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| **Title** | **Demonstrate technical knowledge of and evaluate resource efficiency options for minimising atmospheric emissions** | | |
| **Level** | **5** | **Credits** | **15** |

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| **Purpose** | This unit standard is for people who may be working as resource efficiency programme managers and consultants.<br><br>People credited with this unit standard are able to: demonstrate technical knowledge of atmospheric emission sources, units of measurement, methods of measurement, and requirements for monitoring; and evaluate resource efficiency options for minimising atmospheric emissions. |

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| **Classification** | Zero Waste > Resource Efficiency |

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| **Available grade** | Achieved |

**Guidance Information**

1 Legislation and documents that apply to this unit standard include:
Climate Change Response Act 2002;
Ozone Layer Protection Act 1996;
Resource Management Act 1991;
Health and Safety at Work (Hazardous Substances) Regulations 2017;
AS/NZS ISO 31000:2018 *Risk management – Guidelines*;
*Ambient Air Quality Guidelines* (Wellington: Ministry for the Environment, 2002);
*Revised National Environmental Standards for Air Quality: Evaluation under Section 32 of the Resource Management Act* available at http://www.mfe.govt.nz/publications/air/;
*Workplace Exposure Standards and Biological Exposure Indices* (Wellington: Department of Labour, 2013) current edition available at https://worksafe.govt.nz/;
*Good Practice Guide for Air Quality Monitoring and Data Management* (Wellington: Ministry for the Environment, 2009) available at http://www.mfe.govt.nz/publications/air/;
*Good Practice Guide for Atmospheric Dispersion Modelling* (Wellington: Ministry for the Environment, 2004) available at http://www.mfe.govt.nz/publications/air/;
local authority rules and consents;
safety data sheets.

2 Recommended texts
Best Practice Guides and Guidelines for air quality available at http://www.mfe.govt.nz/publications/air/.

3 Recommended websites
Clean Air Society of Australia and New Zealand – http://www.casanz.org.au/;
Ministry for the Environment – http://www.mfe.govt.nz.

4 Definitions
*Organisation* refers to an entire business entity in the private or public sector or a business unit within the organisation.
*Waste management hierarchy* refers to a preferred order of management approaches – eliminate, reduce at source, reuse, recycle, recover, dispose with minimal impact on environment.

## Outcomes and performance criteria

### Outcome 1

Demonstrate technical knowledge of sources of atmospheric emissions.

**Performance criteria**

1.1 Sources of atmospheric emissions are identified and described in terms of the function of point sources and typical discharges from them.

Range point sources include but are not limited to – stack, vent, cyclone, cooling tower, vat, spray booth, process line.

1.2 Sources of atmospheric emissions are identified and described in terms of the causes of diffuse sources and typical discharges from them.

Range three diffuse sources.

### Outcome 2

Demonstrate technical knowledge of units of measurement for atmospheric emissions.

**Performance criteria**

2.1 Terminology used for quantifying atmospheric emissions is explained in accordance with the *Good Practice Guide for Air Quality Monitoring and Data Management* and *Workplace Exposure Standards and Biological Exposure Indices*.

Range parts per million, cubic metres, $PM_{10}$, particulates, workplace exposure standards, value, ceiling limit value, short term exposure level, long term exposure level, ambient air quality guidelines, obscuration, odour units, maximum ground level concentration.

2.2 Selection of appropriate units for measuring atmospheric emissions is explained in accordance with *Workplace Exposure Standards and Biological Exposure Indices.*

**Outcome 3**

Demonstrate technical knowledge of methods of measurement for atmospheric emissions.

**Performance criteria**

3.1 Emission measurement methods are described in accordance with *Ambient Air Quality Guidelines* and methods for collecting accurate data for atmospheric emission audits are explained in accordance with Good Practice Guide for Air Quality Monitoring and Data Management.

Range methods – sampling, laboratory test;
data includes but is not limited to – titrimetric, gravimetric, chromatographic, electrodes, stack discharge monitoring.

3.2 Equipment used for measuring atmospheric emissions is described in accordance with Good Practice Guide for Air Quality Monitoring and Data Management and its appropriateness for measuring emission sources accurately is explained.

Range equipment – indicator tube, filter, stack sensor, cascade impactor, stack anemometer, pitot tube, flow meter, glassware, in-stack device.

3.3 Mathematical modelling methods for measuring atmospheric emissions are described and illustrated with typical applications in accordance with *Good Practice Guide for Atmospheric Dispersion Modelling*.

Range dispersion modelling, airshed modelling.

**Outcome 4**

Demonstrate technical knowledge of requirements for monitoring atmospheric emissions.

**Performance criteria**

4.1 Potential hazards of monitoring atmospheric emissions are identified and hazard control methods for them are described in accordance with workplace health and safety requirements.

4.2 Requirements for protecting health are explained in accordance with *Workplace Exposure Standards and Biological Exposure Indices*.

Range requirements relating to atmospheric emissions.

4.3 Safety requirements relating to oxidising substances are explained in accordance with the Health and Safety at Work (Hazardous Substances) Regulations 2017.

4.4 Environmental risks from atmospheric emissions are identified and monitoring of risks is explained with reference to legislative requirements.

Range legislative requirements – national environmental standards, regional plans, district plans, discharge to air consents, permitted activities.

**Outcome 5**

Evaluate resource efficiency options for minimising atmospheric emissions.

**Performance criteria**

5.1 Options for minimising atmospheric emissions in one or more organisations are evaluated and prioritised in accordance with recommended texts and websites.

Range at least two of – bio-filter, substitution, filtration, scrubbing, electrostatic precipitation, cyclone, water curtain, solvent recovery, enclosures, reduction, local exhaust ventilation, oxidation, afterburner.

5.2 The evaluation is guided by the waste management hierarchy.

5.3 The evaluation takes account of legislative and local authority requirements relating to atmospheric emissions.

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| **Planned review date** | 31 December 2023 |

**Status information and last date for assessment for superseded versions**

| Process | Version | Date | Last Date for Assessment |
|---|---|---|---|
| Registration | 1 | 17 June 2011 | 31 December 2015 |
| Revision | 2 | 21 November 2013 | N/A |
| Rollover and Revision | 3 | 28 June 2018 | N/A |

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| **Consent and Moderation Requirements (CMR) reference** | 0014 |

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

**Comments on this unit standard**

Please contact MITO New Zealand Incorporated info@mito.org.nz if you wish to suggest changes to the content of this unit standard.