

DRINKING WATER MANAGEMENT SYSTEMS IMPROVEMENT PLAN – TACKLING THE BIG LIST!!



Paper Presented by:

Jillian Busch & Belinda Green

Authors:

Jillian Busch, *Technical Officer & Director,*
Aqualift Project Delivery

Belinda Green, *Director,*
AquaGreen Project Solutions



*10th Annual WIOA
NSW Water Industry Operations Conference and Exhibition
Newcastle Jockey Club,
6 to 7 April, 2016*

DRINKING WATER MANAGEMENT SYSTEMS IMPROVEMENT PLAN – TACKLING THE BIG LIST!!

Jillian Busch, *Technical Officer & Director*, Aqualift Project Delivery
Belinda Green, *Director*, Aquagreen Project Solutions

ABSTRACT

This paper will outline the program that Kempsey Shire Council undertook to address the significant list of actions that were reported in the Council's Drinking Water Management System (DWMS) Implementation Plan. It will identify how the Council staff were taken on the journey after being presented with a list of 170+ outstanding actions and how in the initial stages, further understanding of the identified risks from the DWMS risk workshops were conveyed to staff who weren't involved in the process.

The journey involved operational staff gaining understanding of the process, the identified tasks, the outcomes and the documentation required to sign off on the listed actions. It also identified how 'things' that were done or not done in the past, needed to change.

The paper will identify the learnings of tackling the 'big list' and processes, from a management, technical and operational staff perspective; how priorities were set when addressing the key challenges of staff levels, workloads and culture within the organisation; and what the challenges of working as a consultant entailed.

After working on the task list for 12 months, the outcomes have been varied, but progress has been made in addressing key vulnerabilities such as chemical dosing interlocks, water quality data and Critical Control Point monitoring. Many of these tasks are ongoing, so this list is still a big list! This paper will also discuss how the Council will continue to achieve the improvements required and the support that they envisage is needed to maintain momentum, to ensure this does not end up in the 'too hard' basket or become another document gathering dust on a shelf.

1.0 INTRODUCTION

Kempsey Shire Council has a total of eight (8) water supplies that provide drinking water to townships within the Shire. The source water varies from relatively protected groundwater to unprotected groundwater, and groundwater with surface water interaction. Kempsey also has a 2500 ML dam for the Kempsey and Lower Macleay drinking water supply. The Lower Macleay includes all the rural areas and townships along the Macleay River downstream of Kempsey.

The level of treatment is varied from single barrier chlorine/chloramination disinfection only (5 sites), to membrane, DAF or multimedia filtration at 3 sites.

The Kempsey & Lower Macleay supply system is the largest for Council and was initially considered as the highest risk, especially as the groundwater is unprotected and incorporates a dam where the treatment is chlorination only. For this reason, Council implemented the development of a DWMS for the Kempsey & Lower Macleay supply in 2012. This was prior to it becoming a requirement by NSW Health. In 2014, NSW Health allocated funding to Kempsey Shire Council to develop a DWMS for the rest of their supplies. Council engaged a different consulting company to assist with this development.

The combination of eight water supplies, two separate consultants, two distinct DWMS (both with a large list of implementation works required), meant Council had a very large list of tasks to tackle once the DWMS were completed. Since the DWMS were adopted, a local consultant team was engaged by council to provide the additional resources needed to continue with development of the DWMS and the Implementation Plan.

This paper provides some insight into how the team has worked with Council to do this, the obstacles encountered along the way, some of the tasks undertaken and what has been learnt from the process so far.

2.0 DISCUSSION

2.1 Obstacles/Challenges

There were many challenges that Council have had to face in trying to tackle the ‘big list’ - the Implementation Plan (IP) Action List. Prior to completing the DWMS, two key staff, Manager Water Process and Technical Officer Water Process, both left the organisation. The Manager Water Operations became the default driver of this system, with minimal support from others. Tasks that had been allocated to the vacant Process Manager position were largely added to the expected outputs for the Manager of Operations, so that the implementation plan did not grind to a halt. This has been a huge workload for already stretched resources.

With so many water systems to manage, when new staff start with Council, it takes a lot of time just to learn the supply systems. This has delayed some of the implementation work as staff adjust to the new working environment. Additionally, where new staff have come from interstate, where DWMS have been in place for some time, it has been a difficult task to bring them back to the bare basics and make them understand that Council was still putting together the building blocks of the DWMS. It has been somewhat of a shock for them too, to realise that some of the basic systems and requirements of the DWMS are not yet in place and even worse that they may be responsible for implementing them.

Council is still in the process of developing electronic records and it does not have many documented processes or procedures currently in place. This has meant that information gathering has been difficult, where documents are all over the place, and a lot of information is still in hardcopy/written form. This has improved since the implementation of the DWMS, which has made some information more accessible, however they still have some way to go, in documenting procedures.

The development of the DWMS has been heavy on already stretched resources. While Council is dedicated to tackling this list of 170 tasks, it has been quite difficult for them. As some tasks have been undertaken, they have in turn created more tasks which have needed to be added to the list. At this stage it is difficult for Council to envisage ever completing, or even depleting the ‘big list’ to a reasonable level. In effect the DWMS is leading Council along the road to a continuous improvement program.

As a consultant team engaged by Council, it has become our role to help drive the implementation work. This has been challenging, with having to fit this review in with the staff’s normal work demands. The whole process took longer than expected and we had to be strategic with how went about it.

Flexibility with time lines and review processes has been essential from both Council and consultants to ensure the best service and outcomes possible.

2.2 Actions Undertaken

A number of workshops were initially conducted to introduce key staff to the DWMS. These workshops were tailored to the audience, where some received introductory sessions and key staff were introduced to the system in much more detail. For the treatment plant operational staff, amongst other things, this included a very detailed workshop discussion on all of the Critical Control Points (CCP), a total of 32 for their treatment plants. These were conducted as part of a review process, with changes made to CCP's during these workshops and some additional tasks added to the Implementation Plan (IP). An introduction to some of the tasks was also needed to be undertaken with key staff, as part of this IP review. Crucial to these workshops has been the keeping of detailed documentation and meeting minutes, to ensure that all changes are traceable.

With two DWMS developed for Council, there were also two Implementation Plans. One of the first jobs was to integrate these IP's into one list, and look at where tasks were similar, to merge them into just one rather than two lists. This helped to bring the list down from over 250 tasks to a more manageable list of 170. Further work was needed in developing these issues into individual task lists for each staff member, with higher priority tasks needing long term planning allocated in the first instance. Meeting with the managers helped to understand their priorities and resources available - the lists that were developed focused on high risks, tasks that should be easy to implement, and also allocating the tasks that needed to be outsourced when/if funding was available.

One year on from providing the task lists, an internal audit was undertaken on the IP. During this process, it was possible to provide further one-on-one training of staff to help them understand where all these tasks have come from i.e. risks and hazards originally identified, help prioritise the actions associated with the CCP's, and identify any additional actions. It was also a time to reflect on the allocation of tasks and help identify who within the Council had the most tasks and how they were progressing. Of the key staff within the Council, a graph was prepared to represent the allocation of tasks (Figure 1) which clearly identified that two of the staff (Manager of Water Process and Water Tech Officer) were/are carrying 63% of the load of the work.

During the IP review time, interviews were conducted with staff on a one-on-one basis, and where actions were deemed to be completed, the evidence of this completion was explored and then a progression score was rated against the tasks. This score was mutually agreed and if required, further clarifications of the outstanding actions were recorded. The end result enabled a graph to be prepared of the progression of the IP tasks (Figure 2) and an understanding for management of where progress or further assistance is required.

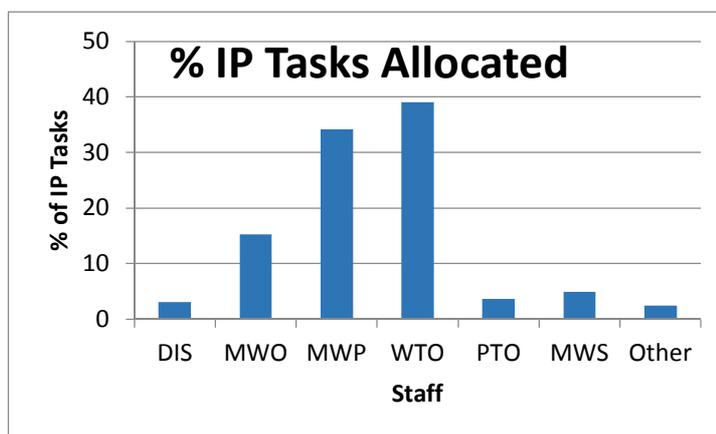


Figure 1: *Implementation Actions Allocated to Staff*

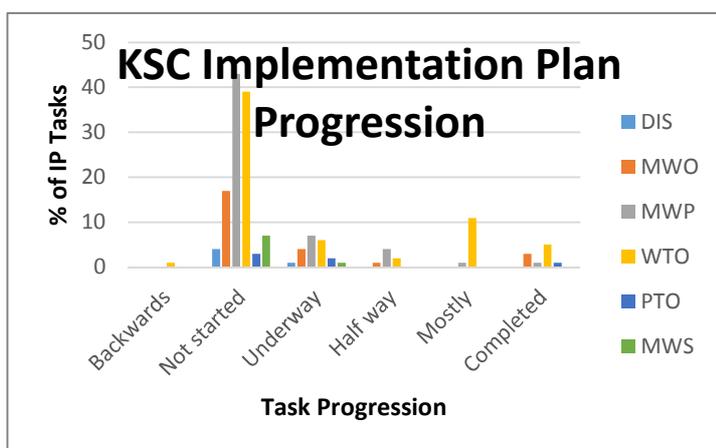


Figure 2: *Overall Summary of Implementation Plan Task Progression*

One of the high priority actions of the IP was the need to understand the chemical dosing interlocks at each of the treatment plants. This action was driven from risks where it was known for example that a raw water pump could keep pumping when a chlorine dosing pump had failed. This task involved visiting each treatment site, and going through all the controls and interlocks at the plant with the Council electricians and the treatment plant operator. An industry expert assisted with the first couple of audits, to determine the scope and also provide technical and peer support throughout the process.

The outcomes have been documented into an audit report for each site, with detailed photos included, and a list of proposed actions has been developed. This detailed review has identified many issues that Council was not aware of, as well as provided further opportunities to introduce the concepts of the DWMS and in particular CCP monitoring. Some of the issues have included;

- Delivery pumps that will continue to run when the chlorination system has failed
- Single chemical dosing interlocks with no secondary interlock in case of failure (flow switch only and not utilising existing flow meters)
- Untidy sites with a lack of good housekeeping or modern site layout
- Inadequate dangerous goods storage
- Untidy wiring & PLC's with no control capabilities
- No capabilities to do chemical pump dose rate tests

- Inadequate storage of chemicals with the potential for contamination
- CCP sample lines and taps not identified or adequately labelled

The Interlock Audit has resulted in an even larger task list than the implementation plan. These actions have been a key to providing guidance to staff on immediate priorities, and has greatly assisted the SCADA upgrade project that is being undertaken by Council. It has also provided direction for where some major upgrades are required to facilities, allowing actions to be prioritised.

2.3 Learnings

There have been many things that have been learnt throughout this implementation work. The following list outlines some of these learnings and also provides some thoughts on how other Councils may consider tackling their “list”.

- Trusting the consultants in taking on the role of the Managers in many instances to drive the implementation, has been key to the ongoing successful outcomes, which otherwise would have ended up on the shelf due to the day to day management priorities and a lack of strategic resources. Not only helping to identify and drive the priority areas, but conducting meetings to update on the progress and also being available to discuss and advise on issues as necessary.
- Additional time was needed with the WTP operators, to give them the opportunity for two way communications to help them understand. It enabled any issues or concerns to be addressed there and then, or to act as a conduit to take these concerns to management. Also some reassurance was provided to them that they have been heard and actions are being planned.
- Involving the Local Public Health Unit and helping them to understand that progress is happening has been invaluable. This has also helped Council to understand the LPHUs priorities and needs.
- Sharing information with other Councils or Water Utilities who may have had similar experiences/actions or examples of how to complete or resolve similar types of issues. Too often we ‘reinvent the wheel’ when we probably didn’t need to – e.g. developing a very large list of Standard Operating Procedures & Incident & Emergency Response Plans that could be relatively generic with templates etc. that would help other councils.
- The IP Audit helped the staff to appreciate and accept the changes that have come as a part of the DWMS i.e. CCP’s, documentation, monitoring & reporting. It also provided an opportunity to review tasks that staff felt were completed, which upon review, contained some gaps. An internal audit also means a softer review as opposed to NSW Health becoming involved, which would probably be harder on staff and involve more serious outcomes.
- A ‘disconnect’ was occasionally observed between knowledge from risk workshops and the allocated tasks lists – i.e. some staff did not understand where the actions had originated and why it was necessary. It is important to be mindful of who is receiving the task, what their history is and identify where some tasks may need to be discussed at the beginning or when allocated (e.g. writing an SOP is simple and doesn’t need much explaining but developing a monitoring program to identify a risk is more complicated).

- Be aware of staff's workload issues and be flexible in managing the timeframes so that workloads are effectively managed. But also ensure staff know where priorities do exist and identify where assistance is required.
- The IP and DWMS is a 'Living document' and as issues arise, actions need to be added along the way. Staff need to be sure that any issues they find are documented, so there is an action trail for the issue. For example, the actions arising from the chemical interlock review highlighted a big gap in knowledge of what was thought to be happening and what was really occurring out in the field, however with this information there is more confidence in the overall outcomes.
- Graphical representation of the IP Audit has helped to look at the fair allocation of tasks and an understanding of how the IP tasks have progressed. It has identified where more support of resources will need to be provided.

3.0 CONCLUSION

The reason Kempsey Shire Council has managed to progress with implementation of the IP, is with the commitment from support provided by 'on-ground' consultants to supplement their existing workloads. Experience with other councils, indicates that many are in the same situation. Staff have high workloads with their normal responsibilities; at times they find it difficult to allocate time & resources to implement these actions and have minimal access to finance to get outside help.

Most staff have embraced the consultants work, as they are seeing things they are complaining about being addressed, and they can see the need to do this work and can now feel more secure in their roles. Example - one comment was that having online analysers would kill their overtime, but by explaining that as this will help identify when intervention is required instead of having to manually check it all the time.

Council still has a very big list, made even bigger with the addition of the actions from the chemical interlock audits. They have started working on a large number of tasks, but most still need to be driven to completion. There needs to be a 'champion' within Council who will be responsible to drive its progress. Council also needs contractors with a personal interest and technical knowledge of Council, to help drive these actions. Councils need finances and resources to be directed towards the implementation of on-ground actions and assurance that this support does not further burden their already stretched resources, by creating additional paperwork, rather than completing actions.

4.0 ACKNOWLEDGEMENTS

Kempsey Shire Council for sharing their information and ideas with us to be included in this paper, and allowing us to discuss how they have progressed with their implementation works.

Murray Thompson, Director of MTWS, for his development of the chemical interlock audit and his ongoing technical support and guidance to Council and Aqualift, with the implementation of the actions out of this Audit.