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Urban Perspectives
Environmental Solutions Pty Ltd
ABN: 13 095 904 224

26/10/2022
Our Ref: 443

To:

Att: Susanna Cheng
Department of Planning, Industry and Environment
12 Darcy St, Parramatta
New South Wales 2150 ·

Dear Susanna,

Re: Submission to proposed Smithfield Materials Recycling Facility at 132-144 Warren Road, Smithfield (SSD-19425495)

The following submission is made on behalf of McCredie Road Properties Pty Ltd who own property at 6 Herbert Place, Smithfield, which is located approximately 200 metres south of the proposed development. Visy currently operates a MRF on their site.

Traffic

Traffix was engaged to undertake a review of traffic impacts. Their review is included at Appendix A.

Visy's Smithfield MRF currently has capacity of 300,000tpa. McCredie Road Properties Pty Ltd is concerned about the cumulative impact of Visy's Smithfield MRF and the proposed MRF on Warren Road as trucks try to access both sites during peak periods.

The Traffic Impact Assessment (TIA) Report at Appendix M of the EIS assumes that trucks with inbound waste will arrive at 7.5 minute intervals and that the maximum waiting time on the weighbridge is 30 seconds. If there is a truck propped within the entry access, whilst a truck is propped on the weighbridge at Gate 1, the TIA recommends that traffic management personnel signal to any subsequently arriving trucks that they are to use the bypass lane at Gate 1 and then prop in the waiting bays until the weighbridge is vacant for the trucks to then manoeuvre onto the weighbridge.

Visy's experience is trucks do not arrive at evenly spaced 7.5 minute intervals and therefore the need to rely on a person to direct trucks to use the bypass lane and the waiting bays at the proposed MRF will occur frequently. The difficulty of manoeuvring trucks from the waiting bay to the inbound weigh station will cause delays that could result in queuing of trucks onto Warren Road. The queuing of trucks onto Warren Road would affect the arrival of trucks to Visy's facility as well as the safety, efficiency and ongoing operation of Warren Road.

The alternatives section of the EIS does not consider alternative design layouts. We submit there is insufficient queuing space at the inbound weigh station during peak periods and the weigh station should be located further into the site and an acceleration lane and deceleration lane be required in accordance with Austroads Guidelines as typically required by TfNSW for major developments with access/egress provided off a classified State Road. We also submit that it would be more appropriate to quantify the trip generation of the proposed development through comprehensive surveys of similar developments in accordance with TfNSW Guide to Traffic Generating requirements rather than make assumptions about arrival times.

Traffix also identifies the following issues:

- The TIA adopts the parking rates nominated for "warehouses" without any justification how it is relevant to the propose MRF. A "warehouse" is defined in the TfNSW Guide to Traffic Generating Developments 2002 as "a building or place used for the storage of goods, merchandise or materials pending their sale and distribution to persons engaged in retail trade." It is unclear how this is similar to the proposed MRF with specialised plant and equipment for processing waste. In the circumstances, it is appropriate to quantify the off-street parking requirements through comprehensive surveys of similar developments in accordance with TfNSW Traffic Generating Guidelines.
- The SIDRA modelling shows that right turn movement from Sturt Street southeast approach operates at a level of Service (LoS) F with average vehicle delays of 81.1s. Similarly, there are multiple individual movements at the Warren Road / Percival Road intersection that operates with extensive delays over 60 seconds during both the AM and PM peak periods, showing the intersection is unable to satisfactorily accommodate the additional traffic demands generated by the proposed development. Mitigation measures need to be identified or the quantity of material delivered to the plant reduced and the SIDRA modelling updated to address the performance issues at these intersections as well as the modelling of all proposed driveways and impacts of predicted traffic within a 10-year horizon.
- The TIA references the Building Code of Australia (BCA) but remains silent on the accessible parking rate that has been adopted and the number of accessible parking spaces that have been provided. Accessible parking requirements and provision should be clarified.
- The TIA is silent on the provision of bicycle and motorcycle parking facilities. Sustainable transport options should always be considered in any new development and therefore, bicycle and motorcycle parking should be considered.
- The TIA acknowledges the current AS 2890.2 (2018) but references 19m semi-trailers. which is in the former standard that has now been superseded, and therefore all relevant assessments must be updated to ensure manoeuvring areas are satisfactorily designed for 20m semi-trailers as per current standards. In addition, the review identifies several issues in relation to the swept path analysis. Therefore, the swept path analysis should be revised to satisfy AS 2890.2 (2018) requirements.

Fire Hazards

A fire at the proposed MRF is a potential risk to Visy's Smithfield MRF and therefore Vector Alliance was engaged to undertake a review of fire management (refer to Appendix B). While, we have full confidence with Fire and Rescue's assessment we do raise the following concerns:

- The proposed design is based on the 2019 edition of the BCA and not the current 2022 version.
- The proposed 'in series' configuration of the fire brigade booster assembly and diesel fire pumpset does not align with the parallel configuration recommended in AS 2419.1:2005.

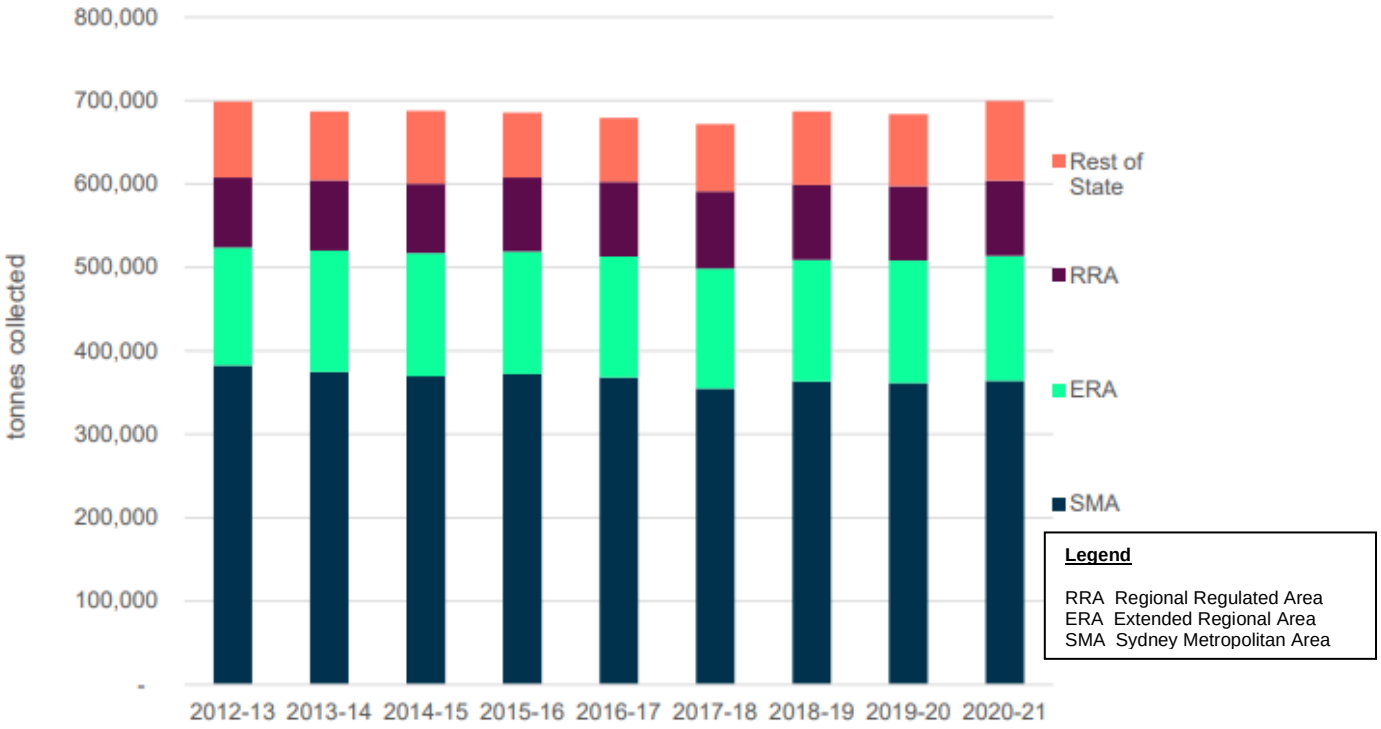
- The EIS does not address approval and associated requirements for direct suction from a Sydney Water asset by a fire pumpset.
- The single diesel fire pumpset arrangement is not considered to provide sufficient redundance in the system based on the high-risk nature of the proposed site.
- The proposed location of external fire hydrants does not appear to comply with AS 2419.1:2005 as they are located immediately adjacent the external walls of the building without being safeguarded by a fire rated barrier.
- Upgrading of external walls to achieve required Fire Rating Level (FRL) do not appear to have been addressed in the design, with the EIS advising there will be no change to the building façade.
- The Fire Services Plan drawing indicates fire hydrant coverage is achieved. However, coverage markups indicate the assumption that firefighters can carry their hose through roller doors and storage piles. As roller doors may be closed or storage piles may be full, fire hydrant coverage should be assessed based on using perimeter personnel access doors and treating storage pile zones as obstructions. Therefore, additional fire hydrants may be required.
- Waste storage fires present a unique environment where a deep-seated fire may not respond to surface level suppression application. It is considered a significant risk for a site to be designed without fixed monitors or systems to support mobile monitors. The fire water infrastructure design should cater for the simultaneous flow and pressure requirements of fire hydrants and fire monitors.
- The storage arrangement is proposed to include baled and stockpile storage areas up to 4 m in height and 1,000 m^3 in volume. This is considered outside of the scope of a High Hazard process occupancy as the storage is not considered small, scattered amounts of in-process storage. The design has adopted a High Hazard process risk occupancy designation and as a result, fire water infrastructure has not been appropriately sized.
- Section 7.7.4 of the FRNSW Fire Safety in Waste Facilities Guideline requires manual call points to be installed in clearly visible locations to facilitate early occupant initiation of a fire alarm. The design does not appear to incorporate manual call points.
- A design standard has not been nominated for the smoke exhaust system.

Need & Capacity

The EIS claims that NSW is at the brink of its Municipal Solid Waste recycling capacity, with MRFs "having at present 1,008,000 tpa practical capacity and current throughput of 1,011,000 tpa" (pp 61, EIS). This suggests that Municipal Solid Waste throughput exceeds the current capacity of MRFs. We contend that this is not the case and there is sufficient capacity to meet current demand.

Polytrade has overstated the current throughput of Municipal Solid Waste by more than twice the 2020 rates. EPA data shows that only 500,000 tpa of kerbside recyclables was processed in the MRFs in 2019-2020 (NSW Local Government Waste and Resource Recovery Data Report 2020–21). In fact, EPA data shows that the total waste collected in Sydney Metropolitan Area (SMA) and the rest of NSW has remained static since 2012-2013 (Figure 1) despite the state's population growing 13% in the same period.

Figure 1: Kerbside dry recyclables collect by area 2012 to 2020 (source EPA, NSW Local Government Waste and Resource Recovery Data Report 2020–21)



With regards to capacity Visy advises that it currently has 95,000 tpa of available capacity at its Smithfield and Taren Point MRFs, with a further 110,000 tpa that can be made available at its Alexandria MRF within 18 months if required. This does not include available capacity at other MRFs that Visy does not operate.

We strongly disagree that NSW is at the brink of its Municipal Solid Waste recycling capacity and we do not believe this should be used as justification for approving the proposed development. Approval of the proposed MRF may not be viable in the short to medium term due to existing capacity at other MRFs and the lower throughput than assumed in the EIS. Consequently, the socio-economic benefits of the proposed development, including employment of 36 people during its operational phase, will not be realised if the facility is not viable in the short to medium term.

Conclusion

In summary, we submit that there is insufficient justification for the need of the proposed development. The proposed MRF may not be viable in the short to medium term due to the existing capacity at other MRFs and the lower throughput than assumed in the EIS. Viability of the project is a relevant community concern if the project receives government grants or financial support. It also negates the stated social and economic benefits of the project.

McCredie Road Properties Pty Ltd is particularly concerned about the impact of the proposed development on existing truck movements on Warren Road. The SIDRA modelling shows that the proposed development will cause significant delays to right turn movement from Sturt Street southeast approach and individual movements at the Warren Road / Percival Road intersection during both the

AM and PM peak periods. In the absence of any proposed road works to improve the performance of these intersections, it is recommended that the traffic be remodelled to determine the appropriate number of truck movements for the satisfactory operation of these intersections. Determination of the appropriate number of truck movements should be used to impose a condition that limits the daily quantity of waste the proposed facility receives.

McCredie Road Properties Pty Ltd is also concerned about the queuing of trucks onto Warren Road which would affect the arrival of trucks to Visy's facility as well as the safety, efficiency and ongoing operation of Warren Road. Consideration should be given to locating the weigh station further into the site and constructing an acceleration lane and deceleration lane on Warren Road.

Finally, Visy's Smithfield MRF is located approximately 200 metres south of the proposed development and a fire at the proposed development could be a potential risk to their operations. Vector Alliance has identified several fire management issues that Polytrade should address prior to determination of the DA.

Regards

Stuart Wilmot
Principal
MURP, BSc, Registered Planner

APPENDIX A: TRAFFIC REVIEW

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

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Reference: 22.539r01v02

25 October 2022

VISY Recycling
6 Herbert Place
Smithfield NSW 2164

Attention: Pramil Agrawal, Group Engineering Manager

Re: 132-144 Warren Road, Smithfield – Proposed Smithfield Recycle Centre
Application No. SSD-19425495
TRAFFIX Peer Review

Dear Pramil,

We refer to the subject development application and advise that we have been engaged by VISY Recycling to review the proposed development from a traffic engineering and transport planning perspective.

In this regard, it is emphasised that we have agreed to undertake such a review on the basis that we do so in the context of an independent peer review, with no expectations that we could advance the concerns of VISY Recycling.

Accordingly, we have reviewed the Traffic Impact Assessment (TIA) and plans prepared for the subject development exhibited on the NSW Planning Portal at:

- https://www.planningportal.nsw.gov.au/major-projects/projects/smithfield-recycling-centre.

The traffic engineering and transport planning issues that arise from the application are discussed separately below.

Road Network and Site Context

The development site is located on the southern side of Warren Road (Cumberland Highway), some 200 metres east of Percival Road. The site is currently vacant comprising a total area of 1.9 ha and is understood to be formerly involved in the fabrication of steel products.

The report has failed to acknowledge that Warren Road is a classified State Road (Highway No. 13) under the care and maintenance of Transport for NSW (TfNSW).

It is understood that traffic surveys were undertaken at two (2) separate locations where Warren Road intersects with Percival Road and also Sturt Street on Thursday 7 April 2022 between 7:00am-9:00am and 4:30pm-6:30pm. The traffic surveys found Warren Road carries between 3,700 to 4,300 vehicles during typical commuter peak hours, and based on TfNSW guidelines, this equates to approximately 71,667 vehicles per day.

Overview of the Development Proposal

The TIA specifies the Development Application (DA) involves the refurbishment of the existing buildings to provide a Material Recycling Facility (MRF) comprising 8,900m^2 floor area and used to process domestic kerbside waste including glass, paper, cardboard, plastics, steel, aluminium and general waste.

The MRF is proposed to have a processing capacity of 150,000 tonnes per annum, operate 24 hours, 7 days a week comprising 2 × 12 hour shifts with up to 12 shift workers per shift. There will also be one (1) site manager, four (4) office staff, two (2) weighbridge operators, two (2) shift managers and three (3) cleaning staff. Accordingly, the TIA notes that there will be a maximum of 36 staff on site at shift changeover times.

Off-Street Parking Provision

Off-Street Car Parking

A total of 41 car spaces are proposed on site, and a new access is to be provided 10m west of the site's eastern boundary to access the parking area.

The TIA correctly refers to the current Cumberland Development Control Plan (DCP) 2021 and notes there are no parking rates specified for an MRF.

The report however then references and adopts the parking rates nominated for "warehouses" stating parking is compliant with DCP requirements without any justification how it is relevant to the propose MRF being a completely different land use to a "warehouse".

A "warehouse" is defined in the TfNSW Guide to Traffic Generating Developments 2002 (here in referred to as TfNSW GTGD) as a building or place used for the storage of goods, merchandise or materials pending their sale and distribution to persons engaged in retail trade. It is unclear how this is similar to the proposed MRF with specialised plant and equipment for processing waste.

In the circumstances, it is appropriate to quantify the off-street parking requirements through comprehensive surveys of similar developments in accordance with TfNSW GTGD requirements, such as the VISY Smithfield Recycling Facility at 6 Herbert Place, Smithfield is operating just down the road from the development site.

Accessible Parking

The TIA references the Building Code of Australia (BCA) but remains silent on the accessible parking rate that has been adopted and the number of accessible parking spaces that have been provided.

The TIA needs to be updated to clearly justify and ensure adequate provision of accessible parking on site.

Bicycle and Motorcycle Parking

The TIA is silent on the provision of bicycle and motorcycle parking facilities, whilst the DCP do not nominate a minimum rate for bicycle and motorcycle parking spaces, sustainable transport options should always be considered in any new development.

Accordingly, the TIA should justify the proposed provision of bicycle and motorcycle parking (or lack thereof).

Servicing and Loading

The TIA specifies access for trucks will comprise up to B-doubles, but it is unclear what is meant by 26m B-double articulated vehicle requiring to "prop" within the accessway for unloading.

The TIA notes the majority of trucks up to 19m in length will circulate clockwise around the site and exit via the existing access adjacent to the site's western boundary.

We note the report acknowledges the current AS 2890.2 (2018) but references 19m semi-trailers which is in the former standards that has now been superseded, and therefore all relevant assessment must be updated to ensure manoeuvring areas are satisfactorily designed for 20m semi-trailers as per current standards.

We note the TIA is silent on loading requirements for commercial and industrial developments specified in Section 4.6 of Council's DCP.

The TIA notes a number of operational restrictions for the use of loading docks and use of 26m B-Double vehicles which warrants a comprehensive Loading Dock Management Plan (LDMP) to be prepared to the satisfaction of the consent authority as part of the application.

A review of the swept path analysis provided in Attachment F & G of the TIA has found the following:

- It is unclear if 600mm vehicle body clearance has been adopted for commercial vehicles in accordance with AS 2890.2 (2018) requirements;
- All semi-trailer swept path analysis needs to be updated to adopt 20m Articulated Vehicles (AVs) in accordance with AS 2890.2 (2018) requirements;
- The eastern combined entry and exit driveway shall be designed in accordance with Figure 3.2 of AS 2890.2 (2018) accommodating 26m B-Double design vehicle;
- The swept path analysis fails to demonstrate how a vehicle entering the eastern commercial driveway will be able to pass another commercial vehicle waiting to exit, resulting the truck having to stop on a classified State Road whilst waiting for truck on the driveway to exit, this is then complicated by the exiting truck needing to cross over three (3) traffic lanes and how they are able to safely enter the road with limited sight distance. Any departure to sight distance requirements specified in AS 2890.2 (2018) must be justified to ensure safe and efficient vehicular access / egress can be achieved via a classified State Road to the satisfaction of TfNSW;
- Swept paths analysis should be provided to demonstrate satisfactory access / egress to every loading dock whilst not impeding access / egress to adjacent loading docks and the circulation driveway;
- It is unrealistic to expect 26m B-double will be able to reverse as shown in the provided swept path analysis unless video evidence can be provided, as such, adequate decoupling areas must be provided for 26m B-double so they can decouple the second trailer and be reversed in as standard AVs to achieve safe and satisfactory operation in accordance with best industry practice;

- The 26m B-double exiting the eastern commercial driveway takes up the entire driveway and all three (3) traffic lanes on Warren Road, it is unclear how this would be acceptable to TfNSW;
- The two-way traffic on the eastern portion of the site involving AVs and B-doubles is chaotic and operational management measures should be provided to ensure safe on-site operation; and
- The 19m AV swept path exiting the western driveway crosses over four (4) lanes of traffic and is unclear how this would be acceptable to TfNSW, noting it will need to be updated to adopt a 20m AV as per AS 2890.2 (2018).

Traffic Impacts

Trip Generation

The TIA has relied on data provided by Polytrade Recycling stating the site is expected to generate 30 truck trips per hour in the AM peak hour (15 in and 15 out) and 10 truck trips per hour in the PM peak hour (5 in and 5 out).

The TIA also estimates staff and visitors will generate 8 vehicle trips during both the AM and PM peak hour as the shift workers have been assumed to travel outside of typical commuter peak periods.

In the circumstances, it is in our view that it would be more appropriate to quantify the trip generation of the proposed development through comprehensive surveys of similar developments in accordance with TfNSW GTGD requirements, such as the VISY Smithfield Recycling Facility at 6 Herbert Place, Smithfield is operating just down the road from the development site.

Traffic Modelling

Notwithstanding whether appropriate trip generation has been considered for the proposed MRF, we provide the following comments relating to the traffic modelling that have been undertaken in the TIA.

The TIA assessed the operational performance of the Warren Road / Sturt Street intersection and Warren Road / Percival Street intersection under both existing and existing plus development scenarios.

The TIA reported on the Degree of Saturation (DoS), Average Vehicle Delay (AVD), 95th percentile queue and Levels of Service (LoS) for the critical movement only.

The TIA is silent on whether TfNSW's TCS plan and SCATS data have been considered, and there are no commentary relating to how the traffic models has been calibrated and validated to existing road conditions.

The presented SIDRA results need to be updated to show the overall average delay over all movements in accordance with TfNSW GTGD.

Furthermore, a close examination of the SIDRA output provided in Attachment J of the TIA has identified the following matters that needs to be addressed:

- The right turn movement from Sturt Street southeast approach operates at a LoS F with average vehicle delays of 81.1s – noting TfNSW GTGD states specifies it is not satisfactory if the average delay on one movement is 60 seconds or more; and
- Similarly, there are multiple individual movements at the Warren Road / Percival Road intersection that operates with extensive delays over 60 seconds during both the AM and PM peak periods, showing the intersection is unable to satisfactorily accommodate the additional traffic demands generated by the proposed development.

SIDRA modelling should also be undertaken at the proposed driveways to assess and mitigate any traffic impacts relating to existing traffic travelling through Warren Road.

The TIA is also silent on whether consultation has been undertaken with TfNSW to determine the need to model these intersections for development opening year and at least a 10-year horizon typically required by TfNSW

Internal Design Aspects

Access

The TIA is silent on the provision and requirements of acceleration lane and deceleration lane in accordance with Austroads Guidelines typically required by TfNSW for major developments with access/egress provided off a classified State Road.

The TIA also notes an additional driveway is proposed to provide separate access to the carparking area, resulting in a total of three (3) driveways off Warren Road. We generally support the approach of providing separate, safe vehicular access to carparking areas for industrial developments, however, it is unclear why this cannot be achieved using the existing two (2) vehicular driveways.

Reference is also made to Clause 2.119 of the Infrastructure State Environmental Planning Policy (Transport and Infrastructure) 2021 specifies that the consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that:

- Where practicable, vehicular access to the land is provided by a road other than the classified road; and
- the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of:
  - the design of the vehicular access to the land, or
  - the emission of smoke or dust from the development, or
  - the nature, volume or frequency of vehicles using the classified road to gain access to the land; and
- The development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures, to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road.

On the above basis, it is in our view the TIA has not sufficiently justify that the safety, efficiency, and ongoing operation of Warren Road will not be adversely affected by the proposed development.

Car Park Layout

The TIA notes the on-site carparking will be reconfigured to provide a total of 41 car spaces in compliance with AS2890.1 (2004) and AS2890.6 (2009).

We generally concur that the proposed carparking area is satisfactory.

Construction Traffic Impacts

It is in our view a preliminary Construction Pedestrian Traffic Management Plan (CPTMP) needs to be prepared given the site's location being only accessible from a classified State Road.

Conclusion

In the view of the above we consider the current state of the Traffic Impact Assessment prepared by EB Traffic Solutions does not adequately assess the traffic and parking impacts arising from the proposed development.

Accordingly, we recommend the consent authority to consider the following matters when assessing the development application and request additional information where required:

- It is in our view that the off-street parking demands and traffic generation potential of the proposed MRF is to be quantified via comprehensive surveys of similar developments in accordance with TfNSW GTGD.
- Accessible parking requirements and provision should be clarified.
- Bicycle and motorcycle parking should be considered.
- Servicing and loading needs to be clarified and appropriate designed for 20m AVs and up to 26m B-Double vehicles as specified in the TIA.
- Swept path analysis should be revised to satisfy AS 2890.2 (2018) requirements.
- SIDRA modelling needs to be updated in accordance with TfNSW GTGD requirements, including the modelling of all proposed driveways, and electronic files should be provided to the consent authority for approval.
- Traffic impacts need to be appropriately assessed and mitigation measures should be provided if required.
- The TIA needs to sufficiently justify that the safety, efficiency and ongoing operation of Warren Road will not be adversely affected by the proposed development.
- Preliminary CPTMP should be considered to the satisfaction of the consent authority.

We trust the above is of assistance and request that you contact the undersigned should you have any queries or require any further information.

Yours faithfully,

Traffix

Thomas Yang
Senior Engineer

APPENDIX B: FIRE MANAGEMENT REVIEW

VECTOR
ALLIANCE

POLYTRADE SMITHFIELD RECYCLING CENTRE

FIRE SAFETY SCOPE REVIEW

Revision: 1

Date: 18 October 2022

Document Reference: 22101-003

DOCUMENT ISSUE REGISTER		
Date	**Revision**	**Description**
18/10/2022	1	Issued for Client Review

AUTHOR

Damian La Starza
Fire Safety Engineer | Fire Systems Designer (F053758D)

REVIEWER

Anderson Claxton
Director | Fire Safety Engineer (BDC3222)

Table of Contents

1 INTRODUCTION

1.1 SCOPE OF ASSESSMENT

Vector Alliance has been engaged by Visy to assist with their public comment submission associated with State Significant Development Application SSD-19425495 for the proposed Polytrade Smithfield Recycling Centre.

Vector Alliance have undertaken a technical review of the fire safety content presented within the project documentation made available on the NSW Planning Portal for public comment. Documentation pertaining to fire safety that form the basis of this review are listed as follows:

- SEARs Scoping Report Rev 0.3 dated 14 May 2021.
- Planning Secretary's Environmental Assessment Requirements dated 10 June 2021.
- Environmental Impact Statement Rev 0.6 dated 19 August 2022, inclusive of the following appendices which pertain to fire safety:
  - Appendix E – Detailed Plans.
  - Appendix L – Stormwater Management Report.
  - Appendix N – DA Stage BCA Report.
  - Appendix O – Fire Services Plan.
  - Appendix P – Fire Management Strategy Overview.

Documentation not listed above that was made available on the NSW Planning Portal was reviewed and determined to not present any information pertaining to fire safety.

The results of the review are presented within this report, with identified errors and omissions pertaining to fire safety highlighted for Visy's consideration.

1.2 SUMMARY OF PROPOSED WORKS

The Polytrade Smithfield Recycling Centre project is understood to comprise the change in use of an existing site to be used as a new waste collection, treatment, and disposal facility at 132-144 Warren Road, Smithfield NSW 2164. The facility is proposed to operate 24/7, receiving up to 150,000 tonnes per annum of domestic and commercial recyclable materials (ferrous metals, non-ferrous metals, glass, plastics, paper, cardboard, and residual) for sorting and transportation to dedicated off-site reprocessing facilities.

The site (Lot 2 of DP 1230452) has an approximate total land area of 19,000 m^2 and is proposed to comprise the existing building (approx. 8,600 m^2), staff and visitor parking (approx. 1,600 m^2), landscaped areas (approx. 1,900 m^2) and external hardstand for circulation (approx. 6,400 m^2). Refer to Figure 1 for an illustration highlighting the proposed works.

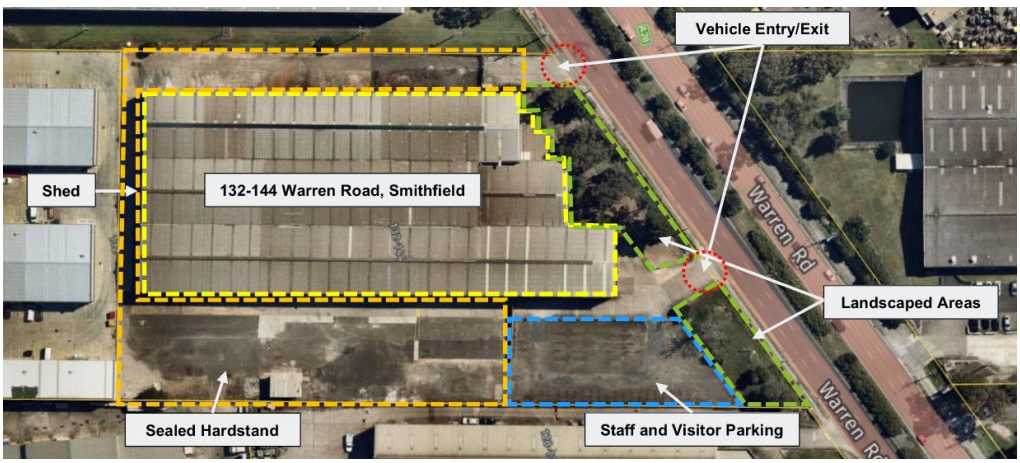

Figure 1 – Extract from Environmental Impact Statement - Illustration of Proposed Works.

The building is proposed to incorporate various sorting plant and equipment, and concrete 'bunker walls' for various stockpile and baled storage areas. Perimeter roller doors and personnel access doors will be provided to facilitate egress from the building. Refer to Figure 2 for an illustration of the proposed general arrangement.

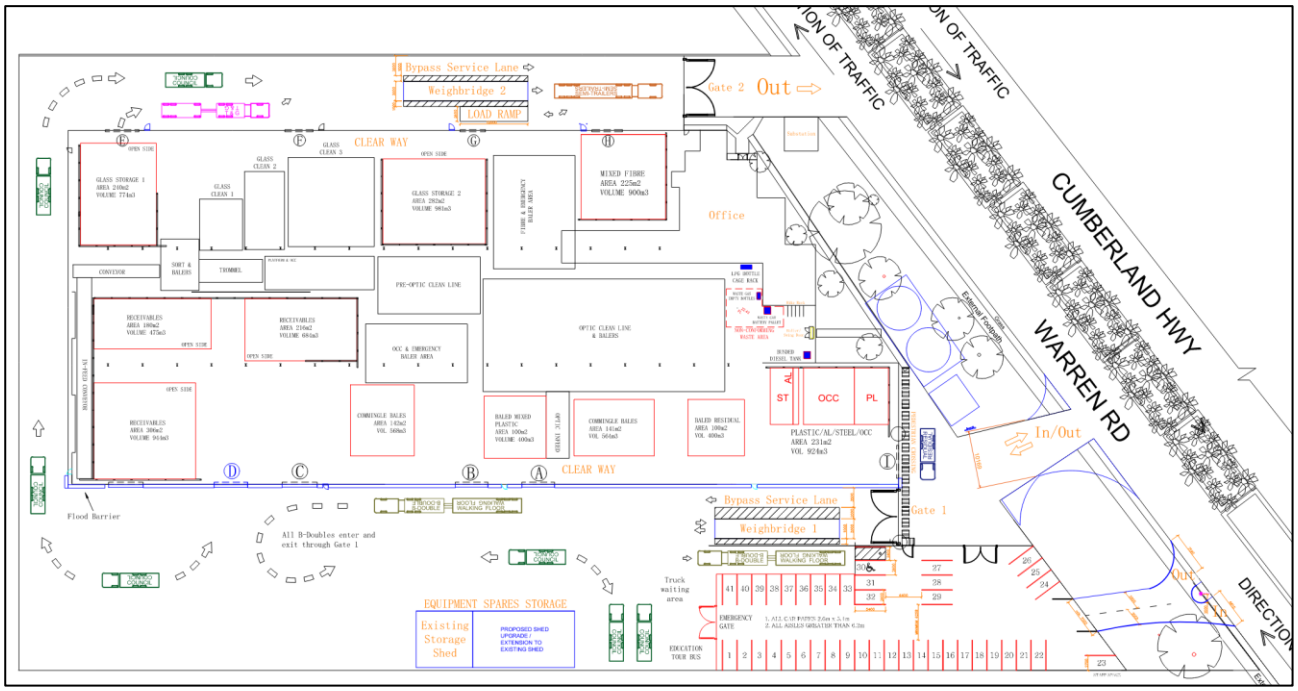

Figure 2 – Extract from Detailed Plans - Illustration of Proposed General Arrangement.

The building generally comprises a single storey, with the exception of the 2-storey Office at the front of the building. The building is understood to comprise a single fire compartment.

The site is generally proposed to comply with the Deemed-to-Satisfy provisions of the National Construction Code Volume 1 2019 Amendment 1 (BCA), with the exception of the following proposed Performance Solutions identified in the BCA Report:

- Perimeter access to north elevation is located more than 18 metres away from the building.
- Exit travel distances exceed 40 m to an exit and 60 m between alternative exits.
- Waste management facility is deemed a special hazard and will require consideration of smoke hazard management systems, onsite stockpile configurations, and associated perimeter wall enclosures.

All Essential Fire Safety measures shall be established as part of the project. Compliance with the following Fire and Rescue NSW Fire Safety Guidelines is required to be achieved:

- Fire Safety in Waste Facilities Version 2.02 dated 27 February 2020.
- Access for Fire Brigade Vehicles and Firefighters Version 5 dated 4 October 2019.

The current Fire Safety Schedule documented in the BCA Report is presented in Figure 3.

Item	Proposed Essential Fire and Other Safety Measures	Standard of Performance
1.	Emergency lighting	**BCA E4.2, E4.4** AS/NZS 2293.1 –2018
2.	Exit signs	**BCA E4.5** (Exit Signs) **BCA E4.6** (Direction Signs) **BCA E4.8** (Design and Operation - Exits) AS/NZS 2293.1 –2018
3.	Portable fire extinguishers	**BCA2019 E1.6** AS2444–2001
4	Fire hydrant	**BCA2019 E1.3** AS2419.1-2005 FRNSW Waste facility guideline
5	Fire hose reels	**BCA2019 E1.4** AS2441-2005
6	Automatic fire suppression system (sprinklers)	**BCA2019 E1.5** AS2118.1-2017 • FRNSW Waste facility guideline • Proposed fire engineering report
7	Large Isolated Building Perimeter emergency vehicle access	**BCA2019 C2.3, C2.4(b)** • FRNSW Guide No. 4 'Guidelines for Emergency Vehicle Access' (current version 02 dated 27 Oct 2010) • FRNSW Waste facility guideline • Proposed fire engineering report
8	Paths of travel • Extended exit travel distance	**BCA2019 Clause E1.4** Proposed fire engineering report
9	Special Hazards	**BCA2019 E1.10 & E2.3** Proposed fire engineering report

Figure 3 – Extract from BCA Report - Proposed Fire Safety Schedule.

The Fire Safety Schedule will need to be updated at the Construction Certificate Stage of the project. It is noted the version of the BCA applicable to new building works is the version applicable at the time of the lodgement of the Construction Certificate. The 2022 edition of the BCA and reference Australian Standards will likely need to be adopted, subject to the date of the Construction Certificate application.

2 FIRE HYDRANT SYSTEM

2.1 PROPOSED CONFIGURATION

The fire hydrant system is generally proposed to be configured as follows:

- Water supply from 150 mm Utility Water Main capable of achieving the following:
  - 10 L/s @ 300kPa.
  - 50 L/s @ 250kPa.
  - 67 L/s @ 200kPa.
- Fire brigade booster assembly located in series with 1 x 5 L/s diesel fire pumpset.
- Ring main water supply pipework located internally at high level.
- External attack fire hydrants located around the perimeter of the building (immediately adjacent external walls).

2.2 FIRE PUMPSET CONFIGURATION

The proposed 'in series' configuration of the fire brigade booster assembly and diesel fire pumpset does not align with the parallel configuration recommended in AS 2419.1:2005. Whilst the proposed configuration is not considered a non-compliance, it is not recommended as it can cause the system to be over-pressurised and present operational issues for the attending fire brigade.

The Environmental Impact Statement presented correspondence between the design team and Sydney Water, with the intent of demonstrating that the design has addressed any issues raised by Sydney Water. It is noted that direct suction from a Sydney Water asset by a fire pumpset is subject to explicit approval by Sydney Water. This matter does not appear to have been addressed.

A single diesel fire pumpset is permitted to serve the fire hydrant system as the building does not have an effective height exceeding 25 m. However, this arrangement is not considered to provide sufficient redundancy in the system based on the high-risk nature of the proposed site. A dual pumpset arrangement is considered necessary to address the Special Hazard presented by the site and achieve compliance with BCA DtS Provisions E1.10 and E2.3.

2.3 FIRE BRIGADE EXPOSURE TO RADIANT HEAT

The Environmental Impact Statement advises '*There will be no change to the building façade*', which is understood to comprise of steel structure and wall linings that will not achieve a fire resistance level (FRL). Clause 3.2.2.2 of AS 2419.1:2005 requires all external fire hydrants to be located in a position not less than 10 m from the building it is protecting unless safeguarded by construction having a FRL of not less than 90/90/90 which extends at least 2 m either side of the fire hydrant outlet and 3 m above the ground.

The proposed location of external fire hydrants does not appear to comply with AS 2419.1:2005 as they are located immediately adjacent the external walls of the building without being safeguarded by a fire rated barrier. Clause 7.5.4 of the FRNSW Fire Safety in Waste Facilities Guideline also requires fire hydrants to not be located within 10 m of stockpiled storage, which is not achieved by the proposed design.

As per the BCA Report, the existing building is setback more than 3 metres from all side allotment boundaries and therefore the external walls do not require a FRL. However, the BCA Report includes the following statements:

'Whilst there is no requirement of the Building Code of Australia 2019 to have any fire protection to external walls of the building due to the setbacks being more than 3 metres to the fire source feature at the allotment boundary, the existing level of fire protection would not be appropriate to the proposed new use due to the additional fire load being provided.'

'Within the proposed fire engineered performance solution for perimeter access, consideration to be given to provision of masonry walls to the rear elevation to provide protection to fire brigade vehicles should they need to pass around the building.'

These statements do not appear to have been addressed in the design, with the Environmental Impact Statement advising there will be no change to the building façade.

2.4 FIRE HYDRANT COVERAGE

The Fire Services Plan drawing indicates fire hydrant coverage is achieved. However, coverage markups indicate the assumption that firefighters can carry their hose through roller doors and storage piles. As roller doors may be closed or storage piles may be full, fire hydrant coverage must be assessed based on using perimeter personnel access doors and treating storage pile zones as obstructions. Additional fire hydrants may be required to be included in the design as a result.

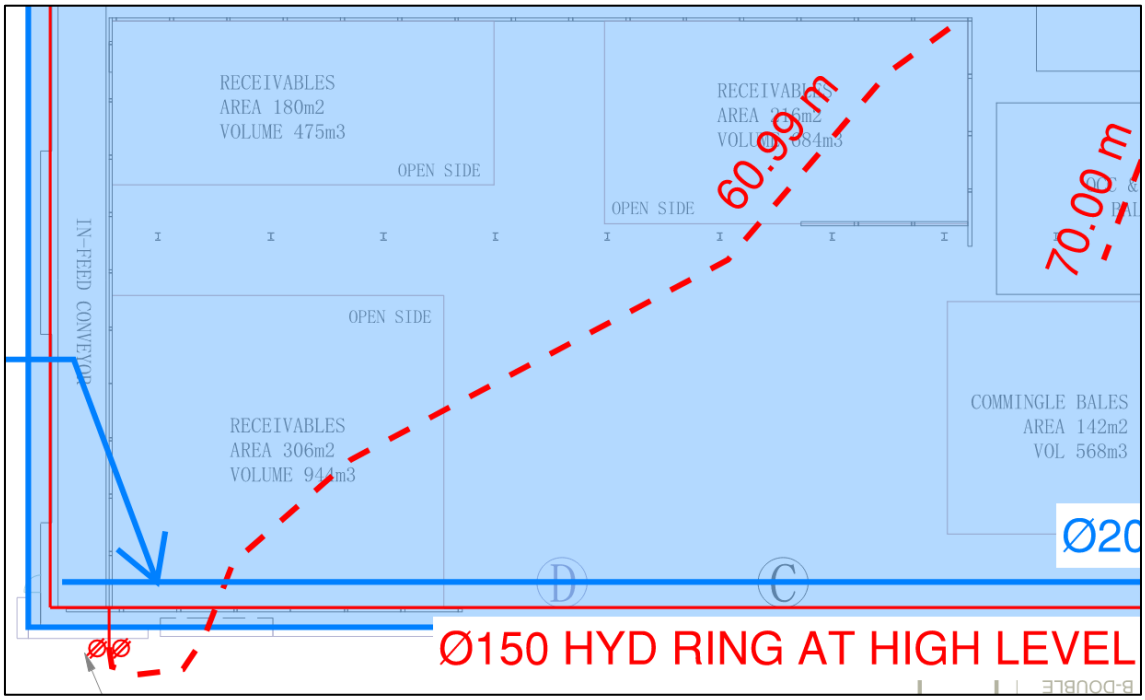

Figure 4 – Extract from Fire Services Plan Drawings – Approach to Achieving Fire Hydrant Coverage.

2.5 FIRE WATER MONITORS

Due to the significant and concentrated fuel source presented by a waste storage area, self-heating is a significant fire safety risk and can result in the realisation of a deep-seated fire. Studies into fire protection of waste facilities identify that digging into the base of a stockpile fire is required to effectively extinguish burning elements (Ibrahim, et al., 2022). Fires resulting from self-heating and self-ignition are generally attributed to deep seated fires in bales and stockpiles due to the heat requiring to be contained and developed to a sufficient level that results in self-ignition.

As the name suggests, a deep-seated fire is one that is initiated below the surface of a storage pile and does not require an external oxygen supply to develop. These fires are typically a result of self-heating, however, can also be a result of damaged batteries within the storage pile or friction from equipment usage. The heat generated within the core or below the surface of the storage stockpile can exceed 250°C, causing material to generate hot combustion gases (pyrolyse). These hot combustible gases develop and rise to the surface of the storage stockpile where combustion occurs when sufficient oxygen is present. This fire development behaviour is likened to fire events realised in coal storages (Sangster, 2018). Figure 5 presents an illustration of the deep seated fire behaviour extracted from a Sloss, Dr L L (2015) report analysing the spontaneous combustion of coal.

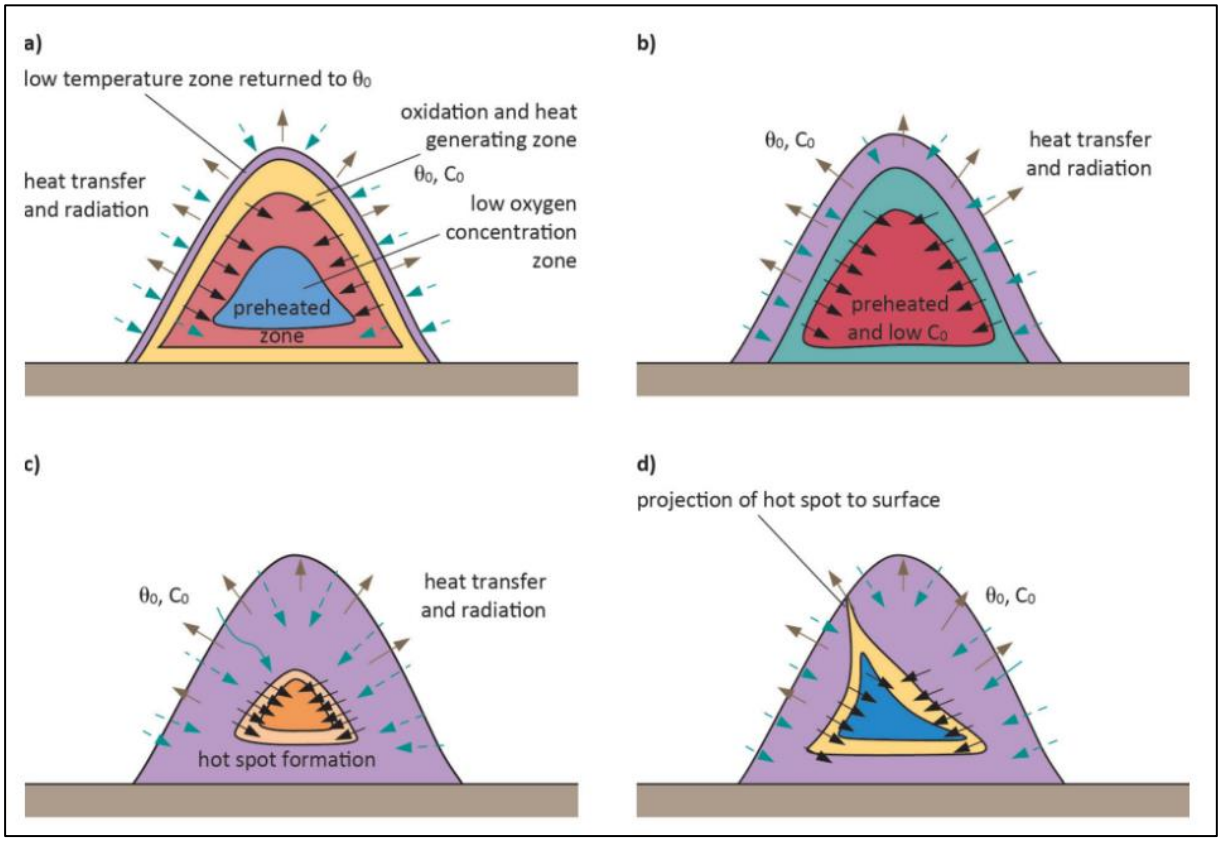

Figure 5 - Behaviour of a Deep-seated Fire Event in a Storage Pile (Sloss, 2015).

The permeability of a fire bed refers to its ability for convection currents (air) to pass through it and promote the spread of fire through the material. Sangaster identified that surface fires on impermeable or semi-permeable fuel beds do not burrow into the material to become a deep-seated fire, they will typically burn with the rate of combustion being controlled by the ash and char production on the surface. As there is no convection through the material, approximately 3% - 5% of the fire's heat is transferred down through conduction. This heat can be sufficient to promote fire spread, however, the ash and char act to smoother the fire, preventing oxygen from reaching the un-pyrolysed fuel bed.

Permeable fuel beds enable the passage of convective heat transfer, where the surface fire is able to spread through the storage volume, resulting in all combustible material being consumed. (Sangster, 2018).

Stacked bale fires behave consistent with both impermeable and permeable storage fires. This is due to the bales themselves forming a dense, impermeable storage medium. However, the stacked arrangement of materials promotes convective air flow through the storage stacks, resulting in oxygen rich air promoting overall fire growth. As the encapsulating medium of the bales (shrink wrap, nylon ties, etc) fails, the bales fall, restricting the flow of air through the storage and resulting in the fire behaving consistent with multiple deep seated fires (Sangster, 2018).

The Sangster study demonstrated that application of water to the stockpile fire was observed to have an immediate impact in reducing the surface temperature of the material, however, it has no noticeable effect 1 m below the material surface. It was noted that once the surface of the medium become saturated, the additional surface water applied simply ran off the surface (Sangster, 2018).

Clause 7.5.5 of the FRNSW Fire Safety in Waste Facilities Guideline introduces the potential incorporation of fixed external fire monitors to serve high risk locations. Fire monitors is a term applied to a firefighting apparatus that is typically able to issue very large volumes of water in jet or fog type arrangements. The versatility in application of these systems results in their wide application in the firefighting industry and the primary equipment used by firefighters during a fire event. Figure 6 presents two typical variations of a fire monitor, the left image is a system that may be operated remotely or manually, affording a very technically advanced firefighting system. The right image presents a simple nozzle attachment that can be effective in a fire event.

Figure 6 – Automatic / Remote Operation Fire Monitor (Left) and Manual Operation Fire Monitor (Right).

As waste storage fires present a unique environment where a deep-seated fire may not respond to surface level suppression application, fire monitors can be an effective addition to the overall Fire Safety Strategy for the building to disrupt the surface and penetrate to the source of the heat. It is considered a significant risk for a site to be designed without fixed monitors or systems to support mobile monitors. The fire water infrastructure design will need to be amended to cater for the simultaneous flow and pressure requirements of the fire hydrants and fire monitors.

3 FIRE SPRINKLER SYSTEM

3.1 PROPOSED CONFIGURATION

The fire sprinkler system is generally proposed to be configured as follows:

- Water supply from 150 mm Utility Water Main providing make-up water to 2 x 150 kL fire water storage tanks.
- Fire brigade booster assembly incorporating tank suction point.
- 2 x 100% duty fire pumpsets.
- 2 x sprinkler control valves serving the following systems:
  - Process and Storage Areas – High Hazard process risk in accordance with AS 2118.1:2017, adopting a design criteria of 12 mm/min/m^2 over 260 m^2.
  - Office Areas – Light Hazard protection in accordance with AS 2118.1:2017.

The fire water infrastructure configuration is presented in Figure 7.

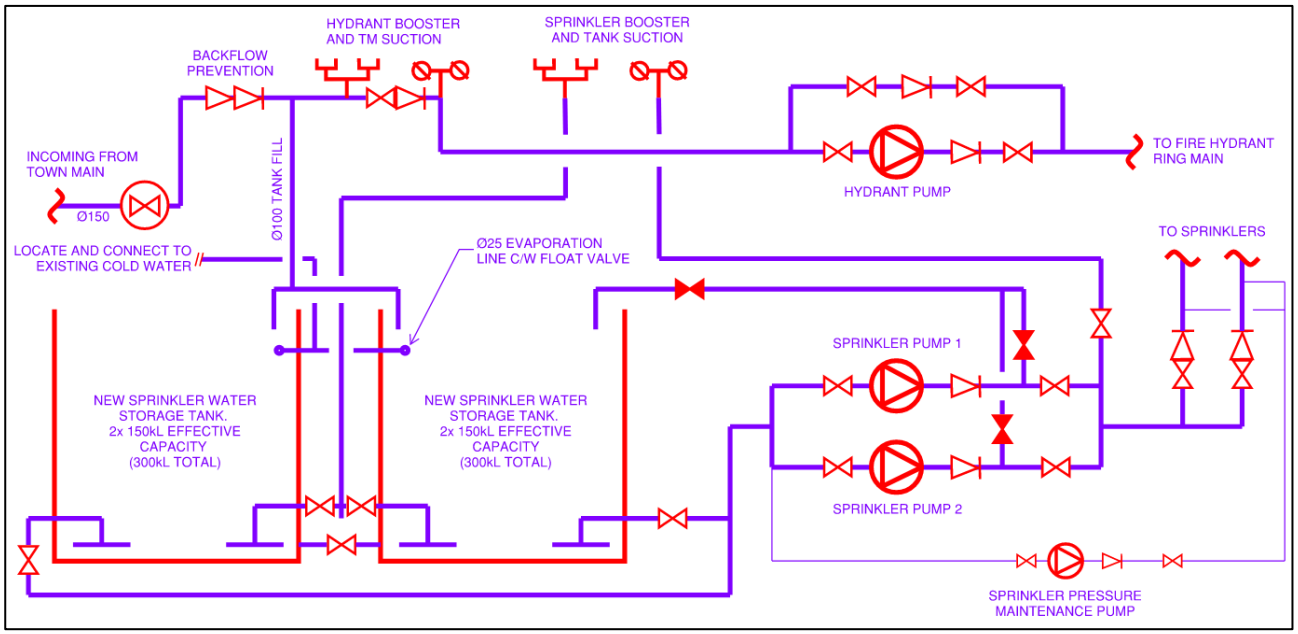

Figure 7 – Extract from Fire Services Plan Drawings – Fire Water Infrastructure Schematic.

3.2 OCCUPANCY CLASSIFICATION

AS 2118.1:2017 separates the hazard classification of an automatic fire sprinkler system into three major categories; Light, Ordinary and High Hazard. The Ordinary and High Hazard classifications are further separated into different sub-classifications to define the required system duty. Appendix A of AS 2118.1:2017 provides guidance on the occupancies that may be attributed to each of the hazard classifications.

In accordance with Section A3.3 of AS 2118.1:2017, Waste Transfer Stations may be considered an OH3 where they don't contain plastic materials. As the site is proposed to accept plastics, this classification cannot be applied and the site must be considered as a High Hazard occupancy.

High Hazard occupancies are divided into process and storage risks. This determination is made by considering the predominate operation completed in the area requiring protection. As per Section 11.3.4.1 of AS 2118.1:2017, '*process occupancies have processes using materials of a hazardous nature likely to develop into rapidly and intensely burning fires, but with small, scattered amounts of in-process storage.*'

The storage arrangement is proposed to include baled and stockpile storage areas up to 4 m in height and 1,000 m^3 in volume. This is considered outside of the scope of a High Hazard process occupancy as the storage is not considered *small, scattered amounts of in-process storage*. The design has instead adopted a High Hazard process risk occupancy designation.

The High Hazard storage design criteria is expected to result in a required increase to the effective capacity of the fire water storage tanks. As per Section 7.6.6 of the FRNSW Fire Safety in Waste Facilities Guideline, the fire sprinkler system shall have a minimum water supply and capacity providing the maximum hydraulic demand (i.e. flow rate) for not less than 2 hours (exceeding the requirements of AS 2118.1:2017).

Any increases to the effective capacity of the fire water storage tanks shall also be incorporated in the sizing of the stormwater containment system, which shall be sized to accommodate 2 hours of fire sprinkler flow and 4 hours of fire hydrant system flow.

4 AUTOMATIC FIRE DETECTION AND ALARM SYSTEM

4.1 PROPOSED CONFIGURATION

The automatic fire detection and alarm system is proposed to comprise the following:

- Fire detection control and indicating equipment (FDCIE, i.e. fire panel).
- Aspirating smoke detection serving the Storage and Process Areas.
- Multicriteria smoke detectors to the Office Area.
- Visual alarm devices as required.
- Fire trips to security and mechanical systems as required.
- 4 x forward looking InfraRed cameras (FLIR A65 FOV 90) providing thermal video with hotspot / temperature overlay.

4.2 MANUAL CALL POINTS

Section 7.7.4 of the FRNSW Fire Safety in Waste Facilities Guideline requires manual call points to be installed in clearly visible locations to facilitate early occupant initiation of a fire alarm. The design does not appear to incorporate manual call points.

5 SMOKE EXHAUST SYSTEM

5.1 PROPOSED CONFIGURATION

The Environmental Impact Statement includes advises the following:

'Ventilation would be provided by roof vents in the ceiling of the warehouse. A smoke hazard management system with rationalised extraction rates in lieu of smoke vents will be implemented.'

No further details or minimum standard of performance (BCA or Australian Standard) appear to have been provided in any of the documents.

5.2 DESIGN CRITERIA

A design standard has not been nominated for the smoke exhaust system. The smoke exhaust system must be designed to comply with BCA Specification E2.2b and AS 1668.1:2015, except that the design shall be based on also preventing the smoke layer from descending below 4 m above floor level to at least 90% of the floor area as per the FRNSW Fire Safety in Waste Facilities Guideline.

6 SUMMARY OF COMPLIANCE ISSUES

Table 1 presents a summary of identified compliance issues presented in this report.

Table 1 – Summary of Identified Compliance Issues.

Fire Safety Measure	Compliance Issue	
	ID	Description
General	1.1	The proposed design is based on the 2019 edition of the BCA. The version of the BCA applicable to new building works is the version applicable at the time of the lodgement of the Construction Certificate. BCA2022 and reference Australian Standards will likely need to be adopted, subject to the date of the Construction Certificate application.
Fire Hydrant System	2.1	The proposed 'in series' configuration of the fire brigade booster assembly and diesel fire pumpset does not align with the parallel configuration recommended in AS 2419.1:2005. Whilst the proposed configuration is not considered a non-compliance, it is not recommended as it can cause the system to be over-pressurised and present operational issues for the attending fire brigade.
	2.2	The Environmental Impact Statement presented correspondence between the design team and Sydney Water, with the intent of demonstrating that the design has addressed any issues raised by Sydney Water. It is noted that direct suction from a Sydney Water asset by a fire pumpset is subject to explicit approval by Sydney Water. This matter does not appear to have been addressed.
	2.3	A single diesel fire pumpset is permitted to serve the fire hydrant system as the building does not have an effective height exceeding 25 m. However, this arrangement is not considered to provide sufficient redundance in the system based on the high-risk nature of the proposed site.
	2.4	The proposed location of external fire hydrants does not appear to comply with AS 2419.1:2005 as they are located immediately adjacent the external walls of the building without being safeguarded by a fire rated barrier. Clause 7.5.4 of the FRNSW Fire Safety in Waste Facilities Guideline also requires fire hydrants to not be located within 10 m of stockpiled storage.
	2.5	The BCA Report includes statements indicating a requirement to upgrade external walls to have a FRL in order to protect attending firefighters from an internal building fire. These statements do not appear to have been addressed in the design, with the Environmental Impact Statement advising There will be no change to the building façade.
	2.6	The Fire Services Plan drawing indicates fire hydrant coverage is achieved. However, coverage markups indicate the assumption that firefighters can carry their hose through roller doors and storage piles. As roller doors may be closed or storage piles may be full, fire hydrant coverage must be assessed based on using perimeter personnel access doors and treating storage pile zones as obstructions. Additional fire hydrants may be required to be included in the design as a result.
	2.7	Waste storage fires present a unique environment where a deep-seated fire may not respond to surface level suppression application. It is considered a significant risk for a site to be designed without fixed monitors or systems to support mobile monitors. The fire water infrastructure design should cater for the simultaneous flow and pressure requirements of fire hydrants and fire monitors.
Fire Sprinkler System	3.1	The storage arrangement is proposed to include baled and stockpile storage areas up to 4 m in height and 1,000 m^3 in volume. This is considered outside of the scope of a High Hazard process occupancy as the storage is not considered small, scattered amounts of in-process storage. The design has adopted a High Hazard process risk occupancy designation and as a result, fire water infrastructure has not been appropriately sized.

Fire Safety Measure	Compliance Issue	
	ID	Description
Automatic Fire Detection and Alarm System	4.1	Section 7.7.4 of the FRNSW Fire Safety in Waste Facilities Guideline requires manual call points to be installed in clearly visible locations to facilitate early occupant initiation of a fire alarm. The design does not appear to incorporate manual call points.
Smoke Exhaust System	5.1	A design standard has not been nominated for the smoke exhaust system.