MAINTAINING WATER SUPPLY ……. - F.A.N.G.

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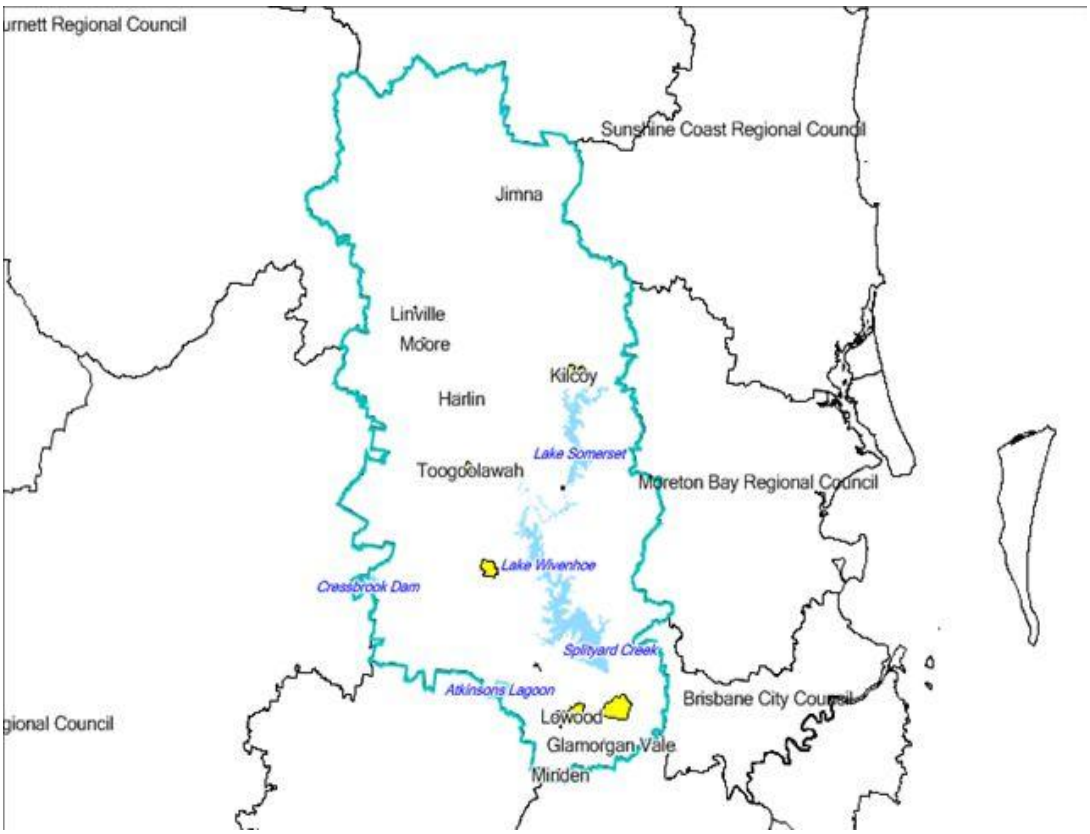
INTRODUCTION

This presentation is to tell our story of how we were able to maintain water supply to most communities in our region. I fully understand that there are a lot of untold stories of people's efforts during the recent January Floods of 2011, how unselfishly people worked to care and cater for their fellow man. That is why I thought I would try and portray the work that Seqwater put into the Somerset region during this event, not to praise our efforts but to relate what can be done, to the best of everyone's ability, with what is available. Some of the reticulation systems had flood damage and this caused loss of supply to certain areas, but this talk is related to keeping supply up to the majority of the reticulation system.

1.0 SOMERSET REGIONAL AREA WTP'S

The area we cover with our twelve "stand-alone" water treatment and sewage plants is quite a vast one with over 100 minutes driving time from Lowood at the southern end to Jimna to the north-west. During the start of the floods, accesses to all plants were cut off by road at one time or another. This did not make our job very easy, with the Area Co-ordinator stranded at Caboolture, myself stranded at home in Toogoolawah, the Esk operator not able to leave his home in Toogoolawah, The Lowood operator drew the "short straw" and was stranded at the plant, with his assistant flood bound at home. The Kilcoy operators were flood bound in Kilcoy and the Jimna staff member held back by landslides on the Jimna Range. We currently have 10 WTP's and 2 sewage Plants that we look after in the area. I will try and tell the story of each plant and what was done to keep supply maintained to all of our customers.



Linville:-

I had a phone call from the neighbouring farmer to the Linville WTP stating that the river level was rising rapidly on Sunday 9th January, and possibly could reach up to the Plant

Building overnight. I nearly fell over backwards when I heard this, he offered to go and turn the power off to the Plant in case the river level got too high. This being done, the whole area north of Toogoolawah to Linville lost power that night, some areas being progressively being restored with power over the next 10 days or so. On Thursday the 13th a generator was kindly offered to us by a local Trucking Company in Kilcoy and they delivered it, and Seqwater electricians had to make alterations to the switchboard so it could be used, and the plant was up and running again by late afternoon on Friday 14th. At the time of the power failure the town reservoir was almost full and got down to about 10% storage left after those 5 days.

Atkinson Dam:-
Only a small facility supplying a camp and caravan ground along with a few residential properties, but still needed water. The bore water pump switchboard was flooded and had to be replaced; in the mean time water was being trucked in to keep up supply.

Kirkleagh :-
Again only a small plant but still water is needed for the permanent residents in the Recreational grounds. No damage to infrastructure, but raw water quality was very poor and as the reservoir was quite full at the time and the park being closed, there was no need for the operation of the plant for a couple of weeks.

Somerset Dam Town WTP:-
Same as Kirkleagh with the reservoir again quite full on Monday 10th, and the raw water quality was very poor the plant was off line for a few days while operators concentrated on Esk. Water was being treated again with close observation by Thursday 13th January.

Wivenhoe Dam WTP:-
Again storage levels were relatively full and the plant was not operational for approx 2 weeks, as the raw water quality was very poor and resources of staff were utilised elsewhere so it was decided to truck water in for the interim period. We got it operational again after other sites were sort of back to normal, and we made clean water again with the area co-ordinator using his secret herbs and spices and some minor engineering feats.

Jimna WTP:-
The raw water pump pontoon got broken in half and washed away, lucky we had standby pump that is situated down into the weir hole and it could be used. As the operator lives in Jimna the supply of water was kept in check, and as people realised there could have been problems with water supply, cut back on usage. The pontoon pump was reinstated late the next week, and changes in treatment processes were required to continue to supply water within specifications.

Kilcoy WTP:-
The Raw Water Pump Station at the Kilcoy Weir lost electricity on Monday the 10th of January, due to power lines and poles being washed away. There was approximately 50 % of water supply in the town reservoirs at this stage and running out quite quickly. On Wednesday the 12th with the help of QUU staff and a local electrician the Kilcoy Operators had a standby bore that had not been run for over 2 years fired up and water was pumped to the Kilcoy WTP by that evening at a rate of 5 l/sec.
The quality of the bore water was very good and only minor treatment processes were needed to produce good quality water to the town. Meanwhile over at the standby Diesel Pump Site we had a huge amount of work to do to get it up and running. The local residents, who live very close to the Somerset Dam upper reaches, rang Council and asked if they should pull the container (which houses the diesel pump) out of the water form the rapidly rising Dam level. They achieved this with the use of 3 tractors and some

mighty amounts of manpower. They had to disconnect the delivery line off the container, and then drag the container, including the suction line which is approximately 100 metres long to higher ground. On Wednesday 12th, Seqwater staff were flown in by helicopter at about 1pm to get this pump working, so Kilcoy would not run out of water. A stranded diesel fitter from the mining industry ably assisted our electrician to start work on the flooded motor. The oil had to be drained and filter replaced, electrical components had to be dried and tested. Everything that could go wrong just about did, with the oil sump plug being rounded off in the past and with little tools available, we had to call back the fitter to get it off. The delivery line was floating some 40m out from the shore and had to reconnected to the pump, what a mongrel of a job this was. With the use of the locals boats and canoes we managed to get it connected by 2 of us standing in "neck-deep" water to do up a 6" flange. Just lining it up and get bolts in place was difficult. The coordinator is a short ---- and he got out of this task. Upon getting 2 bolts in and with my hands cramping up and something causing skin irritation around my groin, I had to get out and let the others take over. Luckily one of staff had Naval diving experience and with all of us together with the area co-ordinator got the pump up and running by approx 8pm that night. Then it was time to get the WTP operational, as it had been sitting idle for some time and needed some attention before sending out the water. We managed to make water until 3 am on Thursday 14th, when the diesel pump lost prime. We shut the motor down to re-prime the pump but then could not get it to start again due to stater-motor failure. We were able to source a spare one from the Council workshops which was a spare for this motor anyway. Up and going again by about 2pm, we then had to use a polymer to assist with coagulation as this plant never seen poor raw water like this before. Continuing into the night and the following morning, we managed to keep Kilcoy with a water supply within ADWG and we produced close to 2 ML before the normal Kilcoy raw water pump station was resurrected.

With no power at the raw water station, of course the sump pumps did not do their job, thus all pumps were submerged in the dry wells. The wells were pumped out on Thursday and motors were allowed to dry out before being checked by our brilliant sparky the next day. Energex had power restored on the Friday afternoon and the Kilcoy WTP was back in action and the operators started shift work to get storage levels back up to a normal level.

Lowood WTP:-

This is the largest of our treatment facilities supplying water from Fernvale through to Withcott including Towns like Lowood, Fernvale, Laidley, Gatton, Helidon and Withcott. We lost power for the raw water pump station and the WTP on Tuesday 11th January and there was no access to the pump station, nor was there any access in and out of Lowood. On the 13th January power was restored to the WTP, and access was again available to get to the Raw PS. All 3 river pumps were submerged along with some switchgear and variable speed drives which means we could not transport raw water to the WTP by normal methods. Our maintenance team and engineers of Seqwater banded together and with the help and assistance of Queensland Urban Utilities and contractors sourced and made available a Diesel generated pump capable of supplying water to the WTP.

This was up and running by 7.30 pm on the 14th January, and we got some water up to the plant for a short period until the VSD on one of the booster pumps decided to fail and production stopped at 2.30am on the 15th January. During these last couple of days we received help from not only QUU but also from the Police Fire Brigade, JPR Electricians, Energex and along with Seqwater personnel got some extraordinary things done. With the Brisbane river levels rising and dropping, rising and dropping due to releases from Wivenhoe and the huge amount of water flowing down the Lockyer Creek, it was very tiring for Seqwater Engineers and the work crews as they were required to relocate the pump and container several times. There were failures with delivery pipe work and it had

to be replaced with Ductile iron pipe and fittings that was sourced from everywhere from Ipswich, Lowood and Esk QUU depots. Staff worked 16 – 20 hours straight at times to make it all happen, cranes were used to shift the pump container and A & M excavators were called at midnight one night to pull the crane out of a bog. Gravel was carted in to restore the track and diesel had to be sourced from wherever we could.

Due to the very heavy rainfalls across this widespread area water main breaks were inevitable, the former Gatton Shire lost a large section of main and inundation of switchboards and pumps at Withcott, meant that area lost supply of mains water. Minden Estate at Lowood also suffered a loss of supply due mains in a gully being washed away, Fernvale lost its supply due to a pipe work stress block being blown away due to the sogginess of the ground. On another night operators working shift work noticed that Fernvale reservoir was losing and not gaining at around 2 am and QUU local plumbers were called in to look for another main break, this was found and fixed in very good time.

The main break at Minden caused the Tarampa Balance Reservoir to go completely empty, and this was on the 11th January, and as this reservoir also supplies Gatton and Laidley, we could not give them any water. On Thursday the 14th it was decide to truck water into Lowood WTP from Ipswich to try and maintain levels and get a head start on delivering water to the Lockyer Valley region. We pumped to the Balance Reservoir in small sessions to fill the mains on the outlet side took quite some time. At this stage we were also obligated to ration supply to Lowood and Fernvale as to get most of the trucked water up and into the Lockyer supply areas. During this week and the following couple of weeks the Lockyer Valley QUU staff worked with us tirelessly by understanding our predicament and fulfilling our requests of when and where they could take water from us and this meant a hell of a lot of valves that had to be turned off and on, and as most of you are aware some valves can take up to 100 turns to operate them. Most of the decision making was done directly with the guys at the coal face, as this enabled a quick response to the reactive situation, and communication with Head Office was often limited. Approx 2 ML was trucked into the Lowood WTP over the next day or two, this helped keep up with our rationing process.

With river levels all over place we had treat water that ranged from 100ntu to 2500ntu during at the end of that first week and into the next. Major problems still existed at the river where the diesel pump was being sat for the final time, this was on the 19th January. Then on the late on the Sunday 21st and early hours of Monday morning the turbidity climbed from 950ntu at 9pm to 4220 at 3am (6 hours). With this being straight conventional with no tertiary treatment at all, the plant performed brilliantly throughout this whole period and beyond. We had settled water at no greater than 4 ntu and filtered water at less than 0.1 ntu, during this rapid rise of the raw water turbidity, none of dosing is controlled so it was all manually adjusted quite often. Polymer dosing was started for the first time at this Plant, during this event and has only recently been turned off.
Also we had only just had new lime pumps installed and they really came in handy, at the peak of the high raw water turbidity, we had 3 Liquid alum pumps, poly dosing ramped up and 3 lime dose pumps running flat out. The clean up and recovery of the raw water intake took approx 6 weeks to get all back to normal.

Figure 2: ***Raw water @ 4220ntu (left) and the final treated water @ 0.24ntu***

In the lead up to the wet season or storm events, we adjust our calling levels of any of the reservoirs in our control so that they are quite full at any given time during the day. We also liaise with the local QUU staff and advise them if they could assist with this as well. Chemical storage is always maintained at close to capacity as possible; as some of our sites are remote we need to make sure we have enough in stock to ride out the height of any event.

In conclusion to this paper I would once again thank all Seqwater staff including the CEO, EGM, Engineers, Maintenance crews and contractors for their massive efforts in ensuring we kept up with supply to our customers. Also to the Operators who ably assisted us out here in the Somerset Region. They came from near and far to help us maintain safe potable water to the regions we cater for. Shift work had to be introduced to enable each and everyone get some of a break when required. During the initial part of the event, staff were running themselves into the ground by working up to 18 hour days, but hey, this what Australians do in time of need.