

### Relocation of Dead Wood and Dead Trees

Hollow-bearing trees and stags would be relocated to the offset area as logs or erected as stags (if feasible).

### Enhancing Structural Complexity

Structural complexity is considered to be a measure of the presence and relative abundance of characteristics such as the number and type of flora species, foliage arrangement, canopy cover, tree diameter and height, tree spacing, understorey vegetation and deadwood. Structurally complex vegetation would support a greater diversity of species.

To re-establish structural complexity and layers of vegetation in the offset area, the following measures would be considered:

- Selecting a mixture of plant species for regrowth.
- Selecting plants that grow to different heights (including different sized trees, shrubs and groundcover species).
- Spacing trees and shrubs at irregular distances.
- Ensuring complex groundcover is provided (including fallen logs and debris).

### Monitoring

On-going annual monitoring would include:

- Establishment of plots for ongoing vegetation monitoring.
- Monitoring vegetation regeneration (diversity assessment).
- Monitoring groundcover.
- Photo points.
- Reporting.
- Details of proposed monitoring are included in the Biodiversity Offset Management Plan (**Appendix H**).

### 8.8.18 Conclusions

The stringent controls to be implemented, the potential eradication of introduced species from the site and the inclusion of approximately 61 hectares of offset compensatory habitat would provide adequate mitigation to ensure there would be no net loss of biodiversity. With the proposed mitigation measures and Biodiversity Offset Management Plan, it is concluded that the proposal would have no long term significant impacts on biodiversity.

## 8.9 Socio-Economic

### 8.9.1 Existing Environment

#### Population

Armidale Dumaresq LGA has experienced moderate growth since the last population census in 2006, with a population increase of 1.6% between 2007-08. The estimated resident population at 30 June 2008 was in the order of 25,000 for the LGA.

Analysis of the age structure of the Armidale Dumaresq LGA in 2006 compared to the State shows Armidale has a relatively younger population than the NSW average with a higher percentage of the population aged under 24, and fewer adults aged over 25 compared with NSW (refer **Table 58**). The median age is significantly lower than NSW at 34 years of age compared to the NSW average of 37.

Table 58: Age Summary for Armidale Dumaresq LGA (2006 Census)

Characteristic	Armidale Dumaresq LGA		NSW Average	
	No. of persons	% of persons	No. of persons	% of persons
Infants (0-4)	1,364	5.8	420,434	6.4
Children (5-14)	3,294	14.1	878,483	13.4
Young Adults (15-24)	4,953	21.2	871,714	13.3
Adults (25-54)	8,371	35.8	2,753,218	42.0
Mature Adults (55-64)	2,399	10.3	719,551	11.0
Aged (65+)	2,988	12.8	905,778	13.8
Median age of persons	34		37	

### Dwellings

Analysis of the housing tenure of the population of Armidale Dumaresq LGA in 2006 compared to the NSW State average shows that there was a larger proportion of households who owned their dwelling; a slightly smaller proportion purchasing their dwelling; and a larger proportion of renters, as shown in **Table 59** below.

Table 59: Dwelling (occupied) summary for Armidale Dumaresq LGA (2006 Census)

Characteristic	Armidale Dumaresq LGA		NSW Average	
	No. of persons	% of persons	No. of persons	% of persons
Owned	2,892	33.4	820,540	30.1
Purchasing	2,185	25.3	745,336	27.3
Renting	3,013	34.8	700,645	25.7
Other or Not Stated	558	6.4	203,920	7.5

### Employment

Employment data from the ABS 2006 census is provided in **Table 60** below. Data shows that employment rates vary for the majority of the Armidale Dumaresq LGA compared with the State, with differences in full time employment being lower in the Armidale Dumaresq LGA than in the State. Unemployment levels in the Armidale Dumaresq LGA are also significantly higher than NSW.

Table 60: Employment summary for Armidale Dumaresq LGA (2006 Census)

Employment Status	Armidale Dumaresq LGA		NSW	
	No. of persons	%	No. of persons	%
Full time	5,800	54.1	1,879,631	60.8
Part time	3,402	31.7	842,714	27.2
Employed Away*	400	3.7	103,522	3.3
Employed Not stated	235	2.2	83,576	2.7
Employed (total)	9,837	91.7	2,909,443	94.1
Unemployed (total)	889	8.3	183,157	5.9

\* Persons employed but away from work

## Economic Structure

The economic structure of the Armidale Dumaresq LGA is reasonably diverse with the highest employment being in the education and training sector (refer to **Table 61** ).

**Table 61: Employment Distribution (%) based on ABS 2006 Census**

Sector	Armidale-Dumaresq LGA	NSW
Agriculture, forestry & fishing	5.3	2.70
Mining	0.24	0.70
Manufacturing	3.24	9.55
Electricity, gas, water & waste services	0.63	1.00
Construction	4.38	7.31
Wholesale trade	2.59	4.70
Retail trade	13.03	11.13
Accommodation & food services	8.69	6.55
Transport, postal & warehousing	1.94	5.00
Information media & telecommunications	1.3	2.37
Financial & insurance services	2.61	4.98
Rental, hiring & real estate services	1.12	1.74
Professional, scientific & technical services	5.99	7.33
Administrative & support services	1.78	3.11
Public administration & safety	6.16	6.01
Education & training	23.05	7.55
Health care & social assistance	12.3	10.46
Arts & recreation services	1.13	1.36
Other services	3.72	3.78
Not stated	0.8	2.65
Total	100	100

## Income

Personal income data for the Armidale Dumaresq LGA is provided in **Table 62** and **Table 63** below demonstrates that approximately 50% of the population earn less than \$600 per week. Weekly income data is slightly negatively skewed with few people earning greater than \$1,600 a week. **Table 63** demonstrates that income in the area is generally lower than that of the NSW average. Median individual and median household income in the Armidale Dumaresq LGA is significantly lower than the State average, however, median family income is only slightly lower than the State average.

Table 62: Weekly personal income for Armidale Dumaresq LGA

Weekly Income	Number of persons	%
Negative/Nil income	85	0.83
\$1-\$149	600	5.84
\$150-\$249	671	6.53
\$250-\$399	1,221	11.88
\$400-\$599	1,981	19.28
\$600-\$799	1,829	17.8
\$800-\$999	1,166	11.35
\$1,000-\$1,299	1,136	11.05
\$1,300-\$1,599	788	7.67
\$1,600-\$1,999	350	3.4
\$2,000 or more	346	3.37
Individual income not stated	104	1.0
Total	10,277	100

Table 63: Personal income data for Armidale Dumaresq LGA

Income	Armidale Dumaresq LGA	NSW
Median individual income (\$/weekly)	384	461
Median household income (\$/weekly)	855	1,036
Median family income (\$/weekly)	1,105	1,181

### 8.9.2 Potential Impacts

#### Social

Community consultation has been undertaken during the preparation of the EA to identify the issues that are considered of concern to the local community (refer **Section 7.0**). For ease of identification and management of the community issues, they have been categorised into key issues. The key issues for the community are those issues associated with:

- Site Selection.
- Landfill Design and Operation.
- Litter and Indiscriminate Dumping.
- Transport and Traffic.
- Air Quality.
- Noise.
- Surface water, Groundwater and Hydrogeology.
- Ecology, Flora and Fauna.
- Community Consultation.

- Visual Impact Assessment.
- Tourism.
- Cultural Heritage.
- Land Use.

A list of the key issues identified, and how the EA addressed and assessed the issues, is summarised in **Section 7.0**.

### **Employment**

The construction phase of the proposed landfill facility would employ up to 15 people. During operation of the proposed landfill, it is estimated that 2 people would be permanently employed on site, however there may also be other indirect employment opportunities including carrying out environmental monitoring of the proposed landfill, suppliers of goods and services and so on.

### **Economic Benefits and Gains**

The proposed landfill facility would have a positive economic impact on the Armidale Dumaresq LGA particularly through the increase in efficiencies associated with the transport of waste to only one location. Efficiencies will also be achieved through the removal of the need for all Councils involved to seek alternatives at a distance and at greater cost to the community.

In the longer term the capping, rehabilitation and decommissioning of the proposed landfill would be sufficient to allow future land practices in accordance with local zoning, including rural uses such as grazing. The Project Site would be returned to its pre-existing landuse condition. The ongoing use would be determined in consultation with relevant stakeholders and agencies. Rehabilitation of the site would be progressive through the stages of the proposed landfill and would be monitored by the DECCW as part of the EPL for the site. It is not anticipated that the landfill footprint would be rendered sterilised.

### **Economic Costs and Disadvantages**

Costs to develop the proposed landfill facility include the purchase of land and the construction costs associated with the development of an engineered landfill and associated facilities, including all nominated environmental controls.

There would be a direct impact on existing agricultural farming practices that are undertaken on the Project Site due to the acquisition of the land required for the proposed landfill. However, the current landowner would be compensated through the Council's purchase of the land.

There would be a direct impact on agricultural production at the Project Site resulting from the use of existing agricultural land for the proposed landfill facility and associated access road and infrastructure. The proposal includes the progressive rehabilitation of the land over the 50 year life of the landfill, with the ultimate aim of returning the landform to its pre-existing condition. In the long term the impact on agricultural production on the landfill footprint is considered to be negligible. There would be a long term impact on agricultural production on the land proposed for the biodiversity offset area. It is proposed to rehabilitate and revegetate approximately 61 hectares of stringybark woodland, box-gum woodland, sedgeland, grassland and wetlands surrounding the landfill footprint, however this would offset the loss of habitat within the landfill footprint and provide important habitat and corridors for long term benefits to biological diversity.

There are potential environmental impacts should the landfill operator not have the financial means within which to carry out remediation and implement adequate environmental safeguards. Financial assurance of the landfill operators is an important aspect relating to the ongoing viability of landfill operations.

### 8.9.3 Mitigation Measures

#### Social

The key issues as identified by the community and government stakeholders during the consultation process are summarised in **Tables 7-4** and **7-5**. This EA discusses specific mitigation strategies for social impacts relating to visual (including amenity issues), transport and traffic, air quality, noise, surface water, groundwater, flora, fauna, heritage issues and land use impacts. The draft SoC contained in **Section 9.0** outlines mitigation measures that will be implemented during both construction and operation phases and demonstrates Council's commitment to the management of social and environmental impacts of the project.

The landfill footprint would be rehabilitated to its pre-existing agricultural land use therefore no further mitigation measures are required.

#### Economic

The issue of appropriate compensation is being negotiated between Council and the two land owners who are directly impacted by the land acquisition requirements for the Project Site. Any future impacts relating to agricultural practices on the neighbouring properties, including loss of livestock through predation from introduced predators and crop damage by introduced pests, would be monitored for the life of the project. It is considered that the stringent daily controls on the management of potential vermin and pests would contain potential impacts.

## 8.10 Indigenous Heritage

Archaeological Surveys and Reports (ASR) was commissioned to undertake an archaeological assessment for the Project Site in 2006. Initial field investigations were undertaken in May 2006 by ASR with appropriate representation from the local Aboriginal community, the Anaiwan Aboriginal Traditional Owners Resource and Cultural Heritage Management Association Incorporation (Anaiwan Aboriginal Traditional Owners). The study sought to identify any Aboriginal sites and/or relics that might be present. The results of the investigation were presented in an initial report by ASR in 2006. Further consultation was also conducted by ASR in order to comply with the requirements of DECCW's *Guidelines For Aboriginal Cultural Heritage Impact Assessment and Community Consultation* document, as required in the revised (2008) DGRs (refer **Appendix A**). This most recent requirement stipulates that "all interested Aboriginal stakeholders" should be appropriately consulted and informed of the proposed development.

Further advertising and consultation with the interested Aboriginal stakeholders was undertaken by ASR in accordance with the requirements of the DECCW guidelines. ASR's initial (2006) report has now been appropriately updated and the final report entitled *The Archaeological Investigation for Sites of Indigenous Cultural Significance for Part 3A Approval – New England Regional Landfill – Waterfall Way, east of Armidale, Northern Tablelands, NSW* (March, 2009) is presented in **Appendix R** and its findings summarised below.

### 8.10.1 Existing Environment

#### Environmental Context

The Project Site lies within a landscape of rolling hills generally bisected by drainage depressions. Some ridges are marked by reef-like exposures of meta-sedimentary rock, particularly those at the northern end of the local area. Surface exposures along the drainage lines also exhibit weathered, almost stoneless sedimentary soils. Most slopes retain a surface layer or A-Horizon of weathered coarse, sandy pasture soils formed on the surface of the Armidale beds.

The Project Site lies less than four kilometres to the north of the Gara Gorge on the eastern escarpment of the Northern Tablelands, a complex landform unit within NSW's Great Dividing Range. The Project Site would be within one of several drainage depressions that form the catchment to an unnamed creek that drains to the north-east and then to the east, ultimately flowing into the Gara River, about two kilometres to the north-east of the survey area. In pre-colonial times, clean, drinkable water would have been available from the Gara River to the local Aboriginal inhabitants and it is therefore considered unlikely that this area's potential for use by Aboriginal people, at that time, would have been limited by the lack of access to a reliable water source.

Aerial photography indicates that at least 60% of the area surrounding the Project Site has been cleared for agriculture. Much of the remaining 40% of tree covered land comprises eucalypt regrowth, or trees that are less than about 150 years old. Cattle grazing around these areas has since severely limited the re-growth of understorey species. It is considered that there would have been few reliable potential food resources in the area, however, typical of most, similar "New England" environments, there would have been potential for the presence of kangaroos, koalas, possums, bats, goannas, lace monitors, skinks and other lizards, snakes, turtles, birds and various edible insects. Other potential food resources would also have been available, like "sugarbag" (i.e. the honey of native bees) for example, but perhaps only opportunistically or infrequently.

No potential source of material that might have been suitable for knapping into stone tools or weapons was observed within the Project Site. If artefacts do exist at this location, it is considered most likely that these would have been imported from a lag deposit stone or outcropping meta-sedimentary formation from outside of the survey area.

### Aboriginal Consultation

DECCW's *Guidelines for Consultation* require that all Indigenous heritage investigations be undertaken with an appropriately nominated Aboriginal community representative. In most instances this representative would be nominated by the LALC, however the office of the Armidale LALC had been closed for several months prior to and during the time of ASR's 2006 investigations. ASR was also unable to contact the past-Chairperson of the Armidale LALC at that time. Contact with the Armidale LALC was therefore not possible, however it was considered that the Anaiwan community was instead able to appropriately represent the local Aboriginal community. The Anaiwan Aboriginal Traditional Owners group was subsequently invited to assist with ASR's 2006 investigations, including the site inspection that was undertaken on 29th May 2006. During these investigations, ASR and the Anaiwan group's representatives discussed the proposed survey strategy, the potential for sites to be present and the results of the investigation. The recommendations that the Anaiwan group were most likely to make were also discussed with ASR. The Anaiwan representative agreed to provide ASR with a written statement of their recommendations, a copy of which is included in the appendices to ASR's report (refer **Appendix R**).

DECCW's *Guidelines for Consultation* require that Aboriginal stakeholders should be appropriately consulted and informed of the proposed development. Appropriate advertisements were therefore placed in the local print media, inviting all Aboriginal stakeholders with a potential interest in the project to register their interest within 14 days of publication the advertisement. Copies of the advertisements placed in The Armidale Express on 2 February 2009 and in The Armidale Independent on 4 February 2009 are also presented in the appendices to ASR's report (**Appendix R**).

Two responses to these advertisements were received, one from Nyakka Aboriginal Culture Heritage Corporation Archaeological & Cultural Heritage Consultants (Nyakka – the current name of the group formerly known as Anaiwan Aboriginal Traditional Owners group, referred to above) and another from an individual respondent. The Nyakka group and the individual respondent have both been formerly registered as stakeholders in this project. In February 2009, ASR contacted both respondents to enquire whether either party wished to participate in a stakeholder meeting to discuss the project further. Both parties have subsequently advised ASR that they regard the information already provided as satisfactory and that a formal meeting of stakeholders would not be required.

In February 2010, a representative on the Board of the reappointed Armidale LALC was contacted and informed of the proposal, consultation and site investigations that have taken place. Ongoing consultation with Aboriginal stakeholders will continue during detailed design of the proposed landfill facility. It is therefore considered that all the relevant requirements for Aboriginal Community consultation under DECCW's *Guidelines* document have been appropriately addressed.

## AHIMS Site Register

For the purposes of its initial 2006 investigations, ASR undertook a search of the DECCW's Aboriginal Heritage Information Management System (AHIMS) Site Register to identify all previously registered sites within an area of 8km (west to east) by 10km (north to south) distance, centred on the location of the Project Site. Details are included in the Appendices of ASR's report, presented in **Appendix R**. Five sites were identified by this search (refer to Figure 1 within ASR's report). Two of the sites were isolated artefacts (TH/JA 4 and TH/JA 6), however one of these sites, TH/JA 4, located beside Billys Gully and less than three kilometres to the east the Project Site, contained 'at least 2,000 artefacts'. Another site, TH/JA 3, contained 26 artefacts and is located less than 350m to the west of the proposed road corridor, on a knoll overlooking a confluence of two tributaries of the catchment area of the Project Site. It has been estimated that the TH/JA 3 site probably contained at least 500 artefacts, of which 26 have been identified and documented. The vast majority of all the artefacts recorded in all five previously registered AHIMS sites consisted of silcrete. The remainder are from various silicified meta-sedimentary rocks, such as greywacke, for example.

Of the five previously registered sites within 8 to 10km of the Project Site, none are within the immediate vicinity.

## Site Survey

A predictive model was developed for the survey area, to assist with development of the survey strategy. The predictive model considers several factors that are likely to affect where Aboriginal people are most likely to have lived, worked or travelled, i.e. where they may have left evidence of their activities. The model also predicts the degree to which evidence might be observable within the present record (on site) (refer **Appendix R**).

It should be noted that within the Project Site there are no stone resources that are considered suitable for knapping material, no mature trees, no reliable water source, no particular food resources, overhangs or shelters and no exposed rock surfaces. The modelling work conducted therefore considers that the following is most likely for this site:

- Isolated artefacts may be present and visible in erosion features.
- Low-density artefact scatters may be present and visible in erosion features, however it is unlikely that any debitage will be visible.
- There is very little potential for any scarred or carved trees to be present as there are few trees likely to be more than 150 years old.
- No shell middens are expected to be present.
- In the absence of any shelters it is not expected that there would be any art sites.
- There would be no surfaces exhibiting engravings or grinding grooves.
- There would be no intact occupation deposits.
- There would be no identifiable mythological sites in or near the Project Site.
- There would be stone quarries.
- There would be visible evidence of burials.
- There would be no surviving or visible Bora rings.
- There would be no stone arrangements.

The site survey undertaken by ASR on 29th May 2006 was assisted by a representative from the Anaiwan Aboriginal Traditional Owners group. The survey was undertaken on foot, in daylight that was considered ideal for observing artefactual material. A further site survey of the TSR area was undertaken on 22nd August 2006, again under suitable conditions. Site photographs taken during the surveys are included in ASR's report, *The Archaeological Investigation for Sites of Indigenous Cultural Significance for Part 3A Approval, New England Regional Landfill* (refer **Appendix R**). Two previously unidentified isolated artefacts were observed during the survey (**Figure 24**) and are described below.



**GL ISO1 – Silcrete Flake Scraper**

GL ISO1 is an isolated artefact consisting of a silcrete flake scraper measuring 62 x 52 x 24 millimetres. It was found in the southern section of the study area (refer **Figure 24**) in an erosion feature in open dry sclerophyll woodland of predominantly regrowth eucalypts with some casuarina trees. The woodland has been logged and felled timber has been heaped into unburnt piles. There is likely to be significant displacement of surface material, however the artefact depositional location was probably within a 20 metre radius of the find-spot. It is unlikely that this was a camp site. The artefact was probably dropped or left behind accidentally as it is still in a usable condition as a scraper.

**GL ISO2 – Silcrete Flake**

GL ISO2 is also an isolated artefact consisting of a silcrete flake. The artefact measures 31 x 46 x 15 millimetres and has a possible 'retouch' to both margins, however this could be a result of being trodden on by stock. A photograph of the artefact is presented in ASR's report (**Appendix R**). The artefact was identified within the southern eroded face of the creek bank within an area of cleared pasture, approximately 350 metres from a small, previously recorded camp site on the summit of a hillock overlooking the creek. It is not possible to say where the artefact was originally deposited because these creek bank deposits are likely to be both alluvial and colluvial in origin. The area has also been cleared of vegetation and subjected to stock grazing. If it is assumed that it has not travelled far from where it was originally deposited, then there is potential for other artefacts to exist along either bank of the creek. Finds would however likely consist of isolated artefacts and/or low density artefact scatters, neither of which would be visible. Owing to the likelihood that any artefacts would be sparsely distributed, ASR concluded that it would not be practical to undertake subsurface investigation.



- Biodiversity offset area
- Landfill footprint
- Leachate pond
- Sedimentation basin
- Dry basin
- Indigenous heritage site

**ARMIDALE DUMARESQ COUNCIL - ARMIDALE REGIONAL LANDFILL FACILITY**  
**LOCATION OF TWO PREVIOUSLY UNIDENTIFIED INDIGENOUS HERITAGE ITEMS**

FEB 2010

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0 150 300 600 m

Fig. **24**

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### 8.10.2 Potential Impacts

Potential impacts of the construction and operation of the proposed landfill would be the disturbance or destruction of archaeological material or depositional contexts via earthworks required for site preparation, construction of the access road, during clearing of vegetation and/or landscaping of peripheral areas or from long term burial beneath the actual landfill mass.

It is reasonable to assume that if there is any artefactual material present within any affected areas of the site, this would most likely occur along the banks of the main creek and would consist of isolated artefacts and/or low density artefact scatters. Where present, these would be expected to be impacted during site clearance and/or other site disturbing activities. It is expected that any artefacts would be sparsely distributed and may be concealed within the sod layer, however it is not considered practical to undertake subsurface investigation in order to potentially recover only a very limited number of further artefacts. It is reasonable to assume, however, that appropriate monitoring of all earthworks conducted along the creek banks might yield additional artefactual material, especially in the vicinity of the artefact find.

It is considered that there is little potential for the Project Site to contain any significant archaeological material, even though the Project Site occurs in a region in which there are known to be places of Aboriginal association. The land is already considerably disturbed and there are few undisturbed contexts in which archaeological material may still occur. If present, such material is more likely to consist of small isolated artefacts or low density open scatters, none of which would be observed other than by chance.

### 8.10.3 Mitigation Measures

The two isolated artefact finds observed during the site survey were not identified during the initial design stages of the proposed landfill facility, however the overall footprint of both the proposed landfill and its access way have since been re-designed around the location of the two artefact sites. Therefore, it is not expected that these identified items would be impacted by the works.

An appropriate management strategy has been developed to further mitigate any potential for either of the sites to be damaged by activities associated with the construction and operation of the landfill facility. Key elements of the management strategy are discussed below.

#### Registering of Sites with DECCW

The two artefact sites identified during the archaeological site survey have been registered with DECCW on their AHIMS Site Register.

#### Stop Work Provisions

The *National Parks & Wildlife Act 1974* requires that “stop work” provisions need to be adhered to by construction teams and all other on-site employees. All employees and/or contractors would therefore be instructed that in the event that they should encounter or unearth any bone or stone artefacts, discrete distributions of shell or any other objects of potential cultural association during earthmoving or other activities, work should cease immediately in the area of that find. The on-site environmental officer would be contacted immediately and would then arrange for a qualified archaeologist to examine the find and advise on an appropriate course of action that would be undertaken prior to any further work being conducted within the vicinity of that location.

#### Monitoring During Certain Works

It is recommended that an appropriate representative of the Nyakka Aboriginal Culture Heritage Corporation Archaeological and Cultural Heritage Consultants be present during the following activities:

- Turf stripping.
- Clearing of piled timber.
- Removal of existing vegetation within wooded areas of the survey area.
- Any earthworks within 25 metres on either side of the main creek line that crosses the road corridor.



### Long Term Protection

Both artefact sites identified during the archaeological site survey would be fenced to provide protection during both the construction and operation phases of the proposed development. Fencing would consist of a circle of vertical posts at a radius of 5 metres from artefact GL ISO1 and 10 metres from artefact GLISO2.

These barriers are intended for the protection of the site during both construction and operation of the landfill and would be in place prior to any such work commencing, where practical.

### Indigenous Heritage Management Plan

An Indigenous Heritage Management Plan (IHMP) would be prepared to set out appropriate mitigation measures to protect the known sites and management actions that would be implemented during construction and operation in the unlikely event that further artefacts are encountered. Further consultation with Aboriginal stakeholders would be undertaken during detailed design and prior to construction commencing. Further mitigation measures required would be confirmed through ongoing consultation and development of the IHMP.

## 8.11 European Heritage

### 8.11.1 Existing Environment

Investigations into the non-indigenous heritage potential within approximately 500 metres surrounding the site were conducted by desk-top searches. The following registers, lists and documents were searched as part of this assessment:

- World Heritage List (DEWHA).
- National Heritage List (DEWHA).
- Register of the National Estate (Australian Heritage Council).
- State Heritage Register and Inventory (NSW Heritage Office).
- Dumaresq LEP No. 1 (As Amended) (Armidale Dumaresq Council).
- Draft Armidale Dumaresq LEP 2006, Schedule 2 (Armidale Dumaresq Council).
- National Trust Register (National Trust of Australia).
- Dumaresq Shire Heritage Study (EJE Town Planning, 1997).

No listed items were identified within 500 metres of the site. This is most likely due to the Project Site being used primarily for agricultural purposes, with low levels of development.

### Travelling Stock Route

Access to the proposed landfill facility crosses a section of TSR dating from at least 1915, although more likely from 1884 when approximately 600,000 hectares of NSW land was set aside as Crown Land to walk stock between properties and to markets. RLPB rangers maintain and police the vast network of reserves, and permits are obtained from the RLPB for walking or grazing stock within the TSR network.

Although formalised as Crown Land during the late 19th Century, many of these routes would have originally been traditional Aboriginal tracks across dry country, linking rivers and scattered water resources such as waterholes and artesian springs (Pearson, 1999). As the requirements of the drovers were the same as the Aboriginal inhabitants – to follow water sources – these tracks were a logical location for stock routes. Eventually, roads (e.g. Waterfall Way) also followed the stock routes for the same reason.

Consultation with the RLPB and also the environmental division of the Department of Lands (Armidale office) was undertaken with the intention of establishing whether any of the TSR have non-indigenous heritage significance. Both the RLPB and Department of Lands advised that this was unlikely as they are not unusual or rare in any way and their greatest significance is usually as remnant vegetation, depending on how much clearing has been undertaken in the surrounds.

### 8.11.2 Potential Impacts

Although the TSR was established in the late 19th Century, it is considered that any potential significance associated with the TSR in this area is more likely associated with the remaining vegetation (in contrast to the clearing which has taken place in the surrounds), rather than any non-Indigenous heritage values. It is therefore considered that any impact to the non-indigenous heritage potential of the TSR as a result of the project would be negligible.

### 8.11.3 Mitigation Measures

As no listed items were found within 500 metres of the Project Site and potential impacts on the non-indigenous potential of the TSR are considered negligible, no mitigation measures have been recommended.

## 8.12 National Environmental Heritage (Oxley Wild Rivers National Park)

Oxley Wild Rivers National Park is part of the GRAWHA, a World Heritage Property protected under the *EPBC Act*. The Oxley Wild Rivers National Park is situated 4 kilometres from the Project Site. The Australian Heritage Database Statement of Significance describes how, in 1986 a number of rainforest reserves located along the great escarpment of eastern NSW, were inscribed on the World Heritage list for their outstanding natural universal values. These rainforest reserves are collectively known as the GRAWHA. Their acknowledged natural values are listed below:

- As an outstanding example representing major stages of the earth's evolutionary history.
- As an outstanding example representing significant ongoing geological processes and biological evolution.
- Containing important and significant habitats for the in-situ conservation of biological diversity.

Given the significance of the area, on 3 August 2007 details about the project were referred to the (former) Commonwealth DEWR (now DEWHA), with a request that a determination be made under the *EPBC Act* (refer **Section 6.2.1**).

DEWR subsequently declared the project to be a "controlled action" under the *EPBC Act*, as it was considered that the proposal has the potential to have a significant impact on the following:

- World Heritage Properties (pursuant to Sections 12 and 15A of the *EPBC Act*).
- National Heritage Places (pursuant to Sections 15B and 15C of the Act).

The proposed development therefore requires assessment under the *EPBC Act* (refer **Section 6.1.1**).

### 8.12.1 Potential Impacts

Community concerns have been noted regarding potential for pollution of the Gara River through leachate migration from the landfill, which if allowed to occur would then flow into the Oxley Wild Rivers National Park. The issues relating to possible surface and ground water migration are addressed in **Sections 8.3 and 8.4** of this EA. The possible pathways for contamination of the Gara River are via leachate or dirty water entering the unnamed creek to the north of the proposed landfill facility; or via a failure of the landfill liner leading to contamination of the groundwater and eventual discharge to the Gara River. Stringent environmental controls to manage dirty stormwater runoff, leachate containment and emergency storage would be implemented and would reduce the likelihood of impacts to surface and groundwater to negligible levels. Therefore, the impacts on the OWRNP and GRAWHA would be negligible.

### 8.12.2 Mitigation Measures

The Commonwealth listed issues to be addressed in a letter (August, 2009) including the ongoing integrity of the landfill's liner system and its ability to adequately address all potentially significant leachate migration problems. A Hydrogeological (Leachate) Assessment (AECOM, 2010) and comprehensive literature review were conducted to provide detailed and quantified information about the long term performance of the landfill liner. The full results of the Hydrogeological (Leachate) Assessment and literature review are presented in **Appendix I**.

In order to maximise the security of the liner, to minimise risk to the environment and to also provide a cost effective outcome for the local community, it is proposed that a liner comprising a clay layer in combination with an artificial liner such as a GCL or an HDPE layer (or other equivalent) would be used (refer **Section 5.2 and Appendix B**).

A WLMP has been developed to ensure that both surface water and leachate are properly and effectively controlled and managed during the operational life of the landfill (**Appendix B**). The WLMP considers all aspects of the surface water and leachate storage at the Project Site, including design of a permanent leachate pond, sedimentation basin and dry basin. The detailed design of the landfill facility would ensure there would be no discharge of operational (i.e. leachate or dirty water) to the receiving environment and all leachate and dirty water up to the 100 year ARI event would be able to be stored on site. The WLMP is presented as an appendix to the LEMP, in **Appendix B**.