

Visit by WSC at Anglian Water, UK



November 2023

By: Trevor Chircop Bray

Introduction

The Sewer Discharge Control Regulations in Malta are enforced by the Water Services Corporation. More specifically, the Discharge Permit Unit (DPU). Ever since the introduction of these regulations back in 1993, the sole aim was to make sure that the wastewater discharged by every trading premises in Malta & Gozo adhered to the stipulated limits. Failure of this would result in great repercussions for both the wastewater network and the treatment of sewage.

Action C10 within the Life IPE MT 0008 project has sought, through its various tasks, to implement a capacity building drive of the DPU to make sure it has enough personnel, equipment, and experience so to become more effective in its target of increasing the overall compliance of the Maltese industry and ultimately improve the quality of the wastewater ending up in the different sewage treatment plants.



Buildup to the Visit

This job-shadowing visit has been planned for quite some time however due to the COVID-19 pandemic, and the subsequent restrictions, this project had to be postponed. After these restrictions were lifted and following an extensive search for a partner that was willing to share their compliance and enforcement efforts with WSC, Anglian Water was suggested to us by the Energy and Water Agency.

The scope of the visit was for staff of the DPU to experience how does an established entity, in this case Anglian Water, go about enforcing the sewage discharge regulations. Apart from that, DPU staff would benefit from the exposure to the mentality adopted, the background to the methodology used and most of all, understand how an example of an effective enforcement system is being implemented. Furthermore, it was also important for the WSC staff to get a first-hand opportunity to participate in site-visits at local manufacturing premises and at a local sewage treatment works.

The job shadowing was divided into two groups, the first one was hosted during week starting 6th November 2023 whilst the second group was hosted during week starting 20th November 2023. Each group spent 3 full days with Anglian Water personnel. In total, 13 WSC staff members participated in this job-shadowing project.

Visit Structure

Day 1

The first day of the visit was characterised with an introduction to Anglian Water, the extent of their operational responsibilities, the regulatory structure for water utilities in the UK and the internal organisational structure at AW in relation to trade effluent regulation.

Next came an extensive introduction into the QA system in place at AW. Basically, this consists of Policies & standards, procedures, work instructions, Technical Expert Team and the QA review group. AW have very extensive and detailed work instructions covering all of their 50 industry types which explain discharge consent monitoring, what should

inspectors look out for, sampling types etc. Other WIs are more of an administrative nature and explain how (for example) to process an application form.

Another very interesting body within the enforcement and regulation structure is the TET (Technical Expert Team). This is part of the QA setup and acts as a consultant body which help guide and tackle grey areas such as situations that are not covered by procedures or work instructions. TET is also the body that drives innovation and improvement such as revision of discharge limits.

Another crucial topic that was discussed was the consenting (permitting) process. One of the major differences between the system implemented in the UK and the one adopted in Malta is that discharge consents are not time-bound as is the case in Malta. However, these consents are reviewed periodically depending on the type of industry which in turn translates to the degree of risk involved to the sewer system. An application fee for new entities is also applicable and can vary from € 150 – € 1000.

New entities seeking a discharge consent ask for guidance through a consultation process. Such premises are assessed for their perceived discharge ‘footprint’ in relation to the Environmental Quality Standards (EQSs) stipulated on the discharge of the particular STP in the relevant wastewater catchment. This is a very crucial point to make. Each sewage treatment plant operated by AW has a maximum limit on the flow and on the concentration of many parameters. This is done so to ensure that the treated wastewater discharged into the receiving body (generally a river) is not polluted. Each consented discharger is allotted a certain maximum discharge level (for given parameters) which when combined should not exceed the acceptable maximum load received by the STP.

The next topic that was covered was Compliance and enforcement. This section is divided into compliance assessment, reporting, trade effluent compliance monitoring, enforcement policy, enforcement process & governance. This section was extremely relevant to DPU since it is one of the areas that improvement is being sought.

Basically, AW have devised a risk assessment that can calculate the overall risk of each discharger. This system is called TERA (Trade Effluent Risk Assessment) and takes into consideration a number of variables such as:

-
- ☞ Type of discharge
 - ☞ Volume of discharge
 - ☞ Proposed consent limits
 - ☞ The receiving Waste catchment
 - ☞ Compliance history

The TERA score is then converted to a sampling frequency for the following year. The TERA dashboard allows AW staff to monitor overall progress wrt compliance and non-conformances which gives a broad view of the status of discharges overall. When there the suspect that a discharger is not complying to regulations AW confirms whether the discharger has a consent first. If so, a sample is collected to assess whether there is a numeric breach of the consented limit. If ok, then the flow condition is assessed. If any breaches are detected, the case is referred to the Enforcement Panel and a decision is made to either resolve it locally or proceed with formal enforcement action. This panel meets every 2 months and reviews pending cases. At the very end, the guiding principles adopted by AW for enforcement are as follows:

- Proportionality in applying the law and securing compliance;
- Consistency of approach;
- Transparency in how the company operates;
- Accountability;
- Targeting of enforcement action;

During the first day, a visit to the AW Laboratories was made. The lab is quite extensive and ranges from organic testing, heavy metals testing, inorganic testing & general lab tests.

Day 2

The second day started with a site visit to a local large scale food manufacturer. They explained to us that in the past they had compliance issues due to an old treatment plant that was not up to the task. Through investment in new treatment technology they are now able to reduce their COD concentrations by 85-95%. Apart from attaining compliance, this has also lowered their sewerage fee which translates to further savings.

Later on during the day the group visited the Cambridge Sewage Treatment Works. This plant has an average daily flow of 44,000 m³. This STP is just one of the 1120 STPs under the responsibility of AW. When it comes to receiving waste water having parameters that have no limits, AW checks whether the concentration is lower than that of domestic discharge. If so, then it is accepted. If not, then AW sets a limit based on type of operation. Ultimately it all boils down to the impact each discharger is having on its receiving STP. AW use a modelling algorithm called ORACLE that can calculate a mass balance of each parameter based on the individual results collected from non-domestic dischargers and also assuming the component from the local population to calculate what will be the resultant concentration of a particular parameter in the STP treated effluent and also in the digested sludge. This is something that WSC does not yet do, i.e. calculating the overall contributions from industry and the residential component and is something that needs to be addressed.

During the STP site visit the group was shown around the plant. This is a standard activated sludge process with no denitrification however the sludge is pasteurized and sent for anaerobic digestion. The resultant sludge is sold as an additive to soil.

Day 3

The final day tackled catchment management, charging of sewage fees, emerging issues/challenges & food service establishments.

Each non-domestic discharger is obliged to have a consent prior to commencing operations. AW adopts an approach of reaching out to those new premises that have no discharge consent.

Catchment management cannot be carried out if the wastewater network is not reviewed. From an operations point of view if there is an issue, example a blockage, network operations investigate if it is due to a trade effluent issue then the inspectors are called in to investigate further.

Catchment reviews are prompted with a number of triggers however one of the most significant triggers is when a problem is identified by the ORACLE model. This might mean that the actual loading of the wastewater network will be causing a predicted non-conformance of the STP in its

discharge. AW use autosamplers in order to ascertain whether a given area or pumping station has a problem or not. If so, the non-domestic dischargers are sequentially checked to see where a given problem is originating. Due to the complexity of the mass balancing model, when a discharge consent lowers the limit for a given parameter, many things need to be taken into consideration.

AW, in its approach to collaborate with non-domestic dischargers has set up a MFI (Metal Finishing initiative) that targets potentially high-risk traders that can potentially cause a risk of hazardous pollutants. The aim here is to work with the traders to prevent pollution by checking risks, discuss findings and providing a written report to the trader.

AW gave an example of a problem parameter detected at the inlet of a particular STP. There was an increase in Nickel. This prompted AW to send a questionnaire to two particular plating companies located next to each other to prompt them to ask certain questions to obtain information and compile a report and ultimately to act upon it.

When an environment action is flagged, AW performs an initial visit to the site within 5 days. The aim is to identify the problem, to check whether further funding is required, to find the root cause and devise an action plan. This plan is closed off within 12 months if there are not further failings.

Trade Effluent charges are an integral part of the way the wastewater networks are maintained. There are two types of charges:

- Primary charges – reception, conveyance and treatment of trade waste
- Non-primary charges – admin of the consent and other services

Each utility company is limited by a revenue cap that is set and reviewed every 5 years by the regulator (OFWAT). Each utility has a 10 year plan that spans all aspects of operations. OFWAT reviews these plans and set the maximum revenue allowed.

Charges applied must be fair and should embrace the polluters pay principle. The structure of charges should incentivise customers to control volumes and loads through volume measuring and load sampling. Charges should be stable, predictable and transparent. The charges are calculated based on the Mogden formula.

Volume is computed either by measuring directly the discharge volume through a meter or another measuring device, or else use water meters for domestic use and a separate meter for trade effluent use. Charges are calculated on past usage (previous year) and the new charges are calculated through separate charging samples that are collected at a frequency dependent on the discharge volume. There is also a fixed charge to cover expenses relating to trade effluent monitoring. At the very end, charges need to be averaged out. You cannot tailor charges since this becomes unrealistic to put into practice.

AW explained how food service establishments (FSEs) are dealt with. In the UK discharges from FSEs is not considered as trade effluent. In this respect, water utilities such as AW do not have direct jurisdiction on these establishments. In the past, AW only did minor enforcement work on FSEs in the form of specific investigations relating to specific hotspot blockage areas. In 2019 AW partnered with ECAS a private contractor that specialises in enforcement of good practices for FSEs in terms of correct treatment of their wastewater. ECAS focuses on problems using a reactive approach and focuses on areas in a proactive manner. ECAS carry out audits of FSEs and supply them with a list of grease traps they can install and the FSE is obliged to install one. ECAS inspect FSEs under its remit 3-4 times a year to make sure that the grease traps are being maintained. However, samples are not collected since it is of their opinion that there is always the possibility of finding an FSE non-compliant. The standard size for a grease trap is about 100 L. When an FSE is found to have caused a blockage, ECAS send them a bill covering the cleaning costs and send them compliance letters. After 3 incidents, a non-compliance notice is sent to the given FSE.

Takeaways

This experience was extremely important for the DPU since it gave the opportunity for its staff to share experiences and ideas with a much more established organization. By understanding the way Anglian Water trade effluent enforcement operates gives the DPU much insight in how the enforcement efforts in Malta can evolve to become more efficient, effective and proactive.

Most noticeable takeaways from this visit are the following points:

- ☞ Discharge consents (permits) do not expire however they are reviewed periodically;
- ☞ Risk is to become core to enforcement efforts since this factor should guide the frequency of inspections, collection of samples and permit review period;
- ☞ The proposed annual fee structure should be oriented towards the concepts adopted by AW;
- ☞ Risk matrix should intrinsically relate to STP design capacity for a given catchment and there should be detailed information on the composition of wastewater catchments in terms of loading;
- ☞ Permits should contain more meaningful information on the sampling point/s, health and safety considerations, registration of sampling points and photos;
- ☞ Results of past samples to be incorporated with DPU database;
- ☞ To start testing sub-catchments by collecting random samples to detect problems in effluent quality;
- ☞ Wastewater carriers to be registered in the DPU database and the individual discharges are to be recorded for each premises served;
- ☞ Application form needs to change to collect more detailed information including metering of wastewater volumes, type of treatment present, hazardous chemicals used, other permits covering the premises;

The DPU will treasure this experience and will work tirelessly to implement as much as possible the salient points highlighted above, both from an internal operational aspect and also from a legal perspective. The ultimate aim being to transform the current DPU operations into a more efficient and effective effort to ensure better quality wastewater being received by the sewage treatment plants in the Maltese Islands.
