# Appendix 1: Hazardous Air Contaminants

*For the context in which Appendix 1 is used, refer to Policy 4.2.9, Rules 11, 12, 13 and 19.*

**Hazardous Air Pollutants**
(Ministry for the Environment, 1994. *Ambient Air Quality Guidelines.* Ministry for the Environment, Wellington.)

The Chemical Abstracts service number merely provides a source of additional information on the substance. It does not specify emission recommendations, as such.

| Chemical Abstracts Service Number | Pollutant |
|---|---|
| 75-07-0 | Acetaldehyde |
| 60-35-5 | Acetamide |
| 75-05-8 | Acetonitrile |
| 98-86-2 | Acetophenone |
| 53-96-3 | 2-Acetylaminofluorene |
| 107-02-8 | Acrolein |
| 79-06-1 | Acrylamide |
| 79-10-7 | Acrylic acid |
| 107-13-1 | Acrylonitrile |
| 107-05-1 | Allyl chloride |
| 92-67-1 | 4-Aminobiphenyl |
| 62-53-3 | Aniline |
| 90-04-0 | o-Anisidine |
| 1332-21-4 | Asbestos |
| 71-43-2 | Benzene |
| 92-87-5 | Benzidine |
| 98-07-7 | Benzotrichloride |
| 100-44-7 | Benzyl chloride |
| 92-52-4 | Biphenyl |
| 117-81-7 | Bis(2-ethylhexyl)phthalate (DEHP) |
| 542-88-1 | Bis(chloromethyl)ether |
| 75-25-2 | Bromoform |
| 106-99-0 | 1,3-Butadiene |
| 156-62-7 | Calcium cyanamide |
| 105-60-2 | Caprolactam |
| 133-06-2 | Captan |
| 63-25-2 | Carbaryl |
| 75-15-0 | Carbon disulfide |
| 56-23-5 | Carbon tetrachloride |
| 463-58-1 | Carbonyl sulfide |

| | |
|---|---|
| 120-80-9 | Catechol |
| 133-90-4 | Chloramben |
| 57-74-9 | Chlordane |
| 7782-50-5 | Chlorine |
| 79-11-8 | Chloroacetic acid |
| 532-27-4 | 2-Chloroacetophenone |
| 108-90-7 | Chlorobenzene |
| 510-15-6 | Chlorobenzilate |
| 67-66-3 | Chloroform |
| 107-30-2 | Chloromethyl methyl ether |
| 126-99-8 | Chloroprene |
| 1319-77-3 | Cresol/cresylic acid (mixed isomers) |
| 95-48-7 | o-Cresol |
| 108-39-4 | m-Cresol |
| 106-44-5 | p-Cresol |
| 98-82-8 | Cumene |
| | 2,4-D (2,4-Dichlorophenoxyacetic acid) (including salts and esters) |
| 72-55-9 | DDE (1,1-dichloro-2,2-bis(p-chlorophenyl) ethylene) |
| 334-88-3 | Diazomethane |
| 132-64-9 | Dibenzofuran |
| 96-12-8 | 1,2-Dibromo-3-chloropropane |
| 84-74-2 | Dibutyl phthalate |
| 106-46-7 | 1,4-Dichlorobenzene |
| 91-94-1 | 3,3'-Dichlorobenzidine |
| 111-44-4 | Dichloroethyl ether (bis[2-chloroethyl]ether |
| 542-75-6 | 1,3-Dichloropropene |
| 62-73-7 | Dichlorvos |
| 111-42-4 | Diethanolamine |
| 64-67-5 | Diethyl sulfate |
| 119-90-4 | 3,3'-Dimethoxybenzidine |
| 60-11-7 | 4-Dimethylaminoazobenzene |
| 121-69-7 | N,N-Dimethylaniline |
| 119-93-7 | 3,3'-Dimethylbenzidine |
| 79-44-7 | Dimethylcarbamoyl chloride |
| 68-12-2 | N,N-Dimethylformamide |
| 57-14-7 | 1,1-Dimethylhydrazine |
| 131-11-3 | Dimethyl phthalate |
| 77-78-1 | Dimethyl sulfate |
| | 4,6-Dinitro-o-cresol (including salts) |
| 51-28-5 | 2,4-Dinitrophenol |
| 121-14-2 | 2,4-Dinitrotoluene |
| 123-91-1 | 1,4-Dioxane (1,4-Diethyleneoxide) |
| 122-66-7 | 1,2-Diphenylhydrazine |

| | |
|---|---|
| 106-89-8 | Epichlorohydrin (1-Chloro-2,3-epoxypropane) |
| 106-88-7 | 1,2-Epoxybutane |
| 140-88-5 | Ethyl acrylate |
| 100-41-4 | Ethylbenzene |
| 51-79-6 | Ethyl carbamate (urethane) |
| 75-00-3 | Ethyl chloride (Chloroethane) |
| 106-93-4 | Ethylene dibromide (Dibromoethane) |
| 107-06-2 | Ethylene dichloride (1,2-Dichloroethane) |
| 107-21-1 | Ethylene glycol |
| 151-56-4 | Ethyleneimine (Aziridine) |
| 75-21-8 | Ethylene oxide |
| 96-45-7 | Ethylene thiourea |
| 75-34-3 | Ethylidene dichloride (1,1-Dichloroethane) |
| 50-00-0 | Formaldehyde |
| 76-44-8 | Heptachlor |
| 118-74-1 | Hexachlorobenzene |
| 87-68-3 | Hexachlorobutadiene |
| | 1,2,3,4,5,6-Hexachlorocyclohexane (all stereo isomers, including lindane) |
| 77-47-4 | Hexachlorocyclopentadiene |
| 67-72-1 | Hexachloroethane |
| 822-06-0 | Hexamethylene diisocyanate |
| 680-31-9 | Hexamethylphosphoramide |
| 110-54-3 | Hexane |
| 302-01-2 | Hydrazine |
| 7647-01-0 | Hydrochloric acid (Hydrogen chloride [gas only]) |
| 7664-39-3 | Hydrogen fluoride (Hydrofluoric acid) |
| 123-31-9 | Hydroquinone |
| 78-59-1 | Isophorone |
| 108-31-6 | Maleic anhydride |
| 67-56-1 | Methanol |
| 72-43-5 | Methoxychlor |
| 74-83-9 | Methyl bromide (Bromomethane) |
| 74-87-3 | Methyl chloride (Chloromethane) |
| 71-55-6 | Methyl chloroform (1,1,1-Trichloroethane) |
| 78-93-3 | Methyl ethyl ketone (2-Butanone) |
| 60-34-4 | Methylhydrazine |
| 74-88-4 | Methyl iodide (Iodomethane) |
| 108-10-1 | Methyl isobutyl ketone (Hexone) |
| 624-83-9 | Methyl isocyanate |
| 80-62-6 | Methyl methacrylate |
| 1634-04-4 | Methyl tert-butyl ether |
| 101-14-4 | 4,4'-Methylenebis (2-chloroaniline) |
| 75-09-2 | Methylene chloride (Dichloromethane) |
| 101-68-8 | 4,4'-Methylenediphenyl di-isocyanate (MDI) |
| 101-77-9 | 4,4'-Methylenedianiline |

| | |
|---|---|
| 91-20-3 | Naphthalene |
| 98-95-3 | Nitrobenzene |
| 92-93-3 | 4-Nitrobiphenyl |
| 100-02-7 | 4-Nitrophenol |
| 79-46-9 | 2-Nitropropane |
| 684-93-5 | N-Nitroso-N-methylurea |
| 62-75-9 | N-Nitrosodimethylamine |
| 59-89-2 | N-Nitrosomorpholine |
| 56-38-2 | Parathion |
| 82-68-8 | Pentachloronitrobenzene (Quintobenzene) |
| 87-86-5 | Pentachlorophenol |
| 108-95-2 | Phenol |
| 106-50-3 | p-Phenylenediamine |
| 75-44-5 | Phosgene |
| 7803-51-2 | Phosphine |
| 7723-14-0 | Phosphorus |
| 85-44-9 | Phthalic anhydride |
| 1336-36-3 | Polychlorinated biphenyls (Aroclors) |
| 1120-71-4 | 1,3-Propane sultone |
| 57-57-8 | beta-Propiolactone |
| 123-38-6 | Propionaldehyde |
| 114-26-1 | Propoxur (Baygon) |
| 78-87-5 | Propylene dichloride (1,2-Dichloropropane) |
| 75-56-9 | Propylene oxide |
| 75-55-8 | 1,2-Propylenimine (2-Methylaziridine) |
| 91-22-5 | Quinoline |
| 106-51-4 | Quinone (p-Benzoquinone) |
| 100-42-5 | Styrene |
| 96-09-3 | Styrene oxide |
| 1746-01-6 | 2,3,7,8-Tetrachlorodibenzo-p-dioxin |
| 79-34-5 | 1,1,2,2-Tetrachloroethane |
| 127-18-4 | Tetrachloroethylene (Perchloroethylene) |
| 7550-45-0 | Titanium tetrachloride |
| 108-88-3 | Toluene |
| 95-80-7 | Toluene-2,4-diamine |
| 584-84-9 | 2,4-Toluene diisocyanate |
| 95-53-4 | o-Toluidine |
| 8001-35-2 | Toxophene (Chlorinated camphene) |
| 120-82-1 | 1,2,4-Trichlorobenzene |
| 70-00-5 | 1,1,2-Trichloroethane |
| 79-01-6 | Trichloroethylene |
| 95-95-4 | 2,4,5-Trichlorophenol |
| 88-06-2 | 2,4,6-Triclorophenol |
| 121-44-8 | Triethylamine |
| 1582-09-8 | Trifluralin |
| 540-84-1 | 2,2,4-Trimethylpentane |
| 108-05-4 | Vinyl acetate |

| | |
|---|---|
| 593-60-2 | Vinyl bromide |
| 75-01-4 | Vinyl chloride |
| 75-35-4 | Vinylidene chloride (1,1-Dichloroethylene) |
| 1330-20-7 | Xylene (mixed isomers) |
| 95-47-6 | o-Xylene |
| 108-38-3 | m-Xylene |
| 106-42-3 | p-Xylene |

Antimony Compounds
Arsenic Compounds (inorganic including arsine)
Beryllium Compounds
Cadmium Compounds
Chromium Compounds
Cobalt Compounds
Coke Oven Compounds
Cyanide Compounds[1]
Glycol ethers[2]
Lead Compounds
Manganese Compounds
Mercury Compounds
Fine mineral fibres[3]
Nickel Compounds
Polycyclic Organic Matter[4]
Radionuclides (including radon)[5]
Selenium Compounds

NOTE: For all listings above which contain the word "Compounds" and for glycol ethers, the following applies: Unless otherwise specified, these listings are defined as including any unique chemical substance that contains the named chemical (ie antimony, arsenic, etc) as part of that chemical's infrastructure.

[1] 'X'CN where X = H' or any other group where a formal dissociation may occur. For example, KCN or Ca (CN)2

[2] $R\text{-}(OCH_2CH_2)_n\text{-}OR'$
where:
n = 1,2 or 3
R = alkyl C7 or less
or R = phenyl or alkyl substituted phenyl
R' = H, or alkyl C7 or less

or ester, sulphate,
phosphate,
nitrate,
sulphonate

[3]Includes mineral fibre emissions from facilities manufacturing or processing glass, rock, or slag fibres (or other mineral derived fibres) of average diameter 1 micrometre or less.

[4]Includes substituted and/or unsubstituted polycyclic aromatic hydrocarbons and aromatic heterocyclic compounds, with two or more fused rings, at least one of which is benzenoid (i.e. containing six carbon atoms and is aromatic) in structure. Polycyclic Organic Matter is a mixture of organic compounds containing one or more of these polycyclic aromatic chemicals. Polycyclic Organic Matter is generally formed or emitted during thermal processes including:

(1) incomplete combustion,
(2) pyrolysis
(3) the volatilization, distillation or processing of fossil fuels or bitumens or
(4) the distillation or thermal processing of non-fossil fuels.

[5]A type of atom which spontaneously undergoes radioactive decay.

# Appendix 2: Regional Ambient Air Quality Guidelines

*For the context in which Appendix 2 is used, refer to Policies 4.2.1 and 4.2.2 and section 7.2.1 of the Plan.*

| Indicator | Maximum Desirable Level | Maximum Acceptable Level | Averaging Times | Techniques for Measurement |
|---|---|---|---|---|
| Particulates | 70 µg/m³ | 120 µg/m³ | 24 hours | AS 3580.9.6-1990 |
| | 40 µg/m³ | 40 µg/m³ | Annual | AS 3580.9.7-1990 |
| Carbon Monoxide | 6 mg/m³ | 10 mg/m³ | 8 hours | AS 3580.7.1 |
| Lead | | 0.5-1 µg/m³ | 3 months | AS 2800-1985 |
| Nitrogen Dioxide | 95 µg/m³ | 300 µg/m³ | 1 hour | AS 3580.5.1-1995 |
| | 30 µg/m³ | 100 µg/m³ | 24 hours | |
| Fluoride | **Special Land Use** | | | |
| | | 1.8 µg/m³ | 12 hours | AS 3580.1.13.1-1993 |
| | | 1.5 µg/m³ | 24 hours | AS 3580.13.2-1991 |
| | | 0.8 µg/m³ | 7 days | |
| | | 0.4 µg/m³ | 30 days | |
| | | 0.25 µg/m³ | 90 days | |
| | **General Land Use** | | | |
| | 1.8 µg/m³ | 3.7 µg/m³ | 12 hours | AS 3580.13.1-1993 |
| | 1.5 µg/m³ | 2.9 µg/m³ | 24 hours | AS 3580.13.2-1991 |
| | 0.8 µg/m³ | 1.7 µg/m³ | 7 days | |
| | 0.4 µg/m³ | 0.84 µg/m³ | 30 days | |
| | 0.25 µg/m³ | 0.5 µg/m³ | 90 days | |
| | **Conservation Areas** | | | |
| | | 0.1 µg/m³ | 90 days | |
| Hydrogen Sulphide | 1 µg/m³ | 7 µg/m³ | 30 minutes | AS 3580.8.1-1990 |
| Ozone | 100 µg/m³ | 150 µg/m³ | 1 hour | AS 3580.5.1-1993 |
| | | 100 µg/m³ | 8 hours | |
| Sulphur Dioxide | | 500 µg/m³ | 10 minutes | AS 3580.8.1-1990 |
| | | 350 µg/m³ | 1 hour | |
| | | 125 µg/m³ | 24 hours | |
| | | 50 µg/m³ | Annual | |

µg - Micrograms
mg - Milligrams
AS - Australian Standard

# Appendix 3: Guidelines for Setting Chimney Heights

## Chimney Height Assessment Criteria

In exercising its discretion with regard to chimney heights, especially with regard to Rule 7, and for heating and electrical generating processes which require a resource consent, the Regional Council will be guided by the following criteria:

(a) In uncomplicated terrain without the presence of high buildings, or no other significant sources of air-borne contaminants, the height of any chimney discharging the products of combustion from conventional fuel burning equipment will be determined in accordance with the following criteria.

  (i) For any discharge from the combustion of fuel where the release of sulphur dioxide is less than 2 kg/hr, the minimum chimney height shall be the higher of either eight metres above finished ground level or three metres above the highest substantial part of any building located within 40 metres of the chimney or any part of the building to which the chimney may be attached.

  (ii) For any discharge from the combustion of fuel, where the release of nitrogen oxides is less than 0.5 kg/hour the minimum chimney height shall be the higher of either eight metres above finished ground level or three metres above the highest substantial part of any building located within 40 metres of the chimney or any part of the building to which the chimney may be attached.

  (iii) For any discharge from the combustion of fuels where the emission of sulphur dioxide is greater than or equal to 2 kg/hour or less than 50 kg/hour or the emission of nitrogen oxides is greater than or equal to 0.5 kg/hour and less than 20 kg/hour then the chimney height shall be calculated in accordance with a standard guideline such as the UK Memorandum (Department of the Environment, 1981), the NZ Guidelines for Determining Chimney Heights (Rolfe, 1978), or the New South Wales Guidelines (EPA, 1993), or other relevant guidelines.

(b) In other circumstances, the height of the chimney is to be determined so that the discharge will not give rise to ground level concentrations of contaminants in excess of 50 percent of the maximum desirable level in the Regional Ambient Air Quality Guidelines (Appendix 2) and based on information from dispersion modelling.

# Appendix 4: Guidelines for the On-Farm Burning of Agrichemical Containers

(Adapted from: British Agrichemical Association, 1998. *After Spraying Container Incineration: A Practical Guide.* British Agrichemical Association, Cambridgeshire, United Kingdom.)

## Container preparation

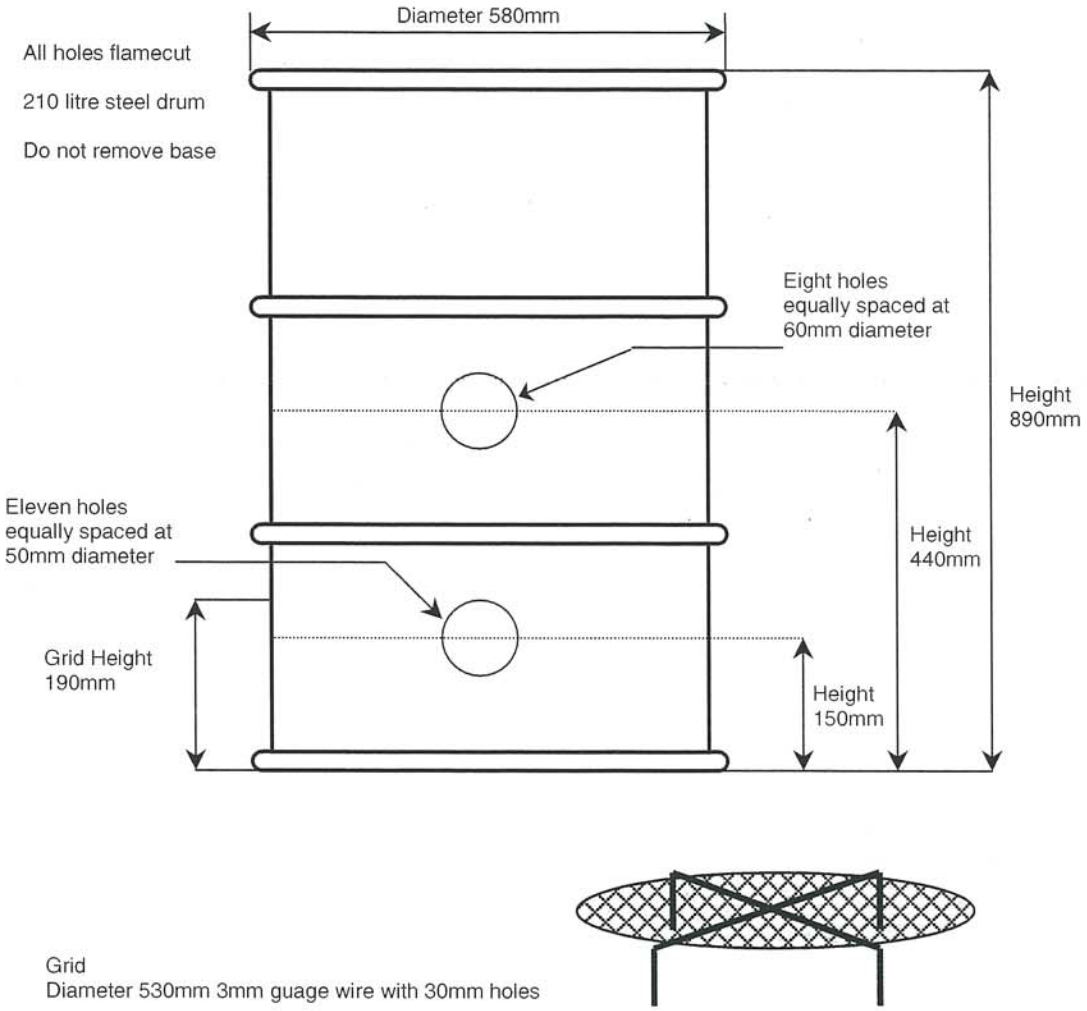
- Disposal of unused agrichemicals is not addressed in these guidelines.
- Thoroughly clean all containers before disposal.
- Triple rinse and drain all containers, then recap and return them to their cardboard case. Either collect washings in a spray tank, or discharge to soil. To triple rinse, fill the container to 10% of its capacity with water, agitate vigorously, and drain for at least 30 seconds after steady flow has ceased. Repeat three times.
- Puncture cleaned containers to prevent re-use.
- Store prepared containers in a dry, secure compound prior to disposal.

## Means of disposal

- Before disposing of containers, check whether they can be recycled or returned to the supplier or manufacturer. Note that Deadly Poison containers must be disposed of in accordance with the provisions of the Toxic Substances Regulations.
- Do not reuse agrichemical containers to store any substance for human or animal consumption.
- If recycling or return to the manufacturer is not possible, containers can be taken to a local authority landfill or burned.
- Do not burn plastics with halogen or phosphorous components without first obtaining a resource consent from the Wellington Regional Council.
- Burning should be carried out in accordance with the guidelines listed below.

## Incinerator design

Make an incinerator using a 210 litre steel drum, in accordance with the diagram below.




## Incinerator management

- Burn small amounts of plastic on a regular basis, rather than large amounts at one time (see 'recommended work rates').
- Locate the incinerator away from roads, livestock, domestic houses, farm buildings, watercourses and sensitive ecosystems.
- Ensure incinerators are not near to any combustible materials such as, wood, straw, fertiliser and the material to be burned.
- Place incinerators on a firm level surface or a concrete pad.
- Keep a water carrier close at hand.

### Recommended work rates

- Start the fire with one case of containers, including the cardboard case. Place a diesel soaked rag or fire lighter in the centre of the case and ignite.
- After 5 minutes of start up time, add further containers at a rate of 30 – 40 containers / 30 minutes.
- The incinerator will burn vigorously for 5-10 minutes, then will reduce to glowing embers about 30 minutes, after the last case is added.

### Managing the incinerator

- Supervise the incinerator at all times.
- Take great care when approaching or loading the incinerator, as the fire will become extremely hot.
- When filling the incinerator, approach from upwind to avoid the flames and smoke. Avoid breathing any smoke or fumes. Thick leather protective gloves are a recommended precaution.
- To minimise dark smoke and for easier handling, add full "cases" of containers. Adding plastic containers alone increases the risk of dark smoke.
- Do not overfill the incinerator, as this tends to decrease its efficiency, and increases the risk that burning ash/cardboard can fly away. Wait until there is sufficient room to hold at least 90% of the material you are adding.
- Avoid poking the fire. This should not be necessary and will increase the risk of generating dark smoke.

### Disposal of ash

The residual ash from burning is retained in the drum. Turn the drum upside down to remove the ash, then dispose either by soil incorporation, burial, or through normal solid waste disposal routes.