
Appendix 3 –Asbestos Risk Assessment (SLR, 2012)



global environmental solutions

**Asbestos Risk Assessment
Block 789 Nudurr Drive, Gungahlin ACT**

Report Number 670.10376-R1

30 August 2012

Umwelt (Australia) Pty Ltd

PO Box 6135

O'Connor ACT 2602

Version: Revision 0

Asbestos Risk Assessment Block 789 Nudurr Drive, Gungahlin ACT

PREPARED BY:

SLR Consulting Australia Pty Ltd
ABN 29 001 584 612
2 Lincoln Street Lane Cove NSW 2066 Australia
(PO Box 176 Lane Cove NSW 1595 Australia)
T: 61 2 9428 8100 F: 61 2 9427 8200
E: sydney@slrconsulting.com www.slrconsulting.com

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the Client.

Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Umwelt (Australia) Pty Ltd. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR Consulting.

SLR Consulting disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
670.10376-R1	Revision 0	30 August 2012	Nalin De Silva	Adam Marshall	Nalin De Silva

Table of Contents

1.0	Introduction	1
2.0	Background	2
3.0	Objectives	3
4.0	Scope of Works	4
5.0	Results	5
5.1	<i>Review of ACT EPA Contaminated Land Search</i>	5
5.2	<i>Review of Coffey Environments (2009) Phase 1 Environmental Site Assessment</i>	5
5.3	<i>Review of Coffey (2012) Contamination Assessment</i>	6
5.4	<i>Proposed Land Use</i>	7
5.5	<i>Site Walkover</i>	8
6.0	Discussion	8
6.1	<i>Characterisation of Asbestos Contamination</i>	8
6.2	<i>Impact and Risk Assessment</i>	9
6.3	<i>Potential Management Options</i>	11
7.0	Conclusion	13
8.0	Recommendations	14
9.0	Closure	15

Appendices

Appendix A	ACT EPA Contamination Land Search
Appendix B	Coffey Figure Showing the Asbestos Landfill Area
Appendix C	Site Photographs

Error! Unknown document property name.
Offset Management Plan - EPBC 2010/5750

Report Number **Error! Unknown document property name.**
Error! Unknown document property name.
Error! Unknown document property name.
Page 1

1.0 Introduction

SLR Consulting Pty Ltd (SLR Consulting) was commissioned by Umwelt (Australia) Pty Ltd (Umwelt) to conduct an asbestos risk assessment at a property located at Block 789 Nudurr Drive, Gungahlin ACT (the site). This report presents the findings of the asbestos risk assessment.

The risk assessment was conducted in accordance with the SLR Consulting's Offer of Services dated 28 June 2012 (ref: 670 10376 P1 20120627).

2.0 Background

The site is proposed to be used as a biodiversity offset with respect to Striped Legless Lizards. Habitat requirements of this species can be generally described as native grasslands, but they are also known to occur in areas dominated by exotic grasses such as the common pasture grass Phalaris. The area would be incorporated into the adjacent Gungaharra Grasslands Nature Reserve and be managed for biodiversity values that favour the protection and recovery of natural temperate grasslands and Striped Legless Lizards. There are also a number of other grassland species which would be targeted in management activities within this area.

The maintenance of the biodiversity offset area will require the undertaking of various activities that will likely disturb the site soils. Such activities include:

- Weed management;
- Pest and animal control;
- Monitoring of Striped Legless Lizard populations and other fauna species;
- Monitoring of flora species;
- Habitat enhancement works including controlled burning; and
- Hazard reduction burning to manage bushfire risk.

Additionally, we understand that the site may also be open to public use as open space recreational land following the inclusion as an ecological offset area.

The site is understood to have been formerly used as an asbestos disposal facility. Asbestos is understood to have been placed in shipping containers and buried at depth.

This risk assessment was required assess the potential asbestos risks if the site was to be used as a biodiversity offset area.

3.0 Objectives

The objectives of the asbestos risk assessment were to:

- Assess the historical asbestos disposal methods and practices that may have occurred at the site using publicly available information;
- Review available information pertaining to the current contamination status of the site;
- Assess potential risks to future site users if the site was to be used as a biodiversity offset area; and
- Outline potential management measures that could minimise identified risks to future site users.

4.0 Scope of Works

SLR Consulting conducted the following scope of works to achieve the above objectives:

- Liaise with ACT EPA to obtain information relevant to the site's historical asbestos disposal activity;
- Conduct an ACT EPA Contaminated Land Search;
- Liaise with ACT EPA and ACT Roads to obtain copies of the following contamination assessment reports that has been prepared for the site:
 - **Coffey Environments, 2009.** Phase 1 Environmental Site Assessment – C09017.1 Gungahlin Asbestos Soil Site Investigation (*ref: ENVICANB00280AA-R01*); and
 - **Coffey Environments, 2012.** Contamination Assessment – Nudurr Drive Extension, Gungahlin ACT (*ref: ENVICANB00280AE-R02_Rev1*)
- Review of the above Coffey Environments reports to assess current site conditions as well as the previous asbestos disposal practices;
- Liaise with Umwelt to assess nature of proposed land use as a biodiversity offset area;
- A site walkover to visually assess the current site conditions, including visible evidence of asbestos contamination; and
- Prepare this report.

5.0 Results

5.1 Review of ACT EPA Contaminated Land Search

A search of the ACT EPA records on contaminated land was requested by SLR Consulting on 11 July 2012. The search result provided by ACT EPA is attached in Appendix A.

The ACT EPA records indicate that the site was formerly known as Block 516 Gungahlin and that a historic asbestos disposal facility is located at the site, which is recorded on the EPA Contaminated Sites Management Database and Geographic Information System as a Landfill site (Appendix A). According to the records the facility was used as a repository for the asbestos collected during the ACT asbestos removal program in the late 1980's and early 1990's. It is understood the asbestos disposed at the site was double bagged and then placed in wooden crates or shipping containers and interned under 3 to 4m of "clean fill."

EPA records also indicate that uncontrolled filling occurred at the site following the closure of the asbestos disposal facility. The record notes that ANZECC 1992 guidelines and Contaminated Sites Environment Protection Policy (EPP) lists landfills as activities associated with land contamination.

The search indicated that ACT EPA has not issued any environment protection orders under the Environment Protection Act 1997 and that the site is not registered on the ACT Contaminated Sites Register.

No information is available on the ACT EPA Contaminated Land search regarding the current contamination status of the site.

5.2 Review of Coffey Environments (2009) Phase 1 Environmental Site Assessment

The Coffey Environments (2009) Phase 1 Environmental Site Assessment (ESA) was prepared for Brown Consulting to assess the suitability of the investigation area for the Nudurr Drive Extension, which passes over the north western corner of the site. The investigation area was limited to only the north western corner of the site. The scope of work conducted included:

- Site history review;
- Site walkover; and
- Ground Penetrating Radar (GPR) survey to assess fill thickness.

Information relevant to our asbestos risk assessment for the proposed biodiversity offset area is summarised below.

The site history review conducted by Coffey Environments (2009) indicated that:

- The site was formerly a clay quarry for the local brickworks;
- Subsequently the site was used for the disposal of asbestos in late 1980's and early 1990's;

- Asbestos was double bagged, placed in crates or shipping containers and buried beneath a soil capping layer of approximately 1m thickness (contrary to the EPA Contamination Land Search which indicated 3-4m of fill thickness);
- Subsequently, the site was used by Delta Demolitions (Delta) for the disposal of general building spoil in the late 1990's;
- Delta was ordered by ACT EPA to remediate the site after 2001, though SLR Consulting notes that the EPA Contaminated Land Search indicates that the site did not have any environmental protection orders issued. If remediation works were in fact undertaken by Delta, the method of remediation or confirmation of remediation works being conducted is not provided in Coffey Environments (2009) report;
- The thickness of capping material initially placed over the landfill was deemed insufficient and additional fill was placed to elevate the site levels to present ground surface;

The GPR survey had indicated that the thickness of capping material (presumably meaning above the bagged and contained asbestos) is less than the 3 to 4m indicated by ACT EPA records, and was likely to vary between 0.5m and 1.5m.

The Coffey (2009) report concluded the following:

- There was some doubt regarding the available information due to discrepancies between elevation of buried asbestos containers and current surface elevations; and
- The actual depth to the buried asbestos is unclear, especially given that the GPR survey suggests cap thickness of between 0.5m to 1.5m.

Coffey (2009) recommended further assessment including intrusive works and soil analysis to characterise the contamination status of the site.

5.3 Review of Coffey (2012) Contamination Assessment

The Coffey Environments (2012) contamination assessment was conducted to fulfil the recommendations made by Coffey Environments (2009). The objectives of the Coffey Environments (2012) assessment included, amongst others, the characterisation of soil contamination within the northern portion of the site where Nudurr Drive extension was proposed. The scope of works conducted included:

- Sampling of stockpiled soil material observed at the site;
- Excavation and sampling of 13 test pits across the northern portion of the site (refer to Coffey Environments (2012) Figure 3 attached in **Appendix B**), with five test pits within the northern portion of the landfill area; and
- Analysis of selected soil samples for a range of contaminants of concern, including asbestos.

Coffey Environments' findings relevant to the asbestos risk assessment are summarised below:

- Subsurface conditions in the northern portion of asbestos disposal area included 100mm to 200mm of topsoil overlying miscellaneous mixed waste. The waste was observed to include plastic bags, plastic and glass bottles, tiles, bricks, concrete, wood, scrap metal including corrugated iron sheeting, and metal drums. In addition, what appeared to be fragments of asbestos containing material (ACM) were encountered in test pit TP11.
- SLR Consulting considers this mixed waste is likely to be a mixture of rubble filled by Delta and uncontrolled filling that occurred on the site, rather than controlled disposal of contained asbestos that occurred in Late 1980's and early 1990's;
- The thickness of the capping material (100mm to 200mm) above the identified mixed waste, which contained asbestos in one tested location, was considered to be less than the 3m required by the ACT EPA requirements;
- No asbestos, including fibres, were detected in samples tested from the test pits;
- Capping material and the mixed waste material observed in the northern portion of the asbestos disposal area were considered suitable to remain on the site, from a contamination perspective, with regards to the extension of Nudurr Drive; and
- The two stockpiles observed at the site consisted of relatively homogeneous soil with occasional gravel and brick fragments and as such were deemed suitable to remain on site.

5.4 Proposed Land Use

Activities that could be expected to occur in relation to maintaining this proposed biodiversity offset area would include:

- Weed management either by spraying or removal. Most weeds are likely to be controlled by spraying however some woody weeds are present in the vicinity that may also be subject to physical removal or 'cut and paint' whereby the stems are cut and the exposed wood painted with a herbicide such as glyphosate. Physical removal would be effected by the use of hand tools such as a mattock and spade;
- Pest animal control that may include baiting, trapping and shooting as required;
- Monitoring of Striped Legless Lizard populations, which have historically included the use of pitfall traps (numerous holes dug to about 50cm along a transect) but more recent surveys have used habitat augmentation methods that do not involve excavation of soil;
- Surveys for other fauna that would include observation only by the researcher walking through the area being assessed;
- Monitoring surveys for plants that would involve direct observation and occasionally also some sampling. Sampling typically involved removing a part of the plant however in some instances the entire plant may be removed, including the root system which needs to be dug up. Should sampling require removal of root systems, this is likely to only be for plants with shallow systems such as grasses in addition to forbs and herbs such as grassland daisies or orchids;
- Photographic monitoring points may also be established, which may involve the installation of a star picket or similar permanent marker to allow subsequent inspections to record the same location;

- Habitat enhancement works including the use of controlled burns to encourage regeneration of the native grass vegetation; and
- Bushfire hazard management, including selected vegetation removal, slashing, targeted grazing and occasional hazard reduction burning. Whether this activity would directly affect Block 789 is unknown at this stage.

Following the inclusion of the site as an ecological offset area, we understand that the site will be open to the public for open space recreational use. It is not known at this stage what specific recreational activities will be permitted at the site.

5.5 Site Walkover

SLR Consulting conducted a site walkover on 10 July 2012. The observed site conditions are summarised below:

- The site covering consisted dense grass cover across the majority of the site, with occasional bare patches or less dense grass in the western portion of the site;
- A long narrow soil mound, approximately 1m to 1.5m high was observed adjacent to the northern site boundary, and consisted of a row of trees, presumably to provide a visual barrier to the residents to the north;
- Another soil stockpile, smaller in size, was located in the north western corner of the site; and
- No obvious visual evidence of asbestos contamination was observed on site during the walkover. However, we note that that site walkover was not a detailed, gridded site walkover, which was indented to provide familiarity with the site rather than to assess the presence of visible asbestos impact.

Selected site photographs are attached in Appendix C.

6.0 Discussion

6.1 Characterisation of Asbestos Contamination

From the information reviewed and discussions with ACT EPA and ACT Roads, the site contains, or potentially contains, asbestos due to:

- Controlled and authorised disposal of asbestos waste, double bagged, contained in crates and shipping containers, buried at a depth 3m to 4m, presumably from the current surface levels;
- Filling of building rubble by Delta, which could also have contained asbestos, though there is no documentation regarding the presence or absence of asbestos in this rubble. In our experience, there is a likelihood of asbestos being present in dumped building rubble. The fact that ACT EPA issued a remediation order to Delta following their filling of the site with building rubble also supports the possibility of contamination, potentially including asbestos, being present in the rubble filled by Delta; and

- Uncontrolled filling that is reported to have occurred on the site. It is unclear from the reviewed information whether the uncontrolled filling occurred before or after (or both) the remediation by Delta.

We note that the reviewed information did not contain any evidence of or reference to any remediation works conducted by Delta to satisfy the remediation order that was issued by the EPA. Additionally, we note that the Coffey Environments reports were generally limited to the northern portion of the site and did not comment on the subsurface conditions throughout the entire site. Based on the reviewed information, SLR Consulting considers that the above identified sources of asbestos (controlled containment of asbestos, filling by Delta and uncontrolled filling) are likely to be applicable to the majority of the site, if not the whole site.

Based on the information reviewed and the site walkover, SLR Consulting considers that there is a moderate potential for asbestos to be present in the fill material in the northern portion of the site, both at the surface and in near surface fill, as well as deeper fill material that comprised mixed waste. Additionally, the site is known to contain double bagged asbestos waste, in shipping containers or wooden crates, buried at depth.

Given that no intrusive assessments have been conducted on the majority of the site (south of the Coffey Environments investigation area – Appendix B), it is not possible to confirm whether the subsurface conditions in those areas are similar to that reported in the northern portion of the site. In the absence of intrusive assessments to suggest otherwise, SLR Consulting considers there is a moderate potential for the majority of the site to contain asbestos contamination in the surface and near surface fill material. Intrusive assessment will be required to rule out the potential for asbestos contamination, or to quantify or assess the extent of such contamination if present.

6.2 Impact and Risk Assessment

Based on the likely activities that would be required if the site was used as a biodiversity offset area, SLR Consulting considers there is potential for the occasional and minor disturbance of surface and near surface soils to a depth of up to 1m, but typically to depths less than 0.5m. Given the assumed moderate potential for asbestos to be present in the surface and near surface soils, we consider that there will be a low to moderate potential for exposure to asbestos contamination by personnel conducting the activities related to the biodiversity offset area. There is also potential for the above mentioned activities to spread any asbestos contamination present to other parts of the site that may not be contaminated, or to even allow the asbestos contamination to migrate offsite.

We have characterised the potential risks as shown in Table 1 below.

Table 1 Characterisation of Potential Asbestos Risks at the Site

Activity	Potential to Disturb of Soil	Potential to Mobilise Asbestos Fibres	Potential for Exposure to Asbestos Fibres	Potential for Offsite Migration of Asbestos Fibres	Comments
----------	------------------------------	---------------------------------------	---	--	----------

Activity	Potential to Disturb of Soil	Potential to Mobilise Asbestos Fibres	Potential for Exposure to Asbestos Fibres	Potential for Offsite Migration of Asbestos Fibres	Comments
Weed management by physical removal using hand tools	High	Low	Low	Low	Low potential to mobilise asbestos due to the use of hand tools. If evidence of ACM is observed at the dig site, measures are required to manage elevated risk.
Pest control	Low	Very Low	Very Low	Very Low	Mobilisation of asbestos unlikely due to low disturbance to soil. Disturbance to soil could be from driving across the site for example.
Monitoring of Striped Legless Lizard populations using Habitat Augmentation Methods	Very Low	Very Low	Very Low	Very Low	Disturbance to soil unlikely
Monitoring of Striped Legless Lizard populations using Pitfall Trap Method (assuming hand tools to dig)	High	Low	Low	Low	Low potential to mobilise asbestos due to the use of hand tools. If evidence of ACM is observed at the dig site, or if power tools are used, measures are required to manage elevated risk.
Survey of other fauna by walking	Very Low	Very Low	Very Low	Very Low	Disturbance to soil unlikely
Plant surveys that require physical removal of root system, assuming hand tools	High	Low	Low	Low	Low potential to mobilise asbestos due to the use of hand tools. If evidence of ACM is observed at the dig site, measures are required to manage elevated risk.
Installation of Permanent Markers such as star pickets or survey pegs	Low	Very Low	Very Low	Very Low	Disturbance to soil unlikely, apart from penetration of the marker through the soil.
Controlled burns to enhance native habitat	Medium	High	High	High	If asbestos is present on the surface (in either bonded or fibrous form), burning could deteriorate the asbestos matrix and mobilise fibres to the air, with the flames and rising hot air.

Activity	Potential to Disturb of Soil	Potential to Mobilise Asbestos Fibres	Potential for Exposure to Asbestos Fibres	Potential for Offsite Migration of Asbestos Fibres	Comments
Bushfire hazard reduction burning	Medium	High	High	High	If asbestos is present on the surface (in either bonded or fibrous form), burning could deteriorate the asbestos matrix and mobilise fibres to the air, with the flames and rising hot air.
Public use of site for recreational purposes	<i>Low to medium, depending on the activities permitted</i>	<i>Low</i>	<i>Actual risk of exposure is low to medium, depending on the activity. But perceived risk is very high.</i>	<i>Low</i>	<i>Actual risk of exposure to asbestos to the public through recreational use at the site is generally low, but can be considered medium if activities such as camping are permitted. However, any asbestos visible to the public, regardless of the actual risk level, will likely result in a strong reaction, including complaints to the EPA, WorkCover and other government bodies, negative press publicity, needless investigations etc.</i>

Notes:

1 – Bushwalking for example would have a low potential while camping for example could have a medium potential.

6.3 Potential Management Options

Given the assumed moderate potential for the whole site to contain asbestos in the surface and near surface fill material, the above risk characterisation indicates there are varying levels of risk of exposure to asbestos (and potential offsite migration of asbestos), depending on the activity being conducted as part of the proposed site usage as a biodiversity offset area. Asbestos risks (mobilisation of asbestos to air, exposure to asbestos and offsite migration of asbestos) associated with some of the activities such as physical removal of plants using hand tools and excavation of pitfall traps) can be mitigated by implementation of an asbestos management plan or a site management plan. Such a plan to mitigate asbestos risks could recommend for example, the use of hand tools only, wetting of soils to be excavated, and personnel being required to undertake the ACT Asbestos Awareness course to enable identification of asbestos.

Mitigation of asbestos risks associated with other activities, such as controlled burns and hazard reduction burns, using simple management strategies is not possible. Remedial measures such as survey and removal of asbestos or placing appropriate surface cover will likely be required mitigate the asbestos risks associated with such burning activities.

A suitable management or remediation strategy will need to be considered following characterisation of the asbestos contamination at the site (ACM or fibrous asbestos, surface or at depth impact, lateral extent of impact etc). Implementing remediation or management strategies, based purely on the above assumed moderate potential for the whole site to contain asbestos in the surface and near surface fill material is not advisable. If the site is established as a biodiversity offset area, then an Asbestos Management Plan will require

preparation and implementation, to ensure that asbestos risks are mitigated during the operational phase of the ecological offset area.

We note that the above risk characterisation and the potential management options are based on the significant assumption (in the absence of any intrusive assessment and analytical data across the majority of the site) that there is a moderate potential for asbestos to be present in the surface and near surface fill material. SLR Consulting considers it would be prudent to conduct an intrusive assessment of the surface and near surface fill material at the site, at an appropriate resolution, to assess the actual status of asbestos contamination at the site. It may also be prudent to assess other typical contaminants associated with uncontrolled filling, such as heavy metals, petroleum and other hydrocarbons and pesticides, together with the asbestos assessment. This information will be valuable to determine the suitability of the site for the proposed land use.

Regardless of the actual level of risk of exposure to asbestos, public's perception of risks associated with asbestos could potentially lead to a claim of exposure to asbestos in a public space resulting in an often disproportional reaction (by public and the media, and consequently by governments trying to address public's concerns). Through prior experience in this matter, SLR Consulting considers that this is a scenario most entities (government and private) strive to avoid. In this context, the presence of asbestos on the surface or near surface soils at the site, which may be open to public, may be deemed unacceptable regardless of any measures to manage the risks.

To address the above issue regarding public perception of the risk of asbestos, SLR Consulting recommends that an intrusive assessment be conducted to characterise the contamination status of the surface and near surface soils at the site. If the assessment indicates that asbestos is present in the surface and near surface soils at the site, remediation may be required to enable the site to be suitable for public recreation. Remediation measures may include manually picking up and removing any bonded asbestos, though this will not be suitable if fibrous asbestos is identified in the soils. Depending on the distribution of asbestos and the type of asbestos identified, management measures may also be available to enable the site to be suitable for public recreation. Such management measures could include ensuring the all areas of the site is well vegetated (without any bare patches) and potentially restricting access to certain areas of the site to minimise access to and thus the potential to mobilise asbestos into the air.

7.0 Conclusion

Based on the above assessment and discussion, SLR Consulting concludes the following:

- The northern portion of the site that has been assessed by Coffey Environments contains mixed fill material, including potential asbestos containing material, in the near surface soils;
- The majority of the site (extent shown in Appendix B) contains asbestos that has been double bagged, placed in containers and buried at 3 to 4m depth, though we note that there is some contradiction regarding this depth in the EPA records and Coffey report;
- Based on the data reviewed, it has been assumed that there is a moderate potential for asbestos contamination of the surface and near surface soils across the majority of the site. No intrusive assessment or analytical results are available across the site to suggest otherwise, except for a small area at the northern portion of the site, where Coffey Environments conducted an assessment relating to the Nudurr Drive extension;
- There are varying levels of asbestos risks (mobilisation of asbestos to air, exposure to asbestos fibres and offsite migration) associated with various activities that may be conducted during the proposed use of the site as a biodiversity offset area;
- Asbestos risks to workers conducting activities related to the ecological offset area can be effectively mitigated by the implementation of an asbestos management plan (involving wetting of soils to minimise dust generation, using hand tools and increased awareness of asbestos) for activities that involve excavation of soil (for example the physical removal of plants and root systems, and installation of pitfall traps);
- Remedial measures such as removal of asbestos or providing sufficient clean surface capping will be required to effectively mitigate asbestos risks for activities that involve burning of vegetation (habitat enhancement and bushfire hazard reduction);
- If asbestos is present on the site, which may be open to public for open space recreational use, regardless of the actual level of risk of exposure to asbestos, public's perception of risks associated with asbestos could potentially lead to a claim of exposure to asbestos in a public space. Such a claim could result in an often disproportional reaction (by public and the media, and consequently by governments trying to address public's concerns); and
- There is a high level of uncertainty regarding the actual status of asbestos contamination in the surface and near surface soils across the site. The risk characterisation and required risk mitigation (management) measures are dependent on the actual status of contamination.

8.0 Recommendations

The above risk characterisation is based entirely on the assumption that there is a moderate potential for the whole site to contain asbestos in the surface and near surface fill material. To better inform the consideration for the site to be used as an ecological offset area that could include access to public for recreational purposes, SLR Consulting strongly advises Umwelt to assess the actual status of contamination at the site.

SLR Consulting recommends the following:

- Conduct an intrusive assessment of surface and near surface soils to assess the status of asbestos contamination. This assessment will enable the above risk characterisation to be updated, if appropriate. The assessment should be conducted by a qualified environmental consultant;
- Concurrently with the above asbestos assessment, assess the status of other potential contaminants of concern (together with the above asbestos assessment), to assess the suitability of the site for the proposed use; and
- Prepare an asbestos management plan or a site management plan by a qualified environmental consultant, to manage the risks posed by identified contaminants during the conduct of activities associated with the biodiversity offset area.

Error! Unknown document property name.
Offset Management Plan - EPBC 2010/5750

Error! Unknown document property name.

Report Number **Error! Unknown document property name.**
Error! Unknown document property name.
Error! Unknown document property name.
Page 15

9.0 Closure

We trust this report meets your requirements at this stage. If you require further information or clarification, please do not hesitate to contact Nalin De Silva on 0407 117 562 or ndesilva@slrconsulting.com.

This letter does not comply with the ACT Government accessibility guidelines for documents that are published on the web. For a copy of this letter please contact the TAMS Environmental Offsets Officer via Canberra Connect 13 22 81

This page has been intentionally left blank





Photo 1: Site covered in dense grass



Photo 2: Site covered in dense grass



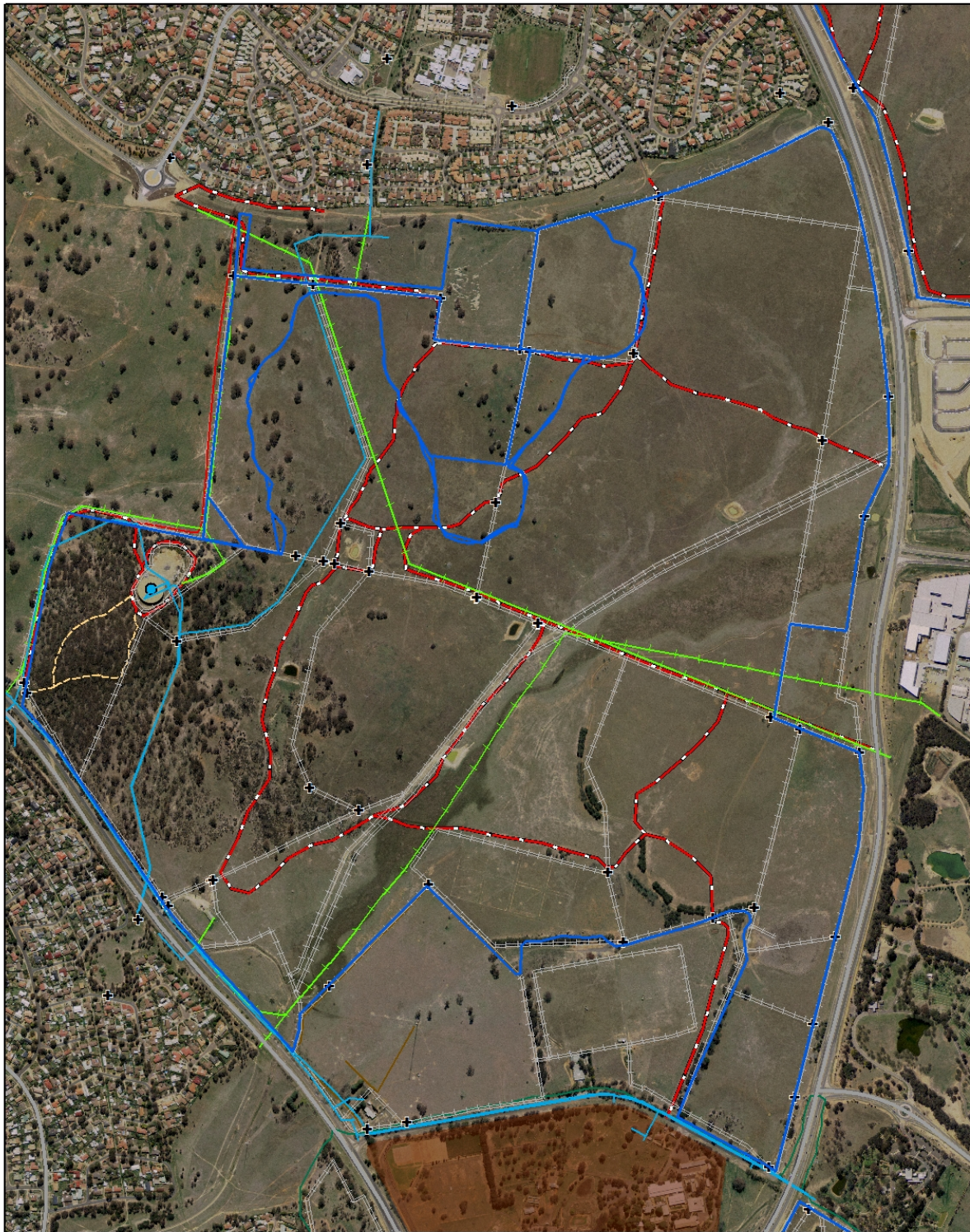
Photo 3: Occasional bare patches in western portion of the site



Photo 4: Soil mound with trees proving a visual barrier to residents to the north of the site

Appendix 4 - Ecological Values and Physical Assets: Gungaderra and Mulanggari Nature Reserves.





<h3>Gungaharra Nature Reserve Physical Assets</h3>	<ul style="list-style-type: none"> — Main Roads — Reserve Boundary — Fences + Gates — Water Main ● Reservoir — Underground Powerline — Overhead Powerline ■ Heritage area 	<ul style="list-style-type: none"> — Equestrian trails — Float — Rigid Float — Tanker — Light Unit — Walking Trail — Dormant Trail — Unknown trail use 	<p>1:11,000</p> <p>0 25 50 100 150 200 Meters</p>	<p>3rd May 2011 Confidential Parks and Conservation Service PO Box 100 Canberra ACT 2601 Phone: 52 32 61</p> <p><small>Disclaimer: ACT Parks and Conservation Service does not warrant that the data is free from errors. Data Copyright: Australian Capital Territory, Canberra 2011.</small></p>



<h2>Mulanggari Nature Reserve Ecological Values</h2>	<ul style="list-style-type: none"> Main Roads Reserve Boundary Gates Fences Monitoring Sites Golden Sun Moth GSM habitat 	<ul style="list-style-type: none"> Perunga grasshopper Perunga buffer Striped legless lizard SLL habitat Cullen tenax buffer Substantially modified woodland Natural Temperate Grassland 	<p>N</p> <p>1:9,500</p> <p>0 30 60 120 180 240 Meters</p>	<p>Date: 30 May 2011 Contact Name: ACT Parks and Conservation Service, PO Box 181, Canberra ACT 2601 Phone: 13 23 23</p> <p><small>Disclaimer: ACT Parks and Conservation Service does not warrant that the data is free from errors. ACT Parks and Conservation Service is not responsible for any loss or damage resulting from the use of the information.</small></p> <p><small>Data Copyright: Australian Capital Territory Canberra 2011.</small></p>
--	--	--	---	--



Mulungari Nature Reserve Physical Assets

- | | |
|------------------|---------------|
| Main Roads | Float |
| Reserve Boundary | Rigid Float |
| Gates | Tanker |
| Fences | Light Unit |
| Heritage area | Walking Trail |
| | Dormant Trail |



Date: 30 May 2011
 Contract Details:
 ACT Planning
 Conservation Service
 80 Sten St
 Canberra ACT 2601
 Phone: 1318 11

Disclaimer: ACT Planning and Conservation Service does not warrant that the data is free from errors. ACT PCBs are not responsible for any or omissions nor any loss or damage resulting from the use of the information.
 Data Copyright: Australian Capital Territory, Canberra 2011.

Appendix 5 – Bushfire Operations Plan – Map 5

