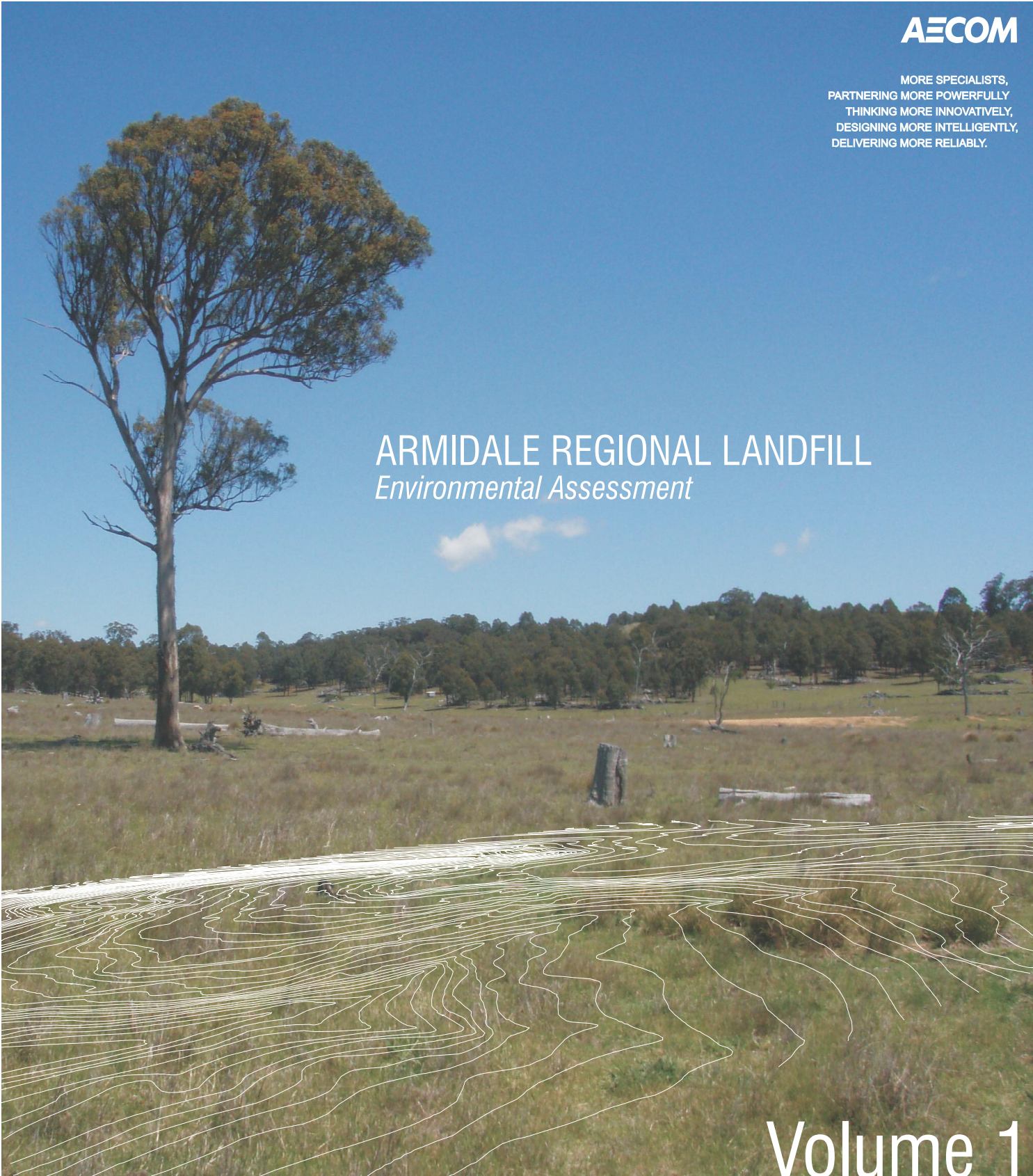




ARMIDALE REGIONAL LANDFILL

Environmental Assessment

Volume 1

ARMIDALE REGIONAL LANDFILL

Environmental Assessment - Volume 1 Main Report

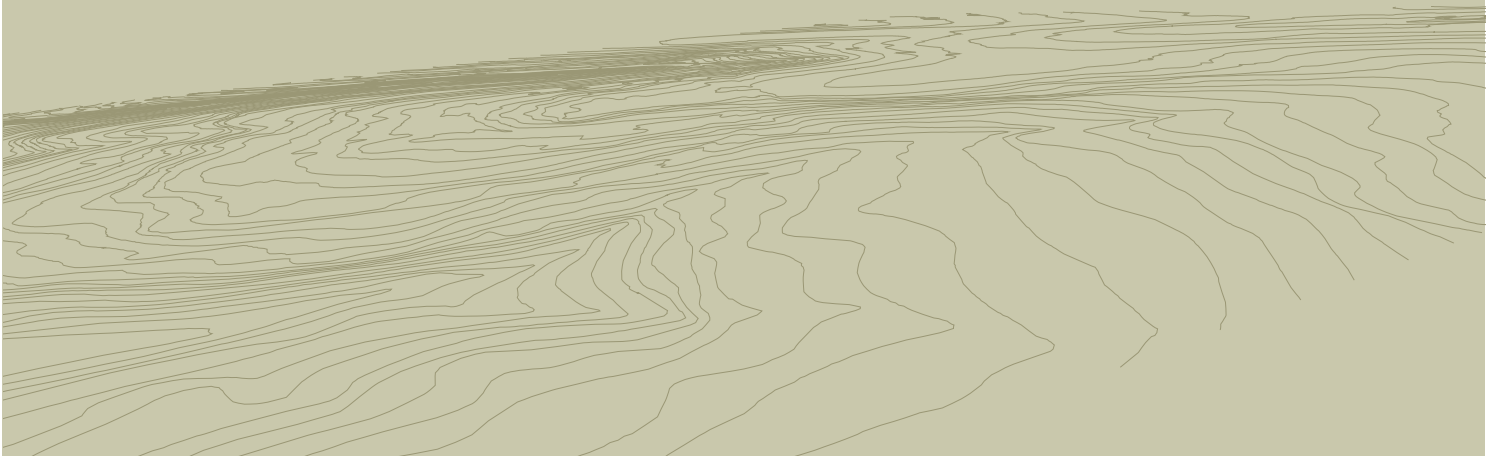
Prepared for
Armidale Dumaresq Council
135 Rusden Street, Armidale NSW 2350

April 2010



ARMIDALE REGIONAL LANDFILL

Environmental Assessment



FINAL

Armidale Dumaresq Council

AECOM

Environmental Assessment

Armidale Regional Landfill



Environmental Assessment

Armidale Regional Landfill

Prepared for

Armidale Dumaresq Council

Prepared by

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Armidale Regional Landfill
Environmental Assessment

Submission of Environmental Assessment
Prepared under the Environmental Planning and
Assessment Act 1979, Section 75H

Environmental assessment

prepared by:

Name

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In respect of:

Project to which Part 3A applies

Applicant name

Address

Land to be developed

Proposed development

Armidale Dumaresq Council

PO Box 75A

Armidale NSW 2350

Construction and operation of a Regional Waste
Facility

Environmental assessment

An environmental assessment is attached

Certificate

I certify that I have prepared the contents of this
document and to the best of my knowledge:

- It is in accordance with the requirements of Part 3A;
- It contains all available information that is relevant to the environmental assessment of the development to which it relates; and
- The information contained in the document is neither false nor misleading.

Signature:



Name

Chris Carloss

Date

13 April 2010

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Contents

Glossary of Terms	xiii
Abbreviations and Acronyms	xix
Executive Summary.....	xxiii
1.0 Introduction.....	1
1.1 Overview	1
1.2 Environmental Assessment	2
1.2.1 Environmental Planning and Assessment Act	2
1.2.2 Preliminary Environmental Assessment	2
1.2.3 Director-General's Requirements.....	2
1.3 The proposal.....	3
1.3.1 Objectives.....	3
1.3.2 Major features of the proposal	3
1.3.3 Design and Operation	4
1.3.4 Land area requirements	4
1.4 Site Description.....	13
1.4.1 Regional Context	13
1.4.2 Site Location and surrounding areas.....	13
1.4.3 Key attributes of the surrounding areas.....	14
1.5 Land Ownership and Existing Development	15
1.6 Land Classification	16
1.7 Surrounding Development.....	16
1.7.1 Nearby Residential Receivers.....	16
1.8 Project Approval Process	19
1.8.1 Approvals Process to Date	19
1.8.2 Stages of Project Development	19
1.8.3 Correlation of the EA to the LEMP	20
1.9 Structure of this Report	20
2.0 Background and Project Need	23
2.1 Strategic Context	23
2.1.1 Regional alliances and regional context	23
2.1.2 Regional Strategies.....	23
2.1.3 Local Strategies	24
2.1.4 Regional Landfill	25
2.2 Existing Waste Management	25
2.2.1 Landfills	25
2.2.2 Resource Recovery Facilities	26

	2.2.3	Chemical Collection	30
2.3		Waste Classification.....	31
2.4		Waste Profile	31
	2.4.1	Waste Volumes Directed to Landfill	31
	2.4.2	Waste Type	32
	2.4.3	Future Waste Profile	33
2.5		Need for a new landfill.....	34
	2.5.1	Extension to the Waste Management Centre landfill.....	34
	2.5.2	Demand for Landfill Space	34
	2.5.3	Future Requirements	34
3.0		Project Justification	35
3.1		Significance of the Proposal	35
3.2		Consideration of Other Options.....	35
3.3		Benefits and Impacts of the Proposed Landfill Site	35
	3.3.1	Biophysical	35
	3.3.2	Economic	36
	3.3.3	Social.....	36
3.4		Sustainability	36
3.5		Conclusion.....	36
4.0		Review of Alternatives and Site Selection Process	37
4.1		Review of Alternatives to Landfilling.....	37
	4.1.1	Identification of Alternatives.....	37
	4.1.2	Do Nothing Option	42
	4.1.3	Additional Studies into Alternative Waste Technology	42
	4.1.4	Transport to another Landfill.....	42
4.2		Alternative Site Assessment.....	43
	4.2.1	Landfill Siting Studies.....	43
	4.2.2	Site Selection Process	44
	4.2.3	Further site suitability assessment and justification.....	48
	4.2.4	Consultation.....	48
5.0		Project Description	51
5.1		Overview	51
5.2		Landfill Design	51
	5.2.1	Cell Design	51
	5.2.2	Leachate Barrier System	57
	5.2.3	Leachate Collection and Conveyance System.....	57
	5.2.4	Leachate Pond.....	57
	5.2.5	Landfill Gas Management.....	58

	5.2.6	Stormwater Management	58
5.3		Landfill Construction.....	61
	5.3.1	Construction Hours	62
	5.3.2	Site Preparation	62
	5.3.3	Cell Preparation	62
	5.3.4	Liner and Leachate Collection System Construction	63
5.4		Landfill Facilities.....	63
	5.4.1	Access Road	63
	5.4.2	Perimeter Road.....	69
	5.4.3	Signage	69
	5.4.4	Fencing and Security	69
	5.4.5	Amenities	69
	5.4.6	Water Supply	70
	5.4.7	Services	70
	5.4.8	Biodiversity Offset Area.....	70
5.5		Landfill Operation.....	70
	5.5.1	Alternatives Considered	70
	5.5.2	Landfill Cell Operation.....	71
	5.5.3	Filling/ Staging Plan	71
	5.5.4	Filling and Cover.....	75
	5.5.5	Landfill Capping.....	75
	5.5.6	Proposed Operational Conditions	76
5.6		Waste Screening.....	78
	5.6.1	Procedures for Acceptance of Waste at the Armidale Waste Management Centre	78
	5.6.2	Inspection at Disposal Point	79
5.7		Environmental Management.....	79
	5.7.1	Landfill Environmental Management Plan (LEMP).....	79
	5.7.2	Odour Management	79
	5.7.3	Dust Suppression.....	80
	5.7.4	Stockpile Management.....	80
	5.7.5	Environmental Monitoring.....	80
	5.7.6	Occupational Health and Safety.....	80
6.0		Planning Framework	81
6.1		Commonwealth Legislation.....	81
	6.1.1	Environmental Protection and Biodiversity Conservation Act 1999.....	81
6.2		State Legislation	82
	6.2.1	Environmental Planning and Assessment Act 1979 and Environmental Planning and Assessment Regulation 2000	82

6.2.2	Crown Lands Act 1989.....	83
6.2.3	Heritage Act 1977	83
6.2.4	Native Vegetation Act 2003	84
6.2.5	National Parks and Wildlife Act 1974	84
6.2.6	Noxious Weeds Act 1993	84
6.2.7	Protection of the Environment Operations Act 1997.....	84
6.2.8	Roads Act 1993	84
6.2.9	Rural Fires Act 1997	85
6.2.10	Threatened Species Conservation Act 1995.....	85
6.2.11	Water Management Act 2000	85
6.3	State Environmental Planning Policies	86
6.3.1	State Environment Planning Policy (Infrastructure) 2007	86
6.3.2	State Environmental Planning Policy No. 33 – Hazardous and Offensive Industry	86
6.3.3	State Environmental Planning Policy No. 44 – Koala Habitat Protection	87
6.3.4	State Environmental Planning Policy No. 55 – Remediation of Land	88
6.4	Other Plans and Strategies.....	88
6.4.1	Regional Environmental Plans.....	88
6.4.2	New England Draft Development Strategy	88
6.5	Local Context.....	88
6.5.1	Armidale Dumaresq Local Environmental Plan 2008 (LEP 2008)	88
7.0	Consultation.....	91
7.1	Consultation Approach	91
7.1.1	Consultation Objectives.....	91
7.1.2	Stakeholder Groups	91
7.1.3	Key Messages	92
7.1.4	Stakeholder Management	92
7.2	Government Consultation.....	92
7.2.1	Initial Planning Focus Meeting (2005)	92
7.2.2	Second Planning Focus Meeting (2008).....	93
7.2.3	Government Departments	93
7.2.4	Additional Consultation with Government Departments	94
7.3	Indigenous Heritage Consultation	94
7.4	Community Consultation	94
7.4.1	Community Meetings	95
7.4.2	Newsletters.....	95
7.4.3	Website	97
7.4.4	Media Releases	98
7.4.5	Direct Contact.....	98

	7.4.6	Public Information Displays	99
7.5		Key Issues Raised	99
	7.5.1	Government Departments	99
	7.5.2	Community	113
7.6		Ongoing Community Consultation.....	113
8.0		Environmental Impact Assessment	119
8.1		Landform and Soils	119
	8.1.1	Topography	119
	8.1.2	Soils	120
	8.1.3	Mitigation Measures	137
8.2		Geology	139
	8.2.1	Existing Environment	139
	8.2.2	Potential Geological Impacts	143
	8.2.3	Mitigation Measures	143
8.3		Surface Water	143
	8.3.1	Existing Environment	143
	8.3.2	Potential Surface Water Impacts.....	144
	8.3.3	Mitigation Measures	145
8.4		Groundwater	148
	8.4.1	Assessment Criteria for Groundwater Quality.....	148
	8.4.2	Existing Hydro-geological Conditions.....	148
	8.4.3	Geology and Soils.....	157
	8.4.4	Potential Groundwater Impacts.....	158
	8.4.5	Mitigation Measures	160
8.5		Air Quality.....	161
	8.5.1	Assessment Criteria	162
	8.5.2	Existing Environment	164
	8.5.3	Potential Air Quality Impacts.....	166
	8.5.4	Mitigation Measures	171
8.6		Greenhouse Gas Emissions	171
	8.6.1	Quantitative GHG Estimate Methodology.....	172
	8.6.2	Comparison with NSW Emissions.....	175
	8.6.3	Regulatory Requirements.....	175
	8.6.4	Proposed GHG Management Measures	176
8.7		Noise.....	178
	8.7.1	Assessment Criteria.....	178
	8.7.2	Existing Environment	180
	8.7.3	Potential Noise Impacts.....	182

	8.7.4	Mitigation Measures	189
8.8		Biodiversity	191
	8.8.1	Methodology	191
	8.8.2	Botanical Survey – Flora	192
	8.8.3	Vegetation Communities	192
	8.8.4	Threatened Plant Species	197
	8.8.5	Endangered Ecological Communities (EEC)	197
	8.8.6	Fauna Survey	203
	8.8.7	Threatened Fauna Species	203
	8.8.8	Other Fauna of Conservation Significance	204
	8.8.9	Fauna Habitat	209
	8.8.10	Endangered Fauna Populations.....	209
	8.8.11	Migratory Species	209
	8.8.12	Key Threatening Processes.....	210
	8.8.13	Recovery Actions.....	212
	8.8.14	World Heritage Values	213
	8.8.15	Potential Impacts	213
	8.8.16	Mitigation Measures.....	214
	8.8.17	Offset Management Strategy.....	218
	8.8.18	Conclusions.....	222
8.9		Socio-Economic.....	222
	8.9.1	Existing Environment	222
	8.9.2	Potential Impacts	225
	8.9.3	Mitigation Measures	227
8.10		Indigenous Heritage	227
	8.10.1	Existing Environment	227
	8.10.2	Potential Impacts	233
	8.10.3	Mitigation Measures	233
8.11		European Heritage.....	234
	8.11.1	Existing Environment	234
	8.11.2	Potential Impacts	234
	8.11.3	Mitigation Measures	235
8.12		National Environmental Heritage (Oxley Wild Rivers National Park).....	235
	8.12.1	Potential Impacts	235
	8.12.2	Mitigation Measures	235
8.13		Land Use.....	236
	8.13.1	Existing Environment	236
	8.13.2	Potential Impacts	236

	8.13.3	Mitigation Measures	237
	8.13.4	End Use	237
8.14		Traffic and Transport	237
	8.14.1	Existing Environment	237
	8.14.2	Potential Impacts	247
	8.14.3	Mitigation Measures	248
8.15		Hazards	249
	8.15.1	Existing Environment	249
	8.15.2	Potential Impacts	249
	8.15.3	Mitigation Measures	251
8.16		Visual	252
	8.16.1	Existing Environment	252
	8.16.2	Methodology	252
	8.16.3	Potential Visual Impacts	253
	8.16.4	Mitigation Measures	259
8.17		Climate Change	260
	8.17.1	Existing Climate	261
	8.17.2	Projected Climate Change	261
	8.17.3	Potential Climate Change Impacts and Risks for the Proposed Landfill Facility	262
	8.17.4	Climate Change Mitigation Measures	263
	8.17.5	Climate Change Adaptation Measures	264
8.18		Cumulative Impacts	264
	8.18.1	Introduction	264
	8.18.2	Potential for Cumulative Impacts with Other Proposals	264
	8.18.3	Potential Cumulative Impacts of the Proposal	264
9.0		Statement of Commitments	267
9.1		Introduction	267
9.2		Environmental Management	267
	9.2.1	Environmental Objectives	267
	9.2.2	Environmental Licensing	267
	9.2.3	Landfill Environmental Management Plan	267
	9.2.4	Environmental Monitoring and Reporting	268
	9.2.5	Occupational Health & Safety	269
9.3		Statement of Commitments	269
10.0		Residual Risk Assessment	273
10.1		Approach	273
10.2		Analysis	274
11.0		Sustainability	275

11.1	Ecologically Sustainable Development (ESD).....	275
11.2	New South Wales Requirements for Ecologically Sustainable Development.....	275
11.2.1	Precautionary Principle	275
11.2.2	Principle of Intergenerational Equity.....	276
11.2.3	Conservation of Biological Diversity and Ecological Integrity.....	276
11.2.4	Improved Valuation, Pricing and Incentive Mechanisms	276
11.2.5	Climate Change	276
12.0	Conclusions	277
13.0	References	279
14.0	Contents of Following Volumes.....	283

List of Tables

Body Report

Table 1: Residential Properties (Receivers) around the Proposed Landfill Site	16
Table 2: Project Stages and Tasks for the Development of a New Landfill.....	19
Table 3: Outline of Report Structure	21
Table 4: Existing Waste Collection Services	26
Table 5: Control Survey Waste Volumes Directed to Landfill at the Armidale Waste Management Centre (Long Swamp Road) between 1998 and 2005 and 2005 and 2008	32
Table 6: Domestic Waste Collected 2004-2009	32
Table 7: Recyclables Collected 2005-2009.....	33
Table 8: Population 2000 - 2006	33
Table 9: Operational Life of Existing Landfills in the Region	34
Table 10: Review of Alternatives to Landfill, 2002.....	39
Table 11: Sites Selected for Site Evaluation (Final Stage).....	44
Table 12: Assessment Criteria for Potential Landfill Sites.....	45
Table 13: Primary Criteria Weightings	46
Table 14: Ranking for Site Suitability	46
Table 15: Site Selection Assessment Results	47
Table 16: Constraints review of access route options.....	67
Table 17: Stakeholder Groups	91
Table 18: Communication Undertaken at Project Stages.....	95
Table 19: Community Information Prepared: Newsletters.....	96
Table 20: Summary of Criteria Raised by NSW Government Departments	101
Table 21: List of Key Issues Raised by the Community	115
Table 22: Typical Soil Profiles	125
Table 23: Soil Landscapes.....	127

Table 24: Summary of Soil Salinity Results	131
Table 25: Summary of Emersion Class Test Results on Soils.....	132
Table 26: Potential Areas of Contaminants on Site	135
Table 27: Registered bores in proximity to site	151
Table 28: EA Systems Piezometer Locations (MGA94 Zone 56) and Water Entry Screen Depths	151
Table 29: RCA Bore Hole Locations (MGA94 Zone 56).....	155
Table 30: Piezometer Summary	155
Table 31: Gauged Groundwater Depths.....	155
Table 32: Hydraulic Conductivity/Permeability Test Result Summary	156
Table 33: Groundwater Geochemistry	156
Table 34: NSW DECCW Criteria for Particulate Matter Concentrations	162
Table 35: NSW DECC Criteria for Dust Fallout	162
Table 36: Odour Performance Criteria for the Assessment of Odour	162
Table 37: Frequency of Occurrence of Stability Classes at Armidale	164
Table 38: Average Temperature, Humidity and Rainfall Data for Armidale Airport*.....	165
Table 39: Dust Emission Estimates	167
Table 40: Predicted Dust Concentrations	168
Table 41: Estimated Near Field Odour Emissions for the Proposed Armidale Landfill.....	169
Table 42: Predicted 99th Percentile Odour Concentrations (ou)	171
Table 43: Global Warming Potential of GHGs.....	172
Table 44: Emission Scopes.....	173
Table 45: Estimated Total GHG Emissions (50 year period).....	174
Table 46: Annual Scope 1 and Scope 2 GHG Emissions	175
Table 47: Resultant Environmental Noise Criteria for the two closest receivers.....	179
Table 48: Road Traffic Noise Criteria.....	179
Table 49: Assessed RBL and Ambient Noise Level	181
Table 50: Equipment SWLs	182
Table 51: All Construction Plant Operating During Daytime under Neutral Meteorological Conditions.....	182
Table 52: Normal Operations During Daytime under Neutral Meteorological Conditions.....	184
Table 53: Increase in Traffic Noise Levels on Waterfall Way – Operation (Worst Case)	187
Table 54: Increase in Traffic Noise Levels on Waterfall Way – Construction (Worst Case)	188
Table 55: Attenuated Equipment SWLs.....	190
Table 56: Attenuated Plant Operating During Daytime under Neutral Meteorological Conditions	190
Table 57: Description of the Vegetation Communities Found in the 361 hectare Surveyed Area of the Proposed Armidale Landfill Site.....	195
Table 58: Age Summary for Armidale Dumaresq LGA (2006 Census)	223
Table 59: Dwelling (occupied) summary for Armidale Dumaresq LGA (2006 Census).....	223
Table 60: Employment summary for Armidale Dumaresq LGA (2006 Census).....	223
Table 61: Employment Distribution (%) based on ABS 2006 Census.....	224

Table 62: Weekly personal income for Armidale Dumaresq LGA.....	225
Table 63: Personal income data for Armidale Dumaresq LGA.....	225
Table 64: Waterfall Way Average Annual Traffic Flows, 2004.....	245
Table 65: Waterfall Way Average Annual Traffic Flows, 2004.....	246
Table 66: Traffic Flows along Key Roads within Armidale Town Centre.....	246
Table 67: Estimated Daily and Peak Hour Flows for the 2004, 2008 and 2028.....	247
Table 68: Dangerous Goods Expected to be Received and/or Stored on the Site	250
Table 69: Extreme rainfall projections for the NSW north-east region	262
Table 70: Risk Rating Matrix	263
Table 71: Risk Rating Matrix for Armidale landfill	263
Table 72: Statement of Commitments	269
Table 73: Residual Risk Matrix.....	274
Table 74: Risk Profile	274

List of Figures

Body Report

Figure 1: Project Site – Regional Context	5
Figure 2: Project site – Local Context	7
Figure 3: Approval Process.....	9
Figure 4: Property Boundaries	11
Figure 5: Location of Sensitive Receivers.....	17
Figure 6: Indicative Site Layout Plan	53
Figure 7: Indicative Cross Section of Landfill Design.....	55
Figure 8: Proposed Stormwater Management.....	59
Figure 9: Access Route Options.....	65
Figure 10: Proposed Staffing and Organisational Structure	76
Figure 11: Local Area Slope Profile.....	121
Figure 12: Borehole and Test Locations.....	123
Figure 13: Distribution of Soil Landscapes over the Site.....	129
Figure 14: Potential Geological Fault.....	141
Figure 15: Registered Groundwater Bore Locations.....	149
Figure 16: Direction of Groundwater Flow at Project Site	153
Figure 17: Average Monthly Temperature and Rainfall at Armidale Airport	166
Figure 18: Vegetation Communities	193
Figure 19: Indicative Location of Threatened Flora Species on the Project Site	199
Figure 20: Records of Threatened Flora within 20 km of the Study Area from DECCW NPWS Atlas of NSW Flora Database	201

Figure 21: Indicative Location of Threatened and Important Fauna Species Records of the Project Site.....	205
Figure 22: Records of Threatened Fauna within 20km of the Study Area from DECCW NPWS Atlas of NSW Wildlife.....	207
Figure 23: Size and Location of Offset Area	219
Figure 24: Location of Two Previously Unidentified Indigenous Heritage Items	231
Figure 25: Local Road Network.....	239
Figure 26: Location of RTA Count Station 92.394	243
Figure 27: Waterfall Way – Variation in Average Weekday Traffic Flow (Two Way) by Hour of the Day, 2004.....	245
Figure 28: Austroads Type B Priority T-Junction Arrangement with Auxiliary Right Turn Lane	249
Figure 29: Visual Receivers	255
Figure 30: View from Receiver 1 - Strathaven.....	257
Figure 31: View from Receiver 2 - Sherraloy.....	257
Figure 32: View from Receiver 3 - Riverton	258
Figure 33: View from Receiver 4 – approximately 1.5 kilometres north of the Project Site	258
Figure 34: View from Receiver 5 – approximately 1.4 kilometres north of the Project Site	259
Figure 35: View from Receiver 6 – approximately 1.9 kilometres northwest of the Project Site	259
Figure 36: Projected Changes in Seasonal Rainfall by 2050	261
Figure 37: Potential Climate Change Impacts to Landfill	262

List of Plates

Body Report

Plate 1: Part of the Site Proposed for the Landfill.....	13
Plate 2: Armidale Waste Management Centre Disposal Bays.....	28
Plate 3: Chemicals, Cooking Oil, Paints and Batteries for Recycling at the Armidale Waste Management Centre ..	29
Plate 4: Sorting of Recyclable Waste at Armidale Waste Management Centre.....	29
Plate 5: Plastics and Container Recycling at the MRF, Armidale Waste Management Centre.....	30

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Glossary of Terms

Term	Definition
Activity	An “activity” is defined in the same manner as under Part 5 of the <i>Environmental Planning and Assessment Act 1979 (EP&A Act)</i> and includes the use of land, the subdivision of land, the erection of a building, the carrying out of a work and the demolition of a building, as well as other things referred to in either the <i>EP&A Act</i> or <i>Regulations</i> for the purposes of this definition.
Activity (Scheduled)	In regulatory terms an activity that is listed in Schedule 1 of the <i>Protection of the Environment Operations Act 1997 (POEO Act)</i> is known as a Scheduled Activity and may be required to be licensed under the provisions of this Act by the Department of Environment, Climate Change and Water (DECCW).
Anaerobic	Living conditions in which there is an absence of oxygen. The term used to describe a biological process which occurs without the need for oxygen and is often used to describe types of bacteria and bacteriological processes. Anaerobic bacterial activity can be seen in the bottom muds of lakes, etc and is also the process by which entombed, putrescible waste is decomposed by organisms that do not require oxygen, i.e. anaerobic organisms.
Anniversary Date	The anniversary date is the anniversary each year of the date of issue of an Environment Protection Licence (EPL). In the case of an EPL continued in force by the <i>POEO Act</i> , the date of issue of the Licence is the first anniversary of the date of issue or last renewal of the Licence following the commencement of the Act.
Aerobic	Aerobic processes are processes that require oxygen. Aerobic bacteria, for example, are bacteria that require oxygen to live. “Anaerobic” (see above) is the opposite of Aerobic.
Assessment Background Level	The Assessment Background Level (ABL) is a measure of the background level for noise, representing discreet assessment periods (i.e. day, evening or night) for each day. It is determined by calculating the 10th percentile (lowest 10%) background noise level over a 90 minute period (LA ₉₀).
Bioremediation	Remediation of contaminated land using biological methods.
CO ₂ e	Equivalent to carbon dioxide. Used as a standard measurement of the level of effect of various gases on the atmosphere, particularly greenhouse gases.
Commercial and Industrial Waste	Wastes generated by businesses and industries and institutions. These include shopping centres, restaurants, offices, schools, hospitals and government offices but exclude any building and demolition waste and municipal waste.
Carbon to Nitrogen (C:N) Ratio	The ratio, by mass, of carbon atoms to nitrogen atoms present within organic material.
EPA	See NSW EPA (Environment Protection Authority).
EPL	Environmental Protection Licence - EPLs, issued by DECCW, are a central means to control the localised, cumulative and acute impacts of pollution in NSW.
Debitage	A term used in archaeology that refers to all the waste material left over after the creation of a stone tool, via the production of chipped stone tools or the knapping of flints, for example. Debitage may include (but is not limited to) different kinds of flakes of lithic material and various other rejected material, as well as waste material that may still be used as tools, for example as scrapers. The term generally refers to pieces of stone that have not been utilised and are therefore discarded, however.
Facility	Premises at which a “scheduled activity”, take place. Scheduled activities are those activities defined under Schedule 1 to the <i>POEO Act</i> .

Term	Definition
FIDOL factor	An acronym used in odour impact assessments when collectively considering the issues of Frequency, Intensity, Duration, Offensiveness and Location of odour events.
General solid waste (putrescible)	The NSW DECCW's July 2009 <i>Waste Classification Guidelines</i> defines general solid waste (putrescible) as including any of the following waste types: - Household waste that contains putrescible organics. - Waste from litter bins collected by or on behalf of local councils. - Manure and night soil. - Disposable nappies, incontinence pads or sanitary napkins. - Food waste. - Animal waste. - Grit or screenings from sewage treatment systems that have been dewatered so that the grit or screenings do not contain free liquids. - Any mixture of the wastes referred to above. It should be noted that, in assessing whether waste has been pre-classified by DECCW as general solid waste (putrescible), the following definitions should also be applied: - Animal waste: includes dead animals and animal parts and any mixture of dead animals and animal parts. - Food waste: means waste from the manufacture, preparation, sale or consumption of food but does not include grease-trap waste. - Manure: includes any mixture of manure and biodegradable animal bedding, such as straw. It should also be noted that wastes may be classified as general solid waste (putrescible) by the DECCW, from time to time, via a notice published in the NSW Government Gazette (all currently gazetted general solid wastes (putrescible) are listed on DECCW's website, at www.environment.nsw.gov.au/waste/wastetypes.htm).
Greenwaste	Organic waste resulting from the trimming, pruning, lopping, cutting or felling of any form of vegetation, for example grass, trees or shrubs.
Harm	Harm to the environment includes any direct or indirect alteration of the environment that has the effect of degrading the environment and, includes any act or omission that results in pollution.
Hazardous Waste	Has the same meaning as in Part 3 of Schedule 1 of the <i>Protection of the Environment Operations Act 1997</i> .
Industrial Waste	Has the same meaning as in Part 3 of Schedule 1 of the <i>Protection of the Environment Operations Act 1997</i> .
Inert Waste	Has the same meaning as in Part 3 of Schedule 1 of the <i>Protection of the Environment Operations Act 1997</i> .
Isopleths	Lines drawn on a map that join locations of equal value, e.g. air pressure, dust concentration, etc.
L _{A1}	The noise level that is exceeded for 1% of the sample period. During the sample period the noise level is below the L _{A1} level for 99% of the time.
L _{A10}	The noise level that is exceeded for 10% of the sample period. During the sample period the noise level is below the L _{A10} level for 90% of the time.
L _{Aeq}	The equivalent continuous sound level (L _{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise, which contains the same energy as the varying noise environment.

Term	Definition
L _{A90}	Generally referred to as the background noise level. It is the noise level that is exceeded for 90% of the sample period. During the sample period the noise level is below the L _{A90} level for 10% of the time.
Leachate	Liquid released by, or water that has percolated through organic waste material and contains other liquids, suspended solids and/or gases.
Licensee	The Licence holder described at the front of an EPL.
Material Harm	Has the same meaning as in Section 147 of the <i>POEO Act</i>, as follows: <i>147 Meaning of material harm to the environment</i> 1) For the purposes of this Part (of the <i>POEO Act</i>): a) harm to the environment is material if: (i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or (ii) it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations), and (b) loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment. For the purposes of the Act, it does not matter that harm to the environment is caused only in the premises where the pollution incident occurs.
Mixed Solid Waste	For the purposes of this EA document, mixed solid waste includes Municipal Solid Waste (MSW), Commercial and Industrial waste and greenwaste.
Municipal Solid Waste (MSW)	Being waste consisting of: a) Household domestic waste that is set aside for kerbside collection or delivered by the householder directly to a waste facility. b) Other types of domestic waste, such as clean-up and residential garden waste. c) Local council generated waste, such as waste from street sweeping, public litter bins or parks.
NSW Department of Environment and Climate Change and Water	The former NSW Department of Environment and Conservation (DEC) was formed in 2003 via the amalgamation of four previously established environmental agencies, these being the Environment Protection Authority (EPA), the National Parks and Wildlife Service (NPWS), Resource NSW and the Botanic Gardens Trust. DEC also provided a co-ordination role for the Sydney Catchment Authority. The DEC was renamed the Department of Environment, Climate Change (DECC) before more recently being renamed the Department of Environment, Climate Change and Water (DECCW) in 2009.
NSW Department of Industry and Investment	The NSW Department of Industry and Investment (DII) is the former energy sector of the NSW Department of Water and Energy (DWE) (previously the former NSW Department of Infrastructure, Planning and Natural Resources - DIPNR). DII has responsibility for the delivery of the NSW Government's policy and reform agenda for the energy sector.
NSW Department of Planning	Department of Planning (DoP) is the NSW Government department primarily responsible for planning matters. Former operating names for DoP include Planning NSW and the Department of Urban Affairs and Planning (DUAP). DoP was also part of the former Department of Infrastructure, Planning and Natural Resources (DIPNR), operating at that time under the name Planning NSW.
NSW Environment Protection Authority	Now part of the NSW DECCW, however the Environment Protection Authority (EPA) also retains its own legal status with respect to certain statutory functions and powers as it exercises these within its overall responsibility to protect the environment of NSW.

Term	Definition
NSW Office of Water	The NSW Office of Water is the former water sector of the NSW DWE (previously the former NSW Department of Infrastructure, Planning and Natural Resources - DIPNR). The Office of Water carries out a regulatory and enforcement function for water matters and has responsibility for the delivery of the NSW Government's policy and reform agenda for the water sector.
Offensive Odour	The <i>POEO Act</i> defines an offensive odour as an odour: (a) <i>that, by reason of its strength, nature, duration, character or quality, or the time at which it is emitted, or any other circumstances:</i> (i) <i>is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or</i> (ii) <i>interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or</i> (b) <i>that is of a strength, nature, duration, character or quality prescribed by the regulations or that is emitted at a time, or in other circumstances, prescribed by the regulations.</i>
Organics	Means natural organic materials of either waste or non-waste origin, including any of the following: a) Putrescible organics such as meat, fish, poultry, fruit, vegetables, or their cooked or processed products, as well as biosolids and manure and other animal materials. b) Non putrescible organics such as timber, garden trimmings, agricultural, forestry or crop materials or natural fibrous organic or other vegetative materials. However the definition does not include any of the following: a) Human-made organic chemicals such as solvents or industrial, agricultural, mining, commercial or household chemicals, cleansing agents or personal care products. b) Naturally occurring organic chemicals which have been refined and/or concentrated by human activity such as oil, petrol, diesel or coal tar.
Pathogen	A living micro-organism that can cause harm to humans, animals, plants or other living organisms, usually by causing disease or other ailment in larger species.
Percentile	The percentage in relation to a number of samples taken that must meet a criterion. Within EPLs, percentile is usually the number of samples, expressed as a percentage that must meet the concentration limit specified in the EPA Licence for that pollutant over a specified period of time. In an EPA licence, the specified period of time is the Reporting Period, unless otherwise stated within the Licence.
Perched Water	Unconfined groundwater held above the water table by a layer of impermeable rock or sediment.
Phytocap	A phytocap, or "phytoremediation cap" is an alternate capping system sometimes used in the management of closed and completed landfill cells. A phytocap commonly incorporates the use of a range of native trees, shrubs and grasses that are tolerant to saline, ammonium-rich leachate and that therefore have the potential to treat leachate on-site. For the proposed landfill development at Armidale, phytocapping may prove to be a viable alternative capping system to the more commonly used, fully engineered capping systems.
Premises	The area occupied by the site referred to under a Licence issued under the NSW <i>POEO Act</i> . The Licence applies to the specified activity conducted on those premises. Premises may include buildings or structures, land or places, mobile plant, vehicles or vessels.

Term	Definition
Proposed Landfill Site	The entire section of land encompassing the proposed landfill to which this EA applies. The total land area of the proposed development site is approximately 86 hectares and incorporates provision for all the following: - Approximately 20 hectares of area that includes all land required for the actual landfill, including all site buildings, other operational requirements and leachate and stormwater management measures. - Site access from Waterfall Way (the relevant site access road). - A biodiversity offset area of approximately 61 hectares.
Putrescible Waste	Putrescible wastes are wastes that are subject to putrefaction (i.e. liable to decay, spoil or to become putrid) and includes the following: - food waste (including meat, fish, poultry, fruit, vegetables and their cooked or otherwise processed by-products). - waste consisting of animal matter (including dead animals and animal parts). - grease trap waste. - biosolids (as categorised as Stabilisation Grade C in accordance with the criteria set out in the EPA's <i>Biosolids Guidelines</i>), including manures and animal materials.
Ramsar Site	Wetlands of international importance declared under the terms of the Ramsar Convention on Wetlands (1971).
Rating Background Level	The Rating Background Level (RBL) for noise in each period is the medium value of the Assessment Background Level (ABL) noise values for the period over all of the days during which noise is measured. There is therefore a noise RBL value for each period, day, evening and night.
Recycling	The processing of waste materials into a similar non-waste product. Related organic processing includes the conversion of organics into soil conditioners, compost, humus or other products such as mulching, fermentation and digestion. Such processes are best carried out under controlled conditions.
Reporting Period	For the purpose of an EPL, the reporting period means the period of 12 months after the issue of the EPL and each subsequent 12 month period. In the case of an EPL continued in force by the <i>POEO Act</i> , the date of issue of the licence is the first anniversary of the date of issue or last renewal of the Licence following the commencement of the Act.
Resource NSW	A former government agency formed by the Waste Avoidance and Resource Recovery (WARR) Act 2001 and now part of the DECCW. DECCW's functions in relation to waste are to develop, coordinate and evaluate the strategies and programmes for the state-wide achievement of the NSW Government's policies for minimising waste and maximising resource recovery.
Residual Waste	The fraction of the total waste stream remaining after re-use, recycling or recovery of materials, within reasonable economic and technical bounds.
Resource Recovery	The extraction from waste of potential resources that can subsequently be used in the manufacture of new products. The value of resource recovery initiatives includes the potential production of energy via the use of various components of waste as fuel, the production of saleable compost made from the organic fractions of waste and potentially the reclamation of land.
Run-off	The portion of rainwater that drains away as surface flow.
Scheduled Activity	An activity listed in Schedule 1 of the <i>POEO Act</i> . See Activity (Scheduled).
State Pollution Control Commission (SPCC)	The former name of the environmental regulatory agency within NSW. The former SPCC now operates under the name EPA and is part of the DECCW.

Term	Definition
Solid Waste	Has the same meaning as defined in Part 3 of Schedule 1 of the <i>Protection of the Environment Operations Act 1997</i> .
Solid Waste Landfill	A site for the disposal of Solid Waste by landfilling, as defined in <i>Environmental Guidelines: Solid Waste Landfills</i> (EPA 1996). Solid Waste Landfills may be defined as either: • General solid waste (putrescible), formerly known as "Solid Waste Class 1". • General solid waste (non-putrescible), formerly known as "Solid Waste Class 2".
Sound Pressure Level	An air pressure in noise measurement, which is the root mean square air pressure expressed as decibels relative to 106 Pascals (Pa).
Sound Power Level	A power measurement that is an intrinsic (independent of distance) parameter for sources of noise.
Turbidity	Turbidity is a measure of suspended material in water that can cause it to look discoloured or muddy. Turbidity is commonly measured in Nephelometric Turbidity Units (NTU), using standard equipment.
Utilisation Area	Area shown as a utilisation area on a map submitted with the application for an EPL.
Waste	Waste is defined under the <i>POEO Act</i> in the following manner: - Any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, or - Any discarded, rejected, unwanted, surplus or abandoned substance, or - Any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, processing, recovery or purification by a separate operation from that which produced the substance, or - Any substance prescribed by the regulation to be waste for the purposes of (the) Act. A substance is not precluded from being waste for the purposes of the Act merely because it is able to be processed, re-used or recycled.
Waste Codes	Waste codes are as listed in Appendix 5 of the EPA document - A Guide to Licensing Part B.
Waste Guidelines	The <i>Waste Guidelines</i> is a document titled <i>Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes</i> , issued by the EPA and in force from 1 July 1999 (EPA 1999a).
Waste Type	A categorisation of waste under the <i>POEO Act</i> and associated regulations into Group A, Group B, Group C, inert, solid, industrial or hazardous waste. Classification into Waste Type is determined under the procedures stated in the <i>Waste Guidelines 2008</i> .

Abbreviations and Acronyms

Abbreviations and Acronyms	Definition
AADT	Annual Average Daily Traffic
AAPH	Average Annual Public Holiday Traffic
AASS	Actual Acid Sulphate Soil
AAWE	Average Annual Weekend Traffic
AAWT	Average Annual Weekday Traffic
ABL	Assessment Background Level
ADLCCC	Armidale Dumaresq Landfill Community Consultative Committee
AECOM	AECOM Australia Pty Ltd
AEP	Annual Exceedance Probability
AGO	Australian Greenhouse Office
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
ANZECC	Australia and New Zealand Environment and Conservation Council
ARI	Average Reoccurrence Interval
ASD	Approach Site Distance
ASR	Archaeological Surveys & Reports Pty Ltd
AUSPLUME	A computer-based air dispersion model
AWT	Alternative Waste Technology
CAMBA	China-Australia Migratory Bird Agreement
CDC	Complying Development Certificate
CEC	Cation Exchange Capacity
CEMP	Construction Environmental Management Plan
CNMP	Construction Noise Management Plan
Council	Armidale Dumaresq Council
CQA	Construction Quality Assurance
CQC	Construction Quality Control
DA	Development Application
DEC	(the former) NSW Department of Environment and Conservation (now DECCW)
DECC	(the former) NSW Department of Environment and Climate Change (now DECCW)
DECCW	NSW Department of Environment, Climate Change and Water (formerly DECC)
DEWHA	Department of Environment, Water, Heritage and the Arts.

Abbreviations and Acronyms	Definition
DEWR	Commonwealth Department of Environment and Water Resources (DEWR, now DEWHA)
DGRs	Director-General's Requirements
DII	NSW Department of Industry and Investment (formerly DPI)
DIPNR	(the former) NSW Department of Infrastructure Planning and Natural Resources (now DoP and DWE)
DLWC	(the former) NSW Department of Land and Water Conservation (now DWE)
DNR	Department of Natural Resources
DoP	NSW Department of Planning
DPI	(the former) NSW Department of Primary Industries (now DII)
DUAP	(the former) NSW Department of Urban Affairs and Planning (now DoP)
DWE	The former NSW Department of Water and Energy (now NSW Office of Water and DII)
EA	Environmental Assessment
EAT	Emerson Aggregate Test
ECRTN	Environmental Criteria for Road Traffic Noise (EPA document)
EEC	Endangered Ecological Communities
EOI	Expressions of Interest
EPA	(the former) NSW Environment Protection Authority (now DECC)
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
EPBC Act	Commonwealth Environmental Protection and Biodiversity Conservation Act 1999
EPL	Environment Protection Licence
ERP	Emergency Response Plan
ESCP	Erosion and Sediment Control Plan
ESD	Ecologically Sustainable Development
ESP	Exchangeable Sodium Percentage
FSQ	Final Storage Quality
GCL	Geosynthetic Clay Liner
GHG	Greenhouse Gas
GIS	Geographical Information Systems
GRAWHA	Gondwana Rainforests of Australia World Heritage Area
GWP	Global Warming Potential
GVEPA	Gara Valley Environment Preservation Association
HDPE	High Density Polyethylene
IPCC	Intergovernmental Panel on Climate Change

Abbreviations and Acronyms	Definition
JAMBA	Japan-Australia Migratory Bird Agreement
LALC	Local Aboriginal Land Council
Landfill Facility	The proposed new Armidale Regional Solid Waste Landfill Facility, the subject of this EA.
LCS	Leachate Collection Systems
LEL	Lower Explosive Limit
LEMP	Landfill Environmental Management Plan
LEP	Local Environmental Plan
LGA	Local Government Area
MBT	Mechanical Biological Technologies
MRF	Materials Recycling Facility
MSDS	Material Safety Data Sheet
MSW	Municipal Solid Waste
NES	National Environmental Significance
NESAC	New England Strategic Alliance of Councils
NGACs	NSW Greenhouse Gas Abatement Certificates
NHNRC	National Health and Nutrition Research Council
NIRW	Northern Inland Regional Waste
NMOC	Non-methane organic compounds
NP&W Act	National Parks and Wildlife Act 1971
NRMMC	National Resource Management Ministerial Council
NTU	Nephelometric Turbidity Units
NV Act	Native Vegetation Act 2003
NW Act	Noxious Weeds Act 1993
°C	degrees of temperature (as measured in the Celsius scale, also known as Centigrade)
OH&S	Occupational Health and Safety
PAS	Priority Action Statement
PASS	Potential Acid Sulphate Soils
PEA	Preliminary Environmental Assessment
PFM	Planning Focus Meeting
PHA	Preliminary Hazard Analysis
POEO Act	NSW Protection of the Environment Operations Act 1997
RBL	Rating Background Level
REC	Renewable Energy Certificate
RFS	NSW Rural Fire Service

Abbreviations and Acronyms	Definition
RL	Relative Level
RLPB	Rural Lands Protection Board
ROTAP	Rare or Threatened Australian Plant
RTA	NSW Roads and Traffic Authority
RUM	Return Unwanted Medicines programme
SEPP	State Environmental Planning Policy
SEPP 2005	State Environmental Planning Policy (Major Development) 2005
SISD	Safe Intersection Sight Distance
SoC	Statement of Commitments
SPL	Sound Pressure Level
STP	Sewage Treatment Plant
SWL	Sound Power Level
TSC Act	Threatened Species Conservation Act 1995
TSP	Total Suspended Particulates
TSR	Travelling Stock Route
Tss	Total Suspended Solids
VCP	Vegetation Clearing Protocol
VCU	Vertical Composting Unit
VMP	Vegetation Management Plan
vpd	Volume per day
vph	Volume per hour
WARR Act	NSW Waste Avoidance and Resource Recovery Act 2001
WLMP	Water and Leachate Management Plan
WMP	Weed Management Plan
WSP	Water Sharing Plans
WSUD	Water Sensitive Urban Drainage
WTS	Waste Transfer Station