

## QUEENSLAND FLOODS COMMISSION OF INQUIRY

Supplementary submission by Craig William Edmonston, Consulting Surveyor.

This submission provides information in addition to my original submission received by the Commission on 18<sup>th</sup> March, 2011, and relates to flooding in the Nogoa River and the Town of Emerald.

### CORRECTION TO ORIGINAL SUBMISSION:

In relation to the section under the heading "Official Flood Warning", I have reported that in the first briefing note the "B.O.M had advised that Emerald is facing a minor flood level of just over 3.5m over the spillway of Fairbairn Dam within the next 72hours." The word over should have been under.

### OFFICIAL FLOOD WARNINGS:

The performance or lack of performance, of the Bureau of Meteorology should be clearly understood, in light of all the information that was available at the time of commencement of the flood on 27<sup>th</sup> December 2010.

I have already documented the contents of the briefing notes and text messages relating to the 2010-11 flood event.

I now refer to my notes taken during the 2008 flood event in Emerald.

A massive rain event occurred over the Bogantungan area west of Emerald.

The Fairbairn Dam first spilled about 11.40am on Saturday 19<sup>th</sup> January 2008. The Nogoa River was about 6.0m at the Town Gauge and Theresa Creek was in major flood and peaked on the same morning at 10.8m. It was this flood in Theresa Creek that washed out the levee at Ensham Mine.

The peak of the Nogoa River flood at the Emerald Town gauge was first predicted to be at 3.30pm on Sunday 20<sup>th</sup> January at a height of 13.5m. This was according to the "model". I advised Acting Mayor Cr Kerry Hayes at the time, as I was monitoring the flood, that he was talking rubbish and it wouldn't be peaking for at least a couple of days.

The evening news later on Sunday amended the peak time to 11.00pm that night.

On Monday 21<sup>st</sup>, both Radio Station 4HI and the ABC quoted the expected peak in Town to be 3.00pm that day.

Shortly after 3.00pm, [REDACTED] (from EMQ I think) spoke on 4HI and stated "water was backing off at Dam and at the bridge but he was not prepared to call it a peak yet as still more water to come down from the Dam".

This was a strange statement, as at the time, the water was still rising at a rate of 35mm per hour at the dam, and at 80mm/hr at the bridge.

That night the water broke over the bank at Roberts Street and started flooding through town. Shortly after, the water flowed around the Western side of town cutting the Capricorn Highway.

There really was no way of knowing exactly what the peak height could be as the Raymond gauge was not working and the water had not previously reached the heights being recorded on the Craigmore gauge or the Fairbairn Dam spillway. Fortunately Theresa Creek had been dropping since Saturday 19<sup>th</sup>.

At 6.00am on Tuesday 22<sup>nd</sup> the water had reached 4.35m over the Spillway and still rising at about 20mm/hr. At the bridge it was 15.1m and still rising slowly.

During the afternoon the water peaked over the Dam spillway at 4.44m and then peaked at the town bridge late that evening at 15.36m – more than 2 days after the first official prediction.

### **2010 FLOOD WARNINGS:**

One would have thought that those involved in the 2008 flood recording and subsequent studies would have been fully prepared and competent to give accurate advice on the 2010 flood.

Sadly this was not the case and it took 48hours to predict that the 2010 flood could be bigger than the 2008 flood by only 300mm. It took a further 24hrs to get to the maximum predicted height. This was far too late.

This is despite the fact that it is quite clear now, that the control room had received repeated advice that a much bigger flood than in 2008 was coming down the river.

This advice was not taken into account when the control room released its official flood advice.

I am advised that the BOM was not prepared to take any advice other than official automatic flood gauge readings. Since the Raymond gauge was out of action, this meant that they had to wait to get the peak height on the Craigmore gauge before they would predict a height at Emerald. This may be fine in theory but certainly not very practical, as far too much time was lost in getting to an accurate prediction.

I am also advised that the “consensus” view of the panel in the control room may not have really been “consensus” by agreement.

The ever increasing height predictions only caused confusion and complacency in the community. The sad fact is that I firmly believe that many millions of dollars worth of property could have been saved had the community been told to prepare for a much bigger flood than in 2008 on the morning of 27<sup>th</sup> December 2010.

I believe that a telling statement was made by the Mayor of the C.H.R.C. at pages 2599 and 2600 of the enquiry transcript when he said “Ideally from this event, if we can get the hydrology, so to speak, that information right, I would be hopeful that we could get, for example, three days notice, at least, in Emerald for residents.”

Bill Wilkinson, in his statement to the enquiry at page 2613 states “Yes, we had information coming from guys saying that it was the biggest flood they had seen in their lifetime in that part of the world. There was a mass of water.”

The facts are that this advice was not reflected in the first official flood warnings. The hydrology used was obviously wrong and the local landowner advice was obviously correct.

### **THE MAXIMUM PREDICTED FLOOD HEIGHT:**

The maximum predicted height for the Town gauge was 16.2m made at about 7.00am on 30<sup>th</sup> December 2010. At this point in time, the river was 15.45m on the gauge and still rising at 0.05m/hr and already 0.1m higher than the 2008 flood.

There was no advice provided through any media as to what the consequence of a 16.2m flood would be. There were some references to an updated map being available on the Council website, but when I clicked on this new map I still got the original map, loaded the day before.

At 16.35m on the Town gauge only 300mm above the peak height the following consequences would have arisen.

1. The rail bridge would be closed even to pedestrian movement and washed out on the western approach. The approaches were already starting to wash out.
2. The only way out of Emerald would be by helicopter.
3. The electricity substation would be under water and the power cut to Emerald, Gemfields, Springsure and all the way to Carnarvon Gorge. The Mayor confirmed this at the public meeting on 28<sup>th</sup> March.
4. The hospital would have been flooded and surrounded by floodwaters.
5. The Blue Care facility in Borilla Street would be flooded and surrounded by water.
6. Water would have washed through the railway line on the western side of the railway station and a rush of water would have flooded many more businesses.
7. The evacuation centre in Gladstone Street would be flooded and closed.
8. About 80%-90% of the Town area West of the Nogoa River would have been inundated.
9. Flood water would be threatening the Town Hall.
10. Almost every low set home on the west side of the Nogoa River would be flooded.
11. There were no evacuation plans in place for this situation.
12. With the failure of electricity and all basic services such as water, sewerage and transport, and food supply, it would be necessary to evacuate the whole area west of the river, by helicopter with limited space available for helicopters to operate safely.
13. All road access to Emerald would be closed, limiting emergency supplies of accommodation, food etc to air transport.
14. Houses on the East side of the river would have been without power and food but may have had water.
15. At the March 28 public meeting, I asked the Mayor to tell the meeting what they would have done, had the flood been 300mm higher. His response was simply "we would have been stuffed".

It is therefore extremely important that the control room get the maximum predicted height as accurate as possible at the earliest possible time.

### **COULD EMERALD GET A BIGGER FLOOD:**

The answer to this question is obviously YES.

As the water first spilled over the Fairbairn Dam the flood in Theresa Creek had started to fall.

Had the rain event moved in a different direction (from South to North), and Theresa Creek peaked just 2-3 days later, the peak height of the flood in Emerald would have certainly been higher and possibly more than 300mm higher.

Had any further significant rain occurred after Boxing Day 2010 the peak height in Emerald could also have been higher.

Had the Boxing Day rain fallen over a larger area within the catchment or the rain cell been positioned further to the North or West a much larger flood would have hit Emerald.

The rain cell that caused the flooding was shared with the Comet River catchment and the rivers flowing to the South and South-west of the Great Dividing Range.

Following the peak of the 2008 flood on 23<sup>rd</sup> January, a major rain event occurred on 4<sup>th</sup> February where 100mm of rain fell in one hour causing substantial local flooding.

Rockhampton experienced a flash flooding event like this recently where severe local flooding was caused by a torrential downpour occurring when the river was in minor flood, with the drains backed up by the floodwater.

I am almost certain that Emerald was completely flooded in January 1918. There was no flood gauge and very few streets then but the flood is reported to "submerged Emerald streets". I have spoken to old timers who were adamant that the flood got right up to the Railway Station.

There is a lot of evidence supporting the size of the flood in the Comet River and the Nogoa River. These rivers join near the township of Comet and form the Mackenzie River.

The Capricorn Highway bridge over the Comet River at Comet was flooded extensively during the 2010-11 floods. This was certainly a high flood.

However this latest record was exceeded by approximately 2.0m by the 1916 flood in Theresa Creek and Nogoa River which backed the water up the Comet River to a height of 154.5m AHD. The bridge deck height is 151.04m.

Therefore, it is very possible, and in fact most likely, that at some time in the future Emerald will have a higher flood than in 2010-2011.

Recent events throughout Queensland indicate that it would be quite possible to experience an event much worse than previously known.

Planning for such an event should be the most urgent activity being undertaken by the C.H.R.C.

**ACCURACY AND LOCATION OF FLOOD & RAIN GAUGES:**

I have previously commented on the inaccuracy of the recording gauges in the Nogoa River catchment and I have recommended that a thorough audit, calibration and updating of the records, is a high priority.

C.H.R.C. through Bill Wilkinson has made much about the work he has undertaken in installing 38 new "rain and river gauging systems" since the 2008 flood.

The fact is that only one new rain gauge station has been established and this is at Sapphire.

16 stations were existing flood and rain gauges and 22 stations were existing rain recording stations.

New radio telemetry equipment was installed that would produce real time information. However this information has always been available by dialling up the station.

Unfortunately the new system didn't work as expected.

Raymond gauge was overtopped during the flood and the rain gauges were faulty and now, a review of their design is being undertaken.

An important issue here is that it is unlikely that anyone from the C.H.R.C. is qualified or competent to understand this equipment, calibrate the equipment or properly service it. There is also a question about the durability of the telemetry system in severe weather. The old system seemed to work quite well in the past.

Attached are:

1. Media Release relating to new gauging stations. (CWE:01)
2. Copy of article from CQ News dated 16/5/2011 regarding installation. (CWE:02)
3. Copy of article from CQ News dated 1/6/2011 regarding design faults. (CWE:03)
4. Copy of letter from C.H.R.C. dated 2/6/2011 regarding the new Alert system and addressing the discrepancies in the gauging information from the same station. (CWE:04)

I note they just select the highest reading, probably to be on the safe side. As I suspected they do not know which reading is correct or if in fact either reading is correct when two different readings are observed. The old board system of recording would only give one answer.

I attach copies of readings from the Craigmore gauge – described by Mr Wilkinson is being “in a very good position, and very accurate”, which show a difference of 0.4m at peak height of the 2010 flood. (CWE:05)

A difference of 0.4m in height when the river is about 18m deep in full flood represents an enormous amount of difference in volume of water flowing downstream.

The two readings obtained from the Fairbairn Dam gauge are consistently in the order of 0.1m to 0.2m different, but the difference varies.

It is extremely important to have correct heights recorded so that when comparing future events they are relevant. And if a “model” is to be used for predicting flood heights, it is simply fundamental that the measured information entered into the model must be absolutely correct.

My original recommendation regarding an audit and calibration of the gauges must be carried out by a qualified person who knows what he/she is doing.

**PROPOSED VAN DYKE CREEK GAUGE:**

If there is only funding available for one additional gauge, it is my view that it would be better located near Mantuan Downs.

The media release from Council appears to state that a new gauge on Van Dyke Creek will give up to 24hrs extra notice to Emerald. This is highly unlikely given the distances involved, and this gauge would only measure a small, though important, catchment. In the case where little rain fell on that catchment it would offer no benefit at all.

The larger catchments of the Claude River and the Nogoia above the Claude junction would appear to present much greater warning on how much water was coming down the River. If Raymond ever works again this will provide back up assurance and give Emerald at least 4 days notice of water coming from this area.

However such decisions should be made by fully qualified, experienced and competent professionals.

**MAPPING OF THE FLOOD PLAIN:**

This task is being acted on with DERM having issued a contract for LiDAR data capture.

As this is for LiDAR capture only, it is unclear if this is to be converted into an accurate contour map and Digital Terrain Model by anyone at this stage.

I have, so far, been unsuccessful in establishing what exactly will be achieved through this mapping project. I tried to meet the C.E.O. of the C.H.R.C. to offer my advice on getting the best possible outcome for the community from the mapping project but I was unable to get an appointment.

This is an essential tool that must be in place before any other worthwhile studies are completed, and also for the long term planning and development of Emerald.

**COUNCIL PLANNING POLICY:**

It seems that Council has been negligent in this area since the early 1990's. Although, there seems to be confusion. In an interview with Michael McKenna of "The Weekend Australian" on January 8-9, 2011, CHRC Councillor Paul Bell is quoted as follows in relation to buildings being flooded.

"Bell, who was also mayor during much of the 1990's, admitted that many homes and businesses had been built on flood plains after Council relied on outdated flood mapping from the 1950's.

He said after years of drought it was only during the 2008 floods, which inundated the town, that the full threat of the Nogoia River system was exposed.

Until then we had 1950's data, which in some instances involved a notch on a tree or the memory of a local, to work from, Bell said."

On the other hand if we turn to the CHRC 'Local Disaster Management Plan' under the section 3.05 RISK STUDIES, we find that the section states.

"The following risk studies have been undertaken in the former local government areas:

- Numerous flood studies of the Nogoia River Floodplain system.

I now turn to a letter received by myself from the CHRC dated 4 April, 2011. This letter is in response to an inquiry about Flood Level Building Line – Emerald.

A copy of this letter is attached. (CWE:06)

The fourth paragraph states – "Under the Emerald Shire Planning Scheme (Amendment 1-2009) no specific flood heights are identified for all affected lands as insufficient information was available at the time of the creation of this document to address the requirements of State Planning Policy 1/03 "Mitigating the Adverse Impacts of Flood, Bushfire and Landslide". As such flood heights and

minimum floor levels such as those imposed on the two decisions you refer to are provided on an advisory basis only and cannot currently be enforced.”

Yet in paragraph 2 we are advised that the information is currently sourced from documents prepared following the 1990 and 2008 flood events of the Nogoia River.

The 1990 flood event had nothing to do with the Nogoia River and was not commissioned by the Council. The 2008 document was a photomap of the 2008 flood showing the area inundated. This was not a study of the 2008 flood. (For the 1990 study see CWE:07)

Council provided me with a copy of “Emerald Town Flood Study” by Kinhill Pty Ltd dated 16 May 2000. It seems that no action was taken as a result of this study. (See CWE:08)

Despite Cr Bell’s comments about flood data, Council in 1991, when he became Mayor, had a very accurate map showing the projected flooding from a 1 in 30yr event, which was the adopted flood line at the time. This mapping was prepared in the years 1980-1982. SPP1-03 required Councils to upgrade the return interval to a 1 in 100 year event, but Council failed to do this despite the 2000 Kinhill study.

Since the 1990’s we have gone from a planning scheme that had clear flood level building line policies to nothing. This is despite the introduction of the 2003 SPP and “numerous flood studies of the Nogoia River Floodplain system”.

Due to the massive coal and gas projects planned for the Central Highlands, recent studies have identified major growth for Emerald. It doesn’t seem possible for Council to get in front of this development and we will continue to see building on floodplain land.

#### **ERGON ENERGY SUBSTATION:**

At the peak of the flood, water had entered the Emerald Substation, which is a critical Regional substation.

Ergon has obtained a site for a future substation on high ground on the Northern edge of Emerald in 2007. No work has been done on this site.

It would appear now that the new substation should be expedited in the interests of guaranteeing power to the Central Highlands in future flood events.

I asked Ergon about the ability of the substation to survive future floods after the 2008 event, as I was concerned about it then, and was told it would never flood as it was built on high ground. This is clearly not the case.

#### **C.H.R.C. DISASTER MANAGEMENT PLAN:**

When the flood commenced on 27 December 2010, I visited the C.H.R.C. website to check the Local Disaster Management Plan. After going through the document I formed the opinion that it was next to useless in the advent of managing a flood.

The plan identifies the various groups and their responsibilities.

However the plan as it still exists on the website today does not contain any information that advises the general public on how to prepare for a flood.

There is no information about how the town floods, what the critical heights on the various gauges mean, or any maps showing areas subject to flooding.

There is no information about evacuation centres, escape routes out of town, evacuation plans, storage facilities, when services break down etc etc.

The title "Disaster Management Plan" is not supported by the contents of the document. There is no plan, rather a description of the bureaucracy involved in organising disaster management, which is of little assistance to the residents facing a disaster.

**FLOOD WARNING BY CIVILLIANS:**

During the flood event of 2010-2011 many householders and some businesses were better prepared for the flood because of prior warning from people who knew that a massive flood was about to happen. See C.Q.News 10/06/11 article (CWE:09). There are many stories like this.

Many people were warned by property owners, helicopter pilots, Mr Geoff Kavanagh and myself that this flood was definitely going to be bigger than the 2008 flood.

My wife and I were heavily involved in recovery work through Rotary as my wife Judith Henderson is the District Governor for D9570, which covers the whole of Central Queensland from Maryborough to Mackay.

We organised assistance to flood victims such as fencing repairs, fodder, food vouchers, cash contributions to community groups and individuals, linen supplies, water purification kits and so on. This brought us into contact with the helicopter pilots who all advised that they had tried to warn the C.H.R.C. and the Mayor about the size and destructive force of the impending flood, but this advice was ignored.

I was personally advised by graziers up the Nogoia above Raymond that they had never seen water like it before and the noise of the rushing water was unbelievable. This advice was consistent in all reports coming from up River on the morning of 27 December 2010.

Yet at 11.00am the Mayor put out the official report that only a minor flood of 14.0m was expected in Emerald.

It was obvious to anyone with an ounce of common sense that given:

- The intensity of the rainfall upstream
- The steep slopes that the bulk of the rain fell on
- The river was already in minor flood and 2.0m over the Fairbairn Dam Spillway and 10.7m in Town.
- There would be 100% runoff.

There had to be a much bigger flood in Emerald than in 2008.

When the Raymond gauge went off the air I rang a property owner in the area and was advised that the gauge had been completely submerged and the water was about 1.4m higher than in 2008. The river would have been 8k or more wide.

I tried to get the message through to the A.B.C. and was told they would ring me back, but they never did.

It seems to be a common theme during the Queensland floods that the practical knowledge of experienced people was largely ignored by the bureaucrats in charge of predicting the outcomes and advising the communities. Where practical experience was used in places such as Alpha, the residents were adequately warned and damage was minimised.

**FLOOD PREVENTION FOR EMERALD:**

During the public meeting held in Emerald on 28 March, several residents raised the possibility of discharging water from Fairbairn Dam to the East during large floods. This discharge would bypass Emerald and enter the Nogoia River further down stream. The Sunwater representatives simply dismissed this proposition.

However such a proposal is not a stupid idea and should be thoroughly investigated.

It has just been proven in New Orleans that such an idea can be made to work.

The Mississippi River flood management system failed for various reasons during hurricane Katrina but it was not the levee concept that failed. The work that has been done since 2005 ensured the safety during the recent extreme flooding event in the Mississippi.

It would seem possible to protect Emerald from flooding by constructing levees and a bypass channel around the western side of the town.

Only minor work would need to be done if the Dam was allowed to discharge to the East in order to minimise the flood height in Emerald.

Such projects will obviously cost money and this should be identified in an appropriate study.

However I personally know of several businesses who have recorded losses of \$1million and more. Houses have cost up to \$200,000 to repair. Every kitchen is about \$40,000. The cost of lost business is many millions and this loss is never recovered.

There will certainly be more floods of equivalent size or bigger. It is only a matter of time. It could be later this year or next year. Meanwhile building is still being carried out in areas that flooded or almost flooded.

If New Orleans can be protected from one of the biggest floods in history, in one of the largest River systems in the World, surely Emerald can be protected from flooding in the Nogoia River.

**RECOMMENDATION:**

I have previously recommended that a thorough study be conducted into levees and obstructions in the Nogoia River downstream of Emerald (Recommendation 4). I believe the C.H.R.C. has issued instructions to KBR Pty Ltd to undertake such a study.

I further recommend that a thorough study be undertaken to investigate all ways of flood proofing Emerald including the discharge from the Fairbairn Dam to the East, construction of levees and channels around the town of Emerald or a combination of both concepts and including raising the level of the spillway.

C.W. Edmonston  
20<sup>th</sup> June 2011

# New gauge to fill warning gap

Simon Green | 16th March 2011

One of the 38 new river gauging systems the CHRC has installed since the 2008 floods.

PLANS are under way to install an important new gauging station along Van Dyke Creek that will give Emerald residents upstream an extra day of warning before future flood events.

Currently there is a large unmeasured gap between Raymond and Craigmere stations before the Nogoa River flows into the Fairbairn Dam, with about 40kms of free-flowing water between the gauges.

"A further gauging station down the bottom end of the Van Dyke will give everybody a better understanding of what's heading towards the Nogoa and the dam and also what's coming down Van Dyke itself," CHRC manager for corporate governance Bill Wilkinson said.

"Raymond is upstream of where Van Dyke comes in, and Craigmere is the last gauge which is in a very good position and very accurate.

"That gives everyone the final readings on what is coming into the dam.

"If we put one in at Van Dyke it should improve the ability of forecasters and might give us an extra day's understanding of what is coming into the dam.

"A gauge on Van Dyke will enable the community and disaster management groups to more quickly assess volumes before they get to Craigmere."

Along with the new Van Dyke gauge, CHRC will be installing an two extra river gauges and a rainfall gauge in the Rolleston township and upstream as a result of a successful funding submission approved late last year.

Since the 2008 floods, CHRC has installed 38 stations containing rain and river-level gauges, with funding secured from the Natural Disaster Management Program.

Mr Wilkinson said the new additions complemented the state-of-the-art weather radar installed post 2008.

"Some people would say we should have gauges on every section of every creek, but it is impracticable to have that density of network. But we are constantly looking at ways to improve the rain and flood warning system for the community across the entire shire," he said.

CHRC Mayor Peter Maguire said in the wake of recent flooding a need for further gauging systems along the Comet River was clearly identified.



ALL CORRESPONDENCE TO BE ADDRESSED TO THE CHIEF EXECUTIVE OFFICER - ATTN: [REDACTED]

CWE:01

Lex Iker owns three properties along Van Dyke Creek and welcomed the addition to the gauging network.

"Recent floods definitely accentuated the need for it, and it's often hard for us to get through to people downstream to let them know that there is a lot of water coming," he said.

"Van Dyke is certainly one of the quicker running creeks in the Fairbairn catchment."

Mr Iker said he lost 16 dams, 50kms of fencing and 60kms of roads, with the majority of damage being caused by Van Dyke Creek.

Installation of the gauges will get underway during the upcoming winter.

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CWE:01

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By SIMON GREEN

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*Note Flood Debris*

■ VITAL EQUIPMENT: One of the 38 new river gauging systems the CHRC has installed since the 2008 floods.

CONT

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CQN WED 16.03.2011

CWE:02

# CH rain gauge design review in pipeline: BOM



employee to ring up a sale at the reopening of the store were excited to be the first customers.

Photos: Lindsey Jackson EME270511colesreopen038

## registers 1 locals



An employee registers his support.

EME270511colesreopen015

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an exciting yet... for Sonia Marsh... ashier to ring up

ised a checkout

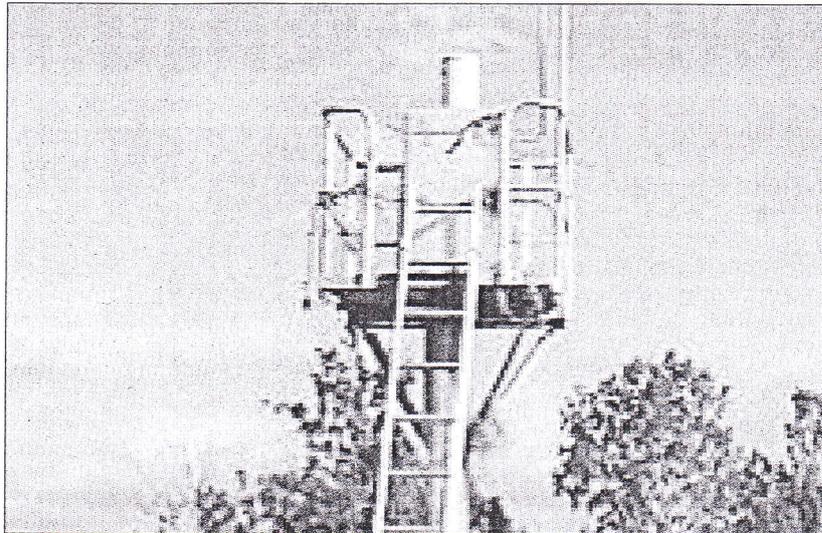


FRESH AND NEW: Customers took their time to peruse the aisles.

EME270511colesreopen036

since I was 16 so this is all pretty new to me as well," Sonia said.

There were plenty of other eager customers who arrived at the store bright and early, and well before opening time, bringing with them comments of excitement.



FAULTY GAUGES: The Central Highlands council is hoping a design flaw in its river gauging network will be fixed.

Photo: Contributed

A BUREAU of Meteorology review of a design fault in rain gauges installed across the Central Highlands is "in the pipeline".

The flawed 0.2ml high resolution rain gauges are susceptible to failure when a small orifice at the outlet of the rain collection funnel becomes blocked with dust and leaf matter.

One on Arcturus Downs in the Orion district was found to have its funnel and filter blocked by another contaminant - cow hair.

Council workers carried out maintenance on four rain gauges in March at Rubyvale, Sunny Park, Blackdown Tableland and Arcturus Downs, all of which were found to be defective.

"The BOM and the suppliers of this (funnel orifice) component have been informed of the issue, and a review of the design and possible modification is in the pipeline," a report to council said.

"Arcturus Downs (rain gauge) is located near a private landing strip

within a paddock with cattle... can only guess that the cow hair is being blown up due to landing strip activity."

Rubyvale's rain gauge was diagnosed with a faulty reed switch on the tipping bucket. A replacement was ordered.

The funnels and filters on the remaining three gauges were cleaned. They will be monitored closely.

Plans are under way to install an important new gauging station along Van Dyke Creek that will give Emerald residents upstream an extra day of warning before future flood events.

Currently there is about 40km of free-flowing unmeasured water between the Raymond and Craigmore stations before the Nogoia River flows into the Fairbairn Dam.

"A further gauging station down the bottom end of the Van Dyke will give everybody a better understanding of what's heading towards the Nogoia," council's Bill Wilkinson said.

## Live cattle suspension costly

THE Federal Government's move to suspend live animal exports to a number of killing facilities in Indonesia could bankrupt northern Australian cattle producers, said the Australian Beef Association.

Agriculture Minister Joe Ludwig said the decision was based on footage collected by Animals Australia that showed cattle being mistreated before slaughter.

The minister said he had asked Australian officials to prepare orders that would enforce the complete suspension of live animal exports to the facilities identified by Animals Australia.

"These orders will strengthen the

decision I took to conduct a full investigation into the footage provided," Senator Ludwig said.

ABA chairman Brad Bellinger expressed his personal disgust at the footage shown on 4 Corners, but said banning live exports was not the answer.

Central Highlands graziers fear a ban could flood the local market and greatly decrease prices.

The ABA has called for stun-guns and proper knocking boxes to be given to any major Indonesian abattoir killing cattle from Australia.

The industry body also advocated for an abattoir to be built in Darwin.

YOUR REF:  
OUR REF: 20110602CraigEdmonston  
CONTACT NAME: Bill Wilkinson  
TELEPHONE: [REDACTED]  
MOBILE: [REDACTED]  
FAX: [REDACTED]  
EMAIL: [REDACTED]  
Emerald Office, PO Box 21 Emerald Qld 4720

2nd June 2011

**Craig Edmonston**  
[REDACTED]

Dear Craig,

**Reference: Your letters - dated 4 April 2011 regarding river gauging stations; and 27 April 2011 regarding LIDAR acquisition**

Sorry for the delay in replying to you.

The article in the CQ News on the 16/3/11 is a positive report to the community about the rain and river gauge ALERT network implemented by Council and the Bureau of Meteorology for flood warning, forecasters and the general public.

There are thirty eight ALERT sites in the network:

- 22 rain gauges only, and all completely new equipment.
- 16 combination rain / river gauges.
- The gauge at Sapphire on Retreat Creek is a completely new installation – tower, pipe work into the stream, sensors, canister and telemetry.
- All other rain / river gauges involved “piggy-backing” ALERT equipment to existing TM gauging stations, owned and managed by either DERM or Sunwater.
- In the instance of Raymond gauge, DERM made the decision that it no longer required the gauge for its business purposes, and transferred ownership of the gauge to Council. Thus, there was a tower on-site, and pipe-work into the stream. However, Council and BOM put in a completely new data canister, rain gauge, and VHF telemetry equipment onto the tower. DERM had removed all their equipment.
- The process of piggy backing the ALERT system to the same river gauges negated the need to replicate pipe-work and height sensor. It was cost effective in delivering real-time data to the BOM site, to the general public and to Council chambers for disaster management purposes.
- We did not have real-time data in 2008 or prior to 2008. All data from the existing stations was acquired by dialing up each station.

ALL CORRESPONDENCE TO BE ADDRESSED TO THE CHIEF EXECUTIVE OFFICER - ATTN: [REDACTED]

CWE:04

- DERM is only now currently upgrading some of their key river stations across the state to be real-time over satellite, so that BOM and the general public will be able to see the real-time rises and falls immediately on the BOM site for the DERM gauges.
- I do not believe Council or I needed to correct the newspaper story (I have attached a copy of the article). The work that went into developing and planning a completely new telemetry network, locating repeaters, checking signal strengths, checking connectivity from one to the next and ensuring the data would transmit to the radar and Council and then to BOM was considerable. The new gear – canisters, VHF telemetry repeaters, rain gauges all in my mind make for a ‘new ALERT gauging system’.
- There was no ALERT system (real time) in existence before this system went in.
- It is a ‘new’ ALERT system.
- I was asked by the press to provide a photo of a river gauge after they had drafted the story. The picture I had on hand happened to be the Raymond gauge – as it is representative of what the ALERT river / rain gauge looks like.

The depth of water over the spillway on the night of the 26<sup>th</sup> December 2010, when the heavy rainfall event began to unfold in the upper catchment was 1.87m.

Your questions regarding the statistical measurements of the Fairbairn Dam and spillway infrastructure are best directed to Sunwater. They are the infrastructure owners, managers and responsible for the information they provide about their asset.

In relation to discrepancies in the gauging information between an ALERT gauge and a TM gauge. No gauge or electronic instrument is infallible. At times calibrations are needed, and readings can be affected by a number of various issues ranging from things affecting the sensor in the river, to things affecting the electronics in the canister, to things affecting the telemetry of the data. Sometimes when there appears to be an error - it is nigh on impossible to access the gauge immediately to undertake an investigation as to the possible cause. We can log remotely using our software and we work closely with BOM to do this. Some errors can be dealt with remotely – others require a field visit. In the instance of Craigmore – the approach BOM and Council will always take is to use the highest depth reading for flood prediction. Later, when the site can be accessed, the equipment is checked, the peak flood height is verified using a registered surveyor to check the gauge readings and discharges.

We have simplified an ALERT warning system and service to forecasters, the general public, disaster response managers etc. The system is working and it is maintained - Council has positioned itself well compared to some other local authorities within the state. We have an excellent working relationship with BOM, Sunwater and DERM and we aim to keep it that way so that collectively we can find cost efficiencies and effectiveness in service delivery of rain and river gauge data. Council has also received a lot of positive feedback about the weather and flood alert network, and the ability to look at things in the catchment real-time on the web site particularly in the lead up to and during this event.

With regard to your LIDAR data questions - I may have inadvertently used the word ‘satellite’ at the workshop – I have been pushing some fairly long hours – I did mean airborne.

Council is working with the lead State agencies (DERM and Dept of Communities) in obtaining this data. The State requested LGA’s to identify priority areas. This then went through a validation check with other State agencies as to the real need. The State will be managing the tenders, acquisition and accuracy standards for numerous local government authorities across Queensland. DERM manages the geodetic network and is heavily involved in defining accuracy needs and

standards. Council simply worked hard to identify the priority areas, gain agreement from other State agencies so that the important areas we needed would be captured.

Council will always look to engaging local consultants and contractors where possible. In this instance, Council is not driving the tender process or the investment by the State, nor paying much of the cost. I am unsure how the State will invite tenders or fill the contract. TR Baillee as you indicate does come very well recommended by a number of mining businesses in our area.

Thank you for your continued interest in how Council and other stakeholders are improving their preparedness and warning mechanisms for disaster management.

Yours Faithfully

Bill Wilkinson  
Manager Corporate Governance  
Central Highlands Regional Council  
Emerald Qld 4720

	16.73
28/12/2010 14:30	16.77
28/12/2010 14:50	16.82
28/12/2010 15:00	16.84
28/12/2010 15:20	16.89
28/12/2010 15:30	16.91
28/12/2010 15:40	16.95
28/12/2010 16:00	16.99
28/12/2010 16:30	17.05
28/12/2010 16:50	17.09
28/12/2010 17:00	17.12
28/12/2010 17:10	17.15
28/12/2010 17:40	17.20
28/12/2010 17:50	17.22
28/12/2010 18:00	17.25
28/12/2010 18:10	17.27
28/12/2010 18:20	17.30
28/12/2010 18:40	17.33
28/12/2010 18:50	17.35
28/12/2010 19:00	17.37
28/12/2010 19:20	17.41
28/12/2010 19:30	17.43
28/12/2010 20:00	17.49
28/12/2010 20:40	17.56
28/12/2010 21:00	17.60
28/12/2010 21:40	17.66
28/12/2010 21:50	17.68
28/12/2010 22:00	17.70
28/12/2010 23:00	17.77
28/12/2010 23:10	17.79
28/12/2010 23:20	17.82
29/12/2010 00:00	17.86
29/12/2010 00:20	17.89
29/12/2010 01:00	17.93
29/12/2010 01:30	17.97
29/12/2010 02:00	17.99
29/12/2010 03:00	18.02
29/12/2010 04:00	18.06
29/12/2010 05:00	18.10
29/12/2010 06:00	18.11
29/12/2010 07:00	18.14
29/12/2010 08:00	18.14
29/12/2010 09:00	18.16
29/12/2010 10:00	18.15
29/12/2010 11:00	18.13
29/12/2010 12:00	18.12
29/12/2010 12:40	18.10

PEAK

18.16  
 17.76  
 0.40 m difference

[Data as Plot](#) | [Back to Bulletin](#)

CWE:05(A)

	16.86
28/12/2010 18:52	16.96
28/12/2010 19:43	17.06
28/12/2010 20:08	17.11
28/12/2010 21:10	17.21
28/12/2010 21:58	17.31
28/12/2010 22:42	17.36
28/12/2010 23:57	17.46
29/12/2010 00:32	17.51
29/12/2010 01:19	17.56
29/12/2010 02:13	17.61
29/12/2010 03:33	17.66
29/12/2010 04:46	17.71
29/12/2010 05:48	17.71
29/12/2010 08:30	17.76
29/12/2010 10:49	17.71
29/12/2010 11:48	17.71
29/12/2010 12:44	17.66
29/12/2010 14:23	17.61
29/12/2010 14:48	17.61
29/12/2010 16:33	17.51

Peak 18.16

[Data as Plot](#) | [Back to Bulletin](#)**About this table**

1. The river height data is the latest available operational data provided for flood warning purposes and has not been quality controlled.
2. Stations marked with \* or # indicate that the data is provided from automatic equipment.
3. Stations marked with \* are Telephone Telemetry Devices and are nominally polled once a day and more often during floods.
4. Stations marked with # are ALERT Radio Telemetry and report every 3 hours and more often when the water level changes.
5. All river height reports are in metres and are shown in local time.
6. Heights or depths above/below roads, bridges, dam spillways and weirs are given as a guide only. For road open/closed information, see the [RACQ](#) website.
7. This product includes data made available to the Bureau by other agencies. Separate approval may be required to use the data for other purposes. Refer to [Listing of Operating Agencies](#) for Station Ownership.
8. Where data is supplied from a Department of Environment and Resource Management (DERM) Monitoring Site, please follow this [link](#) to get advice on data use and copyright.
9. For other Station details: [Flood Classifications](#), [Road Crossings](#), [Survey/AHD Details](#), [Maps](#)

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CWE:05(B)



4 April 2011

CW Edmonston Consulting Surveyor  
PO Box 1498  
YEPPOON QLD 4703

Dear Sir

**FLOOD LEVEL BUILDING LINE - EMERALD**

I refer to your recent correspondence dated 13 March 2011 with regard to the flood level building line and advise as follows.

Council determines applications based on the best available information at the time of decision for applications for Material Change of Use, Reconfiguration of Lot and Operational Works. With respect to flooding impacts in Emerald, this information is currently sourced from documents prepared following the 1990 and 2008 flood events of the Nogoa River, and is subsequently reviewed by Council's engineers.

With regard to the areas of your specific concern it is noted that both decisions considered the impact of flood and overland flows. The conditions imposed on land at Newman Drive, Emerald sought to ensure the development was protected from overland flows as per Council's current practice by ensuring a minimum floor level at least 300mm above the finished ground level. For the proposed extension of the Target Country at the Emerald Market Plaza Shopping Centre however, it is noted that the applicant identified in their planning report that the land was subject to inundation and argued that the extension should be permitted at the level of the existing centre to improve centre functionality.

Under the *Emerald Shire Planning Scheme (Amendment 1 – 2009)* no specific flood heights are identified for all affected lands as insufficient information was available at the time of the creation of this document to address the requirements of State Planning Policy 1/03 "Mitigating the Adverse Impacts of Flood, Bushfire and Landslide". As such, flood heights and minimum floor levels such as those imposed on the two decisions you refer to are provided on an advisory basis only and cannot currently be enforced.

To address this issue Council has engaged Kellogg Brown & Root Pty Ltd (KBR) to undertake an audit of hydrological data from both the 2008 and 2010/11 flood events to assist in the development of a Flood Plain Management Study and has also engaged C&R Consulting to undertake an assessment of the upper Nogoa and Fairbairn Dam catchment and a Urban Flood Plain Analysis from the Fairbairn Dam spillway to downstream of Emerald township at Theresa Creek. These reviews will capture data to assist the creation of a flood plain model, a Flood Plain Management Plan and inform future planning schemes and influence proposed land zoning to minimise the impacts of flooding into the future.

.../2

Response to CW Edmonston-Flood Level Building Line Emerald



CWE:06

KBR and C&R Consulting will also consider issues such as the affect of urban development and structures on the flood plain and will review the impact of levees and structures such as bridges and rail infrastructure.

Unfortunately, these reviews are yet to be completed as information in relation to the 2010/11 flood event is still being compiled and assessed. However, once these studies are completed the resultant Flood Plain Management Plan will be released for public comment and Council would welcome your input given your interest in this issue.

The current timeframe for the completion of this study is outlined below:

- Collation of base data on 2008 and 2010/11 flood events – mid May 2011;
- Gap Analysis to inform Flood Plain Management Study – July 2011; and
- Completion of Hydraulic model for Emerald and upstream catchment area – December 2011.

Further information in relation to these projects can be obtained from Council's Manager Strategic Planning, [REDACTED]

Should you require further information, please contact Council's Development Services Section on telephone number [REDACTED].

Yours faithfully

[REDACTED]  
**Bryan Ottone**  
Chief Executive Officer

S/W/D North Emeralds

**GORDONSTONE COAL MANAGEMENT  
PTY LTD** Box # 61

REPORT ON  
INVESTIGATION OF  
FLOOD PROBLEMS IN EMERALD  
FEBRUARY 1991



**BLAIN JOHNSON PTY LTD**

1371-08:1

**CWE:07**

# EMERALD TOWN FLOOD STUDY

## Hydraulic modelling Nogoa River sensitivity report

*Prepared for:*

**EMERALD SHIRE COUNCIL**  
65 Egerton Street  
Emerald Qld 4720

*Prepared by:*

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16 May 2000

BWJ001-W-DO-001 Rev A

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**CWE:08**