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# Phase 2 of the Impact Assessment of Proposals for a Revised IPPC Directive

## Part 7: Preservation of Wood and Wood Products Final report

June 2008



Llywodraeth Cynulliad Cymru  
Welsh Assembly Government



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# Executive Summary

## Introduction

The Commission published its proposal and an impact assessment for a Directive on industrial emissions (Industrial Emissions Integrated Pollution Prevention and Control, IE(IPPC)D<sup>1</sup>) on 21<sup>st</sup> December 2007. This consolidates seven existing Directives related to industrial emissions into “a single clear and coherent legislative instrument” and includes a number of changes related to new and existing activities. The main objective of this report is to assess, in outline, the likely impacts of the proposal in relation to wood treatment industry within the UK.

## Proposed Changes

The EC has proposed the addition of new text to include the following as a listed activity within Annex I the IPPC Directive:

6.9 *‘Preservation of wood and wood products with a production capacity exceeding 75m<sup>3</sup> per day’.*

The purpose of this inclusion is to cover installations that do not already fall under the IPPC or SED Directives, and which have similar environmental impacts to soil and water as current IPPC/SED installations.

## Scope and Impact of the Proposed Changes

### Number of Installations

According to the Wood Protection Association (WPA), there are approximately 500 industrial wood preservation installations in the UK. At these installations wood is treated with water-based products, solvent-based products or creosote. Information on the size distribution of wood preservation companies in the UK is very limited.

From available data, an upper limit for the average production could be estimated between 20-30 m<sup>3</sup>/day (at 200-300 days/year). From information obtained from the Defra survey for 2007 on numbers of Part B Pollution Prevention and Control regulated sites, there are 43 wood

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<sup>1</sup> “Proposal for a Directive of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) (recast)”. European Commission, Brussels, 21<sup>st</sup> December 2007. Available from: <http://ec.europa.eu/environment/ippc/proposal.htm>

preservation installations. This means that approximately 91% (457 installations) of the wood preservation industry in the UK use less than 25 tonnes of solvent per year. This is because most of the installations do not use solvent-based preservation agents, and therefore are not covered by the IPPC or by SED.

The WPA have indicated that if a daily 75m<sup>3</sup>/day capacity threshold (not adjusted for actual throughput) were to be applied, then more than 50% (250 installations) of the industry in the UK would come under the scope of the IPPC Directive.

### **Number of Installations in the UK and Number Potentially Affected By the Proposed Changes**

<b>No. Of Installations In UK</b>	<b>Average Production Capacity Per Installation M<sup>3</sup>/Day</b>	<b>No. Of Installations Covered By IPPC Part B</b>	<b>No. Of Installations Potentially Affected</b>
500	20-30	43	250

### **Environmental Impacts**

The main environmental aspects of wood preservation are the emissions of VOCs originating from the use of solvent based agents and the effects on water, soil and groundwater from the emission of biocidal chemicals used in the process. Since installations using solvents already fall under the scope of the IPPC Directive and Solvent Emissions Directive (SED), the proposed changes to the IPPC Directive would therefore impact those installations that do not use solvents or use them in small quantities (i.e. currently below the threshold for inclusion under IPPC or SED).

Operators consulted as part of this assessment believe that they already apply Best Available Techniques (BAT) through the Industry Code of Practice. The available information suggests that installations have limited emissions to controlled waters or sewer as many processes recycle aqueous liquors back into the process, resulting in low levels of waste generation or effluent. Of the installations consulted in producing this report, all had spillage control measures, including bunding, throughout the treatment plant and for the preservative storage tanks to prevent any contamination of soil or water.

In the UK, the wood preservation industry is already meeting the requirements of a number of EU Directives to reduce industry emissions. Directives such as the Biocidal Products Directive (BPD) regulate the use of pollutants of concern such as heavy metals and PAHs. Restricting the use of biocidal substances simultaneously reduces the risk of water, soil and groundwater contamination and therefore a high overall level of protection for human health and the environment is achieved without the use of IPPC.

## Costs & Benefits

The main financial impact of the proposed changes will be the associated administrative costs to operators in applying for and complying with a Part A IPPC permit. It has been assumed that all costs associated with the regulatory burden of administering IPPC for 250 new permitted installations will be recovered through the regulatory charging scheme.

## Compliance Costs

From discussions with the Defra, Local Authority Unit and other stakeholders, there is some uncertainty over the exact measures that current IPPC installations may have to implement if they were to be regulated under IPPC following implementation of the proposed changes to the IPPC Directive. The evidence gathered during this report indicates that a combination of other regulatory controls and use of the Industry Code of Practice, results in a high level of overall environmental protection that is comparable (in most aspects) to that required under application of BAT within IPPC. It is therefore not anticipated that there will be any significant measures required by the industry to ensure compliance due to the reduced use of the main pollutants of concern as a result of existing legislation and the fact that BAT is already applied throughout the industry. This results in an assumption that there will be no additional operational costs associated with improvements to meet BAT under the requirements of IPPC.

## Administrative Costs

The administrative costs that would apply to operators following implementation of the proposed changes to the IPPC Directive are related to the transition from a current Part B process (i.e. outside of the current scope of IPPC) to a Part A process or from a current position of regulation under Statutory Nuisance to Part A. To calculate these costs, the present administrative costs required for a Local Authority Part B permit have been compared with applicable charges for a Local Authority Part A permit.

Should it arise that installations in England and Wales were to be regulated by the Environment Agency, the costs indicates here may vary due to higher overall charges however it is assumed that the current regulatory (i.e. Local Authority) arrangements will continue.

Of the 500 installations falling under Section 6.6, it has been estimated that 250 of these will be affected by the proposed changes. 43 of these will be required to bear the costs for conversion from Part B to Part A and a 207 will be required to bear the costs of new applications for operating under a Part A permit.

The estimated administrative cost-ranges for the UK associated with the proposed change to wood preservation installations are summarised in the table below. These figures are based on the cost ranges for installations in England and Wales. The costs will vary if substantive numbers of installations are located in Scotland or Northern Ireland.

#### **Estimated Administrative Cost-Ranges to the UK from the Proposed Changes to IPPC Directive**

<b>Cost Element</b>	<b>Total Costs</b>	<b>Total Annualised One-Off Costs</b>	<b>Total Annualised Administrative Costs</b>
<b>Operators</b>			
43 Part B installations	£602,344 - £975,756	£29,423 - £41,525	£150,597 - £341,708
207 new installations	£2,899,656 - £4,697,244	£141,642 - £199,901	£1,028,223 - £2,056,070
<b>Sub-Total</b>	<b>£3,502,000 - £5,673,000</b>	<b>£171,065 - £241,426</b>	<b>£1,178,820 - £2,397,778</b>
<b>Regulatory Authorities</b>			
Permit application time costs (regulators)	Assuming cost covered within the application fee		
Subsistence time costs	Assuming cost covered within the subsistence charge		
Sub-Total	N/A	N/A	N/A
<b>Total Administrative Costs</b>	<b>£3,502,000 - £5,673,000</b>	<b>£171,065 - £241,426</b>	<b>£1,178,820 - £2,397,778</b>

## Benefits

The main environmental benefit from the proposed changes to the IPPC Directive may potentially be a higher level of protection of controlled water, groundwater and soils when biocidal chemicals are used that are authorised by the BPD without restrictions. The application of IPPC will lead to the use of BAT that may require implementation of techniques to reduce risks of emission or to require assessment of less hazardous chemical substitutes. The industry however argues that such benefits would be minimal as the Code of Practice would cover the use of all products regardless of their status under BPD.

Given the limited availability of emissions data from the wood preservation sector, it has not been possible to quantify the potential benefits.

## Limitations/Uncertainties

There are a number of limitations and uncertainties with the approach applied and input data available that should be noted:

- The views of industry have been taken into account in developing this report, notably with regard to the management of environmental impacts. The initial conclusions are that controls are presently in place to reduce and mitigate risk of environmental pollution that may be commensurate with those required by BAT under IPPC. A full comparative assessment of BAT against the current Industry Code of Practice and operational arrangement would further strengthen this argument;
- there is a lack of data profiling emissions from the sector and in order to further quantify the potential benefits of implementation of the proposed changes, further work would be required to establish this data; and
- it has been assumed that the UK government will apply the proposed IPPC Directive changes in line with current arrangements for IPPC, namely division into part A, A(1), A(2) and part B processes and based upon the same thresholds as currently apply.





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# 1. Introduction

## 1.1 This Report

The overall aim of this work package is to provide support to Defra in response to the publication of the European Commission's proposal for a new Directive on industrial emissions. This work will be undertaken under Entec's framework contract with Defra on "*The Preparation of Regulatory Environmental Impact Assessments in Relation to Proposals for Air Quality Legislation*" contract (RIA). The main objective of this report is to assess the likely impacts of the proposal in relation to **wood preservation installations** within the UK, building and commenting on as well as extending the Commission's Impact Assessment (IA), where appropriate.

The project team has consulted with the following stakeholders to support the development of this report:

- Wood Protection Association;
- Environment Agency Local Authority Unit;
- the main suppliers of timber treatment preservatives;
  - Arch Timber Treatment;
  - Osmose.
- Local Authorities regulating Part B processes;
  - Nottingham City Council;
  - North Tyneside Council;
  - Sedgemoor Council.
- Scottish Environmental Protection Agency (SEPA);
- Environment and Heritage Service (EHS) Northern Ireland;
- A number of timber treatment installations;
  - PTG Treatments Ltd;

- North West Timber Treatments;
- BSW Timber.
- Chase Timber Products;
- BBH Finforest (Kings Linn site);
- Howie Forest Products;
- Nottingham City Homes.

## 1.2 What Is The Issue?

### 1.2.1 Overview of Revised IPPC Directive

The Commission has published its proposal and an impact assessment for a Directive on industrial emissions (Industrial Emissions Integrated Pollution Prevention and Control, henceforth cited as “IE(IPPC)D”<sup>2</sup>) on 21<sup>st</sup> December 2007, which consolidates seven existing Directives related to industrial emissions into a single clear and coherent legislative instrument. These existing Directives include titanium dioxide industry related directives (78/176/EEC, 82/883/EEC, 92/112/EEC), the IPPC Directive (96/61/EC), the Solvent Emissions Directive (1999/13/EC), the Waste Incineration Directive (2000/76/EC) and the LCP Directive (2001/80/EC). The Commission’s IA<sup>3</sup> identified a number of problems related “(1) to shortcomings in the current legislation that lead to unsatisfactory implementation and difficulties in Community enforcement actions and, thereby, to loss of health and environmental benefits and (2) to the complexity and lack of coherence of parts of the current legal framework.”

The Commission has provided an indicative timeline for discussion and implementation of the proposals. It is important to note that this is dependent on the length of time it takes to discuss and agree the proposed directive within the co-decision procedure. The initial timetable is set out below in Table 1.1

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<sup>2</sup> “Proposal for a Directive of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) (recast)”. European Commission, Brussels, 21<sup>st</sup> December 2007. Available from: <http://ec.europa.eu/environment/ippc/proposal.htm>

<sup>3</sup> “Commission Staff Working Document: Accompanying document to the Proposal for a Directive of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) (recast). Impact Assessment.” European Commission, Brussels, 21<sup>st</sup> December 2007. Available from: <http://ec.europa.eu/environment/ippc/proposal.htm>

**Table 1.1 Key Dates For The Discussion And Implementation Of The Proposed IE(IPPC)D**

<b>Date</b>	<b>Description</b>
12/2007	The Commission adopts its proposal for a Directive on industrial emissions as well as issuing its Communication 'Towards an improved policy on industrial emissions'
01/2009	First reading in the European Parliament and political agreement in Council.
12/2010	Completion of the co-decision process and publication of the Directive on industrial emissions within the Official Journal.
07/2012	Member States fully transpose the new Directive (18 months after entry into force). The Directive applies to all new installations from this date onwards.
01/2014	All existing installations previously subject to IPPC, Waste Incineration, Solvent Emissions and Titanium Dioxide Directives must meet the requirements of the new Directive. Large Combustion Plants do not yet need to meet the new Emission Limit Values (ELVs) prescribed within the Directive
07/2015	The newly prescribed activities such as additional poultry installations, smaller combustion units and wood preservation activities must meet the requirements of the new Directive.
01/2016	Large Combustion Plants must meet the requirements set out in Chapter 2 of the new Directive, as well as the ELVs set out in Annex V

### 1.2.2 Proposed Changes:

The EC has proposed the addition of the following as a listed activity within the IPPC Directive:

'Preservation of wood and wood products with a production capacity exceeding 75m<sup>3</sup> per day'.

The purpose of this inclusion is to cover installations that do not already fall under the IPPC or SED Directives, and which have similar environmental impacts to soil and water as current IPPC/SED installations. This option will affect those larger installations which do not use solvents (or small quantities).

### 1.3 What Are The Objectives And Intended Effects?

The main drivers for the revision of industrial emissions legislation are described in the IA undertaken by the Commission:

- The Lisbon Strategy and the EU Sustainable Development Strategy; this strategy stresses the role of environmental technologies in having “*significant economic, environmental and employment potential*”;
- the different Thematic Strategies (for example Air Pollution, Soil Protection) set objectives to protect human health and the environment from key air pollutants. Industrial emissions regulation has a major role in meeting these objectives;
- the need for “Better Regulation” and designing laws and legislation in a more coherent way and with minimum administrative burden; and
- experience in the implementation of the IPPC Directive in the last 10 years and ways to improve the legal framework to ensure that its objectives are met.

The Commission’s proposals aim to address the issues identified via a number of amendments to the existing legislation including the following:

- Clarification and strengthening of the concept of BAT;
- revision of the minimum ELVs for some sectors (for example, large combustion plants) to bring them into line with BAT standards;
- introduction of provisions on inspection and environmental improvements;
- stimulating innovation and the development and deployment of new techniques;
- simplifying and clarifying certain provisions on issuing permits, monitoring and reporting to cut unnecessary administrative burdens; and
- extending and clarifying the scope and provisions of the legislation to better contribute to the objectives of the Thematic Strategies.

For the wood preservation sector the main objectives are to improve consistency providing a more level playing field since only part of the sector currently falls under the scope of the IPPC Directive despite having similar environmental impacts to water and soil.

In addition, it is thought that the proposed changes will provide a positive environmental impact through the implementation of BAT for the sector and positive social impacts through the reduced impacts on health.





## **2. Policy Options**

This section presents the policy options considered in this report for the proposed addition of wood preservation installations, as a listed activity. The policy options in this section have been discussed and agreed with Defra at the inception meeting (08<sup>th</sup> April 2008).

### **2.1 Wood Preservation Installations**

The following two options have been considered for wood preservation installations:

1. No change;
2. As proposed in the IE(IPPC)D.



### **3. Who Is Affected?**

This section presents a list of those stakeholders likely to be affected by the proposed changes for inclusion of wood preservation installations:

- Operators of wood preservation installations with a production capacity above 75m<sup>3</sup> per day;
- regulators e.g. Local Authorities, Scottish Environment Protection Agency (SEPA), Defra, Environment and Heritage Service (EHS); Environment Agency Local Authority Unit;
- Wood Protection Association and other trade bodies; and
- suppliers of timber treatment preservatives.



## 4. Baseline Definition

### 4.1 Approach

This section outlines the approach that has been taken to define the baseline for the relevant installations and/or activities and their associated emissions that may be affected by the proposed changes to the Directive.

#### 4.1.1 Wood Preservation Installations

##### Number of Installations

The wood preservation industry is regulated under The Environmental Permitting (England and Wales) Regulations 2007 and, in Scotland and Northern Ireland, by the Pollution Prevention and Control Regulations for those respective territories. Under all those Regulations, a distinction is made between “Part A” activities which are subject to IPPC and “Part B” activities which are subject only to air pollution controls. Those Regulations also provide for regulation in accordance with the Solvents Emissions Directive (SED). Table 4.1 sets out the criteria for installations coming under Part A, Part B and SED.

**Table 4.1 Criteria for Installations Coming Under IPPC and SED in the UK**

Part A activity	Part B activity	SED
Curing, or chemically treating timber using any substance listed in paragraph 7 of Part 1 of Schedule 1 to the EP Regulations (or the analogous reference in the Scotland and Northern Ireland Regulations	(a) Manufacturing products wholly or mainly of wood at any works if the activity involves a relevant activity and the throughput of the works in any period of 12 months is likely to be more than— (ii) 1,000 m <sup>3</sup>	Covered under SED if an installation uses a wood preservative product that contains solvents such as white spirit, involving 25 tonnes or more organic solvent, or the treating of 1000m <sup>3</sup> of wood per year

According to the Wood Protection Association (WPA), there are approximately 500 industrial wood preservation installations in the UK, with a few locations having more than one treatment

cylinder (1). At these installations wood is treated with water-based products, solvent-based products or creosote. Information on the size distribution of wood preservation companies in the UK is very limited. Table 4.2 provides details of the number of installations in the UK and the numbers of potentially affected by the proposed changes (1, 2).

**Table 4.2 Number of Installations in the UK and Number Potentially Affected By the Proposed Changes (1)**

No. of installations in UK	Average production capacity per installation m <sup>3</sup> /day	No. of installations covered by IPPC Part B	No. of installations potentially affected
500	20-30	43 <sup>4</sup>	250 <sup>5</sup>

According to one of the UK's main suppliers of preservative products, the wood preservation industry is a sector producing around three million cubic metres of treated wood a year (3). From this data an upper limit for the average production could be estimated between 20-30 m<sup>3</sup>/day (at 200-300 days/year). From information obtained from the Defra survey for 2007 on numbers of Part B PPC regulated sites, there are some 43 wood preservation installations<sup>6</sup>. This means that approximately 91% (457 installations)<sup>3</sup> of the wood preservation industry in the UK use less than 25 tonnes of solvent per year. This is because most of the installations do not use solvent-based preservation agents, and therefore are not covered by the IPPC or by SED.

The WPA concluded that if a daily 75m<sup>3</sup>/day capacity threshold (not adjusted for actual throughput) were to be applied, then more than 50% (250 installations) of the industry in the UK would come under the scope of the IPPC Directive (1).

Of the seven installations contacted for this assessment, four were identified that could potentially be affected by the proposed changes, with production capacities above 75m<sup>3</sup>/day and were not covered by IPPC already through the use of solvents. Two of the operators contacted reported that that there were no emissions from operations onsite as all runoff and

<sup>4</sup> Based on Defra survey 2007 figures, not including installations in Scotland. According to the EHS, there are no permitted wood preservation installations in Northern Ireland.

<sup>5</sup> Based on an estimation given by Dr. David Aston, WPA (April, 2008)

<sup>6</sup> This is for England and Wales only and does not include installations regulated in Scotland, numbers of which could not be determined for this assessment. Only an estimation for numbers in England and Wales could be made.

solution is recycled back into the process and in addition all areas are adequately bunded and all necessary control measures are in place to prevent any water or soil contamination. No discharge consents were required by these sites.

Currently plants are regulated on the basis of actual throughput not production capacity. Wood preservation installations are sized on the basis of the sizes and volumes of timber treated. Plants may be large in size but there may be much void volume which is not filled with timber so the actual volume of timber treated may be low in comparison to capacity. In general, for the average sized plant, the actual amount of timber which can practically be treated at any one time in the plant is about 60% of the nominal void volume. Actual plant throughput can easily be quantified through the plant management procedures for recording treatment charges, quantities of wood preservatives used and compliance with timber treatment process specifications. Most plants now operate on automated cycles. Double vacuum/low pressure plants nominally have a much higher potential capacity than high vacuum pressure plants because the process cycle times are much shorter.

The business patterns for some key types of treatment plants can vary seasonally, for example the fencing industry. Some plants only treat for their own wood product manufacturing requirements whilst others provide a timber treatment service for third parties. The WPA are of the belief that the threshold should therefore be based on actual treatment basis not production capacity (1).

## 4.2 Overview of Current Legislation

The most important environmental legislation for the wood preservation industry is related to the use of organic solvents, biocides and by IPPC. The UK is one of a few Member States that have introduced specific requirements for wood preservation sector.

### 4.2.1 Environmental Permitting (EP) Regulations, 2007

#### Integrated Pollution Prevention and Control (IPPC)

The wood preservation industry is regulated under the Environmental Permitting Regulations 2007 in England and Wales) as follows;

*Timber Activities Section 6.6 Part B process:*

*(a) Manufacturing products wholly or mainly of wood at any works if the activity involves a relevant activity and the throughput of the works in any period of 12 months is likely to be more than—*

*(ii) 1,000 cubic metres*

The same activity definitions are contained in the Pollution Prevention and Control Regulations for Scotland and for Northern Ireland..

The sector is also covered under these Regulations for the use of certain substances as follows;

*Timber Activities Section 6.6 Part A(1)*

*Curing, or chemically treating timber using any substance listed in paragraph 7 of Part 1 of Schedule 1*

However, there are currently no timber treatment installations covered by Part A (1) in the UK<sup>7</sup>. Listed substances such as tributyltin compounds/pentachlorophenol/lindane/dieldrin or chromate copper arsenate (CCA) are not in use any more in the UK. This is a result of either industry led/market response changes or the withdrawal of authorisations for the placing on the market of wood preservative formulation containing them.

An installation is covered under the EP Regulations for solvent use if they surface treat timber using organic solvents in a plant with a consumption capacity of more than 150kg/hour or more than 200 tonnes per year. According to the DEFRA survey 2007, there are approximately 43<sup>8</sup> Part B permitted installations in the UK with a throughput of 1000m<sup>3</sup> per annum or more. Part B activities are regulated for emissions to air only.

#### 4.2.2 Solvent Emissions Directive (SED)

The SED requirements are implemented in the UK through the Regulations which transpose IPPC requirements. The Directive focuses on the limitation of organic solvents in certain

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<sup>7</sup> Communication with Environment Agency

<sup>8</sup> These numbers are for England and Wales only and do not include installations in Scotland. The EHS stated that there are no permitted installations in Northern Ireland. It could not be accurately determined how many installations are permitted under Part B as some installations had been wrongly misrepresented under chemical treatment activities.



activities and installations. The Directive establishes emission limit values for VOCs in waste gases and maximum levels for fugitive emissions (expressed as percentage of solvent input) for solvent using operators. In the UK, installations fall under the scope of the SED if they use a wood preservative product that contains solvents such as white spirit, involving 25 tonnes or more organic solvent, or the treating of 1000m<sup>3</sup> of wood per year.

The UK have established the Process Guidance 6/3 (04) 'Chemical Treatment of Timber and Wood Based Products'(20) for the sector which introduces total emission limit values and emission and fugitive limits for VOCs.

The VOC emission limit for all processes/activities with a solvent consumption of 40 tonnes and more is 150 mg/Nm<sup>3</sup>.

**Table 4.3 VOC Emission Limits for Chemical Treatment of Timber and Wood Based Products in UK**

Activities – Solvent Consumption	VOC- Emission Limits
all processes/activities solvent consumption 80 tonnes or more*	VOC expressed as total C excluding particulate matter 150 mg/Nm <sup>3</sup>
all processes/activities solvent consumption 40 – 80 tonnes**	

New, substantially changed and by the 31 October 2007 existing SED installations with a solvent consumption of 25 tonnes or more, should have applied the provisions of;

- Total Emission Limit Values for SED installations, i.e. 11 kg/m<sup>3</sup>;
- Emission and Fugitive Limits for SED installations (Table 4.4).

**Table 4.4 VOC Contained and Fugitive Emission Limits For Activities Not Using Total Emission Limit Values in UK**

VOC In Waste Gases:	Emission Limits/Requirements	Fugitive Emission Values
Wood treatment installations Solvent consumption 25 tonnes or more	VOC expressed as total mass of organic carbon, Note 1	25 % of solvent input
Waste gases from oxidation plant used as abatement	Until 1 April 2013, Note 2 150 mg C/Nm <sup>3</sup>	
Waste gases from turbines, reciprocal engines or boilers used as abatement plant	Until 1 April 2013, Note 2 150 mg C/Nm <sup>3</sup> 100 mg C/Nm <sup>3</sup>	
Any other waste gases	100 mg C/Nm <sup>3</sup>	

Note 1: The emission limit requirements should not apply to processes involving the use of creosote where no other organic solvent borne preservative is employed.

Note 2: For abatement plant existing prior to 1 April 2001, the higher contained emission figure may be used until 1 April 2013 if: the total emissions of the whole installation (fugitive + contained emission) does not exceed the total emission allowed after 1 April 2013 (Fugitive + contained emission after 1 April 2013).

These total emission limit values and waste gas emission and fugitive emission limits correspond to the SED values and limits except for the fugitive emission value which is 25 % of the solvent input, whereas the SED imposes 45%. According to all processes/activities should comply with the emission limits and provisions with regard to non-VOC releases.

#### 4.2.3 Biocidal Products Directive (BPD)

The Biocidal Products Directive concerning the placing of biocidal products on the market has been developed to control the risk of biocides at EU level. Wood preservatives substances currently in use in the UK and which are being reviewed under the BPD review programme include creosote, copper, and permethrins (12). The UK competent authority for the BPD review

programme, the HSE, have concurred that chromium is an active substance with unacceptable properties and it has been removed from the market (13).

Active substances are evaluated at community level and the biocidal products are authorised at national level. Only authorised biocidal products may be placed on the market and only biocidal products containing active substances included in the Annexes I, IA or IB of the Directive may be authorised. If a substance is considered to be an active substance and it fails to get included into Annex I or IA for whatever reason, it cannot be used anymore thereafter in biocidal products as an active substance. Whereas, if a substance is not considered to be an active substance, it does not have to be listed in Annex I or IA and can be used in formulated biocidal products (provided of course that it fulfils all other requirements e.g. regarding acceptability of risks or other requirements) (21).

The inclusion of a substance on Annex I means that the substance has an environmental and human risk profile in terms of its intended use. This includes a risk assessment of the application processes to be used, including wood impregnation plants. As a result of the BPD, substances such as pentachlorophenol and tributyltin compounds have been removed from the market since 2006 and products containing lindane were removed from the market in 1990.

#### 4.2.4 Environmental Protection (Controls of Dangerous Substances) Regulations, 2003

The UK Environmental Protection (Controls of Dangerous Substances) Regulations 2003 implement the provisions in the EU Directive 2003/2/EC, which introduced a partial ban on the use of CCA (copper/ chrome/ arsenic) as a timber treatment, as CCA is considered to be a carcinogen. The risks from CCA are considered to be very small but a very precautionary approach has been taken in this case. In Northern Ireland the EC Directive provisions were implemented through the *Marketing and Use of Dangerous Substances (No. 4) Regulations (Northern Ireland) 2003*, SR 2003/548.

The main concern is over the arsenic content. These Regulations prohibit the use of timber with CCA with effect from 30 June 2004 in applications where there is likely to be repeated skin contact by users. The Regulations do not apply to CCA treated timber already in use. Concerns were raised by those involved in children's play about the implications of the Directive and the Regulations as well as the declaration of CCA as a carcinogen.

#### 4.2.5 Water Framework Directive

The Water Framework Directive (WFD) is the most substantial piece of EC water legislation to date and is designed to improve and integrate the way water bodies are managed throughout Europe. It came into force on 22 December 2000, and was put into UK law (transposed) in 2003. Member States must aim to reach good chemical and ecological status in inland and coastal waters by 2015. As part of the Water Framework Directive, a European 'priority list' of substances posing a threat to or via the aquatic environment has been established.

There are currently thirty three substances on this priority list, which was agreed in 2001 (Decision 2455/2001/EC), and the list will be reviewed on a regular basis. These substances are referred to as 'priority substances', and those which are thought to pose the greatest threat are further identified as 'priority hazardous substances'.

A number of substances are listed that the wood preservation industry has, in the past, been a significant source of, such as some PAHs. However, these substances are not currently used anymore in the UK.

#### 4.2.6 Hazardous Waste Regulations

The Hazardous Waste Regulations (England and Wales) 2005 set out requirements for the controlled management of hazardous waste. The Regulations set out procedures to be followed when disposing of, carrying and receiving hazardous waste.

#### 4.2.7 Limitations Directive and Amendments

The Limitations Directive (76/769/EEC), which was consolidated into a single instrument - the Controls on Dangerous Substances and Preparations Regulation (2006), introduces restrictions on the marketing and use of chemicals which cause unacceptable risk to human health or the environment. Among these chemicals there are also certain biocides. Other Directives have also been introduced to restrict the use of certain biocidal products;

- Arsenic (Directive 2003/2/EC and Directive 2006/139/EC);
- Creosote (Directive 2001/90/EC);
- organic tin compounds (Directive 2002/62/EC);
- Mercury (Directive 89/677/EEC); and

- Pentachlorophenol (PCP) (Directive 1999/51/EC).

Directive 2001/90/EC concerning the marketing and use of creosote states that substances and preparations containing creosote, creosote oil, and others, may not be used in the treatment of wood. However some specific derogations are allowed, e.g. creosote can only be used in closed pressurised systems.

Commission Directive 2003/2/EG relating to restrictions on the marketing and use of arsenic states that arsenic compounds may not be used in preservation of wood.

#### 4.2.8 E-PRTR

The E-PRTR Regulation 2006, requires operators of industries regulated by the Environment Agency and falling under the activities listed in the Regulation, to report their releases and transfers to the European Commission on an annual basis starting in 2007. The relevant substances for the wood preservation industry are copper, chromium and PAHs associated with the use of creosote. Both chromium and copper are currently being reviewed under the BPD review programme on whether they will be included as active substances on Annex I of the Directive. In the UK, chromium already considered an active substance and has been removed from the UK market.

The E-PRTR succeeds the European Pollutant Emission Register (EPER). The new E-PRTR has brought in the requirement for reporting from new sectors, including the wood preservation sector.

Specific measures within the Aarhus Convention on access to environmental information are expected to enhance international reporting and consistency. These international developments will improve public awareness of environmental pollution and enhance transparency and comparability across different countries.

The E-PRTR Regulation aims to enhance public access to environmental information through the establishment of a coherent and integrated E-PRTR, thereby finally also contributing to the prevention and reduction of pollution, delivering data for policy makers and facilitating public participation in environmental decision making. Installations are required to report releases from PPC activities to the E-PRTR. The UK Pollution Inventory is being adapted to meet this reporting requirement.

#### 4.2.9 Other Legislation

##### PAHs

The use of creosote can be a source of PAHs. Certain polycyclic aromatic hydrocarbons (PAH) are classified as carcinogenic, mutagenic and reprotoxic substances. They are also regarded as Persistent Organic Pollutants (POPs) under the UN ECE Protocol on Persistent Organic Pollutants (the 1998 Protocol to the 1979 Convention on Long Range Transboundary Air Pollution on Persistent Organic Pollutants) and are subject to reduce total annual emissions.

Restrictions on PAH's have been agreed as per Directive 2005/69/EC. It is proposed that these provisions should commence from 1 January 2010. Defra has supported the Air Quality Framework Directive and a daughter Directive specifically addressing the need to reduce PAHs, as well as the Protocol on POPs. Support for this Directive would follow the precedent sent by these two preceding tools.

##### Surface Waters (Dangerous Substances) (Classification) Regulations, 1997

The Dangerous Substances Directive (76/464/EEC) was implemented into the UK through the UK Surface Waters (Dangerous Substances) (Classification) Regulations, 1997. The aim of the Directive was to control discharges of dangerous substances to inland surface waters and groundwater's. Chemicals identified as the most hazardous to the aquatic environment are in List 1 of the Directive and the legislation requires that these substances are completely eliminated from discharges to waters. The chemicals in this list are toxic and persist in the environment and accumulate in biological systems causing harm to aquatic life. Dangerous substances in List 2 were thought to be less hazardous than those in list 1. Chemicals in List 2 have an Environmental Quality Standard (EQS) set according to a standard methodology. EQS represent a concentration limit that must not be exceeded in any controlled water in the UK and the dangerous substance is not believed to harmful to the aquatic environment at concentrations below this limit. The UK Surface Waters (Dangerous Substances) (Classification) Regulations, 1997 controls the release of substances, such as chromium, to the aquatic environment.

The UK Surface Waters (Dangerous Substances) (Classification) Regulations, 1997 controls the release of substances, such as chromium, to the aquatic environment, through EQS for hardness.

#### 4.2.10 Further Requirements

##### Air Quality Limit Values

These only apply to solvent-based plants which are covered under Process Guidance 6/3 where BAT has set fugitive emission levels and plant cycles have been changed to comply with this. There are relatively few plants in the UK using organic solvent-based wood preservatives and these are because specific technical requirements.

#### 4.3 Results

The environmental issues related to the impregnation of wood are mainly emissions to air, discharges of hazardous substances to water and risks of soil contamination. The preservatives applied in this industry are intended to prevent the action of organisms that deteriorate wood such as fungi and insects and therefore will be toxic to these organisms (and possibly other non-target organisms) at the concentrations applied to wood. The three main types of preservatives that are used by the industry are: creosote, water-based used at low pressure, water-based used at high pressure and solvent-based preservatives. The main environmental impacts of wood preservation installations relate to emissions to soil and (ground) water. The industry has in the past been a significant source of some POPs (persistent organic pollutants) mainly polycyclic aromatic hydrocarbons (PAHs), due to the use of creosote. In addition, there have been concerns over the potential releases of heavy metals, such as copper and chromium, to soil and water (4).

##### Preservatives Currently Used In the UK

The following information was obtained from one of the UK's main suppliers of preservative products to the wood preservation industry (3). Table 4.5 lists the main types of preservatives and the annual quantities currently used in the UK.

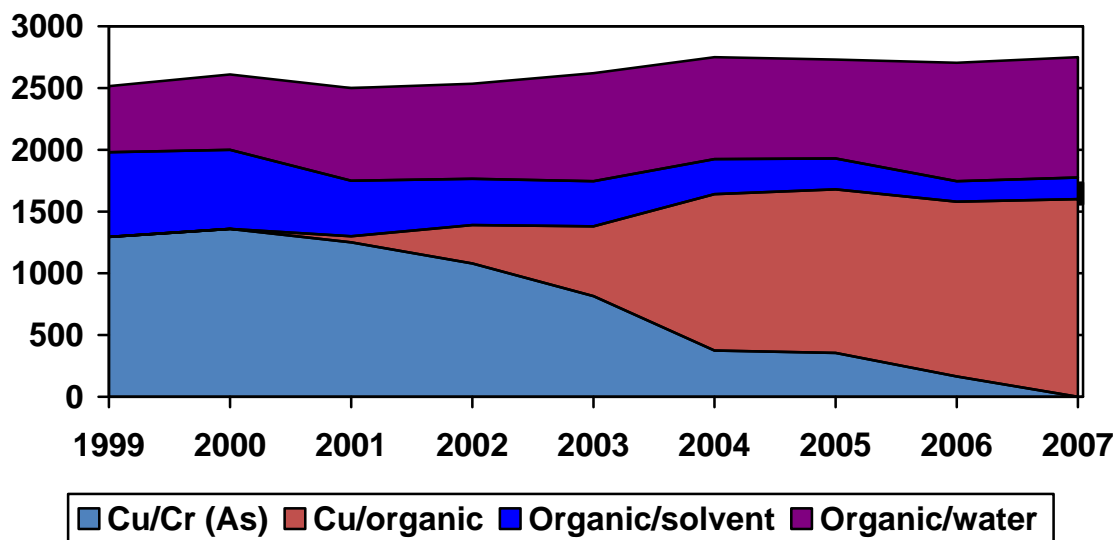
**Table 4.5 Main Types of Product Mix, Preservative Types and Quantities Used In UK (3)**

Product mix	Preservative type	Quantity used in UK per annum	Average retention time of product kg/m <sup>3</sup>	Quantity of treated wood m <sup>3</sup> /year
Copper/organic – quaternary ammonium compounds (QUATS)/copper, azole/copper and copper HDO	Waterborne, copper-based	6000 tonnes	3	2,000,000
Organic/solvent – azoles and permethrins white spirit	Organic solvent-based	1.2 million litres	11	-
Organic/water – azoles and permethrins water	Waterborne	10 million litres	12-13	-
Creosote	Creosote	Unknown	-	-
Copper/Chrome (originally copper/chrome/arsenic then moving to copper/chrome)	Waterborne	Not sold in UK anymore	-	-

There are relatively few plants using organic solvent-based preservatives currently in the UK and only three creosote plants, with the majority of preservatives used being water-based alternatives. From Figure 4.1, which illustrates the trends in usage of the different preservative types in the UK, it is evident that copper/organic water based preservatives are the most widely used in the UK. The use of copper/chrome preservatives has ceased. The individual preservative types are discussed in more detail in the below sections.



**Figure 4.1 UK Preservative Product Mix Trends ('000s m<sup>3</sup> sold/year) (3)**



### Application of Preservatives

The application of the preservative may be carried out via vacuum processes, pressure processes, dipping, spraying or brushing. Vacuum processes are widely used in the UK. The vacuum process may vary slightly depending on the preservative. The application efficiency of the vacuum process, dipping and brushing is close to 90%. Spraying has a much lower efficiency i.e. from 10-50% (4).

### Creosote

Creosote is oil prepared from coal tar distillation. Creosote is the oldest form of wood preservative and is used for external applications such as telegraph poles and railway sleepers. For the preservation of 1 m<sup>3</sup> of wood, an average 100kg of creosote is required. In industrial facilities, timber enters a chamber which has been pressurised with air. The chamber is flooded with hot creosote for 1-3 hours. After draining, a vacuum is applied to draw off excess creosote. The timber is left to dry in open air (5).

In the UK, there are three creosote plants, out of a total 500 installations. Creosote has been identified as a significant source of POPs (persistent organic pollutants) in the form of PAHs, in particular benzo[a]pyrene (6). Wood creosote may be released to soil and water as a result of its use in the wood preservation industry. Information on the contribution of the wood

preservation industry to UK POP emissions could not be determined, however it was reported that at an EU level, the industry contributed to 30% of EU POP emissions (7). Creosote has been gradually replaced by less harmful water-based alternatives. Directive 2001/90/EC concerning the marketing and use of creosote has restricted the levels of benzo[a]pyrene content to 50ppm. With the exception of revised benzo[a]pyrene content, the industry no longer uses any substances which are listed as POPs. The only source of POPs from the wood preservation industry is from the use of creosote (8).

The UK creosote plants currently operate under the requirements of the IPPC Directive and UK Regulations. The relevant UK guidance notes (PG 6/2 (04) and PG 6/3 (04) already require BAT implementation and detailed reporting of product use in addition to detailed monitoring requirements. It can therefore be concluded that the current UK framework already recognises creosote specific issues.

The use of creosote in wood preservatives and its inclusion in Annex I to the Directive 98/8/EC, the Biocidal Products Directive (BPD) is currently being evaluated under BPD review programme. Two grades of creosote oils are presently under evaluation, namely grades B and C. The most common is Grade B and is intended for treatment of timber wood by pressure impregnation. Grade C excludes the lower boiling fraction allowable in Grade B, and because of the lower volatility, a reduction in odour is achieved (9). If creosote is not totally removed from the market as a result of its evaluation, it is likely that it will only be allowed for very limited applications, for example, by railways and utility companies, where very strict conditions of use are applied (1). If it should be decided that creosote cannot be included in Annex I or included with restrictions, the use of biocidal products containing creosote could eventually be prohibited and these products would have to be removed from the EU market (9).

Based on new data submitted to the Commission, a safe use of creosote may be able to be identified with regard to human health. Therefore the recommendation in the competent authority report to the Commission might be revised in order to propose inclusion in the Annex to the BPD Directive. However, risks have been identified for some in-service uses for creosote treated wood. Based on the data presently available it has been shown that there are risks when treated wood is used in use classes 4 and 5, i.e. wood in direct contact with soil or water (freshwater and sea water). It has been suggested by the Commission that benefits from the use of wood preservatives containing creosote should be considered before taking a final decision. In order to perform an overall risk/benefit analysis of the use of creosote as a wood preservative, the Commission services are inviting stakeholders to comment on the possible consequences of the inclusion or non-inclusion of creosote in Annex I to Directive 98/8/EC. In

particular, the Commission services are inviting stakeholders to provide sound data or evidence on:

- The practical and economic consequences of the phasing out of creosote;
- the availability of less hazardous or non-hazardous alternatives to creosote or creosote treated wood;
- advantages and/or disadvantages of the use of these possible alternatives compared to creosote or creosote treated wood;
- practicability of these possible alternatives, in particular whether they can be used in large industrial and/or commercial scale;
- if alternatives are not yet available, estimate of the time needed to develop and make available sound alternatives to the use of creosote; and
- whether or not alternatives can be used in connection with maintenance of cultural heritage or protected constructions.

The consultation will be open from 30 April 2008 (9).

### Water-Based Preservatives

Water-based preservatives consist of solutions of metal salts in water. Copper, chromium and arsenic (CCA) were the most common types used. CCA types are no longer used in the UK and arsenic has been removed from the market (Directive 2003/2/EC and Directive 2006/139/EC). These water-based preservatives are applied in the same way as creosote. The chemicals bind with constituents in the wood and are essentially 'fixed' to the wood in a form that is resistant to leaching out by water. The treated timber is used in applications where long term protection is needed e.g. outdoor furniture, fencing and some treated timber is used in outdoor playground equipment.

The placing on the market of wood preservatives products is regulated under the Biocidal Products Directive (BPD). Releases of heavy metals to land and water are considered to be an important issue of concern for the industry (3, 6). By the introduction of water-based systems, emission relevance has moved from air to water pollution. However, as a result of various legislation restricting the use of certain substances, with the exception of copper and significantly reduced chromium use, the industry no longer uses heavy metals (8).

Some chromium compounds will be toxic to certain wildlife species although toxicity will depend on the level of exposure. In terms of local environmental impacts, certain aquatic species bioaccumulate chromium although fish do not appear to do so. Chromium (VI) compounds are relatively more toxic and are readily absorbed by organisms whereas chromium (III) compounds are less toxic and are not readily absorbed by organisms. The UK legislation controlling releases of chromium, implementing the EC Directives, are the Surface Waters (Dangerous Substances) (Classification) Regulations, 1997 through the introduction of Environmental Quality Standards (EQS) and the PPC Regulations. EQS represent a concentration limit that must not be exceeded in any controlled water in the UK. Chromium is listed as a List 2 dangerous substance and concentration limits have been set for hardness for this substance (11).

The regulatory status of chromium as a wood preservative is still somewhat unclear. Under the BPD review programme, the status of chromium compounds in wood preservative products was reviewed. The industry view was split, some claiming that it was an active substance and others not. The UK Competent Authority, the HSE, concluded that chromium is an active substance with unacceptable properties, and as a result all UK wood-preserving products containing chromium were required to be removed from the market as of 1<sup>st</sup> September 2006 (12). Discussion held with one of the main preservative suppliers in the UK revealed that preservatives containing chromium are no longer in use in UK wood preservatives, having been replaced with substances less harmful to human health and the environment(3).

A number of timber treatment installations were contacted for this assessment. Four installations contacted used copper organic water-based preservatives, the main types on the market was indicated to be Tanalith E or AC 500. It has been estimated that 6000 tonnes of copper organic preservative is used annually in the UK to treat wood, and that 2,000,000 m<sup>3</sup> of wood treated with copper organic preservatives is produced annually (3).

Copper-containing wood preservatives make up a substantial part of the market. The conditions of approval set out in the authorisation of these products (by HSE as the Competent Authority for the BPD), to be placed on the market determine the mode of operation of the timber treatment installation (8). Wood preservation is unlikely to be a significant source of copper to the atmosphere (6). The main concern is the releases to land and water.

Small amounts of copper are essential to many living organisms, including man. At much higher levels, it can be toxic to wildlife. Deposited copper in soils is toxic to certain soil micro-organisms and can disrupt processes such as nutrient cycling or inhibit other processes such as the mineralisation of nitrogen and phosphorous. Accumulation in species varies significantly as

does their ability to cope with a range of copper levels in their bodies. Toxic effects have been observed in some species of fish and in other aquatic organisms (11).

The European Pollutant Release and Transfer Register (E-PRTR), which replaces the European Pollutant Emissions Register (EPER), sets out reporting requirements for operators of the amounts of hazardous and non hazardous waste and also for release to air, water and soil, subject to thresholds. In the UK, releases of copper are controlled under the Environmental Permitting Regulations 2007 (replacing the PPC Regulations in England and Wales). Copper as a wood preservative is currently being reviewed under the BPD review programme with possible inclusion in Annex I of the Directive as an active substance (12).

Quaternary ammonium compounds (QUATS ) are increasingly used in copper/organic water based preservatives. These are a complex group of substances which are currently being reviewed under the BPD review programme to determine if the substance can be considered an active substance and should be included to Annex I of the Directive (13).

Moves to substances less harmful to human health (in manufacture and application) have led to the use of substances such as permethrins. These substances can have high aquatic toxicity (4) and are currently being reviewed under the Biocidal Products Directive (BPD) review programme and are awaiting comments from the Member States as to their inclusion as an active substance on Annex I to the Directive (14).

### Solvent-Based Preservatives (Light Organic)

Light organic solvent preservatives contain organic biocides such as propiconazol (which replaced pentachlorophenol), lindane, permethrin, triazoles and tributyltin compounds. These impregnation agents cause VOC emissions at production stage and during its use. Lindane, tributyltin and pentachlorophenol and chromate preservatives are banned now in the UK for use as biocides (15). Each cubic metre of wood requires 20kg of organic solvent-based preservative. These consist of approximately 10% active ingredient and 90% organic solvent, usually white spirit or other petroleum based hydrocarbons, with the average density being about  $1\text{mg/m}^3$ (4). These preservatives are used in the construction industry and applications where the precise dimensions of the product are important. In industrial installations, timber enters a chamber which is subsequently evacuated. The chamber is flooded with preservative and pressurised for 5 to 20 minutes. After draining the chamber, a final vacuum is applied to draw off excess preservative. The timber is left to dry in the open air (6).

Emissions can be reduced by good solvent management, enclosing the process wherever possible so that air can be extracted through abatement equipment, and using low alternative solvent coatings where possible. Fugitive emissions can occur throughout the handling, application and drying stages of the processes. Timber impregnation using the closed double vacuum process minimises the fugitive loss (5).

According to the WPA, only a small number of plants use organic-based solvents in the UK, the Defra survey 2007 revealed that the number of Part B permitted installations was approximately 43<sup>9</sup>. It has been estimated that 1.2 million litres of organic solvent is used annually in the UK to treat wood, mainly containing azoles and permethrins compounds (3). Installations using solvents already fall under the scope of the IPPC and SED. It has been estimated that approximately 91% (457 installations out of 500)<sup>10</sup> of the UK wood preservation industry use less than 25 tonnes of solvent per year. This is because most of the installations do not use solvent-based preservation agents, and therefore are not covered by the IPPC or by SED. According to the WPA, at least 250 of these installations will be affected by this option (1).

### BAT for the Wood Preservation Sector

BREF for the sector is the 'Surface Treatment Using Organic Solvents'. The BREF considers industrial processes for the preservation with, or immersion of, wood in organic solvent-based preservatives, creosote or solvent free preservatives. The impregnation without solvent use with a consumption of less than 150kg/hour and less than 200 tonnes/ year is not strictly covered by the IPPC Directive. The BREF does contain a number of practices considered to be BAT and which could be applied to the wood impregnation sector. However, there are only a small number of plants using organic solvent-based preservatives which the BREF can be applied to (1).

The BREF Surface Treatment using Solvents mentions a BAT for the reduction of emissions to soil and water from wood impregnation (4):

- Drain surplus pesticide system in contained areas for both water- and solvent based systems. The collected pesticide can either be re-used or disposed of as hazardous waste;
- other measures;

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<sup>9</sup> This for England and Wales and does not include installations in Scotland. The EHS have stated that there are no permitted installations in Northern Ireland.

- take preventive measures (e.g. good housekeeping measures concerning the evacuation of the treated wood from the application area),;
- install a rework system that returns the dripped agent to the storage vessel and/or have an impermeable floor so the risk of soil contamination and possible (ground)water pollution can be avoided;
- when impregnation takes place under pressure usually the vessel is put under vacuum as a final stage of the procedure. Afterwards the wood produces less drip down;
- a fixation process can be performed or otherwise the wood can be stored inside;
- in order to reduce the environmental effects of the use of creosote it is advisable to use a type of creosote with a limited PAH-content;
- process wastewater containing chemical preservatives should be contained as part of a closed loop application system;
- effluents that may contain wood preservative chemicals require an additional level of treatment, such as detoxification (using ultraviolet oxidation) and precipitation or stabilisation of heavy metals, depending on the nature of contamination;
- storage tanks and components should meet international standards for structural design integrity and operational performance;
- chemical storage and treatment sites and tanks should be situated in containment areas for example, a covered, walled, concrete area beneath which there is an impermeable membrane. Any spills into this area should drain into a tank/sump located in a contained area from which leaks can be detected;
- level gauges, alarms, and cut-off systems on storage tanks should be installed to decrease the risk of overfilling;
- tankers delivering bulk shipments of treatment chemicals should employ spill prevention measures;
- a contained and impermeable post treatment dripping zone should be located within the total containment area. Residue from dripping timber should be collected for reuse;
- treatment chemicals that can be heat-cured onto wood should be adopted to prevent leaching properties. The curing machine should be located within the containment area; and

- treated wood that is cured may be stored in the open. If not cured, wood should be covered and storm water should be collected and treated.

The wood preservation industry has established a Code of Practice for Timber Treatment Installations (16), which has been endorsed by the Environment Agency, HSE and fire authorities (1). It currently forms the basis of how the operator and the regulator can demonstrate BAT. The WPA recommends the Code of Practice (CoP) be used as the basis for BREF by the industry. There are plans to review and update the CoP in line with current legislation and industry practices. The CoP outlines measures that should be taken to eliminate, or where this is not possible, minimise and render harmless any releases to air, water (surface and ground) or land (1). Discussions with operators of timber treatment installations confirmed that the industry CoP is widely used within the sector<sup>10</sup> and the following measures are taken to control emissions to soil and water across the industry;

- Bunding of timber treatment plant and wood-preservative storage tanks: The plant associated loading and unloading area and preservative storage tank should be located within a bund. The bund should be impervious and resistant to chemicals that it contains. The bund should be covered in an enclosed area to avoid the collection of rainwater. Provisions should be made for the secure and contained storage of packaging that contains wood preservatives such as 200 litre drums or intermediate bulk containers (IBCs). Bunding should have an adequate capacity to contain a spillage (110% of the total quantity of each). Regular inspections of the bunding should be carried out;
- post treatment containment and conditioning areas: Treated wood must be held until surfaces are dry and within a bunded area. The dripping area should be contained and impermeable and timber should be transferred from plant to post treatment area within a total containment zone.;
- storage of conditioned timber: Bulk dry treated timber should be stored under cover on an impermeable surface;
- waste management: Wastes associated with wood preservation processes (i.e. redundant preservative solution, sawdust used to soak up spills, redundant preservative containers, contaminated rainwater from bunds etc), are usually classified as hazardous and should be dealt with as per Hazardous Waste Regulations;

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<sup>10</sup> It is not possible to say exactly how widely used the CoP is, however, all operators contacted for this assessment stated that they follow the CoP, and this was reaffirmed by the WPA and the main preservative suppliers.



- bulk delivery of chemicals: Containment of any potential spill from the tanker, delivery and/or handling vehicle, taking the discharge system into account. Tankers should discharge chemicals within a contained area close to the bunded storage area; and
- plant maintenance: A planned written scheme of maintenance and examination should be followed. This should cover all protective devices, pressure valves and pipework that could give rise to pollution in the event of failure.

A separate BREF would need to be established to determine BAT for the sector, building on BAT conclusions contained in the BREF on the Surface treatment using solvents and the Industry Code of Practice.

### Impacts on Industry

Two timber treatment companies contacted for this assessment that operate a number of installations stated that there were no emissions to water or soil from onsite processes. These sites were not already covered by IPPC. In these cases, copper based waterborne preservatives are used and all runoff is collected in a sump, and recycled back into the process. The operators stated that this is common throughout the industry. There were no regulatory requirements with regards to discharge consents for discharges to water or any trade effluent consents for discharges to sewer. According to these operators, all necessary control measures were in place to prevent any water or soil contamination. Operators employ BAT through the industry CoP, and related guidance. All installations consulted stated that in addition to the CoP and WPA, the main source of technical and legislative advice came from the preservative suppliers, of which there are four main firms operating in the UK.

Those installations falling under this option would be required to apply for an IPPC Part A permit. Those installations that are above the proposed threshold and are already regulated under a Part B permit for their emissions to air, will most likely be required to acquire a Part A permit to cover their emissions to soil and (ground) water.

Some of the wood preservation installations operating in the UK may hold discharge consents or trade effluent consents for their discharges to surface water or sewer. It is likely that previous discharge limits held by the operators would not provide adequate environmental protection now, with a result that limits will most likely be lowered. Once these installations come under IPPC, their existing discharge consents would be built into their permit (17).

For those not already covered under IPPC, costs to the operators may be incurred through the requirement of additional abatement, monitoring or plant equipment. All of the installations that

were contacted for this assessment, and that were not under IPPC, stated that BAT was applied on their sites through the industry CoP and they did not believe that significant measures would be required to comply with the proposed changes under the Directive. The majority are using water-based alternatives with significantly lower toxicity, and any runoff is reused back in the process. This option should have limited impact on those installations already covered under IPPC or SED, the main cost impact being the possible requirement to be regulated under a Part A (1) or Part A(2) permit, as opposed to a Part B which only covers emissions to air. A decision on who will regulate the proposed new IPPC Directive installations will be made after the revised directive has been adopted. For those already regulated under IPPC Part B, there ought to be no difference in impacts on business from having one or other regulator, only that, as things stand, Local Authority Part A (2) fees and charges and Environment Agency Part A(1) fees and charges are higher than those of the Part B (18).

Being covered by IPPC may also lead to implementation of specific additional BAT concerning soil protection and water treatment. The most significant impacts will be for those installations not already covered by IPPC or SED in terms of regulatory costs. The costs incurred by installations affected by this option will very much depend on the environmental performance of each company, the scale of the company and the measures already in place for environmental protection. Only limited information could be obtained for this assessment on potential costs to industry affected by this option.

The main impact for the Regulatory authorities would be the additional workload involved in processing applications, compliance checking, site inspections etc.

From discussions with one operator, the main concern of further regulation for the industry would be the costs implications for preservatives and plant equipment. The operator believes that the cost of these would increase and stated that the price of treated wood in the UK has not increased for 10 years. This may have significant implications for industry competition with other Member States. It was the operator's belief that many timber treatment companies are shutting down their sites in the UK and relocating to other less regulated parts of Europe and shipping treated wood back to the UK for sale (19).

#### 4.4 **Summary**

This sector covers the impregnation with or immersion of timber in organic-solvent-based preservatives, creosote and water-based preservatives. The wood preservation industry is not currently completely covered by the IPPC Directive, and there have been calls for

environmental regulation of the sector to be extended by including it further in the IPPC Directive.

The main environmental aspects of wood preservation are the emissions of VOCs originating from the use of solvent based agents and the effects on water, soil and groundwater originating from the use of biocidal chemicals in the process. Since installations using solvents already fall under the scope of the IPPC Directive and Solvent Emissions Directive (SED), the main environmental impacts for the installations concerned relate to the emissions to soil and (ground) water. The proposed changes to the IPPC Directive would therefore impact those installations that do not use solvents (or small quantities i.e. currently below the threshold for inclusion under IPPC or SED).

Wood preservation is a major industry, with approximately 3 million m<sup>3</sup> of timber treated annually in the UK alone. The sector is characterised by a large number of relatively small plants. It is believed that there are approximately 500 wood preservation installations in the UK. The UK currently regulates air emissions from the sector as follows:

*Timber Activities Section 6.6 Part B process:*

*(a) Manufacturing products wholly or mainly of wood at any works if the activity involves a relevant activity and the throughput of the works in any period of 12 months is likely to be more than;*

*(ii) 1,000 cubic metres*

Precisely how many installations are above the proposed production capacity threshold of 75m<sup>3</sup>/day and which may come under the IPPC Directive has not been determined. However, it has been estimated that there are approximately 457 installations that are not currently covered by IPPC or SED. According to the Wood Protection Association (WPA), if the 75m<sup>3</sup>/day threshold is applied, they estimate that at least 50% of the wood preservation installations in the UK would be affected. Based on these estimates, the assessment of the costs and benefits to the UK have been made on the basis that 250 installations that are currently either not regulated or are regulated under Part B would be affected by the proposed changes to the IPPC Directive.

The main impact of this option will be the associated regulatory costs under IPPC. All operators consulted as part of this assessment that may potentially be covered by the proposed changes, believed that there would be very little measures required by their installations to ensure compliance with the proposed changes. They already apply what the industry considers to be

BAT, through the industry Code of Practice. Preservatives are typically applied through high and low pressure vacuum processes, which have an efficiency of up to 90%. There appears to be very little emissions to water or sewer and none of the installations consulted holds a discharge consent as all runoff was recycled back into the process, resulting in low levels of waste generation or effluent. All installations had bunding throughout the treatment plant and for the preservative storage tanks to prevent any contamination of soil or water.

In the UK, the wood preservation industry is already meeting the requirements of a number of EU Directives to reduce industry emissions. The main pollutants of concern are heavy metals, such as chromium and copper, and PAHs from the use of creosote. With the exception of copper, the industry does not use any other heavy metals. In addition, there are only three creosote plants out of a total 500 installations. The transposition of the requirements of the Biocidal Products Directive (BPD) (with several amendments) regulates the use of dangerous products taking into account the environmental impact assessments of the different chemicals. Restricting the use of these substances simultaneously reduces the risk of water, soil and groundwater contamination. It could therefore be argued that the BPD already requires the highest level of protection human health and the environment. The main drawback of the BPD is the time lap for entry into force, because a lot of chemicals still have to be reviewed.

On the other hand, when biocidal chemicals are used that are authorised by the BPD without restrictions, the application of IPPCD will lead to the use of BAT that result in a higher protection of the (ground) water and soil. These techniques can prevent or reduce the emission to (ground) water and soil originating from the use of these less toxic biocidal chemicals.

## 5. Costs

### 5.1 Compliance Costs

From discussions with the Defra, Local Authority Unit and other stakeholders, there is some uncertainty over the exact measures that current IPPC installations may have to implement if they were to be regulated under IPPC following implementation of the proposed changes to the IPPC Directive. The evidence gathered during this report indicates that a combination of other regulatory controls<sup>11</sup> and use of the Industry Code of Practice, results in a high level of overall environmental protection that is comparable (in most aspects) to that required under application of BAT within IPPC. It is therefore not anticipated that there will be any significant measures required by the industry to ensure compliance due to the reduced use of the main pollutants of concern as a result of existing legislation and the fact that BAT is already applied throughout the industry<sup>12</sup>. This results in an assumption that there will be no additional operational costs associated with improvements to meet BAT under the requirements of IPPC.

### 5.2 Administrative Costs

#### 5.2.1 Operators

The administrative costs that would apply to operators following implementation of the proposed changes to the IPPC Directive are related to the transition from a current Part B process (i.e. outside of the current scope of IPPC) to a Part A process or from a current position of regulation under Statutory Nuisance to Part A. To calculate these costs, the present administrative costs required for a Local Authority Part B permit have been compared with applicable charges for a Local Authority Part A permit.

Should it arise that installations in England and Wales were to be regulated by the Environment Agency, the costs indicates here may vary due to higher overall charges however it is assumed that the current regulatory (i.e. Local Authority) arrangements will continue.

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<sup>11</sup> Biocidal Products Regulations (SI 2001/880) (as amended) and Biocidal Products Regulations (Northern Ireland) (SR 2001/442) (as amended).

<sup>12</sup> Communication with, WPA

## Part B

In addition to the administrative costs associated with the permit application and subsistence charges, there is also a cost to the operator associated with compliance and reporting, record keeping, inventory preparation, staff training and inspections. Indicative estimates from industry sources appear to suggest that this may be in the region of £400 per installation.

**Table 5.1 Current Cost-Estimates for a Part B Permit (Per Installation)**

Cost Element	Unit Cost (£/Installation)	Unit Cost (£/Installation)	Unit Cost (£/Installation)
	England & Wales	Scotland	Northern Ireland
Permit application fees	£1,514	£2,354	£1,530
Subsistence charge	£1,065-£1,586 <sup>1</sup>	£1,182	£955
Subsistence time costs	£400	£400	£400
Sub-Total	£2,979 - £3,500	£3,936	£2,885
Total annualised one-off costs <sup>2</sup>	£210 - £246	£ 277	£203

Note 1: Subsistence charge is given as a range depending on classification of either medium or high risk.

Note 2: One-off costs have been annualised over the lifetime of a permit (assumed to be 20 years in line with Defra, 2006) with a discount rate of 3.5%

## Part A(2)

In addition to the administrative costs associated with the permit application, subsistence and surrender charge, there is also a cost to the operator associated with completing the application to the required standard, which has been estimated to be between £6000 and £10000 per installation<sup>13</sup>. Additionally, once the permit is in place, there is a cost associated with compliance and reporting, record keeping, inventory preparation, staff training and inspections.

<sup>13</sup> Costs have been estimated from research previously conducted by Entec on behalf of Defra for IPPC application costs for Part A2 installations.

Estimates based on previous experience and feedback from industry suggests that this may be in the region of 2 to 3 man-days per month per installation. Based on an environmental manager salary band of between £25,000 and £40,000<sup>14</sup>, this would work out to be costs in the range of c£2,900 to £6,920 per installation. The figures in table 5.2 reflect these assumptions.

**Table 5.2 Current Cost-Estimate Ranges For a Part A(2) Permit (Per Installation)**

<b>Cost Element</b>	<b>Unit Cost (£/Installation) England &amp; Wales</b>	<b>Unit Cost (£/Installation) Scotland<sup>15</sup></b>	<b>Unit Cost (£/Installation) Northern Ireland</b>
Permit application fees	£3,085	£3,114 <sup>1</sup> - £9,156	£4,385
Application preparation costs	£6,000 - £10,000	£6,000 - £10,000	£6,000 - £10,000
Subsistence charge	£1,383 - £2,047 <sup>2</sup>	£1,182	£1,525
Subsistence time costs	£2,900 - £6,920	£2,900 - £6,920	£2,900 - £6,920
Surrender charge	£640	£2,754	£2,345
<i>Sub-Total</i>	<i>£14,008 - £22,692</i>	<i>£15,306 - £30,858</i>	<i>£17,155 - £25,175</i>
Total annualised <u>one-off</u> costs <sup>3</sup>	£384 - £966	£835 - £1,542	£896 - £1,177
Total annualised admin costs <sup>3</sup>	£4,967 - £9,933	£4,273 - £10,490	£5,321 - £9,622

Note 1: Low figure is based on submission as a Low Impact Installation (LII)

Note 2: Subsistence charge is given as a range depending on classification of either medium or high risk

<sup>14</sup> Employer add-ons calculated at 25% of basic salary.

<sup>15</sup> SEPA (2008) *Summary of charging schemes 2008-2009* CHBK2008-2009 Rev Summary: [http://www.sepa.org.uk/pdf/charging/booklets/2008\\_09/booklet\\_mayRev.pdf](http://www.sepa.org.uk/pdf/charging/booklets/2008_09/booklet_mayRev.pdf)

Note 3: Costs have been annualised over the lifetime of a permit (assumed to be 20 years in line with Defra, 2006) with a discount rate of 3.5%.

### 5.2.2 Regulators

It can be assumed that the permit fees and subsistence charges paid by operators through the charging schemes employed in the UK would be sufficient to cover regulators' costs for the processing of the permit and ongoing enforcement.

## 5.3 Results

### Administrative Costs

Having identified that there are 43 wood preservation installations in the UK currently operating under a Part B permit, these installations will bear a reduced cost for transition to a Part A under the proposed changes to the IPPC Directive. Of the 500 installations falling under Section 6.6, it has been estimated that 250 of these will be affected by the proposed changes. 43 of these will be required to bear the costs for conversion from Part B to Part A and a 207 will be required to bear the costs of new applications for operating under a Part A permit.

The estimated administrative cost-ranges for the UK associated with the proposed change to wood preservation installations are summarised in the Table 5.3. These figures are based on the cost ranges for installations in England and Wales. The costs will vary if substantive numbers of installations are located in Scotland or Northern Ireland.



**Table 5.3 Estimated Administrative Cost-Ranges to the UK From The Proposed Changes to IPPC Directive**

<b>Cost Element</b>	<b>Total Costs</b>	<b>Total Annualised One-Off Costs</b>	<b>Total Annualised Administrative Costs</b>
<b>Operators</b>			
43 Part B installations	£602,344 - £975,756	£29,423 - £41,525	£150,597 - £341,708
207 new installations	£2,899,656 - £4,697,244	£141,642 - £199,901	£1,028,223 - £2,056,070
<b>Sub-Total</b>	<b>£3,502,000 - £5,673,000</b>	<b>£171,065 - £241,426</b>	<b>£1,178,820 - £2,397,778</b>
<b>Regulatory Authorities</b>			
Permit application time costs (regulators)	Assuming cost covered within the application fee		
Subsistence time costs	Assuming cost covered within the subsistence charge		
Sub-Total	N/A	N/A	N/A
<b>Total Administrative Costs</b>	<b>£3,502,000 - £5,673,000</b>	<b>£171,065 - £241,426</b>	<b>£1,178,820 - £2,397,778</b>



## 6. Benefits

### 6.1 Approach

The following section summarises the benefits to be had from permitting the wood preservation industry.

#### 6.1.1 Emission Reductions

There may be reductions in fugitive emissions of heavy metals, such as copper, and PAHs from creosote use. However, due to the limited information on emissions from the wood preservation industry, it has not been possible to quantify any emission reductions. In the UK, the wood preservation industry is already meeting the requirements of a number of EU Directives to reduce industry emissions. Both copper and creosote are currently being evaluated through the BPD, and it is expected that the use of creosote will be restricted to only certain applications. If this happens, then any emission reductions from regulation of the industry under IPPC will be minimal. In addition, chromium is not in use in the UK anymore.

The main benefit of inclusion of the wood preservation industry under the IPPC Directive would be when biocidal chemicals are used that are authorized by the BPD without restrictions, the application of IPPCD would lead to the use of BAT that result in a higher protection of the (ground) water and soil (7). Without a full characterisation of the emissions of biocidal chemicals from UK wood preservation installations, it is not possible to put an estimated figure on the potential benefits.



## 7. Competition Assessment

The competition guidelines (August 2007)<sup>16</sup> set out four main questions, which requires asking whether the proposed revisions in the IPPC Directive would affect the market by:

1. Directly limiting the number or range of suppliers?
2. Indirectly limiting the number or range of suppliers?
3. Limiting the ability of suppliers to compete?
4. Reducing suppliers' incentives to compete vigorously?

A brief summary of the four questions are presented below in Table 7.1 and for those where the answer to one of the questions is "Yes", then an explanation is provided in the following sections.

The results should be included in the "Evidence Base" within the Impact Assessment template.

**Table 7.1 Summary of the Competition Test**

Question	Wood Preservation Installations
Q1. Directly limit the number or range of suppliers?	No
Q2. Indirectly limit the range of suppliers?	No
Q3. Limit the ability of suppliers to compete?	No
Q4. Reduce suppliers' incentives to compete vigorously?	No

There is a lack of available data to determine whether any particular type of installation (e.g. due to a particular process or preservation technique/substance) is more affected than another type<sup>17</sup>. For those affected by the threshold, the cost of compliance is expected to be quite low as the sector is already applying what they consider to be BAT through the industry code of practice. The main cost is the cost of the permit and subsistence costs associated with an IPPC permit.

<sup>16</sup> [http://www.offt.gov.uk/shared\\_offt/reports/comp\\_policy/oft876.pdf](http://www.offt.gov.uk/shared_offt/reports/comp_policy/oft876.pdf)

<sup>17</sup> It is advisable that this be sought during public consultation.

The introduction of the threshold may encourage many smaller installations to reduce their production capacity below 75m<sup>3</sup>/day to avoid the cost of a permit. This may also encourage smaller installations planning to enter the industry to have a production capacity of below 75m<sup>3</sup>/day. This will largely depend on cyclical demand for treated wood over a given year. If it is estimated that the revenue gained from sales when demand requires production capacity above 75m<sup>3</sup>/day outweighs the costs of permits, then installations will still have an incentive to operate with a production 75m<sup>3</sup>/day. Given that average throughput over the year is in the region of 20-30m<sup>3</sup>/day, the adoption of revisions in the IPPC directive may lead to more installations reducing productive capacity below 75m<sup>3</sup>/day. This is likely to be an inefficient use of resources (e.g. labour and capital) compared to a situation with larger companies who can benefit from economies of scale.

## **8. Distributional Effects on Different Sizes**

The main costs of the IPPC are likely to occur on those installations close to the 75m<sup>3</sup>/day threshold. Those installations below the threshold are unaffected whilst those significantly above the threshold are likely to be better financially placed to either pass on the additional costs (permit costs) to their customers or partially absorb some of the costs. The introduction of the threshold may encourage those below the threshold to reduce production capacity below 75m<sup>3</sup>/day to avoid the costs associated with IPPC permits.





## 9. References

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- (5) EGTEI: Preservation of Wood – synopsis sheet, 2005
- (6) Emission Inventory Guidebook – Other uses of solvents and related activities – Preservation of Wood, 2006
- (7) European Commission: Impact Assessment Amendment B5 on Wood Preservation, 2007
- (8) Wood Protection Association: Response to the proposed inclusion of the wood preservation sector under the IPPC Directive, 2007
- (9) Europa website:<http://ec.europa.eu/environment/biocides/creosote.htm>, 2008
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- (11) Environment Agency website: <http://www.environment-agency.gov.uk/business/444255/446867/255244/substances/138/>?, 2008
- (12) Health and Safety Executive: Personal communication, May 2008
- (13) Health and Safety Executive: Biocides Factsheet, 2006
- (14) Entec personnel: Personal communication, May 2008
- (15) Health and Safety Executive website: <http://www.hse.gov.uk>, 2008/
- (16) Wood Protection Association: Timber Treatment Installations – Code of Practice for Safe Design and Operation, 2003
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- (18) Defra: Personal communication, May 2008
- (19) Installation operator: Personal communication, May 2008
- (20) Process Guidance Note 6/3 (04) for Chemical treatment of timber and wood based products, 2004
- (21) Europa website: <http://ec.europa.eu/environment/biocides/index.htm>, 2008