

Stop The Dam, Build A Cistern and Use The Over Flow.

This is concept plan with only a few days notice but urgency to present a better option to the State Government has to take precedence over presentation,

Introduction.

3000 years ago or more the Babylonian civilisation was founded on man made underground storage for water. Farmers found they could produce a good wheat crop if they dug cisterns into the rock and channelled the water to irrigate their fields. Turning an arid dry country into a fertile paradise. This technique was also copied by the Roman civilisation and exported to other similar regions within the realms of their control.

Most thinking people realise that the world is not short of water, the country is not short of water we are only short of the thinking and organisational processes to handle the problems of retaining and distribution of water.

Most country people in Australia know that they are personally responsible for their own water, in the same way that we are all personally responsible for obtaining our own breath. Country people value water and store it in tanks many of them underground, as it is the ideal place to store it.

Miners also know that mines store water, whenever they want to return to a mine, the first job is to pump it out, as mines rapidly fill with ground water. Some mines fill at 1 litre a second and other fill at 60 litres a second depending on the location. The bigger the mine the more water it produces.

All the Mines in our area produce and store water the rock at those levels is not porous it is very dense, and there is no seepage.

The Idea

Mr Steve Mincher from Point Break Mining contacted me on Thursday, with the outline of this plan, he is the proprietor of a contract drilling company that has operations in our local Gold mine and some interstate mines. He is at this moment working in a mine near Armidale NSW, but lives in the Gympie area and is willing to supply more information if we wish to submit a more detailed plan to the State Government.

He has discussed this idea with two other Mining Engineers Rob Scargill and Jason Keilly. As the area at Traveston Crossing is in the Eldorado Mining lease area they have already core drilled and sampled the rock in this area, they believe that this location would be suitable for large cisterns. I spoke to Jason Keilly on Friday morning and he confirms that this concept is possible. There is no limit to size, our mines in Gympie area go to 1.8 kilometers below the surface and stretch many kilometres below our town.

There are large stopes and voids but mainly drives. Voids are quickly created by driving on one level and then driving 20 metres below, and then collapsing the intervening rock. This is called 'long hole stoping'. Storage area for water can be created with every ton of rock taken out.

The idea seems to be that if we cannot stop the State Government from stealing the Mary's

catchment water at least we may be able to save the Mary Valley and prevent the government from creating a downstream desert and an up stream silted swamp.

As water stored underground does not suffer from evaporation and silt and sediment can be eliminated on entry. Ground water is also well filtered.

Mr Steve Mincher's concept is to channel water when the River is running a fresh through silt catches and sediment filters into a multi levelled cistern which can have as great a capacity as the Dam or if needed can be expanded in on an almost limitless scale. See diagrams attached.

The cost as with dams is governed by scale. For every 2.5 tons of rock that comes out one cubic metre is created. One cubic metre holds 1000 litres of water. For every metre of a 6x 6 metre drive produces 36 cubic metres and 36,000 litres so each 27.7 metre of development would produce room for a mega litre of water. This is equal to the relative small scale of mining production which would take half a day with one twin boom jumbo 2 loader and trucks. This would be increased proportionable with more and larger equipment.

The mining engineers inform me that the costs of removing the rock to the surface vary due to scale and what extraction from the rock is required. Currently rock removal is costing \$75.00 per ton but in some large scale mines it is low as \$3.00 per ton. When no extraction is involved the rock could be sold to other companies for either road base or ore deposits. Even if the lowest common denominator of price for storage cannot be met the advantages in quality, (as some of those 3000 year old cisterns are still being used) we know that the investment is insured for a longer time.

The advantages are:-

No water loss from evaporation.

No water loss from seepage.

No algae or weed problems.

No need to resume land.

Can be used anywhere there is suitable rock.

Can be used nearer Brisbane so that there is less pumping.

Ground water adds to the yield.

Ground water and lack of evaporation reduces capacity needs.

Can be used under built up areas so that reduces needs for pumping long distances.

Silt can be harvested and sold to Landscape gardeners.

Rock from excavations can be sold for public works or to mining companies.

Conclusion

This concept needs serious investigation not just a public service whitewash, with this concept the Government has its yield and capacity without destroying the upper Mary Valley. Just the elimination of the evaporation factor could be enough to stop the lower reaches of the Mary River from drying up. What price justifies investigation? How much will it cost if the Government makes a great mistake?

Damming Disaster

**The Dam Disaster Report
Warning This Could Cause Concern For Residents
Impact On Proposed Traveston Crossing Dam.**

Warning Travesty Dam Could Be Fatal

By Councillor Ron Owen JP (Qual)

Prelude

If any would call me a “Greenie” I would take it a cruel insult and in truth I would not qualify, I have not liked the tins of Tuna since they stopped making it “Dolphin Free”. Paradoxically this report is about the environment. Yes, I know I have shot just about everything that has walked or slithered on this continent, No, I have not had a mid life change. Yes, I don’t want the Lungfish to be extinct or the Turtles to all end up in the soup. It is the fear of human extinction that motives this missive.

By chance, information has crossed my path, from three separate sources, which leads me to believe that the people presently existing below Traviston Crossing and above the Mary River barrage could be an endangered species. Harnessing a few billion gallons of water is containing energy, it is a force of almost nuclear proportions, if a government gets it slightly wrong even with the best of intentions the ramifications for the population are terminal.

Up to date the State government has been very sparing with its safety information, either they truly do not know or they do not want to tell us. Please read on and if you have any comments concerning the issues in addition or in doubt please contact me on 07 54825070.

Ron Owen.



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1. Political Expediency.

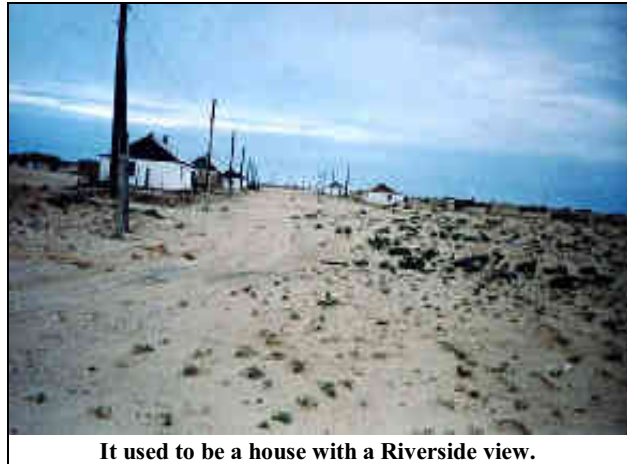
There are many parallels in history of what is occurring in the Mary Basin, but at this present time there are many people suffering the consequences of reliance on Government planning and promises. Other catchments, in other countries have watched and believed as their water was dammed. The population of an agricultural area the size of Southern California is now slowly dying, not all at once, but progressively over the last twenty years and it will probably take another twenty years to polish them all off altogether. The device that is killing them is 'Dams', the rivers that used to sustained them have been redirected to an area with an increase in population of 140%, the promised but denied, downstream flows have silted, salted and turned sea beds to dust.

The locals have a joke line, " If all the consultants that have come from all over the world to study the problem had brought a bucket of water with them, they would n't have a problem".

They like us have a few problems one of them being Governments and the other being consultants or experts.

There are other examples, not as acute but in Australia. Some of the examples are described in this report, it is up the reader to insure that some lessons might be gained from the mistakes of others.

The parallels are not the correlation of the landscape but the impact on people who believed government promises, of Government blunders and of the human right to the access of water.



It used to be a house with a Riverside view.

2. Mary Mary Quite Contrary

One of the other pieces of information. was from a Tiaro Shire Councillor who mentioned that the for the last three months not one drop of water from the Mary River had flown into the Fraser Straits. The Mary River barrage which separates the fresh Mary water from the sea water had not overflowed for three months. This is in a normally dry season, which this year has been particularly wet for the Mary Valley. I asked the Director of Engineering for the Cooloola Shire if he believed that, and he said that he did believe it. It seems that the only time fresh water from the Mary River runs through to the sea is in a minor flood. A key fact (if it is a fact, it could be just more Government information) is that in the Mary Valley catchment 70 % of the water flows on 6% of the days in a ten year cycle. I did a report to Council last year based on three separate studies and each concluded that in the next 50 year cycle we would have approximately the same annual rainfall as the last fifty years but we would have longer periods without any rain and subsequently more floods. That means that figure of 70 % of the rain in 6% of the days of the years is going to be increased with more rain in shorter periods, and less in longer periods of time. So the problem is intensifying.

3. Already the Mary fails to get to the Sea. How far will it get towards the Sea, after the flow is Dammed at Traveston Crossing?

Most people would feel that those figures back up the argument for bigger and more Dams but history and geographical facts warn us that is not the answer, that it could be the final population control. Water harvesting, water conserving, wiers, yes but redirecting river flows is definitely a dangerous affair. So if in it is a fact that even in the best of years the Mary River does not make it to the sea. Where is the flow in the river going to get to after they pump 200,000. Million litres into Brisbane every year. Then they store 660,000 million litres and have to allow for seepage evaporation, so the loss is even greater. Is it going to dry up in Tiaro or Gympie, or eventually Traveston? The Government consultants or modelers will tell us otherwise, but we have to realise the ramifications of decisions such as this are terminal. The human population in this area is now at risk, not animal extinction but human extinction in our part of Queensland.

4. Government Knows, But Gives Us Double Speak.

You would not be blamed for thinking that before a government took a decision to build a large dam, that they would have the all the information at their disposal. The total amount of rainfall that lands in a catchment, the total amount of runoff, into the river system and the total amount per year that runs into the sea. Then we would hope to see a surplus of water to be harvested and a case to show that there is a spare amount of water to be distributed to another place. I have



read the latest two Dam reports by DNR, inquired by fifteen phone calls and found nothing of this information, save from the Tiaro councillor who also adds that in the last few years there has been periods of nearly a year that no flow has gone over the Mary barrage into the sea.

5. This Is What They Are Telling You. Is it Just to Cover Their Tail?

Before we look at examples of government Dam blunders please read the following information taken from the Queensland Government, Water for South East Queensland a Long Term Solution. Consider, that governments have to give some information out at specific times so that at future points of criticism they can refer to something that was mentioned as a risk in a report dated previously that everyone should have been aware of. It is called, "Covering Your Tail."

6. The Government Story.

Allowing for the fact that the public servants have couched this information in government doublespeak or small print so that no one will make a fuss at the time.

On page 83, (three sheets from the back) it states in:-

Attachment

Attachment 1

Report on Environmental Assessments associated with Dam Options in the Logan and Mary Basins Sandra Brizca and Associates

Summary of Key Points

(Not quoted in entirety, Four Dams furphy, and Turtles Frogs and Fish removed, so that people may see what is camouflaged)

Introduction

It is widely recognised that installation of any new dam will cause geomorphological and ecological changes, including:

- *Conversion of riverine, floodplain and upslope habitats to dam pondage habitat within the impounded area - there is significant potential for alien species of plants and fish (e.g. mosquitofish and tilapia) to establish in pondages, posing threats to native species;*
 - *Changes in water quality resulting from water retention in the dam pondage, with implications for ecosystems within the pondage area and downstream;*
 - *Reduced connectivity between upstream and downstream reaches, with implications for downstream transport of sediment and organic matter, and upstream and downstream movement of fauna (particularly migratory fish and crustaceans); and*
 - *Changes in downstream flow regimes with resulting geomorphological and ecological adjustments of flow-dependent ecosystems.*
- However, even full application of all international best practice measures cannot fully counteract or compensate for all impacts.*



If you believe the Government can organise an underwater Car Rally? Well all this may be true.

Mary River Catchment

- *The construction of new dams in both options would lead to significant geomorphological, ecological and water quality changes in the dam pondage areas resulting from conversion of river, floodplain and upslope habitats to dam impoundments. All of the dams under consideration would flood regional ecosystems of conservation significance.*
- *The total submerged area is larger for Traveston Dam (7700 ha) while Traveston Dam impounds about 47 km of the Mary River plus parts of Kandanga and Yabba Creeks). In the(Traveston Dam commands a catchment area 2,110 Kilometres)*
- *.....geomorphological, ecological and changes downstream of the dams resulting in flow regime, interruption of natural transport of sediment and organic matter and reduced*

biological connectivity.

• There is a significant risk that water released/spilled from Traveston Dam would be turbid (due to the "averaging" effects of the dam pondage on turbidity resulting from the storage of turbid flood flows, as well as potential sources of fine suspended and colloidal material in the dam resulting from the dispersal of sodic soils and (wind or boat driven) wave-induced turbulence) - further investigations would be required to quantify this risk, particularly expert soils assessment in the pondage area.

•..... significant impacts would persist further downstream with Traveston than with the Four Dams option

• risks to this species could potentially be greater with Traveston Dam than the Four Dams. If the waters spilled/released from Traveston Dam become highly turbid, ecological changes associated with downstream effects of the dam (including loss of unvegetated sand bar habitat resulting from mud deposition and vegetation colonisation...

•As total outflows from the Mary River remain high (e.g. mean annual flow would be 86% or 88% of pre-development compared with 94% at present) and substantial medium and high flow events would continue to occur, neither dam option is expected to significantly alter the ecological values of the estuary, the Great Sandy Strait or Fraser Island, although incremental increases in impacts on the estuary would be expected. (They omit to mention that 85% of this 88% will only flow in a large flood event as at present it does not flow at all.)

Hydrologically, there is a 2-4% difference in the degree of reduction in mean annual flow between the Traveston and Four Dams options in the Mary River reaches downstream of Gympie, but greater difference with regard to reductions in minor/moderate floods, which are important ecological drivers (up to 15% difference at Fishermans Pocket, decreasing to less than 10% difference at the river mouth). ' Similar "averaging" effects may also apply to some forms of phosphorus and nitrogen.

7. In Other Words They Know But Do Not Want To Say How Bad The Increments Could Be.



The Mary a 100 years ago, without Dams it went all the way to the sea.

The only object of comparing this project with another hypothetical (Four Dams) project is to confuse the issue and stop people asking these sort of questions.

What is the mean annual flow rate in litres per second in 1906 at Fishermans Pocket and the Mary Barrage?

What is the same mean annual flow rate in litres per second in 2006? What is the same figure for 2020 and 2050?

They obviously have these answers but do not want to impart them to the public.

8. Why Does The State Disguise Information?

I have asked many prominent people in our area, if we had a drought, and the State Government had to choose between who they would direct the water to, the thirty thousand in the Shire of Cooloola or the millions to the South of us, would they allow water to run down the river for our consumption and agricultural needs or would it be a power pipeline to votes? We are told constantly that the government has to be responsible for the environment, they prove their conviction with a constant flow of Legislation so the public can be forgiven for this belief. Maybe to late, for the people to realise that the Legislation is not to preserve the environment but to preserve government control over the individual. To allow government the freedom to dispose of water as it wishes, for the State to control the voting influence.

9. Precedents In Dam Danger.

Other Governments in other places have made bold decisions for the benefit of the people let us look at what has happened in other places.

Dam Disasters are Legendary

Dam disaster can be caused by War (Terrorism), Subsidence, Bacterial, Earthquake, Flood, Drought, Design and Environmental.

The following list is just a few of note and not by any means a complete list of Dam failures.

Aswan Dam, Egypt, (ongoing)

Gouhou Dam, China, 1993

Val Di Stave Dam, Italy, 1985

Vajont Dam, Italy, 1961

Teton Dam, USA, 1976

Taum Sauk Dam, USA, 2005

St Francis Dam, USA, 1928

Shakidor Dam, Pakistan, 2005

Opuha Dam, New Zealand, 1997

Malpasset Dam, France 1959

Cascade Dam, USA, 1982

Lawn Lake Dam, USA, 1982

Kelly Barnes Dam, USA 1977

South Fork Dam, USA, 1889

Camara Dam, Brazil, 2004

Buffalo Crk Dam, USA, 1972

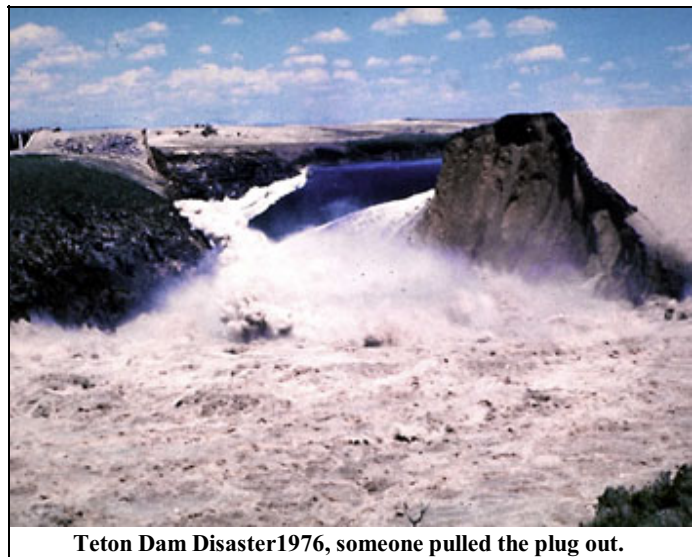
Big Bay Dam, USA, 2004

Shimantan & Banqiao Dam, China,
1975

Jindabyne Dam, Australia, (ongoing)

Baldwin Hills Dam USA

Just one of those disasters which incidently the Government said was designed to withstand a 1 in 1000 year flood was caused mainly by the sediment build up blocking sluice gates. 126,000 people died during the flooding, 145,000 died due to subsequent epidemics, six million buildings collapsed and 11 million residents were homeless.



Teton Dam Disaster 1976, someone pulled the plug out.

Hopefully you will notice that contrary to popular myth most of those disasters are not in the distant past or in third world countries, in fact the countries that seems to have suffered the most are the most developed countries.

10. The Promise.

That list of figures does not include small disasters such as when the Government promises to Orbost in Victoria Australia were broken. The familiar promise was invoked when the Snowy River was to be dammed at Jindabyne. The promise has been used in nearly every projected Dam project in the last century and is, **“You might lose a little of the river flow but you will never have to worry about floods again”**.

(Sound familiar)

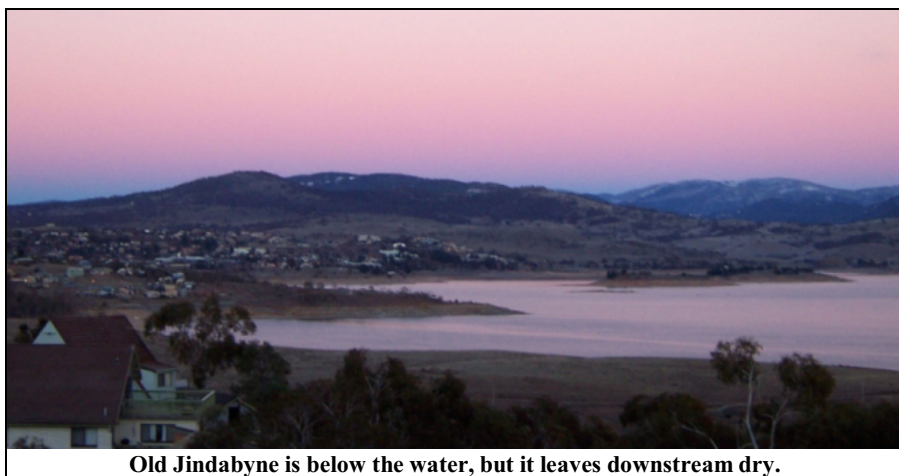
Historically dams have more often than not provoked floods rather than prevented them.



11. The Jindabyne Dam on the Snowy River.

The Snowy River Scheme went ahead the dam on the Snowy at Jindabyne was built, the Snowy River flow has since fell to 1 % of its natural flow. The Town of Jindabyne was submerged for this sacrifice, a new town East Jindabyne was rebuilt at the side of the Dam.

(the old town roofs can still be seen when the levels are down). The 1% flow is causing an environmental and agricultural disaster downstream and in 1970 a flood came down the Snowy River, when the wall of water hit the Orbost flats it cut a new river channel through the Orbost Railway Station. It took railway cars, railway buildings ten miles down towards the sea at Marlo. Four days later, fishermen were still shooting Cows that had been swept eleven miles out to sea. Dams do not insure against floods, maybe little ones but dams by their purpose are to capture water, once it is captured they can let small amounts go but once they are full their only concern in a flood is to survive the flood, by letting it go over the spillway.



The long term damage is ongoing the lack of flow in the Snowy River turns the lower reaches into a desert except when there is a flood which could be every ten years or more. Livelihoods are at stake and the people have elected an independent candidate Craig

Ingram to the Victorian Parliament to the seat of East Gippsland to try and persuade the NSW Government to allow 15 % of the flow to come back to the river. Water has spilt over the Dam spillway at Jindabyne on only five occasions between 1968 and 1989, 1970 being one of the five occasions. The Mowamba River a tributary to the Snowy flows in south of the wall but that has now been diverted through an aqueduct back into the Jindabyne Dam. Now the first major tributary is the Delegate River.

Even though the additional diverted catchment area is only 14% of the total catchment area (as it is head waters) it has reduced the mean annual flow by an extra 45% by the time it gets to the Mouth of the Snowy near Marlo in Victoria. **(This information is very relevant to the Travieston Crossing case.)**

12. This Could Be The Mary Not The Snowy That is Being Discussed.

Owing to the complete diversion in the headwaters, the magnitude of floods of all recurrence intervals has decreased. There has been a reduction of 40-80% in typical flushing flows in each month at Jarrahmond.(that is near the River Mouth at Marlo Vicotria)

The periods of low flow (flow remaining below 225 ML/day for 10+ days) have increased from once every 20 years to once every 1.4 years. The season of peak discharge has also changed from spring to autumn due to diversion of snow-melt. Finally, and perhaps unique to this regulated system, variability in flow has increased, probably due to the lack of stable base flow emanating from the upper catchment.



**The Impact of Damming Yabba Crk already shows in the Mary River.
Unless we have a flood not one drop will make it to the sea.**

13. Impact of Lower Flows.

The major visual impacts of the changed flow regime can be found in the channel of the Snowy River between Jindabyne Dam and the junction of the Delegate River. The channel has dramatically contracted in size and has become overgrown by vegetation, mainly exotic blackberries and willows. This complete change in channel morphology and external input can change the composition of the entire aquatic community in this reach of the river.

There have been numerous reports of increased salinity in the lower catchment both in the main channel and on the flood plain at the mouth of the river. Irrigators and land holders estimate that the saline wedge associated with the river mouth has progressed from approximately 10 km to 17 km upstream as a result of the increased frequency of low flows. The Snowy River Interstate

Catchment Coordination Committee (SRICCC 1993) reports that increased salinity in the lower Snowy is affecting about 550 ha of farm land causing a loss in agricultural production in the order of \$4M annually.

SRICCC (1993) reports that reduced frequency of flushing flows has increased sediment in the lower Snowy River and reduced the number and depth of water holes thought to be critical to breeding for Australian bass, though there is conflicting evidence about sedimentation characteristics since the construction of the scheme.

14. Maybe it Might Change Back A Bit.

Current releases from Jindabyne Dam are made according to the intergovernmental agreement that established the hydro-electric scheme. However, the release requirements do not include the flows needed to sustain ecosystems downstream of Jindabyne. Based on these release requirements, the outlet works from Jindabyne Dam were constructed to release a maximum of approximately 50 ML/day (depending on dam levels). Consequently, modifications to the dam wall would be necessary to provide releases from Jindabyne Dam beyond this level. The chances



When the flow is reduced the rubbish builds up.

of improvement to the flow rate seem much less now the Commonwealth Government and NSW want to sell large sections of the Snowy River Scheme to private overseas investors. An increase in flow rate to the Snowy River would mean less water, less electricity and less profit. So watch out for Government Doublespeak again.

The argument again comes into play. Who's water is it? Do the people upstream have a greater right to it than the people lower stream? Does the Government have the right to use it exclusively for the purpose of buying

votes in large population areas at the expense of country people.

15. What do Dams Do Besides Store Water?

More than half of the world's large rivers have been dammed, regulating and flooding approximately 400,000 square kilometres of land worldwide. These diversions have an effect on diverse ecosystems and habitats around the globe, replacing them with uniform structures and reservoirs and ultimately changing the way otherwise balanced, stable ecosystems function.

16. Stream Flow.

The life of a river is closely tied to its stream flow, which constantly fluctuates. Damming a river and altering its flow pattern generates a number of physical and biological impacts. The disruption of a river's flow obstructs its natural current and affects the water's habitat.

One of the largest impacts a lack of current has on a river is the sediment flow, which is normally carried down the river by the current. When trapped by a dam, the sediment is held in the reservoir and settles to the bottom while clear water containing very little sediment is released down the river.



Over time, the easily erodible material from the riverbed is carried away with no sediment being deposited to replace it. This leaves a rocky stream bed, resulting in a poorer habitat for aquatic fauna.

17. Water Quality Impacts.

When water is held in the reservoir of a dam, the quality of water is affected in several ways, the extent of which depending on how long it is held there.

The initial creation of a reservoir on a flood plain submerges the existing vegetation and soil, causing much of the organic material to decompose over time which can deplete oxygen from the water supply.

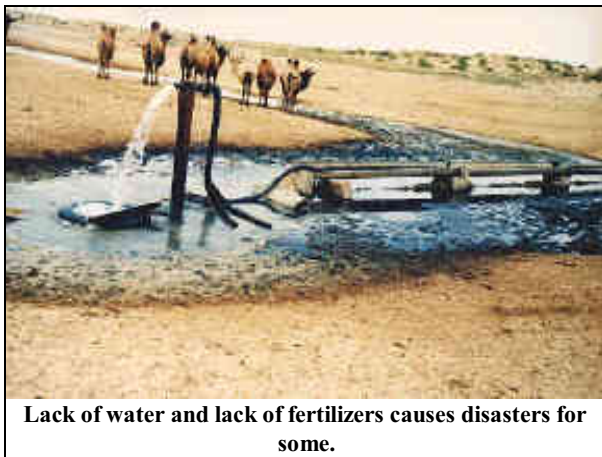
The establishment of a deep reservoir will almost always lead to thermal stratification during summer months. Water warmed by the sun forms an upper warm layer called the Epilimnion which is well oxygenated. The bulk of the water is held in the lower, cold unmixed layer, the Hypolimnion. This cold water receives relatively little light, has no contact with the air and is often depleted in oxygen. The boundary between these two layers is the thermocline.

Where draw-off towers or sluices in dams release water from the Hypolimnion into the downstream river, the water discharged may be unusually cold and may be low in oxygen and high in metals such as Manganese. All these properties can have seriously adverse effects on the normal environment of a river.

Mercury, which can exist at very low levels in the soil in inorganic forms, may be transformed by bacteria into methyl mercury once the soil is flooded if the benthic conditions become substantially anoxic. Methyl mercury is a cumulative toxin to vertebrate species and may enter the food chain from the consumption of reservoir fish or any other produce which is contaminated by the river.

18. Another Example Of 'On Going' Dam Disaster.

The Aswan Dam is sometimes quoted as the worlds worst but there is so much to pick from. Damming the Nile caused a number of environmental issues. It flooded much of lower Nubia and over 90,000 people were displaced. Lake Nasser flooded valuable archeological sites. The silt which was deposited in the yearly floods, and made the Nile flood plain fertile, is now held behind the dam. Silt deposited in the reservoir is lowering the water storage capacity of Lake Nasser. Poor irrigation practices are water logging soils and bringing salt to the surface. Mediterranean fishing declined after the dam was finished because nutrients that used to flow down the Nile to the Mediterranean were trapped behind the dam.



There is erosion of farmland down-river. Erosion of coastline barriers, due to lack of new sediments from floods, will eventually cause loss of the water lake fishery that is currently the largest source of fish for Egypt, and the subsidence of the Nile Delta will lead to inundation of northern portion of the delta with seawater, in areas which are now used for rice crops. The delta itself, no longer renewed by Nile silt, has lost much of its fertility. The red-brick construction industry, which used delta mud, is also severely affected. There is significant erosion of coastlines (due to lack

of sand, which was once brought by the Nile) all along the eastern Mediterranean.

Due to the lack of the natural fertilizers which prior to the Dam were delivered in the flood silt and distributed on an annual basis. The need to use artificial fertilizers supplied by international corporations is controversial too, causing chemical pollution which the traditional river silt did not. Indifferent irrigation control has also caused some farmland to be damaged by water logging and increased salinity, a problem complicated by the reduced flow of the river, which allows salt water to encroach further into the delta.

Mediterranean fish stocks are also negatively affected by the dam. The eastern basin of the Mediterranean is low in fertility, and traditionally the marine ecosystem depended on the rich flow of phosphate and silicates from the Nile outflow. Mediterranean catches decreased by almost half after the dam was constructed. The dam has been implicated in a rise in cases of schistosomiasis (bilharzia), due to the thick plant life that has grown up in Lake Nasser, which hosts the snails who carry the disease.

The Aswan Dam tends to increase the salinity of the Mediterranean Sea, and thus affects the Mediterranean's outflow current into the Atlantic ocean (see Strait of Gibraltar). This current can be traced thousands of kilometers into the Atlantic. Some people believe that the dam's effect on this outflow speeds up processes that lead to the next ice age.

19. This Dam Disaster Could Be The Worlds Worst.

The Aral Sea is located in the lowlands of Turan occupying land in the Republics of Kazakstan and Uzbekistan. From ancient times it was known as a large oasis. Traders, hunters, fishers, and merchants populated this fertile site littered with lagoons and shallow straits that characterised the Aral landscape. The word “aral” in Kazakh is translated “island”, over a thousand of which were scattered throughout this region which made up part of the Silk Road, the highway between Europe and Asia. Once the fourth largest inland body of water in the world, in the past few years the Aral Sea has gained global attention as one of the greatest man-made disasters in the world. Now it is a small inland body of water on account of large amounts of water diverted for crop irrigation from the Amudarya and Syrdarya rivers. Extreme shrinkage of the once abundant Sea has altered the climate and the livelihood of millions of people.

The ARAL SEA, SW Kazakhstan and NW Uzbekistan, E of the Caspian Sea in an area of interior drainage. To the north and west are the edges of the Ustyurt Plateau. In 1960 it was the world's fourth largest lake, the size of the entirety of Southern California (at 26,250 square miles, approximately two hundred times larger than the Salton Sea).

As recently as the 1970s it was still the world's fourth largest lake, but a little smaller at 26,000 sq mi (67,300 sq km) in area and 260 mi (420 km) long and 175 mi (280 km) wide. Fed by the Syr Darya and Amu Darya rivers, it was generally very shallow, attaining a maximum depth of 180 ft (58 m).

In the 1950s the Soviet Union decided to cultivate cotton in the region, and since the early 1960s the Syr Darya and Amu Darya have been used for large-scale irrigation, causing a drop in the flow of freshwater into the sea. The sea is, as a result, now greatly reduced, mainly occupying two basins in the western, and northern sections of its lake bed.

However as a result of a tendency of economy development, and increases in irrevocable water consumption during years of water shortages, water flow into deltas of the Amu Darya and Syr Darya rivers were reduced sharply. In 1982 and 1983 this made up only 2.28 and 3.25 km³, respectively. Since 1961 the sea level has declined with increasing speed from 20 to 80-90 cm per year.

The sea formerly supported local fishing and was navigable from Muinak to Aral. As the Aral has retreated from its former shores, due to the combined effects of evaporation and water diversion, major environmental problems have resulted. The quality of the remaining water has deteriorated, increased salinity has killed fish, and the health of those living along the shore has suffered. Regional weather has been affected as well, becoming harsher as the sea's moderating climatic influence has diminished. The United Nations has estimated that the sea will essentially disappear by 2020 if nothing is done to reverse its decline, The Aral is an inland salt-water sea



with no outlet. It is fed by two rivers, the Amu Darya and Syr Darya. The fresh water from these two rivers held the Aral's freshwater and salt levels in perfect balance.



It might be some time before the tide comes in.

In the early 1960's, the Soviet central government decided to make the Soviet Union self-sufficient in cotton and increase rice production. Government officials ordered the additional amount of needed water to be taken from the two rivers that feed the Aral Sea.

In spite of intensive glacier melting which should have led to increase of territory of the Aral Sea, during last 25 years disastrous reduction of the largest inland water body took place. Situated in the centre of the Central Asian land mass at an altitude of 53 metres above the sea level, the Aral Sea functions as a gigantic evaporator. About 60 km² of water evaporates per year.

The sea contributed to hydrothermal regime improvement, influenced water regimes of arid plants, pasture productivity, and provided normal functioning of artesian wells etc. Ecological balance in the basin was formed in the first half of the 20th century and was stable up to the beginning of the 1960's, with a volume of 1,064 km³, and a water territory of 66.4 thousand sq km. Because of irrevocable blocking of river water, ecological balance began to decline. Only half of the previous river runoff reached the Aral Sea. But even this quantity of water was not sufficient to support sea level at 53 m.

During the last 35 years, from 1960 to 1995, the sea received less than 1,000 km³ of river water, which led to the lowering of the sea level by 19 m, accompanied by a reduction of the volume of the water area by 75%.

It is about a quarter of its former size in area and less than an eighth in volume.

It has now divided into two parts (puddles), the Bolshoi and the Maly (Northern) Aral, and receded 150 km away from the original shore.

From exposed salty bed (35 thousand km²) up to 100 million tons of salty dust flew out annually. Suspended solids in the form of aerosols with agricultural pesticides, fertilizers and other harmful components of industrial and municipal wastes prevail in the composition of the winds. Due to the reduction in the sea dimensions, and the increase in evaporation and drainage-collecting water, water salinity considerably increased from 9.94 g/litre in 1965, to about 15 g/litre in 1996 and is still increasing to date.

20. The Arguments Which Might Lead to War.

Since the mid-1980's, scientists have spoken out more strongly for saving the Aral Sea. Agricultural officials, however, say that it is impossible to demolish the canal system. Too many farmers depend on the income from cotton. Argues an official, "We could reduce by half the amount of land being irrigated. But we have to think of the people who depend on the irrigation

for work. What will they do then? What will they eat?"

The continuing drying up of the landlocked Aral Sea as a result of irrigation purposes in surrounding countries is one of the World's greatest environmental disasters. It has caused a decline in the productive capacity and social conditions of 5 million people living in the region of the Sea due to the degradation of the quality of their drinking water and health, the salination of agricultural lands, a reduction in biodiversity, pollution due to the run-off of pesticides, fertilisers, etc and local climatic changes.

Abandoned fishing boats and scattered marine equipment litter the dry, dusty plains previously covered with water. As water quantity diminished, salinity rises to levels toxic for fish and other wildlife. The first drastic increase occurred between 1971 and 1975 when salinity rose to 12-14%. In the late 1980s the salinity reached 23%. An estimated 60,000 people abandoned their fishing livelihoods. Carp, bream, pike-perch, barbel, sturgeon, and many other types of commercial species of fish used to bolster profitable businesses. Commercial fishing ceased in 1982, and soon muskrat farms and other game trades followed suit. The diversity of the Aral Sea Basin's former biological life has been compared to Africa's. Of the region's 500 species of birds, 200 species of mammals, and 100 species of fish most have perished over the past four decades. Water had been so heavily diverted that by 1995 hardly a stream reached the Sea from either the Amudarya in the south or the Syrdarya in the north.



Fishing boats, could this be Harvey Bay?

21. From The Christian Science Monitor

Due to a strong NE wind, over 100 million tons of salty dust blows away from the Sea annually.



Could this happen at Tin Can Bay?

Aerosols are carried up into the higher layers of the atmosphere and spread all over the globe. Aral region pesticides have even been found in Antarctic penguins. The dust contains an unhealthy mixture of fertiliser and other agricultural chemicals and household waste. Salt and pesticide chemicals have seeped into groundwater and caused health disasters and further complications for agriculture. Polluted water runs down into lowland reservoirs causing secondary salinization and making irrigation less effective. The latter exacerbates the agricultural difficulties because more water is needed to attain a healthy crop. The State Hydrometeorological Committee of Uzbekistan reported data in 1989 that the content of chromium, copper, phenols, and

sulfates reached well above the maximum allowed concentration of contaminants allowed in Russia and the former USSR.

22. Impact On Climate Regime.

During the last 5-10 years the drying off of the Aral Sea, brought about noticeable changes in climate conditions. In the past the Aral was considered a regulator mitigating cold winds from Siberia and reducing the summer heat. Climate changes have led to a dryer and shorter summer in the region, and longer and colder winters. The vegetative season has been reduced to 170 days. The pasture productivity has decreased by a half, and meadow vegetation destruction has decreased meadow productivity 10 times. On the shores of the Aral Sea precipitation was reduced several times. Average precipitation magnitude is 150-200 mm with considerable seasonal un uniformity.

High evaporation (up to 1700 mm per year) is marked while air moisture is reduced by 10%. Air temperature during winters has fallen, and summer temperatures have increased by 2-3 degrees C, including observations of 49 degrees C. The sea bed, formerly referred to as a so-called "fresh water maker" of a vast water collecting basin at the expense of rich sea hydrobiocenose activity, has turned into an artificial anthropogenous volcano, throwing tremendous masses of salt and finely dispersed dust into the atmosphere. Pollution is increased because the Aral Sea is located along a powerful air stream running from west to east. It contributes to aerosol transference into upper layers and quickly spreads in the atmosphere of the Earth. That is why traces of pesticides from the Aral region were found in the blood of penguins in the Antarctic, and typical Aral dust has been found on Greenland's glaciers, in Norway's forests, and Byelorussia's fields, all situated thousands of kilometres away from Central Asia.

Frequent occurrence of long dust storms and ground winds is a characteristic feature of the Pre-Aral area climate. Strong winds often blow in the region. They are the most intensive on the western coast - with perhaps more than 50 days of storms per year. Maximum wind velocity reaches 20-25 m/s.



This could be the Traveston Crossing Dam in a dry year.



No, not a Dry dock, just desert where the sea used to be.

These climatic conditions defined that agriculture without irrigation is impossible. The result is intensive accumulation of salt in the soil leading to water use for watering plants and washing off lands.

23. Impact On Soil Structure.

Most of the sands and soils in the Pre-Aral area are light and easily transported by wind. The drying off of the Aral Sea resulted in two different kinds of desertification. The newly dried sea bed, and the artificial water logging

of irrigated lands. As a result, a new desert "Aralkum" appeared. It is solid salt-marsh consisting of finely dispersed sea depositions and remnants of mineral deposits, washed away from irrigated fields.

24. Disease

Perhaps the most significant factor of the Aral Sea crisis is the health of the people. Hospitalisation rates increased from 20 to 25 per 100 persons between 1980 and 1987. Mortality rates have increased by 15 times in a ten year period, and diseases such as cardiac, vascular, gallstone, and tuberculosis have risen significantly. The rise in child mortality has been attributed to environmental deterioration and now ranks highest in the former Soviet Union. The ecological disaster has been directly linked by medical studies to diseases of blood, cancer, asthma, and heart malfunction. Medecins Sans Frontieres (MSF), a non-governmental organisation, has begun a cooperation with the governments of Turkmenistan and Uzbekistan to implement DOTS, a World Health Organisation strategy used in over 100 countries world-wide to reduce tuberculosis. MSF began to pilot projects in 1998 and vouches to stay committed to the Aral Sea area in order to be certain the disease is effectively combated. 'Dots for All', a program launched by MSF on 24 March 2000, seeks to reach outlying communities where labs and other facilities do not exist but thousands of people have tuberculosis. Currently over 2000 people die each year in the region from the TB epidemic, a number MSF believes can be considerably reduced by effective cooperation of the ministries of health and a thorough execution of 'Dots for All'.

The process of degradation in the Aral region caused progressive crises in the social and economic spheres. The primary victims of the crises were the most vulnerable layers of population, namely children, women, ill-paid inhabitants of cities and rural areas. The region has the highest child mortality rate in the former USSR (75 children per 1000 newly born), high level of maternity death: about 120 women per 10,000 births. Diseases such as TB, infections and parasites, typhus, hepatitis, paratyphoid always accompany poverty.



The disease rate has a tendency to increase. In the epicentre of ecological disaster, anemia, dysfunction of thyroid the gland, kidney and liver diseases are wide spread. Blood, oncological diseases, asthma and heart diseases are progressing. Medical research proves that the incidence and growth of these diseases are directly dependent on ecological disaster.

An estimated five million people have been devastated by the Aral Sea disaster.

The Aral Sea has received no shortage of attention in the past decade. Although measures have been taken on a limited scale to address the environmental and health problems in the basin, no conclusive or all-encompassing program has yet to make satisfactory progress. In the mean time the Sea continues to dry up, drinking water remains contaminated, and crops yield less and less while pollution increases. Whether there will be an Aral Sea in 2010 remains a debatable



To Dry or to wet, Dams designers get it wrong, often.

question, and whether the proposed and approved programs make good on their plans to assist the suffering people of the basins remains to be seen.

As a result of the complete stop of the Amu Darya and Syr Darya runoff a serious complex of ecological, social and economic problems was formed in the Pre-Aral area. These problems by originating in different countries to the countries who have the main level of consequences has international character. Which impacts on the human inhabitation of

the area, creating political tension between nations.

The Aral disaster has deteriorated the sphere of inhabitation of the region sharply, due to polluting of the atmosphere, the drinking water and the soil. Replacing multilayer herbage by single-layer, reduces the quantity of useful feeding plants, and often plants that have no feeding value such as weeds thrive.

25. Now Countries Compete For Water How Soon Before They Fight For Survival.

Before the fall of the Union Soviet Socialist Republic, the water resources in Central Asia were shared between the Republics. Since the fall of the USSR, the topic of water rights has emerged. The downstream nations of Turkmenistan, Kyrgyzstan, and Uzbekistan are dependent on the Aral Sea basin for irrigation especially during the hot summer months. The upstream nations of Kazakhstan and Tajikistan are dependent on the Aral Sea basin for hydroelectric power especially during the cold winter months. As these Central Asian countries try to negotiate treaties and regulations on water use, the Helsinki Rules have been cited and quoted as being the standard in determining the rights of the upstream countries to release or hold water storage.

26. International Law or Moral Law?

Modern international law suggests that water, unlike fossil fuels, is a “free” resource and should be given openly in equitable amounts to downstream users. The pre-eminent framework for analysing watercourse disputes, the United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses, was developed in 1997.

It has yet to be ratified, but arguably represents the current consensus among the world’s nations on international water law.

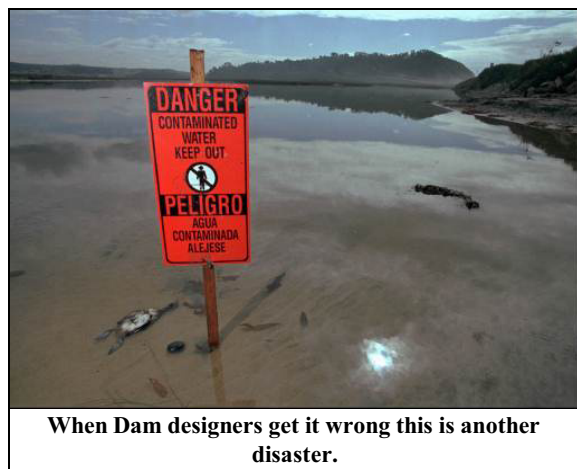
The Convention does not explicitly state that water should not be sold to downstream users, but does make provisions for a balancing of equitable uses with “vital human needs.” By declaring that “vital human needs” play a role in determining allocation amounts between nations, it suggests that water is a resource that must in some circumstances be permitted to pass through free of any constraints, including payment. Analysing the Convention more broadly, it seems

that water must be allocated in “equitable and reasonable” terms as discussed in Article 5, while taking into consideration that every nation along a watercourse has a stake in the water: “Every watercourse State is entitled to participate in the negotiation of and to become a party to a watercourse agreement that applies to the entire international watercourse” Taking Article 4 of the Convention, “Parties to water course agreement,” and Article 6, “Factors relevant to equitable and reasonable utilization” together, it can be surmised that the intended purpose of the Convention would be to determine water entitlements for each nation along a watercourse. The word “entitlement” means that each watercourse nation would be allocated a certain amount of water based upon the Article 6 factors. If the watercourse nations are entitled to a certain amount of water based upon equitable and reasonable factors, then an upstream nation could not charge downstream nations for water that exceeds the upstream nation’s quota. Stated more succinctly, to charge another nation for water, the upstream nation would have to give up some portion of its entitlement for a fee.

27. Is Water As Free As Air?

While the water itself is considered free, the Convention does acknowledge that all users should pay for aiding infrastructure upkeep, albeit infrastructure in one’s own territory. Article 26, Section 1 of the Convention says, “watercourse states shall, within their respective territories, employ their best efforts to maintain and protect installations, facilities and other works related to an international watercourse.” This statement seems to suggest that nations are responsible for upkeep of infrastructure within their territory.

However, the Convention assumes that each nation has its own infrastructure to maintain. While the downstream nations do have their own water infrastructure, this infrastructure is for agriculture – a domestic purpose. The infrastructure for which that Kyrgyzstan and Tajikistan seek help with is for downstream international purposes. Furthermore, since independence, the upstream nations have been receiving bartered payment for storing water, curbing water use, and maintaining water infrastructure. So as the downstream nations have no bargaining power it seems that Article 26 of the Convention has little application in the Aral Basin so have to decide whether they sit and die or fight and die.



28. The Residents of Mary River Basin Are Wronged Twice.

In our local dilemma we have our problem securely within one national boundary, while the International Law may give our residents another venue of Appeal, which does have the advantage of removing it to Court which could not be influenced by the same government that appoints the positions to that court, in our case both the rights of the Up steam residents have been abused as well as the Down stream residents. In the Mary Valley both the people up stream of the Dam and down stream of the dam are the duel victims. This water is bound for another catchment altogether to serve the re-election purposes of the Labour Party.

29. Conclusion:- Discontinue The Dam Or Devastate The Mary Valley.

The chances of the Traveston Crossing Dam failing due to earthquake is uncertain, even though Cooloola Shire Council submission, page 20, reports information supplied from D N R M & W show that there is a block fault, it states, “In the area immediately beside te proposed dam wall



Sand & Silt build up at Traveston Crossing. This could wash away in the next flood but with a Dam will be stuck behind the sluice gates.

records show significant and persistent faulting running along the river basin and perpendicular to it.” Though the knowledge that there are ‘cracks in the rock’, due to this ‘fault’ and if the fault can cause crack in the bed rock a simpleton could see that, if the fault can crack the bedrock it can also crack the wall that it is attached to.

The chances of the Dam failing due to a siltation is a lot more likely. The Dam failing due to a large flood is much more likely. *(No one knows how many years ago the flood debris was*

distributed by flood, that was found in 1980 when the footing for the extension of the Freemason Hotel were dug)

The chances of a dam disaster due to the lack of river flow is highly likely especially when our State government is in control of all the information and decisions.

The only real information from the Government (see Chapter 6. The Government Story) does not discount these effects it just seeks to discount the amount and depths of these effects. The likely hood of living in a valley where the up stream is a silted water logged bog and the downstream a dry flood channel that in non flood times has no chance of ever reaching the sea, is becoming very real.

30. Compensation.

The Mayor Cr Venardos has asked the other councillors to make suggestions to use in the negotiations on compensation which would have to be discussed at some point if this dam goes ahead. In the light of the previous chapters what figures of compensation could be arrived at, without a crystal ball on the future. What price could be put on the impacts of this Mega Dam. I believe we say, **“You want to steal the future and livelihoods of the residents of the Mary Valley so you can get the votes of the people who want to wash two cars every week. Well give every resident, in the area, compensation to pay for the emotional, physical and financial costs to move to another similar valley in another part of the State. That figure should include compensation for all the Council infrastructure that they have contributed towards, to all the industries, business, farms, homes, education, the total sell out figure, to replace this whole valley. Give everyone the option of moving out, at no loss to themselves.**

If the State cannot afford it, then do not build it”.

If we could trust our State Government to only hold the water in a receding flood and not interfere with the already reduced flow. If we could trust our State Government to always tell the people the whole truth, but the fight for water is almost as powerful as the fight for political power or the air we breath. The present record of truth can be judged from the small example in Chapter 6 and on what you know in comparison to what the State Government is telling you. The State Governments decision has impacted on all the residents and industries in our shire it commenced in April and the ramification are only just beginning. As we all know before this Dam is every finished, the project could be sold of to any international corporation that has the money, who is responsible for the promises then. The State Geovernment already has private companies standing in the wings to take over this project. We the people who paid for Australian infrastructure in Telcom and Energex have no chance of making anyone responsible for a government promise.

31. For Whom the Bell Tolls, It Tolls For Thee.

‘For Whom the Bell Tolls’ is the name of a 17th Century poet John Donne, its simple message tells us all, that we are involved, anything that takes away a ‘clod’ from our continent diminishes us all, as it effects us all individually, we all suffer the loss. So to with this Dam proposal if it goes ahead all the residents of the Mary Valley will suffer some loss. So we have a duty to act connectedly against it.

Is it morally right to allow democracy at all costs? That the majority of voters can steal the livelihood from the few. That the right to water is governed not by morals, but by votes. We know our present State Government sees it that way. It is a Travesty that we have to wait to until our homes, our Mary Valley has deteriorated into a disaster area before we will know the truth from our own Government.

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Sometimes the issue is so great that sitting down, turning your back, or any attending a meeting is just not enough.

Addendum.

Letters to Sun Water Re Safety Concerns of Large Dams that are “High Risk” dams as categorised by Department of Emergency Services Queensland. As Yet Both Letters concerning these Questions have not been answered to date.

To Mr Danny Green
Business Manager Sun Water.
34 Enterprise Street,
Bundaberg,
Queensland, 4670
13th Feb 07

Cr Ron Owen
24 Mc Mahon Rd
Gympie, 4570

Re- Safety Concerns for Imbil from Borumba Dam

Dear Sir

Thank you for your visit to the Cooloolool Shire Council today and agreeing to answer questions that might require some research.

Dam Disasters Are Real, So Please Give Serious Attention To These Questions.

Dam disaster can be caused by War (Terrorism), Subsidence, Bacterial, Earthquake, Flood, Drought, Design and Environmental.

The following list is just a few of note and not by any means a complete list of Dam failures.

Gouhou Dam, China, 1993
Val Di Stave Dam, Italy, 1985
Vajont Dam, Italy, 1961
Teton Dam, USA, 1976
Taum Sauk Dam, USA, 2005
St Francis Dam, USA, 1928
Shakidor Dam, Pakistan, 2005
Opuha Dam, New Zealand, 1997
Malpasset Dam, France 1959
Cascade Dam, USA, 1982
Lawn Lake Dam, USA, 1982
Kelly Barnes Dam, USA 1977
South Fork Dam, USA, 1889
Camara Dam, Brazil, 2004
Buffalo Crk Dam, USA, 1972
Big Bay Dam, USA, 2004
Shimantan & Banqiao Dam, China, 1975



Teton Dam Disaster 1976, someone pulled the plug out.

Baldwin Hills Dam USA

Just one of those disasters which incidentally the Government said was designed to withstand a 1 in 10,000 year flood was caused mainly by the sediment build up blocking sluice gates. 126,000 people died during the flooding, 145,000 died due to subsequent epidemics, six million buildings collapsed and 11 million residents were homeless. Hopefully you will notice that contrary to popular myth most of those disasters are not in the distant past or in third world countries, in fact the countries that seems to have suffered the most are the most developed countries.

The Reasons For Following Questions Are That Dam Disasters Are A Reality.

A similar situated St. Francis Dam Disaster which was also built on a earthquake fault. Many other Dams have bust due to seismic activity the St Francis Disaster is just one example.

The St Francis dam was built between 1924 and 1926 under the supervision of William Mulholland, an engineer for the Los Angeles Department of Water and Power. Minutes before midnight on March 12, 1928, the dam catastrophically failed. The resulting flood killed more than 500 people.

Today geologists know that the type of rock found in the San Francisquito Canyon is unsuitable for supporting a dam and a reservoir, but in the 1920s, two of the world's leading geologists at the time, John C. Branner of Stanford University and Carl E. Grunsky, found no fault with the San Francisquito rock. The dam was built squarely over the San Francisquito earthquake fault, although this fault has since been inactive. As the St Francis Dam was built on a **earthquake fault it was a loose rock, earth gravity dam with a concrete liner on the wet side almost the same construction as the diagram of Borumba Dam, depicted on the wall at the Borumba information shelter.**

In 1924, construction began on the St. Francis Dam, which was given an anglicized version of the name of the creek bed on which it rested. The project began quietly so that the farmers dependent on the water of the San Francisquito Creek would not notice the dam and try to stop the construction. The day before the embankment failed a spring was notices on the downstream side.

The dam finally crumbled at 11:57 p.m. on March 12, 1928, scarcely 12 hours after Mulholland had inspected it and certified it as being safe. There were no surviving eyewitnesses to the failure, but one man on the road about a half-mile (800 m) away from the dam recalled feeling a strange shaking of the ground and the sound of "crashing, falling blocks."

The Disaster

Twelve billion U.S. gallons (45 000 000 000 liters) of water surged down San Francisquito Canyon, completely demolishing the heavy concrete walls of Power Station Number Two (a hydroelectric power plant), and scouring away everything else in its path. The flood rampaged south down San Francisquito Canyon, flooding part of present-day Valencia and Newhall. The deluge then turned right, heading west into the Santa Clara River bed. The

towns of Castaic Junction in Los Angeles County and Fillmore, Bardsdale, and Santa Paula in Ventura County were hit especially hard.

Bravery was seen in the actions of telephone operators in Fillmore and motorcycle policemen in Santa Paula who notified people in their homes of the dangers, until the rising floodwaters forced them to retreat.

The Aftermath

The exact number of dead remains unknown to this day as many bodies were washed 54 miles into the Pacific Ocean. The first official count made in August 1928 stood at 385. However more bodies were discovered every few years until the 1950s, and the remains of another victim were found deep underground near Newhall in 1992. It is generally accepted that the death toll was between 500 and 600.

Australians have No Fear of Earthquakes.

With no 30 metre high wall upstream of us holding back many hundreds of thousands of Mega litres of water most Australians would never have a sleepless second to worry about earthquakes but with the proposed Traviston Mega Dam, resident of Cooloola have asked Councillors to obtain more information.

The broad community probably has little perception that earthquakes pose a significant threat to South-East Queensland. Moderate to strong earthquakes such as the 1918 'Bundaberg' earthquake of 6.3 and the 1935 Gayndah earthquake of 6.1 are not known to most residents who do not read Queensland's history. Most would be shocked to know that we are in a region that has the potential of over 7 and that the earthquake that devastated Newcastle was only 5.6. Thank goodness no Dam issue to be concerned of for Newcastle though.

We Should Not Need A Local Disaster To Educate Us.

The risk from earthquakes in South-East Queensland is largely from low probability, but high consequence events, and these events are unlikely to occur in any individual's lifetime. Therefore these events may hold little fear for individuals, even if they are aware of the risks involved. However, strong earthquakes have the potential to impact across large communities. Should they occur, losses can be very high when aggregated across the community. Effective management of this type of risk may be based appropriately at community or corporate levels, and there may be little that individuals should do about this type of risk beyond ensuring they have adequate insurance and not live anywhere near a large Dam wall. Emergency Management Queensland have classified Borumba Dam "High Hazard Risk", not due to the probability of the Dam wall failure but due to the catastrophic ramification to life, if the unthinkable occurs, as per your emergency action plan the town of Imbil is in the path of a devastating deluge.

Cooloola Council Has Information On Fault Line.

Council geology records (supplied DN R M & W) show that the geological formations under and around the Mary River between Imbil and Borumba Dam are from the Amamoor Beds (of the Devonian / Carboniferous era). These formations are described as "old, internally discontinuous (fault bounded), moderately to strongly deformed, folded and in parts have undergone considerable alteration, superimposed by block-faulting. The strata generally dip at high angles of inclination and have been exposed to numerous intrusions.

Director of Engineering R.A. Fredman states on page 20, of his Dam report information supplied from D N R M & W show that there is a block fault, it states, "In the area immediately beside the dam wall records show significant and persistent faulting running along the river basin and perpendicular to it." Though the knowledge that there are 'cracks in the rock', due to this 'fault' and if the fault can cause movement in the bed rock. It must be able to cause movement in the embankment wall.

You will however say that if this seismic movement occurred in a tremor or a quake as the Borumba Dam is a loose rock gravity dam any movement or fissures underneath the embankment would be filled by the gravitational weight of the loose rock falling down to fill the ground fissures (cracks) this would keep the dam sealed. That is why the Dam is constructed this way it is not just for the economy.

Question 1. If you disagree with any of the above could you please supply relevant data, as we are not professionals and I am sure you have much more information available to you?.

To safe guard against earthquake, and economy of building the structure, Borumba Dam, has a concrete sheath a few inches thick on the water side and loose rubble rocks wall. In an explosion or earthquake this rock is left loose so that it can move and fill any fissures made by the force, like the Ruhr Valley Dams "Sorpe and Ennepe" Dams.

This was one of the problems discussed in "A Note on the methods of attacking the Axis Powers". Second Paper 1942 "Spherical Bomb" by Barnes Wallis, faced when designing the "Bouncing Bomb" of Dambuster fame on the Ruhr valley dams. He was assisted by the Building Research Laboratory team led by Dr Norman Davey. His experiments proved that if a relatively small force could be placed low down on the wet side, once the concrete sheath was breached, due to the water tamping the explosion, the water pressure force within the Dam be forced through loose rock wall, overcoming the gravitational loose rock, producing a large breach by washing out the loose core rock from the breach on the downstream side of the wall. One of the dams took several hours after the explosions before it was breached 1294 people were killed 330 injured.

Question 2 If for any reason, terrorist, or earthquake the concrete sheath at the bottom of the wet side Dam wall was breached, could the water pressure caused by the depth, (the water above it) surpass the gravitational force of the loose rock and washout a breach in the embankment?

It is not just that this area, known by CERA a Commonwealth group formed to study earthquakes refers this area as the "Gympie Disaster Area" and that we are situated in an area that has the highest potential alongside areas of Western Australia for high scale earthquakes, Dam ruptures can be caused by terrorists sabotage extreme rainfall events, or mechanical failure of sluice gates. Anywhere in the world where a population centre is below a Dam Wall is a High Risk Dam. Holding large forces of water above the population is a calculated risk but the calculations must be computed on a 100,000 year event not annual rainfall which is only recorded for the last 150 years. The risk not being regular is catastrophic when it finally occurs which could be now or in 100,000 years time. The photograph you perused when you visited Council on the 13th February 07 from the Gympie Times showing the flood

of 1999. The water was 6 metres over the spillway. The cause of this phenomena, stated in the article was 250mm of rain falling within the area during a 24 hour period.

Question 3. As the rainfall in a 24 hour period has been recorded in this area as 907mm falling at Beerwah, between 9am and 9am on the 3rd of February 1893. To locate this information see abs.gov.au. (1301.0 Year Book Australia. Contents Geography and Climate, Rainfall and other precipitation.) In the Borumba Dam safety calculations what is the maximum daily rainfall throughout the whole catchment that the Dam can safely accommodate?

Question 4. What security does the Borumba Dam have on site? does the employee who lives on site work weekends? If there was a terrorist group with a truck load of explosives, (unmarked) and they had a boat with scuba equipment, placing the explosives at the very bottom of the wet side of the Dam Wall, would they have to turn up on working week days to get noticed?

Question 5. Is your staff member equipped with night vision equipment?

A document that has been given to me by Council headed the **Sun Water Emergency Action Plan Borumba Dam Emergency Events and Actions**. Apparently has been modified 12 times between 1993 and 2006, most of these modifications seem to be updating the Telephone Notification List. Your name is on the notification list and apparently per the documents instructions your single employee on site is required to phone you if when the Dam is full to capacity the embankment collapses. That is of course if he has not been swept away by then.

Question 6. What could you do to assist the residents of Imbil, from Bundaberg, and what could any of the other people on the telephone list when they are situated in Maryborough and Bundaberg?

Question 7. On the second page of the telephone notification list it has Police and Council employees, State Disaster Duty Officer but as they are in Gympie and even if they could run out of the door immediately they would never get to Imbil as your Action Plan explains that the flooding of Mary Valley would not be passable by vehicle for 24 hours. So in an emergency Action Plan why would you waste the time of your single employee on site phoning people who could do nothing to assist the people of Imbil?

Question 8. On the Emergency Action Plan telephone notification list you list the phone number of three helicopter services at this point of time, do they have a Cooloola Shire Council Borumba Dam Collapse Imbil Township, Probable Maximum Flood Embankment Failure Map, easily available to them and sites approved and tested, marked for landing for evacuations?

Question 9. In a scenario as described above who would be the person authorised in your Emergency Action Plan to authorise emergency evacuations by helicopter of survivors?

Question 10. How long do you envisage it would take your single on site employee to phone the 30 to 40 phone numbers of local down stream farmers as with a Dam Wall collapse the velocity of water would be over them before the phone rang? After the deluge there would be no phone, no one to hear it and it would make no difference.

Question 11. Imbil Police Station is on the Notification list, it is noticed that if it does not answer to phone the Gympie Police Station, if that was the case it may save Sgt Kennedy's life as the Police Station, Fire Station and SES centre are all close to the Yabba Crk in the direct path of water and deepest inundation. If or when this scenario occurred or even any other emergency like is there any plans or organisation that could assist the people of Imbil or are you just planning for the clean up bag em and tag em approach?

Your Emergency Action Plan, describes events, lists notification for minor flooding, requires staff to monitor and report to Bundaberg, take photographs of spillway, to inspect "**especially near the Spillway**" Section 5 page 3 of 7 revision 7 August 02. Again in Section 5 page 6 of 7 revision 7 August 02 it states, Check for signs of slumps and erosion on the downstream face of the embankment "**especially near the Spillway**".

Question 12. What has happened to the last 20 metres of the Dam wall which is "**especially near the Spillway**"? As the decline towards the downstream on this last section is pronounced and at least 100mm lower than at the up stream side of the wall. This last 20 metre section is lower in overall height and can be observed in photographs. I have inspected the Dam with a resident, an engineer who worked for many years with Readymix, his father worked on the construction of the Borumba Dam in the early 1960s. I did not need him to tell me that the quality control of the original construction would not have allowed this section to be built as a sag or slump. So it has occurred as some later stage. As your Emergency Action plan required special attention to this area, not the spillway area but near the Spillway please explain what force has produced this "slump".?

Question 13. When are you going to repair it?

Questions 14. Where the Emergency Action Plan is deficient in giving a time factor from an event that breaches the Dam wall, of time taken for water to impact on Imbil, and is deficient in providing any serious warning of a catastrophic disaster which would give warning or protection to the people of Imbil, it does positively point out, to all who would bother to read it that this document is only provided to fore fill another government paper chase and was never intended to be any serious use to the safety of the general public. On page 1 of 1 Appendix 4

*"a Probable Maximum Flood resulting from and where applicable **Snow Melt.**"*

Was this document prepared somewhere else and had a name change, as snow has been missing from the local landscape, of late ?

Question 15. In your Emergency Action Plan it states, *"For Increasing flows and Leakage Notify Downstream residents, Notify Disaster District Coordinator, Gympie and the Imbil Police. Monitor Flows hourly. After the event compile an Emergency Event Report."*

On page 2 of 22 it states, *"a **water surface elevation of 101 .70 m SD at 10. 1 hours after it started**".* After what has started, embankment failure, quake or explosion?

Question 16. When the Imbil Weir on Yabba Crk just below the bridge is 76.4 m SD that is **25 metres** of water more than what is in the Yabba Creek now.

“Notify Downstream residents”. If the ground lined telephones are not working due to storm, earthquake or human interference, mobile lines are impossible to get as too many people are using them, they do not work. There is again another suggestion about photographing the event, we can only surmise so they can build it better next time. What is the point of notifying people who, due to the lack of any serious warning will be washed downstream before any warning is given?

There are nice reports sheets and graphs to be filled in but nothing in it about organising prior training, preparing the people who may have to “run for their lives” informing them of which way to go.

In **EARTHQUAKES AND DAMS IN AUSTRALIA** by Gary Gibson, Seismology Research Centre, RMIT, Melbourne from the Seismology Research Centre, RMIT, PO Box 71, Bundoora, Vic 3083. (Gary Gibson, B.Sc, Vice Pres Asian Seis Comm, AEES, GSA, SSA, EERI, AGU, SEG)

He states that large reservoirs can trigger earthquakes. This is due to either a change in stress because of the weight of water, or more commonly due to weakening of fractures and faults under the reservoir by increased water pore pressure. The energy released in a reservoir induced earthquake is normal tectonic strain energy, released prematurely. Study of induced earthquakes provides useful insight into the mechanism of earthquakes in general, because of the effects of pore pressure and because they are likely to be well recorded.

Several Australian reservoirs have experienced reservoir induced seismicity (Talbingo, Thomson and Pindari), and there are several cases of probable induced seismicity (Eucumbene, Warragamba, Gordon and Argyle). The proportion of reservoirs which experience induced seismicity in Australia is much higher than the world average.

Ground water plays a large part in earthquake activity. Fluid injection into wells in USA, Japan and elsewhere has triggered earthquakes. Water pore pressure reduces the normal stress within a rock while not changing the shear stress. Increased pore pressure is due to:

1. the decrease in pore volume caused by compaction under the weight of a reservoir.

2. diffusion of reservoir water through porous rock under the reservoir. The rate of flow depends on the permeability of the rock, so this effect is not instantaneous but takes increasing time with distance from the reservoir. It may take years for the pore pressure to increase at depths of kilometres beneath a reservoir.

These occur under any reservoir, whether there is reverse, strike-slip or normal faulting. The first occurs near instantly, while the second is delayed depending on permeability. Any increase in water pore pressure means that a failure is more likely. The critical value of the shearing stress may be made arbitrarily low by increasing the pore pressure. It is now believed that for RIS, increased pore pressure is more important than stress changes.

If there is a **major fault** near the reservoir, RIS can produce earthquakes exceeding

magnitude 6.0 (Xinfengjiang, China, 1962, M 6.1; Koyna, India, 1967, M 6.3). Several reservoirs have triggered earthquakes exceeding magnitude 5.0 (Eucumbene, 1959, M 5.0; Warragamba, 1973, M 5.4; Thomson, 1996, M 5.0).

Question 17. Has the new information compiled by Mr Gary Gibson and others been taken in to consideration by yourself and others in evaluating the safety of Borumba Dam, or would it alter any future assessments?

Question 18. As CERA and Dr Jack Rynn report that there was an earthquake at Borumba Dam in 1991, do you have any seismic reading equipment at the site that can deny or confirm, if so could you please inform me of what magnitude was this earthquake at Borumba Dam?

Question 19. If the unthinkable ever happens, who will take the blame, business manager, engineer, or the local council?

At the bottom of the first page of this Emergency Action Plan it states the words, “The content of this document has been reviewed by the Manager Dam Safety, and is considered adequate to provide timely warnings to the downstream Population who may be affected by a flooding from the Dam and **or Failure of the Dam.**” A brave man, I wonder if he reviewed the “snow melt” before he signed it? If it goes wrong maybe he should seek employment in an area that has snow melt.

Thank you an in anticipation of your reply.

Ron Owen

To Mr Peter Noonan
Chief Executive
Sun Water
Level 9 120 Edward St
Brisbane.
City East, 4002
Queensland.

Cr Ron Owen
24 Mc Mahon Rd
Gympie, 4570

Re- Safety Concerns for Population of Imbil from Borumba Dam

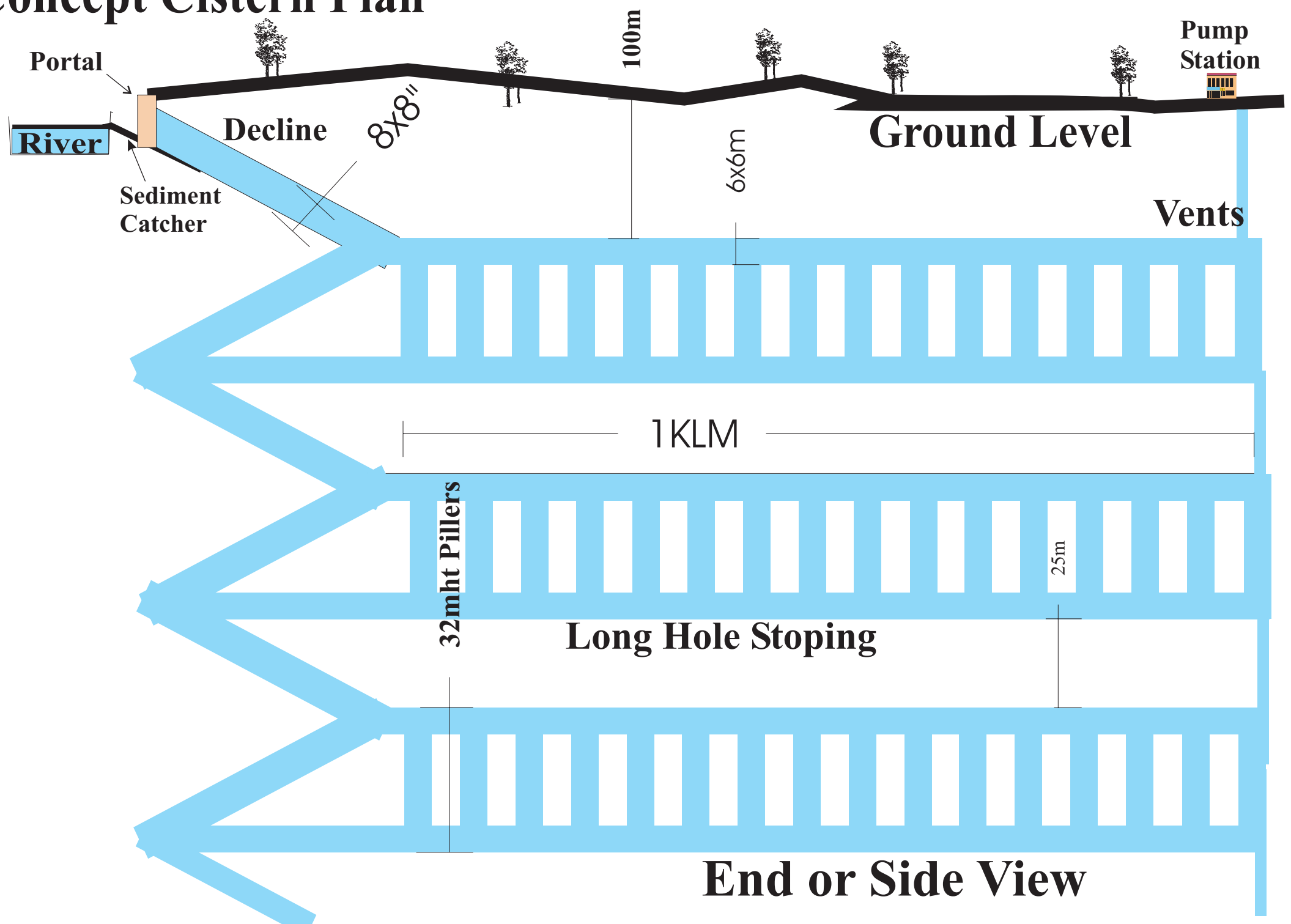
Thank you for your information concerning your membership of ANCOLD. Thank you for your information on the upgrading of the \$3.4 million Borumba Dam spillway. Thank you for your information explaining how Borumba Dam is a Category 2 failure impact rating, a

large Dam considered 'referable' one that would, in the event of failure, put population at risk. Thank you for your information on your safety manuals and annual inspections. Very pleased that your Emergency Action Plan is in the process of revision. Thank you for telling me that I should not be concerned about the safety of Borumba Dam. It is not the safety of the Dam I am concerned about. I am really concerned about your lack of concern for the safety of the people who live in its danger area. Your Emergency Action Plan which involves one employee phoning forty numbers and taking photos after a Dam Wall breach, to comply with your manual sounds like something from a cheap horror movie, but you are for real. Could you now please answer the specific nineteen questions? Answers that were promised by and directed to Mr Danny Green Business Manager Sun Water. 34 Enterprise Street, Bundaberg, Queensland, 4670 on the 13th Feb 07. If you require another copy please just ask. Sun Waters reluctance to answer those specific questions only increases public concern. The community deserves to know how cheaply its State Government values human safety before it imposes another larger 'Traveston Crossing Dam' over shadowing the much larger population base of Gympie.

Yours Sincerely

Cr Ron Owen
CC CEO and All Councillors Cooloola Shire Council
CC Gympie Life

Concept Cistern Plan



DAMMING DISASTER

THE DAM DISASTER REPORT

IS THE MARY VALLEY NEXT?!

WARNING! THIS COULD CAUSE
CONCERN FOR RESIDENTS.