

**BECAUSE THAT IS THE WAY WE HAVE ALWAYS
DONE IT**



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

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ABSTRACT

It's interesting starting in a new organization. Discovering how and why decisions have been made and habits formed.

Take, for example, the effluent meter readings at the Moree sewerage treatment plant. With only three meters to read, you'd think it wouldn't be that difficult to get it right. Right? Particularly when we are charging customers for the effluent and our EPA license conditions require reporting of quantities and locations of effluent discharged to the environment.

The effluent provides water for irrigation at the golf club, cemetery, local sports field and a citrus farm. But what are the consequences when you're reading and recording the meter that you assume serves the golf club but really serves the sports field?

With some redundancy built in, which includes a separate meter at the golf club, effluent quantities were not adding up. A not so simple problem when accounting for effluent and raising invoices for usage charges. Engineers, being the curious lot that we are, tend to ask lots of questions. And resolve lots of problems.

And so it is that this process has allowed us to perfect our skills in writing Council reports, investigate data gaps for the NoW and EPA reports, build positive relationships with the community and ensure pricing equity.

1.0 INTRODUCTION

Moree Sewerage Treatment Plant is a secondary treatment facility producing 3ML to 8ML of effluent per day. Council fully disposes of all effluent via facilities within 2.5km radius of the treatment plant. The effluent water is distributed via pipe work to the Moree Golf Club, the cemetery, Ron Harborne Oval and a citrus farm. The golf club and citrus farm are on a 7 year lease arrangement with renewable options now into their 3 term. The oval and cemetery is an internal supply agreement within Council between Water & Waste section and Engineering parks and gardens.

It came to light with the arrival of new staff that not everything balanced with effluent volumes and areas being irrigated. Meter reading records showed that the golf course and Ron Harborne oval had near identical volumes being disposed of, when the area of the golf club was 3.2 times that of the oval complex. In a hot and dry climate with heavy clay soils something just wasn't making sense. Further checks with another meter at the golf course didn't relate to volumes being read at the treatment plant.

To complicate matters, three meter reading sheets are maintained:

- Daily flow volumes and pump hours at the Sewage Treatment Plant
- Weekly bore meter reading
- Monthly bore meter reading
(it is still unclear why we need both a weekly and monthly meter read on the same meters).

With limited resources nothing occurred until 2015 when new staff were employed, which allowed an investigation to be carried out to try and sort the discrepancy and thus issue invoices to the Golf Club.

The last part of the year revealed, through asking many questions and re-asking the same questions, that one meter was labelled with another name on the meter read sheet.

This situation had developed over many years with staff coming and going until it became a habit “because we have always done it that way”. Further investigations affirmed that staff said they knew the naming of the meter was wrong but continued with the process that was in place as that’s what they were directed to do.

2.0 DISCUSSION

The timelines of events started with an appointment of our Service Engineer in 2011. He went through the usual process of learning what happens where, and asking some questions. At the end of six months he thought he had an understanding of the pipe network, and consequently changed the meter reading forms as he thought appropriate, which left the Operational Staff with meter reading sheets that didn’t reflect the consumption at each site. Unfortunately the Services Engineer left Council in mid-2014 and there was no further progress on resolving the issue until 2015.

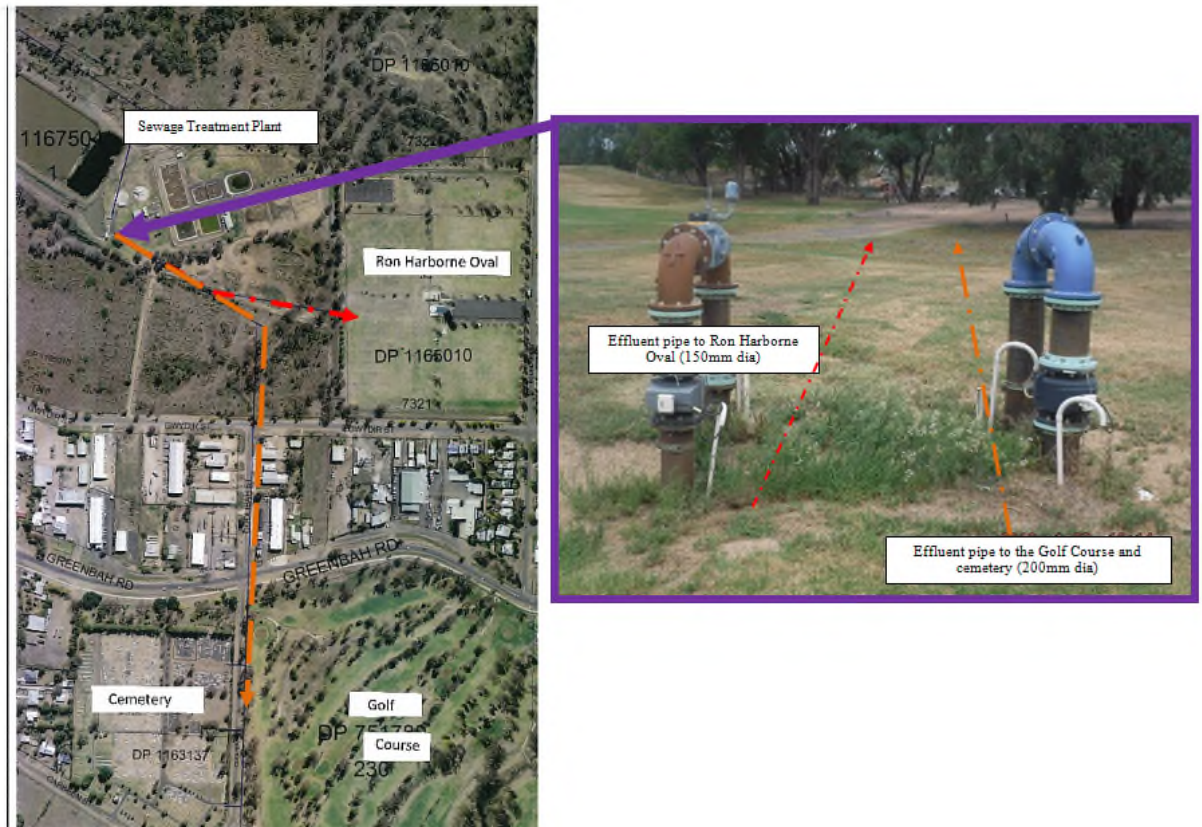
In mid-2015 a new position was created to improve resourcing to assist the Water & Waste Manager (a Director but Council didn’t want the title). That’s where I came in as Water Services Manager. Again after the initial induction period and being shown the various operational areas, the pipe work for the effluent reuse was inspected. It was confirmed that all effluent pipes had both a mechanical meter and magflow meter.

As no invoice had been issued to the Golf Course for the consumption of reuse water since April 2014, the plan was to investigate this arrangement and find out what was actually going on. This coincided with budget preparation, manning issues, capital budget plans, reports to state government and general business of council demands.

Needless to say nothing happened until a new Service Engineer started middle of 2015. After a short time questions were asked about the effluent reuse and quantities which didn’t match the land disposal areas (driven by the need to complete the statistics for the NSW Office of Water Performance Monitoring Report)

This time with better resources and staff that cooperated and worked together, results were achieved. Many questions later and answers being supplied a picture unfolded that didn’t match what we thought we had, based on the meter reading sheets.

2.1 Location and Layout of Effluent Reuse Facilities



2.2 Results of Investigations Carried Out

What unfolded after months of research was our Sewage Treatment Plant meter read sheet had Golf Club as a heading instead of Ron Harborne Oval (Figure 1).

It became apparent that although the Operational staff who were reading meters knew which pipe supplied which disposal area, and they acknowledged the heading was wrong on the sheet, they followed the instructions of the previous Services Engineer and recorded the wrong meter reading for the wrong site.

Outflow - Kirkby's	555495K
Golf Club	0654720

Figure 1: *Moree STP July 1 2015*

In addition, the two magflow meters (for Ron Harborne Oval and the Golf Course) (Figure 2) were read irregularly as:

1. the meters are in the pump shed, and the sewage treatment plant operators didn't go into the shed; and
2. the weekly meter reads were originated as part of the justification for overtime worked on the weekends.

WEEK ENDING *5.7.15* WATER & WASTE

PUMP	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
GOLF CLUB MTR						769504	769529
HOURS 1	*	*	*	*	*		*
HOURS 2	*	*	*	*	*		*
HOURS 3	*	*	*	*	*		*
HOURS 4	*	*	*	*	*		*
OVAL MTR						789576	789834 @ 2.79%
HOURS 1	*	*	*	*	*	4412 *09	4430 *46
HOURS 2	*	*	*	*	*	873 *46	873 *50
HOURS 3	*	*	*	*	*	886 *47	886 *49
HOURS 4	*	*	*	*	*		
HYPO							
COMMENTS							

Figure 2: Weekly Meter Reading Sheet – Week Ending 05 July 2015

To add to the equation the magflow meters are calibrated six monthly. Until November 2015 these meters were calculated to the wrong pipe diameters. This came to light when we were on site discussing the quantity discrepancy in relation to the disposal areas and the calibration contractor, who was showing us the magflow display, went very quiet. After checking, he mentioned the next day that our readings were all in error as they were calibrated to the other pipe size. 200mm for 150mm and vice versa. This affected 17 years of results.

Fortunately for us, the Golf Club has a 200mm mechanical meter which has always been read. These meter reads are recorded on a separate (monthly) meter read form (Figure 3). As we have always done it this way, this meter data helped supply reliable data for us to work through and once the magflow was re-calibrated to the right diameter, it was proved that the mechanical meter was still within 2% accuracy.

The cemetery has three separate 100mm mechanical meters supplying sections of the cemetery. These were all recorded on meter read sheets with the right descriptions.

GREENBAH	FILL		
SMALL METER - 065866		0657986	//////
CEMETERY			
1		043996	
2		007496	
3		023574	
GOLF CLUB		4422843	//////

Figure 3: Monthly Meter Reading Sheet – July 2015

2.3 Effluent Discharge Results

Once we ensured all meters were calibrated appropriately, and the meter readings were processed we were confident that the invoice to the Golf Club would accurately reflect the consumption over the past 15 months.

We had been close to the right amount used on Ron Harborne Oval and therefore didn't need large journals to be carried out for council's engineering section. One bonus that came out of all the investigations.

The cemetery was also right - no journals needed.

Another impact was our reporting to EPA and the NSW Office of Water for disposal of effluent water. Quantities were higher than those reported due to wrong readings being used and our calibration issues. Reportable amounts will be correct in this financial year's statistics.

2.4 Lessons Learnt

- Ask questions and be persistent and ask again. Listen to the answers and don't assume anything.
- Don't accept what is at face value.
- Build a rapport with staff as best as you can at all levels. Keep communication channels open as far as possible. If someone shouts does that mean they are more right?
- Check data, monitor and review on a regular basis.
- Don't fall for the trap "Because that is how we have always done it" so it must be correct.

3.0 CONCLUSION

What appeared to be such a simple starting point of determining used effluent water quantities turned into a three month detailed investigation.

Firstly, the quantities used (based on the three different meter reading sheets) didn't match up:

- Some effluent meters were being read, but not all of them.
- Not all the meters were read at the same time, some daily, some weekly some monthly.
- What we thought were regularly calibrated (magflow meters) on a 6 month cycle were calibrated to the wrong pipe size. (Council hasn't sought a refund from the contractor!).

Secondly, the gut feel of the total land disposal areas compared to quantities of effluent used (i.e. roughly 3 to 1 ratio for the golf club to oval consumption; magflow reading were reflecting a 1 to 1 ratio).

Finally the 200mm mechanical meter for the golf course and the 3 x 100mm mechanical meters for the cemetery were read and recorded correctly.

The golf course reading on another meter read sheet facilitated the oversight of not picking up the wrong named entry on the weekly meter read sheet.

From that starting point we found, after many questions usually asked more than once, the following:

- Not all information can be taken on face value. Be persistent in asking when trying to work out solutions. Then ask again.
- Visit site to gain a visual understanding of what's going on.
- Get a good understanding of the people and skills available, build a rapport, keep communications going in all directions.
- Check data, monitor, review and compare to see still on the right track.
- Avoid the trap "Because that is how we have always done it".

4.0 ACKNOWLEDGEMENTS

To all Moree Plains Shire Council staff in the Water and Waste section. Without their co-operation no solutions would have been achieved. In particular Kent Harris, Jason Southcoat, Michael Baker, Barry Ryan, Carmel Kennedy and David Wolfenden.