



**The Environmental Permitting (England and Wales)
Regulations 2010**

**WASTE MINIMISATION & WATER USAGE REPORT
FOR CONVATEC LIMITED – UNIT 1**

**PPC Permit number NP3433BC,
Variation PP3433LP,
Variation Notice number EA/EPR/NP3433BC/V003, &
Variation Notice number EPR/NP3433BC/V004,
Variation Notice Number EPR/NP3433BC/V005**

**Issue 4
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SUMMARY

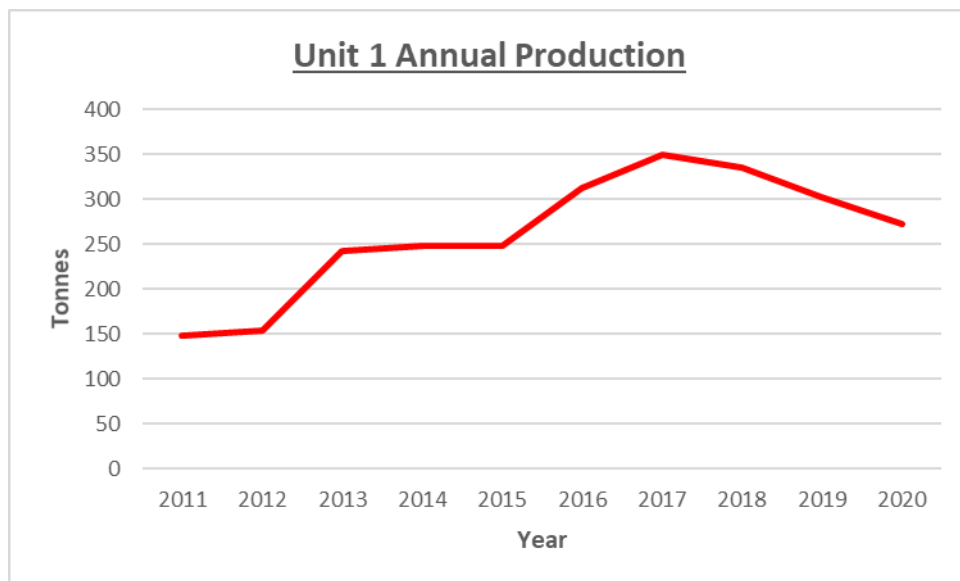
PPC Permit NP3433BC, Condition 2.4.1.2 requires ConvaTec to “carry out periodic waste minimisation audits and water use efficiency audits. If such an audit has not been carried out in the 2 years prior to the issue of this Permit, then the first such audit shall take place within 2 years of its issue. The methodology used and an action plan for increasing the efficiency of the use of raw materials or water shall be submitted to the Agency within 2 months of completion of each such audit and a review of the audit and a description of progress made against the action plan shall be submitted to the Agency at least every 4 years thereafter”

Since the last report (July 2016):-

- A Regenerative Thermal Oxidiser has been installed and commissioned, significantly improving VOC emissions from the hydrocel and silver hydrocel processes.
- An enhancement project designed to increase the capacity of silverised hydrocel production was completed in one suite in October 2019.
- A second Hydrocel suite is an option the site may adopt depending on the anticipated demand over the coming years. Currently there is no requirement for it.
- Production has followed demand with a downward trend since 2017, when compared to earlier years. Demand for 2021 is estimated to be around 2018 levels.
- Waste produced has been in line with production requirements.
- Employee numbers are basically unchanged from approximately 105, however in September 2019 the site switched to a 24/5 pattern of production (a safety and infrastructure team from engineering remains present on-site during weekends) with a security presence 24/7.
- Water consumption has decreased year on year aided by the introduction of a chilled water loop for process cooling. This was originally a single pass cooling system.
- A new fire water tank was installed in April 2020 to increase firefighting capability.

1.0 INTRODUCTION

Unit 1 has been fully operational since January 2006. The Unit chemically treats a cellulose based fibre for the pharmaceutical wound dressing industry. Graph 1 shows the growth in production through early years, the result of the recession in 2008/9 and the completion of our first Hydrocel production suite in the Annex between 2012 and 2013. Since 2017 Unit 1 production has decreased slightly. Production for 2021 is anticipated to be back around the levels seen in 2018.



Graph 1 – Unit 1 Annual Production Comparison

2.0 RAW MATERIALS ANNUAL USAGE

2.1 PRODUCTION (based on 2020 figures)

Table 1

Material	Tonnes
Industrial Denatured Alcohol (IDA)	3160
Acetic Acid	180
Citric Acid	55
Silver Nitrate	42
Sodium Hydroxide	280
Sodium Monochloroacetate (SMCA powder)	120
Tween	6.7
Tow (cellulose)	168

2.1.1 Industrial Denatured Alcohol

IDA continues to be re-distilled from IDA / Water waste, to 96% IDA and is re-supplied to the site as part of a Toll Recovery scheme through Tradebe (was SRM) based in Rhye, England. The site stores IDA in three bulk storage tanks each with a capacity for 30,000 litres. The third IDA bulk storage tank was added to the site in April 2017.

2.2 BIOSCRUBBER

- Urea – 325kg
- Anti-foam - 900 ltr
- Nutrient – 650kg
- Neutraliser – 3780 ltr

Note the bioscrubber was formally decommissioned in December 2018 with the commissioning of the RTO under permit variation EPR/NP3433BC/V005. Since December 2018 no bioscrubber materials have been purchased or used at site. The bioscrubber material tonnage are as above for 2016, 2017 and 2018. Reference to the bioscrubber, its materials and waste to be removed in Version 5 of this report.

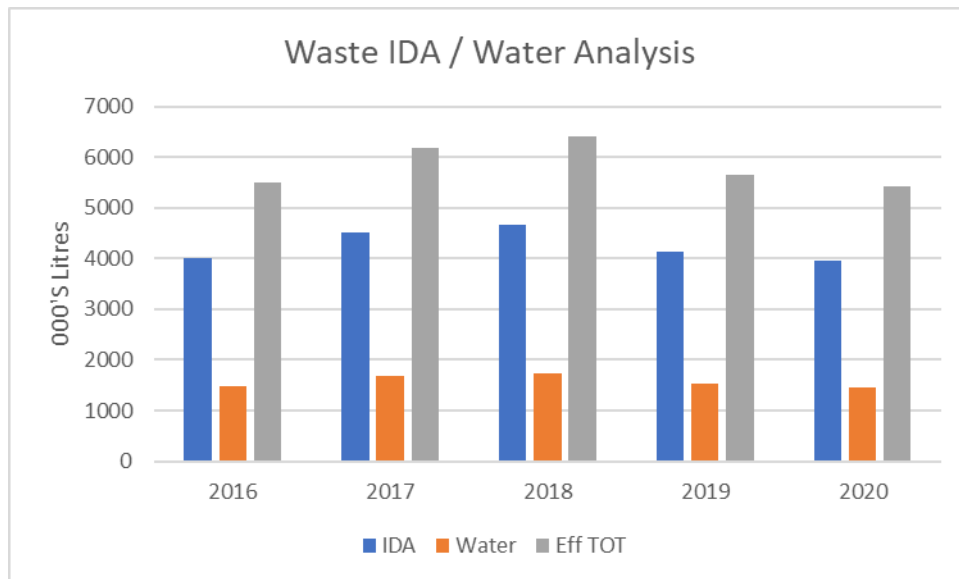
3.0 WASTE

3.1 IDA

Industrial Denatured Alcohol (formerly IMS – Industrial Metholated Spirits) is a hazardous waste due to both its quantity stored at site and its nature. ConvaTec originally had HMR&C Authorisation to receive 3,500,000 litres of 99% IDA for production which is classified as Highly Flammable and certification to distribute the waste for recycling. This authorisation was replaced with one for 3.5 million litres of Duty Free Spirits following the introduction of Toll Recovery, (see 3.1.1).

All processed IDA is collected in one of three 30,000 litre waste tanks and tankered off site. The third waste IDA tank was installed in April 2017. Up until October 2011 all the IDA/water waste was sent to SRM for recovery for re-use as a screen wash product, (see 2.1.1).

Graph 2 overleaf shows the composition of water and IDA tankered off-site to Tradebe for recovery and reuse. As you can see, on average by volume 73% of the waste stream is IDA (by weight this average is 58% IDA).



Graph 2 – Waste IDA / water analysis by volume

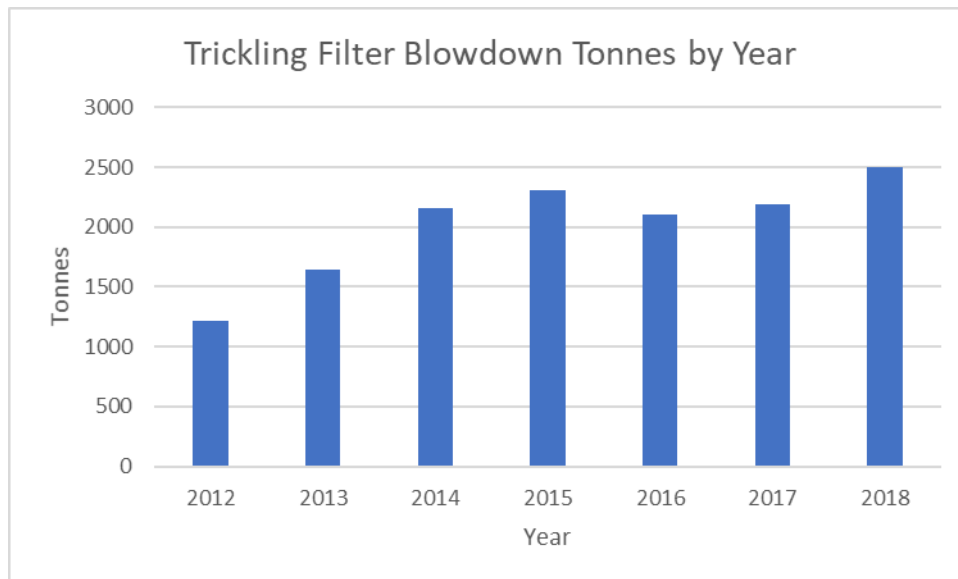
3.1.1 Toll Recovery

In 2011 we embarked on a scheme of “Toll Recovery” with SRM (now Tradebe) who re-distill the waste stream to 96% IDA which the site has approved for production. This allows a single tanker to deliver the IDA to site and remove the waste IDA/water in the same tanker. These both reduce transport costs and carbon footprint.

3.2 TRICKLING FILTER BLOWDOWN

In early years of production, it was found that the levels of COD and Suspended Solids were higher than the permitted consent limits for Trade Effluent, resulting in breaches of the Trade Effluent Consent and the Permit. In 2007 the site took the decision to collect and remove the blowdown waste stream from the trickling filter by Contractor for off-site treatment. This process remained in place until December 2018 when the bio-scrubber plant was decommissioned.

You can see in Graph 3 overleaf that the tonnage increased since 2012. This was due to the increased number of blowdowns of the trickling filter associated with the odour issue experienced by the site.



Graph 3 – Blowdown Water Waste Tonnage

As per the plan, a Regenerative Thermal Oxidiser (RTO) was installed and commissioned in December 2018. The installation of the RTO removed all wastewater treatment and possible resulting odour issues. The RTO was selected to address current and future requirements of production, EPR and the Industrial Emissions Directive.

3.3 SMCA BAGS

Sodium Monochloroacetate powder is used as part of the process. It is delivered in 25 kg plastic bags which form a hazardous waste stream when empty. All SMCA contaminated items, i.e. bags, coveralls, masks, gloves, etc are disposed of as hazardous waste. All such items are segregated and were collected in steel drums for disposal by Egan Waste. In 2014 Chemcycle took over the management of waste disposal and introduced IBC's for collection of the waste bags. This has improved the handling and reduced cost of removal.

The previous capacity increase building project included a different method of transporting the SMCA internally. A sealed system was trialled, incorporating plastic containers and sealed split butterfly valves which remove any possible exposure to SMCA in handling. This also removed the need for bagging of process SMCA. Unfortunately, this process proved unsustainable in the long term as it created processing difficulties. This required the move back to bagging of process SMCA and the tonnage remaining unchanged.

Through 2021 a new project has been raised to look at SMCA handling and removing the contaminated bag waste stream. It is hoped that this will be successful, and if so, SMCA contaminated waste will be dramatically reduced.

3.4 GENERAL WASTE

It is presently difficult to determine the amount of specific general waste being generated from Unit 1 due to having a single waste management system covering both permitted installations. Graph 4 overleaf shows the annual landfill waste leaving site.



Graph 4 – Unit 1 Landfill Waste

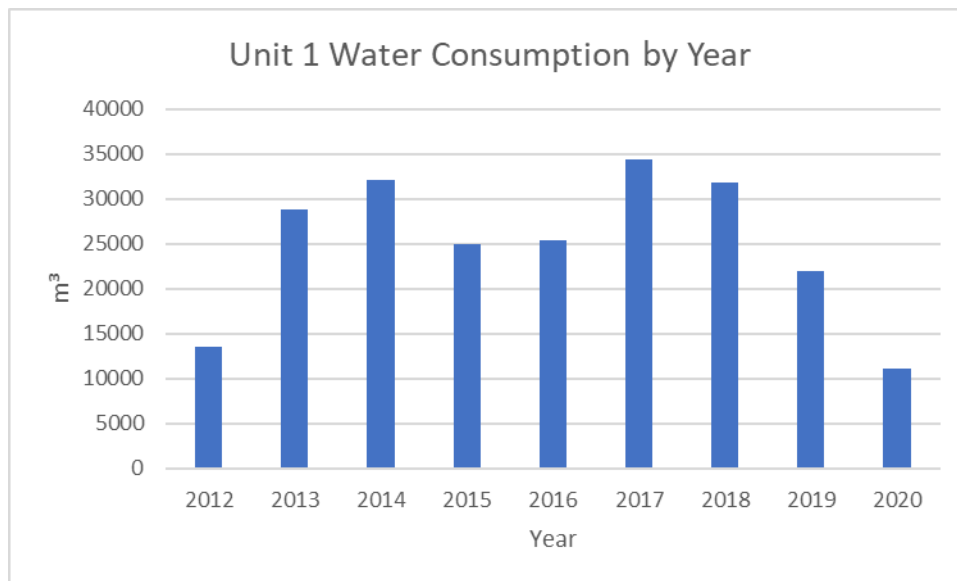
At the end of 2017 the site moved to Energy from Waste for its general waste stream. This dramatically reduced the amount of waste landfilled, since then only a small quantity of hazardous waste has ended up in special landfill. Before this change, and through the previous report the site averaged 50 tonnes of waste to landfill annually. As you can see from Graph 4, the amount of landfill waste since the last report has dramatically reduced. The current streams which end up at landfill are under regular review and more alternatives to landfill are being found. The downward trend in landfilled waste from 2019 is continuing through 2021.

MSS now provide six skips, one for general waste (EfW), two for Dry Mixed Recyclable (DMR), one for construction materials, one for WEEE and one for metal. The general waste and DMR skips are on a regular scheduled collection, whilst all other streams are collected on an ad hoc basis.

4.0 WATER USAGE

Unit 1's annual water consumption can be seen in the Graph 5 overleaf. As seen in Section 1.0, production has decreased since 2017 and water consumption has followed accordingly. Water usage per tonne of product has also decreased however through the connection of unit

1 processes to the chilled water loop. Previously the process was cooled on a single pass system.



Graph 5 – Unit 1 Annual Water Consumption

Main uses of water in Unit 1 are as follows:-

USE	DRIVER	DISPOSAL
Domestic	No of personnel / production dependant	Sewer
Office Heating	Weather Dependant	N/A
Boiler Make-up	Weather & product Dependant	Sewer
Process washes	Pipework contamination	Tanker
EP Water System	Product Dependant	Waste Product
Emergency showers/eyewash stations	Safety Dependant & monthly testing	Sewer/Haz Waste

5.0 IMPROVEMENT PLAN REVIEW

WASTE MINIMISATION

ITEM	ISSUE	ACTION	RESP	TARGET DATE
1a	Unit 1 & 2 general waste reduction	Introduce Dry Mixed Recycling skips	KR/MSS	Complete
1b		Evaluate all waste streams and assess opportunities to reduce waste at source	KR/MSS	Complete

1c		Investigate "Zero to landfill" waste target using waste to energy facility in Cardiff	KR/ MSS	Complete
2	Recycle wooden pallets	Investigate local company to recycle pallets. Edwards & Ross selected.	KR	Complete
3a	SMCA waste bags	Investigate opportunities for reducing Hazardous waste in relation to SMCA, i.e. introduce reusable containers in new Annex.	KR	Complete (Failed)
3b		Introduce IBC's for collecting & disposing of SMCA bags	KR/ MSS	Complete
4	Reduce water usage	Replace Bioscrubber plant with RTO, removing the wet process waste stream & reducing water.	KR	Complete
5	Review Water & Waste usage	Monitor & review water usage and waste quantities generated following completion of the Silver scale-up & Hydrocel suite 4 projects with the aim of minimisation	KR	Complete
6	SMCA Handling	Complete updated SMCA handling project to reduce SMCA contaminated waste.	MT	Q4 2021
7	Bulk hazardous liquid waste reduction	Install heat exchanger cooling loop for citric acid distribution loop in unit and annex processes, to significantly reduce the amount of bulk liquid waste generated annually from citric cleans.	SW	Complete Q1 2021
8	Reduce water consumption	Connect unit 1 insitu driers to the chilled water loop.	GH	Complete Q3 2019