Draft BAT Guidance Note on Best Available Techniques for the Treatment or Protection of Wood, Involving the Use of Preservatives

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# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>1.1</td>
<td>General</td>
<td>1</td>
</tr>
<tr>
<td>1.2</td>
<td>BAT Guidance Note Structure</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>INTERPRETATION OF BAT</td>
<td>2</td>
</tr>
<tr>
<td>2.1</td>
<td>Status of This Guidance Note</td>
<td>2</td>
</tr>
<tr>
<td>2.2</td>
<td>Interpretation of BAT</td>
<td>3</td>
</tr>
<tr>
<td>2.3</td>
<td>BAT Hierarchy</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>SECTOR COVERED BY THIS GUIDANCE NOTE</td>
<td>5</td>
</tr>
<tr>
<td>4.</td>
<td>PROCESS DESCRIPTION, RISK TO THE ENVIRONMENT &amp; CONTROL TECHNIQUES</td>
<td>6</td>
</tr>
<tr>
<td>4.1</td>
<td>Description of Process</td>
<td>6</td>
</tr>
<tr>
<td>4.2</td>
<td>Risk to the Environment</td>
<td>7</td>
</tr>
<tr>
<td>4.3</td>
<td>Control Techniques</td>
<td>9</td>
</tr>
<tr>
<td>5.</td>
<td>BAT FOR THE TREATMENT OR PROTECTION OF WOOD INVOLVING THE USE OF PRESERVATIVES</td>
<td>18</td>
</tr>
<tr>
<td>5.1</td>
<td>Introduction</td>
<td>18</td>
</tr>
<tr>
<td>5.2</td>
<td>BAT</td>
<td>18</td>
</tr>
<tr>
<td>6.</td>
<td>BAT ASSOCIATED EMMISION LEVELS</td>
<td>21</td>
</tr>
<tr>
<td>6.1</td>
<td>Emission Levels for Discharges to Air</td>
<td>21</td>
</tr>
<tr>
<td>6.2</td>
<td>Emission Levels for Discharges to Water</td>
<td>23</td>
</tr>
<tr>
<td>6.3</td>
<td>Emission Levels for Discharges to Sewer</td>
<td>25</td>
</tr>
<tr>
<td>7.</td>
<td>COMPLIANCE MONITORING</td>
<td>26</td>
</tr>
<tr>
<td>7.1</td>
<td>Monitoring of Emissions to Air</td>
<td>26</td>
</tr>
<tr>
<td>7.2</td>
<td>Emissions of Surface Water to Sewer or Waste</td>
<td>26</td>
</tr>
<tr>
<td>7.3</td>
<td>Ambient Surface Water and Groundwater Monitoring</td>
<td>26</td>
</tr>
<tr>
<td>7.4</td>
<td>Monitoring of Waste</td>
<td>27</td>
</tr>
<tr>
<td>7.5</td>
<td>Monitoring of Noise Emissions</td>
<td>27</td>
</tr>
</tbody>
</table>

**APPENDICES**

- Appendix 1 Principle References
- Appendix 2 Glossary of Terms and Abbreviations
1. INTRODUCTION

1.1 GENERAL

This Guidance Note is one of a series issued by the Environmental Protection Agency (EPA) which provide guidance on the determination of Best Available Techniques (BAT) in relation to:

- applicants seeking Integrated Pollution Prevention and Control (IPPC) licences under Part IV of the Environmental Protection Agency Acts 1992 to 2007,
- existing Integrated Pollution Prevention and Control (IPPC) Licensees, whose licence is to be reviewed under the Environmental Protection Agency Acts 1992 to 2007,
- applicants seeking Waste Licenses under Part V of the Waste Management Acts 1996 to 2011,
- existing Waste Licensees, whose licence is to be reviewed under the Waste Management Acts 1996 to 2011.

This Guidance Note shall not be construed as negating the installation/facility statutory obligations or requirements under any other enactments or regulations.

1.2 BAT GUIDANCE NOTE STRUCTURE

This Guidance Note has been structured as follows:

<table>
<thead>
<tr>
<th>Section</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
</tr>
<tr>
<td>2</td>
<td>Interpretation of BAT</td>
</tr>
<tr>
<td>3</td>
<td>Sector Covered by this Guidance Note</td>
</tr>
<tr>
<td>4</td>
<td>Process Description, Risk to the Environment and Control Techniques</td>
</tr>
<tr>
<td>5</td>
<td>Best Available Techniques</td>
</tr>
<tr>
<td>6</td>
<td>BAT Associated Emission Levels</td>
</tr>
<tr>
<td>7</td>
<td>Compliance Monitoring</td>
</tr>
</tbody>
</table>

Where relevant, references are made to other detailed guidance, such as the reference documents (BREF) published by the European Commission, Agency Guidance Notes for Noise in Relation to Scheduled Activities and the determination of BAT should be made giving regard to these.

The information contained in this Guidance Note is intended for use as a tool to assist in determining BAT for the specified activities.
2. INTERPRETATION OF BAT

2.1 STATUS OF THIS GUIDANCE NOTE

This Guidance Note will be periodically reviewed and updated as required to reflect any changes in legislation and in order to incorporate technological advances as they arise. Techniques identified in this Guidance Notes are considered to be current best practice at the time of writing. The EPA encourages the development and introduction of new and innovative technologies and techniques which meet BAT criteria and look for continuous improvement in the overall environmental performance of the sector’s activities as part of sustainable development.

2.2 INTERPRETATION OF BAT

BAT was introduced as a key principle in the IPPC Directive 1996/61/EC. This Directive has been incorporated into Irish law via the Protection of the Environment Act 2003. To meet the requirements of this Directive, relevant Sections of the Environmental Protection Agency Act 1992 and the Waste Management Act 1996 have been amended to replace BATNEEC (Best Available Technology not Entailing Excessive Costs) with BAT.

Best available techniques (BAT) is defined in Section 5 of the Environmental Protection Agency Acts, 1992 to 2007, and Section 5(2) of the Waste Management Acts 1996 to 2011, as the “most effective and advanced stage in the development of an activity and its methods of operation, which indicate the practical suitability of particular techniques for providing, in principle, the basis for emission limit values designed to prevent or eliminate or, where that is not practicable, generally to reduce an emission and its impact on the environment as a whole”, where:

B ‘best’ in relation to techniques, means the most effective in achieving a high general level of protection of the environment as a whole

A ‘available techniques’ means those techniques developed on a scale which allows implementation in the relevant class of activity under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced within the State, as long as they are reasonably accessible to the person carrying on the activity

T ‘techniques’ includes both the technology used and the way in which the installation is designed, built, managed, maintained, operated and decommissioned.

The range of BAT associated emission levels specified in Section 6 indicate those that are achievable through the use of a combination of the process techniques and abatement technologies specified as BAT in Section 5. The licensee must demonstrate to the satisfaction of the Agency, during the licensing process, that the installation/facility will be operated in such a way that all the appropriate preventative measures are taken against pollution through the application of BAT and justify the application of other than the most stringent ELV in the range.

At the installation/facility level, the most appropriate techniques will depend on local factors. A local assessment of the costs and benefits of the available options may be needed to establish the best option. The choice may be justified on the basis of:
– the technical characteristics of the installation/facility;
– the geographical location of the installation/facility;
– local environmental considerations;
– the economic and technical viability of upgrading the existing installation/facility.

The overall objective of ensuring a high level of protection for the environment as a whole will often involve making a judgment between different types of environmental impact, and these judgments will often be influenced by local considerations. On the other hand, the obligation to ensure a high level of environmental protection including the minimisation of long-distance or transboundary pollution implies that the most appropriate techniques cannot be set on the basis of purely local considerations.

The guidance issued in this Note in respect of the use of any technology, technique or standard does not preclude the use of any other similar technology, technique or standard that may achieve the required emission standards and is demonstrated to the Agency to satisfy the requirement of BAT.

2.3 BAT HIERARCHY

In the identification of BAT, emphasis is placed on pollution prevention techniques rather than end-of-pipe treatment.

The IPPC Directive 2008/1/EC and the Environmental Protection Agency Acts 1992 to 2007 (Section 5(3)), require the determination of BAT to consider in particular the following, having regard to the likely costs and advantages of measures and to the principles of precaution and prevention:

(i) the use of low-waste technology,
(ii) the use of less hazardous substances,
(iii) the furthering of recovery and recycling of substances generated and used in the process and of waste, where appropriate,
(iv) comparable processes, facilities or methods of operation, which have been tried with success on an industrial scale,
(v) technological advances and changes in scientific knowledge and understanding,
(vi) the nature, effects and volume of the emissions concerned,
(vii) the commissioning dates for new or existing activities,
(viii) the length of time needed to introduce the best available techniques,
(ix) the consumption and nature of raw materials (including water) used in the process and their energy efficiency,
(x) the need to prevent or reduce to a minimum the overall impact of the emissions on the environment and the risks to it,
(xi) the need to prevent accidents and to minimise the consequences for the environment, and
(xii) the information published by the Commission of the European Communities pursuant to any exchange of information between Member States and the industries concerned on best available techniques, associated monitoring, and developments in them, or by international organisations, and such other matters as may be prescribed.
3. SECTOR COVERED BY THIS GUIDANCE NOTE

This Guidance Note covers the following activities under the First Schedule of the Environmental Protection Agency Acts 1992 to 2007:

8.3 The treatment or protection of wood, involving the use of preservatives, with a capacity exceeding 10 tonnes of wood per day.

12.2.1 The surface treatment of substances, objects or products using organic solvents in particular for impregnating, with a consumption capacity of more than 150 kg per hour or more than 200 tonnes per year.

Any activity above either of these thresholds comes under this guidance note regardless of the type of preservative in use.

In addition to this:

- Any activity giving a loading of preservative in timber with an organic solvent consumption of more than 25 tonnes per year is classed as a Solvents Directive activity. Specific Solvents Directive requirements for such activities above this threshold are included in this guidance Note.

- Any activity carrying out surface treatment using organic solvents, in particular for impregnation of wood, with a consumption capacity of more than 150 kg per hour or more than 200 tonnes per year is an IPPC Directive activity.

For information, the following definitions are taken from the Solvents Directive:

Organic Compound: any compound containing at least the element carbon and one or more of hydrogen, halogens, oxygen, sulphur, phosphorus, silicon or nitrogen, with the exception of carbon oxides and inorganic carbonates and bicarbonates.

Volatile Organic Compound (VOC): any organic compound having at 293.15 K a vapour pressure of 0.01 kPa or more, or having a corresponding volatility under the particular conditions of use.

Organic Solvent: any VOC which is used as a preservative (part of definition relevant to wood preservation).

Consumption: the total input of organic solvents into an installation per calendar year, or any other 12-month period, less any VOCs that are recovered for reuse;

Reuse: the use of organic solvents recovered from an installation for any technical or commercial purpose and including use as a fuel but excluding the final disposal of such recovered organic solvent as waste.

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1 Directive 99/13/EC on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations.

This Guidance Note does not cover:

- The use of preservatives on in-situ timber (for example construction sites, etc.).
- Wood processing operations (sawing, planing, drilling, etc.) that are often also carried out on sites involved in industrial wood preservation.
- Wood conditioning operations (kiln drying, etc.) that are often also carried out on sites involved in industrial wood preservation.
- Wood coating (furniture etc.) using organic solvents. This is covered by a separate BAT Guidance Note (BAT Guidance Note on Best Available Techniques for Solvent Use in Coating, Cleaning and Degreasing).


It should be noted that Annex I of the Industrial Emissions Directive (IED) (2010/75/EU) includes activity 6.10 in relation to the preservation of timber, which was not previously included under the IPPC Directive, i.e.:

6.10 Preservation of wood and wood products with chemicals with a production capacity exceeding 75m³ per day other than exclusively treating against sapstain

Member States are required to bring into force the laws, regulations and administrative provisions necessary to comply with point 6.10 of Annex I by 7 January 2013.

In relation to installations carrying out activities referred to in Annex I, point 6.10 which are in operation before 7 January 2013, Member States shall apply the laws, regulations and administrative provisions adopted in accordance with this Directive from 7 July 2015.

It is anticipated that work on a new BREF document, on the preservation of wood and wood products with chemicals, will be commenced in 2012 by the European Commission's Joint Research Centre.
4. PROCESS DESCRIPTION, RISKS TO THE ENVIRONMENT AND CONTROL TECHNIQUES


While this BREF only covers the use of organic solvent-based wood preservatives, many of the general techniques are also applicable to the use of water-based wood preservatives.

There are also references to other cross-sectoral BREF documents in this guidance note. These are:


4.1 DESCRIPTION OF PROCESS

This document covers the treatment or protection of wood using preservatives at the levels specified in Section 3 of this document.

4.1.1 Preservatives Used

Preservatives can include both water-based and organic solvent-based preservatives. Water-based preservatives can contain various organic and/or organo-metallic pesticides as well as the inorganic preservative. Some of these water-based preservatives can still contain components that are classified as volatile organic compounds (for example, monoethanolamine).

Organic solvent-based preservatives include those based on white spirit or other petroleum based hydrocarbons that, similar to the water based preservatives, contain various organic and/or organo-metallic pesticides. Organic solvent-based preservatives also include creosote.

There have been controls implemented through EU legislation on the use of chromated, copper arsenate (CCA) treated wood. This legislation generally prohibits the use of CCA for the preservation of wood and generally requires that any wood so treated shall not be placed on the market.

4.1.2 Process Description

The application of the preservative can be applied to wood by dipping, brushing or spraying or via pressure processes. The treatment plant typically consists of preservative storage, mixing vessels and treatment vessel. The process steps for the protection of wood using pressure processes can generically be described as follows:
- Delivery and storage of wood and preservative. Preservative is delivered and stored in a bulk tank, either ready to use, or where it may be diluted. Alternatively it may be delivered in containers such as IBCs or drums. Preservative feeds from the bulk tank or containers to the working vessel, and from there into the treatment vessel. A site may operate more than one treatment vessel.

- Wood loading for processing. The wood is loaded into the treatment vessel on loading trolleys, either manually or automatically. Loaded trolleys are wheeled into the treatment vessel, usually on rails.

- Core activity - the preservation process. There are two types of pressure impregnation processes: Double vacuum (low pressure or envelop penetration) and Vacuum-pressure (high pressure or deep penetration). Double vacuum treatment is used for water based and solvent based preservation. Vacuum pressure treatment is used for water based and some other preservatives. Steps are as follows:
  - Initial vacuum: An initial vacuum is applied which results in the air being removed from the timber. The length and degree of this vacuum depends on the specification of preservation required, as the amount of air removed will affect the penetration of the preservative.
  - Flooding: The preservative solution is transferred to the treatment vessel under vacuum. Ambient temperature is used for water-based and solvent-based products while creosote is heated.
  - Pressure period: Once the vessel is flooded the vacuum is released and returned to atmospheric pressure. For double vacuum, the timber is held in the preservative for a period of time, or where specification requires, a low pressure is applied (~ 200kPa). In the case of vacuum pressure a hydraulic pressure is applied (~ 800-1,400kPa). The pressure is maintained for a specified period of time until the wood will no longer absorb the preservative.
  - Initial drain: The treatment vessel is drained and the preservative is transferred back to the working vessel.
  - Final vacuum & drain: A final vacuum is applied to the treatment vessel to remove any excess preservative. The vacuum is then released and the collected excess preservative is then drained and pumped back to the storage tanks for reuse. Vacuum pressure treatment applies a low pressure following final vacuum. In the case of organic solvent based preservatives, fresh air can be drawn through the vessel to remove solvent vapour from the working area around the door to minimise operator exposure.

- Drying - the treated timber is removed from the vessel and stored in a dripping area. Once the treated timber is dry it is moved to a yard for storage/delivery.

Ancillary activities can include the following:

- Wood conditioning – reducing the moisture content of the wood to a level allowing preservative penetration. Conditioning is not always carried out at the same site as preservation. Conditioning can include open air-drying, kiln drying, etc.

- The wood is often processed on-site undergoing cutting, drilling, planning, etc., prior to being treated.
4.2 **RISK TO THE ENVIRONMENT**

The key environmental issues for installations treating or protecting wood using preservatives are the potential risk to surface waters, ground/soil, and ground waters from handling and using the preservatives and, in certain cases, site remediation after cessation or following contamination. Other environmental issues for this activity include raw material consumption and waste, and in some cases emissions to air, noise, and odour.

4.2.1 **Potential Risk to Waters and Land**

There is a potential risk to surface waters, ground waters, and ground/soil, from handling and using the preservatives. Most wood preservatives used are classified as dangerous for the aquatic environment. They are also likely to be classed as not readily biodegradable.

Potential areas of risk include the delivery and handling of the preservative, operation and maintenance of the processing equipment, maintenance of bunds which store preservative vessel, dripping areas, storage of freshly treated timber, transfer of preservative around the site on forklift trucks wheels and personnel footwear, and storage of preservative-containing waste.

Rainwater collected from certain areas has the potential to be contaminated by wood preservative. Areas with the potential for surface water to be contaminated by wood preservative include areas immediately outside access doors of the preservation process building and areas where treated timber is stored outdoors.

4.2.2 **Environmental Liabilities, Restoration and Aftercare**

A key element to understanding and managing environmental risk at an installation is the carrying out of an environmental liabilities risk assessment for known and unknown liabilities (including aftercare), and the financial provision for same. Regard should be had to the Environmental Liabilities Directive 2004/35/EC and consideration should be given to the EPA guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision.

Restoration is a process that will return a site to a condition suitable for the selected afteruse. Restoration includes measures such as soil spreading, final landform construction, landscaping works and aftercare. Aftercare involves any measures that are necessary to be taken in relation to the installation for the purposes of preventing environmental pollution following the cessation of the licensable activity at the site. The length of this aftercare period will vary from site to site and the licence holder remains responsible for the aftercare until the Agency accepts the surrender of a licence.

4.2.3 **Site Remediation**

In certain cases, remediation of soil, surface water and/or groundwater is necessary. This is needed where contamination of soil, surface water or groundwater with preservative has occurred. Sources of such contamination can include damaged bunds, hard surfaces, etc., out-door storage of wet treated timber, accidental spillages, and so forth. It can particularly be an issue for older installations, and is a significant issue to be considered after cessation of an activity. In addition, preservatives which have replaced CCA preservative in recent years, are found to be present in groundwater and surface water at certain plants that are in operation (e.g., pesticides in new preservatives are evident in waters at some active treatment plants). All constituents of the preservative (for new and historic preservatives used at an installation) should be taken into account at the monitoring and remediation phases.
4.2.4 Raw Material Consumption

Principal raw materials consumed are timber and preservative. There may also be packaging utilised on the final timber products. There will also be electricity consumption associated with operating the plant and fuel/electricity consumption in on-site vehicles.

4.2.5 Emissions to Air

Emissions to air are only of relevance for organic solvent based preservatives and for creosote. There will also be emissions to air associated with some water-based preservatives where they contain volatile organic compounds.

There will be some emission points including the vacuum pump exhaust, but such emissions of volatile organic compounds are primarily fugitive in nature. Sources include the process vessel when opened, storage tank working and breathing losses, and losses from the wood itself in the dripping/drying areas. The majority of the emissions occur during the drying process.

Dust can also be an issue at timber treatment sites associated with saw-milling activities however, as this is an ancillary activity, it is not covered by this Guidance note.

4.2.6 Emissions to Waters

There is normally no actual process effluent associated with wood preservation. However, see potential risk to waters and land in Section 4.2.1.

4.2.7 Waste

Waste streams that could be classified as hazardous from this process include wood waste that has been treated with preservative including shavings and sawdust; the preservative itself (out-of-date, contaminated, etc.); packaging, wiping cloths, protective clothing, absorbents, sawdust, etc., that has been contaminated with preservative; any sludges from tanks, the process vessel, interceptors, etc., containing preservative; and any contaminated soils.

Non-hazardous waste streams can include untreated wood waste and uncontaminated packaging. In addition wood waste that is treated by preservative may be classified as a non-hazardous waste. This depends on the type of preservative used and the percentage (or uptake rate) of preservative present in the wood.

4.2.8 Noise

Noise sources from the wood preservation process are mainly on-site vehicle traffic and noise associated with equipment operation.

There may be ancillary activities at the site that are sources of noise, for example wood processing operations (cutting, planning, drilling, etc.). This Guidance note does not address these operations specifically.

4.2.9 Odour

Odour from the wood preservation process is highly dependent on the type of preservative in use.

4.3 CONTROL TECHNIQUES

4.3.1 General Preventive Techniques

The following general techniques can be applied to wood preservation activities:
4.3.1.1 Environmental Management System

Environmental Management System including:

- Consideration of the impact of decommissioning at the design stage for new plants.
- Consideration of the development and use of cleaner technologies.
- Implement a housekeeping and maintenance programme which includes the training and preventive actions needed, as relevant, to minimise the specific environmental risks listed in Section 4.2 of this document.
- Regular re-evaluation, as appropriate, of process specification and quality control of the product, quality control of the process jointly carried out by the customer, operator and the specialists of the preservative supplier.
- Regular internal benchmarking, where practicable, with continuous optimisation against this benchmarking; and the taking of actions based on this benchmarking data to the extent allowable.
- Regular process monitoring and optimisation of appropriate parameters.
- Annual waste minimisation report showing efforts made to reduce specific raw material consumption together with material balance and fate of all materials.
- For automatic processes, use real time process control and optimisation, unless it can be demonstrated to be unfeasible.
- Use of correct operational procedures.
- Training of staff on procedures including information on and guidance in the safe and efficient handling and use of preservatives/pesticides, risks to their health by exposure to preservatives/pesticides and precautions to minimise exposure.

4.3.1.2 Housekeeping and Maintenance

Implement a housekeeping programme which includes the training and preventive actions needed, as relevant, to minimise the specific environmental risks listed in Section 4.2 of this document.

Implement a maintenance schedule that includes regular maintenance of all plant, equipment, bunds and periodic calibration and testing of relevant process instrumentation (e.g., pressure gauges, high liquid levels alarms, etc.). Retaining written records of such maintenance.

4.3.1.3 Wood Preservation Specification

Where possible, use of a decision making process whereby the specifier and/or the end user of the wood decides whether wood preservation is necessary, desirable, optional, or not necessary. This process should take into account timber species, end use, design and location. This may be beyond the influence of the wood preservation process operator.

4.3.1.4 Choice of Materials and Processes

Where possible the use of processes and products that present lower risks to the environment should be used.

Choice of wood from sustainably managed sources. These choices may be beyond the influence of the wood preservation process operator.
4.3.1.5 Requirements for Organic Solvents with Specified Risk Phrases

Those installations which fall under the Solvents Directive 1999/13/EC (see Section 3) must replace as far as possible the materials that contain organic solvents with risk phrases R45, R46, R49, R60, or R61\(^3\) with less harmful materials within the shortest possible time. It should be noted that certain creosote blends could be classified as R45.

4.3.1.6 Periodic Preservative Review

Carry out a periodic review of the type of preservative in use, if needs be in conjunction with the supplier, considering the health and environmental properties of the preservative and any alternatives. The types of preservative on the market tend to evolve with time.

4.3.1.7 Minimisation of Energy Consumption

Energy efficiency of equipment motors, etc., should be considered at the design stage. Measures to reduce energy consumption should be considered and implemented where feasible.

4.3.1.8 Minimisation of Air Emissions

The use of water-based preservatives will minimise or even eliminate emissions to air of VOCs. However, assessment of any particular preservative should take into consideration all environmental media, in particular classification with respect to the aquatic environment. Where two preservatives have the same properties with respect to the aquatic environment, the use of a water-based preservative is preferable to a solvent-based preservative.

4.3.1.9 Minimisation of Water Emissions

Separately collect and monitor, as required, surface waters from potentially contaminated areas. Areas that are a source of potential contamination with preservatives include outdoor timber storage areas and areas outside the access doors of the preservation process building. Storm water from external wood storage areas should pass through a silt trap prior to discharge. Storm water discharge points from the site should be monitored for constituents present in the preservative (for both historic preservative(s) used at the site and the current preservative in use). Groundwater wells should be installed at strategic locations or close to the installation so that an assessment can be made of the current status of groundwater quality upstream of the site, at the site and downstream of the site. This ensures that groundwater monitoring highlights any potential impact that the installation may have on the groundwater quality in the locality.

4.3.1.10 Minimisation of Waste

Preservative collected in bunds, drip trays, etc., should be collected and returned to storage for reuse in the process. Appropriate dedicated equipment (for example portable pumps) should be available to carry out this task.

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\(^3\) R45 (may cause cancer)
R46 (may cause heritable genetic damage)
R49 (may cause cancer by inhalation)
R60 (may impair fertility)
R61 (may cause harm to the unborn child)

It should be noted that “risk phrases” will be replaced by equivalent “hazard statements” by 1\(^{st}\) June 2015 under Regulation (EC) No. 1272/2008.
Where preservative is delivered in containers rather than in bulk, such containers should be reusable/returnable to the supplier.

Any wood processing that is to be carried out (sawing, planning, drilling, etc.) should be carried out before the wood preservation step.

4.3.1.11 Minimisation of Noise

Locating and operating plant and equipment indoors will reduce noise emissions. Landscaping and the use of trees and shrubs at the site boundary can help minimise noise beyond the site boundary. Timber stock can be positioned on the site so as to act as a noise buffer. Restriction of outdoor vehicle activity to certain time periods.

4.3.2 Preventive Techniques for Specific Processes or Unit Operations

4.3.2.1 Preservative Application

Use a trolley design, which minimises the amount of preservative retained on wood when it is removed from the treatment vessel.

Fill the plant to capacity with timber and avoid part loads.

Loading of timber for the treatment process vessel should be done in a manner to avoid retention of excess preservative, including where possible:

- Sloping the timber.
- Stacking the timber so that the greatest surface area is available for the treatment solution.
- Using spacers to avoid capillary retention between surfaces.
- Positioning shaped profiles to limit the amount of liquid preservative trapped in any such profiles.

A final vacuum step in the treatment vessel to remove excess preservative should always be applied, unless proven to be unfeasible.

Prior to discharge from the vessel, as much holding time within the vessel as allowable together with mechanical shaking of the load, where possible, should be carried out to minimise preservative liquid being removed from the vessel. Establish and implement appropriate dripping times within the vessel before removal of the timber load.

The use of a tilting treatment vessel, which aids the drainage of preservative during the final treatment stage, is recommended.

4.3.2.2 Post-treatment dripping

Where possible, it is recommended that the strapping around packs of smooth sawn timber be released after the dripping period, followed by an extended dripping period.

Stacking of timber after the treatment process vessel should be done in a manner to promote dripping of excess preservative in the dripping area, measures include:

- Sloping the timber.
- Using spacers to avoid capillary retention between surfaces.
- Positioning shaped profiles to promote the preservative to run out of any such profiles.
4.3.3 Techniques for Containment

4.3.3.1 Bunding

Bunding should be in place for all preservative storage tanks, delivery connections to bulk storage tanks, mixing tanks, the wood treatment vessel and the storage area for preservative containers. The considerations outlined in the Storage BREF, Section 5.1.1.3. Preventing incidents and (major) accidents: ‘Soil protection around tanks – containment’ should be taken into account.

4.3.3.2 Other Storage Requirements

All mixing, storage vessels and containers should be enclosed or fitted with adequately fitting lids. Containers should be sealed when not in use.

All fixed storage and mixing tanks should be fitted with high-level alarms and level indicators and/or automatic shut-off valves in liquid supply to prevent overflow. See Storage BREF, Section 4.1.6.1.6 and Section 5.1.1.3. Preventing incidents and (major) accidents: Operational procedures and instrumentation to prevent overfill.

All preservative tanks and containers should be labeled indicating the contents.

Organic solvent containing waste (e.g., absorbents, wipes, protective clothing, etc.) should be stored in sealed containers.

Water supply should be measured and controlled.

4.3.3.3 Treatment Vessel

The preservation vessel should have a liquid level indicator and a pressure/vacuum gauge.

There should be safety locks on preservation vessel doors so it cannot be opened when liquid is within the vessel, and to prevent the process from starting until the door is fully closed and locked. Older vessels should have such devices retrofitted.

Seals on treatment vessel doors should be wiped each time before use.

Safety relief valve on the preservation vessel should vent to a suitably sized tank.

4.3.3.4 Roofing

All areas where preservatives are delivered, stored, transferred and used should be roofed. This includes bulk preservative storage tanks, preservative container storage areas, mixing tanks, the wood treatment vessel, and the holding or dripping area for wet, freshly-treated timber (i.e., the dripping area) and the storage area for treated timber up to 48 hours post-timber treatment and until dry to touch.

4.3.3.5 Holding or Dripping Area for Freshly Treated Timber

The holding or dripping area for wet, freshly-treated timber must be under roof, contained and impermeable, must be located adjacent to the processing plant, must be adequately sized, and must facilitate the collection of drips for reuse or safe disposal (e.g., sloped and sumps to enable collection and storage). Treated wood should be removed from the holding or dripping area and sent for storage only after dripping has completely stopped and the wood is dry to touch.

4.3.3.6 Treated Wood Storage

Treated wood that has completely dried (after the 48 hours and is dry to touch) should be stored, where feasible, under cover to prevent groundwater and surface water contamination through leaching during periods of wet weather. If this is not feasible, it
should be stored on an impermeable surface with the treated wood placed on supports to avoid contact with runoff water and the surface water from this area collected separately, with the facility to monitor/sample, prior to any dilution with any other surface waters.

4.3.3.7 Security
All areas where preservatives are delivered, stored, transferred and used should be secure: the site itself should be secure with local measures to ensure security, such as lockable connections to storage tanks or a lockable container storage area.

4.3.3.8 Delivery
Preservative should be delivered to the site either by bulk tanker or in sealed, labeled, containers (appropriate drums or intermediate bulk containers (IBCs)).

During delivery, use drainage shut-off valves, where needed, to isolate from the drainage system.

4.3.3.9 Other Containment Requirements
Operational practices to eliminate the spread of preservative contamination on vehicle wheels and footwear should be implemented. This can include the following measures in the preservation process area, as appropriate: plant design and layout, raised walkways, dedicated forklift trucks in preservative containing areas, restricted vehicle access, restricted personnel access, good housekeeping and wheel washes.

Suitable spill handling and containment equipment should be readily available in all preservative handling areas.

All process pipelines should be over ground.

4.3.4 Techniques for Recovery and Recycling

4.3.4.1 Collect and Re-use Preservative
Collect all preservative from bunds, including the dripping area, and reuse in the process. Use drip trays around treatment vessel doors and collect preservative using for example a dedicated portable pump and reuse in the process.

4.3.4.2 Recycle Uncontaminated Waste Packaging
The following uncontaminated waste packaging streams: aluminum, cardboard, glass, paper, plastic sheeting, steel, and wood packaging, if generated on-site, should be segregated and recycled.

4.3.4.3 Untreated Wood Waste Recovery
Untreated wood waste can be sent off-site:
- To board mills for recycling
- For composting or mulching
- For use as a fuel in a facility authorised to do so
- For use as animal bedding.
- Other uses

In the above cases, measures need to be put in place to ensure no treated wood waste enters this stream.
Untreated waste wood shavings, off-cuts and sawdust can be used as a fuel in boilers on-site, where present, subject to the following:

- Only shavings, off-cuts and sawdust can be used
- No treated shavings, off-cuts or sawdust can be used. Procedures must be in place to ensure any treated shavings, off-cuts or sawdust do not enter this stream
- It is replacing other fuels, which would have been used to fulfil the same function
- Express permission is included in the licence as granted.

### 4.3.5 Treatment Techniques

#### 4.3.5.1 Treatment of Air Emissions

Use of mist eliminators, where needed, to remove liquid droplets of preservative entrained in the air stream.

Where activities that come under the Solvents Directive (i.e., using organic solvents for impregnation of wood with a solvent consumption of more than 25 tonnes per year) or with a capacity to use at least 10 tonnes per year of organic solvents, have either:

- VOCs with the specified risk phrases above the stated mass flow emissions (see Section 6.1.1.1), or
- Have elected to meet the waste gas and fugitive ELVs in Table 6.1.3, VOC abatement equipment may be needed in order to meet the emission limit values specified.

The selection of a particular VOC abatement technique depends on the properties of the VOC, flowrates of waste gases, operational profile of the preservation process, and waste gas concentrations. Techniques can include, but are not limited to, adsorption (see surface treatment BREF Section 18.4.4).

#### 4.3.5.2 Treatment of Waste Water

Wood treatment processes generally do not generate any direct process effluent. However surface water run-off may potentially be contaminated with preservative.

The separate collection and monitoring where required, of surface water from areas that can be potentially contaminated with preservatives should be carried out.

The use of sumps/interceptors for such separate drainage areas can assist in catching leakage or spillage losses (see the Waste Water & Gas Treatments BREF Chapter 3 rainwater).

In certain situations treatment facilities may be necessary for surface water from areas that can potentially be contaminated with preservatives used at the installation. Treatment options can include grit chamber, sedimentation tank or pond, retention pond, sand filter (see the Waste Water & Gas Treatments BREF Chapter 3 rainwater). The need for treatment must be evaluated on a site specific basis.

### 4.3.6 Techniques for Appropriate Disposal

Segregate waste wood off-cuts, sawdust and shavings that has been treated with preservative, and which is potentially hazardous waste, from untreated wood waste.

Waste treated wood off-cuts; sawdust and shavings that contain preservative may be classified as hazardous waste. This depends on the type of preservative and the percentage present in the waste.
Similarly packaging, wiping cloths, protective clothing, absorbents, contaminated soil, etc., that contain preservative may be classified as hazardous waste. This again depends on the type of preservative and the percentage present in the waste.

Waste preservative as well as any sludges from tanks and the process vessel is likely to be classified as hazardous waste.

Waste classified as hazardous, once all reduction, reuse, and recovery options have been exhausted, should only be incinerated in a hazardous waste incinerator or disposed of in a landfill for hazardous waste. Treated wood which is classified as hazardous can either be directly incinerated at an appropriately authorized site or thermally treated by carbonisation/pyrolysis with subsequent extraction of heavy metals as appropriate (see Waste Treatments BREF Section 1.2.11 and Waste Incineration BREF Section 10.2.7 and 10.3.4).

Certain non-hazardous wastes can be landfilled or incinerated in a municipal waste incinerator, once all recovery options have been exhausted, and subject to the acceptance criteria of individual facilities. Such wastes include:

- Untreated wood waste that is not contaminated with preservative or any other dangerous substances. However, total biodegradable waste going to landfills is being progressively limited under the Landfill Directive\(^4\).
- Treated wood waste that is classified as non-hazardous is set out in guidance on waste classification.
- General municipal type waste, with the exception of certain packaging waste streams which must be segregated and recycled – namely aluminum, cardboard, glass, paper, plastic sheeting, steel, and wood packaging, etc.

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5. BEST AVAILABLE TECHNIQUES FOR THE TREATMENT OR PROTECTION OF WOOD INVOLVING THE USE OF PRESERVATIVES

5.1 INTRODUCTION

As explained in Section 2, this Guidance Note identifies BAT but obviously does so in the absence of site-specific information. Accordingly, it represents the requirements expected of any new activity covered by the Note, and ultimately the requirements expected of existing facilities, but do not include additional requirements, which may form part of the granting of a licence for a specific site.

The approach to be used in selecting BAT is based on the following hierarchy:

- Process design/redesign to eliminate emissions and wastes
- Waste reduction by means of process control, inventory control, etc.
- Substitution of materials, fuels, etc., by environmentally less harmful materials
- Reuse of materials within the process and in products
- Recycling of wastes in other applications
- End-of-pipe techniques to control, abate or treat emissions
- Safe disposal.

The technical feasibility of the measures listed below has been demonstrated by various sources. Used singly, or in combination, the measures represent BAT solutions when implemented in the appropriate circumstances. These circumstances depend on plant scale, process type, preservative type, etc.

5.2 BAT

For all activities involved in the treatment or protection of wood using preservatives, BAT is to do the following.

5.2.1 General Preventive Measures

For industrial wood preservation covered by this guidance note, BAT is to use pressure process impregnation.

BAT is to operate an environmental management system, giving consideration to the features outlined in Section 4.3.1.1.

5.2.2 Minimisation of Material Consumption and Waste Generation

BAT is to minimise material use and loss and waste generation by implementing those techniques referred to in Section 4.3.2.1 on preservative application and Section 4.3.2.2 on post-treatment dripping that are feasible for the facility.

BAT is to carry out any required wood processing (sawing, planing, drilling, etc.) before the wood preservation step to the extent possible.

BAT is to use either bulk delivery of preservative, or reusable and/or returnable containers.
5.2.3 Material Use Requirements
If preservatives that contain organic solvents with risk phrases R45, R46, R49, R60, or R61 are in use, BAT is to replace them as far as possible with less harmful materials within the shortest possible time. See Section 4.3.1.5 of this document.

5.2.4 Containment
BAT is to do the following, as relevant to the facility:
1. The bunding techniques outlined in Section 4.3.3.1 of this document.
2. The other storage techniques outlined in Section 4.3.3.2 of this document.
3. The treatment vessel techniques outlined in Section 4.3.3.3 of this document.
4. The roofing techniques outlined in Section 4.3.3.4 of this document.
5. The techniques for the holding or dripping area for freshly treated timber outlined in Section 4.3.3.5 of this document.
6. The treated wood storage techniques outlined in Section 4.3.3.6 of this document.
7. The security techniques outlined in Section 4.3.3.7 of this document.
8. The delivery techniques outlined in Section 4.3.3.8 of this document.
9. The other containment techniques, as appropriate, outlined in Section 4.3.3.9 of this document.

5.2.5 Recovery and Recycling
BAT is to collect and reuse preservative, as far as possible, as outlined in Section 4.3.4.1 of this document.

5.2.6 Measures for Treatment and Disposal
5.2.6.1 Treatment of Air Emissions
For activities that come under the Solvents Directive (i.e., using organic solvents for impregnation of wood with a solvent consumption of more than 25 tonnes per year) or with a capacity to use at least 10 tonnes per year of organic solvents, and:
- Where VOCs are in use with the specified risk phrases above the stated mass flow emissions (see Section 6.1.1.1), BAT is to meet the ELVs specified in Table 6.1 as relevant; or
- Where existing facilities, using existing equipment, and using VOCs other than those with the specified risk phrases, BAT is to meet the ELV specified in Table 6.2 as appropriate; or
  Do not fall under indent 1 or 2, BAT is to meet either:
  - The waste gas ELV and the fugitive emission value specified in Table 6.3, or
  - The total ELV specified in Table 6.4.
For all other activities using preservatives that contain VOCs, BAT is to minimise air emissions through the use of a solvent management plan and the environmental management techniques in Section 4.3.1.1.
5.2.6.2 Collection, Treatment, and Disposal of Surface Water

BAT is to separately collect surface water from areas that can be potentially contaminated with preservatives. Areas considered to be potentially contaminated with preservatives include, unless proven otherwise, outdoor timber storage areas, areas outside access doors to the preservation process building, and any other area open to rain water that could be potentially contaminated with preservatives.

BAT is to collect surface water from areas that can be potentially contaminated with preservatives in impermeable drains, ditches, etc.

BAT is to set emission limit values for discharges of collected surface waters to sewer or waters, where appropriate.

BAT is to collect surface water from the installation and assess the quality of the waters at the installation. This is to ensure that the installation’s activities are not having an impact on the surface water or groundwater quality in the locality.

5.2.6.3 Treatment and Disposal of Waste

For all activities involved in the treatment or protection of wood using preservatives, BAT is to minimise the quantity and load of waste generated using the preventive techniques outlined in Section 4.3.1 and 4.2.3 of this document, in particular Section 4.3.1.10 on minimisation of waste, Section 4.3.2.1 on preservative application, and Section 4.3.2.2 on post-treatment dripping, and then dispose of the waste using appropriately licensed recovery or disposal facilities.
6. BAT ASSOCIATED EMISSION LEVELS

6.1 EMISSION LEVELS FOR DISCHARGES TO AIR

The BAT emission levels for emissions to air are as follows:

6.1.1 BAT emission limit values for emission to air for activities falling under the Solvents Directive (i.e., using organic solvents for impregnation of wood with a solvent consumption of more than 25 tonnes per year - see Section 3)

6.1.1.1 Emission Limit Values for VOCs with Specified Risk Phrases Above Stated Mass Flow Emissions

The BAT emission levels for activities are as follows for VOCs with Specified Risk Phrases above the stated mass flow emissions:

**Table 6.1 Emission Limit Values for VOCs with Specified Risk Phrases Above the Stated Mass Flow Emissions**

<table>
<thead>
<tr>
<th>Activities falling under the solvents Directive: Volatile organic compounds (VOCs) (as C) with Risk Phrase(^5)</th>
<th>Threshold mass flow of the sum of such compounds(^6)</th>
<th>Emission limit value (mass sum of the individual compounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R45 (may cause cancer)</td>
<td>≥ 10 g/h</td>
<td>2 mg/Nm(^3)</td>
</tr>
<tr>
<td>R46 (may cause heritable genetic damage)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R49 (may cause cancer by inhalation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R60 (may impair fertility)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R61 (may cause harm to the unborn child)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R40 (limited evidence of a carcinogenic effect) and halogenated</td>
<td>≥ 100 g/h</td>
<td>20 mg/Nm(^3)</td>
</tr>
</tbody>
</table>

Note 1: This applies at the point of discharge whether abatement is present or not.

\(^5\) R45 (may cause cancer)

\(^6\) R46 (may cause heritable genetic damage)

R49 (may cause cancer by inhalation)

R60 (may impair fertility)

R61 (may cause harm to the unborn child)

R40 (limited evidence of a carcinogenic effect) and halogenated.
6.1.1.2 Emission Limit Values for installations that are Existing Activities Using Existing Equipment

The BAT emission limit values are as follows for activities that are existing facilities using existing equipment and using VOCs other than those with the specified risk phrases:

Table 6.2 Emission Limit Values for Installations that are Existing Activities Using Existing Equipment

<table>
<thead>
<tr>
<th>Existing installations using existing equipment</th>
<th>Emission Limit Value (mg C/Nm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Incineration</td>
</tr>
<tr>
<td>Volatile organic compounds (VOCs) (as C)</td>
<td>50</td>
</tr>
</tbody>
</table>

6.1.1.3 Emission Limit Values for All Other Installations

Activities which do not have specified risk phrase VOC emissions above the stated mass flow emissions and which do not operate existing equipment must either meet the waste gas and fugitive ELVs in Table 6.3 or the total ELV in table 6.4.

Table 6.3 Emission Limit Values for All Other Installations - Emission Limit Value and Fugitive Emission Value

<table>
<thead>
<tr>
<th>All other activities Solvent consumption (t/year)</th>
<th>VOCs waste gas emission limit value mg C/m³</th>
<th>VOCs Fugitive emission Value % of solvent input</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;10</td>
<td>100 Note ¹</td>
<td>45%</td>
</tr>
</tbody>
</table>

Note 1: Does not apply for impregnation with creosote.

As an alternative to meeting the above emission limit value and fugitive emission value, the following total emission limit value can be met instead, as shown in Table 6.4 which follows:
Table 6.4 Emission Limit Values for All Other Installations – Total Emission Limit Value

<table>
<thead>
<tr>
<th>Solvent consumption (t/year)</th>
<th>VOCs total emission limit value VOCs (as C)/m³ wood</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;10</td>
<td>11 kg/m³</td>
</tr>
</tbody>
</table>

6.2 Emission Levels for Discharge to Water

There is normally no process effluent associated with wood preservation. However, rainwater collected from certain areas has the potential to be contaminated by wood preservative (see Section 4.2.1 of this document).

For discharges to sewer or waters of collected surface waters from areas that can be potentially contaminated with preservatives, BAT (see Section 5.2.6.2 of this document) is to only set emission limit values (ELVs) where an ELV is needed:

- To prevent significant environmental pollution; or
- Where environmental pollutants are likely to be emitted in significant quantities; or
- To meet legislative requirements, including:
  - comply with, or not result in the contravention of, any other relevant quality standard for waters, trade effluents and sewage effluents and standards in relation to treatment of such effluents prescribed under Section 26 of the Local Government (Water Pollution) Act 1977 and 1990.
  - comply with, or not result in the contravention of, any relevant standard including any standard for an environmental medium prescribed under regulations made under the European Communities Act 1972, or under any other enactment. Environmental Quality Standards (EQS) for receiving waters (EQSs have been set for arsenic, chromium, copper, and zinc which are of relevance to some wood preservatives);

Taking into account, as relevant, the nature, size, and location of the site; the scale of the operation; the types of preservatives in use; the potential for contamination and the associated preventive measures implemented at the site; and the nature of the receiving water or sewer.

Surface water discharges from the site of the activity to receiving water should be free from contaminants. Site specific warning and action levels may be set on the discharges to surface waters.

Where emission limit values are to be set:

- BAT emission levels are as shown in Table 6.5. All parameters will not be relevant to every installation and will depend on the type of preservatives in use at the facility, any other site specific factors, and the nature of the receiving water or sewer.
- ELVs for discharges to sewer are subject to approval from the relevant Water Services Authority. Different values may apply to those set out in Table 6.5.
### Table 6.5: BAT Associated Emission Levels for Discharge to Waters

<table>
<thead>
<tr>
<th>Constituent Parameter</th>
<th>Group or Parameter</th>
<th>Emission Levels(^\text{Note 1}) (mg/l unless otherwise stated)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td></td>
<td>6 – 9 pH units</td>
<td></td>
</tr>
<tr>
<td>BOD(_5)</td>
<td></td>
<td>25 mg/l or &gt;90% removal</td>
<td></td>
</tr>
<tr>
<td>COD</td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Suspended solids</td>
<td></td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Total Ammonia (as N)</td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Oils, Fats and Greases</td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Arsenic</td>
<td></td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Chromium VI</td>
<td></td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Chromium (total)</td>
<td></td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td></td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td></td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Organohalogens</td>
<td></td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Phenols</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Mineral oil (interceptors)</td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Mineral oil (from biological treatment)</td>
<td></td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Toxic units</td>
<td></td>
<td>10 TU</td>
<td>2</td>
</tr>
<tr>
<td>Priority substances (as per Water Framework Directive(^3))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish tainting(^4)</td>
<td></td>
<td>No tainting</td>
<td></td>
</tr>
<tr>
<td>Other(^5)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note 1:** Limits will depend on the sensitivity of the receiving water body.

**Note 2:** The toxicity of the effluent shall be determined on an appropriate aquatic species. The number of toxicity units (TU) = \(100/96\text{-hour LC}_{50}\) in % vol/vol, so that higher TU values reflect greater levels of toxicity.

**Note 3:** The water framework Directive is Directive 2000/60/EC establishing a framework for Community action in the field of water policy amended by Decision 2455/2001/EC. Of relevance to some wood preservatives are polyaromatic hydrocarbons (priority hazardous substances) and pentachlorophenol (priority substance under review).

**Note 4:** No substances shall be discharged in a manner which, or at a concentration which, following initial dilution, causes tainting of fish or shellfish, interferes with normal patterns of fish migration or which accumulates in sediments or biological tissues to the detriment of fish, wildlife or their predators.

**Note 5:** Any relevant polluting substances as specified in the Schedule to EPA (Licensing)(Amendment) Regulations, 2004 (S.I. No. 394 of 2004) which for wood preservation can include:
- organohalogen compounds and substances which may form such compounds in the aquatic environment
- organophosphorus compounds
- substances and preparations which have been proved to possess carcinogenic or mutagenic properties or properties which may affect reproduction in or via the aquatic environment
- persistent hydrocarbons and persistent and bio-accumulable organic toxic substances
- metals and their compounds
- arsenic and its compounds
- biocides
- substances which have an unfavourable influence on the oxygen balance (and can be measured using parameters such as BOD, COD, etc.).

6.3 EMISSION LEVELS FOR DISCHARGE TO SEWER

All discharges to sewer are subject to approval from the relevant Water Services Authority. Compliance with the Water Framework Directive (2000/60/EC) is required, where relevant.
7. COMPLIANCE MONITORING

The methods proposed for monitoring the emissions from these sectors are set out below. Licence requirements may vary from those stated below due to site location considerations, and scale of the operation.

7.1 MONITORING OF EMISSIONS TO AIR

- Periodic stack sampling, where deemed necessary and as required by the licence, taking account of the nature, magnitude and variability of the emission and the reliability of the control techniques.
- Monitor solvent / VOC usage by use of a solvent management plan on an annual basis and use to determine fugitive emissions.
- Annual monitoring of boiler stack emissions for $SO_x$, $NO_x$, CO and particulates, as required by the licence, taking account of the nature, magnitude and variability of the emission and the reliability of the controls.
- Monitoring of boiler combustion efficiency in accordance with the manufacturer's instructions at a frequency determined by the Agency.
- Periodic monitoring for other parameters as determined by the Agency.

7.2 EMISSIONS OF SURFACE WATER TO SEWER OR WATER

- For emissions to water, establish existing conditions prior to start-up, of key emission constituents, and salient flora and fauna.
- Periodic monitoring, where deemed necessary, of surface water from areas that can be potentially contaminated with preservatives:
  - Exact monitoring requirements, if any, in terms of parameters and frequency will be decided on taking into account the nature, size, and location of the site; the scale of the operation; the types of preservatives in use; the potential for contamination of the collected surface water; the reliability of any control techniques; and the nature of the receiving sewer or water.
  - The parameters that may require monitoring can include any of the following, as appropriate: flow, volume, visual inspection, pH, conductivity, suspended solids, temperature, BOD, COD, organic compounds (phenols, hydrocarbons, PAHs, etc.), individual metals, individual pesticides used in the process (historically and currently), toxicity, and any other relevant parameters as deemed necessary by the Agency.
  - Samples for any monitoring must be taken prior to dilution by any uncontaminated storm water and unfiltered prior to analysis. Similarly, any emission limit values will apply prior to dilution and unfiltered prior to analysis.
  - Periodic biodegradability checks where appropriate on effluents to municipal waste treatment plants, both prior to start-up and thereafter.
  - Where deemed necessary, monitoring of flow and volume are required to be carried out.
  - Monitoring of other relevant parameters as deemed appropriate by the Agency, taking account of the nature, magnitude and variability of the emission, and the reliability of the control technologies.
7.3 AMBIENT SURFACE WATER AND GROUNDWATER MONITORING

Periodic monitoring of groundwater and/or ambient surface waters:

- Exact monitoring requirements, in terms of parameters and frequency will be decided on taking into account the nature, size, and location of the site; the scale of the operation; any historical groundwater contamination; the types of preservatives in use or previously used; the potential for contamination; and the nature, importance, etc., of the groundwater and any ambient surface waters. Monitoring of groundwater at all wood treatment installations is expected to be carried out at least on an annual basis.

- The parameters that may require monitoring can include any of the following, as appropriate: visual inspection (ambient surface water only), pH, conductivity, temperature, alkalinity, suspended solids (ambient surface water only), COD, organic compounds (phenols, hydrocarbons, PAHs, etc.), individual metals, individual pesticides, and any other relevant parameters as deemed necessary by the Agency.

7.4 MONITORING OF WASTES

- Record in a register the types, quantities, date, destination and manner of disposal or recovery of all wastes sent off-site, including solids, liquids, and sludges.

- Leachate testing of sludges and other material, as appropriate, being sent for landfilling.

- Annual waste minimisation report showing efforts made to reduce specific consumption together with material balance and fate of all waste materials.

7.5 MONITORING OF NOISE EMISSIONS

For guidance on measures in relation to noise, have regard to the Guidance Note for Noise in relation to Scheduled Activities and any other noise guidance issued by the Agency.
Appendix 1

PRINCIPAL REFERENCES


## Appendix 2

### GLOSSARY OF TERMS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAT</td>
<td>Best Available Technique</td>
</tr>
<tr>
<td>Consumption:</td>
<td>The total input of organic solvents into an installation per calendar year, or any other 12-month period, less any VOCs that are recovered for reuse</td>
</tr>
<tr>
<td>Organic Compound</td>
<td>Any compound containing at least the element carbon and one or more of hydrogen, halogens, oxygen, sulphur, phosphorus, silicon or nitrogen, with the exception of carbon oxides and inorganic carbonates and bicarbonates</td>
</tr>
<tr>
<td>Organic Solvent</td>
<td>Any VOC which is used as a preservative (part of definition relevant to wood preservation)</td>
</tr>
<tr>
<td>Reuse</td>
<td>The use of organic solvents recovered from an installation for any technical or commercial purpose and including use as a fuel but excluding the final disposal of such recovered organic solvent as waste</td>
</tr>
<tr>
<td>Surface Treatment BREF</td>
<td>Integrated Pollution Prevention and Control final draft reference document on Best Available Techniques on surface treatment using organic solvents, second working draft published by the European Commission, August 2007</td>
</tr>
<tr>
<td>Volatile Organic Compound (VOC)</td>
<td>Any organic compound having at 293.15 K a vapour pressure of 0.01 kPa or more, or having a corresponding volatility under the particular conditions of use</td>
</tr>
<tr>
<td>Symbol</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>°C</td>
<td>Degree Celsius</td>
</tr>
<tr>
<td>CCA</td>
<td>Chromated Copper Arsenate (type of preservative)</td>
</tr>
<tr>
<td>CO</td>
<td>Carbon Monoxide</td>
</tr>
<tr>
<td>ELVs</td>
<td>Emission Limit Values</td>
</tr>
<tr>
<td>kg</td>
<td>Kilogramme</td>
</tr>
<tr>
<td>m³</td>
<td>Cubic Metre</td>
</tr>
<tr>
<td>mg</td>
<td>Milligramme</td>
</tr>
<tr>
<td>Nm³</td>
<td>Normal Cubic Metre (101.3 kPa, 273 K)</td>
</tr>
<tr>
<td>NOₓ</td>
<td>Nitrogen Oxides</td>
</tr>
<tr>
<td>O₂</td>
<td>Oxygen</td>
</tr>
<tr>
<td>PAHs</td>
<td>Polyaromatic Hydrocarbons</td>
</tr>
<tr>
<td>t</td>
<td>Tonne (metric)</td>
</tr>
<tr>
<td>VOC</td>
<td>Volatile Organic Compounds</td>
</tr>
</tbody>
</table>