

ANNUAL ENVIRONMENTAL REPORT

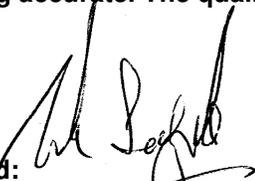
2018

FOR
SunChemical Inks Ltd.,
Palmerstown

IPC License 241

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Signed: 

Mark Sedgwick
EHS Manager Northern Europe

Date: 28/03/2019

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1. INTRODUCTION

Company Details

| | |
|----------------------|-------------------------------|
| Company | SunChemical Inks, Ltd. |
| Address | Glenside House, Mill Lane |
| Town | Palmerstown |
| County / City | Dublin 20 |
| Business | Printing Ink Manufacture |
| Employees | 15 |
| Contact Name | Mark Sedgwick |
| Position | EHS Manager Northern Europe |
| Telephone | 01-6206868 |
| Fax | 01-6262573 |
| Email | mark.sedgwick@sunchemical.com |

2. SITE DESCRIPTION

Previous Site Histories

The Glenside Mill originally housed a furniture factory after a period as a mill. Ink production commenced on site in 1934.

Company Background

The Company is a wholly owned subsidiary of Dainippon Ink and Chemicals, Japan. Sun Chemical continues to be the largest supplier of printing inks in the world, distributing printing inks and varnishes for use in a wide variety of printing and packaging applications and is the only multinational solely dedicated to supplying this sector of the graphic arts industry.

Description of Equipment

The following pieces of equipment and machinery are involved in the manufacturing process:

Paste Ink:

(The blending of oil-based, UV and screen inks)

4X1-10Kg Blending Mixers

2x50 Kg Mixers

1xVacuum Packer / crimper

Waterbased Blending

1xSussmeyer 25hp Stirrer

3x10hp Stirrer

1x5hp Stirrer

Solventbased Blending:

1xInkmake Dispenser System 33 pump

1x20hp Stirrers
1x2.5hp Stirrers
1x3 Roll Mill

Manufacturing Process

There are two main types of product made at this site. A brief description of each process is given below:

Liquid Ink.

This process involves blending a mixture of brought in base inks into a final product. This may be either solvent or water based materials. Components are weighed, added to a mixing vessel and homogenised using an appropriate stirrer.

The inks are then tested for shade, gloss, strength etc. Upon approval inks are then either filtered through a closed pump/sieve unit prior to packaging in an appropriate plastic or metal container, or packaged directly.

Paste Ink.

This process involves the blending of oil based (mineral and vegetable) or UV curing acrylate resin based inks into a final product. Finishing and potting is as above except for filtration (not required).

Screen inks are also now manufactured on site and are a blend of paste and liquid technologies

Company Organisation

The main site responsibilities are as follows:

| Function | Name |
|--------------------------------------|------------------|
| Site Manager / Environmental Officer | Mark Sedgwick |
| Shift Manager | Martin McDonnell |

3. SUMMARY INFORMATION

Self-monitoring Data

Emissions to Surface Water / Sewer. *Emission Point SW-2*

| Date | Lab ID | BOD | COD | pH | Suspended Solids | Cond, uS/cm | TOC | Temp °C | Comments |
|-----------------------|--------|-------|-----|-----|------------------|-------------|------|---------|----------|
| Warning Levels | | 10-12 | 45 | | | | | | |
| Action Levels: | | 25 | 60 | | | | | | |
| 2018 | | | | | | | | | |
| 22.11.18 | 152044 | 2 | 6 | 7.4 | <2 | 78 | <1.0 | 9 | Q4 |
| 21.08.18 | 149655 | <2 | 9 | 6.9 | 1 | 98 | 4.7 | 20 | Q3 |
| 16.05.18 | 147351 | 3 | 12 | 7.2 | 3 | 133 | 5.9 | 14 | Q2 |
| 09.02.18 | 144579 | 4 | 10 | 7.0 | 7 | 130 | <1.0 | 6 | Q1 |

Sun Chemical have an interceptor tank for rainwater run-off and for spillage capture, should there be an incident from a burst barrel or transport mishap. The interceptor is kept covered and checked visually on a daily basis and prior to the release of water. Independent testing is carried out on a quarterly basis against license parameters. No flow is measured as there is no process water or other going to the tank. Tank capacity is 1.4m³.

Four spot-checks were carried out in 2018, by Tellabs, our independent contractor. All results were within license limits. One EPA check was conducted and all results were in compliance with license requirements.

Emissions to Atmosphere. *Emission Point A2-1*

Emissions to atmosphere are measured by an independent, agreed contractor, on a quarterly basis. See table below for a summary of results received during 2018. All results were compliant with license requirements.

| Measured Concentration (mg/m ³) | Emission Limit Value (mg/m ³) | Measured Mass Flow Rate (Kg/Hr) | Measured Volume Flow (Nm ³ /Hr) | Mass Flow Limit (Kg/Hr) | Maximum Volume Limit (Nm ³ /Hr) | Report Reference and Link | Period |
|---|---|---------------------------------|--|-------------------------|--|---------------------------|--------|
| 2018 | | | | | | | |
| 15.67 | 150 | 0.029 | 1901 | 6 | 10400 | 1226-46 v1.00 | Q4 |
| 15.68 | 150 | 0.046 | 2955 | 6 | 10400 | 1226-45 v1.00 | Q3 |
| 16.10 | 150 | 0.043 | 2687 | 6 | 10400 | 1226-44 v1.00 | Q2 |
| 9.71 | 150 | 0.029 | 3055 | 6 | 10400 | 1226-43 v1.00 | Q1 |

Waste Management

Waste details are recorded in the reports section

Agency Monitoring and Enforcement

There was one site monitoring visits by the Agency during 2018, one for surface water. All results were in compliance with license requirements

Energy and Water Consumption

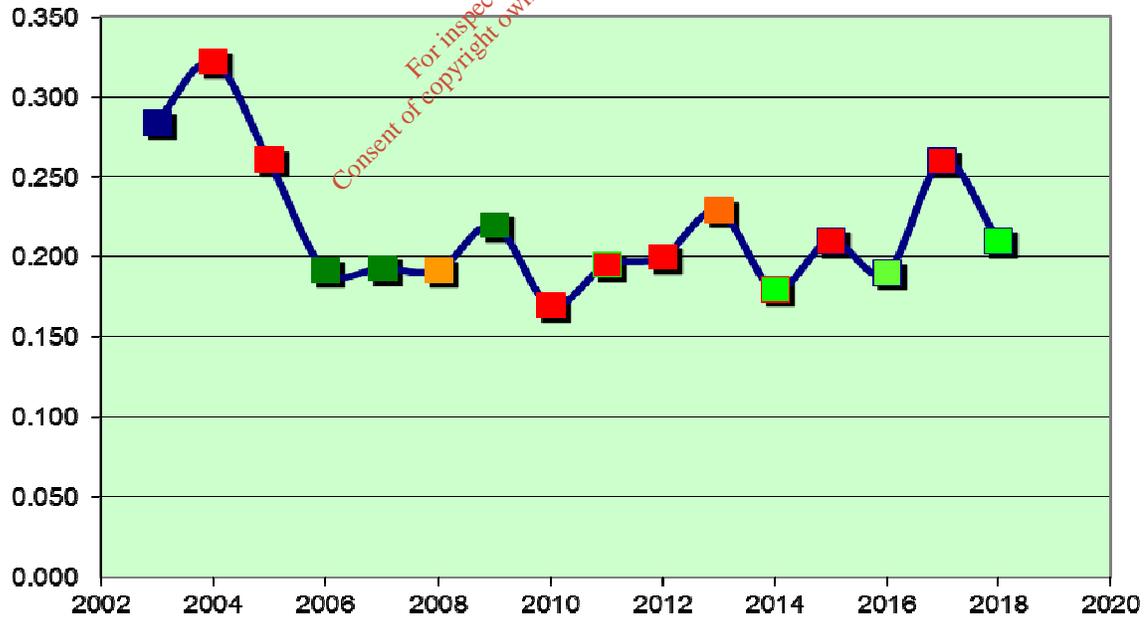
The Company has established further energy monitoring and reduction programs during 2018, however, an increase in some productions has lead to an overall slight increase in energy usage on site. An air compressor problem identified late in the year also had an impact on energy

3.3.1 Energy Consumption Summary:

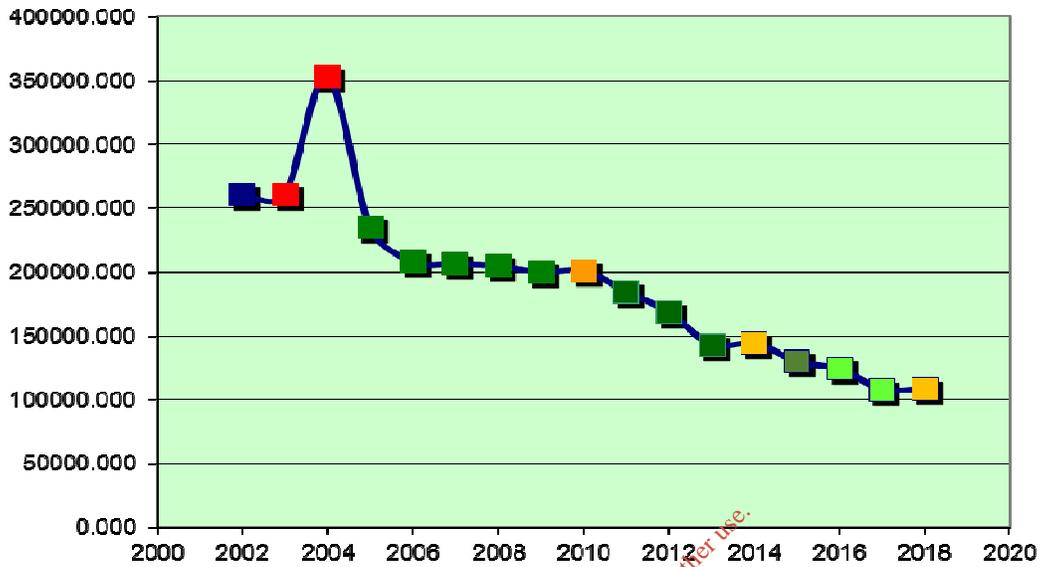
| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Kgs Throughput | 4147609 | 3153000 | 3710000 | 2854311 | 2497198 | 2384520 | 2381546 | 2143604 | 2073974 | 1700559 | 1657139 |
| Fuel Litres | 55200 | 43538 | 37052 | 35050 | 30614 | 36715 | 25000 | 28900 | 24000 | 29485 | 21000 |
| Converted to kWh | 593250 | 491979 | 418688 | 396065 | 345938 | 414882 | 282500 | 326570 | 271200 | 333181 | 237301 |
| Electricity, kWh | 204720 | 199518 | 200582 | 184354 | 163930 | 142660 | 143820 | 129540 | 123840 | 107760 | 108465 |
| Total Energy Used kWh | 797970 | 691497 | 619270 | 580419 | 509868 | 557542 | 426320 | 456110 | 395040 | 440941 | 345766 |
| Energy Index | 0.19 | 0.22 | 0.17 | 0.20 | 0.20 | 0.23 | 0.18 | 0.21 | 0.19 | 0.26 | 0.21 |

Energy versus Kg throughput has been calculated to determine the overall trend in energy usage.

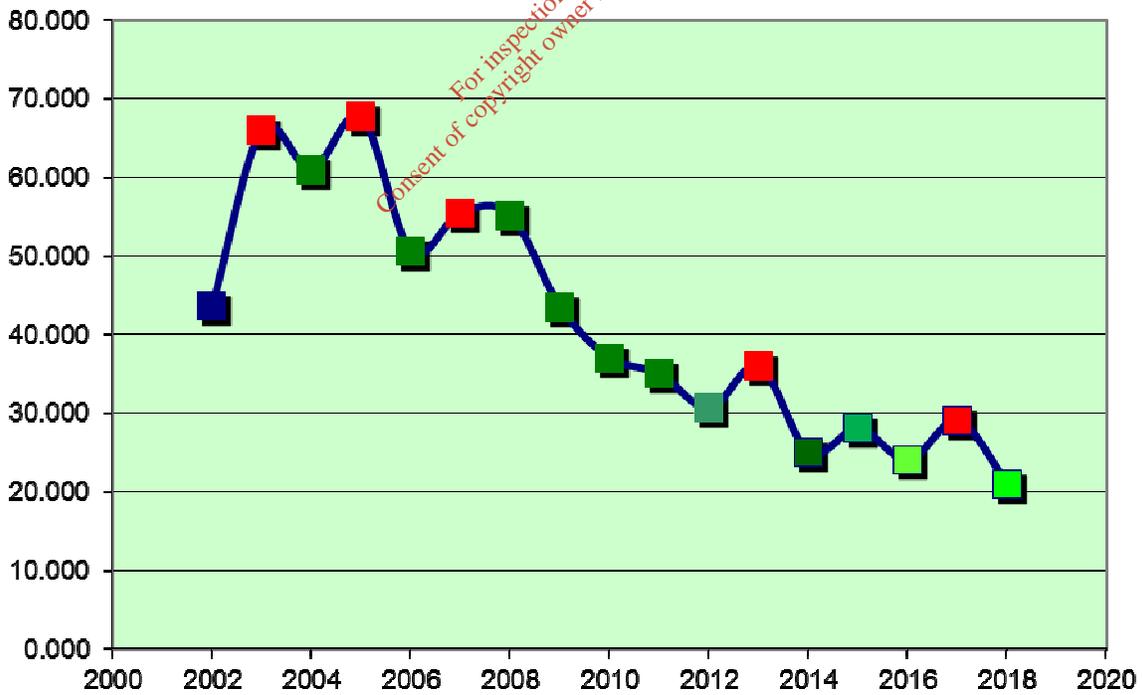
Energy Index (Energy / Kg Throughput)



Actual Electrical Energy (KW/Hr)



Actual Fossil Fuel Usage, Tonnes



3.3.2. Water Consumption

| 2008 M ³ | 2009 M ³ | 2010 M ³ | 2011 M ³ | 2012 M ³ | 2013 M ³ | 2014 M ³ | 2015 M ³ | 2016 M ³ | 2017 M ³ | 2017 M ³ |
|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 190 | 186 | 177 | 165 | 148 | 204 | 210 | 212 | 450 | 452 | 442 |

The significant increase follows changes from SDCC to Irish Water and associated metering.

Water is taken from the district water supply for use in the toilets, canteen and laboratory. Product incorporated water amounted to 66.4 in 2018, used in the manufacture of water-based inks (a 9.1% increase on the previous year).

Environmental Incidents and Complaints

There were no environmental incidents during 2018. Neither was any complaint received from the public, local businesses, or any official body, or reported to the Agency in respect of Sun Chemical.

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4. MANAGEMENT OF THE ACTIVITY

4.1 Schedule of Environmental Objectives and Targets 2019

The following table is a schedule of objectives and targets that have been set out by SunChemical, in order to reduce any environmental impacts and improve environmental

practices. The program was decided and accepted at the Annual Environmental Review held in February 2019 and was based on the critical aspects and impacts of the business on the environment.

| No. | Issue/Aspect | Action Plans | Responsible | By |
|----------|---|--|-------------|------------|
| Energy 1 | Fossil Fuel usage (heating oil) | 1. Enclose Screen cell to conserve heat | MS | 1. Q1 2019 |
| | | 2. Conduct Energy Awareness training | PG | 2. Q2 2019 |
| | | 3. Target energy reduction of 5% over 2018 through turn-off turn down program (-€1.5k) | MS | 3. Q4 2019 |
| RM1 | Water Consumption | Target no increase in domestic water consumption | MS | Q4 2019 |
| | | Carry out water conservation refresher | PG | |
| Waste 1 | Packaging waste Plastic, Metal, Paper/cardboard, Wood | 1. Carry out Workplace Environmental Training / Waste Minimisation | MS | Q2 2019 |
| ENV 04 | | Maintain ISO14001:2015 | MS | Q2 2019 |
| ENV 05 | | Ensure zero environmental complaints | All | YE 2019 |
| ENV 06 | | Maintain zero accidental releases | All | YE 2019 |

4.2 Environmental Management Programme Report 2018

The following outcomes against Environmental Objectives 2018 have been achieved

| No. | Issue/Aspect | Action Plans | Responsible | By |
|----------|---|--|-------------|--------------------------|
| Energy 1 | Fossil Fuel usage (heating oil) | 1. Replace burner in L1 Boiler. (est €1200) | | |
| | | 2. Conduct Energy Awareness training (SBL) | MM | 1. Q1 2018 |
| | | 3. Target energy reduction of 5% over 2017 through turn-off turn down program (-€1.5k) | MS | 2. Q2 2018 3. Q4 2018 |
| Air 1 | Fugitive VOC emissions from mixing solvent inks Source (vent) | 1. Review use, storage and requirements of Sigmatherm Vapish to reduce handling / mixing of product and reduce VOC | PC | Q2 2018 |
| Air 2 | emissions from liquid ink building Electrical | As Above | | |
| Energy 2 | Compressor / compressed air | Get quote to complete work. Evaluate likely savings against fuel usage. | MS | Q3 2018 |
| RM 2 | Fossil Fuels (incl use as Raw Material feedstock) | 1. See Energy target above | | |
| | | 2. Ensure new vans energy efficient (5L/100km) | MS | 1. Q4 2018 |
| | | 3. Facilitate switch to WB from SB at AB Convertors (67 Tonnes of VOC Materials incl 12 Tonnes manufactured) | MS PC | 2. Q1 2018 3. Q1 2018 |
| Waste 1 | Packaging waste Plastic, Metal, Paper/cardboard, Wood | 1. Carry out Workplace Environmental Training / Waste Minimisation | MS | Q2 2018 |

Target 1. Waste increased considerably, mostly due to increased office restructuring

4.3 Further Comment

2018 saw another significant reduction in solvent based inks with the volume being directly replaced at customers by waterbased equivalents.

5. LICENCE SPECIFIC REPORTS

The following reports are included as required by the terms of the Licence:

- Noise Survey (submitted through Eden)
- Waste Details
- Bund Inspections (submitted through Eden)

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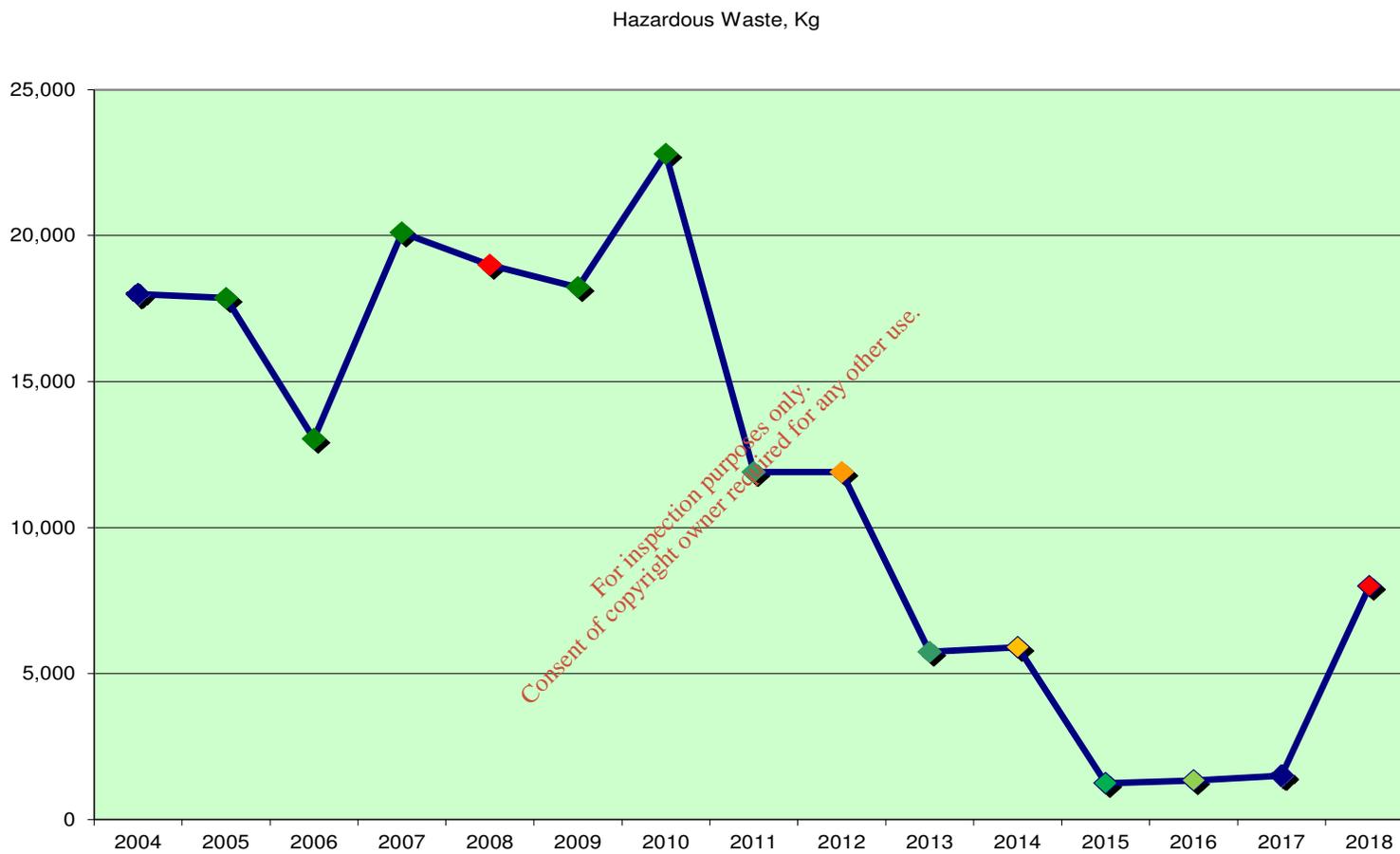
Waste Details Report

| Waste | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|------|------|------|------|------|------|------|------|------|-------|
| Total quantity of waste produced in calendar year(Tonnes) | 47 | 47 | 43.7 | 43.7 | 18.4 | 17.6 | 12.6 | 13.5 | 15.9 | 21.07 |
| total quantity of waste disposed of on-site | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| total quantity of waste disposed of off-site | 31 | 34 | 36.9 | 36.9 | 13.8 | 13.2 | 8.6 | 10.3 | 11.9 | 16.9 |
| total quantity of waste recovered on-site | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| total quantity of waste recovered off-site | 16 | 13 | 6.8 | 6.8 | 4.6 | 4.4 | 4.0 | 3.2 | 4.0 | 4.1 |
| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | | | |
| Quantity of non-hazardous waste produced in calendar year | 28 | 23.9 | 31.8 | 31.8 | 13.8 | 11.7 | 11.3 | 12.2 | 14.4 | 13.1 |
| quantity of non-hazardous waste disposed of on-site | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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| | | | | | | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| quantity of non-hazardous waste disposed of off-site | 12.0 | 10.9 | 25.0 | 25.0 | 9.2 | 7.3 | 7.3 | 8.9 | 10.4 | 9.1 |
| quantity of non-hazardous waste recovered on-site | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| quantity of non-hazardous waste recovered off-site | 16 | 13.0 | 6.8 | 6.8 | 4.6 | 4.4 | 4.0 | 3.2 | 4.0 | 4.1 |
| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Quantity of hazardous waste produced in calendar year (Tonnes) | 19.0 | 22.8 | 11.9 | 11.9 | 5.7 | 5.9 | 1.3 | 1.3 | 1.5 | 8.0 |
| quantity of hazardous waste disposed of on-site | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| quantity of hazardous waste disposed of off-site | 19.0 | 22.8 | 11.9 | 11.9 | 5.7 | 5.9 | 1.3 | 1.3 | 1.5 | 8.0 |
| quantity of hazardous waste recovered on-site | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| quantity of hazardous waste recovered off-site | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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| List of Waste (LoW) | | | | Next Destination | | Final Destination | |
|---------------------|--|----------------|---------------------------------|--|---|-----------------------------------|----------------------------|
| LoW Code | LoW Description | Classification | Quantity of waste Tonnes / year | Organisation | Waste Treatment Operation | Organisation | Waste Treatment Operation |
| 15 01 04 | metallic packaging | - | 4.16 | The Hammond Lane Metal Company Limited - P1002 | R04 - Recycling/reclamation of metals and metal compounds | - | |
| 15 01 06 | mixed packaging | - | 7.08 | Rilta Environmental Limited - W0192 | D01 - Deposit into or on to land (e.g. landfill, etc.) | - | |
| 11 01 14 | degreasing wastes other than those mentioned in 11 01 13 | - | 1.83 | Safety Kleen Ireland Ltd - W0099 | D10 - Incineration on land | - | |
| 08 03 12* | waste ink containing hazardous substances | Hazardous | 8.00 | Rilta Environmental Limited - W0192 | D15 - Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage, pending collection, on the site where the waste is produced) | Afvalstoffen Terminal Moerdijk BV | D10 - Incineration on land |

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