PROFESSIONAL OPERATOR PRACTICES – A SITE SURVEY OF TIMBER TREATMENT BUSINESSES IN THE UK UTILISING BRUSH, DIPPING AND SPRAYING APPLICATION METHODS

1.1 BACKGROUND TO THIS SUMMARY REPORT

Biocides and Pesticides Unit (BPU) commissioned AEA technology to investigate the operating practices at timber treatment sites concerned primarily with brush, roller, spraying, dipping and irrigation applications of wood preservatives, with a view to identifying potential losses to the environment. This report is HSE's summary of the research. This work was required as BPU had little information regarding environmental emission pathways from these practices, whether they are likely to be of concern and if so whether further quantification is necessary.

The research was performed in 2 phases; the first identified a list of potential sites to be visited where professional operators were likely to use wood preservatives. These companies were identified from a cross section of the timber treatment industry such as joinery, wood workers, timber frame buildings and fencing businesses. These companies were then contacted to determine their willingness to participate in this survey and a brief telephone interview conducted to assess their suitability for the purposes of a site investigation. From the 708 companies identified, only 50 were willing to participate in and were considered to be appropriate sites for the survey. The second phase involved conducting visits to the 50 sites.

Site visits involved conducting a face to face interview with the operator, based on a detailed questionnaire, followed by a visual audit of the site and completion of a detailed site walkover questionnaire. The questionnaire and the audit focussed on the type of chemicals in use, the method of treatment and the environmental impact of the operations.

The site investigations were conducted in 21 counties of England, Wales and Scotland. The geographical coverage is illustrated in Appendix 1. HSE acknowledge that by limiting the survey to 50 sites that there were some regions of the UK not covered by this survey, particularly in the southeast of England and northwest of Scotland.

The selection of treatment sites for the survey was dependent on the method of application and although the project did not specifically study applications involving pressure or vacuum systems, these were present at two of the sites investigated. Although efforts were made to select a representative cross-section of both large and small companies, typically the sites were small (1 - 10 employees) with the application of wood preservatives usually being only a small proportion of their work.

The sites investigated all conducted operations involving the application of preservative chemicals to timber. The chemical preservatives used included; light organic solvent preservatives and water based preservatives; such as those applied by industrial vacuum impregnation.

1.2 RESULTS FROM THE SITE INTERVIEW AND SITE WALKOVER QUESTIONNAIRES

1.2.1 PROCESS DESCRIPTION, CHEMICAL USAGE AND LIKELIHOOD OF EMISSION PATHWAYS TO THE ENVIRONMENT

1.2.1.1 Range Of Treated Timber Products And Market Of The Company

The questionnaires indicated that the majority of the sites investigated treated small quantities of timber, manufactured windows, doors and bespoke joinery for a predominantly local market, typically within a 20 km radius of the site, with customers that included the general public, local building merchants and local authorities. However, 1 company manufactured wooden shelters for export to a single EU Member state, whilst another site, which was also a sawmill, treated a much larger quantity of timber for a more extensive market.

1.2.1.2 Distribution Of Products Used

The survey results indicated that the timber treatment operators favoured using products from 1 particular chemical supplier, who supplied 42 % of the sites participating in this survey. The next most popular supplier serviced 18 % of the sites in this survey, and in a number of instances (11 sites) more than one treatment product was retained and used on site for different treatment applications.

1.2.1.3 Length Of Time Preservative Used By Operator

Generally, if a product provided consistent, cost-effective and good results, operators did not experiment with other products; for instance 60 % of the sites surveyed had used the same product for more than five years (see Table 1).

Table 1 Length Of Time Product Used

Length of time used (years)	Number of Sites	% of Sites Surveyed
< 5	20	40
5 - 10	13	26
> 10	17	34

1.2.1.4 Active Ingredients Of The Products Used

The majority of operators in the survey (52 %) favoured products containing either of 2 active ingredients. However, at 22 % of the sites visited, it was uncertain as to what the active ingredients were as either there was no label on the tin used (16 %) or no containers were available for the auditors (6 %). It was also noted that 1 operator was illegally using a product which had had its approval revoked (consent to use expired June 2001), with a requirement to dispose this product by June 2002. However, this survey took place between November 2001 to February 2002 and it is unlikely that this product is still in use despite the fact that it had been illegally used during this survey.

1.2.1.5 Quantity Of Wood Preservatives Used

Although the majority of the timber treatment operators surveyed typically used small quantities of product per annum per site, some sites used significantly more. It was reported that > 50 % of the sites visited used ≤ 200 L, whilst 76 % used ≤ 1000 L and 4 % (comprised

of 2 large sawmills) used > 10,000 L of wood preservatives per annum (see Table 2). HSE noted that at 3 of the sites surveyed, the operators interviewed either did not know or did not wish to disclose how much preservative they used.

Table 2 Annual Chemical Usage Of Sites Investigated

Annual Product Usage (litres)	Number of Sites	% Sites Surveyed
< 25	6	12
26 - 75	8	16
76 - 100	8	16
101 - 200	4	8
201 - 400	8	16
401 - 1000	4	8
1001 - 4000	5	10
4001 - 10,000	2	4
> 10,000	2	4
Quantity unknown	2	4
Quantity not disclosed	1	2

1.2.1.6 Storage Of Chemicals

There was significant variance in the storage of chemicals on-site prior to use. Although some site operators had appropriate procedures in place for chemical storage, due to space being frequently at a premium, the small joinery businesses were generally more concerned with minimising the likelihood of the drums getting in the way rather than the correct storage of the chemicals. Flame-proof cupboards appeared to be uncommon and whilst chemicals are often stored within locked storerooms with solvents and paints, small quantities of treatment chemicals were typically stored beneath work surfaces.

1.2.1.7 Treatment Area, Drying Times And Amounts Of Wood Treated

Most of the small businesses in the survey treated timber within a joinery workshop, however depending upon the weather treatment was occasionally performed outside. Further to this, it was reported that timber treatment at these premises was often sporadic and limited, with storage of the treated timber generally dealt with on an ad-hoc basis, largely dependent upon the application method, location, layout and facilities of each workshop.

The average touch drying times for the treated wood varied depending on the product and process used, with the drying times quoted by the suppliers of the most commonly used products in this survey (60 %) reported to be 1 - 6 hours for brush, spray or dip applications. Few of the joinery businesses visited had dedicated drying-racks.

The amount of softwood timber treated per month varied significantly between < 0.5 m^3 to 500 m^3 at a sawmill, with no clear consensus regarding the seasonal variability of the amount treated. However, fencing businesses did notice a slight increase in demand for fencing, gates and posts during the spring.

1.2.1.8 Application Methods Used By Operators In This Survey And Likely Environmental Emission Pathways

The majority of the operators who participated in this survey applied wood preservatives by brush (64 %) and dipping (16 %), with 16 % performing 2 or 3 different methods of application and 2 sites undertaking vacuum pressure impregnation treatments. In this survey, spray application was not a significant method of application (see Table 3).

Table 3 Application Methods Used By The Timber Treatment Operators

Application Method(s)	Number of Sites	% of Sites Surveyed
Brush only	32	64
Dipping only	8	16
Dipping or Brush	4	8
Brush or Spraying	3	6
Vacuum Pressure only	2	4
Dipping, Brush or Spraying	1	2

Most of the wood preservatives used that are applied by brush required no preparation, whereas dip coat treatments often required some preparation, typically involving dilution with water and this was usually conducted in the treatment tank itself. No specific information was provided regarding the temperature at which dipping usually took place. For economic reasons, the preservative is applied sparingly, with routine collection and recycling of excess preservative from drip trays. Observations were therefore only made with regard to brush and dipping application processes are summarised as follows:

Application by brush

- Liberal application may result in excess product splashing onto surrounding surfaces and/or floor/ground;
- Spills are inevitable, transfer of product from 25 L drums to smaller, more manageable containers is commonplace;
- Brushes are soaked in water or turpentine. Anecdotal evidence implies that this solution is disposed of to the drain, though it is unclear as to whether this is to foul sewer or surface water drainage.

Dip Tanks

- Tanks vary in dimensions depending upon their function (typically 2 m x 2.5 m x 0.5 m);
- Makeshift tanks are constructed from 200 L drums sawn in half lengthways and soldered together to make a trough-like tank;
- Most dip tanks have draining racks so that treated wood can be left to drip dry, minimising chemical loss;
- Given the nature of the task, some splashing of preservative is inevitable;
- Most of the dip tanks were situated on concrete hard-standing hence the impact to the environment is minimal other than a little cosmetic staining;
- Concrete hard standing minimises the threat of groundwater contamination.

1.2.2 TRAINING AND GUIDANCE

Of the fifty businesses visited, 36 % were affiliated to a trade organisation, whilst only 8 % were aware of the British Wood Preserving and Damp Proofing Association (BWPDA) Code of Practice and these tended to be the more established companies.

It was reported that the Environment Agency (EA) had contacted 18 % of the sites in the survey within the last 10 years and that employees at a large proportion of the businesses could not differentiate between the HSE and the EA.

Whilst 6 % of the sites visited, had received professional training from their suppliers, the remaining 94 % of the companies in the survey obtained guidance on safe handling and storage of chemicals from safety data sheets, product labels, and verbal instructions from colleagues.

1.2.3 ENVIRONMENTAL AWARENESS

Most of the timber treatment businesses visited were located upon light industrial manufacturing estates, hence given the site locations and that treatment of timber was generally performed infrequently, the potential for risk to groundwater contamination was considered negligible. With regard to environmental risk assessments, only 4 sites noted a requirement from their contractors to document risk mitigation procedures.

The site operatives interviewed considered that the most common loss of chemical to the environment during the treatment process was due to drips. The operators were also aware that losses could also occur during liberal application by brush; excess preservative dripping from dipped timber unable to be recaptured; losses due to over-spray; and evaporation of product (largely from dip tanks and vessels).

Although uncontrolled accidental discharges to sewer cannot be ruled out, there was no evidence of conscious disposal by this pathway identified. It was reported that none of the sites visited held a sewage discharge consent for the disposal of industrial chemicals. Also, it was reported that in the event of a chemical spill, sawdust was used to absorb excess preservative that was then typically disposed of as commercial waste, although small quantities were reportedly burnt at 11 sites.

The operators reported that usually the finished wooden article undergoes treatment, hence the quantity of waste treated timber requiring disposal is minimal, although small quantities of treated wood were reportedly burnt (9 sites). Furthermore, anecdotal evidence suggests that little chemical residue remains in the bottom of the product containers and although most of these containers are disposed of as commercial waste, some are burnt. On average, most of the timber treatment businesses in this survey disposed of four 25-litre drums per year.

1.2.4 SUMMARY OF SITE WALKOVER ASSESSMENTS

Although site walkover assessments were conducted at most of the sites visited, several of the operators refused to permit these to be conducted.

In the predominantly small joinery businesses of this survey, chemical usage was relatively limited (52 % of the sites used ≤ 200 L per annum) and the application of wood preservatives was usually only a small proportion of their work. Hence the potential opportunity for the occurrence of minor spills and drips of preservative was considered limited, thus providing no significant source of contamination. At a number of the sites investigated there were occasional minor fissures in the concrete hard standing, together with some signs of minor discolouration. However, at the sites investigated, the degree of contamination was deemed negligible.

A large proportion of the timber treatment businesses investigated were situated upon light industrial estates with inherent features such as industrial strength concrete and engineered drainage (incorporating interceptors and sumps that would provide a system for spillage containment). Hence, the likelihood of preservative migration into the groundwater was considered to be negligible. In all cases it was assumed that storm water drainage and foul water discharge systems operated independently. However, the surveys conducted did not allow for a comprehensive drainage survey and cross contamination could not be ruled out.

One of the key features of light industrial estates is that they are typically located away from threatened natural landscapes and designated conservation areas (3 sites were identified as being near at least 1 SSSI at a distance of > 2 km from the site), and urban population centres (37 sites were < 100 m from populated areas; 9 sites > 2 km). Further to this, 1 site was reported to be within 100 m of a waterbody, whilst 41 sites were reportedly located at a distance of > 2 km. Therefore the potential pathway for the migration of contamination to environmentally sensitive receptors is much reduced.

1.3 CONCLUSIONS

This study investigated 50 sites that were considered to be representative of the broad spectrum of small timber treatment and joinery businesses that use wood preservatives on an occasional basis.

It was found that a relatively limited number of preservative products (usually applied by brush or dipping) were used by these site operators, with an annual usage of ≤ 200 L per site, applicable for 52 % of the timber treatment operators in this survey. However, although this research has demonstrated that the typical annual consumption of preservatives is relatively low at small joinery sites, there may be many hundreds of this type of site operating across the UK.

The operational practices observed and the site walkover assessments did not yield any significant causes for environmental concern regarding the timber treatment processes observed in this survey. For example, in many instances (36 %), sites were located on light industrial or industrial estates where hard standing helps to mitigate against potential ground water contamination. The report concluded that the potential for contamination of the environment by chemical preservatives from the sites investigated is considered negligible.

HSE therefore concludes that for the professional application of wood preservatives by brush, spray, and dipping methods at small timber treatment sites such as those observed in this survey, the losses to the environment during the application are considered to be minimal. Although end use of timber articles has not been addressed, this issue is outside the scope of the Control of Pesticides Regulations (COPR) and the Food and Environmental Protection Act (FEPA). However, the issue of end use of timber articles will be addressed during product authorisation under the Biocidal Products Directive (BPD), when and where necessary.

APPENDIX 1
Locations of Sites in the Survey