

## 4.0 Proposal Description

### 4.1 SAWT-BIOWISE Overview

#### 4.1.1 Process

The aim of the SAWT-BIOWISE process is to:

- Recover recyclable materials (steel, aluminium, timber, plastics, glass, paper and cardboard) and organics (green waste and food waste) from Municipal Solid Waste and Commercial and Industrial waste;
- Process source-separated organic waste into a product for reuse;
- Ensure that all process steps are carried out with the highest level of environmental control; and
- Provide for a safe operational environment.

Both processes comprise the following major steps:

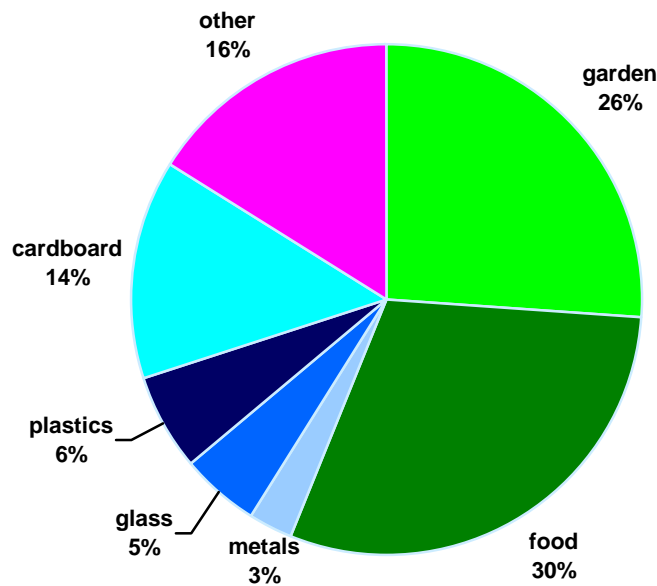
- Recovery of all organics and recyclables from each waste stream through a mechanical Resource Recovery process;
- Aerobic composting within a fully enclosed tunnel (mixed waste) or Biocell Composting System (source-separated organic waste); and
- Preparation on site for sale to market.

Organics recovered from the source separated organic waste streams will be composted separately to the organics recovered from the mixed waste streams. The SAWT-BIOWISE may also receive and process biosolids. The biosolids would be composted along with the source separated organic waste stream.

Recyclables positively sorted from the Waste will be taken offsite for recycling. The putrescible fraction of the Waste will be composted in the Composting Tunnels. The non-putrescible process residual fraction will be disposed of in the adjacent Landfill. In the unlikely event that there is any process residual fraction that contains putrescible material, the stream will be disposed of in an appropriately licenced landfill offsite.

A typical composition of MSW is shown in **Figure 4.1**. This breakdown shows the percentage of recyclable and organic waste typically available for recovery in this process.

**Figure 4.1: Typical Composition of Municipal Solid Waste (MSW)**



As shown in **Figure 4.1**, the typical composition of Municipal Solid Waste is 30% food, 26% garden 28% potentially recyclable materials (cardboard, plastics, glass and metals) and 16% other material.

The typical composition of source separated organic waste is 52% food, 42% garden and 6% recyclables/contamination.

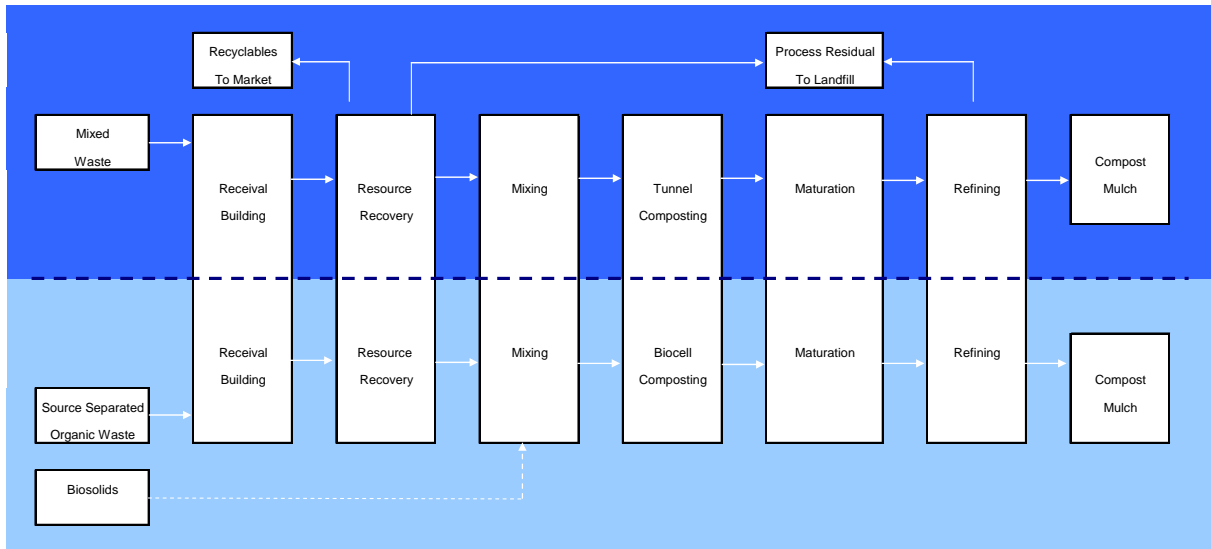
The SAWT-BIOWISE process is based on a combination of mechanical separation, manual sorting, and biological composting technologies that have been successfully applied by SITA in Australia and in Europe, including the Crobern MBT Facility in Germany, the Newcastle Facility in the UK, the Terrays Facilities in France and the Perth BioWise Facility. All of these facilities have a proven track record of sound technological and environmental performance.

The main steps of the process are:

- **Receival:** The acceptance of Waste from transport vehicles in a fully enclosed negative pressure building and initial large item recovery. The Waste will be received and screened for process suitability. The receival building will have sufficient capacity to store up to two days of Waste received, if required;
- **Resource Recovery:** The mechanical and manual separation of putrescible and non-putrescible fractions for recyclable materials recovery and organics recovery;
- **Tunnel Composting:** The biological treatment of the organic fraction of the mixed waste in ventilated, fully-enclosed composting tunnels for several weeks;
- **Biocell Composting:** The biological treatment of the organic fraction of the source separated organic waste in ventilated, fully-enclosed Biocells for several weeks;
- **Maturation:** The curing of the composted product for a few months;
- **Refining:** The screening of composted products with various technologies to improve product quality within an enclosed building; and
- **Landfilling:** The disposal of all process residual to Landfill.

A flow diagram of the overall SAWT-BIOWISE process is shown in **Figure 4.2**.

**Figure 4.2: SAWT-BIOWISE Process Flow Diagram**



#### 4.1.2 Capacity

The SAWT-BIOWISE facility will be capable of processing approximately 120,000 tpa of Waste. Whilst not essential to the composting operation, the SAWT-BIOWISE facility will have the capability to receive and treat up to 14,400 tpa of biosolids in addition to the Waste.

At maximum capacity, the SAWT-BIOWISE facility is expected recover up to 8,000 tpa of recyclables (steel, aluminium, plastics, glass, paper and cardboard) and produce up to 40,000 tpa of compost, leaving an inert residual of up to 35,000 tpa suitable for disposal in SITA's adjacent Solid Waste Class 2 Landfill.

The existing Landfill currently accepts approximately 300,000 tpa which fluctuates yearly depending upon market conditions. The addition of 35,000 tpa of residuals from SITA will have only a minor impact on the life of the existing landfill, which has a current operational life of at least 20 years.

#### 4.1.3 Operations Overview

An overview of the SAWT-BIOWISE operations is described below in more detail.

##### Waste Delivery

The adjacent photo shows a typical domestic waste collection vehicle similar to the type that will deliver Waste to the SAWT-BIOWISE facility. The majority of Waste will be delivered to the facility in this type of vehicle. Transfer vehicles delivering Waste from transfer stations may also be received at the facility. The size and overall dimensions of the transfer vehicles varies but they are typically a 19m long semi trailer vehicle fitted with a 'walking floor' that allows waste contained within the trailer to be walked out of, or ejected from, the trailer in lieu of the entire vehicle body tipping. The SAWT-BIOWISE facility and access roadways are designed to allow delivery of 19m semi trailer transfer vehicles.



## **Receival Building**

Collection vehicles containing Waste will be directed to the Receival Building of the SAWT-BIOWISE facility after exiting the weighbridge. Up to five collection vehicles can unload in the Receival Building simultaneously. The building will be fully enclosed under negative pressure and has large fast acting roller doors to allow vehicle entry and exit along with a leachate capture system.

Mixed waste and source-separated organic waste loads will be handled separately via an internal conveyor system to the Resource Recovery Building for processing.

## **Resource Recovery Building**

The Resource Recovery Building will house two separate processing lines. One for the mixed Waste feedstock and the other for the source-separated organics Waste feedstock. The building will be fully enclosed and under negative pressure. The processing equipment portfolio within the building will include:

- Trommel screens to separate the respective Waste streams by size;
- Manual sorting stations to recover recyclable items;
- Magnetic separators to recover metals;
- Eddie current separators to recover aluminium and other non-ferrous metals;
- Shredding equipment to size reduce and prepare material for composting;
- Mixing equipment to prepare material for composting;
- Storage containers for recovered recyclables and process residuals; and
- Leachate and dust control systems.

The storage containers will be removed from the Resource Recovery building through fast acting roller door exits. The material for composting from the separate processing lines will be transferred via internal conveyor to the Composting Building.

## **Composting Building**

The Composting Building will house the Composting Tunnels, the Biocells and the associated process control equipment. The building will be fully enclosed under negative pressure and contain a leachate capture system. A front end loader will be used within the building to transfer feedstock from the in feed conveyor to the Composting Tunnels or Biocells and to transfer composted material from the Composting Tunnels or Biocells to an out-feed conveyor.

All feedstock originating from the mixed waste input stream will be transferred to the Composting Tunnels for composting. All feedstock originating from the source separated organic waste stream will be transferred to the Biocells for composting.

Fans will be used to provide air supply to the composting material within the Composting Tunnels and the Biocells. An internal sprinkler system will provide water to hydrate the composting material within the Composting Tunnels and the Biocells. Oxygen and temperature sensors will be used to maintain process control of the composting material within the Composting Tunnels and the Biocells. After completion of the composting process, the compost from the Composting Tunnels and Biocells will be transferred separately via conveyor to the maturation pad to undergo maturation.

### Maturation Pad

The Maturation Pad will be constructed outdoors and will consist of a hardstand area made from compacted sandstone and clay and contain a leachate control system. The composted material from the composting building will be transferred via front end loader from the out feed conveyor drop point and placed into windrows for maturation.

Material from the Composting Tunnels and the Biocells will be placed into separate windrows. The material in the windrows will be turned by mechanical equipment on a regular basis until the material is ready for refining.

The matured compost will be transferred via front end loader to the Refining Building.



### Refining Building

The Refining Building will be a fully-enclosed, metal clad, steel portal frame building with a concrete floor and a leachate collection system. This building will contain specialised compost refining equipment as well as storage containers for process residual material.

After refining the final products will be removed by front end loader from the Refining Building and placed on the Maturation Pad ready for export from the site. Depending upon market demand, it may be necessary to store material on the maturation pad, for example during winter months when the demand for compost usually reduces. The market also dictates material quality and one reason for keeping fine material separate from coarse material on the hardstand, is that finer material can be sold at a better price.

Vehicles taking compost off the SAWT-BIOWISE site will be loaded by mobile equipment and pass over the SAWT-BIOWISE facility exit weighbridge to record the amount of compost leaving the SAWT-BIOWISE site.

#### 4.1.4 Product Quality

*Australian Standard 4454 Composts, Soil Conditioners and Mulches, 2003 (AS4454)* sets out the quality parameters required for processing and products derived from composting. SITA will use this standard as the basis for the composting of the all of the organics.

The compost products that originate from the source separated organic waste feedstock will meet the AS 4454 standard with respect to product quality. The compost produced from the mixed waste feedstocks will meet the required standards suitable for end use. All matured compost will be tested for compliance with its intended final use, prior to it being loaded on vehicles and taken off the SAWT-BIOWISE Site for use.

SITA also operates the AWT plant at Port Stephens, NSW. This plant is similar in that it receives MSW and produces a compost product. The chemical analysis results of 37 batches of materials produced at the composting facility at Port Stephens during 2006 are shown in **Table 4.1**.

**Table 4.1: Chemical Analysis of 37 Batches of Materials Produced at the Composting facility at Port Stephens During 2006**

Analyte	Grade A mg/kg	Grade B mg/kg	SITA Product mg/kg
Arsenic	20	20	3.6
Cadmium	3	5	1.0
Chromium	100	250	21.3
Copper	100	375	85.8
Mercury	1	4	0.5
Nickel	60	125	19.8
Lead	150	150	132.0
Selenium	5	8	2.7
Zinc	200	700	346.5
Dieldrin	0.02	0.2	<0.02
Aldrin	0.02	0.2	<0.02
BHC	0.02	0.2	<0.02
Chlordane	0.02	0.2	<0.02
Lindane	0.02	0.2	<0.02
DDE	0.5	0.5	<0.02
HCB	0.02	0.2	<0.02
Heptachlor	0.02	0.2	<0.02
PCB	<0.2	0.3	<0.15

Source: NSW EPA Draft Environmental Guidelines: Composting and Related Organics Processing Facilities, February 2002

Grades A and B are standards proposed in the NSW EPA Draft Environmental Guidelines: Composting and Related Organics Processing Facilities, February 2002. These standards do not form part of the final version of this Guidance (NSW DEC, 2004) but have been included here to allow comparison of the quality of SITA's product.

From these chemical analysis results it can be demonstrated that the SITA product from the Port Stephens operation comfortably meets the requirements of Grade B material. When compared to the requirements for Grade A material, the product also meets all except one of the requirements. The one criterion that is not met is that for zinc. Zinc is often found in batteries and other galvanised metal that may be discarded by householders.

It should be noted that the Port Stephens facility lacks the comprehensive front-end sorting process that is proposed for SAWT-BIOWISE. It is anticipated that the more sophisticated process to be used at the SAWT-BIOWISE facility will significantly reduce the contamination levels of the SAWT-BIOWISE product in general.

SITA has identified and developed appropriate markets for all of the compost types that will be produced by the SAWT-BIOWISE facility. These markets are discussed in **Section 3**.

## 4.2 Site Layout and Access

### 4.2.1 Site Layout

The SAWT-BIOWISE facility will be located in the north-western corner of SITA's Elizabeth Drive Site on approximately 5 ha of land and will consist of three portal framed buildings, Composting Tunnel

structures and associated hardstands and maturation pads (**Figure 4.2**). Existing Landfill operations at the Elizabeth Drive Site do not encroach on the area chosen for the SAWT-BIOWISE facility and are presently located closer to the south-eastern and north-eastern corners of the Elizabeth Drive Site.

The layout of the SAWT-BIOWISE facility has been designed to facilitate the most logical flow of materials through the facility, whilst providing adequate access and egress for vehicles. **Figure 1.1** shows the general layout of the SAWT-BIOWISE facility.

#### **4.2.2 Site Access**

Access to the SAWT-BIOWISE facility will be via a sealed road, constructed in the south-western part of the landfill. For the purposes of site planning and assessment, a worst-case scenario of the road following along the southern and western boundaries of the Elizabeth Drive Site has been adopted. The exact location of this road may change over the life of the facility. All vehicles entering the Elizabeth Drive Site will pass over a weighbridge where vehicle weights and details will be recorded. Vehicle details will also be recorded via video surveillance cameras at this point. Internal traffic flows to the proposed SAWT-BIOWISE facility and the existing Landfill will be separated after the Elizabeth Drive Site entry weighbridge.

The types of waste delivered to the Elizabeth Drive Site will be classified as either waste containing putrescible materials (such as green waste, food waste or biosolids) or non-putrescible waste (i.e. waste that is free of any organics). Appropriately trained gatehouse staff will identify vehicle types and will check to confirm the type of waste delivered to ensure that any putrescible materials are directed to the SAWT-BIOWISE facility. Each vehicle will then be directed by the weighbridge operator to either the Landfill or the SAWT-BIOWISE facility as appropriate.

The weighing, recording and traffic direction practices required are similar to the practices already in place at the Elizabeth Drive Site as part of the waste acceptance procedures for the existing Solid Waste Class 2 and Industrial Waste landfill cells.

The SAWT-BIOWISE facility exit road will include an additional single lane weighbridge to account for all residual non-putrescible waste materials separated by the facility prior to this material being disposed in the existing landfill and all recyclables sent off-site for resource recovery. There is currently a ready market for commercial recycling of glass, metal and paper in Sydney. The final destination of these recyclables will depend on commercial factors. The gatekeeper will operate the SAWT-BIOWISE exit weighbridge via telemetry from the existing Elizabeth Drive Site entrance.

The SAWT-BIOWISE facility will be surrounded by a chain link fence similar to the existing Landfill Site perimeter fence along the northern and western boundaries, which will form part of the SAWT-BIOWISE facility fence. This fence will separate the SAWT-BIOWISE facility from the existing landfill operation to ensure that all vehicles taking residual waste from the SAWT-BIOWISE facility must pass over the exit weighbridge. The fence will be gated on the access road at a point after the SAWT-BIOWISE exit weighbridge (i.e. the weighbridge will be included within the fenced SAWT-BIOWISE perimeter). The gate will be locked outside of SAWT-BIOWISE operational hours to prevent both unauthorised access to the SAWT-BIOWISE facility and to prevent disposal of wastes from the SAWT-BIOWISE facility to the Landfill.

The access road will include necessary road furniture, signage and line markings to provide safe passage of vehicles around the Elizabeth Drive Site. The assigned speed limit on the access road will be 15 km/h near the weighbridge/office and 30 km/h elsewhere on-site.

In addition to waste collection vehicles, access to the SAWT-BIOWISE facility buildings by other vehicles such as service and staff vehicles, will be via the same SAWT-BIOWISE facility access road in the south-western part of the landfill. Vehicular movements between buildings will be limited to

mobile plant and equipment used in the distribution and movement of processed compost and other process output solid materials. Waste collection vehicles, staff cars and most other vehicles are not required to manoeuvre between buildings within the SAWT-BIOWISE facility area.

#### **4.2.3 Building Infrastructure**

The SAWT-BIOWISE facility Receival and Resource Recovery buildings will be enclosed and equipped with roller doors to assist with air management which will reduce any dust or odour. Material will be processed daily at the SAWT-BIOWISE facility and no long term storage is proposed. The Receival Building has a 2-day storage capacity in the event of equipment breakdown. This will be supplemented by alternative disposal arrangements for breakdowns longer than two days or for planned maintenance periods.

The description and approximate dimensions of the main on-site structures are as follows:

- Receival Building (60m x 40m x 9.2m high);
- Resource Recovery Building (77m x 30m x 10.5m high);
- Refining Building (30m x 34m x 10.5m high); and
- 24 Composting Tunnels and 12 Biocells (total 125m x 64m x 5m high) with a central hall (7m high).

Elevation heights of each of these structures are shown on **Figures 5.4** and **5.5**.

The Receival Building and Resource Recovery Building will be constructed from a combination of building materials but can be generally described as portal-framed structures with a concrete floor. The main rafters and columns will be constructed from universal or welded beams. The roof and wall cladding will be constructed using colourbond steel wall sheeting with a colour selected to fit with the surrounding area.

The Composting Tunnel walls, floor and roof will be constructed using reinforced concrete. The composting tunnels will be joined by a steel-framed roof that is supported on the concrete structures to create a central hall. Each tunnel will be approximately 5m high, 6m wide and 24m long.

The Biocell walls and floor will be constructed using reinforced concrete within the Composting Building. Each Biocell will be approximately 3m high, 6m wide and 24m long.

The Refining Building will be a fully enclosed metal clad, steel portal frame building with a concrete floor. The Refining Building will be approximately 30m wide, 34m long and 10.5m high.

All vehicle access doors into the buildings will be fast-acting roller doors. There will be six in total, one each for entry and exit to the Receival building, one at the end of the Composting Tunnels building, one at the end of the Biocells building, and one each for waste and recycling load-out from the Resource Recovery building.

#### **4.2.4 Staff Amenities**

Amenities for the SAWT-BIOWISE facility staff will be provided in accordance with the requirements of the applicable building codes. Specific detail of these amenities will be determined during the detailed engineering design phase.

The amenities block will contain a washroom, toilet, staff change rooms and a lunchroom for use by SAWT-BIOWISE staff and contractors as necessary during the working day.

The toilet and washroom will have a self-contained sewage plant.

Due to the number of personnel required to operate the facility, especially in the Resource Recovery Room, a lunchroom and staff change rooms will be provided for staff.

A site office will be provided within the SAWT-BIOWISE facility for the use of SAWT-BIOWISE site staff. A basic laboratory for product quality control for management of the composting process will also be provided within the SAWT-BIOWISE facility.

### **4.3 Quality Control**

A quality assurance program will ensure the quality of the incoming waste stream, the final compost output and the disposal of residual material to landfill.

#### **4.3.1 Waste Stream**

Quality control of the incoming waste stream will be achieved by identification of the origin of Waste loads received at the entry gatehouse/weighbridge and visual inspection of non-acceptable material after tipping on the waste-handling floor. Quality control on the waste-handling floor will be achieved by SAWT-BIOWISE operations personnel, whereby any visually identifiable non-acceptable materials, such as drums, appliances and furniture will be identified and removed by use of the mobile equipment. Non-acceptable materials will also be removed at the inspection station in front of Trommel 1 to ensure contaminants which may have been missed by SAWT-BIOWISE operations personnel on the waste-handling floor are removed. These materials will be placed into bins and recycled or disposed of as necessary at an appropriately licensed facility.

#### **4.3.2 Compost**

To ensure that the quality of the compost produced by the SAWT-BIOWISE process meets the requirements of its end usage, SITA will have in place a quality control program that will check:

- The processing parameters of each batch of material during the composting process in the Composting Tunnels and biocells. Temperature, oxygen, moisture and other parameters of the composting tunnels will be continuously monitored and controlled by Programmable Logic Controller (PLC). As a batch is passed, it will be allowed to be transferred for maturation, or either be composted further, or segregated and removed for appropriate off SAWT-BIOWISE Site disposal. Composting tunnel/biocell technology is the only technology which allows this level of control on output specification of the compost as all other technologies are continuous flow; and
- The quality of the end product after maturation and refining. As the product is passed, it will be allowed to be exported off-site for usage. If it does not pass the fitness for use test at this stage, it may either undergo further refining or maturation, depending upon the reason as to why it did not pass, or be removed for appropriate off SAWT-BIOWISE Site disposal.

#### **4.3.3 Residual Waste**

As it is not within the SAWT-BIOWISE process' interests to either lose any potentially compostable waste or keep non-compostable material in the putrescible fraction, a further key area of quality control will be the ability to ensure that putrescible materials are not disposed of into the existing Solid Waste Class 2 Landfill. Any residual material requiring disposal in the Landfill will either be oversized materials or material removed during the Resource Recovery or refining process, such as glass and other contaminants removed from the compost. This means that putrescible compostable materials will have passed through at least two checks to ensure that no contaminating materials affect the

quality of the compost. **Section 4.6** describes the process under which materials will be disposed of to the Landfill, using the Landfill's acceptance procedures as a further quality check.

## 4.4 Utility Services

### 4.4.1 Fire Services

The proposed facility is relatively isolated from other buildings and infrastructure. A cleared firebreak of at least 50m would be maintained between SAWT-BIOWISE buildings and existing vegetation.

Fire fighting requires a high volume of water and reliable supply. To provide adequate fire fighting capacity to satisfy relevant building standards consideration will be given during the detailed design phase to providing most of the fire fighting water from the stored water on the site.

Fire fighting water will either be supplied via a storage tank or dam with a minimum storage capacity sufficient to supply the necessary hydrants and other fire fighting systems for a pre-determined period during fire fighting.

Suitable fire fighting apparatus and infrastructure such as fire hydrants, fire extinguishers and sprinkler systems will be provided within the buildings as needed and specified during the detailed design phase. Such systems will be designed to comply with the relevant building standards for electrical and other fires.

The Volunteer Bush Fire Brigade at Kemps Creek is situated approximately 2.5 km from the Elizabeth Drive Site entrance.

### 4.4.2 Water Supply

Potable water will be required for a range of activities at the proposed facility including staff amenities. Town water is available at the administration building at the south-east corner of the site. However, there is no potable water service to the north-western corner of Elizabeth Drive Landfill and connection to the mains water is proposed for potable use at the SAWT-BIOWISE Facility.

The composting process is a net user of water and requires carefully controlled moisture content for both the composting and maturing processes. Rather than place additional demands on Sydney's potable water supply, it is proposed to recycle compost leachate and stormwater runoff for composting. Any leachate generated either as a condensate from the air extraction system from within the Composting Tunnels or Biocells or as stormwater having fallen over areas where waste is contained will be collected and preferentially used in the composting process. Ponds on the western side of the site will prevent runoff from entering Badgerys Creek. Two additional ponds will be constructed as part of this facility. During detailed design, a water balance model will be developed using existing and proposed dams in times of extreme drought, water supplies can be supplemented with mains water. Stormwater from the landfill site will also be used if necessary.

### 4.4.3 Wastewater

Leachate and stormwater run-off collected from within the waste facility will be collected and reused as described in **Section 4.10**. Other greywater produced on-site from showers and kitchen areas will be reused in the process where possible. Wastewater generated on-site will be subject to management under the Water Management Strategy as discussed in **Section 6.2**.

A self contained toilet and shower wastewater service will be required in the SAWT-BIOWISE facility staff amenities building with waste from these facilities being handled in a self contained sewerage plant. The type of treatment facility will be determined during the detailed design phase of the project.

#### 4.4.4 Electrical Power

Preliminary discussions with the site's electricity provider indicate that electricity supply to the site can be provided without augmentation of the electricity network. Electrical mains will be constructed adjacent to the access road. The installed power requirement for the SAWT-BIOWISE facility is estimated at between 1,000 kWh and 1,500 kWh.

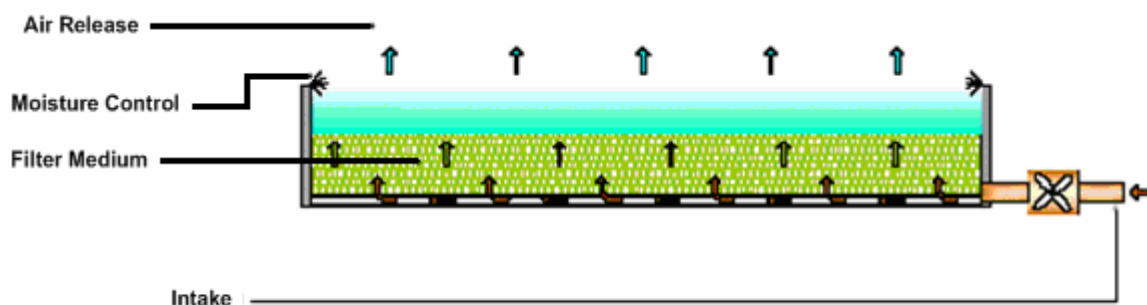
#### 4.5 Odour Management

One of the key elements of the SAWT-BIOWISE facility is the air control system. Detailed modelling by Holmes Air Services (refer **Section 6**) has been undertaken to ensure odour is considered and the appropriate control measures are implemented within the facility. The odour control measures which have been incorporated into the SAWT-BIOWISE facility include:

- All of the waste processes (except for the green waste shredding and maturation) will be carried out in fully enclosed buildings under negative air pressure;
- The buildings will be equipped with rapid closing roller doors to contain odour;
- Composting will take place in the fully enclosed Composting Tunnels or Biocells which are located within the enclosed composting building;
- After undergoing composting in the Composting Tunnels/Biocells, the compost material has low residual odour and can be matured on the outdoor maturation pads without creating odour issues;
- Air from the Reveal Building and Resource Recovery Building will be directed to the Composting Tunnel and Biocell area where it will then be collected via extraction fans and passed through a biofilter to remove odour, before being exhausted to atmosphere. The concept of the proposed biofilter operation is shown in **Figure 4.3**; and
- Biosolids received will be deposited and stored in an above-ground tank or an in-ground pit. The in-ground pit will have a lid which will remain closed at all times, except during loading, to prevent odour generation. Air from the biosolids tank/pit will be directed to the Composting Tunnel and Biocell area where it will then be collected via extraction fans and passed through a biofilter to remove odour, before being exhausted to atmosphere.

**Figure 4.3** displays the details of a typical open air biofilter.

**Figure 4.3: Biofilter Details**



**Typical Section – Open Top Biofilter**

Regular monitoring of the operation of the odour collection and biofilter system at the plant can provide valuable feedback on the health and effectiveness of the system. As a result a monitoring program is recommended for the plant and the biofilters, which will be maintained as part of the site Operations Procedure. This Procedure will include a requirement to routinely check the performance of the biofilters. The biofilter checks will include:

## Daily

- Walk the length of both filters and check for dry spots. Where dry spots are identified, wet with hose or set up soaker hose;
- Check the irrigation system for leaks and correct operation; and
- Check leachate system trends to assess over/under watering. Adjust water duration/frequency if required on the PLC.

## Weekly

- Run all exhaust fans for at least 1 hour each but only one or two at a time. This will ensure that the media will stay aerobic and prevent odours;
- After the fan(s) have run for at least 45 minutes:
  - Using a Vane Anemometer and witch's cone, check and record the air velocity on top of media;
  - Using a Manometer, check and record the pressure in the sample ports along the side of biofilter; and
  - Using a Hot Wire Anemometer, check and record the air velocity in the downcomer pipes.
- Return the completed 'Biofilter Observation Sheet' to Production Supervisor for comment, action and filing; and
- Any unusual plant growth, settlement, dry spots, strange odours or equipment malfunction should be reported to the Plant Manager or Production Supervisor.

Whilst it is not envisaged that operation of the facility will give rise to complaints about odour, the following transparent Customer Feedback program to register and investigate odour complaints is to be implemented.

This program shall typically:

- Allocate a unique number to the customer complaint or correspondence, to allow for effective registration and tracking on SITA's Site Information System;
- Register the complaint or correspondence;
- Allocate a SITA employee 'owner' to address, investigate and provide follow through on the issue;
- Provide adequate resources to allow complaints to be addressed by the appropriate personnel in a time efficient manner;
- Provide a documented response;
- Communicate the response as appropriate;
- Close out correspondence by the Site Manager; and
- Include record of correspondence to the DECC if required by the facility's licence.

A sign will be placed at the entrance of the Elizabeth Road Site, specifically for the SAWT-BIOWISE facility, which will include an all-hours contact telephone number.

The Elizabeth Drive landfill has a weather station on site which will be used to determine wind direction and other parameters to allow thorough investigation of any issue. If required by the Licence, the issue shall be reported to the DECC and once the investigation is completed, the DECC and the original person making the complaint will be contacted and advised of the outcome of the investigation.

The investigation will be the responsibility of the Site Manager. All complaints will be reported in the annual environmental monitoring report to the DECC. If the complaint is valid and emanating from the site, a corrective action request will be raised so that the issue is dealt with to prevent a re-occurrence.

## 4.6 Stormwater Management

### 4.6.1 Classification of Runoff

The concept design has classified the water into five types in order to control the flows separately. Classifications used to describe the flows and qualities of stormwater in, on or around the SAWT-BIOWISE Site are:

- Diverted stormwater runoff from the SAWT-BIOWISE site – draining of stormwater that would have flowed over the location of the proposed SAWT-BIOWISE facility on the Elizabeth Drive Site;
- ‘Clean’ site runoff – stormwater draining from areas of hardstand, roadway, roofing or surfaces within the SAWT-BIOWISE facility that are not used in the handling of solid waste, organic materials or compost;
- Condensate leachate – generated by the composting process within the Composting Tunnels and Biocells;
- Leachate from cleaning – generated within the Receiving Building and Resource Recovery Building; and
- Stormwater leachate – draining from hardstand or pavement areas where there has been direct contact with organic materials (compost and green waste).

SITA intends to reduce the potential adverse impacts of stormwater discharge and to reduce the consumption of potable water by reusing stormwater and leachate where possible. This proposal provides an opportunity to harvest and use both leachate and ‘clean’ stormwater during composting. Reduced potable water usage also translates into increased efficiency and sustainability of the operation.

Aeration of the leachate and stormwater ponds will be carried out as necessary to prevent anaerobic conditions and odour occurring.

### 4.6.2 Management of Stormwater Runoff

For the SAWT-BIOWISE proposal, sedimentation ponds will be used to remove coarse particulates from runoff prior to use on-site or discharge via overland flow. All runoff from the SAWT-BIOWISE site will be captured by the use of appropriate bunds. At the north-western corner of Elizabeth Drive Landfill, there are three EPA licensed points of discharge (if required) during heavy or extended periods of rainfall. There is also a grassed area, which discharges unaffected stormwater flow naturally into Badgerys Creek. Badgerys Creek is the only receiving stream for stormwater from the proposed SAWT-BIOWISE facility. Stormwater will only be discharged to Badgerys Creek if necessary.

#### Diverted Drainage

Diversion of stormwater around the proposed SAWT-BIOWISE facility will be achieved by the construction of drains on the upstream side of the SAWT-BIOWISE facility. This will enable natural drainage to flow around the SAWT-BIOWISE facility and into either the existing North-Western Sedimentation Pond or a proposed new Sedimentation Pond B identified in **Figure 4.5**. These sedimentation ponds will replace the open drain discharge currently used for this particular sub-catchment at the Elizabeth Drive Site. Water from these sedimentation ponds will be used for

operational purposes such as use in the composting process, irrigation, dust suppression and fire fighting.

### ‘Clean’ Site Runoff

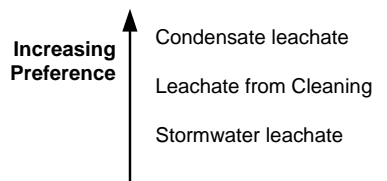
This type of stormwater is designated as ‘clean’ because it is rain that has fallen within the SAWT-BIOWISE facility boundaries (on buildings etc) but has not contacted areas where waste, organic material or compost have been handled or stored. This runoff can be diverted either directly into (either of) the two sedimentation ponds, but would usually drain directly to Sedimentation Pond A, without treatment. Direct inflow into these ponds will be diverted around composting activities and materials handling areas to prevent entrainment of pollution from the compost process.

Storage of stormwater runoff will be suitably managed to ensure as much reuse as is practicable. This type of water will be used for application in the SAWT-BIOWISE process, preferentially to potable water, or would be directly used for operational purposes such as irrigation, dust suppression and fire fighting.

### 4.6.3 Leachate

Leachate can be defined as liquids, including stormwater, that have come into contact with compost or related organic materials (DECC 2004). There will be three sources of leachate from the SAWT-BIOWISE site containing different levels of contaminants. The DECC *Composting and Related Organics Processing Facilities Guidelines* (2004) (Composting Guidelines) require leachate generated from composted materials to be retained and treated, evaporated or in some way disposed of, rather than discharged to the natural environment. To meet this requirement, the design of the SAWT-BIOWISE facility will capture and reuse leachate preferentially. The preference for the reuse of the various sources of leachate generated at the site is shown in **Figure 4.4**.

Figure 4.4: Preferential Reuse of Leachate



### Condensate Leachate

This type of leachate has the highest concentration of contaminants and the smallest generation volumes. It is produced during composting of organic materials within the Composting Tunnels and Biocells. The volume of this type of leachate will be minimised by ensuring that an appropriate composition of waste feedstock material is maintained during composting and by maintaining the moisture and oxygen content of the compost within optimum range. Ensuring that the composition of feedstock material supports a suitable C:N ratio within each Composting Tunnel/Biocell will control nutrient levels in condensate leachate. These process controls will ensure that materials such as food scraps (which typically generate substantial quantities of leachate) are balanced with cellulose materials, which require additional moisture to optimise the composting process (Richard 2000).

Any condensate leachate generated will be extracted from the Composting Tunnels and Biocells via fans in the forced aeration system. Quantities of condensate leachate will be minimised by the fact that all composting is to take place within enclosed buildings. The relatively small volume of condensate generated will be preferentially used for re-application onto the Composting Tunnels and Biocells so no further treatment or disposal of this condensate leachate will be required. Addition of water is necessary for the composting process to keep the waste material moist and assist with conversion to compost. This means that Composting Tunnels and biocells are a net user of water.

Condensate leachate will be stored in sealed tanks. Since the composting operation requires more water than is generated, long term storage of this type of leachate is not required.

### **Leachate from Cleaning**

Small volumes of moderate concentration leachate will be generated within the Receiving and Resource Recovery Buildings through the use of small amounts of water for cleaning of floors or equipment. This leachate will be collected in sumps within the buildings. This type of water would be preferentially re-used, instead of other water sources, in the Composting Tunnels and Biocells.

### **Stormwater Leachate**

Low concentration leachate will be generated when rain falls on material handling, vehicle movement areas, maturation windrows and temporary compost product stockpiles. The characteristics of stormwater leachate are expected to be such that direct short-term storage would not be appropriate because of potential odour generation. It is envisaged that primary physical-biological pre-treatment will be required to enable short-term storage prior to reuse. Water held in the pond would be subject to aeration.

It is proposed that the stormwater runoff leachate will be treated in a bioretention (biofiltration) system. BOD and nutrient pollution in stormwater runoff leachate is typically associated with suspended solids that become entrained in the runoff (Richard 2000). Vegetative filter strips, soil treatment, sedimentation basins and treatment ponds are common methods for managing this type of runoff (Krogmann and Woyczehowski 2000; Richard 2000). The bioretention system will consist of a vegetated basin with porous filtration media and an underdrain collection system. Bioretention systems can effectively remove suspended particulates, assimilate nutrients and consume BOD from the stormwater runoff leachate. In consideration of the association between particulate material, nutrients and BOD, the bioretention system will achieve a very high level of pollution removal.

The pond in which this treatment will be performed is illustrated in **Figure 4.5**. Discharges from the bioretention systems will be stored in Sedimentation Pond A, prior to reuse in the composting process. Implementation of bioretention will enable the water to be stored in an open pond over a short to medium timeframe without producing offensive odours. Aeration of the ponds as necessary will prevent anaerobic conditions and odour occurring. The size of Sedimentation Pond A has been determined at concept-level only to contain a 1 in 10 year, 24 hour storm event volume in addition to the mean monthly runoff volume.

#### **4.6.4 Excess Leachate**

Although the SAWT-BIOWISE process is a net user of water and should generally consume all leachate generated, there will be periods where the stormwater runoff leachate from the SAWT-BIOWISE Site will exceed demand. Typically, these periods will be associated with long periods of wet weather.

To handle excess leachate during these periods, the following methods may be employed.

### **Re-injection**

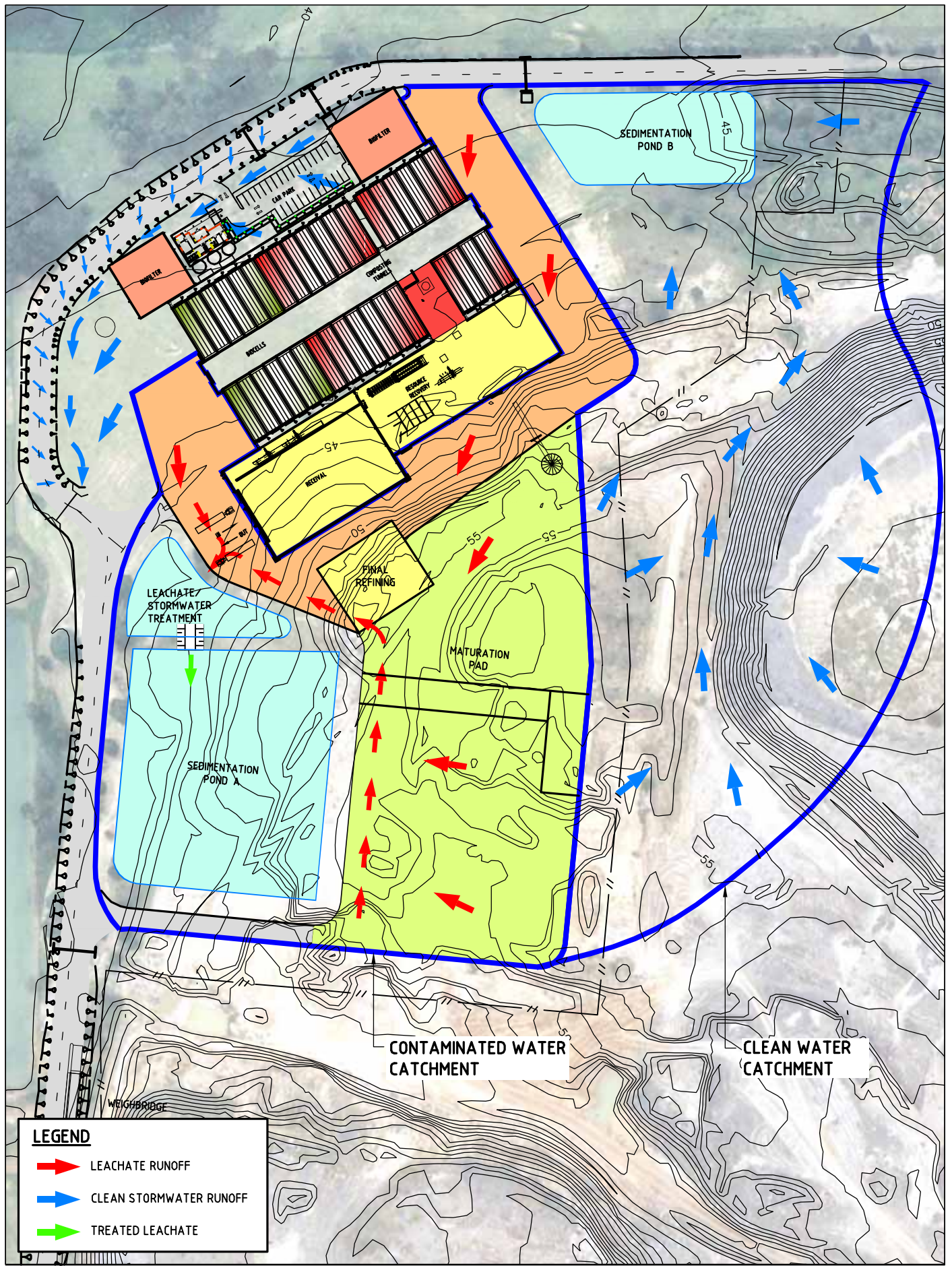
The Composting Guidelines allow for discharge of leachate directly to receiving waters for storm events with greater than a 1 in 10 year Annual Exceedance Probability (AEP). Nevertheless, where the volume of stormwater runoff leachate is likely to exceed the storage capacity required under the guidelines, SITA's preference is to inject this leachate into the waste contained within the existing Landfill. This re-injection practice is carried out with leachate generated within the existing Landfill and the management of this procedure represents standard landfill operational practices. The Landfill has

engineered leachate controls in place to protect the environment and there is an existing DECC licensed environmental monitoring regime that is routinely performed.

### **Irrigation**

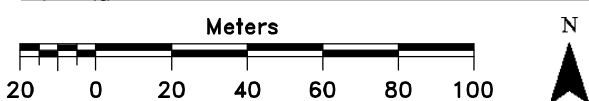
A further option for handling excess stormwater runoff leachate is to investigate the use of irrigation over vegetated areas of the Elizabeth Drive Site or areas undergoing rehabilitation. Leachate potentially carries nutrient loadings that would make it beneficial to plant growth, more so than potable water or water in sedimentation dams.

SITA will demonstrate to the DECC that the quality of collected leachate is suitable for irrigation in terms of pathogen levels. Under the *Environmental Guidelines – use of effluent by irrigation* (DECC, 2004), any areas of the Elizabeth Drive Site where this leachate could irrigate would be classified as a level C area. This requires irrigation water to meet a faecal coliform count of less than 3,000cfu/100mL (geometric mean) and less than 14,000cfu/100mL maximum. This would be achieved either by sampling and analysis of stored leachate prior to irrigation, or by estimation of faecal coliform levels from the temperature, time and turning regime to which compost is subjected in the Composting Tunnels and biocells. The use of this stormwater runoff leachate for irrigation would be negotiated with the DECC, if and when a requirement arises to irrigate with leachate.



**LEGEND**

- ➔ LEACHATE RUNOFF
- ➔ CLEAN STORMWATER RUNOFF
- ➔ TREATED LEACHATE



Advanced Waste Treatment Facility  
Elizabeth Drive

**Figure 4.5: SAWT – Biowise Facility, Stormwater Drainage layout**

If necessary, the treated leachate could be combined with stormwater from the existing North-Western Sedimentation and/or Sedimentation Pond B. Irrigation would be carefully controlled to ensure that all treated leachate infiltrated and no surface runoff was generated. Alternatively, irrigation could be restricted to only those areas of landfill which have not yet been capped. This would ensure that any excess would be re-captured by the landfill leachate collection system.

#### **Additional Leachate Storage**

To provide additional storage for leachate from the Maturation Pads, if required, the stormwater contained within Sedimentation Pond B can be pumped out into nearby Badgerys Creek.

#### **4.6.5 Sedimentation Ponds**

Two new ponds will be constructed on the SAWT-BIOWISE site. Sedimentation Pond A will be used for the short- to mid-term storage of treated stormwater leachate as well as for some untreated 'clean' site runoff from the SAWT-BIOWISE facility. Sedimentation Pond B will be used primarily for the retention of diverted stormwater generated upstream of the SAWT-BIOWISE site.

Preliminary analyses have been conducted to determine the size of both ponds at a concept level only such that they might contain all runoff generated during a 1 in 10 year, 24 hour duration AEP storm event. Sedimentation Pond A has also been sized to include the mean monthly runoff volume, as determined from the mean monthly rainfall at Badgerys Creek Weather Station. This ensures that, if the design event were to occur when the pond is storing the mean runoff volume, there will be no discharge of leachate to the natural waterways.

During detailed design, the size of Sedimentation Pond B will be determined to include a settling zone as determined from the requirements of 'Managing Urban Stormwater: Soils and Construction, 4<sup>th</sup> Ed., Vol. 1, Landcom. 2004'. No settling zone is required for Sedimentation Dam A as it is expected that the bioretention treatment process will remove most of the particulate matter in the leachate. In addition, the expected volume of untreated stormwater entering the pond is small and will not require an additional sedimentation zone.

During detailed design, a comprehensive water balance will be developed in order to further maximise the potential storage in the ponds. Further geotechnical investigation may also be conducted during the detailed design phase to determine if the in situ materials can be suitably compacted to the required DECC permeability criteria to preclude seepage from these ponds.

#### **4.6.6 Summary**

In summary, the proposed water management is as follows:

- Stormwater generated hydraulically upstream of the proposed SAWT-BIOWISE facility will be diverted around the SAWT-BIOWISE facility and ultimately discharged to Badgerys Creek under EPA Licence via the existing North-Western Sedimentation Pond, the proposed new Sedimentation Pond B and/or overland discharge;
- Condensate leachate generated within the Composting Tunnels and Biocells will be of minimal volume and completely re-used in the composting process;
- Leachate generated inside buildings will drain (via sealed working surfaces) into sealed concrete sumps and will be re-used within the composting process;
- Leachate flowing from the SAWT-BIOWISE facility, including the outdoor hardstand and Maturation Pads, will be directed via a series of open grassed drains into the bioretention pond;
- Stormwater and leachate will be treated to enable storage for the short to medium term by a bioretention pond;

- Treated stormwater leachate will be stored in a stormwater storage pond (Sedimentation pond A) that is capable of holding the expected runoff from a 1 in 10 year, 24 hour duration AEP storm event in addition to the mean monthly runoff volume (*Composting Guidelines*);
- Treated stormwater leachate will be reused in the composting process at the Composting Tunnels, Biocells and Maturation Pads;
- Under controlled conditions, any excess leachate will be pumped and re-injected into the Landfill or used for irrigation; and
- Untreated leachate will not be discharged to Badgerys Creek.

## 4.7 Operational Activities

### 4.7.1 Vehicle Movements

Vehicle movements on the site will primarily consist of the following:

- Transportation of Waste, green waste and biosolids to the site;
- Transportation of other miscellaneous equipment such as spare parts and equipment maintenance and consumable supplies;
- Compost transportation from the facility to the end user;
- Removal of recyclable materials to off-site recycling facility;
- Removal of non putrescible material to the adjacent Landfill; and
- Staff and visitor vehicle movements.

#### Delivery Vehicles

All vehicles arriving to use the SAWT-BIOWISE facility will have controlled access via the site entry weighbridge and gatehouse. Vehicles will proceed on a sealed roadway over the south-western part of the landfill site to the location of the proposed treatment facility. Vehicles using the SAWT-BIOWISE facility will enter under controlled conditions that will include speed restrictions while on the site.

Vehicles arriving with materials for processing in the proposed facility will be directed to the relevant part of the site for unloading. Waste collection vehicles will be directed into the Receiving Building. Green waste transport will be directed to the green waste shredder and biosolids transport will be directed to the biosolids storage. Odour from waste delivery will be controlled by the use of enclosed haul transport vehicles, covered transport vehicles and receipt of the Waste in the enclosed Receiving Building.

MSW and C&I waste is delivered to the SAWT-BIOWISE facility typically in enclosed compactor vehicles or walking floor transfer vehicles, however the trucks used for export of recyclables and compost will be of a different configuration. As such, waste delivery vehicles will exit the SAWT-BIOWISE Site empty and compost/recyclables removal vehicles will enter the SAWT-BIOWISE Site empty and leave loaded. All vehicles exiting the site will leave via the same road and Elizabeth Drive Landfill Site gatehouse before exiting to Elizabeth Drive.

Vehicles will be required to transport compost product from the SAWT-BIOWISE Site to customers. These vehicles will be loaded at the maturation area and directed off the SAWT-BIOWISE Site via the exit weighbridge.

#### On-site Vehicles

Vehicles will be required to deliver bin loads of non putrescible residual to the Landfill for disposal. These vehicles will not travel on public roads whilst carrying waste. Their access within the Elizabeth

Drive Site boundaries is restricted to leaving the SAWT-BIOWISE facility via the exit weighbridge and entering the Landfill cell under direction of the Landfill operations staff.

Other vehicle movements around the SAWT-BIOWISE facility are generally associated with the transportation and management of organic materials and compost. Mobile plant such as front-end loaders, will be used for material handling within the SAWT-BIOWISE facility and transfer between the buildings, Composting Tunnels/Biocells and maturation pad. This plant will be dedicated to the SAWT-BIOWISE facility and will not travel to the adjacent landfill site.

### **Personal Transport**

The SAWT-BIOWISE facility will also cater for the personal transport vehicles of up to 30 staff members. Parking within the SAWT-BIOWISE facility boundaries will be provided for these vehicles, in a position where it will not interfere with operational traffic.

**Section 7.2** provides a more detailed description of traffic demand, transport volumes and the impact on Elizabeth Drive.

### **4.7.2 Hours of Operation**

Waste receipt is independent of waste processing due to the buffer storages available in the Receiving Building. The hours for operation outlined below are for a capacity of up to 120,000 tpa of Waste and green waste and 14,400 tpa of biosolids. Reduced operational hours will be worked during the initial stages of the SAWT-BIOWISE facility operation in accordance with the capacity of the facilities.

### **Solid and Green Waste Receipt**

The SAWT-BIOWISE facility will be available for waste to be accepted and product collected at the following times:

- Monday to Friday 6am to 6pm;
- Saturday 8am to 5pm;
- Sunday 8am to 4pm; and
- Public Holidays 7am to 4pm.

This is in line with the current licence for the neighbouring landfill operation.

### **Facility Operation**

The resource recovery and sorting operation will have the flexibility to operate continuously from 7am Monday to 11pm Friday, from 8am to 5pm Saturdays, from 8am to 4pm on Sundays and from 7am to 4pm on Public Holidays during periods of high demand, after downtime, or in order to manage or assist with other extraordinary circumstances. However, operating times will ordinarily be between 7am and 11pm Monday to Friday.

Scheduled maintenance activities would ordinarily take place during operational hours. However, there may be a need for some activities to be carried out during a third shift, or at the weekend.

Continuous operation is required for certain aspects of the SAWT-BIOWISE process. The composting process is a continual 24 hour process and hence the aeration and moisture controls need to continuously operate. The air extraction and filtration processes also need to run continuously at the SAWT-BIOWISE facility to ensure prevention of odour.

## Solid Waste Handling and Storage

SITA requires flexibility in its waste handling and storage arrangements to ensure that the SAWT-BIOWISE process – once started – can be continuously operated over the two shifts. Under normal operating conditions, all waste received at the SAWT-BIOWISE facility will be processed on the same day it is received. Inevitably there will be some exceptions to normal operating conditions where Waste is left stored in the Receiving Building. Circumstances that necessitate waste storage for short periods, including overnight storage, could include unforeseen equipment breakdown, late delivery of Waste by the collection or transfer vehicles or other unexpected circumstances. If Waste must be stored, the roller doors will be closed to contain odour and the air management system will continue to operate. In these situations, when Waste storage capacity is reached no additional Waste loads will be accepted with vehicles being diverted to an alternative Solid Waste Class 1 landfill or disposal facility.

The Receiving Building is designed to accommodate up to two days of Waste storage to enable the operations personnel to deal with incidents such as a major disruption to the SAWT-BIOWISE process facility and/or the inability of the SAWT-BIOWISE facility to process a particular batch of Waste. In the event of a major disruption, the SAWT-BIOWISE facility can be operated for a three continuous shift basis in the one day, to process the stored Waste and return to normal operation. This operation is seen as occurring in unusual circumstances only. Under normal operation, preventative maintenance would be carried out during operational hours, to reduce the possibility of equipment failure.

### 4.7.3 Operational Staff

The SAWT-BIOWISE proposal will create up to 19 new jobs in the initial stages of operation and up to 30 new jobs at full capacity. During the initial stage, estimated to be up to half of the maximum capacity, the following staff are expected to be employed:

- Three (3) Loader Operators or Drivers. Loader operations and drivers are required for the majority of materials handling such as:
  - Waste loading and handling in the Receiving Building;
  - Moving recovered materials from the Separation Building;
  - Moving organic materials to the Composting Tunnels/biocells;
  - Moving composted materials from one Composting Tunnel/biocells to another;
  - Moving composted materials from the Composting Tunnels/biocells to the conveyor for transport to the maturation pad;
  - Moving matured composted materials from the Maturation Pads to refining;
  - Manoeuvring green waste (both shredded and unshredded);
  - Turning compost as it matures; and
  - Loading of transport vehicles with output products for the SAWT-BIOWISE facility.
- 10 manual recovery staff. Manual pickers will be required to assist in two parts of the SAWT-BIOWISE facility in the recovery of materials from the waste stream within the Resource Recovery Building, specifically:
  - Recycling manual recovery (4 people); and
  - Organic audit recovery (4 people).
- One (1) supervisory staff member;
- One (1) compost operator;
- Two (2) labourers; and
- One (1) electrical/mechanical maintenance person.

Staff levels will fluctuate depending upon market demand and operational efficiency. Staff numbers will increase to up to 30 when the throughput of the facility increases and a second shift becomes necessary.

## 4.8 Construction Activities

Construction activities are planned to take place over a period of approximately 12 months.

### 4.8.1 Earthworks and Civil Infrastructure

SITA proposes to build the new infrastructure for the SAWT-BIOWISE facility on areas that are not used in its current landfilling operation at the SAWT-BIOWISE Site. Although the land is cleared and already disturbed, it has not been used for waste disposal of any kind and based upon known site geology will provide a suitable foundation to support the proposed building infrastructure.

The SAWT-BIOWISE Site will be levelled appropriately to provide platforms for each building so as to allow a complementary layout of the SAWT-BIOWISE facility. The base platforms will be at approximately RL42.8m, which is above the 1:100 year flood level. Construction of the plant requires cut and fill of the north western corner of the existing Elizabeth Drive Site to provide suitable levels for all buildings and hardstands. The plant earthworks will be designed without the requirement for imported fill. The cut and fill quantities will be optimised during detailed design of the facility. Material that will be 'cut' from the Elizabeth Drive Site will generally not include material excavated from natural soils but will consist of excavation into temporary on-site stockpiles.

An important component of the civil works is associated with the construction of suitable drainage works, including stormwater drainage, leachate collection devices and leachate collection ponds. These facilities are described in more detail in **Section 4.5**.

Construction of civil infrastructure is expected to take approximately 12 to 16 weeks though this may vary based upon construction contractor and construction techniques employed. Construction activities include earthworks, subgrade and pavement construction, installation of stormwater pipe culverts, construction of lining for leachate storage pond, installation of utility services and other miscellaneous civil construction activities.

### 4.8.2 Building Infrastructure

Construction of the building infrastructure is expected to take approximately 20 to 30 weeks though this may vary based upon construction contractor and construction techniques employed. The building structures consist of steel portal framed buildings, wall and roof cladding, concrete floors, locate retaining walls and other structural items required to support the mechanical equipment.

Concrete will be delivered to site pre-mixed and items formed and constructed on-site. Structural steelwork will be fabricated off-site and erected on-site using cranes and other equipment as determined by the contractor. Cladding will be delivered to the SAWT-BIOWISE Site in sheets and will be fitted to the building framing on-site.

### 4.8.3 Installation of Mechanical Equipment

Mechanical equipment will be constructed off site and delivered in trucks to the SAWT-BIOWISE Site to allow installation and commissioning. This equipment will be required on-site before completion of the building infrastructure to allow the equipment to be easily moved into position before the buildings are completed. The manufacture of some special equipment items could take significant periods of time. Mechanical equipment requires careful installation of associated electrical, mechanical and hydraulic services to suit each piece of equipment. The installation of these equipment items at the SAWT-BIOWISE Site is expected to be complete within the building infrastructure construction period.

#### 4.8.4 Commissioning

The SAWT-BIOWISE facility will require commissioning when the buildings are completed. The commissioning process may extend beyond the construction period stated above. Commissioning will involve two phases, both mechanical/electrical and process commissioning.

Mechanical/electrical equipment commissioning will consist of starting and running all process equipment, as individual item and then as a combined plant. This is performed to ensure that the equipment operates with no waste load, to minimise any potential down time once waste is brought into the plant.

Once the equipment has been verified as working correctly, proven commission will commence. This will involve a limited quantity of waste into the process and surveying that the equipment works when loaded with waste, and that the segmentation of materials occurs as intended. This stage will involve minor modifications to equipment as required to ensure that the process works smoothly.

Construction staging details are currently unknown. At the time of detailed design, details of construction staging will be made available.

#### 4.8.5 Hours of Construction

Construction is scheduled to take place 6 days per week as follows:

- Monday to Friday 6.30am to 6pm;
- Saturday 6.30am to 4pm; and
- Sunday construction is not anticipated unless required to make up for lost time due to poor weather.

Delivery of plant and equipment could be required outside these hours, depending upon transport permits required to transport oversize equipment such as trommels or large conveyors. These activities will be limited and at the discretion of the construction contractor.

#### 4.8.6 Construction Traffic

A forecast of construction traffic is discussed in **Section 7.3**. It is based on the projected volumes of construction material, sequence and rate of construction and the average number of truck deliveries associated with the major period of construction.

The exact sources of supply for the various types of construction materials are not known at this stage, however, it is expected that the majority of construction traffic would access the SAWT-BIOWISE Site along Elizabeth Drive from the east, after travelling along Mamre Road, Wallgrove Road, the Westlink M7 motorway or from the west after travelling along Northern Road (**Section 7.3**). The most likely transport routes would be via existing arterial routes and Elizabeth Drive. Trucks will not use residential streets.

Construction vehicle movements to and on the site will primarily consist of the following:

- Transportation of cut and fill material to provide for the SAWT-BIOWISE buildings (as part of the earthworks stage of construction);
- Transportation of essential construction equipment such as cranes and earth-moving plant;
- Transportation of building materials such as concrete, steel frame components and cladding, etc;

- Transportation of mechanical equipment constructed off-site and delivered to the site on trucks, such as trommels, large conveyors, electromagnets etc;
- Removal of construction waste materials to off-site reuse/recycling facility or to adjacent landfill; and
- Construction staff, supervision staff and visitor vehicle movements.

The estimated construction generated and heavy truck vehicle movements during the construction phase are detailed in **Table 4.2**.

**Table 4.2: Estimated Vehicle Movements during Construction Phase**

	0-3 months	3-9 months	9-12 months
Workers	25/day	45/day	60/day
Deliveries	5/day	15/day	25/day

The *Site Management for SITA Advanced Waste Treatment – Elizabeth Drive* (Grindley Construction, 2007) includes a traffic management section which provides details of the access and egress routes for all construction traffic at the SAWT-BIOWISE site.

**Table 4.3: Estimated Vehicle Movements during Construction Phase**

Month	Activity	Peak / Average Trucks Daily Incoming	Other Traffic Daily Incoming	Comment
1	Commencement/Bulk clearing and excavation	10/5	30	Classified as clean fill and relocated within SAWT-BIOWISE facility
2	Bulk earthworks	15/10	30	
3	Bulk earthworks and structure foundations	40/25	40	Including concrete deliveries
4	Ground slabs and structure	45/25	60	N/A
5	Structure / Masonry / Precast	45/30	60	N/A
6	Leachate ponds / structure / services / maturation pads	65/50	65	Importation of sandstone for crushing for maturation pads / continued concrete and structural steel deliveries
7	Structure / ponds / maturation pads	65/50	65	N/A
8	Structure / fitout / biofilters / maturation pads / ponds	60/45	65	N/A
9	Equipment / services / fitout / pads / ponds	60/45	60	N/A
10	Equipment / services / fitout / pads	50/35	60	N/A
11	Fitout / external works / equipment	45/30	65	N/A
12	Commissioning / external works	45/30	55	N/A
13	Handover	40/25	55	N/A

Source: Grindley Construction, 2007

### **Vehicles Accessing the Site**

All vehicles arriving to the SAWT-BIOWISE facility site during the construction phase will have controlled access via the existing landfill site entry weighbridge and gatehouse. Vehicles will proceed on a roadway around the southern and western boundaries of the site to the location of the proposed treatment facility. Vehicles using the SAWT-BIOWISE facility will enter under controlled conditions that will include speed restrictions while on the site.

All vehicles exiting the site will leave via the same road and Elizabeth Drive Landfill Site gatehouse before exiting to Elizabeth Drive.

### **On-site Vehicles**

Vehicle movements around the SAWT-BIOWISE facility during the construction phase will generally be associated with the transportation of cut/fill material, construction workers and required materials and equipment.

## **4.9 SAWT-BIOWISE Closure**

The lifespan of the SAWT-BIOWISE facility is expected to be greater than 20 years. The exact operational life of the facility will depend upon waste receipt contracts with councils and other clients of SITA, however, it will be generally designed for a 20 year lifespan. Refurbishments may be required to increase this lifespan if required. Upon closure, the plant and footings will be removed, and soil will be tested and disposed of appropriately if contaminated. The SAWT-BIOWISE site may be excavated and used as part of the Elizabeth Drive Solid Waste Class 2 landfill under the existing consent.