

## **Attachment D.1**

- **Assimilative capacity calculations for receiving water**
- **Assessment of impact of discharge(s) from Wellman International Limited on the receiving surface water**
- **Substances used in the manufacturing processes likely to result in discharges of Regulated Substances (Ref. S.I. 272 of 2009)**

## **Substances used in the Manufacturing Process likely to Result in Discharges of Regulated Substances (Ref. S.I. 272 of 2009)**

WIL uses a range of chemical fibre treatments during fibre processing to act as aides for static control, fibre to fibre cohesion and fibre to metal lubrication. These chemical treatments, which are all water soluble, generally have the following chemistries:

- Polyethylene glycols
- Ethoxylated and propoxylated esters of unsaturated and saturated fatty acids
- Phosphate salts of Ethoxylated and propoxylated esters of unsaturated and saturated fatty acids

These chemicals are applied as dilute solutions to the fibre, and can easily be broken down under aerobic conditions in an effluent treatment plant. They may affect the phosphate levels, and the BOD/COD demands of the effluent treatment plant. They should not have any effect on oil/fats/grease or suspended solids levels in the effluent system.

The finishes used in our manufacturing process change depending on which products are being manufactured every week, but involve the following finishes.

- Zetesoft FF100
- Lurol PS-6627
- Atalex Fal
- Permalose TM
- Emulan EL
- Tween 20
- Synlube 6364
- Hansa PP3
- Fibre Finish 1925
- Lurol PS-3919
- Lurol PS-7349
- Lurol PS-611
- Lurol PS-679
- Healthguard LS
- Lurol AM7
- Lurol-9985
- Lurol-13763

- **Environmental Considerations & Best Available Technology (BAT) & BAT Parameters Monitoring**
  - **Environmental considerations in relation to cleaner technologies, waste minimisation and raw material substitution**
  - **BAT that are/will be used to prevent, eliminate or reduce emissions (Ref. Guidance for Synthetic Fibres)**
  - **Measures to ensure that no pollution occurs**
  - **Minimisation of waste production**
  - **Efficient use of energy and other resources, including energy efficiency statement**
  - **Measures to prevent environmental accidents and to limit the consequences of accidents**
  - **Measures to be taken upon cessation of activities to avoid pollution risk and return site operation to a satisfactory state**

## **BAT (Best Available Technology)**

WIL is BAT compliant and complies with the requirements of the *BAT Guidance Note for the Manufacture of Synthetic Fibres*. As part of this guidance WIL is required to comply with emission limit values for additional parameters and constituent groups.

See the results in **Table Att D.2** below which show the concentrations of additional parameters applicable to manufacturers of synthetic fibres. All samples were taken on a daily basis between 23<sup>rd</sup> November . 1<sup>st</sup> December 2011

**Table Att D.2 showing the concentrations of additional water emissions applicable to Manufacturers of Synthetic Fibres**

Parameter	Limit Value	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
Phenol (mg/l)	1.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cyanide (mg/l as CN)	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mineral Oil (mg/l)	1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

From the Table above, it may be observed that the concentrations of additional parameters applicable to Manufacturers of Synthetic Fibres are all significantly below the concentration limit values specified.

## **Environmental considerations in relation to cleaner technologies, waste minimisation and raw material substitution**

In conjunction with our environmental improvement projects submitted to the Agency each year as part of the Annual Environmental Report (AER) submission, and our ethos of continuous improvement underpinned by our certification to the ISO 14001 environmental management standard, WIL continues to improve wherever feasible in relation to cleaner technologies, waste minimisation and raw material substitution.

**Cleaner Technologies** . WIL commenced feasibility studies in the use of both Combined Heat & Power (CHP) and wind energy in 2011. These studies are yet to be fully concluded, but it is anticipated that some potential for improvement is possible, particularly in relation to the harnessing of wind energy. Additional information is available in the most recent AER submission, which will be further updated in the AER to be submitted in 2012.

Further investment in studying the feasibility of further cleaner technologies is planned in 2012 and will be outlined in our environmental management program projects and our documented objectives and targets programme required under our ISO 14001 management system. A feasibility study on the use of biomass boilers will also be considered.

**Waste Minimisation** . WIL is firmly committed to the minimisation of all waste types generated by our activities. WIL is the largest recycler of post consumer PET bottles in Europe, and uses almost 5 million post consumer PET bottles every day that would otherwise have to be sent to landfill or incinerated. Over 75% of our raw material mix comes from post consumer PET bottles.

The waste generated by WIL is continuously reviewed, and waste minimisation projects are implemented as outlined in the environmental management program projects section of our AER submissions. The most recent waste minimisation related initiatives in 2011 were to recycle our plastic jumbo sacks, diverting them away from landfill. We have also introduced a waste segregation system for our canteen. Every year WIL also completes audits on a selection of our waste contractors, to ensure that our waste is being handled, recycled and where relevant disposed of in accordance with environmental requirements.

In 2012, the feasibility of diverting much of our remaining landfill to %waste to energy+will be investigated. Progress towards target will be included in subsequent AERs.

Significant progress has also been made in reducing the amount of waste polymer that is sent to landfill. The previous environmental management program project relating to waste management including in AER submissions between 2004 and 2007 detailed the reuse of much of our %dunker+polymer waste, removing the need for use landfill for much of the waste polymers generated by our manufacturing process.

**Raw Material Substitution** . The principle raw material used at WIL recycled post consumer PET bottles. As a result the raw material that WIL uses is a recycled material that would otherwise be disposed of via landfill or incineration. WIL evaluates the proportion of our raw material that comes from recycled PET bottles and continuously strives to improve the percentage of recycled raw material used each year. An increase to a total of 83.7% recycled raw materials was achieved in 2010.

## **Use of BAT to Prevent, Eliminate & Reduce Emissions**

See attachment E.1 for additional information on demonstration of compliance to BAT.

WIL implements a series of environmental management programme projects as part of compliance with our IPPC licence and other environmental regulations. A programme of environmental objectives and targets is also devised and implemented as part of our ISO 14001 management system. Both our environmental projects and our environmental objectives and targets programme aim to ensure that continuous environmental improvement and BAT are considered and implemented.

In order to ensure that BAT is applied, existing environmental controls are continuously reviewed to ensure that where possible new controls and available technologies are identified and implemented as suitable.

As part of our ongoing review of BAT, we have a current environmental management project program to update the design and technologies associated with the WIL effluent treatment plant. As part of this project the sludge dewatering press was rewired and upgraded to improve treatment efficiency in 2011. The bio tower was also renovated and the old distribution plates were replaced with splash plates to improve treatment efficiency. There also are plans for 2012 to replace our aeration system with a new more efficient design. An improved water filtration system on the river in-feed was also fitted in 2011.

## **Measures to ensure that no pollution occurs**

WIL monitors all emissions in accordance with licence limits specified in our IPPC licence. All monitoring is completed to the required specifications and test methods, and any non conformances will be notified to the Agency immediately upon identification.

WIL complies with all applicable environmental legislation, and formally reviews a dedicated environmental register of legislation and pending legislation on a regular basis.

Environmental incidents are formally recorded on an Environmental Communications Form. The role of environmental incident reporting is introduced to all employees during induction training held at the commencement of employment. All environmental incidents are reviewed and root causes are identified. Effective preventative or corrective measures are identified and feedback is provided to all relevant personnel, including those who report the incident.

Environmental training is provided to all new employees as part of their induction programme. Training for laboratory personnel, process operators and effluent plant technicians is provided in the various sampling, monitoring and environmental procedures that apply to them.

Effective environmental emergency measures are in place at the WIL site. This includes a trained emergency response team and designated emergency evacuation and spill control procedures. A dedicated emergency response compound is in place at WIL with suitable fire fighting, spill control and other equipment as relevant to our site and activities. Fire water retention ponds are in place to contain a large scale incident or spill were it to arise. Training in the operation of the pond system is provided at regular intervals to relevant employees and on site security contractors. Emergency drills are also held on multiple occasions each year.

All waste generated is fully documented in accordance with environmental regulations. Only approved and fully compliant waste contractors and collectors are used to transfer, dispose of, or recover waste. Our waste contractors are audited every year under our ISO 14001 system.

As part of our ISO 14001 system our environmental records, legal compliance and environmental practices are audited by the EPA and the NSAI on a regular basis. Any corrective or preventative actions identified are addressed immediately and with high priority. Internal environmental audits are also completed on a regular basis, with formal records generated and preventative and corrective actions identified and implemented.

A system of preventative maintenance is in place at WIL. A system of work orders are also in place. These are reviewed by maintenance and HSE personnel on a regular basis. This ensures that important repair work is completed in an effective and timely manner, and that all preventative maintenance work necessary for well functioning pollution abatement and monitoring equipment is completed.

## **Minimisation of waste production, prioritisation of waste recovery for wastes generated and reduction of impact of waste when disposed**

As the largest recycler of post consumer PET bottles in Europe, WIL is keenly aware of the importance of both recycling and the minimisation of waste generated by our activities. Under our environmental management system, WIL continuously introduces new waste minimisation and waste recovery options whenever they become available.

The continuing progress towards waste minimisation and the prioritisation of waste recovery may be noted from the information submitted to the Agency each year in the environmental management program projects section of the AER (Annual Environmental Review). WIL has increased the proportion of raw materials obtained from post consumer PET to help the organisation work towards its goal of waste minimisation. The proportion of waste generated for landfill has consistently been reduced due to various initiatives outlined in the AER each year. See the earlier section on waste minimisation in Attachment D.2 for more information of recent waste minimisation projects completed.

Reduction of impact of waste when disposed is also monitored on an ongoing basis. Where possible treatment options are prioritised based on low impact to the environment. WIL consults with its waste contractors and collectors in order to identify new or lower risk environmental options for waste recovery and disposal. In 2012, a feasibility study for sending current land filled waste types for ~~waste~~ waste to energy+ treatment will be investigated. Progress made on this and other environmental projects will be included annually in the AER.



## **Efficient use of energy and other resources**

At WIL, energy consumption is monitored on critical items of plant on a regular basis. This monitoring is recorded in-house and assessed to ensure that energy savings achieved are ongoing. WIL has long implemented sound energy efficiency principles, underpinned by our Energy Policy. In 1997, WIL won an international UNIPEDE award for energy efficient projects undertaken. WIL was also shortlisted by the SEAI in 2007 for energy efficiency projects in the Large Industry Category B. This included energy efficiency upgrades made to our steam producing boiler, including the fitting of an economiser on our boiler, and a plant wide upgrade of our steam traps system.

WIL undertook an energy audit in 2005 with an external consultant. The audit recommended a number of energy saving projects. A number of these recommendations were implemented in addition to a number of energy saving initiatives that were later identified. The completion of these initiatives have allowed WIL to increase its energy efficiency per tonne of product by >11%, since 2004.

WIL continues to identify and implement energy conservation initiatives where viable. At present, WIL is investigating wind energy and CHP proposals with a view to making further savings. Further information on these proposals can be viewed in our annual environmental reports submitted to the Agency.

As part of our environmental management system, ISO14001, WIL also includes a number of energy saving projects each year for consideration in our objectives programme. This is based on an in-house review of our energy consumption which is then summarised in the SEAI (Sustainable Energy Authority Ireland) questionnaire under the self-audit scheme. Details of these projects and progress made are notified to the Agency each year in the annual environmental report in the section relating to environmental management program projects. A dedicated project is assigned to energy reduction, while another project is currently dedicated to the investigation of alternative energies.

Major energy conservation projects completed in recent years include;

- Installation of Variable Speed Drives (VSDs) on Dryer recycle fans
- Replacement of process fans on Chip Dryers with low pressure blowers
- Introduction of new controls for factory lighting
- Installation of automatic stops to switch off Dryers when not in use
- Installation of controls on raw material feed systems (Saxlund)
- Upgrading of steam traps on condensate return pipes plant wide
- Installation of an economiser in the flue gas section of main steam producing boiler

## **Measures to prevent environmental accidents and to limit the consequences of accidents**

WIL has clear procedures in place for the reporting and control of environmental accidents and related consequences. The procedures for %Emergency Response . Designated Duties+, %General Evacuation+, the %Containing of Spills+and %Activation of Fire Water Retention Ponds+are attached. Relevant personnel receive training in these procedures on a regular basis.

Several key forms are also posted around key locations of the site to help remind all personnel of important environmental arrangements in place for environmental accidents. This includes EC44 Guidelines for Emergency Response, EC63 Guidelines for Containing Spills and EC49 Guidelines for the Storage of Chemicals and Finishes.

A dedicated Emergency Response Team is in place to assist in the event of any environmental accident or emergency situation. This Team receives regular training several times a year, in areas such as fire fighting and spill containment. A range of fire fighting equipment and spill control products are held around the site and in a designated Emergency Response compound.

All employees are trained in the importance of reporting both environmental and health and safety related incidents and are made aware of our environmental communications form during their induction training process. The form for reporting an environmental communication (EC18) is also included at the back of this section. All environmental accidents are immediately notified to the EPA, and where relevant other agencies, such as local authorities, the HSA and the Fisheries Board.

A network of foul drains is connected directly to our effluent treatment plant. These drains are situated in locations where process finishes and other potentially harmful environmental substances are used or stored. This includes our finishing lines, our finish mixing areas, our chemical stores and our waste oil compound. In the event of an environmental incident the fire water retention ponds can also be activated where necessary . see attached procedure on activation of the firewater retention ponds.

A number of bunded areas are also used on site - these are tested and re-certified every 3 years in accordance with our IPPC licence. Further information on bund testing is included in AER submissions.

WIL has also completed a Seveso assessment in accordance with requirements under the Control of Major Accident Hazards legislation. While WIL does not hold sufficient quantities of any named hazardous substance or hazard category to be directly affected by this legislation, an inventory of the quantity of each hazardous chemical on site is maintained for reference.

A formal approval system for all new chemicals is also in place which includes the formal retention of all MSDS and an environmental and health and safety related risk assessment. See attached form FN61 Approval & Risk Assessment of New Chemicals.

## **Measures to be taken upon cessation of activities to avoid pollution risk and return site operation to a satisfactory state**

WIL has completed a Closure Plan and Environmental Liabilities Risk Assessment in 2007 in consultation with external environmental consultants, RPS, and the EPA guidance document entitled "Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provisions" 2006. This plan includes estimates of the financial cost of implementing the closure plan, and outlines the various steps identified during the decommissioning and decontamination of site buildings.

In the event that the entire facility is closed, all areas of the facility shall be decommissioned and decontaminated. All plant and utilities will be decommissioned and decontaminated, and all waste arising from this shall be handled appropriately on site and removed for safe disposal or recovery by a licensed contractor. All documentation relating to decommissioning, decontamination and waste disposal/recovery will be made available for inspection.

WIL management will notify the Agency of all plans to cease operations with either partial or full closure of the facility for a period greater than 6 months. An agreed timeframe and methodology will be submitted to the Agency for agreement prior to any cessation. Other statutory bodies including the local authority will be notified of plans to cease operation and notified of the proposed closure time frame.

## River (Notionally clean river) WAC Calculations

Parameters used in calculations		Units	BOD	NH3-N	Ortho P
Effluent Concentration based on IPPC ELV's					
Effluent Concentration		mg/l	18	1.45	0.75
Effluent Volume		m <sup>3</sup> /day	580	580	580
Effluent Volume		m <sup>3</sup> /s	0.0067	0.0067	0.0067
Weight of parameter discharged per day		kg/day	10.44	0.841	0.435
Regulation requirement		mg/l	2.6	0.14	0.075
Notionally clean river		mg/l	0.26	0.008	0.0050
95%ile River Flow F <sub>95</sub>		m <sup>3</sup> /s	0.075	0.075	0.075
50%ile River Flow F <sub>50</sub>		m <sup>3</sup> /s			

**Notes:**

Notionally clean river levels provided by EPA

WAC of River		Units	BOD	NH3-N	Ortho P
C max		mg/l	2.6	0.14	0.075
C back		mg/l	0.2600	0.0080	0.0050
F 95		m <sup>3</sup> /sec	0.075	0.075	0.075
Multiplying factor			86.4	86.4	86.4
WAC = (Cmax- C back) * F 95 x 86.4kg/day)		kg/day	15.16	0.86	0.45
<b>Maximum Flow permitted at expected concentration</b>		<b>m<sup>3</sup>/day</b>	<b>842.4</b>	<b>589.9034483</b>	<b>604.8</b>
<b>% of capacity to be assimilated at proposed discharge rate</b>			<b>69%</b>	<b>98%</b>	<b>96%</b>

Assuming notionally clean water, the maximum allowable discharge concentrations to achieve compliance with 95%ile good status limits would be 1.45 mg/l Ammonia and 0.75mg/l Ortho-Phosphate at licence value flow rate 580 m<sup>3</sup>/day pro rata. The current IPPC licence limit for BOD is 18mg/l and will be significantly below the maximum allowable discharge concentration.