

ENVIRONMENTAL ACTION FOR THE PRINTING INDUSTRY



ACKNOWLEDGMENTS

This information for the printing industry was prepared by the Department of Environment and Conservation NSW (DEC), which incorporates the NSW Environment Protection Authority (EPA).

DEC acknowledges the help of the following organisations in completing this guide:

- News Ltd
- Focus Press
- Kwik Kopy, Auburn
- Printing Industries Association of Australia
- Heidelberg Australia and New Zealand
- Penfold Buscombe Printers
- Randwick City Council

Please note:

This guide provides information relevant at the time of publication. It is not a regulatory document and does not provide legal advice. If you need more information regarding legal obligations, consult a lawyer, the legislation, DEC or your local Council.

While reasonable efforts have been made to ensure the contents of this guide are factually correct, DEC does not accept responsibility for the accuracy or completeness of the contents and is not liable for any loss or damage that may occur directly or indirectly through the use of, or reliance on, the contents of this guide.

Published by:

Department of Environment and Conservation NSW

59-61 Goulburn Street
PO Box A290
Sydney South 1232

Ph: (02) 9995 5000 (switchboard)

Ph: 131 555 (environment information and publications requests)

Ph: 1300 361 967 (national parks information and publications requests)

Fax: (02) 9995 5999

TTY: (02) 9211 4723

Email: info@environment.nsw.gov.au

Website: www.environment.nsw.gov.au

DEC is pleased to allow this material to be reproduced in whole or in part, provided the meaning is unchanged and the source is acknowledged.

DEC 2006/357

ISBN 1 74137 950 4

November 2006

Printed on recycled paper (elemental chlorine free).

CONTENTS

Priority actions for furniture and timber product manufacturers	2
Overview and opportunities	4
Information sheet 1:	8
Environmental compliance – meeting your legal responsibilities	
Information sheet 2:	14
Resource efficiency	
Information sheet 3:	20
Pre-press area	
Information sheet 4:	24
Press area	
Information sheet 5:	32
Collating and binding	
Information sheet 6:	34
Dispatching and receiving goods	
Information sheet 7:	38
Building and site management	
Information sheet 8:	44
Hazardous and solid waste	
Information sheet 9:	50
Working with suppliers	
Information sheet 10:	52
Bringing it all together – planning	
USEFUL TOOLS	
Environmental self-assessment	54
Environmental action plan	66
Checklists: daily and weekly	68
Useful contacts	69

ABBREVIATIONS

EPA	Environment Protection Authority – part of the Department of Environment and Conservation NSW	MSDS	Material Safety Data Sheet/s
DEC	Department of Environment and Conservation NSW	OH&S	Occupational Health and Safety
		POEO Act	<i>Protection of the Environment Operations Act 1997</i>
		VOCs	Volatile organic compounds

PRIORITY ACTIONS FOR PRINTERS

1. PRE-PRESS AREA



- Make sure all discharges to the sewer comply with the trade waste agreement you hold with your local water authority
- Look into converting to computer-to-plate technology – this can save money and eliminate film waste
- Ensure customers' requirements are interpreted correctly to prevent wastage
- Work with your customers on design layout to prevent waste

2. PRESS AREA



To reduce VOC emissions and improve air quality:

- Consider changing your printing process to one that uses fewer or no solvents, such as waterless printing
- Consider using low VOC ink, such as soy-based or water-based ink
- Use solvents efficiently – train staff to use the least amount and install efficient blanket washing systems that use the least amount of blanket wash
- Use a solvent recycling system

3. COLLATING AND BINDING



- Train staff in cutting techniques, binding techniques and use of glues to reduce waste
- Reduce waste from excess trim
- Reduce the need for trimming by making sure that jobs fit reel and sheet sizes accurately
- Consider using water-based glues for binding and labels

4. DISPATCHING AND RECEIVING GOODS



- Make sure your products are packed to minimise damage but without excessive packaging
- Train staff and suppliers in efficient handling and stacking to minimise damage
- Find out how you can reuse packaging received from suppliers
- Separate wastes and send them for recycling or back to suppliers
- Consider signing the National Packaging Covenant
- Be mindful of the noise made by vehicle activities. Organise deliveries and forklift movements in standard operating hours

5. BUILDING AND SITE MANAGEMENT



- Keep your premises and grounds free of litter and waste materials
- Design your chemical storage area to contain any spills or leaks
- Clearly label all chemical containers
- Set up spill prevention and management procedures and review them regularly
- Make sure staff understand the potential hazards of the chemicals they use and know what to do if there is a spill
- Minimise noise: locate noisy equipment away from doors and use noise insulation

6. HAZARDOUS MATERIALS AND WASTE



- Store hazardous liquids/waste in a bunded, sealed and covered area to contain any spills or leaks
- Segregate each waste and clearly label each waste container
- Dispose of hazardous liquids using an EPA-licensed waste transporter and make sure your waste is disposed of at an appropriate waste facility
- Follow your industry PURE Code of Practice for Liquid Waste Management and Disposal

OVERVIEW AND OPPORTUNITIES

This guide is part of an Environment Action Series prepared by the Department of Environment and Conservation NSW (DEC) to provide information for businesses on improving their environmental performance.

Similar guides for other business sectors are available through the DEC Environment Line on 131 555 or visit the DEC website – www.environment.nsw.gov.au.

THE PRINTING INDUSTRY

The printing industry covers a broad range of printing types. They all have potential environmental impacts because of the raw materials and chemicals they use and the waste they generate. The following printing types are covered in this guide:

- Lithographic
- Gravure
- Flexographic
- Digital
- Letter press
- Screen printing
- Label printing
- Web and sheet fed
- Other associated printing types.

WHAT IS THE PURPOSE OF THIS GUIDE?

This guide is designed to help NSW printers:

- Understand the environmental risks and responsibilities associated with the printing industry.
- Take action to improve the environmental management of their operations.
- Take advantage of the business benefits that result from improved environmental practices.

This guide provides information for owners, managers and staff. It will also be useful to environmental officers employed by local government. The guide does not provide legal advice but will provide printers with an understanding of regulatory requirements under environment protection laws.

The 'Useful tools' section of the guide contains templates to help you develop your own environmental management tools, such as



WHAT ARE THE KEY ENVIRONMENTAL ISSUES?

Key environmental issues for printers are:

- Air pollution, e.g. releasing volatile organic compounds (VOCs) into the atmosphere due to solvents use.
- Handling and disposing of hazardous materials, such as solvent wastes and photographic chemical wastes.
- Waste management, including the reuse, recycling and disposal of inks, paper, plates and pallets.
- Energy use from the printing process and transport contributes to greenhouse gas emissions and climate change.



checklists and an action plan. It also contains an 'Environmental self-assessment' checklist of the types of questions that an officer from your local Council or the EPA could ask when visiting your premises. You can use this self-assessment tool to evaluate the environmental performance of your business and identify areas for improvement.

Printers can find further information on managing environmental issues associated with their operations in the Printing Industries Association's Environmental Management Manual and Print 21 (see below for details).

OCCUPATIONAL HEALTH AND SAFETY

Many of the issues addressed in this guide are also relevant to occupational health and safety (OH&S). In fact, many businesses with good OH&S procedures are also excellent performers with respect to the environment. This guide does not address OH&S issues in detail so it's important that you contact WorkCover NSW for more information.

ENVIRONMENTAL MANAGEMENT – RISKS AND OPPORTUNITIES

For printers, improving environmental performance is about managing risk and taking advantage of opportunities that will boost efficiency and profits.

A good starting point is to identify and prevent risks to your business from poor environmental management. A chemical spill or high solvent emissions for example could pose the risk of:

- Environmental prosecutions and fines
- Damage to company reputation
- Harmful affects on the health, safety and productivity of staff.

A spill or other environmental incident could also harm the local environment, which belongs to all members of the community and impacts on their quality of life.

Improving environmental management also provides opportunities to make a business more profitable and viable in the long-term. Even small changes can save money. For example, many printers have cut costs by installing or cleaning skylights, filtering press water and reusing it for several weeks and working with designers to avoid excessive trim. Some of these simple improvements are described in more detail in 'Information sheet 2: Resource efficiency'.

The benefits of a high standard of environmental management go beyond 'housekeeping' and efficiency. They also include benefits from:

- An enhanced reputation as a company that is well-managed and a valuable long-term business partner.
- Becoming a 'supplier of choice', particularly to corporate and government clients who are starting to consider environmental performance of suppliers and products as part of their green procurement policies.
- Improved employee satisfaction, retention and productivity. Companies with a good environmental record are more likely to win the 'battle for talent' in attracting and retaining staff. As well, employees are generally happier and more productive in a workplace that is clean, healthy and environmentally responsible.

Successful printers are coming to understand that good environmental practice is a business opportunity. These opportunities are maximised when management of environmental issues is integrated with other business planning and becomes part of continuous improvement. Better results are also likely when staff at all levels are involved in identifying and delivering environmental projects.

Further information

- DEC Environment Line – phone 131 555 or www.environment.nsw.gov.au
- Your local Council
- Printing Industries Association of Australia, New South Wales Region – phone (02) 8789 7300, toll free 1800 227 425 or www.printnet.com.au for:

Printing Industries Environmental Management Manual, 2005

Print 21 – on-line news – www.print21online.com



CASE STUDY

Focus Press – Environmental Management System

Focus Press, a lithographic printing company, applied for funding under the DEC's Industry Partnership Program to develop and implement an Environmental Management System (EMS).

The first step involved identifying environmental issues, followed by staff training in environmental work practices. Computer-to-plate technology was introduced to reduce the use of resources and improve waste handling and disposal. Benchmarks were established against best practice.

The following benefits were gained:

- Alcohol use was reduced by at least 66%.
- Waste sent to landfill was reduced by over 90% (costs fell from \$1,200 per \$million in annual sales to \$100 per \$million in annual sales).
- Water consumption dropped by over 82.5%, saving 2,500 kL/year.
- Use of ink dropped by 30% by changing to soy-based inks.
- Use of paper and other raw materials in setting up and running print jobs was reduced by up to 50%.
- Quantities of hazardous substances were reduced, leading to a 95% reduction in hazardous waste disposal.



Focus Press is now recycling or reusing 95% of its waste. Hazardous waste has been reduced by replacing volatile solvents and carbon-based inks with less volatile substances and cartridge-delivered soy-based inks. The only hazardous waste being generated is impregnated rags and used developer from plate processing (after recycling once). The rags are incinerated under controlled conditions by a licensed waste treatment plant and the developer is pH neutralized and disposed of by a licensed liquid waste contractor.

For further information visit
www.environment.nsw.gov.au

ENVIRONMENTAL COMPLIANCE – MEETING YOUR LEGAL RESPONSIBILITIES

NSW has a number of laws and regulations to help protect the environment and give guidance to business.

The Protection of the Environment Operations Act 1997 (POEO Act) is the main piece of NSW environmental legislation covering water, land, air and noise pollution and waste management.

In some cases breaking these laws carries serious penalties. If you break the law and end up in court, the prosecutor may not have to prove that you intended to cause the damage or pollution. Even accidents can result in prosecution and penalties.

Everyone involved in your business (including owners, managers, supervisors, operators, contractors and subcontractors) needs to be aware of environmental laws and penalties that may apply to your operations. Individuals are required to minimise the risk of an environmental incident by implementing precautionary and control measures.

By gaining awareness of environmental laws, and how your business has the potential to affect the environment, you will be in a better position to manage risk in your business.

Managers and directors can be prosecuted for offences committed by their company, unless they can demonstrate that they exercised all due diligence to prevent the contravention of the POEO Act or that they could not influence the conduct of their company in relation to the contravention. They cannot use lack of knowledge about the contravention as a defence.

A comprehensive approach to addressing regulatory requirements includes:

- Developing a plan that incorporates environmental management
- Undertaking staff training and supervision
- Completing a self-assessment process or independent audit.

These ideas are discussed in this guide.

WATER POLLUTION

Under section 120 of the POEO Act it is illegal to pollute waters.

Under the Act, 'water pollution' includes introducing litter, sediment, oil, grease, wash water, debris and flammable liquids such as paint, etc. into waters or placing such material where it is likely to be washed or blown into waters or the stormwater system or percolate into groundwater.

An individual guilty of water pollution under section 120 of the POEO Act may be fined up to \$250,000, plus up to \$60,000 per day for a continuing offence. A company committing the same offence may be fined up to \$1,000,000, plus up to \$120,000 per day for a continuing offence.

Alternatively, on-the-spot fines of \$750 for individuals and \$1500 for corporations may be issued where pollution could enter or has entered gutters, drains or waterways.

You should take all practicable steps to make sure that unforeseen events, such as spills or leaks, do not result in polluted water entering the stormwater system or groundwater. This means keeping chemicals in a properly maintained and operated bunded and covered storage area, having adequately stocked spill kits on hand and making sure staff know how to use them. Under no circumstances should you hose a chemical spill down the drain.



Solvents are a major source of air pollution for printing facilities due to their volatile nature.

AIR POLLUTION

Air pollution means emitting any impurities into the air, including odours, volatile organic compounds (VOCs), smoke, dust, gases, fumes and solid particles of any kind.

Under the POEO Act (Sections 124-126), businesses must maintain and operate equipment and deal with materials in a proper and efficient manner to prevent air pollution at all times.

Under Section 129 of the POEO Act, Printers licensed by the EPA must not cause or permit the emission of any offensive odour from the premises.

LAND POLLUTION

Under section 142 of the POEO Act it is an offence to pollute land. Additionally, section 116 of the POEO Act makes it an offence to wilfully or negligently cause any substance to leak, spill or otherwise escape in a manner that harms or is likely to harm the environment.

HAZARDOUS MATERIALS AND WASTE

When handling hazardous materials and waste keep in mind that it is an offence to cause any substance to leak, spill or otherwise escape in a manner that harms or is likely to harm the environment (POEO Act section 116).

Make sure you're aware of the legal requirements before using, storing, transporting and disposing of hazardous materials (e.g. dangerous goods and chemicals). The laws relating to chemical storage vary depending on the amount that you are storing. For more information contact WorkCover NSW.

The movement of most hazardous waste must be tracked during its transport to a facility for treatment, recycling or disposal. Waste may be tracked 'on line' – for more information contact the DEC Environment Line on 131 555.

The most effective way of dealing with hazardous materials is to:

- Avoid them by replacing them with less toxic materials
- Use work practices that minimise their use.

INFORMATION SHEET 1

OFFENSIVE NOISE

By law (POEO Act sections 139 and 140), you must not allow noise from your premises to be generated as a result of the failure to maintain or operate machinery or deal with materials in a proper and efficient manner.

Regulatory authorities may also issue notices and directions requiring you reduce or cease noise from your premises that could be found offensive. 'Offensive noise' means that by reason of its level, nature, character, quality or the time at which it is made, or any other circumstance, the noise is harmful or interferes unreasonably with the comfort of people who are outside your premises.

WASTE

Under the POEO Act there are heavy penalties for unlawful disposal of waste. The owners of waste (as well as transporters and receivers) have a responsibility to ensure their waste is managed, transported and disposed of appropriately.

The *Waste Avoidance and Resource Recovery Act 2001* encourages the most efficient use of resources, to reduce environmental harm and to provide for an ongoing reduction in waste generation.

The following hierarchy for managing waste, from most desirable to least desirable, meets the objectives of the Act:

- 1 Avoid unnecessary resource consumption
- 2 Recover resources (including reusing, reprocessing and recycling) and recover energy
- 3 As a last resort, dispose of the material safely and lawfully.

Are you required to report your emissions to air, land and water?

The National Pollutant Inventory (NPI) is an internet database that displays information about the annual emissions from industrial facilities and diffuse sources of 90 different chemical substances to air, land and water. Your facility may be required to report to the NPI if you trip any of the reporting thresholds such as using 10 tonnes or more of any of the NPI listed substances. The NPI Emission Estimation Technique Manual for Printing, Publishing, and Packaging describes the procedures and recommended approaches for estimating emissions.

For more information visit the NPI website: www.npi.gov.au or phone the DEC Environment Line on 131 555.



WHO 'POLICES' ENVIRONMENTAL LAW?

Environmental laws are policed by the 'appropriate regulatory authority' – generally the EPA (part of the Department of Environment and Conservation NSW) or the local Council.

The EPA regulates the activities listed in Schedule 1 of the POEO Act, usually large companies and industries that have the potential to seriously affect the environment. See 'Do you need an environment Protection licence?' on page 12.

Local Councils regulate other, usually smaller, businesses and industries through notices and prosecutions. They can also regulate using development consents.

The POEO Act gives the appropriate regulatory authority the power to enter and inspect premises, and issue clean-up notices or prevention notices and issue on-the-spot fines. The regulatory authority may prosecute a business where environmental laws have not been complied with.

You must report incidents that harm the environment

If a pollution incident occurs during an activity and it causes or threatens 'material harm' to the environment, by law you must tell the appropriate regulatory authority – either the local Council or the EPA.

You must contact them as soon as you can after you become aware of the incident. This 'duty to notify pollution incidents' extends to employers, the person carrying out the activity, employees, occupiers, contractors and agents.

For more information call the DEC Environment Line on 131 555 or visit www.environment.nsw.gov.au.

You must report land contamination

You must notify the EPA of any land contamination that poses a significant risk of harm to human health or the environment (*Contaminated Land Management Act 1997*). This 'duty to notify contamination' falls on the owner of the property and on the person whose activities have caused the contamination.

For more information call the DEC Environment Line on 131 555, or refer to *Guidelines on the Significant Risk of Harm from Contaminated Land and the Duty to Report* (1999). You can find these guidelines on the DEC website – www.environment.nsw.gov.au.

What are the penalties for environmental offences?

The most serious offences (Tier 1 offences) are wilful breaches of the law that harm or are likely to harm the environment. These carry penalties of up to \$5 million for a company or \$1 million for an individual and/or seven years imprisonment.

Where breaches are negligent, the penalties for the most serious offences are up to \$2 million for a company or \$500,000 for an individual and/or four years imprisonment.

Most other offences (Tier 2 offences) carry penalties of up to \$1 million (plus a daily penalty of up to \$120,000 for continuing offences) for companies or \$250,000 (plus a daily penalty of up to \$60,000 for continuing offences) for individuals.

Less serious breaches can result in an 'on-the-spot' fine (penalty notice) with a penalty of \$750 for individuals and \$1500 for corporations.

ENVIRONMENT PROTECTION NOTICES

Clean-up Notices

A Clean-up Notice may be issued by the EPA and local Councils when a pollution incident has occurred or is occurring. Clean-up notices may direct an occupier of a premises or the polluter to take clean-up action as specified in the notice. An administration fee (currently \$320) is payable to the EPA or local Councils for the issuing of a clean-up notice. There is no right of appeal against a clean-up notice.

Prevention Notices

Prevention notices can be issued if an activity has been or is being carried out in an environmentally unsatisfactory manner. Prevention notices require that actions specified in the notice are carried out. Prevention notices can include directions – such as installing bunding within one month around a chemical storage area. An administration fee (currently \$320) is payable to the EPA or local Council for the issuing of a prevention notice. There is a right of appeal against a prevention notice to the Land and Environment Court.

Noise Control Notices

Noise control notices can be issued to prohibit an activity, or the use of equipment, from emitting noise above a specified noise level. There is a right of appeal against a noise control notice to the Land and Environment Court.



LICENCES AND PERMITS

Do you need an Environment Protection Licence?

The EPA is the appropriate regulatory authority for activities listed in Schedule 1 of the POEO Act and is responsible for issuing Environment Protection Licences to conduct those activities.

A licence may also be required if certain waste activities are carried on your facility, such as the storage or generation of certain hazardous wastes.

Small and medium size businesses generally do not require an Environmental Protection Licence. A licence is mainly required by larger businesses or in industries that have been identified as having potentially significant environmental impacts.

Licences are usually issued with conditions. These conditions may include requirements for pollution limits, monitoring, mandatory environmental audit programs, pollution studies, pollution reduction programs or financial assurances.

To find out if you require a licence:

- Call the DEC Environment Line on 131 555, or
- Refer to the *Guide to Licensing Under the POEO Act 1997* and check Schedule 1 of the POEO Act which can be downloaded from the DEC website – www.environment.nsw.gov.au.

Businesses that do not require a licence are still required to comply with environmental laws.

Trade waste permit or agreement

Generally, businesses must have a written agreement or permit to discharge trade wastewater to the sewer. You must negotiate a trade waste permit with your water authority – either Sydney Water, Hunter Water Corporation or your local Council – before discharging any trade waste to the sewer. The permit establishes the discharge conditions for the wastewater.

Dangerous goods

Dangerous goods include flammable, toxic or corrosive substances, such as solvents, which should be stored in containers displaying the relevant diamond-shaped label. Since 1 September 2005 businesses that store dangerous goods in their premises may have to notify WorkCover NSW – the need to notify depends on the amount stored.

FURTHER INFORMATION

- DEC Environment Line – phone 131 555 or www.environment.nsw.gov.au for:
 - Guide to Licensing Under the POEO Act 1997*
 - Changes to legislation administered by DEC
 - Noise Guide for Local Government*
 - Local Government Air Quality Toolkit*
- Your local Council
- Environmental Defender's Office – phone (02) 9262 6989 or – www.edo.org.au/edonsw for the *Environmental Law Fact Sheets*
- WorkCover NSW – phone 13 10 50 or www.workcover.nsw.gov.au for:
 - NSW Code of Practice for the Storage and Handling of Dangerous Goods*
 - Notification of Dangerous Goods on premise
- Sydney Water – phone 13 20 92 or www.sydneywater.com.au
- Hunter Water Corporation – phone (02) 4979 9589 or www.hunterwater.com.au
- New South Wales Consolidated Acts – text of all NSW Acts on line – www.legislation.nsw.gov.au

RESOURCE EFFICIENCY

Good managers understand that an efficient business is a profitable business.

Efficiency in running a business includes reducing the use of resources (raw materials, water and energy) and lowering the volume and toxicity of waste and other emissions. This efficiency is often referred to as 'LEAN manufacturing', 'cleaner production' or 'resource efficiency'. It involves finding ways to reduce costs and environmental impacts along the entire production or service delivery process, from the supply of raw material to operations and distribution.

Identifying and implementing resource efficiency measures is 'easy' for managers who know their business and are prepared to have a close, systematic look at inefficiencies in their operation. It is an opportunity to profit from:

- Reducing the use of energy, water and raw materials.
- Avoiding waste and reusing and recycling materials.
- Minimising waste volumes and reducing waste toxicity to lower the cost of treatment and disposal.
- Implementing process changes to increase production and reduce spoilage.
- Reducing the use of hazardous and dangerous materials to minimise dangerous goods storage and environmental and OH&S liability risks.
- Providing a safe, clean and pleasant work environment that leads to increased staff productivity.

CASE STUDY

Large web printer – recyclables in waste bins

A large web printing company thought it had a good recycling system. On inspection, and by using simple visual measurement techniques, the environmental 'champion' found that up to 50% of waste going to landfill was recyclable paper.

It turned out that when recycling bins were full the staff simply placed the recyclable paper in the landfill bin. To fix this, more colour-coded recycling bins were put into operation and staff were trained in how to use the new recycling system.

As a result the site cut its waste bill by 20% and added 4% to its bottom line.



WHERE DO I START?

Plan and organise

Dozens of success stories prove that a team approach to resource efficiency is best. With management support, establish an environment team that includes staff from different areas of the business. Appoint a ‘champion’ or team leader and consider inviting suppliers or customers to join the team on occasions.

Ideally, the environmental champion will have the full support of management and other staff.

From the outset, identify how you will integrate resource efficiency into business planning and staff responsibilities to make it a continuous process.

Assess and measure

The environment team needs to assess the processes, material flows and costs within the business, and identify any internal barriers that may be preventing the implementation of more efficient practices.

The team should start by collecting baseline data on resource use and waste – what gets measured gets considered! The team should also complete an initial business and processes assessment, which could include brainstorming sessions, a facility ‘walk-through’ or a more formal audit. It’s also wise to involve an outside person with technical expertise who can provide a ‘fresh pair of eyes’ and ideas from other companies.

The initial assessment and data will provide you with a benchmark against which to measure ongoing improvement.

Measurement approaches – waste management

To understand how much money you could be losing through poor waste management you need to measure your waste.

Measuring waste doesn’t have to be as accurate as weighing product. Simple, quick and cheap quantification techniques can be used, including:

- Using contractor’s weights/volumes – if your wastes are not mixed with others wastes, ask your waste contractors for the weight recorded at the landfill or recycling centre.
- Counting waste – for example, you could count how many ink tins per week are disposed of to landfill.
- Simple weighing – for example, place the bin containing shrink wrap on a scale and record the weight (deduct the weight of the bin).
- Visual inspections – for example, use simple measurements such as the bin is half-full, the waste bin has 30% recyclable paper in it, 90% of all the recycling bins are full.

Collect baseline data on resource use and waste – what gets measured gets considered!

INFORMATION SHEET 2

Identify opportunities and implement priority actions

Your assessment of resource use will almost certainly identify immediate opportunities for cost savings, and these should be implemented as quickly as possible. These 'small wins' will help to maintain the team's enthusiasm. Other ideas may need further research and assessment and may take longer to implement.

The team should record ideas and options and prepare a simple action plan outlining opportunities, issues requiring further investigation, priorities, timeframes and staff responsibility for actions. As a starting point, the team could use the environmental action plan template in the 'Useful tools' section of this guide, and adapt it to suit their situation.

Document results and evaluate success

Record financial investment in resource efficiency projects and the time taken to recover these costs – known as the 'payback' period. Set up simple

spreadsheets or other tools to document project results in terms of their financial, environmental and other outcomes. Take the time to note 'qualitative' results such as staff enthusiasm, improved working relationships with suppliers and comments from customers. These records will help to justify further resource efficiency projects.

Reward and revisit

The work of the environment team should be acknowledged and the team should be encouraged to continue to look for new ideas. Consider 'refreshing' the group by alternating leaders and inviting new team members. Remember, efficiency is a continuous process and the resource efficiency plan should be regularly revisited.

What if my business is too small for an environment team?

Simply follow this suggested process on your own or with one or two workmates.

CASE STUDIES

Viscount Plastics (Australia) Pty Ltd – saving energy

Viscount Plastics (running a screen printing operation) introduced smart meters to monitor its electricity use. After fine-tuning equipment, power costs were reduced by \$500 a month. With a capital outlay of \$8,500 the return on this investment was eighteen months. As electricity charges rise, the financial benefits will increase.

News Ltd – saving energy

After improving the efficiency of its air compressors and air conditioning, News Ltd discovered it could make further energy savings by reducing the line voltage of florescent lighting.

A small reduction in the line voltage reduced power use by 33%. This was achieved by using readily available commercial products and replacing double florescent tubes with single triphosphor light tubes. These measures reduced light output by 16%, but lighting levels are still well within the specifications for office and factory use. The payback period was less than one year, and the initiative halved the number of florescent tubes required – cutting ongoing replacement and disposal costs.



Significant energy savings can be achieved by installing skylights and roof insulation and by using energy efficient lighting.



With the ink injector system only 0.2% of the ink in the tube is wasted, whereas ink tins can waste up to 7% of the ink.

OPPORTUNITIES FOR PRINTERS

Cost-effective resource efficiency opportunities can be found in several areas.

Good housekeeping

- Install electricity usage meters to measure the amount of electricity used in separate areas of the business.
- Use high-efficiency electric motors and lighting.
- Maintain equipment on a regular basis and keep it in good working order.
- Check your compressed air system for leaks and fix them. Leaks make compressors run unnecessarily and result in higher electricity use.
- Operate air compressors with variable speed drives at minimal pressure to reduce air leaks.
- Turn off air compressors and lights during breaks and on non-working days.
- Install skylights and use natural rather than electric lighting. Keep skylights and lights clean.
- Increase the thermostat setting on your air conditioner by 1 to 2°C in warm weather, and decrease it slightly in cool weather.
- Ask your electricity supplier about using power factor correction equipment. This will regulate the power received in your premises and may result in substantial cost savings.
- Improve building insulation and enclose and ventilate heat-generating equipment.
- Recycle warm air to reduce winter heating bills. In colder months hot air from presses can replace heating.
- Improve the efficiency of the transport system. Reduce fuel bills by improving transport routes and loading vehicles efficiently.
- Improve waste management by segregating waste for recycling, and separating contaminated and non-contaminated wastes. See if rags can be cleaned for reuse rather than thrown away.
- Check taps and toilets for leaks and drips and repair them promptly.
- Install AAA-rated low-flow taps or tap aerators, dual flush toilets and water-efficient showerheads (which also save energy by reducing hot water use).

CASE STUDY

Spectrum Printing – waterless offset lithographic printing

Spectrum Printing is a waterless, computer-to-plate printer. Spectrum has made environmental responsibility a matter of policy since its inception in 1996.

Spectrum has found that waterless printing has a sharper dot, produces brighter colours and dries more quickly. Other advantages of waterless printing at Spectrum include:

- Saving 10,000 to 20,000 litres of water per shift per year on a medium press.
- Saving 1-2 tonnes of VOCs from being released into the atmosphere per year.
- Reducing paper waste by 40%.
- Reducing make-ready time.

Other innovations in Spectrum's environmental management include:

- Using computer-to-plate technology that is chemical-free, so there are no costs associated with disposing of film or processing chemicals.
- Using 100% non-toxic vegetable-based powder.
- Recycling printer cartridges.
- Endeavouring to be 'carbon neutral' by planting trees to equal the CO₂ burnt during operation.
- Using recyclable cardboard boxes for storing and transporting inks, thereby reducing waste.

Chemicals and toxic materials

- Reduce your use of toxic raw materials, including alcohol and solvent-based inks.
- Use a non-flammable blanket wash. This can simplify dangerous goods storage requirements and reduce your waste liabilities.
- Reuse and recycle materials, including filters and developer.
- Review ink use and switch to products that are less hazardous and easier to recycle. Also recycle solvents wherever possible.
- Clean and reuse rags.
- Change your fountain solution to reduce your reliance on iso-propanol and other alcohols. For lithographic printing, changing the fountain solution type can minimise consumption of both water and solution.
- Keep lids on chemical containers and fit taps to reduce evaporation and avoid loss of raw materials.

Working with suppliers and clients

- Ask your paper suppliers for stock that has a high recycled content and is easy to recycle.
- Use less packaging when shipping the final product. This will contribute to the goal of reducing packaging waste under the National Packaging Covenant. For more information on the Covenant, phone (02) 6274 1111.
- Encourage suppliers to provide materials in bulk and take back their packaging for reuse and recycling.
- Train your design, sales and office staff to promote environmentally preferable printing options to clients. Clients may not be aware of the environmental improvements that have been achieved in the printing industry.
- Inform your clients of the amount of paper that will be wasted if non-standard size print jobs are requested.

- Clients may want to promote their commitment to using environmentally preferable print products. If so, ask them to name your business so you gain extra publicity.
- Encourage your clients to use recycled content paper. For more information see *Know Your Printing Paper Guide* in 'Further Information' below.
- Modifying plate and photographic development equipment can reduce your water use. One company found that wash water was continuing to flow for two minutes after a plate had passed through the developing process. A simple change to the operating code cut the water consumption.
- Look at switching to waterless printing.

Technology upgrades

- New printing technologies are designed to use recycled paper, without compromising quality.
- Introducing digital processing and computer-to-plate technology (CTP) will cut your water and energy use, and eliminate photographic film, silver and other chemicals. It will reduce 'make-ready' time, lower labour costs and reduce paper usage.

DON'T FORGET THE FEEDBACK

Don't forget to regularly communicate resource saving successes to your staff, clients and suppliers.

FURTHER INFORMATION

- DEC Environment Line – phone 131 555 or www.environment.nsw.gov.au for:
Cleaner production case studies
Profits from Cleaner production: A Self-help Tool for Small to Medium-sized Businesses
Know Your Printing Paper Guide, 2004
- Printing Industries Association (PIA) – phone (02) 8789 7300 or www.printnet.com.au for:
Printing Industries Environmental Management Manual, 2005
Print 21 Manual
- National Packaging Covenant – phone (02) 6274 1111 or www.deh.gov.au
Department of Energy, Utilities and Sustainability – www.deus.nsw.gov.au for energy and water saving ideas

- Sydney Water – phone 13 20 92 or www.sydneywater.com.au for information on the 'Every Drop Counts' program (a water saving program for business) and water saving ideas
- Queensland EPA has a free 'ecoBiz' tool that can help in identifying cost savings – www.epa.qld.gov.au

Useful international websites

- Printers' National Environmental Assistance Center (PNEAC) – www.pneac.org. A US environmental assistance centre for the printing industry
- Envirowise – www.envirowise.co.uk. The United Kingdom's environmental assistance centre for industry, including printing and related industries.

PRE-PRESS AREA

Waste is the major environmental issue in the pre-press area. Although computer-to-plate (CTP) technology is revolutionising the pre-press process, trade wastewater and solid waste remain significant challenges.

Typical wastes from the pre-press area include:

WASTE	WASTE MINIMISATION IDEAS
Photographic wastes from developing	Change to computer-to-plate printing
Film and bromide wastes	Identify a suitable film/plastic recycler
Damaged or old stock	Improve materials and stores management
Old plates and reject plates (and old equipment)	Send to metal recycler (or sell on second-hand market)
Old proofs and test prints	Recycle proofs and paper
Etching solutions (gravure printing)	Use direct metal etching rather than acids
Screen and stencil waste (screen printing)	Recycle frames
Printer cartridges (digital printing)	Collect and arrange for recycling
Office paper waste	Separate, reuse and recycle waste paper

COMPUTER-TO-PLATE TECHNOLOGY

Computer-to-plate technology (CTP) has eliminated photographic film, silver and other chemicals from the pre-press area. This 'cleaner' process has greatly improved productivity for many printing companies. By replacing older photographic processes with CTP technology, film and photographic waste can be cut significantly and water consumption can be reduced. Many

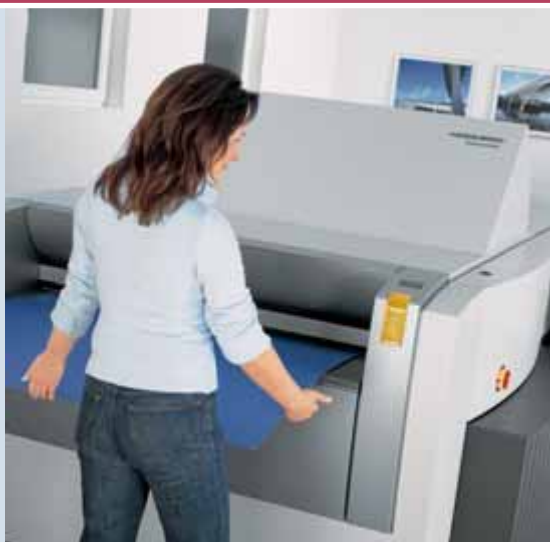
printers have converted to CTP technology and are using digital photography. Consequently, printers' use of film is on the decline.

Equipment replacement is also a source of waste, especially redundant IT equipment. Computer auctioneers can sell old equipment on your behalf or you could try selling it yourself. Insist that suppliers trade-in old IT equipment or take it back for recycling.

CASE STUDY

Focus Press, lithographic printer – computer-to-plate technology

Focus Press switched to computer-to-plate technology in 1999-2000. This technology enabled the company to increase productivity by approximately 90% and reduce water usage by 60%. It has also eliminated photographic film, silver and other chemicals from the factory floor. Make-ready time is 80% quicker and labour, paper, waste and energy costs have been reduced. Introducing CTP has provided \$20,000 per month in material savings.



TRADE WASTEWATER

Trade waste is any liquid, and any substances contained in it, produced by an industrial or commercial activity at a business premises. Wastewater from printers may contain pollutants such as sediments, particles and chemicals. It must not enter the stormwater system.

Photographic processing waste is generally the largest component of the wastewater that printers discharge to the sewer, especially if photographic rather than digital systems are used. If you use photographic processes for image conversion or plate-making, consider following the PURE Code of Practice for Management and Disposal of Liquid Wastes from Photographic Film/Paper Processing. See 'Further information' below on where to obtain this Code.

The press area can also generate trade waste. Lithographic printing generates waste fountain solution, which may be sent to sewer when diluted. However, always check requirements with your local water authority before disposing of trade waste to the sewer.

If you use a silver recovery unit, check with your local water authority about requirements for residual silver in wastewater. If you can't recover silver waste on-site, store it appropriately until it can be collected by a licensed silver-recovery agent.

Sydney Water and Hunter Water Corporation have trade waste officers who can help you fill out an application form for your trade wastewater permit.

Consider following the PURE Code of Practice for Management & Disposal of Liquid Wastes from Photographic Film/Paper Processing.

PRE-PRESS AREA

INFORMATION SHEET 3

Discharging to the sewer – legal requirements

You must have a trade waste agreement or permit with your local water authority to discharge trade wastes to the sewer.

The two main wastewater authorities in NSW are Sydney Water in the Sydney, Blue Mountains and Illawarra areas, and Hunter Water Corporation in the Newcastle region. Outside these areas local Councils are the local water authority and manage trade wastewater. Most water authorities require businesses to treat trade waste before discharging it to the sewer.

Roller wash must not be discharged to the sewer. It must be collected for disposal off-site to an EPA licensed waste facility.

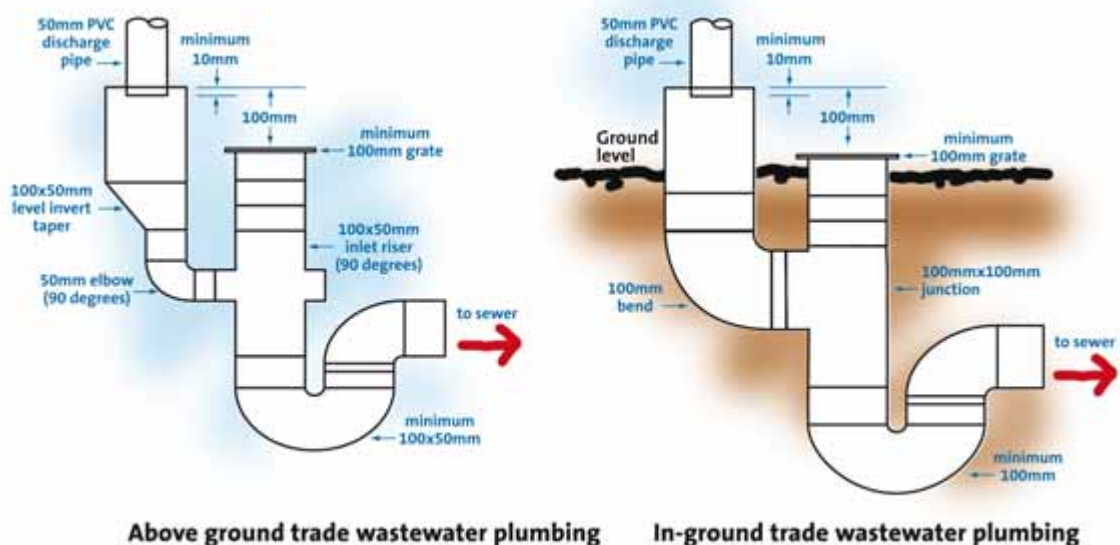
AIR EMISSIONS

The pre-press area can generate air emissions from the use of inks, solvents and various photographic chemicals. To reduce the health impacts of these emissions keep lids on containers and make sure the area is well ventilated.

KEEPING COSTS DOWN

The following ideas may help reduce your running costs:

- Eliminate film waste and reduce water usage by changing to computer-to-plate technology.
- Use stock-control practices that prevent film becoming 'out of date'.
- Look for markets for your waste products.



Plumbing connections for pre-treatment to sewer – with permission from Sydney Water.



To reduce the health impacts of air emissions keep lids on containers



To avoid water and land contamination, keep chemicals in a bunded and covered storage area.

WHAT THE LAW SAYS

Environmental laws require that you do not pollute waters or the land. For more information on legal requirements, refer to 'Information sheet 1: Environmental compliance'.

In practice this means that you should:

- Make sure that any chemical spill or leak is contained and doesn't enter the stormwater system.
- Keep chemicals in a bunded and covered storage area.
- Never hose a chemical spill down the drain.

Under the POEO Act there are heavy penalties for unlawful disposal of waste. Both the person that dumps the waste and the person who owned the waste may be liable – so it's important that you make sure your waste is managed, transported and disposed of appropriately. Refer to 'Information sheet 8', for the legal requirements of the disposal of hazardous waste.

FURTHER INFORMATION

- Sydney Water – phone 132 092 or www.sydneywater.com.au for:
 - Trade waste agreements
 - 'Every Drop Counts' program – a water saving program for business
- Hunter Water Corporation – phone (02) 4979 9589 or www.hunterwater.com.au for
 - Information on trade waste agreements, and water saving ideas
- Your local Council
- The *Photographic Uniform Regulations for the Environment (PURE)*, code of practice can be obtained from your chemical supplier, or from the Photographic Imaging Council Australia (PICA) website – www.photoimaging.com.au or phone (03) 9421 0310
- Yellow Pages – www.yellowpages.com.au. Look under 'Sewage and Wastewater Treatment', 'Effluent Treatment Equipment and Services', 'Waste Reduction and Disposal Services' and 'Environmental and/or Pollution Consultants'.

INFORMATION SHEET 4

PRESS AREA

The press area is usually the main source of air emissions, which come from the storage, use and disposal of chemicals and liquid waste. Printing inks and solvents contain volatile components that have also the potential to generate odours. Odours that can be detected by neighbours may lead to complaints and regulatory action, and they can also indicate that your operations are inefficient and costing you money.

See Information sheets 7 and 8 for more detailed information on storing and managing chemicals and hazardous wastes.

VOLATILE ORGANIC COMPOUNDS (VOCs)

The most common emissions produced by the printing process are gases and emissions of volatile organic compounds (VOCs) from process chemicals and cleaning solutions. Some adhesives, used in post-press operations, also generate VOCs.

VOCs released into the atmosphere are toxic and odorous, and also contribute to photochemical smog (ground level ozone). Photochemical smog is the white haze that can be seen over cities on a warm summer's day.

VOCs such as xylenes, ketones, alcohols and aliphatics are contained in printing inks, fountain solutions and cleaning products. Cleaning products such as washes for rollers, blankets and presses have traditionally been petroleum-based products containing naphtha, mineral spirits, methanol and toluene.



Keeping printing equipment well-maintained will help minimise VOC emissions from the press area.



Consider purchasing printing equipment that use fewer solvents.

VOCs can also be released from:

- Gravure and flexographic printing processes, where volatile solvents emit vapours
- Inks and solvents used in large heat-set lithographic printing processes
- Glues and adhesives used in the press and binding areas.

To minimise VOCs:

- Change the printing process to one that uses fewer solvents. For example, waterless printing reduces VOC emissions because fewer chemicals are required.
- Maintain printing equipment:
 - Keep ink rollers clean and in good condition
 - Clean presses immediately after use to prevent a build up of ink, paper dust and lint.

CASE STUDY

Mailing and Print Services Pty Ltd – alcohol-free printing

This lithographic printing company became aware of the concept of alcohol-free printing when a member of staff attended a trade show in Germany. With strong management commitment, alcohol was removed from the printing process in early 2000. Removing alcohol from the premises has had the following benefits:

- No storage licence is required
- No dangerous goods store is needed
- No decanting devices are required
- Cost savings are 20 tonnes at \$2.60/litre per year
- Materials dry more quickly and colours are more vibrant
- Fumes have been reduced.

INFORMATION SHEET 4



Solvent waste disposal can be kept to a minimum by employing an on-site recovery unit and adapting work practices that reduce solvent use.

- Use a reticulated chiller unit to keep the ink fountain solution clean and cool, reducing evaporation. Make sure the chiller unit is regularly maintained.
- Use water-based inks wherever possible. They are available for screen printing, flexographic, gravure and lithographic printing processes. Some printers report disadvantages with water-based printing. They claim the equipment requires frequent cleaning, the inks are more susceptible to equipment imperfections and paper curling can be a problem. They can also use more energy than other inks. However, many printers argue that water-based inks tend to hold their colour and viscosity longer during printing and give more coverage per kilogram of ink used, reducing costs.
- If water-based inks are not viable, look into using low-solvent inks or vegetable inks such as soy or linseed oil-based inks. Alternative inks allow you to substitute solvent-based cleaning products and fountain solutions with water-based products. Some printers believe that linseed oils are better for use in lithographic printing processes than soy-based inks.
- Regularly maintain pollution control equipment, such as cyclones, filters or afterburners as per manufacturers' instructions. Immediately replace or repair any emission control equipment that is blocked, frayed, leaking or not functioning within specifications. Keep spare bags and filters on-site.
- Keep volatile solvent-based liquids cool and stored in a covered container to prevent vapour loss. They should be pumped instead of poured.

MANAGING SOLVENTS

Industrial solvents and solvent-based coatings pose the single greatest risk to the environment in a printing operation. They are toxic, dangerous materials that can cause significant water and air pollution, as well as soil contamination. Solvents also have the potential to impact on the health and safety of staff.

The purchase and disposal of solvents, including inks and solvent contaminated rags is costly. A solvent audit is highly recommended. It will help measure and manage the purchase, inventory, use and disposal of solvents, and assist even small operations to save thousands of dollars a year.

There are many ways to reduce solvent use and waste:

- Avoid solvents – use soap or detergent solutions wherever possible or use acetic acid-based cleaners. Use solvents only when other cleaners are ineffective.
- Change to lower volatility products. Consult your supplier about changing to a non-flammable solvent. This has many

advantages, including simpler storage requirements under dangerous goods legislation and AS 1940–2004: *The storage and handling of flammable and combustible liquids*. Test the new solvent for effectiveness and sell its advantages to staff. Inform staff that the new solvent is healthier and produces fewer VOC emissions.

- Install efficient blanket washing systems that use only a small quantity of blanket wash. For instance, automatic blanket cleaning systems automatically flush inked areas such as blankets and ink rollers with cleaning products. They improve the cleaning process and reduce the evaporation of solvents.
- Use a solvent recycling system. In-house solvent distillation systems can be used to recycle gravure and flexographic solvents, which can then be used to wash print machinery. If buying a solvent recovery unit is too expensive, dispose of waste solvents via a solvent recycling company or licensed waste contractor.

CASE STUDY

Mailing and Print Services Pty Ltd – blanket and roller wash

Mailing and Print Services replaced the cleaning solutions in its blanket and roller wash processes with a multi-purpose emulsion. The emulsion is water miscible and is mixed with 50% water.

This has resulted in a wash that:

- Is non-flammable and doesn't need special storage
- Is not classed as a dangerous good (and so avoids the extra work associated with dangerous goods)
- Cleans deeply and removes both oil and water-soluble materials
- Penetrates as well as any standard blanket and roller wash
- Has few odours

- Reduce the quantity of solvent or blanket wash used and minimise solvent losses. Train employees to use the least amount of solvent possible. Several washes with a small amount of solvent will be more effective than a single wash with a larger total volume. Wet cloths and paper wipes should be stored in a sealed container after use. Solvent-laden rags can have their solvent recycled using a solvent recovery unit. Recovered solvent can then be reused for cleaning.
- Capture solvent vapours from the press area using catalytic afterburners or remove the solvent by passing it through activated carbon filters. This is especially relevant for processes such as gravure and flexography, which use inks with high solvent content.

Good practice note: solvent use hierarchy

Solvents are often used for cleaning, where safer alternatives could be used. To determine the best solvent for the job, start at the safer end of the spectrum (where 1 is the safest alternative) only moving to the next level if the solvent does not perform the cleaning job adequately:

- 1 Non-flammable
- 2 Flammable
- 3 Alcohol
- 4 Acetone
- 5 Toluene-based.

It is recommended that all xylene and benzene-based solvents be replaced by one of the lower toxicity solvents mentioned above.

MANAGING INK

The use of solvent-based inks has risks associated with air emissions and stormwater pollution. To reduce these risks, printers should consider using new types of ink. Water-based inks have low VOC emissions and wash-up waste may be suitable for disposal to the sewer. UV-cure inks generate less waste and have lower VOC emissions. These

inks are available for lithographic, screen printing, gravure and flexographic printing processes. Newer inks based on vegetable oils and pigments are more environmentally friendly and may require a non-flammable solvent for obtaining the correct operating viscosity, thus further reducing VOC emissions.

In most printing jobs, the raw material cost of the ink is usually only around 5% of the total cost. However, costs may be higher if ink is wasted as a result of using the wrong colours, hickies, runs, drips or failures to dry.

Ink-related waste can be due to:

- Inefficient ink-mixing, leading to over-production of special colours.
- Inefficient ink delivery systems, leading to spillages, lost time and injuries.
- Poor press quality control, leading to ink and substrate waste.
- Inefficient ink recovery from the presses, requiring excessive cleaning and producing greater volumes of wash-down waste.
- Poor stock control and unsuitable storage conditions, leading to oversupply, ink degradation and waste.

There are many ways to reduce ink waste and improve productivity:

- Change from manual handling of ink tins to bulk pressure ink delivery systems.
- Change from tins to plastic cartridges. Some newer presses use cartridge inks, which use a piston to push the ink out, leaving a clean container.
- Use computer-based ink management systems to keep track of ink in your inventory and produce recipes for PMS colours from excess stock. These systems can barcode tins and blends to maximise ink reworking.

- Mix excess ink, including black and coloured inks, to produce usable ink. Many printers like the quality of the black ink produced from mixing coloured inks, because the coloured inks are of such a high quality they produce a richer, darker black tone.
- Mix excess ink with virgin ink of the same colour – if the excess ink is contaminant-free. Ask your ink supplier if they can blend the ink and remove impurities.
- Install a computerised colour matching system equipped with colour scanners if the volume is large enough.
- Investigate with suppliers the possibility of re-working older inks on-site. This may mean a change in the type of ink used. Companies with more than one press may consider implementing changes on one press at a time to minimise new process errors.
- Fill ink fountains according to expected needs, as opposed to routine filling.
- Keep lids on ink tins to ensure longer storage life.
- Improve purchasing practices so the site is not over or under-stocked with inks. Find the right balance between buying in bulk or large sizes versus holding too much aging ink.

MANAGING OIL AND GREASE

The following procedures will help avoid oily waste:

- Place drip trays under all printing presses that may generate oily wastes. Improve your operating procedures and maintenance to reduce leaks and drips.
- For large presses, install an oil sump to capture the oil and install grease trap interceptors on all drains.

Do not allow waste oil and grease to be discharged to the sewer or to enter the stormwater system.



Mixing coloured inks to produce a rich, black ink can improve print quality as well as reduce ink waste.

SOLID WASTES

Many printing companies are finding ways to cut their make-ready and spoilage waste. Newer computerised press equipment has greatly reduced the make-ready waste stream and helped reduce spoilage, as long as the presses are operated efficiently.

Identify the source of each type of waste you generate and find out why and how much is generated. This will help you work out the most appropriate management options.

Consider ways to eliminate and reduce waste. Substrate waste is generally the largest waste stream and should be segregated to make sure it is being recycled to its fullest extent. Remember, each waste stream you identify may indicate inefficiencies and unnecessary costs.

For detailed information on Press Area wastes see 'Information sheet 8: Hazardous and solid waste'.

MANAGING NOISE

Noise is an OH&S and an environmental issue. It can also affect neighbours and you need to make every effort to reduce all nuisance noise.

There are many ways to reduce noise:

- Shield, enclose and muffle machinery and mount machinery on rubber.
- Maintain equipment regularly so it's in good working order and does not rattle or vibrate.
- Close external windows and doors when working outside standard operating hours, but make sure the work area is well-ventilated.



A water filter unit on a printing press can significantly reduce water use and cost

KEEPING COSTS DOWN

Many cost saving ideas have been suggested in this information sheet – see the information about managing solvents and ink, above. Make sure you have efficient ink mixing and delivery systems in place, and your stock control processes and storage conditions are appropriate.

The following ideas might be a further help in keeping your running costs down:

- Audit your purchasing and use of chemicals and assess whether you need all of them.
- Find out if changing to a non-combustible liquid solvent can reduce your insurance premiums. You may also be able to simplify your dangerous goods storage requirements.
- Place water filter units on the printing press to remove fine particles of paper dust, ink pigment and other impurities. The water can be reused for several weeks, resulting in savings in maintenance-hours and water and chemical costs.
- Use dampener roller washers that use a high-pressure water spray to wash ink rollers. In this process water is sprayed into the ink rollers at high pressure, causing them to spin during the washing process, and is then filtered through a pad before being reused. This process uses significantly less water. It's more time efficient and often cuts down solvent usage, odours and waste. It can also extend the life of the ink rollers and reduce the down time required to clean up a press. A dampener roller washer can be purchased for a few thousand dollars, offering a quick pay back period and substantial cost savings over time.

WHAT THE LAW SAYS

Air pollution

It is an offence to create air pollution (including dust) through inefficient maintenance or operation of equipment or handling of materials. This means you need to:

- Manage solvents and other sources of VOCs to prevent the escape of vapours. As well, you should regularly inspect and maintain your filtration and ventilation systems.
- Control and clean up dust. Controlling paper dust and printing powders will improve indoor air quality and lift your OH&S performance. Keep dust levels down by sweeping regularly or using an industrial vacuum cleaner.
- Ensure odours generated by your operations cannot be detected beyond the boundary of your premises. If odours are affecting neighbouring businesses or residents, you may be issued with fines or notices requiring you to prevent the odour.

If you consume 25 tonnes or more of solvent per year you may be required by law to report this to the National Pollutant Inventory. See 'Information sheet 1'.

Offensive noise

The POEO Act provides regulatory authorities with powers to require that offensive noise be ceased. If someone can hear your business activities and they have reasonable grounds to be annoyed by this, you may be issued with a notice or direction to cease making offensive noise. It is an offence to continue the noise in breach of the notice or direction. For more information, refer to 'Information sheet 1'.

Check your development consent for conditions relating to noise and hours of operation.

FURTHER INFORMATION

- DEC Environment Line – phone 131 555 or www.environment.nsw.gov.au for:
Licence thresholds and environmental laws
Local Government Air Quality Toolkit
Assessment and Management of Odour from Stationary Sources in NSW (Draft policy)
- Warringah Council – www.warringah.nsw.gov.au for
Best Practice Air Quality Guidelines – Printing Industry
- Yellow Pages – www.yellowpages.com.au.
Look under 'Noise Control Equipment', 'Noise Insulation' or 'Acoustic Materials and/or Services'

- The Printing Industries Association of Australia – phone (02) 8789 7300 or www.print21.com.au for:
Reducing VOC solvent use in the Printing Industry

Useful international websites

- Printers' National Environmental Assistance Center (PNEAC) – www.pneac.org.
A US environmental assistance centre for the printing industry
- Envirowise – www.envirowise.co.uk.
The United Kingdom's environmental assistance centre for industry, including printing and related industries.

COLLATING AND BINDING

Cutting and binding books, magazines and other printed items can generate waste, excess packaging and air emissions from glues.

MANAGING WASTE

Collating and binding processes vary depending on the item being printed. By training staff in cutting techniques, effective use of glues and correct binding techniques you can reduce the quantity of wasted product and save money. If collating and binding is done well you can cut back on overprinting to compensate for downstream errors.

Typical wastes from collating and binding

WASTE SOURCES	WASTE MINIMISATION IDEAS
Excessive trim	Provide feedback to estimators
Poor quality cut	Keep knives sharp
Excess or waste glues	Train staff in how to use less glue
Incorrect binding	Load machines correctly
Wrong trim	Provide clear instructions



Page layout and final adjustments at the binding and finishing stage can reduce trim, and therefore generate savings on production costs.



Consider using water-based glues that emit no VOCs and easily dissolve during recycling.

Binding operations can also be used to manage excess paper stock. Some printers collate the ends of web rolls or excess sheets to make blank pads or inserts that can be reused in the workplace as note pads, or given away to other organisations, rather than sending offcuts to a recycler.

KEEPING COSTS DOWN

The following ideas may help reduce your running costs:

- Review your workflow and processes to look for opportunities to reduce wastage of raw materials.
- Conduct a waste audit to work out how you can save on waste disposal costs.
- Find markets for your waste products – ask your waste contractor. In most cases pre-consumer waste paper from trimming, collating and binding can be recycled.

FURTHER INFORMATION

- Your local Council
- Suppliers of collating and binding equipment
- Larger waste companies offer advice on recycling services and how to increase the recovery and recycling of waste materials.

RECEIVING AND DISPATCHING GOODS

The receiving and dispatching of goods provides opportunities to save large amounts of waste without risking product damage. In general, waste can be minimised by good housekeeping and staff awareness.

MANAGING WASTE

To reduce waste generated by dispatching and receiving goods:

- Discuss your product packaging with your clients. You need to balance minimal packaging to avoid waste with adequate protection to avoid product damage.
- Reuse packaging materials such as wooden boxes and web cores.
- Obtain the correct size and type of recycling bins, and make sure they're set up in the best locations.
- Deliver the finished product as quickly as possible to avoid the possibility of damage prior to dispatch. The longer the product remains in the warehouse, the greater the risk of damage.

- Ensure storage conditions are correct for the finished product, to prevent deterioration while it awaits dispatch. Monitor the conditions in the dispatch area and the quality of the finished product.
- Consider ordering metal reel cores, instead of cardboard. They can reduce the amount of damage to reels, are easier to re-use and can be returned to the supplier.

Printers' participation to the National Packaging Covenant (NPC) is not required by law, but many are actively helping with the drive to reduce packaging waste under the NPC. See 'Further information' to find out more about this.

Other sources of waste from the dispatching and receiving goods area include:

WASTE SOURCES	WASTE MINIMISATION IDEAS
Damaged items delivered	Return damaged items to suppliers
Tears, cuts and nicks during handling	Improve materials handling skills
Damage caused by forklift prongs	Train staff in safe and efficient stacking and storage
Incorrect storage conditions	Keep products covered or wrapped
Contamination from waste materials	Keep wastes separated
Waste exposed to weather or poorly stored	Store waste safely and appropriately. Treat it as a resource
Lost stock or unmarked containers	Label items and keep a stock inventory
Crushed cores	Record causes of damage and improve work practices
Dust build-up	Separate storage areas from dust sources

MANAGING NOISE

Truck movements and loading noises are common causes of complaints from neighbours. Be mindful of the noise generated by vehicle activity.

To avoid noise complaints:

- Plan the times during which truck movements occur to avoid early mornings and late nights which can disturb neighbours.
- Reversing beepers on forklifts and trucks are very noisy and are a common source of complaints to local Councils. Limit forklift use to standard operating hours wherever possible.
- Reduce banging and sudden loud noises, such as those caused by forklifts running over loose stormwater grates or drain covers. Bolt down drain grates to avoid noise from vehicle movements.

Consider your neighbours – limit heavy vehicle movement to normal work hours.



Correct handling and storage of your supplies and finished products can save on production time and costs.

INFORMATION SHEET 6

EFFICIENT TRANSPORT

If you operate your own transport fleet, work out how you can use less fuel and improve your fuel efficiency. As well as saving you money, this will reduce your contribution to harmful air emissions, including greenhouse gases.

KEEPING COSTS DOWN

The following ideas may help reduce your running costs:

- Conduct a waste audit to work out how you can save on waste disposal costs.
- Talk to your suppliers to see if products can be delivered with less packaging or taken back.
- Reuse packaging where possible.
- Choose light-weight and efficiently designed packaging to reduce costs and wastage.
- Find markets for your waste products.

Conduct a waste audit to work out how you can save on waste disposal costs.

CASE STUDY

Using careful transport to reduce packaging

One printing company uses a furniture transporter to deliver their products. Taking extra care with the transportation has reduced the amount of packaging required to protect products. The cost of transporting the goods is higher, but the printing business makes an overall saving because there is less packaging required.





WHAT THE LAW SAYS

Offensive noise

You may be committing an offence if noise is emitted from your premises due to your failure to maintain or operate equipment efficiently, or to deal with materials in a proper and efficient manner.

Your local Council is responsible for dealing with noise complaints about your premises, unless you hold an Environment Protection Licence issued by EPA. Check your development consent for requirements to do with your hours of operation and any conditions relating to noise.

FURTHER INFORMATION

- DEC Environment Line – phone 131 555 or www.environment.nsw.gov.au for:
 - Noise Guide for Local Government*
 - Information on waste minimisation
- National Packaging Covenant (NPC) – phone (02) 6274 1111 or www.deh.gov.au
- Your local Council.

SITE MANAGEMENT

By making sure your buildings and site are well-managed you can minimise the risk of causing damage to the environment, increase the efficiency of your operations and save on running costs.

This sheet contains information on:

- Preventing stormwater pollution
- Using and storing chemicals and dangerous goods
- Preventing and containing spills
- Managing noise and air emissions
- Conserving water and using local plants in outdoor areas

PROTECTING WATERWAYS

The drain is just for rain!

Stormwater is rainwater that flows across outside surfaces into stormwater drains or directly into waterways. The stormwater from your business travels via gutters and drains to local creeks or canals and eventually ends up in our rivers, harbours and beaches. Stormwater should not contain any pollutants from your business activities.

To prevent stormwater pollution:

- Clearly mark all stormwater drains on your premises and surrounding your site. Make sure all staff know where the drains are located and understand that only rainwater should enter the drains.
- Store all chemicals and liquid waste in a properly maintained and operated bund. See information below on 'bundling'. Never store chemicals or waste near a stormwater drain.

- Have a spill response plan and spill kits ready to manage any spills and prevent them from entering stormwater drains.
- Make sure staff know that paint, inks, solvents and other toxic substances must not be poured on the ground or into stormwater drains.
- Keep the footpath, gutter and external areas near your business free of litter and other potential pollutants.
- Do not hose outdoor surfaces into gutters or drains. In addition to environmental impacts, hosing of hard surfaces is prohibited in many areas because of water restrictions. Sweep driveways and work areas and put litter in waste bins.
- Provide containers for cigarette butts in smoking areas. Cigarette butts pollute stormwater, and owners of these butts can be fined under environmental legislation.
- Ensure rainwater does not enter parts of your site where it could pick up anything on its way to the stormwater drain. Pollution, and even the possibility that pollution could happen, can result in prosecution.



Make sure all stormwater drains on your premises – and surrounding your site – are clearly marked and kept free of debris.

STORING AND USING CHEMICALS

Hazardous materials used in the printing industry, such as photographic chemicals and solvents require special handling and storage. You should:

- Store each type of chemical in a separate container. Clearly label each container with the name of the chemical it contains. Keep an up-to-date register of all chemicals on site, including Material Safety Data Sheets, and make sure all staff know about the potential hazards of the chemicals on-site.
- Use the 'first in first out' procedure for chemical supplies. Date the chemicals you buy and use them in the order in which they arrive. This will conserve their quality and minimise waste from out-of-date chemicals.
- Make sure your storage of solvents, fuels, inks and other dangerous goods complies with the *Occupational Health and Safety Act 2001*. Contact WorkCover NSW for advice on dangerous goods licensing and storage requirements (see 'Further information' below).
- If you use or store flammable liquids, you must comply with AS 1940–2004: *The storage and handling of flammable and combustible liquids*.
- Where chemicals are in constant use, place drip trays where leakage is likely to occur. Regular equipment maintenance and careful handling should prevent all leaks and spills.
- Store drums of chemical waste awaiting collection for off-site treatment in a covered and bunded area. Seal the drums, store them upright and have them removed as soon as possible. Make sure fuel and oil storage areas and fuel tanks are adequately bunded and covered.

INFORMATION SHEET 7



Another form of bunding is a spill tray, which is an effective solution for small containers. Spill trays are available from industrial and safety products suppliers.

Labels on chemicals

Make sure staff read the labels on all the chemical products they use. Labels on chemical products help to identify the product, its ingredients, and its hazards or dangers. Labels also contain important health and safety information.

Material Safety Data Sheets

A Material Safety Data Sheet (MSDS) is an information sheet about the safe handling, storage, transport and disposal of a material. It is just as important as any tool or piece of equipment in your business. The information on the MSDS can save lives in an emergency and you should:

- Make sure you receive an MSDS for every hazardous substance you buy or use. If you don't have one for a material, ask your supplier.
- Make sure all relevant MSDS are readily accessible and check they are up-to-date.

WorkCover NSW also has some useful publications on managing chemical hazards in the workplace. Phone 13 10 50 for more information.



Make sure spill kits are checked regularly and contain the right materials for the chemicals you use on-site. All staff should be trained in how to deal with a spill.

PREVENTING AND CONTAINING SPILLS

Chemical spills can pollute waterways, contaminate soil and make your business open to prosecution and clean-up costs.

To reduce the risk of spills:

- Minimise the movement of chemicals or other liquids.
- Fit taps to chemical containers so that hand pouring is not required.
- Where you have to pour by hand, use a funnel.

Bunding

Chemicals should be stored in a banded area to prevent spills reaching the stormwater system or soaking into the ground. Bunding is secondary containment of stored materials.

A bund is a low wall built to contain liquids. It can be made of any impervious material (i.e. liquids can't flow through). Banded chemical storage units can be purchased for smaller chemical storage

needs or bunding can be constructed on site. The volume of the bund should be large enough to hold the contents of the largest container plus 10%.

Outdoor bunded areas should be roofed to prevent rain from entering them and washing chemicals out or rusting metal drums. Check with WorkCover NSW regarding safety considerations before installing a roof over bunded chemicals.

A bund should be regularly maintained and appropriately operated.

DEALING WITH SPILLS

A spill management plan should be written to ensure effective response to spills. Ensure staff are familiar with the plan and it is regularly updated.

All chemical and other spills should be cleaned up immediately – no matter how small. Spill kits should be appropriate for the operation and the materials stored on site. They should be kept stocked with relevant absorbent and clean-up materials. A clear sign outlining spill clean-up procedures and emergency contact numbers should be prominently displayed.

The general response to a small scale spill is:

- 1 Eliminate the source of the spill immediately if it is safe to do so.
- 2 Contain the spill. Use the materials in the spill kit to contain the spill and control its flow. If necessary, stop the spill from entering any stormwater drains by blocking the drain inlets.
- 3 After referring to the relevant MSDS, clean up the spill promptly. It is important to clean up all spills quickly, even small ones, as they can easily flow into stormwater drains or be washed there by rain.
- 4 Store all waste generated from spill clean up in sealed vessels (limiting emission of odorous or volatile compounds) and in a bunded and covered area.

- 5 For serious spills, or where there is any doubt about the safety of the situation, contact the Fire Brigade immediately on 000.
- 6 Contact a waste contractor who is licensed to dispose of the absorbents used in the spill clean-up.

AVOIDING LAND CONTAMINATION

Hazardous liquids or other chemicals must not be allowed to soak into the ground within your site or in any other area. Chemicals can accumulate in the soil and seep to ground water, causing contamination and limiting future use of the land.

Never use soil as a means of disposing of chemicals. Accumulated chemicals in soil will be identified when the site is sold. Pre-acquisition audits are normal practice on industrial land and are likely to find any contamination. Clean-up costs are substantial and will reduce the value of the land.

When chemicals spill onto unsealed areas and soak into the soil, special care needs to be taken to remove the contamination. Contact your local Council or DEC if your land has areas where chemicals have soaked into the soil.

Underground tanks are a potential source of soil contamination. Management systems are available for preventing and identifying leakages in underground tanks and should be used. Old tanks should be given regular integrity checks if they can't be removed or replaced.

BE PREPARED FOR EMERGENCIES

Flammable materials such as fuels, solvents, oils, paper, inks and wood make fire a major threat to a printing site. Council building regulations cover fire-fighting equipment.

Make sure your emergency contact list is up-to-date and displayed where your staff can find it easily. A sample contacts list is included in the 'Useful tools' section of this guide.

INFORMATION SHEET 7

MANAGING NOISE

The main sources of noise that impact on neighbours tend to be:

- Overall noise from your operation – vehicle movements, shouting, public address or telephone systems, filling and emptying waste bins (especially if early in the morning) or machinery noise generated inside or outside the building.
- Specific units or machines – often located outside buildings and close to neighbours, such as air conditioners, air compressors, extraction systems and fans.
- Rattling or ringing that can sometimes be generated from exhaust stack vibrations.

To improve noise management:

- Take a regular walk around your premises and the neighbouring area to monitor noise from your business activities, especially hums or rattles from units located on the outside or rear of your building as these may not be noticeable from the inside.
- Make contact with your neighbours – build a working relationship so that any concerns about your operations that may arise in the future can be readily addressed.
- Be mindful that background noise levels can be reduced after normal business hours and the noise of your operation could therefore seem louder to neighbours.
- Consider noise reduction measures such as shielding or muffling of noisy equipment and machinery. An acoustic consultant can advise you on the best way to do this. Look under 'Noise Control Equipment', 'Noise Insulation' or 'Acoustic Materials and/or Services' in the Yellow Pages: www.yellowpages.com.au.
- Locate noisy equipment away from doorways.
- Find out about low-noise options when you purchase new equipment.
- Avoid using telephone extension bells or public address systems.

MANAGING AIR EMISSIONS

In addition to printing processes, site management contributes to air emissions.

To control and reduce these emissions:

- Adopt energy conservation practices. Refer to 'Information sheet 2: Resource efficiency'.
- Control and clean up dust. Controlling paper dust and printing powders will improve indoor air quality and lift your OH&S performance.
- Find out if CFCs are used in your refrigeration and air conditioning equipment. If they are, make sure this equipment is well-maintained. It is an offence to allow these gases to escape to the environment.
- Replace any yellow halon or BCF fire extinguishers on-site. For information about how to dispose of these extinguishers contact the DEC Environment Line on 131 555 or the National Halon Bank on 1800 658 084.
- Don't burn waste. It's against the law in most areas of NSW to burn any rubbish on-site, including paper, oily rags, solvents or wood.

CONSERVING WATER AND USING LOCAL PLANTS IN OUTDOOR AREAS

Outdoor areas are often valuable to the appearance of your premises and can provide staff with areas for a break or for recreation. These areas can be designed to incorporate gardens that require minimal watering and maintenance.

Sydney Water has a planting guide on its website that provides information about choosing appropriate low water usage plants. It also includes ideas for reducing the amount of watering required through composting and mulching and the use of water retaining agents.

Installing rainwater tanks to capture roof water is gaining popularity with many businesses.

By planting locally sourced native plant species you can also provide habitat for wildlife such as birds and butterflies which will increase biodiversity at a local level.

KEEPING COSTS DOWN

The following ideas may help reduce your running costs:

- Conduct a waste, energy and water audit to determine where savings can be made.
- Install electricity usage meters to measure the amount of electricity used in separate areas of the business.
- Switch off lighting and equipment when it's not required.
- Use energy efficient lighting and improve building insulation.
- Check with your suppliers to find out if empty containers can be returned.
- Organise your chemical storage areas so that older chemicals are used first.

WHAT THE LAW SAYS

Water pollution

Stormwater pollution is a serious offence under NSW environmental law and can lead to on-the-spot fines or legal proceedings. It is important to keep stormwater free of chemicals, inks, solvents, dirt, litter or any other pollutants.

Spills or pollution incidents that cause material harm to the environment must be reported to the appropriate regulatory authority – either the EPA or the local Council. For more information, call the DEC Environment Line on 131 555 or visit www.environment.nsw.gov.au.

Offensive noise

Any business that uses machinery has the potential to create noise pollution. Noise is both an OH&S and environmental issue. If someone can hear your business activities and they have reasonable grounds to be annoyed by this, you may be issued with a notice or direction to cease making offensive noise.

FURTHER INFORMATION

- Standards Australia, for AS 1940-2004: *The storage and handling of flammable and combustible liquids*
- DEC Environment Line – phone 131 555 or www.environment.nsw.gov.au
Bunding and Spill Management Guidelines
- Your local Council
- Workcover NSW – phone 131 050 or www.workcover.nsw.gov.au, for:
Information on dangerous goods management
Occupational Health and Safety regulation 2001
- Yellow Pages – www.yellowpages.com.au.
Look under 'Oil and Chemical Spill Recovery or Dispersal' and 'Environmental and/or Pollution Consultants'
- Sydney Water – phone 13 20 932 or www.sydneywater.com.au for water saving ideas.

HAZARDOUS AND SOLID WASTE

Waste management is one of the biggest environmental issues faced by printers.

This sheet contains information about how to identify the various types of waste generated, and how to minimise, recycle and dispose of wastes appropriately.

To determine the best waste management option, from most desirable to least desirable, consider the following waste hierarchy:

- 1 Avoid unnecessary resource consumption.
- 2 Recover resources (including reusing, reprocessing and recycling) and recover energy.
- 3 As a last resort, dispose of the material safely and lawfully.

By focusing on waste, printers can save money, protect the environment and human health and conserve natural resources. To improve your waste management:

- Conduct a waste audit and measure the amount and type of wastes you generate, and work out how these can be minimised.
- Avoid waste by:
 - Using raw materials more efficiently by decreasing off-cut waste and converting more into product.
 - Reducing the amount of materials purchased. Hazardous waste is expensive to dispose of and requires approval and transport documents, so it's a good idea to avoid it altogether by reducing chemical use.

- Reuse materials. For example you can use the blank side of used paper for press set up and make-ready instead of new sheets.
- Recycle materials to preserve resources.
- Only dispose of wastes after trying the options above first.

MANAGING HAZARDOUS WASTE

As a rule, hazardous wastes cannot go to landfill or be discharged to the sewer or stormwater system. These wastes are highly toxic and will damage the environment if not dealt with appropriately. For example rags that are soaked with inks or oils generally cannot be sent to landfill.

If you are a generator of hazardous waste you are responsible for ensuring that it is transported to a facility that is licensed to receive and/or treat that type of waste. Your waste contractor should be able to provide advice on these issues.

Note: In this document 'hazardous waste' includes wastes classified as hazardous, industrial or Group A in accordance with the DEC *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes*.

To be accepted at a licensed waste facility, hazardous waste must be assessed and classified according to the DEC *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes*. When sending hazardous waste for treatment or disposal, make sure that:

- The transporter is appropriately licensed.
- The waste is being sent to a facility that can lawfully take it.
- You keep all collection receipts.

The movement of most hazardous waste must be tracked during its transport to a facility for treatment, recycling or disposal. Wastes may be tracked online.

Generally, if you store more than two tonnes of hazardous waste, you are required to hold an Environment Protection Licence.

For more information about online waste tracking or your need for a licence, contact the DEC Environment Line on 131 555.

TYPES OF HAZARDOUS WASTE GENERATED BY PRINTERS

In NSW wastes are classified according to the DEC Waste Guidelines. The classification dictates how the waste must be dealt with.

An ink, solvent or photographic chemical container may be classified as hazardous or industrial waste if it is not cleaned before disposal. If you do not want to clean them on-site, have a licensed contractor collect these containers.

Typical printing wastes that are likely to have special storage, handling, transport and disposal requirements include:

- Solvents and blanket wash
- Rags containing ink, oil or solvent
- Inks and ink tins
- Fountain solution
- Oil and grease
- Photographic chemicals
- Glues and varnishes
- Acids and etching wastes from gravure printing processes
- Any waste that is classed as a dangerous good.



Store drums of chemical waste awaiting collection in a covered and banded area. Ensure there is no possibility that waste chemicals could be washed into gutters or drains, or into the sewer.



Rags that are heavily inked or contain oil or solvents are classified as hazardous waste and should not be disposed of with your general waste.

INFORMATION SHEET 8

Ideas for minimising the quantity and toxicity of these wastes are discussed below.

Solvents and blanket wash

Actions to reduce hazardous solvent waste include:

- Discuss new products with your supplier to find out how to minimise solvent use.
- Minimise the amount of solvent you use and the solvent waste you generate by recovering solvents, either using on-site distillation (for flexographic and gravure solvents) or filtering and solid separation (for blanket wash solvents).
- Use recovered distilled solvents for blending ink or cleaning rollers and other print machinery.
- Limit the amount of solvent applied to cleaning rags – apply solvents with a squeeze bottle or plunger rather than by soaking a rag in them.
- Use a separate container of solvent for cleaning each colour printing unit, then collect the solvent and use it again for the same colour – this solvent can be reused to clean most of the ink from a unit, and only a small amount of fresh solvent will be needed to complete the job.
- Reduce your need for cleaning solvents by starting your printing with the lighter colours first.

Remember, solvent waste cannot be disposed of to sewer or stormwater drains. It should be sent to a licensed liquid waste facility. Under no circumstances should evaporation be used as a means of disposing of waste solvents.

Rags containing ink, oil or solvent

Rags that are heavily inked or contain oil or solvent are classified as a hazardous waste. It is difficult and expensive to dispose of them. To reduce the amount of rags you dispose of:

- Reuse rags for as long as possible. Use a dirty rag for the first pass and a clean one for the second.
- Consider using a rag recycling or laundry service, but first remove as much solvent as possible from the rags, for example, by wringing or squeezing.
- Use scrap material rags rather than new disposable wipes. By using scrap cloth you are reusing someone else's waste.

Inks and ink tins

To reduce ink waste:

- Rework or re-blend old inks where possible. Contact your ink suppliers for more information about this option. If you use sufficient quantities of ink, some suppliers may take back your old ink.
- Change from tins to plastic cartridges. Some newer presses use cartridge inks, which push the ink out through a piston, leaving a clean container.
- Adopt a standard ink sequence. This will eliminate the need to clean out the fountains to change the ink rotation.
- Clean ink fountains only when changing colours or when the ink may dry out between runs. Special non-drying aerosols can be sprayed onto ink fountains to prevent the ink from drying overnight or during shutdowns.
- Clean out old ink tins thoroughly. Residues could classify them as hazardous waste.

See 'Information sheet 4: Press area' for further information on reducing solvent and ink waste.

Fountain solution

To reduce the toxicity of fountain solution waste:

- Consider the use of alcohol free fountain solution. It may be discharged to sewer but you must check first with your water authority.

Fountain solution from lithographic printing should not be disposed of to the sewer. Check with your water authority to find out their requirements.

Oil and grease

Most lubricating oil can be collected and recycled by a licensed contractor. Oil recycling generally does not require an Environment Protection Licence or involve time-consuming paper work for tracking the waste.

Oils and greases that cannot be recycled should be disposed of by a licensed waste contractor.

Photographic chemicals

If you use photographic processes for image conversion or plate-making, follow the *PURE Code of Practice for Management and Disposal of Liquid Wastes from Photographic Film/Paper Processing*. Phone (03) 9421 0310 for a copy.

To reduce photographic waste:

- Move to a fully digital workflow and computer-to-plate process to reduce the need for film and the production of film waste.
- Use a silver recovery unit, and check with your local water authority about requirements for residual silver in wastewater.
- If you can't recover silver waste on-site, store it appropriately until it can be collected by a licensed silver-recovery agent.

Glues and varnishes

Non-soluble glue waste and spent varnish, which can be highly flammable, are both classified as Group A liquid waste and must be collected by a licensed contractor and disposed of at an appropriate waste treatment facility.

It might be possible to discharge water-based glues to the sewer, but you must check with your local water authority regarding requirements. See also Information sheets 3: Pre-press and 4: Press Area.

Acids and etching wastes

If possible, avoid this waste altogether – consider converting your equipment to laser etching.



Talk to your waste contractor about the best way to separate different types of solid waste – you can cut waste costs by making reuse, recycling and disposal more efficient.

INFORMATION SHEET 8

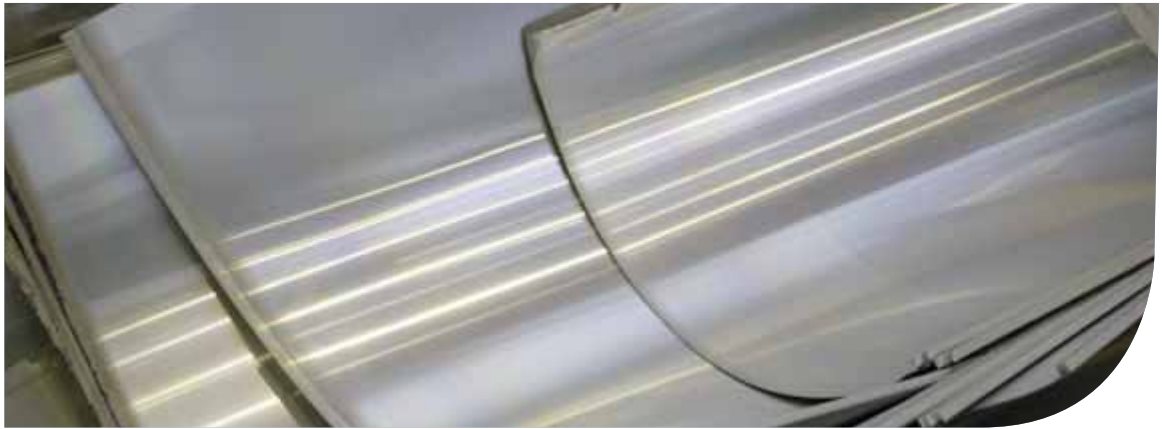


Image carriers (plates) are typically metallic and may be recycled by a metal recycler. Rubber plates can be reused or recycled. If plates are discarded they should be thoroughly cleaned before being placed in the industrial waste bin.

MANAGING SOLID WASTE

Waste disposal can be expensive and businesses able to reduce the volume of waste sent to landfill enjoy considerable cost benefits.

To reduce solid waste, consider the following options:

Paper and board

- Keep your presses well-maintained to avoid spoilage.
- Set up the presses for optimum performance and train your staff to achieve minimum make-ready waste.
- Seek out the causes of spoilage and try to eliminate them.
- Make sure each job is fully signed-off by the pre-press area to avoid waste from proofing, copy or artwork mistakes.
- Consider improving efficiency by using a newer press, preferably computer-controlled.
- Find out if you can recycle paper or board in two grades. Non-inked or less inked paper can be worth more to recyclers, and if so, could bring you a better return.
- Find out if it's easier and more economical to have your recycling contractor sort out the different grades of paper for you.
- Make blank pads from excess paper.

Non-paper substrate (plastics, metals, wood, flexibles, glass, fabric, laminates)

- If you don't print on paper but use another substrate, the recyclability of that material will be critical to reducing the costs of your operations.
- Consider reusing or recycling screen-printing frames where possible.

Plastics

- Many plastics can be recycled, including shrink-wrap, but some contractors require the plastic types to be separated.
- Inks can be supplied in plastic cartridges that are reusable.

Metals

- Metals are easily recycled. Separate them into different types to increase their value.
- Aluminium printing plates are commonly recycled as scrap metal.

Wood

- Wood is a common printing waste. Some of it is reusable, such as pallets in good condition. You can also reuse wood as packaging for your final products.
- Ask your suppliers if they can take back non-standard pallets.

Containers

- Purchase products from suppliers that provide a collection, reuse or refill service for containers.
- Purchase ink and other products in containers that are made from easily recyclable materials.
- Glass and some plastic containers may be able to be recycled. Check with your waste service contractor or your local Council.

Segregating recyclable materials as much as possible from other waste streams will increase their value and reduce your waste disposal costs.

Keeping costs down

The following ideas may help further reduce your running costs:

- Conduct a waste audit to determine where cost savings in waste disposal can be made. Calculate how much it costs you to send paper to landfill and how much you could save by reducing paper wastage or getting paper collected for recycling.
- Find markets for your waste products.
- Donate waste products such as paper waste and inks to schools or other organisations.

WHAT THE LAW SAYS

Under the POEO Act there are heavy penalties for unlawful disposal of waste. Both the person who dumps the waste and the person who owned the waste may be liable – so you should make sure that your waste is managed, transported and disposed of appropriately.

FURTHER INFORMATION

- DEC Environment Line – phone 131 555 or www.environment.nsw.gov.au for:
 - Liquid Waste Facts Sheets – information on the handling, storage and disposal of liquid waste
 - Controlled waste requirements
 - Waste tracking requirements
 - Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes (2004)*
 - The Protection of the Environment Operations (Waste) Regulation 2005*
- Planet Ark – www.planetark.com for ‘Cartridges 4 Planet Ark’ – where to recycle printer cartridges
- Yellow pages – www.yellowpages.com.au. Look under ‘Waste/ recycling contractors’
- Waste Contractors and Recyclers Association – phone (02) 9604 7206 or www.wcra.com.au for a list of waste contractors
- The Publishers National Environment Bureau (PNEB) – phone 02 9262 1164 or www.pneb.com.au for information on the sustainable recovery of old newspapers and magazines.

Segregating recyclable materials will increase their value and reduce your waste disposal costs.

WORKING WITH SUPPLIERS

Working collaboratively with suppliers and using their knowledge can help improve the efficiency and environmental performance of your business. Suppliers compete to offer you the best product for your needs and should be approached to look at your whole operation.

PURCHASING SUPPLIES

Poor purchasing practices dictated by price alone generate waste. Detailed analysis has shown that buying a more expensive raw material can result in overall lower costs. For example, replacing a solvent with one that is more expensive but non-flammable means fewer air emissions, a safer working environment and simpler, less costly storage requirements.

Packaging is an important issue. Paper sheets are commonly delivered with large amounts of packaging, including wood, shrink-wrap, metal or plastic ties, cardboard protective coverings and sub-sized wooden pallets. The quantity of the packaging is often related to the supply source. International freight will typically have more packaging than local freight. Local suppliers will usually use less packaging and it may be easier to approach them to discuss minimising packaging waste.

Recyclability is another important consideration when purchasing raw materials such as printing plates or photographic film.

Good practice note

Approach your suppliers and ask them to identify better products that reduce waste, save money overall and help the environment. For example, some suppliers may take back or recycle their packaging. The most efficient printers use this approach very successfully.

REDUCING WASTE AND EMISSIONS

- Talk to your waste contractor about new recycling opportunities.
- Approach suppliers whose packaging is the most problematic, and ask them to redesign their packaging or use less of it. Ask if they can take their packaging back or if the packaging can be recycled.
- Ask solvent suppliers about less hazardous materials and materials with lower volatility and use these instead.
- Ask your toner cartridge supplier if they offer recycled cartridges or a take-back service.
- Graphic design choices can reduce waste too. Encourage designers to consider waste minimisation as part of the design process. For example, they could think about decreasing ink coverage and using layouts that reduce paper waste.

Choice of paper stock is usually part of the design process. Discuss the options and availability of paper with recycled content with your designer. Information about sheet sizes and printing and binding efficiencies can also help designers to reduce waste. For more information, refer to DEC's *Know Your Printing Paper Guide, 2004*, available on DEC web site www.environment.nsw.gov.au.

REDUCING HAZARDOUS MATERIALS

- Ask solvent suppliers to look for ways of reducing the amount of flammable solvent you use, such as changing to a non-flammable solvent or water-based cleaner.
- Ask suppliers of recycling systems about the issues associated with using in-house recycling systems. Could such systems reduce hazards or reduce the amount of solvent you use?
- Ask ink suppliers how to cut your ink waste. Can they manage old ink? Are alternatives to ink tins, like cartridges or boxes, available? What new, less hazardous inks are available?

IMPROVING QUALITY

- Talk to your press supplier and discuss how you can make presses run more efficiently.
- Find out about the quality improvements that are possible using vegetable-based inks and recycled paper. Some new presses are designed to produce superior quality products with these types of raw materials.



Left: Ask your suppliers to take back and reuse their delivery pallets.

Right: Traditional ink tins (top right) hold waste ink that cannot be recovered for use, and the tins have to be treated as toxic waste. Containers used for storing plant-based ink (bottom right) allow most of the ink to be recovered and are made of plastic that can be recycled.

BRINGING IT ALL TOGETHER – PLANNING

This information sheet is about the use of good planning to help achieve best practice and ensure that problems don't arise.

There are many steps along the path to best practice. Here are some suggestions:

- Make a commitment to yourself and your staff that you will consider the environmental impact of your business in your day-to-day decision-making, such as deciding which chemical stock to purchase.
- Commit yourself to increasing your environmental awareness. Reading this guide and offering staff time to read this guide can help in this process.
- Create an environment team or committee to identify environmental issues and propose solutions, or identify someone as a 'champion' who can foster the adoption of environmental practices.
- Make contact with your local Council and industry association to tell them what you are doing. They may have some advice or may know of programs that could help you.
- Make contact with your neighbours to find out if there are any reasonable issues they have about your operations, and develop a mitigation strategy to address them.

DOCUMENTING YOUR PROGRESS

There are several advantages to planning and documenting measures to improve the environmental performance of your business.

- Directors and managers may have a defence in the event of an environmental pollution offence committed by their company, if they can demonstrate they used all 'due diligence' to prevent the offence.
- Taking active steps to prevent pollution occurring means it is less likely that you will commit an environmental offence and may reduce your culpability if an offence does occur. If an environmental incident occurs on your site, providing documentation

that shows that you have been acting responsibly and actively trying to avoid such incidents could reduce your culpability.

- Customers may have a preference for businesses that are able to demonstrate their environmental credentials.
- Planning and reviewing allows you to be systematic in improving your environmental performance and documenting your cost savings.

Types of documents you can keep

If you are already considering potential and actual environmental issues on your site, regularly checking and maintaining your equipment and premises to minimise pollution, and planning improvements, then why not keep the documents to prove it? Helpful documents include:

- An environmental policy
- An environmental action plan
- Records of staff training, staff inductions, waste disposal receipts and maintenance and inspection schedules.

An environmental policy could be as simple as a one paragraph or a one page statement that articulates your commitment to complying with environmental laws and implementing best practice wherever possible.

An environmental action plan sets out environmental risks and opportunities and what is being done to address them. It doesn't have to be a large document and could be part of your OH&S documentation. The important thing is that somewhere you have a document that:

- Contains **actions** for environmental improvement (both ongoing and planned)
- Indicates **who** is responsible for carrying out each action
- Indicates **when** (by what date or how often) these actions will be carried out

- Contains quantified **reduction targets** (in volume, weight or costs) for resource efficiency savings and other environmental impacts.

It is a good idea to review and change your environmental action plan regularly. A sample action plan is included in the 'Useful tools' section of this guide.

Examples of daily and weekly checklists are also included in the 'Useful tools' section. You can adapt these to suit your business and incorporate OH&S issues as well.

DEVELOPING OR REDEVELOPING A NEW SITE

If you are relocating or starting up a printing business at a new site, you have a great opportunity to factor better environmental management into the design of your new workplace.

Ask your architect for ideas on reducing the environmental impact of your facilities and reducing costs. This might include:

- Using recycled timber (or Forestry Stewardship Council certified timber) and recycled content products.
- Selecting less toxic paints – they 'off gas' lower amounts of harmful VOCs.
- Energy efficiency ideas such as building orientation, wall and ceiling insulation, efficient heating, cooling, hot water, lighting and equipment to reduce energy consumption.
- Water conservation methods such as including a rainwater tank or planting low water usage gardens.
- Waste management plans may be required as part of the planning process. Many Councils have incorporated the Waste Not Development Control Plan into their local environmental plan.

The local Council will also have requirements and conditions that will need to be satisfied as part of the development application process.

BENCHMARKING

The printing industry is increasingly adopting the use of benchmarking to measure how well sites are performing compared with previous years. Benchmarking involves gathering data and calculating various performance indicators.

To compare yourself with other printers, it's best to use a comparable indicator, such as 'amount of make-ready waste on a four-colour lithographic press'. Other examples of comparable indicators include spoilage, ink use and amount of waste generated.

Some suggestions for benchmarking:

- Calculate indicators weekly or monthly.
- Use a common measurement, based on published benchmarks for your type of printing process.
- Present the results graphically each week or month, according to each shift, in a way that will clearly identify improvements and goals to be reached.
- For each type of waste generated, measure quantities generated, recycled and disposed of, to better identify trends.
- Measure overall efficiency, such as amount of paper, board or substrate converted to final product.

PRINTING INDUSTRIES ASSOCIATION

The Printing Industries Association of Australia (known as 'Printing Industries') has been closely involved with environmental management for some time. The Association's objectives are to:

- Make sure the industry is kept abreast of the wide range of issues involved and their impacts.
- Work collaboratively with government and other organisations to introduce positive initiatives.
- Act as a positive catalyst and driver encouraging the industry to adopt proactive, environmentally friendly practices – because they can make good business sense.
- Collaboratively develop strategies and policies that meet and balance society's environmental needs and concerns with the needs and concerns of the industry.

Environment Management Manual

- You can find more detailed information in the *2005 Printing Industries Environmental Management Manual* – phone (02) 8789 7300 or www.printnet.com.au
- Queensland EPA has a free 'ecoBiz' tool that can help in identifying cost savings – www.epa.qld.gov.au.

SELF-ASSESSMENT CHECKLIST

This checklist can help you evaluate your environmental performance and identify areas for improvement.

You can use this as a starting point and refine it, where needed, to best suit your business. It's strongly recommended that you complete some form of environmental self-assessment for your business on a regular basis.

This checklist is comprehensive and may take over an hour to complete.

Date of assessment: _____

Company name: _____

Property address: _____

Person conducting assessment: _____

Area/building being assessed: _____

What types of activities are carried out in this area/building? _____

Is a site plan available? Yes No N/A Don't know

Actions needed: _____

If yes, please attach a copy of the site plan.

The following questions are designed to help you identify and prioritise actions for environmental improvement. The checklist will also help you identify a way forward to best practice and determine if you are vulnerable to prosecution and fines under environmental legislation.

Once you have completed this checklist, take a look at the questions that you consider require further investigation or action. Use these questions to develop an environmental action plan. A sample 'Environmental action plan for printers' is included in the 'Useful tools' section of this guide.

REGULATORY ISSUES

Are you aware of the environmental laws and regulations relating to your operations?

Yes No N/A Don't know

Actions needed:

Do you hold an Environment Protection Licence?

Yes No N/A Don't know

Actions needed:

If so, do you comply with the environmental obligations specified in your Environment Protection Licence?

Yes No N/A Don't know

Actions needed:

Do you comply with the conditions of consent provided in your development approval?

Yes No N/A Don't know

Actions needed:

Is your company a signatory to the National Packaging Covenant?

Yes No N/A Don't know

Actions needed:

Are you required to report under the National Pollutant Inventory because of the quantity of solvents you use? (25 tonnes or more per year).

Yes* No N/A Don't know

Actions needed:

ENVIRONMENTAL MANAGEMENT

Are daily or weekly checks carried out to make sure correct procedures are being followed to protect the environment? (Refer to the sample daily and weekly checklists in the 'Useful tools' section of this guide).

Yes No N/A Don't know

Actions needed:

Do you have an environmental policy?

Yes No N/A Don't know

Actions needed:

Do you have an environmental action plan?

Yes No N/A Don't know

Actions needed:

If so, does the environmental action plan have objectives, targets, responsibilities and budgets (where applicable)?

Yes No N/A Don't know

Actions needed:

Do you have an emergency response plan (including a spill management plan and emergency response plan)?

Yes No N/A Don't know

Actions needed:

Do you have a procedure in place to deal with complaints from the public, regulatory authorities or staff regarding environmental issues?

Yes No N/A Don't know

Actions needed:

Do you have formal reporting requirements in place for recording accidents and spills that harm or may harm the environment (i.e. an incident reporting form)?

Yes No N/A Don't know

Actions needed:

Are your staff aware of your commitment to improving the environment?

Yes No N/A Don't know

Actions needed:

Have all staff been trained in environmental responsibility (such as minimising VOCs emissions, avoiding spills, minimising waste, etc.)?

Yes No N/A Don't know

Actions needed:

Are your customers aware of your commitment to improving the environment?

Yes No N/A Don't know

Actions needed:

STORMWATER MANAGEMENT

Do you know where the stormwater drains are located on and surrounding your premises?

Yes No N/A Don't know

Actions needed:

Are the stormwater drains around your business always kept free of pollution, such as litter, paper dust and oil?

Yes No N/A Don't know

Actions needed:

Do you have any structures – such as a bunded storage area – or procedures in place to prevent stormwater contamination?

Yes No N/A Don't know

Actions needed:

Are stormwater drains protected from accidental spills?

Yes No N/A Don't know

Actions needed:

Do you have measures in place to prevent solid wastes from washing or blowing into stormwater?

Yes No N/A Don't know

Actions needed:

Are staff aware that it is illegal to sweep or hose paper dust, inks or any pollutants into stormwater drains?

Yes No N/A Don't know

Actions needed:

WASTEWATER MANAGEMENT

Are inks, solvents, oils or chemicals discharged to the sewer?

Yes* No N/A Don't know

Actions needed:

Do you have a trade waste agreement or permit?

Yes No N/A Don't know

Actions needed:

Is wastewater treated before it goes to the sewer?

Yes No N/A Don't know

Actions needed:

Do you have a silver recovery system in place?

Yes No N/A Don't know

Actions needed:

Is there any evidence of ground contamination anywhere on your site?
(e.g. visual stains, odours, affected vegetation)

Yes* No N/A Don't know

Actions needed:

AIR QUALITY MANAGEMENT

Have all potential sources of air emissions been reviewed,
for example ink drying and solvent use?

Yes No N/A Don't know

Actions needed:

Have you received complaints about air emissions or odours
from staff or neighbours?

Yes* No N/A Don't know

Actions needed:

Do you stop dust and fumes leaving your premises?

Yes No N/A Don't know

Actions needed:

Are lids kept on chemical containers when not in use?

Yes No N/A Don't know

Actions needed:

Are solvents stored and applied using methods that minimise air emissions?

Yes No N/A Don't know

Actions needed:

Are ozone-depleting substances used or stored on-site?

Yes* No N/A Don't know

Actions needed:

HAZARDOUS MATERIALS AND DANGEROUS GOODS MANAGEMENT

Does the hazardous material storage area meet dangerous goods legislation and appropriate Australian Standards? For example, is the area bunded, covered and fire-proofed, and are non-compatible materials separated?

Yes No N/A Don't know

Actions needed:

Have you notified WorkCover NSW of the dangerous goods stored and handled on premises?

Yes No N/A Don't know

Actions needed:

Do you keep an up-to-date register of all of the chemicals stored at the site?

Yes No N/A Don't know

Actions needed:

Are the contents of all containers identified and labeled?

Yes No N/A Don't know

Actions needed:

Do you have copies of all relevant Material Safety Data Sheets (MSDS)?

Yes No N/A Don't know

Actions needed:

Do all staff know where to find the Material Safety Data Sheets (MSDS) ?

Yes No N/A Don't know

Actions needed:

Do staff know how to prevent, contain and clean-up spills?

Yes No N/A Don't know

Actions needed:

Are spill kits available?

Yes No N/A Don't know

Actions needed:

Do the spill kits contain the correct materials to deal with spills from all of the hazardous materials and dangerous goods kept on-site?

Yes No N/A Don't know

Actions needed:

Are spill kits regularly checked and refilled?

Yes No N/A Don't know

Actions needed:

HAZARDOUS AND SOLID WASTE MANAGEMENT

Has a waste review been carried out?

Yes No N/A Don't know

Actions needed:

Complete the following to obtain baseline information on your wastes:

Landfill waste _____ kg/month disposal cost \$ _____ per month

Hazardous waste _____ kg/month disposal cost \$ _____ per month

Liquid waste _____ L/month disposal cost \$ _____ per month

Do you dispose of liquids in to the general waste bins?

Yes* No N/A Don't know

Actions needed:

Is your hazardous waste (e.g. waste solvents and acidic and caustic cleaning chemicals) collected by a licensed waste contractor and taken to an appropriate waste facility legally permitted to receive it?

Yes No N/A Don't know

Contractor name:

Waste facility name:

Actions needed:

Does your disposal of hazardous wastes comply with your licence requirements?

Yes No N/A Don't know

Actions needed:

Do you store all your hazardous waste in appropriate containers and in a bunded and covered area to avoid pollution of the environment?

Yes No N/A Don't know

Actions needed:

Do you keep your solid waste bins with the lid on and stored in a covered area to prevent the wind blowing waste away?

Yes No N/A Don't know

Actions needed:

Do you separate different types of waste so they can easily be reused, recycled or returned to the supplier?

Yes No N/A Don't know

Actions needed: _____

Do you encourage your suppliers to take back packaging wastes, such as crates and plastic drums?

Yes No N/A Don't know

Actions needed: _____

Have you talked to your waste company about recycling options?

Yes No N/A Don't know

Actions needed: _____

Do you recycle or reuse paper?

Yes No N/A Don't know

Contractor name: _____

Actions needed: _____

Do you recycle or reuse cardboard?

Yes No N/A Don't know

Contractor name: _____

Actions needed: _____

Do you recycle or reuse metal, such as aluminium, copper and steel?

Yes No N/A Don't know

Contractor name: _____

Actions needed: _____

Do you recycle or reuse solvents?

Yes No N/A Don't know

Contractor name: _____

Actions needed: _____

Do you recycle or reuse inks?

Yes No N/A Don't know

Contractor name: _____

Actions needed: _____

Do you recycle or reuse glass containers?

Yes No N/A Don't know

Contractor name: _____

Actions needed: _____

Do you recycle or reuse wood, such as pallets and boxes?

Yes No N/A Don't know

Contractor name: _____

Actions needed: _____

Do you recycle or reuse plastic drums and containers?

Yes No N/A Don't know

Contractor name: _____

Actions needed: _____

NOISE MANAGEMENT

Are you aware of the effects of your noise on your neighbours?

Yes No N/A Don't know

Actions needed: _____

Are noise complaints followed up?

Yes No N/A Don't know

Actions needed: _____

Can you hear your business activities from your site boundaries?

Yes* No N/A Don't know

Actions needed: _____

Do you regularly check and maintain noisy equipment, such as presses and air compressors?

Yes No N/A Don't know

Actions needed: _____

Are any pieces of equipment, motors or fans left running after business hours?

Yes* No N/A Don't know

Actions needed: _____

RESOURCE EFFICIENCIES

Complete the following to obtain baseline information on your utility use:

Cost of electricity \$ _____ per month

Cost of water \$ _____ per month

Cost of waste \$ _____ per month

Other \$ _____ per month

Total \$ _____ per month

Do you have a team or 'champions' looking at on going efficiency improvements?

Yes No N/A Don't know

Actions needed:

Do you monitor raw material, electricity and water use and waste disposal?

Yes No N/A Don't know

Actions needed:

Do you have energy, water saving and waste reduction procedures and targets in place?

Yes No N/A Don't know

Actions needed:

Do you use energy efficient motors?

Yes No N/A Don't know

Actions needed:

Do you use water saving devices?

Yes No N/A Don't know

Actions needed:

Do you have a preventive maintenance program to make sure all machines are operating efficiently? For example, are air compressors regularly checked for leaks?

Yes No N/A Don't know

Actions needed:

Have you installed insulation to avoid heating or cooling energy loss (e.g. insulation of roof, wall, piping, etc.)?

Yes No N/A Don't know

Actions needed:

Do you use water-based products wherever possible?

Yes No N/A Don't know

Actions needed:

Do you use vegetable-based inks?

Yes No N/A Don't know

Actions needed:

Do you use computer-to-plate (CTP) technology?

Yes No N/A Don't know

Actions needed:

Have you considered waterless printing?

Yes No N/A Don't know

Actions needed:

Do you try to minimise packaging for products that you send out?

Yes No N/A Don't know

Actions needed:

Have you investigated alternatives to hazardous materials or dangerous goods you use?

Yes No N/A Don't know

Actions needed:

FOLLOW-UP

Do you have a system in place to follow-up any concerns or actions that need to be addressed following this self-assessment?

Yes No N/A Don't know

Actions needed:

When you have completed this self-assessment checklist, go back over it and highlight the questions that you have answered with a:

'No'

'Don't know' or

'Yes*' (with an asterisk)

You have identified these questions as areas where you need to undertake further research, make improvements, or take immediate follow-up action. It's recommended that you:

- refer back to the relevant information sheets in this guide to find more information
- develop an environmental action plan
- get started on an environmental improvement program that will be good for your business, your staff and your customers.

It's a good idea to keep completed self-assessment checklists for your own records.

ENVIRONMENTAL ACTION PLAN

FOR PRINTERS

Sample only – expand and adapt this to your situation.

ENVIRONMENTAL ISSUE	ACTION OR MEASURE	WHO IS RESPONSIBLE?	WHEN?
1. AIR QUALITY MANAGEMENT			
Minimise emissions of VOCs	Check solvent containers have lids on and are kept in designated storage areas.	Press Area Supervisor	Daily
	Check performance levels of pollution control equipment (such as catalytic afterburners) to make sure they are working to optimum levels.	Press Area Supervisor	Weekly
Minimise airborne paper dust and powders	Sweep or vacuum paper dust and powders regularly, and place into sealed bags or containers for disposal.	Designated staff	Daily or as necessary
	Carry out routine inspections and maintenance of dust extraction systems.	Press Area Supervisor and designated staff	Monthly or as necessary
2. HAZARDOUS MATERIALS AND WASTE			
Safe use of solvents	Provide staff training on safe use of solvents.	Press Manager/ Overseer (with all staff involved)	February
	Produce solvent use poster that describes the correct amounts of solvent needed for a process (to reduce excess solvent use).	Press Manager/ Overseer	February
	Laminate solvent use posters and place them at locations where solvents are used.	Press Area Supervisor	February
	Check solvent storage areas and update the stock inventory.	Designated staff	Monthly
	Make sure MSDS for all solvents are up-to-date and accessible at any time.	Designated staff	Monthly
	Make sure all containers are labelled, dated and properly closed.	Designated staff	Monthly
	Arrange for a solvent recycler to collect solvents that are no longer used or out-of-date.	Press Area Supervisor	Quarterly

ENVIRONMENTAL ISSUE	ACTION OR MEASURE	WHO IS RESPONSIBLE?	WHEN?
3. WASTE MANAGEMENT			
Prevent solvents entering the stormwater or sewerage system	Check that all solvent and ink waste storage areas are under cover, bunded, sign-posted and stored according to Australian Standards.	Press Manager/ Overseer	Quarterly
	Develop a system for recycling used inks in-house or returning them to the ink supplier.	Press Manager/ Overseer (with all staff involved)	April
Prevent excess waste	Carry out a waste audit of the Press area to find out how much waste is being generated.	Press Area Supervisor (with all staff involved)	Daily or after use
	Review results of the waste audit and work out how waste can be eliminated, minimised, separated, reused or recycled.	Press Area Supervisor (with all staff involved)	May
	Set quantified waste reduction targets (in volume, weight or costs).	Press Area Supervisor (with all staff involved)	June
4. RESOURCE EFFICIENCY			
	Investigate options for using lower volatility solvents.	Press Area Supervisor	March
	Keep up-to-date with new technologies. Investigate options for waterless printing.	Press Area Supervisor (with designated staff)	Quarterly
	Set quantified reduction targets for resource efficiency savings (e.g. raw materials, energy, water).	Press Area Supervisor (with all staff involved)	June

DAILY AND WEEKLY CHECKLISTS

Sample only – expand and adapt these checklists to your situation.

DAILY CHECKLIST	TICK
All stormwater drains have been checked and they are clear of paper dust, debris and litter. Only rainwater can enter the stormwater system.	
Paper dust and powders have been swept or vacuumed and placed into sealed bags or containers for disposal.	
Car parking and other external areas have been inspected for dust or wastes, and cleaned up if necessary.	
All chemical containers in use are placed on drip trays.	
All solvent containers have been checked for leaks. All lids are properly sealed.	
All hazardous liquid containers are stored in a bunded and covered area and have been checked.	
Waste storage areas are not overfull. Wastes cannot be blown or washed away by rain.	
Checks carried out by:	
Signed: _____ Date: _____	

WEEKLY CHECKLIST	TICK
Daily checklists have all been completed.	
All bunds have been checked and any damage or anomalies reported to the manager.	
All spill kits have been checked and contain all relevant materials.	
The performance levels of all pollution control equipment have been checked and the equipment is working to optimum levels.	
Noise reduction equipment has been checked and is operating effectively.	
Liquid wastes awaiting collection are stored in separate containers are correctly labeled and placed in a bunded and covered area.	
Waste bins and waste storage areas have been checked to make sure there is no build-up of waste materials.	
Checks carried out by:	
Signed: _____ Date: _____	

USEFUL CONTACTS

Sample only – expand and adapt this list for your business.

ORGANISATION	PHONE NO.
Emergency services: ambulance, fire, police	000
Local council	
Department of Environment and Conservation (NSW)	131 555
NSW Workcover Authority	131 050
Poisons Information Centre	131 126
Local water authority/trade waste contact	
Waste solvent recycler	
Waste disposal contractor	
General recyclers	

