NSW GOVERNMENT | Planning & Environment

STATE SIGNIFICANT DEVELOPMENT ASSESSMENT:
Lucas Heights Resource Recovery Park Project
SSD-6835

Environmental Assessment Report
Section 89H of the
Environmental Planning and Assessment Act 1979

December 2016

ABBREVIATIONS

Applicant	SITA Australia Pty Ltd and Sutherland Shire Council (joint Applicants)
ARRT Facility	Advanced Resource Recovery Technology Facility
CEMP	Construction Environmental Management Plan
Council	Sutherland Shire Council
DA	Development Application
Department	Department of Planning and Environment
Development	Increase landfill capacity, relocate and expand the existing garden organics facility and construct and operate a new resource recovery facility at the LHRRP
DPI Water	Department of Primary Industries, Office of Water
EIS	Environmental Impact Statement titled *Environmental Impact Statement – Lucas Heights Resource Recovery Park Project*, prepared by GHD dated October 2015
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
GO Facility	Garden Organics Facility
LHRRP	Lucas Heights Resource Recovery Park encompassing the existing landfill, garden organics facility and resource recovery centre
Lucas Heights 1	A rehabilitated landfill located to the north east of the LHRRP, containing the Barden Ridge Sporting Complex
Lucas Heights 2	The existing operational landfill within the LHRRP
Minister	Minister for Planning (or delegate)
OEH	Office of Environment and Heritage
RMS	Roads and Maritime Services
RTS	Response to Submissions titled *Lucas Heights Resource Recovery Park Project Response to Submissions and Preferred Project Report*, prepared by SUEZ Recycling and Recovery, dated June 2016 and supplementary information titled *Response to DPI Comments on RTS*, prepared by SUEZ Recycling and Recovery, dated 3 August 2016 and *Response to Biodiversity Offsets Review*, prepared by SUEZ Recycling and Recovery, dated 29 July 2016 and *Response to Cronulla Model Aero Club*, prepared by SUEZ Recycling and Recovery, dated 29 July 2016
Secretary	Secretary of the Department, or nominee
SEPP	State Environmental Planning Policy
Sensitive receiver	Residence, education institution, health care facility, religious facility and child care facility
SITA	SITA Australia Pty Ltd
SRD SEPP	*State Environmental Planning Policy (State and Regional Development) 2011*
SSD	State Significant Development
SUEZ	SUEZ Australia and New Zealand (owns SITA Australia Pty Ltd)

Cover photos: Active landfill cell at the Lucas Heights Resource Recovery Park
Masterplan for parkland following closure of the landfill

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EXECUTIVE SUMMARY

SITA Australia Pty Ltd (SITA) currently operates the Lucas Heights Resource Recovery Park (LHRRP) on Little Forest Road, Lucas Heights in the Sutherland Shire. The LHRRP includes a landfill, garden organics composting facility and resource recovery operations. The site also contains a range of infrastructure to support these facilities including surface water, leachate and gas management. The LHRRP accepts municipal solid waste from kerbside collections across the Sydney metropolitan area and waste from the construction and demolition sector. The LHRRP is currently licensed to accept and process up to 730,000 tonnes per year of waste, until 2024 when capacity would be reached.

As population growth continues in Sydney, waste volumes are steadily increasing, with annual waste volumes projected to increase from 12.7 million tonnes in 2015 to 18 million tonnes in 2037. In addition, the NSW Government's *Waste Avoidance and Resource Recovery Strategy 2014-21* (WARRS) identifies targets for reducing volumes of waste sent to landfill and increasing the recovery of resources from the waste stream. SITA has identified the LHRRP as a suitable facility for accepting and processing the increased volumes of waste generated in the Sydney metropolitan area and expanding its existing resource recovery operations in line with the NSW Government's WARRS targets.

SITA, in conjunction with Sutherland Shire Council (as joint applicants) have lodged an application to increase waste processing volumes at the LHRRP, extend the life of the landfill and construct and operate an advanced resource recovery facility. The proposed development involves:

- re-profiling the existing landfill to provide additional capacity for a total of 8.3 million tonnes of waste. This would increase the height of the final landform by 8 metres;
- extending the landfill life by a further 13 years, from 2024 to 2037;
- constructing and operating an advanced resource recovery facility to process 200,000 tonnes per year of waste;
- relocating and expanding the existing garden organics facility and increase its processing capacity from 55,000 to 80,000 tonnes per year; and
- rehabilitating the site following closure of the landfill in 2037 and transferring the site to Council for use as public parkland.

The proposal is classified as State significant development (SSD) under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) because it involves an extension to a putrescible landfill and construction of a resource recovery facility that meets the criteria in Clause 23 of Schedule 1 in *State Environmental Planning Policy (State and Regional Development) 2011*. Consequently, the Minister for Planning is the consent authority for the proposed development.

While landfilling activities have been on-going on the site since 1987, the proposed development is not permissible under the current *Sutherland Local Environmental Plan 2015* (SLEP). The Applicant submitted a concurrent Planning Proposal with the SSD application to add a provision to the SLEP, to make the proposed development permissible. The Deputy-Secretary, as delegate of the Greater Sydney Commission, approved the amendment to the SLEP, with the amendment commencing on 23 December 2016.

The Planning Assessment Commission will determine the SSD application in accordance with the Minister for Planning's delegation, as SITA made reportable political donations.

The development has a capital investment value of $95 million and would create 62 jobs during operation and up to 100 construction jobs during peak periods.

The Department exhibited the Environmental Impact Statement (EIS) for the proposed development from 6 November 2015 until 18 December 2015 and received nine submissions including, six from government agencies, one from a special interest group and two from the general public. Of the nine submissions received, two objected to the proposed development. Key issues raised related to odour impacts, pests and vermin, pollution of local creeks, visual amenity, impact on property values and provision of space for specific recreational uses following closure of the landfill. SITA provided a Response to Submissions (RTS) report and supplementary information to address the issues raised.

development. The assessment has considered the development in the context of strategic plans and policies for NSW and Sydney and the issues raised by Government agencies, special interest groups and the local community. The key issues identified by the Department include:

- odour control, dust management and greenhouse gas emissions;
- leachate management;
- surface water and groundwater impacts;
- final landform, rehabilitation, closure and final land use;
- visual amenity; and
- biodiversity.

The Department has also evaluated other issues relevant to the development, including traffic, noise, development contributions, litter and illegal dumping, hazards, fire management and heritage.

The Department's assessment concludes the proposed development is consistent with the aims and objectives of strategic planning policy for NSW and Sydney. The proposal would provide on-going capacity for the growing volumes of waste, as the population of Sydney continues to grow, and landfills within the metropolitan area have reached capacity and closed. The proposed development is consistent with the key aim of the WARRS, to divert more waste from landfill into resource recovery, as it provides for a new facility with capacity to recover 200,000 tonnes a year of resources from the waste stream. The development also includes an expanded and upgraded garden waste processing facility.

The proposed development would enable expansion of landfill capacity and annual processing volumes within the existing footprint of the landfill by placing waste on top of the existing landfill. The final landform slopes would also improve long term management of the landfill and reduce leachate generation. The Applicant's assessment has adequately demonstrated the proposed development would meet all relevant environmental and amenity criteria. The Department's assessment has concluded odour from the facility would be lower than 2015 levels, leachate would be effectively controlled and managed, and surface water and groundwater resources would be monitored and protected.

The Applicant would rehabilitate the land in 2037 when the landfill reaches capacity and would transfer the land to Council for use as public open space. The Applicant would enter into a Voluntary Planning Agreement (VPA) with Council, which provides a $100 million contribution to local services and infrastructure and sets out the maintenance and management responsibilities for SITA for the long-term.

The Department has recommended a range of conditions to manage the residual impacts of the proposed development. These include limits on waste quantities and types, odour audits, annual calibration of the leachate water balance, a stream rehabilitation plan for Mill Creek, biodiversity offsets, visual screen planting and execution of the VPA prior to construction.

The Department considers the proposed development meets all relevant environmental and amenity criteria and assists in servicing the waste disposal and recycling needs of a growing Sydney. Increasing the capacity of an existing landfill and co-locating resource recovery operations would result in less environmental impacts than constructing and operating an entirely new landfill. Consequently, the Department considers the development should be approved, subject to conditions.

1. BACKGROUND

1.1. The Department's Assessment

This report details the Department of Planning and Environment's (the Department) assessment of the State significant development (SSD-6835) application for the Lucas Heights Resource Recovery Park (LHRRP). SITA Australia Pty Ltd (SITA) and Sutherland Shire Council (Council) as joint applicants propose to increase landfill capacity, relocate and expand the existing garden organics facility and construct and operate a new resource recovery facility. The SSD application is supported by a concurrent Planning Proposal, to amend the *Sutherland Local Environmental Plan 2012* (SLEP) to include 'waste or resource management facility' as an additional permitted use under the current zoning. The Planning Proposal would enable the proposed SSD to be permissible with consent under the SLEP.

The Department's assessment considers all documentation submitted by the Applicant, including the Environmental Impact Statement (EIS) and Response to Submissions (RTS), and submissions received from government authorities, stakeholders and the public. The Department's assessment also considers relevant legislation and planning instruments, including the Planning Proposal submitted with the SSD application.

This report describes the proposed development, surrounding environment, relevant strategic and statutory planning and the issues raised in submissions. The report evaluates the key issues associated with the development and provides recommendations for managing impacts during construction, operation and long-term management following closure of the landfill.

The Department's assessment of the SSD for the LHRRP has concluded the development should be approved, subject to conditions.

1.2. Site Description and Surrounding Land Uses

SITA operates the LHRRP in the suburb of Lucas Heights in the Sutherland local government area. The site is located 30 kilometres (km) south-west of the Sydney city centre and covers 205 hectares (ha) of land (see **Figure 1**). The LHRRP has operated since 1987 and contains a solid waste landfill, garden organics processing facility and resource recovery centre.

The site is located on the south-western edge of the Sydney metropolitan area and is situated between the Holsworthy military reserve and the residential suburbs of Barden Ridge and Engadine. The nearest residential properties are located 2 km to the east of the site in north Engadine. Areas to the north, west and south of the site are predominantly native vegetation.

The Australian Nuclear Science and Technology Organisation (ANSTO) facility is located 500 metres (m) to the east of the site. ANSTO owns 116 ha of the LHRRP site, which includes a buffer zone established around the ANSTO facility (see the green circle in **Figure 1**). ANSTO leases the land to SITA for waste management purposes. The remaining 89 ha of the LHRRP located outside of the ANSTO buffer zone is owned by SITA. Other uses located within the boundary of the LHRRP include the Sydney International Clay Target Association (SICTA) and Police Citizens Youth Club (PCYC) mini-bike area. Both the SICTA and PCYC areas are leased from SITA for recreational uses.

The LHRRP is accessible from Little Forest Road, off New Illawarra Road. Little Forest Road is a 100 m long, two-way road which services only the LHRRP. The ANSTO facility is accessed from New Illawarra Road, which is a two-way arterial road (referred to as A6) extending between Heathcote and Carlingford. Heathcote Road borders the western boundary of the LHRRP.

The Barden Ridge sporting complex is located 2 km to the north-east. The sports fields are located on the site of the rehabilitated Lucas Heights 1, a former landfill which closed in the late 1980's. Lucas Heights 1 contains an operational wastewater treatment plant that receives and treats leachate from the rehabilitated Lucas Heights 1 and the LHRRP.

Some parcels of land located to the north east of the LHRRP near the Barden Ridge sporting complex were rezoned in 2014 by the then Minister for Planning. A total of 23 ha of land was rezoned as low-density residential to enable future development for up to 500 residential lots. The site is known as Heathcote Ridge West Menai and is owned by the Gandangara Local Aboriginal Land Council.

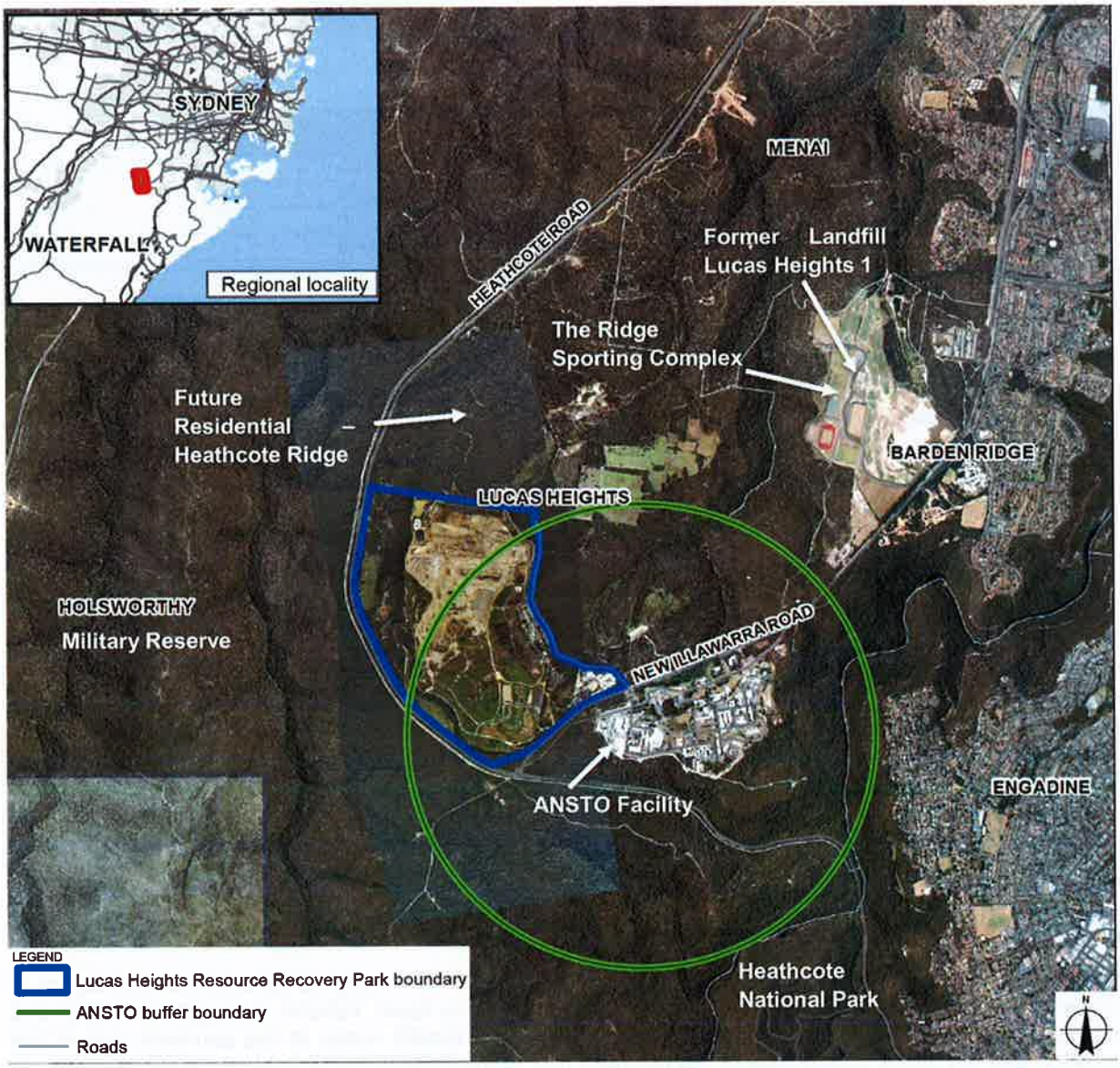

Figure 1: *Site Location*

1.3. Site History – Project Approvals

The LHRRP commenced landfilling waste in 1987 in accordance with an approval granted by Sutherland Shire Council (Council). The landfill was referred to as Lucas Heights 2.

In 1999, in accordance with a development consent (DA 11-01-99) granted by the then Minister for Planning, the landfill was expanded and composting and resource recovery operations were added. The consent enabled expansion of total landfill capacity by 8.225 million tonnes and extended the landfill life until 2024. The consent also covers on-going wastewater treatment operations at Lucas Heights 1 and management of the conservation area located between Lucas Heights 1 and Lucas Heights 2. The development consent also covers capping, landscaping and rehabilitation of the landfill for recreational use and transfer to Council following closure.

The consent has been modified five times since 1999. The modifications have removed restrictions on the source locations to enable waste receival from locations outside of the southern Sydney Council areas, changes to parking and access roads and additional excavation within some landfill cells.

A separate application for an alternative waste technology (AWT) facility at the LHRRP was approved by the former Minister for Planning in 2010, however the project has not proceeded.

Table 1 shows the current approved waste disposal and processing limits at the LHRRP.

***Table 1**: Approved disposal and processing limits*

Activity	Current approval (tonnes/year)
Landfill disposal	575,000
Resource recovery centre and garden organics	55,000
AWT facility (not constructed)	100,000
Total	**730,000**

1.4. Existing Infrastructure and Approved Operations

The existing infrastructure at the LHRRP is shown on **Figure 2**. The LHRRP includes:

- a solid municipal waste landfill;
- a resource recovery centre and waste collection point;
- a garden organics processing facility (GO facility);
- renewable energy production facility (landfill gas capture, operated by a third party); and
- a truck parking area, administration building, weighbridge, workshops, stormwater and leachate dams.

As of January 2015, the landfill had 4.32 million tonnes of total capacity remaining and would operate until 2024. A description of the key components is provided below.

Landfill

The landfill accepts 575,000 tonnes a year (t/yr) of municipal solid waste from various Council kerbside collections across Sydney. Waste material is received by truck from Council collection vehicles, commercial waste contractors and from SITA operated waste transfer stations. The trucks pass through a weighbridge on entering the site and proceed via an internal road network to the active landfill cell, currently in the northern part of the site. Trucks deposit the waste material in the cell and then exit the site after passing through the weighbridge. The waste material is spread and compacted (see the cover photograph of this report). At the end of each day, the material is covered with a layer of compacted soil to prevent ponding of water, escape of litter and odour emissions. Waste disposal activities occur between the hours of 6 am and 4 pm Monday to Friday and 8 am to 5 pm Saturday and Sunday.

Landfill cells are progressively capped once they are filled. The capping includes several layers of material including a seal bearing layer, low permeability clay layer, subsoil, re-vegetation layer and topsoil. **Figure 2** shows the completed and re-vegetated landfill areas in the southern part of the LHRRP and the active landfill cells in the northern part of the LHRRP (cells 5.3A and 5.3B).

Resource Recovery Centre

The resource recovery centre (RRC) is located in the eastern part of the site. It receives recyclable materials dropped off by private vehicles, such as:

- used plastic containers, paper, cardboard and electronic waste;
- ferrous metal including washing machines, stoves, bicycles and scrap steel;
- hazardous items including paint, batteries, engine oil and gas cylinders;
- mattresses and old clothing; and
- household rubble including bricks, concrete, roof tiles and terracotta pipes.

Items that cannot be reused or recycled are moved to the landfill. Up to 10,000 t/yr of material from the RRC are disposed of in the landfill.

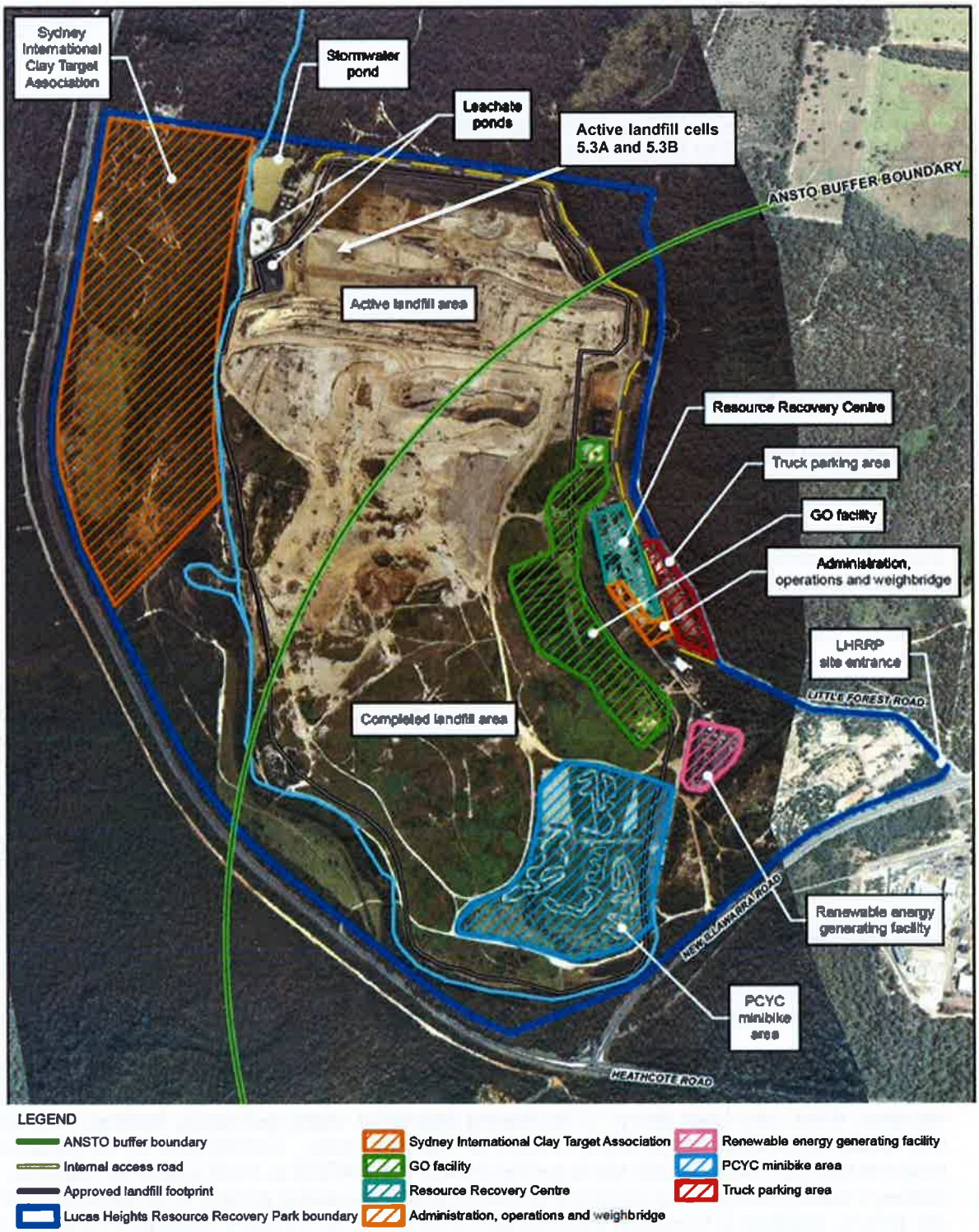

Figure 2: *Existing LHRRP Infrastructure*

Garden Organics Facility

The garden organics (GO) facility is located adjacent to the RRC in the eastern part of the site. Council collection vehicles, householders and small businesses deliver garden waste to the site for processing. The material is shredded, then stockpiled and watered to maintain moisture and commence the composting process. The product is moved by truck to the main composting area where it is regularly turned and watered. After approximately four months, the material is transferred to open windrows for further maturation. The matured compost is then moved to a blending area where it is mixed with sand, composted manure or bark, preparing it for sale as compost or mulch. The entire process takes

between 24 and 30 weeks. Currently, the composting process is undertaken outdoors, without any permanent cover.

Ancillary Infrastructure

The LHRRP includes an extensive gas collection network to capture methane gas from decomposing waste within the landfill. The biogas is collected from wells located within the landfill and transferred via header pipes to a renewable energy generating facility in the south-eastern part of the LHRRP. The renewable energy facility is operated by a third party, Energy Developments Limited (EDL), and is licensed separately by the EPA. The facility captures approximately 67% of the methane gas generated by the landfill and converts it to electricity for supply to the grid.

An administration office, covered workshop, hardstand parking area for trucks and light vehicles and a 12,000 litre diesel fuel storage tank are also located close to the eastern site boundary.

Community Uses

The area covered by the LHRRP also supports the following community uses:

- SICTA leases an area in the north-western part of the site for clay target shooting;
- the Sutherland branch of the PCYC leases an area of rehabilitated landfill for a mini-bike club in the south-eastern part of the site; and
- a local volunteer group operate a plant nursery collecting and propagating endemic species from the site to supply the local community with plants and for rehabilitation works on site, immediately south of the administration building.

1.5. Applicant's Justification for the Development

The Applicant identified the following reasons supporting the need for increased landfill capacity at the LHRRP:

- the two current major landfills within the Sydney metropolitan area include the Eastern Creek Resource Recovery Park (ECRRP), which is due to close in mid 2018 and the LHRRP, currently approved to operate until 2024. The other major landfill processing waste from the Sydney metropolitan area is located at Woodlawn, near Goulburn, with waste transported by train to the landfill. Under SITA's current approval, the LHRRP would cease operating in 2024, which would mean sole reliance on the Woodlawn landfill. The Applicant notes it would take considerable time to identify, approve and develop an alternative landfill or waste processing facility to manage Sydney's waste. As such, extension of the LHRRP operating life by a further 13 years, to 2037 would provide enough time to develop another major facility for the Sydney region;
- the Applicant noted the extension of landfill life at the LHRRP would ensure the landfill is available in the event of an emergency at the Woodlawn landfill. The Applicant identified potential emergency situations such as fire, train derailment or line disruption, which would affect municipal, commercial and industrial waste collection and disposal across Sydney, if an alternative landfill is not available. Extension of the landfill life at the LHRRP would provide this emergency capacity for a further 13 years;
- the NSW Government's *Waste Avoidance and Resource Recovery Strategy 2014-21* (WARRS) identified alternative waste technology facilities as a key aspect for managing Sydney's waste. However, there have been delays in developing alternative waste technology facilities, with only one facility constructed since 2009, located at Eastern Creek. Construction of an advanced resource recovery facility on the site is consistent with the WARRS to divert waste from landfills;
- Sydney's waste volumes have continued to rise along with population growth, by an estimated 1.2% per annum, resulting in increased volumes sent to landfills. As Sydney's population continues to increase, waste volumes would also increase requiring additional waste recycling and disposal facilities. The Applicant provided estimates of waste volumes and population projections, indicating a projected 50% increase in the volume of waste generated from 2015 (12.7 million tonnes) to 2037 (18 million tonnes), requiring additional facilities to process this volume of waste; and
- as Sydney's population grows, there is increasing generation of garden organics waste. The LHRRP GO facility is currently operating at capacity. The proposed relocation of the GO facility would enable an increase in processing capacity from 55,000 t/yr to 80,000 t/yr to meet growing demand.

2. PROPOSED DEVELOPMENT

2.1. Description of the Development

SITA and Council are joint applicants for the proposed development. **Table 2** summarises the major components of the development and **Figures 3** to **9** show the key elements. GHD's Environmental Impact Statement (EIS), in Appendix D, describes the development in detail.

***Table 2**: Main Development Components*

Aspect	Description
Summary	**Increase landfill capacity, relocate and expand the garden organics facility and construct and operate a new resource recovery facility, see Figure 3.**
Increase landfill capacity by re-profiling the landfill	• re-profile the existing landfill to provide an additional 8.3 million cubic metres of capacity (equivalent to 8.3 million tonnes of waste). Re-profiling would be undertaken in 9 phases. **Figure 4** shows phases 5 and 6; • remove the existing capping material over already capped landfill areas and place additional waste on top; • increase the quantity of waste landfilled from 575,000 to 850,000 t/yr; • increase the final landform level by 7.9 m post-settlement, from 172 m to 179.9 m Australian Height Datum (AHD); • increase the landfill by 25 ha to include the area of the existing GO facility; and • augment the existing gas and leachate collection systems.
Relocate and expand the existing GO facility	• relocate the GO facility from the eastern side of the site to the western side covering 3.7 ha (see **Figure 5**); • increase processing capacity from 55,000 to 80,000 t/yr; • construct a waste reception and sorting area; • construct 34 partially enclosed concrete composting bunkers with breathable membrane covers (30 m long by 5 m wide) and an active aeration system (see **Figures 6** and **7**); • construct maturation, finished compost and mulch storage areas; • construct a leachate storage pond for recycling leachate and rainwater back into the composting process; and • amenities office and electrical room.
Construct and operate an advanced resource recovery technology (ARRT) facility	• construct a new ARRT facility covering 8 ha on the western side of the site immediately north of the new GO facility (see **Figure 8**); • receive and process 200,000 t/yr of waste in an enclosed building with a footprint of 18,500 square metres (m2). The building would be under negative pressure with biofilters for air treatment; • construct an enclosed composting hall of 11,500 m2 in area; • construct an enclosed conveyor to transfer pre-processed waste to the composting hall; • install biofilters with spray irrigation systems and 20 m high stacks for dispersion of treated air; • site office including amenities and laboratory for product quality control; • a leachate storage tank; and • parking area for 50 staff and 20 visitors.
Ancillary infrastructure	• extension of above ground power lines and potable water supply to connect the new GO and ARRT facilities; • rainwater tanks, stormwater and leachate ponds; and • fire water storage tanks and maintenance of a 10 m asset protection zone between the ARRT facility and existing vegetation.
Continued operation of existing infrastructure and facilities	• weighbridge at site entrance, truck parking area and workshop; • landfill gas extraction wells and renewable energy production; • administration office and diesel fuel storage tank; • plant nursery; and • community lease areas for SICTA and PCYC mini-bike club.
Roadways and traffic	• extension of the internal road network along the western perimeter of the landfill to connect to the GO and ARRT facilities; and • increase vehicle movements in peak periods from 50 to 64 per hour.
Re-align Mill Creek	• re-align a section of Mill Creek to remove a 300 m long curved section and replace with a straighter section and fill in Mill Pond (see **Figure 9**).

Aspect	Description
Rehabilitate post-closure for community parkland	• decommission and demolish the GO and ARRT facilities and close the landfill in 2037; • rehabiliate and landscape the landfill to provide 149 ha of community parkland by 2039; and • final landscape masterplan includes roads, pedestrian and cycle pathways, water features, lawn and picnic areas and amenities.
On-going maintenance post closure	SITA's responsibilities following completion of rehabilitation in 2039 include: • monitoring of landfill cap, gas and leachate infrastructure for 30 years; • landscaping for 2 years; • stormwater infrastructure for 5 years; • roads and cycle paths for 5 years; and • facilities (toilets) for 15 years.
Operating life	Extended from 2024 to 2037
Construction period	18 months for GO and ARRT facilities and ancillary infrastructure. Landfill re-profiling is an operational activity.
Working hours	See **Table 3**.
Workforce	Construction: 30 for construction of GO and ARRT facilities, peaking at 100. Operation: 62. Includes 50 new staff for the ARRT facility, 5 new staff for the expanded GO facility and 7 staff for the expanded landfill.
Capital investment value	$94,950,000.

***Table 3**: Proposed Operational Hours*

Activity	Day	Proposed Hours
Waste receival	Monday – Friday Saturday and Sunday	6 am – 5 pm 8 am – 5 pm
Construction and landfilling	Monday – Friday Saturday and Sunday	6 am – 5pm 8 am – 5pm
Other activities[1]	Monday - Sunday	Anytime
GO facility	Monday - Sunday	Anytime
ARRT facility	Monday - Sunday	Anytime

[1] Other activities include machinery and infrastructure maintenance and repairs and emergency management activities. Other activities also include loading bunkers and final product preparation manufacture at the GO facility (but does not include shredding).

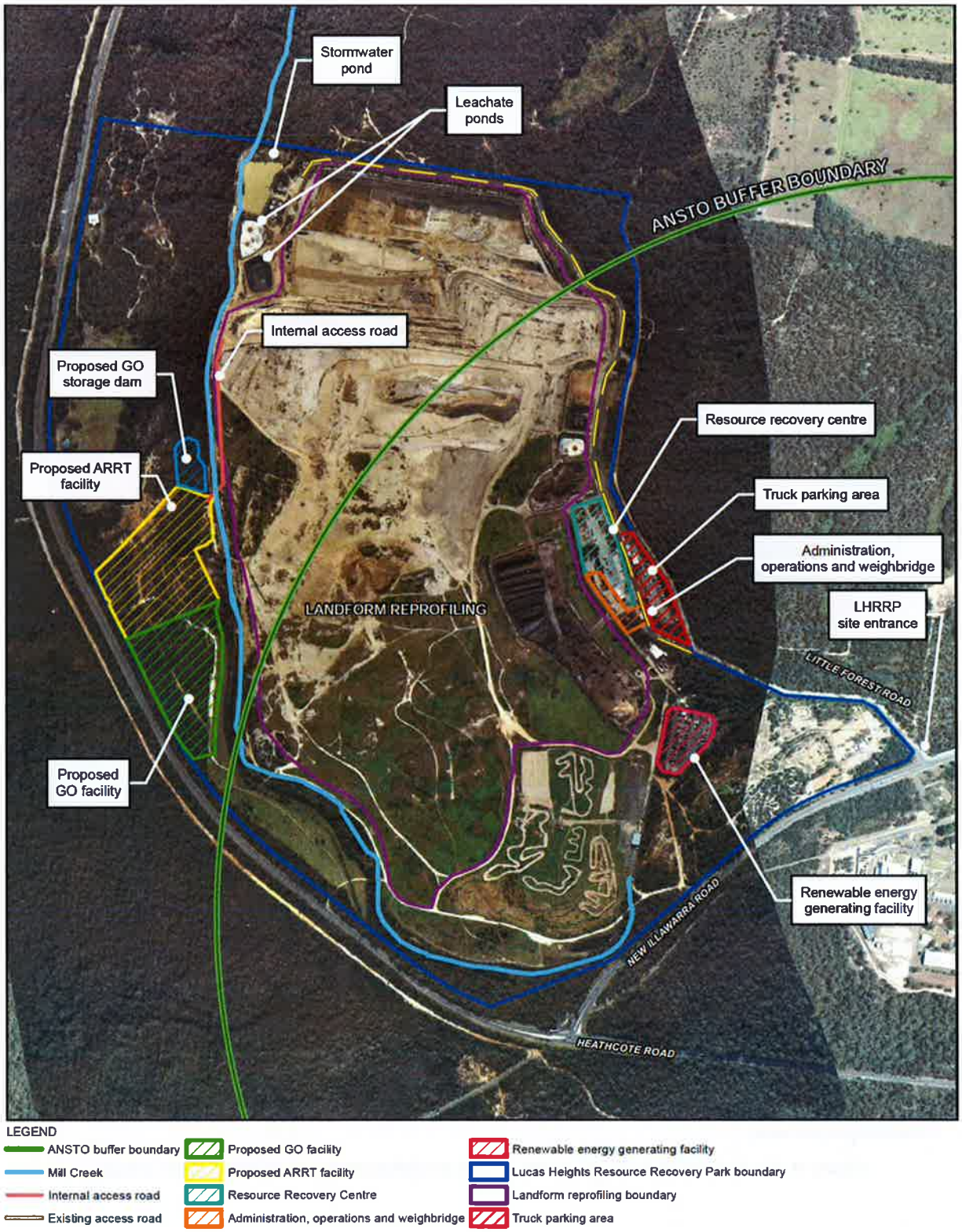

Figure 3: *Proposed Infrastructure*

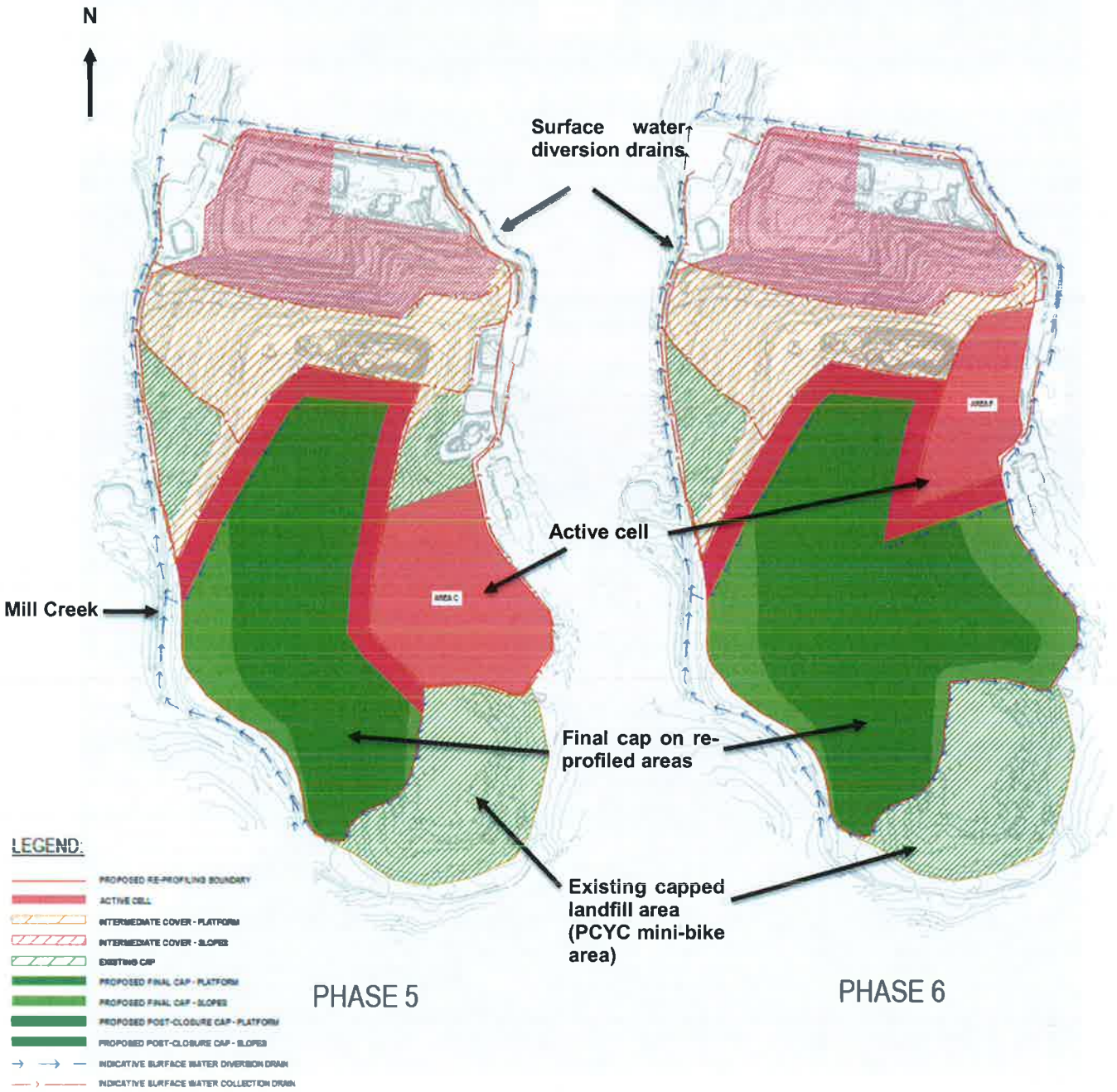

Figure 4: *Re-Profiling of Existing Landfill (shows landfilling on top of already capped areas)*

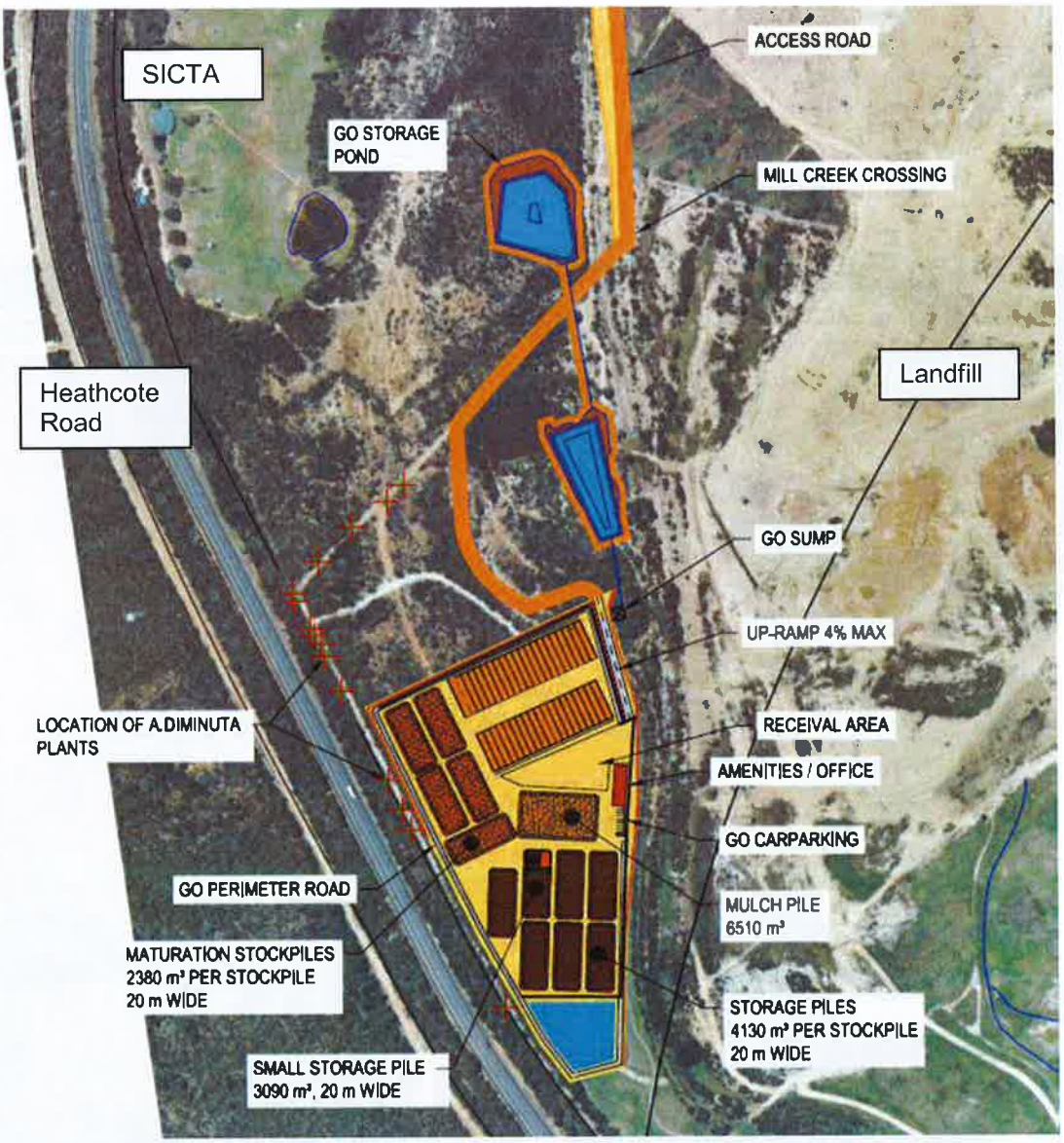

Figure 5: *Proposed Garden Organics Facility*

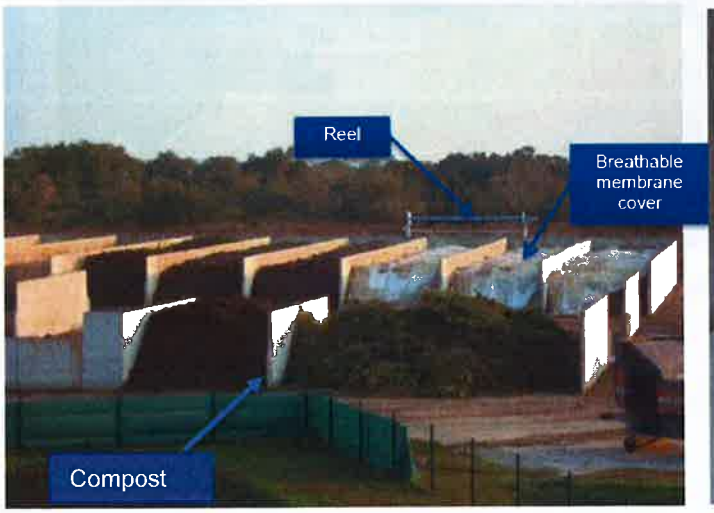

Figure 6: *Example of Concrete Bunkers for Composting at GO Facility*

Figure 7: *Example of Aerated Concrete Bunker Floor at GO Facility*

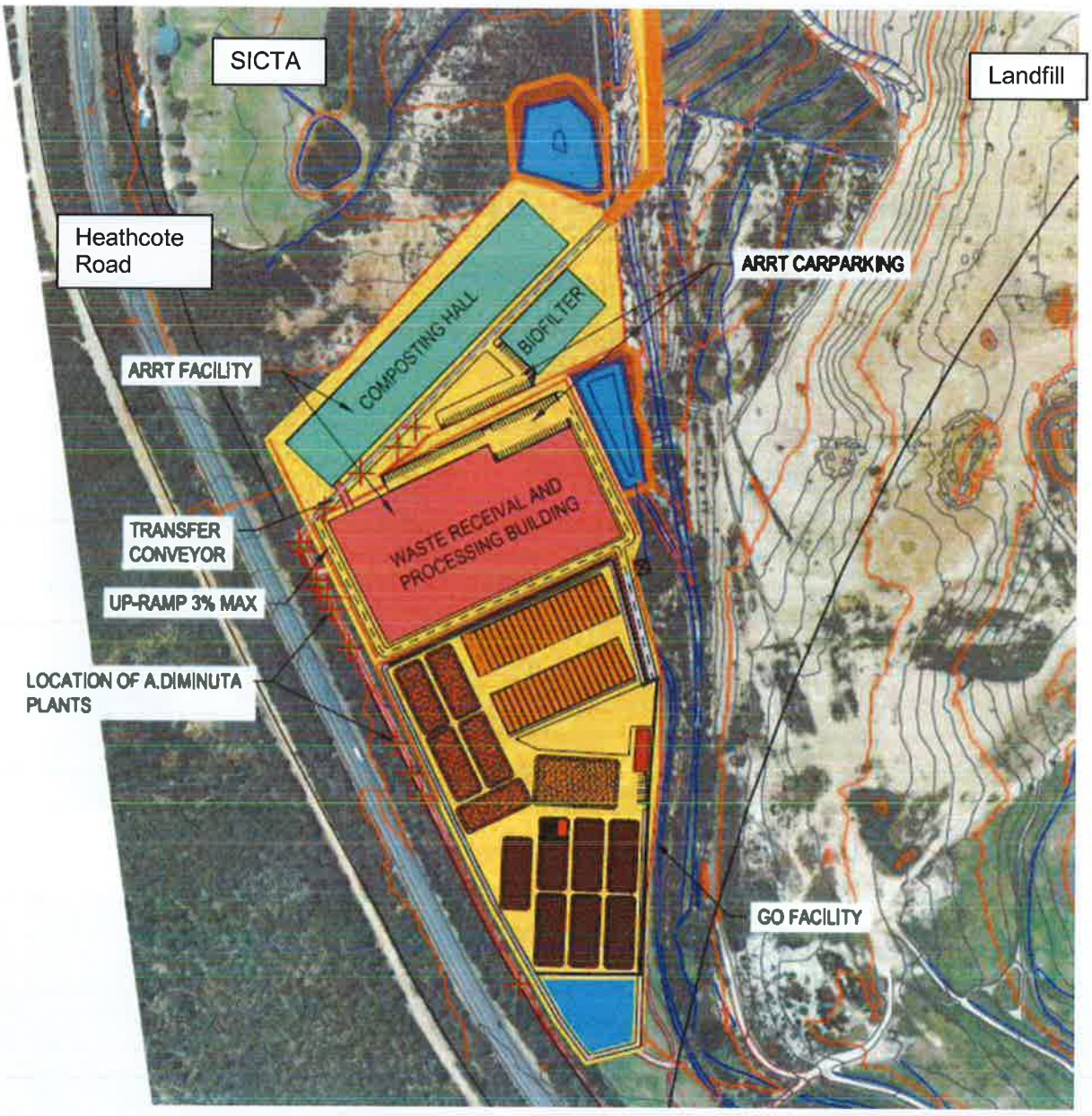

Figure 8: *Proposed Advanced Resource Recovery Technology Facility*

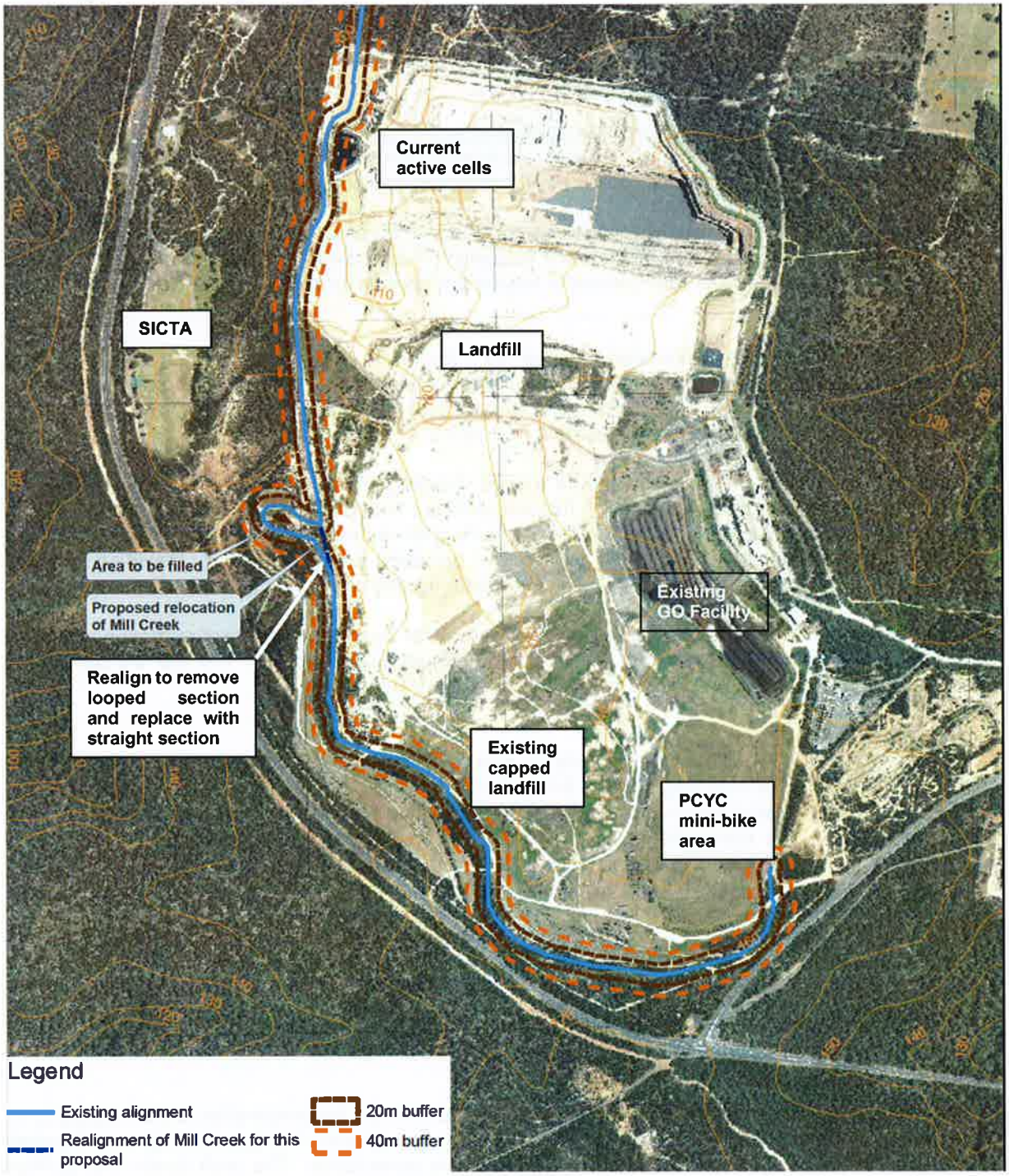

Figure 9: *Mill Creek Re-alignment*

3. STRATEGIC AND STATUTORY CONTEXT

3.1. Strategic Context

Strategic planning in NSW and Sydney is established in *NSW 2021*, *Premier's Priorities* and *A Plan for Growing Sydney*. The primary strategic waste policy in NSW is the *Waste Avoidance and Resource Recovery Strategy 2014-21*. The Department has considered the development in the context of these strategic plans and policies.

NSW 2021

NSW 2021 is a 10 year plan that sets strategies and goals for Government action in NSW, covering areas such as transport, community services, economic growth and the environment. *NSW 2021* includes specific targets and actions for increasing recycling and combating illegal dumping.

The development would increase recycling rates through the construction of a resource recovery facility that would recover resources from 200,000 t/yr of waste. The Applicant also contributes to a litter and illegal dumping fund and works with Council to implement specific strategies to manage this issue.

Premier's Priorities

The NSW Government has announced the Premier's Priorities, which cover 12 key areas including economic growth, provision of infrastructure, protection of vulnerable communities, improving education and environmental protection. One of Premier's key priorities is Creating Jobs. The NSW Government aims to provide 150,000 new jobs over the next four years.

The proposed development would contribute toward Creating Jobs by providing 62 new operational jobs and up to 100 construction jobs, during the peak period. The development represents a $95 million capital investment in waste management in the Sutherland Shire that would create and retain jobs. The proposed development also contributes toward the provision of infrastructure, providing a waste management service to support the growing NSW economy and population growth.

The development would enable continued use of the site for waste management purposes and allow expansion to cater for increased waste generation due to population growth. The site will continue to provide employment and play an important role in managing Sydney's waste.

A Plan for Growing Sydney

A Plan for Growing Sydney (the Plan) aims to ensure Sydneysiders have greater access to great outdoor spaces, greater housing choice, living closer to work, and world-class job opportunities. The Greater Sydney Commission is tasked with implementing the plan in partnership with State and local governments. The plan includes specific directions for creating jobs closer to home for Sydney residents, improving transport connections, delivering housing supply and well-planned neighbourhoods, providing networks of green and open spaces and protecting Sydney's unique natural environments.

The Department has considered the development in the context of the Plan and notes the development would create and retain jobs for residents in the Sutherland Shire and would ultimately provide a substantial area of public open space and recreational facilities for the local community following closure of the LHRRP. The development would contribute to achieving the aims of the Plan.

Draft South District Plan, 2016

To implement the broad aims of the Plan, the Minister has directed the preparation of districts plans for six geographical districts across Sydney. District Plans are currently being prepared, with the draft South District Plan released in November 2016 for public consultation. The draft South District Plan provides a link between the broad aims of a *Plan for Growing Sydney* and local environmental plans. It sets key priorities and actions for delivering productive, liveable and sustainable communities. The draft South District Plan includes job and housing targets, strategies for improved housing choice and affordability and protection and enhancement of natural resources.

The Department considers the development is consistent with the priorities of improving productivity within the district by delivering jobs closer to home. The development would provide an additional 62 operational jobs and up to 100 construction jobs within the district. Ultimately, the development would also provide for the protection and enhancement of natural resources through rehabilitation of the site and designation as public recreational space.

Waste Avoidance and Resource Recovery Strategy 2014-21 (WARRS)
The WARRS aligns with the waste reforms identified in *NSW 2021*. The WARRS sets targets for reduced waste generation, increased recycling rates, diversion of wastes from landfill and measures to reduce litter and combat illegal dumping. The WARRS provides a clear framework for waste management to 2021-22 and provides an opportunity for NSW to continue to increase recycling across all waste streams.

The development would contribute to achieving the aims of the WARRS, by providing increased garden organics processing capacity and providing a new resource recovery facility that would process and recover resources from 200,000 t/yr of waste, diverting this material from landfill. The Applicant also contributes to a litter and illegal dumping fund and works with Council to implement specific strategies to prevent illegal dumping in the local area. These measures are consistent with the aims of the WARRS.

3.2. State Significant Development
The proposal is classified as State significant development (SSD) under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) because it involves an extension to a putrescible landfill and construction of a resource recovery facility that meets the criteria in Clause 23 of Schedule 1 in *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). Consequently, the Minister for Planning is the consent authority for the proposed development.

3.3. Permissibility
Two land use zones apply to the site under the *Sutherland Local Environmental Plan 2015 (SLEP),* see **Figure 10**:

- SP1 – Special Activities (Waste Recycling); and
- RE1 – Public Recreation.

Figure 10: *Site Zoning*

Activities that are permissible with consent in the SP1 zone include waste recycling. Activities that are permissible with consent in the RE1 zone include environmental, community and recreational facilities.

The proposed development involves:

- waste disposal (landfill re-profiling); and
- resource recovery (GO and ARRT facilities).

Under the SLEP, waste disposal is not permissible in the SP1 or RE1 zones and resource recovery is not permissible in the RE1 zone. Therefore, the Applicant submitted a Planning Proposal to amend the SLEP to include new provisions for the LHRRP to allow the development to be permissible within the current zoning, see Section 3.4.

3.4. Planning Proposal

At the time of lodgement of this SSD application, the Applicant wrote to the Secretary requesting a Planning Proposal be prepared to amend the SLEP to include development for the purpose of a waste or resource management facility on the LHRRP site, to facilitate consideration of this SSD application.

Under Section 59 of the EP&A Act, the Deputy Secretary, as delegate of the Greater Sydney Commission, amended the SLEP, with the amendment commencing on 23 December 2016. Therefore, the proposed development is permissible with consent.

3.5. Consent Authority

On 14 September 2011, the then Minister for Planning delegated the functions to determine SSD applications to the Planning Assessment Commission (the Commission), where:

- the relevant local council has made an objection;
- there are more than 25 public submissions in the nature of objections; or
- a political disclosure statement has been made.

Under the Ministerial Delegation, the Commission must determine the SSD application as the Applicant made reportable political donations.

3.6. Other Approvals

Under Section 89K of the EP&A Act, other approvals may be required and must be approved in a manner that is consistent with any Part 4 consent for the SSD under the EP&A Act.

The development would require an Environmental Protection Licence (EPL) under the *Protection of the Environment Operations Act 1997* (POEO Act), as it is a scheduled activity. The Applicant currently holds three separate EPL's for operations at the LHRRP, including one for the landfill, one for the garden organics facility and one for the PCYC mini-bike area. The Applicant would need to apply for variations to the existing EPL's or apply for new EPLs for the development. The EPA provided draft EPL conditions for the landfill, GO and ARRT facilities. As the proposed development does not involve any change to the PCYC mini-bike area, a revised EPL is not required for this facility.

The development may also require licenses for extraction of groundwater and realignment of Mill Creek under the *Water Act, 1912* and the *Water Management Act, 2000*. DPI Water provided comments on the proposal and recommended conditions.

3.7. Considerations under Section 79C of the EP&A Act

Section 79C of the EP&A Act, sets out matters to be considered by a consent authority when determining a development application. The Department's consideration of these matters is set out in Section 5 and Appendix B. In summary, the Department is satisfied the proposed development is consistent with the requirements of Section 79C of the EP&A Act.

3.8. Environmental Planning Instruments

Under Section 79C of the EP&A Act, the consent authority, when determining a development application, must take into consideration the provisions of any EPI, draft EPI (that has been subject to public consultation and notified under the EP&A Act) that apply to the proposal.

The Department has considered the development against the relevant provisions of several key EPI's including:

- *State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP);*
- *State Environmental Planning Policy (Infrastructure) 2007 (ISEPP);*
- *State Environmental Planning Policy No. 19 - Bushland in Urban Areas (SEPP 19);*
- *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33);*
- *State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55);* and

- *Sutherland Local Environmental Plan 2015 (SLEP 2015).*

Development Control Plans (DCPs) do not apply to SSD under Clause 11 of the SRD SEPP. Detailed consideration of the provisions of all EPIs that apply to the proposal is provided in Appendix C. The Department is satisfied the proposal generally complies with the relevant provisions of these EPIs.

3.9. Public Exhibition and Notification

Under Section 89F(1) of the EP&A Act, the Secretary is required to make the development application and any accompanying information of an SSD application publicly available for at least 30 days. The application was on public exhibition from 6 November 2015 until 18 December 2015. Details of the exhibition process and notifications are provided in Section 4.1.

3.10. Objects of the EP&A Act

In determining the application, the consent authority should consider whether the proposal is consistent with the relevant objects of the EP&A Act. These objects are detailed in Section 5 of the Act. The objects of relevance to the merit assessment of this application include:

(a) to encourage:
- *(i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,*
- *(ii) the promotion and co-ordination of the orderly and economic use and development of land,*
- *(iv) the provision of land for public purposes,*
- *(v) the provision and co-ordination of community services and facilities,*
- *(vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and*
- *(vii) ecologically sustainable development, and*

(b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and

(c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.

The Department has fully considered the objects of the EP&A Act, including the encouragement of Ecologically Sustainable Development (ESD), in its assessment of the application (see **Table 4**).

***Table 4**: Objects of the EP&A Act and Relevance to the Development*

Object	Consideration
5(a)(i)	The proposal would ensure the proper management and conservation of natural resources, including native vegetation on the site. The Applicant re-designed and re-located the GO and ARRT facilities to minimise impacts on native vegetation. The Applicant has committed to implementing a biodiversity offset strategy prior to construction to ensure biodiversity impacts are adequately offset. The Applicant has also committed to seed collection and propagation of this species for planting on site and within the offset area.
5(a)(ii)	The proposal would ensure the orderly and economic use of the land, as the development would utilise an existing landfill and its water and gas management infrastructure for continued waste disposal and recycling for the Sydney metropolitan area.
5(a)(iv)	Following closure of the landfill, GO and ARRT facilities, the entire site would be rehabilitated for future public recreational use. The land would be transferred to Council for on-going public use.
5(a)(v)	Following closure of the landfill, the site would be rehabilitated and community facilities would be constructed including public open space, pedestrian and cycle paths, picnic facilities and public amenities.
5(a)(vi)	The development has been designed to avoid impacts on native animals and plants, with the remaining impacts to be offset through implementation of a biodiversity offset strategy. The Applicant maintains an on-site nursery for the collection of native seed and propagation of plants for the local community.
5(a)(vii)	The development is consistent with the principles of ESD as it would utilise an existing landfill for continued waste disposal and recycling for Sydney's metropolitan waste, without adverse impacts on the natural environment.
5(b)	The Department has assessed the development in consultation with, and giving due consideration to, the technical expertise and comments provided by Council and other Government authorities.

Object	Consideration
	This is consistent with the object of sharing the responsibility for environmental planning between the different levels of government in the State.
5(c)	The Department exhibited the EIS for the application for 42 days and received submissions from the public, special interest groups and government agencies. The Department's assessment has considered the issues raised in submissions, including consideration of issues that were raised after the formal public exhibition period.

3.11. Ecologically Sustainable Development

The EP&A Act adopts the definition of ESD found in the *Protection of the Environment Administration Act 1991*. Section 6(2) of that Act states that ESD requires the effective integration of economic and environmental considerations in decision-making processes and that ESD can be achieved through the implementation of:

(a) the precautionary principle;
(b) inter-generational equity;
(c) conservation of biological diversity and ecological integrity; and
(d) improved valuation, pricing and incentive mechanisms.

The potential environmental impacts of the development have been assessed and, where potential impacts have been identified, mitigation measures and environmental safeguards have been recommended.

As demonstrated by the Department's assessment in Chapter 5 of this report, the development is not anticipated to have adverse impacts on native flora or fauna, including threatened species, populations and ecological communities, and their habitats. Although some vegetation would be removed for construction of the ARRT facility, the impacts would be offset by conservation of similar species through a biodiversity offset strategy to be secured prior to construction. As such, the Department considers that the proposal would not adversely impact on the environment and is consistent with the objectives of the EP&A Act and the principles of ESD.

3.12. Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Under the EPBC Act, assessment and approval is required from the Commonwealth Government if a development is likely to impact on a matter of national environmental significance (MNES), as it is considered a 'controlled action'.

The Applicant referred the proposal to the Commonwealth Department of Environment as the proposal footprint contains threatened biota. On 13 April 2015, the Department of Environment determined that the proposal is not a controlled action and no further assessment or approval is required under the EPBC Act.

4. CONSULTATION & SUBMISSIONS

4.1. Consultation by the Department

After accepting the EIS for the application, the Department:

- made it publicly available from **Friday 6 November 2015** until **Friday 18 December 2015**:
  - on the Department's website;
  - at the Department's Information Centre (Bridge Street, Sydney);
  - at the Nature Conservation Council's Head Office (Sydney); and
  - at Sutherland Shire Council;
- notified landowners in the vicinity of the site about the exhibition period by letter;
- notified relevant State government authorities and Council by letter; and
- advertised the exhibition in the St George and Sutherland Shire Leader.

The Department received nine submissions on the development, including eight during the exhibition period and one received after the close of exhibition. The submissions included:

- six from public authorities;
- one from a special interest group; and
- two from the general public.

Of the nine submissions, two from the general public objected to the development. A summary of the issues raised in submissions is provided below, with a full copy included in Appendix E.

4.1.1. Government Agencies

Sutherland Shire Council (Council) is a joint Applicant for the development. Council noted its support for the application and advised it had been actively involved during preparation of the EIS. Council advised it had worked with SITA to refine the development to be broadly acceptable to Council and the EIS had addressed all matters raised by Council. This included:

- covering the active composting phase for the GO facility;
- provision of a scrubber unit at the ARRT facility, in addition to the biofilter;
- improved leachate and gas management; and
- development of a Voluntary Planning Agreement (VPA) to provide monetary and environmental benefits to the Sutherland Shire (see Section 5.7).

The Applicant's Response to Submissions (RTS) was provided to Council for review. Council did not provide any further comments or conditions on the proposal.

The **Environment Protection Authority (EPA)** provided detailed comments on the noise, air quality, surface water and leachate assessments included in the EIS. The EPA advised the EIS was inadequate for completing an assessment and requested further information in relation to air quality, surface water and leachate management.

In relation to air quality, the EPA advised the odour assessment was inadequate and requested justification for the use of the AUSPLUME model. EPA also requested further detail on the assumptions used for the GO and ARRT facilities and justification for the odour emission rates used in the modelling. The EPA requested verification monitoring of the three large odour emission sources identified in the EIS, noting the conclusions of the odour assessment were reliant on achieving odour reductions from proposed rectification measures.

The EPA requested further information regarding surface water management in the GO facility, justification for the proposed leachate collection system on the re-profiled landfill areas and an assessment of the integrity of the existing leachate collection system for the proposed additional landfill loads. The EPA also requested minor clarifications on the noise assessment.

SITA met with the EPA during preparation of its RTS. Following a review of the RTS, the EPA advised the RTS had satisfactorily addressed the issues raised. The EPA provided recommended conditions for the Department to consider including in the development consent as well as draft conditions for the amended EPL's required to operate the landfill, GO and ARRT facilities. The EPA's recommended conditions cover air quality and odour, landfill gas and leachate management, surface water management, hours of operation, limits on processing quantities and rehabilitation and closure management.

The **Office of Environment and Heritage (OEH)** provided comments on the biodiversity aspects of the development. OEH identified inconsistences in the biodiversity assessment and advised the offset strategy is inadequate and does not address the requirements of the *Frameworks for Biodiversity Assessment* (FBA). OEH noted:

- the biodiversity assessment was inconsistent in reporting impacts on endangered populations, estimates of species credits and the survey was undertaken in the wrong season for particular species. OEH recommended further survey or provision of expert advice confirming the adequacy of the survey;
- the offset strategy was inadequate as the offset site needs to be identified and assessed to determine and secure the required species credits; and
- if a variation to the offset rules is required (due to a lack of available species credits), the process takes six months to complete and should be commenced early to avoid delays.

The Applicant provided further information in the RTS, including an Expert Report to address OEH's concerns regarding field survey, minor changes to the location of the GO and ARRT facilities to avoid impacts on threatened species, revised species credit calculations and a staged biodiversity offset strategy. Following a review of the RTS, OEH advised that whilst the RTS made some progress, the revised offset strategy did not provide enough certainty that suitable credits are available to support the development. OEH advised it would not sign-off on any variations or supplementary measures, if this

issue is not addressed prior to determination of the application. Section 5.6 details the Department's consideration of this issue.

Department of Primary Industries (DPI), which incorporates **DPI Water, Fisheries, Agriculture and Lands** provided a submission. DPI Agriculture, Lands and Fisheries raised no issues. DPI Water did not object to the development but raised a number of matters to be addressed during the detailed design and through ongoing management plans. DPI Water requested:

- clarification regarding proposed riparian widths adjacent to Mill Creek;
- consideration be given to relocating the proposed sediment ponds and dam at the GO and ARRT facilities to avoid existing native vegetation;
- additional water quality sampling and aquatic monitoring to further establish baseline conditions prior to commencement of the development;
- preparation of a Mill Creek stream rehabilitation, stabilisation and vegetation management plan to address the proposed creek realignment and for the post-closure landform;
- increased groundwater monitoring to detect leachate contamination and movement and lead contamination from the adjacent clay target shooting range; and
- refinement of monitoring and management plans including revised trigger levels for lead.

The Applicant provided further information in the RTS and in supplementary correspondence to address the issues raised by DPI Water. Following a review of the additional information, DPI Water advised it was satisfied and provided recommended conditions including the requirement for a Mill Creek Rehabilitation and Vegetation Management Plan, prepared in consultation with DPI Water.

NSW Roads and Maritime Services (RMS) requested clarifications on the traffic numbers generated by the development compared with an earlier traffic assessment and development approval granted for the facility in 1999. SITA provided a response confirming that the traffic assessment was carried out in accordance with the *Guide to Traffic Generating Development* (Roads and Traffic Authority, 2002) and supersedes the 1999 traffic study. RMS reviewed the response and raised no objection to the development.

Department of Industry (Resources and Energy), Geological Survey of NSW (GSNSW) raised no objection to the development. GSNSW advised that Coal Authorisation (AUTH) 6 held by the Secretary of NSW Department of Industry on behalf of the Crown exists over a broad regional area including the site.

4.1.2. General Public

Two submissions were received from the general public during the exhibition period. Both submissions objected to the development. Key issues raised included:

- concerns regarding continued expansion of the landfill at an environmental cost to the local community;
- no finite end to waste disposal in Sutherland Shire given successive extensions to the landfill;
- need for guaranteed reduced disposal costs for Sutherland Shire as compensation for the impacts of the landfill for the benefit of the greater metropolitan area;
- existing environmental impacts would be increased including:
    - odour especially during winter mornings;
    - pests;
    - runoff pollution of local creeks;
    - visually unattractive earth mounds; and
    - impact on residential property values;
- landfill should be located further away from existing and planned residential areas; and
- further investment should be made into recycling initiatives.

One of the public submissions that objected to the development noted its support for recycling and resource recovery activities but objected to increased landfill operations.

4.1.3. Special Interest Groups

One submission was received from a special interest group, the Cronulla Model Aero Club (CMAC). The CMAC did not object to the development but raised concerns that the EIS had not identified a suitable recreational space for flying model aeroplanes. CMAC advised the development would further delay the provision of recreational space and did not guarantee the final landform would be suitable for model aeroplane flying, given the increased slopes. CMAC advised it had previously raised these concerns with SITA and Council, through the community liaison group meetings and was concerned it

had not been addressed. In its RTS, the Applicant reiterated that Council would determine the future land uses based on community needs at the time the site is rehabilitated and transferred to Council in 2039. Section 5.4 details the Department's consideration of this issue.

The Department's response to the issues raised by the general public and special interest groups is provided in **Table 8** in Section 5.8.

4.2. Response to Submissions and Supplementary Information

In June 2016, SITA provided a response to the issues raised in submissions (see Appendix F). The RTS report was made publicly available on the Department's website and was provided to key agencies to consider whether it adequately addressed the issues raised. As detailed above, the RTS provided additional information on:

- the odour modelling, rectification measures and dust assessment;
- leachate, surface water and groundwater management; and
- biodiversity offset strategy

Following further correspondence from OEH, DPI Water and CMAC, the Applicant provided supplementary information to address the issues raised. This included further work on the biodiversity offset strategy and details of proposed riparian zone management and additional aquatic monitoring.

The Department has considered the issues raised in submissions and the Applicant's RTS and supplementary information in its assessment of the development application.

4.3. Consultation by the Applicant

SITA undertook a range of consultation activities throughout preparation of the EIS including:

- quarterly meetings with the Lucas Heights Community Reference Group (CRG);
- meetings with key stakeholders;
- invitations to numerous local organisations to comment on the proposal;
- three community drop-in sessions;
- site tours (attended by 616 visitors during 2015); and
- maintenance of a project website, including a video showing the proposal.

SITA also undertook a range of consultation activities during the EIS public exhibition period, including:

- advertisements in the St George and Sutherland Shire Leader and Shire News;
- display posters and brochures at the Engadine Community Centre, Council administration building and The Ridge Sports Complex. SITA personnel were at The Ridge Sports Complex display for two Saturdays during the exhibition period;
- a static display at Menai Marketplace including posters summarising the findings of the EIS, brochures, proposal video and information on how to make a submission. The display was in place for 3 weeks of the exhibition period, with SITA personnel at the display 3 days a week;
- Facebook advertising to approximately 8,800 people in the project area;
- information flyers distributed to 10,400 households in the Barden Ridge, Engadine, Menai and Sandy Point areas; and
- proposal website, video, email address and contact number for inquiries.

SITA proposes to continue consultation activities during construction and operation of the development including, newspaper advertisements, site tours, website, video and a permanent outdoor information display.

5. ASSESSMENT

The Department has considered the EIS, the issues raised in submissions and the Applicant's RTS and supplementary information in its assessment of the proposal. The Department considers the key issues are:

- odour, dust and greenhouse gas;
- leachate management;
- surface water and groundwater;
- final landform, rehabilitation, closure and final land use;

- visual amenity; and
- biodiversity.

The Department has considered a number of other issues in **Table 7** in Section 5.7 including traffic, noise, development contributions, litter and illegal dumping, hazards, fire management and heritage.

5.1. Odour, Dust and Greenhouse Gas

The development has the potential to generate odour, dust and greenhouse gas (GHG) emissions through landfilling and operation of the GO and ARRT facilities.

GHD prepared an air quality assessment (AQA) to predict odour, dust and GHG emissions from the LHRRP, including cumulative emissions from existing and proposed operations. The AQA was prepared in accordance with relevant guidelines including:

- *Assessment and Management of Odour from Stationary Sources in NSW*, DEC 2006;
- *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW*, DEC, 2005; and
- *Environmental Guidelines: Solid Waste Landfills*, EPA 2016.

The AQA compared predicted odour and dust emissions with relevant EPA criteria at the nearest sensitive receivers, including the residential areas of Engadine, Barden Ridge and Menai located 2 to 3 kilometres (km) to the east, the ANSTO facility and Lucas Heights Motel 300 m to the east and the future residential development Heathcote Ridge, 1.5 km to the north and north-west.

5.1.1. Odour

The primary landfilling, composting and resource recovery activities that would generate odour include:

- depositing waste on the active landfill face;
- covered landfill areas;
- stripped back area (removal of previous cover to deposit more waste on top);
- leachate ponds;
- garden organics receival area;
- compost and stockpiled materials at the GO and ARRT facilities;
- turning of compost;
- compost ponds; and
- emissions from the biofilter at the ARRT facility.

The AQA included modelling to predict odour emissions from the site and potential impacts at the nearest receivers. The odour modelling used odour emission rates from extensive sampling conducted across the existing landfill. Odour emission rates from the GO and ARRT facilities were adopted from other similar sites operated by the Applicant in NSW and Victoria.

Odour monitoring conducted across the landfill, for input into the modelling, identified three large existing odour emission sources. These included:

- two areas of intermediate cover, one south of the natural material stockpile and the other adjacent to it; and
- the existing northern landfill batter.

The AQA modelled these odour emission sources assuming proposed rectification measures had been implemented to reduce these odour sources. The EPA noted these emission sources have a substantial influence on the outcomes of the modelling and requested odour sampling to validate the effectiveness of the rectification measures and as such, the robustness of the modelling conclusions.

The Applicant provided odour sampling results in the RTS to verify that the measures had been implemented and were effective in reducing odour emission rates to the levels included in the modelling. The rectification works included installation of additional gas collection wells and filling over the landfill batter. The EPA advised the RTS had satisfactorily addressed the EPA's concerns.

Several operating scenarios were modelled for the proposed development to determine odour emissions from the various stages of landfill re-profiling and concurrent operation of the GO and ARRT facilities at maximum capacity. The worst-case scenario (year 2021) was modelled to present a conservative assessment. This included Phase 5 landfilling (active tip face closest to residential receptors) and concurrent operation of the GO and ARRT facilities. The modelling included the following conservative assumptions:

- a conservative odour emission rate for intermediate cover areas;
- shredding of garden waste occurring every day from 7 am to 5 pm, when this would be unlikely in practice;
- conservative values for turning of compost (values were calculated assuming the largest surface area being used for turning); and
- a conservative odour reduction rate for the breathable membrane covers at the GO facility (modeling used a lower odour reduction rate than is expected from the covers). **Figure 10** shows an example of the membrane covers.

Figure 10: *Example of Breathable Membrane Covers to be used at the GO Facility*

The AQA considered odour emissions would reduce after 2021 as the Applicant would progressively cap and revegetate the landfill.

The AQA predicted odour from the worst-case scenario in 2021 would comply with the EPA criteria of 2 odour units (OU) at all sensitive receiver locations. **Figure 11** shows the predicted odour contours.

The Department notes the proposed development is designed to minimise odour generation through the following measures, which were included in the modelling assumptions:

- phased landfill re-profiling, capping and revegetation, to reduce the area of exposed waste at any one time;
- increased batter slopes on the final landform to increase stormwater runoff and reduce leachate generation (which is a source of odour);
- relocation of the existing GO facility to the west, further away from residential areas. This aspect was estimated to reduce the odour contribution from the GO facility by approximately 50%;
- first stage of composting to be undertaken in aerated bunkers with semi-permeable covers;
- all operations at the ARRT facility to be undertaken in fully enclosed buildings under negative pressure, including storage of compost products; and
- treatment of all air emissions from the ARRT facility through a biofilter prior to discharge.

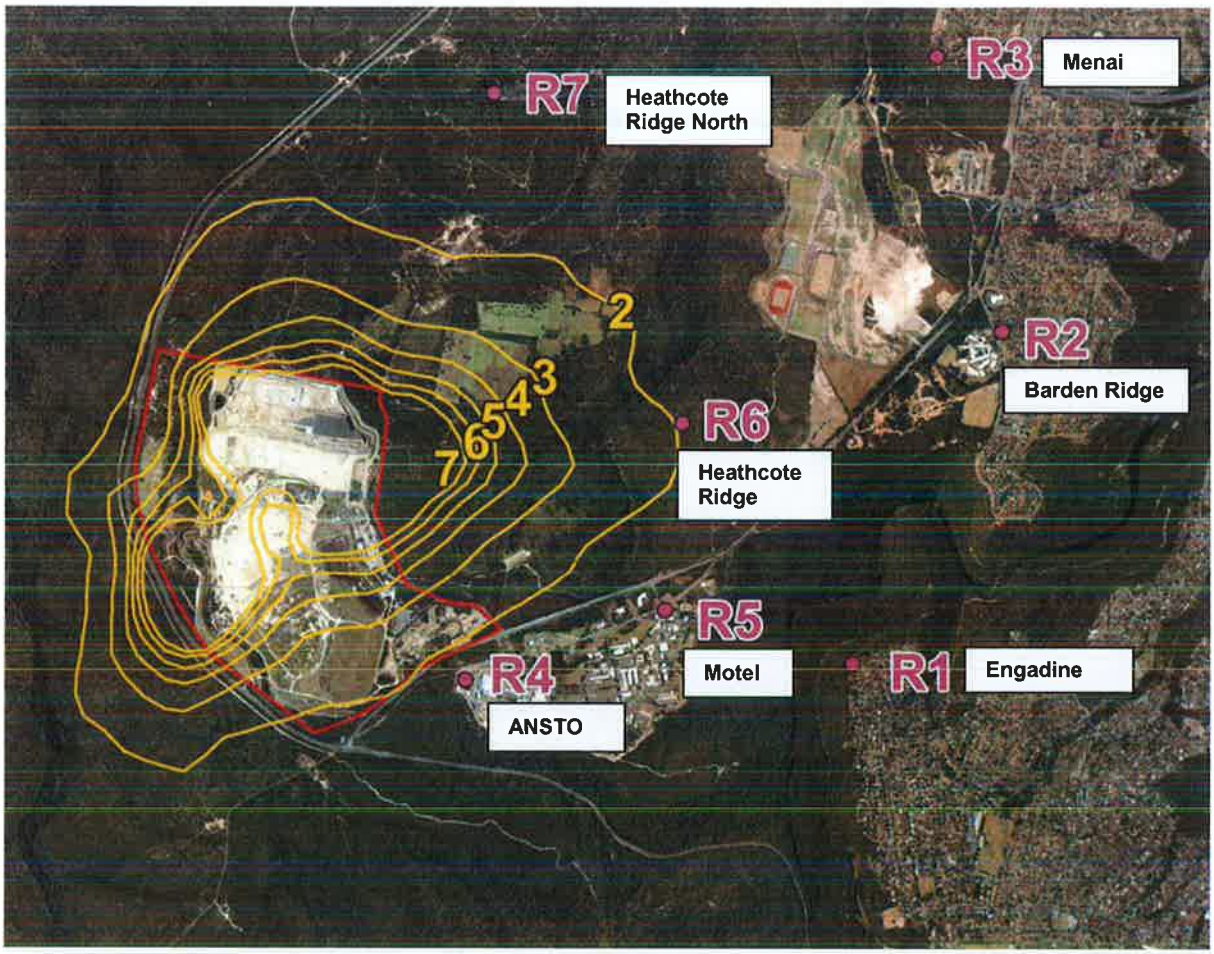

Figure 11: *Worst-Case Predicted Odour Impact (Year 2021 with Breathable Membrane Covers at the GO Facility)*

The AQA included further analysis of day time and night time odour contributions. The analysis concluded the active tip face would contribute the highest odour emissions during the afternoon period. However, the afternoon is when wind speeds are greater, enabling improved dispersion, which reduces the potential for off site impacts. During night time periods, when there is no active tipping and the waste is covered, emissions from the biofilter at the ARRT facility are the largest contributor. Night time atmospheric conditions are often more calm, resulting in less dispersion of odours. Despite this, all odour emissions are expected to be below 2 OU at the nearest receivers under all conditions.

The AQA also compared the predicted odour emissions from the proposed development against existing operations. Existing operations include the GO facility in its current eastern location, closer to sensitive receivers and the three large emission sources prior to rectification measures. Under existing conditions, odour levels would be 10.9 OU at ANSTO, 10.2 OU at Heathcote Ridge and between 4 and 5 OU at the Engadine, Barden Ridge and Menai residential areas. The Department notes the Independent Environmental Audit of the site recorded 33 odour complaints during 2015. The audit report noted the three large odour emission sources and the proposed measures to reduce emissions, including additional landfill gas collection wells.

Odour emissions from the proposed development are predicted to be noticeably lower than emissions from the operating facility in 2015 and marginally lower than current levels following implementation of odour rectification measures in 2016. Odour is predicted to be below the EPA criteria of 2 OU at all sensitive receivers, under worst-case conditions, provided the assumptions of the modelling are implemented as control measures. **Table 5** presents the odour emissions from 2015, 2016 (post-rectification measures) and 2021 (proposed development worst-case) for comparison.

Table 5: Odour Emissions (Existing and Predicted)

Location	Existing Site (2015)	Existing Site (post-rectification measures)	Worst-case prediction 2021 (with membrane covers)	EPA Criteria (OU)
Engadine	4.1	1.1	0.9	2
Bardon Ridge	4.8	1.0	1.0	2
Menai	4.5	1.1	1.0	2
ANSTO	10.9	4.2	1.7	2
Lucas Heights Motel	7.0	2.1	1.4	2
Heathcote Ridge	10.2	2.5	2.0	2
Heathcote Ridge North	7.8	1.4	1.3	2

Council noted its support for the application and advised it had worked with SITA to ensure the proposal minimises odour emissions, including covering the active composting phase at the GO facility and requiring a scrubber (or similar pre-treatment system) at the ARRT facility to treat air prior to discharge via the biofilter.

One community submission raised odour as a concern and the Department notes there were 33 odour complaints during 2015 (prior to the rectification measures).

The Department considers it imperative the landfill, GO and ARRT facilities are operated and maintained in a manner that reduces and manages odourous emissions. The proposed development would extend the life of the landfill for a further 13 years, would increase annual waste processing volumes by 275,000 tonnes a year and would add a new resource recovery facility to the site. The recently approved residential subdivision at Heathcote Ridge would also increase the number of residences potentially affected by operations at the site.

The EPA advised the Applicant had addressed the issues raised, and the assessment was adequate to enable provision of recommended conditions for the control and management of odour from the site. The Department has incorporated these into the recommended consent. The conditions would ensure the site is operated to minimise and manage odours. The conditions also require the Applicant to routinely report on odour performance. The recommended conditions include:

- an on-site weather monitoring station, to assist in managing works during adverse weather and for input to monitoring reports;
- an air quality and odour management plan for the site, including a separate plan for the ARRT facility. The management plan would show the location, frequency and duration of odour and dust monitoring, detail key performance indicators and measures to be implemented to meet the criteria;
- several odour audits to validate the predictions in the AQA including the effectiveness of the rectification measures on the existing landfill, and post-commissioning odour audits on the GO and ARRT facilities to verify the effectiveness of the proposed odour controls;
- design requirements for the biofilter on the ARRT facility and pre-treatment and post-treatment odour controls, verified by an independent odour expert; and
- a biofilter and pre-treatment monitoring and maintenance plan.

The Department notes the odour sampling for the AQA identified three key odour sources and the Applicant has implemented measures to rectify these emission sources. The modelling predicts odour from the expanded landfill, GO and ARRT facilities would be below the EPA criteria of 2 OU at the nearest receivers. The Department's assessment concludes the development would not lead to offensive odour at off-site receptors, provided the Applicant implements routine and on-going management and maintenance procedures as required by the recommended conditions. The Department is satisfied the recommended conditions require the Applicant to routinely monitor and audit odour from the proposed development and require the Applicant to implement additional control measures, if odour impacts occur off-site.

5.1.2. Dust

The key activities on site that would generate dust include:

- wheel generated dust from trucks traveling on unpaved surfaces;
- wind erosion from unsealed surfaces including the intermediate cover and stockpiles;
- unloading waste; and
- bulldozers moving waste and soil cover around.

The AQA modelled dust emissions from the site for comparison with the relevant criteria and concluded the proposed development would not exceed dust criteria at off-site receivers. The EPA noted some inadequacies in the dust modelling and requested clarifications. The Applicant provided further information in the RTS including dust deposition monitoring data from its six dust gauges on site. The Applicant noted there had been no exceedance of annual dust deposition criteria since 2011 at any of the dust gauges on site and the conclusions of the assessment were unchanged.

The EPA did not provide any further comments in relation to dust and recommended conditions requiring the Applicant to maintain all facilities to prevent the emission of dust and to install a weather monitoring station on the site. The Department has included these recommendations in the conditions along with the requirement for dust monitoring and management measures to be included in the air quality and odour management plan. The Department notes the site has an adequate buffer to residential receptors and dust impacts can be effectively controlled through the use of water carts and modifying works during periods of high wind. The Department's assessment concludes the recommended conditions would provide for the effective management of dust emissions from the site.

Dust generated during construction would be limited to the areas surrounding the GO and ARRT facilities. Standard dust controls would be implemented through a Construction Environmental Management Plan (CEMP), required as a condition of consent. The Department concludes implementation of the CEMP would be adequate for managing construction dust.

5.1.3. Greenhouse Gas

A greenhouse gas assessment (GHGA) was prepared to assess the greenhouse gas emissions from the existing landfill operations (for the next 10 years) for comparison with emissions from the proposed development (for the next 23 years). The GHGA was prepared in accordance with relevant Commonwealth and International guidelines.

The GHGA estimated the Scope 1 (direct) and Scope 2 and 3 (indirect) emissions from the landfilling of waste and operation of the GO and ARRT facilities. The GHGA estimated the proposed development would generate:

- 13,983,039 tonnes of carbon dioxide equivalent (t CO_2-e) in total; or
- 191,548 t CO_2-e per year.

The existing landfill would generate a total of 5,337,021 t CO_2-e, equating to 88,950 t CO_2-e per year.

The substantial increase in emissions from the proposed development is due to the longer operating life of the landfill (an extra 13 years) and the larger volume of waste received (an extra 275,000 tonnes per year). Decomposing waste within the landfill generates methane gas emissions, which are the highest contributor to total emissions from the site, representing 93.7%. Methane has a greater global warming potential, 21 times that of carbon dioxide. This factor is taken into account in the GHGA, with emissions converted into carbon dioxide equivalent to present a single comparable figure.

Annual emissions from the proposed development represent 0.12% of total annual emissions in NSW and 0.035% of Australia's annual emissions.

The Applicant currently captures 67% of methane emissions from the landfill through its network of landfill gas extraction wells. The methane is transferred to the renewable energy generating facility located on site and is converted and transferred to the electricity supply network. As methane gas is the largest greenhouse gas emission from the site, the most effective minimisation measure is to increase the amount of methane captured and reused. The Applicant will continue to capture around 67% of methane gas emissions from the expanded landfill and has committed to undertake regular testing and monitoring of the effectiveness of the gas collection system and continue to improve the efficiency and volume of methane captured.

The Department notes the increase in greenhouse gas emissions and acknowledges landfill gas emissions would occur irrespective of the development, as the waste would need to be landfilled at another location in NSW. The Department considers the Applicant has an existing system for the capture and reuse of landfill gas that would be continually evaluated and augmented to increase gas capture rates. The Department considers the emissions from the proposed development would be minor in the context of NSW and Australian emissions. However, the Department has included a condition requiring the Applicant to implement all reasonable and feasible measures to reduce the greenhouse gas emissions generated on the site.

5.2. Leachate Management

A key aspect of landfill management is the minimisation, management and treatment of leachate. Leachate is water that passes through or comes into contact with waste and extracts both soluble and suspended solid contaminants from the waste. The contaminated water (leachate) requires treatment and discharge to sewer. If not properly managed, leachate can enter groundwater or surface water on and near the site, including Mill Creek and Georges River. Leachate is also a contributing source of odour. The odour assessment discussed in Section 5.1 considered leachate as an odour source.

The EIS included a leachate assessment to evaluate the capacity of the existing leachate management system to effectively collect, treat and dispose of leachate from the expanded landfill. As for current operations, the proposed development would transfer leachate to the existing treatment plant located at the Lucas Heights 1 facility to the north west of the site (see **Figure 12**). This facility collects and treats leachate from three sources:

- the capped and completed Lucas Heights 1 landfill;
- Harringtons Quarry, a capped and completed landfill located immediately north of the site; and
- the existing landfill at the LHRRP (referred to as Lucas Heights 2).

Figure 12: *Location of Leachate Treatment Plant and Leachate Sources*

The leachate assessment considered the cumulative leachate generated by the existing sources and the proposed landfill expansion. Assessment of leachate generated by the GO and ARRT facilities was considered separately in the surface water assessment as these facilities would be independent of the landfill leachate management system (see Section 5.3 below).

Key design measures included in the proposed development to reduce leachate generation include:

- surface water diversion infrastructure established around each phase of landfill re-profiling, prior to stripping works (see **Figure 4** for indicative location of surface water diversion drains);
- provide a final capping layer of low-permeability clay which decreases infiltration and the generation of leachate (see **Figure 12**); and
- re-profiling the final landform to increase slopes and reduce rainfall infiltration.

The existing landfill contains varied leachate collection systems as the landfill has developed over time and leachate controls have become more advanced. In general, a series of slotted drainage pipes are located on the floor of the landfill, which drain to leachate collection trenches and ultimately the leachate dam in the north-western part of the site. The later landfill stages include clay barrier layers as part of the leachate collection system and the most recent cells (5.2B and 5.3) include a double liner (clay and geomembrane) along the cell walls and base. These cells have greater capacity to collect and contain fluctuations in leachate volumes during periods of sustained rainfall.

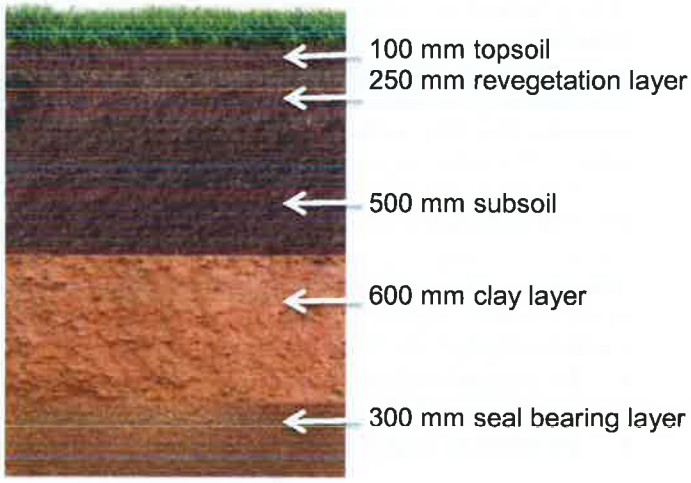

Figure 12: *Final Cap Profile*

The landfill also contains approximately 100 extraction wells for collection of leachate. In addition, a series of stormwater diversion channels and temporary bunds are in place to divert clean water away from the landfill to reduce leachate volumes.

All leachate is transferred to a 10 megalitre (ML) leachate dam in the north-west of the site (see **Figure 13**). In 2014, the Applicant constructed a second dam for emergency leachate storage. The second dam is double lined, has 9.2 ML capacity and is located adjacent to the main storage dam. There are also five 100 kilolitre (kL) leachate storage tanks adjacent to the dams. Leachate is transferred from the storage dams via pipeline to the existing treatment plant at Lucas Heights 1 where it is treated prior to discharge to sewer in accordance with a Trade Waste Agreement (TWA). The treatment plant operates in accordance with the existing development consent (DA 11-01-99), which covers Lucas Heights 1 and 2. Leachate is discharged to sewer in accordance with a TWA with Sydney Water. The TWA has a maximum daily discharge limit of 1,500 kL and an average daily discharge limit of 800 kL.

The Applicant proposes to retain the existing system for the collection, storage, treatment and discharge of leachate with the following additions for the expanded landfill:

- extension of the existing leachate extraction risers and gas wells to extend through the increased waste height;
- construction of a dual gas and leachate collection trench near the perimeter of the re-profiling areas to collect any sideways moving leachate;
- increase the average daily treatment capacity from 570 to 870 kL/day. The Applicant proposes to implement these changes in early 2017; and
- increase the daily discharge to trade waste to 1,200 kL/day, which is within the existing TWA limit of 1,500 kL/day.

The leachate assessment predicted the volume of leachate generated for each phase of landfill re-profiling and assessed the capacity of the existing system to store, treat and dispose of leachate during average and high rainfall years, being 50% Annual Exceedance Probability (AEP) and 10% AEP respectively. The assessment concluded:

- the proposed final cap would significantly reduce infiltration rates compared with the existing final cap on the old landfill areas. The existing landfill would generate 133,300 cubic metres per year (m^3/yr) of leachate in an average rainfall year compared with 88,400 m^3/yr for the proposed development; and
- the existing leachate containment and treatment system has adequate capacity to store and treat leachate for the expanded landfill and the proposed final landform.

The assessment recommended the Applicant increase treatment plant capacity to 870 kL/day and increase average daily discharge to sewer to 1,200 kL/day, by early 2017. The Applicant noted this would provide some contingency to manage any system disruptions. Whilst the proposed development would reduce the volume of leachate generated over the long term, the Applicant proposes to increase its discharge volumes to ensure there is adequate contingency to manage any changes in flows or disruptions to the system. The assessment also recommended continued monitoring of leachate

volumes from all sources to allow on-going calibration of the leachate model and adjustment of containment capacity, treatment and disposal volumes.

The EPA requested further justification for the proposed leachate collection system on the re-profiled landfill areas and an assessment of the integrity of the existing leachate collection system for the additional waste loads. The Applicant provided further details in the RTS and the EPA advised it was satisfied with the additional information. The EPA provided recommended conditions including:

- EPA approval of the final design of the dual gas/leachate collection trench, prior to construction and landfill re-profiling;
- installation of extraction risers within the dual gas/leachate trench to transfer leachate to the existing leachate ring main;
- preparation of a construction environmental management plan to manage installation of the dual gas/leachate trench;
- re-establishment of four historic groundwater monitoring bores and monitoring in accordance with EPA requirements to detect any leachate in groundwater to the north of the site; and
- ensuring the stripped area (exposing old waste) is limited to a maximum of 2,500 m^2.

The Department reviewed the advice provided by the EPA and the existing development consent conditions (DA 11-01-99) for the management of leachate. The Department considers the responses provided in the Applicant's RTS included sufficient technical detail to support the conclusions of the leachate assessment. The Department notes the Applicant is in the process of increasing the capacity of the existing treatment plant from 570 to 870 kL/day and would increase daily discharge volumes to 1,200 kL, which is consistent with the existing TWA. The increases to treatment plant capacity and discharge volumes would be sought by separate application. The Applicant confirmed there is adequate containment capacity in the existing cells 5.2B and 5.3 and the leachate dams to manage fluctuations, however increased treatment capacity and discharge volumes would provide some contingency to manage any system disruptions. The Department notes the design of the final landform would reduce rainfall infiltration and the generation of leachate over time, as landfill cells are progressively completed and capped.

The Department has incorporated the EPA's recommended conditions and included a requirement for the Applicant to routinely monitor leachate volumes from all sources and provide details of the leachate model calibration in annual reports to the Secretary. The Department has recommended a condition requiring the Applicant to implement any recommended measures to maintain adequate storage, treatment and disposal capacity as identified by annual model calibrations.

With these measures in place, the Department concludes leachate from the expanded landfill would be adequately monitored and managed to minimise the potential for off site impacts on surface water and groundwater resources.

5.3. Surface Water and Groundwater

The landfill expansion, GO and ARRT facilities have the potential to impact on surface water in Mill Creek, which is located on the site and the Georges River, downstream of the site. The development also has the potential to impact on local groundwater. The EIS included a surface water and groundwater assessment to determine potential impacts on water resources and propose specific management controls.

Surface Water

Mill Creek originates on the LHRRP site and traverses in a north-south direction through the centre of the site separating the landfill from the area proposed for the GO and ARRT facilities (see **Figure 9**). Mill Creek drains to the Georges River approximately 8 km north of the site. Existing surface water management infrastructure on the site is shown on **Figure 13** and includes surface water diversion drains around the landfill, disturbed area drainage channels (diverted to the leachate ponds), three sedimentation basins (the largest being 32 ML), a stormwater treatment plant and a licensed discharge point to Mill Creek.

Surface water is managed by diverting clean water away from landfill areas and collection in the sedimentation basins to settle out sediments prior to discharge. The stormwater treatment plant is used to treat high sediment laden water with flocculants to meet the current EPL criteria, prior to discharge to Mill Creek. The EPL sets specific monitoring requirements for discharges, including suspended solids and nitrogen (an indicator of leachate contamination).

Key aspects of the proposal that have the potential to impact on surface water include:

- realignment of a 300 m section of Mill Creek near the proposed GO facility;
- erosion and sedimentation and potential discharge of sediment laden water from construction of the GO and ARRT facilities, stripped back areas of the landfill, covered areas prior to revegetation and stockpiles; and
- leachate entering the surface water system and being discharged off site.

The surface water assessment included baseline water quality data and an aquatic habitat survey to establish the quality of Mill Creek on the site and upstream and downstream of the site. The assessment concluded there were minor localised impacts on Mill Creek adjacent to the LHRRP, however, stream health improved downstream.

The Applicant proposes to maintain existing surface water infrastructure for the expanded landfill. A site water balance indicated the existing system would adequately capture and manage flows from the expanded landfill. The surface water assessment included details of the clean water diversion drains to be constructed around each active landfill cell for each phase of the development. The Applicant also notes the progressive capping and rehabilitation of landfill cells would contribute to an overall reduction in sediment laden runoff. Water from the main sedimentation basin would be used for dust suppression, as it is currently.

Construction of the GO and ARRT facilities requires realignment of Mill Creek (as shown on **Figure 9**). These facilities would also be designed to minimise leachate generation and reuse water. The ARRT facility is fully enclosed and would not generate any leachate. Surface water collected on the roof and hardstand areas would be discharged to Mill Creek. The GO facility would have open areas of compost. Water that comes into contact with organic material would be collected in a sump and pumped to a supply dam for reuse in the composting process. Any overflows from the sump and storage dam downstream of the ARRT facility would be discharged to sewer in accordance with a Trade Waste Agreement.

DPI Water raised a number of matters for consideration during detailed design of the development and through ongoing management plans. Specifically, DPI Water requested clarifications on the final riparian widths to be maintained adjacent to Mill Creek, relocation of the proposed storage dam at the GO and ARRT facilities to avoid native vegetation and preparation of a Mill Creek stream rehabilitation plan. DPI Water also recommended further baseline aquatic monitoring prior to commencement of the development.

The Applicant provided further clarification and detail in the RTS including:

- revising the design of the GO and ARRT facility surface water management system to reduce the size of the northern storage dam and install an additional storage dam to the east of the ARRT facility;
- details of existing monitoring requirements under the EPL; and
- a commitment to undertake aquatic habitat monitoring every three years to monitor stream health in Mill Creek.

Following a further request for clarification and provision of supplementary information by the Applicant, DPI Water was satisfied and provided recommended conditions requiring a Mill Creek Rehabilitation and Vegetation Management Plan be prepared in consultation with DPI Water.

The EPA requested clarification on the storage capacity of the main sediment dam at the landfill for managing surface water flows during larger storm events and clarification on the management of surface water falling on the membrane covers at the GO facility. The Applicant provided further details in the RTS to address these issues. The EPA was satisfied with the clarifications and provided recommended conditions for surface water management. Specifically, the EPA requested the Applicant obtain approval from the EPA of the detailed design of the surface water collection from the GO facility membrane covers and roof areas. The EPA advised if the design is approved, an additional monitoring point would be required in Mill Creek to assess any impacts from the discharges.

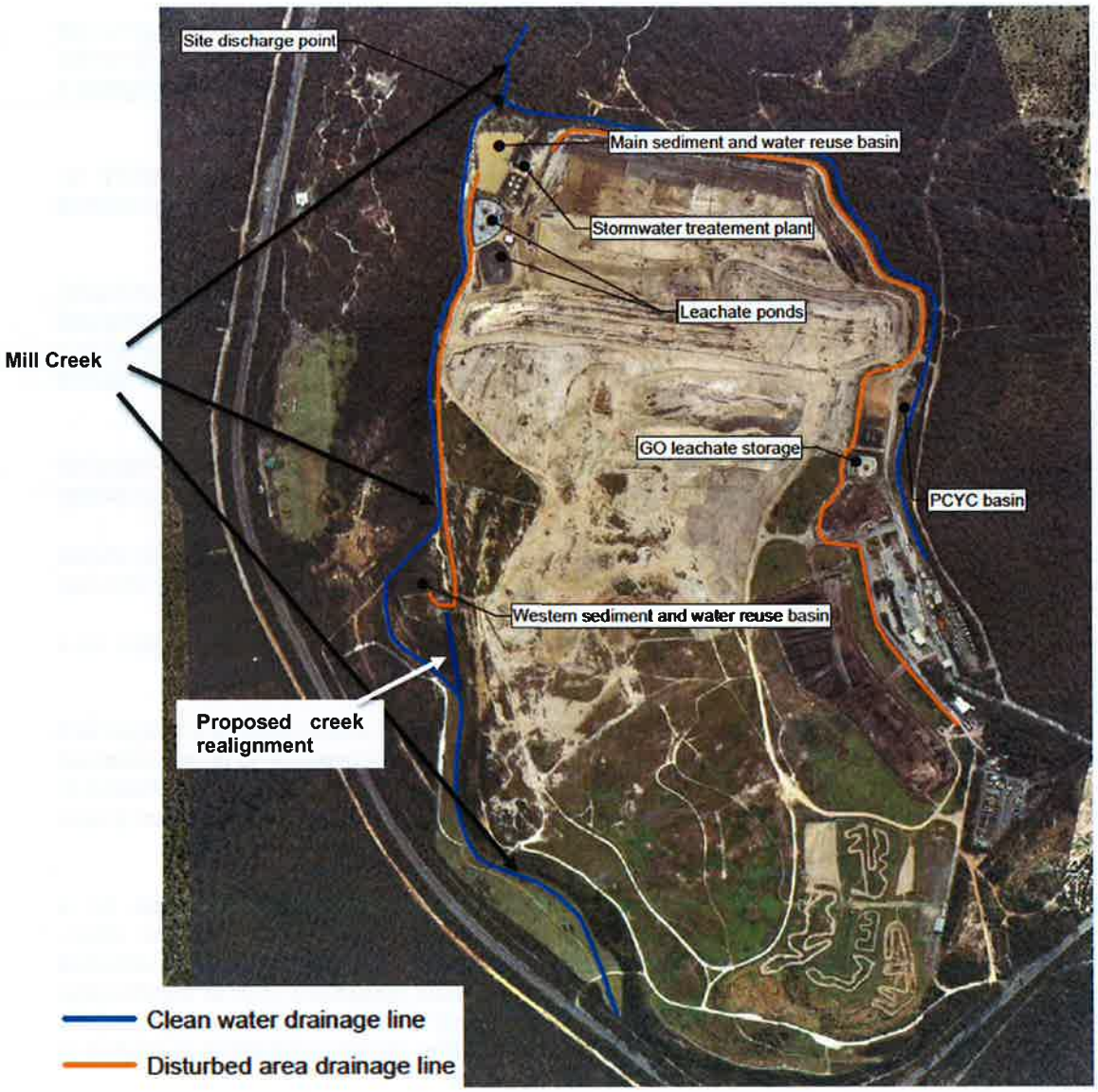

Figure 13: *Existing Surface Water Infrastructure*

The Department notes the Applicant has an established surface water management system that would be augmented to manage the development. The existing EPL for the landfill requires routine monitoring of discharges into Mill Creek and the EPA has recommended this continue with an additional monitoring point to ensure discharges from the GO facility do not affect water quality. The Department also notes the requirement of DPI Water to prepare and implement a rehabilitation and vegetation management plan for Mill Creek within the site, as the riparian widths proposed for the original development were a minimum of 20 m wide. The proposed development involves realignment of Mill Creek and a reduction in riparian widths to 10 m either side of the creek. The Department has recommended the Mill Creek Stream Rehabilitation and Vegetation Management Plan detail opportunities to maximise the riparian widths, particularly for the final landform.

The Department considers the Applicant has addressed the requirements of the key agencies in relation to surface water management and impacts on Mill Creek would be appropriately minimised through implementation of the recommended conditions.

Groundwater

The Applicant maintains a series of groundwater monitoring wells at the landfill to monitor groundwater flow, elevation and to detect if leachate is entering the groundwater system. The monitoring network has been in place since 1992, with the historical data indicating limited interaction between landfill leachate and groundwater.

Groundwater generally flows in a northerly direction beneath the landfill and is likely to discharge to low lying parts of Mill Creek in the north of the LHRRP. Key receptors that would be impacted by changes to groundwater include surface water bodies (such as Mill Creek), groundwater dependent ecosystems (including native vegetation near the site) and groundwater users (licensed bores).

The EIS included a groundwater assessment which considered the potential impacts of landfill re-profiling and operation of the GO and ARRT facilities on the key receptors. Specific matters considered included groundwater availability (recharge) and quality (impacts of leachate).

The assessment concluded the GO and ARRT facilities would have minimal impact on groundwater availability and quality, with the proposed surface water and leachate management systems adequate for ensuring impacts would be minimal. However, the assessment recommended installation of four shallow and two deeper groundwater monitoring bores near the GO and ARRT facilities and routine monitoring.

Landfill re-profiling works have greater potential to impact groundwater availability and quality, however the assessment predicted the impacts would be minor. Specific measures for minimising groundwater impacts at the landfill include:

- the measures to reduce leachate generation described in Section 5.2, including increased slopes on the final landform, phased landfilling and on-going assessment of collected leachate volumes and composition; and
- on-going groundwater monitoring from the existing 14 monitoring wells for a suite of analytes on a quarterly and yearly basis.

DPI Water requested further information be provided during detailed design and in specific management plans for the protection of groundwater, and requested further monitoring coverage to detect potential leachate pathways in the shallow aquifer. DPI Water also requested analysis of lead contamination in soils and groundwater from the SICTA clay target shooting range during operation, and continuing post closure of the LHRRP.

The Applicant clarified the existing groundwater monitoring network has been reviewed by a hydrogeologist and confirmed to be adequate for monitoring groundwater up-gradient and down-gradient of the landfill. The Applicant also included a commitment in the Operational Environmental Management Plan (OEMP) for the ARRT facility, requiring a site audit statement prior to construction of the ARRT facility, to identify and appropriately manage any heavy metal contamination from SICTA activities. DPI Water reviewed the RTS and did not provide any further recommendations in relation to groundwater.

The Department notes there is an established groundwater monitoring network in place at the landfill, and this would be augmented with additional wells to monitor impacts from the proposed GO and ARRT facilities. The Department notes the existing EPL for the landfill details the frequency of monitoring and the specific analytes measured. The Department considers the EIS has identified the potential groundwater impacts of the development and proposed appropriate safeguards to monitor impacts during construction, operation and post closure.

The Department's assessment concludes the proposed development would not adversely affect groundwater availability or quality. The Department recommends the Applicant augment the existing groundwater monitoring program with six additional wells, prior to construction of the GO and ARRT facilities. The Department has also recommended a condition requiring the Applicant to implement contingency measures to address any impacts identified by the routine monitoring. With these measures in place, the Department concludes groundwater resources on and near the site would be adequately protected.

5.4. Final Landform, Rehabilitation, Closure and Final Land Use

The development involves changes to the approved final landform and an extension of operations by 14 years. Under the existing development consent, the landfill would close in 2024 and be rehabilitated for use as public open space. Some community submissions raised questions regarding the final uses that would be available on the rehabilitated landfill and raised concerns about the delay in providing the public open space. The Cronulla Model Aero Club (CMAC) raised concerns about the specific designation of space for flying model aeroplanes.

Final Landform

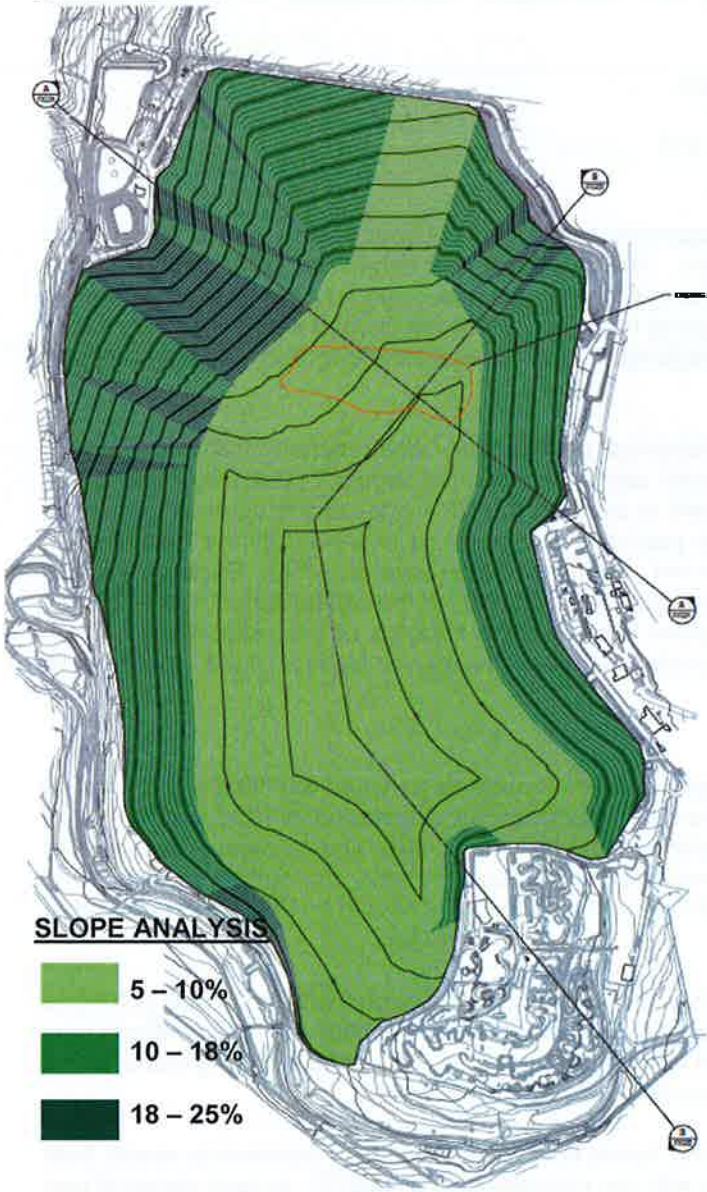

Figure 14: *Proposed Final Landform Slopes*

The final landform approved in 1999 does not meet the slope requirements of the EPA's *Guidelines for Solid Waste Landfills*. The final landform proposed in this application has increased batter slopes to ensure adequate drainage of rainfall away to defined drainage channels. This would reduce the potential for water to pond on the surface, infiltrate the waste cell and generate leachate. **Figure 14** shows the final landform with batter slopes ranging between 10-25% to direct rainfall to defined drainage channels. The re-profiled landfill would be 8 m higher than the current approved final landform, with a final height of 179.9 m Australian Height Datum (AHD) after settlement of the waste mass. Section 5.5 of this report addresses the change in visual impact due to the increased height.

The final landform was included as a key component of the final masterplan for rehabilitation and use of the site post closure.

The Department's assessment concludes the proposed landform would comply with current EPA guidelines, assist in reducing leachate and enable an appropriate end use of the site (discussed below). The Department has recommended a condition requiring the Applicant to rehabilitate the site to achieve the final landform design included in the EIS and ensure the height does not exceed 179.9 m AHD following settlement of the waste mass and with final capping.

Rehabilitation and Closure

Following completion of landfilling in 2037, the Applicant proposes to decommission and demolish the GO and ARRT facilities and rehabilitate the site to provide open space and parkland. The Applicant would progressively cap and rehabilitate as each landfill stage is completed. Parts of the landfill cap would be thickened with additional soil cover to support larger plants and trees. The rehabilitation would take two years to complete, from 2037 until 2039.

Rehabilitation would include establishing water features on the site including Mill Pond and Duck Pond and installation of surface water infrastructure to direct rainfall towards the existing sediment dams, which would be retained for irrigation of the parkland. The Applicant would undertake landscaping over a two year period, including planting trees, shrubs and lawn areas. Other parkland infrastructure would be constructed including pedestrian and cycle paths, internal vehicular access roads and amenities including car parking, toilets and picnic facilities.

The Applicant proposes to enter into a Voluntary Planning Agreement (VPA) with Council, which describes the post-closure responsibilities for both parties. The Applicant would execute the VPA prior to commencing any construction works or landfill re-profiling. The VPA describes the maintenance periods and responsibilities of the Applicant post closure of the landfill. Specifically the VPA includes:

- dedication of SITA owned land to Council at no cost, following closure of the landfill, for use for public recreation; and

- environmental undertakings, landscaping and post-closure responsibilities for SITA including maintenance post-closure of:
    - landscaping for 2 years;
    - stormwater infrastructure for 5 years;
    - roads and cycle paths for 5 years;
    - facilities (e.g. toilets) for 15 years; and
    - the landfill cap for 30 years.

No issues were raised in any submissions regarding rehabilitation (issues were raised about post-closure land uses, these are discussed below). The Applicant has committed to providing a post-closure plan to the EPA for approval, 12 months prior to the planned closure of the landfill. The post-closure plan would detail requirements for on-going management of the capped waste mass, including cap integrity, leachate and surface water management, landfill gas monitoring and management and rehabilitation works.

The Department notes the VPA clearly establishes post-closure maintenance and management responsibilities and the post-closure plan would detail the required works. The Department has recommended conditions requiring the Applicant to execute the VPA prior to the commencement of construction and landfill re-profiling, and for the post-closure plan to be approved by the EPA and the Secretary prior to closure and commencement of rehabilitation works. The Department has recommended the post-closure plan include specific requirements for the rehabilitation, including key performance measures and a monitoring program to ensure the success of the rehabilitation. With these measures in place, the Department concludes the rehabilitation and closure of the landfill would be effectively undertaken and monitored.

Final Land Use

The EIS included a masterplan showing the proposed final land use as parkland with flexibility to provide for a range of recreational activities. The masterplan was originally developed in 1998 and approved under the development consent for Lucas Heights 1 and 2 (DA 11-01-99). The Applicant reviewed the masterplan for the proposed development to ensure the final use remains appropriate for closure in 2037 and consistent with current legislation. The revised masterplan is shown on **Figure 15** and further details are provided in the EIS in Appendix D.

The masterplan provides large, gently undulating and sloping spaces edged with trees and pathways to cater for a range of different recreational activities. The masterplan identifies the final landform may support a range of future uses including a model aeroplane flying area, walking and cycling paths, picnic areas, equestrian uses, dog walking and various other recreational activities.

The EIS notes that Council would determine the future land uses, based on community needs from 2037 onwards. This would involve consultation with the community and ANSTO, as land owner of part of the site. As there is a buffer zone around the ANSTO facility, approval is required from ANSTO for any recreational or other uses within this zone.

The CMAC raised concerns about the lack of a designated flying space for model aeroplanes in the masterplan. The CMAC stated it had been involved in community liaison group meetings with SITA and had raised this issue previously with Council. CMAC raised concerns that the proposed final landform would not be suitable for model aeroplane flying, due to increased batter slopes, and extension of the landfill by a further 14 years would substantially delay provision of recreational space.

The Department notes Council considered this issue in May 2015, when it reviewed the proposed final landform prior to finalisation of the EIS. Council noted the final landform would provide improved environmental outcomes, would comply with the EPA's *Guidelines for Solid Waste Landfills* and would enable substantially increased landfill capacity without expanding the landfill footprint. Council also noted the final landform may not provide suitable space for model aeroplane flying and noted that ANSTO would be unlikely to support such a use within its buffer zone. Council recommended the EIS identify suitable alternative space for model aeroplane flying. The EIS states a model aeroplane flying area could be located in a section on the northern boundary of the site, however it is not clear where the area would be or if the final slopes could enable this use.

Figure 15: *Masterplan – Final Land Uses*

The Department acknowledges the difficulty in assigning specific uses at this stage, as the landfill would operate until 2037, ANSTO owns approximately two-thirds of the site and needs to approve specific uses, and Council would have ultimate control over the remaining one third of the site. The Department considers the final land uses can only be determined closer to the time of landfill closure, as community needs may change over time. However, given the issues raised by the CMAC, the Department has recommended specific conditions requiring consultation with CMAC and other local sporting groups in developing the final land uses on the site, as part of the post-closure plan.

The Department notes the importance of ensuring the post-closure landform complies with the EPA guidelines for long-term management of the waste mass and leachate system to ensure residual impacts are minimised. The Department notes this aspect is a key constraining factor for the final landform and subsequent uses. The ANSTO buffer zone is another constraining factor that may limit future recreational uses. The Department considers these components prevail over designing the landform to achieve a specific future use. The Department's assessment concludes the final landform would enable a range of recreational uses whilst complying with EPA guidelines.

The Department has recommended conditions for the post-closure plan, including consultation with the CMAC and approval of the post-closure plan by Council, ANSTO, EPA and the Secretary prior to the commencement of rehabilitation works on the site.

5.5. Visual Amenity

The development has the potential to affect the visual amenity of the local area through extended operation of the active landfill, construction of the GO and ARRT facilities and changes to the final landform height.

The EIS included a visual impact assessment, which considered potential impacts from nine receptor locations. **Figure 16** shows the receptor locations, which include the residential areas of Barden Ridge, Engadine and Menai, the future residential area of Heathcote Ridge, the Ridges Sporting Complex, ANSTO facility, passing motorists on New Illawarra Road and Heathcote Road and recreational visitors to the PCYC mini-bike club and SICTA gun club.

The key aspects of the development likely to be visible from these locations include:

- the final landform at 184.9 m Australian Height Datum (AHD) pre-settlement and 179.9 m AHD post-settlement. This is 8 m higher than the current approved final landform and 2 m higher than the existing stockpile of cover material that is visible from several receptor locations;
- intermediate stages, including Phase 5 and 6 which involve the largest area of exposed landfill batter towards the east, where the majority of receptor groups are located;
- stockpiles and buildings associated with the relocated garden organics facility; and
- the ARRT facility buildings and two, 20 m high biofilter ventilation stacks.

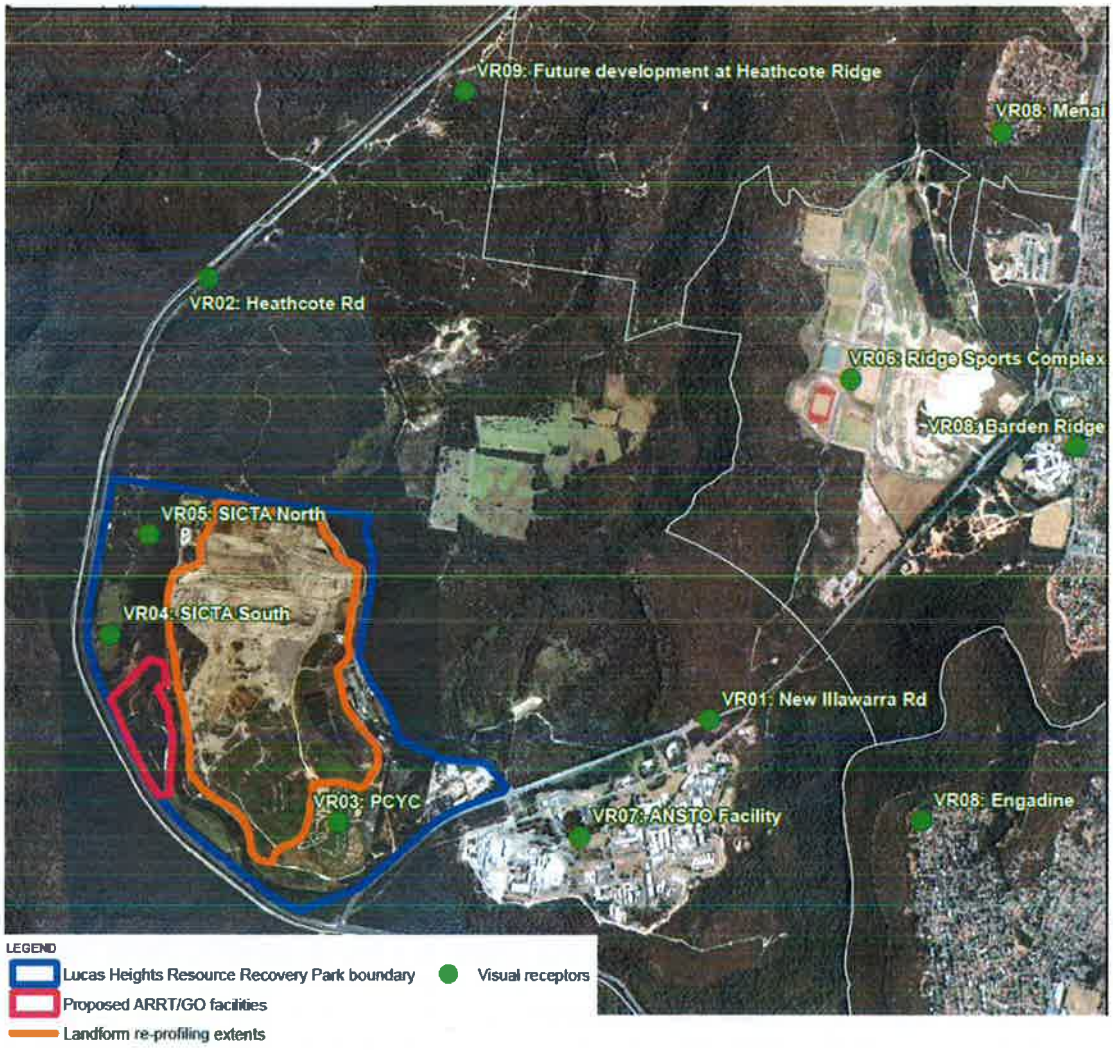

Figure 16: *Locations of Key Visual Receptors*

GHD prepared the visual assessment in accordance with the UK *Guidelines for Landscape and Visual Impact Assessment Third Edition, 2013.* The assessment characterised the visual catchments surrounding the site and evaluated the sensitivity of each receptor group to changes in the landscape. The magnitude of the changes proposed by the increased final landform height and GO and ARRT facilities was evaluated, with acknowledgement that the landform changes would occur slowly over the next 13 years. These factors were used to rate the significance of visual impacts at each receptor

location or group and determine the need for and type of mitigation measures. The visual assessment noted the subjective and variation nature of visual impacts and referred to the methodology in the *Guidelines for Landscape and Visual Impact Assessment* for presenting an objective analysis for the purposes of assessment.

For the residential receptors located to the east of the LHRRP (Engadine, Barden Ridge and Menai), the assessment concluded the visual impacts would be moderate to low. The assessment noted these receptors are located over 2.5 km from the LHRRP, making changes to the landform height less visible and intrusive. Some of the residential properties have expansive views over vegetated areas to their west. Once rehabilitated, the final landform would integrate with this natural outlook, minimising residual impacts. The GO and ARRT facilities would not be visible from the residential areas given the distance and intervening vegetation.

For the future residential developments to the north (Heathcote Ridge), the assessment concluded the impacts would be low given the intervening native vegetation and topography separating the LHRRP from the proposed residential areas. The assessment also acknowledged the residential development could be designed to minimise views of the landfill and ensure retention of native vegetation to screen views.

Users of the Ridge Sporting Complex have direct views towards the landfill from the western part of the sporting complex, with the existing stockpile clearly visible above the ridgeline, see **Figure 17**. The visual assessment concluded impacts on this receptor would be moderate and noted the changes to the final landform would be incremental over time. **Figures 17** to **19** show the existing view and an impression of the final landform. The assessment also considered visual impacts on this receptor during landfilling in Phases 5 and 6. The assessment considered these phases the worst-case visual scenario, with the active landfill face closest to these receptors for a two year period. The visual assessment recommended grassing the intermediate cover areas during re-profiling works to minimise visual impacts during this period. **Figure 20** shows the view at the end of Phase 5 landfilling, with the batter exposed, to represent the worst-case.

***Figure 17**: Existing View from Ridges Sporting Complex*

Other receptors include workers at the adjacent ANSTO facility, recreational users of the SICTA gun club and PCYC mini-bike club and passing motorists on New Illawarra Road and Heathcote Road. These receptors would have occasional views of the LHRRP when using the recreational facilities,

driving past or when arriving to and departing from work. Visual impacts on these receptors would vary from negligible - low when viewed by passing motorists to moderate - low when viewed from the adjacent recreational areas.

***Figure 18**: Comparison of Approved and Proposed Final Landform*

***Figure 19**: Proposed Final Landform Vegetated - Shown in real colour*

Figure 20: *View from Ridge Sporting Complex (Phase 5 landfill re-profiling)*

The Applicant has proposed initial rehabilitation works, including screening vegetation around the southern boundary of the completed landfill, see **Figure 21**. The planting would screen the landfill, GO and ARRT facilities from the ANSTO facility, adjacent roads and the PCYC mini-bike area, in approximately 3 to 5 years once the vegetation matures.

The Applicant also committed to apply hydromulch on exposed batter areas and progressively grass and rehabilitate completed landfill areas to minimise visual impacts for receptors to the west.

The Department notes one public submission identified the existing landfill as visually unattractive with visible earth mounds (referring to the large existing stockpile of cover material). No other submissions raised visual impacts as a concern.

The Department visited the site in 2016 and noted the extensive native vegetation surrounding the site and the undulating topography, which enables views of the site from certain ridgelines. The Department also noted the residential areas were some distance from the landfill, with many of the areas screened by intervening vegetation and topography.

The Department considers the conclusions of the visual assessment are appropriate and recommends the Applicant implements its commitments to undertake early screen planting and progressively hydro-mulch and grass completed landfill areas to minimise visual impacts. The Department has included timeframes in the recommended conditions for the early screen planting works, subject to agreement with ANSTO (the landowner). This would ensure planting is completed in a timely manner and the benefits of visual screening are provided well ahead of the proposed landfill closure in 2037. The Department has also recommended a condition requiring the Applicant to ensure the final landform height does not exceed 179.9 m AHD post-settlement. The Department's assessment concludes the visual impacts of the proposal would be minimised, with the recommended conditions in place.

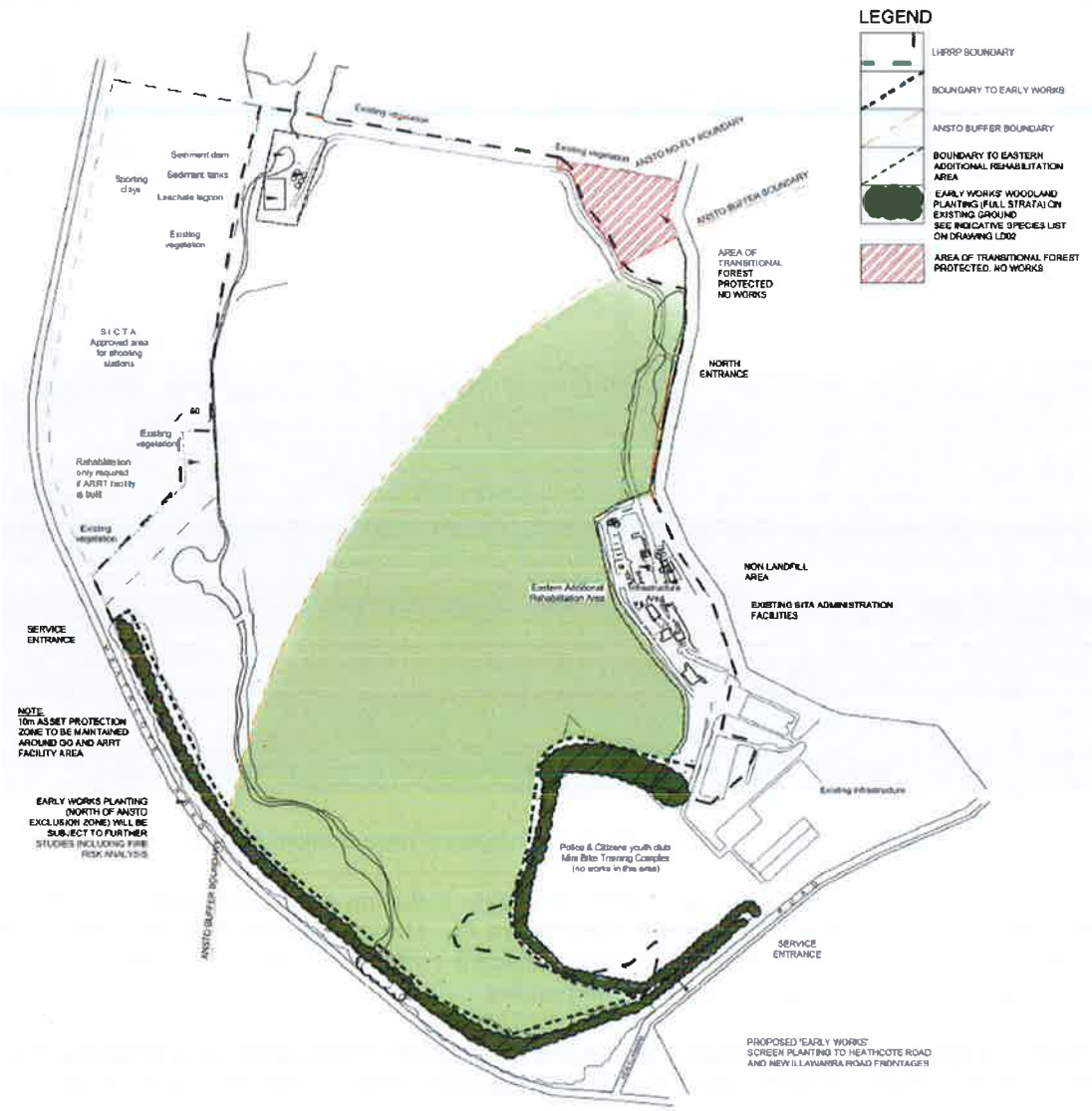

Figure 15: *Proposed Vegetation Screening*

5.6. Biodiversity

The development has the potential to impact on biodiversity directly through clearing of native vegetation for construction of the GO and ARRT facilities, the access road and realignment of Mill Creek. The proposal may also have indirect impacts through changes to surface water and groundwater regimes from landfill re-profiling and leachate management and edge effects including weed invasion.

GHD undertook a biodiversity assessment in accordance with OEH's *Frameworks for Biodiversity Assessment* (FBA, 2014). The assessment included desktop analysis and field surveys to identify threatened flora and fauna species potentially impacted by the development. The assessment also included calculations of the ecosystem and species credits required to offset the impacts of the development in accordance with the FBA, 2014.

Field surveys included assessment of fauna habitat such as hollow-bearing trees and rock outcrops, koala spot assessments, targeted frog and bat surveys, nocturnal survey and aquatic habitat assessment. Field surveys identified the following within the development footprint (see **Figure 22**):

- one native vegetation type, Red Bloodwood – Scribbly Gum heathy woodland in the western part of the site;
- one threatened flora species, *Acacia bynoeana*, listed as endangered on the NSW *Threatened Species Conservation Act, 1995* (TSC Act) and vulnerable on the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act);
- one endangered population, *Allocasuarina diminuta subsp. Mimica*, listed as an endangered population under the TSC Act, occurring along the western boundary adjacent to Heathcote Road;

- large cleared areas of the existing landfill and revegetated areas of the old landfill;
- one threatened fauna species potentially recorded during field survey, the Greater Broad-nosed Bat; and
- no threatened species listed under the *Fisheries Management Act, 1994* (FM Act) in Mill Creek within the site.

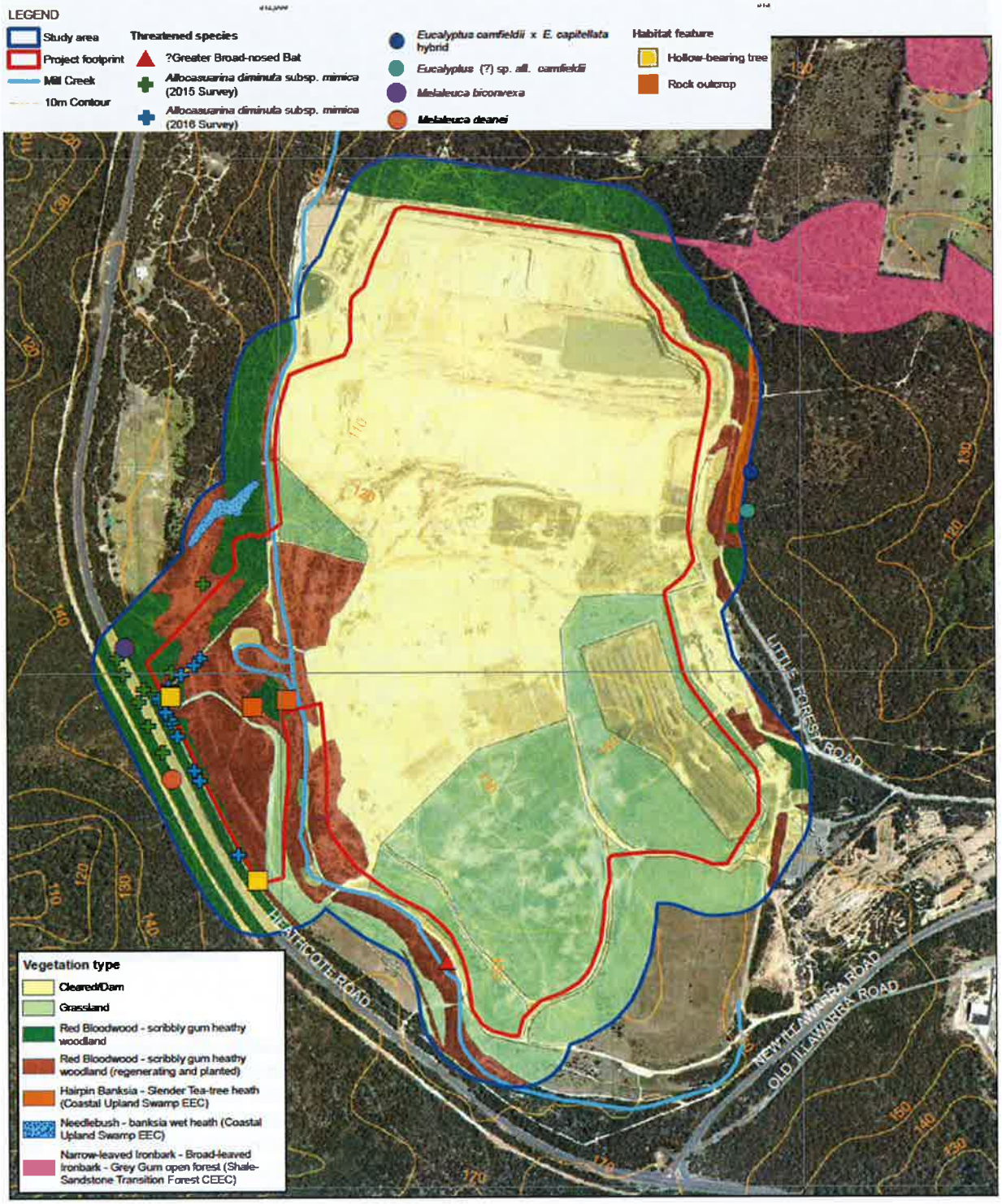

Figure 22: *Vegetation Types and Threatened Species*

Two threatened ecological communities listed on the TSC Act are located in close proximity to the development footprint, including Coastal Upland Swamp: Needlebush – Banksia wet heath on sandstone plateaux and Hairpin Banksia – Slender Tea-tree heath, see **Figure 22**. One critically endangered ecological community, Shale-Sandstone transition forest is located immediately to the

north-east of the development footprint. Large areas of native vegetation exist around the site, including the Holsworthy Military Reserve to the west and Heathcote National Park to the south, see **Figure 23**.

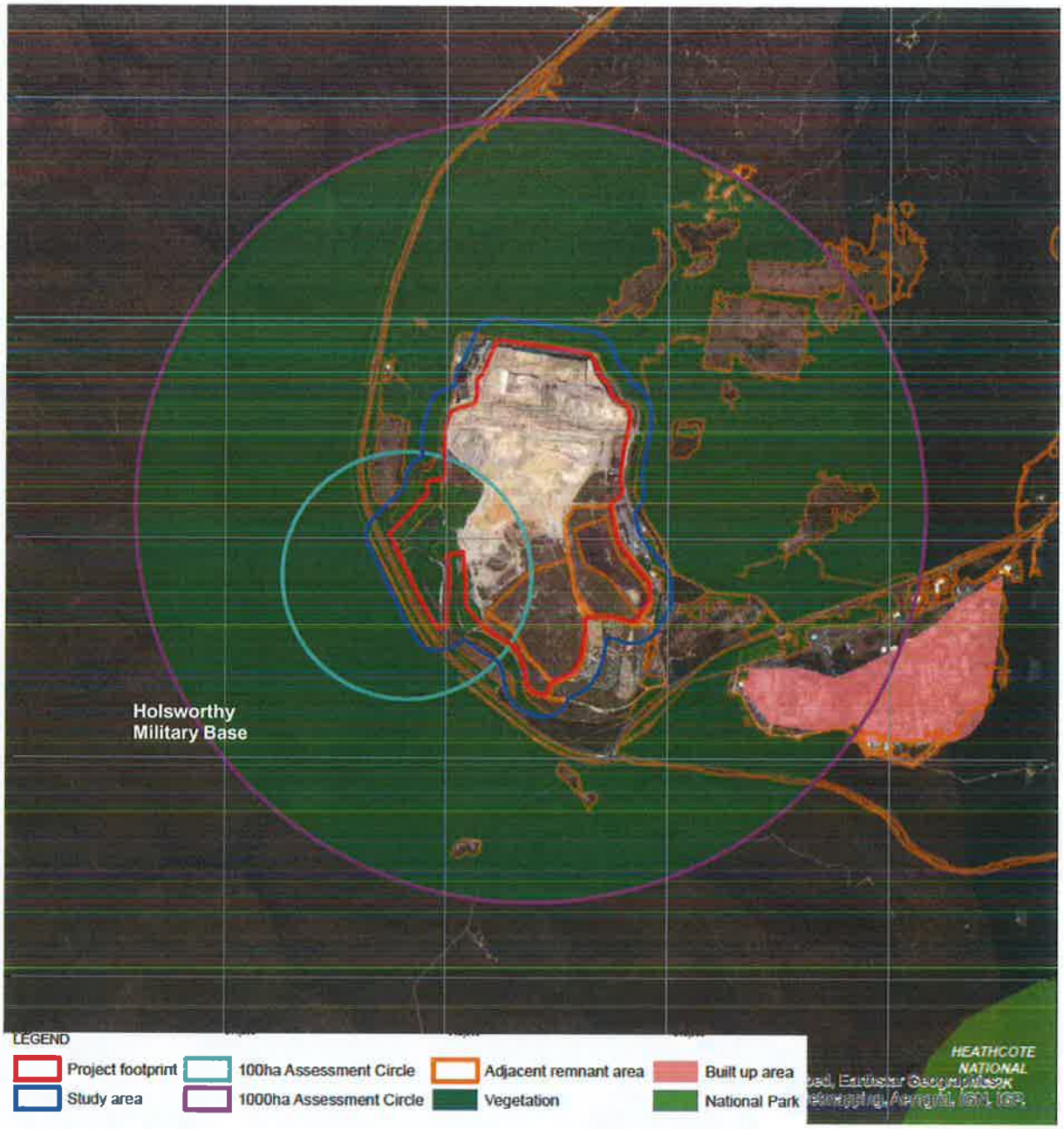

Figure 23: *Native Vegetation Surrounding the Site*

OEH identified some inconsistences in the biodiversity assessment and requested the Applicant provide an Expert Report to confirm field surveys were undertaken in the correct season. OEH also requested further progression of the proposed biodiversity offset strategy. OEH noted the need to identify and assess the offset site to ensure it provides adequate credits to offset the impacts of the development. OEH also noted the potential lack of available credits for *Allocasuarina diminuta subsp. Mimica* and advised the Applicant to commence the process of applying for a variation to the offset rules if required, as the process can take six months.

In the RTS, the Applicant updated the biodiversity assessment report to:

- correct inconsistencies and include an Expert Report on the suitability of field surveys;
- show adjustments made to the location of the GO and ARRT facilities to minimise impacts on *Allocasuarina diminuta subsp. Mimica* and set the development further back from the Coastal Upland Swamp EEC;
- provide revised credit calculations, to include credits for *Allocasuarina diminuta subsp. Mimica* based on OEH's recommended formula; and

- provide a revised biodiversity offset strategy, delivered in two separate stages for the GO and ARRT facilities.

The RTS identified the development would have the following impacts on biodiversity:

- clearing 9.25 ha of Red Bloodwood – Scribbly Gum heathy woodland for construction of the GO facility (4.84 ha) and ARRT facility (4.41 ha). Approximately 6.82 ha of this vegetation is regenerating and planted woodland;
- removal of five hollow-bearing trees with small hollows of less than 5 centre metres (cm);
- removal of up to 67 ramets (individuals within a colony of identical plants) of *Allocasuarina diminuta subsp. Mimica* (endangered) for construction of the ARRT facility; and
- loss of riparian, stream and dam habitat for frogs, reptiles and macroinvertebrates due to the realignment of a section of Mill Creek.

There would be no direct impacts on threatened ecological communities, the critically endangered Shale-Sandstone transition forest or any threatened biota listed under the FM Act.

The biodiversity assessment noted the removal of 67 ramets of *Allocasuarina diminuta subsp. Mimica* represents less than 3% of the total endangered population in the area. The assessment noted there were over 200 ramets located close to the site and unaffected by the development, along the verges of Heathcote Road and the adjacent drainage line and in the SICTA land to the north.

The biodiversity assessment calculated the ecosystem and species credits required to offset the direct impacts of the development using OEH's Biobanking credit calculator. The Applicant's proposed biodiversity offset strategy is based on the credit calculations shown in **Table 6**.

***Table 6**: Proposed Biodiversity Offset Strategy*

Location	Area of native vegetation removed (ha)	No. of credits	Type
GO facility	4.84	185 ecosystem	Red Bloodwood – Scribbly Gum heathy woodland on sandstone plateaux
		97 species	Eastern Pygmy-possum
ARRT facility	4.41	143 ecosystem	Red Bloodwood – Scribbly Gum heathy woodland on sandstone plateaux
		88 species	Eastern Pygmy-possum
		5,154 species	*Allocasuarina diminuta subsp. mimica*

The revised biodiversity offset strategy presented in the RTS includes:

- Stage 1 – GO facility – purchase and retire ecosystem credits from biobank sites managed by The Hills Sire Council prior to construction. The Applicant notes there are currently no species credits for the Eastern Pygmy-possum on the Biobank market. The Applicant has commenced discussions with existing Biobank site operators (including Hornsby Shire Council) to undertake assessments to generate these credits and is concurrently working with Sutherland Shire Council to identify a suitable site to place under a Biobanking Agreement to secure these credits; and
- Stage 2 – ARRT facility – purchase and retire ecosystem and species credits prior to construction of the ARRT facility. Availability of credits yet to be identified and may involve an existing Biobank site or the open Biobank market.

In addition, the Applicant proposed a number of management measures to minimise impacts on biodiversity including:

- collection of seeds of *Acacia bynoeana* and propagation in the on site nursery for planting on site;
- relocation of the one individual *Acacia bynoeana* for replanting at the offset site;
- collection of seeds from *Allocasuarina diminuta subsp. Mimica* prior to clearing, propagation in the on site nursery and replanting in areas not impacted by the development, including realigned sections of Mill Creek and the offset site; and
- construction management measures, including marked clearing limits, presence of an ecologist on site during clearing and creek realignment, rescue and relocation of fauna and erosion and sediment controls.

As discussed in Section 3.12, the Applicant referred the proposal to the Commonwealth Government in accordance with the EPBC Act. The Minister for Environment determined the proposal is not a controlled action and therefore had no requirements for biodiversity offsets under the EPBC Act.

Following a review of the RTS and revised biodiversity offset strategy, OEH advised that while some progress had been made, the revised offset strategy does not provide enough certainty suitable credits are available to support the development. OEH's primary concern is the availability of credits for *Allocasuarina diminuta subsp. Mimica*, given the very restricted distribution of the species and the lack of sufficient investigations by the Applicant to determine if the credits are available. OEH advised the Applicant of the process for seeking a variation to the offset rules (that would allow the use of other species or supplementary measures as an offset, where *Allocasuarina diminuta subsp. Mimica* credits are not available). However, OEH advised it would not agree to sign-off on any variations or supplementary measures, if these issues are not addressed prior to determination of the application.

The Department has considered the staged offset strategy proposed by the Applicant and OEH's position with the goal of finding a workable solution. In developing this solution, the Department has considered the scale of the biodiversity impacts, the nature and duration of the development, other cumulative impacts and the proposed rehabilitation of the final landform.

The Department considers the key aspects of the development to consider in the context of the biodiversity impacts include:

- extension of the existing landfill by a further 13 years and increasing waste processing capacity by 275,000 tonnes per annum would be achieved within the footprint of the existing landfill, without the need for a greenfield site, which may require significantly larger areas of native vegetation to be removed;
- co-location of green waste and resource recovery operations reduces transport impacts by having a centralised location for the disposal and processing of waste;
- the Applicant has re-designed the footprint of the GO facility to avoid impacts on *Allocasuarina diminuta subsp. Mimica* and has committed to finding suitable offsets for this species prior to construction of the ARRT facility;
- the development would require removal of 9.25 ha of native vegetation of which a large portion (6.82 ha) is planted and regenerating vegetation;
- the Applicant maintains an on site nursery for seed collection and plant propagation including *Allocasuarina diminuta subsp. Mimica;* and
- there are significant stands of similar native vegetation surrounding the site within the Holsworthy Military Reserve, Heathcote National Park and the Heathcote Ridge site to the north, which are protected but not available to the Applicant as biodiversity offsets.

The biodiversity offset strategy would ensure the biodiversity impacts of the development are offset prior to the impacts occurring. The Department notes the Applicant proposes to construct the ARRT facility at a later stage, once it secures waste contracts, giving sufficient time for the Applicant to investigate and secure the required biodiversity offsets. The Applicant has commenced the process of searching for the required credits and has committed to securing the credits prior to construction. In the context of the development as a whole, the Department concludes the biodiversity impacts are minor and the recommended conditions would ensure the biodiversity impacts are offset prior to the impacts occurring. The Department recommends conditions requiring the Applicant to:

- prepare and implement a vegetation and fauna management plan for construction, including pre-clearance surveys, clearing protocols and the presence of an ecologist during clearing and creek realignment works;
- implement the biodiversity offset strategy in accordance with the FBA, 2014, to achieve the ecosystem and species credits identified, prior to construction of the GO and ARRT facilities; and
- secure the biodiversity offsets through a conservation mechanism agreed with OEH and the Secretary.

The Department's assessment concludes the recommended conditions would ensure the biodiversity impacts of the development are offset prior to construction commencing.

5.7. Other Issues

Table 7 details the Department's assessment of other issues including traffic, noise, development contributions, litter and illegal dumping, hazards, fire prevention and heritage.

***Table 7**: Assessment of other issues*

Consideration	Recommended Conditions
Traffic	
• GHD prepared a traffic impact assessment (TIA) in accordance with the *Guide to Traffic Generating Development* (Roads and Traffic Authority 2002) and in consultation with RMS, Council and ANSTO. <u>*Operation*</u> • The TIA identified the impacts of the development on the safety and capacity of Little Forest Road (local), New Illawarra Road (arterial) and Heathcote Road (arterial) and key intersections focusing on 2027 as the peak traffic year for the development, also assuming all facilities operating at maximum capacity. • There is no public transport service to the LHRRP therefore impacts on and use of public transport was not considered in the TIA. • Traffic counts were taken in 2014 and RMS growth factors were applied to estimate future traffic volumes in 2017 and 2027. Consideration was also given to the increases in traffic from the approved residential development at Heathcote Ridge. • Worst-case estimates of traffic volumes generated by the development were based on weighbridge traffic data supplied by SITA. • The existing facility generates 157,000 vehicle trips (light and heavy) per year. The proposed development is predicted to generate an additional 112,518 vehicles per year for the peak scenario in 2027 due to increased waste processing volumes. This equates to an additional 32 vehicle movements during the AM peak hour in 2027, with the majority being heavy vehicles. • The TIA considered existing traffic volumes (which includes the current operation) and worst-case estimates from the development. The assessment concluded the development would increase traffic by 1.4% on New Illawarra Road and 2.1% on Heathcote Road. Existing traffic on New Illawarra Road is approximately 2,000 vehicles per hour in the AM peak and on Heathcote Road approximately 1,500 vehicles per hour in the AM peak. • On Little Forest Road, the increase from the development is 46% in the AM peak and 55% in the PM peak as the road is used solely by vehicles accessing the LHRRP. • Analysis of intersection performance determined there would be no change to the level of service (LOS C) at the Heathcote Road/New Illawarra Road intersection due to the development. At the New Illawarra Road/Little Forest Road intersection, the level of service would not change during the PM peak, however there would be a reduction in LOS from B to D for the right turn from Little Forest Road into New Illawarra Road in the AM peak hour. The assessment noted this level of service is still satisfactory. • The TIA recommended a safety review of this intersection in 2020 and 2025 to determine if any modifications are necessary to improve the layout. • RMS and Council did not raise any issues in relation to traffic. <u>*Construction*</u> • The TIA estimated construction would generate a maximum of 60 additional vehicle movements a day which would occur prior to the AM and PM peak hour periods, resulting in minimal impact on the existing road network and intersections. • The TIA also noted that 96 new car parking spaces would be provided at the GO and ARRT facilities, consistent with relevant guidelines. • RMS reviewed the TIA and did not object to the development or provide any recommended conditions. Similarly, Council raised no issues in relation to traffic. • The Department's assessment concludes the increased traffic from construction and operation of the development would have minimal impact on the capacity of the existing road network and intersections. However, the Department notes the right turn from Little Forest Road to New Illawarra Road requires review in the future to ensure intersection safety is maintained throughout the life of the development. • Therefore the Department agrees with the recommendation of the TIA to conduct a safety review of the intersection in 2020 and 2025 and requires the Applicant to implement the recommendations of the safety review, including any required intersection upgrades and payment for the works, to the satisfaction of the Secretary and RMS (as the relevant roads authority).	Require the Applicant to: • implement a construction traffic management plan; • ensure all staff vehicles, plant and equipment are parked on site and do not park on the public road network; • conduct a safety review of the Little Forest Road/New Illawarra Road intersection in 2020 and 2025 and implement the recommendations of the safety review, including any required intersection upgrades, to the satisfaction of the Secretary and RMS.
Noise	
• GHD prepared a noise impact assessment (NIA) in accordance with relevant guidelines to assess noise impacts from construction, operation and road traffic on the nearest sensitive receivers. • The nearest receivers are located over 300 m to the east (ANSTO) and the nearest residential receivers are the Lucas Heights Motel (500 m east), Engadine (2 km	Require the Applicant to: • limit hours of work for construction and operational activities;

Consideration	Recommended Conditions
east), Barden Ridge (3 km north-east) and the future residential areas of the Heathcote Ridge development (1.5 km to the north and east). • The NIA established project specific noise criteria using data from attended noise monitoring at 11 locations across the LHRRP. Predicted worst-case noise levels for construction and operation were compared with the project-specific criteria. *Construction Noise* • Construction of the GO and ARRT facilities is expected to take 18 months and involve earthworks, civil works, construction of buildings, concrete pouring, transport of pre-fabricated components and building fit-out. Re-profiling of the landfill was considered an operational activity in the NIA. • Works would be undertaken during standard construction hours and were predicted to comply with the noise management goals at all receivers, determined in accordance with the EPA's *Interim Construction Noise Guideline*. *Operational Noise* • The NIA predicted worst-case noise levels from landfill re-profiling and operation of the GO and ARRT facilities. The NIA compared predicted noise levels with the night-time criteria, as the ARRT facility would operate 24 hours a day and landfilling commences at 6 am, which is considered the night-time period as it is before 7 am. • The NIA considered two scenarios, including re-profiling in the northern and southern areas of the landfill. • The NIA concluded operation of the LHRRP would generate noise levels below the night-time criteria at all receivers for both scenarios. Noise levels were predicted: o between 26-32 dB(A) at Engadine, Barden Ridge and Menai compared with criteria of 37-38 dB(A); o 31-37 dB(A) at Heathcote Ridge compared with criteria of 37 dB(A); and o 40 dB(A) at the Lucas Heights Motel, which is equal to the criteria of 40 dB(A). • These levels are equal to or below the night-time criteria and well below the day time criteria. *Road Traffic Noise* • The NIA assessed noise increases from road traffic for the worst-case scenario in 2027, being an increase of 432 vehicles per day. This represents approximately 1% of existing traffic volumes on New Illawarra Road and Heathcote Road. • Noise levels on New Illawarra Road and Heathcote Road were predicted to increase by less than 0.1 dB(A) as a result of the development, and are compliant with the *NSW Road Noise Policy*. *Conclusion* • The NIA concluded the development would meet all relevant noise criteria for construction, operation and road traffic. The Applicant provided recommended noise control measures in the OEMPs submitted with the EIS, including maintaining equipment with residential grade silencers, using reverse quackers instead of alarms on excavators and wheel loaders and restricting noisy activities to day time hours. • The EPA advised it had no significant concerns regarding noise from construction and operation and requested minor clarifications on the noise assessment. These were provided in the RTS and the EPA subsequently provided recommended conditions for managing noise including noise limits in line with the predictions in the EIS and a requirement for annual noise monitoring and reporting. The EPA recommended hours of operation, including a restriction on the GO facility to operate during day time hours only. • The Department also notes the Independent Environmental Audit in 2015 found there were no noise complaints over the 12 month period and noise was not raised in the public submissions. • The Department has recommended standard conditions for managing noise at the LHRRP, including specific hours of work, noise limits, annual monitoring and implementation of the management measures described in the OEMPs. • The Department's assessment concludes the development would be unlikely to result in adverse noise impacts at the nearest sensitive receivers given the considerable distance between the LHRRP and receivers.	• meet noise limits at the nearest sensitive receivers; • conduct annual noise monitoring to demonstrate compliance with the noise limits and report the results of monitoring to the EPA and the Secretary; and • implement the noise management measures described in the OEMPs for the LHRRP, GO and ARRT facilities.
Development Contributions	
• The EIS included a draft Voluntary Planning Agreement (VPA) between the Applicant and Council. The draft VPA includes a $100 million financial contribution from the Applicant to Council to fund community infrastructure throughout the Sutherland Shire, with a commitment to spend a minimum of 20% within a 7.5 km radius of the site. The contributions would be paid quarterly from 2016 to 2032. • The VPA also includes dedication of SITA owned land to Council at no cost following closure of the landfill, for use as public recreation.	Require the Applicant to: • execute the VPA with Council prior to commencement of construction.

Consideration	Recommended Conditions
• The VPA includes environmental undertakings, landscaping and post-closure responsibilities for SITA including maintenance post-closure of: – landscaping for 2 years; – stormwater infrastructure for 5 years; – roads and cycle paths for 5 years; – facilities (e.g. toilets) for 15 years; and – landfill cap for 30 years. • Council publicly exhibited the draft VPA from 1 June to 29 June 2016. Council received three community submissions. The submissions included a request for lots of tree planting and questioned whether the 30 year long-term maintenance period for SITA is enough. Council addressed the submissions and concluded the VPA did not require any amendments. • Council recommended the environmental management plans are amended and approved by Council, following issue of the development consent and that the VPA be executed once the environmental management plans are approved. • Given the substantial monetary contribution by SITA to Council, the Department does not recommend any further contributions be levied on the Applicant (such as Section 94 or 94A contributions under the EP&A Act). Council agreed with the Department's recommendation and advised it was satisfied with a condition requiring execution of the VPA prior to construction. • As a condition, the Department recommends the Applicant execute the draft VPA with Council prior to commencement of construction.	
Litter, Illegal Dumping and Pest Control	
• The Applicant included specific measures to manage litter escaping from the landfill and from trucks transporting waste to the site. These measures are important for maintaining a clean and tidy landscape and minimising the impacts of litter on nearby watercourses and native vegetation. The OEMP submitted with the EIS describes these measures. • The EIS also identified specific programs for combatting illegal dumping within the Sutherland Shire. The Applicant has dedicated $60,000 per annum over five years to a Litter and Illegal Dumping Fund and is working with Council to implement specific strategies to prevent illegal dumping in the area. This includes community education programs, signage and increased surveillance of dumping hot spots. • The Department has recommended conditions requiring all waste loads to be covered and for the Applicant to inspect and clear the site of litter on a daily basis and maintain the site in a clean and tidy state at all times. • The EIS did not raise pest control as a specific issue, however one public submission raised concern about increases in ibis, crows, foxes and rats with increased landfilling. The Department notes the practice of applying daily cover over landfilled waste and maintaining a clean site assists in reducing pests. However, the Department has also recommended conditions requiring the Applicant to implement measures to manage pests, vermin and noxious weeds to ensure these species are controlled. • The Department's assessment concludes the Applicant is actively contributing to the management of litter from its operations and is assisting Council to implement strategies to prevent and manage illegal dumping.	Require the Applicant to: • ensure all waste loads are covered; • inspect and clear the site (and if necessary, surrounding area) of litter on a daily basis; • maintain the site in a clean and tidy state; and • implement measures to manage pests, vermin and declared noxious weeds and inspect the site regularly to ensure the measures are effective.
Hazards and Risks	
• The proposed development is located in an area well separated from existing and known future residential and sensitive land uses. The quantities of dangerous goods to be stored on site are below the threshold for *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development*. • Therefore, the Department does not recommend any hazard related conditions.	None required.
Fire Prevention and Management	
• The site is located on bushfire prone land as bushfire prone vegetation adjoins the western and northern site boundaries. • The EIS considered the bushfire attack level of the site by combining the attributes of vegetation coverage, slope and fire danger index. • The EIS noted the site and surrounding landscape contain large areas of contiguous forest with high potential for a high intensity fire to occur at some point over the life of the development. • The Applicant identified the need to develop strategies and procedures to mitigate bushfire risk. These include: – a 10 m wide asset protection zone (APZ) around the northern and western sides of the GO and ARRT buildings;	Require the Applicant to: • prepare an Emergency Response Plan detailing emergency access and egress routes, alternative routes, escape routes and refuge areas; • design and construct the GO and ARRT facilities to meet the

Consideration	Recommended Conditions
– construction standards for the buildings including screening of air intakes, windows and air-conditioning vents on buildings within 100 m of Heathcote Road; and – site-specific emergency response procedures including emergency access and egress routes, escape routes and refuge areas. • The Applicant also identified potential fire risks from landfill areas and combustion within mulch and composting materials in the GO and ARRT facilities. Specific operational procedures would be implemented to mitigate and manage these risks. • The application was referred to Fire and Rescue NSW, however they did not comment on the proposal. • The Department recommends the commitments made by the Applicant are included as recommended conditions, including the requirement for an emergency response plan, design and construction of the GO and ARRT facilities to meet the fire safety requirements of the Building Code of Australia (BCA) and maintenance of a 10 m wide APZ. • The Department's assessment concludes the Applicant has identified the potential risks from bushfires and operation of the landfill, composting and recycling facilities, and has proposed appropriate measures to mitigate and manage these risks.	fire safety requirements of the BCA; and • maintain a 10 m wide APZ around the northern and western sides of the GO and ARRT buildings.
Heritage (Aboriginal and Non-Aboriginal)	
• A heritage assessment was undertaken by Artefact Heritage and included a search of all relevant heritage registers and a site inspection. • Four sites registered on the Aboriginal Heritage Information Management System (AHIMS) were identified within the site. These include three rock shelters and one open artefact scatter. All sites have been completely removed during previous landfilling activities. The Applicant proposes to submit site impact recording forms for these sites to OEH to update their status on AHIMS. • The proposal would have no impact on Aboriginal heritage items as all previously recorded sites have already been impacted by the existing landfill. No items of Aboriginal or non-Aboriginal heritage were recorded in the proposed location of the GO and ARRT facilities as these areas have been previously cleared for the realignment of Mill Creek as part of earlier landfill construction. • One non-Aboriginal heritage item recorded on the SLEP 2015 is located to the north-east of the site, with a very small portion located within the boundary of the LHRRP. The item is an area of Grey Ironbark and would not be impacted by the development. • OEH and Council did not comment on the heritage assessment. • The Department's assessment concludes the development would have no impact on heritage values and recommends standard conditions for the management of unexpected finds.	Require the Applicant to: • Prepare and implement an unexpected finds protocol; and • Submit Site Impact Recording Forms to OEH for the four previously impacted Aboriginal heritage items.

5.8. Consideration of key issues raised in public submissions

Table 8 presents the key issues raised in the public submissions and how the Department has considered each issue.

Table 8: *Department's Response to Issues Raised in Public Submissions*

Concerns Raised	Department's Comments
Continued expansion of the landfill at an environmental cost to the local community	• The Department's assessment of odour, leachate, water resources, final landform, visual amenity, biodiversity, noise and traffic concluded the development would meet all relevant criteria. The Department's assessment is contained in Sections 5.1 to 5.7 and includes a range of recommended measures to manage any residual environmental impacts from the proposed development. • The Applicant is responsible for long-term management of the completed landfill and leachate collection system to ensure impacts to groundwater and surface water do not occur. • The final landform would be rehabilitated to provide a significant community resource in the form of public parkland. • The Department also notes the Applicant has committed to a $100 million financial contribution for the provision of services and infrastructure in the local community.
No finite end to waste disposal in Sutherland Shire Council given successive extensions to the landfill	• The proposed development would extend the life of the landfill by 13 years, until 2037. • The Department's assessment concluded further landfill capacity is required to service the growing population of Sydney and the proposed

Concerns Raised	Department's Comments
	development provides advanced resource recovery to meet the targets identified in the strategic waste policy for NSW. • The recommended conditions limit the receipt of waste until 2037. Following a period of rehabilitation, the land will be available as public open space from 2039. • The recommended conditions require the Applicant to prepare and implement a post-closure plan, including details of rehabilitation works, monitoring and performance criteria.
Odour especially during winter mornings	• The Applicant undertook odour sampling at the existing landfill to identify key odour sources. The Applicant then implemented rectification measures on the three largest odour sources and demonstrated through subsequent sampling that these measures have reduced odour from the site. • The odour assessment included in the EIS predicted odour from the expanded landfill would be lower than 2015 levels and would comply with the EPA criteria at all receiver locations. • The recommended conditions require odour audits of the landfill, GO and ARRT facilities to ensure the development meets the predictions in the EIS and the EPA odour criteria of 2 OU at residential receptors.
Pests	• The Department notes the application of daily cover over waste and maintaining the site in a clean and tidy state reduces pests. • The Department recommends conditions to manage pests, vermin and declared noxious weeds, including regular site inspections to ensure the measures are effective and pests, vermin or noxious weeds are not present in sufficient numbers to pose an environmental hazard, or cause the loss of amenity in the surrounding area.
Run-off pollution into local creeks	• The Applicant has proposed a series of measures to minimise impacts on water quality during construction and operation. • Mill Creek traverses the site and the Applicant discharges to the creek in accordance with an EPL. The Applicant would re-align the creek for construction of the GO and ARRT facilities. The Department has recommended a stream rehabilitation, stabilisation and vegetation management plan be prepared in consultation with DPI prior to construction of the GO and ARRT facilities. • The Department's assessment concluded the development would not adversely impact surface water quality provided all measures are routinely implemented.
Visually unattractive earth mounds	• Section 5.5 assesses the visual impacts of the development. The Department notes the earth mound would be integrated into the final landform as the landfill is progressively rehabilitated. • The visual assessment concluded the development would have moderate to low impacts on residential receptors with impacts reducing gradually over time. Residential areas are located over 2 km from the site, which reduces the visual impacts of the re-profiled landfill. • The Department has recommended conditions requiring early screen planting, progressive rehabilitation and adherence to the final landform height.
Provision of recreational space for flying model aeroplanes	• Section 5.4 discusses the proposed recreational uses and addresses the issue raised by the Cronulla Model Aero Club. • Council will determine the final recreational uses once the landfill is rehabilitated and the land transferred to Council. As the needs of the community change over time, the Department accepts it's difficult to determine end users of the land prior to rehabilitation in 2039. • ANSTO approval for end uses would also be required, as a landowner. • The Department has recommended a condition requiring the Applicant to consult with Council, the CMAC and other recreational and sporting clubs during preparation of the post-closure plan to ensure the final land use provides for a range of recreational needs.

6. CONCLUSION

The Department's assessment of the application has fully considered all relevant matters under Section 79C of the EP&A Act, the objects of the EP&A Act and the principles of ecologically sustainable development. The assessment has considered the development in the context of strategic plans and policies for NSW and Sydney and the issues raised by Government agencies, special interest groups and the local community.

The Department's assessment concludes the proposed development is consistent with the aims and objectives of strategic planning policy for NSW and Sydney. The proposal would provide on-going capacity for the growing volumes of waste, as the population of Sydney continues to grow, and landfills within the metropolitan area have reached capacity and closed. The proposed development is consistent with the key aim of the *Waste Avoidance and Resource Recovery Strategy 2014-21*, to divert more waste from landfill into resource recovery, as it provides for a new facility with capacity to recover 200,000 tonnes a year of resources from the waste stream. The development also includes an expanded and upgraded garden waste processing facility.

The proposed development would enable expansion of landfill capacity and annual processing volumes within the existing footprint of the landfill by placing waste on top of the existing landfill. The Applicant's EIS, RTS and supplementary information has adequately demonstrated that the landfill, GO and ARRT facilities would be operated to meet all relevant environmental and amenity criteria. The Department's assessment has concluded odour from the facility would be lower than 2015 levels, leachate would be effectively controlled and managed, and surface water and groundwater resources would be monitored and protected. The Applicant would rehabilitate the landfill, GO and ARRT facilities in 2037 when capacity is reached and the land with SITA's ownership would be transferred to Council for use as public open space. The Applicant would enter into a Voluntary Planning Agreement with Council which provides for a $100 million contribution to local services and infrastructure and sets out the maintenance and management responsibilities for SITA for the long-term.

The Department has recommended a range of conditions to manage the residual impacts of the proposed development. These include limits on waste quantities and types, odour audits, annual calibration of the leachate water balance, a stream rehabilitation plan for Mill Creek, biodiversity offsets, visual screen planting and execution of the VPA prior to construction.

The Department considers the proposed development meets all relevant environmental and amenity criteria and assists in servicing the waste disposal and recycling needs of a growing Sydney. Consequently, the Department considers the development should be approved, subject to conditions.

7. RECOMMENDATION

It is recommended that the Planning Assessment Commission, as delegate of the Minister for Planning:

- **considers** the findings and recommendations of this report, noting the Department considers the application is approvable, subject to conditions; and
- if the Commission determines to grant consent to the application, **signs** the attached development consent (**Appendix A**).

Deana Burn
Specialist Planner, Industry

C. Ritchie

Chris Ritchie 23/12/16.
Director
Industry Assessments

Sargeant

Anthea Sargeant 23/12/16
Executive Director
Key Sites & Industry Assessments