

Environmental Assessment

APPENDIX G
HAZARDS AND RISK ASSESSMENT

Spring Farm Advanced Resource Recovery Technology (ARRT) Facility

Hazards and Risk Assessment

NA89913061

Prepared for
SITA Australia Pty Ltd

17 October 2013



Document Information

Prepared for SITA Australia Pty Ltd
Project Name Hazards and Risk Assessment
Job Reference NA89913061
Date 17 October 2013

Document Control

Version	Date	Author	Reviewer
Draft	22 May 2013	Christina Chiu	Emma Maratea
Final	30 May 2013	Christina Chiu	Belinda Crichton
Final 2	2 July 2013	Christina Chiu	Belinda Crichton
Final 3	23 July 2013	Christina Chiu	John O'Grady

Prepared for:
SITA Australia Pty Ltd

Prepared by:
Cardno (NSW/ACT)

“© 2013 Cardno All Rights Reserved. Copyright in the whole and every part of this document belongs to Cardno and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or in or on any media to any person without the prior written consent of Cardno.”

Table of Contents

1	Introduction	5
1.1	Site Description	5
1.2	The Proposed Development	6
1.3	Scope of Works	6
2	Existing Environment	8
3	Statutory Requirements	9
4	Preliminary Hazard Analysis	10
4.1	Risk Screening	10
4.2	Level of Assessment	12
4.3	Preliminary Hazard Analysis Methodology	13
4.4	Preliminary Hazard Analysis Results	14
5	Potential Impacts and Mitigation Measures	18
6	References	19

Tables

Table 3-1	Issues Identified in SEPP33 for Consideration by Consent Authority	9
Table 4-1	Hazardous Materials Inventory and Risk Screening	10
Table 4-2	Hazardous Materials Transport to the Project Site	11
Table 4-3	Environmental Risk Assessment Matrix	13
Table 4-4	Likelihood of Environmental Risk	13
Table 4-5	Consequence of Environmental Risk	14
Table 4-6	Hazard Analysis	15

Figures

Figure 1.1	The Spring Farm ARRT Site	6
------------	---------------------------	---

Glossary

ARRT Facility	Advanced Resource Recovery Treatment Facility
Biogas	Gas produced during the breakdown of organic matter in the absence of oxygen
BPL	Bush Fire Prone Land
DGR's	Director General's Requirements
DOP	Former NSW Department of Planning (now DP&I)
DP&I	NSW Department of Planning and Infrastructure
EA	Environmental Assessment
EMP	Environmental Management Plan
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence, issued under the POEO Act
ERP	Emergency Response Plan
LEMP	Landfill Environment Management Plan
Liquid Waste	Material classified as Liquid Waste under Schedule 1 (Clause 49) of the <i>Protection of the Environment Operations Act, 1997</i>
LGA	Local Government Area
MRF	Materials Recycling Facility
MSW	Mixed Solid Waste classified as inert or solid waste under Schedule 1 (Clause 49) of the <i>Protection of the Environment Operations Act, 1997</i>
NSW	New South Wales
OEMP	Operational Environment Management Plan
PHA	Preliminary Hazard Analysis
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
RFS	NSW Rural Fire Service
SEPP 33	<i>State Environmental Planning Policy No 33 – Hazardous and Offensive Development</i>
SEPP – Major Development	<i>State Environmental Planning Policy (Major Development) 2005</i>
SFRRP	Spring Farm Resource Recovery Park
SITA	SITA Australia Pty Ltd (SITA)

1 Introduction

SITA Australia Pty Ltd (SITA) Pty owns and operates the Spring Farm Advanced Resource Recovery Treatment Facility (ARRT Facility) at Richardson Road, Spring Farm (**Figure 1.1**). The Spring Farm ARRT Facility consists of a number of linked areas for processing of mixed solid waste (MSW) and organic material. The facility incorporates an anaerobic digestion tank farm and electricity plant, a tunnel composting facility (organics processing) and a mechanical pre-treatment area, where non-organic materials are removed from MSW.

The Spring Farm ARRT Facility is located within the Spring Farm Resource Recovery Park (SFRRP), which also contains a non-putrescible landfill, a Materials Recycling Facility (MRF) a small vehicle drop off facility, and a landfill gas power generation plant.

Various planning consents and Environmental Protection Licences apply to the operations at SFRRP. The ARRT Facility operates under Minister's consent no. 05/0098 (7 September, 2006) for the Jacks Gully Alternative Waste Treatment facility, granted under the now abandoned Part 3A of the *Environmental Planning and Assessment Act, 1979* (EP&A Act).

Cardno (NSW/ACT) Pty Ltd has been commissioned by SITA to prepare an application to the Minister for Planning in accordance with Part 2A of *State Environmental Planning Policy (Major Development) 2005* (SEPP – Major Development), to modify the Transitional Part 3A Approval in order to permit receiving and processing of various waste products, in addition to the currently approved waste quantities.

This Hazard and Risk Analysis provides input to the Environmental Assessment which will accompany the Modification Application. This Hazard and Risk Assessment has been prepared to respond to the Director General's Requirements (DGRs) issued after consultations between SITA and the NSW Department of Planning and Infrastructure (DP&I).

1.1 Site Description

The Spring Farm Resource Recovery Precinct (SFRRP) occurs on Lot 35 DP1098588, Lot 21 DP1125616, Lot 2 DP1076817 and Lot 33 DP1096463 at Richardson Road, Spring Farm. The site is located within the Camden Local Government Area (LGA) and is close to the boundary of the Campbelltown LGA. The Spring Farm residential release area is near the north west boundary of the SFRRP, the suburbs of Mount Annan and Narellan Vale occur to the north and north east, Mount Annan Botanic Gardens lie to the east and the Camden Organics Plant, a SITA owned and operated business, to the south. Land uses in the broader area include a coal preparation plant, sand mining, poultry farms and an agricultural research station.

The SFRRP operates under separate planning approvals:

- > The earlier developed facilities on the site – the landfill and MRF, both of which operate under historic planning approvals granted under Part 4 of the EP&A Act; and
- > The ARRT Facility (the former Jacks Gully Alternative Waste Treatment Complex), operating under the Transitional Part 3A Approval.

The proposal that is the subject of this Modification Application applies to the second listed facility. The subject site, for the purposes of this Modification Application, occurs on Lot 35 in DP1098588 (**Figure 1.1**)

The SFRRP is currently accessed via a private access road extending east from Richardson Road through land proposed for subdivision as part of the Spring Farm residential release. Access to the ARRT Facility is via an internal access road that extends from the weighbridge along the eastern edge of the existing landfill. Urban Growth (formerly Landcom) is required under a Deed with SITA to ensure access to the site during and consequent to the subdivision development.



Figure 1.1 The Spring Farm Resource Recovery Park Site

1.2 The Proposed Development

Under its current Major Project Approval (as Modified) the ARRT Facility is permitted to:

1. Receive:
 - 130,000tpa of mixed municipal waste classified as inert or solid waste under Schedule 1 of the *Protection of the Environment Operations Act, 1997*
 - 25,000tpa of garden waste; and
 - An additional 5,000tpa of garden waste or biosolids; and
2. Process:
 - 90,000tpa of mixed municipal waste classified as inert or solid waste under Schedule 1 of the *Protection of the Environment Operations Act, 1997*;
 - 25,000tpa of garden waste; and
 - An additional 5,000tpa of garden waste or biosolids.

The current consent provides that 40,000tpa of mixed municipal waste can be received at the ARRT Facility but not processed on site. This allowance has been made in order to provide for the operation of the receival hall as a transfer station, allowing delivery to and storage of local waste material on the site prior to transfer to other waste management facilities within the metropolitan area.

SITA now intends to lodge an application to the Minister for Planning in accordance with Part 2A of *State Environmental Planning Policy (Major Development), 2005 (SEPP – Major Development)*, to modify the Transitional Part 3A Approval in order to permit, in addition to the currently approved waste quantities:

1. Receiving and processing of 520m³ per day of liquid waste (comprising organic liquid waste, leachate and industrial liquid waste) at the existing facility utilising existing on site infrastructure, for disposal to sewer; and

2. Processing of 130,000 tonnes per annum (tpa) of mixed solid waste (MSW) classified as inert or solid waste under Schedule 1 of *the Protection of the Environment Operations Act, 1997* again using existing infrastructure.

1.3 Scope of Works

The following scope of works has been undertaken as part of this study:

- > Review of relevant legislation and guidelines;
- > Undertake a risk screening;
- > Undertake a qualitative Preliminary Hazard Analysis (PHA) in accordance with relevant guidelines; and
- > Provide recommendations for measures to minimise the potential for or consequences of hazards and risks to the project.

SITA has consulted with the NSW DP&I with regard to an appropriate assessment and approvals process for this proposal. The DP&I has notified that the appropriate development assessment process is a Modification to the existing Major Project Approval via Section 75W of the EP&A Act. Accordingly, DGR's for the Environmental Assessment (EA) of the proposal have been issued. The scope of works outlined above will ensure the following DGR's are addressed:

- > An assessment of the potential hazards and risks associated with the project; and
- > A preliminary risk screening must be completed in accordance with *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33)* and *Hazardous and Offensive Development Application Guidelines – Applying SEPP 33 (DOP, 2011a)*, and where necessary, a Preliminary Hazard Analysis (PHA) is undertaken.

2 Existing Environment

The ARRT Facility is located within the SFRRP. The SFRRP is licensed under the provisions of the *Protection of the Environment Operations Act, 1997* (POEO Act). The SFRRP holds the following Environmental Protection Licences (EPLs):

- > Ecolibrium Mixed Waste and Organics Facility (EPL 12588): This licence authorises “Generation of electrical power otherwise than from coal or from gas” (0 - 250 Gwh generated), “Non-thermal treatment of general waste” (0 – All), “Recovery of general waste” (0 – All) and “Composting” (>5000 – 50000 T received). This licence is for the former Alternative Waste Treatment Complex, now for the current ARRT Facility;
- > Jacks Gully Waste and Recycling Centre (now known as Spring Farm Resource Recovery Park) (EPL 5105): The licence authorises the carrying out of the scheduled activities “Waste disposal (application to land)” (0 - All), “Composting” (>5000 – 50000 T received), “Waste Storage – Hazardous, restricted, solid, liquid, clinical & related, Asbestos waste” (0 – All), “Waste storage – Other types of waste” (0 – All) and “Waste storage – Waste tyres” (0 – All). This licence is for the landfill site; and
- > Spring Farm Material Recycling Facility (EPL 20021): The licence authorises the “Recovery of general waste” (0 – All) and “Waste storage – other types of waste” (0 – All). This licence is for the Material Recycling Facility (MRF).

The management plan currently in use for the ARRT Facility is the legacy document *Macarthur Resource Recovery Park – Ecolibrium Mixed Waste and Organics Facility Operational Environmental Management Plan* (OEMP) (WSN, 2008). This document is currently being updated to the *Spring Farm Advanced Resource Recovery Park – Advance Resource Recovery Treatment and Garden Organics Facility Environmental Management Plan* (EMP) (SITA, 2013).

Compliance under the ARRT Facility EPL (No. 12588) is addressed through the existing EMP identified above. The Landfill Environmental Management Plan (LEMP) prepared by SITA (2012) addresses compliance for the whole SFRRP site. The EMP is integral in the identification, mitigation and remediation of potential hazards and risks at the ARRT Facility.

The SFRRP site covers an area of approximately 36 hectares. The ARRT Facility comprises a portion of this site. The area surrounding the SFRRP includes the suburbs of Spring Farm to the west, Mount Annan to the east, Narellan Vale to the north and Glenlee and Menangle to the south. Land uses in the broader area include transport companies, a coal preparation plant, land used for research as part of the Elizabeth Macarthur Agricultural Institute, sand mining, botanic gardens, poultry farms, an open windrow composting facility, a winery, and existing and proposed residential developments.

Potential hazard receivers are considered to be the local surrounding environment, staff and contractors, waste truck drivers, visitors to the site and residential areas located within a 2km radius from the site boundary, which includes suburban areas of Spring Vale, Narellan Vale and Mount Annan.

3 Statutory Requirements

State Environmental Planning Policy No 33 – Hazardous and Offensive Development (SEPP 33) aims to ensure that development that is classified as potentially hazardous or offensive is identified and assessed appropriately and that conditions to reduce or minimise any adverse impact are identified.

Under SEPP 33, the proposed development is considered as ‘potentially offensive’ because waste related activities could potentially impact on the surrounding locality, even after measures are taken to reduce or minimise the potential impacts. However, according to the DOP (2011a) *Hazardous and Offensive Development Application Guidelines – Applying SEPP 33* (referred to as ‘Applying SEPP 33 Guidelines’) if assessments can demonstrate that the offence can be controlled to a level that is not significant, then the activity would not be considered offensive. Assuming the development would comply with the EPL (re)issued for the ARRT Facility, then the development is not considered an offensive development.

Development which could potentially pose a significant risk to human health, life or property or the biophysical environment if not managed appropriately, is classified as development for the purposes of a ‘potentially hazardous industry’ under SEPP 33. In accordance with the DGR’s and the *Applying SEPP 33 Guidelines* (DOP 2011a) a Risk Screening (refer **Section 4.1**) was undertaken to determine if the proposed modification would be considered ‘potentially hazardous’. Results of the screening determined that the proposed development is potentially hazardous under SEPP 33 and a Preliminary Hazard Analysis (PHA) was undertaken (refer **Section 4.4**) in accordance with Clause 12 of SEPP 33 and the *Hazardous Industry Planning Advisory Paper No 6 – Hazard Analysis* DOP (2011b).

Matters to be considered by the Consent Authority are contained in Part 3(13) of SEPP 33. These matters are listed in **Table 3-1**, along with the Section of this EA where each issue is addressed.

Table 3-1 Issues Identified in SEPP33 for Consideration by Consent Authority

Issues to be Considered by Consent Authority in Accordance with Requirements of SEPP33	Reference in EA or Other
Current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development.	<i>SEPP 33 – Hazardous and Offensive Development.</i> <i>Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines</i> (2011a). <i>Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis</i> (2011b). <i>Australian Code for the Transport of Dangerous Goods by Road and Rail</i> (NTC, 2011).
Consultation of relevant public authorities concerning environment and land use safety requirements.	Section 5 of EA
Preliminary hazard analysis – for potentially hazardous industries.	This report
Alternatives to the development and justification for the development (including justification of site location).	Section 2.2 of EA
Likely future land use and surrounding development.	Section 3.2 of EA

4 Preliminary Hazard Analysis

There are a number of potential hazards and risks that require consideration in the context of the proposed activities. Hazards and risks can be considered to be substances or events that have the potential to place the local community in danger or cause loss of property or life.

A legacy OEMP for the ARRT Facility (WSN, 2008) is currently in place to identify, mitigate and remediate potential hazards and risks at the site associated with the existing landfill and waste management activities (SITA, 2012). An updated EMP for the ARRT Facility is currently in progress (SITA, 2013). Therefore, the current assessment of hazards and risks is concerned with those hazards and risks potentially associated with the proposed liquid waste management activities at the site.

4.1 Risk Screening

It has been identified that consideration should be made as to whether the proposed activities are considered hazardous or potentially hazardous under SEPP 33. In accordance with the *Applying SEPP 33 Guidelines* (DOP, 2001a), a risk screening for the proposed development has been undertaken which presents the details of the determination as to the classification of the proposed activities under SEPP 33.

The *Applying SEPP 33 Guidelines* (DOP, 2001a) lists five main factors which risk typically depends on:

- > The properties of the substance(s) being handled or stored;
- > The conditions of storage or use;
- > The quantity involved;
- > The location with respect to the site boundary; and
- > The surrounding land use.

An inventory of potentially hazardous materials proposed for use associated with the proposed activities has been compiled, based on information provided by SITA. Potentially hazardous materials are defined in the Australian National Transport Commission (NTC, 2011) *Australian Code for the Transport of Dangerous Goods by Road and Rail* (referred to as the "Australian Dangerous Good Code"), which may include storage, transport, use or production of hazardous materials associated with the management of liquid waste at the site.

An inventory of the hazardous materials that are likely to be stored onsite associated with the proposed activities is provided in **Table 4-1**.

Table 4-1 Hazardous Materials Inventory and Risk Screening

Hazardous Material	Description	Storage Location	Storage Quantity	Classification	Screening Threshold from Applying SEPP 33 Guidelines
Ferric Chloride	To control the concentration of hydrogen sulfide in the biogas.	ARRT Facility	25,000L tank (equivalent to approx. 35T)	Class 8 Corrosive Substances	50T (PGIII)
Sodium Hydroxide	To adjust the pH of wastewater prior to and/or after the treatment.	ARRT Facility	25,000L tank (equivalent to approx. 36T)	Class 8 Corrosive Substances	25T (PGII) or 50T (PGIII)
Hydrochloric Acid		ARRT Facility	2,000L tank (equivalent to approx. 2.4T)	Class 8 Corrosive Substances	25T (PGII) or 50T (PGIII)

Hazardous Material	Description	Storage Location	Storage Quantity	Classification	Screening Threshold from Applying SEPP 33 Guidelines
Flocculent - Copolymer of sodium acrylate and acrylamide (water soluble polymer) in emulsion	To improve the dewatering system efficiency	ARRT Facility	2,000L-3000L	N/A*	N/A
Coagulant - Aluminium hydroxide chloride mixture		ARRT Facility	2,000L-3000L	N/A*	N/A

PG – Packing Group

*The flocculants and coagulants are not classified as non dangerous goods according to Australian Code for the Transport of Dangerous Goods by Road and Rail (6th Edition) as outlined in the Integra MSDS (Integra, 2008 and 2009) provided by SITA.

The risk screening in **Table 4-1** identifies that the screening threshold for sodium hydroxide would be exceeded, based on a conservative assessment. As such, the proposed development should be considered as potentially hazardous and SEPP 33 will apply. All other hazardous materials have been assessed to be below the SEPP 33 screening thresholds.

The proposed development may also be potentially hazardous if the number of generated traffic movements (for significant quantities of hazardous materials entering or leaving the site) is above the cumulative annual or peak weekly vehicle movements outlined in Applying SEPP 33. Transport information for transport of hazardous materials to the site is provided in **Table 4-2**.

Table 4-2 Hazardous Materials Transport to the Project Site

Material	Classification	Average No. of Loads per Annum	Load Size	Screening Threshold from Applying SEPP 33 Guidelines
Ferric Chloride	Class 8 Corrosive Substances	12	10,000L (equivalent to approx. 14T)	>500 vehicle movements per annum (cumulative) for significant quantities (>2T per load-bulk)
Sodium Hydroxide	Class 8 Corrosive Substances	12	10,000L (equivalent to approx. 15T)	>500 vehicle movements per annum (cumulative) for significant quantities (>2T per load-bulk)

The risk screening for the transport of ferric chloride and sodium hydroxide in **Table 4-2** do not exceed the SEPP 33 guidelines. Therefore, a route evaluation study does not need to be completed for the proposed development.

Vehicle movements associated with transport of the other hazardous substances (hydrochloric acid, flocculent and coagulants) would be below the SEPP 33 screening threshold guidelines based on annual use and substance make up.

In the Conditions of Consent for the then named Jacks Gully Alternative Waste Technology Facility, transport conditions are outlined, including:

- > Heavy vehicles do not enter or exit the site between 10pm and 7am;
- > All waste received is received between the following hours:
 - 7am to 5pm, Mondays to Fridays, inclusive
 - 8am to 4pm, Saturdays and Sundays and
 - 7am to 2pm on Public Holidays
- > Vehicles carrying waste to/from the site use the following routes prior to the finalisation of public access to the site:

- Narellan Road, Camden Bypass, Springs Road, Richardson Road and current right of way when accessing the site from the north or east, and/or
 - Old Hume Highway, Camden Bypass, Springs Road, Richardson Road and the current right of way when accessing the site from the south or west; and
- > Vehicles carrying waste to/from the site use the following routes prior to the finalisation of public access to the site:
- Narellan Road, Camden Bypass, arterial road and new public road when accessing the site from the north or east; and/or
 - Old Hume Highway, Camden Bypass, arterial road and new public road when accessing the site from the south or west.

4.2 Level of Assessment

According to the *Applying SEPP 33 Guidelines* (DOP 2011a) the purpose of a PHA is to:

- > Identify all potential hazards associated with the proposal;
- > Analyse all hazards in terms of their consequences (effects) to people and the biophysical environment and their likelihood of occurrence;
- > Quantify the analysis and estimate the resultant risks to surrounding land uses and the environment; and
- > Assess the risks in terms of the location, land use planning implications and existing criteria and ensure that the proposed safeguards are adequate and thus demonstrate that the operation will not impose an unacceptable level of risk.

The level and extent of a PHA assessment required depends on the circumstances of the proposal (the nature and scale of the development) and its location in relation to surrounding land uses and the natural environment.

Applying SEPP 33 Guidelines (DOP 2011a) sets out criteria for using the results of the risk screening to determine which of the following three levels of analysis is appropriate for the PHA:

- > Level 1 – an essentially qualitative approach based on comprehensive hazard identification to demonstrate that the activity does not pose a significant risk;
- > Level 2 – supplements the qualitative analysis by sufficiently quantifying the main risk contributors to show that risk criteria will not be exceeded; and
- > Level 3 – a full quantitative analysis.

According to *Applying SEPP 33 Guidelines* (DOP 2011a) a qualitative (Level 1) PHA may be sufficient in the following circumstances:

- > Where the materials are relatively non-hazardous (for example, corrosive substances and some classes of flammables);
- > Where there are no major worst-case consequences;
- > Where the technical and management safeguards are self-evident and readily implemented; and
- > Where the surrounding land uses are relatively non-sensitive.

Based on the nature and scale of the development, a qualitative (Level 1) PHA assessment is assumed to adequately address the hazardous scenarios associated with the development. The PHA has been undertaken in accordance with the SEPP33 legislation and relevant guidelines.

This PHA has been completed in accordance with the objectives and guidelines provided in the DOP (2011b) *Hazardous Industry Planning Advisory Paper No 6 – Hazard Analysis* and it considered to address the requirements of SEPP 33.

4.3 Preliminary Hazard Analysis Methodology

Potentially hazardous scenarios indicated for the proposed activities are identified in the following section. All of these scenarios have been considered as part of the Preliminary Hazard Analysis (PHA).

For the analysis and estimates of potential risk the following approach has been utilised and is adapted from the AS/NZS Standard for Risk Management ISO 31000:2009 (Standards Australia, 2009). For each of the potentially hazardous scenarios, the potential environmental issues are identified and classified as to its probability of occurrence and potential impact on the environment should the scenario eventuate. A standard classification system of, minor, moderate or major is used to rank the hazards.

Having identified the potential hazards, it is necessary to determine what event or action may cause that problem. This step is critical to linking potential hazards and potential solutions. Each potential hazard may have several likely causes. Potential solutions are any preventive actions, which can reduce the probability of impacts occurring, or can reduce the consequence of the impact should it occur.

The risk scale adopted is provided in **Table 4-3**. Those risks highlighted in red are considered major risks, those highlighted in orange are considered moderate risks, and those highlighted in green are considered low risks. The classifications of likelihood and consequence are provided in **Table 4-4** and **Table 4-5**, respectively.

Following the initial analysis of risk, appropriate mitigation measures are identified to manage the risks and the likelihood and consequence classifications are updated accordingly to calculate the residual risk (i.e. the risk of the hazard after the mitigation measures have been implemented).

No further assessment under SEPP 33 is required for projects not considered potentially hazardous following a SEPP 33 Risk Assessment.

Table 4-3 Environmental Risk Assessment Matrix

		Likelihood				
		L1	L2	L3	L4	L5
Consequence	C1	Major	Major	Moderate	Moderate	Moderate
	C2	Major	Moderate	Moderate	Moderate	Low
	C3	Moderate	Moderate	Moderate	Low	Low
	C4	Moderate	Moderate	Low	Low	Low
	C5	Moderate	Low	Low	Low	Low

Table 4-4 Likelihood of Environmental Risk

Likelihood	Category	Description
L1	Nearly Certain	Expected to occur in most circumstances (i.e. annually)
L2	Likely	Will probably occur in most circumstances (i.e. once every 3 years)
L3	Possible	May occur at some time (i.e. once every 10 years)
L4	Unlikely	May occur at some time, but is considered unlikely (i.e. once every 30 years)
L5	Rare	Could occur in exceptional circumstances (i.e. once every 100 years)

Table 4-5 Consequence of Environmental Risk

Consequence	Category	Description
C1	Extreme	Major irreversible impact
C2	Major	Significant impact, long term, potentially irreversible
C3	Moderate	Medium impacts, potential to reverse
C4	Minor	Low impact, localised
C5	Negligible	Insignificant impact

4.4 Preliminary Hazard Analysis Results

The development site is heavily disturbed, and therefore are already environmental hazards and risks associated with the existing landfill and waste management activities on site. However, these hazards and risks were addressed within the *Environmental Assessment - Proposed Alternative Waste Technology Facility at Jacks Gully Waste and Recycling Centre* (GHD, 2006). This current assessment identifies the additional hazards and risks which may arise from the proposed additional activities of the receipt and treatment of liquid waste.

Potentially hazardous scenarios associated with the receipt and treatment of liquid waste at the site would include:

- > Transportation and depositing of liquid waste materials onto the site or other wastes not licensed to be accepted under the EPL;
- > Spill/leakage of leachate and/or liquid waste;
- > Accidental fuel spill (i.e. during refuelling) or chemical spills on site;
- > Fire from improper storage of combustible wastes/biogas with ignition sources (cigarette butts, glass, cylinders).
- > Incidents between people and vehicles or vehicular accidents on site;
- > Vandalism of the ARRT Facility (e.g. vandalism of liquid waste storage areas, deliberate fires);
- > Natural hazards such as flooding;
- > Natural hazards such as bushfire;
- > Fire within vehicles or buildings on site;
- > Generation of dust, odour and noise from the site;
- > Disruption to services if utilities are damaged;
- > Injury to public/visitors (i.e. when accessing unauthorised areas);
- > General work health and safety incidents at the site (i.e. slips/falls, snakebite, etc); and
- > Increase to the traffic network.

Results of the hazard analysis for each of the potentially hazardous scenarios identified are provided in **Table 4-6**.

Table 4-6 Hazard Analysis

Event/Issue	Cause/Comments	Impact/Potential Consequences	L	C	Risk	Mitigation/Management Measures	L	C	Residual Risk
Receipt of liquid wastes onto the site not licensed to be accepted under the EPL.	Receipt of unacceptable liquid wastes.	Breach of EPL licence. Risk to life and health of personnel due to toxic substances and/or fumes. Potential contamination of other liquid waste received compromising the whole waste treatment process.	L3	C3	Moderate	The proposed development would only accept organic liquid (product destruction such as food juice, soft drink) and leachate. The mitigation measures outlined in the current OEMP would also be applied to the proposed activities at the ARRT Facility: - Signs at entrance of the facility indicating wastes which are accepted and not accepted. - Adequate training of personnel to ensure compliance and identification of accepted and not accepted substances. - Refusal of entry of unacceptable waste by personnel with the records kept of any rejected waste in the weighbridge data system. - Identification of appropriate suppliers of liquid waste.	L4	C4	Low
Spill/leakage of liquid waste (including leachate and other liquid organic wastes).	Containment issues i.e. a breach in storage areas/pipes, spillage during transportation and/or handling.	Environmental pollution by contamination of soil, surface water and/or ground water at and within close proximity to the site.	L3	C4	Low	The proposed development would be contained within existing buildings and bunded areas of the ARRT Facility. Storage areas for the liquid wastes would be appropriately sized. The following existing mitigation measures outlined in the current OEMP would also be applied to the proposed activities at the ARRT Facility to minimise the frequency and damage of spills: - All chemicals used are delivered and unloaded within the tank farm containment bund - Depot users are made aware of the requirement for loads to be delivered and removed in covered or sealed vehicles. - Spillage of liquids is absorbed using "dri-sorb" and is collected and transported to a suitable disposal location. Once the bulk of the spill has been removed, the area is cleaned appropriately. - It is ensured that the existing leachate management system has been sized and designed for the volumes of leachate produced at the site and has been designed in accordance with best practice. This system should ensure that no leachate is able to discharge to nearby waterways or in surface water runoff at the site - Any spill of leachate or stormwater is managed in accordance with measures outlined in the OEMP and LEMP for the greater SFRRP, including spill containment, clean up and reporting to the EPA, if required. - Spill kits are available and regularly maintained.	L4	C4	Low
Accidental fuel spill (i.e. during refuelling) or chemical spills on site.	Containment issues i.e. a breach in bunding of stored fuel/chemicals, spillage during transportation and/or handling.	Environmental pollution by contamination of soil, surface water and/or ground water at and within close proximity to the site and possible fire if an ignition source is present. Risk for injury and to life of on-ground personnel from chemical spills.	L2	C3	Moderate	A number of hazardous chemicals would be stored within the ARRT Facility as part of the proposed development. Mitigation measures would include: - Any chemicals stored on site would be stored in appropriately bunded and ventilated areas, with both primary and secondary containment measures in place. - Storage and handling of hazardous substances would be in accordance with Australian Standards and relevant Work Health and Safety policies; - All relevant Materials Safety Data Sheets (MSDS) should be maintained on site. - Appropriate signage of corrosive substances. - All fuels/oils must also be stored within appropriately contained areas. - All major maintenance of vehicles to be undertaken off-site. - Any refuelling of machinery/vehicles to be undertaken on site should be undertaken in a designated bunded area. - Appropriate spill kits should also be maintained on site and all site personnel trained in their use. - The Site Manager and the EPA should be notified immediately of any spills on site. - Induction of work safety procedures for new personnel and continual training for existing personnel on handling of hazardous substances. - On site flow diversion measures would be maintained to contain runoff that may be contaminated by a spill.	L3	C3	Moderate
Fire from combustible wastes/biogas.	Fire from improper storage of combustible wastes/biogas with ignition sources (cigarette butts, glass, cylinders).	Risk to life and health of personnel. Damage or loss of assets.	L3	C2	Moderate	The OEMP does not outline in detail an emergency response plan. SFRRP Emergency Response Plan (ERP) is applicable to this site as outlined in the LEMP. In addition, measures including the following should be specified for the proposed development: - Continual visual monitoring by site personnel. - Training and awareness of site personnel. - Flammable and combustible wastes should be stored in accordance with relevant Australian Standards and Work Health and Safety policies to minimise the likelihood of ignition. - Appropriate signage to prevent ignition sources should be in the vicinity of combustible materials.	L4	C2	Moderate
Incidents between people and vehicles or vehicular accidents on site.	Driver and/or personnel confusion in procedure. Lack of communication between drivers and/or on-ground personnel.	Risk for injury and to life of on-ground personnel. Damage to vehicles and assets.	L3	C2	Moderate	The following mitigation measures are currently being implemented on site. These measures would continue to be implemented during the operation of the proposed development: - Ensure waste delivery and transfer procedures for heavy vehicles are implemented and followed. - Ensure heavy vehicles have a reverse beacon. - Limit onsite personnel in areas where there are frequent vehicle movements. - Ensure on-ground personnel wear PPE clothing. - Signage warnings to warn vehicles and on-ground personnel of heavy vehicle movements. - Prohibit general public vehicles from entering operational areas of the site to prevent incidents between general public vehicles and heavy vehicles.	L4	C2	Moderate

Event/Issue	Cause/Comments	Impact/Potential Consequences	L	C	Risk	Mitigation/Management Measures	L	C	Residual Risk
Vandalism of the ARRT Facility (e.g. vandalism of liquid waste storage areas, deliberate fires).	Unauthorised access to the site.	Damage to site property and equipment.	L3	C4	Low	Current management practices include measures to ensure the security of the entire SFRRP, as outlined in the SFRRP LEMP. These practices would continue and would be applied to the proposed activities at the ARRT Facility. Security of the facility and equipment should be achieved through maintenance of lockable security gates, fencing around the site boundary and no trespassing signs. Outside normal working hours, access gate is locked, on-site electronically monitored security and night security patrols are provided. The boundary fence is inspected regularly for deterioration or vandalism.	L4	C4	Low
Natural Hazards: Flooding	External natural causes. The ARRT Facility is not located on flood affected land (Camden Council, 2006). However, significant stormwater runoff could still cause flood damage.	Damage to site property and equipment	L4	C3	Low	Provision for safe passage of stormwater flows are considered in the current design of the proposed site. Building and/or structure modifications should be implemented if stormwater flows are identified as a potential hazard during extreme rainfall events in the future.	L4	C4	Low
		Risk to life and health of personnel in the vicinity of the site	L4	C2	Moderate	The SFRRP ERP for natural disasters should be adhered to, as outlined in the SFRRP LEMP. For emergency assistance during a flood or storm the State Emergency Services (SES) should be contacted.	L4	C3	Low
Natural Hazards: Bush Fire	External natural causes. The southern portion of the ARRT Facility lies within bush fire prone land (Camden Council and NSW Rural Fire Service, 2009).	Damage to site property and equipment	L2	C2	Moderate	SFRRP ERP and the Spring Farm Bushfire Management Plan 2009 are applicable and should be adhered to. The following facilities should exist on site for fire fighting purposes, and all staff should be trained to use them: - Fire protection equipment. - Portable fire extinguishers and pumps.	L2	C3	Moderate
		Risk to life and health of personnel in the vicinity of the site	L2	C2	Moderate	The following control measures should be taken in the event of a fire: - Ensure the safety of all people at / near the site. - Contact NSW Fire Brigade and/or Rural Fire Service. - Contact site supervisor. Bush fire protection measures should be implemented at the site in accordance with the Rural Fire Service (RFS, 2006) guideline <i>Planning for Bush Fire Protection</i> .	L2	C3	Moderate
Fire within vehicles or buildings on site.	Overheating or ignition of combustible / flammable material.	Damage to site property and equipment	L3	C3	Moderate	The SFRRP ERP for an on-site fire hazard should be adhered to. Measures including the following should be specified in the updated EMP for the site: - Appropriate maintenance of vehicle and plant equipment. - Regular cleaning and waste removal from buildings.	L4	C3	Low
		Risk to life and health of personnel in the vicinity of the site	L3	C2	Moderate	- Any spills of flammable material are to be contained and cleaned up immediately. - Asset Protection Zones should be maintained around individual buildings on site.	L4	C2	Moderate
Generation of dust, odour and noise from the site.	Vehicle movements and operation of plant equipment.	Impacts on air quality could lead to environmental and health issues in the local area.	L2	C4	Moderate	Mitigation measures that should be included in the updated EMP are: - Ensure internal roads are regularly maintained to minimise dust generation from heavy vehicle wheels. - Paved areas are regularly watered to minimise dust problems. - Internal routes of heavy vehicles should be designed so that minimal reversing and manoeuvres are needed to limit reverse beacon noise and screeching.	L3	C4	Low
		Noise impacts on local receivers could cause annoyance and/or health impacts.	L2	C4	Moderate	The current OEMP dictates: - All plant and equipment to be used onsite are properly maintained and serviced. - Plant is turned off when not in use.	L3	C4	Low
Generation of dust, odour and noise from the site.	Odour generation from waste processing activities.	Odour impacts on residences and visitors to the vicinity of the site.	L3	C4	Low	Odour generation at residential acceptors for the proposed activities were found to be below guidelines. Current OEMP dictates the following mitigation measures, these measures would continue during operation of the proposed development: - Wastes are processed within 24 hours of being received. - Weekly odour monitoring is undertaken at site boundaries. If odour is detected, further monitoring is undertaken. - Received complaints are logged on the complaints register and investigated. Corrective action is undertaken.	L4	C4	Low
						Odour should be further managed by: - Implementing traffic management procedure to co-ordinate the delivery schedule and avoid a queue of the incoming or outgoing trucks for extended periods of time.			
Biological hazards spread on site.	Biological hazards from waste received spread by litter, vermin and pests.	Risk to life and health of personnel in the vicinity of the site.	L3	C2	Moderate	Some litter and vermin controls are already implemented under the OEMP and LEMP and should be adhered to for the proposed activities including: - Daily collection of litter in the facility. - Vermin population is controlled by a qualified pest exterminator inspecting the site once a year. Additional mitigation measures should include: - Personnel should follow hygiene practices to prevent contact with biological hazard. - Personnel should wear protective clothing when handling received waste.	L4	C2	Moderate
Disruption to services if utilities are damaged.	Electrical power outages construction, maintenance, day to day activities or external reasons.	Environmental pollution due to failure of systems due to power outages.	L3	C4	Low	In the event there was a power outage for more than couple of days, a small diesel generator would be made available to operate the flare to avoid biogas build up in the gas storage balloon (Sarah Barrett, SITA Australia, pers. comm).	L3	C5	Low
Injury to public/visitors	Public accessing unauthorised areas.	Risk to life and health of public/visitors who are not authorised on site.	L3	C3	Moderate	- Implement a "sign in-sign out" procedure for visitors to the facility. - Ensure visitors are accompanied by site personnel at all times. - Have security personnel to ensure unauthorised persons do not enter the facility.	L4	C3	Low

Event/Issue	Cause/Comments	Impact/Potential Consequences	L	C	Risk	Mitigation/Management Measures	L	C	Residual Risk
General work health and safety incidents at the site (i.e. slips/falls, snakebite, etc.).	Working in proximity to machinery / equipment, operating a vehicle and working adjacent to an operational landfill site.	Risk to life and injury to personnel.	L3	C2	Moderate	- Implement a Work Safety Health and Safety Plan for the site and proposed activities. - Induction of work safety procedures for new personnel and continual training for existing personnel. - Adhering to EMP procedures.	L4	C2	Moderate
Traffic generation	An increase in heavy vehicle movements to and from the site due to the proposed increase of liquid wastes accepted.	Marginal increase of traffic on Spring Road and Richardson Road. Predicted additional traffic generated was found to have little negative impact on the traffic road network.	L1	C5	Moderate	Impacts can be further reduced by issuing a 'recommended truck route map' for SITA vehicles incoming and exiting the site.	L2	C5	Low

5 Potential Impacts and Mitigation Measures

Potential impacts from the hazards and risks identified at the ARRT Facility and for the proposed activities are listed in **Table 4-6**.

Moderate risks prior to implementing mitigation measures are generally associated with risk to life or injury; these moderate risks are due to the greater consequences rather than higher likelihoods. However, in most cases these risks to personnel and public safety can be lessened by applying mitigation measures, which can minimise the likelihood of occurrence and/or the severity of consequence, resulting in a lower residual risk. However, in some cases, mitigation measures can only minimise the likelihood of occurrence or the severity of consequence minimally, leaving the residual risk rating the same.

The assessment identifies the key potentially hazardous scenarios associated with the receipt and treatment of liquid waste at the site. These are:

- > Accidental fuel spill (i.e. during refuelling) or chemical spills on site;
- > Fire from combustible wastes/biogas;
- > Incidents between people and vehicles or vehicular accidents on site;
- > Fire within vehicles or buildings on site (risk to life and health of personnel in the vicinity of the site);
- > Natural hazards such as bushfire; and
- > Biological hazards spread on site.

However with appropriate mitigation measures in place, it is considered that the risks and potential impacts associated with such risks can be effectively managed. The PHA has not identified any residual risks to be 'Major'. This would suggest that there are no significant hazards when mitigation measures are applied. The mitigation measures listed in **Table 4-6** can effectively manage the potential hazards associated with the proposed activities and inherent hazards on the site. Therefore, there are no significant threats to human health, life, property and assets or the biophysical environment when appropriate mitigation measures are applied.

6 References

Camden Council (2006) *Camden Flood Study: Tile 17*, Camden Council

Camden Council and NSW Fire Rural Services (2009) *Camden Council Bushfire Prone Land*, Camden Council

DOP (2011a) *Hazardous and Offensive Development Application Guidelines – Applying SEPP 33*. NSW Department of Planning, Sydney. January 2011.

DOP (2011b) *Hazardous Industry Planning Advisory Paper No 6 – Hazard Analysis*. NSW Department of Planning, Sydney. January 2011.

Integra (2008) *Material Safety Data Sheet. Clearfox 526*. Issued by Integra Water Treatment Solutions, Reference Number: Version 20.10.2008, dated 20 Oct 2008.

Integra (2009) *Material Safety Data Sheet. Polyflox 135D*. Issued by Integra Water Treatment Solutions, Reference Number: Version 02.06.2009, dated 2 June 2009.

NTC (2011) *Australian Code for the Transport of Dangerous Goods by Road and Rail. Australian National Transport Commission*. Seventh edition, originally published in 2007 but republished electronically in 2011 incorporating Corrigendum 1. Available online at: www.ntc.gov.au.

SITA (2012) *Landfill Environmental Management Plan - Spring Farm Advanced Resource Recovery Park*. April 2012.

SITA (2013) *Spring Farm Advance Resource Recovery Park – Advance Resource Recovery Treatment and Garden Organics Facility Environmental Management Plan* (being prepared). June 2008.

WSN (2008) *Macarthur Resource Recovery Park – Ecolibrium Mixed Waste and Organics Facility Operational Environmental Management Plan*, WSN Environmental Solutions. June 2008.