ABRASIVE BLASTING updated May 2011

Abrasive blasting can have minimal environmental impact if it is located in an appropriate area and sited, designed and operated properly. If proper care is not taken in addressing environmental issues, however, it has the potential to cause environmental harm.

For the purposes of this guide, abrasive blasting is defined as cleaning materials by the abrasive action of any metal shot or mineral particulate propelled in a gaseous or liquid medium solely by using blast cleaning cabinets less than 5 cubic metres in volume or totally enclosed automatic blast cleaning units. When an abrasive blasting proposal does not fall within this definition it must be referred to the Environment Protection Authority (EPA) under Schedule 8 Item 11 Schedule 22 (2)(1) of the *Development Regulations* 1993.

The purpose of this guide is to help council planners assess proposals for abrasive blasting from an environmental viewpoint. It focuses on environmental issues and does not deal with the process of assessing proposals against the provisions of the Development Plan.

Key environmental issues

- Air quality
- Noise
- Water quality
- Waste management

Information requirements

The following environmental information is required to undertake an adequate assessment:

- separation distances from residential or other sensitive receivers
- air quality protection measures
- noise mitigation measures
- water demand and use.

- water and soil protection measures including
  - wastewater containment and disposal
  - chemical storage and work areas
  - stormwater pollution prevention
  - solid waste storage and disposal

Applications lacking any of this information should not be accepted.

Environmental assessment

Air quality

All abrasive blasting must be carried out in a cabinet constructed to contain the emission of particulate matter (generally dust) from the blasting operation. The blast room or cabinet must be totally enclosed and vented to the atmosphere through an effective dust collector, preferably a fabric filter or paper cartridge. Open air blasting is only permissible with the consent of the EPA (via referral to EPA under Schedule 8 Item 11 Schedule 22 of the Development Regulations 1993 and subsequent licensing), when the object is too large or too heavy to fit in a booth, or is a fixed structure.

Fabric filters (felted cloth, pulse air cleaned) and paper cartridges (pulse air cleaned) are the recommended dust collectors. Filters must ensure that the maximum pollution level of solid particulates in each cubic metre of residual gases does not exceed 250 mg per cubic metre of exhaust air in accordance with the *Environment Protection (Air Quality) Policy* 1994. Wet scrubbers are not recommended as they do not work well if not properly maintained.

For air quality purposes, the recommended minimum separation distance between the abrasive blasting room or cabinet and the nearest residential (or other sensitive land use) premises is 50 metres.

If lead paint removal is to be undertaken, the following issues must be addressed:

- the capture of lead contaminants
- removal from the grit recycling process
- the process for following Australian Standard AS 4361.1 Guide to Lead Paint Management Part 1: Industrial Applications, 1995.

All exhaust ducts should terminate at least 3 metres above the highest structure within a 30-metre radius of the exhaust. Discharge from the dust collector to the atmosphere must be vertical, at a minimum discharge velocity of 10 metres per second. All cabinets that have external exhaust ducts should meet the required separation distances.

Noise

The Environment Protection (Noise) Policy 2007 (Noise Policy) provides maximum permissible noise levels as a guide to assist in determining whether the general environmental duty is being met. The maximum permissible noise level at a noise affected premises[1] is termed the Indicative Noise Level (INL) and is determined using Table 2 of the Noise Policy.

EPA publication *The Environment Protection (Noise) Policy 2007 and its impact on existing and proposed development* (June 2009) explains in detail how the Noise Policy affects existing and future developments.

The following table of maximum permissible noise levels already incorporates such a 5dB(A) reduction for development assessment purposes.

Description of area in which the noise source is situated[1]	**Maximum noise levels[1] dB(A)**	
	7am-10pm	**10pm-7am**
Rural or predominantly rural	42	35
Urban residential	47	40
Urban residential with some commerce, or with a school, hospital or the like	50	40
Urban residential with some manufacturing industry or with some place of public entertainment or place of public assembly or licensed premises	53	45
Predominantly commercial	60	55
Predominantly industrial	65	65

1. *While this description focuses on the source of the noise, it is reasonable that it should also extend to the area where the nearest sensitive receivers are. Typically, sensitive receivers will be found to exist in more sensitive zones than the source itself, for example, an industry zone may have a nearby residential zone containing the closest houses.*

2. *Measured at any place, other than the premises from which the noise emanates, where a person lives or works.*

The above noise levels may be exceeded where an acoustic engineer can show that the noise from the development will not cause an adverse impact due to the existing influence of ambient noise, or the limited duration or frequency of the activity.

The onus of proof that the noise reduction measures prevent adverse noise impacts rests with the developer.

[1] Measurements to determine compliance from a noise source are to be taken in relation to premises at which the noise is audible (noise-affected premises) that—

(a) are in separate occupation from the noise source and used for residential or business purposes; or

(b) constitute a quiet ambient environment set aside as a park or reserve or for public recreation or enjoyment.

Water quality

Pollutants generated by abrasive blasting should be prevented from entering water bodies (including groundwater) through direct discharge, seepage or through contamination of stormwater. Pollutants may include suspended solids, grease, lubricants, solvents, nutrients and oils.

Wastewater management

Hazardous materials (fuels, oils, pesticides and other chemicals) must be stored in a bunded and preferably rainproof area to minimise the risk of surface/groundwater contamination. The EPA *Guideline for Bunding and Spill Management* provides information on design and management of bunded areas. Disposing of liquids that accumulate in such areas to sewer will require approval from SA Water's Trade Waste Group.

Stormwater management

Roof stormwater should be collected for reuse and must be managed separately from potentially contaminated runoff (ie from car parking and other hard paved areas).

The facility should incorporate a stormwater management system for all areas where contaminated runoff may be generated (including car parks). Structural controls such as bunded storage areas, first flush diverters, gross pollutant traps, oil/water separators, hydrocarbon absorbers, infiltration basins (eg grassed or vegetated swales, garden strips or stone filled trenches), sediment traps or soluble pollutant removers are all acceptable methods. Stormwater treatment specialists should be consulted to determine which management systems will be most effective.

Water conservation

Abrasive blasting facilities should incorporate systems that enable the containment and reuse of water (including treated stormwater and wastewater) to replace potable (mains) supplies for operations such as landscape irrigation, toilet flushing and process water (eg machine cooling and cleaning).

Behavioural work practices, such as stormwater drain labelling, signage displaying standard operating procedures and training employees are also encouraged in addition to the in-built structural controls outlined above.

Waste management

All used abrasive and waste products generated during abrasive blasting (i.e. surface coating, spent media, filter cartridges, personal protective clothing) must be contained and securely stored before disposal to a licensed waste depot. Abrasive waste that contains toxic heavy metals (e.g. lead) must be disposed of at a licensed hazardous waste facility approved to take heavy metals. Silica-free abrasives must be used.

Checklist of environmental issues

- ❑ Type of land uses in the vicinity of the site
- ❑ Machinery appropriately enclosed with appropriate separation distances
- ❑ Use of lead-based paint
- ❑ Proposed abrasive blasting dust extraction system meets standards

Draft standard conditions

To use and adapt as may be applicable to a specific proposal

1. All abrasive blasting must be carried out in a cabinet constructed to contain the emission of particulate matter (generally dust) from the blasting operation. The blast room or cabinet must be totally enclosed, and vented to the atmosphere through an effective dust collector, preferably a fabric filter or paper cartridge.
2. Filters must ensure that the maximum pollution level of solid particulates in each cubic metre of residual gases does not exceed 250 mg per cubic metre of exhaust air.
3. All exhaust ducts should terminate at least 3 metres above the highest structure within a 30 metre radius of the exhaust. Discharge from the dust collector to the atmosphere must be vertical and at a minimum discharge velocity of 10 metres per second.
4. Any material (paints, solvents, coolants, degreasing agents, etc) likely to degrade water must be stored within a bunded compound or area suitable for preventing material from escaping into surface or underground water resources.
5. All stormwater runoff from car parking, driveways, and other areas that are hard paved and used in conjunction with the bulk handling facilities, must be directed into:
   - grassed swales, vegetated or garden strips
   - small infiltration basins over permeable soils
   - surface or underground stone filled trenches (i.e. similar to a septic tank absorption field) and/or
   - sediment traps.

   which are sized to effectively contain and filter out sediment in a three (3) month average recurrence interval run-off event, prior to any discharge off site. In the case of a larger runoff event, allowance can be made to discharge stormwater overflow direct to the council stormwater system by means of a high flow bypass.

6. Noise generated from the development must not exceed … between the hours of … and … measured and adjusted at the nearest sensitive receiver in accordance with the Noise Policy.

The following note provides important information for the applicant and should be attached to the approval notice.

- The applicant is reminded of their general environmental duty, as required by Section 25 of the *Environment Protection Act 1993*, to take all reasonable and practical measures to ensure that the activities on the whole site, including during construction, do not pollute the environment in a way which causes or may cause environmental harm.

- The applicant must not exceed the relevant maximum noise levels specified in the Noise Policy . Note that operation outside usual business hours may well result in impact off-site, particularly at night time or early morning when background noise levels are usually lower, and justified complaint may necessitate proof (in the form of a professional acoustic report) that the policy levels are not being exceeded.

References

Information sheets, guidance documents, codes of practice, technical bulletins referenced in this guide can be found at: www.epa.sa.gov.au

These include the following EPA Guidelines:

Abrasive Blast Cleaning, September 2003
Draft Guidelines for Separation Distances, August 2000
Bunding and Spill Management, January 2004.

The *Environment Protection (Air Quality) Policy* 1994 and the *Environment Protection (Noise) Policy* 2007 can be accessed through www.legislation.sa.gov.au

The following standard can be purchased through: www.saiglobal.com
Australian Standard AS 4361.1 *Guide to Lead Paint Management Part 1: Industrial Applications,* December 1995 may cause environmental harm.

FURTHER INFORMATION

Legislation

Legislation may be viewed on the internet at: <www.legislation.sa.gov.au>
Copies of legislation are available for purchase from**:**

Service SA Government Legislation Outlet 101 Grenfell Street Adelaide SA 5000	Telephone: Facsimile: Internet:	13 23 24 (08) 8204 1909 <shop.service.sa.gov.au>

For general information please contact:

Environment Protection Authority GPO Box 2607 Adelaide SA 5001	Telephone: Facsimile: Freecall (country): Internet: E-mail:	(08) 8204 2004 (08) 8124 4670 1800 623 445 <www.epa.sa.gov.au> <epainfo@epa.sa.gov.au>
