3.0 Project Justification

This section considers the need for the proposed project in terms of landfill capacity, government policy and the requirement for compost. During the concept design, SITA considered alternatives for the SAWT-BIOWISE proposal, including alternative locations for the SAWT-BIOWISE facility within the Elizabeth Drive Site, alternative locations within Sydney and alternative advanced waste treatment technologies currently operating in Australia and overseas.

3.1 Proposal Need

3.1.1 Sydney Metropolitan Area

Landfill capacity for untreated organic waste in the Sydney Metropolitan Area is very limited relative to the amount of waste being produced and the rapidly decreasing available airspace. The only facilities within Sydney either currently capable of treating organic waste using mechanical biological waste treatment technologies or in the planning process are:

- UR3R at Eastern Creek, with an approved capacity of approximately 175,000 tpa;
- Earthpower at Camellia, with an approved capacity of approximately 90,000 tpa of food waste; and
- Ecolibrium to be located in Camden (MACROC) and commissioned in 2008 with a proposed capacity of approximately 90,000 tpa.

Based upon DoP figures, approved landfills servicing the Sydney region and able to accept organic waste between June 2004 and June 2014 have a total available capacity of approximately 12 million tonnes (Mt) (Cleland, 2005). Sydney's organic waste generation over the same period is expected to be approximately 18.5 Mt, leaving a shortfall of approximately 6.5 Mt. Additional capacity of approximately 1.3 Mt could be available if known existing approvals sought are granted, but this would still leave a shortfall of 5.2 Mt over this period. The SAWT-BIOWISE proposal could accept up to 120,000 tpa of waste and 14,400 tpa of biosolids, for a period in excess of twenty years, which will assist in meeting this shortfall.

The Commission of Inquiry for Environment and Planning into the Proposed Alterations and Extensions at Eastern Creek Waste Management Centre, in its report to the Minister, noted that even with new alternative waste treatment facilities operational at UR-3R, Woodlawn and MACROC, *'…this still leaves a substantial amount of putrescible waste to be treated by AWT facilities if the waste diversion targets noted [in the WARR Strategy] are to be met by 2014.'*

Waste Generation

In 2000, the State Government of NSW commissioned the *Alternative Waste Management Technologies and Practices Inquiry* (the Waste Inquiry) (Wright 2000). Based upon 1998 estimates, the Waste Inquiry identified Sydney's putrescible waste generation as approximately 2 million tonnes per annum (Mtpa) (**Table 3.1**).

Table 3.1: Wastes Generated in Sydney

	Municipal Sector (Mtpa)*	Commercial & Industrial Sector (Mtpa)	Total (Mtpa)
Recycled or Reprocessed	0.450	0.500	0.950
Inert Waste Landfill	0	0.975	0.975
Putrescible Waste Landfill	1.350	0.625	1.975
Total Waste Generated	**1.800**	**2.100**	**3.900**

Reference: The Waste Enquiry – Wright 2000a.

** Note: Million tonnes per annum (Mtpa).*

A similar figure of 1.854 Mtpa, averaged over 10 years from June 2004 – June 2015, was reported in the Commission of Inquiry into the proposed alterations and extensions to the Eastern Creek Waste Management Centre (Cleland, 2005).

Available Landfill Space

Cleland, (2005) reported that approved landfills accepting putrescible waste between June 2004 and June 2014 had a total available capacity of 10.01 Mt. The additional 2.9 Mt recently approved for Eastern Creek brings this to 12.01 Mt (**Table 3.2**).

Table 3.2: Estimated Landfill Capacity in Sydney for Putrescible Waste

Landfill Site	Available Void Space (million tonnes) June 2004-June 2014
Belrose	0.295
Eastern Creek	2.900
Lucas Heights	5.75
Jacks Gully	0.39
Windsor	0.05
Woodlawn	3.525
Total void space	**12.01**

Compared with Sydney's putrescible waste generation of 18.54 Mt over the same ten year period, this leaves a shortfall of approximately 6.5 Mt or 650,000 tpa. Additional capacity totalling approximately 1.3 Mt could be available if approvals sought at Jacks Gully are granted (Cleland, 2005). This would still leave a shortfall of 5.2 Mt or 520,000 tpa over this period. The SAWT-BIOWISE proposal would accept up to 120,000 tpa of mixed waste and 14,400 tpa of biosolids.

3.1.2 Western Sydney

Waste Generation in Western Sydney

In March 2003, SITA commissioned an evaluation, based upon existing available information, of waste tonnages and composition in western Sydney, defined here as the Local Government Authorities (LGAs) of Blacktown, Campbelltown, Fairfield, Liverpool and Penrith. Quantities for LGAs outside the five areas studied were not reviewed because longer distance haulage costs to a waste management facility located in Western Sydney appear today to be less economically viable for other local government areas. Waste generation data was forecast to 2010-2011 using 2000 census population

and the former-DIPNR growth forecasts. Residual waste generation estimates based upon waste currently being disposed of to landfill for 2010-2011, obtained during this survey are shown in the **Table 3.3**.

Table 3.3: Predicted Waste Generation in Western Sydney in 2010 to 2011

Local Government Area	Municipal Waste* (includes Mixed Solid, Garden & Non-putrescible Waste (tpa)
Penrith	60,076
Blacktown	84,568
Campbelltown	77,888
Fairfield	67,555
Liverpool	63,984
Total Municipal Waste	354,071

**Assumes 100% recycling of recyclables*

Source: *Infield Strategic Assessment and Planning, 2003.*

While this estimate of 354,071 tpa was based on only one possible scenario, it is an indication of the likely waste generation in Western Sydney within a decade. SITA has responded to the need to implement local initiatives through development of the SAWT-BIOWISE proposal.

SITA have recently been awarded two contracts for the treatment of waste at the proposed SAWT-BIOWISE facility from Liverpool City Council and PCC and these are expected to commence in the financial year 2008-2009.

The PCC waste contract allows for the collection, treatment and disposal of initially approximately 25,000 tpa of municipal solid waste, organics (source separated food waste) and green waste. It is expected that the amount of waste from PCC to be treated at the SAWT-BIOWISE facility will increase to approximately 35,000 tpa over the ten year contract period.

The Liverpool City Council waste contract (Contract ST948) allows for the acceptance, treatment and disposal of initially approximately 40,000 tpa of municipal solid waste and 15,000 tpa of green waste. It is expected that the amount of waste from Liverpool City Council to be treated at the SAWT-BIOWISE facility will increase to approximately 75,000 tpa over the ten year contract period. The Liverpool City Council contract is for ten years and has an option to extend for a further five years at Council's discretion.

Due to the variable nature of waste generation and possible changes to contracts, the above waste tonnages stated are estimates only, actual amounts treated at the proposed facility may vary from the estimates provided herein.

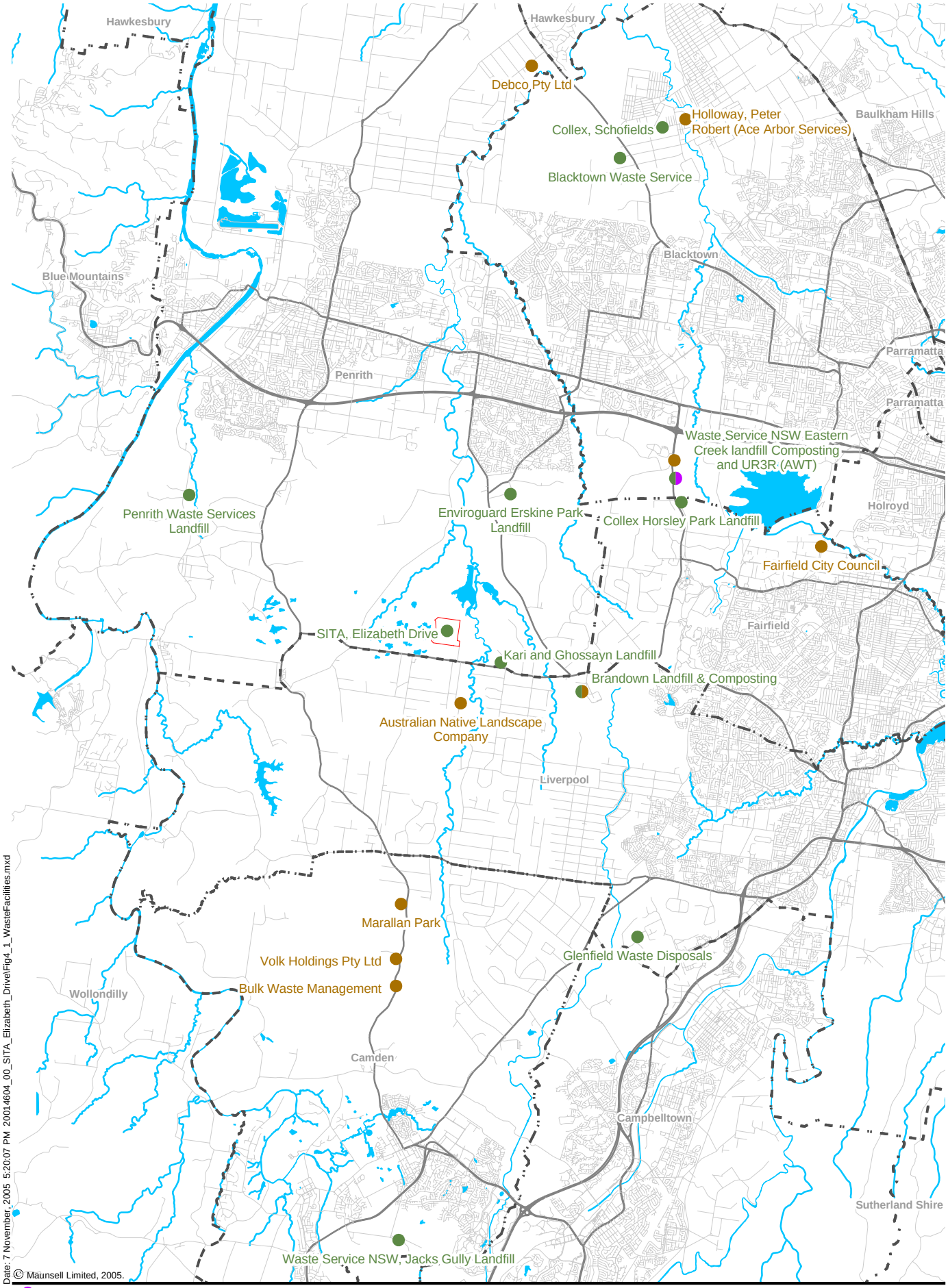
Available Landfill Space

Currently in the local (Western Sydney) region, encompassing the Penrith, Liverpool, Fairfield. Campbelltown and Blacktown LGAs, there are 11 DECC licensed operational landfills. **Table 3.4** lists the DECC licensed operational Solid Waste Landfills within these local government areas (**Table 3.3**). Each landfill is classified as either:

- Solid Waste Class 1 (Able to accept putrescible waste); or
- Solid Waste Class 2 (Non-putrescible waste only).

Of these landfills, only one, Eastern Creek is able to accept putrescible solid waste, which severely limits waste disposal options for Western Sydney. If Eastern Creek Landfill only accepted putrescible waste from Penrith, Liverpool, Fairfield, Campbelltown and Blacktown LGAs with a waste generation rate of 354,000 tpa (assuming 100% recycling), the 2.90 Mt capacity of Eastern Creek putrescible waste landfill would be exhausted in 8.2 years. Eastern Creek has been granted an acceptance capacity of 500,000 tpa, so with this rate, Eastern Creek putrescible waste capacity will be exhausted in 5.8 years.

Cleland (2005) in the Commission of Inquiry into the proposed expansion of Eastern Creek Landfill, specifically restricted the proposed capacity of this conventional landfill in order to stimulate the use of more sustainable advanced treatment facilities.



Advanced Waste Treatment Facility
Elizabeth Drive

FIGURE 3.1: Licensed Waste Facilities in Western Sydney (6 LGAs) Contained within the Map Boundaries (17km North and South of the Elizabeth Drive Site)

Table 3.4: Landfills within the Local Government Areas of Penrith, Liverpool, Fairfield, Blacktown and Campbelltown

Operator or Owner	Location	Licence Classification (Class)	Local Govt Area	Remaining Capacity to Accept Putrescible Waste* Mtpa
Blacktown Waste Services Pty Ltd	Richmond Road, Marsden Park	Solid Waste Class 2	Blacktown	0
Brandown Pty Ltd	Elizabeth Drive, Kemps Creek	Solid Waste Class 2	Liverpool	0
Collex Pty Ltd	Wallgrove Road, Horsley Park	Solid Waste Class 2	Fairfield	0
Collex Pty Ltd	Burfitt Road, Schofields	Solid Waste Class 2	Blacktown	0
Enviroguard	Mamre Road, Erskine Park	Solid Waste Class 2	Penrith	0
Glenfield Waste Disposals (L.A. Kennett Enterprises Pty Ltd)	Cambridge Avenue, Glenfield	Solid Waste Class 2	Campbelltown	0
Kari and Ghossayn Pty Ltd	Clifton Avenue, Kemps Creek	Solid Waste Class 2	Penrith	0
Penrith Waste Services Pty Ltd	Mulgoa Road, Mulgoa	Solid Waste Class 2	Penrith	0
SITA Environmental Solutions	Elizabeth Drive, Kemps Creek	Solid Waste Class 2 + Industrial Waste	Penrith	0
Waste Service NSW (Eastern Creek)	Wallgrove Road, Eastern Creek	Solid Waste Class 1	Blacktown	2.90**

1. NSW EPA Public Register website: **www.epa.nsw.gov.au/prpoeo/LicenceN.asp**. Cleland, 2005.

** Source:http://www.waste.com.au/dir138/publish.nsf/AttachmentsByTitle/EasternCreek_Minutes_170305.pdf/$FILE/Eastern+Creek+CAC+Minutes+17+March+2005.pdf. Accessed 26 June 2006.

3.1.3 Government Policy

NSW Waste Avoidance and Resource Recovery Strategy

In 2003, the *NSW Waste Avoidance and Resource Recovery* (WARR) *Strategy* was introduced. The WARR Strategy is the primary document to guide the efforts of State and Local Government agencies, industries and the broader community in waste prevention and avoidance, reuse and recycling. The WARR Strategy identifies targets for achieving waste avoidance and resource recovery and sets a framework for delivering targets through the commitment of industry, Government and other stakeholders to key programs and actions.

The WARR Act 2001

The NSW Government has established a waste hierarchy under the WARR Act 2001 which attempts to ensure that resource management options are considered against the following priorities:

a) **Avoidance**, which is action to reduce the amount of waste generated by households, industry and all levels of government, as the **highest priority**;
b) **Resource Recovery**, which is reuse, reprocessing, recycling and energy recovery, consistent with the most efficient use of the recovered resources. Resource Recovery maximises the options for reuse, reprocessing, recycling and energy recovery at the highest net value of the recovered material; and
c) **Disposal**, which is management of all disposal options in the most environmentally responsible manner. Disposal is the **least desirable option** and must be carefully handled to minimise negative environmental outcomes.

The SAWT-BIOWISE proposal fits well with the WARR Strategy in that it recovers resources and reduces the amount of waste material going to landfill. SITA intends to treat or process up to 120,000 tpa of mixed solid waste that would otherwise be disposed of to landfill. The proposal will convert these wastes, with potentially a further 14,400 tpa of biosolids, into approximately 28,000 tpa of useable compost each year. Although recycling is widely practised in Sydney many recyclable materials end up as mixed solid waste going to landfill. The SAWT-BIOWISE process will also recover up to 8,000 tpa of these recyclable materials to be used as a resource.

The Waste Inquiry

The Waste Inquiry (Wright, 2000) suggested three scenarios for NSW's future waste management with each of these scenarios advocating progressively more diversion for beneficial use and less disposal. These scenarios are:

- **Scenario 1** – Continue the current situation:
  - 25% municipal diversion; and
  - 24% commercial & industrial diversion.
- **Scenario 2** – Improved initiatives:
  - 49% municipal diversion; and
  - 42% commercial & industrial diversion.
- **Scenario 3** – Aggressive initiatives:
  - 66% municipal diversion; and
  - 63% commercial & industrial diversion.

Each scenario includes six specific types of initiatives relating to putrescible waste. In each initiative scenario, the treatment and processing of mixed solid waste is a key scenario for the commercial and industrial sector to achieve the desired outcomes. The initiatives contained within the aggressive scenario include the composting of food waste with garden waste as a key initiative within the municipal sector. A key driver of the Waste Inquiry was the Government's need to establish a strategic policy framework which would drive the private sector to identify and take up novel management practices and innovative treatment technologies.

The proposed SAWT-BIOWISE facility contributes to achieving these targets, by contributing to the diversion of more than 60% of the residual waste stream from landfill. This 60% diversion, in combination with current diversion practices described in the Waste Inquiry, will assist greatly with the alignment to Scenario 3, whereby over 66% of the total MSW stream will be diverted from landfill.

Local Government Action Plan

As a result of the WARR Strategy, in 2003 the DECC published the Local Government Action Plan. This is a consultation paper, which proposes a draft Action Plan to identify the commitment required by councils to achieve the goals of the WARR Strategy.

Compared with reduction targets based on the period of 1990 to 2000, the Local Government Action Plan sets improved and aggressive resource recovery targets to guide councils in development of their resource recovery strategies. These strategies are not mandatory and councils may adopt other ways to increase resource recovery.

The strategies are intended to improve on the current situation as follows:

- **Scenario 2** – Improved Initiatives set targets to be achieved by 2008, which include:
  - Increased diversion of garden organics from 9% to 16%;
  - Increased collection of kerbside recyclables from 19% to 23%; and
  - Treatment and processing of about 12% of mixed residual waste.
- **Scenario 3** – Aggressive Initiatives set targets to be achieved by 2014, which include:
  - Collection and processing of food waste with garden waste;
  - Increased collection of kerbside recyclables from 23% to 27%; and
  - Treatment and processing of residual waste from 12% to 16%.

Part 5 of the Local Government Action Plan is the main thrust of the document. This part provides an overview of the areas where councils can make most contribution to waste avoidance and resource recovery. The main categories for these objectives are listed in Part 5 of the Local Government Action Plan, which also tables the actions and targets for each category.

The potential activities and targets listed in the Local Government Action Plan are achievable, based upon the development of resource recovery activities, which include AWTs. These activities have the potential to contribute to reducing waste being disposed of to landfill to achieve the target which has been set for the Sydney Metropolitan area. This target is to divert 66% of the total domestic waste stream from landfill by 2014. The SAWT-BIOWISE proposal will make a major contribution towards achieving this.

Section 88 Levy

Under the POEO Act, the NSW government imposes a financial levy on every tonne of waste accepted for disposal at waste management facilities within the Sydney Metropolitan and Extended Metropolitan Region. The levy is currently $30.40 and will increase to $38.60 on 1 July 2007. The levy will continue to rise by $7.00 per tonne plus the consumer price index every year for the next four years. As a result, the levy on waste going for disposal will be in excess of $50 per tonne in the near future. This is as a result of the NSW State Government, specifically the DECC, stating that landfilling should be more expensive to encourage alternative waste treatment and technologies.

With this increase in the levy for waste to landfill, the likely gate fee of alternative waste treatment facilities, of which the SAWT-BIOWISE is one such facility, will now become comparable, and will provide a financially-viable choice and competition for those with waste to dispose.

It is assumed that the levy will only apply to the residual waste material which leaves the SAWT-BIOWISE facility for disposal to landfill. Hence, SITA are applying for a separate licence for the SAWT-BIOWISE facility, so that the levy will not apply to all of the waste material which is received at the facility.

3.1.4 Requirement for Compost

Compost is a much-needed product in NSW for improving water holding capacity and enhancing the poor quality of most soils. While there are currently a number of licensed compost-related activities in Sydney, most of these use green waste and Biosolids (or manure) to produce a Grade A saleable product for the general public or for use (if biosolids are used in its manufacture) in landscaping of public areas.

There is also a requirement for compost that complies with the standard of Grade B of the *NSW Environmental Guidelines for Use and Disposal of Biosolids Products* (Biosolids Guidelines). Uses for Grade B compost include mine site rehabilitation, large-scale agricultural application, landfill rehabilitation and potential for methane oxidation in Landfill caps. The demand for compost for rehabilitation is increasing in the Greater Sydney Region (GHD, 2004).

SITA engaged EC Sustainable Environment Consultants to conduct a market analysis so as to determine the current and potential market for organic products derived from MSW and C&I waste in Sydney and elsewhere in NSW. The key objectives of the market analysis were to:

- Identify comparative technical and market profiles of SITA products and similar products to those proposed by SITA;
- Assess the SITA product applicability to potential markets;
- Estimate applicable market demand volumes and values for SITA products; and
- Identify potential future markets for SITA products.

The analysis identified ample potential market opportunities within a range of market segments and sectors using the following application rates and product selling prices. Totals have also been included excluding rehabilitation, since this market sector is not a significant sales opportunity with only a $2 per tonne fee with transport not included. Rehabilitation offers SITA an option to take large volumes of material as an overflow for surplus in the unlikely event that it cannot be sold into the other markets. The first priority for SITA in this market would be the 68 ha of landfill rehabilitation available on its own Site, of which 7 ha are imminently available.

Table 3.5: Total Potential Sales Volume (tonnes)

Market Sector	Market Segments	Sydney
Rehabilitation	Extractive Industry Sites Industrial Sites Commercial Cites Agricultural Sites State and Local Government	8,718,800
Intensive Agriculture	Vegetable Production Viticulture Fruit – Orchards Fruit – Non-tree Turf Grass Growing Production Nurseries Cut Flower Growing	79,200 303,150 52,750 5,850 69,250 25,000 20,400
Organic Agriculture	All Agricultural Target Markets	56,500

Market Sector	Market Segments	Sydney
Amenity	Landscape Contractors Landscape Suppliers State and Local Government** Sport Recreation	258,917
Enviro – remediation	Contaminated Sites Acid Drainage Sites Stormwater Treatment	52,238
Sydney Total (excl. rehabilitation)		**923,255**
Sydney Total (incl. rehabilitation)		**9,642,055**

1. All of the target markets are considered to be annual markets, with the exception of rehabilitation where the demand is not as renewable (since there large area of degraded land that once rehabilitated may not require further applications). However, of course, new areas will also become degraded through time, but probably not at the past rate with a history of neglect and stricter land use controls now in effect.

** Demand in the Local Government market has been conservatively estimated and may be greater than stated (see for example, a report by Love and Rochfort (2000) for the Northern Sydney Waste Boards and work by the Department of Environment and Conservation (formerly Resource NSW) identifying a particularly high Council demand in the areas surrounding the proposed SITA facility.

Table 3.6: Market Segment Product Selling Price

Market Segment	Product Selling Prices ($ per tonne)
Extensive Agriculture	$20.00
Intensive Agriculture	$20.00
Organic Agriculture	$20.00
Amenity	$35.20
Rehabilitation	$2.00#
Enviro-remediation	$70.00

Footnotes:

1. Based on $20.00 per cubic metre.

Due to the low market value, many suppliers of organic inputs in Sydney do not currently supply products to this market segment. This notion of only supplying to the higher value markets has resulted in organic material stockpiling in NSW, SITA has evaluated the economics of its proposed facility and calculated that the operation will still be viable with supply to the lower selling price rehabilitation market, opening significant product placement opportunities.

Based on economic models, SITA has access to the lower product selling price markets such as rehabilitation that have a large potential for product. This is unlike many organics processing facilities around NSW, who hold out for higher value product sales. This can result in stockpiling if the higher-value markets become saturated within the transport reach of particular facilities. SITA has also been practical in its economic evaluation when searching for markets beyond the geographical scope of many facilities within Sydney. These factors appear to allow SITA ample opportunity to place their product capacity. The total potential market (not including rehabilitation) is approximately 925,000 tpa in Sydney and 2,800,000t in NSW. To meet its full production capacity of 40,000 tpa SITA requires only around 3% of the Sydney compost market and around 1% of the total NSW market, not including rehabilitation. This is readily achievable, with the rehabilitation markets as a fallback opportunity for placement.

Up to 96,560 t of compost are required as a growing medium for rehabilitation the whole of SITA's Elizabeth Drive Landfill Site. This is based on an application thickness of 250 mm on the site areas available for rehabilitation. This is a conservative application rate, with a thickness of up to 500 mm being possible. If necessary therefore, SITA can use up to seven years worth of SAWT-BIOWISE compost production, at the initial production rate of up to 14,000 tpa, or up to three years of full-scale production.

The timing of routine Landfill Site rehabilitation would be co-ordinated with commissioning of the SAWT-BIOWISE facility to ensure that the compost is utilised as it is produced and matured for the appropriate period of time. This would avoid the need for excessive storage of SAWT-BIOWISE and/or imported compost on-site. Existing Landfill Site requirements for compost could also be balanced to use the SAWT-BIOWISE compost produced only in times of low commercial demand but must be balanced with landfill capping phasing. This gives SITA ample opportunities to develop sales of compost in the broader market.

In addition to the wider market, SITA is also in the process of securing contracts to supply compost from the SAWT-BIOWISE. Specific customers have been identified and agreements that will come into effect when the SAWT-BIOWISE is operational are being negotiated.

SITA engaged OTS Strategic Developments Pty Ltd to conduct a market analysis to determine the current and potential market for organic products derived from the proposed SAWT-BIOWISE facility. The analysis focused on the current recycled organics industry in Sydney and surrounding regions to ascertain the market's capacity to accept the annual quantity of compost produced by the proposed SAWT-BIOWISE facility over the operational life of the facility.

The following summarises key findings of the market analysis undertaken:

- The SAWT-BIOWISE facility will eventually produce approximately 40,000 tpa of compost products once the facility is at full capacity.
- The proposed NSW DECC *Fuel, Fertiliser and Fill Regulations* (referred to as the '3F' Regulations) is expected to have the greatest impact on where and how SITA can apply/sell the compost produced at the SAWT-BIOWISE facility.
- The compost derived from the municipal waste stream (which has undergone composting in the composting tunnels) is most likely to be classified under the 3F Regulation "as '*soil replacement wastes'* and will be limited to those type-specific standards (i.e. general exemptions) applicable to environmental remediation". Therefore SITA will have to seek a specific exemption from the DECC to sell its compost derived from the municipal waste stream into agricultural markets.
- SITA should be able to achieve the specific exemptions required under the 3F Regulation to enable the sale of compost derived from the municipal waste stream into the agricultural markets.
- "As the identified existing annual demand in the low-quality target markets exceeds the annual production capacity of the Elizabeth Drive facility, any market access restriction due to the 3F Regulations will not affect SITA's organic marketing platform".
- The SAWT-BIOWISE compost produced will be "more mature, stabilised compost with a higher nutrient content than most garden organic-derived products currently available within the GSR". Therefore the "SAWT-BIOWISE organics products will… have a marketing advantage over garden organics RO *(*recycled organics) products".
- There may also be further markets developed in the future including the potential for other agricultural target markets where affordability is currently too low or the area under cultivation too small. These include the extensive agricultural target markets (cereals for grains, crops and pastures for hay, legumes for grains and pasture farming) and intensive agriculture crops such as avocados and olives.

Eight strategic business partners have been identified “for all the possible contaminant grades of SAWT-BIOWISE organics products that are likely to be produced from the Elizabeth Drive facility”. Letters of Intent and Endorsement Letters from these companies have been obtained for more than the volume of compost expected to be produced at the facility.

Letters of Intent and Endorsement Letters have been obtained from the following industries: mining; native land restoration; extensive agriculture; market gardens; nurseries and landscaping.

The annual demand requirement for the identified strategic business partners is expected to increase progressively as discussions with other clients continue, product experience is obtained and new Letters of Intent are signed.

SITA will work with Australian Native Landscapes (ANL) in relation to the products originating from the source separated organic Waste feedstock. ANL are the largest recycled organics operator within Australia. ANL currently processes in the order of 500,000 tonnes of green waste per annum. ANL has led the compost industry in supply chian development, quality control procedures and the creation of safe and viable end products that provide the end users with products that are quality certified and fit for purpose. All of this material has been sold through an extensive and varied customer base without giving rise to a single complaint or any other issue regarding their use.

Producing the right products and targeting the key customers in each market sector will be the role of the ANL distribution facilities that include:

- Badgerys Creek (transport, composting and distribution);
- Terrey Hills, Seven Hills, North Ryde (Sales and Marketing);
- Wyong, Cooranbong (Production marketing and sale of packaged products);
- Eastern Creek (Production and Sales); and
- Horsley Park (Production, marketing and sale of packaged products).

Within ANL’s supply chain itself, there are some fundamental partnerships and influencers that will determine the long-term development of all aspects of the market for recycled organic materials in general, and consequently the markets for the products. There are 3 key market segments for products originating from the Elizabeth Drive processing facility sourced feed material:

- Urban Amenity:
  - Commercial – Landscaper/Civil Contractor/Builder;
  - Government Authority (PCC); and
  - Retail Consumers.
- Intensive Horticulture:
  - Cut Flower;
  - Vegetable; and
  - Container Crop Production.
- Agriculture:
  - Intensive Production;
  - Viticulture;
  - Extensive Crop production; and
  - Broadacre Cropping.

These market segments have a capacity to absorb all of the source separated organics Waste origin products that will be produced by the SAWT-BIOWISE facility.

3.2 Alternative Locations

SITA commenced investigation into providing an AWT treatment facility in early 2002. SITA considered several options for siting the waste processing plant and selected the western part of Metropolitan Sydney as an area with an obvious need for AWT.

Western Sydney provides an appropriate waste catchment. The area is experiencing strong population growth, which is fuelling an increased demand for services and, in turn, construction and development. Waste generation in Western Sydney is increasing with population growth and suitable waste management technologies are required to meet this need. Local and State Governments are increasingly looking to AWT to meet requirements to reduce quantities of waste to landfill. Locating the SAWT-BIOWISE facility in the western suburbs will meet a demand for such facilities to cater for the increased waste production in the area.

The proposed SAWT-BIOWISE facility is ideally located within the Penrith LGA and immediately adjoining the northern border of the Liverpool LGA. The proposed facility location has been a contributing factor in SITA securing the two ten-year waste treatment contracts for both these LGAs (refer **Section 3.1.2** for details of these waste contracts). The award of these contracts to SITA is a further indication of the need for a waste treatment facility in the locality.

3.2.1 The Preferred Site – Elizabeth Drive

SITA has owned and operated the landfill at Kemps Creek for over 10 years. Co-location of the SAWT-BIOWISE facility with the Landfill will provide SITA with a position that is well connected to major transport routes and well located within the Western Sydney waste catchment. The Elizabeth Drive Site has sufficient space to allow the construction of the SAWT-BIOWISE facility without interfering with the independent operation of the Landfill. Furthermore, the existing Elizabeth Drive Site is already cleared and is positioned with good buffers to nearby sensitive receptors (e.g. residences). The surrounding land is rural and is generally not developed.

Co-locating the SAWT-BIOWISE facility with an existing landfill is the most desirable outcome for SITA as it allows the inorganic residual waste materials to be disposed off in an efficient manner. Co-location of the SAWT-BIOWISE facility reduces potential environmental and social impacts of the facility by placing the treatment plant adjacent to similar land uses and significantly reducing traffic impacts. In addition, landfills are generally located some distance from sensitive development and generally provide large buffers to nearby residents.

The north-western corner of the Elizabeth Drive Site was selected as the preferred location because of its geotechnical stability, undisturbed land and distance from sensitive receptors. The corner location is the most distant position (on-site) from the residential dwelling to the east, and from Elizabeth Drive to the south. This particular SAWT-BIOWISE Site is lower in elevation than the area around the gatehouse, which will reduce potential visual impacts. The distance from existing residences and the shielding offered by the existing Landfill operations also help to reduce noise impacts on the eastern and southern residential dwellings. The selected location maximises the available void space and time span of the existing Landfill.

3.2.2 Alternative Sites

Other land that was considered included some commercial and industrial land. Such land is generally unsuitable because of insufficient buffer distances to neighbouring properties, the difficulty of obtaining approval and required licences, and the inefficiencies associated with transporting the inorganic material from a site for disposal.

Within the PCC area the only industrial precinct, which could readily be identified as suitable for the proposed SAWT-BIOWISE facility would be the St Marys – Dunheved precinct. Property value levels there suggest that a 5 ha site, if available, would cost in the vicinity of 150 dollars per square metre (i.e. 7.5 million dollars for a 5 ha site), which would make the SAWT-BIOWISE proposal non-viable commercially.

Having contracts to treat both waste from Penrith City and Liverpool City Councils, the sites proximity on the Penrith side of the boarder between these two councils is ideal for access.

3.2.3 Alternative Locations on the Elizabeth Drive Site

The option to position the SAWT-BIOWISE facility closer to the existing entrance to the Elizabeth Drive Site was investigated, because this would enable more efficient use of existing infrastructure and reduce costs associated with construction of items such as haulage roads and utility services. However, locating the SAWT-BIOWISE facility in this position has disadvantages in that potential nuisance impacts on the neighbouring dwellings would be more difficult to mitigate. The SAWT-BIOWISE facility would also be highly visible from Elizabeth Drive.

The construction of building infrastructure requires sound footings to support the structure and mechanical equipment inside. Construction over the already completed sections of the Landfill would be technically more difficult and more expensive due to the need to provide sound foundations.

3.3 Alternative Waste Technologies

The Waste Inquiry conducted by the NSW State Government in April 2000 provides a summary of waste treatment technology, available at that time. Both before The Waste Inquiry and in the period since, a number of AWTs have been established in Australia, with varying degrees of success. These technologies are generally grouped into mechanical separation technologies, biological technologies, thermal technologies and landfill technologies.

In NSW, AWT facilities are licensed by the DECC as Composting or Organics Processing Related Facilities. According to the DECC public register of POEO Act Licence there are 59 facilities currently licensed to perform composting activities in NSW although most of these facilities are not AWTs. Many are primarily green waste composting activities, which operate using relatively low technology such as open stockpile and windrow composting of green waste and manure. These facilities have much lower environmental controls and therefore potentially higher impact than SAWT-BIOWISE.

A summary of those that are generally considered as AWT processes by the waste industry (not including bioreactor technology), either operating or currently, under construction or being commissioned in Australia, is provided in **Table 3.7**.

Table 3.7: Alternative Waste Technology

Technology	Provider	Stated Capacity (t/yr)	Project Location	Project Status
ArrowBio water separation of MSW, followed by refining and composting	Ecolibrium/WSN Environmental	90,000[6]	Camden, NSW	Currently being constructed, due to operate from 2008
UR-3R 'Percolation' followed by composting and refining of MSW	Global Renewables Limited/ WSN Environmental	175,000 initially (potentially up to 260,000)[1]	Eastern Creek, NSW	Operational since September 2004
Revolving compartmentalised aerobic composting of MSW, commercial waste and Biosolids	SITA	35,000[5]	Port Stephens, NSW	Operational since July 1999
Enclosed tunnel aerobic composting of Biosolids, Greenwaste and kerbside collected, separated organics	Remondis Pty Ltd/ Hastings Council	greater than 40,000[3]	(Hastings Council) Cairncross, NSW	Operational since November 2001
Anaerobic digestion of source segregated commercial and residential food waste	Earthpower Technologies Sydney Pty Ltd	76,650[4]	Camellia, NSW	Operational since November 2003
Aerated Static pile composting of Biosolids, green organics, grease trap waste and food residue	BioWise (SITA and Water Corp of WA)	25,000[2]	Kwinana, WA	Operational since 2001
Revolving compartmentalised aerobic composting of MSW, C&I and Biosolids	SITA-CEC Environmental Solutions	90,000[5]	Cairns, Qld	Operational since January 2003
Revolving compartmentalised aerobic composting of MSW	Bedminster Bioconversion Pty Ltd	109,200[5]	Canning Vale, WA	Operational since January 2003
Atlas aerobic composting of MSW	Atlas Group	50,000[7]	Calingiri, WA	Recommenced operation August 2001

Sources:

1. Global Renewables corporate brochure/www.grd.com.au
2. Data supplied by SITA
3. www.rethmann.com.au
4. www.earthpower.com.au
5. Data supplied by SITA and www.bedminster.com.au
6. www.wsn.com.au
7. www.atlas-group.com.au and www.stirling.wa.gov.au

Initiatives to reduce waste-to-landfill are relatively new in Australia. SITA has experience operating AWT facilities whereas many of the alternative technologies are still under construction or in commissioning phases in Australia and there is little long-term local operating data on the facilities, to date. Consequently, since the SAWT-BIOWISE meets the Project Objectives, SITA prefers to use its proven AWT.

3.3.1 Do Nothing Option

If SITA does not proceed with this SAWT-BIOWISE project, it is envisaged some of the consequences may be as follows:

- A lost opportunity to contribute to a Local Government Action Plan for Western Sydney's waste while landfill void space continues to be depleted;
- Loss of employment opportunities;
- Loss of security of long term waste treatment and recovery;
- A lost opportunity to contribute to the increased re-use objectives of the Local Government Waste Strategy and its aggressive re-use targets;
- Continuing and longer term use of landfill;
- The regional[2] need for compost would not be met;
- No improvement in the removal rate of recyclables from the MSW stream;
- SITA would need to import and transport large volumes of compost to its Elizabeth Drive Site for rehabilitation of the Landfill;
- PCC and Liverpool City Council have both signed ten year contracts with SITA for the treatment of their municipal solid waste at the proposed SAWT-BIOWISE facility. If the proposed facility does not proceed, both Councils will have to secure alternative waste treatment/disposal contracts for the disposal of their waste at other AWT facilities or landfills.

Therefore, development of the SAWT-BIOWISE facility will carry the following advantages:

- Security of sustainable waste disposal;
- Maximisation of resource recovery;
- Establishment of Penrith as a leader in AWT;
- Local jobs and employment across a range of skills;
- Support for local businesses;
- Local economic development;
- Security of price of waste disposal;
- Council budget security;
- Establishment of tried and tested technology with an expert operator;
- Production of quality compost; and
- No significant environmental impacts.

If the SAWT-BIOWISE proposal did not proceed, the local region's wastes, and in particular Penrith and Liverpool Council's, may need to be sent to another region where a facility already exists or could be developed with implications for associated greater haulage costs, and environmental and social impacts of transporting regional waste to another region.

The proposed SAWT-BIOWISE facility would be in an ideal location to serve both Liverpool and Penrith Councils and provide a beneficial resource potentially allowing both Councils to play a significant part in meeting State Government targets for the reduction of waste to landfill.

[2] Sydney, Hunter, Central West and Illawarra Regions