Statement of Environmental Effects

for the

Proposed Development of

Hay Shire Council

Resource Recovery Centre

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INTRODUCTION

This statement of environmental effects has been prepared by JustWaste Consulting to accompany a development application for a Hay Shire Council Resources Recovery Centre (RRC), incorporating a materials recovery facility (MRF) and organics processing facility (OPF) at 109 Thelangerin Road, Hay NSW 2711. The application is being lodged by Hay Shire Council, pursuant to Clause 4.12 of the Environmental Planning and Assessment Act 1979.

The proposal has been designed to achieve the relevant provisions of *Hay Local Environmental Plan (2011)* (Hay LEP), and Clause 4.15 of the *Environmental Planning and Assessment Act (1979)* (as amended).

The Hay Shire Council has conducted investigations into the Hay Shire Waste Transfer Station site (Title Reference 113/448476) and adjacent Council land (1/517869) and found it to be suitable location for the RRC of the proposed size and scope.

A geotechnical survey, an aerial topographic survey and planning analysis of nearby land use and environmental aspects (water, soil, air, flora & fauna) will be conducted to confirm the site selection. This Statement of Environmental Effects (SEE) has been prepared to assess the potential environmental issues associated with the proposed development.

The organics processing facility at the RRC will accept and process self-haul green waste and food and garden organics (FOGO) from local kerbside collection services currently in the planning stages. Processing (composting) of the material will be undertaken on a compacted clay liner hardstand. The hardstand will be bunded to exclude uncontaminated storm water and be constructed so that leachate generated on-site is discharged into a water storage area for recirculation.

Council have investigated various composting methods and given the site parameters, and to maintain a low input-cost project, have decided to pursue an open windrow composting methodology. This option makes use of the existing resources of space, infrastructure, machinery, and staff, ensuring low capital expenditure and maintenance costs.

Under the proposed organics composting method, FOGO material will be deposited on a bunded, concrete input pad, spread and manually decontaminated, with contaminants taken directly to the Council-owned landfill located 1 km away. The remaining feedstock will be windrowed on the bunded clay pad with the first windrow established over approximately 2 weeks, ensuring the composition and amount of material is right for proper composting conditions (i.e. C/N ratio, moisture). Upon full operation, the site will have at least five windrows, each at various stages of decomposition, and all monitored for temperature and moisture, ensuring optimum composting conditions. The windrows will be turned as required to ensure adequate material breakdown, and at the end of stage five, the material will be screened and tested for contaminates, and if satisfactory, moved to a maturation pad awaiting distribution and use. Any oversized screened

material will be reintegrated into stage 1 for further breakdown, windrow cover and the introduction of established inoculants.

Approval is sought to process up to 4,251 tonnes per annum (tpa). It is estimated that the FOGO service will collect 429 tpa after the second year of operation, while self-haul green waste across all council facilities will remain stable at 321 tpa. Based on these figures, this input amount can produce 300 tpa of compost. Council currently uses 120 tpa of mulch and compost and is further committed to increasing use for improved moisture retention, carbon storage and to mitigate the impacts of climate change. Additional product is expected to be made available for sale to the public and businesses.

The proposed location for the RRF facilities is zoned as Primary Production (RU1) under the Hay LEP. The scale and location of the operation does not qualify as Designated Development under the *Environmental Planning and Assessment Regulation (2000)*, however, as a scheduled activity, the scale of the operation requires licencing from the NSW Environment Protection Authority (EPA) under the *Protection of the Environment Operations Act* (1997) (Refer to APPENDIX A: PLANNING EXCERPTS).

THE PROPOSAL

1.1. Objectives

Hay Shire Council (HSC) is committed to diverting waste from landfill. The objective of this proposal is to develop a council owned and operated resources recovery facility that encompasses a composting facility that will recycle organic material from households and self-haul green waste into a valuable resource that can save on council expenditure whilst delivering significant environmental benefits.

1.2. Proposal rationale and alternatives

There are 1,632 households with existing residual kerbside services estimated to produce 5.05 kg/household/week of FOGO material or 428.56 tonnes per annum. Currently, this material is being landfilled, with the obvious implications on landfill space, excess greenhouse gas emissions, and an overall poor utilisation of what would otherwise be a valuable resource with potential for improved land management.

A market analysis investigated capacity of existing regional composting facilities in Wagga Wagga (239 km), Coolamon (218 km) and Carrathool (54 km). The amount of FOGO material generated within the Shire is estimated at around 8.2 tonnes per week, and it has proven more cost effective to process this material locally, rather than transport material to other facilities and absorb their associated disposal fees. At a reserved rate of combined transport and gate fee of $100/tonne this would equate to $46,800/annum. Enabling local processing of FOGO also allows Council to integrate and utilise self-haul green waste, which would otherwise have no way of being processed. In addition, Council may save between $4,000 and $8,000/annum on importing soil and mulch, with any surplus being made available for purchase by the public.

Hay Shire Council owns the proposed site, which is not accessible to the public and currently vacant land. The site displays suitable characteristics for a low-cost construction composting facility. Council have applied for funding under the NSW EPA Waste Less Recycle More (Organics Infrastructure – Large and Small) grant stream to assist with the capital expenditure and of the establishment of the site. Is successful, Council will be able to make use of existing staff, and operational costs will be negated when balanced out against the costs saved from purchasing compost. This proposal will enable Council to deliver an excellent service to the community, reduce waste to landfill and produce compost for the local landscape. Local processing of organics material also gives Council and the community greater ownership and responsibility towards practicing sustainable waste management within the local government area.

1.3. Site description and suitability

The 90-ha site for the proposed facility shares a southern boundary with the Sewage Treatment Plant (Lot 2 DP 517886) and is located 1 km from the Hay Waste Management Centre (Lot 113 DP 448476). All three sites are located on Bairds Lane, an access road off The Langerin Road, which is approximately 1.6 km west of the Hay town centre (

Figure 1).

The proposed compost pad will be located in the centre of Lot 1 DP 517869 (

Figure 1, Picture 1 & Picture 2).

The site is flat and is sparsely vegetated by weeds and grasses with some established windbreak trees dotted around the perimeter (Picture 1 & Picture 2) and an elevation of approximately 89 m above sea level (Google Earth Pro, 2018). There is no identified flooding (NSW SES, 2014) or subsidence risk (NSW Government, 2021c). The site will be securely fenced, more trees planted around boundaries to complete the windbreaks and further supress particulates/noise, and a wildlife / natural revegetation corridor established on the southern boundary extending up the south-eastern boundary (Figure 8).

The site is currently vacant except for two derelict sheds left behind by a piggery closed many years ago. A geotechnical investigation will be conducted to identify the soil properties of sub-surface materials and determine the suitability of the indigenous soil to form the compacted clay liner for the composting pad.

Hay Shire has hot summers with monthly mean temperatures ranging between 32.3 to 35.2 ^{o}C and cooler winters with monthly mean temperatures ranging between 15.8 to 17.5 ^{o}C (Figure 2). The area receives approximately 40% of its rainfall in the four months between November and February with lower, more consistent rainfall from March to October (Figure 2). Although mean annual temperature and total annual rainfall has been quite variable from 2008, climate change trends indicate that the region is experiencing increases in mean annual temperatures combined with a concurrent decrease in total annual rainfall (Figure 3). This suggests that fire risk, both from the composting process and from bushfire, from high temperature and dry conditions will need to be monitored and managed.

The annual average wind directions and speeds are illustrated with wind roses in Figure 4. 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-Mar) winds are predominantly southernly at 9 am and south-westerly at 3 pm. Winter (Jul-Sep) winds are predominantly south-westerly at 3 pm however at 9 am, winds are equally divided between northernly and south-westerly. On an annual basis, 9 am winds can be evenly divided between

northernly, southernly, and south-westerly while 3 pm wind direction is predominantly south-westerly (Figure 4). Wind speeds (indicated in the coloured sections of the arms) can be interpreted as dominantly calm to gentle and very rarely strong (above 40 km/h) (Figure 4) according to the Beaufort scale (Figure 5).

Figure 1 Property Boundary map for the proposed Resource Recovery Centre Lot 1 DP 517869 and Lot 113 DP 448476 (outlined in cyan) (NSW Spacial Map Viewer, 2020).

Picture 1: The proposed composting site Lot 1 DP 517869 in foreground of frame, with proposed MRF shown at centre back of frame.

Picture 2: This aerial view of the proposed site looks south, showing the southern half of the proposed site.

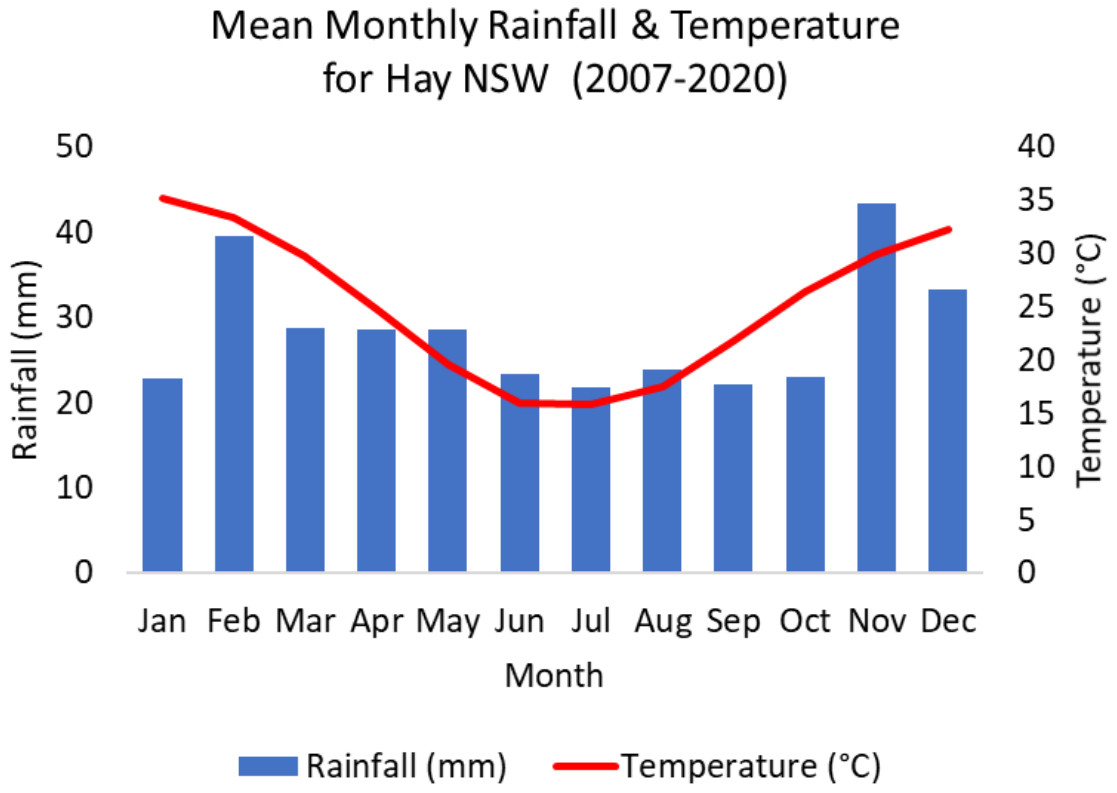


Figure 2 Mean monthly rainfall (mm) and temperature (°C) at Hay Airport, Station No. 75019 for the years 2007 to 2020 (BOM, 2021c).

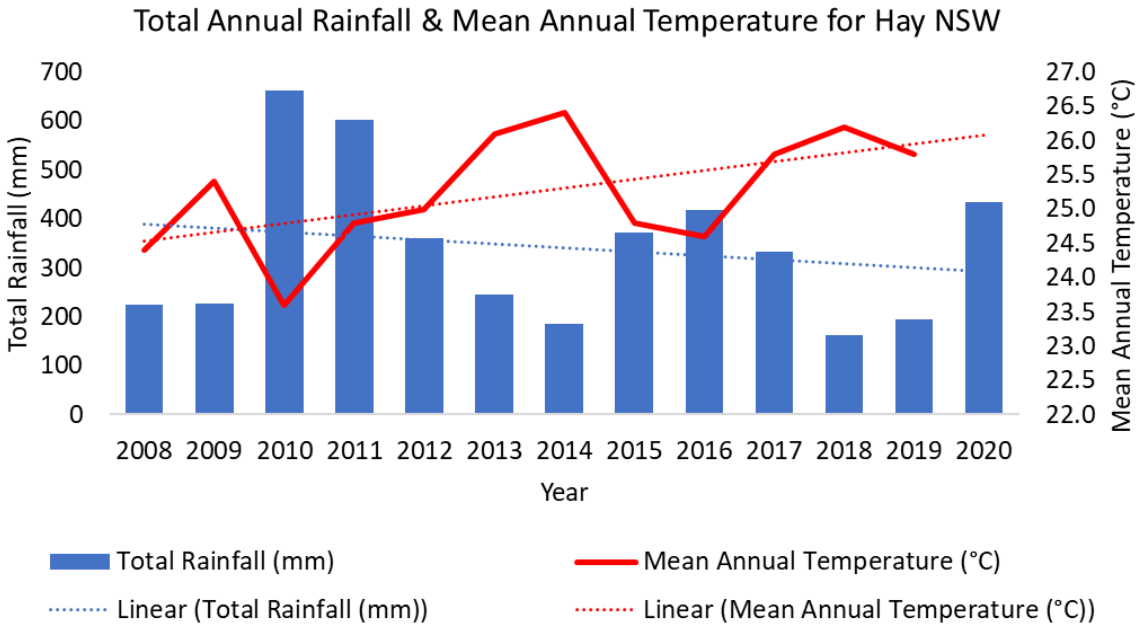


Figure 3 Total annual rainfall (mm) and mean annual temperature (°C) at Hay Airport, Station No. 75019 (BOM, 2021c).

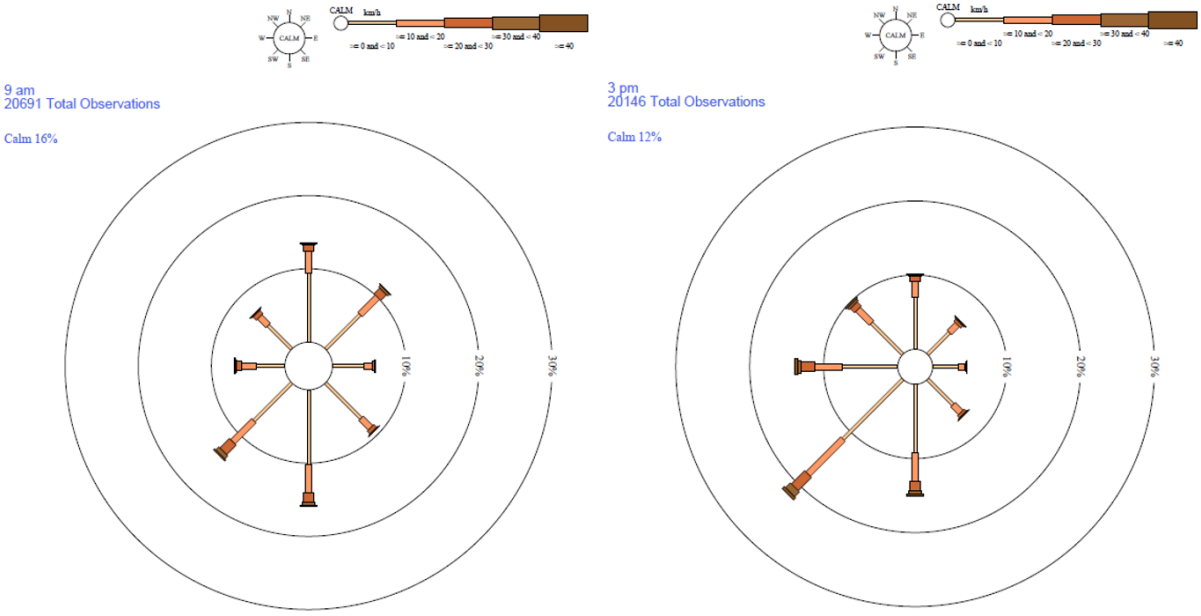


Figure 4: Annual average Rose of Wind direction versus Wind speed in km/h as observed at Hay, Miller Street, between 1 January 1957 to 9 January 2015 (BOM, 2019).

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 5: Beaufort Scale windspeed interpretations (Claire Flynn, 2016).

Figure 6 shows a map of the site and nearby land uses as classified by the Hay LEP, while Figure 7 shows a map of the site, access road and closest sensitive receptors. The site itself is zoned RU1 Primary Production, while the surrounding land is zoned similarly or SP 2 Infrastructure (Figure 6). Other land zonings within 3 km of the site include RU4 Primary Production Small Lots, RE1 Public Recreation, IN1 General Industrial and RU5 Village. According to the Biodiversity Values Map and Threshold Tool (NSW Government, 2021a), other than the Protected Riparian Land bordering the Murrumbidgee River, situated 1.890 km from the site at its closest point (Figure 7), there are no protected areas within 3 km of the site.

The nearest sensitive receptors include four residential dwellings, with the closest (Title Reference 110/448476) located 0.501 km to the north of the site, the general industrial area located 1.043 km to the south-east and the protected riparian land 1.890 km to the south of the site (Figure 7).

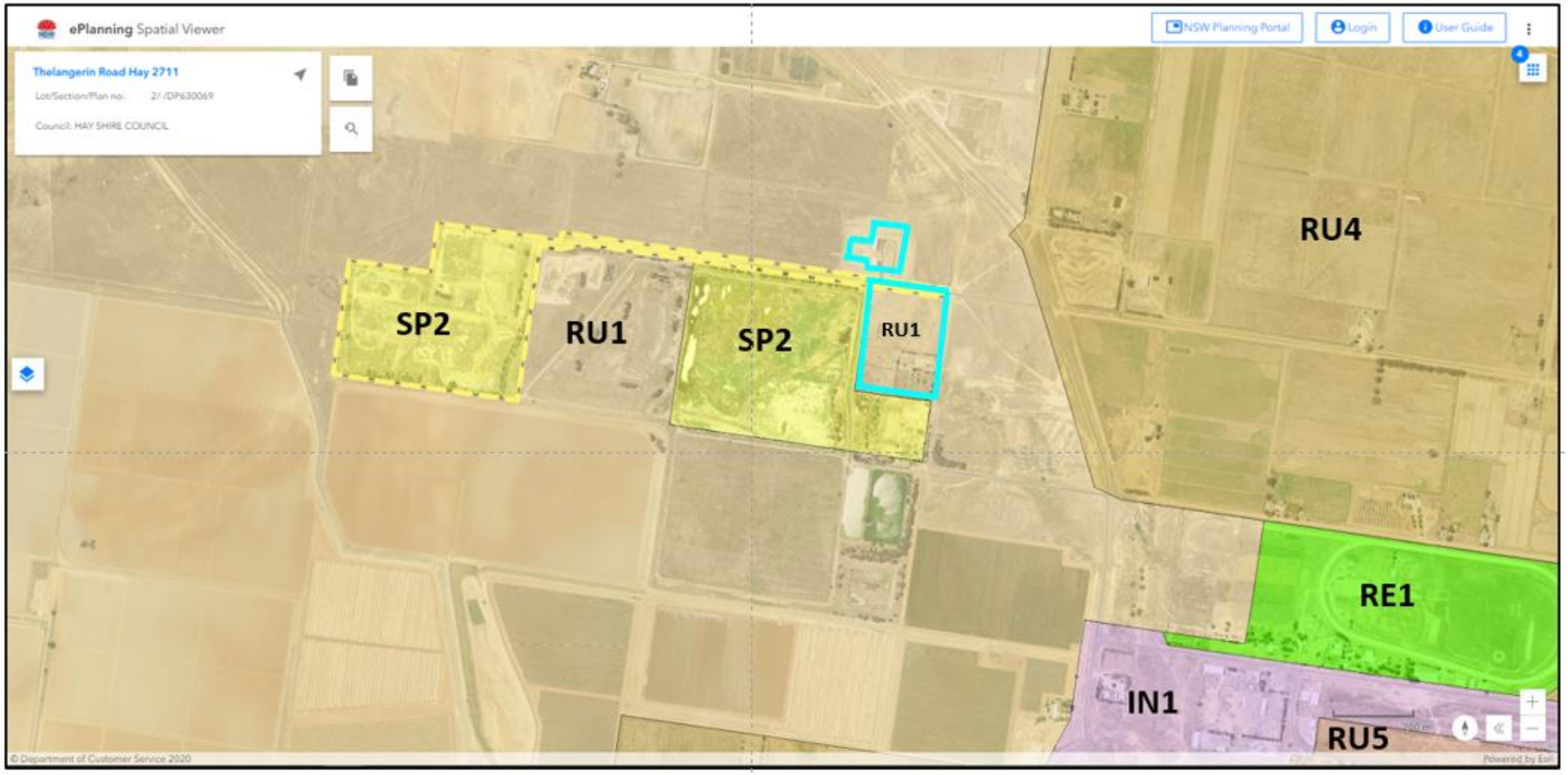


Figure 6 Proposed site surrounding land uses. SP2: Infrastructure, RU1: Primary Production, RU4: Primary Production Small Lots, RE1: Public Recreation, IN1: General Industrial, RU5: Village (NSW Government, 2021b).

Figure 7 Proposed site, access road and nearest sensitive receptors. A: Residential dwelling (112/448476) 1.126 km, B: Residential dwelling (110/448476) 723 m, C: Residential dwelling (912/785530) 1.412 km, D: General industrial area (IN1) 1.576 km, E: Residential dwelling (45/225) 1.230, and F: Protected riparian land 1.630 km from site boundary.

1.4. Proposed development

The site is owned by the Hay Shire Council and is currently vacant land. The proposed OPF will be very convenient for local residents self-hauling to the local landfill and will serve as a visual reminder of the organic waste service. The site will be fully fenced, however incorporated into the development plan is a plant nursery, and to offer finished compost sales once the OPF operation is fully functional. Council will consider the employment of new staff and the training of existing staff for the management and operation of all elements of the site.

The internal access road will be 8m wide, compacted, covered with gravel, and regularly maintained. Due to low use and suitable high compaction material available, the road will enable wet weather construction to Council classification Gravel Class 2 without needing to be sealed. The road will be a one-way loop around the site for optimal safety, incorporating a 10 m x 12 m concrete receival pad.

Open windrow composting will be the preferred method for organics processing at the facility. The area designated as the composting pad will consist of a compacted, clay-lined and bunded hardstand, constructed from inert low-permeability material and sloped towards a leachate dam to comply with the permeability and characteristics outlined in the *Environmental Guidelines: Composting and Related Organics Processing Facilities (Department of Environment and Conservation (NSW), 2003b).*

The perimeter of the composting pad will be bunded to exclude uncontaminated storm water from the composting site while directing on-site discharges into a leachate dam for treatment, storage, and reuse within the process.

All working stages will have a surrounding 10 m buffer with 6 m between each windrow to allow for the free movement of machinery. The site is designed to be able to process up to 7,663 tpa of feedstock, however it is anticipated that less than half will be used in the first 1-3 years of operation. Feedstock will build windrows, each measuring approximately 2 m x 2 m x 50 m, and consisting of 150 m^3 or 60 tonnes of feedstock. A stockpile of chipped green waste measuring approximately 15 m x 4 m x 3 m will be situated adjacent to the receiving pad. A 30 m x100 m maturation pad will be positioned centrally in the site for easy access for distribution.

A shed will be constructed on site and used for safe maintenance and storage of sampling equipment, and for storage of sampling records and safe operating procedures. The shed will be located south of the composting pad and adjacent to the internal road.

The proposed operations will include the use of a water cart, used for wetting down composted material. Water will be sourced from on-site storage tanks, which will collect run-off from the composting pad. A wheeled loader will be used for turning windrows and managing incoming feedstock and outgoing product.

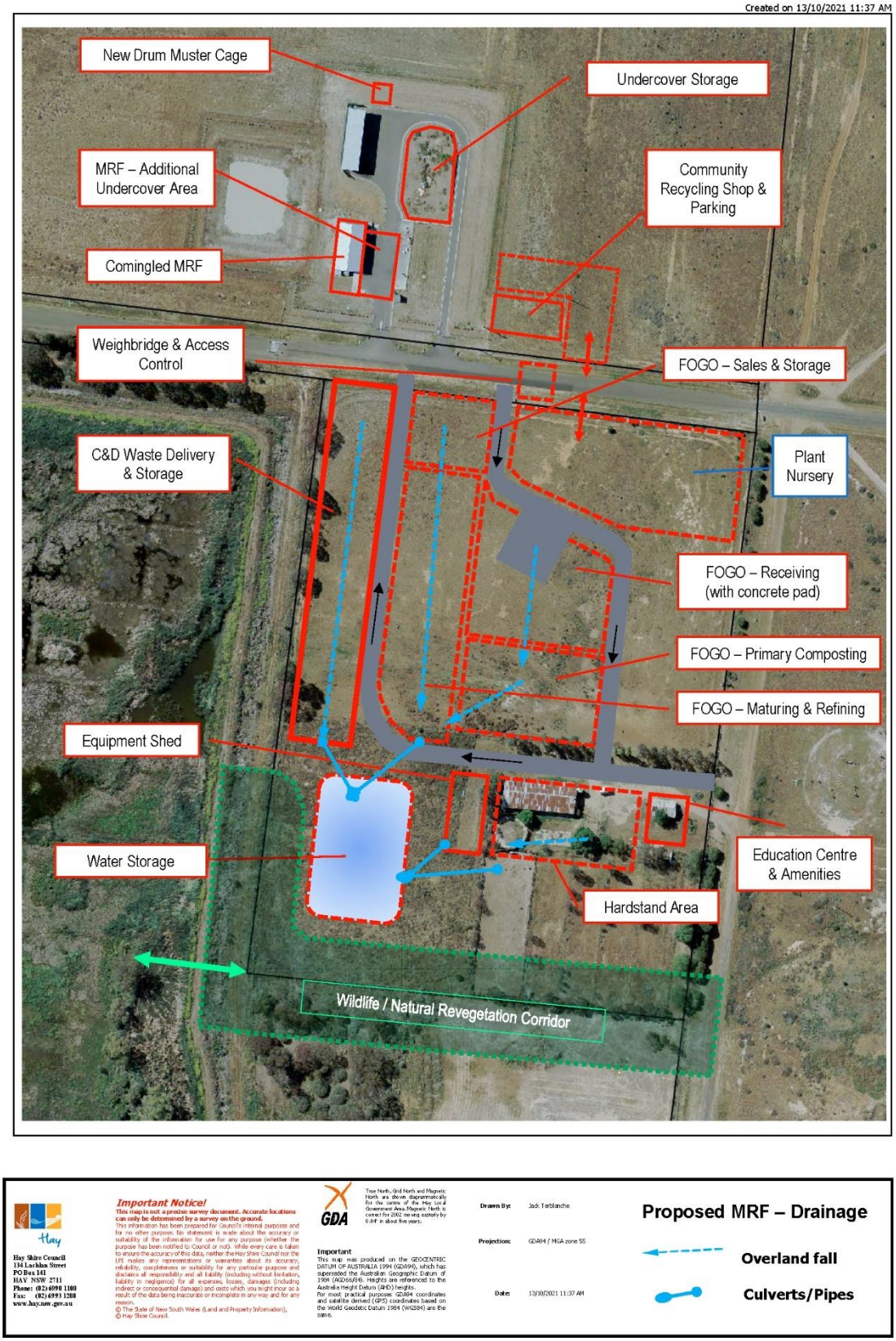


Figure 8: Hay Organic Processing Facility proposed site design

1.5. Proposed operation

The incoming feedstock from the kerbside FOGO collections will be delivered to the site one day per week. It is anticipated that this will involve up to two truck movements to the site for dumping, however volumes of FOGO material may increase over time with the potential increase of another two trucks. The loads will be deposited on a concrete receiving pad, where a manual pick will be undertaken to remove contaminants. Following this, the loader will move the new feedstock to the stage 1 windrow and mix it with stockpiles of mulched self-haul green waste. A windrow may take 4 weeks to build from incoming FOGO material and self-haul green waste used for blending and covering. Once a windrow is at capacity, the composting process will be fully implemented, over a five-stage turning process, where each stage is kept at a minimum of 55^{o}C over 15 days. Where temperatures climb above 60°C, cooling may be required.

It is envisaged that, at any time, there will be two windrows at stage 1. One in the process of construction and the other commencing the first stage of composting. As the reduction in volume is the greatest in this process, two stage 1 rows could be integrated to form a stage 2 windrow. Initially, only one windrow will be established, with additional windrows created as more feedstock is delivered to site.

Temperature records for windows will be maintained, and as material is deemed to be adequately processed, material will be screened. It is estimated that approximately 40% of the screened material will be oversize and therefore reintegrated into stage 1. A further 20% is likely to be inert contamination (rocks, bulky wood) which will be used as cover material at the Hay landfill. The remaining 40% will be compost material and can be set aside for maturation at the maturation pad, thereby ensuring that decomposition is complete prior to distribution and application. Each finished compost windrow will be kept in separate piles to allow for testing. From the maturation pad, Council can use and distribute the material accordingly.

1.6. Materials for composting

Council has applied for funding to roll out a council-wide FOGO service to its 1,632 tenements. The service is estimated to generate 5.05 kg/household/week or 428.56 tpa. There is further opportunity to integrate stockpiled and future self-haul green waste dropped off at Council's waste facility, with volumes estimated at 320 tpa. The volume of self-haul green-waste has the potential to change post implementation of the kerbside FOGO service however, the combined volume of Hay FOGO and green-waste should remain consistent.

1.7. Products of the composting process

Monitoring the composting process will show when the product has reached pasteurisation, thus eliminating weed seeds. A sampling regime will be implemented to ensure that the hazardous material and attributes listed in Table 1 are within acceptable levels (Table 1).

Table 1 Composting contamination attributes and acceptable levels as listed in *The compost order 2016 (NSW EPA, 2016).*

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

Rigorous testing at the initial stage will establish a baseline, which may involve testing all batches over a year. Based on the small and consistent volume, it is unlikely to require ongoing laboratory testing, 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 integrated, a new baseline will be established.

The compost produced at the proposed facility will be used for Council-run projects such as on public parks and sports grounds and incorporated into new landscaping and site rehabilitation. Council currently uses approximately 120 tonnes of compost and mulch material throughout the Shire per annum. Excess compost not used for Council projects will be made available for purchase by the public or businesses.

2. MATTERS FOR CONSIDERATION

2.1. Summary

The proposed location for the Hay Resource Recovery Centre is zoned as 'Primary Production' (RU1) under the Hay Local Environmental Plan (2011).

The scale of the operation is not classified as designated development under *EP&A Regulation 2000* (schedule 3) (APPENDIX A) but will still require this Statement of Environmental Effect for Council to reasonably judge the impact of the development.

Further, section 48 in *Protection of the Environment Operations Act 1997* lists 'composting' as a scheduled activity if more than 200 tonnes of organics is received from off site (APPENDIX A). Accordingly, section 43 (b) states that an environmental protection licence 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 product.

Finally, this development application is classified as an 'integrated development' as per Section 4.46 of the *Environmental Planning and Assessment Act (1979)* (APPENDIX A) and as such, Council will need to refer the development application to the Environmental Protection Authority as the relevant approval body.

3. POTENTIAL ENVIRONMENTAL ISSUES

3.1. Identification and prioritisation of issues

This SEE has used the *Composting and Related Facilities: EIS Guidelines* (NSW Department of Urban Affairs and Planning, 1996) as a framework for environmental considerations and information to support the development application. Although these guidelines are designed for an Environmental Impact Statement it states "*this guideline is equally applicable for identifying the issues which may need to be addressed in an EIS or a SEE" (NSW Department of Urban Affairs and Planning, 1996, p.7)*.

The prioritisation of issues where management and mitigation measures have been applied is relative to site characteristics and proposed size and scope of operation. Additionally, advice was sought from Lockhart Shire Composting facility as a case study for a similar type and scope of OPF operation.

Potential risks were considered in the site selection and design considerations. Based on the small and controlled feedstock, the known geotechnical aspects of the proposed site and studied examples of similar type and size of operation, risks are considered manageable.

The key potential environmental issues identified for this approval include water, air, fire, and flora & fauna. As such, mitigation measures addressing these issues have been incorporated in the physical design and proposed management of the site.

3.2. Prioritised environmental considerations

4.2.1 Water Issues

Both the OPF and the MRF sites are very flat, and the region is characterised by low rainfall. A geotechnical investigation is yet to be conducted however, data from the *Australian Groundwater Explorer* indicates that the local aquifer is quite deep. Groundwater bore GW404462.1.1, located 1.3 km from the proposed RRC for the purposes of water supply, has a depth of 96 m (BOM, 2021a) (Figure 9). In addition, soil profiles from Espade v2.1, survey no. 1004554, located 3.4 km from the site, indicate that the local physiography is alluvial plain, with a poorly drained profile, moderate erosion hazard and no evidence of salting (NSW Department of Planning Industry and Environment, 2020). Given the geotechnical properties of the surrounding environment, including a deep aquifer and poorly drained soil profile, it is not expected that groundwater contamination will be an issue.

However despite the low probability of groundwater contamination, Council will be installing groundwater bores to monitor any potential impact on the groundwater quality.

The closest agricultural dams are located 2.67 km m away and the closest creek is 1.54 km away.

Figure 9 Google Earth image indicating the location of groundwater bore GW404462.1.1 (north-west corner) in relation to the proposed site (south-east corner) ((Google Earth, 2018).

4.2.1.1 Surface water controls

The proposed design will include bunded perimeters and cut-off drains to manage surface water.

Clean stormwater generated outside the compost pad will be excluded from the OPF site and prevented from becoming leachate. Bunds will surround the active composting pad and cut-off diversion drains will be dug around the compost pad directing rainfall away. The bunds will be covered by topsoil and vegetated. The area surrounding the composting pad retains reasonable vegetation of grass and trees around the boundaries which will be maintained and enhanced with further tree plantings to solidify windbreaks. A wildlife/natural revegetation corridor is planned for the southern and south-western boundaries.

Drains will follow the lines of the bunds and be directed to sediment traps to maximise sediment retention on site and minimise erosion and particulate pollution. However, as the site is flat there is no collection area for storm water to be directed toward the site.

The site will not need to install stormwater ponds. The reasons for this are threefold: 1) the topography is relatively flat (low velocity runoff and the elevation of the site is gentle (flooding risk); 2) there is relatively low annual rainfall and low occurrence of extreme rainfall events, and 3) there is a good extent of vegetation in the catchment area and directly surrounding land parcels, with more plantings included as part of the site development.

4.2.1.2 Leachate management

All liquid generated from within the composting pad will be considered and treated as leachate. Leachate generated from composting operations can be high in nutrients and can cause eutrophication and pollute groundwater, surface waterbodies and subsoils.

Although the geotechnical investigation is yet to be conducted, it is expected that the aquifer is situated at a significant depth. The expected depth of the aquifer, coupled with the low rainfall for the area, indicates that the proposed compacted clay liner with a drainage system should amply protect any sub-surface water from potential leachate contamination.

The site is very flat therefore the drainage layer of the composting pad will be designed with a gentle slope (2 degree minimum). The position of the windrows will consider this slope and ensure that water does not pool in and around the windrows.

As described in section 2.3, although the site experiences relatively low rainfall (Figure 2) and an overall drying trend, total annual rainfall has been quite variable between 2008 and 2020, fluctuating between 162 mm and 663 mm (Figure 3). Although this is not expected to become an issue, the composting pad will be cleared and designed to resist infiltration.

The *Composting and Related Organics Processing Facilities,* section 4 (NSW Department of Urban Affairs and Planning, 1996), requires that leachate catchment systems need to be able to cope with, at a minimum, a 24-hour storm event of a 1-in-10-year intensity. According to the Intensity-Frequency-Duration statistics calculated by the Australian Bureau of Meteorology (BOM, 2021b), a 1-in-10-year 24-hour storm event would result in 70.8 mm of rainfall (Figure 10). In the years between 2007 and 2020, there have been 2 days where rainfall has equalled or exceed this level with 82.8 mm over 24-hours on the 5 February 2011 and 85.8 mm over 24-hours on the 5th November 2015 (BOM, 2021c). According to these statistics, if the leachate dam and drains are designed to cope with 1-in 20-year, 30-hour rainfall event of 88.0 mm (Figure 10), there will be virtually no risk of a water storage pond overflow occurring at the site.

All surfaces that will be receiving FOGO material and C&D waste will be compacted clay, formed to drain to the south to the water storage area (Figure 8). This will be conveyed via pipes and culverts from the hardstand areas to one half of the storage pond, where it will be used for watering the windrows and for irrigation of landscaping within the perimeter. The storage pond will be split in two sections by a clay bank, with the other half being designated for surface water catchment and subsequent irrigation of perimeter landscaping and the wildlife/natural revegetation corridor.

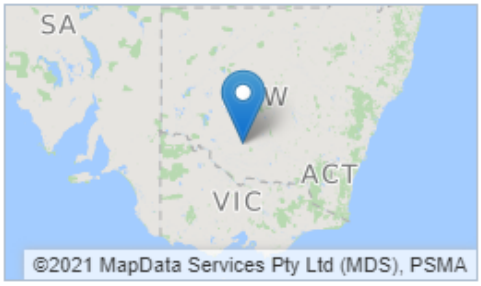
The proposed MRF has existing bunded areas and overland flows to the storage pond to the west of the development.

Location

Label: Hay

Latitude: -34.4913 [Nearest grid cell: 34.4875 (S)]

Longitude: 144.8132 [Nearest grid cell: 144.8125 (E)]



IFD Design Rainfall Depth (mm)

Issued: 08 January 2021

Rainfall depth for Durations, Exceedance per Year (EY), and Annual Exceedance Probabilities (AEP).
FAQ for New ARR probability terminology

Table | Chart

Unit: mm

	Annual Exceedance Probability (AEP)						
Duration	**63.2%**	**50%#**	**20%***	**10%**	**5%**	**2%**	**1%**
24 hour	37.7	42.7	59.1	70.8	82.8	99.5	113
30 hour	39.6	45.0	62.6	75.2	88.0	106	120
36 hour	41.1	46.8	65.4	78.6	92.1	111	125
48 hour	43.3	49.5	69.6	83.9	98.4	118	133
72 hour	45.9	52.6	74.7	90.3	106	127	143
96 hour	47.4	54.5	77.5	93.9	111	132	149
120 hour	48.6	55.8	79.3	96.0	113	135	153
144 hour	49.6	56.8	80.4	97.3	114	137	155
168 hour	50.5	57.7	81.2	98.0	115	139	157

Note:
The 50% AEP IFD **does not** correspond to the 2 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 1.44 ARI.
* The 20% AEP IFD **does not** correspond to the 5 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 4.48 ARI.

Figure 10 IFD Design Rainfall Depth (mm) over various durations and Annual Exceedance Probabilities (AEP) for the proposed site at Hay (BOM, 2021b). Note that an AEP of 10% is equivalent to a 1-in-10-year event while an AEP of 5% is equivalent to a 1-in-20-year event.

Preparation of the composting area (including composting pad and the leachate dam) will:

- Remove any topsoil. Material including tree roots shall be stripped in the foundation area.
- Proof roll the exposed subgrade to detect any soft, loose, or heaving areas.
- Any wet, soft or heavy clay areas, if detected, will be excavated down at least 0.5 m, and backfilled with appropriate approved excavated materials compacted in 150 mm thick layers to the minimum equivalent density of 98% of standard compaction maximum dry density (SMDD) at a moisture content within the range of –2% to 0% of standard optimal moisture content (SOMC).
- Any area of exposed subgrade, which exhibits shrinkage cracking and does not require recompacting, will be watered and rolled until the shrinkage cracks do not reappear. During this, care should be exercised to ensure the surface does not become soft.

The composting pad will:

- Cover the entire proposed operation from disposal point to maturation pad, excluding the receiving pad which will be constructed of concrete.
- Be 600 mm deep.
- Be constructed using clay from the site if the geotechnical investigation identifies it as suitable (i.e., min of 1 x 10^{-7} m/sec).
- Cover the composting area with layers of up to 300 mm uncompacted thickness and scour the laid surface in-between each compaction to prevent lamination.

The water storage dam and embarkment preparation will include:

- Dam is sufficient to contain the volume of water generated in a 1-in-10-year, 24-hour storm event (82.8 mm).
- A 900 mm liner constructed using medium & high plasticity silty clay/sandy clay/clay material found on site (or imported similar clay material) which will be placed in horizontal layers and compacted in 200 mm thickness to the equivalent density of 95% to 98% of SMDD at a moisture content within -2% to 0% of SOMC.
- The compaction of the inside batter of the embankment extending to the top of the outside batter, should be strictly controlled in such a way that it achieves relative compaction of at least 98% of SMDD for the top 0.9 m perpendicular to the embankment batters. The remaining embankment shall be compacted to 95% SMDD.
- A topsoil layer or less reactive layer, such as sandy silty clay/clayey silt/sandy silt/clayey silty sand material and non-dispersive soil layer of at least 200 mm should be placed on the inside batter, also serving to reduce surface erosion and prevent cracking. The crest and outside batter should also be protected with a topsoil layer or less reactive and non-dispersive soil layer.
- Embankment using above clay material should have a maximum batter of 2.5H: 1V for the upstream (inside batter) and 2.0H: 1V for the downstream (outside batter).
- A minimum crest width of 2.5 m is recommended.
- A minimum freeboard of 1.0 m is recommended.

4.2.2 Air quality: odour, particular pollution, and methane gas management

The risks of impact on air quality relate mainly to the composting process, although un-composted feedstocks and the water storage pond can also be potential sources of odour emissions. If conditions within the windrows become anaerobic, the emission of gaseous compounds including sulphur, nitrogen, methane and volatile fatty acids can cause the generation of unpleasant odours (NRCS, 2007). The volatilisation of ammonia is the most common source of odorous emission during normal composting conditions (NRCS, 2007). The production of methane under anaerobic conditions is undesirable both because of the unpleasant odour and also because it is considered a potent greenhouse gas which is more than 20 times more potent than carbon dioxide (NRCS, 2007).

Under aerobic conditions, composting odours are characterised by an earthy woody scent. Gases released in these conditions can be toxic but when managed appropriately the concentrations are not high enough to be considered a health risk (Clark et al., 1983). Under aerobic conditions, the production of methane is minimal with carbon dioxide produced in its place. The amount of methane emitted during composting can be minimised by regular aeration of the pile, reducing the presence of clumps, avoiding compaction, and not allowing the pile to become too wet (NRCS, 2007). Methane emission is not considered a significant risk in a well-maintained open-windrow operation (NRCS, 2007).

The risk of emitting and dispersing odorous gases is greatest upon the delivery of feedstocks, during compost turning, and the screening of mature compost. Emissions can be minimised through good management of the composting process. The key parameters for pasteurisation and odour control include:

- Maintain a nutrient balance between carbon and nitrogen of between 25:1 and 35:1. High nitrogen feedstocks should be mixed with carbon-rich feedstocks to achieve the ideal carbon to nitrogen ratio (EPA Victoria, 2017).

- Moisture levels should be maintained between 45%-60%. Moisture levels above 60% will lead to anaerobic conditions and the production of odorous emissions (EPA Victoria, 2017).

- Available oxygen should be maintained at greater than or equal to 10%. Oxygen levels are influenced by porosity, moisture content, bulk density, windrow size or bed depth and frequency of turning. Lack of oxygen will result in the release of odorous methane gas (EPA Victoria, 2017).

- Maintain a pH between 6.5 and 8.0. Lower pH, coupled with anaerobic conditions, can lead to the production of odorous compounds such as sulphides, amines, ammonia, and volatile fatty acids while a higher pH can lead to gaseous losses of ammonia (EPA Victoria, 2017).

- The porosity and bulk density of the pile should be maintained at 45%-65% and 400-700 kg/m^3, respectively. Porosity and bulk density have a great influence on oxygen availability. Anaerobic conditions are most likely with low porosity and high-density feedstocks. Piles should be constructed to between 1.5-3.0 m in height to minimise the effects of compression yet enable material to heat up sufficiently and allow oxygen to move throughout the pile (EPA Victoria, 2017).

- The temperature should be maintained between 55°C and 75°C. Temperature influences the rate of decomposition and thus oxygen demand, microbial population, and overall propensity to generate odorous compounds. This temperature range is optimal for pasteurizing the compost (EPA Victoria, 2017).

Using non-putrescible category 1 organics including leaves, plants, branches, tree trunks to blend with rapidly biodegradable organics is a good way to manage odour risks. Kerbside FOGO bins are generally 70-80% garden material and Hay Shire Council will have access to 320 tpa of mulched green waste to blend with the FOGO feedstock. Given the proposed area does not have heavy rainfall to create excessive moisture levels within the windrows, and the feedstock will be dominated by high carbon, category 1 organics, it is not expected that the site will generate excessive odour emissions.

4.2.2.1 Odour dispersion meteorology

High peak odour emissions at composting facilities generally occur during the preparation of feedstocks and the turning of the windrows (Department of Environment and Conservation (NSW), 2003a). The resulting odour impacts are most likely to occur during periods of low wind where stable wind conditions cause minimal odour dispersion. Calm conditions commonly occur in the mornings and evenings during late autumn and winter (Department of Environment and Conservation (NSW), 2003a).

Summary climate statistics, including wind speed and direction, have been collected between 1st January 1957 and the 9th of January 2015 from Miller Street, Hay, located approximately 5 km from the proposed site (Figure 4).

The lowest mean windspeed of 6.0 km/hr (considered light wind Figure 5) was recorded in June and July with calm conditions occurring up to 28% of the time in June and 25% of the time in July (Table 2 & Table 3). These light winds were predominantly northly and south-westerly (Table 2). Sensitive receptors identified in Figure 7 and labelled C and F, lie downwind of these prevailing winds. Table 4 however, indicates that the dispersion effects of winds between 2 and 11.5 km/h, are good to excellent during periods of strong solar radiation, dropping to marginally good with weak to slight solar radiation and marginally poor to very poor on heavily overcast days and night-time. Given the sensitive receptors are 0.501 km away from the site (Figure 7) over flat terrain, the site is at a low risk of atmospheric odour emissions causing a nuisance. Should circumstances

present an issue, the offending pile of organic matter can be speedily removed and landfilled at the Hay waste management site only 1km away. Buffer trees are also being planted.

Table 2 Wind speed and direction frequency (9 am) measured at the Bureau of Meteorology weather station at Miller Street, Hay (Site number: 075031) between 1957 and 2015 (BOM, 2019).

Month	Mean 9 am Wind Speed (km/h)	Wind Direction Frequency (%)								
		N	NE	E	SE	S	SW	W	NW	Calm
January	10.9	15	12	8	13	24	11	3	5	9
February	10.1	14	19	9	16	12	10	3	4	13
March	9.2	12	14	8	13	20	11	4	4	14
April	7.5	12	13	7	11	18	12	5	4	18
May	6.3	12	10	7	7	11	12	8	9	24
June	6.0	12	9	5	7	10	12	8	9	28
July	6.0	15	9	3	5	9	13	10	11	25
August	7.7	14	10	5	5	10	15	11	11	19
Septembe	9.4	14	11	4	7	12	18	11	9	14
October	11.0	12	11	6	9	17	18	9	7	11
Novembe	11.3	14	11	8	11	18	18	5	5	10
Decembe	10.8	13	11	8	11	20	18	5	4	10
Annual	**8.8**	**13**	**11**	**7**	**9**	**15**	**13**	**8**	**8**	**16**

red = highest value blue = lowest value

Table 3 Wind speed and direction frequency (3 pm) measured at the Bureau of Meteorology weather station at Miller Street, Hay (Site number: 075031) between 1957 and 2015 (BOM, 2019).

Month	Mean 3 pm Wind Speed (km/h)	Wind Direction Frequency (%)								
		N	NE	E	SE	S	SW	W	NW	Calm
January	10.8	10	8	5	9	19	21	12	8	8
February	9.8	9	8	8	8	18	19	11	8	11
March	9.7	8	7	6	11	16	21	12	7	12
April	8.5	8	7	6	8	17	20	12	8	14
May	8.0	10	5	5	5	15	21	10	10	19
June	8.2	10	7	5	7	14	19	10	11	17
July	9.0	13	6	3	5	11	20	14	15	13
August	10.2	13	6	3	4	11	21	17	14	11
Septembe	10.9	11	6	4	3	12	25	18	11	10
October	11.2	11	6	3	6	15	22	18	10	9
Novembe	11.5	9	5	4	6	15	27	17	9	8
Decembe	11.2	8	6	3	7	16	25	18	8	9
Annual	**9.9**	**10**	**6**	**5**	**7**	**15**	**21**	**14**	**10**	**12**

red = highest value blue = lowest value

Table 4 The effect of weather conditions on odour dispersion. Colours correspond to dispersion categories in the Oklahoma Dispersion Model (EX – excellent, G – good, MG – moderately good, MP – moderately poor, P –

poor, VP – very poor). Note that the first four categories for solar radiation are functions of sun angle and cloudiness amount (adapted from Carlson & Hamilton (2019).

Wind Speed (Km/h)	Daytime					Night time		
	Solar Radiation					Cloudiness		
	Strong	Moderate	Weak	Slight	Heavy Overcast	Heavy Overcast	Cloudy/ Mostly Cloudy	Partly Cloudy/ Clear
2	G	G	MG	MG	P	P	VP	VP
5	EX	G	MG	MG	P	P	VP	VP
8	EX	G	MG	MG	MP	MP	P	VP
11	EX	EX	G	MG	MP	MP	P	VP
15	EX	G	G	MG	MP	MP	MP	P
18	G	G	MG	MG	MG	MG	MG	MP
21	G	G	MG	MG	MG	MG	MG	MG
24	G	G	MG	MG	MG	MG	MG	MG
32	EX	G	G	G	G	G	G	G
40	EX	G	G	G	G	G	G	G
48	EX	G	G	G	G	G	G	G

Particulate pollution may present a problem if feedstocks or windrows are allowed to become dry, particularly during the blending and/or turning stages of the process or during periods of high wind. The moisture level of the windrows and feedstocks will be monitored, and where appropriate, a water cart will be used for wetting the compost windrows and feedstock stockpiles. The maximum mean windspeed, as measured at Miller St, Hay, has been recorded as 11.5 km/hour which is considered a light to gentle wind (Table 2 & Table 3 & Figure 5). For this reason, despite the absence of significant wind breaks in the area, particulate pollution is not expected to be a significant concern. Should high winds become a problem, compost turning will be restricted and deliveries of feedstocks will be postponed. Additional buffer trees are also being planted to supplement the existing trees onsite, and should be mature enough to assist by the time the operation is fully scaled to capacity.

4.2.3 Fire risk

The site is not zoned as being bushfire prone, although the riparian zone located 1.872 km away at its closest point, is classified as bushfire prone. Although the locality overall is quite dry, the light to gentle windspeeds would mean the risk of fire escaping the proposed site would be minimal.

Despite this, large piles of organic material can be considered fuel, susceptible to random combustion and as feedstock for a moving bushfire. As such, risk will be mitigated by maintaining a fire break around the site, in addition to an on-site water storage tank fitted with a STORZ valve for fire-fighting purposes. Windrows will be monitored for temperature, moisture and air content and maintained within optimal parameters to ensure that anerobic methane production is limited and random combustion does not occur.

Figure 11: Distance of proposed site from land classified as bushfire prone land, as per GIS software (IntraMaps8). Measurements indicate the site is 872.2 m from the nearest bushfire prone land.

4.2.4 Flora and fauna issues

The proposed site is not zoned as 'Terrestrial Biodiversity', 'Riparian Lands and Watercourses', 'Scenic Protection Land', 'Wetlands' or 'Environmentally Sensitive Land' under the Hay LEP.

The closest vulnerable environment according to ePlanning Spatial Viewer, is the Riparian Lands and Watercourses, located over 1.89 km from the site on the Murrumbidgee River (Figure 7).

Despite this, the feedstocks used in the composting process are predicted to contain weeds which could pose environmental harm to surrounding land use. Moisture will be managed to minimise windblown matter. Regular site assessments of weeds will be carried out and, if needed, sprayed to ensure that weeds do not take root onsite or spread to surrounding land.

The feedstock may attract vermin in the form or birds and rodents. This will be managed by thorough mixing of the incoming feedstock and covering each incoming FOGO load with a layer of mulched green waste.

4.3 Other low risk considerations

4.3.1 Litter

Windblown litter may be generated by feedstock contamination. It is likely that material from the kerbside collection truck will pose the highest litter risk. A staff member will be ready to screen the material upon delivery. The site will be fenced, and regular site checks will include litter picking.

4.3.2 Traffic and noise issues

The access road to the site is Thelangerin Road which has very few residential dwellings located on it and is one of the major roads leaving the main township of Hay to the north. The proposed operation will involve 3-4 extra collection drop-offs per week once fully established and is highly unlikely to impact any sensitive receptor. There will be increased use of wheel loader on site which will be restricted to working hours (8am - 4pm). No surrounding land uses are likely to be impacted by the proposed site operation. Council will keep a noise complaint register to monitor any issues that may arise.

4.3.3 Amenity issues

The area surrounding the proposed site is classified as primary production. There are no dwellings or sites used by the public nearby. The change from current use to being used by a composting operation is not likely to negatively impact on any amenity.

4.3.4 Soil issues

The identified potential soil risk relates to the possible impact of erosion and contamination during earthworks construction. Although the geotechnical investigation is yet to be conducted the proposed site is relatively flat (<2°) and there is no identified risk of subsidence from previous use of the land. Erosion control measures will be employed during site establishment, and earthworks will be completed in a timely manner to minimise the exposure of bare earth.

Risk of site contamination from leachate will be managed by a barrier system and storm water management will be constructed using bunds, drains and sediment traps.

4.3.5 Economic issues

The cost associated with the establishment of the site is approximately $2,974,087 of which a portion may come from the NSW EPA Waste Less Recycle More (Organics Infrastructure – Large and Small) grant stream, providing the application is successful. The remaining capital expenditure has been budgeted for. The RRC is estimated to cost $150,000 pa to operate but will generate savings of greater than $50,800 pa. The diversion of organic materials from the council-owned landfill will extend the life of the landfill, reduce environmental impacts, and contribute to a more resilient waste management system. There is also the possibility of accepting more feedstocks from the agricultural sector at a small gate fee, thus increasing the volume of mature compost available

for sale to the public. There is little risk in the proposed operation's finances as Council owns and operates the nearby landfill so in the event of contamination or other issues, material can be redirected back to landfill.

5. MANAGEMENT COMMITMENTS

On application for an environment protection licence from the EPA, an Environmental Management Plan will be developed, building on the information presented in this SEE, but also detailing:

- How pollution incidents will be reported and actioned (Pollution Incident Response Management Plan)
- Operational management plan (wardens, evacuation, supervisor responsibilities)
- Occurrence and attributes for monitoring, including:
    - Litter
    - Weeds
    - Moisture and temperature of compost
    - Leachate dam
    - Compost pad and surface integrity
    - Water tank capacity and fire management systems
- Water management plan and vadose zone monitoring
- Odour monitoring
- Procedures for how to decontaminate and record incoming feedstock.

APPENDIX A: PLANNING EXCERPTS

Hay Local Environmental Plan 2011

Zone RU1 Primary Production

1 Objectives of zone

• To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.

• To encourage diversity in primary industry enterprises and systems appropriate for the area.

• To minimise the fragmentation and alienation of resource lands.

• To minimise conflict between land uses within this zone and land uses within adjoining zones.

2 Permitted without consent

Environmental protection works; Extensive agriculture; Home-based child care; Home occupations; Roads; Water reticulation systems

3 Permitted with consent

Air transport facilities; Airstrips; Animal boarding or training establishments; Aquaculture; Bed and breakfast accommodation; Boat launching ramps; Boat sheds; Building identification signs; Business identification signs; Cellar door premises; Cemeteries; Community facilities; Correctional centres; Depots; Dual occupancies (attached); Dwelling houses; Eco-tourist facilities; Environmental facilities; Extractive industries; Farm buildings; Farm stay accommodation; Forestry; Freight transport facilities; Helipads; Home businesses; Home industries; Home occupations (sex services); Industrial training facilities; Information and education facilities; Intensive livestock agriculture; Intensive plant agriculture; Jetties; Landscaping material supplies; Open cut mining; Plant nurseries; Recreation areas; Recreation facilities (major); Recreation facilities (outdoor); Roadside stalls; Rural industries; Rural workers' dwellings; Veterinary hospitals; Water recreation structures; Water supply systems

4 Prohibited

Any development not specified in item 2 or 3

Environmental Planning and Assessment Regulation 2000

Relevant documents to accompany development application as per Schedule 1 Forms of the *Environmental Planning and Assessment Regulation:*

2 Documents to accompany development application

(1) A development application must be accompanied by the following documents –

(a) A site plan of the land,

(b) A sketch of the development

(c) A statement of environmental effects (in case of development other than a designated development or State significant development),

(d) In the case of the development that involves the erection of a building, an A4 plan of the building that indicates its height and external configuration, as erected, in relation to its site (as referred to in clause 56 of this Regulation),

Under the *Environmental Planning and Assessment Regulation (2000),* the relevant consent authority is the Hay Shire Council as the proposed development does not classify as designated development under Schedule 3 of Environmental Planning & Assessment Regulation 2000 where a designated development of a ***Composting facilities or works*** will meet the following criteria:

13 Composting facilities or works

Composting facilities or works (being works involving the controlled aerobic or anaerobic biological conversion of organic material into stable cured humus-like products, including bioconversion, biodigestion and vermiculture):

(a) that process more than 5,000 tonnes per year of organic materials, or

(b) that are located:

(i) in or within 100 metres of a natural waterbody, wetland, coastal dune field or environmentally sensitive area, or

(ii) in an area of high water table, highly permeable soils, acid sulphate, sodic or saline soils, or

(iii) within a drinking water catchment, or

(iv) within a catchment of an estuary where the entrance to the sea is intermittently open, or

(v) on a floodplain, or

(vi) within 500 metres of a residential zone or 250 metres of a dwelling not associated with the development and, in the opinion of the consent authority, having regard to topography and local meteorological conditions, are likely to significantly affect the amenity of the neighbourhood by reason of noise, visual impacts, air pollution (including odour, smoke, fumes or dust), vermin or traffic.

Protection of the Environment Operations Act 1997

The proposed activities for the OPF 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,

48 Licensing requirement—scheduled activities (premises-based)

(1) Application of this 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.

(2) Offence A person who is the occupier of any premises at which any such scheduled activity is carried on is guilty of an offence, unless the person is, at the time that activity is carried on, the holder of a licence that authorises that activity to be carried on at those premises.

Maximum penalty –

(a) in the case of a corporation - $1,000,000 and, in the case of a continuing offence, a further penalty of $120,000 for each day the offence continues, or

(b) in the case of an individual - $250,000 and, in the case of a continuing offence, a further penalty of $60,000 for each day the offence continues.

Schedule 1 defines composting as a scheduled activity as:

Schedule 1 Scheduled activities

12 Composting

(1) This clause applies to ***composting***, meaning the aerobic or anaerobic biological conversion of organics into humus-like products -

(a) by methods such as bioconversion, biodigestion or vermiculture, or

(b) by size reduction of organics by shredding, chipping, mulching or grinding.

(2) The activity to which this clause applies is declared to be a scheduled activity if -

(a) where it takes place inside the regulated area, or takes place outside the regulated area but receives organics from inside the regulated area (whether or not it also receives organics from outside the regulated area)-

(i) it has on site at any time more than 200 tonnes of organics received from off site, or

(ii) it receives from off-site more than 5,000 tonnes per year of non-putrescible organics or more than 200 tonnes per year of putrescible organics, or

(b) where it takes place outside the regulated area and does not receive organics from inside the regulated area:

(i) it has on site at any time more than 2,000 tonnes of organics received from off site, or

(ii) it receives from off-site more than 5,000 tonnes per year of non-putrescible organics or more than 200 tonnes per year of putrescible organics.

(3) For the purposes of this clause, 1 cubic metre of organics is taken to weigh 0.5 tonnes.

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.

Environmental Planning and Assessment Act 1979

This development application is classified as an integrated development as per Section 4.46 of the *Environmental Planning and Assessment Act (1979)* and as such, Council will need to refer the development application to the Environmental Protection Authority as the relevant approval body.

Division 4.8 Integrated development

4.46 What is "integrated development"?

(1) Integrated development is development (not being State significant development or complying development) that, in order for it to be carried out, requires development consent and one or more of the following approvals –

Protection of the Environment Operations Act (1997)	Ss 43(a), 47 and 55	Environmental protection licence to authorise carrying out of scheduled development work at any premises.
	Ss 43(b), 48 and 55	Environmental protection licence to authorise carrying out of scheduled activities at any premises (excluding any activity described as a "waste activity" but including any activity described as a "waste facility").
	Ss 43(d), 55 and 122	Environment protection licences to control carrying out of non-scheduled activities for the purposes of regulating water pollution resulting from the activity.

Where a ***waste facility*** is – any premises used for the storage, treatment, processing, sorting or disposal of waste,

and ***waste*** includes -

(a) any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, or

(b) any discarded, rejected, unwanted, surplus or abandoned substance, or

(c) any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, processing, recovery or purification by a separate operation from that which produced the substance, or

(d) any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations, or

(e) any substance prescribed by the regulations to be waste.

A substance is not precluded from being waste for the purposes of this Act merely because it is or may be processed, recycled, re-used or recovered.

APPENDIX B: BUDGET

Hay Resource Recovery Centre (RRC)			
	Unit Cost ($)	**Unit**	**Cost ($)**
MRF and Composting Facility:			
DA Approval & EPA Licencing	15,000	1	15,000
Facility Design	14,000	1	14,000
		Sub-Total:	**29,000**
Materials Recovery Facility (MRF)			
Sorting and Processing Equipment	909,800	1	909,800
3 Phase Power provision	90,000	1	90,000
Shed Extension (including concrete slab)	81,527	1	81,527
Misc - drainage, move tank, other	15,000	1	15,000
		Sub-Total:	**1,096,327**
FOGO/Composting			
Trommel	349,000	1	349,000
Pre-Shredder	410,000	1	410,000
Windrow Turner + Water Wagon	85,000	1	85,000
Tractor - Kubota M100GX	90,500	1	90,500
Concrete Pad	110	625	68,750
Crushed Concrete Pad	8	2,500	20,000
Clay Pads and Water Runoff Storage for windrows	4	5,000	20,000
Misc - signage, fencing, water provisions	20,000	1	20,000
Training of Staff	50,000	1	In Kind
		Sub-Total:	**1,063,250**
Hay MRF and Composting Facility- Phase 2:			
Polystyrene Baler	0	1	0
Undercover Public Area	88,568	1	88,568
Storage Shed	190,900	1	190,900
Bins/Trolleys & Kerbside Recycling Bins	89,375	1	89,375
Drum Muster Cage	5,000	1	5,000
Secondary Shredder	211,400	1	211,400
Gate House, including civil works	35,000	1	35,000
Misc- including signage, power and water	40,000	1	40,000
Weighbridge	125,267	1	125,267
		Sub-Total:	**785,510**
Total Project Value			**2,974,087**

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