrs T. Lomas Mr H. Clark Mrs I. Ellis

C2 Study Team

STUDY TEAM

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APPENDIX D

APPENDIX D

HYDROLOGY

D1 Basic Data Reports

D2 Peak Flood Heights

D3 Monthly Maximum Instantaneous Flows

D4 Mean Stream Discharges

D5 Miscellaneous Spreadsheets

D1 Basic Data Reports

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Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE
01/02/1954	16:00	3.660	392.603
02/02/1954	16:00	3.350	332.939
03/02/1954	16:00	3.250	314.753
04/02/1954	16:00	3.120	291.885
04/02/1954	20:00	3.200	305.854
05/02/1954	08:00	3.810	423.260
05/02/1954	20:00	4.720	653.059
06/02/1954	08:00	5.720	997.406
06/02/1954	20:00	6.480	1245.042
07/02/1954	08:00	7.010	1427.230
07/02/1954	20:00	7.390	1564.694
08/02/1954	08:00	7.720	1688.658
08/02/1954	20:00	8.690	2077.409
09/02/1954	08:00	12.890	5132.647
09/02/1954	16:00	13.030	5286.464
09/02/1954	20:00	13.000	5253.258
10/02/1954	08:00	12.770	5003.120
10/02/1954	20:00	12.730	4960.413
11/02/1954	08:00	12.880	5121.772
11/02/1954	20:00	13.180	5454.523
12/02/1954	08:00	13.590	6059.557
12/02/1954	20:00	13.870	6621.842
13/02/1954	08:00	14.210	7358.078
13/02/1954	20:00	14.550	8156.230
14/02/1954	08:00	14.950	9199.919
14/02/1954	20:00	15.320	10260.558
15/02/1954	08:00	15.660	11317.137
15/02/1954	20:00	15.950	12283.794
16/02/1954	08:00	16.170	13059.165
16/02/1954	20:00	16.370	13796.701
17/02/1954	08:00	16.480	14215.955
17/02/1954	20:00	16.550	14487.898
18/02/1954	08:00	16.580	14605.668
18/02/1954	20:00	16.580	14605.668
19/02/1954	08:00	16.560	14527.062
19/02/1954	20:00	16.520	14370.864
20/02/1954	08:00	16.470	14177.437
20/02/1954	20:00	16.420	13986.053
21/02/1954	16:00	16.360	13759.061
22/02/1954	16:00	16.220	13240.579
23/02/1954	16:00	16.040	12596.524
24/02/1954	16:00	15.830	11876.286
25/02/1954	16:00	15.630	11220.638
26/02/1954	16:00	15.440	10624.276
27/02/1954	16:00	15.190	9877.588
28/02/1954	16:00	14.780	8742.289
01/03/1954	16:00	14.160	7246.011
02/03/1954	16:00	12.400	4617.014
03/03/1954	16:00	9.500	2429.487
04/03/1954	16:00	7.540	1620.515
05/03/1954	16:00	7.110	1462.854
06/03/1954	16:00	6.760	1339.900
07/03/1954	16:00	6.540	1265.106
08/03/1954	16:00	6.630	1295.470
09/03/1954	16:00	6.300	1185.719
10/03/1954	16:00	5.870	1049.295

← 16.59

DATUM : State (m)

YAMBA

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

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DATE	TIME	HEIGHT	DISCHARGE	DATE	TIME	HEIGHT	DISCHARGE	DATE	TIME	HEIGHT	DISCHARGE
09/01/1918	09:00	0.610	15.634	28/02/1918	09:00	3.660	406.283				
10/01/1918	09:00	0.630	16.292	01/03/1918	09:00	3.630	399.636				
11/01/1918	09:00	1.110	38.498	02/03/1918	09:00	3.960	476.229				
12/01/1918	09:00	3.860	452.206	03/03/1918	09:00	4.320	568.666				
13/01/1918	09:00	3.510	373.675	04/03/1918	09:00	4.190	534.202				
14/01/1918	09:00	5.050	785.517	05/03/1918	09:00	4.010	488.508				
15/01/1918	09:00	7.520	1608.424	06/03/1918	09:00	3.940	471.368				
16/01/1918	09:00	9.220	2301.084	07/03/1918	09:00	4.270	555.265				
17/01/1918	09:00	10.520	2949.390	08/03/1918	09:00	4.110	513.605				
18/01/1918	09:00	11.430	3695.193	09/03/1918	09:00	3.430	356.921				
19/01/1918	09:00	11.960	4181.221	10/03/1918	09:00	3.330	336.594				
20/01/1918	09:00	12.260	4473.892	11/03/1918	09:00	3.100	292.410				
21/01/1918	09:00	12.550	4769.194	12/03/1918	09:00	2.970	269.000				
22/01/1918	09:00	14.710	8558.772	13/03/1918	09:00	2.770	235.149				
23/01/1918	09:00	15.470	10713.918	14/03/1918	09:00	2.690	221.385				
24/01/1918	09:00	15.720	11508.733	15/03/1918	09:00	2.510	191.259				
25/01/1918	09:00	15.290	10168.813	16/03/1918	09:00	3.020	277.872				
26/01/1918	09:00	15.240	10021.335	17/03/1918	09:00	3.730	422.036				
27/01/1918	09:00	15.370	10408.333	18/03/1918	09:00	3.580	388.698				
28/01/1918	09:00	15.930	12211.483	19/03/1918	09:00	3.130	297.972				
29/01/1918	09:00	16.640	14840.175	20/03/1918	09:00	2.740	230.240				
30/01/1918	09:00	17.120	16855.012	21/03/1918	09:00	2.510	191.259				
31/01/1918	09:00	17.320	17755.234	22/03/1918	09:00	2.290	158.054				
01/02/1918	09:00	17.320	17755.234	23/03/1918	09:00	1.910	109.580				
02/02/1918	09:00	17.300	17663.553	24/03/1918	09:00	1.830	100.738				
03/02/1918	09:00	17.220	17300.523	25/03/1918	09:00	1.850	102.906				
04/02/1918	09:00	17.090	16723.141	26/03/1918	09:00	1.880	106.211				
05/02/1918	09:00	16.960	16160.953	27/03/1918	09:00	1.910	109.580				
06/02/1918	09:00	16.800	15489.517	28/03/1918	09:00	1.830	100.738				
07/02/1918	09:00	16.680	15000.471	29/03/1918	09:00	1.830	100.738				
08/02/1918	09:00	16.480	14212.370	30/03/1918	09:00	1.780	95.250				
09/02/1918	09:00	16.230	13273.323	31/03/1918	09:00	1.750	92.045				
10/02/1918	09:00	15.950	12280.119	01/04/1918	09:00	1.750	92.045				
11/02/1918	09:00	15.750	11607.124	02/04/1918	09:00	1.700	86.855				
12/02/1918	09:00	15.570	11026.496	03/04/1918	09:00	1.600	77.040				
13/02/1918	09:00	15.340	10318.002	04/04/1918	09:00	1.520	69.714				
14/02/1918	09:00	14.990	9308.882	05/04/1918	09:00	1.470	65.368				
15/02/1918	09:00	14.710	8558.772	06/04/1918	09:00	1.420	61.132				
16/02/1918	09:00	14.240	7425.425	07/04/1918	09:00	1.300	51.573				
17/02/1918	09:00	13.360	5660.502								
18/02/1918	09:00	11.350	3625.199								
19/02/1918	09:00	8.310	1915.849								
20/02/1918	09:00	7.160	1476.734								
21/02/1918	09:00	6.020	1094.805								
22/02/1918	09:00	4.880	731.427								
23/02/1918	09:00	4.320	568.666								
24/02/1918	09:00	4.040	495.962								
25/02/1918	09:00	4.620	652.945								
26/02/1918	09:00	4.110	513.605								
27/02/1918	09:00	3.890	459.338								

Datum [illegible] State [illegible]
YAMBA

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

BASIC DATA REPORT

produced 30.01.1991

STATION 130005A Batch 801

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Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE
10/01/1991	16:00	21.440	14549.175
10/01/1991	18:00	21.420	14523.673
11/01/1991	00:00	21.363	14449.838
11/01/1991	06:00	21.243	14298.868
11/01/1991	12:00	21.075	14086.961
11/01/1991	18:00	20.907	13876.471
12/01/1991	00:00	20.688	13604.228
12/01/1991	12:00	20.212	13020.892
13/01/1991	00:00	19.615	12305.574
13/01/1991	12:00	18.998	11585.460
14/01/1991	00:00	18.377	10873.759
14/01/1991	12:00	17.695	10129.258
15/01/1991	00:00	17.008	9397.074
15/01/1991	12:00	16.291	8659.387
16/01/1991	00:00	15.475	7853.011
16/01/1991	12:00	14.488	6984.620
16/01/1991	18:00	13.930	6542.079
17/01/1991	00:00	13.271	6033.334
17/01/1991	06:00	12.513	5467.167
17/01/1991	12:00	11.655	4851.499
17/01/1991	18:00	10.686	4211.581
18/01/1991	00:00	9.648	3606.307
18/01/1991	06:00	8.630	3040.276
18/01/1991	12:00	7.661	2528.706
18/01/1991	18:00	6.853	2123.970
19/01/1991	00:00	6.195	1810.136
19/01/1991	06:00	5.686	1532.997
19/01/1991	12:00	5.288	1300.893
19/01/1991	18:00	5.029	1134.660
20/01/1991	00:00	4.661	920.633
20/01/1991	06:00	4.503	836.549
20/01/1991	18:00	3.986	593.175
21/01/1991	00:00	3.818	524.274
21/01/1991	12:00	3.561	426.213
22/01/1991	00:00	3.374	365.249
22/01/1991	12:00	3.228	320.049
23/01/1991	00:00	3.121	289.084
23/01/1991	12:00	3.034	265.234
24/01/1991	00:00	2.958	245.359
24/01/1991	08:50	2.910	233.263

DATE TIME HEIGHT DISCHARGE

DATE TIME HEIGHT DISCHARGE

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

BASIC DATA REPORT

produced 30.01.1991

STATION 130005A Batch 801

Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE
03/01/1991	15:00	14.968	7373.781
03/01/1991	15:15	14.998	7398.362
03/01/1991	15:30	15.018	7416.946
03/01/1991	15:45	15.062	7458.440
03/01/1991	16:15	15.104	7498.150
03/01/1991	16:30	15.159	7550.290
03/01/1991	16:45	15.183	7573.093
03/01/1991	17:15	15.248	7635.008
03/01/1991	17:45	15.307	7691.403
03/01/1991	18:00	15.337	7720.152
03/01/1991	18:15	15.372	7753.751
03/01/1991	18:30	15.425	7804.754
03/01/1991	19:00	15.486	7863.644
03/01/1991	19:15	15.514	7890.740
03/01/1991	19:30	15.581	7955.752
03/01/1991	20:15	15.645	8018.078
03/01/1991	20:30	15.690	8062.031
03/01/1991	21:00	15.747	8117.860
03/01/1991	21:15	15.782	8152.226
03/01/1991	21:30	15.819	8188.629
03/01/1991	21:45	15.862	8231.027
03/01/1991	22:00	15.908	8276.489
03/01/1991	22:15	15.938	8306.198
03/01/1991	22:30	15.966	8333.971
03/01/1991	23:00	16.036	8403.587
03/01/1991	23:15	16.095	8462.466
03/01/1991	23:45	16.165	8532.563
04/01/1991	00:00	16.190	8557.658
04/01/1991	00:15	16.226	8593.855
04/01/1991	00:30	16.256	8624.075
04/01/1991	00:45	16.304	8672.522
04/01/1991	01:00	16.335	8703.874
04/01/1991	01:15	16.366	8735.278
04/01/1991	01:30	16.431	8801.294
04/01/1991	01:45	16.459	8829.797
04/01/1991	02:00	16.479	8850.185
04/01/1991	02:15	16.518	8889.998
04/01/1991	02:30	16.540	8912.495
04/01/1991	02:45	16.595	8968.846
04/01/1991	03:15	16.658	9033.588
04/01/1991	03:30	16.677	9053.154
04/01/1991	03:45	16.739	9117.135
04/01/1991	04:00	16.759	9137.817
04/01/1991	04:15	16.792	9171.986
04/01/1991	04:30	16.846	9228.028
04/01/1991	04:45	16.881	9264.436
04/01/1991	05:00	16.908	9292.563
04/01/1991	05:15	16.936	9321.773
04/01/1991	05:30	17.005	9393.933
04/01/1991	05:45	17.070	9462.136
04/01/1991	06:15	17.120	9514.754
04/01/1991	06:30	17.154	9550.604
04/01/1991	06:45	17.184	9582.294
04/01/1991	07:00	17.266	9669.145
04/01/1991	08:15	17.445	9859.957
04/01/1991	08:30	17.473	9889.952
04/01/1991	08:45	17.534	9955.454
04/01/1991	09:15	17.582	10007.129
04/01/1991	09:30	17.617	10044.885
04/01/1991	09:45	17.688	10121.672
04/01/1991	10:00	17.708	10143.353
04/01/1991	10:15	17.746	10184.595
04/01/1991	10:30	17.778	10219.388
04/01/1991	10:45	17.800	10243.337
04/01/1991	11:00	17.842	10289.130
04/01/1991	11:15	17.907	10360.181
04/01/1991	11:30	17.937	10393.046
04/01/1991	11:45	17.962	10420.471
04/01/1991	12:00	18.014	10477.619
04/01/1991	12:15	18.041	10507.349
04/01/1991	12:30	17.996	10457.823
04/01/1991	12:45	18.109	10582.388
04/01/1991	13:00	18.145	10622.213
04/01/1991	13:30	18.235	10722.069
04/01/1991	14:15	18.287	10779.956
04/01/1991	15:30	18.438	10948.836
04/01/1991	15:45	18.493	11010.646
04/01/1991	16:00	18.516	11036.537
04/01/1991	16:15	18.552	11077.120
04/01/1991	16:30	18.587	11116.644
04/01/1991	16:45	18.610	11142.651
04/01/1991	17:00	18.632	11167.550
04/01/1991	17:15	18.674	11215.156
04/01/1991	17:45	18.714	11260.577
04/01/1991	18:15	18.733	11282.185
04/01/1991	18:30	18.798	11356.238
04/01/1991	18:45	18.773	11327.729
04/01/1991	19:00	18.858	11424.788
04/01/1991	19:15	18.900	11472.885
04/01/1991	19:45	18.939	11517.624
04/01/1991	20:00	18.967	11549.792
04/01/1991	20:15	19.004	11592.366
04/01/1991	20:45	19.043	11637.316
04/01/1991	21:00	19.081	11681.193
04/01/1991	21:15	19.108	11712.409
04/01/1991	21:45	19.152	11763.365
04/01/1991	22:15	19.190	11807.452
04/01/1991	22:30	19.229	11852.775
04/01/1991	23:15	19.286	11919.158
04/01/1991	23:30	19.321	11960.002
04/01/1991	23:45	19.300	11935.487
05/01/1991	00:00	19.380	12028.996
05/01/1991	00:15	19.358	12003.250
05/01/1991	00:30	19.398	12050.082
05/01/1991	01:15	19.447	12107.564
05/01/1991	01:30	19.517	12189.889
05/01/1991	01:45	19.476	12141.640
05/01/1991	02:00	19.568	12250.031
05/01/1991	02:30	19.546	12224.073
05/01/1991	02:45	19.600	12287.837
05/01/1991	03:00	19.632	12325.692
05/01/1991	03:15	19.655	12352.933
05/01/1991	03:45	19.695	12400.374
05/01/1991	04:00	19.666	12365.967
05/01/1991	04:15	19.726	12437.191
05/01/1991	04:30	19.746	12460.977
05/01/1991	04:45	19.766	12484.782
05/01/1991	05:30	19.795	12519.332
05/01/1991	06:45	19.929	12679.534
05/01/1991	07:15	19.966	12723.937
05/01/1991	08:00	20.013	12780.429
05/01/1991	08:15	20.052	12827.399
05/01/1991	08:45	20.090	12873.231
05/01/1991	09:15	20.109	12896.177
05/01/1991	09:30	20.174	12974.819
05/01/1991	09:45	20.149	12944.548
05/01/1991	10:00	20.211	13019.677
05/01/1991	10:30	20.190	12994.209
05/01/1991	10:45	20.260	13079.192
05/01/1991	13:00	20.380	13225.459
05/01/1991	17:00	20.650	13557.234
05/01/1991	18:15	20.690	13606.706
06/01/1991	00:07	20.833	13784.208
06/01/1991	07:00	20.895	13861.491
06/01/1991	11:00	20.840	13792.927
06/01/1991	16:30	20.740	13668.646
07/01/1991	06:00	20.510	13384.740
07/01/1991	12:30	20.460	13323.375
07/01/1991	18:00	20.360	13201.032
08/01/1991	08:00	20.300	13127.863
08/01/1991	11:30	20.310	13140.050
08/01/1991	14:15	20.360	13201.032
08/01/1991	15:00	20.367	13209.580C
08/01/1991	22:15	20.500	13372.460C
09/01/1991	05:30	20.683	13598.044C
09/01/1991	06:30	20.700	13619.086C
09/01/1991	09:45	20.805	13749.371
09/01/1991	18:15	21.150	14181.385
10/01/1991	06:00	21.400	14498.194
10/01/1991	08:00	21.410	14510.936

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

BASIC DATA REPORT

produced 30.01.1991

STATION 130005A Batch 301

Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE	DATE	TIME	HEIGHT	DISCHARGE	DATE	TIME	HEIGHT	DISCHARGE
30/12/1990	10:45	11.013	4408.801	01/01/1991	16:45	11.931	5046.580	02/01/1991	19:15	13.227	5999.908
30/12/1990	11:00	11.036	4424.391	01/01/1991	17:45	11.962	5068.669	02/01/1991	19:45	13.268	6031.051
30/12/1990	11:30	11.070	4447.472	01/01/1991	18:15	11.982	5082.940	02/01/1991	20:00	13.293	6050.072
30/12/1990	12:00	11.095	4464.472	01/01/1991	18:45	12.001	5096.509	02/01/1991	20:30	13.317	6068.349
30/12/1990	12:30	11.121	4482.178	01/01/1991	19:45	12.034	5120.110	02/01/1991	21:00	13.355	6097.333
30/12/1990	13:00	11.146	4499.226	01/01/1991	20:15	12.053	5133.716	02/01/1991	21:15	13.375	6112.608
30/12/1990	13:45	11.170	4515.616	01/01/1991	20:45	12.078	5151.638	02/01/1991	21:30	13.399	6130.958
30/12/1990	14:30	11.189	4528.606	01/01/1991	21:30	12.107	5172.458	02/01/1991	22:00	13.431	6155.455
30/12/1990	15:15	11.209	4542.295	01/01/1991	22:00	12.133	5191.149	02/01/1991	22:15	13.451	6170.781
30/12/1990	16:45	11.242	4564.915	01/01/1991	22:45	12.156	5207.707	02/01/1991	22:45	13.498	6206.859
30/12/1990	18:30	11.261	4577.958	01/01/1991	23:15	12.175	5221.397	02/01/1991	23:15	13.528	6229.928
30/12/1990	19:30	11.280	4591.015	01/01/1991	23:45	12.202	5240.876	02/01/1991	23:45	13.564	6257.652
30/12/1990	21:15	11.301	4605.462	02/01/1991	00:00	12.200	5239.432	03/01/1991	00:00	13.574	6265.362
31/12/1990	00:00	11.296	4602.020	02/01/1991	00:30	12.226	5258.214	03/01/1991	00:15	13.604	6288.509
31/12/1990	03:00	11.273	4586.202	02/01/1991	00:45	12.249	5274.848	03/01/1991	00:45	13.641	6317.102
31/12/1990	05:30	11.250	4570.406	02/01/1991	01:30	12.270	5290.054	03/01/1991	01:15	13.666	6336.451
31/12/1990	06:30	11.229	4556.000	02/01/1991	02:00	12.298	5310.353	03/01/1991	01:30	13.693	6357.368
31/12/1990	07:45	11.206	4540.241	02/01/1991	02:30	12.317	5324.142	03/01/1991	01:45	13.715	6374.431
31/12/1990	10:45	11.180	4522.451	02/01/1991	03:15	12.357	5353.219	03/01/1991	02:15	13.742	6395.396
31/12/1990	12:15	11.202	4537.503	02/01/1991	04:15	12.391	5377.978	03/01/1991	02:30	13.775	6421.056
31/12/1990	13:15	11.221	4550.517	02/01/1991	05:00	12.412	5393.291	03/01/1991	02:45	13.801	6441.298
31/12/1990	14:00	11.247	4568.347	02/01/1991	05:30	12.446	5418.120	03/01/1991	03:15	13.829	6463.124
31/12/1990	14:30	11.267	4582.081	02/01/1991	06:15	12.471	5436.401	03/01/1991	03:30	13.854	6482.835
31/12/1990	15:15	11.286	4595.140	02/01/1991	06:30	12.490	5450.312	03/01/1991	03:45	13.881	6503.730
31/12/1990	15:30	11.314	4614.414	02/01/1991	07:00	12.513	5467.167	03/01/1991	04:15	13.915	6530.330
31/12/1990	16:45	11.338	4630.956	02/01/1991	07:30	12.535	5483.310	03/01/1991	04:30	13.940	6549.914
31/12/1990	17:45	11.357	4644.067	02/01/1991	08:00	12.567	5506.819	03/01/1991	04:45	13.975	6577.372
31/12/1990	18:45	11.376	4657.194	02/01/1991	08:45	12.603	5533.311	03/01/1991	05:15	13.999	6596.221
31/12/1990	20:45	11.414	4683.483	02/01/1991	09:15	12.623	5548.048	03/01/1991	05:30	14.059	6643.434
31/12/1990	22:15	11.433	4696.650	02/01/1991	10:00	12.650	5567.969	03/01/1991	06:15	14.101	6676.559
31/12/1990	23:15	11.454	4711.220	02/01/1991	10:15	12.682	5591.612	03/01/1991	06:30	14.123	6693.934
01/01/1991	00:00	11.461	4716.079	02/01/1991	11:00	12.714	5615.290	03/01/1991	06:45	14.148	6713.698
01/01/1991	01:15	11.487	4734.146	02/01/1991	11:15	12.734	5630.109	03/01/1991	07:15	14.202	6756.463
01/01/1991	02:45	11.505	4746.668	02/01/1991	11:45	12.759	5648.653	03/01/1991	07:45	14.222	6772.326
01/01/1991	03:15	11.533	4766.173	02/01/1991	12:15	12.785	5667.961	03/01/1991	08:00	14.270	6810.458
01/01/1991	04:15	11.554	4780.820	02/01/1991	12:45	12.823	5696.224	03/01/1991	08:15	14.294	6829.550
01/01/1991	05:30	11.582	4800.375	02/01/1991	13:15	12.842	5710.377	03/01/1991	08:45	14.326	6855.041
01/01/1991	06:45	11.606	4817.161	02/01/1991	13:30	12.867	5729.016	03/01/1991	09:15	14.398	6912.519
01/01/1991	07:45	11.635	4837.473	02/01/1991	14:00	12.893	5748.426	03/01/1991	09:45	14.435	6942.128
01/01/1991	09:00	11.679	4868.349	02/01/1991	14:30	12.918	5767.112	03/01/1991	10:00	14.458	6960.554
01/01/1991	09:45	11.698	4881.706	02/01/1991	15:15	12.955	5794.808	03/01/1991	10:30	14.492	6987.828
01/01/1991	10:00	11.675	4865.540	02/01/1991	15:30	12.980	5813.548	03/01/1991	10:45	14.539	7025.596
01/01/1991	10:30	11.707	4888.037	02/01/1991	16:00	13.010	5836.069	03/01/1991	11:15	14.579	7057.798
01/01/1991	11:15	11.728	4902.821	02/01/1991	16:15	13.036	5855.610	03/01/1991	11:30	14.613	7085.213
01/01/1991	11:45	11.748	4916.916	02/01/1991	17:00	13.071	5881.956	03/01/1991	11:45	14.641	7107.817
01/01/1991	12:30	11.767	4930.321	02/01/1991	17:15	13.093	5898.538	03/01/1991	12:15	14.701	7156.348
01/01/1991	13:15	11.802	4955.048	02/01/1991	17:30	13.118	5917.402	03/01/1991	12:45	14.747	7193.638
01/01/1991	13:30	11.821	4968.492	02/01/1991	18:00	13.150	5941.579	03/01/1991	13:00	14.767	7209.871
01/01/1991	14:45	11.855	4992.581	02/01/1991	18:30	13.174	5959.738	03/01/1991	13:15	14.792	7230.184
01/01/1991	15:45	11.902	5025.950	02/01/1991	18:45	13.194	5974.884	03/01/1991	14:30	14.923	7336.965

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

BASIC DATA REPORT

produced 30.01.1991

STATION 130005A Batch 801 Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE	DATE	TIME	HEIGHT	DISCHARGE	DATE	TIME	HEIGHT	DISCHARGE
28/12/1990	11:30	3.249	326.339	29/12/1990	01:15	5.766	1579.681	29/12/1990	15:00	9.386	3457.945
28/12/1990	11:45	3.336	353.154	29/12/1990	01:30	5.791	1594.405	29/12/1990	15:15	9.451	3494.582
28/12/1990	12:00	3.401	373.986	29/12/1990	01:45	5.826	1615.126	29/12/1990	15:30	9.524	3535.863
28/12/1990	12:15	3.476	398.879	29/12/1990	02:00	5.856	1632.987	29/12/1990	15:45	9.579	3567.059
28/12/1990	12:30	3.548	423.649	29/12/1990	02:30	5.915	1668.382	29/12/1990	16:00	9.619	3589.797
28/12/1990	12:45	3.618	448.557	29/12/1990	02:45	5.942	1684.698	29/12/1990	16:15	9.683	3626.265
28/12/1990	13:00	3.658	463.159	29/12/1990	03:00	5.972	1702.915	29/12/1990	16:30	9.730	3653.115
28/12/1990	13:15	3.698	478.030	29/12/1990	03:15	6.006	1722.753	29/12/1990	16:45	9.780	3681.742
28/12/1990	13:30	3.742	494.701	29/12/1990	03:30	6.041	1738.839	29/12/1990	17:00	9.828	3709.287
28/12/1990	13:45	3.794	514.828	29/12/1990	03:45	6.076	1754.970	29/12/1990	17:15	9.847	3720.206
28/12/1990	14:00	3.827	527.841	29/12/1990	04:00	6.104	1767.905	29/12/1990	17:30	9.899	3750.138
28/12/1990	14:15	3.862	541.848	29/12/1990	04:15	6.139	1784.113	29/12/1990	17:45	9.939	3773.211
28/12/1990	14:45	3.923	566.764	29/12/1990	04:30	6.180	1803.155	29/12/1990	18:00	9.967	3789.386
28/12/1990	15:15	3.961	582.612	29/12/1990	04:45	6.200	1812.465	29/12/1990	18:15	10.013	3816.004
28/12/1990	15:30	3.992	595.727	29/12/1990	05:00	6.245	1833.463	29/12/1990	18:30	10.041	3832.233
28/12/1990	15:45	4.030	612.033	29/12/1990	05:15	6.288	1853.595	29/12/1990	18:45	10.078	3853.709
28/12/1990	16:00	4.065	627.276	29/12/1990	05:30	6.309	1863.450	29/12/1990	19:00	10.098	3865.333
28/12/1990	16:30	4.112	648.085	29/12/1990	05:45	6.362	1888.390	29/12/1990	19:15	10.140	3889.775
28/12/1990	16:45	4.141	661.120	29/12/1990	06:00	6.412	1912.007	29/12/1990	19:45	10.177	3911.345
28/12/1990	17:00	4.189	683.024	29/12/1990	06:15	6.464	1936.660	29/12/1990	20:15	10.210	3930.612
28/12/1990	17:15	4.249	710.982	29/12/1990	06:30	6.501	1954.257	29/12/1990	20:30	10.231	3942.888
28/12/1990	17:30	4.299	734.774	29/12/1990	06:45	6.558	1981.457	29/12/1990	20:45	10.254	3956.344
28/12/1990	17:45	4.340	754.621	29/12/1990	07:00	6.623	2012.609	29/12/1990	21:30	10.273	3967.472
28/12/1990	18:00	4.400	784.215	29/12/1990	07:15	6.701	2050.178	29/12/1990	22:00	10.293	3979.195
28/12/1990	18:15	4.435	801.780	29/12/1990	07:30	6.770	2083.581	29/12/1990	22:45	10.312	3990.341
28/12/1990	18:30	4.488	828.807	29/12/1990	07:45	6.855	2124.947	29/12/1990	23:15	10.337	4005.020
28/12/1990	18:45	4.542	856.874	29/12/1990	08:00	6.947	2169.985	29/12/1990	23:45	10.366	4022.068
28/12/1990	19:00	4.607	891.374	29/12/1990	08:15	7.020	2205.918	30/12/1990	00:00	10.366	4022.068
28/12/1990	19:15	4.672	926.660	29/12/1990	08:30	7.115	2252.938	30/12/1990	00:30	10.391	4036.781
28/12/1990	19:30	4.737	962.735	29/12/1990	08:45	7.219	2304.743	30/12/1990	01:15	10.417	4052.100
28/12/1990	19:45	4.786	990.455	29/12/1990	09:00	7.291	2340.810	30/12/1990	02:00	10.444	4068.026
28/12/1990	20:00	4.851	1027.926	29/12/1990	09:15	7.401	2396.227	30/12/1990	02:45	10.478	4088.107
28/12/1990	20:15	4.898	1055.520	29/12/1990	09:30	7.489	2440.832	30/12/1990	03:30	10.515	4109.992
28/12/1990	20:30	4.968	1097.399	29/12/1990	09:45	7.608	2501.531	30/12/1990	03:45	10.540	4124.799
28/12/1990	20:45	5.023	1130.963	29/12/1990	10:00	7.694	2545.669	30/12/1990	04:00	10.559	4136.063
28/12/1990	21:00	5.085	1169.498	29/12/1990	10:15	7.799	2599.863	30/12/1990	04:45	10.589	4153.865
28/12/1990	21:15	5.132	1199.205	29/12/1990	10:30	7.894	2649.182	30/12/1990	05:15	10.613	4168.124
28/12/1990	21:30	5.182	1231.280	29/12/1990	10:45	7.990	2699.295	30/12/1990	05:30	10.641	4184.777
28/12/1990	21:45	5.240	1269.097	29/12/1990	11:00	8.083	2748.103	30/12/1990	05:45	10.666	4199.662
28/12/1990	22:00	5.289	1301.561	29/12/1990	11:15	8.168	2792.935	30/12/1990	06:15	10.685	4210.985
28/12/1990	22:15	5.349	1341.955	29/12/1990	11:30	8.273	2848.608	30/12/1990	06:30	10.705	4222.913
28/12/1990	22:30	5.389	1365.445	29/12/1990	11:45	8.397	2914.768	30/12/1990	06:45	10.727	4236.045
28/12/1990	22:45	5.446	1396.896	29/12/1990	12:00	8.469	2953.385	30/12/1990	07:00	10.746	4247.397
28/12/1990	23:00	5.490	1421.402	29/12/1990	13:15	8.878	3175.551	30/12/1990	07:30	10.769	4261.150
28/12/1990	23:15	5.530	1443.855	29/12/1990	13:30	8.963	3222.310	30/12/1990	07:45	10.789	4273.120
28/12/1990	23:30	5.575	1469.312	29/12/1990	13:45	9.023	3255.436	30/12/1990	08:15	10.818	4290.494
28/12/1990	23:45	5.610	1489.256	29/12/1990	14:00	9.102	3299.203	30/12/1990	08:45	10.850	4309.689
29/12/1990	00:00	5.648	1511.052	29/12/1990	14:15	9.182	3343.698	30/12/1990	09:00	10.870	4321.699
29/12/1990	00:30	5.694	1537.636	29/12/1990	14:30	9.252	3382.773	30/12/1990	09:30	10.914	4348.153
29/12/1990	00:45	5.719	1552.175	29/12/1990	14:45	9.310	3415.251	30/12/1990	10:00	10.947	4368.027

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

BASIC DATA REPORT

produced 30.01.1991

The Gap

STATION 130005A Batch 801

Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE	DATE	TIME	HEIGHT	DISCHARGE	DATE	TIME	HEIGHT	DISCHARGE
08/10/1990	13:10	1.110	1.132	12/11/1990	17:45	1.047	0.638	16/12/1990	00:00	0.995	0.365
08/10/1990	14:00	1.112	1.151	13/11/1990	00:00	1.055	0.690	17/12/1990	00:00	0.980	0.305
09/10/1990	00:00	1.107	1.104	14/11/1990	00:00	1.052	0.670	18/12/1990	00:00	0.970	0.269
09/10/1990	08:15	1.142	1.466	15/11/1990	00:00	1.052	0.670	18/12/1990	15:00	0.947	0.198
09/10/1990	18:45	1.170	1.810	16/11/1990	00:00	1.042	0.607	18/12/1990	15:15	0.967	0.259
09/10/1990	21:45	1.190	2.089	17/11/1990	00:00	1.042	0.607	19/12/1990	00:00	0.957	0.227
10/10/1990	00:00	1.195	2.164	18/11/1990	00:00	1.042	0.607	20/12/1990	00:00	0.960	0.237
11/10/1990	00:00	1.185	2.017	19/11/1990	00:00	1.030	0.537	21/12/1990	00:00	0.960	0.237
11/10/1990	14:15	1.160	1.681	20/11/1990	00:00	1.012	0.443	21/12/1990	15:15	0.937	0.173
12/10/1990	00:00	1.157	1.644	21/11/1990	00:00	1.012	0.443	22/12/1990	00:00	0.955	0.221
13/10/1990	00:00	1.142	1.466	22/11/1990	00:00	1.017	0.468	23/12/1990	00:00	0.955	0.221
13/10/1990	18:00	1.115	1.180	22/11/1990	10:30	0.997	0.374	24/12/1990	00:00	0.950	0.207
14/10/1990	00:00	1.115	1.180	23/11/1990	00:00	0.997	0.374	25/12/1990	00:00	0.950	0.207
15/10/1990	00:00	1.110	1.132	24/11/1990	00:00	0.997	0.374	26/12/1990	00:00	0.932	0.160
16/10/1990	00:00	1.097	1.014	24/11/1990	21:30	1.020	0.483	26/12/1990	17:15	0.955	0.221
17/10/1990	00:00	1.097	1.014	24/11/1990	23:30	0.987	0.332	27/12/1990	00:00	0.955	0.221
18/10/1990	00:00	1.082	0.888	25/11/1990	00:00	0.987	0.332	27/12/1990	12:45	0.990	0.344
19/10/1990	00:00	1.082	0.888	25/11/1990	19:45	1.015	0.458	27/12/1990	21:15	1.012	0.443
20/10/1990	00:00	1.080	0.872	26/11/1990	00:00	1.000	0.387	27/12/1990	22:00	1.035	0.565
21/10/1990	00:00	1.080	0.872	27/11/1990	00:00	1.000	0.387	27/12/1990	23:15	1.055	0.690
22/10/1990	00:00	1.080	0.872	27/11/1990	13:45	0.977	0.294	28/12/1990	00:00	1.067	0.774
22/10/1990	14:15	1.057	0.704	28/11/1990	00:00	0.980	0.305	28/12/1990	00:30	1.125	1.281
23/10/1990	00:00	1.062	0.738	29/11/1990	00:00	0.980	0.305	28/12/1990	00:45	1.219	2.546
24/10/1990	00:00	1.052	0.670	29/11/1990	17:15	0.960	0.237	28/12/1990	01:00	1.304	4.288
25/10/1990	00:00	1.050	0.657	29/11/1990	17:45	0.980	0.305	28/12/1990	01:15	1.391	7.166
26/10/1990	00:00	1.037	0.577	30/11/1990	00:00	0.980	0.305	28/12/1990	01:30	1.474	11.087
27/10/1990	00:00	1.037	0.577	01/12/1990	00:00	0.970	0.269	28/12/1990	01:45	1.575	17.773
28/10/1990	00:00	1.027	0.520	01/12/1990	14:30	0.950	0.207	28/12/1990	02:00	1.683	26.983
29/10/1990	00:00	1.027	0.520	02/12/1990	00:00	0.967	0.259	28/12/1990	02:15	1.765	33.874
30/10/1990	00:00	1.025	0.509	03/12/1990	00:00	0.950	0.207	28/12/1990	02:30	1.855	42.647
31/10/1990	00:00	1.025	0.509	04/12/1990	00:00	0.950	0.207	28/12/1990	02:45	1.924	50.284
01/11/1990	00:00	1.025	0.509	05/12/1990	00:00	0.950	0.207	28/12/1990	03:00	1.989	58.240
02/11/1990	00:00	1.020	0.483	05/12/1990	15:30	0.975	0.287	28/12/1990	03:15	2.044	65.575
03/11/1990	00:00	1.020	0.483	05/12/1990	16:00	1.002	0.396	28/12/1990	03:30	2.094	72.740
03/11/1990	15:45	1.000	0.387	05/12/1990	18:15	1.042	0.607	28/12/1990	03:45	2.141	79.900
03/11/1990	23:45	1.020	0.483	05/12/1990	19:15	1.065	0.759	28/12/1990	04:00	2.161	83.109
04/11/1990	00:00	1.020	0.483	05/12/1990	20:15	1.087	0.903	28/12/1990	04:30	2.191	88.045
04/11/1990	22:45	1.050	0.657	06/12/1990	00:00	1.097	1.014	28/12/1990	07:45	2.215	92.109
05/11/1990	00:00	1.045	0.626	06/12/1990	15:30	1.077	0.849	28/12/1990	08:15	2.272	102.313
06/11/1990	00:00	1.045	0.626	07/12/1990	00:00	1.077	0.849	28/12/1990	08:30	2.317	110.848
07/11/1990	00:00	1.057	0.704	07/12/1990	15:45	1.052	0.670	28/12/1990	08:45	2.362	119.304
07/11/1990	13:15	1.080	0.872	08/12/1990	00:00	1.065	0.759	28/12/1990	09:00	2.417	128.802
07/11/1990	14:30	1.060	0.724	08/12/1990	12:30	1.045	0.626	28/12/1990	09:15	2.481	140.384
07/11/1990	22:45	1.080	0.872	09/12/1990	00:00	1.045	0.626	28/12/1990	09:30	2.551	153.713
08/11/1990	00:00	1.080	0.872	10/12/1990	00:00	1.035	0.565	28/12/1990	09:45	2.621	167.741
09/11/1990	00:00	1.072	0.810	11/12/1990	00:00	1.025	0.509	28/12/1990	10:00	2.701	184.643
10/11/1990	00:00	1.080	0.872	12/12/1990	00:00	1.010	0.433	28/12/1990	10:15	2.777	201.569
11/11/1990	00:00	1.087	0.928	13/12/1990	00:00	0.995	0.365	28/12/1990	10:30	2.867	222.725
11/11/1990	15:00	1.065	0.759	14/12/1990	00:00	0.995	0.365	28/12/1990	10:45	2.975	249.727
12/11/1990	00:00	1.070	0.796	15/12/1990	00:00	0.995	0.365	28/12/1990	11:00	3.072	275.506

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

The Gap

QUEENSLAND WATER RESOURCES COMMISSION
STREAMFLOW RECORDS APPLICATION

BASIC DATA REPORT IN METRES AND CUBIC METRES PER SECOND
PRODUCED BY #SF17/04181004 ON 13/03/91

STATION 130005A FITZROY RIVER AT THE GAP AMTD 142.1 KM, CHMT 135860 SQKM

DATE	TIME	HGT	DISCH	DATE	TIME	HGT	DISCH	DATE	TIME	HGT	DISCH	DATE	TIME	HGT	DISCH
06/03/88	1300	9.41	4047.975	06/03/88	1800	10.21	4542.981	06/03/88	2300	10.91	5031.640	07/03/88	0300	11.47	5435.671
07/03/88	0900	12.23	6002.185	07/03/88	1400	12.82	6456.106	07/03/88	2200	13.65	7115.090	08/03/88	0600	14.45	7828.865
08/03/88	1100	14.89	8258.684	08/03/88	2140	15.67	9045.942	09/03/88	0600	15.98	9367.760	09/03/88	1400	16.19	9588.637
09/03/88	2200	16.26	9662.778	09/03/88	2330	16.26	9662.778	10/03/88	0600	16.18	9578.067	10/03/88	1430	15.98	9367.760
10/03/88	2130	15.74	9118.168	11/03/88	0630	15.30	8668.479	11/03/88	1300	14.80	8169.926	11/03/88	2030	14.16	7551.239
12/03/88	0130	13.60	7074.726	12/03/88	0620	12.99	6589.150	12/03/88	0950	12.43	6154.688	12/03/88	1300	11.80	5679.112
12/03/88	1600	11.18	5225.004	12/03/88	1900	10.48	4729.281	12/03/88	2200	9.75	4249.789	13/03/88	0100	8.90	3750.715
13/03/88	0300	8.27	3392.843	13/03/88	0500	7.67	3061.978	13/03/88	0700	7.05	2730.755	13/03/88	0900	6.45	2421.034
13/03/88	1110	5.82	2107.885	13/03/88	1120	5.80	2098.154	13/03/88	1127	5.75	2073.883	13/03/88	1134	5.72	2059.360
13/03/88	1142	5.67	2035.222	13/03/88	1149	5.64	2020.780	13/03/88	1156	5.61	2006.367	13/03/88	1204	5.59	1996.776
13/03/88	1211	5.55	1977.633	13/03/88	1219	5.52	1963.311	13/03/88	1226	5.48	1944.263	13/03/88	1233	5.45	1930.013
13/03/88	1241	5.41	1911.061	13/03/88	1248	5.37	1892.163	13/03/88	1256	5.33	1873.320	13/03/88	1303	5.30	1859.224
13/03/88	1310	5.29	1854.533	13/03/88	1318	5.26	1840.479	13/03/88	1325	5.22	1821.789	13/03/88	1332	5.18	1803.155
13/03/88	1340	5.14	1784.577	13/03/88	1347	5.10	1766.055	13/03/88	1355	5.05	1742.983	13/03/88	1402	5.00	1720.000
13/03/88	1409	4.95	1668.547	13/03/88	1417	4.93	1677.437	13/03/88	1424	4.89	1653.340	13/03/88	1432	4.85	1629.407
13/03/88	1439	4.81	1605.638	13/03/88	1446	4.77	1582.033	13/03/88	1454	4.75	1570.292	13/03/88	1501	4.71	1546.933
13/03/88	1509	4.68	1529.522	13/03/88	1516	4.63	1500.709	13/03/88	1523	4.61	1489.256	13/03/88	1531	4.57	1466.473
13/03/88	1538	4.54	1449.494	13/03/88	1545	4.52	1438.226	13/03/88	1553	4.49	1421.402	13/03/88	1600	4.46	1404.671
13/03/88	1608	4.44	1393.569	13/03/88	1615	4.41	1376.993	13/03/88	1622	4.37	1355.036	13/03/88	1630	4.33	1329.086
13/03/88	1637	4.31	1315.618	13/03/88	1645	4.29	1302.228	13/03/88	1652	4.25	1275.684	13/03/88	1659	4.22	1255.982
13/03/88	1707	4.20	1242.946	13/03/88	1714	4.17	1223.537	13/03/88	1722	4.14	1204.304	13/03/88	1729	4.09	1172.637
13/03/88	1736	4.06	1153.870	13/03/88	1744	4.04	1141.455	13/03/88	1751	4.01	1122.977	13/03/88	1758	3.98	1104.673
13/03/88	1806	3.95	1086.541	13/03/88	1813	3.92	1068.581	13/03/88	1821	3.89	1050.794	13/03/88	1828	3.85	1027.344
13/03/88	1835	3.83	1015.732	13/03/88	1858	3.82	1009.955	13/03/88	1912	3.80	998.458	13/03/88	1927	3.74	964.419
13/03/88	1942	3.68	931.057	13/03/88	1957	3.62	898.368	13/03/88	2011	3.56	866.350	13/03/88	2026	3.51	840.177
13/03/88	2041	3.45	809.377	13/03/88	2056	3.39	779.237	13/03/88	2111	3.35	759.508	13/03/88	2125	3.31	740.069
13/03/88	2140	3.27	720.920	13/03/88	2155	3.22	697.388	13/03/88	2210	3.18	678.885	13/03/88	2224	3.15	665.195
13/03/88	2239	3.12	651.666	13/03/88	2254	3.07	629.471	13/03/88	2309	3.02	607.717	13/03/88	2324	2.98	590.630
13/03/88	2338	2.95	577.998	13/03/88	2353	2.91	561.400	14/03/88	0008	2.88	549.133	14/03/88	0023	2.85	537.022
14/03/88	0037	2.81	521.114	14/03/88	0052	2.79	513.264	14/03/88	0107	2.76	501.616	14/03/88	0122	2.74	493.936
14/03/88	0136	2.71	482.544	14/03/88	0151	2.69	475.034	14/03/88	0206	2.66	463.896	14/03/88	0221	2.64	456.555
14/03/88	0236	2.62	449.281	14/03/88	0250	2.59	438.496	14/03/88	0305	2.57	431.369	14/03/88	0320	2.55	424.350
14/03/88	0335	2.53	417.376	14/03/88	0349	2.52	413.915	14/03/88	0404	2.50	407.041	14/03/88	0419	2.47	396.854
14/03/88	0434	2.44	386.815	14/03/88	0449	2.42	380.205	14/03/88	0503	2.41	376.924	14/03/88	0518	2.38	367.180
14/03/88	0533	2.36	360.765	14/03/88	0548	2.34	354.416	14/03/88	0602	2.33	351.265	14/03/88	0617	2.31	345.013
14/03/88	0632	2.29	338.824	14/03/88	0647	2.28	335.754	14/03/88	0702	2.27	332.700	14/03/88	0716	2.25	326.641
14/03/88	0731	2.24	323.635	14/03/88	0746	2.23	320.645	14/03/88	0801	2.21	314.713	14/03/88	0815	2.20	311.771
14/03/88	0830	2.18	305.934	14/03/88	0845	2.17	303.040	14/03/88	0900	2.16	300.161	14/03/88	0915	2.15	297.298
14/03/88	0929	2.14	294.451	14/03/88	0944	2.13	291.619	14/03/88	0959	2.12	288.803	14/03/88	1014	2.10	283.219
14/03/88	1028	2.09	280.450	14/03/88	1043	2.08	277.697	14/03/88	1113	2.07	274.960	14/03/88	1128	2.06	272.238
14/03/88	1142	2.05	269.531	14/03/88	1157	2.04	266.841	14/03/88	1227	2.03	264.165	14/03/88	1241	2.02	261.506
14/03/88	1256	2.01	258.861	14/03/88	1311	2.00	256.232	14/03/88	1326	2.00	256.232	14/03/88	1341	1.98	251.021
14/03/88	2133	1.81	209.185	15/03/88	0526	1.71	186.603	15/03/88	1319	1.63	169.596	15/03/88	2112	1.56	155.477
16/03/88	0505	1.51	145.822	16/03/88	1257	1.44	132.898	16/03/88	2050	1.41	127.570	17/03/88	0443	1.36	118.966
17/03/88	1236	1.31	109.491	17/03/88	2029	1.28	103.798	18/03/88	0422	1.24	96.510	18/03/88	1214	1.20	89.563
18/03/88	2007	1.18	86.214	19/03/88	0400	1.15	81.345	19/03/88	1153	1.12	76.657	19/03/88	1946	1.10	73.632
20/03/88	0339	1.07	69.240	20/03/88	1131	1.04	65.022	20/03/88	1924	1.02	62.305	21/03/88	0317	0.99	58.368
21/03/88	1110	0.98	57.093	21/03/88	1903	0.95	53.376	22/03/88	0255	0.94	52.172	22/03/88	1048	0.91	48.668

STATION 130005A FITZROY RIVER AT THE GAP AMTD 142.1 KM, CHMT 135860 SQKM

DATE	TIME	HGT	DISCH	DATE	TIME	HGT	DISCH	DATE	TIME	HGT	DISCH	DATE	TIME	HGT	DISCH
29/10/87	1200		3.180*	30/10/87	1200		7.860*	31/10/87	1200		17.900*				
01/11/87	1200		22.300*	02/11/87	1200		17.300*	03/11/87	1200		13.200*	04/11/87	1200		11.200*
05/11/87	1200		10.900*	06/11/87	1200		10.500*	07/11/87	1200		10.200*	08/11/87	1200		8.360*
09/11/87	1200		7.140*	10/11/87	1200		10.400*	11/11/87	1200		33.800*	12/11/87	1200		30.800*
13/11/87	1200		27.000*	14/11/87	1200		53.900*	15/11/87	1200		92.500*	16/11/87	1200		92.300*
17/11/87	1200		77.600*	18/11/87	1200		109.000*	19/11/87	1200		118.000*	20/11/87	1200		91.600*
21/11/87	1200		77.100*	22/11/87	1200		72.500*	23/11/87	1200		63.000*	24/11/87	1200		50.300*
25/11/87	1200		40.700*	26/11/87	1200		33.900*	27/11/87	1200		27.900*	28/11/87	1200		22.400*
29/11/87	1200		17.300*	30/11/87	1200		14.500*								
01/12/87	1200		13.000*	02/12/87	1200		19.700*	03/12/87	1200		18.900*	04/12/87	1200		14.600*
05/12/87	1200		13.100*	06/12/87	1200		11.600*	07/12/87	1200		10.200*	08/12/87	1200		9.170*
09/12/87	1200		8.040*	10/12/87	1200		7.440*	11/12/87	1200		7.350*	12/12/87	1200		11.500*
13/12/87	1200		22.600*	14/12/87	1200		27.000*	15/12/87	1200		24.400*	16/12/87	1200		17.200*
17/12/87	1200		12.400*	18/12/87	1200		9.130*	19/12/87	1200		7.530*	20/12/87	1200		6.330*
21/12/87	1200		5.620*	22/12/87	1200		4.990*	23/12/87	1200		4.420*	24/12/87	1200		3.890*
25/12/87	1200		3.340*	26/12/87	1200		2.920*	27/12/87	1200		2.500*	28/12/87	1200		2.170*
29/12/87	1200		2.020*	30/12/87	1200		2.060*	31/12/87	1200		1.950*				
01/01/88	1200		1.800*	02/01/88	1200		1.660*	03/01/88	1200		1.510*	04/01/88	1200		1.340*
05/01/88	1200		1.210*	06/01/88	1200		1.110*	07/01/88	1200		1.010*	08/01/88	1200		0.930*
09/01/88	1200		0.845*	10/01/88	1200		0.780*	11/01/88	1200		0.760*	12/01/88	0000		0.740*
12/01/88	1400	0.08	0.748	13/01/88	1200	0.09	0.825	14/01/88	1200	0.09	0.825	15/01/88	1200	0.09	0.825
16/01/88	1200	0.10	0.907	17/01/88	1200	0.10	0.907	18/01/88	1200	0.10	0.907	19/01/88	1200	0.08	0.748
20/01/88	1200	0.07	0.677	21/01/88	1200	0.08	0.748	22/01/88	1200	0.07	0.677	23/01/88	1200	0.04	0.492
24/01/88	1200	0.03	0.440	25/01/88	1715	0.02	0.397	25/01/88	1800	0.14	1.298	25/01/88	1815	0.22	2.434
25/01/88	1900	0.24	2.805	25/01/88	2100	0.30	4.169	25/01/88	2300	0.33	5.022	26/01/88	1200	0.30	4.169
27/01/88	1200	0.24	2.805	28/01/88	1200	0.21	2.262	29/01/88	1200	0.17	1.664	30/01/88	1200	0.13	1.191
31/01/88	1200	0.11	0.995												
01/02/88	1200	0.09	0.825	02/02/88	1200	0.08	0.748	03/02/88	1200	0.06	0.610	04/02/88	1200	0.04	0.492
05/02/88	1200	0.03	0.440	06/02/88	1200	0.01	0.357	07/02/88	1200	0.02	0.397	07/02/88	1900	0.02	0.397
08/02/88	0700	0.08	0.748	08/02/88	1200	0.08	0.748	09/02/88	1200	0.07	0.677	10/02/88	1200	0.08	0.748
11/02/88	1200	0.09	0.825	12/02/88	1830	0.10	0.907	12/02/88	2100	0.13	1.191	12/02/88	2200	0.17	1.664
12/02/88	2300	0.28	3.670	12/02/88	2359	0.48	11.422	13/02/88	0100	0.77	34.328	13/02/88	0200	1.07	69.240
13/02/88	0300	1.34	115.382	13/02/88	0400	1.55	153.518	13/02/88	0600	1.80	206.860	13/02/88	0700	1.90	230.787
13/02/88	0830	1.99	253.619	13/02/88	1000	2.04	266.841	13/02/88	1300	2.06	272.238	13/02/88	1400	2.07	274.960
13/02/88	1800	2.05	269.531	13/02/88	2359	1.99	253.619	14/02/88	1200	1.80	206.860	15/02/88	1200	1.46	136.520
16/02/88	1200	1.24	96.510	17/02/88	1200	1.10	73.632	18/02/88	1200	0.99	58.368	19/02/88	1200	0.92	49.819
20/02/88	1200	0.89	46.419	21/02/88	1200	0.89	46.419	22/02/88	1200	0.85	42.125	23/02/88	1200	0.77	34.328
24/02/88	1200	0.72	29.967	25/02/88	1200	0.68	26.750	26/02/88	1200	0.65	24.387	27/02/88	1200	0.63	22.470
28/02/88	1200	0.60	19.807	29/02/88	1200	0.57	17.385								
01/03/88	1200	0.58	18.166	02/03/88	1200	0.79	36.181	03/03/88	1200	1.19	87.878	04/03/88	0000	1.30	107.571
04/03/88	1600	1.15	81.345	04/03/88	2000	1.64	171.671	04/03/88	2200	2.32	348.131	05/03/88	0100	3.18	678.885
05/03/88	0500	3.90	1056.704	05/03/88	1000	4.70	1541.119	05/03/88	1400	5.20	1812.465	05/03/88	1800	6.12	2255.421
05/03/88	2100	6.68	2538.469	06/03/88	0100	7.45	2943.181	06/03/88	0500	8.12	3309.199	06/03/88	0900	8.75	3664.559

Rockhampton SIC A R IT

Rockhampton Flood Gauge — datum 4.48m to get AHD

produced 06.09.1991

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STATION ROCKY91 Batch 900 Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE	DATE	TIME	HEIGHT	DISCHARGE	DATE	TIME	HEIGHT	DISCHARGE
29/12/1990	00:00	6.000	4000.001	05/01/1991	18:00	8.850	11407.026	12/01/1991	21:00	9.150	13271.628
29/12/1990	15:00	6.050	4144.023	05/01/1991	21:00	8.900	11702.653	13/01/1991	00:00	9.100	12945.440
29/12/1990	16:00	6.100	4291.980	05/01/1991	22:00	8.900	11702.653	13/01/1991	06:00	9.100	12945.440
29/12/1990	21:00	6.750	5413.598	06/01/1991	00:00	8.900	11702.653	13/01/1991	09:00	9.050	12625.531
30/12/1990	00:30	7.100	5968.164	06/01/1991	03:00	8.950	12004.228	13/01/1991	12:00	9.000	12311.824
30/12/1990	06:00	7.250	6227.324	06/01/1991	04:00	8.950	12004.228	13/01/1991	18:00	9.000	12311.824
30/12/1990	09:36	7.300	6314.954	06/01/1991	06:00	9.000	12311.824	13/01/1991	21:00	8.950	12004.228
30/12/1990	12:00	7.350	6403.207	06/01/1991	08:00	9.000	12311.824	14/01/1991	00:00	8.900	11702.653
30/12/1990	16:00	7.350	6403.207	06/01/1991	09:00	9.000	12311.824	14/01/1991	06:00	8.800	11117.253
30/12/1990	21:00	7.350	6403.207	06/01/1991	10:00	9.000	12311.824	14/01/1991	09:00	8.850	11407.026
31/12/1990	02:30	7.400	6492.082	06/01/1991	11:00	9.000	12311.824	14/01/1991	15:40	8.830	11290.417
31/12/1990	15:00	7.400	6492.082	06/01/1991	12:00	9.000	12311.824	15/01/1991	06:00	8.700	10554.937
31/12/1990	18:00	7.400	6492.082	06/01/1991	13:00	9.050	12625.531	15/01/1991	12:00	8.650	10282.232
31/12/1990	19:00	7.350	6403.207	06/01/1991	14:00	9.050	12625.531	16/01/1991	06:00	8.500	9496.957
31/12/1990	21:00	7.350	6403.207	06/01/1991	15:00	9.050	12625.531	16/01/1991	09:00	8.450	9245.875
01/01/1991	00:00	7.400	6492.082	06/01/1991	16:00	9.050	12625.531	16/01/1991	12:00	8.450	9245.875
01/01/1991	05:00	7.350	6403.207	06/01/1991	17:00	9.050	12625.531	17/01/1991	06:00	8.170	7983.990
01/01/1991	09:00	7.300	6314.954	06/01/1991	18:00	9.050	12625.531	17/01/1991	09:00	8.100	7801.773
01/01/1991	11:00	7.300	6314.954	06/01/1991	20:00	9.100	12945.440	17/01/1991	15:00	8.000	7607.188
01/01/1991	16:00	7.350	6403.207	06/01/1991	21:00	9.120	13075.157	18/01/1991	06:00	7.500	6671.701
01/01/1991	19:00	7.350	6403.207	07/01/1991	00:00	9.150	13271.628	18/01/1991	09:00	7.400	6492.082
01/01/1991	20:00	7.300	6314.954	07/01/1991	05:00	9.150	13271.628	18/01/1991	15:00	7.100	5968.164
01/01/1991	23:00	7.300	6314.954	07/01/1991	08:00	9.150	13271.628	19/01/1991	12:00	1.000	-1.000A
02/01/1991	00:30	7.350	6403.207	07/01/1991	09:00	9.150	13271.628	20/01/1991	12:00	1.000	-1.000A
02/01/1991	02:00	7.300	6314.954	07/01/1991	15:00	9.150	13271.628	21/01/1991	12:00	1.000	1.000A
02/01/1991	07:00	7.300	6314.954	07/01/1991	17:00	9.100	12945.440	22/01/1991	12:00	1.000	1.000A
02/01/1991	12:00	7.300	6314.954	08/01/1991	00:00	9.100	12945.440	23/01/1991	12:00	1.000	-1.000A
02/01/1991	14:00	7.400	6492.082	08/01/1991	12:00	9.100	12945.440	24/01/1991	12:00	1.000	-1.000A
02/01/1991	15:00	7.400	6492.082	08/01/1991	13:00	9.050	12625.531	25/01/1991	12:00	1.000	-1.000A
02/01/1991	21:00	7.500	6671.701	08/01/1991	20:00	9.050	12625.531	26/01/1991	12:00	1.000	-1.000A
03/01/1991	06:00	7.500	6671.701	08/01/1991	21:00	9.100	12945.440	27/01/1991	12:00	1.000	-1.000A
03/01/1991	09:00	7.550	6762.445	09/01/1991	07:00	9.100	12945.440	28/01/1991	12:00	-1.000	1.000A
03/01/1991	13:00	7.640	6927.353	09/01/1991	08:00	9.050	12625.531	29/01/1991	12:00	1.000	1.000A
03/01/1991	15:00	7.750	7131.650	09/01/1991	10:00	9.050	12625.531	30/01/1991	12:00	1.000	1.000A
03/01/1991	16:00	7.800	7225.510	09/01/1991	11:00	9.100	12945.440	31/01/1991	12:00	-1.000	-1.000A
03/01/1991	18:00	7.800	7225.510	09/01/1991	12:00	9.050	12625.531	01/02/1991	12:00	1.000	1.000A
04/01/1991	00:00	7.950	7510.833	09/01/1991	13:00	9.050	12625.531	02/02/1991	12:00	1.000	1.000A
04/01/1991	03:00	7.980	7568.570	09/01/1991	14:00	9.100	12945.440	03/02/1991	12:00	1.000	-1.000A
04/01/1991	06:00	8.000	7607.188	10/01/1991	00:00	9.100	12945.440	04/02/1991	12:00	-1.000	-1.000A
04/01/1991	07:00	8.000	7607.188	10/01/1991	01:00	9.150	13271.628	05/02/1991	12:00	1.000	1.000A
04/01/1991	09:00	8.050	7704.167	10/01/1991	09:00	9.150	13271.628	06/02/1991	12:00	1.000	1.000A
04/01/1991	10:00	8.050	7704.167	10/01/1991	14:00	9.200	13604.193	07/02/1991	12:00	1.000	1.000A
04/01/1991	12:00	8.150	7900.000	10/01/1991	18:00	9.200	13604.193	08/02/1991	12:00	1.000	1.000A
04/01/1991	15:00	8.200	8111.250	11/01/1991	00:00	9.250	13943.233	09/02/1991	05:00	5.200	0.000
04/01/1991	21:00	8.350	8771.128	11/01/1991	02:00	9.250	13943.233	10/02/1991	09:00	6.400	4883.527
05/01/1991	06:00	8.550	9753.327	11/01/1991	23:00	9.250	13943.233	10/02/1991	12:00	6.680	5306.536
05/01/1991	09:00	8.650	10282.232	12/01/1991	02:00	9.300	14288.815	10/02/1991	15:00	6.750	5413.598
05/01/1991	10:00	8.650	10282.232	12/01/1991	05:00	9.200	13604.193	11/02/1991	08:00	7.300	6314.954
05/01/1991	12:00	8.700	10554.937	12/01/1991	08:00	9.200	13604.193	11/02/1991	13:00	7.500	6671.701
05/01/1991	16:00	8.800	11117.253	12/01/1991	15:00	9.150	13271.628	11/02/1991	15:00	7.500	6671.701

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

Yaamba

BASIC DATA REPORT W.R.C.

produced 25.09.1991

STATION 130001C Batch 988

DATE	TIME	HEIGHT	DISCHARGE
04/03/1988	16:45	2.150	156.263
05/03/1988	07:00	3.750	410.857
05/03/1988	07:30	4.000	463.767
05/03/1988	08:30	4.520	594.011
05/03/1988	09:00	4.660	635.009
05/03/1988	13:00	5.820	1033.919
05/03/1988	15:00	6.350	1202.068
05/03/1988	16:05	6.580	1278.561
05/03/1988	19:00	7.160	1480.813
05/03/1988	20:00	7.360	1553.636
05/03/1988	21:00	7.570	1631.785
06/03/1988	05:30	9.500	2429.487
06/03/1988	08:00	9.580	2465.599
06/03/1988	09:00	9.580	2465.599
06/03/1988	10:00	9.740	2538.539
06/03/1988	11:00	9.910	2617.084
06/03/1988	15:00	10.410	2866.658
06/03/1988	21:00	11.260	3549.206
07/03/1988	06:00	12.260	4476.078
07/03/1988	09:00	12.540	4760.767
07/03/1988	15:00	13.050	5308.677
07/03/1988	18:00	13.250	5534.108
07/03/1988	21:00	13.470	5830.233
08/03/1988	01:30	13.790	6457.229
08/03/1988	06:00	14.060	7025.839
08/03/1988	09:00	14.210	7358.078
08/03/1988	15:00	14.480	7986.674
08/03/1988	18:00	14.500	8034.832
08/03/1988	21:00	14.700	8533.178
09/03/1988	06:00	15.000	9338.009
09/03/1988	08:00	14.980	9282.588
09/03/1988	09:00	14.990	9310.263
09/03/1988	10:00	15.010	9365.825
09/03/1988	15:00	15.100	9619.055
09/03/1988	18:00	15.140	9733.294
09/03/1988	21:00	15.170	9819.664
10/03/1988	06:00	15.220	9964.951
10/03/1988	09:00	15.220	9964.951
10/03/1988	15:00	15.200	9906.640
10/03/1988	18:00	15.190	9877.588
10/03/1988	21:00	15.170	9819.664
11/03/1988	06:00	15.070	9534.056
11/03/1988	09:00	15.010	9365.825
11/03/1988	15:00	14.860	8955.372
11/03/1988	18:00	14.820	8848.328
12/03/1988	06:00	14.410	7819.851
12/03/1988	09:00	14.240	7425.961
12/03/1988	12:00	13.860	6601.089
12/03/1988	18:00	13.550	5982.352
12/03/1988	21:00	13.220	5499.909
13/03/1988	09:00	11.430	3697.107
13/03/1988	12:00	10.620	3026.628
14/03/1988	06:30	6.290	1182.462
14/03/1988	18:00	4.240	517.614
15/03/1988	06:00	3.190	304.090
16/03/1988	07:00	2.860	248.764
17/03/1988	07:00	2.620	214.055

Units	Height (metres)		Discharge (cumecs)	
	DATE	TIME	HEIGHT	DISCHARGE

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

ION 1001 Bc 991

DATE	TIME	HEIGHT	DISCHARGE
28/12/1990	15:00	4.650	632.029
29/12/1990	09:00	8.550	2019.075
29/12/1990	15:00	10.100	2706.139
30/12/1990	07:00	12.180	4396.803
30/12/1990	09:00	12.280	4496.042
30/12/1990	12:00	12.400	4617.014
30/12/1990	15:00	12.510	4729.723
30/12/1990	18:00	12.610	4833.706
31/12/1990	09:00	12.760	4992.423
31/12/1990	15:00	12.750	4981.738
31/12/1990	18:00	12.760	4992.423
01/01/1991	09:00	12.830	5067.620
01/01/1991	15:00	12.870	5110.912
01/01/1991	18:00	12.900	5143.538
02/01/1991	06:00	13.160	5431.921
02/01/1991	15:00	13.300	5591.412
02/01/1991	18:00	13.390	5695.514
03/01/1991	09:00	13.900	6684.402
03/01/1991	15:00	14.160	7246.011
03/01/1991	18:00	14.300	7563.179
04/01/1991	09:00	15.040	9449.643
04/01/1991	15:00	15.390	10471.522
04/01/1991	18:00	15.510	10841.040
04/01/1991	21:00	15.670	11349.458
05/01/1991	06:00	16.000	12456.771
05/01/1991	09:00	16.070	12702.126
05/01/1991	12:00	16.160	13023.113
05/01/1991	15:00	16.220	13240.579
05/01/1991	18:00	16.280	13460.885
05/01/1991	21:00	16.320	13609.335
06/01/1991	06:00	16.440	14062.364
06/01/1991	09:00	16.470	14177.437
06/01/1991	12:00	16.480	14215.955
06/01/1991	15:00	16.500	14293.235
06/01/1991	18:00	16.490	14254.561
06/01/1991	21:00	16.490	14254.561
07/01/1991	06:00	16.480	14215.955
07/01/1991	09:00	16.470	14177.437
07/01/1991	12:00	16.450	14100.641
07/01/1991	15:00	16.440	14062.364
07/01/1991	18:00	16.440	14062.364
08/01/1991	06:00	16.410	13948.018
08/01/1991	09:00	16.410	13948.018
08/01/1991	15:00	16.410	13948.018
08/01/1991	18:00	16.410	13948.018
09/01/1991	06:00	16.450	14100.641
09/01/1991	09:00	16.460	14138.986
09/01/1991	12:00	16.480	14215.955
09/01/1991	15:00	16.500	14293.235
09/01/1991	18:00	16.520	14370.864
09/01/1991	21:00	16.550	14487.898
10/01/1991	06:00	16.590	14645.094
10/01/1991	12:00	16.630	14803.624
10/01/1991	15:00	16.640	14843.474
10/01/1991	18:00	16.650	14883.393
10/01/1991	21:00	16.650	14883.393
11/01/1991	06:00	16.650	14883.393
11/01/1991	09:00	16.650	14883.393
11/01/1991	12:00	16.640	14843.474
11/01/1991	15:00	16.620	14763.883
11/01/1991	18:00	16.600	14684.608
12/01/1991	06:00	16.530	14409.782
12/01/1991	09:00	16.500	14293.235
12/01/1991	12:00	16.470	14177.437
12/01/1991	15:00	16.450	14100.641
12/01/1991	18:00	16.420	13986.053
13/01/1991	06:00	16.290	13497.879
13/01/1991	09:00	16.250	13350.378
13/01/1991	12:00	16.230	13277.100
13/01/1991	15:00	16.180	13095.284
13/01/1991	18:00	16.120	12879.674
14/01/1991	06:00	15.920	12180.910
14/01/1991	09:00	15.880	12044.774
14/01/1991	15:00	15.770	11676.543
14/01/1991	18:00	15.730	11544.833
14/01/1991	21:00	15.680	11381.844
15/01/1991	06:00	15.520	10872.274
15/01/1991	09:00	15.460	10685.851
15/01/1991	12:00	15.400	10501.928
15/01/1991	18:00	15.280	10141.510
16/01/1991	09:00	14.920	9117.837
17/01/1991	09:00	13.940	6768.526
18/01/1991	09:00	11.610	3857.960
19/01/1991	09:00	8.420	1965.575
20/01/1991	09:00	6.200	1153.325
21/01/1991	09:00	-1.000	-1.000A
22/01/1991	09:00	-1.000	-1.000A
23/01/1991	09:00	-1.000	-1.000A
24/01/1991	09:00	-1.000	-1.000A
25/01/1991	09:00	-1.000	-1.000A
26/01/1991	09:00	-1.000	-1.000A
27/01/1991	09:00	-1.000	-1.000A
28/01/1991	09:00	-1.000	-1.000A
29/01/1991	09:00	-1.000	-1.000A
30/01/1991	09:00	-1.000	-1.000A
31/01/1991	09:00	-1.000	-1.000A
01/02/1991	09:00	-1.000	-1.000A
02/02/1991	09:00	-1.000	-1.000A
03/02/1991	09:00	-1.000	-1.000A
04/02/1991	09:00	-1.000	-1.000A
05/02/1991	09:00	1.000	1.000A
06/02/1991	09:00	1.000	1.000A
07/02/1991	06:30	5.980	1083.481
07/02/1991	09:00	6.210	1156.546
07/02/1991	12:00	6.710	1322.732
07/02/1991	18:00	7.210	1498.872
08/02/1991	06:00	8.510	2002.544
08/02/1991	09:00	8.510	2002.544
08/02/1991	15:00	9.200	2296.204
08/02/1991	18:00	9.590	2470.129
09/02/1991	06:00	10.850	3208.289
09/02/1991	09:00	11.150	3455.565
09/02/1991	12:00	11.350	3627.024
09/02/1991	15:00	11.580	3830.846
09/02/1991	18:00	11.720	3958.439
10/02/1991	06:00	12.540	4760.767
10/02/1991	09:00	12.750	4981.738
10/02/1991	12:00	12.910	5154.444
10/02/1991	15:00	13.060	5319.806
10/02/1991	18:00	13.280	5568.443
10/02/1991	21:00	13.340	5637.525
11/02/1991	06:00	13.610	6098.438
11/02/1991	09:00	13.690	6255.936
11/02/1991	12:00	13.750	6376.118
11/02/1991	15:00	13.820	6518.576
11/02/1991	18:00	13.880	6642.644
11/02/1991	21:00	13.940	6768.526
12/02/1991	06:00	14.070	7047.617
12/02/1991	09:00	14.100	7113.279
12/02/1991	12:00	14.110	7135.267
12/02/1991	15:00	14.120	7157.306
12/02/1991	18:00	14.130	7179.404
12/02/1991	21:00	14.140	7201.552
13/02/1991	06:00	14.140	7201.552
13/02/1991	09:00	14.130	7179.404
13/02/1991	12:00	14.100	7113.279

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

produced 06.09.1991

STATION 130003A Batch 954

Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE
21/01/1954	09:00	1.170	3.754
22/01/1954	09:00	1.160	3.500
23/01/1954	09:00	2.130	50.922
24/01/1954	09:00	3.200	126.157
25/01/1954	09:00	4.420	311.585
26/01/1954	09:00	5.720	603.658
27/01/1954	09:00	7.320	977.344
28/01/1954	09:00	8.150	1187.593
29/01/1954	09:00	7.470	1012.435
30/01/1954	09:00	6.100	710.000
31/01/1954	09:00	4.720	369.426
01/02/1954	09:00	3.480	150.018
02/02/1954	09:00	3.050	114.112
03/02/1954	09:00	3.200	126.157
04/02/1954	09:00	3.860	197.834
05/02/1954	09:00	5.870	644.468
06/02/1954	09:00	6.810	861.620
07/02/1954	09:00	6.810	861.620
07/02/1954	20:00	7.110	929.017
08/02/1954	08:00	8.790	1365.961
08/02/1954	16:30	10.190	1792.531
08/02/1954	20:00	12.120	2459.520
09/02/1954	08:00	15.370	3832.582
09/02/1954	16:00	16.460	4361.186
09/02/1954	20:00	17.220	4747.945
10/02/1954	07:15	19.000	5734.270
10/02/1954	11:45	19.580	6086.190
10/02/1954	15:45	20.040	6372.472
10/02/1954	18:15	20.320	6549.832
10/02/1954	20:00	20.420	6613.744
11/02/1954	08:00	21.340	7215.737
11/02/1954	12:00	21.590	7383.682
11/02/1954	16:00	21.870	7573.992
11/02/1954	20:00	22.200	7801.278
12/02/1954	06:30	23.270	8560.467
12/02/1954	12:00	23.830	8971.325
12/02/1954	16:00	24.230	9270.469
12/02/1954	18:00	24.440	9429.409
12/02/1954	20:00	24.540	9505.554
13/02/1954	06:30	25.910	11655.059
13/02/1954	09:00	26.210	12203.270
13/02/1954	12:30	26.670	13080.876
13/02/1954	15:47	27.050	13840.583C
13/02/1954	20:39	27.417	14605.033C
14/02/1954	01:32	27.667	15143.487C
14/02/1954	07:54	27.900	15658.494C
14/02/1954	15:18	28.067	16035.564C
15/02/1954	00:46	28.183	16301.436C
15/02/1954	12:00	28.200	16340.663
15/02/1954	19:30	28.183	16301.436C
16/02/1954	05:25	28.100	16110.877C
16/02/1954	15:04	28.017	15921.964C
17/02/1954	03:41	27.867	15584.777C
17/02/1954	16:18	27.700	15215.641C
18/02/1954	06:02	27.483	14745.775C
18/02/1954	18:39	27.237	14226.278C
19/02/1954	20:00	26.670	13080.876
20/02/1954	09:00	26.370	12503.397
20/02/1954	20:00	26.110	12018.454
21/02/1954	09:00	25.910	11655.059
21/02/1954	20:00	25.500	10935.763
22/02/1954	09:00	25.200	10430.782
22/02/1954	16:30	24.990	10087.769
22/02/1954	20:00	24.900	9943.368
23/02/1954	09:00	24.790	9768.975
23/02/1954	20:00	24.480	9459.832
24/02/1954	09:00	24.230	9270.469
24/02/1954	16:00	24.080	9157.734
24/02/1954	20:00	23.950	9060.568
25/02/1954	09:00	23.720	8889.889
25/02/1954	16:00	23.160	8480.854
25/02/1954	20:00	23.040	8394.413
26/02/1954	09:00	22.840	8251.293
26/02/1954	16:00	22.250	7835.995
26/02/1954	20:00	21.790	7519.380
27/02/1954	09:00	20.980	6977.167
27/02/1954	18:00	19.760	6197.459
27/02/1954	20:00	19.250	5884.723
28/02/1954	09:00	17.650	4973.339
28/02/1954	20:00	14.940	3632.581

DATUM : [illegible]

KIVERSLEA

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

DAILY DISCHARGES REPORT

produced 16.09.1991

STATION 130003B Batch 998 CLIMATIC YEAR 90/91

Units Volume (megalitres)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		14.5	0.0	598640.7	6550.6	12618.0						
2		13.4	0.0	932528.3	6806.2	11274.3						
3	34.0	11.8	0.0	1184959.1	6322.4	9963.8						
4	7.1	9.1	0.0	1194457.0	7452.9	8764.0						
5	7.1	9.3	0.0	1142063.8	36068.7	7783.8						
6	6.3	4.6	0.0	1072414.6	107668.8	7028.8						
7	9.8	2.3	0.0	1157964.3C	237223.0	6388.6						
8	8.3	1.6	0.0	1284659.8C	390394.1	5994.5						
9	6.7	1.6	0.0	1264697.8	542139.5							
10	6.2	0.5	0.0	1182561.0	649508.4							
11	7.3	0.1	0.0	1082603.6	643710.8							
12	4.9	0.0	0.0	972966.8	568137.8							
13	2.2	0.0	0.0	856621.7	444107.2							
14	0.6	0.0	0.0	715413.2	320766.0							
15	1.2	0.0	0.0	526171.7	252190.5							
16	1.3	0.0	0.0	320039.0	249248.7							
17	1.2	0.0	0.0	164336.0	233482.6							
18	4.2	0.0	0.0	99330.1	166877.0							
19	4.6	0.0	0.0	60945.4	101802.2							
20	4.7	0.0	0.0	35043.9	87735.2							
21	9.3	0.0	0.0	25145.9	100379.1							
22	20.4	0.0	0.0	19756.4	100831.0							
23	23.5	0.0	0.0	16121.3	88931.6							
24	23.8	0.0	0.0	13742.1	66643.4							
25	33.9	0.0	0.0	11930.5	36345.4							
26	40.9	0.0	0.0	10111.1	22684.5							
27	32.1	0.0	0.0	9426.1	17105.8							
28	29.9	0.0	17924.6	8150.0	14210.5							
29	26.5	0.0	157746.4	7087.1								
30	24.8	0.0	318939.3	6481.6								
31	15.2		438214.8	6319.3								
Month Total	378.2	68.8	932825.1	15982689.0	5505323.5	69588.1						

Datum: AHD (mm)

READING STATUS
A Missing Day
B No Rating
C Derived Height
D Derived Discharge
E No Flow Reading
F Backwater Reading

1991 FLOOD

FITZROY R. at RIVERSLEA

BASIC DATA REPORT

produced 16.09.1991

STATION 1300038 Batch 998 Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE	DATE	TIME	HEIGHT	DISCHARGE	DATE	TIME	HEIGHT	DISCHARGE
03/10/1990	15:00	0.995	0.468	07/11/1990	14:15	0.889	0.015	17/12/1990	00:00	0.528	0.000
04/10/1990	00:00	0.921	0.073	08/11/1990	00:00	0.889	0.015	18/12/1990	00:00	0.528	0.000
05/10/1990	00:00	0.926	0.092	09/11/1990	00:00	0.896	0.023	19/12/1990	00:00	0.528	0.000
06/10/1990	00:00	0.921	0.073	10/11/1990	00:00	0.889	0.015	20/12/1990	00:00	0.528	0.000
07/10/1990	00:00	0.921	0.073	10/11/1990	14:45	0.869	0.000	21/12/1990	00:00	0.529	0.000
07/10/1990	20:00	0.942	0.146	11/11/1990	00:00	0.881	0.005	22/12/1990	00:00	0.529	0.000
08/10/1990	00:00	0.932	0.115	11/11/1990	09:45	0.862	0.000	23/12/1990	00:00	0.529	0.000
09/10/1990	00:00	0.922	0.077	12/11/1990	00:00	0.860	0.000	24/12/1990	00:00	0.529	0.000
10/10/1990	00:00	0.922	0.077	13/11/1990	00:00	0.860	0.000	25/12/1990	00:00	0.530	0.000
11/10/1990	00:00	0.919	0.067	14/11/1990	00:00	0.850	0.000	25/12/1990	21:30	0.550	0.000
12/10/1990	00:00	0.928	0.101	15/11/1990	00:00	0.850	0.000	25/12/1990	21:45	0.577	0.000
12/10/1990	13:30	0.905	0.035	16/11/1990	00:00	0.846	0.000	26/12/1990	00:00	0.577	0.000
13/10/1990	00:00	0.913	0.051	17/11/1990	00:00	0.838	0.000	26/12/1990	03:15	0.602	0.000
13/10/1990	10:15	0.893	0.020	18/11/1990	00:00	0.838	0.000	27/12/1990	00:00	0.610	0.000
14/10/1990	00:00	0.890	0.017	18/11/1990	12:45	0.816	0.000	27/12/1990	06:30	0.632	0.000
14/10/1990	13:00	0.870	0.001	19/11/1990	00:00	0.831	0.000	27/12/1990	22:15	0.687	0.000
15/10/1990	00:00	0.885	0.008	20/11/1990	00:00	0.842	0.000	28/12/1990	00:00	0.702	0.000
16/10/1990	00:00	0.893	0.020	21/11/1990	00:00	0.837	0.000	28/12/1990	01:30	0.727	0.000
17/10/1990	00:00	0.886	0.010	22/11/1990	00:00	0.834	0.000	28/12/1990	05:45	0.747	0.000
18/10/1990	00:00	0.891	0.018	23/11/1990	00:00	0.834	0.000	28/12/1990	06:30	0.767	0.000
18/10/1990	01:15	0.911	0.046	24/11/1990	00:00	0.839	0.000	28/12/1990	07:00	0.792	0.000
19/10/1990	00:00	0.914	0.053	25/11/1990	00:00	0.835	0.000	28/12/1990	07:45	0.822	0.000
20/10/1990	00:00	0.914	0.053	26/11/1990	00:00	0.835	0.000	28/12/1990	08:15	0.847	0.000
21/10/1990	00:00	0.915	0.056	27/11/1990	00:00	0.820	0.000	28/12/1990	08:45	0.875	0.002
21/10/1990	13:15	0.937	0.130	27/11/1990	23:15	0.775	0.000	28/12/1990	09:00	0.897	0.024
22/10/1990	00:00	0.950	0.176	28/11/1990	00:00	0.775	0.000	28/12/1990	09:15	0.922	0.077
22/10/1990	19:30	0.970	0.275	29/11/1990	00:00	0.764	0.000	28/12/1990	09:30	0.952	0.184
23/10/1990	00:00	0.972	0.287	30/11/1990	00:00	0.764	0.000	28/12/1990	09:45	1.005	0.575
24/10/1990	00:00	0.967	0.257	01/12/1990	00:00	0.764	0.000	28/12/1990	10:00	1.055	1.520
25/10/1990	00:00	0.973	0.293	01/12/1990	07:30	0.706	0.000	28/12/1990	10:15	1.107	2.630
25/10/1990	17:15	0.993	0.449	02/12/1990	00:00	0.706	0.000	28/12/1990	10:30	1.155	3.664
26/10/1990	00:00	0.993	0.449	03/12/1990	00:00	0.707	0.000	28/12/1990	10:45	1.210	5.207
27/10/1990	00:00	0.998	0.498	04/12/1990	00:00	0.707	0.000	28/12/1990	11:00	1.267	7.289
27/10/1990	12:00	0.976	0.313	05/12/1990	00:00	0.697	0.000	28/12/1990	11:15	1.332	10.389
28/10/1990	00:00	0.983	0.364	06/12/1990	00:00	0.697	0.000	28/12/1990	11:30	1.395	13.132
29/10/1990	00:00	0.978	0.327	07/12/1990	00:00	0.697	0.000	28/12/1990	11:45	1.457	15.279
30/10/1990	00:00	0.972	0.287	07/12/1990	17:45	0.663	0.000	28/12/1990	12:00	1.505	17.067
31/10/1990	00:00	0.972	0.287	07/12/1990	18:15	0.643	0.000	28/12/1990	12:15	1.557	19.128
31/10/1990	10:15	0.939	0.136	07/12/1990	21:00	0.621	0.000	28/12/1990	12:30	1.600	20.932
01/11/1990	00:00	0.947	0.164	07/12/1990	21:45	0.551	0.000	28/12/1990	12:45	1.647	23.009
02/11/1990	00:00	0.949	0.172	07/12/1990	22:15	0.526	0.000	28/12/1990	13:00	1.685	24.768
03/11/1990	00:00	0.940	0.139	08/12/1990	00:00	0.526	0.000	28/12/1990	13:15	1.735	27.194
04/11/1990	00:00	0.938	0.133	09/12/1990	00:00	0.526	0.000	28/12/1990	13:30	1.805	30.803
04/11/1990	16:00	0.918	0.064	10/12/1990	00:00	0.526	0.000	28/12/1990	13:45	1.905	36.398
04/11/1990	21:30	0.940	0.139	11/12/1990	00:00	0.526	0.000	28/12/1990	14:00	2.032	44.262
05/11/1990	00:00	0.950	0.176	12/12/1990	00:00	0.527	0.000	28/12/1990	14:15	2.185	54.889
05/11/1990	08:15	0.925	0.088	13/12/1990	00:00	0.527	0.000	28/12/1990	14:30	2.372	66.324
06/11/1990	00:00	0.928	0.101	14/12/1990	00:00	0.527	0.000	28/12/1990	14:45	2.560	78.458
06/11/1990	11:15	0.903	0.032	15/12/1990	00:00	0.527	0.000	28/12/1990	15:00	2.790	94.479
07/11/1990	00:00	0.914	0.053	16/12/1990	00:00	0.528	0.000	28/12/1990	15:15	3.035	112.936

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

STATION 130003B Batch 998

Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE
28/12/1990	15:45	3.510	152.679
28/12/1990	16:00	3.725	174.162
28/12/1990	16:15	3.925	209.973
28/12/1990	16:30	4.082	241.355
28/12/1990	16:45	4.225	272.579
28/12/1990	17:00	4.363	301.222
28/12/1990	17:15	4.476	321.959
28/12/1990	17:30	4.583	342.320
28/12/1990	17:45	4.688	362.990
28/12/1990	18:00	4.786	382.905
28/12/1990	18:15	4.873	401.091
28/12/1990	18:30	4.973	422.587
28/12/1990	18:45	5.066	443.152
28/12/1990	19:00	5.163	465.194
28/12/1990	19:15	5.251	485.716
28/12/1990	19:30	5.353	510.134
28/12/1990	19:45	5.458	535.982
28/12/1990	20:00	5.558	561.275
28/12/1990	20:15	5.676	591.973
28/12/1990	20:30	5.798	624.690
28/12/1990	20:45	5.936	662.905
28/12/1990	21:00	6.071	701.539
28/12/1990	21:15	6.186	727.763
28/12/1990	21:30	6.323	756.408
28/12/1990	21:45	6.451	783.551
28/12/1990	22:00	6.581	811.493
28/12/1990	22:15	6.696	836.522
28/12/1990	22:30	6.806	860.735
28/12/1990	22:45	6.911	884.093
28/12/1990	23:00	7.011	906.561
28/12/1990	23:15	7.111	929.245
28/12/1990	23:30	7.186	946.398
28/12/1990	23:45	7.261	963.672
29/12/1990	00:00	7.400	996.000
29/12/1990	00:15	7.470	1012.435
29/12/1990	00:30	7.532	1027.078
29/12/1990	00:45	7.607	1044.899
29/12/1990	01:00	7.650	1055.702
29/12/1990	01:15	7.700	1068.593
29/12/1990	01:30	7.755	1082.850
29/12/1990	01:45	7.817	1099.018
29/12/1990	02:00	7.850	1107.665
29/12/1990	02:15	7.897	1120.030
29/12/1990	02:30	7.922	1126.631
29/12/1990	02:45	7.955	1135.370
29/12/1990	03:00	7.997	1146.533
29/12/1990	03:15	8.022	1153.200
29/12/1990	03:30	8.055	1162.026
29/12/1990	03:45	8.095	1172.762
29/12/1990	04:00	8.135	1183.540
29/12/1990	04:15	8.160	1190.298
29/12/1990	04:45	8.207	1203.046
29/12/1990	05:00	8.237	1211.214
29/12/1990	05:45	8.282	1223.510
29/12/1990	06:15	8.335	1238.059
29/12/1990	06:45	8.365	1246.327
29/12/1990	07:00	8.397	1255.172
29/12/1990	07:30	8.445	1268.489
29/12/1990	08:00	8.495	1282.425
29/12/1990	08:15	8.537	1294.181
29/12/1990	08:30	8.582	1306.827
29/12/1990	08:45	8.615	1316.135
29/12/1990	09:00	8.657	1328.021
29/12/1990	09:15	8.692	1337.961
29/12/1990	09:30	8.740	1351.644
29/12/1990	09:45	8.780	1363.092
29/12/1990	10:00	8.822	1375.157
29/12/1990	10:15	8.872	1389.578
29/12/1990	10:30	8.925	1404.935
29/12/1990	10:45	8.970	1418.031
29/12/1990	11:00	9.027	1434.692
29/12/1990	11:15	9.082	1450.847
29/12/1990	11:30	9.135	1466.488
29/12/1990	11:45	9.210	1488.743
29/12/1990	12:00	9.260	1503.659
29/12/1990	12:15	9.335	1526.152
29/12/1990	12:30	9.412	1549.392
29/12/1990	12:45	9.495	1574.610
29/12/1990	13:00	9.592	1604.301
29/12/1990	13:15	9.690	1634.538
29/12/1990	13:30	9.807	1670.952
29/12/1990	13:45	9.910	1703.290
29/12/1990	14:00	10.022	1738.754
29/12/1990	14:15	10.160	1782.877
29/12/1990	14:30	10.285	1823.250
29/12/1990	14:45	10.420	1867.284
29/12/1990	15:00	10.557	1912.427
29/12/1990	15:15	10.692	1957.359
29/12/1990	15:30	10.835	2005.437
29/12/1990	15:45	10.972	2051.964
29/12/1990	16:00	11.125	2104.460
29/12/1990	16:15	11.272	2155.428
29/12/1990	16:30	11.400	2200.232
29/12/1990	16:45	11.545	2251.459
29/12/1990	17:00	11.685	2301.395
29/12/1990	17:15	11.820	2349.989
29/12/1990	17:30	11.945	2395.368
29/12/1990	17:45	12.065	2439.280
29/12/1990	18:00	12.180	2481.680
29/12/1990	18:15	12.292	2523.272
29/12/1990	18:30	12.405	2565.534
29/12/1990	18:45	12.500	2601.294
29/12/1990	19:00	12.612	2643.725
29/12/1990	19:15	12.702	2678.033
29/12/1990	19:30	12.792	2712.529
29/12/1990	19:45	12.887	2749.146
29/12/1990	20:00	12.990	2789.080
29/12/1990	20:15	13.087	2826.913
29/12/1990	20:30	13.160	2856.681
29/12/1990	20:45	13.235	2887.667
29/12/1990	21:00	13.315	2920.885
29/12/1990	21:15	13.382	2948.839
29/12/1990	21:30	13.445	2975.232
29/12/1990	21:45	13.505	3000.468
29/12/1990	22:00	13.562	3024.531
29/12/1990	22:15	13.610	3044.863
29/12/1990	22:30	13.662	3066.957
29/12/1990	22:45	13.715	3089.552
29/12/1990	23:00	13.752	3105.370
29/12/1990	23:15	13.790	3121.654
29/12/1990	23:30	13.827	3137.545
29/12/1990	23:45	13.865	3153.904
30/12/1990	00:00	13.887	3163.393
30/12/1990	00:15	13.920	3177.651
30/12/1990	00:45	13.972	3200.176
30/12/1990	01:15	14.012	3217.552
30/12/1990	02:15	14.037	3228.433
30/12/1990	02:30	14.070	3242.822
30/12/1990	03:00	14.142	3274.318
30/12/1990	03:30	14.177	3289.678
30/12/1990	03:45	14.197	3298.469
30/12/1990	04:00	14.225	3310.795
30/12/1990	04:30	14.270	3330.648
30/12/1990	05:00	14.307	3347.013
30/12/1990	05:15	14.340	3361.638
30/12/1990	05:30	14.365	3372.738
30/12/1990	06:00	14.420	3397.215
30/12/1990	06:15	14.442	3407.029
30/12/1990	06:30	14.475	3421.773
30/12/1990	07:00	14.515	3439.681
30/12/1990	07:15	14.535	3448.652
30/12/1990	07:30	14.565	3462.128
30/12/1990	08:00	14.615	3484.640
30/12/1990	08:15	14.637	3494.567
30/12/1990	08:45	14.677	3512.649
30/12/1990	09:00	14.725	3534.402
30/12/1990	09:30	14.755	3548.028
30/12/1990	10:00	14.797	3567.144
30/12/1990	10:15	14.817	3576.264
30/12/1990	10:30	14.847	3589.962

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

BASIC DATA REPORT

produced 16.09.1991

STATION 1300038 Batch 998

Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE
0/12/1990	11:15	14.932	3628.906
0/12/1990	11:30	14.967	3644.995
0/12/1990	11:45	14.990	3655.586
0/12/1990	12:15	15.037	3677.272
0/12/1990	12:30	15.067	3691.146
0/12/1990	12:00	15.115	3713.392
0/12/1990	13:15	15.157	3732.903
0/12/1990	13:30	15.157	3732.905
0/12/1990	13:45	15.197	3751.533
0/12/1990	14:00	15.217	3760.863
0/12/1990	14:15	15.250	3776.280
0/12/1990	14:45	15.312	3805.324
0/12/1990	15:00	15.340	3818.472
0/12/1990	15:15	15.362	3828.818
0/12/1990	15:45	15.400	3846.718
0/12/1990	16:00	15.430	3860.876
0/12/1990	16:15	15.475	3882.157
0/12/1990	16:45	15.525	3905.863
0/12/1990	17:00	15.557	3921.071
0/12/1990	17:15	15.585	3934.400
0/12/1990	17:45	15.640	3960.639
0/12/1990	18:00	15.670	3974.986
0/12/1990	18:30	15.715	3996.549
0/12/1990	18:45	15.745	4010.953
0/12/1990	19:00	15.782	4028.751
0/12/1990	19:15	15.807	4040.797
0/12/1990	19:30	15.830	4051.393
0/12/1990	19:45	15.850	4061.554
0/12/1990	20:00	15.905	4088.173
0/12/1990	20:15	15.932	4101.271
0/12/1990	20:30	15.975	4122.167
0/12/1990	20:45	15.997	4132.878
0/12/1990	21:15	16.067	4167.039
0/12/1990	21:45	16.097	4181.718
30/12/1990	22:00	16.142	4203.781
30/12/1990	22:15	16.165	4215.078
30/12/1990	22:30	16.200	4232.296
30/12/1990	22:45	16.242	4252.997
30/12/1990	23:00	16.277	4270.284
30/12/1990	23:15	16.315	4289.090
30/12/1990	23:30	16.350	4306.441
31/12/1990	00:00	16.382	4322.335
31/12/1990	00:30	16.450	4356.197
31/12/1990	00:45	16.472	4367.176
31/12/1990	01:00	16.500	4381.172
31/12/1990	01:15	16.535	4398.691
31/12/1990	01:30	16.567	4414.737
31/12/1990	02:00	16.615	4438.858
31/12/1990	02:15	16.662	4462.532
31/12/1990	02:45	16.717	4490.307
31/12/1990	03:00	16.755	4509.544
31/12/1990	03:15	16.792	4528.310
31/12/1990	03:45	16.847	4556.271
31/12/1990	04:15	16.895	4580.737
31/12/1990	04:30	16.932	4599.635
31/12/1990	04:45	16.957	4612.426
31/12/1990	05:00	16.997	4632.922
31/12/1990	05:15	17.035	4652.433
31/12/1990	05:30	17.067	4668.892
31/12/1990	06:00	17.127	4699.821
31/12/1990	06:15	17.150	4711.703
31/12/1990	06:30	17.180	4727.222
31/12/1990	06:45	17.207	4741.207
31/12/1990	07:00	17.237	4756.768
31/12/1990	07:30	17.287	4782.754
31/12/1990	07:45	17.327	4803.589
31/12/1990	08:00	17.357	4819.244
31/12/1990	09:15	17.487	4887.344
31/12/1990	09:30	17.530	4909.963
31/12/1990	09:45	17.557	4924.189
31/12/1990	10:00	17.592	4942.661
31/12/1990	10:15	17.612	4953.231
31/12/1990	10:45	17.692	4995.607
31/12/1990	11:15	17.722	5011.542
31/12/1990	11:30	17.767	5035.485
31/12/1990	12:00	17.792	5048.807
31/12/1990	12:15	17.835	5071.762
31/12/1990	12:30	17.875	5093.158
31/12/1990	12:45	17.910	5111.912
31/12/1990	13:15	17.952	5134.461
31/12/1990	13:30	17.997	5158.666
31/12/1990	13:45	18.030	5176.452
31/12/1990	14:15	18.057	5191.023
31/12/1990	14:30	18.100	5214.269
31/12/1990	15:00	18.135	5233.223
31/12/1990	15:15	18.160	5246.781
31/12/1990	15:30	18.215	5276.667
31/12/1990	16:00	18.280	5312.083
31/12/1990	16:45	18.320	5337.145
31/12/1990	17:00	18.365	5369.052
31/12/1990	17:15	18.397	5391.804
31/12/1990	17:45	18.432	5416.756
31/12/1990	18:00	18.480	5451.084
31/12/1990	18:30	18.515	5476.194
31/12/1990	18:45	18.542	5495.609
31/12/1990	19:15	18.585	5526.611
31/12/1990	19:30	18.607	5542.511
31/12/1990	20:00	18.665	5584.558
31/12/1990	20:15	18.690	5602.740
31/12/1990	20:30	18.730	5631.897
31/12/1990	21:00	18.765	5657.484
31/12/1990	21:30	18.820	5697.826
31/12/1990	21:45	18.847	5717.689
31/12/1990	22:00	18.870	5734.642
31/12/1990	22:30	18.895	5753.104
31/12/1990	22:45	18.927	5776.782
31/12/1990	23:00	18.947	5791.610
31/12/1990	23:15	18.982	5817.613
31/12/1990	23:30	19.007	5836.224
31/12/1990	23:45	19.032	5854.873
01/01/1991	00:00	19.050	5868.321
01/01/1991	00:15	19.097	5903.519
01/01/1991	00:45	19.122	5922.290
01/01/1991	01:00	19.147	5941.093
01/01/1991	01:15	19.202	5982.589
01/01/1991	01:45	19.235	6007.566
01/01/1991	02:15	19.295	6053.133
01/01/1991	02:30	19.325	6075.989
01/01/1991	02:45	19.350	6095.075
01/01/1991	03:15	19.395	6129.518
01/01/1991	03:45	19.432	6157.920
01/01/1991	04:00	19.460	6179.464
01/01/1991	04:15	19.502	6211.860
01/01/1991	04:45	19.545	6245.131
01/01/1991	05:00	19.565	6260.642
01/01/1991	05:30	19.607	6293.284
01/01/1991	06:00	19.662	6336.179
01/01/1991	06:30	19.710	6373.749
01/01/1991	06:45	19.732	6391.013
01/01/1991	07:00	19.765	6416.959
01/01/1991	07:15	19.797	6442.175
01/01/1991	07:30	19.817	6457.965
01/01/1991	08:00	19.852	6485.651
01/01/1991	08:30	19.912	6533.271
01/01/1991	09:00	19.955	6567.523
01/01/1991	09:30	19.997	6601.076
01/01/1991	09:45	20.017	6617.088
01/01/1991	10:15	20.065	6655.611
01/01/1991	10:30	20.100	6683.785
01/01/1991	10:45	20.120	6699.911
01/01/1991	11:00	20.142	6717.679
01/01/1991	11:30	20.197	6762.216
01/01/1991	12:00	20.252	6806.925
01/01/1991	12:15	20.275	6825.668
01/01/1991	12:30	20.290	6837.912
01/01/1991	12:45	20.327	6868.158
01/01/1991	13:00	20.355	6891.104
01/01/1991	13:15	20.377	6909.161
01/01/1991	13:30	20.405	6932.186
01/01/1991	13:45	20.430	6952.775

Status A Missing Data E No Flow Reading F Backwater Reading

STATION 1300038 Batch 998

Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE
01/01/1991	14:15	20.490	7002.345
01/01/1991	14:30	20.535	7039.653
01/01/1991	14:45	20.565	7064.588
01/01/1991	15:15	20.610	7102.086
01/01/1991	15:30	20.642	7128.819
01/01/1991	15:45	20.697	7174.909
01/01/1991	16:00	20.717	7191.707
01/01/1991	16:15	20.747	7216.956
01/01/1991	16:30	20.777	7242.252
01/01/1991	16:45	20.837	7292.996
01/01/1991	17:00	20.867	7318.444
01/01/1991	17:15	20.892	7339.690
01/01/1991	17:30	20.945	7384.854
01/01/1991	17:45	20.970	7406.211
01/01/1991	18:00	21.040	7466.202
01/01/1991	18:15	21.067	7489.412
01/01/1991	18:30	21.127	7541.149
01/01/1991	18:45	21.152	7562.767
01/01/1991	19:00	21.177	7584.417
01/01/1991	19:15	21.255	7652.203
01/01/1991	19:45	21.337	7723.840
01/01/1991	20:00	21.377	7758.926
01/01/1991	20:15	21.422	7798.510
01/01/1991	20:30	21.452	7824.960
01/01/1991	20:45	21.502	7869.158
01/01/1991	21:00	21.565	7925.055
01/01/1991	22:15	21.825	8158.162
01/01/1991	22:30	21.887	8214.326
01/01/1991	22:45	21.920	8244.311
01/01/1991	23:00	21.972	8291.684
01/01/1991	23:15	22.037	8351.124
01/01/1991	23:30	22.090	8399.770
01/01/1991	23:45	22.140	8445.816
02/01/1991	00:00	22.157	8461.499
02/01/1991	00:15	22.227	8526.276
02/01/1991	00:30	22.277	8572.717
02/01/1991	00:45	22.297	8591.338
02/01/1991	01:00	22.395	8682.895
02/01/1991	01:15	22.432	8717.608
02/01/1991	01:30	22.490	8772.189
02/01/1991	01:45	22.550	8828.858
02/01/1991	02:00	22.575	8852.530
02/01/1991	02:15	22.647	8920.915
02/01/1991	02:30	22.685	8957.132
02/01/1991	02:45	22.732	9002.041
02/01/1991	03:00	22.802	9069.167
02/01/1991	03:15	22.827	9093.207
02/01/1991	03:30	22.892	9155.893
02/01/1991	03:45	22.945	9207.189
02/01/1991	04:00	22.972	9233.386
02/01/1991	04:15	23.022	9282.003
02/01/1991	04:30	23.110	9367.944
02/01/1991	04:45	23.142	9399.304
02/01/1991	05:00	23.217	9473.048
02/01/1991	05:15	23.250	9505.598
02/01/1991	05:30	23.285	9540.196
02/01/1991	06:45	23.527	9781.380
02/01/1991	07:00	23.592	9846.752
02/01/1991	07:15	23.637	9892.161
02/01/1991	07:30	23.702	9957.958
02/01/1991	07:45	23.757	10013.233
02/01/1991	08:00	23.787	10044.390
02/01/1991	08:15	23.842	10100.539
02/01/1991	08:30	23.890	10149.693
02/01/1991	08:45	23.912	10172.268
02/01/1991	09:00	23.987	10249.443
02/01/1991	09:15	24.020	10283.507
02/01/1991	09:30	24.067	10332.137
02/01/1991	09:45	24.107	10373.625
02/01/1991	10:00	24.190	10460.026
02/01/1991	10:15	24.230	10501.811
02/01/1991	10:30	24.290	10564.670
02/01/1991	10:45	24.325	10601.432
02/01/1991	11:00	24.382	10661.471
02/01/1991	11:15	24.420	10701.602
02/01/1991	11:30	24.462	10746.059
02/01/1991	11:45	24.502	10788.502
02/01/1991	12:00	24.555	10844.879
02/01/1991	12:15	24.597	10889.684
02/01/1991	12:30	24.662	10959.229
02/01/1991	12:45	24.692	10991.408
02/01/1991	13:00	24.732	11035.853
02/01/1991	13:30	24.817	11131.419
02/01/1991	13:45	24.867	11187.861
02/01/1991	14:00	24.887	11210.486
02/01/1991	14:15	24.932	11261.490
02/01/1991	14:30	24.992	11329.713
02/01/1991	14:45	25.045	11390.178
02/01/1991	15:00	25.082	11432.506
02/01/1991	15:30	25.175	11539.297
02/01/1991	16:00	25.232	11605.053
02/01/1991	16:15	25.272	11651.320
02/01/1991	16:30	25.320	11706.988
02/01/1991	16:45	25.360	11753.504
02/01/1991	17:00	25.385	11782.632
02/01/1991	18:00	25.527	11948.875
02/01/1991	18:15	25.595	12028.976
02/01/1991	18:30	25.625	12064.419
02/01/1991	18:45	25.662	12108.213
02/01/1991	19:00	25.682	12131.929
02/01/1991	19:15	25.715	12171.113
02/01/1991	19:30	25.780	12248.514
02/01/1991	21:00	25.947	12448.713
02/01/1991	21:15	25.982	12490.922
02/01/1991	21:30	26.030	12548.938
02/01/1991	22:00	26.082	12611.972
02/01/1991	22:30	26.140	12682.494
02/01/1991	22:45	26.172	12721.505
02/01/1991	23:00	26.220	12780.151
02/01/1991	23:30	26.240	12804.638
02/01/1991	23:45	26.280	12853.690
03/01/1991	00:00	26.307	12886.868
03/01/1991	00:30	26.360	12952.133
03/01/1991	00:45	26.405	13007.701
03/01/1991	01:30	26.457	13072.093
03/01/1991	01:45	26.500	13125.479
03/01/1991	02:15	26.520	13150.352
03/01/1991	02:30	26.547	13183.983
03/01/1991	03:00	26.575	13218.907
03/01/1991	03:15	26.620	13275.153
03/01/1991	03:45	26.640	13300.192
03/01/1991	04:15	26.702	13378.008
03/01/1991	05:30	26.765	13457.352
03/01/1991	05:45	26.787	13485.122
03/01/1991	06:15	26.810	13514.192
03/01/1991	08:30	26.937	13675.387
03/01/1991	09:00	26.967	13713.633
03/01/1991	10:15	27.015	13774.954
03/01/1991	11:15	27.035	13800.553
03/01/1991	14:30	27.145	13941.858
03/01/1991	18:30	27.192	14002.487
03/01/1991	19:45	27.220	14038.688
03/01/1991	20:15	27.195	14006.358
03/01/1991	20:45	27.170	13974.086
03/01/1991	21:30	27.197	14008.943
03/01/1991	21:45	27.177	13983.118
03/01/1991	22:00	27.212	14028.339
03/01/1991	22:15	27.165	13967.637
03/01/1991	22:30	27.192	14002.487
03/01/1991	23:45	27.212	14028.339
04/01/1991	00:00	27.197	14008.943
04/01/1991	00:45	27.162	13963.767
04/01/1991	01:00	27.205	14019.287
04/01/1991	02:00	27.185	13993.442
04/01/1991	03:15	27.155	13954.746
04/01/1991	03:30	27.182	13989.575
04/01/1991	04:00	27.152	13950.880
04/01/1991	06:15	27.127	13918.678
04/01/1991	06:45	27.150	13948.297
04/01/1991	07:30	27.127	13918.678

BASIC DATA REPORT

produced 16.09.1991

STATION 1300038 Batch 998

Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE
04/01/1991	03:00	27.135	13922.974
04/01/1991	09:15	27.112	13899.378
04/01/1991	09:45	27.090	13871.101
04/01/1991	11:45	27.057	13828.742
04/01/1991	12:15	27.080	13858.253
04/01/1991	13:30	27.030	13794.156
04/01/1991	13:45	27.070	13845.418
04/01/1991	14:00	27.037	13803.118
04/01/1991	15:45	27.017	13777.515
04/01/1991	17:15	26.992	13745.555
04/01/1991	17:30	27.017	13777.515
04/01/1991	18:00	26.980	13730.225
04/01/1991	20:15	26.920	13653.747
04/01/1991	20:45	26.940	13679.214
04/01/1991	21:30	26.900	13628.310
04/01/1991	21:45	26.920	13653.747
04/01/1991	22:15	26.895	13621.955
04/01/1991	22:30	26.870	13590.210
04/01/1991	23:00	26.890	13615.604
04/01/1991	23:15	26.862	13580.055
04/01/1991	23:45	26.842	13554.699
05/01/1991	00:00	26.852	13567.375
05/01/1991	00:30	26.810	13514.192
05/01/1991	01:45	26.785	13482.598
05/01/1991	03:15	26.740	13425.826
05/01/1991	04:15	26.717	13396.874
05/01/1991	05:45	26.695	13369.203
05/01/1991	06:30	26.670	13337.813
05/01/1991	08:45	26.637	13296.436
05/01/1991	10:00	26.607	13258.887
05/01/1991	10:15	26.635	13293.928
05/01/1991	10:30	26.615	13268.892
05/01/1991	12:45	26.585	13231.386
05/01/1991	15:00	26.540	13175.253
05/01/1991	16:45	26.512	13140.400
05/01/1991	18:00	26.480	13100.627
05/01/1991	18:15	26.455	13069.610
05/01/1991	18:30	26.432	13041.109
05/01/1991	18:45	26.455	13069.610
05/01/1991	19:15	26.432	13041.109
05/01/1991	20:15	26.407	13010.172
05/01/1991	20:30	26.387	12985.459
05/01/1991	21:00	26.367	12960.768
05/01/1991	21:30	26.345	12933.640
05/01/1991	22:00	26.315	12896.706
05/01/1991	22:45	26.292	12868.434
05/01/1991	23:15	26.265	12835.286
05/01/1991	23:45	26.242	12807.088
06/01/1991	00:00	26.245	12810.767
06/01/1991	00:15	26.220	12780.151
06/01/1991	01:00	26.200	12755.695
06/01/1991	01:30	26.170	12719.063
06/01/1991	01:45	26.145	12688.581
06/01/1991	02:45	26.122	12660.577
06/01/1991	03:45	26.090	12621.685
06/01/1991	04:30	26.067	12593.768
06/01/1991	05:15	26.040	12561.048
06/01/1991	05:30	26.017	12533.206
06/01/1991	05:45	25.997	12509.036
06/01/1991	06:00	26.022	12539.256
06/01/1991	06:30	25.997	12509.036
06/01/1991	07:15	25.950	12452.332
06/01/1991	07:45	25.972	12478.855
06/01/1991	08:00	25.937	12436.670
06/01/1991	09:00	25.902	12394.578
06/01/1991	09:30	25.877	12364.564
06/01/1991	10:45	25.847	12328.605
06/01/1991	11:30	25.825	12302.269
06/01/1991	12:45	25.795	12266.417
06/01/1991	15:30	25.772	12238.972
06/01/1991	16:30	25.797	12268.805
06/01/1991	16:45	25.775	12242.546
06/01/1991	18:30	25.807	12280.752
06/01/1991	19:45	25.837	12316.629
06/01/1991	21:15	25.857	12340.586
06/01/1991	22:30	25.882	12370.566
06/01/1991	23:45	25.915	12410.203
07/01/1991	00:00	25.905	12398.188
07/01/1991	00:15	25.925	12422.229
07/01/1991	01:00	25.947	12448.713
07/01/1991	01:45	25.975	12482.474
07/01/1991	02:15	26.005	12518.695
07/01/1991	02:30	26.025	12542.884
07/01/1991	03:00	26.050	12573.151
07/01/1991	03:45	26.075	12603.476
07/01/1991	04:15	26.107	12642.338
07/01/1991	05:00	26.137	12678.843
07/01/1991	05:15	26.172	12721.505
07/01/1991	05:45	26.205	12761.809
07/01/1991	06:00	26.227	12788.724
07/01/1991	06:30	26.255	12823.017
07/01/1991	07:00	26.305	12884.403
07/01/1991	07:15	26.330	12915.164
07/01/1991	08:30	26.415	13020.068
07/01/1991	08:45	26.450	13063.411
07/01/1991	09:00	26.480	13100.627
07/01/1991	09:30	26.522	13152.841
07/01/1991	10:00	26.552	13190.213
07/01/1991	10:15	26.597	13246.383
07/01/1991	10:45	26.622	13277.647
07/01/1991	11:00	26.642	13302.700
07/01/1991	11:15	26.672	13340.319
07/01/1991	11:30	26.700	13375.494
07/01/1991	12:00	26.720	13400.642
07/01/1991	12:15	26.745	13432.135
07/01/1991	12:30	26.782	13478.808
07/01/1991	13:00	26.822	13529.373
07/01/1991	13:30	26.860	13577.521
07/01/1991	14:00	26.890	13615.604
07/01/1991	14:15	26.912	13643.572
07/01/1991	15:30	27.005	13762.167
07/01/1991	15:36	27.037	13803.118
07/01/1991	21:40	27.410	14285.768C
08/01/1991	01:41	27.597	14531.459C
08/01/1991	04:16	27.691	14655.909C
08/01/1991	05:31	27.737	14717.027C
08/01/1991	06:40	27.784	14779.647C
08/01/1991	09:49	27.877	14904.008C
08/01/1991	11:32	27.924	14967.090C
08/01/1991	12:30	27.950	15002.052
08/01/1991	12:45	27.963	15019.554
08/01/1991	15:45	27.943	14992.635
08/01/1991	16:15	27.973	15033.021
08/01/1991	18:00	27.950	15002.052
08/01/1991	18:15	27.970	15028.977
08/01/1991	21:45	27.943	14992.635
08/01/1991	23:00	27.963	15019.554
08/01/1991	23:15	27.935	14981.867
08/01/1991	23:45	27.903	14945.599
09/01/1991	00:00	27.933	14979.184
09/01/1991	01:00	27.880	14908.027
09/01/1991	01:15	27.903	14938.883
09/01/1991	02:00	27.923	14965.745
09/01/1991	02:15	27.893	14925.459
09/01/1991	04:15	27.865	14887.910
09/01/1991	04:30	27.833	14845.094
09/01/1991	04:45	27.875	14901.318
09/01/1991	05:00	27.833	14845.094
09/01/1991	05:15	27.858	14878.543
09/01/1991	05:45	27.828	14838.402
09/01/1991	07:15	27.803	14805.003
09/01/1991	08:15	27.778	14771.639
09/01/1991	09:00	27.738	14718.359
09/01/1991	09:15	27.773	14764.980
09/01/1991	10:00	27.723	14698.407
09/01/1991	11:45	27.698	14665.194
09/01/1991	12:30	27.678	14638.653
09/01/1991	13:00	27.643	14592.284
09/01/1991	13:30	27.675	14634.677
09/01/1991	13:45	27.645	14594.928

C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

STATION 13000038 Batch 998

Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE
09/01/1991	15:00	27.623	14565.816
09/01/1991	15:45	27.603	14539.388
09/01/1991	16:00	27.575	14502.426
09/01/1991	16:30	27.608	14545.992
09/01/1991	16:45	27.580	14509.023
09/01/1991	17:15	27.553	14473.431
09/01/1991	18:30	27.520	14429.993
09/01/1991	20:00	27.500	14403.713
09/01/1991	20:30	27.460	14351.218
09/01/1991	21:45	27.433	14315.857
09/01/1991	22:15	27.410	14285.768
09/01/1991	22:30	27.445	14331.570
09/01/1991	22:45	27.420	14298.847
09/01/1991	23:15	27.385	14253.110
10/01/1991	00:00	27.363	14224.412
10/01/1991	01:15	27.330	14181.425
10/01/1991	01:45	27.308	14152.804
10/01/1991	02:00	27.283	14120.327
10/01/1991	03:00	27.258	14087.896
10/01/1991	03:15	27.278	14113.839
10/01/1991	03:30	27.240	14064.577
10/01/1991	04:30	27.215	14032.218
10/01/1991	04:45	27.193	14003.784
10/01/1991	05:30	27.173	13977.959
10/01/1991	06:30	27.148	13945.723
10/01/1991	07:45	27.125	13916.101
10/01/1991	08:00	27.090	13871.101
10/01/1991	08:15	27.120	13909.669
10/01/1991	08:30	27.078	13855.688
10/01/1991	09:15	27.058	13830.032
10/01/1991	10:00	27.015	13774.954
10/01/1991	11:00	26.988	13740.446
10/01/1991	12:15	26.946	13686.853
10/01/1991	12:45	26.906	13635.938
10/01/1991	13:30	26.876	13597.826
10/01/1991	14:45	26.846	13559.775
10/01/1991	15:30	26.804	13506.604
10/01/1991	15:45	26.836	13547.106
10/01/1991	17:00	26.774	13468.708
10/01/1991	17:15	26.749	13437.174
10/01/1991	18:00	26.709	13386.809
10/01/1991	18:15	26.736	13420.791
10/01/1991	18:30	26.701	13376.751
10/01/1991	19:45	26.671	13339.065
10/01/1991	21:15	26.599	13248.881
10/01/1991	22:15	26.576	13220.148
10/01/1991	23:00	26.551	13188.965
10/01/1991	23:45	26.519	13149.107
11/01/1991	00:00	26.504	13130.448
11/01/1991	00:15	26.526	13157.819
11/01/1991	00:30	26.491	13114.288
11/01/1991	00:45	26.471	13089.457
11/01/1991	01:45	26.441	13052.255
11/01/1991	02:15	26.409	13012.644
11/01/1991	03:15	26.384	12981.756
11/01/1991	03:45	26.354	12944.737
11/01/1991	04:30	26.334	12920.088
11/01/1991	05:15	26.306	12885.632
11/01/1991	05:30	26.286	12861.060
11/01/1991	06:30	26.244	12809.537
11/01/1991	07:00	26.219	12778.934
11/01/1991	08:00	26.199	12754.471
11/01/1991	08:30	26.179	12730.046
11/01/1991	08:45	26.144	12687.363
11/01/1991	09:30	26.116	12653.279
11/01/1991	10:15	26.079	12608.323
11/01/1991	11:15	26.054	12578.005
11/01/1991	11:45	26.016	12531.995
11/01/1991	12:30	25.996	12507.827
11/01/1991	13:15	25.969	12475.237
11/01/1991	13:30	25.941	12441.487
11/01/1991	14:15	25.919	12415.019
11/01/1991	14:45	25.894	12384.973
11/01/1991	15:30	25.869	12354.966
11/01/1991	15:45	25.849	12330.998
11/01/1991	16:15	25.829	12307.060
11/01/1991	17:15	25.801	12273.582
11/01/1991	17:45	25.766	12231.818
11/01/1991	18:30	25.739	12199.659
11/01/1991	19:00	25.714	12169.921
11/01/1991	19:45	25.686	12136.669
11/01/1991	20:15	25.659	12104.662
11/01/1991	20:30	25.636	12077.432
11/01/1991	21:30	25.616	12053.782
11/01/1991	22:15	25.591	12024.261
11/01/1991	22:30	25.569	11998.314
11/01/1991	23:00	25.544	11968.872
11/01/1991	23:45	25.514	11933.597
12/01/1991	00:00	25.519	11939.470
12/01/1991	00:15	25.486	11900.733
12/01/1991	01:00	25.446	11853.875
12/01/1991	01:30	25.424	11828.152
12/01/1991	02:00	25.401	11801.289
12/01/1991	02:15	25.374	11769.809
12/01/1991	03:15	25.344	11734.882
12/01/1991	03:45	25.316	11702.345
12/01/1991	04:45	25.264	11642.056
12/01/1991	05:45	25.229	11601.586
12/01/1991	06:15	25.209	11578.492
12/01/1991	06:45	25.184	11549.667
12/01/1991	07:30	25.156	11517.433
12/01/1991	08:30	25.114	11469.184
12/01/1991	09:15	25.069	11417.625
12/01/1991	09:45	25.049	11394.752
12/01/1991	10:00	25.029	11371.900
12/01/1991	11:00	24.991	11328.572
12/01/1991	11:30	24.969	11303.531
12/01/1991	11:45	24.939	11269.439
12/01/1991	12:30	24.909	11235.405
12/01/1991	12:45	24.881	11203.699
12/01/1991	13:15	24.861	11181.081
12/01/1991	14:00	24.836	11152.845
12/01/1991	14:15	24.816	11130.291
12/01/1991	14:45	24.776	11085.260
12/01/1991	15:30	24.756	11062.783
12/01/1991	16:30	24.719	11021.279
12/01/1991	17:15	24.659	10956.009
12/01/1991	18:00	24.624	10918.542
12/01/1991	18:30	24.586	10877.937
12/01/1991	18:45	24.609	10902.498
12/01/1991	19:30	24.581	10872.604
12/01/1991	20:00	24.551	10840.624
12/01/1991	20:30	24.504	10790.623
12/01/1991	21:15	24.481	10766.208
12/01/1991	22:00	24.449	10732.286
12/01/1991	22:30	24.416	10697.375
12/01/1991	23:00	24.391	10670.970
12/01/1991	23:45	24.366	10644.596
13/01/1991	00:00	24.356	10634.063
13/01/1991	00:15	24.331	10607.746
13/01/1991	00:30	24.304	10579.366
13/01/1991	01:15	24.279	10553.122
13/01/1991	01:30	24.259	10532.162
13/01/1991	02:00	24.236	10508.087
13/01/1991	02:15	24.216	10487.175
13/01/1991	02:45	24.196	10466.284
13/01/1991	03:15	24.176	10445.422
13/01/1991	03:30	24.146	10414.172
13/01/1991	04:00	24.119	10386.088
13/01/1991	05:00	24.081	10346.644
13/01/1991	05:30	24.029	10292.810
13/01/1991	06:15	24.006	10269.049
13/01/1991	06:45	23.981	10243.256
13/01/1991	07:15	23.949	10210.299
13/01/1991	07:45	23.919	10179.456
13/01/1991	08:15	23.889	10148.666
13/01/1991	09:00	23.856	10114.859
13/01/1991	09:30	23.816	10073.974
13/01/1991	09:45	23.794	10051.526
13/01/1991	10:45	23.764	10020.961

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

STATION 13000038 Batch 998

Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE
13/01/1991	12:00	23.686	9941.738
13/01/1991	12:15	23.664	9919.464
13/01/1991	12:45	23.639	9894.183
13/01/1991	13:00	23.609	9863.892
13/01/1991	13:30	23.579	9833.661
13/01/1991	14:00	23.551	9805.488
13/01/1991	14:30	23.531	9785.396
13/01/1991	14:45	23.504	9758.312
13/01/1991	15:15	23.466	9720.255
13/01/1991	16:00	23.409	9663.341
13/01/1991	16:30	23.386	9640.433
13/01/1991	16:45	23.366	9620.536
13/01/1991	17:00	23.341	9595.693
13/01/1991	17:30	23.314	9568.910
13/01/1991	18:15	23.261	9516.462
13/01/1991	18:30	23.236	9491.777
13/01/1991	18:45	23.256	9511.525
13/01/1991	19:00	23.231	9486.847
13/01/1991	19:30	23.206	9462.208
13/01/1991	19:45	23.181	9437.609
13/01/1991	20:15	23.154	9411.078
13/01/1991	20:45	23.131	9388.518
13/01/1991	21:00	23.101	9359.131
13/01/1991	21:45	23.074	9332.729
13/01/1991	22:15	23.026	9285.899
13/01/1991	22:45	22.991	9251.840
13/01/1991	23:30	22.959	9220.763
13/01/1991	23:45	22.934	9196.529
14/01/1991	00:00	22.921	9183.938
14/01/1991	00:15	22.901	9164.592
14/01/1991	00:45	22.854	9119.215
14/01/1991	01:15	22.834	9099.945
14/01/1991	01:30	22.801	9068.202
14/01/1991	02:00	22.771	9039.402
14/01/1991	02:30	22.741	9010.652
14/01/1991	02:45	22.714	8984.825
14/01/1991	03:15	22.684	8956.179
14/01/1991	03:30	22.664	8937.109
14/01/1991	03:45	22.636	8910.447
14/01/1991	04:30	22.596	8872.444
14/01/1991	05:00	22.559	8837.378
14/01/1991	05:15	22.529	8809.002
14/01/1991	05:45	22.494	8775.963
14/01/1991	06:00	22.471	8754.289
14/01/1991	06:30	22.441	8726.066
14/01/1991	07:00	22.404	8691.330
14/01/1991	07:15	22.384	8672.594
14/01/1991	07:45	22.349	8639.847
14/01/1991	08:15	22.324	8616.503
14/01/1991	08:30	22.291	8585.750
14/01/1991	08:45	22.264	8560.631
14/01/1991	09:00	22.241	8539.267
14/01/1991	09:15	22.204	8504.960
14/01/1991	09:45	22.171	8474.436
14/01/1991	10:00	22.149	8454.120
14/01/1991	10:15	22.127	8433.832
14/01/1991	10:45	22.097	8406.207
14/01/1991	11:00	22.070	8381.395
14/01/1991	11:15	22.040	8353.876
14/01/1991	11:45	22.000	8317.260
14/01/1991	12:00	21.977	8296.245
14/01/1991	12:30	21.930	8253.406
14/01/1991	13:00	21.900	8226.132
14/01/1991	13:15	21.880	8207.973
14/01/1991	13:30	21.850	8180.784
14/01/1991	14:00	21.800	8135.581
14/01/1991	14:30	21.770	8108.526
14/01/1991	14:45	21.725	8068.044
14/01/1991	15:15	21.697	8042.916
14/01/1991	15:30	21.672	8020.518
14/01/1991	15:45	21.652	8002.625
14/01/1991	16:00	21.617	7971.369
14/01/1991	16:30	21.575	7933.949
14/01/1991	17:00	21.525	7889.541
14/01/1991	17:30	21.487	7855.882
14/01/1991	17:45	21.465	7836.435
14/01/1991	18:15	21.425	7801.151
14/01/1991	18:30	21.395	7774.745
14/01/1991	18:45	21.340	7726.471
14/01/1991	19:00	21.367	7750.148
14/01/1991	19:15	21.322	7710.709
14/01/1991	19:30	21.280	7674.005
14/01/1991	20:00	21.247	7645.237
14/01/1991	20:30	21.195	7600.029
14/01/1991	21:00	21.145	7556.711
14/01/1991	21:15	21.115	7530.786
14/01/1991	21:45	21.062	7485.114
14/01/1991	22:15	21.027	7455.037
14/01/1991	22:30	21.007	7437.885
14/01/1991	22:45	20.987	7420.753
14/01/1991	23:00	20.952	7390.830
14/01/1991	23:15	20.932	7373.758
14/01/1991	23:30	20.887	7335.440
15/01/1991	00:00	20.837	7292.996
15/01/1991	00:30	20.795	7257.451
15/01/1991	00:45	20.747	7216.956
15/01/1991	01:15	20.710	7185.827
15/01/1991	01:30	20.680	7160.645
15/01/1991	01:45	20.632	7120.459
15/01/1991	02:30	20.572	7070.411
15/01/1991	02:45	20.550	7052.112
15/01/1991	03:00	20.527	7033.012
15/01/1991	03:15	20.492	7003.998
15/01/1991	03:30	20.457	6975.059
15/01/1991	04:00	20.412	6937.948
15/01/1991	04:15	20.370	6903.413
15/01/1991	04:45	20.310	6854.250
15/01/1991	05:00	20.290	6837.912
15/01/1991	05:15	20.257	6810.997
15/01/1991	05:30	20.205	6768.707
15/01/1991	06:00	20.165	6736.285
15/01/1991	06:15	20.130	6707.982
15/01/1991	06:30	20.097	6681.366
15/01/1991	06:45	20.055	6647.578
15/01/1991	07:15	20.000	6603.479
15/01/1991	07:30	19.977	6585.085
15/01/1991	07:45	19.942	6557.153
15/01/1991	08:00	19.915	6535.658
15/01/1991	08:15	19.870	6499.916
15/01/1991	08:30	19.850	6484.065
15/01/1991	08:45	19.800	6444.540
15/01/1991	09:15	19.737	6394.940
15/01/1991	09:30	19.705	6369.831
15/01/1991	09:45	19.677	6347.903
15/01/1991	10:00	19.630	6311.198
15/01/1991	10:15	19.610	6295.620
15/01/1991	10:30	19.567	6262.193
15/01/1991	10:45	19.537	6238.933
15/01/1991	11:00	19.482	6196.423
15/01/1991	11:15	19.452	6173.302
15/01/1991	11:45	19.395	6129.518
15/01/1991	12:00	19.345	6091.253
15/01/1991	12:15	19.322	6073.704
15/01/1991	12:30	19.282	6043.243
15/01/1991	12:45	19.247	6016.665
15/01/1991	13:00	19.205	5984.859
15/01/1991	13:15	19.175	5962.199
15/01/1991	13:30	19.135	5932.063
15/01/1991	13:45	19.110	5913.276
15/01/1991	14:00	19.077	5888.526
15/01/1991	14:15	19.037	5858.607
15/01/1991	14:30	18.997	5828.775
15/01/1991	14:45	18.957	5799.031
15/01/1991	15:00	18.937	5784.191
15/01/1991	15:15	18.892	5750.887
15/01/1991	15:30	18.855	5723.583
15/01/1991	15:45	18.820	5697.826
15/01/1991	16:00	18.765	5657.484
15/01/1991	16:15	18.740	5639.201
15/01/1991	16:30	18.705	5613.664

STAT A ssi ay N tin C ived ight D Derived Discharge E No Flow Reading F Backwater Reading

BASIC DATA REPORT

STATION 1300038 Batch 998

Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE
15/01/1991	17:00	18.610	5544.683
15/01/1991	17:15	18.580	5523.002
15/01/1991	17:30	18.552	5502.808
15/01/1991	17:45	18.522	5481.223
15/01/1991	18:00	18.480	5451.084
15/01/1991	18:15	18.427	5413.188
15/01/1991	18:30	18.387	5384.688
15/01/1991	18:45	18.342	5352.729
15/01/1991	19:00	18.300	5323.000
15/01/1991	19:15	18.277	5310.445
15/01/1991	19:30	18.230	5284.829
15/01/1991	19:45	18.190	5263.073
15/01/1991	20:00	18.125	5227.805
15/01/1991	20:15	18.102	5215.349
15/01/1991	20:30	18.065	5195.346
15/01/1991	20:45	18.005	5162.974
15/01/1991	21:00	17.985	5152.207
15/01/1991	21:15	17.935	5119.961
15/01/1991	21:30	17.897	5104.943
15/01/1991	21:45	17.847	5078.179
15/01/1991	22:00	17.802	5054.144
15/01/1991	22:15	17.775	5039.746
15/01/1991	22:30	17.707	5003.571
15/01/1991	22:45	17.670	4983.938
15/01/1991	23:00	17.630	4962.751
15/01/1991	23:15	17.577	4934.742
15/01/1991	23:30	17.547	4918.919
15/01/1991	23:45	17.487	4887.344
16/01/1991	00:00	17.455	4870.540
16/01/1991	00:15	17.415	4849.575
16/01/1991	00:30	17.372	4827.079
16/01/1991	00:45	17.315	4797.336
16/01/1991	01:00	17.267	4772.352
16/01/1991	01:15	17.227	4751.577
16/01/1991	01:30	17.175	4724.632
16/01/1991	01:45	17.150	4711.703
16/01/1991	02:00	17.095	4683.314
16/01/1991	02:15	17.047	4658.602
16/01/1991	02:30	16.990	4629.333
16/01/1991	02:45	16.947	4607.309
16/01/1991	03:00	16.905	4585.843
16/01/1991	03:15	16.865	4565.438
16/01/1991	03:30	16.810	4537.453
16/01/1991	03:45	16.767	4515.628
16/01/1991	04:00	16.722	4492.836
16/01/1991	04:15	16.662	4462.532
16/01/1991	04:30	16.622	4442.380
16/01/1991	04:45	16.562	4412.229
16/01/1991	05:00	16.530	4396.187
16/01/1991	05:15	16.462	4362.185
16/01/1991	05:30	16.417	4339.750
16/01/1991	05:45	16.377	4319.851
16/01/1991	06:00	16.330	4296.521
16/01/1991	06:15	16.267	4265.341
16/01/1991	06:30	16.217	4240.669
16/01/1991	06:45	16.177	4220.976
16/01/1991	07:00	16.120	4192.988
16/01/1991	07:15	16.072	4169.484
16/01/1991	07:30	16.020	4144.088
16/01/1991	07:45	15.957	4113.414
16/01/1991	08:00	15.920	4095.448
16/01/1991	08:15	15.870	4071.226
16/01/1991	08:30	15.817	4045.621
16/01/1991	08:45	15.765	4020.571
16/01/1991	09:00	15.717	3997.509
16/01/1991	09:15	15.652	3966.376
16/01/1991	09:30	15.605	3943.931
16/01/1991	09:45	15.550	3917.742
16/01/1991	10:00	15.495	3891.632
16/01/1991	10:15	15.452	3871.273
16/01/1991	10:30	15.397	3845.302
16/01/1991	10:45	15.345	3820.822
16/01/1991	11:00	15.290	3795.005
16/01/1991	11:15	15.235	3769.268
16/01/1991	11:30	15.177	3742.214
16/01/1991	11:45	15.122	3716.640
16/01/1991	12:00	15.067	3691.146
16/01/1991	12:15	15.020	3669.424
16/01/1991	12:30	14.957	3640.395
16/01/1991	12:45	14.905	3616.515
16/01/1991	13:00	14.850	3591.333
16/01/1991	13:15	14.795	3566.232
16/01/1991	13:30	14.737	3539.849
16/01/1991	13:45	14.687	3517.176
16/01/1991	14:00	14.635	3493.665
16/01/1991	14:15	14.585	3471.125
16/01/1991	14:30	14.527	3445.063
16/01/1991	14:45	14.477	3422.667
16/01/1991	15:00	14.415	3394.986
16/01/1991	15:15	14.362	3371.406
16/01/1991	15:30	14.305	3346.128
16/01/1991	15:45	14.247	3320.495
16/01/1991	16:00	14.190	3295.391
16/01/1991	16:15	14.140	3273.441
16/01/1991	16:30	14.090	3251.558
16/01/1991	16:45	14.027	3224.079
16/01/1991	17:00	13.975	3201.478
16/01/1991	17:15	13.915	3175.488
16/01/1991	17:30	13.870	3156.060
16/01/1991	17:45	13.812	3131.097
16/01/1991	18:00	13.760	3108.795
16/01/1991	18:15	13.702	3084.002
16/01/1991	18:30	13.652	3062.703
16/01/1991	18:45	13.590	3036.384
16/01/1991	19:00	13.537	3013.966
16/01/1991	19:15	13.490	2994.150
16/01/1991	19:30	13.432	2969.777
16/01/1991	19:45	13.385	2950.093
16/01/1991	20:00	13.315	2920.885
16/01/1991	20:15	13.270	2902.179
16/01/1991	20:30	13.220	2881.457
16/01/1991	20:45	13.162	2857.506
16/01/1991	21:00	13.110	2836.107
16/01/1991	21:15	13.047	2811.287
16/01/1991	21:30	13.005	2794.917
16/01/1991	21:45	12.957	2776.259
16/01/1991	22:00	12.890	2750.305
16/01/1991	22:15	12.845	2732.931
16/01/1991	22:30	12.787	2710.608
16/01/1991	22:45	12.745	2694.491
16/01/1991	23:00	12.690	2673.448
16/01/1991	23:15	12.637	2653.237
16/01/1991	23:30	12.582	2632.331
16/01/1991	23:45	12.535	2614.523
17/01/1991	00:00	12.475	2591.264
17/01/1991	00:15	12.432	2575.676
17/01/1991	00:30	12.380	2556.158
17/01/1991	00:45	12.327	2536.330
17/01/1991	01:00	12.285	2520.664
17/01/1991	01:15	12.232	2500.954
17/01/1991	01:30	12.177	2480.570
17/01/1991	01:45	12.130	2463.207
17/01/1991	02:00	12.082	2445.528
17/01/1991	02:15	12.027	2425.338
17/01/1991	02:30	11.980	2408.141
17/01/1991	02:45	11.935	2391.725
17/01/1991	03:00	11.882	2372.451
17/01/1991	03:15	11.835	2355.415
17/01/1991	03:30	11.790	2339.153
17/01/1991	03:45	11.740	2321.141
17/01/1991	04:00	11.685	2301.395
17/01/1991	04:15	11.642	2286.009
17/01/1991	04:30	11.600	2271.022
17/01/1991	04:45	11.550	2253.234
17/01/1991	05:00	11.505	2237.278
17/01/1991	05:15	11.462	2222.075
17/01/1991	05:30	11.417	2206.212
17/01/1991	05:45	11.367	2188.644
17/01/1991	06:00	11.322	2172.893
17/01/1991	06:15	11.275	2156.475

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

STATION 1300038 Batch 998

Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE
17/01/1991	06:45	11.192	2127.626
17/01/1991	07:00	11.147	2112.055
17/01/1991	07:15	11.105	2097.566
17/01/1991	07:30	11.062	2082.775
17/01/1991	07:45	11.017	2067.345
17/01/1991	08:00	10.977	2053.671
17/01/1991	08:15	10.935	2039.354
17/01/1991	08:30	10.887	2023.043
17/01/1991	08:45	10.852	2011.186
17/01/1991	09:00	10.812	1997.671
17/01/1991	09:15	10.772	1984.194
17/01/1991	09:30	10.727	1969.080
17/01/1991	09:45	10.687	1955.686
17/01/1991	10:00	10.652	1943.999
17/01/1991	10:15	10.607	1929.017
17/01/1991	10:30	10.572	1917.396
17/01/1991	10:45	10.535	1905.146
17/01/1991	11:00	10.497	1892.599
17/01/1991	11:15	10.465	1882.061
17/01/1991	11:30	10.425	1868.923
17/01/1991	11:45	10.390	1857.459
17/01/1991	12:00	10.352	1845.048
17/01/1991	12:15	10.320	1834.623
17/01/1991	12:30	10.285	1823.250
17/01/1991	12:45	10.245	1810.288
17/01/1991	13:00	10.210	1798.980
17/01/1991	13:15	10.182	1789.955
17/01/1991	13:30	10.145	1778.059
17/01/1991	13:45	10.110	1766.836
17/01/1991	14:00	10.080	1757.241
17/01/1991	14:15	10.040	1744.482
17/01/1991	14:30	10.012	1735.575
17/01/1991	14:45	9.980	1725.418
17/01/1991	15:00	9.947	1714.971
17/01/1991	15:15	9.917	1705.497
17/01/1991	15:30	9.890	1696.990
17/01/1991	15:45	9.855	1685.989
17/01/1991	16:00	9.825	1676.584
17/01/1991	16:15	9.797	1667.826
17/01/1991	16:30	9.767	1658.464
17/01/1991	16:45	9.740	1650.057
17/01/1991	17:00	9.712	1641.359
17/01/1991	17:15	9.677	1630.513
17/01/1991	17:30	9.652	1622.785
17/01/1991	17:45	9.622	1613.531
17/01/1991	18:00	9.597	1605.838
17/01/1991	18:15	9.567	1596.626
17/01/1991	18:30	9.542	1588.967
17/01/1991	18:45	9.512	1579.796
17/01/1991	19:00	9.490	1573.086
17/01/1991	19:15	9.460	1563.954
17/01/1991	19:30	9.435	1556.362
17/01/1991	19:45	9.407	1547.878
17/01/1991	20:00	9.380	1539.715
17/01/1991	20:15	9.355	1532.173
17/01/1991	20:30	9.330	1524.648
17/01/1991	20:45	9.305	1517.138
17/01/1991	21:00	9.277	1508.745
17/01/1991	21:15	9.255	1502.165
17/01/1991	21:30	9.227	1493.807
17/01/1991	21:45	9.205	1487.255
17/01/1991	22:00	9.182	1480.418
17/01/1991	22:15	9.160	1473.891
17/01/1991	22:30	9.132	1465.601
17/01/1991	22:45	9.110	1459.102
17/01/1991	23:00	9.087	1452.320
17/01/1991	23:15	9.065	1445.846
17/01/1991	23:30	9.037	1437.624
17/01/1991	23:45	9.012	1430.299
18/01/1991	00:00	8.992	1424.451
18/01/1991	00:15	8.967	1417.156
18/01/1991	00:30	8.947	1411.331
18/01/1991	00:45	8.922	1404.064
18/01/1991	01:00	8.897	1396.814
18/01/1991	01:15	8.877	1391.024
18/01/1991	01:30	8.855	1384.668
18/01/1991	01:45	8.835	1378.900
18/01/1991	02:00	8.810	1371.705
18/01/1991	02:15	8.790	1365.961
18/01/1991	02:30	8.770	1360.227
18/01/1991	02:45	8.745	1353.073
18/01/1991	03:00	8.722	1346.506
18/01/1991	03:15	8.702	1340.807
18/01/1991	03:30	8.682	1335.118
18/01/1991	03:45	8.657	1328.021
18/01/1991	04:00	8.637	1322.355
18/01/1991	04:15	8.617	1316.699
18/01/1991	04:30	8.597	1311.054
18/01/1991	04:45	8.570	1303.450
18/01/1991	05:00	8.550	1297.829
18/01/1991	05:15	8.530	1292.218
18/01/1991	05:30	8.510	1286.618
18/01/1991	05:45	8.490	1281.028
18/01/1991	06:00	8.465	1274.056
18/01/1991	06:30	8.422	1262.100
18/01/1991	07:00	8.382	1251.022
18/01/1991	07:15	8.360	1244.947
18/01/1991	07:45	8.320	1233.934
18/01/1991	08:00	8.297	1227.620
18/01/1991	08:15	8.277	1222.141
18/01/1991	08:30	8.256	1216.399
18/01/1991	09:00	8.216	1205.494
18/01/1991	09:30	8.168	1192.464
18/01/1991	10:00	8.133	1183.000
18/01/1991	10:30	8.098	1173.569
18/01/1991	10:45	8.076	1167.657
18/01/1991	11:00	8.056	1162.294
18/01/1991	11:15	8.033	1156.139
18/01/1991	11:30	8.013	1150.798
18/01/1991	11:45	7.991	1144.936
18/01/1991	12:15	7.951	1134.309
18/01/1991	12:45	7.916	1125.045
18/01/1991	13:00	7.891	1118.448
18/01/1991	13:30	7.856	1109.240
18/01/1991	14:00	7.821	1100.065
18/01/1991	14:15	7.796	1093.530
18/01/1991	14:30	7.776	1088.315
18/01/1991	15:00	7.736	1077.916
18/01/1991	15:30	7.698	1068.076
18/01/1991	15:45	7.678	1062.913
18/01/1991	16:15	7.636	1052.105
18/01/1991	16:45	7.598	1042.754
18/01/1991	17:15	7.563	1034.430
18/01/1991	17:30	7.543	1029.685
18/01/1991	17:45	7.523	1024.943
18/01/1991	18:15	7.486	1016.207
18/01/1991	18:30	7.466	1011.494
18/01/1991	19:00	7.426	1002.093
18/01/1991	19:15	7.406	997.405
18/01/1991	19:45	7.371	989.222
18/01/1991	20:00	7.348	983.858
18/01/1991	20:15	7.328	979.204
18/01/1991	20:45	7.291	970.614
18/01/1991	21:00	7.268	965.290
18/01/1991	21:30	7.233	957.209
18/01/1991	21:45	7.213	952.603
18/01/1991	22:15	7.176	944.104
18/01/1991	22:30	7.156	939.522
18/01/1991	22:45	7.133	934.264
18/01/1991	23:15	7.098	926.284
18/01/1991	23:30	7.078	921.735
18/01/1991	23:45	7.058	917.196
19/01/1991	00:00	7.038	912.665
19/01/1991	00:15	7.018	908.142
19/01/1991	00:30	6.998	903.628
19/01/1991	01:00	6.958	894.626
19/01/1991	01:15	6.938	890.138
19/01/1991	01:45	6.898	881.188
19/01/1991	02:15	6.861	872.940
19/01/1991	02:30	6.836	867.384

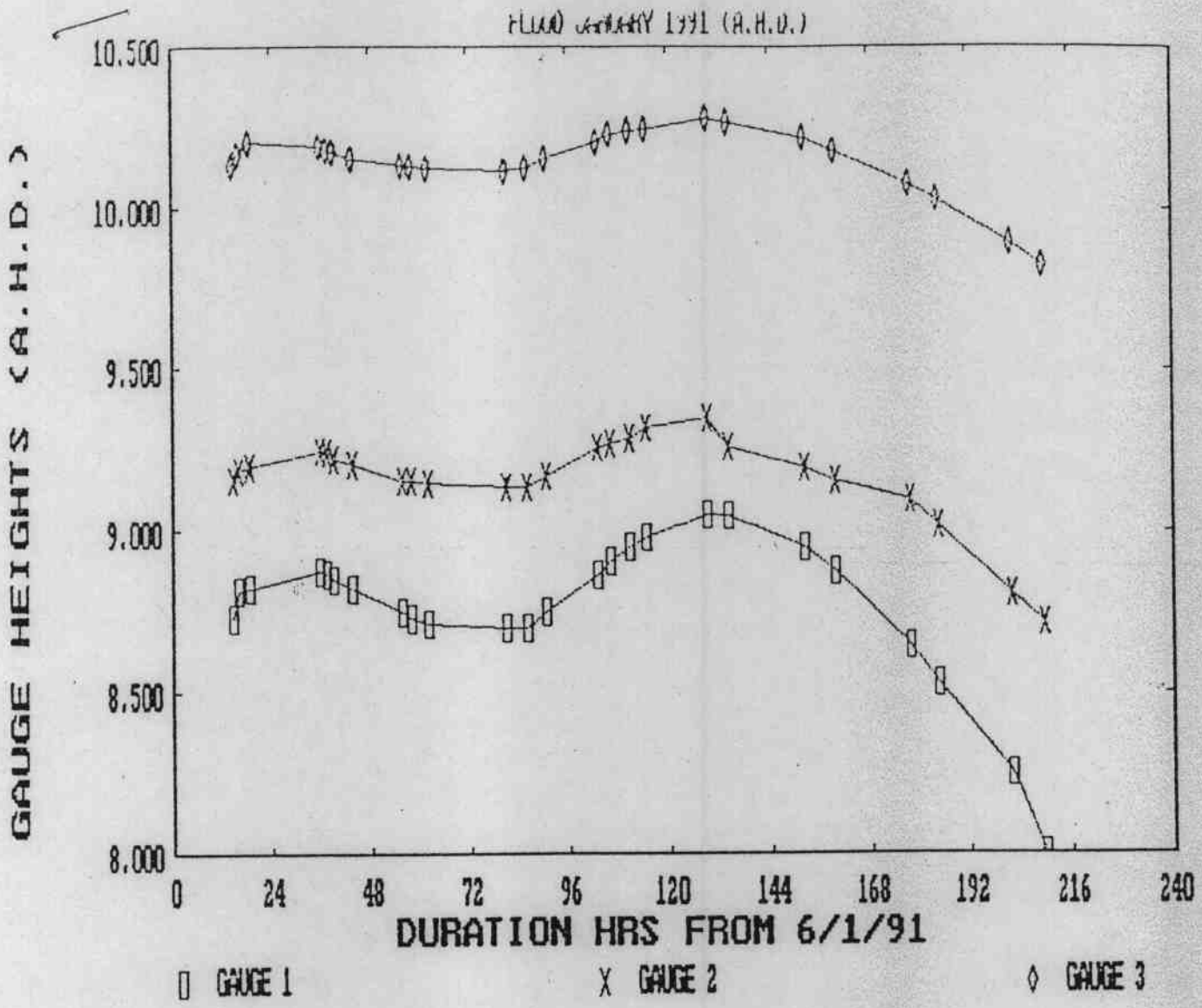
STA Iss: Day B N: Datim C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading

STATION 1300032 Batch 998

Units Height (metres) Discharge (cumecs)

DATE	TIME	HEIGHT	DISCHARGE
19/01/1991	03:15	6.778	854.546
19/01/1991	03:45	6.741	846.395
19/01/1991	04:15	6.703	838.055
19/01/1991	04:30	6.678	832.585
19/01/1991	05:00	6.643	824.951
19/01/1991	05:15	6.623	820.600
19/01/1991	05:30	6.601	815.825
19/01/1991	06:00	6.563	807.602
19/01/1991	06:15	6.543	803.286
19/01/1991	06:30	6.523	798.980
19/01/1991	07:00	6.483	790.394
19/01/1991	07:30	6.448	782.911
19/01/1991	07:45	6.428	778.647
19/01/1991	08:00	6.406	773.967
19/01/1991	08:15	6.383	769.085
19/01/1991	08:45	6.348	761.680
19/01/1991	09:15	6.311	753.882
19/01/1991	09:30	6.288	749.049
19/01/1991	10:00	6.256	742.346
19/01/1991	10:30	6.218	734.416
19/01/1991	10:45	6.198	730.256
19/01/1991	11:15	6.163	722.996
19/01/1991	11:45	6.126	715.353
19/01/1991	12:15	6.088	706.492
19/01/1991	12:45	6.048	694.869
19/01/1991	13:15	6.016	685.649
19/01/1991	13:30	5.993	679.066
19/01/1991	14:00	5.963	670.532
19/01/1991	14:30	5.926	660.092
19/01/1991	15:00	5.893	650.859
19/01/1991	15:30	5.853	639.767
19/01/1991	16:00	5.828	632.888
19/01/1991	16:30	5.791	622.786
19/01/1991	17:00	5.758	613.853
19/01/1991	17:30	5.723	604.459
19/01/1991	18:00	5.698	597.799
19/01/1991	18:30	5.666	589.335
19/01/1991	19:00	5.633	580.679
19/01/1991	19:30	5.606	573.650
19/01/1991	20:00	5.573	565.126
19/01/1991	20:15	5.553	559.994
19/01/1991	21:00	5.521	551.839
19/01/1991	21:30	5.491	544.256
19/01/1991	22:00	5.463	537.231
19/01/1991	22:30	5.436	530.506
19/01/1991	23:00	5.406	523.091
19/01/1991	23:30	5.383	517.446
20/01/1991	00:00	5.353	510.134
20/01/1991	00:30	5.328	504.087
20/01/1991	01:00	5.301	497.601
20/01/1991	01:30	5.278	492.114
20/01/1991	02:00	5.253	486.188
20/01/1991	02:30	5.231	481.008
20/01/1991	03:00	5.206	475.159
20/01/1991	03:30	5.186	470.509
20/01/1991	04:00	5.161	464.733
20/01/1991	04:30	5.138	459.455
20/01/1991	05:15	5.108	452.621
20/01/1991	05:45	5.086	447.647
20/01/1991	06:30	5.058	441.361
20/01/1991	07:00	5.038	436.902
20/01/1991	07:30	5.016	432.027
20/01/1991	08:15	4.988	425.867
20/01/1991	09:45	4.936	414.560
20/01/1991	11:15	4.878	402.151
20/01/1991	12:00	4.856	397.500
20/01/1991	12:45	4.831	392.251
20/01/1991	13:30	4.808	387.458
20/01/1991	14:15	4.783	382.286
20/01/1991	15:00	4.761	377.767
20/01/1991	15:45	4.738	373.075
20/01/1991	16:45	4.713	368.013
20/01/1991	17:30	4.688	362.990
20/01/1991	18:30	4.668	359.000
20/01/1991	19:30	4.646	354.639
20/01/1991	20:30	4.621	349:721
20/01/1991	21:30	4.596	344.842
20/01/1991	22:30	4.573	340.387
20/01/1991	23:30	4.553	336.540
21/01/1991	00:00	4.543	334.625
21/01/1991	01:00	4.521	330.436
21/01/1991	02:00	4.498	326.088
21/01/1991	02:45	4.478	322.333
21/01/1991	03:45	4.458	318.604
21/01/1991	05:00	4.436	314.529
21/01/1991	06:00	4.416	310.851
21/01/1991	07:00	4.396	307.197
21/01/1991	07:45	4.376	303.568
21/01/1991	09:00	4.353	299.425
21/01/1991	10:15	4.331	295.492
21/01/1991	11:30	4.311	291.942
21/01/1991	12:45	4.288	287.163
21/01/1991	14:00	4.268	282.477
21/01/1991	15:30	4.246	277.383
21/01/1991	17:15	4.223	272.124
21/01/1991	19:00	4.203	267.607
21/01/1991	20:45	4.183	263.141
21/01/1991	22:45	4.161	258.286
22/01/1991	00:00	4.151	256.100
22/01/1991	01:45	4.128	251.119
22/01/1991	03:45	4.103	246.842
22/01/1991	05:45	4.086	242.194
22/01/1991	07:45	4.064	237.606
22/01/1991	09:00	4.044	233.487
22/01/1991	10:30	4.024	229.416
22/01/1991	13:00	4.004	225.394
22/01/1991	15:00	3.982	221.025
22/01/1991	17:00	3.957	216.130
22/01/1991	20:30	3.937	212.268
22/01/1991	23:00	3.917	208.452
23/01/1991	00:00	3.912	207.506
23/01/1991	02:15	3.889	203.189
23/01/1991	04:30	3.869	199.486
23/01/1991	06:15	3.849	195.829
23/01/1991	08:45	3.827	191.358
23/01/1991	10:45	3.804	187.766
23/01/1991	12:45	3.784	184.256
23/01/1991	14:45	3.764	180.791
23/01/1991	17:00	3.742	177.031
23/01/1991	20:45	3.719	173.157
23/01/1991	23:45	3.697	169.720
24/01/1991	00:00	3.697	169.720
24/01/1991	02:15	3.677	167.861
24/01/1991	04:15	3.657	166.010
24/01/1991	06:30	3.637	164.168
24/01/1991	08:15	3.617	162.335
24/01/1991	10:00	3.597	160.511
24/01/1991	12:00	3.574	158.424
24/01/1991	14:15	3.552	156.439
24/01/1991	17:00	3.527	154.196
24/01/1991	20:00	3.507	152.412
24/01/1991	22:30	3.487	150.637
25/01/1991	00:00	3.472	149.311
25/01/1991	02:15	3.452	147.552
25/01/1991	04:00	3.429	145.539
25/01/1991	06:00	3.407	143.626
25/01/1991	08:15	3.382	141.464
25/01/1991	10:15	3.359	139.488
25/01/1991	11:45	3.339	137.780
25/01/1991	13:30	3.319	136.080
25/01/1991	16:00	3.294	133.969
25/01/1991	18:30	3.272	132.122
25/01/1991	20:30	3.252	130.453
25/01/1991	23:00	3.232	128.794
26/01/1991	00:00	3.222	127.967
26/01/1991	02:00	3.199	126.075
26/01/1991	03:45	3.177	124.276
26/01/1991	05:30	3.158	122.732
26/01/1991	07:15	3.138	121.115
26/01/1991	08:30	3.118	119.508

STATUS A Missing Day B No Rating C Derived Height D Derived Discharge E No Flow Reading F Backwater Reading



ROCKHAMPTON AIRPORT ARBITARY GAUGE HEIGHTS
FLOOD JANUARY 1991

DATE	TIME	CORR TIME	GAUGE1	GAUGE2	GAUGE3
6/1/91	1430	14.5	8.731	9.155	10.135
SUNDAY	1600	16	8.811	9.185	10.165
	1830	18.5	8.821	9.195	10.205
7/1/91	1200	36	8.876	9.245	10.19
MONDAY	1330	37.5	8.866	9.24	10.18
	1515	39.25	8.851	9.22	10.175
	1930	43.5	8.821	9.205	10.155
8/1/91	730	55.5	8.751	9.155	10.135
TUESDAY	1000	58	8.731	9.155	10.13
	1400	62	8.711	9.145	10.125
9/1/91	900	81	8.701	9.135	10.115
WEDNESDAY	1400	86	8.701	9.135	10.125
	1830	90.5	8.751	9.165	10.155
10/1/91	700	103	8.861	9.255	10.205
THURSDAY	1000	106	8.906	9.265	10.23
	1430	110.5	8.951	9.285	10.24
	1830	114.5	8.981	9.315	10.245
11/1/91	900	129	9.051	9.345	10.28
FRIDAY	1400	134	9.046	9.26	10.265
12/1 91	815	152.25	8.951	9.195	10.22
SATURDAY	1530	159.5	8.876	9.155	10.18
13/1/91	930	177.5	8.646	9.095	10.08
SUNDAY	1630	184.5	8.531	9.015	10.035
14/1/91	1000	202	8.251	8.805	9.895
MONDAY	1730	209.5	8	8.715	9.825

BARRAGE AND TMT WKS GAUGE HTS (S.D.) AND (R.C.C.SEW)
JANUARY 1991 FLOOD

DATE	CORR TIME	BARRAGE	CORR TIME	TMT WKS
6/1/91	0	31.766	0	33.38
			12	33.534
7/1/91	24	31.979	24.5	33.635
	36	31.979	36.75	33.61
8/1/91	48	31.949	55	33.565
			64	33.534
9/1/91	72	31.918	79	33.534
	84	31.918	90	33.585
10/1/91	96	31.979	102.5	33.656
11/1/91	120	32.101	121.5	33.748
	127	32.113	126.5	33.763
	135.5	32.113	133	33.748
12/1/91	154	32.04	148	33.687
13/1/91			171.5	33.534
			185	33.38
14/1/91	199	31.696	199	33.29
	207.5	31.623	214.5	33.107
15/1/91	223	31.476	222.75	33.001
	231.5	31.4	235	32.848

deduct 22.53 for AHD

D2 Peak Flood Heights

QUEENSLAND FLOOD-WARNING NETWORK

SURVEY HISTORY

Station: ROCKHAMPTON CBM No: 039264 AWRC No: 130910

Latitude & Longitude:
Catchment: FITZROY RIVER
Ownership: CBM

Stream: FITZROY RIVER
Catchment area (sq km):
Maintenance Agency: CBM

SITE A

GAUGE LOCATION: Harbour Board gauge near Derby and Quay St intersection.
RANGE:
CONSTRUCTION: CBM plates
AMTD (kms): 56.50

DATE OF LAST SURVEY:
DATE ESTABLISHED: 1/ 9/18
DATE DISCONTINUED: 1/ 9/63

BENCH MARK (1)
Description: State BM no. 6.
At Court House.
RL/DATUM: 10.936 AHD

BENCH MARK (2)
Description:
RL/DATUM: 0.000

GAUGE ZERO (1)
RL/DATUM: -1.006 AHD Date from: 1/ 9/18 Date to: 1/ 9/28

GAUGE ZERO (2)
RL/DATUM: -1.311 AHD Date from: 1/ 9/28 Date to: 1/ 9/63

SITE B

GAUGE LOCATION: On pump station near Quay St and Stanley St intersection.
RANGE: 3-10m
CONSTRUCTION: CBM plates
AMTD (kms): 56.40

DATE OF LAST SURVEY:
DATE ESTABLISHED: 1/ 9/63
DATE DISCONTINUED: 1/11/76

BENCH MARK (1)
Description: State BM no. 6.
At Court House.
RL/DATUM: 10.936 AHD

BENCH MARK (2)
Description:
RL/DATUM: 0.000

GAUGE ZERO (1)
RL/DATUM: -1.384 AHD Date from: 1/ 9/63 Date to: 1/11/76

GAUGE ZERO (2)
RL/DATUM: 0.000 Date from: Date to:

QUEENSLAND FLOOD-WARNING NETWORK

SURVEY HISTORY

Station: ROCKHAMPTON CBM No: 039264 AWRC No: 130910

Latitude & Longitude: Stream: FITZROY RIVER
Catchment: FITZROY RIVER Catchment area (sq km):
Ownership: CBM Maintenance Agency: CBM

SITE C

GAUGE LOCATION: At end of Derby St.
RANGE: 3-11m DATE OF LAST SURVEY: 1/11/86
CONSTRUCTION: CBM plates on gal/HW posts DATE ESTABLISHED: 1/11/76
AMTD (kms): 56.60 DATE DISCONTINUED:

BENCH MARK (1)
Description: State BM no. 6.
At Court House. RL/DATUM: 10.936 AHD

BENCH MARK (2)
Description: BM on kerb.
Corner of Quay St and Derby St. RL/DATUM: 7.709 AHD

GAUGE ZERO (1)
RL/DATUM: -1.448 AHD Date from: 1/11/76 Date to:

GAUGE ZERO (2)
RL/DATUM: 0.000 Date from: Date to:

Remarks: AHD = SD + 0.180m. AHD = Rockhampton Sewerage Datum - 22.531m.

Bureau of Meteorology

Date: 25/ 9/91

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : ROCKHAMPTON
Stream : FITZROY RIVER

CBM No : 039264
AWRC No : 130910

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Obs Site
01/1859		8.15 *	C	REGISTER	OBSERVED	A
03/1864		8.38 *	C	REGISTER	OBSERVED	A
03/1875		8.38 *	C	REGISTER	OBSERVED	A
06/04/1890		8.46 *	C	REGISTER	OBSERVED	A
10/02/1896		8.61 *	C	REGISTER	OBSERVED	A
17/02/1898		7.92 *	C	REGISTER	OBSERVED	A
24/03/1908		6.76 *	C	REGISTER	OBSERVED	A
08/02/1910		7.42 *	C	REGISTER	OBSERVED	A
29/03/1910		7.85 *	C	REGISTER	OBSERVED	A
16/01/1911		3.99 *	C	REGISTER	OBSERVED	A
13/02/1911		7.59 *	C	REGISTER	OBSERVED	A
01/04/1911		4.39 *	C	REGISTER	OBSERVED	A
06/03/1913		5.08 *	C	REGISTER	OBSERVED	A
09/01/1917		7.87 *	C	REGISTER	OBSERVED	A
17/03/1917	0900	6.45 *	C	REGISTER	OBSERVED	A
23/01/1918	1100	9.30 *	C	REGISTER	OBSERVED	B
31/01/1918	1800	10.11 *	C	REGISTER	OBSERVED	B
02/01/1922	0100	6.58 *	C	REGISTER	OBSERVED	B
11/02/1922	2400	7.98 *	C	REGISTER	OBSERVED	B
02/01/1927		5.82 *	C	REGISTER	OBSERVED	B
28/04/1928		8.38 *	C	REGISTER	OBSERVED	B
23/02/1929	1400	7.72 *	C	REGISTER	OBSERVED	B
04/04/1929	1700	7.47 *	C	REGISTER	OBSERVED	B
28/01/1930		5.23 *	C	REGISTER	OBSERVED	B
26/03/1940	1900	8.02 *	C	REGISTER	OBSERVED	B
16/02/1942	1400	7.26 *	C	REGISTER	OBSERVED	B
09/01/1943		5.03 *	C	REGISTER	OBSERVED	B
14/02/1943		5.21 *	C	REGISTER	OBSERVED	B
22/02/1943	1700	5.82 *	C	REGISTER	OBSERVED	B
19/02/1947		5.10 *	C	REGISTER	OBSERVED	B
09/03/1949		5.82 *	C	REGISTER	OBSERVED	B
13/03/1950		6.22 *	C	REGISTER	OBSERVED	B
08/12/1950	1000	6.12 *	C	REGISTER	OBSERVED	B
22/01/1951	0900	8.30 *	C	REGISTER	OBSERVED	B
19/02/1954	0900	9.40 *	C	REGISTER	OBSERVED	B
23/02/1955		5.10 *	C	REGISTER	OBSERVED	B
03/03/1955	0900	5.51 *	C	REGISTER	OBSERVED	B
19/03/1955	0900	8.23 *	C	REGISTER	OBSERVED	B
03/06/1955	1000	6.48 *	C	REGISTER	OBSERVED	B
23/02/1956	0900	8.08 *	C	REGISTER	OBSERVED	B
09/04/1956	1500	6.81 *	C	REGISTER	OBSERVED	B
28/12/1956	0930	6.04 *	C	REGISTER	OBSERVED	B
04/01/1957	1630	6.73 *	C	REGISTER	OBSERVED	B
28/02/1958	0900	7.06 *	C	REGISTER	OBSERVED	B
13/04/1958	0900	8.15 *	C	REGISTER	OBSERVED	B
27/02/1959	0615	7.67 *	C	REGISTER	OBSERVED	B

Note : Must be read in conjunction with Explanatory Notes.

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : ROCKHAMPTON
Stream : FITZROY RIVER

CBM No : 039264
AWRC No : 130910

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Obs Site
04/04/1963	1000	5.94 *	C	REGISTER	OBSERVED	B
18/01/1968	1300	4.58 *	C	REGISTER	OBSERVED	B
25/02/1968	1100	5.95 *	C	REGISTER	OBSERVED	B
06/02/1970	1145	4.40 *	C	REGISTER	OBSERVED	B
14/02/1971	1500	6.74 *	C	REGISTER	OBSERVED	B
01/03/1971	1430	6.58 *	C	REGISTER	OBSERVED	B
27/12/1973	2400	7.98 *	C	REGISTER	OBSERVED	B
12/01/1974	2400	6.94 *	C	REGISTER	OBSERVED	B
17/01/1974	2100	7.57 *	C	REGISTER	OBSERVED	B
08/02/1974	1500	6.76 *	C	REGISTER	OBSERVED	B
10/03/1974	2400	5.21 *	C	REGISTER	OBSERVED	B
19/01/1975	0300	4.45 *	C	REGISTER	OBSERVED	B
01/01/1976	1330	6.25 *	C	REGISTER	OBSERVED	B
30/01/1976	1500	6.98 *	C	REGISTER	OBSERVED	B
09/02/1976	0900	5.08 *	C	REGISTER	OBSERVED	B
10/02/1976	0600	5.11 *	C	REGISTER	OBSERVED	B
18/03/1977	1135	5.60	C	REGISTER	OBSERVED	C
12/02/1978	0500	8.15	C	REGISTER	OBSERVED	C
14/02/1979	1300	5.03	C	REGISTER	OBSERVED	C
20/03/1979	0600	5.90	C	REGISTER	OBSERVED	C
05/03/1983	1600	4.60	C	REGISTER	OBSERVED	C
12/05/1983	1500	8.25	C	REGISTER	OBSERVED	C
30/05/1983	1200	5.90	C	REGISTER	OBSERVED	C
11/03/1988	0300	8.40	C	REGISTER	OBSERVED	C
14/04/1989	2100	6.00	C	REGISTER	OBSERVED	C
31/12/1990	0230	7.40	C	OPERATIONAL	OBSERVED	C
06/01/1991	2200	9.15	C	OPERATIONAL	OBSERVED	C
12/01/1991	0200	9.30	C	OPERATIONAL	OBSERVED	C
13/02/1991	0600	7.80	C	OPERATIONAL	OBSERVED	C

END OF REPORT

Note : Must be read in conjunction with Explanatory Notes.

QUEENSLAND FLOOD-WARNING NETWORK

SURVEY HISTORY

Station: YAAMBA CBM No: 033076 AWRC No: 130001

Latitude & Longitude:
Catchment: FITZROY RIVER
Ownership: CBM

Stream: FITZROY RIVER
Catchment area (sq km): 136650
Maintenance Agency: CBM

SITE A

GAUGE LOCATION: Adjacent to pump station.
RANGE: 2-18m
CONSTRUCTION: CBM plates on wooden posts
AMTD (kms): 108.80

DATE OF LAST SURVEY: 25/ 5/91
DATE ESTABLISHED: 1/ 9/11
DATE DISCONTINUED:

BENCH MARK (1)
Description: PSM 7070.
RL/DATUM: 14.938 AHD

BENCH MARK (2)
Description: New TBM GI pipe on SE corner of pump station.
RL/DATUM: 19.370 AHD

GAUGE ZERO (1)
RL/DATUM: 1.303 AHD Date from: 1/ 9/11 Date to:

GAUGE ZERO (2)
RL/DATUM: 0.000 Date from: Date to:

Bureau of Meteorology

Date: 25/ 9/91

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : YAAMBA
Stream : FITZROY RIVER

CBM No : 033076
AWRC No : 130001

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Obs Site
29/12/1889		6.71		REGISTER	OBSERVED	
08/02/1896		16.48		REGISTER	OBSERVED	
19/01/1898		10.92		REGISTER	OBSERVED	
16/02/1898		15.47		REGISTER	OBSERVED	
23/03/1898		13.18		REGISTER	OBSERVED	
29/03/1898		11.86		REGISTER	OBSERVED	
06/01/1899		4.11		REGISTER	OBSERVED	
04/02/1899		8.79		REGISTER	OBSERVED	
11/03/1901		4.27		REGISTER	OBSERVED	
04/04/1903		9.14		REGISTER	OBSERVED	
09/04/1904		9.91		REGISTER	OBSERVED	
21/01/1905		11.58		REGISTER	OBSERVED	
13/03/1906		12.19		REGISTER	OBSERVED	
21/01/1907		5.49		REGISTER	OBSERVED	
17/01/1908		8.94		REGISTER	OBSERVED	
18/02/1908		6.40		REGISTER	OBSERVED	
23/03/1908		13.18		REGISTER	OBSERVED	
23/01/1909		7.77		REGISTER	OBSERVED	
07/02/1910		14.12		REGISTER	OBSERVED	
28/03/1910		14.78		REGISTER	OBSERVED	
17/01/1911		8.43		REGISTER	OBSERVED	
13/02/1911		14.15		REGISTER	OBSERVED	
31/03/1911		9.19		REGISTER	OBSERVED	
21/06/1912		11.35		REGISTER	OBSERVED	
18/01/1913		7.21		REGISTER	OBSERVED	
05/03/1913		10.95		REGISTER	OBSERVED	
28/06/1913		4.04		REGISTER	OBSERVED	
04/01/1914		5.41		REGISTER	OBSERVED	
19/03/1914		4.57		REGISTER	OBSERVED	
08/01/1917		14.71		REGISTER	OBSERVED	
05/10/1917		7.59		REGISTER	OBSERVED	
30/11/1917		5.54		REGISTER	OBSERVED	
24/01/1918	0000	15.85		REGISTER	OBSERVED	
31/01/1918	1300	17.32		REGISTER	OBSERVED	
19/03/1921		5.56		REGISTER	OBSERVED	
01/07/1921		3.99		REGISTER	OBSERVED	
13/09/1921		4.22		REGISTER	OBSERVED	
21/01/1922	0900	11.51		REGISTER	OBSERVED	
11/02/1922	1600	14.10		REGISTER	OBSERVED	
27/12/1922		6.25		REGISTER	OBSERVED	
17/01/1923		4.04		REGISTER	OBSERVED	
28/02/1924		8.84		REGISTER	OBSERVED	
04/04/1924		4.19		REGISTER	OBSERVED	
18/11/1924		6.22		REGISTER	OBSERVED	
04/02/1925		4.27		REGISTER	OBSERVED	
11/02/1925		4.19		REGISTER	OBSERVED	

Note : Must be read in conjunction with Explanatory Notes.

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : YAAMBA
Stream : FITZROY RIVER

CBM No : 033076
AWRC No : 130001

Date	Time	Gauge Height (metres)	Site	Data Source	Date Type	Obs Site
13/01/1926		5.54		REGISTER	OBSERVED	
27/05/1926		3.51		REGISTER	OBSERVED	
28/12/1926		3.43		REGISTER	OBSERVED	
29/01/1927		6.07		REGISTER	OBSERVED	
06/02/1927		6.63		REGISTER	OBSERVED	
03/04/1927		3.53		REGISTER	OBSERVED	
23/12/1927		5.13		REGISTER	OBSERVED	
01/01/1928		11.84		REGISTER	OBSERVED	
24/02/1928		8.56		REGISTER	OBSERVED	
01/03/1928		5.97		REGISTER	OBSERVED	
28/04/1928	0800	15.06		REGISTER	OBSERVED	
18/01/1929		3.66		REGISTER	OBSERVED	
30/01/1929		3.51		REGISTER	OBSERVED	
23/02/1929	1030	12.95		REGISTER	OBSERVED	
03/04/1929		8.13		REGISTER	OBSERVED	
09/04/1929		7.85		REGISTER	OBSERVED	
20/06/1929		4.22		REGISTER	OBSERVED	
28/01/1930		9.27		REGISTER	OBSERVED	
09/02/1930		9.30		REGISTER	OBSERVED	
14/05/1930		8.53		REGISTER	OBSERVED	
20/06/1930		4.85		REGISTER	OBSERVED	
04/02/1931	1600	6.65		REGISTER	OBSERVED	
19/12/1931	0800	8.79		REGISTER	OBSERVED	
28/01/1932	0900	5.31		REGISTER	OBSERVED	
29/12/1932	0900	2.29		REGISTER	OBSERVED	
06/02/1933	1600	4.11		REGISTER	OBSERVED	
19/07/1933	1600	9.65		REGISTER	OBSERVED	
07/10/1933	0900	8.00		REGISTER	OBSERVED	
19/11/1933		5.18		REGISTER	OBSERVED	
23/12/1933	1100	3.86		REGISTER	OBSERVED	
02/02/1934		4.11		REGISTER	OBSERVED	
08/02/1934	0900	4.72		REGISTER	OBSERVED	
18/01/1936		5.03		REGISTER	OBSERVED	
27/02/1936	0900	5.41		REGISTER	OBSERVED	
20/03/1936	1600	7.77		REGISTER	OBSERVED	
22/02/1937	1800	8.48		REGISTER	OBSERVED	
21/03/1937	0900	6.40		REGISTER	OBSERVED	
30/03/1938	0900	3.96		REGISTER	OBSERVED	
04/04/1938	0900	5.64		REGISTER	OBSERVED	
06/06/1938	0900	5.36		REGISTER	OBSERVED	
02/02/1939	1800	7.77		REGISTER	OBSERVED	
20/03/1939		3.96		REGISTER	OBSERVED	
13/02/1940		8.03		REGISTER	OBSERVED	
27/02/1940		9.50		REGISTER	OBSERVED	
09/03/1940	0300	10.01		REGISTER	OBSERVED	
26/03/1940		14.40		REGISTER	OBSERVED	

Note : Must be read in conjunction with Explanatory Notes.

Bureau of Meteorology

Date: 25/ 9/91

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : YAAMBA
Stream : FITZROY RIVER

CBM No : 033078
AWRC No : 130001

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Site
14/04/1940	1800	8.48		REGISTER	OBSERVED	
21/01/1941	0900	5.41		REGISTER	OBSERVED	
05/02/1941	0900	5.26		REGISTER	OBSERVED	
19/04/1941	0900	6.15		REGISTER	OBSERVED	
31/01/1942	0900	3.96		REGISTER	OBSERVED	
16/02/1942	0900	13.64		REGISTER	OBSERVED	
22/02/1942	0900	9.78		REGISTER	OBSERVED	
16/07/1942		3.76		REGISTER	OBSERVED	
10/01/1943		10.69		REGISTER	OBSERVED	
14/02/1943	1700	10.36		REGISTER	OBSERVED	
20/02/1943	1700	11.40		REGISTER	OBSERVED	
01/03/1943	0900	7.47		REGISTER	OBSERVED	
20/02/1944		7.77		REGISTER	OBSERVED	
26/02/1944	0900	7.62		REGISTER	OBSERVED	
05/04/1944		5.61		REGISTER	OBSERVED	
29/01/1946	0900	5.94		REGISTER	OBSERVED	
12/03/1946	1600	8.23		REGISTER	OBSERVED	
19/02/1947	0900	11.71		REGISTER	OBSERVED	
01/03/1947		6.40		REGISTER	OBSERVED	
03/03/1947		4.29		REGISTER	OBSERVED	
20/02/1949	1600	8.69		REGISTER	OBSERVED	
08/03/1949	1600	12.34		REGISTER	OBSERVED	
24/10/1949	1600	5.97		REGISTER	OBSERVED	
22/02/1950		9.47		REGISTER	OBSERVED	
12/03/1950	0900	12.65		REGISTER	OBSERVED	
20/03/1950	0900	12.78		REGISTER	OBSERVED	
17/04/1950		11.13		REGISTER	OBSERVED	
01/08/1950	0800	6.78		REGISTER	OBSERVED	
01/10/1950	0800	4.42		REGISTER	OBSERVED	
01/12/1950	1200	6.48		REGISTER	OBSERVED	
08/12/1950	1900	12.67		REGISTER	OBSERVED	
11/01/1951	0800	13.18		REGISTER	OBSERVED	
21/01/1951	0600	15.09		REGISTER	OBSERVED	
31/01/1951	0900	10.97		REGISTER	OBSERVED	
13/01/1952	1600	4.65		REGISTER	OBSERVED	
05/03/1952	0745	3.63		REGISTER	OBSERVED	
31/03/1952	0900	3.15		REGISTER	OBSERVED	
30/01/1953	0800	8.53		REGISTER	OBSERVED	
23/02/1953	0800	5.36		REGISTER	OBSERVED	
29/01/1954	0900	6.25		REGISTER	OBSERVED	
18/02/1954	0800	16.59		REGISTER	OBSERVED	
24/07/1954	0730	7.70		REGISTER	OBSERVED	
28/01/1955		7.42		REGISTER	OBSERVED	
22/02/1955	0900	14.73		REGISTER	OBSERVED	
23/02/1955		10.82		REGISTER	OBSERVED	
02/03/1955	0600	11.58		REGISTER	OBSERVED	

Note : Must be read in conjunction with Explanatory Notes.

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : YAAMBA
Stream : FITZROY RIVER

CBM No : 033076
AWRC No : 130001

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Obs Site
18/03/1955	1800	14.81		REGISTER	OBSERVED	
03/06/1955	1600	12.65		REGISTER	OBSERVED	
14/03/1956	0900	10.06		REGISTER	OBSERVED	
09/04/1956	0000	12.93		REGISTER	OBSERVED	
08/05/1956	0900	7.19		REGISTER	OBSERVED	
30/06/1956		6.30		REGISTER	OBSERVED	
03/07/1956	1700	7.65		REGISTER	OBSERVED	
17/07/1956		7.06		REGISTER	OBSERVED	
27/12/1956	1600	12.17		REGISTER	OBSERVED	
03/01/1957	1600	12.90		REGISTER	OBSERVED	
18/01/1957	0900	6.83		REGISTER	OBSERVED	
27/02/1958	1600	13.49		REGISTER	OBSERVED	
01/03/1958	0900	13.16		REGISTER	OBSERVED	
12/04/1958	0900	14.88		REGISTER	OBSERVED	
09/01/1959		3.68		REGISTER	OBSERVED	
02/02/1959		4.85		REGISTER	OBSERVED	
26/02/1959	0900	14.50		REGISTER	OBSERVED	
07/08/1959	1600	9.12		REGISTER	OBSERVED	
12/12/1959	0900	3.86		REGISTER	OBSERVED	
25/02/1961	0900	7.54		REGISTER	OBSERVED	
09/03/1961	0800	6.71		REGISTER	OBSERVED	
26/12/1961	0900	4.80		REGISTER	OBSERVED	
19/03/1962	0800	5.36		REGISTER	OBSERVED	
03/04/1963	1500	11.96		REGISTER	OBSERVED	
21/12/1965	0900	5.08		REGISTER	OBSERVED	
02/02/1966	1800	5.36		REGISTER	OBSERVED	
06/02/1967	0900	3.12		REGISTER	OBSERVED	
22/06/1967	0900	4.34		REGISTER	OBSERVED	
16/01/1968	0900	8.81		REGISTER	OBSERVED	
25/02/1968	0600	11.91		REGISTER	OBSERVED	
27/01/1970	0400	7.75		REGISTER	OBSERVED	
07/02/1970	0900	4.60		REGISTER	OBSERVED	
20/12/1970	0900	6.65		REGISTER	OBSERVED	
06/01/1971	1300	5.84		REGISTER	OBSERVED	
09/02/1971	0600	12.22		REGISTER	OBSERVED	
14/02/1971	0000	12.93		REGISTER	OBSERVED	
01/03/1971	0900	12.47		REGISTER	OBSERVED	
13/03/1971	0900	4.88		REGISTER	OBSERVED	
01/01/1972	1000	8.89		REGISTER	OBSERVED	
21/01/1972	2100	5.64		REGISTER	OBSERVED	
25/02/1972	2100	7.01		REGISTER	OBSERVED	
01/03/1972	0900	4.17		REGISTER	OBSERVED	
y /01/1973	0900	8.86 *		REGISTER	OBSERVED	
26/02/1973	2100	6.10		REGISTER	OBSERVED	
26/12/1973	1800	14.45		REGISTER	OBSERVED	
12/01/1974	0900	12.50		REGISTER	OBSERVED	

Note : Must be read in conjunction with Explanatory Notes.

Bureau of Meteorology

Date: 25/ 9/91

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : YAAMBA
Stream : FITZROY RIVER

CBM No : 033076
AWRC No : 130001

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Obs Site
17/01/1974	1500	12.86		REGISTER	OBSERVED	
07/02/1974	1500	12.32		REGISTER	OBSERVED	
10/03/1974	0900	10.26		REGISTER	OBSERVED	
02/04/1974	1500	4.90		REGISTER	OBSERVED	
03/01/1975	0900	6.97		REGISTER	OBSERVED	
18/01/1975	0900	9.16		REGISTER	OBSERVED	
27/02/1975	1500	5.01		REGISTER	OBSERVED	
05/03/1975	1500	8.10		REGISTER	OBSERVED	
28/03/1975	0900	4.00		REGISTER	OBSERVED	
02/04/1975	0900	3.75		REGISTER	OBSERVED	
28/10/1975	0900	4.54		REGISTER	OBSERVED	
18/12/1975	1600	4.97		REGISTER	OBSERVED	
31/12/1975	1600	11.94		REGISTER	OBSERVED	
01/01/1976	0900	11.87		REGISTER	OBSERVED	
29/01/1976	1700	12.84		REGISTER	OBSERVED	
01/02/1976	0900	11.60		REGISTER	OBSERVED	
08/02/1976	0900	10.51		REGISTER	OBSERVED	
13/03/1976	0900	8.59		REGISTER	OBSERVED	
17/03/1977	1600	10.75		REGISTER	OBSERVED	
11/02/1978	1600	14.75		REGISTER	OBSERVED	
11/11/1978	0900	4.08		REGISTER	OBSERVED	
14/02/1979	0900	10.36		REGISTER	OBSERVED	
~~20/02/1979~~	2200	6.45		REGISTER	OBSERVED	
19/03/1979	1130	11.69		REGISTER	OBSERVED	
14/01/1980	0000	6.96		REGISTER	OBSERVED	
13/02/1981	0900	7.28		REGISTER	OBSERVED	
05/03/1983	1000	9.62		REGISTER	OBSERVED	
11/05/1983	0600	14.97		REGISTER	OBSERVED	
30/05/1983	0630	11.45		REGISTER	OBSERVED	
09/12/1983	1000	4.47		REGISTER	OBSERVED	
11/02/1984	1030	7.13		REGISTER	OBSERVED	
28/10/1986	1800	5.60		REGISTER	OBSERVED	
10/03/1988	0600	15.22		REGISTER	OBSERVED	
13/02/1989	0900	6.95		REGISTER	OBSERVED	
14/04/1989	0700	12.05		REGISTER	OBSERVED	
03/04/1990	0900	8.28		F521	OBSERVED	
26/04/1990	0900	7.80		OPERATIONAL	OBSERVED	
03/05/1990	0900	8.20		OPERATIONAL	OBSERVED	
06/01/1991	1500	16.50		OPERATIONAL	OBSERVED	
10/01/1991	2100	16.65		OPERATIONAL	OBSERVED	
12/02/1991	2100	14.14		F521	OBSERVED	

END OF REPORT

Note : Must be read in conjunction with Explanatory Notes.

QUEENSLAND FLOOD-WARNING NETWORK

SURVEY HISTORY

Station: TAROOM CBM No: 035115 AWRC No: 130912

Latitude & Longitude:
Catchment: FITZROY RIVER
Ownership: CBM

Stream: DAWSON RIVER
Catchment area (sq km): 15720
Maintenance Agency: CBM

SITE A

GAUGE LOCATION: North St Taroom adjacent to caravan park.
RANGE: 2-15m
CONSTRUCTION: CBM plates, galv/HW posts
AMTD (kms): 384.80

DATE OF LAST SURVEY: 1/ 6/88
DATE ESTABLISHED: 1/ 9/11
DATE DISCONTINUED:

BENCH MARK (1)
Description: PSM 57056, brass plaque in concrete.
Adjacent to QWRC recorder hut.
RL/DATUM: 191.740 AHD

BENCH MARK (2)
Description:
RL/DATUM: 0.000

GAUGE ZERO (1)
RL/DATUM: 180.820 AHD Date from: 1/ 9/11 Date to:

GAUGE ZERO (2)
RL/DATUM: 0.000 Date from: Date to:

Bureau of Meteorology

Date: 25/ 9/91

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : TAROOM
Stream : DAWSON RIVER

CBM No : 035115
AWRC No : 130912

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Obs Site
21/03/1864		13.11		REGISTER	HISTORICAL	
25/03/1890		14.78		REGISTER	HISTORICAL	
14/01/1898		7.85		REGISTER	HISTORICAL	
20/02/1900		4.85		REGISTER	HISTORICAL	
08/07/1901		4.88		REGISTER	HISTORICAL	
28/05/1904		5.49		REGISTER	HISTORICAL	
08/04/1905		5.38		REGISTER	HISTORICAL	
06/02/1906		8.23		REGISTER	HISTORICAL	
06/03/1906		6.53		REGISTER	HISTORICAL	
14/01/1907		6.71		REGISTER	HISTORICAL	
07/03/1908		6.25		REGISTER	HISTORICAL	
18/03/1908		7.54		REGISTER	HISTORICAL	
19/01/1909		5.49		REGISTER	HISTORICAL	
17/01/1910		7.16		REGISTER	HISTORICAL	
22/03/1910		6.25		REGISTER	HISTORICAL	
13/12/1910		5.23		REGISTER	HISTORICAL	
16/02/1911	0000	7.87		REGISTER	OBSERVED	
13/06/1912	0930	7.03		REGISTER	OBSERVED	
21/12/1913		6.40		REGISTER	OBSERVED	
06/11/1916		5.56		REGISTER	OBSERVED	
06/02/1917	1500	6.50		REGISTER	OBSERVED	
10/03/1917		4.50		REGISTER	OBSERVED	
26/09/1917	0900	7.01		REGISTER	OBSERVED	
18/11/1917		6.10		REGISTER	OBSERVED	
03/01/1918		3.73		REGISTER	OBSERVED	
17/01/1918	0900	5.43		REGISTER	OBSERVED	
02/02/1918	1200	6.71		REGISTER	OBSERVED	
05/03/1919	1800	4.57		REGISTER	OBSERVED	
30/12/1921	0900	5.99		REGISTER	OBSERVED	
05/02/1924	1200	6.07		REGISTER	OBSERVED	
20/02/1924	2300	6.63		REGISTER	OBSERVED	
08/03/1924	0900	5.87		REGISTER	OBSERVED	
10/11/1924	2200	6.48		REGISTER	OBSERVED	
26/11/1924	0630	5.69		REGISTER	OBSERVED	
17/12/1924	1300	5.64		REGISTER	OBSERVED	
04/01/1926	0900	6.22		REGISTER	OBSERVED	
18/05/1926	2200	6.25		REGISTER	OBSERVED	
24/04/1928	1400	7.52		REGISTER	OBSERVED	
05/04/1929	2300	6.81		REGISTER	OBSERVED	
05/12/1929	0900	5.23		REGISTER	OBSERVED	
11/05/1930	1700	6.05		REGISTER	OBSERVED	
09/12/1931	0500	7.42		REGISTER	OBSERVED	
03/10/1933	1700	6.61		REGISTER	OBSERVED	
17/01/1935	0900	6.17		REGISTER	OBSERVED	
14/02/1937	0300	6.10		REGISTER	OBSERVED	
17/03/1937	1200	6.58		REGISTER	OBSERVED	

Note : Must be read in conjunction with Explanatory Notes.

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : TAROOM
Stream : DAWSON RIVER

CBM No : 035113
AWRC No : 130912

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Qual Code
27/05/1938	2100	6.88		REGISTER	OBSERVED	
29/01/1939	1500	6.38		REGISTER	OBSERVED	
02/03/1940	1700	6.22		REGISTER	OBSERVED	
21/03/1940	0600	7.37		REGISTER	OBSERVED	
27/01/1941	0900	6.20		REGISTER	OBSERVED	
16/03/1941	1600	6.30		REGISTER	OBSERVED	
12/02/1942	0700	6.15		REGISTER	OBSERVED	
01/01/1943	0900	7.16		REGISTER	OBSERVED	
24/01/1946	2000	6.10		REGISTER	OBSERVED	
14/02/1947	1830	6.22		REGISTER	OBSERVED	
07/03/1947	1000	5.89		REGISTER	OBSERVED	
14/12/1947	1100	5.66		REGISTER	OBSERVED	
18/02/1949	0900	3.53		REGISTER	OBSERVED	
07/03/1949	1045	4.11		REGISTER	OBSERVED	
29/03/1949	1530	4.65		REGISTER	OBSERVED	
17/10/1949	1430	6.48		REGISTER	OBSERVED	
26/10/1949	1700	4.29		REGISTER	OBSERVED	
24/11/1949	1700	3.20		REGISTER	OBSERVED	
10/02/1950	2100	3.96		REGISTER	OBSERVED	
19/02/1950	1700	6.86		REGISTER	OBSERVED	
10/04/1950	1800	5.99		REGISTER	OBSERVED	
21/07/1950	1700	4.42		REGISTER	OBSERVED	
30/07/1950	0900	6.93		REGISTER	OBSERVED	
13/10/1950	1400	5.82		REGISTER	OBSERVED	
15/11/1950	1000	4.17		REGISTER	OBSERVED	
19/11/1950	1200	4.85		REGISTER	OBSERVED	
27/11/1950	0930	7.47		REGISTER	OBSERVED	
22/03/1952	1700	5.99		REGISTER	OBSERVED	
24/02/1953	0830	4.27		REGISTER	OBSERVED	
20/01/1954	0830	6.02		REGISTER	OBSERVED	
28/01/1954	0830	4.57		REGISTER	OBSERVED	
15/02/1954	1700	8.15		REGISTER	OBSERVED	
01/03/1954	1000	6.17		REGISTER	OBSERVED	
14/07/1954	1100	7.52		REGISTER	OBSERVED	
14/08/1954	1100	6.22		REGISTER	OBSERVED	
28/02/1955	1130	5.54		REGISTER	OBSERVED	
02/05/1955	1015	4.32		REGISTER	OBSERVED	
28/05/1955	0700	7.67		REGISTER	OBSERVED	
17/07/1955	0700	4.32		REGISTER	OBSERVED	
23/01/1956	1000	6.91		REGISTER	OBSERVED	
11/02/1956	1430	9.27		REGISTER	OBSERVED	
21/03/1956	1700	4.95		REGISTER	OBSERVED	
31/03/1956	1700	5.56		REGISTER	OBSERVED	
04/05/1956	0900	4.80		REGISTER	OBSERVED	
26/06/1956	1200	6.53		REGISTER	OBSERVED	
10/07/1956	1630	5.49		REGISTER	OBSERVED	

Note : Must be read in conjunction with Explanatory Notes.

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : TAROOM
Stream : DAWSON RIVER

CBM No : 035115
AWRC No : 130912

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Obs Site
23/12/1956	1915	6.76		REGISTER	OBSERVED	
12/06/1958	0200	4.62		REGISTER	OBSERVED	
31/12/1958	1230	5.21		REGISTER	OBSERVED	
19/02/1959	2000	7.82		REGISTER	OBSERVED	
20/02/1961	1200	5.82		REGISTER	OBSERVED	
02/03/1961	2200	5.72		REGISTER	OBSERVED	
28/11/1961	2030	3.89		REGISTER	OBSERVED	
16/12/1961	2300	6.81		REGISTER	OBSERVED	
16/01/1962	0800	4.42		REGISTER	OBSERVED	
14/03/1962	0900	5.84		REGISTER	OBSERVED	
07/04/1962	1700	3.33		REGISTER	OBSERVED	
15/04/1962	0700	5.49		REGISTER	OBSERVED	
02/01/1963	0900	5.26		REGISTER	OBSERVED	
13/01/1963	0900	3.23		REGISTER	OBSERVED	
19/01/1963	0000	4.67		REGISTER	OBSERVED	
17/03/1963	0900	3.73		REGISTER	OBSERVED	
23/03/1963	0900	4.19		REGISTER	OBSERVED	
01/04/1963	1500	5.28		REGISTER	OBSERVED	
12/03/1964	0900	3.07		REGISTER	OBSERVED	
05/12/1965	1700	4.19		REGISTER	OBSERVED	
11/12/1965	2200	5.54		REGISTER	OBSERVED	
16/12/1965	2100	6.02		REGISTER	OBSERVED	
07/02/1966	1630	3.91		REGISTER	OBSERVED	
26/03/1966	0600	3.89		REGISTER	OBSERVED	
22/01/1967	2100	5.18		REGISTER	OBSERVED	
05/03/1967	1445	4.45		REGISTER	OBSERVED	
11/03/1967	0700	3.56		REGISTER	OBSERVED	
15/01/1968	0430	5.00		REGISTER	OBSERVED	
21/10/1969	2100	3.07		REGISTER	OBSERVED	
16/11/1969	1300	4.42		REGISTER	OBSERVED	
26/12/1969	0900	3.89		REGISTER	OBSERVED	
27/01/1970	0900	3.20		REGISTER	OBSERVED	
02/02/1970	1200	4.19		REGISTER	OBSERVED	
18/11/1970	1800	4.06		REGISTER	OBSERVED	
10/12/1970	1200	6.99		REGISTER	OBSERVED	
18/12/1970	0900	3.30		REGISTER	OBSERVED	
28/12/1970	0900	6.53		REGISTER	OBSERVED	
26/01/1971	0900	5.97		REGISTER	OBSERVED	
08/02/1971	2100	6.65		REGISTER	OBSERVED	
24/02/1971	1500	6.88		REGISTER	OBSERVED	
09/03/1971	2100	2.79		REGISTER	OBSERVED	
30/12/1971	0200	4.45		REGISTER	OBSERVED	
15/02/1973	2100	3.51		REGISTER	OBSERVED	
22/02/1973	2100	3.05		REGISTER	OBSERVED	
10/07/1973	0900	4.42		REGISTER	OBSERVED	
07/11/1973	2100	2.59		REGISTER	OBSERVED	

Note : Must be read in conjunction with Explanatory Notes.

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : TAROOM
Stream : DAWSON RIVER

CBM No : 03511[illegible]
AWRC No : 13091[illegible]

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Obs Site
28/12/1973	0830	2.97		REGISTER	OBSERVED	
10/01/1974	1500	6.10		REGISTER	OBSERVED	
31/01/1974	0900	6.32		REGISTER	OBSERVED	
30/04/1974	2100	4.57		REGISTER	OBSERVED	
11/01/1975	0900	5.90		REGISTER	OBSERVED	
27/02/1975	2100	3.84		REGISTER	OBSERVED	
25/12/1975	1500	6.50		REGISTER	OBSERVED	
15/01/1976	0900	6.00		REGISTER	OBSERVED	
06/02/1976	1500	6.15		REGISTER	OBSERVED	
02/03/1976	0900	3.21		REGISTER	OBSERVED	
17/11/1976	0900	5.80		REGISTER	OBSERVED	
13/03/1977	2100	5.00		REGISTER	OBSERVED	
17/05/1977	2100	6.28		REGISTER	OBSERVED	
24/01/1978	1900	4.08		REGISTER	OBSERVED	
02/02/1978	0900	3.30		REGISTER	OBSERVED	
12/07/1978	1500	3.11		REGISTER	OBSERVED	
09/09/1978	1800	5.70		REGISTER	OBSERVED	
07/11/1978	2100	3.20		REGISTER	OBSERVED	
07/03/1979	0900	3.30		REGISTER	OBSERVED	
12/02/1980	1130	5.34		REGISTER	OBSERVED	
06/02/1981	0900	3.70		REGISTER	OBSERVED	
10/02/1981	1500	4.10		REGISTER	OBSERVED	
02/04/1981	1500	6.40		REGISTER	OBSERVED	
03/06/1981	0900	6.74		REGISTER	OBSERVED	
18/11/1981	2100	3.67		REGISTER	OBSERVED	
20/01/1982	2100	4.55		REGISTER	OBSERVED	
23/01/1982	2100	4.70		REGISTER	OBSERVED	
10/03/1982	2100	3.70		REGISTER	OBSERVED	
13/03/1982	2100	4.55		REGISTER	OBSERVED	
05/01/1983	1200	5.00		REGISTER	OBSERVED	
04/05/1983	0900	7.46		REGISTER	OBSERVED	
27/05/1983	0900	6.22		REGISTER	OBSERVED	
29/05/1983	2100	6.12		REGISTER	OBSERVED	
23/06/1983	2100	6.68		REGISTER	OBSERVED	
14/10/1983	0900	3.90		REGISTER	OBSERVED	
06/11/1983	0900	4.19		REGISTER	OBSERVED	
23/11/1983	1715	5.80		REGISTER	OBSERVED	
01/12/1983	0900	4.38		REGISTER	OBSERVED	
06/12/1983	2100	5.48		REGISTER	OBSERVED	
01/02/1984	2100	6.10		REGISTER	OBSERVED	
21/02/1984	2100	3.76		REGISTER	OBSERVED	
03/03/1984	2100	3.08		REGISTER	OBSERVED	
29/07/1984	1500	6.57		REGISTER	OBSERVED	
01/11/1984	0900	3.22		REGISTER	OBSERVED	
06/11/1984	2100	3.10		REGISTER	OBSERVED	
19/12/1984	2100	5.14		REGISTER	OBSERVED	

Note : Must be read in conjunction with Explanatory Notes.

Bureau of Meteorology

Date: 25/ 9/91

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : TAROOM
Stream : DAWSON RIVER

CBM No : 035115
AWRC No : 130912

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Obs Site
28/01/1985	2100	3.00		REGISTER	OBSERVED	
10/03/1985	2100	2.92		REGISTER	OBSERVED	
08/02/1986	1800	3.70		REGISTER	OBSERVED	
02/02/1987	1800	3.90		REGISTER	OBSERVED	
12/11/1987		3.60		REGISTER	OBSERVED	
04/02/1988	0600	3.95		REGISTER	OBSERVED	
06/04/1988	1800	3.35		REGISTER	OBSERVED	
31/03/1989	0600	3.35		REGISTER	OBSERVED	
06/04/1989	0600	3.90		REGISTER	OBSERVED	
29/04/1989	0600	6.60		REGISTER	OBSERVED	
09/06/1989	1800	4.50		REGISTER	OBSERVED	
09/06/1989	1800	4.50		OPERATIONAL	OBSERVED	
28/10/1989	0900	5.45		F521	OBSERVED	
08/11/1989	0200	6.30		F521	OBSERVED	
11/11/1989	1100	5.05		F521	OBSERVED	
15/11/1989	0630	4.08		F521	OBSERVED	
02/04/1990	0100	4.90		F521	OBSERVED	
09/04/1990	2200	4.55		F521	OBSERVED	
23/04/1990	0630	6.35		F521	OBSERVED	
27/05/1990	0600	4.20		F521	OBSERVED	
10/06/1990	0600	3.40		F521	OBSERVED	
10/02/1991	1300	6.24		OPERATIONAL	OBSERVED	

END OF REPORT.

Note : Must be read in conjunction with Explanatory Notes.

QUEENSLAND FLOOD-WARNING NETWORK

SURVEY HISTORY

Station: TARTRUS CBM No: 034082 AWRC No: 130308

Latitude & Longitude:
Catchment: FITZROY RIVER
Ownership: CBM

Stream: MACKENZIE RIVER
Catchment area (sq km): 75445
Maintenance Agency: CBM

SITE A

GAUGE LOCATION: Adjacent "Tartrus" homestead.
RANGE: 2-18m
CONSTRUCTION: CBM plates on galv. posts
AMTD (kms): 428.60

DATE OF LAST SURVEY: 1/ 5/89
DATE ESTABLISHED: 1/ 9/74
DATE DISCONTINUED:

BENCH MARK (1)
Description: PSM 7089.
RL/DATUM: 146.751 AHD

BENCH MARK (2)
Description: BM nail on top of septic tank.
About 20m east of top gauge.
RL/DATUM: 93.988 AHD

GAUGE ZERO (1)
RL/DATUM: 76.088 AHD Date from: 1/ 9/74 Date to:

GAUGE ZERO (2)
RL/DATUM: 0.000 Date from: Date to:

Remarks: New QWRC PSM star picket in concrete nr recorder hut: RL 89.660 AHD.

Bureau of Meteorology

Date: 25/ 9/91

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : TARTRUS
Stream : MACKENZIE RIVER

CBM No : 034082
AWRC No : 130908

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Obs Site
11/02/1954		17.48		REGISTER	ESTIMATED	
26/02/1955		12.19		REGISTER	ESTIMATED	
12/03/1955		16.11		REGISTER	ESTIMATED	
30/05/1955		12.93		REGISTER	ESTIMATED	
17/02/1956		14.15		REGISTER	ESTIMATED	
03/04/1956		13.97		REGISTER	ESTIMATED	
30/12/1956		13.18		REGISTER	ESTIMATED	
22/02/1958		14.83		REGISTER	ESTIMATED	
06/04/1958		18.19		REGISTER	ESTIMATED	
20/02/1959		16.10		REGISTER	ESTIMATED	
30/03/1963		11.96		REGISTER	ESTIMATED	
05/04/1963		12.19		REGISTER	ESTIMATED	
07/01/1974	1300	13.41		REGISTER	OBSERVED	
31/12/1974		6.00		REGISTER	OBSERVED	
27/12/1975	1500	11.00		REGISTER	OBSERVED	
25/01/1976	1100	14.50		REGISTER	OBSERVED	
03/02/1976	2100	12.30		REGISTER	OBSERVED	
10/03/1976	0900	10.05		REGISTER	OBSERVED	
13/03/1977	2100	11.90		REGISTER	OBSERVED	
20/05/1977	0700	9.25		REGISTER	OBSERVED	
05/02/1978	0000	16.60		REGISTER	OBSERVED	
04/02/1979	1800	10.80		REGISTER	OBSERVED	
10/02/1979	0600	13.30		REGISTER	OBSERVED	
17/02/1979	2100	7.60		REGISTER	OBSERVED	
06/03/1979	2100	9.00		REGISTER	OBSERVED	
14/03/1979	2100	14.15		REGISTER	OBSERVED	
11/01/1980	0600	8.20		REGISTER	OBSERVED	
14/02/1980	1500	4.90		REGISTER	OBSERVED	
09/02/1981	0900	6.40		REGISTER	OBSERVED	
06/03/1982	0600	4.30		REGISTER	OBSERVED	
06/05/1983	1500	14.90		REGISTER	OBSERVED	
26/05/1983	0600	12.20		REGISTER	OBSERVED	
07/02/1984	1800	7.20		REGISTER	OBSERVED	
17/03/1985	0600	4.40		REGISTER	OBSERVED	
04/03/1988	0100	17.90		REGISTER	OBSERVED	
09/02/1989	0600	8.70		REGISTER	OBSERVED	
09/04/1989	0600	14.70		REGISTER	OBSERVED	
21/05/1989	0600	8.90		REGISTER	OBSERVED	
30/03/1990	0600	10.40		F521	OBSERVED	
23/04/1990	0600	8.90		F521	OBSERVED	
30/04/1990	0600	8.60		F521	OBSERVED	
01/01/1991	0200	18.10		OPERATIONAL	OBSERVED	
06/01/1991	0600	18.00		OPERATIONAL	OBSERVED	
07/02/1991	0600	15.80		OPERATIONAL	OBSERVED	

Note : Must be read in conjunction with Explanatory Notes.

QUEENSLAND FLOOD-WARNING NETWORK

SURVEY HISTORY

Station: SALTBUSH PARK CBM No: 034073 AWRC No: 130906

Latitude & Longitude:
Catchment: CONNORS RIVER
Ownership: CBM

Stream: FUNNEL CREEK
Catchment area (sq km): 6580
Maintenance Agency: CBM

SITE A

GAUGE LOCATION: About 500m from homestead.
RANGE: 0-11m
CONSTRUCTION: CBM plates on galv. posts
AMTD (kms): 21.60

DATE OF LAST SURVEY: 1/ 4/88
DATE ESTABLISHED: 1/ 9/43
DATE DISCONTINUED:

BENCH MARK (1)
Description: BM 48525 on coolibah.
Next to tree about 100m W of top gauge. RL/DATUM: 133.718 AHD

BENCH MARK (2)
Description:
RL/DATUM: 0.000

GAUGE ZERO (1)
RL/DATUM: 129.483 AHD Date from: 1/ 9/43 Date to:

GAUGE ZERO (2)
RL/DATUM: 0.000 Date from: Date to:

Bureau of Meteorology

Date: 25/ 9/91

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : SALTBUSH PARK
Stream : FUNNEL CREEK

CBM No : 034073
AWRC No : 130906

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Obs Site
31/01/1896		9.98		REGISTER	HISTORICAL	
23/01/1918		11.35		REGISTER	HISTORICAL	
08/04/1940		8.15		REGISTER	OBSERVED	
13/02/1944		6.93		REGISTER	OBSERVED	
21/02/1944		5.61		REGISTER	OBSERVED	
30/03/1944		6.78		REGISTER	OBSERVED	
15/01/1946		5.03		REGISTER	OBSERVED	
21/01/1946		3.89		REGISTER	OBSERVED	
23/01/1946		3.89		REGISTER	OBSERVED	
25/01/1946		3.12		REGISTER	OBSERVED	
09/02/1946		1.83		REGISTER	OBSERVED	
05/03/1946		7.30		REGISTER	OBSERVED	
06/02/1947		7.01		REGISTER	OBSERVED	
11/02/1947		6.78		REGISTER	OBSERVED	
03/03/1947		1.91		REGISTER	OBSERVED	
31/03/1947		2.21		REGISTER	OBSERVED	
13/02/1948	0800	4.55		REGISTER	OBSERVED	
06/03/1949		3.43		REGISTER	OBSERVED	
16/03/1949		4.57		REGISTER	OBSERVED	
28/03/1949		2.13		REGISTER	OBSERVED	
19/01/1950	1500	4.72		REGISTER	OBSERVED	
16/02/1950	0900	3.40		REGISTER	OBSERVED	
31/02/1950	1500	6.40		REGISTER	OBSERVED	
10/03/1950	0900	7.62		REGISTER	OBSERVED	
10/07/1950	0900	4.34		REGISTER	OBSERVED	
18/07/1950	0900	2.16		REGISTER	OBSERVED	
27/07/1950	0900	4.72		REGISTER	OBSERVED	
07/12/1950	0900	3.05		REGISTER	OBSERVED	
11/01/1951	0900	7.24		REGISTER	OBSERVED	
27/01/1953		5.33		REGISTER	OBSERVED	
17/02/1953		5.33		REGISTER	OBSERVED	
24/01/1954		5.87		REGISTER	OBSERVED	
09/02/1954		8.76		REGISTER	OBSERVED	
15/02/1954	0600	9.14		REGISTER	OBSERVED	
14/04/1954	0900	3.81		REGISTER	OBSERVED	
23/02/1955		7.24		REGISTER	OBSERVED	
08/03/1955		8.53		REGISTER	OBSERVED	
26/05/1955		7.87		REGISTER	OBSERVED	
24/01/1956	0850	6.65		REGISTER	OBSERVED	
03/02/1956	1615	4.11		REGISTER	OBSERVED	
09/02/1956	1700	6.25		REGISTER	OBSERVED	
28/03/1956	0900	7.09		REGISTER	OBSERVED	
29/12/1956	0900	5.94		REGISTER	OBSERVED	
17/02/1958	1500	3.35		REGISTER	OBSERVED	
03/04/1958		9.22		REGISTER	OBSERVED	
27/03/1963		7.16		REGISTER	OBSERVED	

Note : Must be read in conjunction with Explanatory Notes.

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : SALTBUSH PARK
Stream : FUNNEL CREEK

CBM No : 034073
AWRC No : 130906

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Obs Site
02/04/1963	0900	5.33		REGISTER	OBSERVED	
16/01/1968	1500	4.85		REGISTER	OBSERVED	
08/03/1971	1500	5.18		REGISTER	OBSERVED	
25/12/1971	1200	3.35		REGISTER	OBSERVED	
07/01/1972	0900	4.42		REGISTER	OBSERVED	
17/01/1975	1500	5.72		REGISTER	OBSERVED	
28/02/1975	0900	5.30		REGISTER	OBSERVED	
28/03/1975	0900	4.40		REGISTER	OBSERVED	
24/10/1975	1800	1.50		REGISTER	OBSERVED	
25/10/1975	0900	1.50		REGISTER	OBSERVED	
13/12/1975	0600	6.40		REGISTER	OBSERVED	
28/12/1975	1030	4.85		REGISTER	OBSERVED	
31/12/1975	0700	6.15		REGISTER	OBSERVED	
21/01/1976	1200	6.70		REGISTER	OBSERVED	
31/01/1976	1200	7.56		REGISTER	OBSERVED	
02/02/1976	0900	6.62		REGISTER	OBSERVED	
02/11/1976	1200	1.90		REGISTER	OBSERVED	
03/02/1977		5.05		REGISTER	OBSERVED	
08/03/1977	0900	2.10		REGISTER	OBSERVED	
29/01/1979	0300	7.20		REGISTER	OBSERVED	
01/02/1979	1100	7.80		REGISTER	OBSERVED	
07/02/1979	1730	8.25		REGISTER	OBSERVED	
14/02/1979	1800	7.08		REGISTER	OBSERVED	
03/03/1979	1430	6.95		REGISTER	OBSERVED	
06/03/1979	0400	6.70		REGISTER	OBSERVED	
11/03/1979	0600	7.40		REGISTER	OBSERVED	
06/02/1981	0700	4.80		REGISTER	OBSERVED	
01/03/1981	0600	4.30		REGISTER	ESTIMATED	
04/03/1982	2100	4.75		REGISTER	OBSERVED	
04/01/1983	0600	3.30		REGISTER	OBSERVED	
04/05/1983	0130	6.30		REGISTER	OBSERVED	
22/05/1983	0600	6.55		REGISTER	OBSERVED	
19/06/1983	1500	2.30		REGISTER	OBSERVED	
14/03/1985	1000	7.00		REGISTER	OBSERVED	
23/10/1985	1900	3.00		REGISTER	OBSERVED	
25/11/1985	1530	4.50		REGISTER	OBSERVED	
11/11/1987	0900	5.00		REGISTER	OBSERVED	
02/03/1988	1200	9.55		OPERATIONAL	OBSERVED	
05/04/1989	1800	8.60		REGISTER	OBSERVED	
26/03/1990	1200	7.60		OPERATIONAL	OBSERVED	
04/04/1990	0900	4.92		OPERATIONAL	OBSERVED	
10/04/1990	0700	4.65		OPERATIONAL	OBSERVED	
20/04/1990	0630	7.10		OPERATIONAL	OBSERVED	
28/12/1990	1400	8.00		OPERATIONAL	OBSERVED	
30/12/1990	1800	9.40		OPERATIONAL	OBSERVED	
02/01/1991	1800	7.30		OPERATIONAL	OBSERVED	

Note : Must be read in conjunction with Explanatory Notes.

Bureau of Meteorology

Date: 25/ 9/91

PEAK FLOOD HEIGHTS
(Chronological Listing)

Station : SALTBUSH PARK
Stream : FUNNEL CREEK

CBM No : 034073
AWRC No : 130906

Date	Time	Gauge Height (metres)	Site	Data Source	Data Type	Obs Site
04/01/1991	1800	8.75		OPERATIONAL	OBSERVED	
09/01/1991	0600	6.75		OPERATIONAL	OBSERVED	
03/02/1991	1900	7.85		OPERATIONAL	OBSERVED	
05/02/1991	0700	8.05		OPERATIONAL	OBSERVED	
08/02/1991	0700	6.45		OPERATIONAL	OBSERVED	
17/02/1991	0700	5.85		OPERATIONAL	OBSERVED	

END OF REPORT

Note : Must be read in conjunction with Explanatory Notes.

D3 Monthly Maximum Instantaneous Flows

130302 DAWSON RIVER AT TAROOM

A. TAROOM

LOCATION: LATITUDE 25 38 18 S LONGITUDE 149 47 12 E
GRID REFERENCE 798 614 MAP TAROOM NO. 8846-
1: 100000 SERIES
ADOPTED RIVER DISTANCE: 384.6 KM
CATCHMENT AREA: 15720 SQ.KM
PERIOD OF RECORD: 1911 - DATE
METHOD OF RECORDING: STAFF GZ180.820 31/12/11
L S GE 2180.820 03/02/82
GAUGE ZERO: 180.820 AUSTRALIAN HEIGHT DATUM
CONTROL: CONTROL WEIR
OTHER RECORDS OBTAINED: RANDOM WATER QUALITY SAMPLES AND WATER TEMPERATURES

HIGHEST FLOW MEASUREMENTS

	1	2	3	NUMBER OF MEASUREMENTS
A. GAUGE HEIGHT METRES	6.52	6.62	6.60	379
DISCHARGE CUMECS	1111.000	1109.000	1068.000	
DATE	29/07/84	29/04/89	29/04/89	

SUMMARY OF FLOW DATA

OVERALL PERIOD OF RECORD JANUARY 1911 TO JUNE 1990

ANNUAL SUMMARY BASED ON 77 COMPLETE CLIMATIC YEARS

	MAXIMUM	YEAR	MINIMUM	YEAR	MEAN
ANNUAL DISCHARGE IN MEGALITRES	2909172	1955-56	3608	1968-69	388674
MONTHLY DISCHARGE IN MEGALITRES	1454069	1955-56	0	1914-15	
INSTANTANEOUS FLOW CUMEC	3916	1955-56	0	1911-12	

RUNOFF IN MILLIMETRES

MEAN ANNUAL RUNOFF 25

RAINFALL

MEAN ANNUAL CATCHMENT RAINFALL 661 MM 1919-1969

130302 DAWSON RIVER AT TAROOM

MONTHLY MAXIMUM INSTANTANEOUS FLOWS IN CUMECS

CLIMATIC YEAR	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1949-50	691.16	37.44	6.59	4.48	818.95	2.09	433.51	2.31	32.60	964.47	414.54	1.72
1950-51	396.14	1382.71	126.08	26.30	36.68	18.44	1.78	0.96	0.65	0.43	0.22	0.13
1951-52	2.41	0.58	1.21	2.03	0.97	453.07	35.35	2.65	0.66	0.38	0.38	0.25
1952-53	0.38	0.51	0.04	0.21	143.41	21.12	3.12	1.30	0.23	0.14	0.23	0.23
1953-54	1.30	21.65	16.45	482.43	1991.71	535.07	2.31	1.05	0.80	1429.85	568.47	15.46
1954-55	2.99	8.12	1.33	1.33	355.61	273.01	1.92	1560.68	205.04	146.32	6.94	3.02
1955-56	3.51	7.25	2.86	946.02	3915.65	396.14	795.58	237.11	717.02	344.31	4.96	2.48
1956-57	1.67	4.14	850.33	11.53	3.58	0.73	0.41	0.41	0.41	0.57	0.41	0.28
1957-58	0.25	0.41	0.07	7.94	21.12	5.35	1.30	0.10	189.74	0.41	0.16	0.09
1958-59	0.41	0.16	284.98	282.68	1716.82	67.20	2.21	0.93	0.80	0.55	0.33	0.33
1959-60	1.05	11.03	33.96	4.48	77.63	2.96	0.33	14.56	2.31	0.41	0.41	0.21
1960-61	5.94	4.68	1.60	0.61	420.55	396.14	0.48	0.30	0.30	0.48	0.48	0.21
1961-62	2.25	102.85	880.70	159.94	10.34	426.61	344.31	1.46	0.53	0.85	0.54	0.51
1962-63	0.41	8.27	112.67	297.31	2.36	277.53	302.10	0.93	1.16	0.48	0.80	0.48
1963-64	0.27	2.18	16.45	0.74	2.38	43.11	0.43	0.30	0.49	0.33	0.23	9.19
1964-65	16.92	0.18	9.15	7.99	6.91	0.05	0.00	0.18	0.10	0.31	0.18	0.86
1965-66	0.68	0.07	402.43	1.08	105.17	102.85	2.03	0.19	0.48	0.25	4.66	1.37
1966-67	34.61	0.05	0.16	237.11	9.93	193.71	0.11	0.52	2.20	0.58	0.20	0.15
1967-68	0.27	0.10	8.81	250.10	65.49	0.77	23.33	29.33	0.45	0.28	0.24	0.24
1968-69	0.24	0.02	9.10	0.18	0.10	0.05	0.00	0.00	0.27	0.15	0.10	0.06
1969-70	45.75	126.08	102.85	55.46	134.55	7.59	0.51	0.05	0.29	0.06	0.03	0.03
1970-71	0.02	120.53	981.11	462.31	929.85	35.27	0.49	0.23	0.28	0.23	0.49	0.44
1971-72	0.08	0.05	164.58	186.37	193.57	1.91	0.24	0.11	0.09	0.05	0.05	0.05
1972-73	18.35	40.99	0.24	13.90	68.88	15.04	0.43	0.20	0.09	161.98	50.67	42.45
1973-74	1.27	29.93	40.13	621.21	513.89	3.00	172.53	113.71	2.26	0.06	0.55	0.31
1974-75	0.73	0.80	1.62	441.18	40.99	15.99	9.18	0.23	0.18	0.14	0.10	0.08
1975-76	5.00	21.00	701.94	473.71	534.96	51.26	2.74	0.37	0.24	0.19	0.16	0.24
1976-77	0.90	556.69	13.19	2.03	0.21	249.33	1.70	592.88	3.10	0.45	0.27	0.19
1977-78	0.14	0.16	0.16	122.02	56.74	0.70	0.60	0.04	0.16	45.60	1.84	392.00
1978-79	0.83	50.67	5.14	4.59	0.57	24.17	0.70	0.40	0.45	0.24	0.10	0.06
1979-80	0.01	21.93	70.33	6.55	316.97	0.10	0.03	0.00	0.05	0.10	0.18	0.05
1980-81	0.00	0.00	0.79	4.01	118.76	1.20	518.05	27.70	838.14	0.68	0.44	0.42
1981-82	0.48	83.51	29.48	226.73	35.33	160.06	0.47	0.30	0.27	0.22	0.20	0.13
1982-83	0.08	0.02	9.00	235.01	4.00	0.13	174.72	1731.65	1106.51	30.83	10.38	3.40
1983-84	80.09	455.91	364.23	375.98	596.38	39.33	0.47	0.33	0.43	1051.42	459.35	1.63
1984-85	38.00	44.93	301.88	34.47	6.92	34.47	0.26	0.15	1.43	0.54	0.28	0.28
1985-86	21.13	4.27	13.24	0.52	73.86	4.75	0.11	0.25	0.07	0.20	0.31	0.10
1986-87	1.76	0.41	8.42	22.50	87.41	0.20	0.11	0.93	0.11	0.08	0.10	0.11
1987-88	7.31	64.19	1.49	65.43	86.66	6.54	49.46	2.64	0.11	7.58	1.37	0.33
1988-89	0.11	0.00	2.29	20.68	0.57	54.83	1119.61	513.28	152.32	36.21	1.19	-

NOTE: "-" INDICATES INCOMPLETE RECORD

130302 DAWSON RIVER AT TAROOM

MONTHLY MAXIMUM INSTANTANEOUS FLOWS IN CUMECS

CLIMATIC YEAR	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1910-11	-	-	-	738.79	1763.09	9.53	1.83	0.71	0.56	0.52	0.73	0.56
1911-12	0.90	0.48	1.33	19.26	80.60	3.69	0.27	0.13	1022.26	84.70	0.73	0.33
1912-13	111.97	60.86	2.20	8.06	0.56	12.49	1.33	1.33	351.19	28.95	0.36	0.27
1913-14	0.22	0.56	80.60	14.69	130.43	116.86	57.83	1.20	22.94	21.89	0.34	0.17
1914-15	0.34	292.27	76.65	7.79	1.83	0.06	5.06	0.00	0.00	0.00	0.00	0.56
1915-16	0.48	3.14	4.39	236.19	11.78	80.60	13.92	0.08	0.34	88.70	1.70	0.48
1916-17	0.06	357.46	50.40	116.86	698.37	167.34	11.78	0.22	0.22	0.13	0.34	1005.24
1917-18	25.85	511.91	199.61	328.91	2185.60	1.86	0.74	0.52	0.56	0.62	0.64	0.47
1918-19	0.26	0.24	0.30	0.19	1.74	177.63	1.61	0.51	0.51	0.28	0.24	0.24
1919-20	0.16	0.09	0.65	1.93	184.90	2.42	0.60	0.56	2.71	4.87	10.65	11.25
1920-21	53.32	3.84	119.68	73.06	0.32	1.57	0.60	0.64	122.22	323.67	2.10	42.48
1921-22	0.27	0.86	472.46	351.89	2.46	53.32	0.24	0.32	0.27	0.27	0.14	0.12
1922-23	0.15	0.10	74.84	11.10	4.18	0.15	6.75	0.22	11.36	0.30	0.20	3.14
1923-24	19.26	8.64	139.04	238.27	767.32	432.64	2.53	0.26	0.33	0.45	0.60	1.07
1924-25	181.03	659.73	375.28	173.88	69.38	14.66	0.50	0.35	0.42	0.22	0.22	0.17
1925-26	0.11	3.38	199.61	553.94	33.57	20.24	0.03	576.64	0.96	0.16	0.16	0.20
1926-27	0.09	0.12	64.21	249.41	144.76	199.61	106.94	0.17	0.26	0.26	0.19	0.19
1927-28	13.95	25.85	307.68	3.55	157.48	3.16	1408.43	22.41	4.40	0.86	0.56	0.39
1928-29	0.31	0.43	14.32	11.33	23.48	74.84	871.36	0.35	0.38	0.38	0.21	0.17
1929-30	0.14	0.73	286.86	5.43	26.42	9.70	0.41	491.27	9.79	4.33	1.06	0.55
1930-31	0.63	13.48	1.49	0.26	25.28	0.63	0.25	0.28	0.19	0.18	0.14	0.10
1931-32	0.28	21.31	1319.48	1.70	0.56	0.10	99.84	2.09	1.30	0.20	0.11	0.14
1932-33	4.14	41.72	27.67	258.14	32.83	24.09	11.68	0.14	0.32	93.09	20.67	71.09
1933-34	753.79	40.51	5.34	0.57	13.88	2.23	0.58	0.71	1.48	1.54	1.37	0.50
1934-35	0.50	323.67	375.28	543.50	2.14	0.63	0.08	0.10	0.10	0.31	0.11	20.24
1935-36	43.68	1.37	0.20	69.38	69.38	9.27	0.42	0.15	0.31	0.42	0.13	0.10
1936-37	0.05	0.01	1.39	19.26	511.91	732.20	1.63	0.32	0.53	0.29	0.29	0.21
1937-38	0.14	41.63	6.71	62.62	99.84	3.22	1.66	919.54	74.84	1.58	4.62	0.28
1938-39	19.26	157.48	50.40	634.45	272.80	345.69	1.33	3.14	0.56	2.88	1.19	0.18
1939-40	0.15	1.57	6.18	8.19	429.42	1278.00	5.08	0.70	0.42	0.39	0.25	0.25
1940-41	0.22	0.20	122.22	553.94	80.60	593.10	4.03	0.33	0.91	0.37	0.20	0.16
1941-42	0.14	2.57	0.45	7.04	531.95	2.99	0.15	0.31	0.24	0.26	0.18	0.12
1942-43	0.15	0.22	935.39	1115.44	4.35	0.53	0.14	0.15	0.22	0.15	0.15	15.88
1943-44	17.27	139.04	1.86	1.49	8.11	0.13	0.07	0.14	0.24	0.10	0.10	0.08
1944-45	0.05	0.02	22.94	2.39	25.21	8.70	21.89	6.47	1.61	8.00	0.51	4.38
1945-46	0.58	1.76	22.94	511.91	3.88	2.78	0.39	0.23	0.34	0.51	0.38	0.16
1946-47	0.25	6.68	105.17	14.99	640.13	433.51	117.97	0.63	1.05	1.05	1.05	13.62
1947-48	2.09	22.25	378.31	1.30	0.63	0.48	0.33	11.03	2.51	6.59	0.48	2.72
1948-49	0.48	0.21	2.09	30.64	72.74	193.71	32.60	0.33	0.21	0.21	0.13	0.33

NOTE: "-" INDICATES INCOMPLETE RECORD

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130302 DAWSON RIVER AT TAROOM

MONTHLY MAXIMUM INSTANTANEOUS FLOWS IN CUMECS

CLIMATIC YEAR	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1989-90	378.96	796.59	45.42	1.05	0.37	85.91	815.59	101.12	50.51	-	-	-

90-91 10·86 721-71

NOTE: "-" INDICATES INCOMPLETE RECORD

Water Resources

ByMonth Output 05/09/199

Maximum Stream Discharge in Cubic Metres/Second

Fitzroy River at Yeamba

Station No 130001A

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Max	Year
1914	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	3.92	47.99	[ ]	1914
1915	39.33	58.89	3.24	1.17	0.78	0.17	0.17	0.09	0.07	0.17	0.17	45.54	58.39	1915
1916	23.0	58.4	25.6	37.1	15.1	3.8	195.2	110.2	7.3	154.3	313.6	1340	1340	1916
1917	2099	2967	4707	100.5	16.4	7.8	5.4	4.9	319.4	1617	949.5	847.7	2099	1917
1918	17997	17997	568.3	303.5	315.9	28.4	18.1	11.4	8.5	6.0	4.3*	2.9*	17997 *	1918
1919	1.5*	16.5	44.7	17.2	37.1	60.4	22.1	4.4	2.2	1.0	0.5	0.3	60.4*	1919
1920	674.4	262.9	20.4	2.7	4.9	15.5	15.9	6.1	2.9	76.8	146.8	97.8	674.4	1920
1921	968.5	116.9	956.6	74.5	10.3	335.7	554.5	150.2	540.8	29.6	5.0	3649	3649	1921
1922	3762	7105	157.4	23.8	34.4	3.3	4.4	3.9	2.7	1.2	0.8	1166	7105	1922
1923	554.5	43.3	5.3	4.4	2.0	21.5	7.3	1.6*	0.9	0.4*	0.0	29.2	554.5*	1923
1924	78.9	2135	1839	514.8	20.3	5.4	4.0	2.4	19.0	52.2	1241	349.6	2135	1924
1925	347.1	551.8	84.7	40.1	4.3	24.3	14.7	1.7	1.0	0.6	0.2	28.5	551.8	1925
1926	934.5	17.4	4.6	1.9	336.3	78.1	3.8*	0.6	0.5	0.4*	0.0	368.6	934.5*	1926
1927	1109	1292	397.1	390.9	9.5	12.0	3.6	1.0	0.4	0.0	[ ]	[ ]	[ ]	1927
Mean	2699 *	2455	678.1	116.4	62.1	45.9	65.3*	23.0*	69.6	149.2*	205.1*	613.4*	3638 *	Mean
Max	17997 *	17997	4707	514.8	336.3	335.7	554.5*	150.2*	540.8	1617 *	1241 *	3649 *	17997*	Max
Min	1.5*	16.5	3.2	1.2	0.8	0.2	0.2*	0.1*	0.1	0.0*	0.0*	0.3*	58.9*	Min
Count	13	13	13	13	13	13	13	13	13	13	13	13	12	Count

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All recorded data is continuous and reliable except where the following tags are used...

* ... Estimated Data

[ ] Data Not Recorded

Maximum Stream Discharge in Cubic Metres/Second

Fitzroy River at [illegible] Station No 1300015

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Max	Year
1927	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	10.4*	4142	[ ]	1927
1928	4222	2111	1137	10261	6586	35.1	20.8	8.7*	4.1*	2.4*	0.7	47.2	10261 *	1928
1929	336.0	5163	1250	~~1857~~	42.1*	380.3*	36.7*	5.3*	2.3*	1.2*	0.6*	125.3*	5163 *	1929
1930	1651 *	2047 *	71.5*	19.1*	1907 *	402.7*	178.7*	23.3*	6.8*	3.0*	0.8	5.2*	2047 *	1930
1931	9.2	1173	10.6	1.5	0.6	0.6	0.5	0.3	11.6	2.7	6.2	2200	2200	1931
1932	927.2	164.5*	3.7	44.7	42.0*	2.3	1.4	1.0*	0.4*	1.1	4.6	234.3	927.2*	1932
1933	356.8	601.3	103.0	14.6	4.1*	1.3*	2545	163.1	28.6	1876	845.4	398.0	2545 *	1933
1934	48.7	840.7	699.6	11.0	4.3	1.6	1.2*	0.5	0.3	0.1	282.0	497.2	840.7*	1934
1935	415.3	76.7	12.9	2.5*	0.3*	0.2	79.3	7.9	0.9	2.2	3.9	13.9	415.3*	1935
1936	805.9	955.4	1717	214.7	6.9*	254.6*	329.1	8.2	1.5*	0.4*	0.0*	32.0*	1717 *	1936
1937	117.6	2045	1270	161.6	6.8	2.1	0.8	0.7*	0.2	0.7	282.0	134.5	2045 *	1937
1938	29.7	202.6	544.6	1013	518.9	1020	22.1	7.7	4.6	79.8	435.1	30.0	1020 *	1938
1939	1270	1765	545.3	119.8	17.1	3.5	1.6	1.0	0.7	0.2	1.0	58.0	1765	1939
1940	51.8	2435	8739	2089	77.5	13.7	10.9	252.7	163.8	4.0	35.0	238.7	8739	1940
1941	906.1	865.0	262.0	1127	55.7	189.0	67.7*	6.8	2.1	1.0	0.3	0.0	1127 *	1941
1942	647.7	6145	586.2	26.1	14.0	12.3	487.0	22.2	4.3	1.0	144.0	294.2	6145	1942
1943	3070	3620	1579 *	21.2*	7.1*	2.6*	3.4*	2.5*	3.2*	84.9*	34.0	84.6	3620 *	1943
1944	62.7	1676	537.4	927.5	11.0	4.0	3.0	2.1*	1.2*	0.3*	0.1*	29.6	1676 *	1944
1945	81.0	14.2	22.4	3.5	0.3	6.6	120.9	12.0	1.7	33.2	34.1	23.7	120.9	1945
1946	1058	841.2	1900	16.8	2.9	1.0	0.6	0.0	0.0	0.0	13.4	42.1	1900	1946
1947	35.2	3632	1249	307.9	14.9	4.7	2.4	1.7	40.5	9.6	9.4	189.0	3632	1947
1948	45.6	82.2	368.3	12.8	22.7	5.6	5.8	3.5	3.1	1.8	0.0	7.7	368.3	1948
1949	63.3	2045	4556	570.8	15.8	4.9	2.8	1.2	0.2	1044	323.3	204.7	4556	1949
1950	299.2	2454	5065	3383	92.7	374.2	1245	2554	48.2*	582.8*	901.2*	4894	5065 *	1950
1951	10534	3173	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	1951
Mean	1127 *	1839 *	1401 *	966.0*	410.9*	118.4*	224.7*	134.2*	14.4*	162.3*	140.3*	580.3*	2933 *	Mean
Max	10534 *	6145 *	8739 *	10261 *	6586 *	1020 *	2545 *	2554 *	163.8*	1876 *	901.2*	4896 *	10262*	Max
Min	9.2*	14.2*	3.7*	1.5*	0.3*	0.2*	0.5*	0.0*	0.0*	0.0*	0.0*	0.0*	120.9*	Min
Count	24	24	23	23	23	23	23	23	23	23	24	24	23	Count

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All recorded data is continuous and reliable except where the following tags are used...

* ... Estimated Data

[ ] Data Not Recorded

Water Resources

Maximum Stream Discharge in Cubic Metres/Second

HyMonth Output 05/09/1981

Fitzroy River at Yeppoon

Station No 130001C

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Max	Year
1950	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	901.2*	4894 *	[ ]	1950
1951	10534 *	3173 *	68.0*	24.2*	5.5*	3.5*	2.8*	2.1*	2.0*	1.5*	0.8*	0.2*	10534 *	1951
1952	690.4*	16.1*	402.7*	200.6*	42.3*	67.5*	12.7*	3.5*	1.0*	45.0*	86.8*	11.9*	690.4*	1952
1953	2732 *	2670 *	391.6*	93.9*	10.3*	2.6*	3.9*	1.2*	0.7*	4.3*	9.1*	13.1*	2732 *	1953
1954	1680 *	15084 *	8470	288.4	85.0	21.9	1679	506.3	81.2	42.7	32.1	38.5	15084 *	1954
1955	42.7	3578	8850	800.8	3617	4874	135.3	78.6	28.0	11.5	14.7	27.0	8850	1955
1956	1655	8631	2709	5172	1527	1254	1659	159.1	64.7	47.0	51.7	4381	8631	1956
1957	5159	230.5	218.6	34.0	12.6	8.6	9.4	67.4	36.6	5.5	44.8	8.6	5159	1957
1958	16.7	5862	5599	9133	80.8	135.3	54.3	15.4*	7.9*	5.1*	2.3	85.8	9133 *	1958
1959	439.8	7329	4407	166.0	24.7	17.0	9.5	7.3	4.8	9.0	25.3	434.1	7329	1959
1960	1919	1066	828.4	39.1	342.5	115.7	10.4	7.7	4.5	10.6	15.9	12.5	1919	1960
1961	41.9	1621	1321	30.4	8.1	5.8	3.4	2.1	1.6	10.6	109.1	677.7	1621	1961
1962	397.0	117.5	863.2	238.5	43.7	7.7	4.0	2.1*	1.3*	0.1*	0.0	98.2	863.2*	1962
1963	1025	148.8	2562	4180	43.0	12.7	6.9	4.0*	3.8*	2.5*	1.3*	12.1*	4180 *	1963
1964	30.6*	4.4*	28.3*	11.1*	4.8	1.2*	23.2*	3.9*	43.7	181.3	46.9	40.4	181.3*	1964
1965	28.7	31.3*	4.2*	5.2*	73.0	2.6*	0.6*	0.0	0.0	0.0	0.0	770.8	770.8*	1965
1966	577.8	893.6	24.5	31.8*	3.3*	0.0	0.0	340.2	133.6	6.7*	24.8*	54.4	893.6*	1966
1967	380.9	395.0	163.1	9.5*	0.5*	849.2*	141.1	4.8	1.2*	0.1*	33.8*	105.3	849.2*	1967
1968	2167	4135	628.0	138.4	357.8	45.6	8.8	5.3	2.5*	0.3	0.0	138.4	4135 *	1968
1969	12.9	0.7	0.2	0.2	0.0*	0.0*	4.8*	0.0	0.0	0.1	[ ]	[ ]	[ ]	1969
1970	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	1970
1971	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	1971
1972	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	1972
1973	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	1973
Mean	1554 *	2295 *	1975 *	1084 *	330.6*	390.9*	198.5*	63.7*	22.1*	20.2*	73.7*	621.3*	4642 *	Mean
Max	10534 *	15084 *	8850 *	9133 *	3617 *	4874 *	1679 *	506.3*	133.6*	181.3*	901.2*	4894 *	15035*	Max
Min	12.9*	0.7*	0.2*	0.2*	0.0*	0.0*	0.0*	0.0*	0.0*	0.0*	0.0*	0.2*	181.3*	Min
Count	19	19	19	19	19	19	19	19	19	19	19	19	18	Count

---------- Notes ----------

All recorded data is continuous and reliable except where the following tags are used...

* ... Estimated Data

[ ] Data Not Recorded

130005 FITZROY RIVER AT THE GAP

A. THE GAP

LOCATION: LATITUDE 23 05 34 S LONGITUDE 150 06 20 E
GRID REFERENCE 035 432 MAP RIDGELANDS NO. 8951-
1: 100000 SERIES
ADOPTED RIVER DISTANCE: 142.1 KM
CATCHMENT AREA: 135860 SQ.KM
PERIOD OF RECORD: 1964 - DATE
METHOD OF RECORDING: L S GE 20/05/64
GAUGE ZERO: 9.680 STATE DATUM
CONTROL: ROCK BAR
OTHER RECORDS OBTAINED: RANDOM WATER QUALITY SAMPLES AND WATER TEMPERATURES

HIGHEST FLOW MEASUREMENTS

	1	2	3	NUMBER OF MEASUREMENTS
A. GAUGE HEIGHT METRES	16.06	16.10	16.20	154
DISCHARGE CUMECS	9450.000	9290.000	9260.000	
DATE	09/03/88	10/03/88	09/03/88	

SUMMARY OF FLOW DATA

OVERALL PERIOD OF RECORD MAY 1964 TO AUGUST 1990

ANNUAL SUMMARY BASED ON 23 COMPLETE CLIMATIC YEARS

	MAXIMUM	YEAR	MINIMUM	YEAR	MEAN
ANNUAL DISCHARGE IN MEGALITRES	19864286	1973-74	88936	1968-69	4973301
MONTHLY DISCHARGE IN MEGALITRES	10669548	1982-83	0	1965-66	
INSTANTANEOUS FLOW CUMEC	9663	1987-88	0	1964-65	

RUNOFF IN MILLIMETRES

MEAN ANNUAL RUNOFF 37

RAINFALL

MEAN ANNUAL CATCHMENT RAINFALL 690 MM 1919-1969

130005 FITZROY RIVER AT THE GAP

MONTHLY MAXIMUM INSTANTANEOUS FLOWS IN CUMECS

CLIMATIC YEAR	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1963-64	-	-	-	-	-	-	-	4.42	1.38	27.24	3.52	41.78
1964-65	199.20	56.37	32.61	32.61	37.41	3.91	5.02	91.86	2.66	0.92	0.50	0.20
1965-66	0.00	0.00	811.71	712.52	986.11	39.27	34.93	2.64	0.52	0.23	358.30	99.99
1966-67	6.75	24.14	56.16	290.00	546.32	158.30	8.01	0.99	782.70	139.63	3.00	3.00
1967-68	0.53	32.07	119.92	2479.95	4075.31	498.28	124.67	333.45	38.20	8.57	4.81	2.29
1968-69	0.54	0.42	142.23	11.96	0.47	0.51	0.48	0.37	0.43	0.43	0.43	0.44
1969-70	0.43	46.59	252.96	2024.94	1096.67	229.95	15.36	3.25	2.82	0.29	0.07	0.90
1970-71	0.71	137.06	1361.55	996.90	5169.88	4744.51	40.09	12.08	2.63	4.64	19.33	7.02
1971-72	1.93	9.59	2352.56	2372.82	1547.83	561.81	25.61	17.50	2.38	1.93	0.74	0.64
1972-73	0.56	37.00	44.00	99.48	1136.76	336.93	69.35	7.02	7.98	36.52	28.00	6.15
1973-74	16.64	116.77	7140.30	4849.65	4571.11	2968.78	639.83	70.72	36.52	9.59	7.80	10.69
1974-75	14.21	69.35	680.90	2692.61	881.45	2162.36	472.39	27.02	10.17	4.49	2.36	2.36
1975-76	707.92	130.26	4440.86	5234.79	3485.33	2307.13	290.00	36.63	19.40	12.56	8.86	26.30
1976-77	32.19	210.96	629.76	137.52	459.74	3468.51	166.61	2449.21	349.37	24.39	13.80	9.50
1977-78	4.10	328.51	34.70	1784.58	8003.45	93.38	52.59	20.80	13.17	854.82	38.71	371.03
1978-79	63.53	445.07	33.75	101.33	3398.44	4285.70	84.37	18.20	9.58	8.80	7.63	3.80
1979-80	1.26	17.58	56.53	1466.57	604.13	35.67	14.72	11.73	22.19	4.47	2.94	1.70
1980-81	0.51	0.82	0.82	401.18	1695.63	345.83	445.07	614.14	859.80	32.54	12.00	4.17
1981-82	1.19	9.82	317.67	300.16	180.12	607.72	41.09	17.39	3.01	1.09	0.75	0.83
1982-83	0.20	0.06	26.75	463.90	43.17	2355.38	1282.29	7896.55	3658.84	1269.10	58.37	15.19
1983-84	63.65	151.57	505.48	67.82	1659.35	111.43	12.00	2.61	1.09	20.67	749.75	47.54
1984-85	18.17	202.25	400.23	186.60	50.99	541.04	67.82	10.87	264.17	9.33	5.34	1.54
1985-86	175.86	294.45	286.00	149.64	286.00	113.40	2.26	52.17	1.41	1.19	1.80	0.68
1986-87	909.19	163.46	373.66	60.97	195.46	10.87	1.54	16.63	2.61	1.19	0.75	0.36
1987-88	17.90	118.00	27.00	5.02	274.96	9662.78	351.27	37.13	65.02	323.64	-	-
1988-89	-	110.00	660.00	269.00	1541.12	442.07	4604.77	1766.06	1300.00	127.58	33.43	12.59
1989-90	-	-	63.66	-	-	-	2137.16	2210.85	660.65	42.13	9.82	-

NOTE: "-" INDICATES INCOMPLETE RECORD

Water Resources

Network Output 05/08/1990

Maximum Stream Discharge in Cubic Metres/Second

Fitzroy River at Riverslea

Station No 130003A

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Max	Year
1922	[ ]	[ ]	[ ]	10.31	7.76	4.11	19.27	4.11	0.97	0.45	0.01	1346	[ ]	1922
1923	583.5	332.6	2.17	1.10	0.43	36.29	19.31	0.92	0.24	0.05	0.00	8.54	583.5	1923
1924	107.8	2044	1550	397.0	11.99	4.75	2.78	1.42	41.71	71.41	1086	457.9	2044	1924
1925	361.7	419.1	117.7	23.50	2.58	41.71	9.27	1.02	0.24	0.03	0.00	89.76	419.1	1925
1926	828.7	9.97	14.15	7.33	374.7	55.32	1.73	0.64	0.05	0.00	0.00	312.9	828.7	1926
1927	828.7	1009	410.5	397.0	5.88	22.98	2.31	1.20	0.16	1.12	22.81	4697	4697	1927
1928	3970	1933	846.1	3655	3616	25.16	15.67	4.85	1.88	0.64	0.07	134.3	3655	1928
1929	406.2	2537	575.1	1623	25.10	583.5	21.96	2.48	0.96	0.36	11.47	220.8	2537	1929
1930	953.6	2410	69.02	15.32	2211	573.6	234.3	14.85	4.98	1.50	0.36	8.27	2410	1930
1931	1.04	258.4	13.17	4.52	0.18	0.01	0.00	0.00	0.00	0.00	0.05	2203	2203	1931
1932	811.5	62.17	3.25	49.62	22.75	1.21	1.21	0.36	0.13	0.03	21.00	1e2.3	811.5	1932
1933	355.4	484.6	126.6	31.20	2.09	0.36	2624	158.6	586.8	1841	695.8	326.7	2624	1933
1934	37.01	711.9	340.9	26.85	2.18	0.79	0.64	0.32	0.07	0.02	220.8	431.9	711.9	1934
1935	375.7	33.92	12.79	0.68	0.25	0.07	108.6	4.78	10.38	11.94	16.21	32.69	375.7	1935
1936	648.7	863.6	1694	78.14	4.95	383.6	188.7	7.24	3.19	0.24	0.16	56.13	1694	1936
1937	139.8	2044	1186	68.34	3.72	0.73	0.37	0.12	0.02	0.47	294.8	147.4	2044	1937
1938	19.31	201.2	530.0	972.1	530.5	972.1	20.58	11.53	2.05	67.96	410.5	43.47	972.1	1938
1939	1653	1767	520.9	52.71	12.75	5.22	1.21	2.42	0.37	0.07	15.07	110.9	1767	1939
1940	98.54	2575	8090	1375	85.74	7.73	4.34	300.4	111.0	1.91	99.52	238.0	8090	1940
1941	823.2	728.1	336.0	1106	49.10	220.8	95.87	4.91	1.43	0.47	0.34	0.62	1106	1941
1942	8.64	7268	295.9	18.91	20.39	11.42	544.7	12.85	3.77	1.31	194.1	465.7	7268	1942
1943	3419	3876	1361	15.31	4.75	4.34	1.64	1.04	3.18	117.7	92.51	98.54	3876	1943
1944	128.2	1718	169.0	881.3	9.07	3.37	2.17	1.47	1.14	0.43	0.05	24.75	1718	1944
1945	148.8	25.12	36.67	0.61	0.08	21.88	266.3	17.63	1.10	28.50	24.18	38.70	266.3	1945
1946	1022	660.9	2000	28.61	3.59	0.14	0.14	0.00	0.00	0.00	33.33	98.54	2000	1946
1947	42.70	4058	516.5	262.8	63.95	7.85	1.27	0.65	38.70	9.09	66.55	220.8	4058	1947
1948	66.55	179.5	383.6	84.10	38.70	9.20	3.52	3.52	0.54	0.01	1.67	18.12	383.6	1948
1949	66.55	2367	5323	340.9	13.49	3.82	1.09	0.34	0.09	990.8	349.0	207.8	5323	1949
1950	370.5	2741	5441	3864	300.5	328.6	1463	2480	35.51	568.9	1806	5469	5469	1950
1951	9106	3048	142.3	19.5	3.3	1.7	1.3	0.9	0.7	0.6	0.3	0.1	9106	1951
1952	828.8	86.3	410.6	210.9	41.3	30.3	10.4	2.2	0.4	31.2	111.7	10.3	828.8	1952
1953	2010	1761	436.0	45.2	10.9	1.1	0.5	0.2	0.1	0.0	8.7	60.4	2010	1953
1954	1186	17258	3345	304.7	56.1	11.9	1600	544.7	64.5	15.7	11.9	28.8	~~17258~~ 15876	1954
1955	28.1	3768	7646	615.9	4733	4911	139.3	70.5	15.2	8.6	11.0	15.7	7646	1955
1956	1584	7735	2852	5268	1448	1454	1584	125.0	41.9	28.5	34.4	5074	7735	1956

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* ... Estimated Data

[ ] ... Data Not Recorded

Water Resources

Maximum Stream Discharge in Cubic Metres/Second

ByMonth Output 05/09/1981

Fitzroy River at Riverslea

Station No 130003A

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Max	Year
1957	5323	179.5	241.4	18.7	8.4	6.0	6.6	82.8	27.8	3.5	41.3	4.1	5323	1957
1958	49.6	6076	4266	8507	69.6	135.8	28.7	12.8	5.3	4.0	1.7	108.7	8507	1958
1959	639.3	7233	2576	158.7	18.7	12.4	7.4	6.1	3.3	11.1	15.8	419.2	7233	1959
1960	1891	978.1	736.0	21.4	198.2	56.9	5.4	3.1	1.8	13.5	10.0	6.2	1891	1960
1961	47.1	1524	1227	26.8	5.7	4.2	2.6	1.5	1.0	8.7	99.5	664.3	1524	1961
1962	370.6	158.7	869.3	277.5	33.8	5.1	3.4	1.8	1.0	0.5*	0.8*	22.9*	869.3*	1962
1963	744.5*	110.1*	4223 *	4475 *	74.4*	14.3	7.4	5.4	5.2	1.3	0.2	16.3	4475 *	1963
1964	43.1	5.9	37.7	13.5	4.7	5.7	26.1	2.9	10.1	175.0*	62.6*	20.0*	175.0*	1964
1965	39.0*	42.9*	5.3*	57.4*	102.0*	1.6*	0.4	0.1	0.0	0.0	0.0	771.7*	771.7*	1965
1966	580.0*	600.0*	53.4*	35.8*	1.9*	0.2	0.1	397.8*	108.1*	4.6*	23.0*	90.6*	600.0*	1966
1967	308.1*	361.8*	140.0*	16.8*	0.7*	380.0*	81.0*	5.8*	0.4	0.1*	49.1*	118.2*	380.0*	1967
1968	2368 *	4451 *	400.0*	95.0*	387.2*	25.5*	5.0*	2.8*	1.5	0.3*	2.9	277.8*	4451 *	1968
1969	3.4	2.0	0.0	2.9*	0.9*	8.0*	0.5	0.2	0.0	0.0*	72.4*	333.2*	333.2*	1969
1970	1932 *	1112 *	333.2*	9.8*	5.3*	2.8*	1.1*	0.0*	0.0	0.0*	151.6*	1336 *	1932 *	1970
1971	991.6*	5596	4439 *	22.9*	7.1*	2.9*	4.1*	3.8*	3.7*	1.3*	4.4*	2501 *	5596 *	1971
1972	2103 *	1516 *	333.2*	12.3*	4.6	3.5	2.9	1.4	0.1	0.0	73.3	46.1*	2103 *	1972
1973	201.3*	1086 *	333.9*	29.0*	7.2*	8.5*	37.0*	36.0*	14.0*	14.0	129.3*	7953 *	7953 *	1973
1974	4888	4996 *	2991 *	494.6*	70.0*	40.0*	5.2*	6.6*	8.5*	[ ]	[ ]	[ ]	[ ]	1974
Mean	1068 *	2172 *	1345 *	772.3*	277.7*	197.3*	173.9*	82.2*	21.4*	77.7*	122.7*	722.1*	3404 *	Mean
Max	9106 *	17258 *	8090 *	8655 *	4733 *	4911 *	2624 *	2480 *	556.8*	1841 *	1806 *	7953 *	17258*	Max
Min	1.0*	2.0*	0.0*	0.6*	0.1*	0.0*	0.0*	0.0*	0.0*	0.0*	0.0*	0.1*	175.0*	Min
Count	52	52	52	53	53	53	53	53	53	52	52	52	51	Count

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* ... Estimated Data

[ ] Data Not Recorded

Water Resources

HyMet 5 Output 05/09/1991

Maximum Stream Discharge in Cubic Metres/Second

Fitzroy River at Riverslea Recorder

Station No 1300038

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Max	Year
1974	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	80.84*	995.7 *	[ ]	1974
1975	2620 *	881.6 *	2095 *	406.8 *	19.50*	3.39*	3.39*	17.20*	20.00*	627.9 *	110.0 *	4841 *	4841 *	1975
1976	5816	3518	2314 *	285.2 *	32.00*	13.80*	13.04*	6.75*	22.41	114.8	196.0	446.3	5816 *	1976
1977	109.4	396.2	3595	148.7 *	2238	214.6	19.68	9.11	5.25	2.29	317.1	30.70	3595 *	1977
1978	276.4	9436	102.6	32.10	11.49	8.79	848.3	36.85	365.3 *	73.22*	426.3	44.99	9436 *	1978
1979	653.4	*3743	*4634 *	64.80	17.73	9.30	9.29	8.10	3.93	2.80	42.20	68.08	4634 *	1979
1980	1453	603.6	33.81	10.28	12.97	27.95	3.11	1.94	5.34	3.44	0.94	15.39	1453	1980
1981	406.8	1631	347.5	428.5	579.8	868.2 *	25.78	11.64	3.22*	7.05*	143.0 *	361.3 *	1631 *	1981
1982	326.4	152.0	649.9	51.63	14.86*	1.12	0.11	0.09*	0.03*	0.00*	0.00	33.81	649.9 *	1982
1983	511.8	28.67	171.6	1716	9086	3569	1258 *	68.00*	10.70*	90.00*	245.8 *	536.4 *	9086 *	1983
1984	57.16	1594	109.4	7.89	1.18	0.28	316.3	817.8	58.33	11.43	230.6	415.4	1594	1984
1985	148.4 *	29.27	574.7	36.11	10.59	287.6	8.68*	2.92*	0.84*	209.0	307.9 *	282.9 *	574.7 *	1985
1986	135.3*	226.6*	107.9*	3.8*	11.6*	2.3*	0.9	0.9	13.3	961.1	88.6	402.6	961.1*	1986
1987	144.8	209.0*	5.7*	0.5	25.5	3.0	0.3*	0.0*	0.0*	34.4	149.1	26.0	209.0*	1987
1988	0.9	304.3	11487 *	343.7	32.2	30.5	326.5	469.1	109.7	16.5	181.8	760.0*	11487 *	1988
1989	276.0	1462	453.1	4994	1634	1323	122.1	25.0	12.5	2.2	590.4	53.1	4994	1989
1990	13.0	4.3	2052 *	2079 *	2140	141.7	107.5	72.2	36.9	[ ]	[ ]	[ ]	[2079]	1990
1991	15033												15033	
Mean	809.4*	1513 *	1796 *	663.1*	991.9*	406.6*	191.5*	96.7*	41.7*	143.8*	194.4*	582.2*	4064 *	Mean
Max	5816 *	9436 *	11487 *	4994 *	9086 *	3569 *	1258 *	817.8*	365.4*	961.1*	590.4*	4841 *	11487*	Max
Min	0.9*	4.3*	5.7*	0.5*	1.2*	0.3*	0.1*	0.0*	0.0*	0.0*	0.0*	15.4*	209.0*	Min
Count	16	16	16	16	16	16	16	16	16	15	16	16	15	Count

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* ... Estimated Data

[ ] Data Not Recorded

D4 Mean Stream Discharges

Mean Stream Discharge in Cubic Metres/Second

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean Monthly	Year
1914	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	1.980	22.05	[ ]	[illegible]
1915	10.79	[illegible]	[illegible]	0.904	0.518	0.170	0.133	0.074	0.067	0.053	0.040	23.07	5.53	[illegible]
1916	13.08	27.85	11.62	21.63	7.50	2.95	22.31	22.81	6.17	19.87	100.3	264.5	43.59	1916
[illegible]	[illegible]	[illegible]	1341	33.15	10.90	6.71	5.10	4.40	15.67	279.6	176.1	130.5	455.5	1917
[illegible]	[illegible]	[illegible]	[illegible]	95.63	89.91	22.23	14.31	9.68	7.11	5.20	3.27*	[illegible]	1158	[illegible]
[illegible]	[illegible]	[illegible]	16.94	3.62	15.77	17.25	9.94	3.00	1.53	0.70	0.36	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	8.30	1.82	1.53	6.88	9.77	3.68	2.70	11.43	52.53	38.45	[illegible]	[illegible]
[illegible]	[illegible]	2.14	[illegible]	28.12	6.24	86.55	205.1	33.66	115.3	11.78	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	11.26	10.08	2.35	2.92	3.59	1.80	0.96	[illegible]	130.7	308	[illegible]
1922	909.4	[illegible]	[illegible]	2.39	1.56	5.97	3.25	1.16*	0.67	0.17*	0.05	[illegible]	20.2	[illegible]
[illegible]	75.21	559.3	[illegible]	96.31	8.81	4.04	2.90	2.08	7.08	6.45	316.3	104.2	125.8	[illegible]
[illegible]	115.6	[illegible]	[illegible]	13.17	2.76	5.06	5.21	1.26	0.81	0.33	0.07	6.02	31.71	[illegible]
1926	254.0	8.32	2.75	1.46	37.38	14.42	2.00*	0.43	0.22	0.09*	0.00	77.97	33.26*	1926
1927	372.6	[illegible]	20.68	110.1	4.68	4.93	1.79	0.73	0.05	0.00	[ ]	[ ]	[ ]	1927
Mean	741.7 *	1013	188.2	33.04	15.20	13.81	21.91*	6.66*	12.35	25.89*	50.42*	80.42*	192.6 *	Mean
Max	4979	*8384	[illegible]	110.1	89.91	86.55	205.1 *	33.66*	115.3	279.6 *	316.3 *	264.5 *	1158 *	Max
Min	1.12*	8.32	1.71	0.90	0.52	0.17	0.13*	0.07*	0.05	0.00*	0.00*	0.24*	5.34*	Min
Count	13	13	13	13	13	13	13	13	13	13	13	13	12	[illegible]

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All recorded data is continuous and reliable
except where the following tags are used...

* ... Estimated Data

[ ] Data Not Recorded

Mean Stream Discharge in Cubic Metres/Second

Fitzroy River at Mc Mundos

Station No 1500010

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean Monthly	Year
1927	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	2.99*	623.4	[ ]	1927
1928	471.9	710.1	318.3	2386	831.8	23.82	14.10	5.88*	3.25*	1.19*	0.45	13.78	398.4 *	1928
1929	104.8	812.9	195.2	621.6	19.63*	61.99*	13.04*	3.72*	1.60*	0.81*	0.44*	23.09*	154.9 *	1929
1930	332.2 *	684.7 *	32.35*	8.99*	260.0 *	106.6 *	69.21*	11.85*	4.63*	1.68*	0.62	1.89	124.5 *	1930
1931	3.25	147.4	4.29	0.91	0.56	0.42	0.30	0.25	0.41	1.60	4.60	[ ]	69.58	1931
1932	113.9	28.88*	1.54	9.60	10.46*	1.47	1.26	0.72*	0.35*	0.37	0.34	30.82	16.64*	1932
1933	57.24	234.1	55.56	8.65	2.24*	0.78*	789.8	53.96	13.31	653.3	204.1	110.5	181.9 *	1933
1934	13.10	302.1	92.17	6.97	2.42	1.42	0.96*	0.36	0.13	0.05	76.88	152.4	56.51*	1934
1935	129.7	18.47	6.26	1.16*	0.15*	0.14	20.57	2.24	0.59	1.18	1.85	5.64	19.07*	1935
1936	199.1	162.4	590.8	32.55	4.48*	3.80*	65.67	3.72	0.99*	0.15*	0.02*	4.36*	88.35*	1936
1937	64.54	651.9	464.4	29.71	4.13	1.52	0.69	0.46*	0.12	0.22	29.07	43.00	165.8 *	1937
1938	15.73	68.26	52.99	182.8	45.12	259.9	10.99	6.11	2.80*	5.33	89.38	21.61	63.21*	1938
1939	68.06	539.4	199.3	29.45	8.23	2.38	1.34	0.82	0.36*	0.05	0.28	17.73	77.29	1939
1940	19.85	977.2	2872	525.2	27.62	8.66	5.00	15.82	21.94	1.95	6.28	72.18	379.5	1940
1941	286.4	300.5	77.91	489.8	19.31	62.22	20.79*	3.82	1.31	0.46	0.13	0.00	105.2 *	1941
1942	26.74	1771	96.92	14.58	10.40	9.63	67.18	10.19	2.29	0.84	22.35	30.89	171.9	1942
1943	908.0	1207	227.5 *	12.02*	3.90*	1.93*	2.60*	1.87*	2.27*	17.64*	10.95	29.22	203.7 *	1943
1944	23.20	474.4	45.34	124.6	5.94	3.05	2.40	1.69*	0.72*	0.19*	0.01*	7.89	57.46*	1944
1945	17.94	4.63	9.28	1.28	0.14	1.10	25.36	3.83	0.97	2.23	14.70	16.40	8.15	1945
1946	254.0	173.2	316.6	6.61	1.74	0.73	0.24	0.00	0.00	0.00	1.54	19.36	64.51	1946
1947	16.46	1376	284.5	73.70	7.50	3.05	1.90	1.37	10.90	3.99	2.00	52.48	152.8	1947
1948	16.22	14.27	70.28	5.62	7.93	2.72	3.03	2.58	2.12	0.30	0.00	1.69	10.51	1948
1949	26.64	697.1	1323	117.3	8.29	3.70	2.00	0.52	0.09	255.4	76.02	52.29	203.5 *	1949
1950	31.16	909.7	2162	1592	45.93	136.6	392.0	733.2	30.46*	205.1 *	121.0 *(22)		614.8 *	1950
1951	3.35	228.1	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	1951
Mean	283.2 *	537.5 *	413.1 *	264.4 *	56.87*	30.43*	64.81*	37.61*	4.48*	50.18*	27.76*	134.0 *	144.2 *	Mean
Max	3615	*1771	*2872	*2386	* 831.8 *	259.9 *	789.8 *	733.2 *	30.46*	653.3 *	204.1 *1221	*	614.8 *	Max
Min	3.25*	4.63*	1.54*	0.91*	0.14*	0.14*	0.24*	0.00*	0.00*	0.00*	0.00*	0.00*	8.15*	Min
Count	24	24	23	23	23	23	23	23	23	23	24	24	23	Count

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All recorded data is continuous and reliable except where the following tags are used...

* ... Estimated Data

[ ] Data Not Recorded

Mean Stream Discharge in Cubic Metres/Second

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Year
1950	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	121.1	*1221 *	[ ]	1950
1951	3605	* 723.1 *	43.18*	12.37*	4.46*	3.16*	2.46*	2.03*	1.91*	1.11*	0.55*	0.16*	[illegible]	1951
1952	117.7 *	[illegible]	58.59*	72.05*	22.40*	28.06*	6.87*	2.73*	0.56*	22.03*	33.80*	9.09*	[illegible]	1952
1953	688.9 *	809.0 *	37.16*	18.01*	3.89*	0.76*	2.23*	0.70*	0.46*	0.74*	1.73*	6.33*	101.7	1953
1954	214.9	*8093	*1099	108.9	39.88	19.21	332.2	105.5	29.23	19.11	19.07	15.08	860.9	1954
1955	9.45	766.7	4786	173.6	515.5	1470	80.56	46.28	18.32	9.69	11.15	16.04	[illegible]	1955
1956	269.0	3562	1616	2047	546.6	214.0	839.7	89.17	53.23	36.01	34.20	1160	857.[illegible]	1956
1957	1005	25.48	68.80	20.30	10.26	8.60	8.64	16.69	11.60	4.01	12.36	3.32	[illegible]	1957
1958	[illegible]	[illegible]	459.4	2066	45.06	69.82	26.77	11.68*	6.30*	3.62*	[illegible]	[illegible]	[illegible]	1958
1959	[illegible]	[illegible]	[illegible]	21.59	20.43	15.97	7.88	6.19	3.43	3.02	11.35	165.5	[illegible]	1959
1960	185.7	[illegible]	192.8	19.67	43.64	26.81	8.64	6.23	3.02	3.20	9.50	5.83	[illegible]	1960
1961	17.91	409.6	472.4	13.83	6.05	4.64	2.85	1.85	1.21	4.68	27.68	171.4	[illegible]	1961
1962	114.1	54.13	253.3	86.93	13.31	5.96	2.85	1.66*	0.28	0.16*	0.00	3.51	[illegible]	1962
1963	365.1	78.45	176.5	1470	21.69	9.89	5.17	3.07*	3.34*	1.64*	0.52*	3.42*	178.[illegible]	1963
1964	11.07*	3.41*	7.37*	7.87*	2.55	0.79*	12.40*	2.36*	6.59	43.98	15.04	16.00	[illegible]	1964
1965	16.12	12.76*	2.27*	3.56*	16.87	1.47*	0.24*	0.00	0.00	0.00	0.00	240.5	[illegible]	1965
1966	69.26	158.9	10.54	13.20*	0.86*	0.00	0.00	28.07	32.78	1.55*	11.83*	16.93	[illegible]	1966
1967	74.64	122.6	49.75	2.69*	0.31*	138.4 *	24.80	2.86	0.63*	0.04*	11.30*	39.32	59.00	1967
1968	585.5	1949	114.5	35.47	187.2	16.52	6.53	3.59	1.21*	0.22	0.00	26.53	185.[illegible]	1968
1969	[illegible]	0.05	0.04	0.05	0.00*	0.01*	0.14*	0.00	0.00	0.02	[ ]	[ ]	[ ]	1969
1970	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	1970
1971	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	1971
1972	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	1972
1973	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	1973
Mean	418.[illegible]	[illegible]	* 508.8 *	328.2 *	78.90*	106.9 *	72.15*	17.38*	9.17*	8.22*	17.03*	164.8 *	[illegible]	Mean
Max	3605	*8088	*4686	*2058 *	546.6	*1470 *	839.7 *	105.5 *	53.23*	43.98*	121.1	*1221 *	857.[illegible]	Max
Min	1.68*	0.05*	0.04*	0.05*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.16*	[illegible]	Min
Count	19	19	19	19	19	19	19	19	19	19	19	19	[illegible]	Count

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All recorded data is continuous and reliable
except where the following tags are used...

* ... Estimated Data

[ ] Data Not Recorded

130005 FITZROY RIVER AT THE GAP

MONTHLY AND ANNUAL VOLUMES IN MEGALITRES AND ANNUAL RUNOFF IN MILLIMETRES

CLIMATIC YEAR	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	CLIMATIC YEAR TOTAL	RUNOFF MILLIMETRES
1963-64	-	-	-	-	-	-	-	6816	2470	33024	6190	16733	-	-
1964-65	108517	37708	37019	34439	31433	5595	8912	43326	3623	1876	851	257	313554	2
1965-66	0	0	648796	248680	361809	26423	31694	3115	993	487	79697	79877	1481570	11
1966-67	5024	30415	43554	182835	249513	125657	7468	2138	354555	61352	5243	5018	1072771	8
1967-68	1073	27898	110341	1633337	3251365	305273	89285	451096	40352	16927	9294	3560	5939800	44
1968-69	1229	913	70925	8067	697	866	934	869	1054	1138	1138	1106	88936	1
1969-70	1138	4552	150350	644552	854338	117176	13672	6137	3781	333	125	375	1796526	13
1970-71	421	110755	918823	860249	6470735	2444308	57227	16968	5097	7858	16700	13715	10922854	80
1971-72	2821	2415	476327	834100	927357	456878	31387	10820	5578	3598	1881	1536	2754698	20
1972-73	1330	28157	25082	50382	532052	170371	49572	12884	13805	38285	26556	10582	959057	7
1973-74	17830	118310	5306467	8628366	3635582	1668340	291743	102565	47707	18477	11442	17457	19864286	146
1974-75	16852	51035	48715	3456530	195301	1420638	379221	47276	17901	9465	4498	4167	5651599	42
1975-76	296633	97854	2229095	5890397	4945768	1930601	254302	71515	30829	27090	21141	20672	15815896	116
1976-77	46016	220115	411824	117722	213795	3335066	191000	2109159	266919	50043	31852	15768	7009280	52
1977-78	6775	116692	41980	239970	7532884	112677	47494	31420	30188	541514	49756	351938	9103289	67
1978-79	69279	239917	47587	94838	2875276	3164021	100901	37910	22271	19129	14411	5846	6691386	49
1979-80	2740	5155	47476	648116	353187	57665	16537	14125	26065	7843	5677	2301	1186889	9
1980-81	916	1278	908	350974	1125639	218189	282601	279385	572352	41356	18904	7520	2900071	21
1981-82	1748	5969	210722	216666	141764	355480	61585	19882	4489	2611	1455	814	1023185	8
1982-83	388	48	12738	325549	23550	331463	159404	10669548	2536742	618855	76257	32105	14786647	109
1983-84	45085	137424	432644	50421	964647	109909	16699	4621	2165	6819	533768	61560	2365760	17
1984-85	18444	183628	284868	139301	30958	209138	45027	13742	133553	18985	7449	2257	1087351	8
1985-86	61715	114405	305731	98105	180850	76823	2345	24266	3000	2539	2508	828	873115	6
1986-87	288955	59540	143081	27998	141374	10338	2282	15554	4197	2052	1453	582	697404	5
1987-88	3003	109457	26546	3219	101576	4900085	177828	47969	47302	152314	190222	70238	-	-
1988-89	4636	32859	421455	282370	736593	342892	2719882	1807832	794590	137139	50941	19371	-	-
1989-90	8026	473967	49236	12013	1871	21475	2440708	1354188	605422	60514	15438	-	-	-
MEANS	41580	69460	480857	1002687	1435124	875835	287681	637227	206556	69690	38255	27038	4973301	37

NOTE: "-" INDICATES INCOMPLETE RECORD

Water Resources

Monthly Output 05/09/xx

Mean Stream Discharge in Cubic Metres/Second

Fitzroy River at Riverston

Station No 130xxxA

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean Monthly	Year
1957	940.1	57.03	56.31	13.70	6.80	6.01	6.44	19.36	8.81	2.49	12.04	1.36	94.21	1957
1958	1.94	1403	381.1	1874	36.67	57.48	19.71	9.50	4.46	2.71	1.24	16.16	317.4	1958
1959	184.6	2084	295.1	57.12	15.98	9.81	6.64	4.79	2.45	3.65	8.40	172.5	255.4	1959
1960	442.6	258.9	163.9	11.83	25.90	14.97	3.95	2.54	1.44	2.74	3.38	2.88	77.93	1960
1961	16.78	418.7	367.9	11.21	4.48	3.19	2.03	1.25	0.74	4.07	29.04	163.6	85.26	1961
1962	152.7	47.34	212.9	84.61	11.82	4.49	2.51	1.33	0.67	0.16*	0.01*	4.71*	43.61*	1962
1963	301.4 *	49.24*	301.9 *1400	*	29.28*	10.74	4.86	3.32	2.73	0.66	0.11	4.72	175.8 *	1963
1964	15.04	2.76	9.57	5.90	2.42	0.50	10.14	1.31	1.91	24.09*	14.20*	8.58*	8.03*	1964
1965	15.70*	10.01*	1.81*	2.01*	16.61*	0.84*	0.18	0.02	0.00	0.00	0.00	215.6 *	21.90*	1965
1966	91.47*	106.0 *	45.43*	7.77*	0.74*	0.20	0.11	38.13*	26.51*	0.91*	5.98*	18.96*	26.02*	1966
1967	67.93*	92.98*	52.09*	5.61*	0.30*	104.4 *	22.52*	1.79*	0.28*	0.02*	10.11*	47.23*	33.76*	1967
1968	519.3 *1199	*	96.41*	28.32*	189.3 *	10.32*	3.00*	1.95*	0.61*	0.14*	0.91	23.95*	172.7 *	1968
1969	2.91	0.94	0.01	0.80*	0.23*	0.76*	0.39	0.09	0.00	0.00*	8.43*	61.87*	6.37*	1969
1970	229.4 *	347.9 *	53.63*	4.38*	4.11*	1.85*	0.33*	0.01*	0.01	0.00*	47.08*	350.3 *	86.59*	1970
1971	319.2 *2541		710.0 *	12.81*	4.37*	1.78*	3.41*	2.63*	2.20*	0.55*	0.23*	251.6 *	320.8 *	1971
1972	426.2 *	379.3 *	108.9 *	7.68*	3.75	3.24	2.16	0.77	0.02	0.01	9.09	7.10*	80.69*	1972
1973	36.29*	226.2 *	50.11*	14.18*	3.82*	4.19*	14.71*	10.92*	4.88*	9.06	44.18*	2147 *	213.8 *	1973
1974	2958	1614 *	660.8 *	92.49*	37.22*	14.73*	4.35*	2.82*	5.11*	[ ]	[ ]	[ ]	[ ]	1974
Mean	282.1 *	695.7 *	350.8 *	220.3 *	51.88*	46.70*	49.37*	21.71*	4.30*	22.49*	24.19*	169.1 *	156.0 *	Mean
Max	3001	*8432	*3845	*2137	* 598.3	*1254	* 728.6 *	673.6 *	35.91*	569.7 *	311.1 *	*2147	* 826.3 *	Max
Min	0.29*	0.94*	0.01*	0.30*	0.07*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.08*	6.37*	Min
Count	52	52	52	53	53	53	53	53	53	52	52	52	51	Count

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* ... Estimated Data

[ ] Data Not Recorded

Water Resources

Mean Stream Discharge in Cubic Metres/Second

MyMonth Report 05/09/1993

Fitzroy River at Riverslea

Station No 130003A

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean Monthly	Year
1922	[ ]	[ ]	[ ]	5.146	4.214	1.352	5.194	2.578	0.547	0.136	0.001	346.8	[ ]	1922
1923	334.6	71.39	1.416	0.746	0.242	10.01	2.679	0.516	0.120	0.010	0.000	5.748	35.62	1923
1924	44.87	576.3	310.3	74.51	5.840	2.832	1.764	0.907	10.57	13.29	311.1	139.8	124.3	1924
1925	144.3	174.8	39.60	9.411	1.194	4.914	3.283	0.555	0.142	0.009	0.001	18.09	33.02	1925
1926	182.9	4.79	3.29	1.92	60.74	7.95	0.87	0.24	0.02	0.00	0.00	95.63	29.87	1926
1927	228.3	277.3	132.8	101.9	2.37	7.41	1.62	0.39	0.03	0.08	6.96	802.5	130.1	1927
1928	288.9	593.1	206.7	2137	530.4	17.78	9.51	3.65	1.29	0.30	0.03	24.02	317.6	1928
1929	137.8	502.0	154.4	454.5	13.49	93.73	8.73	1.54	0.65	0.22	1.38	28.67	116.4	1929
1930	262.8	707.8	29.58	7.17	362.9	109.7	74.95	8.48	3.09	1.08	0.21	3.58	130.9	1930
1931	0.29	58.41	6.26	1.63	0.11	0.00	0.00	0.00	0.00	0.00	0.00	616.7	56.71	1931
1932	116.9	16.55	1.64	16.51	6.16	1.07	0.68	0.24	0.08	0.02	6.91	56.74	16.96	1932
1933	47.08	180.1	42.35	8.91	0.88	0.19	663.3	42.38	19.86	569.7	171.8	96.68	153.6	1933
1934	12.28	200.2	52.83	6.64	1.21	0.67	0.49	0.16	0.02	0.01	61.82	127.9	38.69	1934
1935	121.4	12.45	4.14	0.36	0.10	0.04	19.88	1.44	0.75	2.42	3.84	6.45	14.44	1935
1936	171.3	170.5	517.7	18.36	2.45	30.91	29.15	3.15	0.63	0.11	0.02	9.15	79.45	1936
1937	41.33	597.8	346.4	16.27	1.92	0.50	0.20	0.05	0.01	0.04	45.51	30.85	90.08	1937
1938	12.64	98.76	39.67	167.6	71.34	211.4	11.78	5.54	1.37	6.23	102.6	22.41	62.62	1938
1939	134.3	411.4	203.1	20.53	7.50	2.67	0.98	0.97	0.16	0.02	2.35	28.91	67.75	1939
1940	24.18	877.4	2745	346.8	19.96	5.54	3.45	37.76	19.37	0.63	13.83	104.4	349.9	1940
1941	294.4	272.7	93.13	456.2	23.25	82.01	32.70	2.58	0.83	0.24	0.12	0.12	105.3	1941
1942	0.84	1747	89.32	8.52	9.02	6.36	83.21	6.80	2.10	0.87	26.63	40.73	168.4	1942
1943	956.7	1086	152.7	7.09	3.24	3.15	1.35	0.54	1.77	16.94	16.15	30.92	189.7	1943
1944	30.54	403.4	34.72	128.4	5.31	2.59	1.76	1.35	0.75	0.24	0.00	5.67	51.23	1944
1945	33.33	3.48	10.16	0.30	0.07	6.88	43.25	5.92	0.71	5.87	5.19	16.89	11.00	1945
1946	248.1	272.9	329.9	12.45	1.17	0.14	0.07	0.00	0.00	0.00	7.96	26.62	74.95	1946
1947	20.30	1406	238.3	153.5	21.43	4.73	0.92	0.49	14.31	2.96	3.65	64.88	160.9	1947
1948	12.89	20.21	63.69	8.29	8.00	2.82	2.14	1.63	0.17	0.00	0.03	8.65	10.71	1948
1949	23.96	500.5	1255	103.9	8.11	1.74	0.70	0.19	0.07	255.7	64.80	43.58	138.2	1949
1950	59.43	951.8	1814	1472	54.38	117.7	384.8	673.6	17.35	200.9	151.1	1254	595.9	1950
1951	3001	438.8	57.42	8.87	2.37	1.51	1.09	0.80	0.56	0.44	0.20	0.08	292.8	1951
1952	80.15	2.83	97.14	46.01	12.08	18.30	4.88	1.02	0.28	5.76	20.47	3.13	24.34	1952
1953	398.3	401.5	90.94	20.57	3.82	0.74	0.29	0.18	0.08	0.03	1.75	13.27	77.63	1953
1954	186.2	8482	594.2	121.1	24.05	9.93	309.4	143.5	21.25	7.24	7.31	10.02	826.3	1954
1955	5.08	714.4	3845	133.3	598.3	1254	75.59	35.71	10.01	6.76	8.06	7.77	557.8	1955
1956	292.7	3105	1115	1967	488.2	204.0	728.6	63.01	35.91	20.02	21.76	1228	772.7	1956

Notes --

All recorded data is continuous and reliable except where the following tags are used...

* ... Estimated Data

] No cor

Water Resources

Mean Stream Discharge in Cubic Metres/Second

Fitzroy River at Riverslea Recorder

Station No 130003A

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean Monthly	Year
1974	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	22.43*	49.17*	[ ]	1974
1975	1133 *	82.10*	502.1 *	126.0 *	8.79*	2.71*	2.44*	2.75*	13.04*	81.11*	26.88*	954.0 *	244.6 *	1975
1976	2189	1816	625.2 *	89.29*	23.27*	10.62*	9.56*	5.62*	5.44*	20.07	83.11	116.6	410.2 *	1976
1977	29.07	86.08	1119	57.45*	657.5	63.29	13.73	7.52	3.06	1.26	44.42	10.76	176.6 *	1977
1978	6.59	3230	39.51	14.28	7.27	6.32	182.3	14.85	131.7 *	21.10*	90.03	14.80	313.2 *	1978
1979	44.63*	1169 *	1193 *	32.61	12.42	8.06	6.64	5.19	3.03	1.50	2.95	13.65	206.9 *	1979
1980	222.2	140.4	20.63	4.49	5.98	10.39	1.94	1.40	0.68	0.87	0.16	0.43	34.16	1980
1981	136.5	457.5	70.22	111.0	92.54	211.1 *	11.03	4.81	1.68*	0.70*	5.13*	86.48*	98.07*	1981
1982	83.98	28.48	129.1	20.57	5.91*	0.38	0.08	0.06*	0.01*	0.00*	0.00	5.60	29.83*	1982
1983	130.2	5.72	32.58	58.59	4207	854.2	189.1 *	26.79*	7.43*	17.94*	58.06*	151.0 *	478.3 *	1983
1984	11.59	387.5	32.35	3.45	0.67	0.18	11.15	198.1	21.88	3.64	67.60	110.1	70.69	1984
1985	42.27*	7.26	79.69	9.80	4.86	51.01	4.85*	1.61*	0.27*	31.55	47.26*	99.16*	31.63*	1985
1986	38.61*	62.70*	22.71*	0.33*	1.89*	1.05*	0.42	0.39	0.26	119.6	13.71	51.71	20.12*	1986
1987	9.60	52.47*	1.70*	0.15	4.13	1.26	0.08*	0.01*	0.00*	4.04	43.06	8.11	10.33*	1987
1988	0.28	39.18	1932 *	58.04	14.96	9.71	46.85	64.72	16.92	2.12	15.88	168.2 *	197.6 *	1988
1989	93.05	284.0	118.3	1048	691.1	240.4	36.06	15.21	5.50	1.06	182.6	16.10	222.6	1989
1990	3.78	0.83	111.9 *	895.5 *	375.1	124.6	89.88	54.59	19.86	[ ]	[ ]	[ ]	[ ]	1990
Mean	260.3 *	490.6 *	377.0 *	158.1 *	382.1 *	99.71*	37.88*	25.23*	14.42*	20.44*	43.96*	116.0 *	170.2 *	Mean
Max	2189 *	3230 *	1932 *	1048 *	4207 *	854.2 *	189.1 *	198.1 *	131.7 *	119.6 *	182.6 *	954.0 *	478.3 *	Max
Min	0.28*	0.83*	1.70*	0.15*	0.67*	0.18*	0.08*	0.01*	0.00*	0.00*	0.00*	0.43*	10.33*	Min
Count	16	16	16	16	16	16	16	16	16	15	16	16	15	Count

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All recorded data is continuous and reliable except where the following tags are used...

' ... Estimated Data

[ ] Data Not Recorded

D5 Miscellaneous
Spreadsheets

	039082 Rockhampton 23 24 S 150 30 E (1871–1967)			039083 Rockhampton 23 23 S 150 29 E (1939–1989)			039082 & 039083 Weighted Average (1871–1989)		
Month	No. of Rainfall Obs.	Mean (mm)	Median (mm)	No. of Rainfall Obs.	Mean (mm)	Median (mm)	No. of Rainfall Obs.	Mean (mm)	Median (mm)
Jan	97	179	122	50	146	122	147	168	122
Feb	97	189	112	50	154	124	147	177	116
Mar	97	110	83	50	107	75	147	109	80
Apr	97	58	39	51	45	37	148	54	38
May	97	41	28	51	52	36	148	45	31
Jun	97	58	32	51	37	24	148	51	29
Jul	97	41	21	51	34	19	148	39	20
Aug	97	22	13	51	27	18	148	24	15
Sep	97	29	17	51	24	11	148	27	15
Oct	96	45	34	51	50	46	147	47	38
Nov	96	62	58	51	70	64	147	65	60
Dec	96	112	92	51	99	77	147	107	87
TOTAL	96	946	864	50	845	797		912	

	033050 Marlborough 22 49 S 149 54 E (1870–1989)			033054 Nebo 21 42 S 148 42 E (1870–1989)			035019 Clermont 22 50 S 147 38 E (1870–1989)		
Month	No. of Rainfall Obs.	Mean (mm)	Median (mm)	No. of Rainfall Obs.	Mean (mm)	Median (mm)	No. of Rainfall Obs.	Mean (mm)	Median (mm)
Jan	118	172	118	117	146	119	119	122	102
Feb	120	167	127	117	134	102	119	115	85
Mar	119	114	83	117	113	89	119	77	49
Apr	119	48	30	117	50	28	119	40	30
May	119	44	28	117	34	22	120	37	22
Jun	119	48	28	118	40	29	119	36	23
Jul	119	34	16	118	30	13	120	27	12
Aug	117	23	13	117	19	8	120	18	8
Sep	119	25	16	117	21	8	120	21	7
Oct	119	45	34	117	32	18	120	35	27
Nov	119	67	53	117	55	44	120	56	44
Dec	118	112	99	117	94	89	119	93	71
TOTAL	114	899	862	114	768	730	118	677	634

	035027 Emerald 23 32 S 148 10 E (1883–1989)			035065 Springsure 24 07 S 148 05 E (1865–1989)			035070 Taroom PO 25 39 S 149 48 E (1870–1989)		
Month	No. of Rainfall Obs.	Mean (mm)	Median (mm)	No. of Rainfall Obs.	Mean (mm)	Median (mm)	No. of Rainfall Obs.	Mean (mm)	Median (mm)
Jan	107	105	93	123	106	85	114	102	92
Feb	107	100	76	123	110	88	115	86	61
Mar	107	69	54	123	71	53	115	66	52
Apr	107	36	21	123	39	25	115	37	23
May	107	34	23	123	36	25	115	42	26
Jun	107	35	21	122	39	22	114	38	28
Jul	107	29	15	122	31	16	115	37	26
Aug	107	21	11	123	25	14	115	28	20
Sep	107	24	10	122	29	17	115	32	22
Oct	107	40	31	122	45	39	115	53	44
Nov	107	59	49	123	64	49	115	77	66
Dec	107	89	79	123	89	78	114	89	78
TOTAL	107	641	618	119	684	635	113	687	672

RAINFALL (mm) – WEST CENTRAL COAST, QLD. (District 34)

MONTH	LOWEST	DECILE 1	MEDIAN	DECILE 9	HIGHEST
JAN	17	28	116	233	432
FEB	1	29	105	280	595
MAR	2	11	80	179	342
APR	0	1	17	74	232
MAY	0	0	11	71	117
JUN	0	0	12	65	155
JUL	0	0	5	61	85
AUG	0	0	3	41	73
SEP	0	0	3	42	94
OCT	0	1	13	54	104
NOV	1	4	33	107	157
DEC	1	22	70	144	268

RAINFALL (mm) – CENTRAL HIGHLANDS, QLD. (District 35)

MONTH	LOWEST	DECILE 1	MEDIAN	DECILE 9	HIGHEST
JAN	16	34	87	164	462
FEB	8	23	83	204	436
MAR	4	15	53	127	297
APR	0	3	23	79	176
MAY	0	2	20	73	232
JUN	0	1	28	71	105
JUL	0	1	14	75	179
AUG	0	1	12	47	137
SEP	0	0	12	59	115
OCT	0	5	33	75	177
NOV	2	13	52	107	208
DEC	9	24	85	169	248

RAINFALL (mm) – PORT CURTIS, QLD. (District 39)

MONTH	LOWEST	DECILE 1	MEDIAN	DECILE 9	HIGHEST
JAN	15	47	137	283	605
FEB	8	38	116	336	498
MAR	5	26	72	215	316
APR	6	19	48	115	280
MAY	1	6	37	120	256
JUN	2	7	41	116	198
JUL	3	5	32	117	224
AUG	1	5	24	58	92
SEP	0	3	27	68	113
OCT	5	12	54	128	174
NOV	2	25	69	148	201
DEC	8	45	100	210	358

FITZROY RIVER FLOODS

Year	Station	Annual Maximum Discharge (cumecs)	Month	Cyclone Occurrence	
1915	Yaamba	59	Feb		
1916	Yaamba	1340	Dec		
1917	Yaamba	8599	Jan	Dec 26–28, 1916	*
1918	Yaamba	17997	Jan/Feb	Jan 19–22, 1918	*
1919	Yaamba	60	Jun		
1920	Yaamba	674	Jan		
1921	Yaamba	3649	Dec		
1922	Yaamba	7105	Feb		
1923	Yaamba	555	Jan		
1924	Yaamba	2135	Feb		
1925	Yaamba	552	Feb		
1926	Yaamba	935	Jan		
1927	Yaamba	4142	Dec		
1928	McMurdos	10261	Apr	Apr 18–24, 1928	*
1929	McMurdos	5163	Feb		
1930	McMurdos	2047	Feb		
1931	McMurdos	2200	Dec		
1932	McMurdos	927	Jan		
1933	McMurdos	2545	Jul		
1934	McMurdos	841	Feb		
1935	McMurdos	415	Jan		
1936	McMurdos	1717	Mar		
1937	McMurdos	2045	Feb		
1938	McMurdos	1020	Jun		
1939	McMurdos	1765	Feb		
1940	McMurdos	8739	Mar	Mar 15–18, 1940	*
1941	McMurdos	1127	Apr		
1942	McMurdos	6145	Feb	Feb 7–14, 1942	*
1943	McMurdos	3620	Feb	Jan 27–31, 1943	*
1944	McMurdos	1679	Feb		
1945	McMurdos	121	Jul		
1946	McMurdos	1900	Mar		
1947	McMurdos	3632	Feb	Feb 2–13, 1947	*
1948	McMurdos	368	Mar		
1949	McMurdos	4556	Mar	Feb 26–Mar 3, 1949	*
1950	McMurdos	5065	Mar	Feb 23–28, 1950	*
1951	Yaamba	10534	Jan	Jan 25–30, 1951	*
1952	Yaamba	690	Jan		
1953	Yaamba	2732	Jan		

FITZROY RIVER FLOODS

Year	Station	Annual Maximum Discharge (cumecs)	Month	Cyclone Occurrence	
1954	Yaamba	14606	Feb	Feb 5–8, 1954	*
1955	Yaamba	8850	Mar	Mar 4–8,1955	*
1956	Yaamba	8631	Feb	Jan 15–27, 1956	*
1957	Yaamba	5159	Jan		
1958	Yaamba	9133	Apr	Apr 1–2, 1958	*
1959	Yaamba	7329	Feb	Feb 12–17, 1959	*
1960	Yaamba	1919	Jan		
1961	Yaamba	1621	Feb		
1962	Yaamba	863	Mar		
1963	Yaamba	4180	Apr		
1964	Yaamba	181	Oct		
1965	Yaamba	771	Dec		
1966	Yaamba	894	Feb		
1967	Yaamba	849	Jun		
1968	Yaamba	4135	Feb		
1969	The Gap	253	Dec		
1970	The Gap	2025	Jan		
1971	The Gap	5170	Feb	Feb 17–28, 1971	*
1972	The Gap	2373	Jan		
1973	The Gap	7140	Dec	Dec 17–19, 1973	*
1974	The Gap	4850	Jan		
1975	The Gap	4441	Dec		
1976	The Gap	5235	Jan	Jan 14–22, 1976	*
1977	The Gap	3469	Mar	Mar 9–10, 1977	*
1978	The Gap	8003	Feb		
1979	The Gap	4286	Mar	Feb 13–Mar 5, 1979	*
1980	The Gap	1467	Jan		
1981	The Gap	1696	Feb	Feb 9–15, 1981	*
1982	The Gap	608	Mar		
1983	The Gap	7897	May		
1984	The Gap	1659	Feb		
1985	The Gap	541	Mar		
1986	The Gap	909	Oct		
1987	The Gap	195	Feb		
1988	The Gap	9663	Mar	Feb 21–Mar 1, 1988	*
1989	The Gap	4605	Apr	Mar 31–Apr 5, 1989	*
1990	The Gap	2211	May	Mar 15–26, 1990	*
1991	The Gap	14549	Jan	Dec 18–24, 1990	*

FITZROY RIVER FLOODS

Year	Station	Annual Maximum Discharge (cumecs)	Month	Cyclone Occurrence	
1923	Riverslea	584	Jan		
1924	Riverslea	2044	Feb		
1925	Riverslea	419	Feb		
1926	Riverslea	829	Jan		
1927	Riverslea	4697	Dec		
1928	Riverslea	8655	Apr	Apr 18–24, 1928	*
1929	Riverslea	2537	Feb		
1930	Riverslea	2410	Feb		
1931	Riverslea	2203	Dec		
1932	Riverslea	162	Jan		
1933	Riverslea	327	Jul		
1934	Riverslea	432	Feb		
1935	Riverslea	33	Jan		
1936	Riverslea	1694	Mar		
1937	Riverslea	2044	Feb		
1938	Riverslea	972	Jun		
1939	Riverslea	1767	Feb		
1940	Riverslea	8090	Mar	Mar 15–18, 1940	*
1941	Riverslea	1106	Apr		
1942	Riverslea	7268	Feb	Feb 7–14, 1942	*
1943	Riverslea	3876	Feb	Jan 27–31, 1943	*
1944	Riverslea	1718	Feb		
1945	Riverslea	266	Jul		
1946	Riverslea	2000	Mar		
1947	Riverslea	4058	Feb	Feb 2–13, 1947	*
1948	Riverslea	384	Mar		
1949	Riverslea	5323	Mar	Feb 26–Mar 3, 1949	*
1950	Riverslea	5469	Mar	Feb 23–28, 1950	*
1951	Riverslea	9106	Jan	Jan 25–30, 1951	*
1952	Riverslea	829	Jan		
1953	Riverslea	2010	Jan		
1954	Riverslea	15876	Feb	Feb 5–8, 1954	*
1955	Riverslea	7646	Mar	Mar 4–8,1955	*
1956	Riverslea	7735	Feb	Jan 15–27, 1956	*
1957	Riverslea	5323	Jan		

FITZROY RIVER FLOODS

Year	Station	Annual Maximum Discharge (cumecs)	Month	Cyclone Occurrence	
1958	Riverslea	8507	Apr	Apr 1–2, 1958	*
1959	Riverslea	7233	Feb	Feb 12–17, 1959	*
1960	Riverslea	1891	Jan		
1961	Riverslea	1524	Feb		
1962	Riverslea	869	Mar		
1963	Riverslea	4475	Apr		
1964	Riverslea	175	Oct		
1965	Riverslea	772	Dec		
1966	Riverslea	600	Feb		
1967	Riverslea	380	Jun		
1968	Riverslea	4451	Feb		
1969	Riverslea	333	Dec		
1970	Riverslea	1932	Jan		
1971	Riverslea	5596	Feb	Feb 17–28, 1971	*
1972	Riverslea	2103	Jan		
1973	Riverslea	7953	Dec	Dec 17–19, 1973	*
1974	Riverslea	4994	Feb		
1975	Riverslea	4841	Dec		
1976	Riverslea	5816	Jan	Jan 14–22, 1976	*
1977	Riverslea	3595	Mar	Mar 9–10, 1977	*
1978	Riverslea	9436	Feb		
1979	Riverslea	4634	Mar	Feb 13–Mar 5, 1979	*
1980	Riverslea	1453	Jan		
1981	Riverslea	1631	Feb	Feb 9–15, 1981	*
1982	Riverslea	650	Mar		
1983	Riverslea	9086	May		
1984	Riverslea	1594	Feb		
1985	Riverslea	575	Mar		
1986	Riverslea	961	Oct		
1987	Riverslea	209	Feb		
1988	Riverslea	11487	Mar	Feb 21–Mar 1, 1988	*
1989	Riverslea	4994	Apr	Mar 31–Apr 5, 1989	*
1990	Riverslea	2079	Apr	Mar 15–26, 1990	*
1991	Riverslea	15033	Jan	Dec 18–24, 1990	*

Year	039083 Rockhampton Rainfall (mm)	033050 Marlborough Rainfall (mm)	033054 Nebo Rainfall (mm)	035019 Clermont Rainfall (mm)	035027 Emerald Rainfall (mm)	035085 Springsure Rainfall (mm)	035070 Taroom PO Rainfall (mm)	Mean Rainfall (mm)	Yaamba/McMurdos/The Gap Catchment 136500 sq.km. Stream flow (ML)	Stream flow (mm)	Cumul. Rainfall (mm)	Cumul. Stream flow (mm)	Runoff Coeff. x 1000	Riverslea Catchment 132100 sq.km. Stream flow (ML)	Stream flow (mm)	Cumul. Rainfall (mm)	Cumul. Stream flow (mm)	Runoff Coeff. x 1000	Taroom Catchment 15720 sq.km. Stream flow (ML)	Stream flow (mm)	Cumul. Rainfall (mm)	Cumul. Stream flow (mm)	Runoff Coeff. x 1000
1866						456		456															
1867						614		614															
1868						393		393															
1869						991		991															
1870																							
1871	1045	1113	578	751		384	648	753															
1872	1202	899	546	667		433	681	738															
1873	975	893	490	632		923	674	798															
1874	996	1108	849	966		858	660	906															
1875	1472	1348	806	833			667	1025															
1876	1226	1004	749	1081			613	935															
1877	684	233	559	662		408	501	505															
1878	1295	1012	1093	729		786	748	944															
1879	868	965	1039	948		910	755	914															
1880	1065	652	984	794		777		854															
1881	678	876	757	535		514		672															
1882	1264	1537		1294		824		1230															
1883	579	721		371	383	434		494															
1884	662	878	993	598	457	487		679															
1885	420	480	639	123	272	316	461	387															
1886	1143	1159	936	986	831	1034	989	1011															
1887	1062	973	891	785	710	398	929	821															
1888	1064	975	555	454	380	388	486	615															
1889	1013	1090	985	809	739	690	909	891															
1890	2096	2190	1489	1242	1201	1085	1206	1501															
1891	1208	1236	1089	1027	779	855	683	982															
1892	860	1082	709	479	432	513	882	708															
1893	1451	1384	836	606	807	680	805	939															
1894	1442	1057	982	825	877	1010	957	1021															
1895	724	695	498	484	657	814	516	627															
1896	1521	1394	990	870	749	733	684	992															
1897	803	686	474	539	604	544	634	612															
1898	1416	1151	1310	951	851	770	803	1007															
1899	1485	1306	932	895	889	574	678	909															
1900	437	403	546	407	482	565	616	494															
1901	669	730	535	426	473	417	491	534															
1902	628	339	305	187	399	391	242	356															
1903	854	949	990	458	521	547	905	746															
1904	869	773	656	546	577	664	521	658															
1905	962	696	647	493	596	500	613	644															
1906	1202	1243	1111	947	922	1014	1000	1063															
1907	687	821	573	618	829	820	636	712															
1908	917	827	792	751	703	626	693	756															
1909	813	951	746	802	656	624	637	747															
1910	1324	1243	1471	858	794	901	848	1063															
1911	1075	982	932	639	564	596	592	769												1164433	74	769	74	96.34
1912	847	830	439	605	606	632	686	664												394928	25	1432	99	37.66
1913	1324	973	793	809	811	596	692	857												126239	8	2289	107	9.372
1914	696	976	647	520	512	402	504	608												240665	15	2897	123	25.17
1915	595	500	269	386	308	391	455	418	168308	1	418	1	2.952							12543	1	3315	123	1.91
1916	805	953	807	1237	807	755	707	867	1368347	10	1285	11	11.56							208549	13	4182	137	15.3
1917	997	1001	1091	1134	1105	1027	915	1039	14364648	105	2324	116	101.3							893023	57	5221	193	54.7
1918	1358	1757	1124	894	904	1114	510	1094	36518688	268	3418	384	244.5							657683	42	8315	235	38.23
1919	523	315	313	277	205	348	363	335	221067	2	3753	386	4.834							36769	2	8650	238	6.982
1920	757	782	549	658	542	592	862	649	844849	6	4402	392	9.539							119152	8	7299	245	11.68
1921	1445	1352	850	790	741	852	718	984	2951454	22	5366	413	22.43							309415	20	8263	265	20.42
1922	857	860	644	820	671	581	367	686	9725702	71	6052	485	103.9							175214	11	8949	276	16.25
1923	515	360	448	535	484	527	535	486	658787	5	6538	490	9.931	1123312	9	486	9	17.5		52415	3	9435	279	6.861
1924	1040	805	748	780	596	900	1027	839	3967229	29	7377	519	34.62	3919925	30	1325	38	35.35		1126065	72	10274	351	85.33
1925	718	573	637	575	539	601	696	620	1000007	7	7997	526	11.82	1041319	8	1945	46	12.72		142605	9	10694	360	14.63
1926	616	481	424	197	254	371	612	422	1048887	8	8419	534	16.2	941980	7	2367	53	16.89		426254	27	11316	387	64.23
1927	1121	1051	868	867	721	992	726	907			8419	534		4102834	31	3274	84	34.26		319720	20	12223	407	22.43
1928	1401	981	787	561	821	854	727	876	12563942	92	9295	626	105.1	10015834	76	4150	160	86.55		462246	31	13099	438	35.02
1929	1805	967	754	626	548	834	773	872	4884926	36	10167	661	41.03	3670790	28	5022	188	31.86		288825	18	13971	457	21.07
1930	1428	906	705	648	482	657	533	768	3926232	29	10933	690	37.57	4128062	31	5788	219	40.82		121706	8	14737	464	10.11
1931	849	834	543	427	427	617	694	627	2187968	16	11560	706	25.55	1788407	14	6415	233	21.58		622261	40	15364	504	53.11

Year	039083 Rockhampton Rainfall (mm)	033050 Marlborough Rainfall (mm)	033054 Nebo Rainfall (mm)	035019 Clermont Rainfall (mm)	035027 Emerald Rainfall (mm)	035065 Springsure Rainfall (mm)	035070 Taroom PO Rainfall (mm)	Mean Rainfall (mm)	Yaamba/McMurdos/The Gap Catchment 136500 sq.km. Streamflow (ML)	Streamflow (mm)	Cumul. Rainfall (mm)	Cumul. Streamflow (mm)	Runoff Coeff. x 1000	Riversleа Catchment 132100 sq.km. Streamflow (ML)	Streamflow (mm)	Cumul. Rainfall (mm)	Cumul. Streamflow (mm)	Runoff Coeff. x 1000	Taroom Catchment 15720 sq.km. Streamflow (ML)	Streamflow (mm)	Cumul. Rainfall (mm)	Cumul. Streamflow (mm)	Runoff Coeff. x 1000
1932	676	463	454	313	322	362	480	439	524759	4	11999	710	8.766	534851	4	6854	237	9.232	66356	4	15803	508	9.625
1933	1333	1114	820	1072	726	913	1002	997	5736398	42	12996	752	42.15	4843930	37	7851	273	36.77	380744	24	16800	532	24.29
1934	1000	804	595	448	516	658	751	682	1719027	13	13677	765	18.47	1220128	9	8532	263	13.55	280872	18	17481	550	26.21
1935	624	613	482	337	447	522	482	501	494169	4	14178	768	7.226	455380	3	9033	286	6.881	147663	9	17982	560	16.75
1936	719	711	970	603	600	503	397	643	2786206	20	14822	789	31.73	2505535	19	9677	305	29.48	53727	3	18626	563	5.313
1937	910	661	568	461	603	516	712	633	3336509	24	15455	813	38.61	2840763	22	10310	327	33.97	416397	27	19259	590	42.05
1938	794	578	678	783	624	721	628	687	1993391	15	16141	828	21.27	1974784	15	10996	341	21.77	349290	22	19945	612	32.36
1939	674	662	496	559	511	659	793	651	2279737	17	16792	844	25.67	2136564	16	11647	358	24.86	490337	31	20596	643	47.95
1940	603	959	1105	778	743	586	905	840	11967912	88	17632	932	104.4	11034446	84	12487	441	99.47	778435	49	21436	692	58.81
1941	617	746	731	1097	702	796	492	740	3317587	24	18372	956	32.84	3320741	25	13227	466	33.97	354172	23	22176	715	30.44
1942	1238	993	920	747	678	901	926	915	5421038	40	19286	996	43.42	5310662	40	14141	507	43.95	312769	20	23090	735	21.75
1943	1046	1135	866	440	479	614	709	756	6423883	47	20042	1043	62.29	5982379	45	14897	552	59.94	366177	23	23848	758	30.83
1944	617	744	701	543	449	534	535	589	1812059	13	20631	1057	22.54	16155589	122	15486	674	207.7	7971	1	24435	759	0.861
1945	576	593	441	457	638	496	629	547	257018	2	21178	1058	3.441	346896	3	16033	677	4.799	33318	2	24962	761	3.874
1946	646	585	762	436	496	370	445	534	2034387	15	21712	1073	27.9	2363623	18	16567	695	33.49	154769	10	25516	771	18.43
1947	861	762	768	557	732	740	793	745	4818701	35	22457	1109	47.41	5074142	38	17312	733	51.58	552526	35	26261	806	47.2
1948	537	587	333	261	274	357	468	402	331443	2	22859	1111	6.034	337751	3	17714	736	6.353	19520	1	26663	807	3.086
1949	883	900	528	583	844	901	690	761	6417576	47	23621	1158	61.76	5935075	45	18476	781	59.02	374185	24	27425	831	31.27
1950	1413	1362	1362	1250	1073	1564	1034	1294	19388333	142	24915	1300	109.8	18792302	142	19770	923	109.9	1458261	93	28719	924	71.69
1951	670	1010	690	513	444	357	360	576	11576866	85	25492	1385	146.8	9233741	70	20347	993	121	52843	3	29296	927	5.819
1952	844		726	505	504	581	610	628	1102163	8	26120	1393	12.85	767586	6	20975	998	9.248	159504	10	29924	937	16.15
1953	836	784	568	601	646	644	572	664	3207211	23	26785	1416	35.38	2448140	19	21640	1017	27.89	69247	4	30589	941	6.63
1954	1162	1252	915	993	1004	1127	1196	1093	26516822	194	27878	1611	177.8	26056197	197	22733	1214	180.5	2051212	130	31682	1072	119.4
1955	1326	1202	1128	1074	952	1037	779	1071	19930752	146	28948	1757	136.4	17590781	133	23803	1347	124.4	789035	50	32752	1122	46.87
1956	1491	1652	1265	1160	1406	1589	1153	1368	18524246	136	30336	1892	97.77	24367867	184	25191	1532	132.9	3108154	198	34140	1320	142.4
1957	399	589	621	558	423	438	364	485	3825317	28	30821	1920	57.84	2971007	22	25676	1554	46.42	18242	1	34825	1321	2.395
1958	945	1141	1490	799	617	703	623	903	10589789	78	31723	1998	85.96	10009526	78	26578	1630	83.96	115939	7	35527	1328	6.172
1959	705	797	879	726	710		669	751	7928150	58	32474	2056	77.35	7423574	58	27329	1686	74.84	691347	44	36278	1372	58.57
1960	809	719	515	505	551	681	705	641	3028717	22	33115	2078	34.63	2457601	19	27970	1705	29.04	40492	3	36919	1375	4.02
1961	848	737	617	544	658	882	840	732	3006958	22	33847	2100	30.08	2688759	20	28702	1725	27.8	557305	35	37651	1410	48.41
1962	644	593	643	421	523	631	618	610	1485030	11	34458	2111	17.82	1375285	10	29313	1736	17.06	432200	27	38262	1438	45.04
1963	631	592	697	688	691	634	550	640	5619715	41	35098	2152	64.29	5544029	42	29953	1778	65.54	400841	25	38902	1463	39.82
1964	771	769	832	477	452	570	559	604	334912	2	35702	2155	4.06	253234	2	30557	1780	3.172	40996	3	39506	1466	4.316
1965	472	472	297	464	390	583	487	452	771770	6	36154	2161	12.51	690636	5	31009	1785	11.56	258513	16	39958	1482	36.38
1966	620	554	650	448	521	626	537	565	934285	7	36720	2167	12.11	820567	6	31575	1791	10.99	63467	4	40524	1486	7.144
1967	726	839	622	388	574	508	665	617	1181497	9	37337	2176	14.02	1064655	8	32192	1799	13.05	111341	7	41141	1494	11.47
1968	1129	1098	757	704	623	834	630	825	5861742	43	38162	2219	52.05	5446267	41	33017	1840	49.97	122706	8	41966	1501	9.461
1969	641	576	363	319	533	303	684	488	171909	1	38650	2220	2.578	200884	2	33505	1842	3.113	93192	6	42454	1507	12.14
1970	615	624	845	697	566	536	806	670	2670485	20	39320	2240	29.21	2730702	21	34175	1863	30.86	704012	45	43124	1552	86.86
1971	1087	1409	731	693	581	804	677	855	10374418	76	40175	2316	88.94	10116749	77	35030	1939	89.62	997935	63	43979	1616	74.29
1972	605	430	524	501	490	409	657	517	2327704	17	40691	2333	33.01	2544640	19	35546	1958	37.29	152388	10	44495	1625	18.77
1973	1637	1436	780	1113	854	886	815	1074	6347095	46	41766	2379	43.28	6742397	51	36621	2009	47.5	191565	12	45570	1637	11.34
1974	1173	1625	1155	929	978	857	702	1060	14538281	107	42826	2486	100.5			36621	2009		407459	26	46630	1663	24.46
1975	814		1028	1141	1077	1065	715	990	8158579	60	43816	2546	60.37	7713706	58	37611	2068	58.98	372843	24	47620	1687	23.96
1976	996		1018	681	881	804	666	807	13870269	102	44623	2647	125.9	13125283	99	38418	2167	123.1	659693	42	48427	1729	51.98
1977	835		686	646	676	828	456	688	6496772	48	45311	2695	69.2	5499876	42	39106	2209	60.53	268087	17	49115	1746	24.79
1978	1179		806	934	888	902	836	925	9294825	68	46235	2763	73.65	9877075	75	40031	2284	80.88	218582	14	50039	1780	15.04
1979	470	684	1184	433	446	361	675	608	6389974	47	46843	2810	77.05	6524798	49	40638	2333	81.3	64915	4	50647	1784	6.797
1980	603	674	550	497	565	541	515	564	1134620	8	47407	2818	14.75	1078639	8	41202	2341	14.46	64442	4	51211	1788	7.274
1981	710	865	817	698	754	733	824	772	3063139	22	48178	2840	29.08	3124272	24	41973	2365	30.65	503449	32	51982	1800	41.51
1982	395	422	352	273	344	315	543	378	817920	6	48556	2846	15.86	721228	5	42351	2370	14.45	172349	11	52360	1811	29.03
1983	1062	1243	1191	1070	968	1034	1117	1098	15388628	113	49654	2959	102.7	15080515	114	43449	2484	104	1782760	112	53458	1923	102.1
1984	697	697	533	726	733	915	1056	765	2237547	16	50419	2976	21.42	2229280	17	44214	2501	22.05	648435	41	54223	1965	53.9
1985	798	586		594	519	691	509	616	1082262	8	51035	2984	12.87	997484	8	44830	2509	12.25	46833	3	54839	1968	4.835
1986	782	690	510	616	659	600	607	636	882840	6	51673	2990	10.14	823720	6	45468	2515	9.774	23516	1	55477	1969	2.345
1987	607	524	615	602	554	734	438	582	344834	3	52255	2993	4.341	327344	2	46050	2518	4.258	65256	4	56059	1973	7.133
1988	1002	871		869	717		571	606						6225206	47	46856	2565	58.47	72018	5	56865	1978	5.684
1989	1112	937			858	827		934						7177594	54	47790	2619	58.21					
Mean	932.3	889.3	758.7	673.9	641.0	680.6	682.7	752.0	5673345	41.6			48.4	5241952	39.7			47.8	398607	25.4			30.5
S.D.	322.9	327.6	263.9	250.8	208.8	239.5	186.1	221.6	6676535	48.9			45.9	5637870	42.7			42.6	497118	31.6			28.5
Coeff. of var.	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.3	1.2	1.2			0.9	1.1	1.1			0.9	1.2	1.2			0.9

APPENDIX E

APPENDIX E

HYDRAULICS

E1 Yeppen Crossing Design Data

E2 Yeppen Crossing 1988 Flood Gauging Data

E3 Yeppen Crossing 1991 Flood Gauging Data

E4 1991 Floodplain Flow Calculations

E1 Yeppen Crossing Design Data

QUEENSLAND TRANSPORT
Transport Technology Division
Queensland Department of Transport
Spring Hill Office Complex
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23 October 1991

Enquiries: Mr M Hee
Telephone: 834 2210
Our Ref:
Your Ref:

Mr D Sargent
Scott & Furphy Consulting Group
200 Mary Street
BRISBANE QLD 4000

Dear Sir

RE: YEPPEN CROSSING BRIDGES
BRUCE HIGHWAY : BENARABY-ROCKHAMPTON

It is confirmed that there is no formal Report for the hydraulic design of these bridges. However, the following notes give the essential features of the design:

1. Percentage flow distributions, not actual discharges, were adopted from the Yeppen Model tests carried out by the Capricornia Institute of Advanced Education.

2. The design total discharge for the selected tailwater level was based on velocity measurements taken by Engineer B Carseldine in the 1978 flood which reached a level of RL 6.5 metres (S.D.). Details of these measurements are no longer available.

3. Theoretical calculations extrapolated these velocity measurements to discharges for higher floods.

4. The <u>maximum</u> afflux expected was 0.30 m as shown on the attached notes of 31 July 1981. The afflux was expected to <u>reduce</u> for higher floods.

5. The brief to the Bridge Branch at the time was on the basis that the maximum upgrading of the Bruce Highway possible because of financial constraints was with the road at RL 7.46 but the bridges could be higher.

Yours faithfully

M. Hee

M Hee
PRINCIPAL ADVISOR (HYDRAULICS)

Alternatives for Yeppen Crossing Bridges 2 & 3 and Scrubby Creek (Bruce Highway : Benaraby-Rockhampton)

The following alternatives have been calculated to give uniform overtopping of the Yeppen Crossing on the Bruce Highway except where indicated.

(A). Flood immunity 1 in 12 years as for the 20/10 m spans bridge at ch. 1400 (Job No.147/16A/4).

ADOPTED

Tailwater for this newly constructed bridge is 0.30 m below the headwater at R.L. 7.46 when the approaches are on the point of being overtopped.

For all bridges in this and other alternatives the afflux given is the difference in the headwater at R.L. 7.46 and the tailwater.

(1). Bridge 2 requires 10/10 m spans (℄ at Ch. 2535)

afflux = 0.30 m with
V = 1.48 m/s thro' bridge.

(2). Bridge 3 requires 6/10 m spans (℄ at Ch. 3380)

afflux = 0.25 m with
V = 1.32 m/s thro bridge.

(3). Scrubby Creek Bridge requires 6/10 m spans (℄ at Ch. 4025)

afflux = 0.28 m with
V = 1.53 m/s thro' bridge.

Alternative (A) requires a total of 22/10 m spans.

(B). Flood immunity 1 in 10 years (overtopping before Job. No. 147/16A/4).

(1). Bridge 2 requires 9/10 m spans (℄ at ch. 2535).

afflux = 0.48 m with
V = 1.80 m/s thro' bridge.

(2). Bridge 3 requires 5/10 m spans (℄ at Ch. 3380)

afflux = 0.45 m with
V = 1.69 m/s thro bridge.

(3). Scrubby Creek Bridge requires 5/10 m spans (℄ at Ch. 4025)

afflux = 0.39 m with
V = 1.73 m/s thro' bridge.

Alternative (B) requires a total of 19/10 m spans.

(C). Flood Immunity 1 in 6 years (overtopping before Job No. 147/16A/4)

(1). Bridge 2 requires 8/10 m spans (℄ at Ch.2535)

afflux = 0.70 m with
V = 2.22m/s thro' bridge.

(2). Bridge 3 requires 4/10 m spans (℄ at Ch. 3380)

afflux = 0.82 m with
V = 2.36 m/s thro' bridge.

(3). Scrubby Creek Bridge requires 5/10 m spans
(℄ at Ch. 4025)

afflux = 0.39 m with
V = 1.73 m/s

Although theoretically it may be possible to reduce this crossing to 4/10 m spans it is not recommended, given the accuracy of the hydraulic model study for such small flows.

Alternative (C) requires a total of 17/10 m spans.

N.B. The high affluxes for comparatively low velocities are due to the very small ratios of bridge opening to area of embankment blocking the flood plain.

Each bridge considered had a different ratio.

RECOMMENDATIONS

(1). That Alternative (A) be adopted giving the same flood immunity as the 20/10 m spans bridge recently constructed.

The 1 in 12 years flood immunity is considered the minimum acceptable for such an important combined Bruce Highway/rail crossing.

(2). That downstream protection of embankments be adopted.

Although there may be a temptation just to allow natural grass cover on embankments in Alternative A, the flood immunity is still relatively low despite the 0.58 hour/year average time of submergence for the bridge approaches. A road at the proposed level would have been submerged for 12 and 24.5 days for the 1954 and 1918 floods respectively. Similar magnitudes for major floods would be anticipated for existing post barrage conditions in the Fitzroy River.

M. Hee.

M. Hee
Executive Engineer

31 July, 1981.

E2 Yeppen Crossing
1988 Flood Gauging Data

QUEENSLAND WATER RESOURCES COMMISSION—OFFICE MEMO.

To: Regional Engineer - BURNETT

From: Sup/Hyd Bird - BUNDABERG Date 5 / 4 / 88 File SG12

Copies to:

Subject: MARCH 1988 FLOOD GAUGING ON YEPPEN YEPPEN Reference:
FLOOD PLAIN ROCKHAMPTON

Preamble: At the request of R/E Central Queensland, accompanied by C/Hyd Ken Klaasen I carried out a series of gaugings on Yeppen Flood Plain to provide data to test a model constructed for Main Roads Department.

Site Description: The gaugings were carried out at four sets of culverts under the Bruce Highway, installed to carry floodwaters in a runner of the Fitzroy River. The runner bifurcates from the mainstream above the barrage, passing through a string of lagoons as it circles to the south of Rockhampton, before crossing the Burce highway in an easterly direction and eventually rejoining the Fitzroy River.

From north to south the four sets of culverts were named for purposes of the exercise :

Yeppen Yeppen Lagoon at Bruce Highway
Yeppen Yeppen Flood Plain at Centre Channel
Yeppen Yeppen Flood Plain at South Channel
Scrubby Creek at Bruce Highway

Of these, the first carried the bulk of the discharge. The other three only came into play when water flowed over the Gracemere Road, which it did to a depth of 200mm, with sufficient force to knock over guide posts.

Centre Channel flowed in the wrong direction for the duration of the exercise, carrying up to 25 cumecs of backwater.

Preparation: Much time was wasted setting up a boat gauging cable upstream of the main waterway. This proved unmanageable because of a combination of supercritical velocities, standing waves and a barbed wire fence.

An uncored bridge gauging cable was used to obtain velocity profiles at 1/4, 1/2 and 3/4 of the way across but this method was too cumbersome for the rapidly-changing conditions and full gaugings were

.../2

Subsequent Noting: TO NOTE
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25/5

abandoned in favour of taking surface velocities with rods. Highest velocities measured were three metres per second. The effects of the pylons were ignored, although they would have had a slight influence.

Results: TBM's were painted on upstream and downstream kerbs of each set of culverts and later tied to datum. Distances were painted on the kerb. All velocities were taken from the upstream kerb in each case (we had to cross the highway at Centre Channel).

MHI's were installed on the two inundated crossings at Pink Lily Lagoon near the breakout from the Fitzroy River.

Method: Gaugings are attached together with level book, cross sections and notes taken, together with their source.

Peak heights on the MHI's at Pink Lily lagoon were levelled by Sup/Hyd Beran at the side of Richlands Road. They were described as:

First MHI on right of main road near brick house = EL9.579 AHD
Second MHI on left of main road at road sign = EL9.68 AHD

First and second refer to order as you leavé Rockhampton.

Figure 1 is a height x time hydrograph of the Fitzroy River at Rockhampton. Peak height occurred at approx. 1800 hrs 11/03/88.

Figure 3 is the corresponding hydrograph, heigh x time for Yeppen Yeppen Lagoon at Bruce Highway. Peak height occurred at approx. 1730 hrs 11/03/88 i.e., the two peaks were to all intents and purposes simultaneous. Data for fig. 1 was supplied by CBM. Data for fig. 3 came from actual observations from the TBM to water level. Fig. 3 has been extended forwards in time to 2300 hrs 10/03/88 to provide information for the rising limb of the discharge hydrograph (fig. 4)

Fig 2 is a graph of mean velocity x time. To shape up this critical curve I have noted the gauged relationship between velocities at the abutments, to mean velocity. This breaks down to two figures which appeared reasonably consistent in the gaugings i.e., on the rise, mean velocity = 0.6 times mean of the velocities noted at the abutments and on the fall the figure is 0.75.

These multipliers were then applied to observations by Main Roads Engineer Bob Neilsen of velocities at the abutments during the rise on the night of 10th March. The results are plotted in fig. 2, and indicate that mean velocity peaked at approx. 2m per second at 0200 hrs on 11/03/88. From fig. 3 it can be seen that the stream continued to rise for about 16 hours further, during which time mean velocity dropped steadily.

Actual gaugings were plotted against the time they were done, on fig. 4. To obtain the shape of the hydrograph, discharge x time in fig. 4, I have carried out the following procedure.

1) Select a time from the scale at the bottom of the page.
2) At this time note the water level height from fig. 3. Plot this height on a cross section and calculate depths at various chainages as for a gauging. Calculate cross sectional area as for a gauging. These plot points are shown on fig. 5.
3) At the same time note mean velocity from fig. 2.
4) Compute discharge Q = A.V. This has been done at points A,B ....G on fig. 4 which is a hydrograph of discharge x time.

Discussion: These methods are unusual, and a poor substitute for a comprehensive series of gaugings. It is easy to be wise in retrospect. I have perservered with the method outlined above in order to describe how the flood plain system performs, which is what I was requested to do. The results were quite different from what I expected. In view of the conditions encountered, I was inappropriately equipped (see "Recommendations").

.../3

Results: Of the four waterways gauged, Yeppen Yeppen Lagoon at Bruce Highway carried the most by far, peaking at a discharge of 640 cumecs at approx. 0200 hrs 11/03/88. After this time there was a significant dropoff in velocities accompanied by a rise in level, as the storage area downstream of the Bruce Highway filled. This shows as a 'hump' effect on the loop-curve relationship depicted in fig. 6.

Fig. 6 plots points A to G as 'derived gaugings' and includes actual gaugings 1, 2 and 3. The 'hump' effect is described by the gaugings themselves and is the dominant feature of the stage-discharge relationship. I would expect that the 'hump' would vary according to factors such as the rate of rise or fall, variations in roughness factors in the water ways further downstream and how much water is stored downstream.

In this event water broke from the Fitzroy River and moved under the Bruce Highway in an upstream direction to fill Yeppen Yeppen and other lagoons. It also broke through Pink Lily Lagoon from the top end, and the two were observed by the Premiers Dept. helicopter pilot to join at 1015 hours on 10/03/88; however it took approx. 8 more hours to reverse the flow at Yeppen Yeppen.

Conclusion: Unfortunately in the time available it was necessary to concentrate on the main waterway. For lack of information I have been unable to provide hydrogaphs on the others. My estimates of peak flows are :

Yeppen yeppen at Bruce Highway	: 640	cumecs
Yeppen Centre	: -24	"
Yeppen South	: 40	"
Scrubby Ck at Bruce Highway	: 60	"
TOTAL	716	cumecs

Discharge in the Fitzroy River at the Gap was 9750 cumecs, which has a frequency interval of 20 years. Deducting 716 from 9750 cumecs, we have Yeppen Floodplain carrying 8% of the total discharge.

I was impressed with the way the whole culverts system worked. it appears that in a higher flood the Gracemere Road would be sacrificed to preserve trafficability on the Bruce Highway, and the three sets of culverts that did not carry much of the flow this time would run to capacity before the highway would inundate.

One point that did look too low, however was the roundabout, which was almost topped in this event. If this was raised approx. 300mm the culverts would hold much higher flows without the Bruce highway being cut.

Recommendations: If this exercise is to be repeated the following are necessary to obtain the necessary precision:

1) A bridge gauging crane is a must, mounted on wheels, and set up to take a winch and at least a 50lb. weight. 100lb would be better.

2) Two parties would be required in a higher flood (two parties were needed in this one !), one to cover the main channel and the other to measure the other three.

3) During the rise discharges would be gauged continuously, using estuarine techniques. If gaugings were done at night lights would be required, witches hats, warning signs etc. MRD kindly loaned us some of these and a worker, Mr. Richie Wass, to deploy them.

Disclaimer: At risk of appearing immodest, I believe I display some rectitude in developing the results to this stage. The data was more sketchy than was ideal, especially on the rise of the discharge hydrograph, but was as good as could be sampled by a party unprepared for the eccentricities of the site.

I am reasonably confident of the general accuracy of the data to approx. ± 20 %. The format used should permit useful comparisons with the theoretical model and indicate what further data, if any, is required.

R.G. Bird.
SUPERVISING HYDROGRAPHER
BUNDABERG

B/C: REGIONAL ENGINEER
CENTRAL QUEENSLAND

For your information

A.G. Mueller

REGIONAL ENGINEER
BURNETT

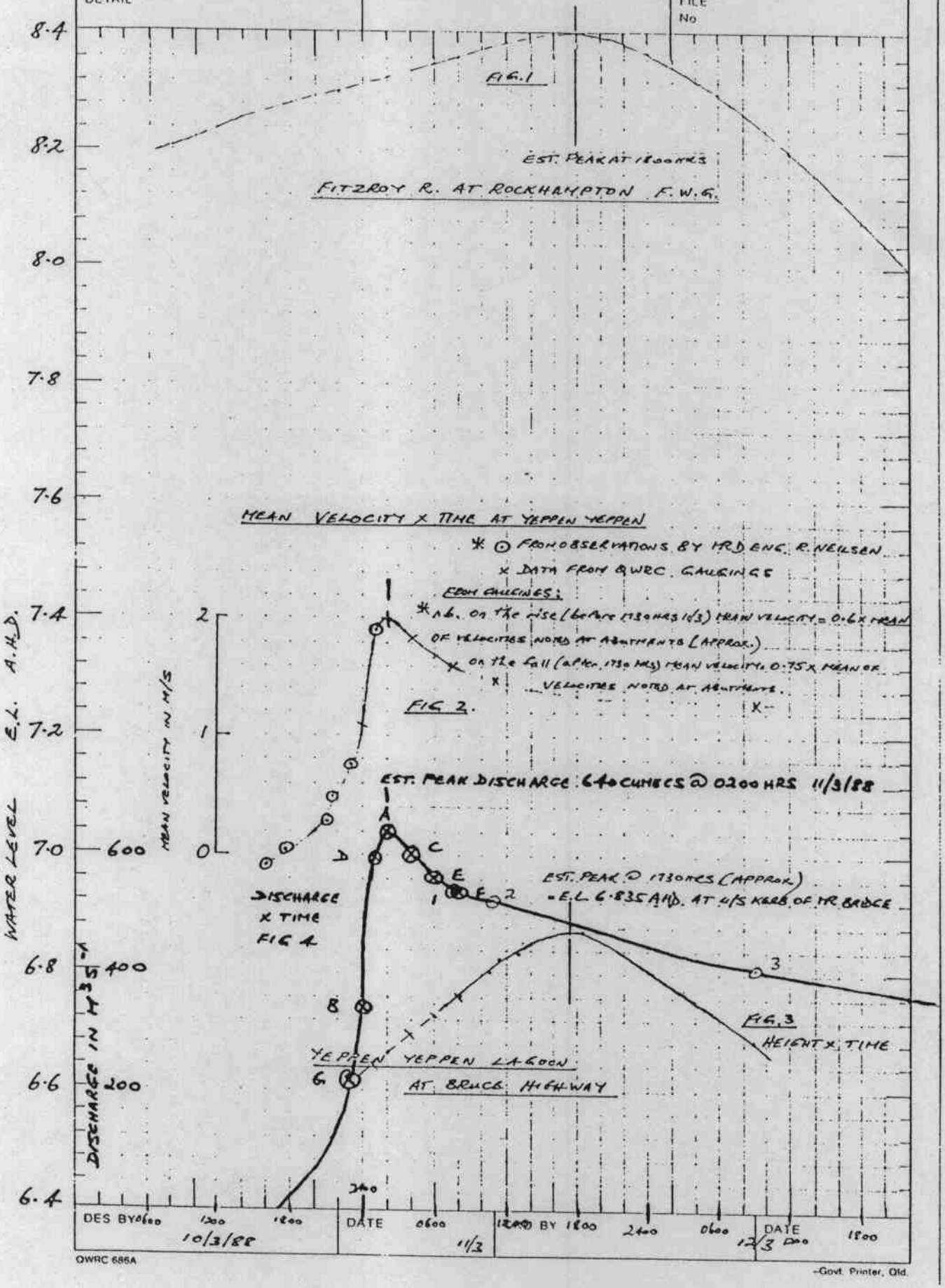
PROJECT

DETAIL

FEATURE COMPARITIVE HYDROGRAPHS
HEIGHT X TIME

SHEET No. OF

FILE No



QWRC 686A

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PROJECT	FEATURE	SHEET No OF
DETAIL		FILE No.

YEPPEN TOPPEN LAGOON AT BRUCE HIGHWAY

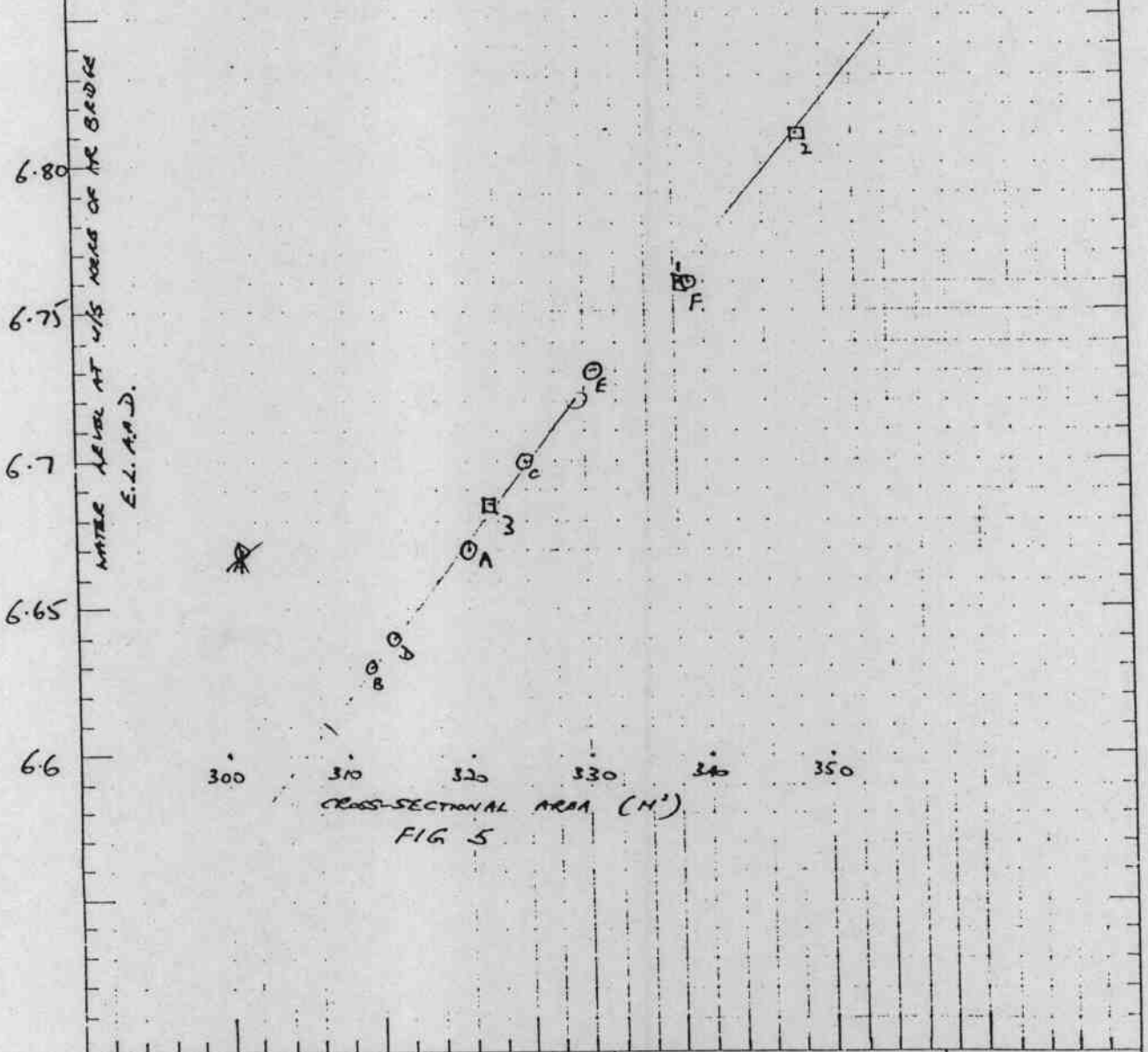


FIG 5

DES BY	DATE	CKD BY	DATE

QWRC 686A

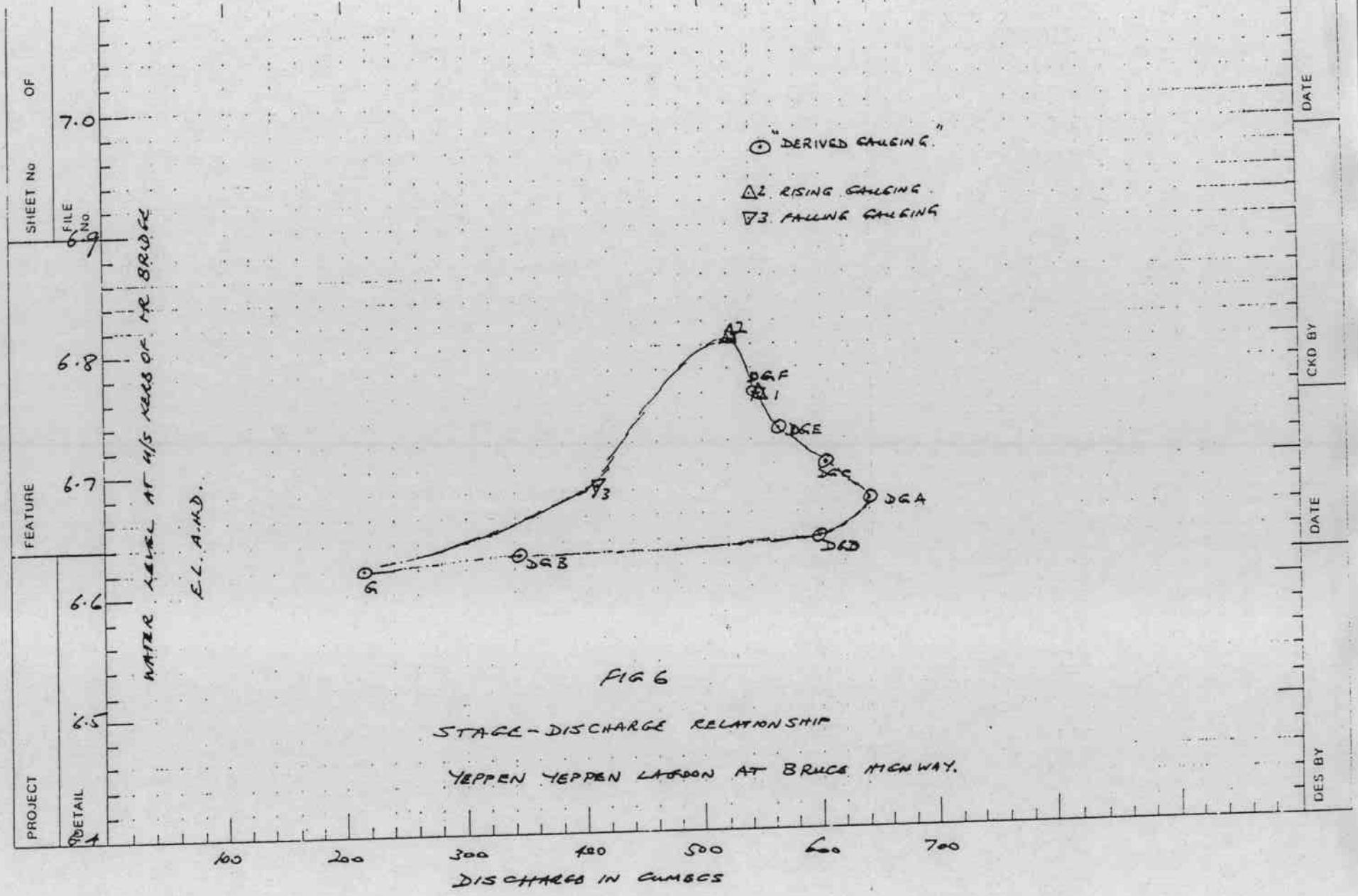


FIG 6

STAGE - DISCHARGE RELATIONSHIP

YEPPEN YEPPEN LAGOON AT BRUCE HIGHWAY.

PROJECT YEPPEN YEPPEN FLOOD PLAIN O BRUCE HIGHWAY

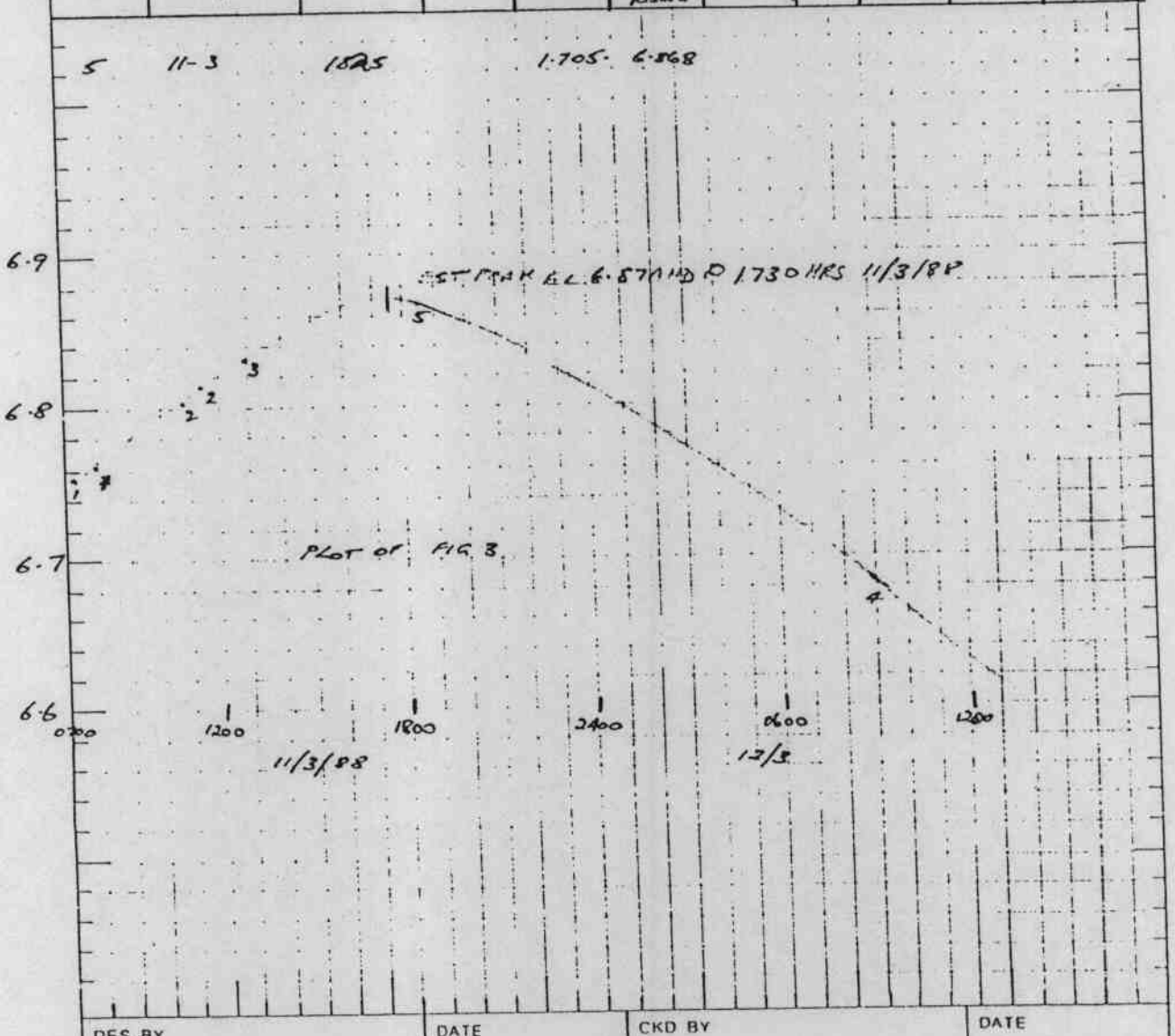
DETAIL YEPPEN XING

FEATURE HEIGHT DATA, ESTIMATED HYDROGRAPH

SHEET No. OF

FILE No.

GAUGING NO.	DATE	TIMES	HEADWATER T.B.M. E.L.	HEADWATER DIST TO W/L (m)	HEADWATER W/L E.L.	HEADWATER MEAN	TAILWATER T.B.M. E.L.	TAILWATER DIST TO W/L (m)	TAILWATER W/L E.L.	TAILWATER MEAN
1	11-3-88	0710	8.573	1.82	6.753	6.758	8.573	1.83	6.743	6.753
	Q=548.470 m^3s^{-1}	0755		1.81	6.763			1.81	6.763	
2	11-3	1043		1.77	6.803	6.808		1.78	6.793	6.798
	Q=524.145	1123		1.76	6.813			1.77	6.803	
3	11-3	1255		1.74	6.833	6.833		1.755	6.818	6.818
4	11-3	0850		1.885	6.688	ADOPT 6.685		1.865	6.708	6.705
	Q=411.074	0927		1.87 IRRATIONAL READING	6.703			1.87	6.703	
5	11-3	1825		1.705	6.868					



DES BY | DATE | CKD BY | DATE

OWRC 686A

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PROJECT Yeppen Yeppen Flood Plain @ Bruce Highway | FEATURE Height Data | SHEET No. OF | FILE No.

DETAIL Centre Channel

Gauging No.	Date	Times	Headwater TBM E.L.	Headwater Dist. to W/L (m)	Headwater W/L E.L.	Headwater Mean	Tailwater TBM E.L.	Tailwater Dist. to W/L (m)	Tailwater W/L E.L.	Tailwater Mean
1	11-3-88	1004	8.561	1.925	6.636	6.656	8.566	1.925	6.641	6.659
	Q=24.460 m^3s^{-1}	1031		1.885	6.676			1.89	6.676	
2	12-3-88	0820		1.93	6.631	6.631		1.93		
	Q=10.085	0842		1.93	6.631			1.93		

Yeppen Yeppen @ South Channel

Gauging No.	Date	Times	Headwater TBM E.L.	Headwater Dist. to W/L (m)	Headwater W/L E.L.	Headwater Mean	Tailwater TBM E.L.	Tailwater Dist. to W/L (m)	Tailwater W/L E.L.	Tailwater Mean
1	11-3-88	0920	8.573	1.955	6.618	6.633	8.579	1.955	6.624	6.637
	Q=26.714	0956		1.925	6.648			1.93	6.649	
2	12-3-88	0756		1.95	6.623	6.620		1.955	6.624	6.621
	Q=12.836 m^3s^{-1}	0814		1.955	6.618			1.96	6.619	

Scrubby Ck at Bruce Highway

Gauging No.	Date	Times	Head Water TBM E.L.	Head Water Dist. to W/L (m)	Head Water W/L E.L.	Head Water Mean	Tailwater TBM E.L.	Tailwater Dist. to W/L (m)	Tailwater W/L E.L.	Tailwater Mean
1	11-3-88	0856	8.570	1.915	6.625	6.628	8.569	1.95	6.619	6.622
	Q=46.386 m^3s^{-1}	0914		1.94	6.63			1.945	6.624	
2	12-3-88	0731		—	—	6.655		1.925	6.644	6.644
	Q=31.907	0750		1.915	6.655			1.925	6.644	

8.570
− 1.915
6.655

DES BY	DATE	CKD BY	DATE

QWRC 686A

–Govt. Printer, Qld.

E3 Yeppen Crossing
1991 Flood Gauging Data

QUEENSLAND TRANSPORT

Transport Technology Division

Queensland Department of Transport
Spring Hill Office Complex
477 Boundary Street Spring Hill
GPO Box 1412 Brisbane 4001
Telephone: (07) 834 2011
Facsimile: (07) 834 2022

3 April 1992

Enquiries: Mr M Jempson
Telephone: 834 2297
Our Ref:
Your Ref:

Attention: Mr D Sargent
CMPS & F
GPO Box 684
BRISBANE 4001

Dear Sir

ROCKHAMPTON FLOOD INFORMATION

Enclosed are flood levels and velocities for the Scrubby Ck bridge on the Bruce Highway. It should be noted that the downstream flood levels will be affected by drawdown through the bridge. The values given in the first table from the 13/1/91 to 15/1/91 are obviously erroneous as the afflux would not be increasing like this at this stage of the flood.

Yours faithfully

M. Hee

M Hee
PRINCIPAL ADVISOR (HYDRAULICS)

ROCKHAMPTON FLOOD JANUARY 1991

Bridge Site: Scrubby Ck (Bruce Highway) - Flood levels

Guide Post Zero = 9.26

Scrubby Sign Zero= 9.96

Date	Time	U/S R.L. (Guide Post) (AHD)	D/S R.L. (Sign Post) (AHD)	Afflux (m)
7/1/91	1000	8.48	8.24	0.24
	1600	8.47	8.22	0.25
8/1/91	1000	8.42	8.12	0.30
	1700	8.37	8.10	0.27
9/1/91	1100	8.36	8.06	0.30
10/1/91	1100	8.48	8.24	0.24
11/1/91	1500	8.56	8.33	0.23
12/1/91	1200	8.38	8.20	0.18
13/1/91	1200	8.24	7.88	0.36
14/1/91	1300	7.96	7.50	0.46
15/1/91	0800	7.63	7.19	0.44

The guide post is 22.3m from the face of the northern abutment.
The 'Scrubby Ck' sign is 11.8m from the face of the northern abutment.
These levels may be affected by drawdown through the bridge.
There would appear to be some error in the levels from the 13/1/91 on as the afflux would not be increasing like this.

ROCKHAMPTON FLOOD JANUARY 1991

Bridge Site: Scrubby Ck

Flood levels taken from bridge measuring down from the kerb.

Date	Time	U/S R.L. (AHD)	D/S R.L. (AHD)	Afflux (AHD)
4/1/91	1600	6.35	6.35	0.00
	2400	6.46	6.46	0.00
5/1/91	0300	6.78	6.78	0.00
	0800	7.36	7.25	0.11
	1000	7.54	7.45	0.09
7/1/91	1000	8.44	8.26	0.18
	1600	8.41	8.22	0.19
8/1/91	1000	8.30	8.13	0.17
	1700	8.33	8.08	0.25
9/1/91	1100	8.28	8.05	0.23
10/1/91	1100	8.44	8.26	0.18
11/1/91	1500	8.53	8.34	0.19
12/1/91	1200	8.45	8.21	0.24
13/1/91	1200	8.19	7.93	0.26
14/1/91	1300	7.75	7.58	0.17
15/1/91	0800	7.45	7.32	0.13
	1600	7.30	7.21	0.09
16/1/91	0900	6.95	6.92	0.03
	1600	6.80	6.79	0.01
17/1/91	0800	6.47	6.47	0.00
	1500	6.34	6.34	0.00

These levels will be affected by drawdown through the bridge.

ROCKHAMPTON FLOOD JANUARY 1991

Bridge Site: Scrubby Ck

Velocity Readings

Date	Time	U/S				D/S			
		R.L. of Reading 1	Velocity (m/s)	R.L. of Reading 2	Velocity (m/s)	R.L. of Reading 1	Velocity (m/s)	R.L. of Reading 2	Velocity (m/s)
5/1/91	0800					7.1	2.1	6.2	2.15
8/1/91	1000	8.15	1.2	4.16	1.4	7.98	1.5	4.16	1.6

Transport Technology Division

QUEENSLAND TRANSPORT

Queensland Department of Transport
Spring Hill Office Complex
477 Boundary Street Spring Hill
GPO Box 1412 Brisbane 4001
Telephone: (07) 834 2011
Facsimile: (07) 834 2022

19 September 1991

Enquiries: Mr M Jempson
Telephone: 834 2297
Our Ref: MJ:TD
Your Ref:

Attention: Mr D Sargent

Camp Scott Furphy Pty Ltd
GPO Box 684
BRISBANE 4001

Dear Sir

An error has been detected in the Flood Gauge Heights table forwarded on the 17 September 1991. Enclosed is a copy of the new table.

Yours faithfully

M. Hee

M Hee
PRINCIPAL ADVISOR (HYDRAULICS)

D Sargent

Rockhampton Flood January 1991

Flood Gauge Heights: The levels obtained from these field observation are of low accuracy. All gauges are on the u/s side.

Date	Time	Gauge Reading Nth of Scrubby (m) * Ch=3810	Gauge Reading Sth of Yeppen 3 (m) Ch=3595	R.L. (AHD)	Gauge Reading Nth of Yeppen 3 (m) Ch=3165	R.L. (AHD)	Gauge Reading Sth of Yeppen 2 (m) Ch=2834	R.L. (AHD)	Gauge Reading Nth of Yeppen2 (m) * Ch=2234	Gauge Reading South'n Approach R'bout (m)	R.L. (AHD)
5/1/91	0850				0.41	7.63	0.38	7.73	0.38		
	0930	0.20	0.40	7.73	0.50	7.72	0.41	7.76			
	0955	0.25	0.41	7.74							
	1030	0.30	0.50	7.83	0.55	7.77	0.50	7.85	0.5		
7/1/91	1000	0.90	1.08	8.41	1.08	8.30	1.04	8.39	1.08	1.16	8.52
	1600	0.90	1.05	8.38	1.20	8.42	1.05	8.40	1.10	1.18	8.54
8/1/91	1000	0.83	1.00	8.33	1.10	8.32	1.00	8.35	1.00	1.15	8.51
	1630	0.80	1.00	8.33	1.10	8.32	1.00	8.35	0.98	1.08	8.44
9/1/91	1000	0.80	1.00	8.33	1.00	8.22	0.97	8.32	0.97	1.00	8.36
10/1/9	1100	0.98	1.10	8.43	1.18	8.40	1.10	8.45	1.15	1.10	8.46
11/1/9	1500		Submerg.	>8.77	1.44	8.66	1.20	8.55	1.20	1.20	8.56
12/1/9	1200		1.14	8.47	1.20	8.42	1.10	8.45	1.15		
13/1/9	1200		0.92	8.25	1.00	8.22	0.90	8.25	0.92		
14/1/9	1300		0.63	7.96	0.70	7.92	0.63	7.98	0.60	0.70	8.06
15/1/9	0800		0.35	7.68			0.32	7.67	0.30		
	1600		0.15	7.48	0.25	7.47	0.12	7.47	0.46	0.41	7.77
					<0		<0		<0	<0	

* These gauges do not have a zero as they are no longer in place.

QUEENSLAND TRANSPORT

Transport Technology Division

Queensland Department of Transport
Spring Hill Office Complex
477 Boundary Street Spring Hill
GPO Box 1412 Brisbane 4001
Telephone: (07) 834 2011
Facsimile: (07) 834 2022

17 September 1991

Enquiries: Mr M Jempson
Telephone: 834 2297
Our Ref: MJ:KD
Your Ref:

Attn: Mr D Sargent

Scott & Furphy Consulting Group
215 Coronation Drive
MILTON QLD 4064

Dear Sir

Attached is the Rockhampton flood information (that has been processed to this date) that was recorded by the Department of Transport. The following comments are provided to give an indication of the accuracy and applicability of the results.

Flood Gauge Heights

Flood gauges are the roadside depth indicator posts. The readings were taken from a boat at a distance of approximately 40 m. There was considerable splash around the posts and in some cases debris. It is, therefore, considered that readings are of a low accuracy. The chainage for the post on the southern approach to the roundabout is not yet available.

Yeppen 1 Bridge

Flood levels were taken at several locations at this bridge. The first Yeppen 1 table gives levels that were taken on the northern approach embankment. The U/S levels were taken at a light pole 14.4 m from the face of the northern abutment.

The D/S levels were taken at the "Yeppen Flood Plain" sign 24.7 m from the face of the northern abutment. It should be noted that before the bridge was overtopped water levels at the light pole and sign post may have been affected by drawdown through the bridge.

Flood levels were taken in the middle of Spans 5, 10 and 16. These levels are given in the second Yeppen 1 table. The negative numbers in this table can be assumed to be field recording errors. There was no reverse flow at these times.

Yeppen 2 Bridge

The first Yeppen 2 table does not give a true indication of the afflux. The U/S RL, measured 22.7 m from the face of the southern abutment, is a good indication of the headwater RL,

however, the D/S RL is at the abutment. This location is affected by the drawdown through the bridge and reverse flow. Unfortunately, the markers put in for the true D/S RL have disappeared.

The flood levels in the second Yeppen 2 table were taken from Span 5. These figures give a better indication of the afflux but are still subject to drawdown. However, the afflux at the peak of the flood seems to be too large probably because of the effect of the bridge kerbs (top of the kerbs at RL 8.57).

It should be noted that the rail bridge is a few metres D/S from the road bridge.

Yeppen 3 Bridge

The first Yeppen 3 table does not give a true indication of the afflux. The U/S RL, measured 22.6 m from the face of the southern abutment, is a good indication of the headwater RL, however, the D/S RL was taken at the abutment. This location is affected by drawdown through the bridge.

The flood levels in the second Yeppen 3 table were taken from Span 4. As with the Yeppen 2 results there is an increase in the afflux at the peak of the flood. This is not expected as the bridge and highway were overtopped at these levels again reflecting the effect of the bridge kerbs (top RL 8.58).

Velocities

The velocity readings were taken from the same span as the flood levels on all bridges. The readings were taken using a Price current meter. The additional velocities given at Yeppen 1 were made by determining the time for debris to flow between the road and rail bridge.

Further information as it becomes available will be forwarded to you.

Yours faithfully

M. Hee

M Hee
PRINCIPAL ADVISOR (HYDRAULICS)

Rockhampton Flood January 19[illegible]

Flood Gauge Heights: The levels obtained from these field observation are of low accuracy. All gauges are on the u/s side.

SUPERSEDED REFER D.O.T. LETTER 15.3.91

Date	Time	Gauge Reading Nth of Scrubby (m) * Ch=3810	Gauge Reading Sth of Yeppen 1 (m) Ch=3565	R.L. (AHD)	Gauge Reading Nth of Yeppen 1 (m) Ch=3165	R.L. (AHD)	Gauge Reading Sth of Yeppen 2 (m) Ch=2834	R.L. (AHD)	Gauge Reading Nth of Yeppen2 (m) * Ch=2234	Gauge Reading South'n Approach R'bout (m)	R.L. (AHD)
5/1/91	0850				0.41	7.63	0.38	7.73	0.38		
	0930	0.20	0.4[illegible]	7.73	0.50	7.72	0.41	7.76			
	0955	0.25	0.41	7.74							
	1030	0.30	0.5[illegible]	7.83	0.55	7.77	0.50	7.85	0.5		
7/1/91	1000	0.90	1.0[illegible]	8.41	1.08	8.30	1.04	8.39	1.08	1.16	8.52
	1600	0.90	1.05	8.38	1.12	8.34	1.05	8.40	1.10	1.18	8.54
8/1/91	1000	0.83	1.00	8.33	1.10	8.32	1.00	8.35	1.00	1.15	8.51
	1630	0.80	1.00	8.33	1.10	8.32	1.00	8.35	0.98	1.08	8.44
9/1/91	1000	0.80	1.00	8.33	1.00	8.22	0.97	8.32	0.97	1.00	8.36
10/1/9	1100	0.98	1.10	8.43	1.18	8.40	1.10	8.45	1.15	1.10	8.46
11/1/9	1500		Submerg[illegible]	8.77	1.44	8.66	1.20	8.55	1.20	1.20	8.56
12/1/9	1200		1.1[illegible]	8.47	1.20	8.42	1.10	8.45	1.15		
13/1/9	1200		0.9[illegible]	8.25	1.00	8.22	0.90	8.25	0.92		
14/1/9	1300		0.63	7.96	0.70	7.92	0.63	7.98	0.60	0.70	8.06
15/1/9	0800		0.35	7.68			0.32	7.67	0.30		
	1600		0.1[illegible]	7.48	0.25	7.47	0.12	7.47	0.46	0.41	7.77
					<0		<0		<0	<0	

* These gauges do not have a zero as they are no longer in place.

ROCKHAMPTON FLOOD JANUARY 1991

Bridge Site: Yeppen 1- Flood levels taken near bridge where where drawdown effects were considered to be negligible.

Light Pole Zero = 8.74

Yeppen Sign Zero = 9.59

Date	Time	U/S R.L. (Light Pole)	D/S R.L. (Sign)	Afflux (m)
5/1/91	0840	7.94		
	1340	8.15	7.85	0.30
6/1/91	1130	8.50	8.19	0.31
7/1/91	1115	8.62	8.27	0.35
	1615	8.59	8.29	0.30
8/1/91	1030	8.53	8.13	0.40
	1700	8.52	8.21	0.31
9/1/91	1000	8.50	8.19	0.31
10/1/91	1130	8.63	8.35	0.28
11/1/91	1610	8.69	8.35	0.34
12/1/91	1340	8.61	8.26	0.35
13/1/91	1320	8.40	8.08	0.32
14/1/91	1350	8.11	7.77	0.34
15/1/91	0915	7.85	7.47	0.38

Flood levels taken on bridge measuring down from the top of the kerb unit.

Date	Time	Span 5 U/S R.L. (AHD)	Span 5 D/S R.L. (AHD)	Span 5 Afflux (m)	Span 10 U/S R.L. (AHD)	Span 10 D/S R.L. (AHD)	Span 10 Afflux (m)	Span 16 U/S R.L. (AHD)	Span 16 D/S R.L. (AHD)	Span 16 Afflux (m)
4/1/91	1600	6.47	6.47	0.00	6.45	6.45	0.00			
5/1/91	0130				7.19	7.09	0.10	7.07	6.93	0.15
	0645	7.46	7.47	0.00	7.57	7.48	0.09	7.52	7.47	0.05
	1030	7.79	7.74	0.05	7.80	7.65	0.15	7.79	7.73	0.06
	1345	7.87	7.84	0.03	7.95	7.88	0.07	7.97	7.89	0.09
6/1/91	1200	8.36	8.15	0.21	8.30	8.23	0.07			
7/1/91	1115	8.57	8.27	0.30	8.56	8.31	0.25	8.54	8.37	0.16
	1600	8.54	8.28	0.26	8.50	8.25	0.25	8.49	8.30	0.19
8/1/91	1000	8.42	8.21	0.21	8.35	8.16	0.19	8.43	8.23	0.20
	1700	8.41	8.19	0.22	8.34	8.20	0.14	8.41	8.23	0.18
9/1/91	1000	8.38	8.14	0.24	8.32	8.14	0.18	8.38	8.21	0.18
10/1/91	1100	8.53	8.32	0.21	8.54	8.34	0.20	8.51	8.30	0.21
11/1/91	1600	8.64	8.32	0.32	8.67	8.42	0.25	8.64	8.42	0.23
12/1/91	1400	8.58	8.31	0.27	8.59	8.35	0.24	8.55	8.30	0.25
13/1/91	1300	8.24	8.11	0.13	8.32	8.15	0.17	8.25	8.05	0.20
14/1/91	1400	7.82	7.86	-0.04	7.89	7.91	-0.02	7.85	7.80	0.05
15/1/91	0900	7.57	7.51	0.06	7.58	7.62	-0.04	7.46	7.54	-0.08
	1600	7.49	7.37	0.12	7.50	7.55	-0.05	7.42	7.35	0.07
16/1/91	0900	7.17	7.18	0.00	7.27	7.31	-0.04	7.21	7.12	0.10
	1600	7.05	7.09	-0.04	7.16	7.21	-0.05	7.13	7.04	0.09
17/1/91	0800	6.69	6.69	0.00	6.71	6.74	-0.03	6.71	6.66	0.05
	1500	6.45	6.45	0.00	6.48	6.49	-0.01	6.45	6.45	0.00
18/1/91	0800	6.00	6.01	0.00	6.00	6.02	-0.02	5.98	6.00	-0.02
	1000				5.96	5.96	0.00	5.95	5.96	0.00

The light pole is 14.4m from the face of the northern abutment.
The "Yeppen Flood Plain" sign is 24.7m from the face of the northern abutment.

ROCKHAMPTON FLOOD JANUARY 1991

Bridge Site: Yeppen 2 - Flood levels

Guide Post Zero = 9.23

Top of Abutment = 8.55

Date	Time	U/S R.L. (Guide Post)	D/S R.L. (Abutment)	Afflux (m)
6/1/91	1200	8.66	Unknown	Unknown
7/1/91	1000	Unknown	7.86	Unknown
	1600	8.43	7.86	0.57
8/1/91	1000	8.35	7.72	0.63
	1700	8.35	7.70	0.65
9/1/91	1100	8.34	7.69	0.64
10/1/91	1100	8.47	7.90	0.56
11/1/91	1500	8.58	8.12	0.45
12/1/91	1200	8.46	8.00	0.46
13/1/91	1200	8.22	7.78	0.44
14/1/91	1300	7.93	7.48	0.45
15/1/91	0800	7.60	7.21	0.38

Flood levels taken from bridge measuring down from the kerb.

Date	Time	U/S R.L. (AHD)	D/S R.L. (AHD)	Afflux (m)
4/1/91	1600	6.39	6.39	0.00
	2400	6.52	6.52	0.00
5/1/91	0300	6.81	6.81	0.00
	0800	7.34	7.30	0.04
	1000	7.54	7.52	0.02
6/1/91	1200	8.22	7.97	0.25
7/1/91	1000	8.38	8.14	0.24
	1600	8.34	8.12	0.22
8/1/91	1000	8.14	7.96	0.18
	1700	8.20	8.00	0.20
9/1/91	1100	8.19	7.98	0.21
10/1/91	1100	8.34	8.10	0.24
11/1/91	1500	8.53	8.11	0.42
12/1/91	1200	8.27	7.95	0.32
13/1/91	1200	8.00	7.85	0.15
14/1/91	1300	7.65	7.57	0.08
15/1/91	0800	7.40	7.30	0.10
	1600	7.27	7.21	0.06
16/1/91	0900	6.94	6.94	0.00
	1600	6.82	6.82	0.00
17/1/91	0800	6.50	6.50	0.00
	1500	6.31	6.31	0.00

Guide post is 22.7m from the face of the southern abutment.
The abutment is the southern abutment.
The levels thaken from the abutment give an indication of the drawdown through the bridge not the tailwater R.L. Therefore the afflux shown in the first table will be larger than the true afflux.

ROCKHAMPTON FLOOD JANUARY 1991

Bridge Site: Yeppen 3 - Flood levels

Guide Post Zero = 9.19

Fence Post Zero = 9.07

Date	Time	U/S R.L. (Guide Post)	D/S R.L. (Fence Post)	Afflux (m)
7/1/91	1000	8.50	8.12	0.38
	1545	8.46	8.10	0.36
8/1/91	0955	8.39	7.99	0.40
	1640	8.38	8.03	0.35
9/1/91	1030	8.37	7.96	0.41
10/1/91	1105	8.48	8.14	0.34
11/1/91	1530	8.56	8.24	0.32
12/1/91	1255	8.47	8.12	0.35
13/1/91	1235	8.24	7.85	0.39
14/1/91	1308	7.94	7.49	0.45
15/1/91	0815	7.60	7.25	0.35

Flood levels taken from bridge measuring down from the kerb.

Date	Time	U/S R.L. (AHD)	D/S R.L. (AHD)	Afflux (m)
4/1/91	1630	6.37	6.37	0.00
	2400	6.48	6.48	0.00
5/1/91	0230	6.79	6.79	0.00
	0800	7.35	7.29	0.06
	1000	7.51	7.49	0.02
7/1/91	1000	8.38	8.11	0.27
	1600	8.40	8.14	0.26
8/1/91	1000	8.29	8.08	0.21
	1700	8.25	8.01	0.24
9/1/91	1100	8.22	7.98	0.24
10/1/91	1100	8.37	8.13	0.24
11/1/91	1500	8.51	8.17	0.34
12/1/91	1200	8.38	8.02	0.36
13/1/91	1200	8.03	7.82	0.21
14/1/91	1300	7.68	7.52	0.16
15/1/91	0800	7.42	7.3	0.12
	1600	7.27	7.17	0.10
16/1/91	0900	6.93	6.91	0.02
	1600	6.82	6.82	0.00
17/1/91	0800	6.5	6.5	0.00
	1500	6.35	6.35	0.00

The guide post is 22.6 m from the face of the southern abutment.
The fence post is at the southern abutment.
The d/s water levels in table 1 are not a true reflection of the tailwater as the measurements taken at the fence post are affected by the drawdown through the bridge.

ROCKHAMPTON FLOOD JANUARY 1991

Bridge Site: Yeppen 1

Velocity Readings

SPAN 5

Date	Time	U/S				D/S			
		R.L. of Reading 1	Velocity (m/s)	R.L. of Reading 2	Velocity (m/s)	R.L. of Reading 1	Velocity (m/s)	R.L. of Reading 2	Velocity (m/s)
5/1/91	0645							6.91	2.4
6/1/91	1200	7.8	1.6	7.36	1.8			7.8	2
8/1/91	1000	7.8	1.3	6.67	1.7	7.8	2	6.67	2.1

SPAN 10

Date	Time	U/S				D/S			
		R.L. of Reading 1	Velocity (m/s)	R.L. of Reading 2	Velocity (m/s)	R.L. of Reading 1	Velocity (m/s)	R.L. of Reading 2	Velocity (m/s)
5/1/91	0645					7.45	2.4	6.91	2.4
6/1/91	1200	7.8	1.35	7.8	1.4			7.8	1.8
8/1/91	1000	7.8	1.95	6.67	1.75	7.8	2	6.67	2.05

SPAN 15

Date	Time	U/S				D/S			
		R.L. of Reading 1	Velocity (m/s)	R.L. of Reading 2	Velocity (m/s)	R.L. of Reading 1	Velocity (m/s)	R.L. of Reading 2	Velocity (m/s)
5/1/91	0645							7.8	1.5
6/1/91	1200	7.8	1.3	7.8	1.6			6.67	1.2
8/1/91	1000	7.8	1.25	6.67	1.55	7.8	0.9		

ADDITIONAL INFORMATION

Velocities:

The following velocities were measured by recording the time taken for debris to travel from the road bridge to the rail bridge.

Date	Time	Velocity (m/s)
5/1/91	1345	2.43
7/1/91	1115	2.16
13/1/91	1330	2.19
14/1/91	1400	2.3

Afflux:

The Bruce Highway first overtopped between the roundabout and Yeppen 1 bridge at 0145 on 5/1/91. The afflux at the point of overtopping was 0.71m. This measurment can be considered to be accurate. It should be noted that the afflux measured at the bridge at the same time was in the order of 0.1m to 0.15m.

ROCKHAMPTON FLOOD JANUARY 1991

Bridge Site: Yeppen 2

Velocity Readings

Date	Time	U/S				D/S			
		R.L. of Reading 1	Velocity (m/s)	R.L. of Reading 2	Velocity (m/s)	R.L. of Reading 1	Velocity (m/s)	R.L. of Reading 2	Velocity (m/s)
5/1/91	0800					7.14	1.9	6.43	1.9
6/1/91	1200			6.88	2.2			6.88	2.3
8/1/91	1000	7.8	1.4	6.9	2.1	7.8	2	6.9	2.25

ROCKHAMPTON FLOOD JANUARY 1991

Bridge Site: Yeppen 3

Velocity Readings

Date	Time	U/S				D/S			
		R.L. of Reading 1	Velocity (m/s)	R.L. of Reading 2	Velocity (m/s)	R.L. of Reading 1	Velocity (m/s)	R.L. of Reading 1	Velocity (m/s)
5/1/91	0800					7.12	2	6.12	2
8/1/91	1000	7.8	1.5	7.1	2.1	7.8	2.2	7.1	2.3

E4 1991 Floodplain Flow Calculations

BRUCE HIGHWAY BRIDGE OPENING AND WEIR FLOWS DURING 1991 FLOODS

Flows through bridges calculated using area of bridge opening x recorded/estimated velocities (refer to Spreadsheet 1):

Yeppen 1 Bridge	1,022 m^3/s
Yeppen 2 Bridge	587 m^3/s
Yeppen 3 Bridge	380 m^3/s
Yeppen 4 Bridge (Scrubby Creek)	525 m^3/s
1991 Peak Flood Total	2,500 m^3/s

Weir flows over Bruce Highway calculated from recorded/estimated flood levels and velocities (refer to Spreadsheet 2):

1991 Peak Flood Total	5,100 m^3/s

∴ Total 1991 Peak Flow at Yeppen Crossing (Bruce Highway Bridges) = **7,600 m^3/s**

ROCKHAMPTON FLOOD MANAGEMENT STUDY -Bruce Highway Bridge Flow

Discharge(Q) = Area*Velocity

Bridge Location	Area(m2)	Vel.(m/s)	Q m3/s
Yeppen 1	510.8	2.0	1022
Yeppen 2	293.4	2.0	587
Yeppen 3	190.2	2.0	380
Yeppen 4 (Scrubby Creek)	262.5	2.0	525
	TOTAL DISCHARGE		2500 m3/s

NOTES:

1. Calculations prepared by CSF from information provided by DOT

ROCKHAMPTON FLOOD MANAGEMENT STUDY -Bruce Highway Weir Flows

Weir Flow Q=(CLH)^1.5

Location	Date	Time	C	L(m)	H(m)	CLH^1.5(m3/s)
Yeppen 1 L.Pole/Sign	11/1/91 (Peak)	1610	1.68	125	1.31	314
Gauge on Sth. approach to Roundabout	11/1/91 (Peak)	1500	1.68	900	1.18	1930
Yeppen 2 to Yeppen 3	11/1/91 (Peak)	1500	1.68	670	1.23	1530
Sth.of Yeppen 3	11/1/91 (Peak)	1500	1.68	485	1.39	1331
					TOTAL	5105 m3/s

NOTES:

1. Tailwater conditions during the peak of the 1991 flood were such that un-drowned flow occured over the Bruce Highway embankment
2. Calculations prepared by CSF from information provided by DOT

APPENDIX F

APPENDIX F

QUESTIONNAIRE SURVEY

F1 Householder Survey

F2 Business Survey

F1 Householder Survey

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ROCKHAMPTON FLOOD MANAGEMENT STUDY
FLOOD DAMAGE SURVEY
RESIDENTIAL/COMMERCIAL/INDUSTRIALQUESTIONNAIRE

Camp Scott Furphy has been appointed by the Water Resources Commission (State Government) to carry out a flood management study for Rockhampton with a view to making recommendations to help reduce the impact of future floods.

Information is required in respect of the following:

- Direct and indirect damages and losses from the 1991 flood and a range of possible flood heights. Indirect losses may have occurred even if your premises were not flooded, for example, due to closure of road and rail links;
- The effectiveness of flood warnings and the level of flood awareness/preparedness;
- Social impacts of flooding.

This information is vitally important to the Study. It will be used to:

- Evaluate the cost of the recent flood, and the cost effectiveness of a range of flood mitigation options (i.e. the relationship between their cost and the degree of reduction in flood damages) to enable a management strategy and programme of works to be formulated;
- Evaluate the effectiveness of flood warnings with recommendations to improve warnings and increase the level of flood preparedness in the community;
- Evaluate social impacts of flooding and of any proposed works and management strategies.

In order to obtain this information, we are visiting a significant sample of households and businesses affected by the recent flood.

A few minutes of your time to provide the information requested, will better enable us to formulate flood management proposals to reduce **your** damages and losses in future floods.

The information provided will be treated in the strictest confidence. No names will be kept; addresses will be used only to provide information on location. Only summary statistics will be published.

We should be grateful if you are able to help us with this survey by completing our detailed questionnaire. In the case of larger businesses we shall initially leave a copy of the questionnaire to enable you to compile the relevant information. One of our researchers will then make an appointment to collect/complete the questionnaire.

We can be contacted at the offices of Capricorn Survey Consultants, 101 Bolsover St, Rockhampton, Tel. 275199 or at the Brisbane address given above.

Yours faithfully,

D. M. SARGENT
Project Manager

CAMP SCOTT FURPHY PTY. LTD.
ROCKHAMPTON FLOOD MANAGEMENT STUDY

HOUSEHOLDER SURVEY

ADDRESS: _____ Date:_____
_____

ZONE/AREA
ANUFLOOD GRID REF

FLOOD WARNING

1(a) Did you, or anyone in your family, get a flood warning of any sort:
YES
NO Were you listening/watching radio/TV at the time? _____
Which station?_____
Who got the warning?_____

(b) Where did the warning come from? (GET SPECIFIC DETAILS, RADIO/TV STATION)
_____

(c) When did you get the warning? _____

(d) What did the warning say? (SPECIFIC DETAILS) _____

(e) Was the warning convincing/ did you believe it?
VERY CONVINCING _____
CONVINCING _____
UNCONVINCING _____

(f) Why do you feel that? _____

(g) Looking back, was the warning accurate? How accurate? _____

(h) How much warning time were you given? (days) _____

2. During the recent flood, when did you first realise that your house could be flooded?

_____

3. How did you know the house was going to flood?

_____

_____

4(a) When you realised that your house might be flooded, what did you think of doing? (IN WHAT ORDER) _____

_____

(IF NOT MENTIONED)

(b) Did you think about leaving the house? YES NO

(DETAILS)_____

_____

5(a) Were you able to relate the predicted flood height to the level the flood waters could reach at your house? If so, how?

_____

_____

(b) How deep did you think the water would get – inside the house?

_____

(c) How deep did it get?
grounds? _____
overfloor? _____

(d) During the flood did you ask anyone for help? YES NO

(IF YES)
Whom_____
When_____
What sort of help_____
Why that group/person_____
How did you know about them (IF APPROPRIATE)

_____

(e) When you realised your house was going to be flooded, what steps did you take to reduce damage to house contents, vehicles, etc?
inside house _____
outside/under house_____

6(a) Who do you think should be responsible for giving warnings to the public? (eg Police, Council, SES, radio station, TV station, Bureau of Meteorology, etc.)

_____

Why?_____

(b) What would you say were the good points of the warnings (based on their own or others experience)? (Rank from 1 most important)

_____

_____

_____

(c) What were the bad points (based on their own or others experience e.g. confusion due to warnings being given by various sources)? (Rank from 1 most important)

_____

_____

_____

(d) What can be done to overcome these problems?

_____

_____

7(a) What sort of information do you think should be given to people who might be flooded?

_____

(b) Would you like to have some means of accurately relating predicted flood level to flooding at your home?

_____

(c) How should the information be distributed? (eg in pamphlets, street markers, radio, etc)_____

EVACUATION

8(a) Did you have to evacuate your house? YES/NO

(b) If yes, when did you leave? _____

(c) Were you advised to leave? (If so by whom?)_____

(d) Who helped you evacuate?_____

FLOOD AFTERMATH

9. Could you tell us what help you received after the flood, for example:
help with cleaning up_____
replacement of furniture/goods_____
someone to talk to about how you felt_____
financial assistance_____

FLOOD DAMAGE

10. What sort of damage did the flood cause (take down details)?
(a) house structure? Any estimates of repair costs?_____

_____

(b) house contents (incl. cars etc)
within house?_____
outside/under house_____

(c) lost wages for any member of the household?
(If so, how much and for how long?)
_____

(d) disruption to normal routine for any member of the household
(e.g. cost of alternative accommodation, extra travel)?
_____
_____

(e) Clean up costs?_____

(f) Other?
_____
_____

11(a) Have you received any insurance money for any of your losses? (DETAILS) YES/NO
_____

(b) Have you received any other form of relief – money or other? (DETAILS) YES/NO
_____

KNOWLEDGE ABOUT FLOODS IN AREA

12. How long have you lived a) in the Rockhamton area?
b) in this house?

13(a) Before the recent flood, what did you know about floods in this area?
_____

– How did you know?_____

(b) Before the recent flood, did you realise that your house could be flooded?_____
(DETAILS – WHEN, WHERE)_____
_____

(c) Do you know if your house had been flooded before the recent flood?_____

How many times?

(d) Before the recent flood, what sort of experience had you had with flooding?_____
_____

(e) Did your earlier flood experience help you this time?_____

14(a) Is there anything about this house which makes it better able to withstand flooding?

_____

_____

(b) When was that done?

_____

QUESTIONS ABOUT YOURSELF

15. Do you own or rent this property? OWN RENT

16. How many people live here? Over 18_____
Under 18_____

17. Which of these best describes your household?

Young single person
Single parent with children
Young group house
Young/mature couple
Couple with young children
Couple with school age children
Couple with mature family
Elderly single person
Other (eg. extended family) Specify_____

18. Are you employed? Yes – Full Time, Part-time, Occasional
No – Home duties, pensioner

(a) IF APPLICABLE – SAME QUESTIONS FOR SPOUSE/PARTNERS

Is your spouse employed? Yes – Full time, Part time, Occasional
No

19. Sex of Respondant MALE/FEMALE

20. Would you tell me what age category you fit into?

<20	60–69
20–29	70–79
30–39	80–89
40–49	>90

EMOTIONAL RESPONSE

21. Would you say that the flood affected the health of anyone in your household?

Adults: Trouble sleeping, feeling on edge, lose temper easily, find it hard to relate to other people, lack of energy, things are getting me down.

Children: Trouble sleeping, feeling on edge, lose temper easily, find it hard to relate to other people, lack of energy, things are getting me down.

22. Now when it rains heavily, how do you feel?

ROCKHAMPTON FLOOD MANAGEMENT STUDY
HOUSEHOLDER SURVEY

LOCALITY	FLOOD WARNING Y/N	OVERFLOOR FLOODING DEPTH mm	HH's ABILITY TO RELATE PREDICTED FLOOD HEIGHTS TO LEVEL OF WATER AT HOUSE	SUGGESTED RESPONSIBILITY FOR FLOOD WARNINGS	MEANS OF ACCURATE FLOOD LEVEL INFO TO BE PROVIDED TO HOUSEHOLDER	EVACUATION Y/N	INSURANCE Y/N	FLOOD DAMAGE Y/N $	COST OF REPAIRS $	FLOOD RELIEF Y/N $	NO. OF PERSONS IN HOUSE	AGE CATEGORY RESPONDENT	PHYSICAL/EMOTIONAL HEALTH EFFECTS	REMARKS
Pink Lily	Yes	450	No	Police	Map in telephone booth	Yes	No	Yes		Yes	2	40–49	Stress, tired, angry	Couldn't cope if similar situation occurred
North R'bn	Yes		Council yellow taps showing 1954 flood level	Police	Yellow taps showing prior flood levels	No	No	Yes		No	3	40–49	Extreme stress	Extreme depression
Pink Lily	Yes	200	River heights upstream	Local person	Radio/TV community awareness	Yes	Yes	Yes		Yes	1	40–49	Quite upset	Loses temper easily
Pink Lily	Yes	200	No	One group only	Street markers	Yes	No	Yes		No	4	30–39		
Pink Lily	Yes	250												Things are getting her down
Pink Lily	Yes	100	Previous floods elsewhere	Police,Council,SES, Radio/TV,Bur of Met	Flood gauges in whole area	Yes	No	Yes		No	2	50–59		
Port Curtis	No	225	Previous floods	As above	SES updates & street markers	Yes	No	Yes		No	4	50–59		Now nervous & worried
Port Curtis	Yes	50	Not living there–renting for 1 wk			Yes	Yes	Yes		No				
Depot Hill	No	75		TV – as is regular	Pamphlets	Yes	Yes	Yes	212	100	2	40–49	Quite distressed	Things getting them down–dreed another flood
Depot Hill	No	800	1954 flood levels	Council	Surveys, marked posts	Yes	Yes	500		Yes	2	60–69	Stress	Diabetes & gastro disorder–worry when it rains
Depot Hill	No	150	New tenant											
Depot Hill	No	150	Away from home			No	No		5500	450	1	60–69		
Depot Hill	Yes	75	Could relate to 1954 levels	Police,Council,SES, Radio/TV,Bur of Met	Previous levels to be marked	Yes	No	Yes		No	6	30–39	Stress	Stressed if rains–couldn't cope if happened again
Depot Hill	No	1000	Yellow makers on poles	As above		Yes		Yes	12000		4	40–49	Stress	On edge,bee temper,lack of energy,things getting her down
Depot Hill	Yes	1000	No	Radio/TV–regular	Radio	Yes	No	No		No	2	60–69		
Depot Hill		150												
Depot Hill	Yes	1000	Some idea–previous flood levels	TV,Council,Police	Street markers	Yes	No	Yes		400	1	70–79		High blood pressure from stress
Depot Hill	No	1200	No	All above	Street markers	Yes	No	Yes		No	5	20–29		
Depot Hill	Yes	500	Yellow makers & neighbours	One only	Street markers,also each house	Yes		Yes	210	Yes	1	40–49		Loses temper easily
Depot Hill	Yes	50	No	TV	Street markers	Yes	No	No		No	4	<20		
Park Ave	Yes	900	No		Police,SES,maps,makers etc	Yes	No	Yes	12000	6200	4	20–29		
Park Ave	Yes	600	Previous experience & neighbour	Police,Council,SES, Radio/TV,Bur of Met	Street markers,maps	Yes	No	Yes	3500	3500	2	40–49	Stress	Conflict living with relatives–couldn't cope if happens again
Park Ave	Yes	500	City council	As above		No	No	Yes		No	2	40–49		
Park Ave	No	900	Tenants away					Yes						
Park Ave	Yes	450	Previous experience	One body with correct information	Street markers	Yes	No	Yes	3000	600	2	50–59		Nervous breakdown,feeling on edge
North R'bn	Yes	600	No	TV–News & Weather	Pamphlets	Yes	No	Yes		Yes	4	60–69	Trouble sleeping	Things getting them down,on edge
North R'bn	Yes	450	Yes–previous floods	Police,Council,SES, Radio/TV,Bur of Met	Street markers	Yes	No	Yes			4	30–39		
North R'bn	Yes	300	No	Radio	Street markers	Yes	Yes	Yes		No	4	20–29		
North R'bn	Yes	150	No	Police,Council,SES, Radio/TV,Bur of Met	Pamphlet with flood graph	Yes	No	No		No	2	50–59	Trouble sleeping	
North R'bn	Yes	400	River height	Elected local person	Place which displays relevant info on previous flooding	Yes	No	Yes		No	3	40–49		
North R'bn	Yes	300	No	Radio/TV	Street markers	Yes	Yes	Yes		No	2	30–39		
North R'bn	Yes	25	Yes–relating to 1954 levels	Council–more info & liaison	Street markers	Yes	No	Yes	420	700	2	50–59		
North R'bn	Yes	600	Past history of floods	Radio/TV	Street markers	Yes	No	Yes		2500	2	50–59	Trouble sleeping	Ongoing emotional problems
North R'bn	Yes	600	No	Council,Media, Police, SES etc.	Not necessary	Yes	No	Yes	9000	8000	1	60–69		
North R'bn	Yes		No	As above	Not necessary	Yes	No	Yes		No	1	60–69		
North R'bn	No		Wasn't worried			No	No	No			1	60–69		
Koongal	Yes		Refer to 1988 flood levels–nghbr	One group only	Pamphlets,street markers etc.						4	40–49		
Koongal	Yes		Previous flood levels	Police then council	Street markers	No	No	No		No	5	30–39		
Koongal	Yes		Council put marks on trees–not accurate enough to guess height	Police & council	Personal visit	No	No	No	150	No	4	30–39		
Koongal	Yes		No	SES	Pamphlets,maps,street markers	No	No	No		No	4	30–39	Anxiety	Child ex contracted gastro bug from water (playing)
Koongal	Yes		No	SES	Street markers	No	No	No		No	4	40–49		Doesn't bother her
Koongal	Yes		No	Police,Council,SES, Radio/TV,Bur of Met	Street markers	No	No	No	Nil	No	3	30–39		Doesn't bother her
Koongal	Yes		No	All of the above	Street markers	No	No	No	Nil	No	5	30–39		Doesn't bother her
Kaka	Yes		Prior knowledge	As above and personal notification	Street markers	No	No	No	Nil	No	3	20–29		
North R'bn	Yes		Check it by eye level	Police,Council,SES, Radio/TV,Bur of Met	Street markers	Yes	No	No	No	No	5	30–39		Would worry if the creek rose
Kaka	Yes		1954 level marked by surveyor	As is		Yes	No	Yes		No	4	30–39		
Kaka	Yes		No	As is	NOT Street markers–hard to sell house	No	No	No		No	1	30–39		
Kaka	Yes		No	As is but not enough info	Street markers	No	No	No		No	1	70–79		
Kaka	Yes		1988 levels only guide	Police,Council,SES, Radio/TV,Bur of Met	Map & street markers	Yes	No	No		No	4	20–29	Trouble sleeping	Worried about creek rise,depressed
North R'bn	Yes		No	TV	Street markers	No	No	No		No	3	<20		Doesn't bother her
North R'bn	Yes		No	Council		Yes	No	No			5	30–39	Moody	
North R'bn	Yes		No	Police,Council,SES,		No	No	No		No	2	60–69	Tired	Lack of energy
North R'bn	Yes		No	As above		No	No	No		No	3	20–29		
North R'bn	Yes		No	Improve TV/Radio	Street markers	No	No	No		No	5	30–39		
North R'bn	Yes		Levels given when house bought	SES,TV/Radio	Pamphlets,street markers	No	No	No		No	4	30–39		
Kaka	Yes		No	No idea–more info	Personal visit	Yes	No	Yes	70	No	5	30–39		Will watch creek rise in trepidation in future
Allenstown	Yes		No	Radio	Street markers	No	No	Yes	90	No	2	60–69		Always on mind
Allenstown	Yes		Previous flood levels			No	No	No		No	1	60–69		Tropical ulcer from walking in water
Allenstown	No		Previous flood experience			Yes					2	60–69		
Bouldby Ck	No	150	No–supposed to be lower than 1954 levels	Police–more accurate levels		No	No			5000	4	50–59	Lost incentive	
Alton Downs	Yes	1200	Not at all	Police,SES,Radio/TV		No	No	Yes		No	7	50–59	Trouble sleeping,bee temper,lack of energy, things getting them down	2 families 2 storey house

F2 Business Survey

CAMP SCOTT FURPHY PTY. LTD.

ROCKHAMPTON FLOOD MANAGEMENT STUDY

QUESTIONNAIRE - DIRECT AND INDIRECT FLOOD DAMAGE ASSESSMENT FOR MAJOR COMMERCIAL/INDUSTRIAL/INSTITUTIONAL/GOVERNMENT SECTORS

A. GENERAL

1. Names of Company/Institution.....
2. Contact Name.....Telephone.....
3. Type of Business.....
   i) Short Description.....
4. Address.....
5. Location on Flood Grid.....
   The grid reference should describe the whole site and, where appropriate, the major individual buildings noted in Q.6.
6. Total ground area of premises.....m^2
7. Floor area of buildings
   i) Total area.....m^2
   ii) Separate estimates for each major building.
   NOTE: The individual buildings in Q.7 (ii) should, if possible, be separately assessed for damage in Sections F & G. Extra booking forms should be used for each major building.
8. Floor height of buildings.....
   (Note datum eg AHD, State Datum, Rockhampton Sewerage Datum)
   NOTE: These should be converted to flood map datum. Check if any buildings have floor heights below ground level. If so give height of lowest point as 'floor height'.

B. ACTUAL DIRECT DAMAGES 1991 FLOOD

9. Were your premises flooded in the 1991 flood? YES/NO
   If NO go to Q. 15.
10. What was depth of flooding above floor?.....m (ft)
    (May need to answer separately for each major building)
11. What damages were sustained (list)?.....
12. What is your estimate of the cost of total physical damage $.....
    (include loss of equipment, stock, removal, clean-up, vehicle damage, structural damage)
13. Was the damage covered by insurance? YES/NO
14. For what period were the premises flooded?.....days

C. INDIRECT DAMAGES AND LOSSES 1991 FLOOD

Even if not directly flooded, indirect damages and losses may have occurred.

15. In addition to any direct damage due to inundation by floodwaters, which, if any, of the following apply, together with an estimate of loss incurred.

a) loss of production $.....(also as % of normal production) %
b) Loss of sales $.....(also as % of normal sales) %
c) Cancellation of orders/bookings $.....
d) Increased freight costs $.....
e) Shortage of raw materials $.....
f) Shortage of stock $.....
g) Inability to pass on additional costs $.....
h) Postponement of seasonal work $.....
i) Other $.....

16. How long after the flood did you return to full production? .....weeks/months/not yet
17. Did the flood cause you to lay-off or retrench staff?
If yes, how many?.....
How many of these staff have been re-employed.....
(break down into full-time, part-time, casual if necessary)

D. FLOOD WARNING

18. Could you relate the predicted flood levels to depth of flooding at your premises? .....YES/NO
How? .....
19. In hindsight, how accurate was the warning and your estimate of whether your premises would be flooded and to what depth?.....
20. Have your premises been flooded previously? YES/NO
If so when? 1988 1983 1978 1973 1958 1954 1918 other
21. By which means were warnings received?
TV/RADIO/POLICE/SES/COUNCIL/OTHER
22. What period of flood warning did you receive?.....days
23. Was this period sufficient to enable you to move high value goods to higher levels? YES/NO
24. If yes, estimate reduction in losses so achieved?
25. Does your company have a contingency plan to minimise flood losses? YES/NO
26(a) What sort of information do you think should be provided to businesses whose premises might be flooded?.....
(b) How should this be distributed? (eg pamphlets, radio, maps, etc)
.....

E. PERCEPTION OF FLOOD PROBLEMS AND SOLUTIONS

27(a) Do you have any perceptions regarding the causes of flooding and flood losses in Rockhampton? If yes, what are they?.....
.....
.....
(b) Do you have any suggestions regarding possible solutions either regarding your business specifically, or generally? If yes, what are they?
.....
.....

F. POTENTIAL DIRECT DAMAGES

		Floor Level to 0.3m (1 ft)	Floor Level to 1.5m (5 ft)	Floor Level to 3.0m (10 ft)
28	What percentage of plant and equipment is kept at the following heights?	.....%	.....%	.....%
	What is the total present value of this plant and equipment?	.....%	.....%	.....%
	What percentage of this value would be lost through water damage? Allow for likely flood-reduction measures that would be made, calculate the loss in dollars	.....% S.....	.....% $.....	.....% $.....

		Floor Level 0.3m (1 ft)	Floor Level 1.5m (5 ft)	Floor Level 3.0m (10 ft)
29.	What percentage of raw materials & unfinished products are stored at the following heights?	.....%	.....%	.....%
	What is the present value of these raw materials and unfinished products	S.....	$.....	$.....
	What percentage of this value would be lost through water damage? Allow for likely flood-reduction measures that would be made, calculate the loss in dollars	.....% $.....	.....% $.....	.....% $.....

30. How many days or weeks supply of raw material and unfinished goods are normally kept on the premises .....days or.....weeks

		Floor Level 0.3m (1 ft)	Floor Level 1.5m (5 ft)	Floor Level 3.0m (10 ft)
31.	What percentage of finished goods are stored at the following height?	.....%	.....%	.....%

	What is the average value of finished goods on site at any one time?	$.....	$.....	$.....
	What percentage of this value would be lost through water damage? Allow for likely flood-reduction measures that would be made calculate the loss in dollars	.....%	.....%	.....%
		$.....	$.....	$.....

		Floor Level to 0.3m (1 ft)	Floor Level to 1.5m (5 ft)	Floor Level to 3.0m (10 ft)
32.	If the site was flooded to the following depths throughout the premises, could you estimate the cost of total physical damage? This should include removal, storage and clean-up costs and costs on site (e.g. possible vehicle damage on site damage to building fabric) plus damage to plant and contents covered in questions above. It should also include damage to all materials that are not stored in building.	$.....	$.....	$.....

G. INDIRECT DAMAGE

		Up to 0.3m (1 ft)	Up to 1.5m (5 ft)	Up to 3.0m (10 ft)	Not flooded but road/rail links closed
33.	Estimate the period for which you consider production would be seriously affected for the following flood heights.	.....days	.....days	.....days	.....days
34.	What is the average output/turnover per week?		$.....		
35.	Could production be deferred, if flooded, and subsequent production losses be made up on this site?	Yes /	No /	Don't know	

36. Are there other branches of this company to which production could and would be immediately transferred if this site was flooded, thereby offsetting all or some of the production losses?

Yes / No / Don't know

If 'YES' estimate percentage of production that could be transferred. .....%

37. Do delays in production because of floods adversely affect sales? YES/NO

If so, can you estimate roughly how much? $.....

38. a) How many persons are employed? .....

b) Would employees be paid during any period of disruption due to flooding? .....

c) Would some employees be paid to assist with clean-up and re-establishment of production? If so how many (approx)? .....

ROCKHAMPTON FLOOD MANAGEMENT STUDY

TYPE OF BUSINESS A3	ASIC CODE NO.	DIRECT DAMAGE Y/N B9	INDIRECT LOSSES B12 TOTAL LOSSES $	INDIRECT LOSSES B12 TOTAL LOSSES %	NO. OF EMPLOYEES G34
Agriculture	125	No			20
Agriculture	195	No	1000		1
Agriculture	195	Yes			5
Agriculture	196	No			1
Agriculture	196	Yes	20000		2
Fishing	433	No	150000		7
Fishing	433	No	5000		5
	1620		14000	10	132
Meat	2115	No	1500000		470
Meat	2115	Yes	150000		30
Meat	2115	Yes		100	650
Manufacture	2151	No	15000		28
Manufacture	2161	No	15000		65
Manufacture	2165	No		30	15
Manufacture	2185	No	9000	100	8
Manufacture	2531	Yes	100000		
Manufacture	2765	No	3000		1
Concreting	2800	No			1
Manufacture	2874	Yes	10000		2
Manufacture	2874	No	15000		5
Fab. Str. Steel	3141	No	14000	50	5
Agric. Mach	3361	No	30000		5
Farm Machinery	3361	No	300000		18
Manufacture	3369	Yes	375000		146
Electricity	3610	No			650
Gas	3610	No	53000		21
Builder	4111	No	100000		30
Electrical	4200	No	2000		
Electrical	4200	No		80	2
Plumbing	4242	No			2
Electrical	4243	No			2
Construction	4247	Yes	20000		8
Construction	4247	No	60000	99	7
Construction	4247	Yes	7000		
Construction	4247	No	15000		16
Construction	4247	No	40000		8
W'sale Trade	4726	No		100	6
Wholesale Trade	4762	No	30000	60	3
Wholesale Trade	4769	No	40000	20	8
Wholesale Trade	4783	No	20000		18
Furniture Mfr	4783	No		90	20
Retail Trade	4800	No	1500		3
Retail Trade	4814	Yes			14
Retail Trade	4814	No	20000		45
Retail Trade	4814	No			0
Retail Trade	4861	No	80000	25	79
Retail Trade	4861	No	135000		54
Retail Trade	4861	Yes			2
Retail Trade	4862	No	30000		4
Retail Trade	4862	Yes	100000		3
Retail Trade	4881	Yes	14000		2
Retail Trade	4881	No	50000		4
Retail Trade	4881	No	4000		100
Retail Trade	4881	No	500000		40
Retail Trade	4882	No	5500		3
Retail Trade	4882	No			2
Retail Trade	4885	No			
Retail Trade	4885	No	1500		3
Retail Trade	4885	No			4
Retail Trade	4885	No			80
Retail Trade	4885	No			
Retail Trade	4885	No			40
Retail Trade	4885	No			
Retail Trade	4885	No			2
Retail Trade	4894	No			
Retail Trade	4894	No			
Retail Trade	4894	No	40000	30	3
Retail Trade	4894	No			2
Retail Trade	4895	No	10000		8
Transport	5112	No	24000		10
Transport	5121	No	600000		30
Transport	5121	No	58000	98	6
Transport	5123	No			200
Transport	5711	No		50	70
Transport	5711	No	59000		2
Transport	5742	No		45	
Communication	5900	No			230
Finance Property	6310	No	500000		1
Finance Property	6310	No		50	5
BusinessServices	6367	No			50
Cleaning Serv.	6367	No			10
Bus. Services	6390	No			3
Bus. Service	6390	Yes	80000		13
Vet. Services	8160	No	1500	30	4
Veterinary Proct	8160	No		25	
Community Servtce	8305	No			
Recreation	9133	No			15
Recreation	9133	No	600		10
Recreation	9144	No	2000000		4
Recreation	9144	No		50	30
Retail Trade	9144	No	3000		5
Restaurant	9231	No			5
Recreation	9239	No	3000	65	9
Recreation	9239	No	17000	99	4
Recreation	9239	No	120000		11
Recreation	9241	No			
Recreation	9242	No	100000		15
Recreation	9243	No	27000		4
Recreation	9244	Yes			79
Personal Serv.	9352	No			4
Personal Serv	9352	Yes	3000		5
Personal Serv.	9352	No			5
Other Services	9362	No			
			7500600		3759

APPENDIX G

APPENDIX G

COST ESTIMATES

APPENDIX G

LEVEE SCHEMES

Unit Rates

• Clearing and grubbing	$500/ha
• Topsoiling and grassing	$10,000/ha
• Levee embankment	$15/m³
• Land resumption	$50,000/ha
• Roadway over levee (Major)	$50,000 each
• Roadway over levee (Minor)	$25,000 each
• Floodgate – creek/drain	$10,000/m width
• Floodgate – railway crossing	$220,000 each

Scheme 1

• Clearing and grubbing	$6,000
• Topsoiling and grassing	$120,000
• Levee embankment	$3,922,000
• Land resumption	$570,000
• Roadway over levee	$325,000
• Floodgate – railway crossing	$440,000
	$5,383,000
Contingency 10%	$538,000
TOTAL	$5,931,000

Scheme 2

• Clearing and grubbing	$7,000
• Topsoiling and grassing	$133,000
• Levee embankment	$3,665,000
• Land resumption	$640,000
• Roadway over levee	$100,000
• Floodgate – railway crossing	$220,000
• Floodgate – drain	$300,000
• Stormwater – drainage	$500,000
	$5,565,000
Contingency 10%	$556,000
TOTAL	$6,121,000

Scheme 3

• Clearing and grubbing	$9,000
• Topsoiling and grassing	$193,000
• Levee embankment	$5,876,000
• Land resumption	$925,000
• Roadway over levee	$200,000
• Floodgate – railway crossing	$220,000
• Floodgate – drain	$300,000
• Stormwater – drainage	$500,000
	$8,223,000
Contingency 10%	$822,000
TOTAL	$9,045,000

Scheme 4

• Clearing and grubbing	$18,000
• Topsoiling and grassing	$367,000
• Levee embankment	$11,762,000
• Land resumption	$1,795,000
• Roadway over levee	$50,000
• Culvert over Lion Creek	$320,000
	$14,312,000
Contingency 10%	$1,431,000
TOTAL	$15,743,000

Scheme 5

• Clearing and grubbing	$11,000
• Topsoiling and grassing	$222,000
• Levee embankment	$5,602,000
• Land resumption	$1,085,000
	$6,920,000
Contingency 10%	$692,000
TOTAL	$7,612,000

Scheme 6

• Clearing and grubbing	$18,000
• Topsoiling and grassing	$364,000
• Levee embankment	$10,859,000
• Land resumption	$1,780,000
• Roadway over levee	$50,000
• Culvert structure	$320,000
	$13,391,000
Contingency 10%	$1,339,000
TOTAL	$14,730,000

Scheme 7

• Clearing and grubbing	$6,000
• Topsoiling and grassing	$120,000
• Levee embankment	$2,700,000
• Land resumption	$585,000
• Floodgate – creek	$1,000,000
• Stormwater – drainage	$5,550,000
• Valves/penstocks	$300,000
	$10,261,000
Contingency 10%	$1,026,000
TOTAL	$11,287,000

Scheme 8

• Clearing and grubbing	$4,000
• Topsoiling and grassing	$81,000
• Levee embankment	$1,769,000
• Land resumption	$395,000
• Floodgate – creek	$1,000,000
• Valves/penstocks	$300,000
	$3,549,000
Contingency 10%	$355,000
TOTAL	$3,904,000

Scheme 9

• Clearing and grubbing	$7,000
• Topsoiling and grassing	$150,000
• Levee embankment	$4,398,000
• Land resumption	$730,000
• Floodgate – creek	$500,000
	$5,785,000
Contingency 10%	$578,000
TOTAL	$6,363,000

Scheme 10

• Clearing and grubbing	$2,000
• Topsoiling and grassing	$30,000
• Levee embankment	$648,000
• Land resumption	$145,000
• Roadway over levee	$100,000
• Floodgate – creek	$500,000
• Floodgate – railway crossing	$220,000
	$1,645,000
Contingency 10%	$164,000
TOTAL	$1,809,000

FLOODWAY SCHEME

Unit Rates

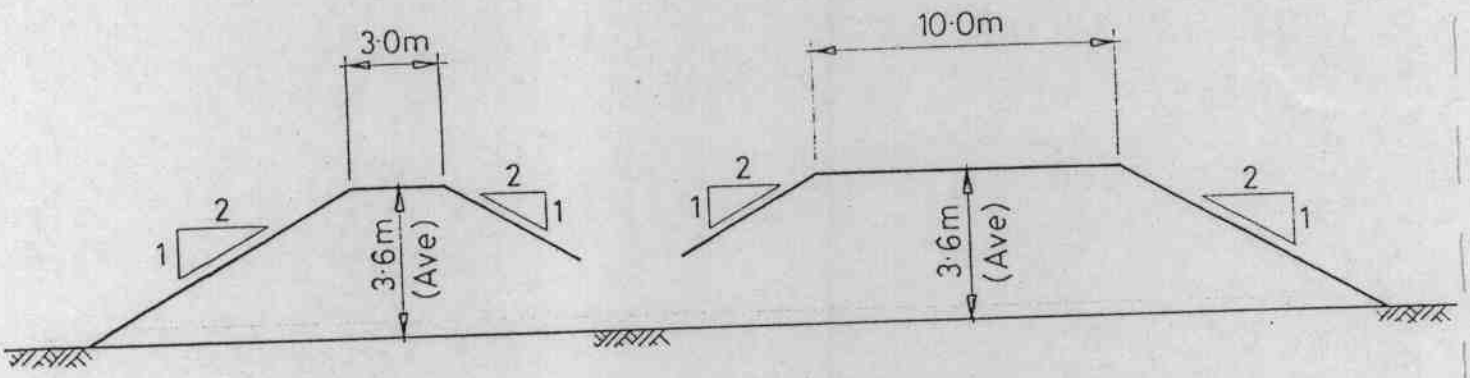
• Clearing and grubbing	$300/ha
• Topsoiling and grassing	$10,000/ha
• Channel excavation	$2/m³
• Channel embankment	$1.50/m³
• Spoil disposal	$0.50/m³
• Land resumption	$50,000/ha
• Bridge structure	$1,200/m²

Estimates of Cost

• Clearing and grubbing	$487,000
• Topsoiling and grassing	$18,430,000
• Channel excavation	$42,771,000
• Channel embankment	$15,306,000
• Spoil disposal	$3,500,000
• Land resumption	$96,450,000
• Bridge structures	$49,075,000
	$226,019,000
Contingency	$22,602,000
TOTAL	$248,621,000

COST ESTIMATION

Estimate of costs associated with increasing waterway areas through the Bruce Highway/North Coast Rail Line.



Rail
(X–Sect. Area 37 m²)

Carriageway
(X–Sect. Area 62 m²)

ASSUMED BRUCE HIGHWAY AND NORTH COAST RAIL X-SECTIONS

Existing Bridge Length ~ 420 m

1. Increase to 900 m

Earthworks excavation:	49,500 m³ @ $10/m³*	=	$495,000
Bridging:	7,500 m² @ $1,200/m² *	=	$9,000,000
Fill between Bridges:	59,000 m³ @ $5/m³ *	=	$295,000
Roadworks:	Paving 15,000 m³ @ $45/m³ *	=	$675,000
	Surfacing 30,000 m² @ $3.50/m² *	=	$105,000
Reballasting:	3,600 m³ @ $10/m³	=	$36,000
Diversion Works:	Allowance to construct diversion routes	=	$1,400,000
	Sub Total =		$12.01 M
	+ 20% Contingencies =		$2.40 M
	TOTAL =		$14.41 M

2. Increase to 1,200 m

From previous page (1. Increase to 900 m):		
Cost of Earthworks, Bridging and Roadworks		
= \$10.61 M x $^{8}/_{5}$	=	\$16.98 M
Diversion Works:		
Allowance to construct diversion routes	=	\$1.70 M
Sub Total =		\$18.68 M
+ 20% Contingencies =		\$3.74 M
TOTAL =		\$22.42 M

* Unit rates as provided by DOT – Rockhampton.

APPENDIX H

APPENDIX I

APPENDIX H

ANUFLOOD DATABASES

Key to Residential Coding

Key to Commercial Coding

Note: Databases supplied to Water Resources Commission on disk

KEY FOR CODING RESIDENTIAL PROPERTY

Code, Type of Residential Property	Detached = 1 Semi-detached = 2 Flat or unit = 3
Storeys	Number of Storeys, 1 = 1, 2 = 2, etc.
Raised	Not raised = 0 Raised = 1
Height Raised	To nearest 0.25m e.g. 0.75, 2.00
Grid Reference	Ten-figure grid reference, see Section 3.3.7
Construction Material	Not available = 1 W'board or wood = 2 Fibro = 3 Brick = 4 Iron = 5 Stone = 6 Other = 7
House Size	Small = 1 Medium = 2 Large = 3
Size of Grounds of Property	Small = 1 Medium = 2 Large = 3
Condition	Poor = 1 Fair/Good = 2
Age	Pre-War = 1 Post-war = 2

KEY FOR CODING COMMERCIAL PROPERTY

Code	This is a four-figure number obtained from the Australian Standard Industrial Classification (ASIC)
Storey	Number of storeys, 1 = 1, 2 = 2, etc.
Raised	Not raised = 0 Raised = 1
Height Raised	To nearest 0.25m e.g. 0.75, 2.00
Grid Reference	Ten-figure grid reference, see Section 3.4.9
Construction Material	Not available = 1 Wood (w/b) = 2 Fibro = 3 Brick = 4 Iron = 5 Stone = 6 Other = 7
Age	Pre-war = 1 Post-war = 2
Size	Class 1 (<186m2) = 1 Class 2 (186-650m2) = 2 For Class property (>650m2) give the area as square metres, e.g. 750 or 125000.

Ground and Floor Height are discussed in Sections 3.4.14 and 3.4.15

Value Class	Low value = 1 Medium value = 2 High value = 3 (for detail see Figure 3.6)

FLOOD DAMAGE CATEGORIES FOR COMMERCIAL PROPERTIES

Low Value	Medium Value	High Value
Florists	Food shops, including Fruit and vegetables	Electrical goods, wholesale, retail, hire and repair. (Includes TV, 'white goods', hi-fi, etc)
	Butchers	
Garden Centres	Bakery	Clothing, both men's and women's, all footwear and drapery
Cafes/restaurants	Grocers	Chemists, including photography departments
Wholesale storage of timber, hardware, fuel	Service Stations	Watch/jewellery of high standard including repair (not variety shops)
	Department Stores	
Offices, except in in cases where extensive computer equipment is involved	Hardware	Premises solely concerned with motor accessories (not sale of vehicles)
	Furniture	
Vehicle sales, extensive uncovered sales area	Newsagents	Bottle shops (but not hotels)
	Take-away foodstuffs	
Schools	Public houses, hotels	Vehicle sales showrooms
Churches	Secondhand goods	Bookshops
Consulting Rooms	Variety shops	Musical instruments sales
Post-offices	Library	
	Clubs, especialy with gaming machines	
	Banks	
	Fire and ambulance stations	
	Doctor's surgeries	

The Table can also be used to estimate the flood damage category for unlisted categories

APPENDIX I

DRAFT FLOOD PROOFING CODE

Source: NSW Floodplain Development Manual 1986

APPENDIX . Draft Flood Proofing Code

Acequate flood proofing of buildings in flood liable areas is an effective and equitable means of reducing flood damage to the structure or buildings. It is essential that flood proofing be a condition of both compatible and conditional developments in flood liable areas.

A draft flood proofing code is incorporated in Table 10. This code is based on the Australian Department of Housing and Construction "Housing in Flood Prone Areas 1975". It is included as an example of the type of information and conditions that should be required for buildings on flood liable land. Action is currently being taken by the Australian Standards Association to produce an official flood proofing code.

1 Construction Methods and Materials

Construction methods and materials are graded into four classes according to their resistance to floodwaters.

Suitable — the materials or products which are relatively unaffected by submersion and unmitigated flood exposure and are the best available for the particular application.

Mild effects — where the most suitable materials or products are unavailable or economic considerations prohibit their use, these materials or products are considered the next best choice to minimise the damage caused by flooding.

Marked effects — as for "2nd preference" but considered to be more liable to damage under flood conditions.

Severe effects — the materials or products listed here are seriously affected by floodwaters and in general have to be replaced if submerged.

2 Electrical and Mechanical Equipment

For dwellings constructed on flood liable land, the electrical and mechanical materials, equipment and installation should conform to the following requirements.

Main power supply — Subject to the approval of the relevant county council the incoming main commercial power service equipment, including all metering equipment, shall be located above the DFL. Means shall be available to easily disconnect the dwelling from the main power supply.

Wiring— All wiring, power outlets, switches, etc., should, to the maximum extent possible, be located above the DFL. All electrical wiring installed below the DFL should be suitable for continuous submergence in water and should contain no fibrous components. Only submersible-type splices should be used below the DFL. All conduits located below the DFL should be so installed that they will be self-draining if subjected to flooding.

Equipment — All equipment installed below or partially below the DFL should be capable of disconnection by a single plug and socket assembly.

Reconnection — Should any electrical device and/or part of the wiring be flooded it should be thoroughly cleaned or replaced and checked by an approved electrical contractor before reconnection.

3 Heating and Air Conditioning Systems

Heating and air conditioning systems should, to the maximum extent possible, be installed in areas and spaces of the house above the DFL. When this is not feasible every precaution should be taken to minimise the damage caused by submersion according to the following guidelines.

Fuel — Heating systems using gas or oil as a fuel should have a manually operated valve located in the fuel supply line to enable fuel cut-off.

Installation — The heating equipment and fuel storage tanks should be mounted on and securely anchored to a foundation pad of sufficient mass to overcome buoyancy and prevent movement that could damage the fuel supply line. All storage tanks should be vented to an elevation of 600 millimetres above the DFL.

Ducting — All ductwork located below the DFL should be provided with openings for drainage and cleaning. Self draining may be achieved by constructing the ductwork on a suitable grade. Where ductwork must pass through a water-tight wall or floor below the DFL, the ductwork should be protected by a closure assembly operated from above DFL.

TABLE 1 Draft Flood Proofing Code

component	order of preference suitable	mild effects	marked effects	severe effects
flooring and sub-floor structure	• concrete slab-on-ground monolith construction note: clay filling is not permitted beneath slab-on-ground construction, which could be inundated • suspension reinforced concrete slab	• timber floor (T & G boarding, marine plywood) full epoxy sealed joints	• timber floor (T & G boarding, marine plywood) with ends only epoxy sealed on joints and provision of side clearance for board swelling	• timber close to ground with surrounding base • timber flooring with ceilings or soffit linings • timber flooring with seal on top only
floor covering	• clay tiles • concrete, precast or in situ • concrete tiles • epoxy, formed-in-place • mastic flooring, formed-in-place • rubber sheets or tiles with chemical-set adhesives • silicone floors formed-in-place • vinyl sheets or tiles with chemical-set adhesive • ceramic tiles, fixed with mortar or chemical-set adhesive • asphalt tiles, fixed with water resistant adhesive	• cement/bitumenous formed-in-place • cement/latex formed-in-place • rubber tiles, with chemical-set adhesive • terrazzo • vinyl tile with chemical-set adhesive • vinyl-asbestos tiles asphaltic adhesives • loose rugs • ceramic tiles with acid and alkali-resistant grout	• asphalt tiles with asphaltic adhesive • loose fit nylon or acrylic carpet with closed cell rubber underlay	• carpeting, glue-down type or fixed with smooth edge on jute felts • chipboard (particle board) • cork • linoleum • PVA emulsion cements • vinyl sheets or tiles coated on cork or wood backings • fibre matting (sea-grass matting)
wall structure (up to the DFL)	• solid brickwork, blockwork, reinforced, concrete or mass concrete	• two skins of brickwork or blockwork with inspection openings	• brick or blockwork veneer construction with inspection openings	• inaccessible cavities • large window openings
roofing structure (for situations where DFL is above the ceiling)	• reinforced concrete construction • galvanised metal construction	• timber trusses with galvanised fittings	• traditional timber roof construction	• inaccessible flat roof construction • ungalvanised steel work e.g. lintels, arch bars, tie rods, beams etc. • unsecured roof tiles

component	order of preference suitable	mild effects	marked effects	severe effects
doors	• solid panel with water proof adhesives • flush door with marine ply filled with closed cell foam • painted metal construction • aluminium or galvanised steel frame	• flush panel or single panel with marine plywood and water proof adhesive • T & G lined door, framed ledged and braced • painted steel • timber frame fully epoxy sealed before assembly	• fly-wire doors • standard timber frame	• hollow core ply with PVA adhesives and honeycomb paper core
wall and ceiling linings	• asbestos-cement board • brick, face or glazed • clay tile glazed in waterproof mortar • concrete • concrete block • steel with waterproof applications • stone, natural solid or veneer, waterproof grout • glass blocks • glass • plastic sheeting or wall with waterproof adhesive	• brick, common • plastic wall tiles • metals, non ferrous • rubber mouldings and trim • wood, solid or exterior grade plywood fully sealed	• chipboard exterior grade • hardboard exterior grade • wood, solid (boards or trim) with allowance for swelling • wood, plywood exterior grade • fibrous plaster board	• chipboard • fibreboard panels • minerar fibreboard • paperboard • plaster-board, gypsum plaster • wall coverings (paper, burlap cloth types) • wood, standard plywood strawboard
insulation	• foam or closed cell types	• reflective insulation	• bat or blanket types	• open cell fibre types
windows	• aluminium frame with stainless steel or brass rollers	• epoxy sealed timber waterproof glues with stainless steel or brass fittings • galvanised or painted steel		• timber with PVA glues mild steel fittings
nails, bolts, hinges and fittings	• brass, nylon or stainless steel • removable pin hinges	• galvanised steel • aluminium		• mild steel