Revolution in Trade Waste Data

Why is the wastewater industry set to benefit from today's data revolution? Mott MacDonald's process and environmental team leader **Nick Dempsey** explains.

We are currently going through what is often described as a data revolution. Recent estimates surmise that 90 percent of the world's data has been created in the past two years, and this continues to grow. Our ability to capture and analyse data is crucial in maintaining economically efficient processes – and the water and wastewater industries are no exception. In fact they are prime candidates to benefit from the big data revolution.

There are over 60 Councils in New Zealand that currently monitor trade waste from some or all industrial contributors. Some of these do so under a Trade Waste Bylaw (Local Government Act [LGA] 2002), while others are via individual trade waste agreements. In all cases, cost recovery and understanding the risks are key. How does the Council understand what proportion of the cost for the treatment of the wastewater entering the plant is associated with the trade waste customer compared with that from the domestic customer? And how does the Council cover administration, regulation and monitoring costs for its trade waste customers?

Councils that manage industrial wastes have many obligations to balance and stakeholders to satisfy. They must protect the people in their community and the wastewater system servicing them. They must minimise the effect of discharges to the environment within the bounds of their consent or other obligation. And they often have a number of other internal, regional, or national KPIs. This work comes at a cost and it must be maintained at manageable levels, so any opportunity to reduce data handling benefits all stakeholders.

MANAGING THE DATA

The more we know about a process, the more we are able to control it and if we are in full control of something we can drive efficiency. Data gives us the ability "to know", but only if it is in a format that we can readily utilise and manipulate.

The current practice for trade waste management in many New Zealand Councils is manual data collection and analysis. This often involves many spreadsheets that collate and store information on different computers and with different people.

However, spreadsheets rely on manual user input, can be clumsy to maintain, have a limit to data storage, rely on the acquisition of special knowledge in order to use them, and lack accessibility. They often become the unwitting harbourers of human error and are vulnerable to the 'silo effect' whereby data is locked in a proprietary spreadsheet which in turn is hidden away on "Bob's" computer and only remains useful up until the point when Bob leaves Council, taking with him all the knowledge and methods required to utilise the information. Spreadsheets stagnate data and take away the inherent informative power of data.

The rest of the world has moved on from this form of data "management". Our personal lives are now hyper-connected and dynamic with interactive systems like Facebook and Google, and we would no longer tolerate isolated and clunky storage. Our modern world exists on the internet or "cloud". This allows our data to be accessible from many devices and many different people, it gives us the power to transfer data between platforms, display, navigate, interpret and add data easily. Cloud-based data storage doesn't require special knowledge and it allows data to exist in perpetuity. If this is the way of the future, then why shouldn't this be the case for trade waste management?

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Digital cloud-based middleware that links data with engineer expertise to create value from data is the solution, and it is already with us. It needs to be applied to our industry, as it is with the rest of our daily lives. This provides an easy-to-use interface that allows interaction between councils, engineers and laboratories.

Platforms such as H2knOwhow mine data from GIS, SCADA, CAD, BIM, remote sensors, CCTV and laboratories, and then funnel this through a trade waste database model. This can be programmed to include whichever proprietary model is most applicable for a Council to produce a useful output. These outputs are exposed to a wider audience to inform stakeholders with real time and fully interactive reporting and result visualisation to any device.

Collection of data through a cloud-based platform in this way allows for automation, accessibility and integrated data storage, analysis and interpretation and allows for automated

trade waste invoicing, mobile applications for field data entry, an easy and accessible platform that links treatment plant operations and consenting data and sophisticated data visualisations.

IMPROVED DATA MANAGEMENT

A number of local councils have taken the logical step of transferring their trade waste systems onto map- and cloud-based platforms for improved management and invoicing.

Palmerston North City Council (PNCC) receives and manages the discharges from a significant number of trade waste customers into its wastewater network and through the wastewater treatment plant (WWTP). The trade waste contribution is approximately 12 percent of the flow to the plant and 28 percent of the input load. This equates to approximately $780,000 of revenue to cover costs on an annual basis. This work is currently undertaken and overseen by Trade Waste Officers (TWOs) with associated help from depot staff.

The effective management and administration of trade waste takes a considerable amount of TWO time and in particular the access to, analysis and management of the data and information. Current costs involved with trade waste management include:

- sampling scheduling;
- data inputting;
- liaising with clients and la;
- consenting and providing information and results to clients;
- inspection of trade waste premises including grease traps and interceptors; and
- calculating trade waste charges.

This was previously managed by a number of spreadsheet databases and the manual integration of these with other legacy Council financial and billing systems. This, in particular, was where a substantial portion of time was utilised with manual analysis, manipulation and presentation of data and reports. PNCC estimated that approximately 110 hours at a cost of $9640 per month was spent on these tasks.

In addition, there was limited visibility and access for the TWOs in the field and/or by the management team to the trade waste information and thus it is difficult to share information and knowledge between departments and coordinate activities.

Utilising a centralised data management and reporting platform like H2knOwhow that is specifically catered to trade waste management has been estimated to save PNCC at least three to four days per month of employee time which is up to an equivalent of $12,000 in savings per year.

In addition to this, there are further unquantified savings realised through better access to the data and consenting information by other Council departments along with benefits of having a centralised system that any authorised person can use and can be accessed in the field.

Risks to the council's networks and plant are further mitigated through the more efficient storage, access to and analysis of data collected by PNCC and others as the time saved will allow for more time to be spent on other tasks and/or with customers.

Whangarei District Council (WDC) has reported similar cost efficiencies with its centralised data platform. In particular, it has stated that a centralised database platform has taken away the resource draining effort of manual spreadsheet based data analysis.

WDC uses its database to automatically generate invoices for trade waste clients from data that is uploaded directly by its laboratory, saving significant time in manually transferring data to accounting packages. It has also allowed WDC to take the trade waste dataset beyond financial management to operational management with the platform acting as a database for categorising waste discharge in order for WDC to understand the proportion of trade waste within the total waste stream.

CONCLUSIONS

Cloud-based data management is an intrinsic part of our daily lives, both at home and in the office. There is no reason why the water industry should be any different. Middleware platforms such as H2knOwhow that streamline large volumes of data from silos into usable formats have been shown to increase efficiency and reduce costs.

These savings ultimately end up with the end user – in this case industrial dischargers, by reducing their compliance charges through reduced council costs. The added benefits in terms of data accessibility, transfer, and manipulation for councils make it a win-win solution. **WNZ**