

DECEMBER 2020

Environmental impact statement for Tumut composting facility

Final Report

Snowy Valleys Council

Table of Contents

List of figures and photos	3
A. Executive summary	4
B. The proposal	9
B.1 OBJECTIVE	9
B.2 MATERIALS FOR COMPOSTING	10
B.3 PRODUCTS OF THE COMPOSTING PROCESS	10
B.4 COMPOSTING OPERATION AND MANAGEMENT	11
B.5 SITE MAP	17
B.6 SITE PREPARATIONS, EQUIPMENT, AND LAYOUT	18
B.7 CONSIDERATIONS OF ALTERNATIVES AND JUSTIFICATION OF PREFERRED OPTION	21
C. The location	23
C.1 PLANNING CONTEXT, SITE DESCRIPTION AND LOCALITY INFORMATION	23
C.2 OVERVIEW OF THE AFFECTED ENVIRONMENT	27
D. Identification and prioritisation of issues	34
D.1 OVERVIEW OF THE METHODOLOGY	34
D.2 OUTCOMES OF THE PROCESS	45
E. The environmental issues	46
E.1 AIR QUALITY	46
E.2 WATER	51
E.3 SOIL	54
E.4 TRANSPORT AND TRAFFIC	55
E.5 NOISE	56
E.6 ENERGY	58
E.7 SOCIAL	59
E.8 HEALTH	60
E.9 VISUAL	60
E.10 FLORA AND FAUNA	61
E.11 HAZARDS	69
E.12 HERITAGE	78
E.13 ECONOMIC	82
E.14 CUMULATIVE	83
F. List of approvals and licences	84
F.1 DEVELOPMENT APPROVAL	84
F.2 LICENCING	84

F.3	COMPOST QUALITY ASSURANCE	85
G.	Compilation of mitigation measures	86
H.	Justification for proposal	89
H.1	PRECAUTIONARY PRINCIPLE	90
H.2	INTERGENERATIONAL EQUITY	90
H.3	CONSERVATION OF BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY	90
H.4	IMPROVED VALUATION, PRICING, AND INCENTIVE MECHANISMS	90
H.5	CONCLUSION	90
I.	References	91
	GUIDELINES, POLICY, REGULATION AND LEGISLATION	91
	SNOWY VALLEYS COUNCIL DOCUMENTS	92
	REPORTS AND RESOURCES	92
	List of appendices	94

List of figures and photos

Figure B-1: Conceptual composting model for the Snowy Valleys Council composting facility	12
Figure B-2: Site map	17
Figure B-3: 3D model of the proposed composting pad illustrating slope to leachate collection dam	20
Figure C-1: Site location	23
Figure C-2: Riparian Lands and Watercourses and Terrestrial Biodiversity overlays in relation to proposed site	24
Figure C-3: Landslide Risk overlay in relation to the proposed site	24
Figure C-4: Bushfire Risk overlay in relation to the propose site	25
Figure C-5: Neighbouring land uses and distances from the proposed site	26
Figure C-6: Catchment area of 3.65 km ² feeding Killarney Creek	30
Figure C-7: IFD Design Rainfall Depth (mm per hour); Rainfall Depth for Duration (min, hours, days), Exceedance per Year (EY) and Annual Exceedance Probabilities (AEP) (1-63.2%) for the proposed site in Tumut (BOM, 3/4/2020)	31
Figure C-8: Wind roses as observed in Wagga Wagga at 3pm and 9am respectively. The roses illustrate wind intensity (km/h) by colour and frequency of occurrence by length (%)	32
Figure C-9: Beaufort Scale windspeed interpretations (Flynn 2016)	33
Figure D-1: Proposed development site with surrounding stream orders (1,2,3) numbered (Courtesy of NRAR 2021)	39
Figure D-2: Exported map from SEPP Koala Habitat Protection 2019 mapping with the site noted as a star	42
Figure E-1: Maximum predicted odour impact contour plot for the Proposed Facility	49
Figure E-2: BioNet Atlas map indicating all flora and fauna sightings with red triangles in relation to the site, indicated with a yellow star	62
Figure E-3: BioNet Atlas map indicating recorded sightings of Brown Treecreeper (<i>Climacteris picumnus victoriae</i>) with red triangles	63
Figure E-4: BioNet Atlas map indicating recorded sightings of Large Bent-winged Bat (<i>Miniopterus orianae oceanensis</i>) with red triangles	64
Figure E-5: SEED mapping vegetation communities on and around the proposed site	65
Figure E-6: Topographical map of the town area showing the site of the compost facility and the catchment of the creek that runs through the site	72
Figure E-7: Mapping of Flood Prone Land in the Tumut region, in relation to the proposed development site	73
Figure E-8: Cross section of the creek looking upstream showing that the compost pad embankment is located above the 1% ARI flood level	74
Figure E-9: Simple flooding map of the Killarney Creek in a 100yr flood worst case scenario where the culvert at the highway is blocked	75
Figure E-10: Archaeological survey results with low, medium, and high archaeological potential identified	80
Figure E-11: Identification of aboriginal sites with test excavations notes as squares	81
Figure E-12: Identification of aboriginal sites with test excavations with proposed site layout overlay	81
Photo 1: Aeration pipework laid out for a single module	15
Photo 2: Loading product onto aeration pipes	15
Photo 3: Compost pile under active control	15
Photo 4: 1,500m ³ batch with temperature probes	15
Photo 5: Aerial photo from north looking south: access road from highway and TWRC with the proposed site in the upper centre point of the image (John Stanfield, 2020)	27
Photo 6: Aerial photo from north looking south, with the creek gully in the bottom, the cleared proposed site above, and the upper vegetated section of the lot (John Stanfield, 2020)	28
Photo 7: Aerial photo of site with upper reaches of the creek line (within the site) vegetated and green, sparse vegetation, and grazing cattle (John Stanfield, 2020)	28
Photo 8: Looking south towards the proposed site with the vegetated corridor between Bellettes and TWRC	66

A. Executive summary

The Snowy Valleys Council (SVC) commenced the development of their Zero Waste Strategy (draft) 2019-2030 in early 2019. The SVC is an amalgamated council, formed in 2016 from Tumbarumba and Tumut Shires. The aim of the strategy was to develop coherent, progressive, and resilient management of resources to retain maximum value for the Council. A key focus of community, business, and councillor strategy development workshops was identification of the desire, need, and opportunity that 'waste' organics diversion from landfill offers. The resulting Strategy was approved by Council in August 2019.

In April 2019 Council had already approved a waste rate increase and harmonisation of fees between all incorporated shires. This displayed SVC's commitment and transparent budgeting for the roll-out of a kerbside Food Organics Garden Organics (FOGO) service.

In-depth research and discussions with stakeholders have investigated existing and potential opportunities for processing organic materials to support the roll-out of a kerbside FOGO service, including the potential development of a composting facility. Composting has been identified as a key opportunity compared to other options. A composting facility requires submission and approval of an Environmental Impact Statement (EIS).

This EIS report has therefore been prepared in accordance with EIS Guidelines Composting and Related Facilities (DUAP 1996). The site, process, operation, and construction design of the proposed facility has been developed in accordance with the Environmental Guidelines Composting and Related Organic Processing Facilities (DEC NSW 2004).

The proposed compost facility

Council owns the land of the proposed site for the composting facility, which is located on an undeveloped section of the same property on which the Tumut Waste and Recycling Centre (TWRC) is situated. The facility and infrastructure will be constructed and owned by Council and operated by Valmar Support Services, which is a not-for-profit disability employment organisation that currently operates the TWRC.

Waste to landfill has been increasing steadily in the SVC region. A 2020 compositional waste audit recorded the average household bin weight at 11.12 kg. Applied to 5,868 households, this results in a total waste generation of 3,393 tonnes per annum. The audit found that, on average, the residual waste was composed of 46% organic material. Current estimates suggest that, in addition, 5,000 tonnes per annum of self-haul green waste is disposed of at the Council's five receiving transfer stations. This green waste lacks a strategic processing approach and is left poorly separated for years at the sites. Based on current estimates and allowing for expansion of the organics collection and diversion service, the proposed composting facility (facility) will be designed to have a throughput capacity of 10,000 tonnes/annum.

Many types of composting technology and site configurations have been considered in the research stages of the proposal development. The proposed site was chosen for ease of logistics and operation, as well as the fit with associated neighbouring land uses (landfill, transfer station, timber yard). There are some rural residential blocks in close proximity. As such, odour management has been a key consideration for the choice of composting technology. Case studies and expert advice indicate that odour can be managed by implementing Mobile Aerated Floor (MAF) technology with Covered Aerated Static Pile (CASP) on known and controlled feedstock, which will be key components of Valmar's operational environmental management plan for the composting site.

MAF technology maintains active oxygen control throughout the 6-8 week composting process in a five-stage procedure and, importantly, it can control odour in the accumulation stage where risk is highest. The MAF requires a compost hardstand of compacted clay for the five stages and a concreted receiving pad. The pad will be constructed with a leachate barrier system and a leachate storage dam. Here, two members of staff will select and intermittently spread the material to be composted using a loader to decontaminate each load. A key part of maintaining low contamination of incoming FOGO bin materials will be the education plan delivered through the FOGO bin project. A wheel loader and composting screener is required for the decontamination process, as well as a shed to safely store machinery. The site will need electricity and water utilities to operate. The required toilet facilities will be provided at the nearby recovery centre.

The final compost product will be used by Council for parks, cemeteries, and as soil conditioner in landscaping. Further, the compost will be offered for sale for use in the Council's rich agricultural area. Initial investigations suggest a demand for the use of compost in the region's fruit sector and for large-scale application to pastures and cropping areas on farms. Conversations with key agricultural bodies and larger scale farm owners confirmed the interest in the use of the compost, especially since it will be locally available. Use of compost on land can mitigate climate change (OEH, 2011) and improve land management through carbon addition to soil, substitution of some mineral fertilisers, and positive flow-on effects on soil health and water holding capacity (Gilbert *et al.* 2020). Valmar has an established reputation in the SVC, has commenced conversations with key farmers, and is planning and budgeting for a compost use advertising campaign.

The success of the project will be addressed in three areas: feedstock, process, and distribution. Active education and engagement with the FOGO service will monitor uptake and correct usage. Continual training, regular control, and a detailed operational and environmental management plan for the composting site will be developed and maintained. Valmar's high standards of operation in other areas testifies to their ability to deliver excellent project management. Continued advertisement and Council promotional use of the compost together with targeted collaboration with the region's interested landholders, will ensure the distribution of compost is maintained.

Identification and prioritisation of environmental issues

The following steps were undertaken in order to identify and prioritise issues:

- Application for Secretary Environmental Assessment Requirement (SEAR's) through the submission of a Form A
- Review of regulatory and best practise requirements such as the Composting Guidelines 2003 and EIS Guidelines (DUAP 1996)
- Review of previous work, including risk assessments, options assessments, and other investigations
- Consultation with key stakeholders specifically the regional EPA and direct neighbours to the site.

All environmental, social, and economic impacts have been assessed; the key impacts and findings are summarised in Table A-1 below.

Table A-1: Summary of environmental aspects and assessment findings

ENVIRONMENTAL ASPECT	KEY ASSESSMENT FINDINGS
Odour	<ul style="list-style-type: none"> There is an odour risk (5.6 ou) in the worst-case scenario for 2 out of the 8 residential neighbours The risk can be managed through considered processing, screening, and monitoring and using MAF technology
Particulate matter	<ul style="list-style-type: none"> There is a low risk of particulate matter becoming airborne, especially in dry and windy conditions This risk can feasibility be managed with moisture control of the composting material and limited operational activity on high wind days
Greenhouse gas	<ul style="list-style-type: none"> The proposed development generates significant less greenhouse gas emissions through less transport to the regional landfill and avoiding putrid emission generation from organic material in landfill and green waste deposits
Surface water	<ul style="list-style-type: none"> The risk of surface water increasing overland flow and potentially maiming with contaminants is considered low The risk will be managed by vegetation retention and planting, bunds, cut-off drains, and sediment traps
Groundwater	<ul style="list-style-type: none"> The geological investigations and assessment conducted for the neighbouring land uses identifies that contamination of groundwater is highly unlikely The risk will be monitored by the installation of groundwater bores or sampling, via a lysimeter on regular intervals
Leachate	<ul style="list-style-type: none"> The risk associated with leachate contaminating surrounding land, groundwater, or surface water and creeks has been a key consideration in the design of the site and is therefore considered manageable to avoid off-site effects Key management actions include the construction of a composting pad and leachate dam which will be used to add moisture to the compost and designed to specifications outlines in <i>Composting Guidelines 2003</i>, as well as regular monitoring of the quality
Soil	<ul style="list-style-type: none"> The site is zoned as a landslide risk area and sections of the property slope moderately The positioning and design of the site has considered this and, with that and other mitigation efforts, including vegetation retention and planting and citing and compaction, the risk is manageable
Transport and traffic	<ul style="list-style-type: none"> The traffic movement will increase by 5.5 vehicles per day, which was considered negligible in the industrial precinct on Killarney Road The road access is considered A-grade and in good condition to handle the increased traffic Traffic and onsite vehicle movement will be restricted to opening hours (07.00-17.00) to manage amenity
Noise	<ul style="list-style-type: none"> The operational noise associated with the development will come from the loader, the collection trucks, and deliveries, and compost material distribution vehicles The closest sensitive receptor (residential dwelling) point is closer to the AKD timberyard and the Snowy Mountains Highway than the proposed operation. As such, the on-site generated noise (traffic, loader use), is found to have a negligible impact on the closest sensitive receptors Management of noise for workers and the industrial area, includes limiting opening hours, the use of mufflers, and monitoring noise. Staff will have a decibel app to track noise and additional studies will be commissioned in the event that concerns are raised

ENVIRONMENTAL ASPECT	KEY ASSESSMENT FINDINGS
Visual amenity	<ul style="list-style-type: none"> The site is currently visible from the Snowy Mountains Highway and close residential blocks on the opposite side of the highway A vegetation screen will be planted to improve the current view, which will have associated biodiversity benefits Weeds and litter control will be a part of weekly and daily management tasks
Flora and fauna	<ul style="list-style-type: none"> A very small section of the site is zoned as Terrestrial Biodiversity under Tumut LEP The riparian vegetation has been significantly improved under the management of Valmar and the SVC, and some other regrowth has occurred in the southern section of the property A Biodiversity Offset Scheme Entry Threshold (BoSET) map and assessment tool BMAT found that the threshold for the Biodiversity Offset Scheme has not been exceeded and thus, that a Biodiversity Development Assessment Report is not required The proposed vegetation clearing only includes a small section of previously planted she-oaks, none of which are identified as significant vegetation under the BD act The test of significance against key threatening processes has considered the full impact of the proposal and found that the proposed operations minimal impact (clearing, use) can be managed by vegetation retention, revegetation (fire resistant/tolerant species), and weed management
Fire hazards	<ul style="list-style-type: none"> Sections of the site are zoned as bushfire prone land mapped predominantly as "vegetation buffer" with a small section of "vegetation category 3" Fire hazards posed to the site are considered manageable with setbacks of the site footprint from existing vegetation The assessment against six Bushfire Protection Measures from the Planning for Bush Fire Protection Guide determines that the risk is manageable with setbacks, vegetation buffer retention, and pump facilitates
Flooding hazards	<ul style="list-style-type: none"> The risk of flooding has been assessed for on-site and off-site impacts and considered manageable through vegetation retention, leachate and drainage management, and positioning setback from the riparian vegetation
Aboriginal	<ul style="list-style-type: none"> The proposal conducted an Aboriginal Cultural Heritage Assessment, which found three areas with Aboriginal significance The significance of the sites varied from low to medium, but the impact assessment concluded that the proposal can proceed with recommended mitigation strategies, including the fencing of areas and application of an Aboriginal Heritage Impact Permit
Social and economic	<ul style="list-style-type: none"> The proposal will facilitate a local FOGO service to households and produce compost for Council landscaping improvements and prominent agricultural sector Initially, three part-time positions will be created with two positions for people living with a disability, as well as regular employment for a local green waste chipper contractor The economic modelling indicates that the proposal will save the Council significant budget over a 15-year timeframe, with the added benefit of economic resilience and local employment generation
Health	<ul style="list-style-type: none"> The risk of environmental contamination accumulation and the flow on impact on community has been considered negligible or positive (landscaping) and material will be contained as a closed system on-site Ongoing monitoring of the surface and groundwater quality will ensure that impacts remains controlled and managed The potential risk of product/s (compost/mulch) with contaminants being distributed will be managed by quality control procedures including monitoring (lab analyses)

Justification and conclusion

The proposed development has been designed in accordance with the Composting Guidelines and has been assessed in accordance with the EIS guidelines and SEAR's. The pre-proposal research and project analysis has been multi-disciplinary (B.7) and a specialised consultant has been engaged to address key aspects of the proposal. The proposed development will deliver environmental, economic, and social benefits to the local community and, although small-scale, broad reaching benefits include leading by example, reducing emissions, reducing pollution from landfill, and adhering to national waste policy goals.

The potential for adverse impact on the local environment and adjacent land users has been considered in the design and operation of the proposed development. As this assessment outlines, the environmental issues (s E.1-E.14) have been considered and the mitigation, monitoring, and management commitments comply with the assessment criteria.

If the proposed development does not proceed, there will not be a local option for FOGO waste or an environmentally sound option for processing green waste. Transportation associated emissions and cost would render other options unviable. The council would remain dependant on the regional landfill with greater emissions generated, as well as significant economic and potential environmental risk.

As recommended once the Development Application has been approved, the SVC will apply for an Aboriginal Heritage Impact Permit prior to commencing construction.

The proposed operation will develop and be managed on a day-to-day basis according to an environmental management plan (EMP). The EMP will addresses the list of management and mitigation measures from this EIS and any imposed conditions from an Environmental Protection License (EPL). The SVC will apply for an EPL to operate under the *Protection of the Environment Operations Act 1997 sections 43 (b), 48, & 55*.

Further, the SVC will create a quality control assurance process and insurance structure for the compost product/s. The compost product/s will need to comply with conditions outlined in the Australian Standard (AS-4454).

B. The proposal

B.1 OBJECTIVE

The Snowy Valleys Council (SVC) owns the Tumut Waste and Recycling Centre (TWRC) which includes a waste transfer station, community recycling drop-off service, and a recycling facility and is operated by regional waste processor Valmar Support Service (Valmar), under a Memorandum of Understanding (MoU). The current operations are not a licenced activity. The SVC has identified a need for recycling of organic material from the current kerbside residual stream and green waste from the transfer stations around the Council area. As such, the SVC is proposing to develop a composting operation adjacent to the TWRC site, which will also be operated by Valmar. The purpose of this Environmental Impact Statement (EIS) is to enable consideration for the environmental implications of the proposed development.

The objective of this proposed composting facility is to divert organic material from landfill in a sustainable and ongoing way. This has the associated environmental benefits of reducing groundwater eutrophication risks, greenhouse gas emissions, and associated anaerobic rotting or putrescible waste going to landfill. Further, the local composting site will reduce transportation of organics to the regional landfill, which will both positively impact the amenity of the communities around the Snowy Mountains Highway and reduce air pollution and emissions associated with fuel use. The facility's leachate system will capture all water on-site in a dam for recirculation as moisture control in the composting process, thus enabling a sustainable water supply. It is also SVC's plan to plant a native vegetation screen around the site to screen it from the highway and neighbouring properties, as well as carry out diverse creek rehabilitation planting that will build bank stability and maintain an important fauna corridor.

The final composted product will be offered for sale including for use by graziers, and fruit producers with a means to improve productivity and manage land sustainably. The quality compost product will also provide Council with a supply of material to improve the region's parks and sporting fields for community enjoyment. The compost will add value to land to which it is applied by improving soil health, carbon storage, and moisture retention.

SVC does not operate a landfill facility able to receive the residual waste generated by the community. As such, they rely on expensive gate fees and transportation from private enterprises. Reducing the need to landfill waste will build resilience for future waste management. The project will divert the processing of organic waste from a regional landfill to a local composting operation, generating 1 full-time and 1-2 part-time positions.

Residents will receive a third bin for FOGO material with associated recycling conveniences. This is likely to be especially appreciated by older members of the community. Making it easy for residents to recycle facilitates good practice and can help forge a sense of connection to nature, which is strongly outlined in the SVC Community Plan 2028. There is small, steady population growth in SVC, and they want to remain attractive for newcomers. Council has noted residents and visitors requesting a green service, which shows the increasing expectations of the broader community. This composting facility will enable the FOGO service to be provided and the development of a truly local circular economy for organics within Snowy Valleys.

In summary the objectives include:

- Generate a local circular economy for organic waste material
- Diversion of organics from the residual bin and landfill
- Establish a strategic and controlled process for the estimated 5,000 tonnes per annum of self-hauled green waste at Council transfer stations
- Build waste management resilience and lessen dependency on privately operated regional landfills

- Generate valuable local employment, including 1 part-time position for a person with a disability and 1-2 full-time positions for a manager, as well as construction and consultancy opportunities for local businesses
- Produce quality compost products that can be sold to offset operational costs
- Provide quality compost products to landholders looking to improve land management, soil health, and productivity
- Address and facilitate organics diversion as outlined in the SVC Zero Waste Strategy, the National Waste Policy, the NSW Waste Avoidance and Resource Recovery Strategy 2014-21, and the direction of NSW 20-year waste strategy.

B.2 MATERIALS FOR COMPOSTING

There will be two streams of feedstock to the site: FOGO kerbside collected waste and green waste from transfer stations.

A 2020 compositional waste audit found that on average residual waste was composed of 5.5% garden material, 24.1% food organics, and 8.9% other organics. The weekly FOGO kerbside service is expected to deliver 50 tonnes/week. Loads will be received five days a week, at 2-3 loads per day estimated from a weekly generation per household of 8.53 kg. This amounts to an estimated kerbside collection of 2,604 tonnes/annum across the SVC area. The kerbside services are currently, and will remain, managed by Council. Additional operation demands are funded by a raise in waste services charges, which was approved by Council in April 2019 and came into effect in July 2019.

With the introduction of FOGO and construction of a composting facility, it is planned that green waste from transfer stations will be processed, transported, and included in the composting process. Self-haul green waste can currently be disposed free of charge at Council managed transfer stations, excluding Tumut. The combined annual green waste is estimated at 5,000 tonnes/annum (SVC 2019, Pers. Comms.). Currently, this material is chipped on an ad-hoc basis and left uncontrolled. The current receipt and processing of this material will change (see section B.4).

B.3 PRODUCTS OF THE COMPOSTING PROCESS

At capacity (10,000tpa input), approximately 20,000m³ of mulch and soil conditioner will be produced. Whilst volume reduces, density and weight increase with moisture being added.

ASSUMPTIONS FOR ESTIMATING COMPOSTING PRODUCTS:

- Total capacity of the site is 10,000 tonnes per annum, or 33,000 m³
 - 2% is separated as contamination for landfill
 - 1.5% is separated as oversized and set aside for grinding
 - Input reduces by 35% in the composting process
- The screening process produces
 - 10% oversize separated as oversized and set aside for grinding
 - 40% as mulch, of which 5% is used for daily cover in stage 0
 - 50% soil conditioner/compost

The proposed equipment records temperature and oxygen attributes automatically and keeps a digital record. A regular review of this record and functionality will be developed. Further, a sampling regime will be implemented to ensure that hazardous material and attributes listed in Table B-1 (The compost order 2016) are within acceptable levels.

In accordance with section 4.2 of AS 4454, baseline testing will demonstrate samples representative of products produced under normal production conditions. The initial stage baseline may involve testing all batches over a year. Given the small and consistent volume and feedstock source, it is unlikely ongoing laboratory testing will be required, but any batch that raises concern will be tested. All testing must be carried out by a NATA accredited laboratory. The feedstock will remain constant and when a new stream (i.e. commercial or biosolids) is considered for integration, a new baseline will be established.

Table B-1: Composing contamination attributes and acceptable levels

Column 1	Column 2
Attributes	Absolute maximum (% 'dry weight' unless otherwise specified)
1. Glass, metal and rigid plastics > 2 mm	0.5
2. Plastics – light, flexible or film > 5 mm	0.05
3. Salmonella spp	absent in 25 g
4. Escherichia Coli (E. Coli)	<100 MPN/g*
5. Faecal coliforms	<1000 MPN/g*

*MPN = most probable number

As there are other landscape material suppliers (ANL, Elliott's, and Corkhill Bros) in the region, the Council is also seeking an alternative market (i.e. not landscaping). Council is aware that creating a compost product that is specific to the need of the buyers is important. It is Council's intention to deliver market engagement with the regions agricultural sector, and work with the equipment provider and relevant consultant to develop suitable compost products. Valmar has commenced conversations with farmers and the Batlow Fruit Co-operative, Landcare groups, and the vigneron association with positive feedback and interest. Council will also offer buy backs to the community as a measure of engagement, which will be a bagged compost product. Alternatively, or in addition, the local landscaper, Elliott's, has expressed interest to buy all of the produced compost.

B.4 COMPOSTING OPERATION AND MANAGEMENT

B.4.1 MATERIAL RECEPTION, STORAGE, & COMPOSTING PROCEDURES

The composting process for a mobile aerated floor has been provided by the technology provider. Each stage has room for two process lines. To start, it is likely one of the two will be active and that in a few years, the site can run at capacity, as illustrated in the diagram (Figure B-1).

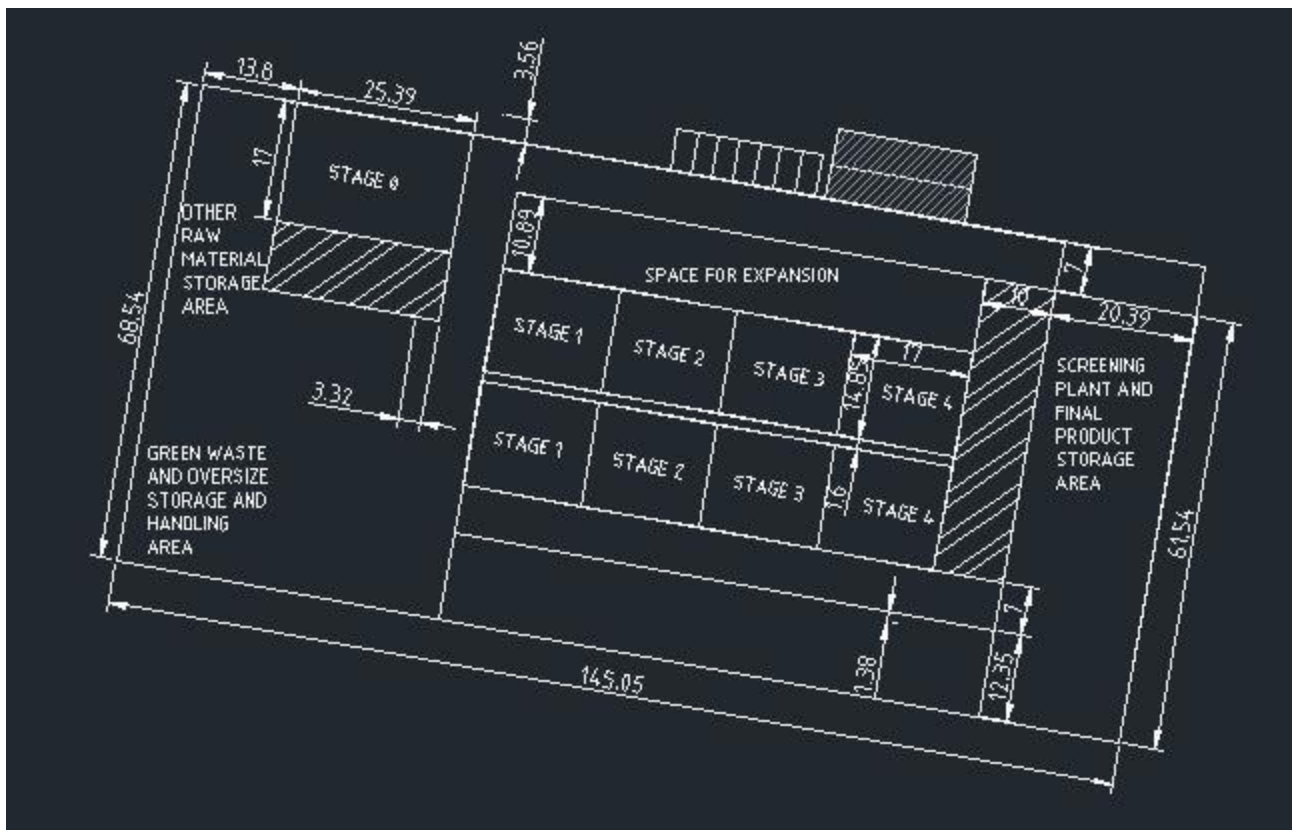


Figure B-1: Conceptual composting model for the Snowy Valleys Council composting facility

The site has taken into account the input noted from the Council audit and knowledge (Table B-2). Stage 0 and the green waste storage area are designed for the calculated input weight. Volume reduction and adding moisture changes the weight through the process.

Table B-2: Quantification of material held at each process point of the site at maximum capacity (note presented numbers are rounded tp)

SITE MAP FEATURE	DIMENSIONS AND AREA				VOLUME OF PRODUCT IN PEAK	
	SIDE (M)	SIDE (M)	AREA (M ²)	AREA (M ²)	M ³	TONNE
Green waste and oversize storage and handling	39	52	2000	2000	3500	1300
Stage 0 (one area with room for 2 piles)	17	25	432	432	1209	363
Stage 1 (x2)	15	17	252	505	1088	326
	15	17	252			
Stage 2 (x2)	15	17	252	505	979	392
	15	17	252			
Stage 3 (x2)	15	17	252	505	881	441

SITE MAP FEATURE	DIMENSIONS AND AREA				VOLUME OF PRODUCT IN PEAK	
	SIDE (M)	SIDE (M)	AREA (M ²)	AREA (M ²)	M ³	TONNE
	15	17	252			
Stage 4 (x2)	15	17	252	505	793	476
	15	17	252			
Screening plant and final product storage area	20	62	1255	1255	4182	2509
Screening area	20	20	400	400	400	n.a.
Leachate dam	25	35	875	875	1050	n.a.

The FOGO loads will be deposited at Stage 0, which is a concreted receiving pad. Here, two staff will sort the material with the use of a loader (Hyundai HL 730-9) to intermittently spread and mix the material. It is estimated that 2% of incoming material will be set aside for landfill due to contamination. This material will be taken over to the TWRC for transfer. An additional 1.5% of oversize contamination is estimated to be set aside for grinding prior to reintroduction into Stage 0. Shredded green waste from the transfer station's self-haul area will be stored adjacent to Stage 0 to blend with the FOGO material and be introduced gradually into the composting process. The site design could store approximately 5,000 m³. The operations proposed suggest that one fifth of the annual green waste (1,300t/3,500m³) is stored on site in two or three windrows. Each windrow will be approximately 12 meters wide and up to three meters high, whilst length can vary depending on direction. Each windrow will be at least 6 meters apart. This height, width, and distance will control the self-combustion risk.

The loads will build the first composting pile in Stage 0. This will be covered daily by a 300 mm bio blanket of finished mulch product. This process is commonly referred to as Covered Aerated Static Pile (CASP). Once the Stage 0 pile is full (500m³ ≈ 200 tonnes), no additional material will be added and the pile will be aerated for two weeks for initial pasteurisation to be completed, with daily moisture and temperature probing that is logged and monitored. While Stage 0 is composting, a parallel Stage 0 commences. After two weeks, Stage 0 is flipped by a loader ensuring that the material from the outer edges of the MAF pile goes to the centre of Stage 1. This is then covered and is left for two weeks for primary pasteurisation in accordance with the process definition below, and consistent with AS4454 process criteria (sections 3.2.1 and 3.2.2.). Stage 2, 3, and 4 are flipped every 2 weeks to achieve humification and breakdown. The composting process will take somewhere between 6-8 weeks depending on season (temperature and moisture). The input material is estimated to reduce 35% in volume.

Post Stage 4, material is screened, and final decontamination is carried out.

A Terra Select T3 trommel screen will enable screening to 20mm. It is estimated 2% will be inert material, mostly rocks, which will be taken to the neighbouring Bellettes' landfill. The screening process is estimated to produce 50% soil conditioner and 40% mulch, which may be sold as a product or reintroduced in Stage 0 for further breakdown and the long goal of producing more soil conditioner. Screened mulch will be used for the daily CASP cover. Estimations have allowed for 10% of screened material to be set aside for grinding prior to reintroduction into Stage 0.

At capacity, the operations could produce approximately 10,000 m³ of soil conditioner and 8,400 m³ of mulch, complying with AS4454 classifications (Table 3.1). Five batches a year can be completed. The site will have space to stockpile approximately 4,500 m³. Piles will be managed for size and moisture/temperature to ensure combustion does not occur. With the client mix (internal Council use, Elliotts, and agriculture) and space limitations, the proposed operations will be able to design a production and sale routine that ensures product availability and flow.

Composting is a process in which organic material decomposes in a controlled environment in the presence of natural bacteria, fungi, worms, and with other factors to produce humus. The Compost Order 2016 (NSW EPA) define composting as:

"a process of managed biological transformation (a) to achieve pasteurisation: and (b) for a period of not less than a total of 6 weeks of composting and curing at an adequate moisture level >40% by weight), and/or until an equivalent level of biological stability can be demonstrated"

AS 4454 (section 3.2.1) defines pasteurisation as:

"a process to significantly reduce the numbers of plant and animal pathogens and plant propagules. Pasteurisation requires that the entire mass of organic material be subjected to either of the following: (a) Appropriate turning of outer material to the inside of the windrow so that the whole mass is subjected to a minimum of 3 turns with the internal temperature reaching a minimum of 55°C for 3 consecutive days before each turn. Where materials with a higher risk of containing pathogens are present, including but not limited to manure and food waste, the core temperature of the material mass should be maintained at 55°C or higher for 15 days or longer, and during this period the windrow should be turned a minimum of 5 times. (b) An alternative process of pasteurisation that guarantees the same level of pathogen reduction, and the reduction of plant propagules as in (a). Any such alternative process must be clearly defined in writing and validated by a suitably qualified person before claiming compliance with this order. A written record of the validation report must be kept for a minimum period of six years."

The composting operations will include the MAF technology whereby the feedstock is layered upon pipes, which contains holes and that are connected to a machine that pumps air into the pipes. This forces aeration of the compost pile from below. As such, this active control of aeration is the main advantage of the MAF technology, enabling a high level of odour management from the point of accumulation. The process of flipping piles is perceived to be a point in the composting process where pockets of odorous material can be exposed to the surrounds and to the atmosphere. This is very unusual in a MAF systems as the forced aeration encourages composting throughout the pile. Still, turning, if required, will be omitted on windy days and limited to opening hours of the facility.



Photo 1: Aeration pipework laid out for a single module



Photo 2: Loading product onto aeration pipes



Photo 3: Compost pile under active control



Photo 4: 1,500m³ batch with temperature probes

The self-haul green waste will change procedures in receipt and processing. Site operators of the transfer stations will receive training and control the procedures for dropping off self-haul green waste at the transfer stations. Staff will be engaged in education about composting and the importance of controlled, clean feedstock. Specifically, transfer station staff will be required to identify treated timber and other contaminants when receiving green waste and ensure that this material is excluded from the green waste stockpiles. SVC transfer stations are all fenced, locked, and open only when an operator is present. When the stockpile at a transfer station warrants chipping, a contractor will be engaged. Council will then transport the raw chipped material to the composting facility. Valmar staff will inspect the incoming mulched material for contamination, remove any obvious material or reject the load if necessary. Valmar will maintain regular dialogue with transfer station operators to ensure decontamination processes at the site are maintained to a high standard. Green waste will remain at the transfer stations, and chipped and transported periodically (every 3 months). This will be done to ensure that stockpiles of chipped green waste are manageable at the composting site and to avoid commencement of greenwaste decomposition, and associated emissions.

Valmar will record incoming loads date, amount (volumetric estimating), source, and description (i.e. FOGO or mulched green waste).

B.4.2 AIR QUALITY – ODOUR, GAS, AND PARTICULATE MATTER

The spread of odour is at highest risk when the material is being deposited and screened, as well as when windrows are turned. Further odour generating conditions include:

1. Moisture levels above 60%,
2. Carbon to nitrogen ratios below 25:1
3. pH greater than 7.5.

These three risk factors are generated by rapidly biodegradable organics including food, grass clippings and animal manure. Using non-putrescible category 1 (DEC NSW 2003, Table 3) organics high in carbon, including leaves, plants, branches, and tree trunks to blend with rapidly biodegradable organics is a good way to manage odour risks. Background research for the SVC FOGO Business Case estimated that 75% of the FOGO feedstock will be garden material and SVC will have access to 5,000 tonnes/annum of mulched green waste to blend with the FOGO feedstock. As such, the feedstock will be dominantly category 1 organics, which are generally high in carbon.

The proposed area does not have heavy rainfall to create excessive moisture levels in the compost piles. The key odour management control are the three aspects of the MAF technology: the forced aeration, the moisture and temperature monitoring equipment, and CASP. By automatically recording moisture and temperature, operators will be able to detect unbalance in a pile and adjust conditions using the forced aeration. Further, consistent with the CASP method, new feedstock arriving each day will be covered by composted mulch to manage any temporary potential odour.

Finally, the neighbouring land uses include inert landfill, a landscaping compost facility, and a timber yard, which defines this highly industrial area as suitable for similar operations, such as a well-managed composting facility. The nearest sensitive receptors are two residential dwellings at 250m and 315m distance from the proposed footprint of the operation. The vicinity of these dwellings has driven the investment in MAF which, through case studies, has shown no odour leaves the site under normal conditions.

Considering other land uses in the vicinity, which can at times be odorous, the highway separating the proposed operations from the residential dwellings, and the investment in MAF, it is highly unlikely that the proposed development and operation will entail odour issues. As a final resort, should an issue arise, the pile will be landfilled at the adjacent site.

B.5 SITE MAP

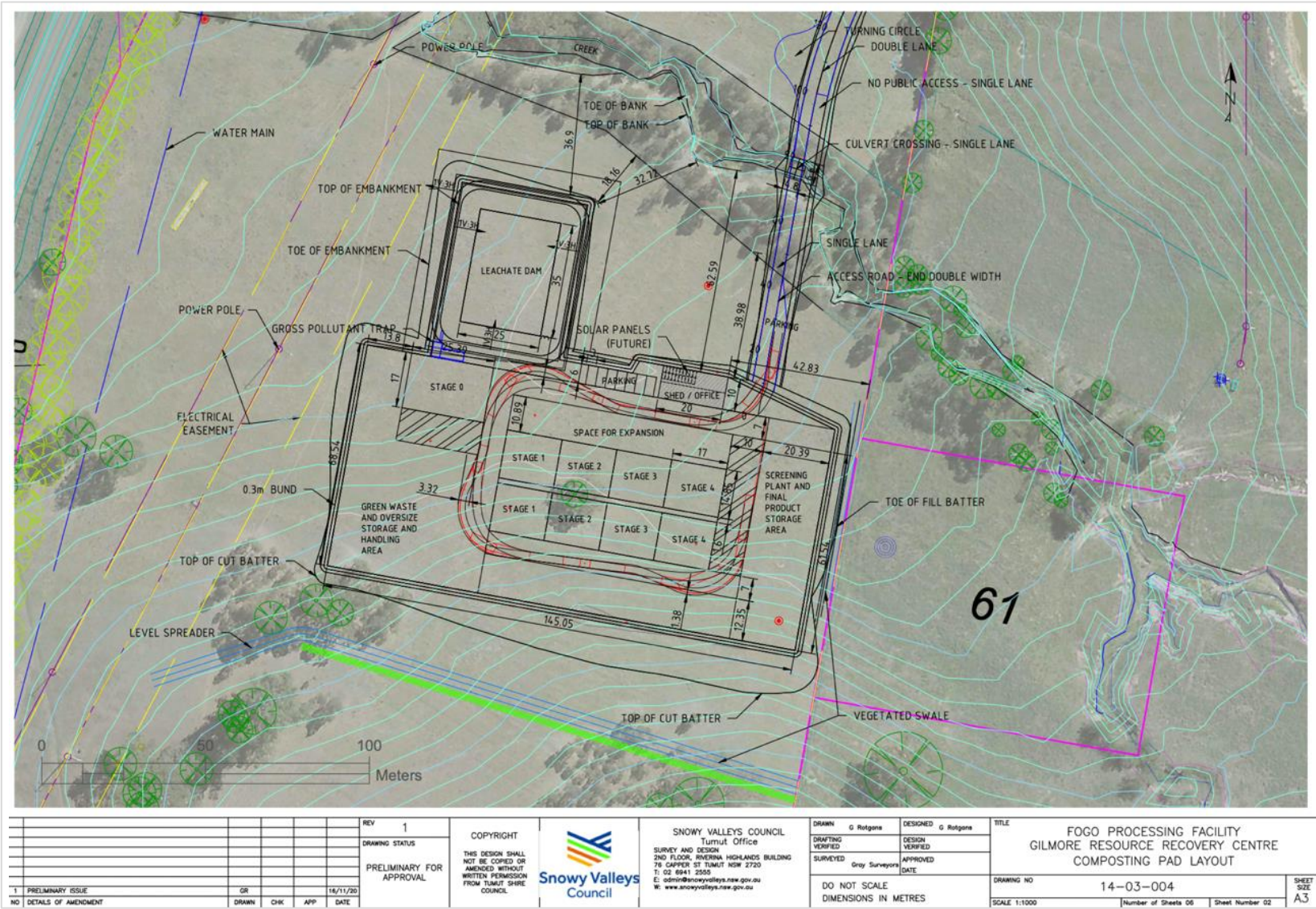


Figure B-2: Site map

B.6 SITE PREPARATIONS, EQUIPMENT, AND LAYOUT

The design of the site and operation have been completed in accordance with the *Composting Guidelines 2003*. This proposal includes the design, construction, and maintenance of a surface water and leachate barrier system including exclusion bunding, a composting pad with clay barriers, and a slope that drains potential leachate generation into a dam with suitable capacity. The site predominantly slopes from north to south at approximately 1V (vertical) to 20-30H (horizontal) with a central point of 1V to 3H.

The positioning of the proposed development on the site considers the slope and minimises cut and fill, whilst adhering to setbacks from creek line, powerlines, and boundaries. The upper southern and eastern side will include vegetated swales. The composting pad will include an area of 145.05m x 61.54m.

The site will be fenced and connected to the electricity grid and mains water. No sewage will be produced from the composting operation and the wash-bay water will be integrated into the TWRC system. The proposed opening hours will correspond with the collection days, Monday to Friday, and are suggested to be between 07.00-17.00. This mimics the TWRC opening hours for operations.

In summary the following infrastructure and equipment will be implemented on site:

- Internal site access will include road construction from the current transfer station across a creek bed to the composting pad
- Stage 0, which includes the receiving pad, will be concreted to withstand high loader use and truck movement over time, as well as to provide a solid surface for manual screening operations
- The composting pad will be made of compacted clay with a gravel top. Cut and fill construction will cut from the lower eastern section of the pad and fill in the south western section.
- The leachate capture and storage system will include a leachate barrier liner for the whole active area with a 1° slope directed to a leachate dam
- A pumping system will allow leachate to be rearticulated on compost
- The site will be fenced using security mesh and a small shed will be constructed for the safe storage of the equipment, gear, & monitoring logs
- A wheel loader will be used to mix and blend the feedstock, deposit and flip the material between various stages, and load vehicles for distribution
- A trommel screen will be used to produce different quality products and meet AS 4454 Standards
- A MAF system, including 4 master units and 6 subunits, is the key piece of equipment for the composting process.

B.6.1 MAIN FEATURES

Features highlighted in the site map include:

Site access road and road crossing

The site will be accessed through the existing TWRC. This will include the construction of a new internal road that will cross the creek over culverts. The internal access road will mimic the TWRC speed control of max 15km/h. It will be graded at approximately 3% crossfall and sealed with 40mm hot mix Asphaltic Concrete (AC) to ensure weather will not impede access. The road will be 3.5m wide for single lane and 7m wide for dual lane and will be setback from the boundary by 2.5m. The road construction will adhere to AS 2890.2.

The construction will adhere to erosion and sediment control on unsealed roads (BDC 2012). The access to the site is designed to minimise impact on the creek and flooding – the road is single lane as it crosses the creek to minimise impact on the riparian environment. The access road is lowered on the northern side of the creek to allow the passing of floodwaters (the pad on the southern side is raised to prevent floodwaters impacting on the composting facility, potentially leading to a pollution event). To adhere with *Guideline for watercourse crossings on waterfront land – Culverts* the design will include

- Box culverts, rather than pipes.
- Alignment of culverts with downstream channel.
- Incorporate elevated dry cells and recessed wet cells with the invert at or below the stable bed level.
- certification by a suitably qualified engineer.

The construction of a new designed and considered crossing will allow the unofficial crossing (see Photo 7) to be fenced off and revegetated.

Internal roads

The on-site traffic will enter on the north eastern side and follow an anti-clockwise movement. This will be graded and gravelled, and a speed limit of 15 km/h will be implemented. All utilities will follow the access road to minimise disturbance of the site.

Wash bay

The washbay will be located on the northern side of the creek directly adjacent to the road. The wash-bay will facilitate the cleaning of trucks to prevent debris or contaminants leaving site on to adjacent roads. The wash bay will be a covered and bunded space. The design of it will meet relevant requirements and be constructed to an equivalent standard of details in appendix A. The bay will be 7.5 m wide and 13 m long. There will be a series of treatments in the closed-loop water treatment system which will allow water to be recycled in the wash bay. No wash bay waste water will be released to the environment. The water recycling plant will be designed and supplied by an external contractor.

Shed and office

The shed will include an office and plant storage. It will be 20 m x 10 m and include a slab. The shed will provide safe storage for record keeping and plant equipment. The shed will be constructed on a concrete slab and adhere to building codes and relevant standards. Quotes and final design will be finalised in March 2021.

Parking

Parking spots for staff and visitors will be positioned adjacent to the office and include approximately 5 spots and one disabled parking space over a 15 m x 10 m area.

B.6.2 LEACHATE MANAGEMENT FEATURES

The leachate is proposed to be used for rearticulation of the composting piles when moisture content is low. Surface water will be monitored in the creek on the rare occasion it flows. At a minimum, two ground water quality monitoring bores will be established adjacent to the creek line – one on the western section as the gully enters the site and one on the eastern section as the gully exists the site.

The leachate management system will include a:

1. Leachate barrier system comprising of a compacted clay liner
2. Drainage system of the whole footprint of the composting site that slopes gently to direct liquid to the dam
3. Leachate storage dam.

Composting pad

The pad is the main area for all activities of the proposed development. It will run 145.05m x 61.54m. Further, Figure B-3 illustrates extent of the compacted pad liner and how it facilitates drainage into the dam by slope.

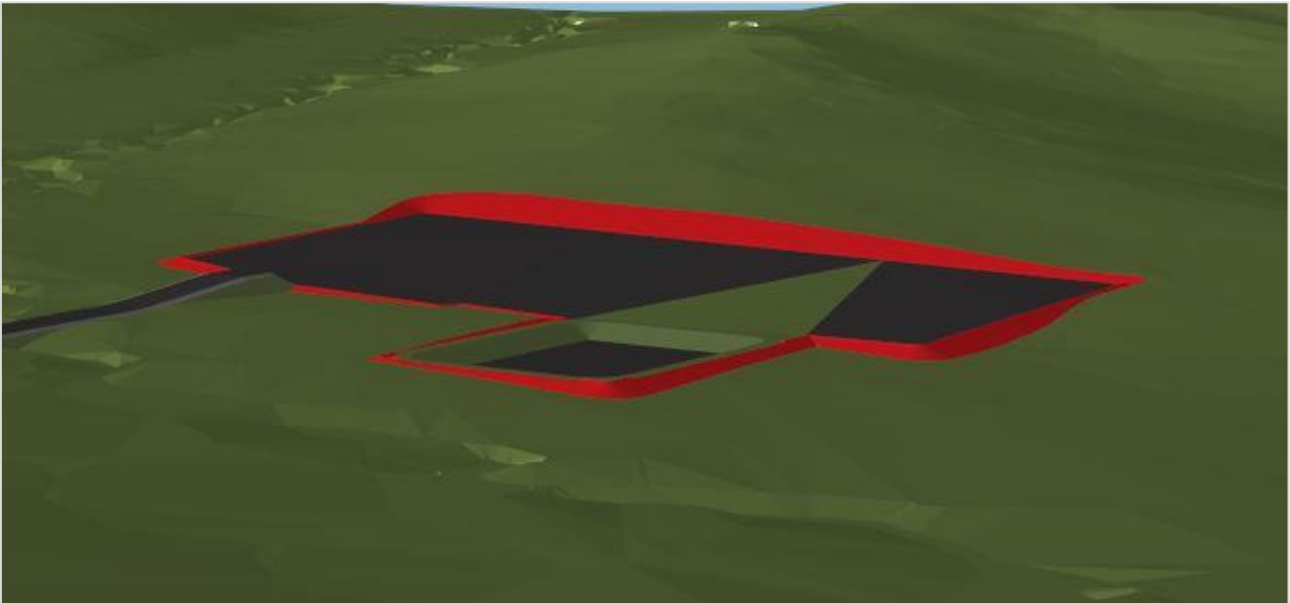


Figure B-3: 3D model of the proposed composting pad illustrating slope to leachate collection dam

All technical detail is included in (appendix B)

B.6.3 SURFACE WATER DESIGN FEATURES

The site design includes measures for exclusion of surface water run-off to ensure clean stormwater generated outside the footprint of the operational area does not enter the site where it would become classified as leachate. Any water collected from within the footprint of the composting area will be treated as leachate. The exclusion measures include:

▪ Vegetated swales

The vegetated swales are set back from the posed development area of the composting pad. They are focused on the southern and eastern upper ranges of the site and will include grass, shrubs, and small trees. The aim of these is to increase infiltration and stability of the land.

▪ Bunds

Bunds of 300 mm height will surround the compost pad. Bunds will be planted with suitable vegetation (grass). The bunds exclude runoff from entering the site and becoming leachate, thus remaining uncontaminated.

▪ Cut off drains

The cut off drains are design features that disperse water that comes up against bunds, to manage channelling and erosion. Drains and cut-off drains will surround the site and be diverted to sediment traps to ensure sediment retention.

B.7 CONSIDERATIONS OF ALTERNATIVES AND JUSTIFICATION OF PREFERRED OPTION

Different types of composting operations and equipment, as well as different site configurations have been considered in the research stages for Snowy Valleys Council's (SVC) organics diversion project.

A multi-criteria analysis investigated different collection-processing scenarios:

1. No FOGO collection, waste avoidance education, and home composting encouragement
2. Regional transportation of FOGO material to Wagga Wagga
3. Council owned composting operation.

Option 3 is the proposed approach and it performed best environmentally and socially in the analysis. Whilst this option generated marginally less profit in the 15-year cost analysis, it addressed FOGO and self-haul green waste organics diversion, which were inadequately addressed and not costed for the other options.

In combination with the development of the three scenarios explored for the multi-criteria analysis, a business case analysed:

- Different existing regional composters capacity and cost to take the potential SVC FOGO material. This also included costing transportation to the different site locations.
- Existing local composters capacity and interest to process the potential SVC FOGO material
- Different Council owned sites including characteristics, location, and operation opportunities.

The local composters were excluded from further analysis because they were found incapable to receive FOGO (category 3 organics). Other than the Wagga Wagga option, regional composters were found comparatively costly due to transport and gate fees. Other Council sites investigated included the old Tumut Landfill and Batlow and Tumbarumba Waste Transfer Stations.

The proposed option 3 was chosen for suitable location and neighbouring land uses (landfill, transfer station, timber yard). This option also posed the advantage of extending Valmar operational responsibilities to include the composting facility. Engaging Valmar has proven to be financially and socially positive for Council and the community in the operation of the TWRC.

The proposed site location has some rural residential blocks in close proximity. As such, odour management has been a key consideration in the choice of composting technology.

The methods considered for the proposed site were:

- a) Mechanically turned, open windrows, using a loader for flipping
- b) Mechanically turned, open windrows, using a compost turner as a tractor fitting for turning and a loader for moving the material
- c) Mobile Aerated Floor (MAF).

Option a) is successfully implemented in neighbouring Coolamon and Tasmania's McRobie's composting facility but they lack rigorous procedures for control of environmental impacts. Whilst option b) was the option preferred by Council, and is used by other small-scale regional facilities, such as Cooma, the lack of odour control was an issue for existing sensitive land use near the site. Further, this option requires a chipper, a tractor, a water wagon, as well as the compost turner, all at significant capital investment and with ongoing maintenance needs.

The Mobile Aerated Floor (MAF) technology actively controls aeration which enables a high level of odour management from the point of accumulation. Launceston City Council operates a 10,000 tonne/annum throughput MAF facility and has shared their two season odour studies with the SVC. These studies found that there was no impact outside the composting site boundaries. Further conversations with odour consultants (Odour Unit) confirmed that with the expected controlled feedstock and proposed MAF system, odour could be managed to ensure standard requirements are met at the nearest sensitive receptor.

Supply of MAF systems, as the preferred equipment choice, is restricted to one supplier in Australia, C-Wise in Western Australia. C-Wise has been operating the same system at their site in Mandurah, 72km south of Perth, and the same system is used in Bega Shire Council. They supply the equipment with a three-day training course, seven-day service, support visits over 24 months, and ad-hoc technical and operational support via phone for 24 months. This has the added advantage of providing opportunity to upskill local Valmar staff.

In summary, with the research presented, it is our considered opinion that the only equipment that adequately meets the needs of Council is the MAF, which can only be sourced from C-Wise.

C. The location

C.1 PLANNING CONTEXT, SITE DESCRIPTION AND LOCALITY INFORMATION

C.1.1 ZONING AND EASEMENT

The site is located in New South Wales in Snowy Valleys Council, at 6 Kearney, Gilmore, 2720 on lot 1/-/DP197308. The land title is held by the Council.

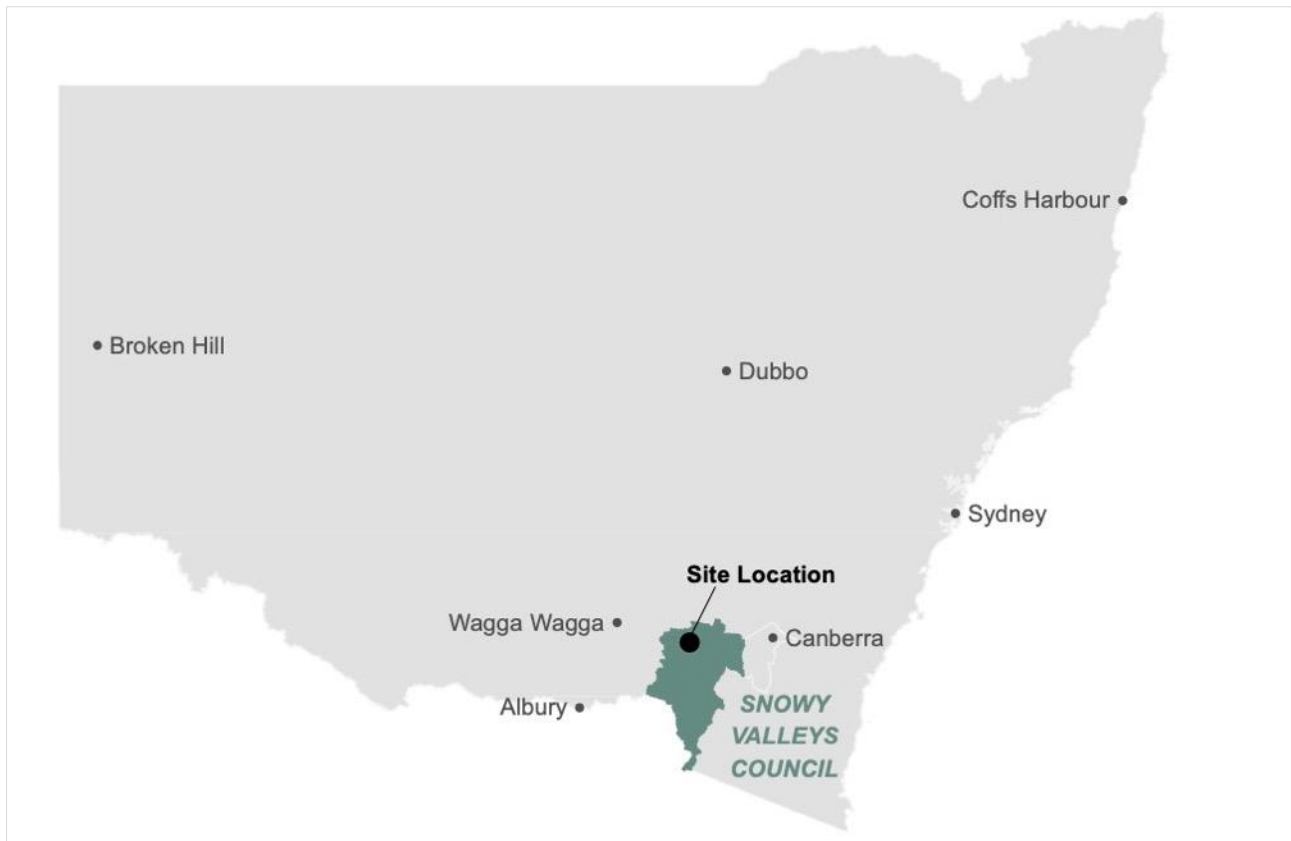


Figure C-1: Site location

The lot is zoned as Primary Production (RU1) in the Tumut Local Environmental Plan. The site has additional local provision layers including: Landslide Risk, Riparian Lands and Watercourses, and Terrestrial Biodiversity. Other local restrictions include having been partially mapped as Bushfire Prone, needing a 1.5 m buffer around Classified Roads, and considering the presence of Electrical Infrastructure (powerlines).

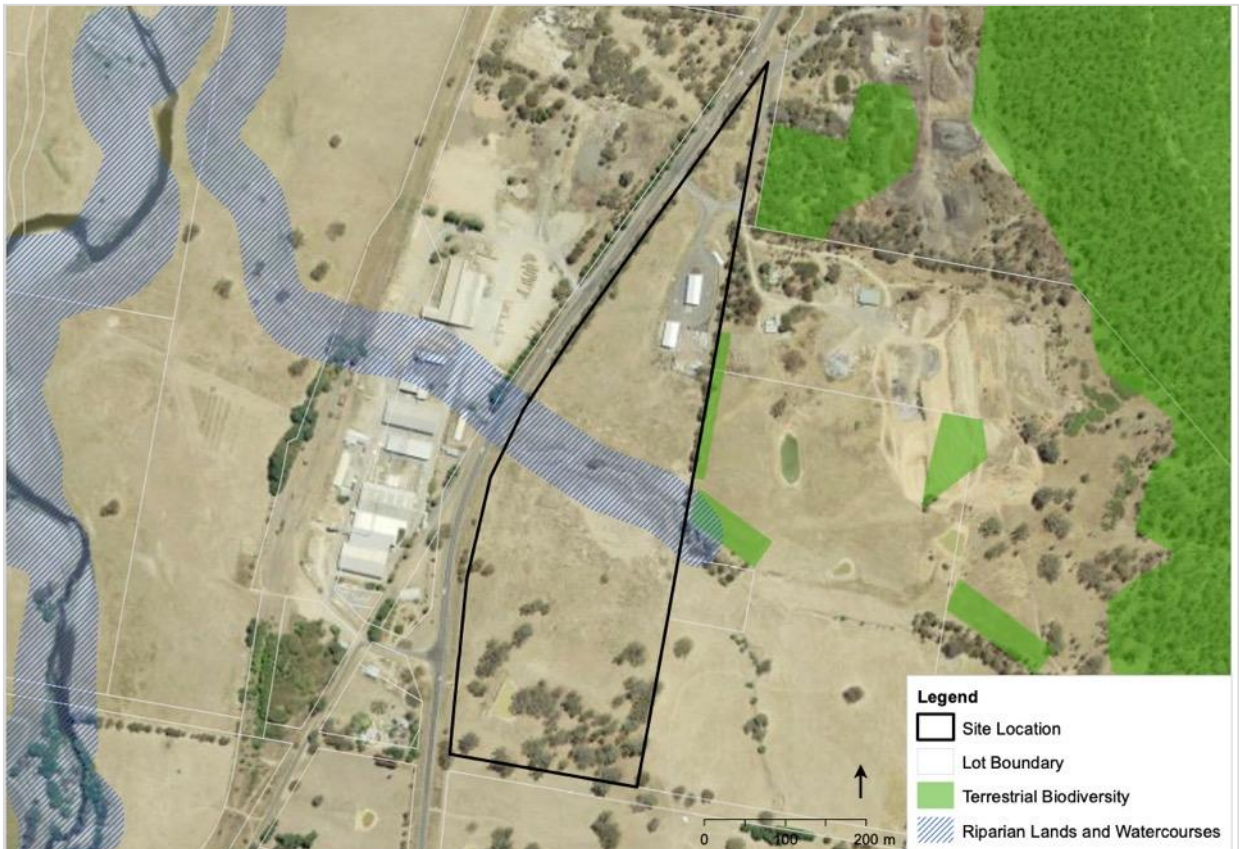


Figure C-2: Riparian Lands and Watercourses and Terrestrial Biodiversity overlays in relation to proposed site



Figure C-3: Landslide Risk overlay in relation to the proposed site

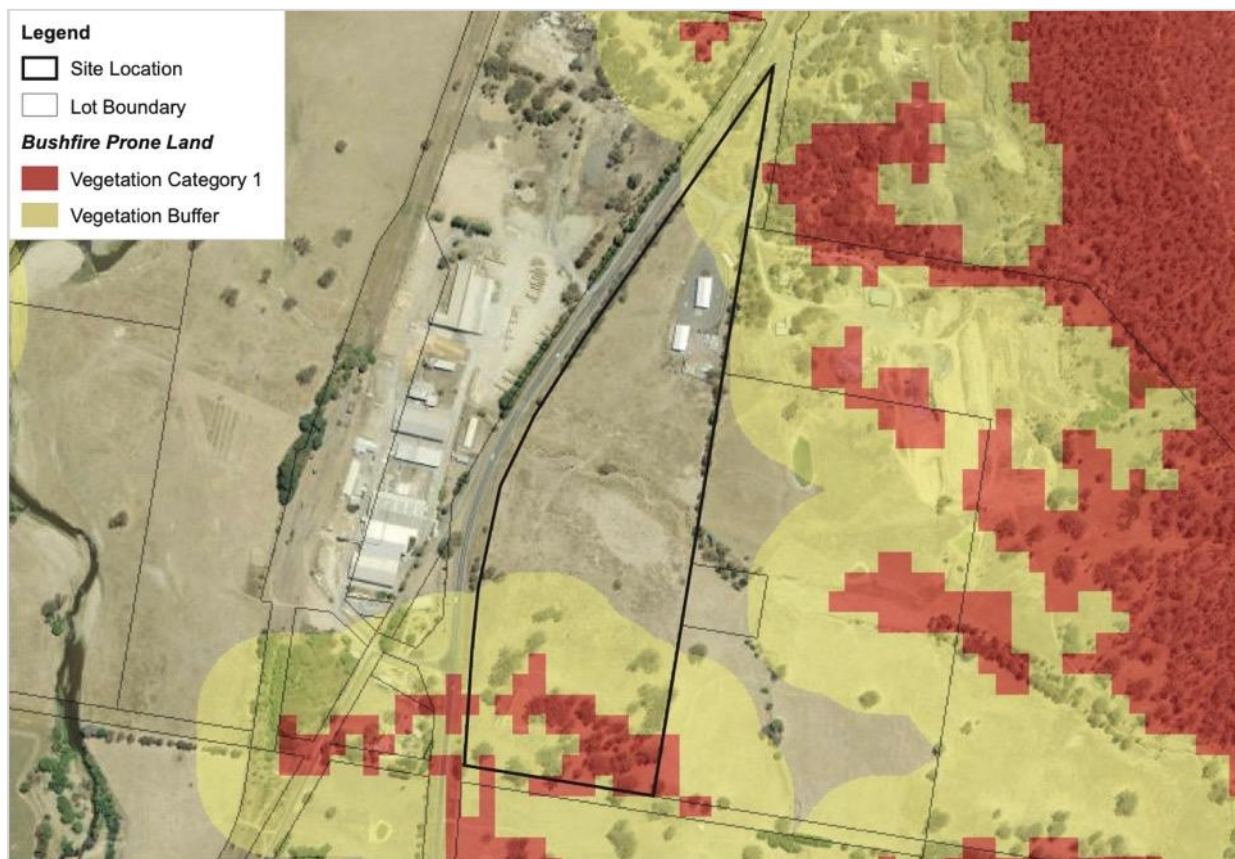


Figure C-4: Bushfire Risk overlay in relation to the propose site

C.1.2 CURRENT SITE USE AND SURROUNDING LAND USE

The proposed site for operation is a section of undeveloped land on the TWRC and transfer station. This site is operated by Valmar and includes a recycling facility that manually sorts the Council's recycling stream into a premium product, a singulator machine for the container deposit scheme, a waste transfer shed, a second-hand shop, and transfer station drop-off points for waste and recycling. Adjacent land uses include Bellettes inert landfill, ANL landscaping suppliers, AKD Softwoods timber store yard and a few rural residential properties (see Table C-1). All adjacent property is zoned as Rural – 01 and 03.

Table C-1: List of nearby sensitive receptors

LOCATION	RECEPTOR TYPE	DISTANCE FROM PROPOSED SITE
40 Whatmans Lane, Gilmore	Residential	810m
21 Gilmore Mill Road, Gilmore	Residential	250m
25 Gilmore Mill Road, Gilmore	Residential	315m
49 Gilmore Mill Road, Gilmore	Residential	500m
53 Gilmore Mill Road, Gilmore	Residential	560m
66 Gilmore Mill Road, Gilmore	Residential	660m
Australian Native Landscapes 210 Killarney Rd, Gilmore	Industrial	665m
AKD Softwoods Timber Mill	Industrial	230m
Bellettes Landfill	Industrial	370m

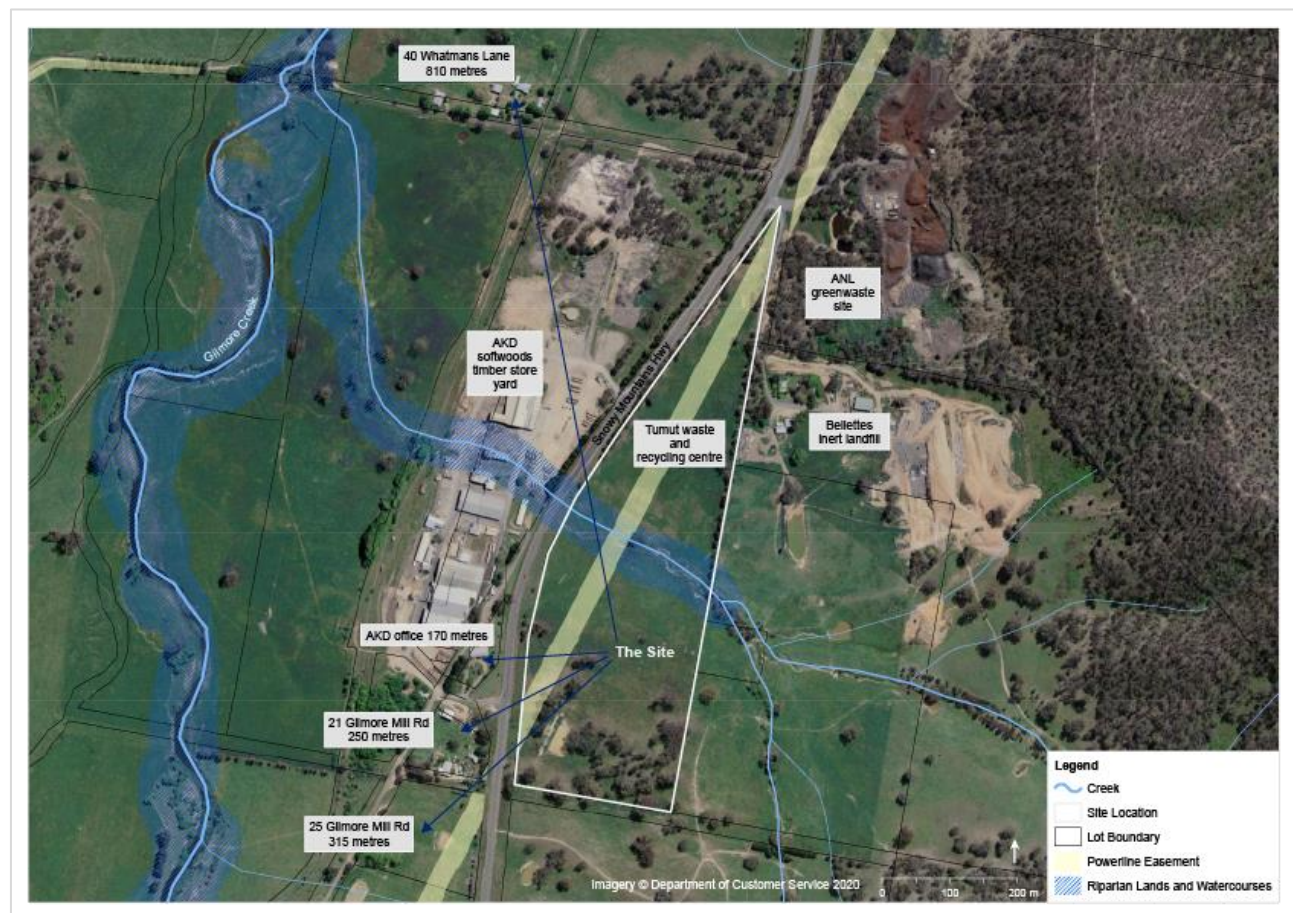


Figure C-5: Neighbouring land uses and distances from the proposed site

C.2 OVERVIEW OF THE AFFECTED ENVIRONMENT

C.2.1 PHYSICAL SITE DESCRIPTION

The site of the proposed development is currently not assigned or used for a specific purpose but is, at times, grazed by cattle. It has basic cattle fencing and an existing dam. The majority of the site is cleared with some medium sized trees around the dry creek line, fences, and the upper southern section. The open areas are covered in grass. Powerlines run along the western side of the site.

C.2.2 FLORA AND FAUNA

The proposed development has been positioned on the southern section of the lot. This position has considered slope and vegetation and is thus located on the flattest section of cleared land.

The section of land to the south of the gully is approximately 8ha. Under Keith (2004) definitions of Vegetation Formations (PBP 2006), approximately 50% of this section is cleared pasture classified as Grasslands. The other 50% is mixed grasses with medium high *Eucalyptus polyanthemos* red box shrub and *Eucalyptus spp.* gums classified as Grassy Woodlands. The grasslands are throughout the site are comprised of introduced exotic grasses. The trees are native: a mix of boxes and gums common in the surrounding area.

Since 2010, the council has planted sections of the title. A mixture of native species was used throughout including *Callistemon spp.* bottlebrushes, *Eucalyptus camaldulensis* red gums, *Eucalyptus deanei* round leaf gum, *Acacia spp.* wattle, and *Grevillea spp.* grevilleas. The eastern boundary towards Bellettes was planted with *Casuarina cunninghamiana* river sheoaks. The other planted sections include:

1. The western boundary towards the Snowy Mountains Highway
2. The riparian corridor, on both sides of the ephemeral creek
3. Around the western, southern, and eastern side of the internal footprint
4. Within the site gardens.



Photo 5: Aerial photo from north looking south: access road from highway and TWRC with the proposed site in the upper centre point of the image (John Stanfield, 2020)



Photo 6: Aerial photo from north looking south, with the creek gully in the bottom, the cleared proposed site above, and the upper vegetated section of the lot (John Stanfield, 2020)



Photo 7: Aerial photo of site with upper reaches of the creek line (within the site) vegetated and green, sparse vegetation, and grazing cattle (John Stanfield, 2020)

C.2.3 SLOPE

The site slopes predominantly from south to north at approximately 1V (vertical): 20-30H (horizontal). The section of the property that is proposed to host the site with construction of the pad has the gentlest slope. A section in the middle of the property has an increased slope of 1V:3-5H, with a change in elevation of 2-3 meters. The proposed site and pad construction is designed to minimise cut into this section.

C.2.4 SOIL

Aitken Rowe (Appendix B) conducted a geotechnical investigation on the 10 October 2019, including physical site assessment and the drilling of eight holes to assess horizon depths and gather soil samples for laboratory analysis. In general, there was little topsoil (0.05-0.2m) and the subsurface was natural alluvial and residual material comprised of clay (low-medium plasticity), silty clay, gravelly clay, and sandy clay. Bore termination depth varied (2.3m - 3.0m) and slight groundwater seepage was encountered at 2.8 - 3.0m at one borehole in the western section of the proposed pad location (BH4).

The underlay was extremely weathered, extremely low strength, siltstone bedrock. Soil properties for the location of the proposed leachate dam indicates that material generally contains 18 to 44% gravel, 18 to 28% sand and 39 to 53% silt and clay content with Plasticity Index (PI) ranging from 10 to 19%. The materials are generally classified as “CL-CI – low to medium plasticity gravelly clay, fine to medium gravel, with fine to coarse sand” and “CL – low plasticity clay, with fine to coarse sand, with fine to medium gravel” in accordance with AS1726 - 2017 Geotechnical Investigations.

The permeability tests carried out on the clay-based samples recovered from bore holes BH1 and BH2 indicated the permeability of 3×10^{-10} m/sec on low to medium plasticity gravelly clay and low plasticity clay, which were compacted at 98% of SMDD at nearest 100% of SOMC. The dispersion (Emerson Class) tests carried out on the same samples showed “Emerson Class 5” and therefore the clay materials are considered “potentially slightly dispersive”.

The middle section of the site has a slope gradient of 20-33% with an elevation of 2-3m. The geotechnical study found that the “Urban Capability Study” identifies ‘Class Cp’ at the site with the association of ‘Soil Unit B’. However, though the subject site falls into ‘Class Cp’ in respect to slope gradient and poor permeability constraint, the soil encountered appeared to be similar to ‘Soil Unit E’, in accordance with “Urban Capability Study”. Soil Unit E is assessed as a “moderate to high erosion hazard”. As such, citing the slope gradient, permeability, and stability of the site is recommended for the construction of the site and pad.

The whole composting area will be covered by the composting pad which will be compacted, lined with clay, covered with a drainage material, and slope towards a leachate dam. This will ensure the construction of the pad comply with the permeability of a leachate barrier and characteristics of a leachate drainage and collection system outlined in the environmental guidelines for *Composting and Related Organics Processing Facilities* (DEC 2003, section 5.1-5.4).

C.2.5 METEOROLOGICAL CHARACTERISTICS

Tumut Shire and the proposed development site typically experience hot summers (average 29-30 °C), cooler winters (average 12-14°C), and mild shoulder seasons (17-27 °C)¹. On average, the area receives most (68-85mm/month) rainfall in winter-spring (May-Oct) but rainfall is maintained (40-65 mm/month) in the summer-autumn period (Nov-April)². Climate change trends indicate that the region is experiencing increases in annual and all-season maximum temperatures. Rainfall trends indicate a small reduction in total rainfall, specifically in spring, summer, and autumn rainfall, with an increase in winter rains³. 2017 - 2019 have been drier than averages generated from 1985 - 2020 statistics. However, the rainfall trend in the last two decades reveals a drying trend of less than average annual rainfall, with a few years recording above average rainfall. 2019 rainfall was recorded at 508mm compared to 742mm as the average (generated from 2010-2020).

The catchment area for the small valley in which the proposed site is located is almost entirely vegetated (Figure D-6).

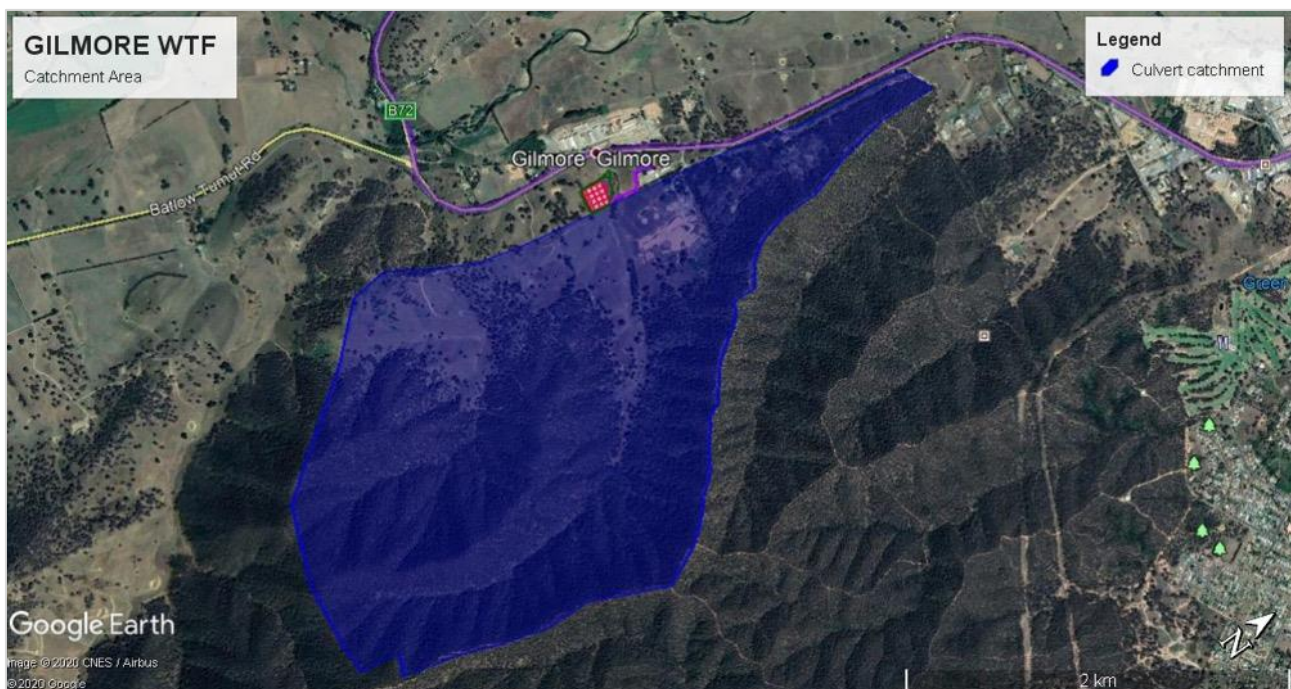


Figure C-6: Catchment area of 3.65 km² feeding Killarney Creek

The climate data suggests that fire risk, for both the composting process and bushfire, from high temperatures and dry conditions will need to be monitored and managed.

Figure C-7 displays the Australian Bureau of Meteorology (BOM) Intensity Frequency Duration (IFD) statistic for the site where the annual exceedance probability of 10% (1:10) varies depending on duration. For a 24 hour scenario the rainfall is estimated at 95.9mm.

¹ Bureau of Meteorology 2020, http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=122&p_display_type=dailyDataFile&p_startYear=1994&p_c=-1036808966&p_stn_num=072000. Accessed 2/4/2020

² Bureau of Meteorology 2020, http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=136&p_display_type=dailyDataFile&p_startYear=&p_c=&p_stn_num=072044. Accessed 2/4/2020.

³ Bureau of Meteorology 2020, <http://www.bom.gov.au/climate/change/index.shtml#tabs=Tracker&tracker=trend-maps&tQ=map%3DRAIN%26area%3DAUS%26season%3D0911%26period%3D1970>.

The Composting Guidelines (DEC 2003) state that the design requirement for leachate and stormwater management systems must be able to cope with a 1-in-10-year, 24-hour storm event.

An approximate 35 m x 25 m x 1.2 m dam with a volume of 1,310 m³ at 1 meter freeboard and 2,796 m³ at 100% capacity is proposed on site. The pad area is 11,654 m² with the potential to generate 1,105 m³ or 1.105 ML from run-off.

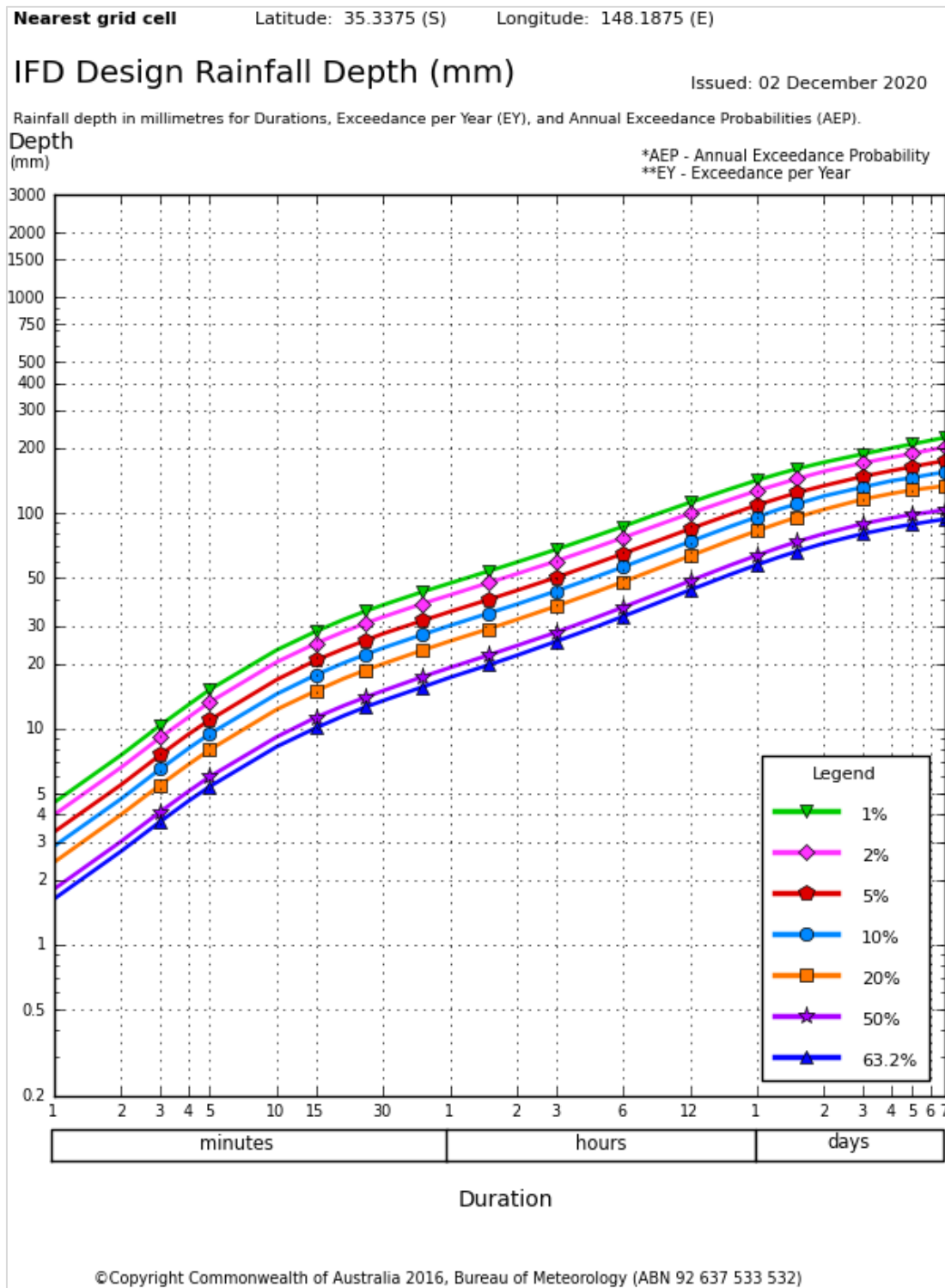


Figure C-7: IFD Design Rainfall Depth (mm per hour); Rainfall Depth for Duration (min, hours, days), Exceedance per Year (EY) and Annual Exceedance Probabilities (AEP) (1-63.2%) for the proposed site in Tumut (BOM, 3/4/2020)

The annual average wind directions and speeds are illustrated by the wind roses in Figure C-8. The length of each arm is proportional to the frequency of the direction and the length of each segment within each arm corresponds to the range of speeds from that direction. The different times (9 am and 3 pm) are used to show the normal variation over a day. Summer (Jan-March) winds are dominantly east-northeast at 9am and east-southeast at 3 pm. Winter (Jul-Sep) winds are predominately easterly at 9 am with a slight shift to east-southeast at 3 pm⁴.

Wind speeds (indicated in the coloured sections of the arms) can be interpreted as dominantly calm to gentle and very rarely strong (above 40km/h) according to the Beaufort scale (Figure D-9). This indicates the area is a good setting for the composting operations as calm-gentle wind speeds minimises the risk of odour or particles being spread by wind.

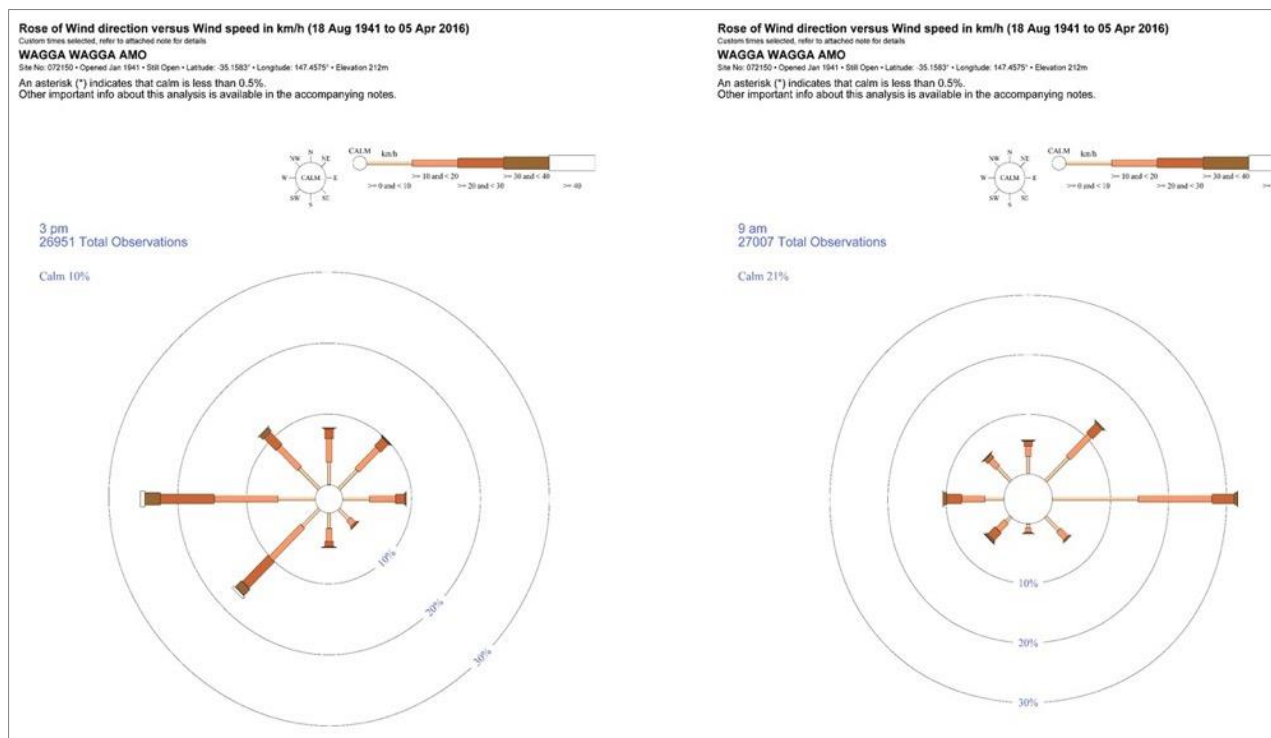


Figure C-8: Wind roses as observed in Wagga Wagga at 3pm and 9am respectively. The roses illustrate wind intensity (km/h) by colour and frequency of occurrence by length (%)

4 Bureau of Meteorology 2019, http://www.bom.gov.au/cgi-bin/climate/cgi_bin_scripts/windrose_selector.cgi?period=Annual&type=9&location=72150, Accessed 5/9/19.







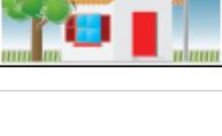
Description	Mean Wind Speed	Appearance of Wind Effects		
		On a Tree	On Land	
Calm	< 1 knot < 1 km/h	Still	Smoke rises vertically	
Light Air	1 – 3 knots 1 – 5 km/h		Smoke drifts, wind vanes are still	
Light	4 – 6 knots 6 – 11 km/h	Leaves rustle	Wind felt on face, vanes begin to move	
Gentle	7 – 10 knots 12 – 19 km/h	Leaves and small twigs move	Flags flap	
Moderate	11 – 16 knots 20 – 28 km/h	Small branches move	Dust and loose paper lifted	
Fresh	17 – 21 knots 29 – 38 km/h	Small trees in leaf begin to sway	Flags fully extended	
Strong	22 – 27 knots 38 – 49 km/h	Larger branches shake	Whistling in wires, umbrellas become difficult to use	

Figure C-9: Beaufort Scale windspeed interpretations (Flynn 2016)

D. Identification and prioritisation of issues

D.1 OVERVIEW OF THE METHODOLOGY

The following steps were undertaken in order to identify and prioritise issues:

- Application for Secretary Environmental Assessment Requirement (SEARs) through the submission of a Form A
- Review of regulatory and best practise requirements
- Review of previous work including risk assessments, options assessments and other investigations
- Consultation with key stakeholders specifically the regional EPA and direct neighbours to the site.

A summary of the SEARs application, relevant regulatory and best practise requirements, past assessments, and consultations used to inform the identification and prioritisation of issues is provided below.

D.1.1 SEARS

A Form A – Request for the Planning Secretary's Requirements for the preparation of an Environmental Impact Statement was submitted. The Department of Planning, Industry and Environment (DPIE) consulted with and received responses from the:

- Environment Protection Authority (Appendix C)
- Biodiversity and Conservations Division (of DPIE) (Appendix D)
- Transport for New South Wales (Appendix E).

The Rural Fire Service (RFS) were contacted but unable to provide a response in time. A bushfire assessment has been completed for the proposed development and the SVC will work with the RFS in the future to manage fire risk for the area.

All responses were summarised by DPIE and are in Appendix F. The key issues identified are summarised in Table E-1.

Table D-1: Summary of key issues identified in the SEARs

KEY ISSUE	DESCRIPTION	EIS SECTION
Strategic and statutory context	▪ A detailed justification for the proposal and suitability of the site for the development.	Section B
	▪ A demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, and development control plans (DCPs), or justification for any inconsistencies.	Section D and E
	▪ A list of any approvals that must be obtained under any other Act or law before the development may be lawfully carried out.	Section F
Waste management	<ul style="list-style-type: none">▪ Details of the type, quantity, and classification of waste to be received at the site, details of the resource outputs, and any additional processes for residual waste▪ Details of waste handling including, transport, identification, receipt, stockpiling, and quality control, as well as details of the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives, and guidelines in the NSW Waste Avoidance and Resource Recovery Strategy 2014-21.	Section B

KEY ISSUE	DESCRIPTION	EIS SECTION
Hazards and risk	<ul style="list-style-type: none"> An assessment of the risk of bushfire, including addressing the requirements of Planning for Bush Fire Protection 2019 (RFS). Any proposed Asset Protection Zones must not adversely affect environmental objectives (e.g. buffers). 	Section E.11.1
	<ul style="list-style-type: none"> Any geotechnical limitations that may occur on the site and if necessary, appropriate design considerations to address these. 	Section B.5 and E.3
	<ul style="list-style-type: none"> An assessment of flood risk on the site. The assessment should determine the flood hazard in the area, address the impact of flooding on the proposed development, and address the development's impact (including filling) on flood. Behaviour of the site and adjacent lands and address adequate egress and safety in a flood event. 	Section E.11.2
Air quality and odour	<ul style="list-style-type: none"> A quantitative assessment of the potential air quality, dust, and odour impacts of the development in accordance with relevant Environment Protection Authority guidelines A description and appraisal of air quality and odour impact mitigation and monitoring measures. 	Section E.1
Soil and water	<ul style="list-style-type: none"> A description of local soils, topography, drainage, and landscapes. 	Section C.2
	<ul style="list-style-type: none"> Details of water usage for the proposal including existing and proposed water licencing requirements in accordance with the Water Act 1912 and/or the Water Management Act 2000 A detailed site water balance An assessment of potential impacts on floodplain and stormwater management and any impact to flooding in the catchment and characterisation of the waterbodies in relation to their ecological and hydrological function. 	Section E.2
	<ul style="list-style-type: none"> Details of sediment and erosion controls to avoid impacts to water quality in the riparian corridor. 	Section C.3.3, C.2.4, E.2.1 and E.3
	<ul style="list-style-type: none"> Details of the proposed stormwater and wastewater Management systems (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts An assessment of potential impacts on the quality and quantity of surface and groundwater resources. 	Section C.2.1, E.2
Noise	<ul style="list-style-type: none"> A description of all potential noise sources during construction and operation, including road traffic noise A noise and vibration assessment in accordance with the relevant Environment Protection Authority guidelines A description and appraisal of noise and vibration mitigation and monitoring measures. 	Section E.5
Traffic and transport	<ul style="list-style-type: none"> Details of road transport routes and access to the site A Traffic Impact Assessment, including road traffic predictions for the development during construction and operation, particularly the access connection to the Snowy Mountains Highway An assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development. 	Section B.5 and E.4
Biodiversity	<ul style="list-style-type: none"> Accurate predictions of any vegetation clearing on site or for any off site infrastructure upgrades 	Section C.2.2 and E.10

KEY ISSUE	DESCRIPTION	EIS SECTION
	<ul style="list-style-type: none"> An assessment of the proposal in accordance with the Biodiversity Assessment Method (BAM) including the potential impacts on any threatened species, populations, endangered ecological communities or their habitats, and groundwater dependent ecosystems Measures that will be taken to protect, and where possible enhance the biophysical processes, hydrological processes, and ecological integrity of the riparian corridor A detailed description of the measures to avoid, minimise, mitigate, and/or offset biodiversity impacts. 	
Infrastructure	<ul style="list-style-type: none"> An assessment of the impacts of the development on existing utility infrastructure and service provider assets within and surrounding the site. 	Section B.5 and B.6
Visual	<ul style="list-style-type: none"> Including an impact assessment at private receptors and public vantage points. 	Section E.9
Heritage	<ul style="list-style-type: none"> Aboriginal and non-Aboriginal cultural heritage. 	Section E.12

D.1.2 REGULATORY AND BEST PRACTISE REQUIREMENTS

The following standards and guidelines are considered relevant to the site selection and proposed operation:

- Environmental guidelines: Composting and Related Organics Processing Facilities (NSW DEC 2004)
- Australian Standard AS 4454 (2012): Compost, soil conditioners and mulches
- The Compost Order 2016 (NSW EPA)
- The Compost Exemption 2016 (NSW EPA)
- EIS Practical Guidelines: Composting and Related Facilities (DUAP 1996).

D.1.3 PLANNING AND LICENSING REQUIREMENTS

Appendix G describes the consent pathway considered prior to designing the proposed development. This section addresses specific planning controls and considerations.

D.1.3.1 SNOWY VALLEYS COUNCIL PLANS AND TUMUT LOCAL ENVIRONMENT PLAN

Community Strategic Plan – Snowy Valleys 2028 – Our Vision Our Future

The proposal is considered to address Theme 3 of the *Community Strategic Plan – Snowy Valleys 2028 – Our Vision Our Future*. Specifically, strategy:

3.1 Demonstrate leadership in environmental sustainability by reducing Council's carbon footprint and supporting the use of clean energy; and

3.3. We sustainability manage waste through a commitment to resource recovery and best practice waste management.

Tumut Local Environment Plan 2012

The proposed location for the compost facility is zoned as **Primary Production (RU1)** under Tumut Local Environmental Plan (LEP) 2012. This zone permits land to be used for **Rural Industries** which includes **Composting facilities and works** as use of land with consent, which means that a development application for the proposed site construction and operation is required. The LEP also zone the site as:

- 'Terrestrial Biodiversity', as such, the proposed operation will consider the need for protection and management of native flora and fauna
- 'Riparian Lands and Watercourses', as such, the riparian area will be maintained, revegetated and the current unofficial crossing fenced and revegetated. The creek crossing is designed to minimise impact and allow for flooding thus not disrupting the natural flow.
- 'Landslide Risk', which was considered in mid 2019 prior to commencing the EPA grant application and further analysis of the site. Geotechnical investigations outlined the landslide risk of the site and how to mitigate it in the construction process.

Snowy Valley Development Control Plan 2019

The proposed operations and location have been considered to adhere to the general principles of Development outlines in the *Snowy Valley Development Control Plan (2019)*.

Section 3 of the Plan outlines requirements applying to all types of development. Section 6 applies to industrial development in the RU1 Zone. Relevant development standards outlined in these two sections are complimentary to the assessed environmental issues, as outlined in Table E-2.

Table D-2: Development control areas and location direction for EIS description

RELEVANT DEVELOPMENT CONSIDERATIONS	EIS RELEVANT SECTION
Air Quality	Section E.1
Vehicle Access Standards	Section B.5 and E.4
Bushfire	Section E.11.1
Carparking – assessed on merit	Section B.5 and B.6
Construction over Council Land and Services	NA – the site is not public land
Contaminated Land	NA – the land is not contaminated
Cut and Fill	Section B.6
Demolition	NA – no demolition required
Development Near Electrical Easements	Approval sought and gained from local provider.
Erosion and Sediment Control	Section B.6, E.2, and E.3
Flooding	Section E.11.2

RELEVANT DEVELOPMENT CONSIDERATIONS	EIS RELEVANT SECTION
Hazardous Goods and Site Contamination	Section E.11.2
Heritage	Section E.12
Landscaping	Section C.2.2. and E.10
On-site Wastewater Management	NA - the site will not be connected to Councils sewerage system. Compost leachate management is outlined in Section E.2. The wash bays wastewater treatment is outlined in Section B.6.
Provision of Services	Section B.5
Retaining Walls	NA – the proposal does not include any retaining walls
Safer by Design	NA – not a risk to users and community
Stormwater Management	Section E.2

D.1.3.2 STATE REGULATIONS AND ACTS

The scale of the operation triggers designated development under *EP&A Regulation 2000* (schedule 3), point (a) relating to the total amount of material processed per annum being more than 5,000 tonnes. The proposal will thus require this Environmental Impact Statement for Council to judge the impact of the development.

Schedule 1 of the *Protection of the Environment Operations Act 1997* outlines the scheduled activities that may require an environment protection licence (EPL). Section 48 lists 'composting' as a scheduled activity if more than 200 tonnes of organics is received onto the site. Accordingly, section 43 (b) states that an environmental protection licence (EPN) is required. This licence is likely to impose conditions around acceptable levels of air, water, and noise pollution, as well as assurances for the quality of the products.

As a designated development, the site and operation will require environmental licencing from the consent authority (regional EPA). *Relevant legislative requirements are outlined in the following acts and regulations:*

- *Protection of the Environment Operations Act 1997*
- *Environmental Planning and Assessment Act 1979*
- *Environmental Planning and Assessment Regulation 2000*
- *Draft Policy: Assessment and Management of Odour from Stationary Sources in NSW (EPA 2001b)*
- *Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW.*

WaterNSW is responsible for surface and groundwater regulation and manages two types of assessment and approval processes under the Water Management Act 2000. As Table D-3 outlines, they are not applicable to the proposed development.

Table D-3: Works approvals managed by WaterNSW and relation to the proposed development.

WATERNSW MANAGED ASSESSMENT	PROPOSED DEVELOPMENT LINK
<p>1. The following works require Water Supply Work Approvals from WaterNSW:</p> <ul style="list-style-type: none"> ▪ Water pump or water bore contracted for the purpose of taking water from a water source, including temporary dewatering purposes ▪ Tank, dam or a weir constructed for the purpose of capturing, impounding or storing water ▪ Water pipe or irrigation channel constructed for the purpose of conveying water ▪ Bank or levee that could divert water flowing to or from a water source 	<p>The proposed development does not intend to pump, use, store, channel or divert the Killareny creek, and does not require and Water Supply Work Approval.</p>
<p>2. The following works require Flood Work Approvals from WaterNSW:</p> <ul style="list-style-type: none"> ▪ Barrage, causeway, cutting or embankment that is situated in or in the vicinity of a river, estuary, lake or within floodplain and that it is likely to have an effect on the flow of water to or from a river, estuary or lake or the distribution or flow of floodwater in times of flood. 	<p>Section E.11.2 assesses the proposed development against the flood risk of Killareny creek and the impact from the proposed development. The proposed development will not impact the flow of water or distribution of the potential floodwater from the creek and does not require a Flood Work Approval</p>

The department for Natural Resource Access Regulator (NRAR) is responsible for assessment and approvals of controlled activities for the protection of waterfront land under the Water Management Act 2000. Waterfront land is defined as any land within 40 meters of the top of a bank of a creek. Certain developments with a 1st or 2nd order stream can be exempt. Killareny Creek is 3rd order stream.

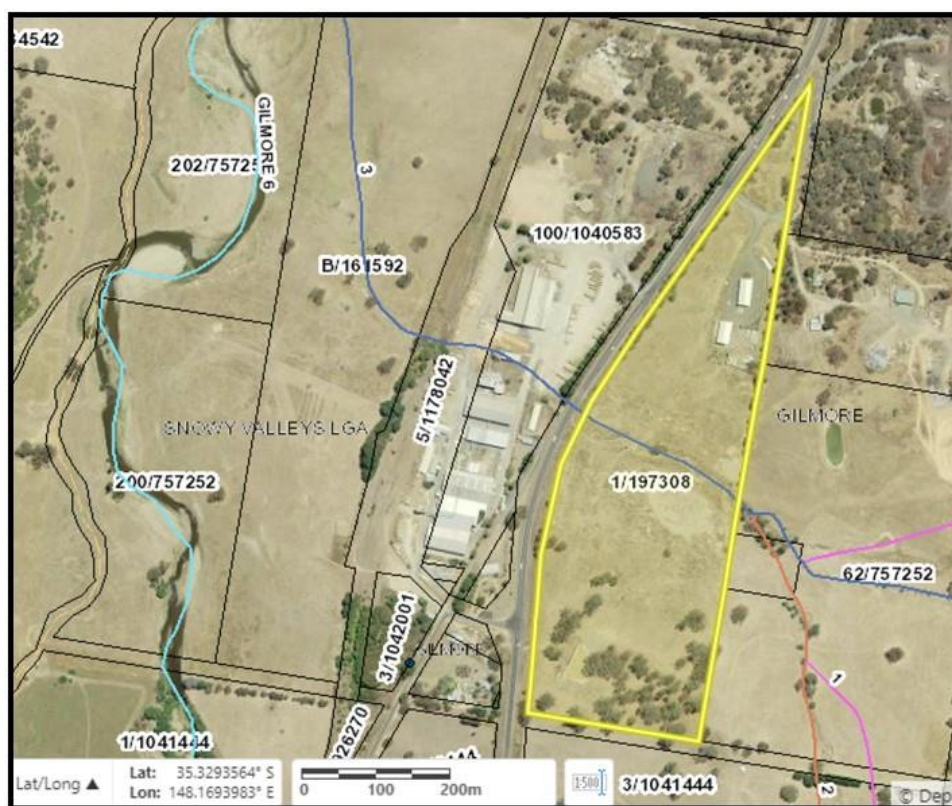


Figure D-1: Proposed development site with surrounding stream orders (1,2,3) numbered (Courtesy of NRAR 2021)

The road crossing of Killareny Creek triggers an assessment from the Natural Resource Access Regulator which may require a Controlled Activity Approval (CAA) under the Water Management Act (2000). The *Guidelines for watercourse crossings on waterfront land*⁵ outlines that the aim of the works should be to “protect and enhance water flow, water quality, stream ecology and existing riparian vegetation. Impacts on the hydrologic, hydraulic and geomorphic functions of a watercourse should also be minimised”. The assessments related to water (E.2), flora and fauna (E.10) and flooding (E.11.2) have considered, and outline the protection of, the creek vegetation, natural flow, and bank enhancement. The proposed design has been considered to achieve a net beneficial impact on the land through:

- Replacing informal crossing (see Photo 7) with a new designed culverted crossing that will adhere to erosion and sediment control on unsealed roads (BDC 2012) and is designed to minimise impact on the creek and flooding – the road is single lane as it crosses the creek to minimise impact on the riparian environment. The access road is lowered on the northern side of the creek to allow the passing of floodwaters (the pad on the southern side is raised to prevent floodwaters impacting on the composting facility and aiming to avoid a pollution event).
- The proposed development will be improving vegetation and bank stabilisation through increased planting and vegetation around the riparian areas and the site more broadly.

D.1.3.3 STATE ENVIRONMENTAL PLANNING POLICIES (SEPPS)

State Environmental Planning Policies (SEPPs) is an environmental planning instrument which aims to address specific significant issues to ensure state consistency. In the SEARs response, the NSW Department of Planning, Industry and Environment highlighted the following SEPPs for consideration against the proposed development:

⁵ Department of Primary Industries, NSW Office of Water, 2012. Controlled activities on waterfront land - Guidelines for watercourse crossings on waterfront land.

State Environmental Planning Policy (Infrastructure) 2007

The aim of the SEPP (infrastructure) is to facilitate effective delivery of infrastructure across the state.

Part 3 outlines development controls.

Division 2 refers to development in or adjacent to road corridors. Subdivision 2, Clause 104 specifies that an application for a resource management facility of any size must be referred to Transport for New South Wales and must undertake relevant assessments. This was confirmed by the TfNSW SEARs response, and the assessment is conducted in section E.4.

Division 34 refers to waste or resource management facilities. Clause 121 defines development permitted with consent and outlines that resource recovery facilities, which include composting facilities, are permissible with consent if the proposed development is on a prescribed zone, which includes RU1 Primary Production. As the Tumut LEP outlines, the site is RU1 Primary Production and the proposed development is therefore permissible with consent.

State Environmental Planning Policy (Aboriginal Land) 2019

The aim of the SEPP (Aboriginal Land) 2019 is to provide for development delivery plans and for development to be regionally significant for areas owned by Local Aboriginal Land Councils.

The policy applies to land specified in Land Application maps. Currently only the Central Coast LGA has a Land Application Map.

The proposed development site is not owned by the Brungle-Tumut LALC and thus a development delivery plan is not required.

State Environmental Planning Policy (Primary Production and Rural Development) 2019

The new aim of the SEPP (Primary Production and Rural Development) is to:

- a) Facilitate the orderly, economic use and development of lands for primary production
- b) Reduce land use conflict and sterilisation of rural land by balancing primary production, residential development and the protection of native vegetation, biodiversity, and water resources
- c) Identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic, and environmental considerations
- d) Simplify the regulatory process for smaller-scale, low risk, artificial waterbodies, and routine maintenance of artificial water supply or drainage in irrigation areas and districts, and for routine and emergency work in irrigation areas and districts
- e) Encourage sustainable agriculture, including sustainable aquaculture
- f) Require consideration of the effects of all proposed development in the State on oyster aquaculture,
- g) Identify aquaculture that is to be treated as a designated development using a well-defined and concise development assessment regime based on environmental risks associated with site and operational factors.

Part 2 outlines development constraints to agricultural land of state significance. Schedule 1 defines agricultural land of state significance and is currently blank, thus not imposing any development constraints on the proposed development.

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

The SEPP *Policy No. 33* (Hazardous and Offensive Development) aims to define hazardous and offensive industries and to regulate to a state standard the safety of operations and site selection for such industries.

A preliminary hazard analysis (PHA) assessment has been completed as suggested by the EIS Guidelines (DUAP 1996) in section E.11.2.

State Environmental Planning Policy (Koala Habitat Protection) 2019

The SEPP (Koala Habitat Protection) aims to conserve and encourage management of areas of native vegetation that provide koala habitat through identifying habitat areas and areas with potential habitat characteristics.

Koala habitat is defined in schedule 1 which lists the Snowy Valleys Council Central and Southern Tablelands as a koala management area. The proposed development is in the Central/Southern Tablelands area.

The Koala Habitat Protection Guidelines (2019) development assessment pathways find that the proposed development is Tier 1 and does not require further investigation.

- No Koala Plan or Management applies to the land (see
- Figure D-2)
- The proposed development will have no impact on koalas or koala habitat because it meets the following 3 criteria (section 3.1 of the Koala Guidelines):
 1. No regionally relevant trees of species listed in Schedule 2 will be cleared
 2. The development does not trigger the Biodiversity Offset Scheme threshold under the BC Act
 3. The council agrees that the development will have no impact on koalas or koala habitat.

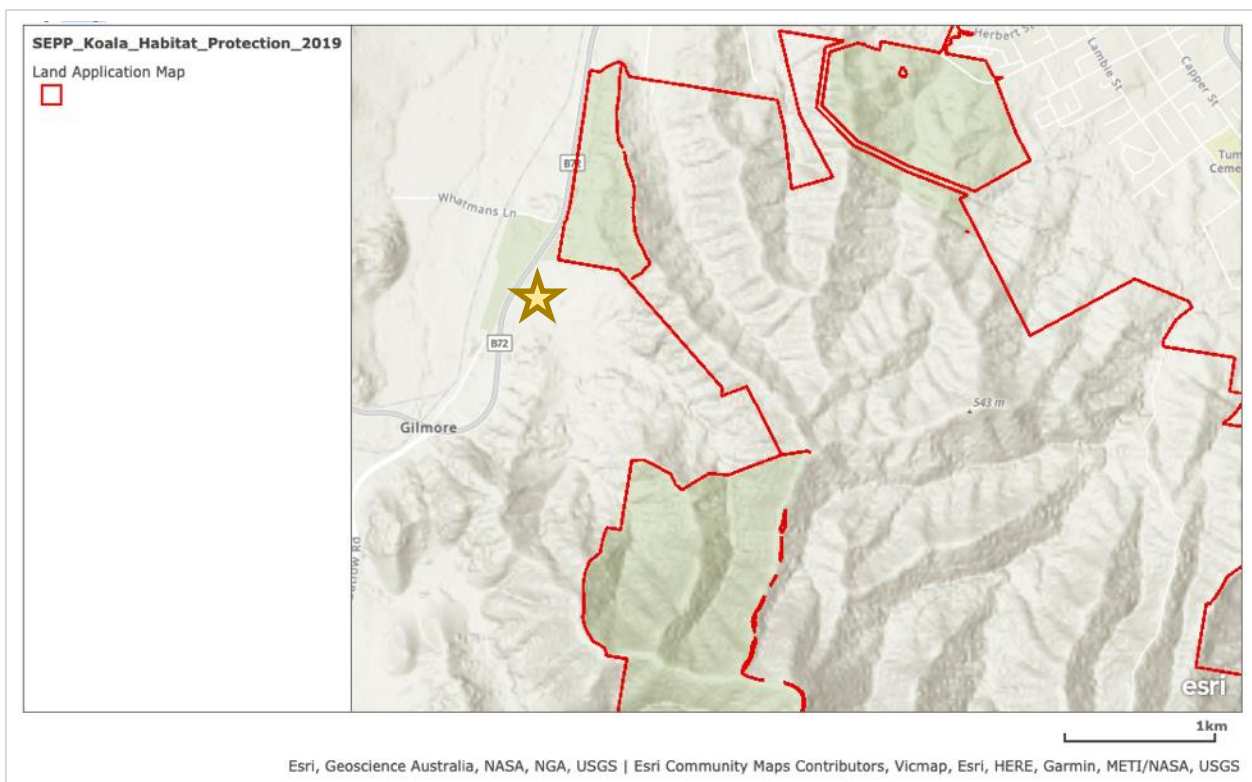


Figure D-2: Exported map from SEPP Koala Habitat Protection 2019 mapping with the site noted as a star

State Environmental Planning Policy No. 55 – Remediation of Land

The objective of this SEPP is to provide a state-wide planning approach to the remediation of contaminated land. Clause 7 outlines when contamination and remediation is to be considered in determining a development application.

Clause 7(1) outlines that a consent authority must not consent to the carrying out of any development on land unless:

- a) It has considered whether the land is contaminated
- b) If the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable after remediation) for the purpose for which the development is proposed to be carried out
- c) If the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

The site is not found to be contaminated and the SEPPs consent considerations do not apply, as:

- A search in the List of NSW Contaminated sites does not include the site, as of 28/10/20 (Appendix H)
- A search in the NSW Contaminated Land Public Records, as of 28/10/20, found no records of contaminated sites with the Tumut region (Appendix I)
- A search in the NSW EPA POEO Act Public register of licences, applications, and notices found no record of the proposed site, as of 28/10/2020.

D.1.4 RISK ASSESSMENT

A risk assessment was completed for the project (Appendix J) which highlighted the prioritised environmental issues but also how risks could be mitigated and managed. As such, mitigation measures addressing these issues have been incorporated in the physical design and proposed management of the site.

Options assessment

Section B.7 outlines the options that were considered by Council when seeking a path to divert their organic material from landfill and uncontrolled decomposition. In summary this included:

- Business case for FOGO options available to the SVC
- EPA grant development for FOGO infrastructure support
- Business case and option analysis of organic processing
- Multi criteria analysis of diversion packages
- EPA grant development for ORF support.

Environmental, social, and economic considerations were factored into the options assessment, including identification of potential issues and mitigation or avoidance opportunities.

D.1.5 ADDITIONAL INVESTIGATIONS

In association with the investigative reports outlined in section B.7 reports, advice was sought from the Launceston City Council MAF composting facility on their odour modelling, to which they shared their results. Valmar, Council, and key Council staff also undertook a field trip to Bega composting facility at Merimbula where the MAF system is also being used. A geotechnical investigation was also completed for the site and initial advice sought from The Odour Unit. This body of research and lessons learnt have provided Council with the confidence that environmental issues can be mitigated on site and that the proposal will deliver environmental gain to the whole Shire.

D.1.6 CONSULTATION

During the development of the concept and the proposal, Council have initiated a range of different consultation efforts as outlined in Table E-3.

Table D-4: Consultation groups, methods and results initiated by Council.

GROUP	METHOD	RESULTS
Department of Planning, Industry and Environment, including <ul style="list-style-type: none"> Biodiversity and Conservation Division of Water Group the Natural Resources Access Regulator Environment Protection Authority 	Sought input through submitting Form A for input.	SEARs responses for assessment criteria. Responses were discussed for local relevance before commencing the assessment.
Fire & Rescue NSW NSW Rural Fire Service	Sought direct input from the Rural Fire Service and was directed to the assessment procedures.	SVC approached RFS NSW who said they would assess it in DA stage. This EIS assessed proposal according to relevant guidelines.
Transport for NSW	Sought direct input from the regional division of Transport NSW and was directed to the assessment procedures.	TfNSW were contacted and have as a result made the decision to consider lowering the speed limit on the Snowy Valleys Highway.
Brungle/Tumut Local Aboriginal Land Council	The LALC team was engaged in the strategy development and the organics diversion project from 2019. Their unofficial support for the composting facility was sought prior to commencing planning. The official cultural heritage assessment also delivered a highly engaged result.	Support was gained from the start and increased through more active engagement.
Surrounding landowners and occupiers that are likely to be impacted by the proposal.	Project summary letter drops and door knocking was initiated in May 2020 to: Residential <ul style="list-style-type: none"> 40 Whatmans Lane, Gilmore 21 Gilmore Mill Road, Gilmore 25 Gilmore Mill Road, Gilmore 49 Gilmore Mill Road, Gilmore 	No initial concern was raised. Some questions were answered specifically in relation to potential impacts of the creek.

GROUP	METHOD	RESULTS
	<ul style="list-style-type: none"> ▪ 53 Gilmore Mill Road, Gilmore. Industrial <ul style="list-style-type: none"> ▪ 66 Gilmore Mill Road, Gilmore ▪ Australian Native Landscapes, 210 Killarney Rd, Gilmore ▪ AKD Softwoods Timber Mil ▪ Bellettes Landfill. 	

D.2 OUTCOMES OF THE PROCESS

The following environmental issues requiring approval were identified as a result of the SEARs application, review of regulatory and best practise requirements, past assessments, and consultations:

- Water: surface water, ground water, and leachate management
- Soil: landslide risk in the construction phase and erosion
- Air quality: odour and particulate matter
- Hazards: fire and heavy rainfalls
- Flora & fauna: the function of existing trees.

All environmental issues have been considered to some degree in the design and operation of this proposal, including extensive construction considerations, odour modelling, and detailed water management design.

E. The environmental issues

E.1 AIR QUALITY

E.1.1 DUST AND PARTICULATE MATTER

Description

The objective of the *Composting guidelines 2003* for particulate matter is to “*Minimise particulate matter emissions from the facility*”.

Dust and particles carried by wind can occur during the construction and the operational phase of this proposal. During the construction phase, the cut and fill excavations and the compaction and layering of the composting pad and leachate dam will be the most at risk works for dust generation.

Particulate pollution could also be generated if the feedstock or composting piles become dry, as in this condition, the material would be more likely to become airborne during the depositing, blending, and/or flipping stages. Such potential issues could be exacerbated by high wind conditions.

Assessment

The proposed excavations will be temporary (2-4 weeks). Active works will be limited if extreme wind is predicted and moisture spray will be available if required. The finished site will adhere to strict compaction requirements (see section E.2).

The operation of the composting site will use the MAF system to automatically monitor moisture level and have a rearticulation system available to add moisture, if required, to the compost. The site is located in a gully and does not experience very windy conditions. Flipping will be restricted if winds are strong.

Mitigation and management can ensure no impact is felt outside the site boundary.

Mitigation, management, and monitoring

To mitigate particulate impact:

- Construction will not occur during high winds
- Water spraying will be implemented if conditions require it during a certain construction phase
- As soon as the pad and dam are constructed, the area will be seeded with grass and bush and tree planting will occur where suitable (i.e. outside compacted areas)
- The internal access road will be constructed of gravel
- High use areas, receiving and screening pad, will be concreted
- Watering of compost piles will occur if compost piles become too dry
- Flipping will be limited in windy and dry conditions
- Maximum existing vegetation (grass, bush, and trees) will be retained on the site.

E.1.2 GAS

Description

The *Composting guidelines 2003* objective for methane gas management is to “*Minimise emissions of Methane to air and diffusion through soil strata such as the risk to humans in confined spaces*”.

Assessment

The green waste process currently applied in SVC is not a composting process according to the above definition and would be susceptible to anaerobic conditions and increased CH₄ (methane) generation (wet & cold conditions) for several cycles during wintertime. FOGO waste currently included in the residual kerbside collection is disposed of at a regional landfill with flares (assumed to be able to capture and burn 70% of methane generated).

Composting is estimated to reduce the greenhouse gas (GHG) generated from landfill decomposition by 85% – 98.6% (Anderson et al. 2010, MMA 2010). Moulton et al. (2018) found that composting food waste negatively generated GHG emissions at a rate of -0.031 t CO₂-e per tonne of food waste. However, lack of aeration in composting piles or windrows creates anaerobic conditions and produces CH₄ emissions, which is amplified in cold temperatures and wet conditions (Barker et al. 2017).

A multi criteria analysis calculated the associated GHG emissions from the introduction of a FOGO collection and composting operation and found that the comparative CO₂-e savings from current operations was significant.

The greenhouse gas emission budget calculates:

- 700tpa of food and paper packaging waste could be diverted from landfill, reducing emissions by 1,330tpa of CO₂-e from the landfill emissions.
- 215tpa of garden waste could be diverted from landfill, reducing emissions by 301tpa of CO₂-e from the landfill emissions.
- 5,000tpa of self-haul green waste could be diverted from unmanaged stockpiles, reducing emissions by 7,000tpa CO₂-e from being processed in a composting process.
- 915tpa of organic waste could be diverted from landfill, reducing collection and transportation emissions. Introducing a third collection will increase the collection traffic, generating emissions. These factors combined will increase emissions by 14.7tpa CO₂-e, from transportation associated fuel use.
- The MAF system requires significant power, estimated at 30,000kWh, generating 365t CO₂-e from electricity use.

Mitigation, management, and monitoring

To manage gas:

- Composting processes will be adhered to AS4454 standards
- Feedstock will be constant and blended to ensure the right C:N ratio is achieved
- Moisture and temperature will be monitored and managed with aeration and rearticulation
- Forced aeration technology will be used

E.1.3 ODOUR

Description

The *Composting guidelines 2003* objective for odour management that “No emissions of offensive odours outside the boundaries of the premises”. The NSW EPA SEARs response outlines that “measures to prevent or control the emission of odour from the composting activities must be detailed based on the outcome of an air quality impact assessment undertaken in accordance with the *Approved Methods and Guidance for Modelling and Assessment of Air Pollutants in New South Wales* (EPA 2016)”.

The SEARs outlined that the premises meet the performance criteria specific of the Protection of the Environmental Operations (Clean Air Act) Regulation 2010.

Assessment

Compost rich in oxygen does not smell. Odorous composts are often linked to anaerobic conditions, at times in combination with wet conditions, that generate sulphur compound gases that can smell rotten.

The *process* of composting largely determines the air quality impact. Common gaseous compounds can include sulphur, nitrogen, and volatile organic compost, but ammonia is the most common and easily identifiable unpleasant odour (Miller 1993). Anaerobic conditions in compost piles is the most common cause for strong odour, and this condition is also conducive to methane production which is a potent greenhouse gas.

Methane emission is not considered a significant risk in a well-maintained open-windrow operation (USEPA 2002). Section B.4.1 describes a well-maintained and highly controlled composting process. The system forcing the aeration automatically monitors and adjusts aeration levels to achieve desired temperature, moisture, and oxygen levels.

Additionally, the proposed operations will use Covered Aerated Static Pile (CASP) on known and controlled feedstock. A CASP can also be called a bio-blanket and is essentially a cover of shredded green waste material placed on the FOGO material on a daily basis, capping any odour from material that was received in a putrid condition. MAF technology maintains active oxygen control throughout the 6-8 week composting process in a five-stage procedure and, importantly, can control odour in the accumulation stage where risk is highest.

The site design and process operations (B.4) have been designed to control and manage potential odour impact.

The Odour Unit (TOU) completed an Odour Impact and Management Assessment (OIMA) of the proposed operation and site (Appendix K). The Impact Assessment Criterion (IAC) and dispersion modelling methodology for the Level 2 OIMA are contained within the following documents:

- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (EPA, 2017)
- Technical framework: assessment and management of odour from stationary sources in NSW (EPA, 2006a)
- Technical notes: assessment and management of odour from stationary sources in NSW (EPA, 2006b).

The IAC is relative to the population densities of an area. Based on the 6 nearest residential sensitive receptors and an occupancy of 2.3 people per household, the odour IAC for this assessment is 5.6 Odour Units (OU).

The level 2 OIA was carried out using AUSPLUME with worst-case meteorological data and a maximum odour emissions scenario. In this scenario, the modelling shows that 5.6 OU is exceeded at two of the residences; 21 and 25 Gilmore Mill Road. The critical risk points include:

- The relatively clear line-of-sight pathway from Receptors 2 and 3 (Figure F-1) to the Proposed Facility
- Receiving and decontamination of feedstock and forming and transfer of the piles during meteorological conditions that are unfavourable for effective dispersion
- High organic loading of the unaerated leachate dam, leading to elevated odour emissions.

Based on the OIMA, the risk can be mitigated through additional measures and the operational management commitments outlined below.

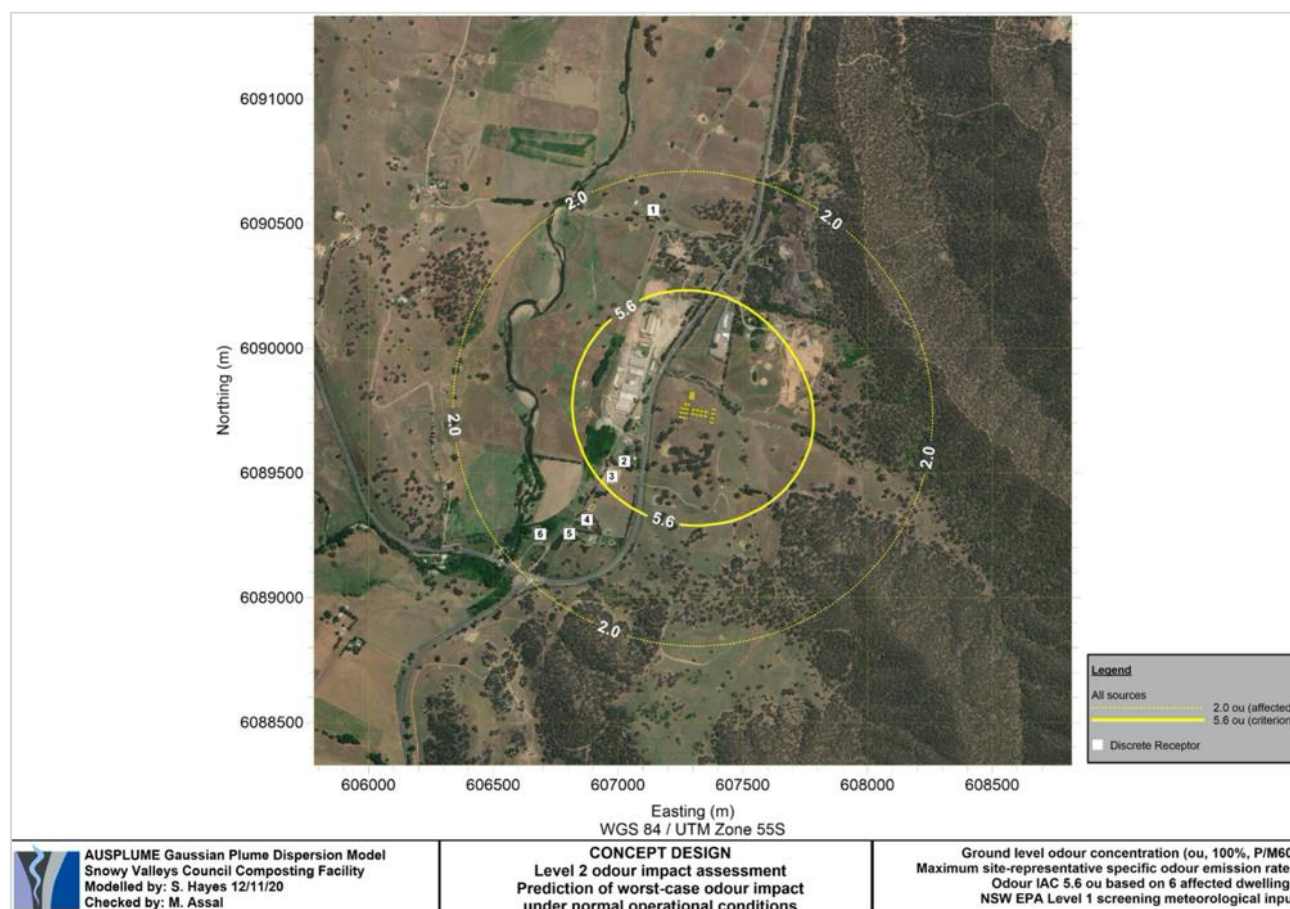


Figure E-1: Maximum predicted odour impact contour plot for the Proposed Facility

Mitigation, management, and monitoring

To manage odour and associated gases:

- It is understood that pre-processed GO, screened mulch, and ground oversize material will be utilised as a cover through the different composting stages. The protocol for the utilisation of this cover will need to be aligned with the following objectives:
 - The pre-processed material is of mature quality (i.e. 12 weeks from a particle size reduction process such as grinding or shredding)

- The mature material is to be applied at a minimum thickness of 300mm at each stage of the composting process
- This material is to be applied as part of the first four weeks of the composting process (as a minimum) i.e. Stage 0 and Stage 1
- The blending, forming, and transfer of feedstock stockpiles and composting windrows will be performed under the following conditions:
 - Day-time hours
 - More than two days after a rainfall event and with active aeration.
- The application of moisture control will adhere to the following protocol:
 - Only quality leachate/potable water will be used for treatment; and
 - If a sprinkler delivery system is utilised, treated quality leachate will only be used during calm to light (< 4 m/s) winds, with higher wind speeds avoided.
- Temperature and oxygen will be monitored and logged daily for all active windrows to determine turning frequency and to ensure optimum composting conditions are maintained. This will minimise/prevent the formation of anaerobic pockets/conditions and elevated levels of odour (particularly during a turning event).
- The leachate dam water quality will be monitored monthly for key wastewater parameters (e.g. pH, BOD5, COD, ammonia/nitrogen). If it is found that the leachate dam cannot be operated sustainably in a condition that minimises the risk of elevated levels of odour, provisions will need to be made for the implementation of a suitably sized aerator to manage oxygen demand levels.
- A windbreak will be planted as soon as practicable to establish a vegetative barrier surrounding the facility. The windbreak will be comprised of species that will provide sufficient height, thickness, and width within a reasonable timeframe to reduce wind speed at the site and aid odour dispersion in the plume pathway. This is considered to be a medium to long-term odour management strategy.
- A site-specific odour management plan (**OMP**) is to be developed and implemented as part of an overarching Environmental Management Plan (**EMP**) to reflect the proposed operational practices and odour control strategy at the Proposed Facility. The OMP is a 'live' document and an administrative-based control that outlines how the Proposed Facility will eliminate, prevent, or minimise the potential for odour generation from its composting activities. Its implementation is consistent with industry best practice.
- An on-site, air-quality grade meteorological station, for use to validate complaints and for future air quality assessments (if required), is to be installed and sited to applicable Australian Standards including:
 - AS/NZS 3580.1.1 – Methods for sampling and analysis of ambient air, Part 1.1: Guide to siting air monitoring equipment
 - AS/NZS3580.14 – Methods for sampling and analysis of ambient air, Part 14: Meteorological monitoring for ambient air quality monitoring applications
- Within six to twelve months of commencement of operations, the Proposed Facility is to undertake an audit of site odour emissions and management practices to validate the source inputs used in the dispersion modelling and the effectiveness of the implemented management practices.

E.2 WATER

The site has a gentle slope, and the region is not characterised to have extreme rainfall events. Geotechnical investigations found no evidence of any groundwater aquifer.

The *Composting Guidelines 2003* objective is to “Prevent water pollution. Surface or underground discharges of leachate and water from the facility must not pollute groundwater or surface waters.”

E.2.1 SURFACE WATER AND RUNOFF

Description

The site design and operation address the design requirements in the *Composting Guidelines 2003* which includes:

- The prevention of mixing clean surface water with leachate generated on site through exclusion bunding and compaction of the leachate barrier system
- Minimising clearing.

The site is at the bottom of a small valley. The majority of the catchment is forested with a small section of grassland pasture. There are no bare surfaces in the catchment and bushes and trees will be maintained above the site to encourage infiltration. The compost site and pad itself will be cut into a low gradient slope (3%). Directly above the pad there is a fall of a 1V:3-5H gradient with a change in elevation of 2-3 meters. The soil analysis from this area identified poor permeability which can create overland flow of surface water. This in turn could create rill erosion, especially if it hits the composting bund, which could lead to particulate pollution of stormwaters entering the gully.

Assessment

This upper section of the site will remain vegetated with grass to increase infiltration and with trees/bushes to obstruct rapid flow. Cut-off drains and sediment traps address diversion of surface water without causing increased water velocity and potential associated erosion.

The design of the proposed development has been positioned to minimise vegetation clearing and soil disturbance. The site design (B.6.3) includes bunds to exclude surface water fallen outside the footprint of the compost site. Based on a 1 in 10-year rainfall event and the expectation that existing vegetation will be maintained, excavation of the areas with greater slope will be minimised and drains, cut-off drains, and sediment traps will be used, a stormwater pond is not deemed necessary.

- With the site selection and positioning, the management designs, and natural landscape particulate pollution into any natural water feature from storm water is highly unlikely.

Mitigation, management, and monitoring

Key mitigation of surface water risk:

- Almost all vegetation will be retained on site: only the grassed area and a few small trees within the compost pad footprint will be cleared
- Bunds will surround the composting site footprint and be seeded with grass
- Cut-off drains will manage surface water flow velocity
- Sediment traps will capture any particulate matter, e.g. from very high rainfall events
- Regular monitoring of bunds, drains, and traps will ensure they are maintained
- Planting on site will include increasing trees around the riparian area, a screen towards the highway, and potentially around the high gradient slope above the compost site.

E.2.2 GROUNDWATER

Description

The geotechnical investigation (Aitken Rowe 2019) found no groundwater in the 8 bores dug to 2.4 - 3.0m depths. The site investigations were conducted in August 2019. Section C.2.5 describes the drying trends in the general Tumut area, the site was subject to recent (monthly) and ongoing (over year) below average rainfall. It is thus possible that groundwater could look different in characteristically wet times.

The Composting Guidelines 2003 specify that if groundwater is absent, a suction lysimeter should be used to extract bore water to monitor the vadose zone beneath the composting facility.

Issues with groundwater contamination can occur if the leachate barrier system is broken or degraded over time from lack of monitoring and maintenance.

Assessment

If conditions become excessively wet and/or any concerns around the barrier arises, any potential seepage in the vadose zone can be monitored. The risk of the proposed composting operations on groundwater is considered low and will be managed through a leachate management system.

Mitigation, management, and monitoring

In preparation for potential wet times, and to monitor that surrounding land use does not impact the composting site, monitoring will include:

- Sampling of groundwater (lysimeter or bore) on a regular interval; more intensive in the beginning of operation of the facility and relaxed if no seasonal effects are demonstrated
- The installation of two groundwater bores on the northern lower hydraulic gradient: one on the eastern point as the gully enters the site and one on the western lower point as the gully exits the site.
- The installation of one bore on the south-east corner of the proposed facility.
- Initial and ongoing testing of the surface water starting in Jan 2021, when the ephemeral creek is flowing.

Groundwater study results and ongoing groundwater monitoring presented in Bellettes Landfill Expansion Environmental Impact Statement (November 2019), conducted on land adjacent to the proposed site, found:

- The development site is located on the south-western edge of the Murray Darling Basin Fractured Rock (Lachlan Fold Belt)
- The development site is outside of the "Groundwater Vulnerability" area, on the groundwater vulnerability map of NSW
- Recorded groundwater levels from bores at the development site indicate the groundwater elevation has been relatively stable over the last two years, with indication of an overall slight decline in groundwater level since April 2018
- Previous geotechnical investigations at the development site did not encounter shallow groundwater in test pits
- Analyte concentrations for the groundwater bores at the development site are generally low and have been mostly consistent.

E.2.3 LEACHATE

Description

Organic material has a high moisture content and can generate leachate in a decomposing or composting process, especially if additional moisture (rain) is added (DEC 2003). Leachate generated during composting is generally characterised by high levels of salt, ammonium (NH₄), and organic load. However, Romero et al. (2013) demonstrated that the nutrient profile of compost-generated leachate can be used as commercial liquid fertiliser, providing that levels of heavy metal and pathogens are monitored and managed. This indicates that while leachate generation from compost needs to be managed, it is the salt and nutrient concentration rather than the composition that can pose risks.

The *Composting Guidelines 2003* outline minimum design requirements for the protection of waters which the Geotechnical Investigation refers to.

Assessment

The proposed operations will only incorporate known feedstocks and will monitor the quality of the compost product to ensure that the level of contaminations (see Table B-1) is not hazardous. This will enable tracing and monitoring of any potential harmful materials that could then also potentially be present in the leachate.

All liquid generated and collected on site will be considered leachate and be managed. The objective of the leachate barrier and collection system is to stop leachate entering any aspects of the natural environment including soil, groundwater, and water bodies.

The proposed operations will be fully contained within a managed leachate barrier system and require no discharge to land or water, thus posing little risk to the surrounding fields or ephemeral creek. Nor are they likely to pose a risk to the groundwater, being noted as absent. However, the composting pad's leachate barrier must be monitored, and any faults must be addressed to ensure that no seepage is occurring.

Managing leachate production volumes on site and maintenance of the leachate dam freeboard will be critical in avoiding high rainfall events causing the dam capacity to be exceeded, and leachate entering the gully. Section 4 in the *Composting Guidelines 2003* outlines that leachate dams need to be able to cope with a 24-hour storm of a 1-in-10-year event. The operational plan of the proposed development will monitor the freeboard regularly and reticulate water, should additional evaporation be required.

Mitigation, management, and monitoring

- Construction of low-permeable compost pad as a barrier for seepage including a drainage layer that collects all on-site leachate and directs it to a leachate dam
- Construction of a dam, with suitable impermeability and gradient (see section B.6.2), to collect leachate and maintain a minimum of 1 meter freeboard in order to collect leachate generated from a 1 in 10-year rainfall event (95.9 mm/24 hour scenario), which equates to 1.1ML for a 11,654 m² collection area
- Reticulation pump system to manage dam capacity as well as moisture content in compost
- Monitoring of leachate parameters according to required intervals: more intensive in the beginning of the operation of the facility and relaxed if no seasonal effects are demonstrated.

E.3 SOIL

Description

The location of the proposed construction has a gentle slope (less than 3%) and is vegetated. The geotechnical investigation and soil analysis identified that there was little topsoil and most material was highly weathered and composed of different clays with a significant gravel and sand component. Permeability was poor (3x10⁻¹⁰ m/sec) and potentially slightly dispersive.

The site is zoned as having a landslide risk. The geotechnical investigation (Aitken Row 2019) assessed the site soil, landform, and surface drainage according to The Urban Capability Study (the Study) (Soil Conservation Service of NSW 1982). According to the study, the site has 'Soil Unit E' and is classified with a capability of "Class Cp". The investigation noted that 'Class Cp' is associated with 'Soil Unit B' in the study but the site soil samples found the soil to be similar to 'Soil Unit E'. The investigation found the section of the site for the proposed pad has a 3-5% slope gradient, with a section of the land above having a 20-33% slope gradient.

The investigation recommended citing slope gradient during construction. The investigation notes that 'Soil Unit E' can be a moderate to high erosion risk and this can pose constraints on excavations of the proposed leachate dam and potentially the compost pad. Further, the investigation states that the poor soil drainage for 'Class Cp' will require surface water management in the upper levels of the site (see section E.2.1).

Assessment

The experienced Council construction team have provided a robust design that demonstrates adherence to the *Composting Guidelines 2003* design requirements and considerations for minimising cut and fill and vegetation removal. Further, the positioning of the site was placed on the flattest section of the land.

The design mitigation measures can address the low risk of soil dispersion and erosion and therefore landslide risk. As demonstrated by other land uses in the valley, namely the TWRC and Bellettes landfill, the risk can be successfully managed. The proposed development will have comparatively low risk.

Mitigation, management, and monitoring

Mitigation and management strategies include:

- Positioning of the pad within the flatter section of the site
- Maximising vegetation retention
- Planting of vegetation in identified higher erosion risk areas (higher slopes)
- Citing and compaction of excavated areas to specification (see section B.6.2).

E.4 TRANSPORT AND TRAFFIC

Description

The Composting guidelines 2003 consider traffic an amenity issue from noise generation.

The EIS Guidelines (DUAP 1996) and the SEARs response from the EPA request, in summary:

- Details of road transport routes and access to the site and current traffic loading
- A Traffic Impact Assessment, including road traffic predictions for the development during construction and operation, particularly the access connection to the Snowy Mountains Highway
- An assessment of impacts to the safety and function of the road network and details of any road upgrades required for the development.

Assessment

Between 30 May 2016 and 24 July 2016, Council conducted a traffic monitoring survey at the access to Killarney Road, just off the Snowy Mountains Highway. It found:

- a) Average Daily Traffic Flows (AADT) – 200 vehicles
- b) Percentage of Commercial Vehicles – 5.7%.

The proposed operations are estimated to increase FOGO kerbside collection deliveries whilst reducing the residual waste collection. The proposal will increase traffic by delivering mulched green waste to the composting facility whilst reducing transport of residual waste from the TWRC to Jugiong Landfill. The distribution of compost material is estimated to require 780 vehicular movements per annum.

Table E-1: Expected changes of vehicular movements for the operation of the site

INCREASED TRAFFIC	DECREASED TRAFFIC
520 FOGO kerbside collection trucks (2 per day/2,468t FOGO). 175 semi-trailers of green waste every second day (5,000t to be delivered). 780 compost trucks for distribution (average 3t/load of a total of 2,350t product to be distributed). 520 staff cars (2 per day).	520 less residual kerbside collection trucks (2 per day/fortnightly residual collections). 50 less semi-trailers per year (1,231 tonnes diverted).
1,995 total vehicle movement per year. 7.7 total vehicle movements per day (260 days of operation).	570 total saved vehicle movements per year. 2 total saved vehicle movements per day.
1,425 total additional vehicle movements per year. 5.5 total additional vehicle movements per day.	

The proposed development will require a new internal access road, turning circle, and staff parking. Access from the Snowy Mountains Highway will occur using the same access as TWRC. The highway is a major transport and commuting route. The construction of the TWRC in 2012 incorporated the construction of a new access from the highway to Killarney Road that assured safe access. This new access was discussed and agreeable to the RTA. *The Guide to Traffic Generating Development (NSW 2013)* use number of lanes and vehicular movement per hour to generate a Level of Service (LoS) categorisation.

Table E-2: Level of Service categorisation for roads in relation to vehicular movement

LoS	ONE LANE (VEH/HR)	TWO LANES (VEH/HR)	OPERATION
A	200	900	Good
B	380	1400	Good with minimal delays and space capacity
C	600	1800	Satisfactory with spare capacity
D	900	3300	Operating near capacity
E	1400	2800	At capacity and accident will cause excessive delays

Source: NSW Guide to Traffic Generating Development

The Council traffic data collected in 2016 is for the number of vehicles travelling in one direction. Assuming the standard assumption of 10% at peak hour, and splitting this to unidirectional flow, results in 10 veh/hr. It is anticipated that 4 of the estimated 5.5 additional vehicles to the composting site will enter prior to 08.00 in the morning. Even at that, LoS of the road is considered A grade – good condition.

- Traffic can be considered an amenity issue. As demonstrated here, the site location is in a high traffic area and the additional movement of 5.5 vehicles per day entering and existing the Snowy Mountains Highway at the industrial precinct on Killarney Road can be considered negligible.

Mitigation, management, and monitoring

To manage the amenity impact of traffic, the operation hours will be limited to 07.00-17.00.

E.5 NOISE

Description

The site is located in a gully surrounded by hills, limiting exposure of noise to the eastern section of the site. The western side of the site borders the Snowy Mountains Highway. The upper sections of the valley are forested and so are the sides of the highway.

The *Composting guidelines* refer to the Industrial Noise Policy (NSW EPA 2017) to assess the impact of noise. These guidelines direct how to achieve a *project noise trigger level* which is the more stringent of *intrusiveness noise level* and *project amenity noise level*. Noise mitigation measures for noise must be considered if the project noise trigger level is exceeded at existing noise-sensitive receivers.

Assessment

In 2009, prior to the construction and operation of the TWRC, an acoustic study measured the background noise at Killarney Road, Gilmore (Tumut Shire Council, Development application 09-10-134, 2010) and found:

- Ambient noise levels were at 55 to 60dB mainly from the timber mill and road traffic
- Peak noise level at 60 to 65dB from cars and small trucks
- Peak noise levels at 60 to 80dB from heavy articulated trucks
- Peak noise level at 90 to 100dB from heavy trucks using exhaust breaks.

SLR (2019) completed a noise assessment for the EIS for Bellettes Landfill Expansion that found that the ambient noise level, measured at Gilmore road and Whatman' lane, was 55dB and 56dB respectively.

The NSW industrial noise policy (table 2.2. EPA 2017) recommends an amenity noise level 50dB as a receiver parameter for a rural residential area (RU1) in the daytime (07.00-18.00).

Two studies (2009 and 2019) show that the short time noise measurements are at the lowest 55dB which can be considered the rating background noise level (RBL).

Table E-3 outlines how *intrusive noise level* and *project amenity noise* levels can be calculated using and RBL for rural areas (RU1) and Urban areas. The *project noise trigger level*, being the more stringent noise out of the two, is therefore the project amenity noise level at 48dB.

Table E-3: Intrusive and project amenity noise levels applied to the zoning of the nearest sensitive receptors (RU1)

PERIOD	INTRUSIVE NOISE LEVEL ⁶	PROJECT AMENITY NOISE LEVEL ⁷
Day for RU1	60 dB LAeq,15min (55 + 5)	48 dB LAeq,15min (50 – 5 + 3)
Day for Urban / High traffic ambient noise scenario	65 dB LAeq,15min (60 + 5)	58 dB LAeq,15min (60 – 5 + 3)

Whilst the *project amenity noise* is lower than the *intrusive noise level*, the parameters outlined in Table 2.3, *determining which of the residential receivers' categories applies* from the Industrial Noise Policy (NSW EPA 2017), do not suggest that the typical existing background noise level for RU1 applies. This table suggest that RU1 is typically <40dB in daytime, whilst that measured at the closest noise-sensitive receivers was 55dB. There are two reasons for this, 1) the proximity to the AKD industrial timber yard and 2) the proximity to the Snowy Mountains Highway. Using table 2.3 (EPA 2017), the acoustic studies identified background noise more characteristic of Urban, >45dB in the daytime.

As Table E-3 outlines considering and RBL of and urban area applied to this above average rural area would generate a *project noise trigger* level at 58dB.

The Industrial Noise Policy (NSW EPA 2017) outlines that areas of high traffic can be considered where:

- Traffic noise is the dominate noise source at a site
- Existing traffic is unlikely to decrease in the future
- Traffic noise level exceeds the recommended amenity noise level with more than 10dB.

The recommended amenity noise level is 48 dB and traffic noise is measured between 55-100dB. Whist no specific high traffic noise study has been conducted, it does indicate that traffic noise is the main noise source. This can have the effect that the industrial source is effectively inaudible at the sensitive receptor (NSW EPA 2017).

⁶ Intrusiveness noise level is LAeq,15min RBL + 5 (Section 2.1 of NSW EPA 2017).

⁷ Project amenity noise level (ANL) is RU1 ANL (Table 2.1) minus 5 dB(A) plus 3 dB(A) to convert from a period level to a 15-minute level (dB = decibel; RBL = rating background noise level). (Section 2.1 of NSW EPA 2017).

The operational noise associated with the proposed development will come from the loader, the collection trucks, deliveries, and compost material distribution vehicles. Deliveries and distribution vehicles will be very low (5.5 per day) and mostly occurs during a short time period (1-2 hours in the morning). As such the main noise generating equipment will be the loader (Hyundai HL730 – 9), which is reported to generate a dynamic outside noise at 0m of 104dB. Porter Equipment Australia measured the noise of the loader at 250 m distance, recording an idle noise level at 45bB, and dynamic level at 53.6dB. The access to site will occur through Killarney Road and the internal access through TWRC. This point is approximately 1 km away from the residential dwellings on Gilmore Mill road, ensuring a suitable distance from the residential dwellings and breaking trucks.

As shown in the above studies, the Snowy Mountains Highway ambient noise level is 55 to 60dB, with levels of 65dB from moving traffic being common. The noise of traffic from the operations will be insignificant in the context of the highway.

The highest level of noise from the proposed operations are estimated at 53.6dB from the dynamic loader at the compost receival point. The nearest residential dwellings are closer to the AKD timberyard and the Snowy Mountains Highway than the proposed operation. The low level of noise generated, the distance from sensitive receptors and other noise generating activities (highway, AKD) suggest that the proposed operation will not impact the amenity noise at the residential dwellings.

Mitigation, management, and monitoring

Key noise mitigating strategies include:

- Limiting operating hours to 07.00-17.00 Mon-Fri
- Keeping the access point from the highway at the upper end of the TWRC and accessing the site along the eastern boundary
- Maintaining and increasing vegetation cover screening
- Fitting a residential grade muffler on the loader
- Minimising simultaneous use of noise generating equipment – i.e. not using the loader when trucks are delivering or loading material on site
- Commissioning noise monitoring if complaints are received to verify that noise generation is not excessive, and potentially adjust operation.

E.6 ENERGY

The proposed operations are estimated to use 30,000 kWh which has been calculated to generate 362 t CO₂-e/annum. However, this proposal of source separating organics and processing property and locally is far more efficient and reduces emissions significantly from current collection and transportation practices (B.4.2). The proposed operations will require electricity to run the aerations, however, it uses less energy than traditional windrowing operations.

Council is currently exploring the use of renewable energy at its waste sites, current and closed. This proposal does not include the use of solar or co-generation options, but Council is committed to combating climate change, and future ventures may be possible.

E.7 SOCIAL

Description

Neighbouring land uses include a landfill (Bellettes), landscape facility (ANL), timberyard (AKD), low intensity agricultural areas, as well as a few residential dwellings (see section C.1.2). Valmar has operated the TWRC for eight years and maintains a good relationship with the industrial neighbours. Whilst there is no existing relationship with the residential owners, there has been no complaints registered to the TWRC construction or operation which includes the transfer of kerbside collected residual waste in an open shed throughout the week. In June 2020, all residents within 1km were visited by knocking on doors and delivering project information summaries with contact details. No concerns were raised, and no calls followed.

The site is located in an area with industrial operations. There are no public areas in close proximity and the adjacent highway is a major transport and commuting path.

Engagement was conducted in combination with the development of the Zero Waste Strategy. It included two sessions with the general public, two business consultations, three council workshops, and targeted phone calls to farmers. Whilst this engagement was not targeted at this proposed site development, much of the discussions focused on organic diversion and the opportunity for a local recycling option, with both receiving strong support. Councillors approved a waste fee charge increase which has been linked to increased expectations in service delivery.

SVC residents will receive a new kerbside service, with its associated convenience for recycling. Local farmers will be able to purchase a quality compost product to improve their soils and production and help manage their land sustainably. There will be three part-time positions created, specifically two positions for people living with a disability and regular employment of a local green waste chipper contractor. The approvals and construction phase will engage local based contractors. Some equipment and landscaping items (shed, loader, nursery plants) will be sourced locally. Valmar is planning an advertising campaign for the compost product that will engage a local advertising company.

Assessment

With the engagement that has occurred, the raised fees, and the acceptance of the Zero Waste Strategy after public display, in conjunction with a lack of negative feedback, indicate overall acceptance of cost and a desire for organics diversion in the SVC.

The impact of the proposed development will be socially and economically beneficial to the community through increased service provision (waste servicer and compost supply), better Council budget resilience, local employment generation, and associated environmental benefits. The local impact of the site on amenity (visual and odour) has been considered in the design of the operation and the choice of composting technology. The planned vegetation will improve the visual of the site for passers-by.

Mitigation, management, and monitoring

- Planting increased vegetation screening along the highway
- Odour, dust, noise, and traffic management.

E.8 HEALTH

Description

There are two aspects of health to consider for a composting facility and operations:

1. The local risk to environment (water, air, soil) and its potential to accumulate risk through migration of contaminants, as well as road safety at the local access area
2. The risk to the community and land where the product is applied, where contamination could be widespread if quality cannot be assured.

Assessment

The ephemeral creek on the site will be close to the composting operations. Whilst it does not flow regularly, this area will be at the highest risk to health impact, both locally and through transportation outside of the site. Mitigation of this risk relies on management of water (E.2)

Product quality will be assured and maintained through controlled feedstock, monitoring, and analysis, as well as robust composting process. Specifically, the equipment monitors and allows for management of moisture and temperature. Recording and screening feedstock will establish and maintain quality input. The sampled baseline of product to AS4454 standards and ongoing monitoring to the parameters will ensure product quality.

As outlined in section E.2 the water management design will be compliant with the *Composting Guidelines 2003*. This will include monitoring and maintenance in the operational aspects of the proposal to ensure compliance over time. Thus, the risk of contamination (through leachate) will be highly controlled and the risk to the local or greater environment very low. Further, through controlled, monitored, recorded, and screened feedstock the risk of the composition of the leachate will be low. Finally, the area around the ephemeral creek will be improved through planting, increasing infiltration and obstructing high velocity flows with the potential cumulative impacts of erosion and particulate pollution.

Product quality will be monitored in the composting process (temperature, moisture, time) and when finished (sampling according to AS4454). Distribution will remain local and engagement with buyers will encourage feedback and evaluation of products impact on land application. The quality assurance will thus be strong and the operations will be able to identify failure of any specific batch in one of the three monitoring times: process, finished product, or buyer engagement.

Mitigation, management, and monitoring

Key mitigation and management strategies include:

- Water, air, and soil management
- Composting process and finished product monitoring
- Buyers engagement and feedback.

E.9 VISUAL

Description

The proposed site has established vegetation on the southern and south western section. This screens the proposed site from the Gilmore Mill Road residents and traffic moving south to north. The site also hosts significant vegetation along the creek, which is a visual barrier for moving traffic travelling north to south. There are few established trees along the western section of the site facing AKD and the highway. Vegetation will be planted close to the site as well as along the boundary by the highway.

Assessment

With the current and proposed screening, the visual impact on neighbours and through-passing traffic will be negligible.

Mitigation, management, and monitoring

Key mitigation and management strategies include:

- Retention of established vegetation
- Planting of vegetation along the western side of the site
- Weekly litter control.

E.10 FLORA AND FAUNA

Description

The EIS Guidelines (DUAP 1996) and the SEARs response from the EPA request, in summary, that:

- Plant and animal habitat at, and ecological communities on and surrounding the proposed site are identified
- Accurate predictions of any vegetation clearing on site or for any off-site infrastructure upgrades are provided
- An assessment is conducted of the proposal in accordance with the Biodiversity Assessment Method (BAM) including the potential impacts on any threatened species, populations, endangered ecological communities or their habitats, and groundwater dependent ecosystems
- Measures will be taken to protect, and where possible enhance, the biophysical processes, hydrological processes, and ecological integrity of the riparian corridor
- A detailed description of the measures to avoid, minimise, mitigate, and/or offset biodiversity impacts.

The site is highly modified grazing lands with non-native grasslands and a patch of regrowth *Eucalyptus polyanthemus* red box and *Eucalyptus spp.* stringy bark. The site is isolated from the surrounding state forest. A search in the NSW eplanner indicates that the site borders a small section zoned as Terrestrial Biodiversity under the Tumut LEP. This strip of Terrestrial Biodiversity corridor is between, and mostly contained within, the neighbouring Bellettes landfill site. The mapped corridor does not include the *Casuarina cunninghamiana* river she oaks contained within the TWRC planted by the Council during the construction of the TWRC (Photo 8).

Assessment

In 2002, Ettamogah Research Consultants (Appendix L) conducted an Environmental Assessment on the site which included a survey of existing flora and fauna. This was done in conjunction with the rezoning of the lands, and no flora of significant value was recorded. Rather, the site was identified to be mostly non-native pasture grasses and weeds with several isolated *Eucalyptus macrorhyncha* red stringy bark and red box trees.

A report from the Biodiversity Offset Scheme Entry Threshold (BoSET) map and assessment tool BMAT (Appendix M) shows that the threshold for the Biodiversity Offset Scheme has not been exceeded, and thus a Biodiversity Development Assessment Report is not required.

A complete search in the BioNet Atlas, including non-protected and NSW and Commonwealth listed flora and fauna, and associated list⁸, illustrates that there are no recorded observations on site and that hotspots are located in Werreboldera State Conservation Area, Tumut State Forest, as well as Tumut townships gardens.

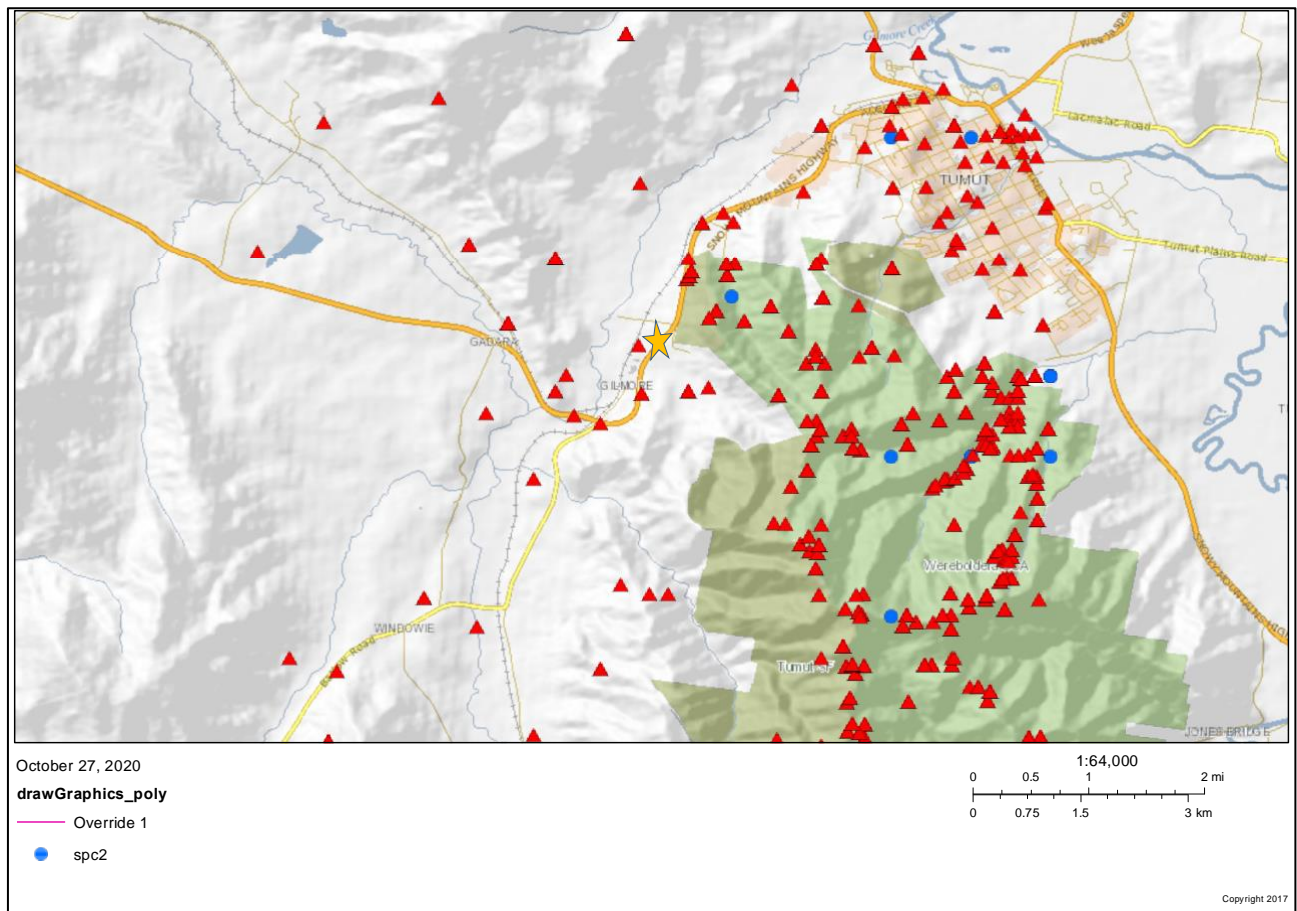


Figure E-2: BioNet Atlas map indicating all flora and fauna sightings with red triangles in relation to the site, indicated with a yellow star

Fauna

The Threatened Species Test of Significance Guidelines state that a proposed development under Part 4 of the EP&A Act must identify if the site includes any threatened species (Schedule 1, BC Act).

Outside of the property, there are two fauna species recorded within the region surrounding the site, including the Brown Tree Creeper (*Climacteris picumnus victoriae*), and Large Bent-winged Bat (*Miniopterus orianae oceanensis*) (previously known as Common Bent-Wing Bat (*Miniopterus schreibersii*)). These are both listed as Vulnerable under the NSW Biodiversity Conservation Act 2016.

Using the threatened species website and NSW BioNet biodiversity Atlas to search for recorded sightings of threatened fauna found that neither of these two species have otherwise been previously recorded on or directly adjacent to the site.

⁸ BioNet flora and fauna report generated on 27/10/2020,
file:///Users/isabela/Desktop/Isabela%20Projects/%23777%20SVC%20EIS/Biodiversity/List%20Bionet%20atlas%20-%20all%20flora%20and%20fauna.htm

Rather, as Figure E-3 and Figure E-4 illustrate the two listed vulnerable species that live in the region around the proposed site. However, no sightings on the site have been recorded. As avian species, their ability to move through and use the site as habitat will not be impacted.

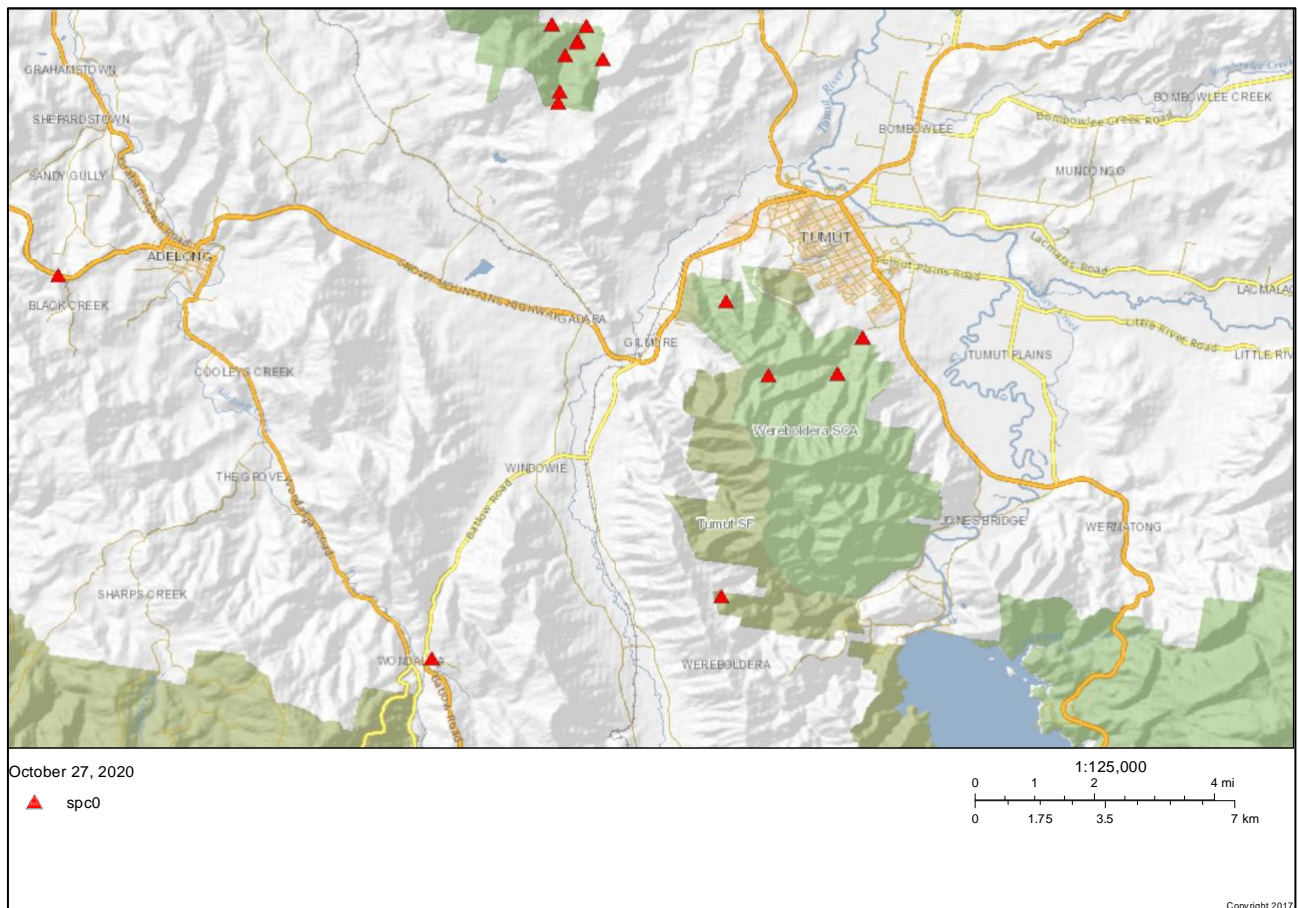


Figure E-3: BioNet Atlas map indicating recorded sightings of Brown Treecreeper (*Climacteris picumnus victoriae*) with red triangles

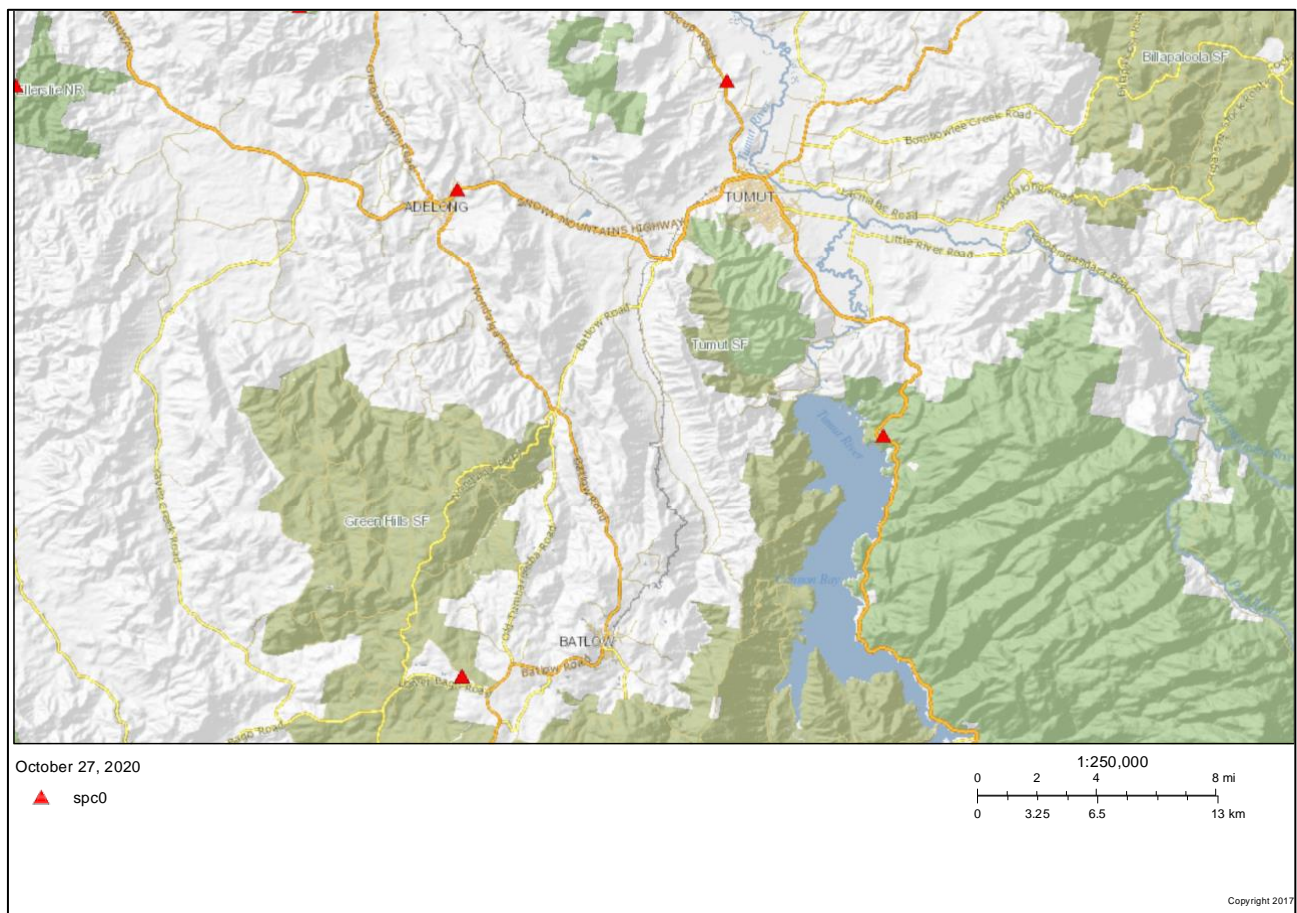


Figure E-4: BioNet Atlas map indicating recorded sightings of Large Bent-winged Bat (*Miniopterus orianae oceanensis*) with red triangles

Vegetation

The Threatened Species Test of Significance Guidelines state that a proposed development under Part 4 of the EP&A Act must identify if the site includes any Threatened Ecological Communities (Schedule 2, BC Act).

Using NSW SEED portal to search the sites vegetation classification found no threatened vegetation communities on or adjacent to the site.

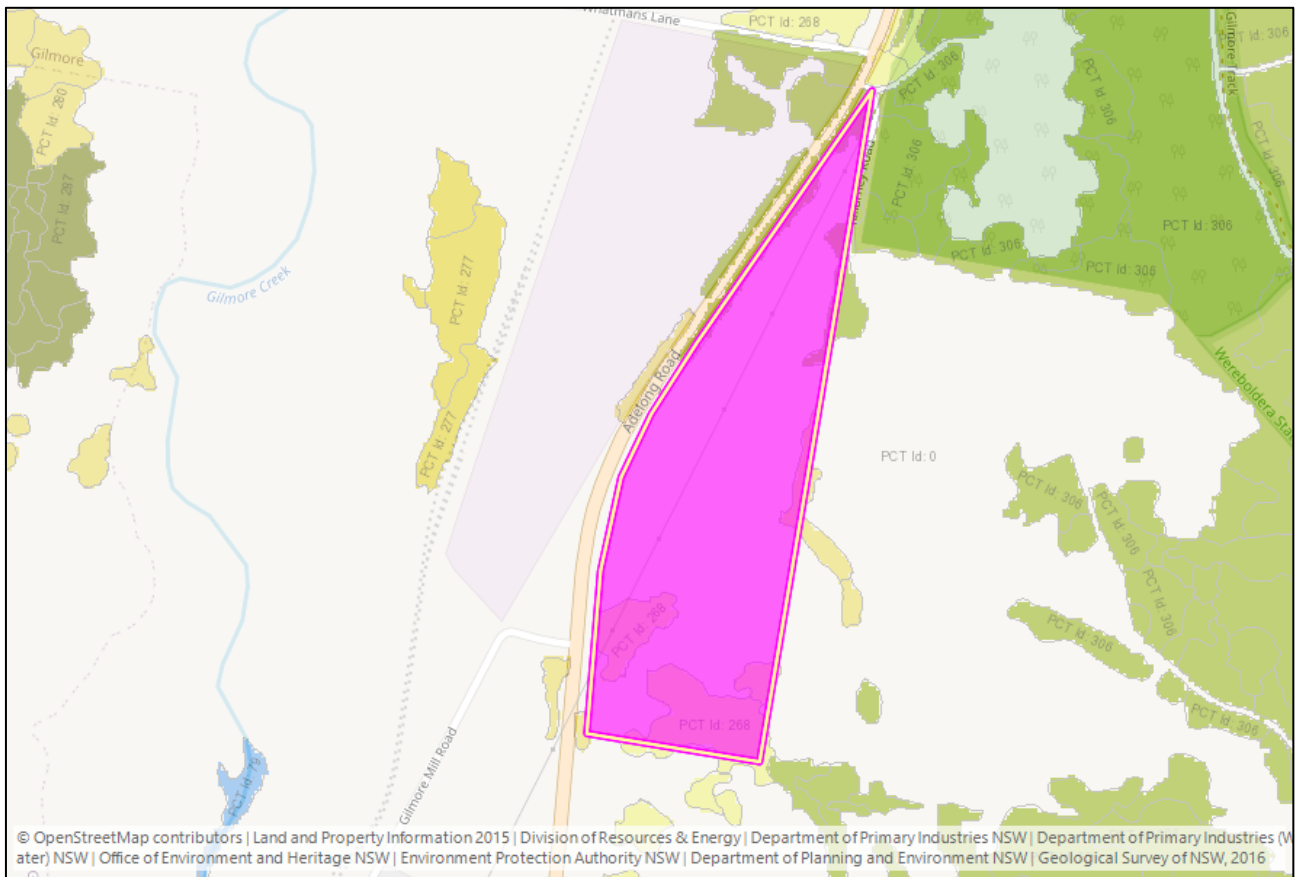


Figure E-5: SEED mapping vegetation communities on and around the proposed site

The mapping found that:

- The layer Vegetation_SVTM_RiverinaSVM_v1 at the proposed development site (the composting pad) is Not Native (PCT Id. 0)
- On the eastern side of the current TWRC, a small section of vegetation, mostly contained within Bellettes Landfill site, is identified as:
 - Vegetation Formation: Dry Sclerophyll Forests (Shrub/grass sub formation)
 - Vegetation Class: Upper Riverina Dry Sclerophyll Forests
 - PCT Id. 306: Red Box - Red Stringybark - Nortons Box hill heath shrub - tussock grass open forest of the Tumut region
- On the eastern side, a corridor of vegetation was identified as:
 - Vegetation Formation: Grassy Woodlands
 - Vegetation Class: Western Slopes Grassy Woodlands
 - PCT Id. 280: Red Stringybark - Blakelys Red Gum +/- Long-leaved Box shrub/grass hill woodland of the NSW South Western Slopes Bioregion
- On the southern upper section of the site a small patch of vegetation was identified as:
 - Vegetation Formation: Grassy Woodlands
 - Vegetation Class: Western Slopes Grassy Woodlands
 - PCT Id. 268: White Box - Blakelys Red Gum - Long-leaved Box - Nortons Box - Red Stringybark grass-shrub woodland on shallow soils on hills in the NSW South Western Slopes.

None of the identified patches of vegetation are listed as threatened under Schedule 2 in the Biodiversity Conservation Act 2016.

The sites vegetation has improved since the study in 2002 and since the construction of the TWRC, with significant planting around the operational area, as well as in the riparian area of the ephemeral creek. This is a good example of when a development and responsible management by Valmar can result in improved biodiversity values, whilst unmanaged land degrades.

Vegetation clearing

The positioning of the site has been carefully considered based on the geotechnical investigation and site assessment. The design shape, size, and access has been considered to minimise vegetation clearing and cut-and fill works, as well as to ensure appropriate and safe setbacks from boundaries, the creek and vegetation are maintained.

The proposed development will require selective tree felling. One section of river she oaks planted by Valmar in the last 10 years and a few planted natives at the creek crossing will need to be cleared for the internal access road and select trees will need to be removed from the compost pad area. In Photo 8, the orange lines indicate the areas where selective clearing will occur. These are not identified as areas of significant vegetation (schedule 2, BD Act).



Photo 8: Looking south towards the proposed site with the vegetated corridor between Bellettes and TWRC

The other identified potential flora impact, which could have cumulative impacts on fauna, is the introduction of new and/or more weeds. However, as identified, the site and surrounds already have significant weed presence and by actively managing the site and planting more natives, it is likely that the site will be improved.

Test of significance

The Department of Biodiversity and Conservation (NSW) recommended that the Threatened Species Test of Significance Guidelines be considered against the proposed development. As such, with the threatened flora and fauna assessed above, Table E-4 considers the proposed development against factors listed in schedule 4 of the BC Act 2016. The assessment applies to the footprint and design of the development and includes:

- Pre-construction, construction, and occupation phases
- All on-site and off-site impacts, including location, installation, operation, and maintenance of auxiliary infrastructure and fire management zones

- All direct and indirect impacts
- The frequency and duration of each known or likely impact/action
- The total impact which can be attributed to that action over the entire geographic area affected over time
- The sensitivity of the receiving environment
- The degree of confidence with which the impacts of the action are known and understood.

Table E-4: Assessment against key threatening processes listed in schedule 4 of the BC Act

FACTORS OF THE TEST OF SIGNIFICANCE	IMPACT OF THE PROPOSED DEVELOPMENT
<p>Adverse effects on the life cycle of species</p> <p>Applies to listed species (Schedule 1 BC Act)</p> <p><i>in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction [BC Act section 7 (1)(a)]</i></p>	<p>The proposed development will have no adverse impact on species listed in Schedule 1 of the BC Act. The life cycles of viable populations are not directly related to, dependent on, or active on the site, but rather in the adjacent state forest and conservation area. The proposed development will not risk the extinction of any species or modify any habitat.</p> <p>There have been no sightings of threatened species on the highly modified site. The vulnerable species identified in the region will be able to move through, feed, and reside on the vegetated section of the site.</p>
<p>Adverse effect on ecological communities</p> <p>Applies to endangered and critical endangered ecological communities listed under part 1 and 2 of schedule 2 in the BC Act</p> <p><i>in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:</i></p> <p><i>(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or</i></p> <p><i>(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction [BC Act section 7(1)(b)]</i></p>	<p>The site does not have any endangered or critically endangered ecological communities. No remnant native vegetation will be cleared. The proposed development will have no negative impact on the vegetation communities on or surrounding the site.</p>
<p>Adverse effects on habitats</p> <p>Applies to the habitat area used by threatened species and ecological communities on and surrounding the site.</p> <p><i>in relation to the habitat of a threatened species or ecological community:</i></p> <p><i>(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and</i></p> <p><i>(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and</i></p> <p><i>(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality</i></p>	<p>No threatened flora species or ecological communities have been recorded on or around the site.</p> <p>The two threatened fauna species previously identified on the site are both avian and may thus interact with the site as a transport corridor.</p> <p>The proposed clearing is minimal and is not expected to fragment, isolate, or significantly modify the habitat for the identified threatened fauna species. In addition, through planting of vegetation, potential habitat and corridors will be improved and maintained.</p> <p>The proposed development is therefore not expected to have an adverse effect on habitat for any threatened species or ecological community.</p>

FACTORS OF THE TEST OF SIGNIFICANCE	IMPACT OF THE PROPOSED DEVELOPMENT
<p>Adverse effects on areas of outstanding biodiversity value</p> <p>Applied to declared areas of outstanding biodiversity value (AOBVs)</p>	<p>The site is not in or within proximity to any areas of AOBV.</p>
<p>Key Threatening Processes</p> <p>Applies for processes listed in schedule 4 of the BC Act</p> <p><i>whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process [BC Act section 7(1)(e)]</i></p>	<p>Appendix N assesses the proposed development against each listed process. In summary, impacts considered include:</p> <p>Clearing and/or loss of native vegetation (habitat, dead treed, hollow tree)</p> <p>No significant native vegetation will be cleared or altered; rather vegetated corridors are likely to be improved.</p> <p>Impact on native flora and fauna by feral animals (Rabbit, goats, cat, pigs, toad, fish, honeybees, bell miners, horses, deer, red fire ants, Yellow Crazy Ant, fox, rats)</p> <p>The proposed development will not improve feral animal habitat or facilitate the spread of any invasive fauna.</p> <p>Impact on native flora and fauna by pathogens and disease (Psittacine Circoviral, chytridiomycosis, <i>Phytophthora cinnamomi</i>, Pucciniales pathogenic)</p> <p>The proposed operation is contained and managed within a footprint of the site. Specifically, leachate and water will not be able to carry pathogens and disease as the management system is closed. Further, all vehicles accessing the site will use the wash-bay prior to leaving the site and are therefore unlikely to carry any potential pathogens or diseases off-site. Also, the controlled composting process ensures no pathogens remain in the products for distribution.</p> <p>Impact of the introduction and establishment of exotic species (vines, scramblers, Scotch Broomm, African Olive, <i>Chrysanthemoides monilifera</i>, perennial grasses, escaped garden plants, including aquatic plants, lantana)</p> <p>Incoming material is actively managed on site. The controlled and monitored composting process ensures product does not contain viable seeds or tubers. The site and surrounds, where windblown seed may become established, will be actively monitored for weeds and sprayed for control.</p>

The proposed development is predicted to have a net positive effect on the flora and fauna on site.

Mitigation, management, and monitoring

The design and positioning of the site have been considered to minimise impact on vegetation and the environment. The proposed location considered the slope, minimisation of cut-and fill, and existing vegetation, to minimise clearing.

The site design has incorporated the following vegetation management techniques to improve biodiversity and stability of the land:

- Vegetated swales using native deep-rooted grasses/small bushes planted in high slope areas south of the composting pad
- Planting of native vegetation to increase the ecological value of the creek line and the western edges of the site. Specifically, around the current unofficial creek crossing that is cleared
- Regular site checks to monitor weed spread and implement spraying to manage any identified spread.

E.11 HAZARDS

E.11.1 FIRE

Description

The *Composting Guidelines 2003* objective is “To ensure that the facility is not a fire risk and that the facility is adequately prepared in the event of fire”.

The site has been zoned as bushfire prone land (BPL) under a mapping layer prepared by Council, which was certified by the commissioner for the NSW Rural Fire Service and is managed under the Planning for Bush Fire Protection (PBP) Guide (2006). The purpose of this mapping layer is to encourage sensible building design and bush fire protections measures (BPM). The layer includes 4 categories:

- Vegetation Category 1
- Vegetation Category 2
- Vegetation Category 3
- Vegetation Buffer.

The site mostly contains Vegetation Buffer and a very small section of Vegetation Category 3. There is an area zoned as Vegetation Category 1 in the upper eastern side of the valley which is 500m-1000m away from the site.

The proposed development is not a state level matter or a residential development and thus does not necessarily need to consult with RFS (Development control process for development in bush fire prone areas, PBP, pp.8). But the proposed development will still need to comply with PBP and the local LEP. Because the proposed development does not relate to buildings, the application of the Building Code of Australia and AS 3959 with a construction certificate does not apply.

Assessment

The PBP outlines six key BPM (Table F-5).

Table E-5: Assessment of the proposed development bushfire protection measures

KEY PBP BPM	ASSESSMENT OF DEVELOPMENT PERFORMANCE
The provision of clear separation of buildings and bush fire hazards, in the form of fuel reduced Asset Protection Zone (APZ) (and their subsets, inner and outer protection areas and defendable space)	<p>The vegetation formation classification is outlined in section C.2.1. The site is dominantly surrounded by grasslands on the northern, eastern, and western side of the proposed development. The sparse vegetation classed as woodland is uphill from the proposed site, on the northern side. The vegetation is uphill and thus considered to have an effective slope of 0°. The site lies within the Southern Slope Fire Area which is characterised by and Fire Danger Index (FDI) of 80.</p> <p>According to Appendix 2 (Determining Asset Protection Zones) in the PBP (2006) the northern, eastern, and western site boundaries of the proposed development do not need to consider a setback for the asset protection zone. The northern boundary will require a setback of 10 meters.</p>
Construction standards and design	<p>Site infrastructure needs to comply with AS 3959 which relates to building design in a bush fire prone area. This does not apply for any building constructed 100m or more from a bush fire hazard.</p> <p>According to Appendix 3 (Site Bush Fire Attack Assessment) in the PBP (2006), the only building on site will be a shed in the north-eastern corner of the site, which is 100m away from the zoned Vegetation Buffer of the BPL. With minimal exposure to radiant heat and flame due to this distance, there are no construction requirements under AS 3959.</p>
Appropriate access standards for residents, fire fighters, emergency service workers and those involved in evacuation	<p>The main access road to the site is along the eastern boundary. However, there is an existing unofficial road directly to the west, as well as another across the middle section of the site and one to the south. As the site is pastureland with a generally flat surface and little vegetation, it is possible to access the site from all directions and also gain safe exit to the highway at several points along the western border of the site.</p>
Adequate water supply and pressure	<p>The leachate dam will be fitted with a pump for reticulation for compost operations. This pump will also be able to be used to put out fires, especially if started on site. A fire hose will be able to be fitted to this system.</p>
Emergency management arrangements for fire protection and/or evacuation	<p>The management of evacuation arrangement will be included in the operational manual of the composting facility.</p>
Suitable landscaping, to limit fire spreading to a building.	<p>The site is located on a section of land which is surrounded mostly by grassland, which should limit radiant heat and flame impingement, especially to the shed. This also provides significant defendable space.</p> <p>In accordance with Appendix 5 (Landscaping and Property Maintenance) in the PBP (2006) The planned planting for screening and improvement of ecological values for the riparian section will consider choice of plant that don't generate excessive leaf litter and debris and have fire retardant characteristics.</p> <p>The tree vegetation on the eastern and southern side will be beneficial as windbreaks.</p>

Whilst a section of the land is zoned as BPL, it only includes the lower risk categories (Vegetation Category 3 and Vegetation Buffer) and only covers the southern section of the site. As such, the proposed development will occur outside the actual mapped risk. Nevertheless, several BPM has been considered in the design and operation.

Mitigation, management, and monitoring

Key management and mitigation measures include:

- Positioning of the site on cleared grassland with the shed more than 100m away from woodland and the BFL zone
- A fire hose and pump on site to put out fires started on site
- Firefighting vehicular access from both north and south, and maintenance of access to the highway along the eastern boundary
- Consideration of fire-retardant characteristics and expected leaf litter dropping for all plants chosen for landscaping
- Maintaining a vegetation buffer around site infrastructure (i.e. shed).

E.11.2 FLOODING

Description

Flooding can be a hazard if either the proposed development impacts flood liability of surrounding land by changes to the land, as well as if the site is vulnerable for inundation from flooding. The risk of flooding to and from the proposed development may be caused by:

- Increased run-off and therefore increased flow into the stream
- Flash flooding from a high rainfall event and a swelling of the ephemeral creek over the site
- Occupation (e.g. through works such as construction fill or embankments or bridge piers or culverts, and the like) of flood flow paths can change the flooding pattern upstream and downstream.

Figure E-6 shows the site is located in the Gilmore Creek catchment, approximately 5 km upstream of the Tumut River. The site is not flood prone from Gilmore Creek or the Tumut River, but an un-named tributary (known locally as Killarney Creek) drains a small, largely wooded catchment. The creek runs across the site from east to west, before passing under the highway, through the wood mill, and joining with Gilmore Creek at Whatmans Lane.

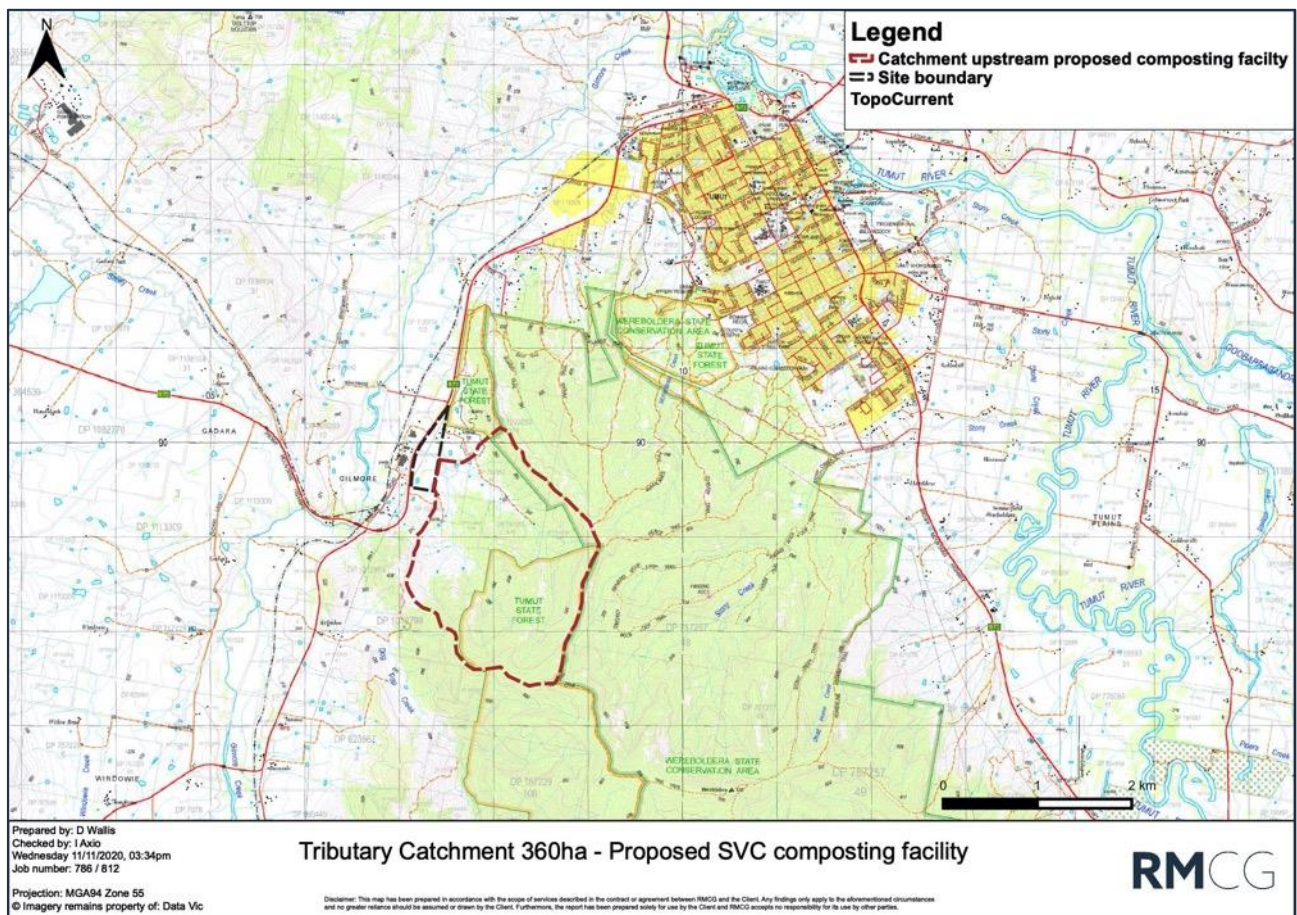


Figure E-6: Topographical map of the town area showing the site of the compost facility and the catchment of the creek that runs through the site

For this proposal, the works on the site may have flooding impacts, if:

- Leachate dam water is mixed with flood water and taken downstream
- Material on site comes into contact with flood water and is taken downstream
- Embankments or other obstructions occupy significant volumes of floodplain storage or divert floodwaters from their natural path
- Humans are crossing the creek from north to south when the creek is in flood.

The Biodiversity Conservation Department provided specific guidance for assessing flooding impacts in their SEARs response and outlined requirements for:

- Mapping:
 - Flood prone land
 - Flood planning area
 - Hydraulic categorisation
 - Flood Hazards
- Model consideration of:
 - 1% and 5% AEP flood levels and climate change impacts
 - Existing flood studies
 - Maximum flood
 - Existing Council flood studies in the area and examination the consistency of the flood behaviour documented in these studies

- The impact on existing flood behaviour for a full range of flood events including up to the probable maximum flood.
- Impacts of the development on flood behaviour resulting in detrimental changes in potential flood affection of other developments or land. This may include redirection of flow, flow velocities, flood levels, hazards, and hydraulic categories.

Assessment

The proposed site and associated waterway are not zoned under the Flood Planning mapping layer of the Tumut LEP, which identifies only that central area of Tumut, more than 5km away.

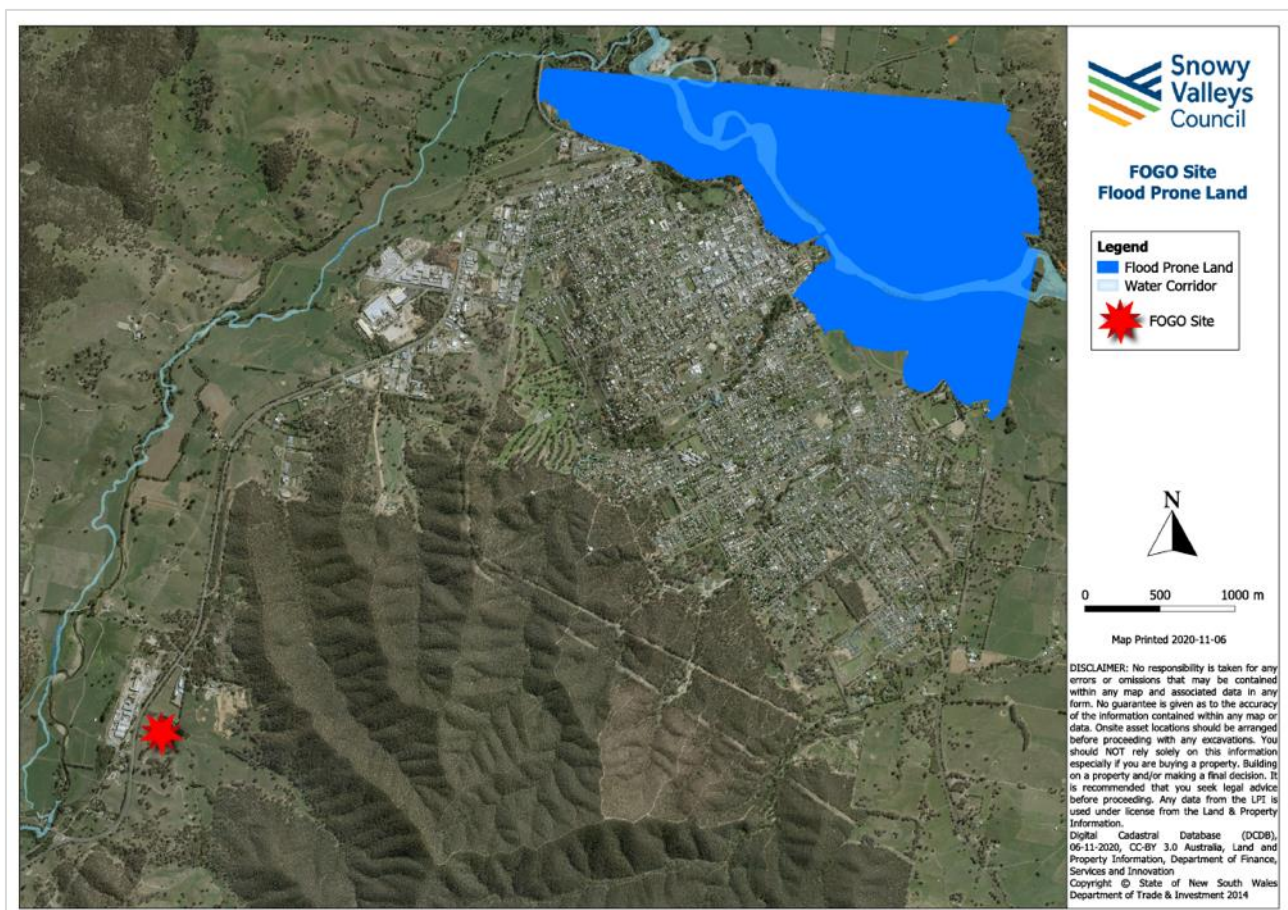
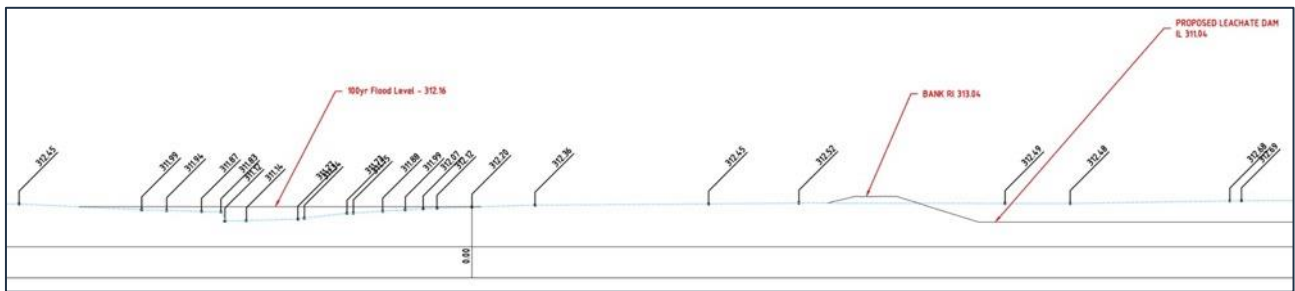


Figure E-7: Mapping of Flood Prone Land in the Tumut region, in relation to the proposed development site

The ephemeral creek hydraulic flow has been modelled by the engineering department of SVC using the HEC-RAS⁹ program. The model used a Probabilistic Rational Method applied to 3.65km² catchment, under a 46.5mm/h rainfall event, and with a runoff coefficient of 0.336. The results from a 100yr flood (Annual Recurrence Interval = 1%) was a flow of 15.9m³/s. Reference to IFD curves are presented in Section C.2.5.

The model used a worst-case scenario where the culvert at the Snowy Mountains Highway was assumed to be blocked. The results are produced for a time of concentration of 75min. The resultant flood level is shown in the cross section in Figure E-8. Further details of the 100yr flood estimation are contained on Council Drawing No 14-03-004 (Figure F-9).

⁹ <https://www.hec.usace.army.mil/software/hecras/>



In consideration of climate change impact resulting in more intense rainfall events, a flow of 25m³/s was also modelled. Both scenarios show that the footprint of the site will remain un-impacted. A flow of 15.9m³/s reached RL 312.16 and a flow of 25m³/s increases that to RL 312.2, but all the works, except the causeway are above this at RL.

Additionally, the ephemeral creek on the site has been significantly revegetated in the last 10 years since Valmar and the SVC commenced management of the site. Diverse vegetation obstructs water flow and provides a physical soil structure which facilitates increased infiltration and water holding capacity. In turn, this slows down peak flow, minimising downstream effects.

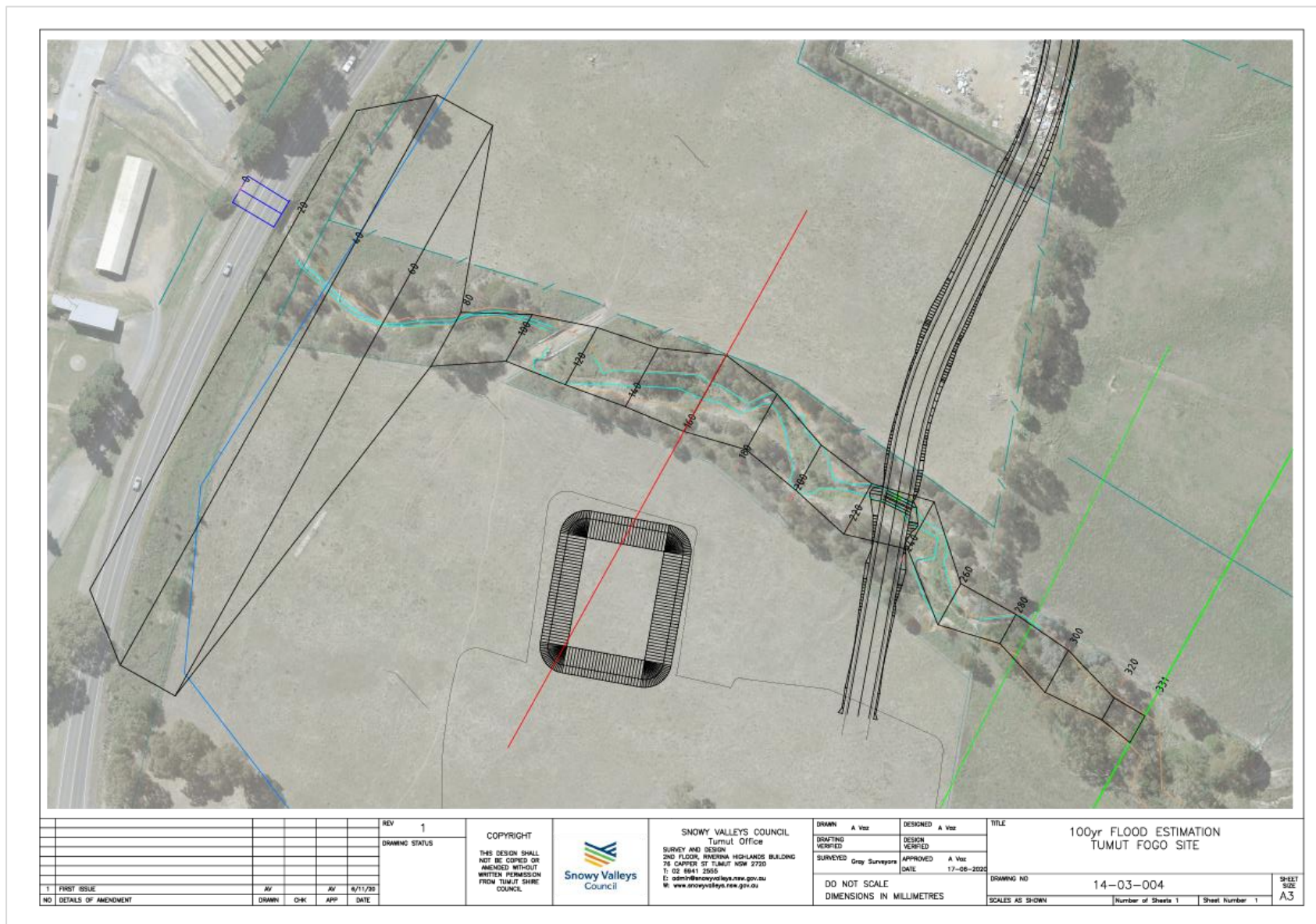


Figure E-9: Simple flooding map of the Killarney Creek in a 100yr flood worst case scenario where the culvert at the highway is blocked

Table E-6: Flooding assessment against SEARs requirements

SEARS IMPACTS FOR ASSESSMENT	PROPOSALS JUSTIFICATION
Whether there will be detrimental increases in the potential flood affectation of other properties, assets, and infrastructure.	<p>The proposed development will not impact the flooding behaviours of the ephemeral creek, or impact other properties, assets, and infrastructure because:</p> <ul style="list-style-type: none"> ▪ It will manage stormwater to not increase run-off into the creek ▪ It will manage onsite leachate within the site footprint and have a sufficient dam capacity. ▪ It will not disturb the creek line or riparian area but rather maintain setbacks and improve vegetation within and around this area to improve infiltration of the catchment and stream flow. ▪ Potential impacts of the proposed development in relation to surface water flow around the site and how they will be managed is outlined in section E.2.1. Further, surface water generated within the footprint of the site is considered leachate and management of this aspect is out lined in section E.2.3.
Consistency with Council Floodplain Risk Management Plans.	<p>The land is not zoned or in proximity to land zoned as flood prone and does not incorporate any flood plains (area of land subject to inundation).</p> <p>The SVC have a 2018 floodplain risk management study and plan for Adelong Creek, of which the site and Gilmore Creek are not included.</p>
Consistency with any Rural Floodplain Management Plans.	There are no specific Rural Floodplain Management Plans applicable to or in close proximity to the property
Compatibility with the flood hazard of the land.	There is no flood hazard on the land. Hydraulic flow modelling shows that extreme rainfall events are contained within the creek channel and lower floodplain terrace.
Compatibility with the hydraulic functions of flow conveyance in floodway's and storage in flood storage areas of the land.	<p>The creek is ephemeral and is fed by a 3.65km², well vegetated catchment. The runoff coefficient is 0.336.</p> <p>The creek channel (bank to bank) is approximately 10m. An additional riparian area is well vegetated, excluded from site uses and maintained as a flood storage area.</p>
Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site.	<p>The proposed development will not impact the flow or inundation capacity of the floodplain, on, adjacent to, or downstream of the site long term.</p> <p>The construction of the road to the site will involve crossing over a culvert. Because of the decreased friction within the culvert, the speed of flow could temporarily increase. Council have a proven ability to improve vegetation and will continue to revegetate and preserve the creek vegetation.</p> <p>The site's closest set back from the riparian area is 18m and 32m to the top of the bank.</p>
Whether there will be direct or indirect increases in erosion, siltation, or destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses.	The proposed development will not directly increase erosion, siltation, destruction of riparian vegetation, or bank stability. The proposed development will have a minimal and managed impact on a small section of the creek where the road will cross. This will be offset by increased protection of the surrounding riparian area on site and by the revegetation of the unofficial crossing that has existed off site closer to the highway (see Photo 7).
Any impacts the development may have upon existing community emergency	The proposed development will not increase flooding or associated risk.

SEARS IMPACTS FOR ASSESSMENT	PROPOSALS JUSTIFICATION
management arrangements for flooding. These matters are to be discussed with the SES and Council.	
Whether the proposal incorporates specific measures to manage risk to life from flood. These matters are to be discussed with the SES and Council.	Risk on site will be managed through informed operation. In the case of access road inundation, the operations will cease temporarily.
Emergency management, evacuation and access, and contingency measures for the development considering the full range of flood risk (based upon the probable maximum flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of Council and the SES.	<p>The site can be accessed and exited in the south, east, or west should staff become trapped on-site. SES will be invited to review the Operational and Environmental Management Plan.</p> <p>Traffic signs will be installed on the track into the site to indicate "Road subject to inundation" and water level gauges will be installed to indicate to drivers the depth of flooding.</p>
Any impacts the development may have on the social and economic costs to the community as consequence of flooding.	None.

Mitigation, management, and monitoring

Key mitigation and management strategies include:

- Vegetation retention and revegetation around riparian area and bunds.

E.11.3 OTHER

Description

The EIS Guidelines (DUAP 1996) suggest that a preliminary hazard analysis (PHA) should be considered where fire, explosion, or release of chemical substances may occur. Fire management is addressed in E.11.1 and landslides and slips and high rainfall are addressed in the soil (E.3) and water (E.2) sections.

Assessment

To evaluate the need for a PHA, the screening assessment procedures identified in Applying SEPP 33 (*Department of Planning 1995*) have been considered. Section 2 of the SEPP 33 outlines 3 criteria to consider, as outlined in Table F-7.

Table E-7: Preliminary risk screening assessment

CRITERIA	EXPLANATION	JUSTIFICATION
Does the proposal require development consent or approval under Part 3A or Part 4 of the EP&A Act?	Part 3A of the EP&A Act refers to state significant development (SSD) and State significant infrastructure (SSI). Part 4 refers to if the proposal will need development consent from a consent authority. The proposal is not SSD or SSI but will require consent from a consent authority.	The proposal will require consent but the impact assessment of potentially offensive impact on air and water is included in this EIS and comply with the environmental requirement in the Composting Guidelines 2003.
Is the proposal a 'potentially hazardous industry'?	The screening process to establish if the proposal is a hazardous industry considers quantity of dangerous good involved and the distance of these materials from the site boundary. Appendix 3 in the SEPP 33 includes a list of industries that may be "potentially hazardous". The proposed operation will store motor vehicle oil, grease, and diesel. None of these are included in the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code).	The proposed operations are not included in the List in Appendix 3 in the SEPP 33. The proposed operation will not store any dangerous goods on site. The proposed operation is not considered a potentially hazardous industry.
Is the proposal a 'potentially offensive industry'?	SEPP appendix 3 list industries that may be potentially offensive. This includes processing of waste and its potential impact on air and water. Figure 1 in the EIS guidelines for composting and related facilities outlines that if a proposal is potentially offensive, consultation with the EPA and consent authority should investigate if a pollution control licence can be obtained.	The proposed development may be potentially offensive to air and water. However, this EIS has outlined the management and mitigation measures needed to assess a pollution control licence.

The proposed construction and design are not considered hazardous.

E.12 HERITAGE

Description

This site sits within an area of Minjary Hills and Ranges and Tumut Channels and Floodplains soil landscapes. This area was historically abundant with avian, terrestrial, and aquatic flora and fauna which would have been used by the Aboriginal inhabitants in a variety of ways including fibres woven into nets, baskets, and fishing lines, bark used for shelter, and edible plants and animals for nourishing food. The region would have been fully occupied, particularly around the creek and river valley systems.

Since European settlement, the region has been primarily pastoral and the site would have been completely cleared in the 1900's but the creek line remains unmodified, except for vegetation removal. The cleared landscape is likely to have been significantly impacted by fluvial processes over time.

The BCD SEARs response outlined that the EIS must identify and describe the Aboriginal cultural heritage value in accordance with the *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW* (OEH 2010), and should be guided by the *Guide in investigating, assessing, and reporting on Aboriginal Cultural Heritage in NSW* (DECCW 2011). Further, if Aboriginal cultural heritage values are identified, consultation with Aboriginal people must be undertaken and documented in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW).

Assessment

Biosis Pty Ltd aboriginal heritage team conducted an Aboriginal Cultural Heritage Assessment (ACHA) (Appendix O) which included:

- A search of the Aboriginal Heritage Information Management System (AHIMS) database which identified sites within a 20km by 20km area. None were identified on the site.
- Aboriginal community consultation which included close collaboration and communication with Brungle Tumut Local Aboriginal Land Council (BTLALC) who also attended the field investigation and excavations
- Field investigation including archaeological survey in conjunction with BTLALC (see Figure E-10)
- Test excavation to determine whether archaeological deposits exist at the site/in the region. The extent of the test pits are noted in Figure E-11. The test excavations resulted in the identification of three previously unrecorded Aboriginal sites (Gilmore-AD-01, AHIMS #pending, Gilmore-AD-02, AHIMS #pending, and Gilmore-AD-03, AHIMS #pending).

The archaeological site assessment, test excavations, and consultation were performed in accordance with:

- Practice for Archaeological Investigations of Aboriginal Objects in NSW (OEH 2010)
- Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (DECCW 2011)
- The Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW 2010b).

For participation in the consultation, known Aboriginal organisations were contacted directly and an advertisement was placed in Tumut and Adelong Times newspapers. Nine organisations registered their interest in being involved.

Table E-8: Registered organisation from the ACHA engagement call-out.

NO.	ORGANISATION	CONTACT PERSON
1	Brungle/Tumut Local Aboriginal Land Council (LALC)	Sue Bulger
2	Snowy Mountains Indigenous Elders Group	Lindsay Connolly
3	Alice Williams	-
4	Murra Bidgee Mullangari Aboriginal Corporation	Darlene Johnson
5	Gulgunya Ngungawal Heritage Aboriginal Consultancy	Glen Freeman
6	Merrigarn	Shaun Carroll
7	Jesse Johnson	-
8	Mathew Marlow	-
9	Oak Hill Enterprises	Sonia Shea

Information from the consultation guided the archaeological investigation, for example, identifying specific areas (riparian/crest) and items (trees).

The site investigation identified that the site contained areas of low, moderate, and high archaeological potential (Figure E-10).

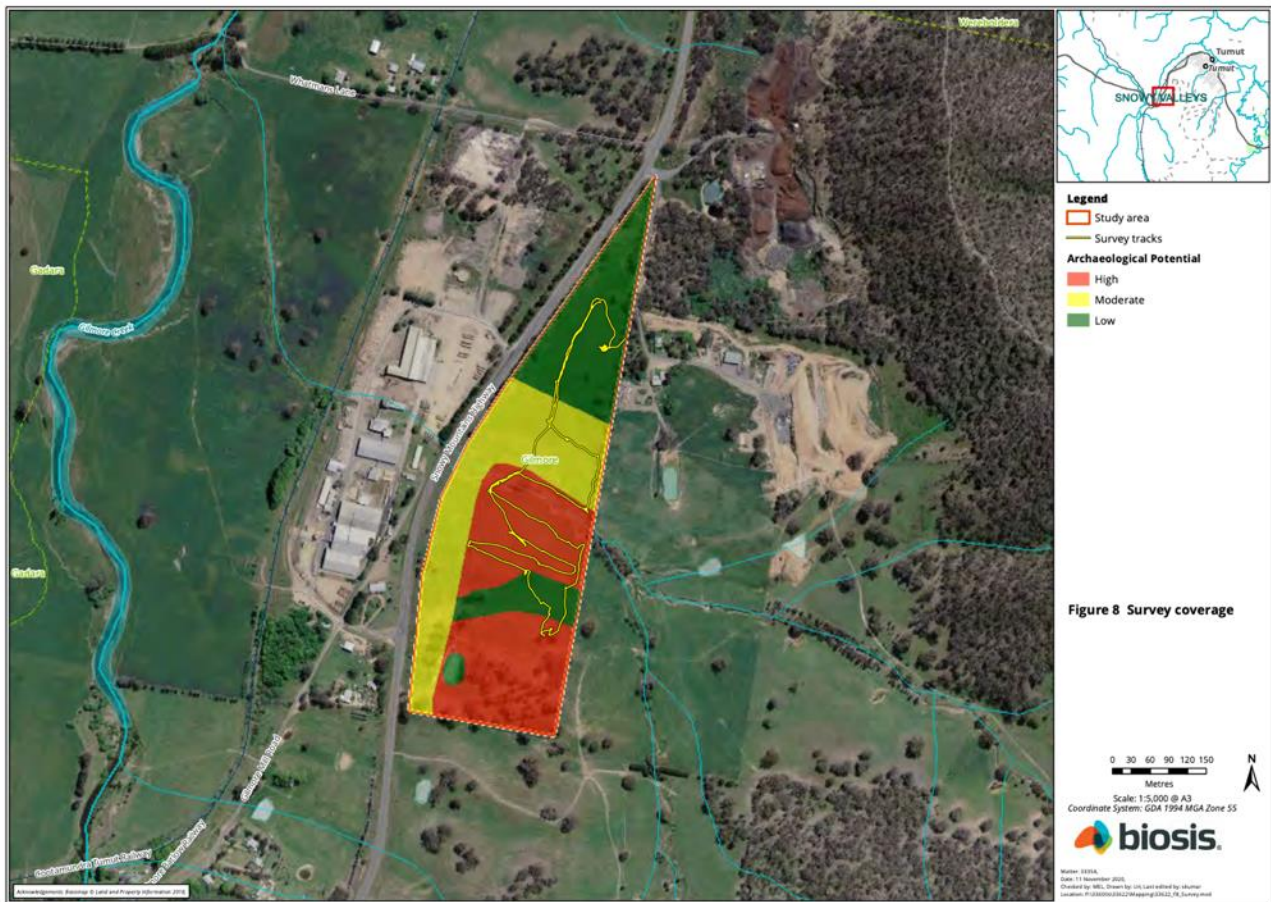


Figure E-10: Archaeological survey results with low, medium, and high archaeological potential identified

The excavation findings were assessed against scientific values and historical, aesthetic, social, and scientific significance. The assessment found that:

- Gilmore-AD-01 artefact may have been deposited by colluvial processes and not in situ. The significance of this site has therefore been assessed as low.
- Gilmore AD 02 has low significance and poor, disturbed conditions
- Gilmore-AD-03 has low scientific research potential but extends along the crest landform which may contain higher density of artefacts and is therefore assessed to be moderately significant.

The impact assessment concluded that:

- Gilmore-AD-01 would experience no harm
- Gilmore AD 02 harm would be direct and total with a result of total loss of value
- Gilmore-AD-03 harm would be direct and partial of total loss of value.

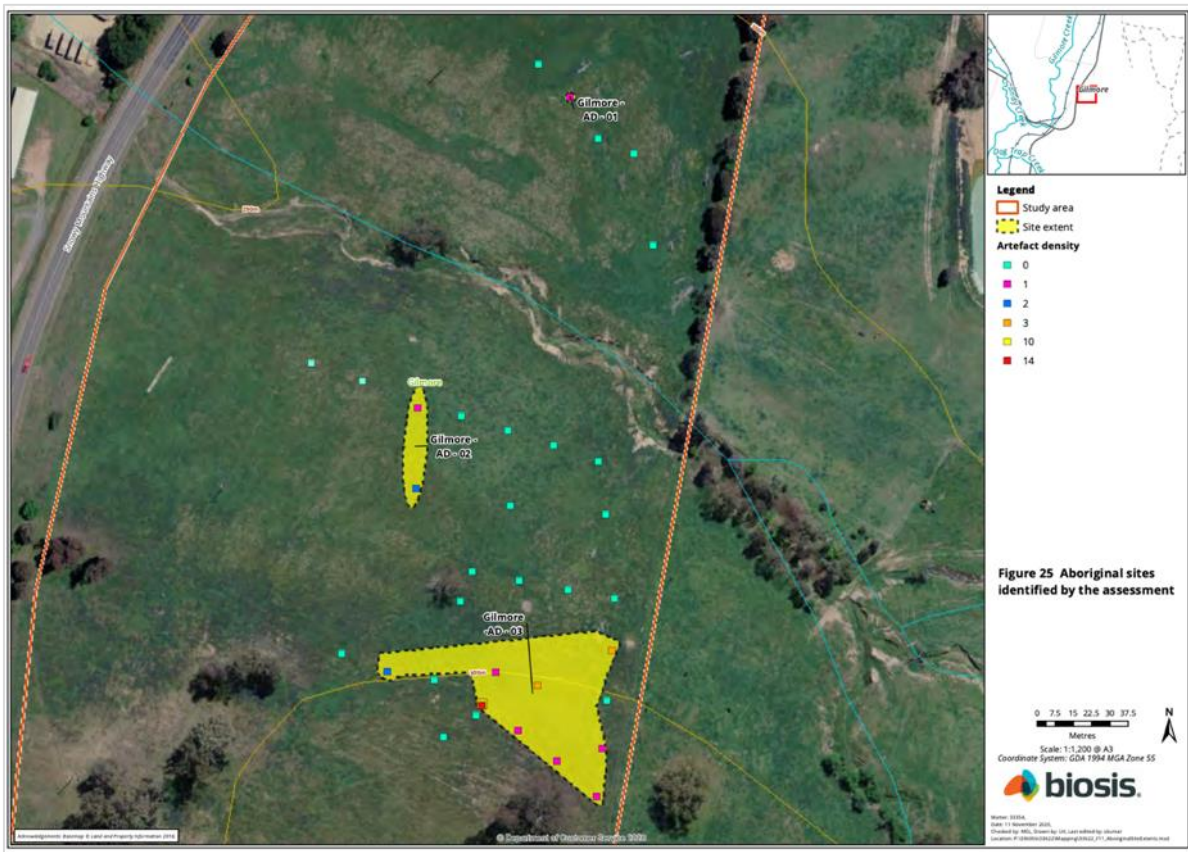


Figure E-11: Identification of aboriginal sites with test excavations notes as squares

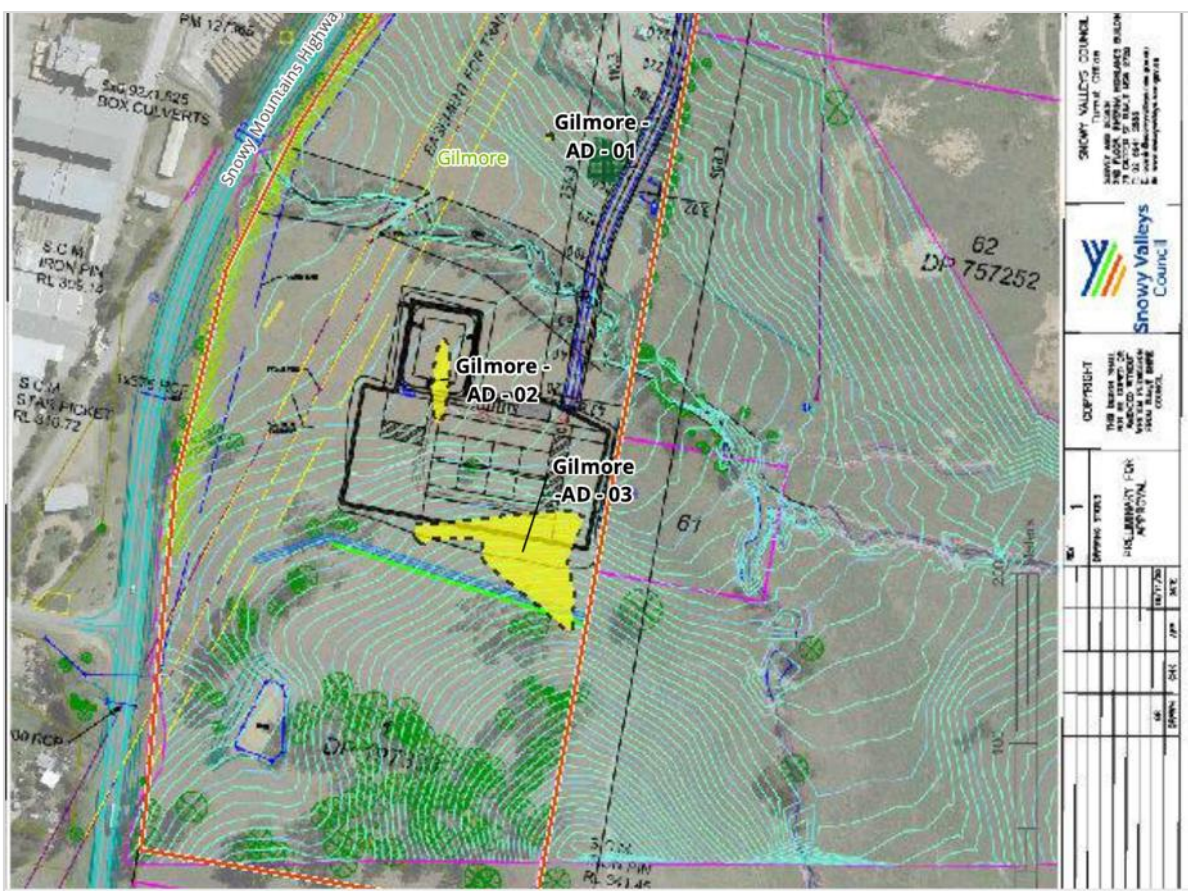


Figure E-12: Identification of aboriginal sites with test excavations with proposed site layout overlay

The sites footprint cannot be moved because of the setback required for the powerlines, riparian area, and boundary. As such, the proposed development will result in the total loss of Gilmore-AD-02 and a portion of Gilmore-AD-03. However, the assessment found Gilmore-AD-02 to have low value and Gilmore-AD-03 to have moderate value. By implementing the mitigation measures below, the impact will be minimised and, according to the AHIMS and SEARs recommendation, an AHIP will be required.

Mitigation

The proposed development includes the protection and natural improvement of much of the site. The loss of the archaeological artefacts and associated cultural, historical, and social impacts will be mitigated by implementing the AHIMS recommended actions, which includes:

1. Application of and Application for an Aboriginal Heritage Impact Permit (AHIP) for Gilmore-AD- 02, AHIMS #pending, and part of Gilmore-AD-03
2. Fencing of Gilmore-AD-01, AHIMS #pending, part of Gilmore-AD-03, and the southern extent of proposed works.
3. If during constructions, the discovery of:
 - a. **Unanticipated Aboriginal Objects** are encountered, works will cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object, the archaeologist will provide further recommendations. These may include notifying Heritage NSW and Aboriginal stakeholders.
 - b. **Unanticipated Historical Relics** are encountered, they will not be disturbed except with a permit or exception/exemption notification. Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic.
 - c. **Aboriginal Ancestral Remains** are discovered during any activity, SVC will:
 - i. Immediately cease all work at that location and not further move or disturb the remains.
 - ii. Notify the NSW Police and Heritage NSW Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
 - iii. Not recommence work at that location unless authorised in writing by Heritage NSW.
4. Continued consultation with the registered Aboriginal parties (RAP) about the management of Aboriginal cultural heritage sites within the study area throughout the life of the project.

E.13 ECONOMIC

Significant economic and financial analysis has been conducted for the proposed development. Further, cost-benefit and multi-criteria analysis of three options have been completed.

Currently, no FOGO material is collected or processed in the SVC and current self-haul green waste is managed both environmentally and financially poorly. Green waste can be disposed of and collected by community members free-of-charge. The SVC manages and chips the material every three years by a contracted mulcher at an estimated annual cost of \$71,659. It provides no real diversion from landfill, nor does it generate a commercial product or increase jobs or services to the community.

The proposed development Capex was calculated at \$1.95M in January 2020 and Council was granted EPA OILS funding of \$955,094 to establish the site. A 15-year financial analysis was completed for three organics diversion options (see multi-criteria analysis s. B.7), identifying that the proposed option was the most costly but also the most lucrative. Financial risk modelling explored variable compost prices, bin flip costs, and 10% and 30% contingencies and found the proposed option to be robust and turning a profit in year 5 to 7,

depending on the contingencies. The revenue generation from the sale of compost is budgeted reservedly to be \$140,115 pa but scenarios suggest figures around \$450,000 pa could be possible. Further, concrete savings from landfill avoidance and green waste processing is estimated at \$292,088 pa and other benefits are estimated at \$73,546 pa.

Additional to the viability of the proposed operations, it is considered as an exercise in building economic resilience towards regional landfilling gate fees, state and national future waste management requirements, and transportation costs. Further, the proposed development also considers the local and regional economic benefits of job creation, both temporary (construction) and ongoing (management). Finally, establishing a local provider of affordable compost to the agricultural sector was considered beneficial after initial conversations with the sector found great interest but poor access.

C O S T

Operational costs for this option include staffing of the composting facility, loader use, electricity use for MAF, maintenance of equipment, monitoring and testing of product, chipping and shredding of green waste, and the increased cost associated with increased collection frequencies. This option has also included a part time education officer to provide increased education and engagement. This role is only funded in the first year of operations.

Capital expenditure includes the purchase of a loader, construction of a composting site (with associated approvals costs) and infrastructure required for the introduction of a FOGO bin. The capital expenditure will be \$2,944,254.

* The total cost over 15 years is \$13,879,158.

I N C O M E

Grant income has the potential to be \$405,242 for the FOGO bin infrastructure and \$955,064 for the construction of the composting facility (both granted in January 2020 from EPA NSW OILS program). Revenue (waste charge increase) is estimated at \$655,745 pa. The cost saved from avoiding landfill charges for organic material has the potential to be \$220,429 pa. Compost sales at \$35/tonne can generate \$51,189 pa.

* The 15-year accumulative income would be \$19,803,420.

E.14 CUMULATIVE

The proposed development has been designed to process and manage Council collected and generated FOGO and green waste. Therefore, it does not compete with other established processors or markets.

The location of the site is within an area of high intensity industries. Specifically, the neighbouring waste transfer station, landfill, and timber yard are the focus for potential cumulative environmental impacts considering water, air quality, noise or traffic disturbance, public health, visual impacts, or loss of heritage items, vegetation, and fauna habitat. TWRC has operated for 10 years with an improved result to many of those aspects. Bellettes landfill has recently applied for an extension of their operations, and the detailed accompanying assessment demonstrates their commitment to sustainable management, as well as a proven track record. Whilst there is a low risk of negatable impacts on water, air quality, and soil, they are unlikely to be cumulative over time and space with the proposed monitoring and management operations.

In the context of the setting, the proposed development is likely to improve vegetation and fauna habitat and effectively monitor and manage other risks. Considering the site's location and options for alternate use, the proposed development is well matched to current land uses but still carefully considers the sensitive receptors.

F. List of approvals and licences

F.1 DEVELOPMENT APPROVAL

The development site is zoned as RU1 under the Tumut Local Environment Plan which permits the development of rural industries including “Composting facilities or works” with consent.

F.1.1 DESIGNATED DEVELOPMENT

EPA Regulations 2000 - Schedule 3/Part 1/Clause 13 classifies composting facilities or works as ‘designated development’ by virtue of the fact that Clause 13(a) and 13(b)(i) declare that composting facilities or works that receive over 5,000 tpa of organic waste are designated development.

As such, the development application must be accompanied by an Environmental Impact Statement (in accordance with with Clause 4.12(8) of the EPA Act 1979, which will need to comply with Composting and Related Facilities EIS Guidelines (DUAP 1996). An EIS for designated development must be prepared in accordance with the Planning Secretary’s Environmental Assessment Requirements (SEARs) which was sought from DPIE.

F.1.2 INTEGRATED DEVELOPMENT

EP&A Act (1979), Part 4 (DIV 4.8) defines a development as integrated development (not being state significant development or complying development) that, in order for it to be carried out, requires development consent and approval under the POEO Act.

The proposed development constitutes integrated development by virtue of the fact that the development operations require an EPL (see F.2).

The consent authority (the Snowy Valleys Council) will need to gain approval from approval authority (EPA) to approve the development application.

F.2 LICENCING

The POEO Act specifies that an operation requires an environmental protection license (EPL) if it is a scheduled activity. Composting is triggered as a scheduled activity in schedule 1 if it has more than 200 tonnes of organics on site at any one time, or if it receives more than 5,000 tonnes per annum on non-putrescible organics.

As such, the proposed composting facility will need to gain a licence under *Protection of the Environment Operations Act 1997 section 43 (b), 48, & 55*.

43 (b) to authorise the carrying out of scheduled activities at any premises, as required under section 48.

Licensing requirements—scheduled activities (premises-based)

(1) Application of section This section applies to scheduled activities where Schedule 1 indicates that a licence is required for premises at which the activity is carried on.

(Schedule 1 defines composting as a scheduled activity)

55 Grant or refusal of application -

(1) The appropriate regulatory authority may grant or refuse an application for the issue or transfer of a licence. An application is granted by the issue or transfer of the licence concerned.

(2) The appropriate regulatory authority must not refuse such an application unless before doing so —

(a) it has given notice to the applicant that it intends to do so, and

(b) it has specified in that notice the reasons for its intention to do so, and

(c) it has given the applicant a reasonable opportunity to make submissions in relation to the matter, and

(d) it has taken into consideration any such submissions by the applicant.

F.3 COMPOST QUALITY ASSURANCE

The compost product/s will need to be comply with conditions outlined in the Australian Standard (AS-4454).

G. Compilation of mitigation measures

Table G-1: Mitigation, monitoring and management commitments for environmental impacts identified in this assessment.

ENVIRONMENTAL IMPACT	MITIGATION, MONITORING, AND MANAGEMENT COMMITMENT
Air quality: odour and particulate matter	<ul style="list-style-type: none"> ▪ Construction will not occur during high winds ▪ Water spraying will be implemented if conditions require it during a certain construction phase ▪ As soon as the pad and dam are constructed, the area will be seeded with grass and bush and tree planting will occur where suitable (i.e. outside compacted areas). ▪ The internal access road will be constructed of gravel ▪ High use areas, receiving and screening pad, will be concreted ▪ Watering of compost piles will occur if compost piles become too dry ▪ Flipping will be limited in windy and dry conditions ▪ Maximum current vegetation (grass, bush, and trees) will be retained on the site ▪ Composting processes as defined in B.4.1 will be adhered to ▪ Feedstock will be constant and blended to ensure right C:N ratio ▪ Moisture and temperature will be monitored and managed with aeration and rearticulation ▪ Forced aeration technology will be used ▪ A vegetation corridor along the Snowy Mountains Highway will be planted as a barrier ▪ It is understood that pre-processed GO, screened mulch, and ground oversize material will be utilised as a cover through the different composting stages. The protocol for the utilisation of this cover will need to be aligned with the following objectives: <ul style="list-style-type: none"> - The pre-processed material is of a mature quality (i.e. 12 weeks from a particle size reduction process such as grinding or shredding) - The mature material is to be applied at a minimum thickness of 300mm at each stage of the composting process - This material is to be applied as part of the first four weeks of the composting process (as a minimum) i.e. Stage 0 and Stage 1 ▪ The blending, forming and transfer of feedstock stockpiles and composting windrows will be performed under the following conditions: <ul style="list-style-type: none"> - Day-time hours - More than two days after a rainfall event - With active aeration. ▪ The application of moisture control will occur under the following protocol: <ul style="list-style-type: none"> - Treatment will only occur with quality leachate/potable water - If a sprinkler delivery system is utilised, treated quality leachate should be used during calm to light (< 4 m/s) winds, with higher wind speeds avoided ▪ Temperature and oxygen will be monitored and logged daily for all active windrows to determine turning frequency and to ensure optimum composting conditions are maintained. This will minimise/prevent the formation of anaerobic pockets/conditions and elevated levels of odour (particularly during a turning event) ▪ The leachate dam water quality will be monitored monthly for key wastewater parameters (e.g. pH, BOD5, COD, ammonia/nitrogen). If it is found that the leachate dam cannot be operated sustainably in a condition that minimises the risk of elevated levels of odour, provisions will be made for the implementation of a suitably sized aerator to manage oxygen demand levels

ENVIRONMENTAL IMPACT	MITIGATION, MONITORING, AND MANAGEMENT COMMITMENT
	<ul style="list-style-type: none"> ▪ A wind-break will be planted as soon as practicable to establish a vegetative barrier surrounding the facility. The windbreak will be comprised of species that will provide sufficient height, thickness, and width within a reasonable timeframe to reduce wind speed at the site and aid odour dispersion in the plume pathway. This is considered to be a medium to long-term odour management strategy ▪ A site-specific odour management plan (OMP) is to be developed and implemented as part of an overarching Environmental Management Plan (EMP) to reflect the proposed operational practices and odour control strategy at the Proposed Facility. The OMP is a 'live' document and an administrative-based control that outlines how the Proposed Facility will eliminate, prevent, or minimise the potential for odour generation from its composting activities. Its implementation will be consistent with industry best practice ▪ An on-site, air-quality grade meteorological station, to validate complaints and for future air quality assessments (if required), will be installed and sited to applicable Australian Standards including: <ul style="list-style-type: none"> - AS/NZS 3580.1.1 – <i>Methods for sampling and analysis of ambient air, Part 1.1: Guide to siting air monitoring equipment</i>, - AS/NZS3580.14–<i>Methods for sampling and analysis of ambient air, Part 14: Meteorological monitoring for ambient air quality monitoring applications</i>; and ▪ Within six to twelve months of commencement of operations, the Proposed Facility will undertake an audit of site odour emissions and management practices to validate the source inputs used in the dispersion modelling and determine the effectiveness of the implemented management practices.
Water: Surface water, groundwater, and leachate	<ul style="list-style-type: none"> ▪ The maximum amount of vegetation will be retained on site: only the grassed area and a few small trees within the compost pad footprint will be cleared ▪ Bunds will surround the composting site footprint and be seeded with grass ▪ Cut-off drains will manage surface water high flow ▪ Sediment traps will capture particulate matter from very high rainfall events ▪ Bunds, drains, and traps will be regularly monitored and maintained ▪ Planting on site will include increasing trees around the riparian area, a screen towards the highway and potentially around the high gradient slope in the middle of the site ▪ Sampling of groundwater (lysimeter or bore) will occur at regular intervals; more intensive in the beginning of the operation of the facility and relaxed if no seasonal effects are demonstrated ▪ The installation of 2 groundwater monitoring bores on the northern lower hydraulic gradient: one on the eastern point as the gully enters the site and one on the western lowest point as the gully exits the site ▪ A low-permeable compost pad will be constructed as a barrier for seepage including a drainage layer that collects all on-site leachate and directs it to a leachate dam ▪ Construct, in accordance with <i>The Composting Guidelines Section 5</i>, of a dam, with suitable impermeability and gradient to collect leachate and that maintains at a minimum of 1 meter freeboard and that can collect leachate generated from a 1 in 10-year rainfall event (95.9 mm/24 hour scenario) which equates to 1.1ML for a 11,654m² collection area ▪ Reticulation pump system to manage dam fullness as well as moisture content in compost ▪ Monitoring of leachate parameters according to required intervals: more intensive in the beginning of operation of the facility and relaxed if no seasonal effects are demonstrated.
Soil: landslide risk and erosion	<ul style="list-style-type: none"> ▪ Positioning of the pad within the flattest sections of the site ▪ Maximisation of vegetation retention ▪ Planting of vegetation in identified higher erosion risk areas (higher slopes) ▪ Citing and compaction of excavated areas to specification (see section B.6.2)

ENVIRONMENTAL IMPACT	MITIGATION, MONITORING, AND MANAGEMENT COMMITMENT
Flora & fauna: vegetation and biodiversity	<ul style="list-style-type: none"> ▪ Vegetated swales using native deep-rooted grasses/small bushes planted in high slope areas south of the composting pad ▪ Planting of native vegetation to increase the ecological value of the creek line and the western edges of the site. Specifically, around the current unofficial creek crossing that is clear ▪ Regular site checks to monitor weed spread and implement spraying to manage the spread ▪ Positioning for minimal disturbance of land and vegetation
Hazards: fire, flood and rainfall	<ul style="list-style-type: none"> ▪ Positioning of the site on cleared grassland with the shed more than 100m away from woodland and the BFL zone ▪ Fire hose and pump on site to put out fires started on site ▪ Firefighting vehicular access from both north and south, and maintenance of access to the highway along the eastern boundary ▪ All plants chosen for landscaping will consider fire retardant characteristic and limiting excessive leaf litter dropping ▪ Maintain a vegetation buffer around site infrastructure (i.e. shed) ▪ Setback from ephemera creek and riparian area ▪ Internal site generated stormwater management ▪ Vegetation retention and revegetation around riparian area and bunds
Cultural heritage	<ul style="list-style-type: none"> ▪ Application of and Application for an Aboriginal Heritage Impact Permit (AHIP) for Gilmore-AD- 02, AHIMS #pending, and part of Gilmore-AD-03 ▪ Fencing of Gilmore-AD-01, AHIMS #pending, part of Gilmore-AD-03 and the southern extent of proposed works. ▪ If during construction the discovery of: <ul style="list-style-type: none"> – Unanticipated Aboriginal Objects be encountered works will cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the Heritage NSW and Aboriginal stakeholders – Unanticipated Historical Relics are encountered they will not be disturbed except with a permit or exception/exemption notification. Should unanticipated relics be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic – Aboriginal Ancestral Remains are discovered during any activity SVC will: <ul style="list-style-type: none"> – Immediately cease all work at that location and not further move or disturb the remains – Notify the NSW Police and Heritage NSW Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location – Not recommence work at that location unless authorised in writing by Heritage NSW ▪ Continued consultation with the registered Aboriginal parties (RAP) about the management of Aboriginal cultural heritage sites within the study area throughout the life of the project

H. Justification for proposal

The organics diversion project initiated by the SVC aims to divert organic waste from landfill, sustainably manage green waste, reduce transportation, and create a local circular economy for organic material. The research and analysis that has led Council to design this proposed site and operations is extensive. Other options have been considered for collection, processing, and site selection. Considering the proposal as a whole, including the organics collection aspects, this proposed development resulted in the greatest environmental, economic and social benefits when compared to other options (SVC MCA 2019).

Ecologically Sustainable Development (ESD) is integrated into the EP&A Act under Section 6(2) of the *Protection of the Environment Administration Act 1991* as:

6(2) For the purposes of subsection (1)(a), ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:

a) the precautionary principle - namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

- i. careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
- ii. an assessment of the risk-weighted consequences of various options,*

b) inter-generational equity - namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

c) conservation of biological diversity and ecological integrity - namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

d) improved valuation, pricing and incentive mechanisms - namely, that environmental factors should be included in the valuation of assets and services, such as:

- iii. polluter pays - that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,*
- iv. the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,*
- v. environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*

H.1 PRECAUTIONARY PRINCIPLE

The proposed development site was chosen because of location and logistics. The proposed equipment and operations have been carefully designed to ensure no net negative impact on the environment.

As outlined in this EIS and through associated specialist assessments, this proposed development has been carefully considered, avoiding serious or irreversible damage to the direct environment. The option analysis and risk assessment have limited risks through design mitigation and, where risks remain, monitoring and management has been outlined to reduce the risk.

H.2 INTERGENERATIONAL EQUITY

The site design and operations will be an improvement on current management, with increased vegetation promoting diversity on site. This proposed development will deliver the Council with a sustainable and resilient management of organics and waste, ensuring that current practices assist to build a stronger and better managed future. The environmental benefits resulting from the use and application of compost product will deliver individual, regional, national, and global environmental health benefits and increased productivity. This ties in with the Council commitment to local climate action to reduce energy and emissions footprint and to mitigate climate change risk to the community.

H.3 CONSERVATION OF BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY

The proposed development will improve the vegetation on site which will improve diversity of flora and fauna on site and beyond as it can be used for foraging animals, seed dispersal from vegetation planting, and to provide a safe corridor for animals moving outside the native forest in the area.

H.4 IMPROVED VALUATION, PRICING, AND INCENTIVE MECHANISMS

The cost of designing this proposal to avoid environmental risk where possible will be consumed by the project. The management and monitoring of environmental health are built into the economics of this proposal.

H.5 CONCLUSION

The proposed development has been designed in accordance with the Composting Guidelines and has been assessed in accordance with the EIS guidelines and SEARs. The pre-proposal research and project analysis has been multi-disciplinary (B.7) and specialised consultants have been engaged to address key aspects of the proposal. The proposed development will deliver environmental, economic, and social benefits to the local community and, although small-scale, broad reaching benefits include leading by example, reducing emissions, reducing pollution from landfill, and adhering to national waste policy goals.

The potential for adverse impacts on the local environment and adjacent land users has been considered in the design and operation of the proposed development. As this assessment outlines (s E.1-E.14), the environmental issues have been considered and the mitigation, monitoring, and management commitments comply with the assessment criteria.

I. References

GUIDELINES, POLICY, REGULATION AND LEGISLATION

EIS Guidelines Composting and Related Facilities (DUAP 1996).

Environmental Guidelines Composting and Related Organic Processing Facilities (DEC NSW 2003).

Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW.

The Guide to Traffic Generating Development (NSW 2013).

Planning for Bush Fire Protection (PBP) Guide (2006).

Australian Standard AS 4454 (2012): Compost, soil conditioners and mulches.

Department of the Environment and Energy (DEE) 2011, *The National Greenhouse and Energy reporting Technical Guidelines, 2011*.

State Environmental Planning Policy No 33 – Hazardous and Offensive Development (Department of Planning 1995).

State Environmental Planning Policy (Infrastructure) 2007.

State Environmental Planning Policy (Aboriginal Land) 2019.

State Environmental Planning Policy (Primary Production and Rural Development) 2019.

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development.

State Environmental Planning Policy (Koala Habitat Protection) 2019.

State Environmental Planning Policy No. 55 – Remediation of Land.

Industrial Noise Policy (NSW EPA 2017).

The Compost Order 2016 (NSW EPA).

The Compost Exemption 2016 (NSW EPA).

Draft Policy: Assessment and Management of Odour from Stationary Sources in NSW (EPA 2001).

Protection of the Environment Operations Act 1997.

Environmental Planning and Assessment Act 1979.

Environmental Planning and Assessment Regulation 2000.

Tumut Local Environment Plan 2012.

The Rural Fires Act 1997.

SNOWY VALLEYS COUNCIL DOCUMENTS

JustWaste 2019, SVC multi-criteria analysis of FOGO collection and organic processing options.

JustWaste 2019, Business case and option analysis of organic processing.

JustWaste 2019, Business case for FOGO options available to the SVC.

JustWaste 2020, Domestic Kerbside Waste Audit for Snowy Valley Council.

Snowy Valleys 2028 Community Strategic Plan.

Tumut Local Environmental Plan 2012.

Snowy Valleys Council Zero Waste Strategy 2019-2030.

Snowy Valleys Council Development Control Plan 2019.

Snowy Valleys Council 2019, EPA grant development for FOGO infrastructure support.

Snowy Valleys Council 2019, EPA grant development for ORF support.

Tumut Shire Council, 2010, Proposed integrated waste transfer and recycling facility.

REPORTS AND RESOURCES

Andersen, J. K., A. Boldrin, J. Samuelsson, T. H. Christensen, and C. Scheutz. 2010, 'Quantification of Greenhouse Gas Emissions from Windrow Composting of Garden Waste', *Journal of Environmental Quality*, Vol. 39, Issue 2, pp. 713–724.

Aitken Rowe 2019, Geotechnical Investigation – Proposed receiving and composting pad and leachate dam, Proposed waste transfer station, Snowy Mountains Highway, Tumut, NSW.

Barker XZ., KB. Shannon, KT Paw U, m. Burger & WR. Horwath 2017, 'Greenhouse gas emissions from green waste composting windrow', *Waste Management*, vol 50, pp. 70-79.

Flynn, C2016, "What is a fresh wind? AN explanation of windspeeds and the Beaufort Scale" MetService, <https://blog.metservice.com/BeaufortWindScale>, accessed 12/9/19.

Gilbert J., Ricci-Jürgensen M and A. Ramola 2020, "Benefits of compost and anaerobic digestate when applied to soil", International solid waste association.

Hyder 2012, 'Food and garden organics – Best practice collection manual, Prepared for Department of Sustainability, Environment, Waste, Population and Communities, Commonwealth of Australia.

JustWaste Consulting 2019, *Three bin waste audit*, Wagga Wagga Council.

McLennan Magasanik Associates (MMA) Pty Ltd 2010, *Climate change and the Resource Recover and Waste Sectors*, Department of the Environment, Water, Heritage and the Arts, Commonwealth Government of Australia.

Metropolitan waste and resources recovery group (MWRRG) 2018, 'Introducing a kerbside food and garden organics collection service', <https://www.mwrrg.vic.gov.au/assets/resource-files/MWRRG-FOGO-Text-Interactive-20181119.pdf>.

Miller, F. C., 1993, Minimizing odor generation. In H. A. J. Hoitink and H. M. Keener (eds) *Science and Engineering of Composting: Design, Environmental, Microbiological and Utilization Aspects*, Renaissance Publications, Worthington, United States of America, pp 219–41 (also contains other relevant articles).

Moult J.A., S.R Allan, Hewitt C.N & Berners-Lee M. 2018, 'Greenhouse gas emission of food waste disposal for UK retailers', *Food Policy*, Vol. 77, pp. 50-58.

NSW EPA 2014, 'Domestic kerbside waste and recycling in NSW'- results from the 2011 waste audits', State of NSW and Environment Protection Authority.

Office of Environment and Heritage (OEH), Biala, J (2001), *The benefits of using compost for mitigating climate change*.

Romero C., Ramos P., Costa C., & C. Marques 2013, 'Raw and digested municipal waste compost leachate as potential fertilizer: comparison with a commercial fertilizer', *Journals of Cleaner Production*, vol. 59, November 2013, pp.73-78.

SLR Consulting 2019, Bellettes Landfill Expansion - Environmental Impact Statement, Prepared for Bellettes Landfill Pty Ltd.

USEPA, 2002, *Solid Waste Management and Greenhouse Gas Emissions: A Life Cycle Assessment of Emissions and Sinks, Second Edition* (EPA530-R-02-006), United States Environmental Protection Agency Office of Solid Waste and Emergency Response, Washington DC.

List of appendices

Appendix A	Washbay overview
Appendix B	Geotechnical investigation report
Appendix C	SEARS response from Environment Protection Authority
Appendix D	"SEARS response from Biodiversity and Conservations Division "
Appendix E	SEARS response from Transport of New South Wales
Appendix F	SEARs DPIE summary
Appendix G	Consent pathway references
Appendix H	List of NSW Contaminated sites
Appendix I	NSW Contaminated land Public Records
Appendix J	Risk Assessment
Appendix K	Odour assessment (TOU)
Appendix L	2002 biodiversity survey
Appendix M	Biodiversity Offset Scheme Entry Threshold map (BoSET) search
Appendix N	Assessment against all key threatening processes listed in schedule 4 of the BC Act
Appendix O	Cultural heritage assessment report

This report has been prepared by:

RM Consulting Group Pty Ltd trading as RMCG

29 York Town Square, Launceston Tasmania 7250

rmcg.com.au — ABN 73 613 135 247

Offices in Victoria, Tasmania, ACT and NSW

Key RMCG contact

Isabel Axio

0424 966 367 — isabela@rmcg.com.au



Document review and authorisation

Project Number: #0777

Doc Version	Final/Draft	Date	Author	Project Director review	BST QA review	Release approved by	Issued to
1.0	Draft	04/12/2020	I. Axio	D. Blaesing	M. Sandford J. Longford	D. Blaesing	Snowy Valleys Council
2.0	Final	18/12/2020	I. Axio	D. Blaesing	-	D. Blaesing	Snowy Valleys Council
2.1	Final (amended)	17/03/2020	I. Axio	D. Blaesing	S. Scrivens	D. Blaesing	Snowy Valleys Council