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Environmental Impact Statement
REMONDIS Australia Pty Ltd
Tomago Resource Recovery Facility and Truck Parking Depot (SSD-10447)

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This Environmental Impact Statement has been prepared by the following staff of Jackson Environment and Planning Pty Ltd, Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060.

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We declare that:

We declare that: The statement has been prepared in accordance with clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation* 2000.

The statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates, and the information contained in the statement is neither false nor misleading.

Report version	Authors	Date	Reviewer	Approved for issue	Date
Draft V1	R.Loemker, J. Lethlean, Dr M. Jackson	31/08/20	Dr M.Jackson	Dr M.Jackson	31/08/20
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Executive Summary

About the development

REMONDIS Australia Pty Ltd is proposing to develop a Resource Recovery Facility and Truck Parking Depot at 21D (Lot 11, DP270328) and 21F (Lot 8, DP DP270328) and part of Lot 301, DP 634536 School Drive, Tomago. As part of this development project, REMONDIS will be relocating its existing truck parking depot and resource recovery facility in Thornton to the Tomago site. The new facility will expand the operations that REMONDIS currently performs, to help provide a broader range of critical recycling services for the Hunter region.

REMONDIS proposes to use the existing buildings at 21D School Drive for the receipt and processing of up to 98,201 tonnes per annum of solid and liquid waste materials. Waste materials include dry non-putrescible waste materials from domestic, commercial, industrial and construction sources. Each recycling operation will be established in discreet parts of the existing industrial warehousing, and collectively, the Tomago Resource Recovery Facility will provide a wide range of recycling services through:

- A fully integrated Materials Recovery Facility for sorting and processing:
  - Commercial and industrial mixed general solid waste (non-putrescible) (60%); and
  - Construction building waste from residential and commercial construction (non-putrescible) (40%);
- A Cardboard Baling Facility for source separated cardboard collected from businesses;
- A Drill Mud Recycling Facility for drill muds sourced from the civil, construction and mining industries;
- A Packaged Food Recycling Plant, which will accept packaged foods and drinks, separating the food contents and packaging for recycling;
- A Garden Organics Primary Processing plant, which will receive, decontaminate, and shred woody garden organics for off-site composting;
- A Hazardous Waste Recycling Facility, for sorting and aggregating a range of spent solid materials and liquids containing oils and chemicals;
- A Copper Processing area; and
- A Metals Recycling Facility.

A truck parking depot will be established on the adjacent vacant lot referred to as 21F School Drive to provide overnight parking for 24 rigid trucks and 9 semi-trailers.

The proposed development will provide a broader range of recycling options and make progress towards the NSW Government's recycling targets. It will also deliver on key priorities of the NSW Government to develop new recycling infrastructure to boost the recovery of municipal, commercial, industrial and construction waste in the Newcastle and Hunter region. The project will also provide 76 full time jobs and involve an investment of $8.975M in site upgrades alone.

Purpose of the environmental impact statement

The EIS study evaluates the social, environmental, and economic impacts and benefits of the project. The EIS defines the context of the proposed development, and examines those issues considered to be relevant. This EIS considers the potential environmental effects of the proposal during construction and operation, and proposes mitigation measures to prevent, reduce or offset significant adverse impacts on the environment. The aims of this EIS are to:

- Identify all constraints affecting future development on the subject site;
- Consider the economic, social and environmental impacts of the proposed development; and
- Assess the capability of the subject site to support the proposed development.

In delivering this EIS, Jackson Environment and Planning Pty Ltd has undertaken all statutory planning assessments, including the preliminary hazard analysis and environmental risk assessment, and stakeholder consultation. Consultation was undertaken with:

- Neighbouring properties;
- Port Stephens Council;
- Department of Planning, Industry and Environment - Environment, Energy and Science Group;
- Department of Planning, Industry and Environment - Water Group;
- Environment Protection Authority;
- Fire and Rescue NSW;
- Rural Fire Service;
- Transport for NSW;
- Hunter Water;
- SafeWork NSW;
- Department of Planning, Industry and Environment - Biodiversity and Conservation Division; and
- Department of Planning, Industry and Environment - Industry Assessments.

A range of consultants have been commissioned to undertake the specialist studies required to address the regulatory agency requirement and to develop this EIS.

The EIS has considered a range of social, environment and economic factors of the project, with a focus on Ecologically Sustainable Development principles. The study found that there were no significant environmental impacts that could not be mitigated by appropriate mitigation measures and management strategies.

The environmental assessment process has been used to inform the design of the site and ensure operations will be sustainable and create minimal disruption to neighbours and the local community. Waste receival, processing and recycling operations have been designed to minimise traffic impact on local roads, effective management of wastes, protection of soils, protection of surface and ground water quality, and minimise noise and dust emissions.

Planning and approvals pathway

REMONDIS propose to treat, store and dispose of industrial liquid waste and will handle more than 1,000 tonnes per year of other aqueous or non-aqueous liquid industrial waste. Therefore, the development is considered to be a State Significant Development under clause 23(6b) of Schedule 1 of the *State Environmental Planning Policy (State and Regional Development*) 2011.

All State Significant Development applications must be accompanied by an Environmental Impact Statement (this report which is prepared in accordance with the Planning Secretary's environmental assessment requirements (SEARs). The SEAR's (10447) for the project was issued on 24th April 2020 by the NSW Department of Planning, Industry and Environment. All EIS requirements provided by the following agencies have been addressed in this EIS.

- Department of Planning, Industry and Environment (SEARs No. 10447);
- Department of Industry – Water;
- Port Stephens Council;
- NSW EPA;
- Department of Planning, Industry and Environment – Biodiversity and Conservation Division;
- Department of Planning, Industry and Environment – Water and the Natural Resources Access Regulator;
- Transport for NSW; and
- Fire & Rescue NSW.

The proposed development also requires an Environment Protection Licence from the NSW Environment Protection Authority as the site is located in the levy-paying area and the facility will have a processing capacity greater than 6,000 tonnes per annum, pursuant to Clause 34(3) of Schedule 1 of the *Protection of the Environment Operations Act* 1997.

State Significant Development is assessed the Department of Planning, Industry and Environment or the Independent Planning Commission, under delegation from the Minister of Planning.

General overview of the proposed development

The Tomago Resource Recovery Facility will receive, sort, process and recycle a range of materials from households, businesses and industries across the Hunter. The operation will also include a truck parking depot for the collection fleet, a maintenance workshop and self-bunded storage tanks for liquid wastes and fuels/oils to support the collection fleet.

The recycling operations will be established within Buildings 1 and 2 on 21D School Drive. Each recycling operation listed below will be established in discreet parts of the existing industrial warehousing, and collectively, the Tomago Resource Recovery Facility will provide a wide range of recycling services.

Materials Recovery Facility

The Materials Recycling Facility will sort and recycle non-putrescible commercial and industrial mixed general solid waste via front-lift bin collections (approximately 60% of total waste received) and construction building waste from residential and commercial construction. This includes office fit-outs (approximately 40% of total waste received). The Materials Recycling Facility is expected to process up to 31,000 tonnes per annum.

Cardboard Baling Facility

A separate part of the Building 1 will be a dedicated Cardboard Baling Facility which will process up to 30,000 tonnes per annum.

Drill Mud Recycling Facility

Drill mud is currently generated by various commercial activities which include hydro-excavation or non-destructive digging, exploration drilling and horizontal boring. Drilling fluid (drill mud) is used as a lubricant and as a coolant during drilling operations such as horizontal direction drilling, potholing and investigative digging for civil, construction and mining. Drill mud is a mixture of water, clays, fluid loss control additives, density control additives and viscosifiers, which typically requires transport for off-site treatment at a recycling facility. The Drill Mud Recycling Facility is expected to process up to 5,000 tonnes per annum.

Packaged Food Recycling Plant

The Packaged Food Recycling Plant will receive, de-package and recycle foods, drinks and associated packaging collected from retailers and manufacturers. The PFRP will separate foods from their packaging, to enable the recovery of the food fraction (such as through off-site composting or soil injection) and packaging, including steel, aluminium, plastics and liquid paperboard. The Packaged Food Recycling Plant is expected to process up to 2,000 tonnes per annum.

Garden Organics Primary Processing plant

A separate part of the Tomago Resource Recovery Facility will be a dedicated Garden Organics Primary Processing plant. This facility will receive, shred and send off-site primary processed garden organics to licenced composting facilities for processing and manufacturing into compost. The Garden Organics Primary Processing is expected to process up to 5,000 tonnes per annum.

A Hazardous Waste Recycling Facility

A range of spent solid materials and liquids containing oils and chemicals will be received, aggregated and stored according to chemical group within the Tomago Resource Recovery Facility. These materials are collected from mining

and manufacturing in the Hunter. Sorting and aggregation of the materials by type enables these materials to the efficiently collected and transported to off-site processing, recycling or disposal facilities. The HWMR is expected to process up to 20,201 tonnes per annum. Quantities sorted on site will be less than Dangerous Goods threshold levels.

A Copper Processing area

The Tomago Resource Recovery Facility will also include a Copper Processing area. This area will involve the processing of electrical cabling sourced from mine sites, building and communications centre decommissioning to enable the recovery of copper wire and plastics. The Copper Processing area is expected to process up to 1,000 tonnes per annum.

A Metals Recycling Facility.

A separate part of the Tomago Resource Recovery Facility will be a dedicated Metals Recycling facility. This facility will receive, sort, cut and potentially bale ferrous and non-ferrous metals from commercial and industrial collections. The Metal Recycling facility is expected to process up to 4,000 tonnes per year of ferrous and non-ferrous metals.

Maintenance Workshop

A maintenance workshop will be established within Building 3. The workshop will provide vehicle maintenance services to support the REMONDIS truck collection fleet. The workshop will store a limited quantity of fuels, oils and cleaning chemicals to support the operations. All maintenance activities will be performed indoors within this building. The maintenance workshop will also be used for parking 6 rigid trucks overnight.

Truck parking depot

The Tomago Resource Recovery Facility will incorporate a truck parking depot on 21F School Drive, directly east of the operations proposed on 21D School Drive.

This will provide parking for 24 rigid trucks and 9 semi-trailers for overnight parking demands associated with the project needs.

Summary of environmental issues

Waste

A Waste Management Plan was prepared by Jackson Environment and Planning Pty Ltd. The Waste Management Plan is contained in Appendix E.

The construction of the Tomago Resource Recovery Facility and Truck Parking Depot will generate construction waste. Typical construction activities will include:

- Clearing of vegetation and grubbing for the proposed truck parking depot on 21F School Drive;
- Earthworks and installation of a weighbridge on 21D School Drive; and
- Installation of above ground mechanical and electrical plant and equipment Installation for sorting and processing waste withing the buildings on 21D School Drive, Tomago.

Trees/shrubs removed during initial works will be mulched and surface applied to exposed soil surface outside of the immediate construction area for soil erosion control in accordance with Appendix D of Landcom (2004) *Managing Urban Stormwater – Soils and Construction*. All vegetation will be fully recycled and re-used on-site as erosion control mulch.

It is noted that site soils on 21F School Drive will be largely retained and capped on site as recommended by the Remedial Action Plan by JM Environments (see Appendix M3 of the EIS). Where site soil is surplus to requirements and cannot be used on site, this waste will be classified under the NSW EPA's *Waste Classification Guidelines Part 1: Classifying Waste* (2014). This soil will be placed in labelled hook lift bins and sent off-site for lawful disposal.

The site operations will generate little waste itself. The vast bulk of "waste" materials will be brought onto site for processing or for aggregation and off-site transport to other facilities for recycling. While some material will be non-recyclable "residual" waste, most material will be recovered, processed and sold as products.

The recycling operations will be established within existing buildings on the Site, which were approved under Major Project MP 10_003 and will process up to 98,201 tonnes of solid and liquid waste materials per annum. The project will involve the construction of sorting plant, sorting equipment, mobile plant and waste and sorted material storage bunkers. The Tomago Resource Recovery Facility will recycle an expected 97.4% of all incoming waste (or 95,151 tonnes per annum). The remainder of the waste received will be disposed at a lawful landfill (~3,050 tonnes per annum). The major products expected to be manufactured by the facility include paper and cardboard (~28,500 tonnes per year), followed by RDF (15,500 tonnes per year), contaminated soils (12,000 tonnes per annum) and recovered fines (11,470 tonnes per annum). These five products make up ~69% of all products manufactured.

The proposed Facility has been designed to recover residual materials with calorific value for manufacturing of fuel. Energy recovery facilities may only receive feedstock from waste processing facilities or collection systems that meet the criteria outlined in Table 1 of the *NSW Energy from Waste Policy Statement*.

The Materials Recovery Facility will receive up to 31,000 tonnes, consisting of approximately:

- 18,600 tonnes per annum of commercial and industrial mixed general solid waste (non-putrescible); and
- 12,400 tonnes per annum of construction building waste from residential and commercial construction (non-putrescible).

All waste materials and processed products will be stored in separate concrete bays with three sides or in dedicated hook lift bins. Storage of incoming waste in dedicated areas and sorted materials and products in dedicate bays helps in inventory control, good housekeeping, reduces potential for cross contamination and is critical for quality control.

REMONDIS seek authorisation to store up to 3,500 tonnes of material (both waste and product) at any one time under the proposed consent.

By accepting and processing the waste, the facility will contribute towards the recycling targets as set out in the *NSW Waste Avoidance and Resource Recovery Strategy* 2014-21.

Air Quality

Air Noise Environment assessed the potential air quality impacts on the surrounding area as a result of the proposed development. The Air Quality Impact Assessment Report is contained in Appendix F. The assessment has been undertaken in accordance with the requirements of the Port Stephens Council, NSW EPA and the Secretary's Environmental Requirements.

Key air emissions associated with the recycling processes above include particulates ($PM_{2.5}$, PM_{10} and TSP) and odour (from the Garden Organics Primary Processing Plant, Drill Mud Recovery Recycling Facility and the Packaged Food Recycling Plant). Particulate emissions are also associated with the onsite haul routes. VOC and odour emissions are expected to occur from the waste oil unloading which is associated with the truck parking depot. The site is surrounded primarily by industrial uses. Sensitive uses, including the historic Tomago House, are located to the south east and south west of the proposed development site.

The results of the modelling demonstrate compliance with the air quality criteria for the proposed compliance with the air quality criteria for the proposed development for VOC and odour at the property boundary and nearby sensitive receptors by a significant margin. Cumulative PM_{10} and $PM_{2.5}$ predictions are indicating exceedances to the 24-hour and annual criteria. PM_{10} and $PM_{2.5}$ 24-hour exceedances for the Mayfield station have been reviewed. It is noted that no additional exceedances are predicted as a result of the emissions the proposed development.

It is noted that highly conservative modelling assumptions have been made, such as emission factors not accounting for activities occurring within buildings. The emissions factors which have been adopted are also based on material handling and processing from the mining industry. It is therefore noted that pollution concentrations from the development are likely to be lower in practice.

To minimise potential dust and odour emissions from the site, best practice measures are proposed including buildings to enclose all material handling, shredding and sorting activities, paved truck routes and an odour control system on the Food De-packaging Plant.

Overall, the site represents a suitable location for the proposed resource recovery facility and truck parking depot from an air quality perspective. Based on the findings of the air dispersion modelling and proposal air quality mitigation measures, the contribution of the proposed development to the local and regional air quality environment is expected to be low and within relevant targets.

GHG emissions associated with the Project are primarily associated with the combustion of fuels, in particular diesel. Therefore, opportunities for reducing emissions are related to alternative fuel types used, use of low emissions technology (e.g. equipment with latest technology) and maintenance of equipment. In summary, opportunities for reducing GHG emissions for these sources include the following:

- Minimising the use of fuel by selecting fuel efficient plant and equipment, operating vehicles and machinery in a fuel-efficient manner e.g. turning off idling equipment, and selecting construction techniques that utilise lower amounts of fuel;
- Implementation of a maintenance plan for all fuel and electrically powered equipment;
- Implementation of energy conservation practices by all staff (which can be enforced through appropriate training); and
- Use of solar panels.

Noise and vibration

Waves Consulting conducted the noise and vibration impact assessment for the proposed development. The Noise and Vibration Assessment Report is contained in Appendix G.

The assessment has demonstrated that the predicted noise emissions from the site to the surrounding environment are low. The proposed development satisfies the Project Noise Trigger Levels (PNTLs) of the NSW EPA's *Noise Policy for Industry* during all time periods at all nearby noise-sensitive receivers. No operational mitigation measures are required at the site.

The sleep disturbance impacts from the operational noise events generated by the site were investigated in the noise and vibration impact assessment. The proposed development satisfies the sleep disturbance trigger levels at all nearby sensitive receivers.

The existing traffic noise levels on the nearby affected roads exceeds the *NSW Road Noise Policy* (RNP) criteria. Therefore, all new traffic noise increases must satisfy the RNP 2 dB increase criteria. The noise and vibration impact assessment shows that the proposed development generates negligible additional traffic noise. The NSW Road Noise Policy (RNP) criteria are satisfied as a result.

The construction noise impacts have been assessed in accordance with the *NSW Interim Construction Noise Guidelines* (ICNG). During standard construction hours no exceedances of the NMLs are predicted at the closest residential receivers. No receivers were found to be 'highly noise affected' as per the ICNG. Standard noise mitigation measures are not required for the construction phase.

Construction traffic noise levels must satisfy the RNP 2 dB increase criteria. The noise and vibration impact assessment shows that the construction traffic generates negligible additional traffic noise. The *NSW Road Noise Policy* (RNP) criteria are satisfied as a result.

The offset distances (in all directions) between the vibrationally intensive equipment and any sensitive receivers is large (> 100 m). The potential for vibration impacts due to the construction or operation of the development are effectively nil. All vibration criteria with respect to cosmetic damage to buildings and human comfort impacts will be satisfied as a result.

It is concluded that the proposed Resource Recovery Facility and Truck Parking Depot is a complying development with respect to noise and vibration impacts and is therefore suitable for construction and operation.

Traffic and transport

Seca Solution Pty Ltd conducted the Traffic Impact Assessment for the proposed development. The Traffic Impact Assessment Report is contained in Appendix H.

From the site survey work undertaken and the review of the proposed development and associated plans against the requirements of the *Guide to Traffic Generating Developments* and *Austroads Guide to Traffic Management*, it is considered that this project is acceptable with regards to traffic, parking and access.

The project will allow for a re-use of an existing industrial building and will allow for the development of a waste resource management centre. Traffic flows that will be generated by the project have been determined based upon similar sites operated by REMONDIS and the impact of this additional traffic on the local road network has been assessed. The key intersection that could be impacted upon by the project is that connecting McIntyre Road to Tomago Road. Sidra modelling has been completed for this intersection and shows that whilst some delays may occur in 2030, driver behaviour will continue to allow for safe traffic movements and acceptable delays and minor queues.

The other intersections impacts include the roundabout controlled intersection of Tomago Road and Old Punt Road and the Sidra modelling demonstrates that this will continue to operate very well with minor delays / congestion for the future design year of 2028 and beyond. It is noted that the planned upgrade to provide the M1 to Raymond Terrace Road link will significantly alter the traffic patterns in this location, with new grade separated links and a new link road from Tomago Road that will bypass the roundabout at Tomago Road / Old Punt Road. Whilst no timeframe is confirmed for this road upgrade, planning is well advanced and partial funding has been provided.

Parking for the project will utilise the existing on-site provision and will satisfy the demands associated with staff. A dedicated parking area will be provided for the trucks to park on site overnight and has been assessed with Autoturn to ensure that these vehicles can safely enter and exit the layover area. The operation of this area will be enforced through an on-site traffic management plan.

Overall, it is concluded that the project shall have an acceptable impact upon the road network.

Biodiversity

Wildthing Environmental Consultants prepared the Biodiversity Development Assessment Report for the proposed development to identify the potential impacts on biodiversity. The Biodiversity Development Assessment Report is contained in Appendix I.

This Biodiversity Development Assessment has been completed in accordance with the Biodiversity Assessment Method and includes a Biodiversity Assessment (Stage 1) and an Impact Assessment (Stage 2). The assessment was also undertaken having regard to Matters of National Environmental Significance listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act), the *NSW Biosecurity Act* 2015 and relevant State Environmental Planning Policies.

Impact to vegetation is confined to 21F School Drive, Tomago where a paved and bunded overnight truck parking area and Onsite Stormwater Detention area are to be constructed. Taking into consideration the native species composition within the site and that occurring within the locality One Plant Community Types (PCT) was determined to be present, being PCT 1647 – Red Bloodwood – Smooth-barked Apple heathy woodland on coastal sands of the Central and lower North Coast. PCT 1647 occurring within 21F was found to be highly disturbed and consisted of a few native shrubs

with a largely introduced groundcover. No upper stratum was present. This PCT was uniform in condition within the site and did not require further stratification into vegetation zones. The PCT was given the Vegetation Zone name PCT 1647_Disturbed.

The development footprint has been positioned on an area of land that has been subject to a number of disturbances from past industrial development activities. The direct impacts arising from the project include:

- The removal of up to 0.1 ha of Vegetation Zone PCT 1647_Disturbed;
- The removal of up to 0.1 ha of habitat assumed present for 1 Species Credit Species *Uperoleia mahonyi*.

Considerations have been made to the *Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act* 1999. It was determined that there would be no significant matters of national significance and no referrals should be required.

No Ecosystem Credits are required to be retired as a vegetation integrity score of 12.1 (i.e. ≤17) was given for the PCT zone 1647 located within the study area.

Due to time constraints, a total of one Species Credit Species was assumed present within the study area as fieldwork for this BDAR was undertaken outside of the survey period for these species. Species Credits required to be retired to offset the impacts of the project include:

- 1 species credit for impacts on *Uperoleia mahonyi*

To avoid and minimise potential impacts of the project on biodiversity, a series of mitigation and management measures have been identified and detailed within the report.

Soil and Water

Northrop Consulting Engineers was commissioned by REMONDIS to prepare a Soil and Water Management Plan including a stormwater management plan. The Soil and Water Management Plan is available at Appendix J.

The proposed stormwater management design presented has been prepared to comply with Port Stephens Council's DCP 2014, as well as industry best practice. The design philosophy is based on the principle of at source treatment, to reduce conveyance infrastructure to manage water quantity and quality aspects.

The outcomes of the preliminary stormwater management strategy indicate that detention measures can be adopted to attenuate post developed flows to pre-developed rates. In addition to this, through the adoption of WSUD principals, the water quality reduction targets can be achieved.

Based on the investigation and concept design, it is considered that the proposed development can adequately manage and address all items surrounding stormwater runoff, and soil and water management.

Flooding

A Flood Certificate was obtained from Port Stephens Council for the subject. The site has been identified to be located in a flood prone area. However, the site is not a 'flood control lot'. A Flood Planning Level (FPL) is not applicable for the subject site with the Probable Maximum Flood (PMF) level listed as 6.3m AHD.

In accordance with B5.6 of the Port Stephens Council DCP (2014) the development is located within the minimal risk flood hazard category, which applies to critical emergency response and recovery facilities or vulnerable development types such as aged care and childcare facilities. The subject development does not fall within these classifications.

The proposed industrial development does not include any habitable rooms, and thus is not required to meet the requirements for a habitable room as outlined in Section B5.5 of the PSC DCP. As previously identified, a Flood Planning level (FPL) is not applicable to the site development thus negating the need for electrical fixtures to be located above the FPL for non-habitable rooms.

A storage area is provided by the second storey of the existing buildings that will enable the storage of goods above the PMF flood level.

The proposed truck depot will require fill to construct the pavement to the finished design levels. This will raise the surface levels locally by approximately 100-500mm. It is our opinion that for the minor degree of filling required, the proposed development will not substantially impede the flow of floodwater and will not contribute to significant flooding or ponding of water on adjacent properties.

The 5% AEP flood level is not applicable for this site and as such the finished surface level for the truck depot has been deemed acceptable.

Heritage

Heritage Now was engaged by REMONDIS to prepare an Aboriginal Cultural Heritage Assessment Report for the proposed development. The Aboriginal Cultural Heritage Assessment Report is contained in Appendix K.

The AHIMS search results showed that there were no previously registered Aboriginal sites within the Project Area and background research showed that the area had been previously disturbed.

The development area was surveyed on 10 July 2020. No Aboriginal sites or potential archaeological deposit were identified during the survey. No further archaeological investigation is required for the Project Area.

In the unlikely event that Aboriginal or suspected Aboriginal archaeological material is uncovered during the development, then works in that area are to stop and the area cordoned off. The project manager is to contact the heritage consultant to make an assessment as to whether the material is classed as Aboriginal object/s under the *National Parks and Wildlife Act* 1974 and advise on the required management and mitigation measures. Works are not to re-commence in the cordoned off area until heritage clearance has been given and/or the required management and mitigation measures have been implemented.

Heritage Now have also prepared a Statement of Heritage Impact for the proposed development. The assessment identified the closest heritage items at 350 m from the Project Area - Tomago House and Chapel – which are listed as two separate heritage items on the *Port Stephens Local Environmental Plan* 2013 and as a single listing on the State Heritage Register.

Past land use of the area by early settlers was likely agricultural. The land has since been heavily modified through industrial land use, including sandmining. There are no heritage items within the development area and therefore no specific mitigation measures are needed.

Contamination

JM Environments was commissioned to conduct a Detailed Contamination Assessment of the proposed development, with a focus on 21F School Drive, Tomago. The Detailed Contamination Assessment Report and Remedial Action Plan are contained in Appendix M.

The following scope of works was undertaken:

- Review of previous contamination assessments;
- Review of published information and government records;
- Drilling and sampling of two boreholes in the western part of the site (21D School Drive) in the vicinity of a hydrocarbon storage trench;
- Excavation and sampling of 15 test pits in the eastern part of the site (21F School Drive); and
- Laboratory analysis.

Sampling and analysis included both soils and groundwater. The site was mostly flat and divided into two parts. The western part of 21D School Drive is paved and contains two large sheds, and some smaller buildings and water tanks. Beneath the pavement, brown gravelly sand, containing concrete and brick rubble to a depth of between 1mbgl and

1.8mbgl, was interpreted to be fill. This material had previously been assessed as meeting the criteria for excavated natural material, and for commercial/industrial land use. Light brown fine to medium grained sand beneath the fill was interpreted as representing *in situ*, 'natural' material. Groundwater was intersected at 2.4mbgl. Hydrocarbon contamination was not detected in samples collected from adjacent to the hydrocarbon trench in 21D School Drive, indicating that significant contamination of soils in this area had not been caused by leaks from the trench.

The eastern part of the site (21F School Drive) was unpaved, and sparsely covered with grass and other low vegetation. Fill mounds including concrete, metal and timber were observed, and concrete beams and concrete-filled tyres had been stockpiled in the northern part of 21F School Drive. Elevated zinc and copper concentrations in this material were considered to be consistent with the use of sandblasting in the metal manufacturing process.

Beneath the fill, brown sand, interpreted as representing in-situ material, appeared to be largely uncontaminated. Elevated cadmium, arsenic and lead concentrations were observed in dark sandy material on the surface in the northeast corner of the site. These analytes are commonly found at high concentrations in slag.

The groundwater assessment found that chromium, copper and zinc were detected in some wells at concentrations exceeding adopted ecological investigation levels, and exceeding background concentrations. The assessment considered that under the proposed remediation and redevelopment, the risk associated with exposure to contaminated groundwater to on-site ecological receptors would be negligible, and to off-site receptors would be low.

The studies show that the site has been impacted by contamination comprising heavy metals at concentrations exceeding guideline values for commercial/industrial land use. The site could meet the environmental requirements for commercial/industrial land use subject to the development and successful implementation of an appropriate Remedial Action Plan.

A Remedial Action Plan has been prepared (Appendix M3). The objective of remediation is to remove a potential exposure pathway between heavy metal contamination of surface fill in 21F School Drive and site workers, the local ecology and groundwater. As this part of the site is destined for vehicle parking and equipment laydown purposes, it was considered that a cap and contain remedial approach would be appropriate for the site.

Since the remedial plan does not recommend the full removal of contamination from the site, there is an ongoing requirement to manage the contamination remaining on site. This commitment will be addressed via a Long-Term Environmental Management Plan.

Bushfire

REMONDIS commissioned Newcastle Bushfire Consulting to conduct a bushfire assessment to assess the proposed development against the requirements of Section 4.14 of the *Environmental Planning and Assessment Act* 1979, AS3959:2018 *Building in Bushfire Prone Areas* and *Planning for Bush Fire Protection* (2019). The Bushfire Assessment Report is contained in Appendix N.

The highest Bushfire Attack Level to the proposed building was determined to be BAL-12.5. The building is outside flame contact zone. Non-residential Class 5 to 8 buildings require no specific level of construction in accordance with AS3959:2018. The waste oil tank will be located 53 metres off the short heath being BAL-12.5 with the diesel tank being located more than 100 metres from a bushland threat.

The proposed development offers compliance with *Planning for Bush Fire Protection*. There is potential for bushfire attack at this site and a list of recommendations has been included to reduce that risk. Based upon an assessment of the plans and information received for the proposal, it is recommended that development consent be granted subject to the following conditions:

1. At the commencement of building works and in perpetuity, the entire property shall be managed as an inner protection area (IPA) as outlined within Appendix 4 of *Planning for Bush Fire Protection* 2019 and the NSW Rural Fire Service's *Standards for Asset Protection Zones*;

2. Landscaping is to be undertaken in accordance with Appendix 4 of *Planning for Bush Fire Protection* (2019) and managed and maintained in perpetuity;
3. It is recommended that the property owner and occupants familiarise themselves with the relevant bushfire preparation and survival information provided by the New South Wales Rural Fire Service; and
4. The building manager shall have emergency evacuation plans prepared for the workplace with specific consideration of bushfire evacuation and management planning.

Fire Safety

ACOR have completed a fire safety study for the proposed development, including an assessment of the project under NSW Fire and Rescue Guidelines. The proposed development will store significant fire loads within both Building 1 (15,300GJ) and Building 2 (15,000GJ). A smaller fire load is contained in two storage tanks outside Building 3 (2,900GJ).

Both Building 1 and Building 2 would be classified as incidental high hazard storage, due to the intermittent quantities of plastics stored on site. However, as the 'íncidental' classification may change, both buildings will require sprinkler systems compliant with AS 2118.1:2017 high hazard classification.

Both Building 1 and Building 2 are classified as Incidental High Hazard storage with fire protection based on Ordinary Hazard 3 occupancies (OH3-bbb) under AS 2118.1:2017. Building 1 has an automatic sprinkler system installed. Building 2 will have an automatic sprinkler system installed to the same standard as Building 1. Both buildings will require their fire detection, alarm and notification equipment to be upgraded to current AS 4428, including direct notification to the Tarro fire station, approximately eight (8) minutes response time.

A number of building upgrades have been recommended. Subject to implementation of the mitigation measures and preventative practices, the fire safety study and risk assessment has identified that the proposed facility can operate with acceptable risk to persons and property.

Visual

Moir Landscape Architecture have conducted a Visual Impact Assessment for the proposed development. The purpose of the VIA was to assess the landscape character and visual setting of the proposed development as well as assess the potential visual impacts. The Visual Impact Assessment Report is contained in Appendix Q.

Overall, the proposed truck parking depot will only be visible from the entrance to the site via a private access road. Vegetation and existing buildings screen the proposal from public areas. There is potential for future developments to remove vegetation currently screening the project site. However, the project is in keeping with the existing land use. The proposed development is not likely to alter the existing visual character of the area. The existing landscape is industrial in nature with large scale infrastructure part of the landscape character.

In addition, due to the site set back from public roads, as well as being screened by existing buildings and Tomago Aluminium, it is unlikely that the proposed truck parking depot will be visible from public roads. As a result, impacts assessed were low.

Mitigation measures are aimed at improving the integration of the proposed development with future development that is likely to occur in future. Considering the existing character of the landscape, the land use, and the number of viewers that the visual impacts associated with the proposal are acceptable within this location.

Due to the already existing infrastructure, as well as the nature of the intended use of the site, limited opportunity exists to improve existing conditions. Implementation of the Detailed Landscape Concept Plans (Appendix R) do not fully comply with the *Port Stephens Development Control Plan* 2014, however REMONDIS will rely on Clause 11(a) of the *State Environmental Planning Policy (State and Regional Development)* 2011 to override this requirement and use a lower level of landscaping.

Economic and social impacts

The *NSW Lower Hunter Regional Strategy* (NSW Department of Planning, 2006) identifies the site as employment land. Additionally, there is proposed employment land planned to be located adjacent the site on the southern side of Tomago Road. Tomago Aluminium is also one of the largest employers in the area.

The new facility will represent a major piece of infrastructure that will assist in creating jobs within the Hunter region. The project will create up to 15 jobs in construction over a 3-month period, and up to 76 full-time jobs during the operational phase.

CONTENTS

1. Introduction

1.1. Project Overview

REMONDIS Australia Pty Ltd is proposing to develop a Resource Recovery Facility and Truck Parking Depot at 21D (Lot 11, DP270328) and 21F (Lot 8, DP DP270328) and part of Lot 301, DP 634536 School Drive, Tomago. As part of this development project, REMONDIS will be relocating its existing truck parking depot and resource recovery facility in Thornton to the Tomago site. The new facility will expand the operations that REMONDIS currently performs, to help provide a broader range of critical recycling services for the Hunter region.

REMONDIS proposes to use the existing buildings at 21D School Drive for the receipt and processing of up to 98,201 tonnes per annum of solid and liquid waste materials. Waste materials include dry non-putrescible waste materials from domestic, commercial and industrial sources. Each recycling operation will be established in discreet parts of the existing industrial warehousing, and collectively, the Tomago Resource Recovery Facility will provide a wide range of recycling services through:

- A fully integrated Materials Recovery Facility for sorting and processing:
  - Commercial and industrial mixed general solid waste (non-putrescible) (60%); and
  - Construction building waste from residential and commercial construction (non-putrescible) (40%);
- A Cardboard Baling Facility for source separated cardboard collected from businesses;
- A Drill Mud Recycling Facility for drill muds sourced from the civil, construction and mining industries;
- A Packaged Food Recycling Plant, which will accept packaged foods and drinks, separating the food contents and packaging for recycling;
- A Garden Organics Primary Processing plant, which will receive, decontaminate, and shred woody garden organics for off-site composting;
- A Hazardous Waste Recycling Facility, for sorting and aggregating a range of spent solid materials and liquids containing oils and chemicals;
- A Copper Processing area; and
- A Metals Recycling Facility.

A truck parking depot will be established on the adjacent vacant lot referred to as 21F School Drive to provide overnight parking for 24 rigid trucks and 9 semi-trailers.

The proposed development will provide a broader range of recycling options and make progress towards the NSW Government's recycling targets. It will also deliver on key priorities of the NSW Government to develop new recycling infrastructure to boost the recovery of municipal, commercial, and industrial waste in the Newcastle and Hunter region.

1.2. Purpose of the report

The EIS has prepared by Jackson Environment and Planning Pty Ltd on behalf of REMONDIS. It presents the findings of a comprehensive environmental evaluation which has been undertaken to establish the potential impacts associated with the establishment of the Tomago Resource Recovery Facility and Truck Parking Depot.

The EIS study evaluates the social, environmental, and economic impacts and benefits of the proposed development. The EIS defines the context of the proposed development, and examines those issues considered to be relevant. This EIS considers the potential environmental effects of the proposed development during construction and operation, and proposes mitigation measures to prevent, reduce or offset significant adverse impacts on the environment.

The aims of this EIS are to:

- Identify all constraints affecting future development on the subject site;
- Consider the economic, social, and environmental impacts of the proposed development; and
- Assess the capability of the subject site to support the proposed development.

In delivering this EIS, Jackson Environment and Planning Pty Ltd has undertaken all statutory planning assessments, including the preliminary hazard analysis, waste management plan, chemicals and fuels assessment, Emergency Management Plan and preparation of the Pollution Incident Response Management Plan. We have also prepared environmental risk assessment, including stakeholder consultation. Jackson Environment and Planning has consulted with:

- Neighbouring properties;
- Port Stephens Council;
- Department of Planning, Industry and Environment - Environment, Energy and Science Group;
- Department of Planning, Industry and Environment - Water Group;
- Environment Protection Authority;
- Fire and Rescue NSW;
- Rural Fire Service;
- Transport for NSW;
- Hunter Water;
- SafeWork NSW;
- Department of Planning, Industry and Environment - Biodiversity and Conservation Division; and
- Department of Planning, Industry and Environment - Industry Assessments.

A range of consultants have been commissioned to undertake the specialist studies including:

- Air quality assessment;
- Noise and vibration impact assessment;
- Flood assessment;
- Soils and water impact assessment
- contamination assessments;
- Fire safety study;
- Civil and stormwater design;
- Traffic impact assessment;
- Architectural design;
- Landscape Architecture;
- Visual impact assessment;
- Bushfire threat assessment;
- Biodiversity development assessment; and
- Aboriginal cultural heritage.

The proposed development is considered State Significant Development under Schedule 1(23)(6b) of the *State and Regional Development* SEPP as the facility proposed to treat, store and dispose of industrial liquid waste and handle more than 1,000 tonnes per year of other aqueous or non-aqueous liquid industrial waste. The State Significant Development application is to be assessed by the Minister for Planning and referred under delegation to Department of Planning, Industry and Environment (DPIE) or the Independent Planning Commission for assessment.

The development is also considered to be an Integrated Development, requiring a licence from the NSW EPA under Schedule 1 of the *Protection of the Environment Operations Act* 1997.

The EIS has also been delivered to meet the NSW Department of Planning and Environment's Secretary's Environmental Assessment Requirements, which were issued on 24 April 2020 by Chris Ritchie, Director, Industry Assessments as a delegate of the Secretary (refer to Appendix A). An overview of how the SEARs requirements have been addressed can be found in Appendix U.

1.3. The site

The Site consists of three lots. The Site is located at 21D and 21F School Drive Tomago within the Port Stephens Local Government Area (LGA). The development also includes part of Lot 301, DP 634536 School Drive, Tomago (directly north of 21D School Drive). All lots are zoned IN1 General Industrial under *Port Stephens Local Environmental Plan* 2013. The general locality of the Site is shown in Figure 1.1, and with zoning of the lands shown in Figure 1.2.

The existing developed lot at 21D School Drive (Lot 11, DP270328) consists of two large warehouse buildings and one workshop (refer to Figure 1.3). The adjacent lot at 21F School Drive (Lot 8, DP270328) is currently undeveloped, with the majority of vegetation cleared.

We note that a development application for a boundary adjustment has been prepared by ADW Johnson and submitted to Port Stephens Council under DA16-2020-497-1. This boundary adjustment seeks to merge land associated with the road located on Lot 301, DP 634536 with 21D School Drive, so access can be provided to the northern side of Building 2 from within 21D School Drive. A letter providing a progress update on the boundary adjustment is provided in Appendix W. It is expected that the boundary adjustment will be determined by Port Stephens Council in late December 2020.

The total development comprises an area of 4.08 ha.

Figure 1.1. General locality of the Site. Approximate site boundaries are shown in yellow for 21D School Drive (and part of Lot 301, DP 634536), and in blue for 21F School Drive.

Date	Revision	Drawn By	Site description
30/10/19	Revision A	R. Loemker	21D and 21F School Drive Tomago, and part of Lot 301, DP634536
04/02/20	Revision B	M.Jackson	
30/04/20	Revision C	R. Loemker	

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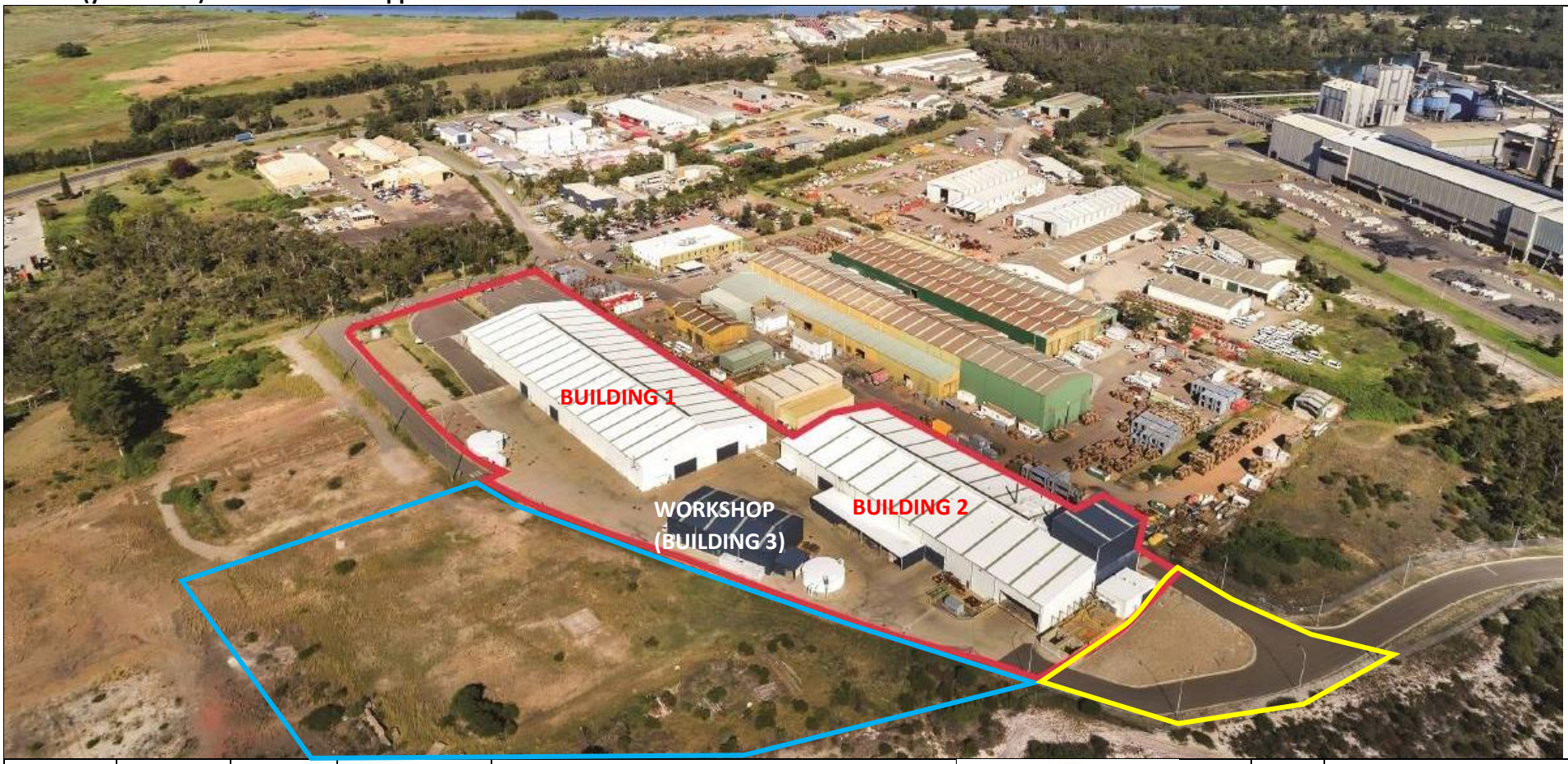
Client	**REMONDIS Australia Pty Ltd**
Project	Environmental Impact Assessment
Title	General Locality
Scale	As shown
Source	Google Maps

Figure 1.2. Land use zoning IN1 General Industrial under *Port Stephens Local Environmental Plan* 2013. Approximate site boundaries are shown in yellow and blue.

Date	Revision	Drawn By	Site description	Jackson Environment and Planning Pty Ltd		Client	REMONDIS Australia Pty Ltd
30/10/19	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536	Strategy | Infrastructure | Compliance | Procurement A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060 E: admin@jacksonenvironment.com.au T: 02 8056 1849 W: http://www.jacksonenvironment.com.au		Project	Environmental Impact Assessment
04/02/20	Revision B	M.Jackson				Title	Land use zoning
30/04/20	Revision C	R. Loemker				Scale	As shown
						Source	NSW Department of Planning and Environment

Figure 1.3. Aerial view of 21D School Drive Tomago (Lot 11, DP270328) (red line) and 21F School Drive Tomago (Lot 8, DP270328) (blue line) (partial) and Lot 301, DP 634536 (yellow line). Boundaries are approximate.



Date	Revision	Drawn By	Site description
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30/04/20	Revision C	R. Loemker	

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Client	REMONDIS Australia Pty Ltd
Project	Environmental Impact Assessment
Title	Aerial Image
Scale	N/A
Source	Newcastle Herald

1.4. Site history and approvals

Historical data indicates that the site was part of a larger farming property which had been subdivided a number of times. The site was used for farming purposes between 1878 and 1968 and for industrial uses from the 1970s to the present. During this time, the Site underwent a number of changes. A review of the site dating back to 1954 are summarised in Table 1.1.

Table 1.1. Site history and aerial photograph review.

Year	Site	Surrounding Land
1954	Completely covered by thick vegetation.	• Completely covered by vegetation to the north. • Land cleared to the south, some trees and low density residential.
1974	Site has been cleared, possibly for sand mining.	• Large area including the site and to the north, northwest and south has been cleared, possibly for sand mining. • Similar low-density residential areas to 1954.
1987	Allco Steel has been constructed.	• Allco Steel has been constructed on and directly around the site. • Metal materials stored on site, and a small car park occupies an area to the southwest of the site. • More residential lots appear to the south; vegetation has thickened in some parts. • Tomago Aluminium has been constructed directly west of the site. • Possible sand mining cleared land has remained unoccupied. • Small amounts of vegetation have begun to grow.
1993	Similar to 1987.	• Similar to 1987.
2007	Materials appear to have been removed from the site. A small shed appears in the southwest.	• Similar to 1993. • Additional industrial development to west.
2016	Large sheds (Midal) have been built in the western part of the site.	• Similar to 2007. • Residences to the south appear to have been replaced by commercial/industrial premises.

On 5 August 2012, the development of the Tomago Aluminium Rod and Conductor Manufacturing Facility was approved by the Director-General of the Department of Planning and Infrastructure on 21D School Drive under Part 3A of the *Environmental Planning and Assessment Act* 1979 (Major Project Development Approval MP 10_0039).

This project involved developing a facility to manufacture aluminium rods and conductors from molten aluminium sourced from the Tomago Aluminium Smelter. The key features of this project included:

- A haul road approximately 150m long that was used for transport of molten aluminium from the Tomago Smelter;
- A building approximately 98m by 35m and 8m high (previously referred to as Building 1) to house the gas fired furnace and rolling mill that would manufacture aluminium rod. Ancillary infrastructure such as the gas fired furnace and rolling mill control rooms, and undercover rod storage were located within this Building;
- Cooling towers and infrastructure associated with the gas fired furnace and rolling mill;
- A building approximately 124m by 46m and 8m high (previously referred to as Building 2) to house wire drawing machines, stranding machines and associated facilities;
- Laboratories and administration buildings;
- Stores building, electrical and mechanical workshops;
- Hardstand movement, loading areas, and car parking;
- Stormwater detention and nutrient control device that was part of a water management system that would maximise water reuse in the manufacturing process;

- Stormwater detention and nutrient control devices that formed part of a water quality treatment system;
- Onsite sewage treatment plant with onsite subsurface irrigation of the landscaping areas.

The development was also approved for the storage of hazardous substances and Dangerous Goods (DG) in accordance with the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code). These included the following, which were to be stored appropriately in the hazardous good store:

- Chromic acid – DG Class 8;
- Hydrochloric acid and Sulphuric acid – DG Class 8;
- Nitrogen – DG Class 2.2;
- Alumol 195 – DG Class 8;
- Molten aluminium – DG Class 9; and
- Dross aluminium – DG Class 4.3.

1.5. Surrender of original Development Consent

Tomago Aluminium Company Pty Ltd (TAC) is the owner of 21D and 21F School Drive, Tomago (Lot 11, DP270328, Lot 8, DP DP270328), and Lot 301/DP634536. TAC notes that upon the granting of development consent for the proposed Resource Recovery Facility and Truck Parking Depot, the site's existing development consent under DA10_0039 for the Tomago Cable Manufacturing Plant will be surrendered, and ownership on the proposed lands will transfer to REMONDIS. This is further outlined in the Owner's Consent Letter (Appendix V).

1.6. Easements and covenants on site and buffer zone matters

There are no listed easements or covenants on the Site.

The site is located within the Tomago Aluminium Smelter Buffer Zone as defined in the Section 10.7 Planning Certificate (Appendix S). The Tomago Aluminium Smelter Buffer Zone has been established on lands surrounding the smelter within a 4 km radius as a condition of consent for the smelter plant under Map 1, Schedule 1 of DA4908/90. Under condition 30(c) of DA4908/90, we note that TAC is to take all reasonable steps to acquire properties within the boundaries of the Buffer Zone, except for land zoned "general industrial" under the Port Stephens Local Environmental Plan.

Air quality modelling performed as part of this EIS (Section 7 and Appendix G) has demonstrated that the proposed development will have negligible impact on existing sulfur dioxide and fluoride emissions in the area, and will not impact on the smelter's ability to comply with its conditions of consent under DA4908/90 or its EPA licence obligations under EPL 6163. These findings have been shared with Tomago Aluminium Corporation.

Tomago Aluminium Corporation has been consulted on this matter, and the company has advised that they support the proposed development given that the project will not impact on the Tomago Aluminium Smelter Buffer Zone Furthermore, on approval of the development application, the ownership of the lands will pass onto REMONDIS Australia Pty Ltd. Please refer to the Owners Consent letter in Appendix V.

1.7. The proponent

The proponent for the development and the responsible person is:

Ms Susie McBurney
General Manager NSW/ACT
REMONDIS Australia Pty Ltd
32 - 36 Christie Street
St Marys NSW 2760

T: (02) 8805 5804
E: Susie.McBurney@REMONDIS .com.au

1.8. Project team

Jackson Environment and Planning Pty Ltd engaged a project team on behalf of REMONDIS to undertake the design and specialist investigations for the EIS. The role/s of each team member is given below:

- Town planning – Jackson Environment and Planning Pty Ltd;
- Surveying – Tony Mexon & Associates Pty Ltd;
- Architectural design – EJE Architecture;
- Capital Investment Valuation – Muller Partnership
- Community consultation – Jackson Environment and Planning Pty Ltd;
- Waste management – Jackson Environment and Planning Pty Ltd;
- Air quality assessment – Air Noise Environment Pty Ltd;
- Noise and vibration impact assessment – Waves Acoustic Consulting Pty Ltd;
- Traffic impact assessment – Seca Solution Pty Ltd;
- Biodiversity development assessment – Wildthing Environmental Consultants;
- Soils and water and flood impact assessment – Northrop;
- Civil and stormwater design – Northrop;
- Aboriginal cultural heritage – Heritage Now; and
- Statement of Heritage – Heritage Now;
- Preliminary and detailed contamination assessments – JM Environments;
- Bushfire threat assessment – Newcastle Bushfire Consulting;
- Waste and chemicals – Jackson Environment and Planning Pty Ltd;
- Fire safety study – ACOR Consultants (WA) Pty Ltd;
- Visual impact assessment – Moir Landscape Architecture Pty Ltd;
- Landscape concept plan – Moir Landscape Architecture Pty Ltd;
- Landscape compliance report – Moir Landscape Architecture Pty Ltd;

1.9. Site suitability and review of alternative sites

The selected site is suitable as a resource recovery facility and truck parking depot:

- It is located within an industrial precinct away from residential areas;
- It is easy for heavy vehicles to access using major roads for the majority of their journey;
- The site is a low risk for flooding;
- The site contains existing warehouse buildings, which require only minor modification to make the existing structures suitable for the establishment of a resource recovery facility;
- The site is strategically located a short distance from the population centre of Newcastle, and the site has efficient transport access to customers in the Hunter and Upper Hunter regions; and
- As discussed in detail in this EIS, the potential emissions can be mitigated to ensure there is no impact on surrounding properties.

The suitability of the site has also been reviewed through consultation meetings done with the Department of Planning, Industry and Environment on 3rd December 2019; the NSW EPA (Newcastle Office) on 17th December 2019; and Port Stephens Council on 4th February 2020.

REMONDIS has also considered alternative sites for the establishment of its resource recovery options. Consideration was given to upgrades to the company's existing premises, location on two lots at 31-34 Waterloo Avenue, Thornton (Lot 102/DP873751 and Lot 1/DP1028711). The REMONDIS Materials Recovery Facility (MRF) at this site has approval

to receive, sort, process and recycle up to 100,000 tonnes per year of dry non-putrescible recyclables from domestic and commercial sources (approved under DA04-2759). These materials include: Glass; PET bottles; Steel; Aluminium; Liquid paperboard; Paper / cardboard; Commercial paper; and Non-recyclable material.

Under a Section 96 development modification in 2013, approval was sought for (within the 100,000 tpa approval) to receive up to 30,000 tpa of dry non-putrescible waste from commercial sources, including: Paper/cardboard; Rigid/hard/film plastics; Ferrous and non-ferrous metals; Wood; and Aggregates/soil.

Given the limited land area available, the current site provides limited opportunities for expansion of REMONDIS ' growing Hunter regional business.

The Tomago site is a large site that will enable the growth of the REMONDIS resource recovery business, which will better serve many commercial customers across the Hunter region. The existing site can be repurposed with little modification, to create a best practice and fully indoor recycling facility. Vacant land adjacent to 21D School Drive is currently unused and is well suited for use as a support truck parking depot. The site owner, Tomago Aluminium Corporation has welcomed the opportunity for REMONDIS to establish its operations at the site, and to further invest and contribute to the economic performance of the Tomago industrial precinct.

1.10. Environmental benefits

The proposed development will consider environmental best practice and sustainability to reduce the impact of the development on the environment. The resource recovery facility will use best practice fixed and mobile plant and equipment for waste processing to enable the processing of up to 98,201 tonnes per year.

The proposed development will expand recycling infrastructure in regional NSW and will make an important contribution towards increasing the recycling rate of business waste from 53% (in 2017-18) to 70% by 2021, supporting the *NSW Waste and Resource Recovery Strategy 2014-21* [1].

1.11. Social and economic benefits

The NSW Lower Hunter Regional Strategy (NSW Department of Planning, 2006) identifies the site as employment land. Additionally, there is proposed employment land planned to be located adjacent the site on the southern side of Tomago Road. Tomago Aluminium is also one of the largest employers in the area.

The new facility will represent a major piece of infrastructure that will assist in creating jobs within the Hunter region. The project will create up to 15 jobs in construction over a 3-month period, and up to 76 full-time jobs during the operational phase.

1.12. Project justification and need for the development

1.12.1. NSW EPA's Strategic Plan and the WARR Strategy 2014-2021

This *Waste Avoidance and Resource Recovery Act* 2001 (WARR Act) underpins the NSW Government's *Waste Avoidance and Resource Recovery Strategy 2014 – 2021*, setting targets for recycling and reduction of litter in key priority area.

The *NSW Waste and Resource Recovery Strategy 2014-21* was released in December 2014. It sets clear directions for a range of priority areas over the next seven years and aligns with the NSW Government's waste reforms in *NSW 2021: A plan to make NSW number one*.

[1] NSW EPA (2014). *NSW Waste Avoidance and Resource Recovery Strategy: 2014 – 2021*. Internet publication: http://www.epa.nsw.gov.au/wastestrategy/warr.htm

The strategy seeks to support investment in much-needed infrastructure, encourage innovation and improve recycling behaviour. The strategy also seeks to facilitate the development of new markets for recycled materials and reduce litter and illegal dumping.

The strategy sets the following targets for 2021–22:

- avoiding and reducing the amount of waste generated per person in NSW
- increasing recycling rates to:
  - 70% for municipal solid waste
  - 70% for commercial and industrial waste
  - 80% for construction and demolition waste
- increasing waste diverted from landfill to 75%
- managing problem wastes better, establishing 86 drop-off facilities and services across NSW
- reducing litter, with 40% fewer items (compared to 2012) by 2017
- combatting illegal dumping, with 30% fewer incidents (compared to 2011) by 2017.

The new strategy provides a clear framework for waste management to 2021-22 and provides an opportunity for NSW to continue to increase recycling across all waste streams.

The proposed development will commit to environmental sustainability, waste avoidance and reduction practices. The proposed development will also increase and expand recycling infrastructure in Singleton and the broader Hunter region and will make an important as well as increased recycling to help meet the waste targets under the NSW Government's *Waste Avoidance and Resource Recovery Strategy 2014-2021*.

1.12.2. NSW Waste Less, Recycle More Initiative

The NSW Government's $337 million Waste Less, Recycle More program includes $48 million to support the development of new infrastructure for both municipal, commercial and construction and demolition waste materials.

1.12.3. NSW EPA Waste and Resource Recovery Infrastructure Strategy 2017-2021

In August 2017, the NSW EPA published the State's first draft strategy for prioritising new recycling infrastructure required across NSW by regional council groupings. The NSW EPA recognises that to achieve the diversion from landfill targets, significant investment in new infrastructure is still needed.

The Hunter and Central Coast has a shortfall in processing infrastructure to meet the 2021 recycling targets, including the need for:

- 1 new non-putrescible waste MRF to address a processing capacity shortfall of 54,000 tpa;
- 2 new packaging MRFs to address a processing capacity shortfall of 61,000 tpa; and
- 1 new putrescible organics processing facility to address a processing capacity shortfall of 62,000 tpa.

The proposed Tomago Resource Recovery Facility will help address these critical infrastructure gaps and drive progress towards meeting municipal and commercial and industrial recycling targets by 2021 as set by the NSW Government in the *NSW Waste Avoidance and Resource Recovery Strategy: 2014-2021*[2].

1.13. Staging of the development

It is noted that REMONDIS, as part of this development application, seeks approval for development, construction and operation of the Tomago Resource Recovery Facility. Whilst this development application is considered a standalone

[2] NSW EPA (2014). *NSW Waste Avoidance and Resource Recovery Strategy: 2014 – 2021*. Internet publication: http://www.epa.nsw.gov.au/wastestrategy/warr.htm

single-stage development, the establishment of the recycling operations within the buildings will occur over time as business opportunities arises with its customers.

The second stage of the development will involve a future application for the development of the remainder of 21F School Drive. Master planning for development of this aspect of the site is still underway and is yet to be determined.

REMONDIS is also considering a possible third stage for the development, including the acquisition and development of 21G School Drive. This site is located directly east of 21D School Drive. Again, master planning for this part of the site is still underway and is yet to be confirmed. Stage 3 may or may not be the subject of a future development application.

We note that any future development application(s) on 21F and 21G School Drive will complement the overall functions and operations of the resource recovery operations proposed as part of this development application for 21D and 21F School Drive. The development of these lands now and into the future will help support the Hunter region with critical waste processing and recycling infrastructure.

2. Description of the proposed development

2.1. Existing Infrastructure

The current infrastructure on the 21D School Drive site has been approved under Major Project MP 10_003 and includes two large industrial warehouses with internal offices and mezzanine areas. Office space and staff amenities are located in the southern portion of Building No 1. This includes an office, lunchroom and bathroom facilities. There is also a smaller metal clad workshop with associated offices plus car parking.

The Site has two points of access, the front entrance via School Drive and a side entrance via a private road that extends off School Drive. This road has a combination of sealed and gravel surface sections. A haul road into the site also exists on the northern boundary of the property, although this access is not on the property and was formerly used to transport molten aluminium from Tomago Aluminium into the site.

The entire outdoor area of the site is hardstand area with the exception of a few landscaped area at the front of Building 1. A total of 82 car parking spaces were approved for staff and visitors parking in the southern portion of the site, adjacent to Building No. 1.

The site is supplied by mains electricity. The electricity infrastructure in the vicinity of the site was upgraded in late 2011 to meet the increasing demands of the existing development.

An existing 150mm diameter Hunter Water Corporation main supplies potable water to the site. The existing main is fed by a 500mm diameter main that runs along Tomago Road.

To carry out the proposed development, no equipment needs to be removed from the warehouses as this has already been performed as part of the decommissioning process of the former cable manufacturing plant. Furthermore, no demolition is required as part of the proposed development.

2.2. Proposed Use

REMONDIS proposes to use the existing buildings at 21D School Drive for the receipt and processing of up to 98,201 tonnes per annum of solid and liquid waste materials. Waste materials include dry non-putrescible waste materials from domestic sources, commercial, industrial and construction sources. Each recycling operation will be established in discreet parts of the existing industrial warehousing, and collectively, the Tomago Resource Recovery Facility will provide a wide range of recycling services through:

- A fully integrated Materials Recovery Facility for sorting and processing:
  - Commercial and industrial mixed general solid waste (non-putrescible) (60%); and
  - Construction building waste from residential and commercial construction (non-putrescible) (40%);
- A Cardboard Baling Facility for source separated cardboard collected from businesses;
- A Drill Mud Recycling Facility for drill muds sourced from the civil, construction and mining industries;
- A Packaged Food Recycling Plant, which will accept packaged foods and drinks, separating the food contents and packaging for recycling;
- A Garden Organics Primary Processing plant, which will receive, decontaminate, and shred woody garden organics for off-site composting;
- A Hazardous Waste Recycling Facility, for sorting and aggregating a range of spent solid materials and liquids containing oils and chemicals;
- A Copper Processing area; and
- A Metals Recycling Facility.

A maintenance workshop will be established in Building 3. The workshop will provide vehicle maintenance services to support the REMONDIS truck collection fleet.

A truck parking depot will be established on the adjacent vacant lot referred to as 21F School Drive providing overnight parking for 24 rigid trucks and 9 semi-trailers.

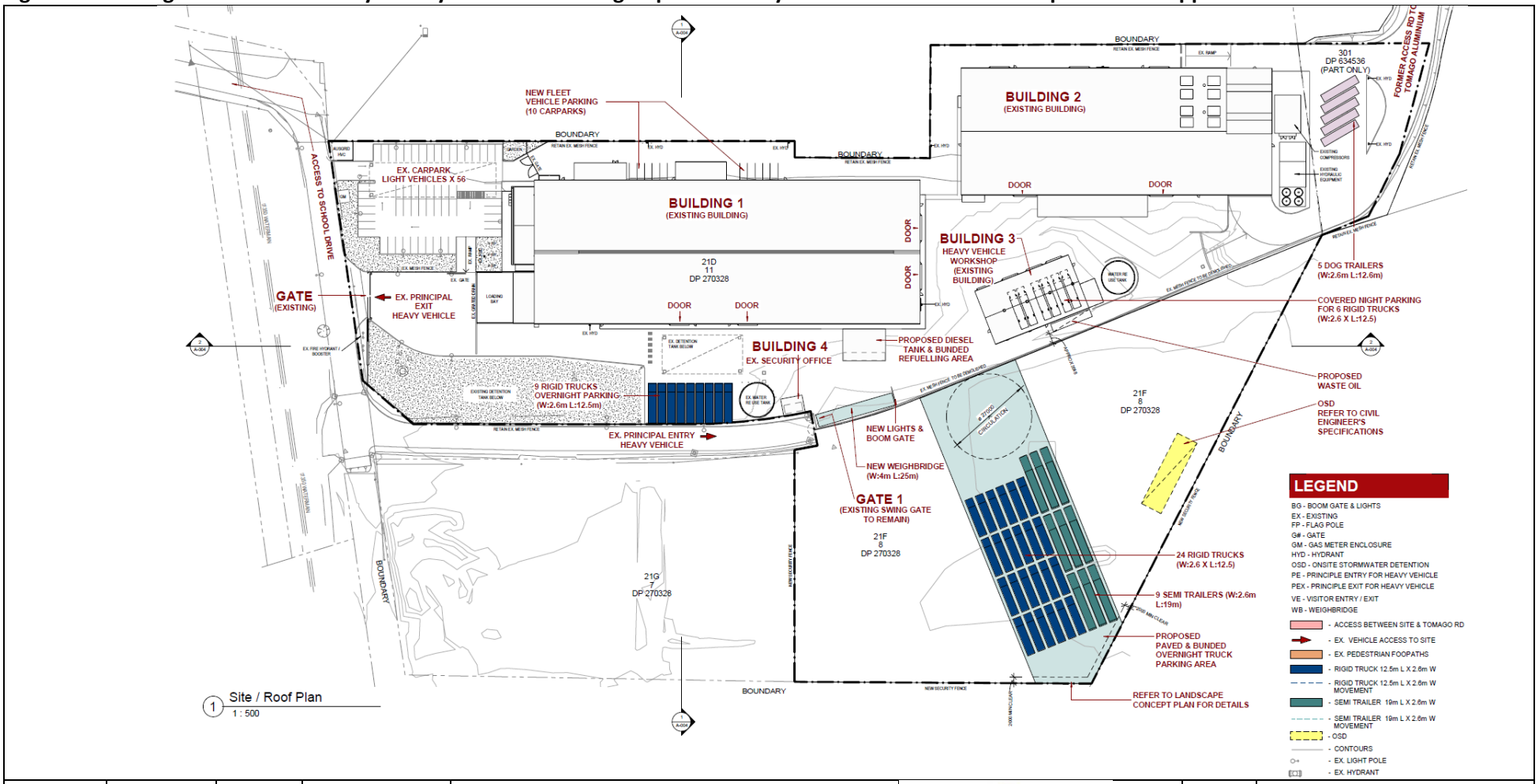
A detailed description of the proposed recycling operations is provided in Sections 2.1 to 2.12.

Figure 2.1 provides an image of the front of building 1. Figure 2.2 provides the site layout plan for the proposed operation. Figures 2.3-2.5 provide the general arrangement plan for Buildings 1-3. The architectural plans and drawings for the proposed development are provided in Appendix B.

Figure 2.1. Tomago Resource Recovery Facility and Truck Parking Depot – front of Building 1 and location of proposed truck parking depot in background.

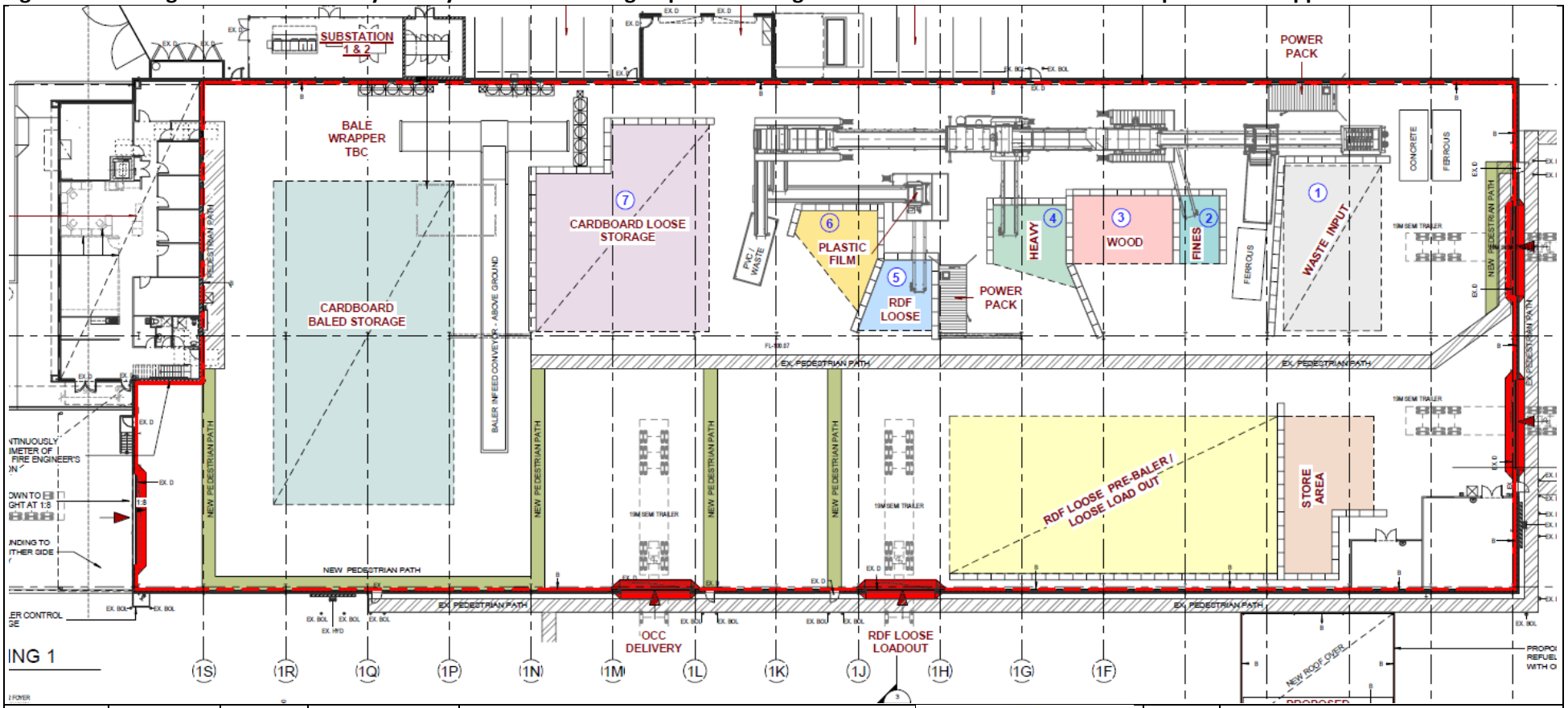
Date	Revision	Drawn By	Site description	Jackson Environment and Planning Pty Ltd	Client	REMONDIS Australia Pty Ltd
01/05/20	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536	Strategy | Infrastructure | Compliance | Procurement A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060 E: admin@jacksonenvironment.com.au T: 02 8056 1849 W: http://www.jacksonenvironment.com.au	Project	Environmental Impact Assessment
					Title	Aerial Image
					Scale	N/A
					Source	Newcastle Herald

Figure 2.2. Tomago Resource Recovery Facility and Truck Parking Depot – Site Layout. Detailed Site Plans are provided in Appendix B.



Date	Revision	Drawn By	Site description	Jackson Environment and Planning Pty Ltd	Client	REMONDIS Australia Pty Ltd
18/08/20	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536	Strategy | Infrastructure | Compliance | Procurement A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060 E: admin@jacksonenvironment.com.au T: 02 8056 1849 W: http://www.jacksonenvironment.com.au	Project	Environmental Impact Assessment
13/11/20	Revision B	R. Loemker			Title	Site Layout
					Scale	N/A
					Source	EJE Architecture

Figure 2.3. Tomago Resource Recovery Facility and Truck Parking Depot – Building 1 Floor Plan. Detailed Site Plans are provided in Appendix B.



Date	Revision	Drawn By	Site description
18/08/20	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536
13/11/20	Revision B	R. Loemker	

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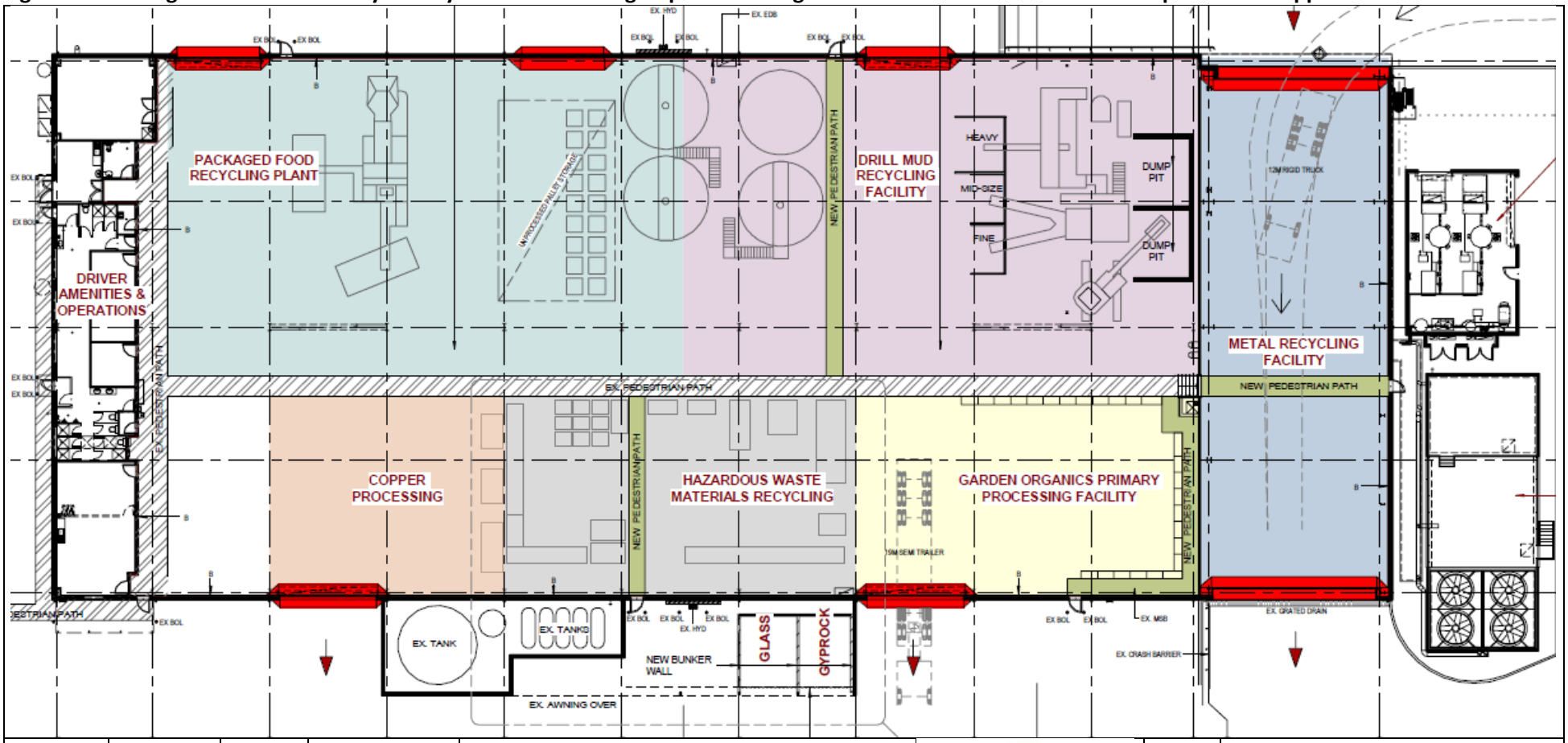
Client	REMONDIS Australia Pty Ltd
Project	Environmental Impact Assessment
Title	Building 1 Floor Plan
Scale	N/A
Source	EJE Architecture

Figure 2.4. Tomago Resource Recovery Facility and Truck Parking Depot – Building 2 Floor Plan. Detailed Site Plans are provided in Appendix B.



Date	Revision	Drawn By	Site description
18/08/20	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536
13/11/20	Revision B.	R. Loemker	

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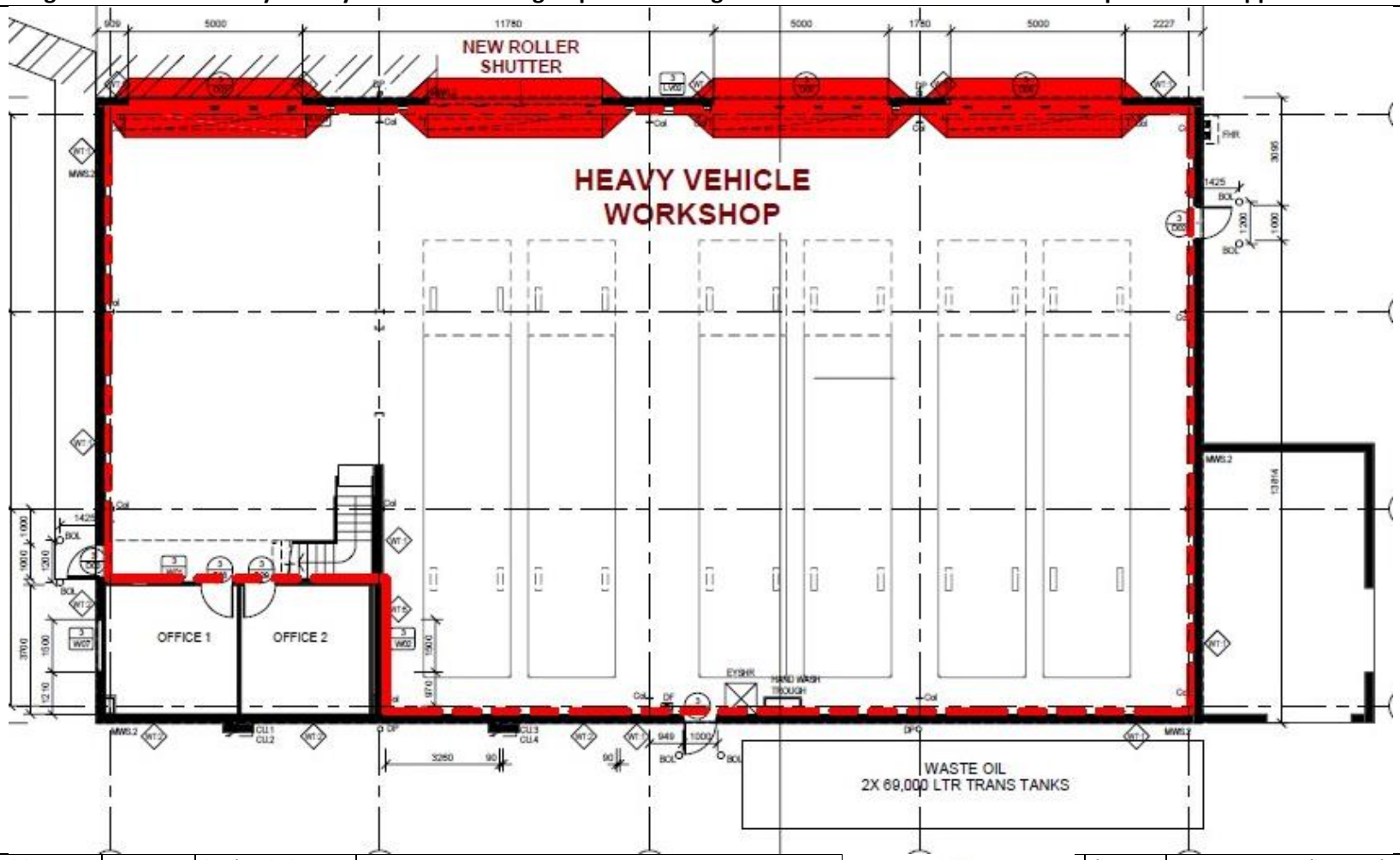
Client	**REMONDIS Australia Pty Ltd**
Project	Environmental Impact Assessment
Title	Building 2 Floor Plan
Scale	N/A
Source	EJE Architecture

Figure 2.5. Tomago Resource Recovery Facility and Truck Parking Depot – Building 3 Floor Plan. Detailed Site Plans are provided in Appendix B.



Date	Revision	Drawn By	Site description
18/08/20	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536

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Client	REMONDIS Australia Pty Ltd
Project	Environmental Impact Assessment
Title	Building 3 Floor Plan
Scale	N/A
Source	EJE Architecture

2.3. Materials Recycling Facility

Building 1 will house the Materials Recycling Facility (MRF) for sorting and recycling non-putrescible commercial and industrial mixed general solid waste via front-lift bin collections (approximately 60% of total waste received) and construction building waste from residential and commercial construction, including office fit-outs (approximately 40% of total waste received). The MRF is expected to process up to 31,000 tonnes per annum.

Collection vehicles will enter from the front of the site in the forward direction, pass over the weighbridge for gross weight recording and then will enter Building 1 for unloading (refer to Figure 2.3 and architectural plans in Appendix B).

All incoming waste from construction sites will be managed in accordance with the *Standards for Managing Construction Waste in NSW* (NSW EPA, 2018) and *the Waste Classification Guidelines* (NSW EPA, 2014).

Accepted waste will be tipped in the "tip and spread inspection area" which is in a bunded inspection bay. This area will be used solely for tipping, spreading, turning and inspecting each load of construction waste as required. Rejected loads and unwanted materials will be managed accordingly. Any gross physical contamination will be removed by a Material Handler and placed into a waste disposal bin.

Waste materials suitable for processing will then be loaded into a hopper of the sorting plant for separation by material type. The MRF processing line will produce the following:

- Recovered fines;
- Shredded wood;
- Heavies (concrete/brick/tile);
- Loose Refuse-derived fuel (RDF);
- Plastics; and
- PVC.

Waste outputs will be stored in separate storage areas. Products such as RDF, concrete/brick/tile, recovered fines, engineering fill, timber / wood mulch and Gyproc will be sampled and tested where required to confirm conformance with the relevant NSW EPA Resource Recovery Order specifications.

The RDF fraction will consist of the dry calorific fractions derived from the waste which usually contains plastics, timber, paper, cardboard, rubber and textiles. The materials will be separated, shredded, stored loose or baled and wrapped to be transported as feedstock to a third-party user.

Products will then be transported off site by vehicles for manufacturing, recycling or use off-site. Note that vehicles will pass over the weighbridge for net weight assessment prior to exiting the facility in the forward direction.

Table 2.1 provides details of the equipment to be used for the Materials Recovery Facility and RDF production.

Table 2.1. Proposed Equipment for the Materials Recovery Facility and RDF production located within Building 1.

Operational Activities	Equipment Item	Make	Model	Capacity (tonnes)
Materials Recovery Facility - MRF sorting and RDF production	Loader	Liebherr	L514	6
	Loader	Caterpillar	IT38G	7.6
	Material Handler	Liebherr	LH22	22
	Excavator	Caterpillar	319D	23
	Forklift	Toyota		2.5
	Forklift	Linde	H25D	2.5
	Forklift	Nissan	FD25T	2.5
	Pre-shredder	Metso	M&J 4000S	17.0
	Screen	Binder Bivitec	KRL/EDS 16600	16.8
	Windshifter	Redox	RSB 1600	11.1
	Fine shredder	Metso	M&J 1550	10.0
	Magnet	Steinert	MAGZ-55-CB1PC	20
	Conveyors	Brentwood	Various	20
	Near-Infrared	MSS	Sapphire	20

2.4. Cardboard Baling Facility

A separate part of the Tomago Resource Recovery Facility will be a dedicated Cardboard Baling Facility (CBF). Collection vehicles will enter from the front of the site in the forward direction, pass over the weighbridge for gross weight recording, and then will enter the eastern side of Building 1 for unloading in the dedicated OCC delivery bay area (refer to Figure 2.3 and architectural plans in Appendix B). The CBF is expected to process up to 30,000 tonnes per annum.

Trucks will then manoeuvre to the OCC Tipping and Inspection Area where cardboard is to be emptied within the concrete bunker cardboard receival area. Cardboard will be spread with a front end loader to remove any contamination prior to baling. Contaminants will be separated and placed into an appropriate bin for disposal.

Cardboard will be processed internally in the CBF. A front-end loader will be used to load the cardboard baler. Cardboard is baled in a hydraulic bale press and secured via steel wire into one tonne blocks and stored before transport off-site for recycling. Bales will be stored in a separate area in the southern section of Building 1, prior to loading onto semi-trailers for transport to manufacturers. Trucks carrying baled cardboard will pass over the weighbridge for net weight assessment, and trucks will leave the site in the forward direction.

Table 2.2 provides details of the equipment to be used for the CBF.

Table 2.2. Proposed Equipment for the CBF located within Building 1.

Operational Activities	Equipment Item	Make	Model	Capacity (tonnes)
Materials Recycling Facility - Cardboard baling	Baler	Bollegraf	HBC120S	22

2.5. Drill Mud Recycling Facility

Drill mud is currently generated by various commercial activities which include hydro-excavation or non-destructive digging, exploration drilling and horizontal boring. Drilling fluid (drill mud) is used as a lubricant and as a coolant during drilling operations such as horizontal direction drilling, potholing and investigative digging for civil, construction and mining. Drill mud is a mixture of water, clays, fluid loss control additives, density control additives and viscosifiers, which typically requires transport for off-site treatment at a recycling facility. The Drill Mud Recycling Facility is expected to process up to 5,000 tonnes per year of drill mud.

REMONDIS proposes to establish a small drill mud recycling operation to receive, process and recycle drill muds. Drill mud will be transported via liquid tanker truck to the Tomago Resource Recovery Facility, passing over the weighbridge for gross weight assessment. The vehicle will then manoeuvre to the Drill Mud Recycling Facility (DMRF) in Building 2. The operation will involve the following:

- Drill mud tanker trucks will enter the DMRF and will be pumped out into a bunded 50,000 L drill mud holding tank. Trucks will then exit in the forward direction over the weighbridge for net weight recording;
- The internal body of the tanker truck may be cleaned internally with rainwater from the site's rainwater harvesting system, and the wash out water will be pumped into the 50,000 L drill mud holding tank;
- The contents of the drill mud holding tank will be pumped at a specific rate into an on-site drill mud centrifuge, which will separate the solids (soil) from the liquid phase (mainly water);
- Dewatered solids (soil) will be transferred into a hook lift bin and moved to the dewatered drill mud storage area for sampling and testing to confirm compliance with the EPA's *Treated Drilling Mud Order* 2014;
- The supernatant (liquid phase) will be pumped to a 50,000 L holding tank for testing. This water may be sent off-site for treatment or recycling at a lawful facility.

2.6. Packaged Food Recycling Plant

The Packaged Food Recycling Plant (PFRP) will receive, de-package and recycle foods, drinks and associated packaging collected from retailers and manufacturers. The PFRP will separate foods from their packaging, to enable the recovery of the food fraction (such as through off-site composting or soil injection) and packaging, including steel, aluminium, plastics and liquid paperboard. The PFRP is expected to process up to 2,000 tonnes per annum.

Collection vehicles carrying packaged food on pallets will enter from the front of the site in the forward direction, pass over the weighbridge for gross weight recording, and then will enter Building 2 for unloading (refer to Figure 2.4 and architectural plans in Appendix B).

Trucks will then manoeuvre to the PFRP where pallets of packaged food and drinks will be unloaded and stored in a bunded storage bay. Forklifts will transfer the contents of the pallets into a receiving hopper of the food depackaging unit. The food depackaging unit 'chops and squeezes' the content of the food or drink item, separating the packaging from the food contents. The liquidised food is discharged and pumped into a 20,000 L on-site liquid food waste holding tank, which will be pumped out twice weekly and transported off-site for recycling. Ventilation and odour control systems will be installed as required to manage any odours from the depackaging plant.

Packaging separated by the depackaging unit will be stored in a hook lift bin and transferred to the MRF for processing, separation, and recycling of packaging.

2.7. Garden Organics Primary Processing Plant

A separate part of the Tomago Resource Recovery Facility will be a dedicated Garden Organics Primary Processing area (GOPP). This facility will receive, shred and send off-site primary processed garden organics to licenced composting facilities for processing and manufacturing into compost. The Garden Organics Primary Processing Plant is expected to process up to 5,000 tonnes per year of garden organics.

Collection vehicles will enter from the front of the site in the forward direction, pass over the weighbridge for gross weight recording, and then will enter Building 2 for unloading (refer to Figure 2.4 and architectural plans in Appendix B).

Trucks will then manoeuvre to the GOPP waste receiving area where garden organics are emptied within the concrete bunker receival area. Garden organics will be spread with a telehandler to remove any contamination prior to transfer the pre-processing storage concrete bunker. Contaminants will be separated and placed into an appropriate bin for disposal.

Garden organics will be processed internally in the GOPP. A telehandler or front-end loader will load the decontaminated garden organics into a shredding plant, that will grind the garden organics to <180mm in particle size. Shredded garden organics will then be moved by front end loader to a storage bunker, for regular transport via truck to a licensed composting facility for recycling. Trucks carrying shredded garden organics will pass over the weighbridge for net weight assessment, and trucks will leave the site in the forward direction.

Table 2.3 provides details of the equipment to be used for the GOPP.

Table 2.3. Proposed Equipment for the GOPP located within Building 2.

Operational Activities	Equipment Item	Make (or equivalent)	Model (or equivalent)	Capacity (tonnes)
Garden Organics Primary Processing	Loader (share with Building 1)	Liebherr	L514	6
	Material Handler (share with Building 1)	Liebherr	LH22	22
	Shredder (share with Building 1)	Metso	M&J 4000S	

2.8. Hazardous Waste Recycling Facility

A range of spent solid materials and liquids containing oils and chemicals will be received, aggregated and stored according to chemical group within the Tomago Resource Recovery Facility. These materials are collected from mining and manufacturing in the Hunter. Sorting and aggregation of the materials by type enables these materials to the efficiently collected and transported to off-site processing, recycling or disposal facilities. The Hazardous Waste Recycling Facility is expected to process up to 20,201 tonnes per year of hazardous waste (Table 4.2).

The Hazardous Waste Materials Recycling (HWMR) area will be established in Building 2 (refer to Figure 2.4 and architectural plans in Appendix B). Trucks will enter the facility in the forward direction, over the weighbridge for gross weight recording, and will then manoeuvre to the HWMR area. The manifest for each collection vehicle will be inspected, and solid waste materials in bins or containers will be loaded and inspected in a bunded area. Where appropriate, materials will be hand sorted and stored in bunded closed containers by material category type. This will include:

- Drained oil filters, rags and absorbent material (hydrocarbons);
- Containers & drums of controlled waste residues;
- Contaminated soils;
- Lead acid batteries;

- Batteries (Li-ion/NiCad/etc);
- Fluoro tubes;
- Gyproc;
- Used fire extinguishers and pressure vessels/rams etc; and
- E-waste.

Periodically, vehicles will enter the HWMR and collect aggregated materials for transport to other lawful facilities for processing, recycling or disposal. Trucks will pass over the weighbridge for net weight assessment, and trucks will leave the site in the forward direction.

The facility will also accept a range of trackable liquid wastes for aggregation. This will include:

- Waste Mineral Oils;
- Oily water/Coolant etc; and
- Residual Solvents/Thinners/Paints.

These liquid wastes will be transported to the Tomago Resource Recovery Facility in tankers or specialised containers on collection trucks. These trucks will enter the facility in the forward direction, over the weighbridge for gross weight recording, and will then manoeuvre to the HWMR area. Containers of trackable liquid wastes will be unloaded into a bunded storage area for assessment, classification and then decanting into holding tanks on the site. These tanks will be periodically emptied and transported in specialised containers or tanker trucks for off-site recycling or treatment. Trucks will pass over the weighbridge for net weight assessment, and trucks will leave the site in the forward direction

Table 2.4 provides details of the equipment to be used for the HWMR.

Table 2.4. Proposed Equipment for the HWMR located within Building 2.

Operational Activities	Equipment Item	Make (or equivalent)	Model (or equivalent)	Capacity (tonnes)
Hazardous Waste Recycling Facility	Hazmat P909 sealed storage container for Lithium ion batteries	N/A	N/A	100 kg
	Pallet racking	N/A	N/A	N/A
	Pallet scales	Wedderburn	WS004SBH	N/A
	Elephants Foot Baler	Elephants Foot	Drum Crusher	N/A
	Forklift as per previous plant list	Toyota		2.5
	Hook lift bins (share with Building 1)	Astec	15 cbm	N/A
	Front end loader (share with Building 1)	Liebherr	L514	6

A floor plan providing an overview of storage arrangements of waste materials in the Hazardous Waste Materials Recycling Facility is provided in Appendix B1 (Plan A-102B). This plan has been prepared in accordance with the *Australian Code for the Transport of Dangerous Goods by Road & Rail* (2020) to ensure that no incompatible chemicals are stored with each other.

2.9. Copper Processing area

The Tomago Resource Recovery Facility will also include a Copper Processing (CP) area. This area will involve the processing of electrical cabling sourced from mine sites, building and communications centre decommissioning to

enable the recovery of copper wire and plastics. The Copper Processing area is expected to process up to 1,000 tonnes per year of copper wire.

Collection vehicles will enter from the front of the site in the forward direction, pass over the weighbridge for gross weight recording, and then will enter the eastern side of Building 2 through the Copper Processing roller door for unloading refer to Figure 2.4 and architectural plans in Appendix B).

Trucks will then manoeuvre to the CP area where copper wire will be emptied within a concrete bunker receival area. Cables will be spread with a material handler to remove any contamination, then cut with a shear and placed into storage bins for off-site transport and further processing. Plastic insulation around the wire will also be stored in a bin and will be sent off site for recycling.

Trucks carrying sorted copper or plastics in bins will pass over the weighbridge for net weight assessment, and trucks will leave the site in the forward direction

Table 2.5 provides details of the equipment to be used for the CP area.

Table 2.5. Proposed Equipment for the CP area located within Building 2.

Operational Activities	Equipment Item	Make (or equivalent)	Model (or equivalent)	Capacity (tonnes)
Copper Processing Area	Hydraulic cable shear	Daia	CR-100	N/A
	Electric cable stripper	Diebels	RMH 30	N/A
	Forklift and Material Handler as per previous plant list	Toyota	N/A	2.5

2.10. Metals Recycling Facility

A separate part of the Tomago Resource Recovery Facility will be a dedicated Metal Recycling (MR) facility. This facility will receive, sort, cut and potentially bale ferrous and non-ferrous metals from commercial and industrial collections. The Metal Recycling facility is expected to process up to 4,000 tonnes per year of ferrous and non-ferrous metals.

Collection vehicles will enter from the front of the site in the forward direction, pass over the weighbridge for gross weight recording, and then will enter the rear of Building 2 for unloading (refer to Figure 2.4 and architectural plans in Appendix B).

Trucks will then manoeuvre to the MR waste receiving area where metals are emptied within the concrete bunker receival area. Metals will be sorted with a magnet with the material handler to remove any contamination, then cut with a shear and placed into a baling area or directly into hook lift bins for off-site processing and recycling.

Trucks carrying baled or loose sorted metals in hook lift bins will pass over the weighbridge for net weight assessment, and trucks will leave the site in the forward direction.

Table 2.6 provides details of the equipment to be used for the Metals Recycling facility area.

Table 2.6. Proposed Equipment for the Metals Recycling facility area located within Building 2.

Operational Activities	Equipment Item	Make (or equivalent)	Model (or equivalent)	Capacity (tonnes)
Metals Recycling Facility	Overhead crane (existing)	Demag	32/10T	32
	Material Handler with magnet/shear (share with Building 1)	Liebherr	LH22	22

Operational Activities	Equipment Item	Make (or equivalent)	Model (or equivalent)	Capacity (tonnes)
	Forklift (share with Building 1)	Toyota		2.5
	Bale press (shared with Building 1)	Elephants Foot	Drum Crusher	N/A
	Hook lift bins (shared with Building 1)	Astec	15 cbm	N/A
	Front end loader (shared with Building 1)	Liebherr	L514	6

2.11. Maintenance workshop

A maintenance workshop will be established within Building 3. The workshop will provide vehicle maintenance services to support the REMONDIS truck collection fleet. The workshop will store a limited quantity of fuels, oils and cleaning chemicals to support the operations. All maintenance activities will be performed indoors within this building (refer to Figure 2.5 and architectural plans in Appendix B). The maintenance workshop will also be used for parking 6 rigid trucks overnight.

2.12. Liquid waste and fuel storage

To support the truck parking depot operations and recycling operations, storage tanks for fuels, liquid wastes and waste oils will be provided. These self-bunded and secure storage tanks will be constructed outdoors, with awnings and appropriate bunding to contain any spills which can be easily cleaned. An overview of these storage facilities in provided in Table 2.7.

Table 2.7. Storage tanks for fuels, liquid wastes and waste oils.

Storage tank	Self-bunded storage tank volume (L)
Tank 1 – Waste oil	54,000
Tank 2 – Waste oil	67,000
Tank 3 – Oily water / coolant	20,000
Tank 4 – Oily water / coolant	20,000
Tank 5 – Fuel / AdBlue for refuelling vehicles and equipment (bunded with awning cover adjacent to Building 1)	60,000
Tank 6 – Liquid food waste from Packaged Food Recycling Plant (PFRP)	20,000
Tanks 7 – Drill mud liquid storage tank	50,000

2.13. Truck parking depot

The Tomago Resource Recovery Facility will incorporate a truck parking depot on 21F School Drive, directly east of the operations proposed on 21D School Drive.

This will provide parking for 24 rigid trucks and 9 semi-trailers for overnight parking demands associated with the project needs.

2.14. Waste materials to be received, quantities and storage

A summary of these proposed operations and the materials that will be accepted for recycling is summarised in Table 2.8. This table also lists the projected annual tonnages of materials to be received through each recycling process.

The proposed facility will receive up to 98,201 tonnes per annum of solid and liquid wastes for sorting, processing, aggregation, and recycling. At any one point in time, the facility may store up to 3,500 tonnes of solid and liquid wastes (refer to Table 6.7 and Table 6.8).

Table 2.8. Summary of proposed wastes to be received and annual tonnages projected to be received through each recycling process.

Recycling process	Types of materials to be received and processed	Source	Annual tonnage projections (tonnes pa)	Waste classification
Materials Recovery Facility (MRF)	+ Paper / cardboard + Plastics + Glass + Timber / wood + Mixed dry general waste	Households Businesses	31,000	General solid waste (non-putrescible)
Cardboard Baling Facility (CBF)	+ Cardboard	Businesses	30,000	General solid waste (non-putrescible)
Drill Mud Recycling Facility (DMRF)	+ Drill mud (soil and water mixture)	Industry	5,000	Category 1 trackable liquid waste
Packaged Food Recycling Plant (PFRP)	+ Packaged food products	Businesses Industry	2,000	General solid waste (putrescible)
Garden Organics Primary Processing (GOPP)	+ Woody garden organics	Households Businesses	5,000	General solid waste (non-putrescible)
Metals Recycling (MR)	+ Ferrous metals + Non-ferrous metals	Households Businesses	4,000	General solid waste (non-putrescible)
Copper Processing area (CP)	+ Copper wire	Businesses	1,000	General solid waste (non-putrescible)
Hazardous Waste Recycling Facility (HWRF)	+ Drained Oil filters, rags and absorbent material (hydrocarbons)	Businesses Industry	500	General solid waste (non-putrescible)
	+ Containers & drums of controlled waste residues	Businesses Industry	500	Category 1 trackable solid waste (N100)
	+ Contaminated Soils	Businesses Industry	12,000	Category 1 trackable solid waste (N120)
	+ Lead Acid Batteries	Businesses Industry	500	Category 1 trackable solid waste (D220)
	+ Waste Mineral Oils	Businesses Industry	6,000	Category 1 trackable liquid waste (J100)
	+ Oily water/Coolant etc	Businesses Industry	300	Category 1 trackable liquid waste (J120)
	+ Batteries (Li-ion/NiCad/etc)	Businesses Industry	1	General solid waste (non-putrescible)
	+ Fluoro Tubes	Businesses Industry	50	General solid waste (non-putrescible)
	+ Gyproc	Businesses Industry	200	General solid waste (non-putrescible)
	+ Used Fire extinguishers and Pressure Vessels/Rams etc	Businesses Industry	50	General solid waste (non-putrescible)
	+ Residual Solvents / Thinners / Paints	Businesses Industry	50	Category 1 trackable liquid waste (J100)

Recycling process	Types of materials to be received and processed	Source	Annual tonnage projections (tonnes pa)	Waste classification
	+ E-waste	Businesses Industry	50	General solid waste (non-putrescible)
TOTAL			98,201	

2.15. Staff numbers

In total, it is anticipated that the Tomago Resource Recovery Facility will employ 76 people. This will include:

- 16 office, sales and administration staff during weekday business hours; and
- 60 truck drivers, operators, mechanics and recycling hands split over three crews on two twelve-hour shifts.

2.16. Operational hours

The proposed operational hours for the development are summarised in Table 2.9 below.

Table 2.9. Operational hours

Activity	Operational Hours
Access	24 hrs / 7 days per week
Opening hours (staffed)	
Waste deliveries	
Waste processing	
Products transferred off-site	

REMONDIS provide essential services to various power stations, mine sites, Local Government Authorities and various commercial entities. As a result, REMONDIS have 24/7 response times to mobilise and deploy resources to handle emergency effluent collections, sewer pump station outages, night-shift spills, waste and recycling compactor stoppages and environmental incident response.

2.17. Access

The Site has two points of access, the front entrance via School Drive and a side entrance via a private road on Community Title Land that extends off School Drive (refer to Figure 2.2). This road is sealed. A haul road into the site also exists on the northern boundary of the property, although this access is not on the property and was formerly used to transport molten aluminium from Tomago Aluminium into the site.

Vehicles will turn off Tomago Road from either the east or west, into School Drive and then into the main entrance of the Facility. Outbound vehicles follow School Drive and turn either east or west onto Tomago Road as shown in Figure 2.2.

2.18. Hardstand

An outdoor hardstand area is in place to assist in all-weather vehicle movement and to protect underlying soils from spills.

2.19. Buildings

The Site has two large industrial warehouses with internal offices and mezzanine areas (refer to Figure 2.1). Office space and staff amenities are located in the southern portion of Building 1. This includes an office, lunchroom and bathroom facilities. There is also a smaller metal clad workshop (Building 3) with associated offices plus car parking.

2.20. Car parking

A total of 66 car parking spaces are provided for staff and visitors parking.

2.21. Power supply

The site is supplied by mains electricity. The electricity infrastructure in the vicinity of the site was upgraded in late 2011 to meet the increasing demands of the existing development.

2.22. Potable water supply

An existing 150mm diameter Hunter Water Corporation main supplies potable water to the site. The existing main is fed by a 500mm diameter main that runs along Tomago Road.

2.23. Communications

A telephone line is parallel to the southern boundary.

2.24. Integrated water management

An integrated water management strategy was proposed for the site in the original development and includes the following strategies:

- Rainwater runoff from roofs directed to 250kL storage tanks, and treated for reuse as process water;
- Water from the onsite sewer treatment system treated and re-used for onsite subsurface irrigation;
- Runoff from paved areas treated by gross pollutant traps and directed to infiltration zones;
- In larger storm events, high flows bypass the Gross Pollutant Trap and discharged to the area south of the site; and
- Process water reject is stored separately and tankered and disposed at a facility licenced to accept trade waste.

2.25. Firefighting equipment

The following firefighting equipment and other mitigation measures will be installed at the facility (refer to the fire safety study in Section 18 and Appendix P).

- Access for fire brigade vehicles and firefighters:
    - It has been noted by both BMG (2020) and Affinity Fire Engineering (2020) that emergency vehicle access around the northern end of Building 2 is not deemed to satisfy BCA cl. C2.4, in that the perimeter road is greater than 18 metres from the building in certain locations; and
- Fire safety in waste facilities:
    - Building 1 will be fitted with ridgeline exhaust fans capable of extracting smoke at the rate of 18m^3/s within 10 minutes of the fire reaching steady heat release;
    - Building 1 will have a minimum 10mm high perimeter bund around the inside of the building;
    - Building 2 will be fitted with ridgeline exhaust fans capable of extracting smoke at the rate of 17m^3/s within 6 minutes of the fire reaching steady heat release;
    - Building 2 will have a minimum 16mm high perimeter bund around the inside of the building;
    - Building 3 will be fitted with ridgeline exhaust fans capable of extracting smoke at the rate of 26m^3/s that are interlocked with the fire alarm;

- Building 3 will have a minimum 5mm high perimeter bund around the inside of the building;
- Internal stockpiles will be arranged to allow for six (6) metres unobstructed access around internal stockpiles; and
- Internal stockpiles will have a maximum volume of 1000m^3.

It is further recommended that REMONDIS :

- Provide an emergency tipping area, such as the undeveloped areas on Site 21F, at least 10 metres from parked vehicles and within a 70 metre radius of hydrant FH5;
- Use portable infrared detectors to check for thermal hotspots;
- Install fixed infrared cameras with audible alarm at five (5) identified high fire load locations;
- Install automatic sprinkler system in Building 2;
- Building 2 will require the installation of 4 x 36m (DN19) fire hose reels adjacent personal access doors to ensure coverage of the building internal floor area;
- 2A 60B(E) 9 kg powder fire extinguishers will be installed on all the vehicles working in the vicinity of the fire compartments;
- 5 x 2A 60B(E) 9 kg powder fire extinguishers to be inside the recycling plant;
- Lithium batteries must be stored in accordance with the Dangerous Goods Code and AS/NZS 4681:2000 *The storage and handling of Class 9 (miscellaneous) dangerous goods and articles*; and
- Plastics will be removed on a regular basis to ensure that individual storage areas, no greater than 20m^2 and metres high, are separated from adjoining storages by no less than 2.4 metres.

2.26. Bunding

The following bunding will be provided for the three main buildings on site:

- Building 1 – 10mm bund wall around the inside perimeter of the building and at each building exit to contain a volume of 51m^3.
- Building 2 – 16mm bund wall around the inside perimeter of the building and at each building exit to contain a volume of 51m^3.
- Building 3 – 5 mm bund wall around the inside perimeter of the building and at each building exit to contain a volume of 0.54m^3

2.27. Weighbridge location

All material delivered to and leaving the site will be weighed on a 25m inground weighbridge, which will be positioned on 21D School Drive. Access to the weighbridge will be via a private road on Community Title land associated with Lot 1 / DP270328.

3. Planning and Legislation

3.1. Project approval

REMONDIS propose to treat, store and dispose of industrial liquid waste and will handle more than 1,000 tonnes per year of other aqueous or non-aqueous liquid industrial waste. Therefore, the development is considered to be a State Significant Development under clause 23(6b) of Schedule 1 of the *State Environmental Planning Policy (State and Regional Development*) 2011.

Developments are deemed State significance due to its size, economic value or potential environmental impact. Generally, State significant development (SSD) includes large-scale or complex projects that may involve significant environmental impacts. A development can become SSD in one of two ways:

- It can be declared to be SSD under State Environmental Planning Policy (State and Regional Development) 2011 (State and Regional Development SEPP);
- It can be declared to be SSD by order of the Planning Minister.

The State and Regional Development SEPP sets out categories of development that will qualify as SSD. It also includes certain sites where any type of development is considered to be SSD due to the significance of the site.

All State Significant Development applications must be accompanied by an Environmental Impact Statement (this report which is prepared in accordance with the Planning Secretary's environmental assessment requirements (SEARs).

State Significant Development is assessed the Department of Planning, Industry and Environment or the Independent Planning Commission, under delegation from the Minister of Planning

REMONDIS is committed to complying with all laws that affect its operations and understands that development approval and appropriate licensing is required prior to the proposed development occurring. Under Section 5.18 of the *Environmental Planning and Assessment Act* 1979, REMONDIS prepared a 'Preliminary Environmental Assessment' of the project and requested the SEARs from the DPIE.

The SEAR's (10447) for the project was issued on 24th April 2020 by the NSW Department of Planning, Industry Environment. All EIS requirements provided by the following agencies have been addressed in this EIS.

- Department of Planning, Industry and Environment (SEARs No. 10447);
- Department of Industry – Water;
- Port Stephens Council;
- NSW EPA;
- Department of Planning, Industry and Environment – Biodiversity and Conservation Division;
- Department of Planning, Industry and Environment – Water and the Natural Resources Access Regulator;
- Transport for NSW;
- Fire & Rescue NSW.

The proposed development also requires an Environment Protection Licence from the NSW Environment Protection Authority as the site is located in the levy-paying area and the facility will have a processing capacity greater than 6,000 tonnes per annum, pursuant to Clause 34(3) of Schedule 1 of the *Protection of the Environment Operations Act* 1997.

Under Clause 8A (1) of the *State and Regional Development SEPP,* the Independent Planning Commission will be the consent authority for SSD applications:

- That are not supported by relevant council(s), or
- Where the Department has received more than 25 public objections, or

- That has been made by a person who has disclosed a reportable political donation in connection with the development application

The Minister for Planning is the consent authority for all other SSD applications.

3.2. Statutory Context

The statutory context of the proposed development is summarised in Table 3.1.

Table 3.1. Strategic and statutory context

Regulatory Requirements	Considerations	Relevant section of EIS
Environmental Planning and Assessment Act 1979	The proposed project is considered to be State Significant Development requiring assessment under Part 4 Division 4.7 of the *Environmental Planning and Assessment Act* 1979.	This EIS has been prepared to satisfy the requirements of the *Environmental Planning and Assessment Act* 1979.
Environmental Planning and Assessment Regulation 2000	As State Significant Development, Clause 4.12(8) of the *Environmental Planning and Assessment Act* 1979 applies, and an Environmental Impact Statement in the form prescribed by the *Environmental Planning and Assessment Regulation* 2000 must accompany the development application, in addition to addressing the SEARs.	This EIS has been prepared to satisfy the requirements of the *Environmental Planning and Assessment Regulation* 2000.
Protection of the Environment Operations Act 1997	Schedule 1 of the *Protection of the Environment Operations Act* 1997 (34) details "Resource Recovery" as an activity. Section 48 of the Act requires a person to obtain an Environment Protection License (EPL) from the NSW Environment Protection Authority before carrying out any of the premise-based activities described in Schedule 1 of the Act. The facility will require an Environment Protection Licence (EPL) as it will receive more than 6,000 tonnes per year, and an EPL is required under the *Protection of the Environment Operations Act* 1997.	N/A – an application for an Environment Protection Licence will be made to the NSW Environment Protection Authority following the issue of consent conditions.
Biodiversity Conservation Act 2016	According to the Secretary's Environmental Assessment Requirements (SEARs) for the proposed development, a Biodiversity Development Assessment Report is required to support a development application for the proposed development.	A Biodiversity Development Assessment Report has been prepared according to the methodology detailed within the BAM. The Biodiversity Development Assessment Report has been summarised in Section 10 and the full report is contained in Appendix I.
National Parks and Wildlife Act 1974 and *National Parks and Wildlife Regulations* 2009	The National Parks and Wildlife Act 1974 provides for the protection of Aboriginal sites and the reporting of any new Aboriginal, or suspected Aboriginal, heritage sites.	An Aboriginal Cultural Heritage Assessment and a Statement of Heritage Impact was conducted as part of the Environmental Impact Statement and Development Application process. The Aboriginal Cultural and Heritage is summarised in Section 12 and the report in Appendix K.
Heritage Act 1977	Non-Indigenous heritage in NSW is protected under the Heritage Act 1977 (the Heritage Act) and the Environmental Planning & Assessment Act 1979 (the EP&A Act). Archaeological material is protected under the relics provision of the Heritage Act 1977, it includes any deposit, artefact, or material evidence.	

Regulatory Requirements	Considerations	Relevant section of EIS
NSW Biosecurity Act 2015	Assessment with regards to Matters of National Environmental Significance (MNES) listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), the NSW Biosecurity Act 2015 and relevant State Environmental Planning Policies.	Further information on this matter is provided in Section 10 of this report and within the Biodiversity Development Assessment Report is contained in Appendix I.
Environmental Protection and Biodiversity Conservation Act 1999	Items of national significance are listed on the National Heritage List is administered by the Australian Heritage Council in accordance with the *Environmental Protection and Biodiversity Conservation Act* 1999.	Further information on this matter is provided in Section 10 of this report and within the Biodiversity Development Assessment Report contained in Appendix I.
State Environmental Planning Policy (State and Regional Development) 2011	The proposed development is considered State Significant Development under Schedule 1(23)(6b) of the State and Regional Development SEPP.	This EIS has been prepared to satisfy the requirements of the State and Regional Development SEPP.
State Environmental Planning Policy (Infrastructure) 2007	The proposed development meets the definition of a "Resource recovery facility" and "Waste or resource management facility" under Section 120 of the Infrastructure SEPP. Given the proposed development is to occur in a prescribed IN1 General Industrial zoning, the development is considered to be consistent with Section 120 of the Infrastructure SEPP, being development, which is permissible subject to development consent.	This EIS has been prepared to satisfy the requirements of the Infrastructure SEPP
State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017	The Site is located within "bushland" as identified in the *State Environmental Planning Policy (Vegetation in Non-Rural Areas)* 2017 as the Vegetation SEPP applies to land zoned General Industrial (IN1). However, the site, and general locality is void of vegetation and no clearing is required as part of the proposed development.	Further information on this matter is provided in Section 10 of this report and within the Biodiversity Development Assessment Report contained in Appendix I.
State Environmental Planning Policy No 33 – Hazardous and Offensive Development	*State Environmental Planning Policy No 33: Hazardous and Offensive Development* (SEPP 33) outlines the requirements for a Preliminary Hazard Analysis screening test, required to be undertaken for hazardous and potentially hazardous industries.	The Preliminary Hazard Assessment is given in Chapter 17.
State Environmental Planning Policy No 44 – Koala Habitat Protection	SEPP 44 restricts granting development consent on land identified as a core koala habitat without preparation of a plan of management.	The Biodiversity Development Assessment in Section 10 has determined that no evidence of Koala occurrences within the study area. Consequently, preparation of a koala plan of management is not required under SEPP 44.
State Environmental Planning Policy No 55 – Remediation of Land	Under the provisions of *State Environmental Planning Policy No. 55 – Remediation of Land*, it is necessary to establish if the proposed development is to be developed on land which has been declared or found to be contaminated, where rezoning of the land is proposed or where development contemplates a change of use.	A Stage 2 Detailed Site Investigation with was undertaken at the Site in June 2020. The investigation was undertaken by JM Environments. A summary of the findings of the Detailed Site Investigation and supporting Remediation Action Plan (RAP) is provided in Section 14 and the reports have been attached to this EIS for reference (refer to Appendix M).
State Environment Planning Policy No. 64 – Advertising and Signage	The aim of *State Environmental Planning Policy No 64 – Advertising and Signage* (SEPP 64) is to ensure that signage is compatible with the desired amenity and visual character of an area,	Parts of SEPP 64 apply to the proposed Development, as the business identification signage on the southern facade is visible from the surrounding road network. However signage to

Regulatory Requirements	Considerations	Relevant section of EIS
	provides effective communication in suitable locations and is of a high-quality finish and design.	this part of the building is a 'business identification sign' and therefore Part 3 of SEPP 64 does not apply.
State Environmental Planning Policy (State and Regional Development) 2011	Under Part 2, Clause 8 of the State and Regional Development SEPP, development is declared to be State significant development if the development is specified in Schedule 1 or 2. The relevant Schedule for the proposed development is Schedule 1 Clause 23 *waste and resource management facilities.*	The proposed development is considered State Significant Development under Schedule 1(23)(6b) of the State and Regional Development SEPP.

3.3. Port Stephens Local Environmental Plan 2013

The following Chapter provides the local planning and legislative framework for the proposed development. The purpose of this Chapter is to outline the approval process and identify the applicable local planning controls that relate to the proposed development.

The site is located within the Port Stephens Local Government Area on land zoned IN1 General Industrial, as defined under the *Port Stephens Local Environmental Plan* 2013. The proposed development will focus on resource recovery activities as well as a truck parking depot.

The particular aims of this Port Stephens LEP are as follows:

- To implement the community's *Port Stephens Futures Strategy* 2009 and *Port Stephens Planning Strategy* 2011;
- To cultivate a sense of place that promotes community wellbeing and quality of life;
- To provide for a diverse and compatible mix of land uses supported by sound planning policy to deliver high quality development and urban design outcomes;
- To protect and enhance the natural environmental assets of Port Stephens;
- To continue to facilitate economic growth that contributes to long-term and self-sufficient employment locally;
- To provide opportunity for housing choice and support services tailored to the needs of the community;
- To conserve and respect the heritage and cultural values of the natural and built environments;
- To promote an integrated approach for the provision of infrastructure and transport services;
- To continue to implement the legislative framework that supports openness, transparency and accountability of assessment and decision making;
- To achieve inter-generational equity by managing the integration of environmental, social and economic goals in a sustainable and accountable manner.

3.3.1. Zone objective

The objectives of IN1 General Industrial land zoning are:

- To provide a wide range of industrial and warehouse land uses;
- To encourage employment opportunities;
- To minimise any adverse effect of industry on other land uses; and
- To support and protect industrial land for industrial uses.

3.3.2. Land use permissibility

The *Port Stephens Local Environmental Plan* 2013 permits the development of Truck Depots with consent in the IN1 General Industrial zoning. Waste or resource management facilities are not defined as permissible; however, under Section 121 of the Infrastructure SEPP, development for the purpose of resource management facilities can be carried out with consent on lands in land use zone IN1 General Industrial. Therefore, the proposed development is compatible with the Port Stephens LEP.

3.3.3. Other LEP Provisions

3.3.3.1. Clause 7.3 – flood planning

Under Part 7.3 of the LEP, development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development:

(a) Is compatible with the flood hazard of the land, and
(b) Will not significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties, and
(c) Incorporates appropriate measures to manage risk to life from flood, and
(d) Will not significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses, and
(e) Is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding.

A Flood Certificate was obtained from Port Stephens Council for the subject. The site has been identified to be located in a flood prone area. However, the site is not a 'flood control lot' for the purposes of the *State Environmental Planning Policy* 2008. A Flood Planning Level (FPL) is not applicable for the subject site with the Probable Maximum Flood (PMF) level listed as 6.3m AHD.

In accordance with B5.6 of the *Port Stephens Council DCP* 2014 the development is located within the minimal risk flood hazard category, which applies to critical emergency response and recovery facilities or vulnerable development types such as aged care and childcare facilities. The subject development does not fall within these classifications.

The proposed industrial development does not include any habitable rooms, and thus is not required to meet the requirements for a habitable room as outlined in Section B5.5 of the *Port Stephens Council DCP* 2014. As previously identified, a Flood Planning level (FPL) is not applicable to the site development thus negating the need for electrical fixtures to be located above the FPL for non-habitable rooms.

A storage area is provided by the second storey of the existing buildings that will enable the storage of goods above the PMF flood level.

The proposed truck depot will require fill to construct the pavement to the finished design levels. This will raise the surface levels locally by approximately 100-500mm. Northrop note that given the minor degree of filling required, the proposed development will not substantially impede the flow of floodwater and will not contribute to significant flooding or ponding of water on adjacent properties.

The 5% AEP flood level is not applicable for this site and as such the finished surface level for the truck depot has been deemed acceptable.

3.4. Port Stephens Development Control Plan 2014

The *Port Stephens Development Control Plan* 2014 (Port Stephens DCP) was adopted by Port Stephens Council on Tuesday, 14 July 2015 and became effective on Thursday, 6 August 2015. The Port Stephens DCP aims to facilitate

development in accordance with the Local Environmental Plan applying to the land to which the Port Stephens DCP applies. For the proposed development, Part B2 General Provisions and Part C3 Industrial apply.

The development is required to demonstrate full compliance the *Port Stephens Development Control Plan* 2014. Relevant sections of the *Port Stephens Development Control Plan* 2014 and the chapter / appendix where these provisions have been addressed are summarised in Table 3.2.

Table 3.2. Relevant *Port Stephens Development Control Plan* 2014 Specifications and Standards.

Section of DCP	Relevant section of EIS
B. GENERAL PROVISIONS	
B2. NATURAL RESOURCES	
B2.A. Environmental Significance	Section 10 and Appendix I
B2.C. Noxious Weeds	Section 10 and Appendix I
B3. ENVIRONMENTAL MANAGEMENT	
B3.A. Acid Sulfate Soils	Section 14 and Appendix J
B3.B. Air Quality	Section 7 and Appendix F
B3.C. Noise	Section 8 and Appendix G
B3.D. Earthworks	Section 11 and Appendix J Section 14 and Appendix M Section 6 and Appendix E
B4. DRAINAGE AND WATER QUALITY	
B4.A. Stormwater Drainage Plan	Section 11 and Appendix J
B4.B. On-site Detention / On-site Infiltration	Section 11 and Appendix J
B4.C. Water Quality	Section 11 and Appendix J
B5. FLOODING	
B5.A. Flood Planning	Section 11 and Appendix J
B6.A. Essential Services	Section 11 and Appendix J
B8. HERITAGE	
B8.A. Heritage Impact	Section 13 and Appendix L
B8.D. Aboriginal Heritage	Section 12 and Appendix K
B9. Road Networking and Parking	

Section of DCP	Relevant section of EIS
B9.A. Traffic Impacts	Section 9 and Appendix H
B9.B. On-Site Parking Provisions	Section 9 and Appendix H
B9.C. On-Site Parking Access	Section 9 and Appendix H
B9.D. Visitor Parking & Loading Facilities	Section 9 and Appendix H
B10. SOCIAL IMPACT	
B10.A. Social Impact	Entire EIS Report
C Development Types	
C3 Industrial	
B3.A. Height	Appendix B
B3.B. Building Siting and Design	Appendix B
B3.D. Fencing	Appendix B
C3.F. Landscaping	Section 19 and Appendix R

3.5. Other applicable legislation or strategies

3.5.1. NSW Energy from Waste Policy Statement

The NSW Energy from Waste Policy sets out the policy framework and overarching criteria that apply to facilities in NSW proposing to thermally treat waste or waste-derived materials for the recovery of energy and in doing so provides regulatory clarity to industry and the community.

The Policy was published in 2015 to guide proponents considering the development of Energy from Waste projects in NSW. The Policy provides guidance in relation to the following matters:

- Definition of waste materials that can be considered 'eligible waste fuels'. Facilities that use these materials (e.g. biomass from agriculture) are considered by the EPA to pose a low risk of harm to the environment and human health due to their origin, low levels of contaminants and consistency over time;
- Requirement to use international best practice Energy Recovery technology, particularly for plants seeking to thermally treat non-standard fuels derived from waste materials (such as RDF);
- Technical criteria that relate to time and temperature of combustion, including strict air emission limits;
- Thermal efficiency criteria that relate to the minimum amount of energy recovered as electricity or heat; and
- Resource recovery criteria, which set out limits on the amounts of certain waste materials that can be used as fuel, to avoid impacts on the viability of recycling.

The proposed Tomago Resource Recovery Facility will produce RDF from the residual fraction of mainly commercial and construction waste materials sorted for recycling. The facility will need to comply with the following Resource Recovery Criteria of the Policy:

- Where loads of mixed C&I waste materials are received, up to 50% by mass can be used as a "fuel" (and manufactured into RDF); and
- It is noted that there is no cap on the percentage of C&I waste that can be used "fuel" (and manufactured into RDF) where it can be demonstrated that the business has effective and operating collection systems for all waste streams.

3.5.2. Fire and Rescue NSW – Fire Safety Guidelines

In August 2019, Fire and Rescue NSW published new guidelines that apply to waste and resource recovery operations. These guidelines were updated in February 2020. These guidelines need to be considered for facilities that are seeking approval for upgrades or changes, and for new facilities.

The purpose of the document is to provide guidance on fire safety in waste facilities that receive combustible waste materials, including adequate provision for fire safety and facilitate safe fire brigade intervention to protect life, property and the environment. The guideline specially outlines the requirement of Fire and Rescue NSW for:

a) Considering for safety during all stages of a waste facility, including site selection, planning, design, assessment and operation;
b) Fire safety systems to be adequate to the special hazards identified within a waste facility and which also meet the operational needs of fire fighters;
c) Safe storage and stockpiling of combustible waste material based on expected combustibility and maximum pile size;
d) Workplace fire safety and fire safety planning, including procedures in the event of fire or an emergency incident.

An assessment of the proposed development was carried out in Fire Safety Study in accordance with the Fire and Rescue Guidelines. A summary of the Assessment is provided in Section 18.

3.6. List of approvals and licenses

Several approvals and licenses will be required on issue of State Significant Development consent conditions from the Department of Planning, Industry and Environment or the Independent Planning Commission, under delegation from the Minister of Planning.

A summary of these approvals and licenses is provided in Table 3.3 below, including the relevant laws, regulations and consent authority.

Table 3.3. List of approvals and licenses required for the facility.

Licence or approval required	Underpinning legislation	What is the approval or licence required for?	Consent authority
Approval as a State Significant Development	Schedule 1(23)(6b) of the *State Environmental Planning Policy (State and Regional Development)* 2011.	Planning consent for the Tomago Resource Recovery Facility and Truck Parking Depot	Department of Planning, Industry and Environment or the Independent Planning Commission, under delegation from the Minister of Planning.
Application for an Environment Protection Licence – Scheduled Activity	Section 48 of the *Protection of the Environment Operations Act* 1997.	Refer to Section below	NSW Environment Protection Authority

3.6.1. *Protection of the Environment Operations Act* 1997

The *Protection of the Environment Operation Act* 1997 prohibits any person from causing pollution of waters, or air and provides penalties for air, water and noise pollution offences. Section 48 of the Act requires a person to obtain an Environment Protection License (EPL) from the NSW Environment Protection Authority before carrying out any of the premise-based activities described in Schedule 1 of the Act.

Table 3.4 provides an outline of the Schedule 1 activities. These activities are declared to be a scheduled activity if these activities meet the Schedule Activity Criteria.

Table 3.4. Scheduled activities as per Schedule 1 of the *Protection of the Environment Operations Act* 1997.

Activity	Activity	Scheduled Activity Criteria
34. Resource recovery	Recovery of general waste, meaning the receiving of waste (other than hazardous waste, restricted solid waste, liquid waste or special waste) from off site and its processing, otherwise than for the recovery of energy.	If the premises are in the regulated area:(a) involves having on site at any time more than 1,000 tonnes or 1,000 cubic metres of waste, or (b) involves processing more than 6,000 tonnes of waste per year. If the premises are outside the regulated area:(a) involves having on site at any time more than 2,500 tonnes or 2,500 cubic metres of waste, or(b) involves processing more than 12,000 tonnes of waste per year.
	Recovery of hazardous and other waste, meaning the receiving of hazardous waste, restricted solid waste or special waste (other than asbestos waste or waste tyres) from off site and its processing, otherwise than for the recovery of energy.	Involves having on site at any time more than 200 kilograms of waste.
	Recovery of waste oil, meaning the receiving of waste oil from off site and its processing, otherwise than for the recovery of energy.	Involves processing more than 20 tonnes of waste oil per year or having on site at any time more than 2,000 litres of waste oil.
	Recovery of waste tyres, meaning the receiving of waste tyres from off site and their processing, otherwise than for the recovery of energy.	Involves having on site at any time (other than in or on a vehicle used to transport the tyres to or from the premises) more than 5 tonnes of waste tyres or 500 waste tyres, or involves processing more than 5,000 tonnes of waste tyres per year.
41. Waste processing (non-thermal treatment)	Non-thermal treatment of general waste, meaning the receiving of waste (other than hazardous waste, restricted solid waste, liquid waste or special waste) from off site and its processing otherwise than by thermal treatment.	If the premises are in the regulated area: (a) involves having on site at any time more than 1,000 tonnes or 1,000 cubic metres of waste, or (b) involves processing more than 6,000 tonnes of waste per year.
42. Waste storage	Waste storage, meaning the receiving from off site and storing (including storage for transfer) of waste.	More than the following amounts of waste is received per year from off site: (i) in the case of premises in the regulated area—6,000 tonnes.

The facility will require an Environment Protection Licence (EPL) as it will receive more than 6,000 tonnes per year, and an EPL is required under the *Protection of the Environment Operations Act* 1997. An application for an Environment Protection Licence will be made to the NSW Environment Protection Authority following the issue of consent conditions.

4. Capital Investment Value

A Capital Investment Value (CIV) Estimate was prepared by Muller Partnership in accordance with the NSW Planning Circular PS 10-008: New definition of capital investment value.

The total estimated project costs (excluding GST) is estimated to be $8,976,000. A summary is provided in Table 4.1 below.

Table 4.1. Capital Investment Value summary

Ref	Description	Cost ($) (ex. GST)
1.0	Demolition & Site Preparation	$70,000
2.0	Building 1	$3,504,000
3.0	Building 2	$3,523,000
4.0	Building 3	$34,000
5.0	External Works & Services	$1,029,000
6.0	Preliminaries & Margin (10%)	$816,000
7.0	**TOTAL CONSTRUCTION COST [EXCL. GST]**	**$8,976,000**
8.0	Identified Risk Items	EXCL
9.0	Design Contingency	EXCL
10.0	Construction Contingency	EXCL
11.0	Professional Fees	EXCL
12.0	Authority Fees & Contributions	EXCL
13.0	**TOTAL PROJECT COST [EXCL. GST]**	**$8,976,000**

A copy of the full CIV assessment report is provided at Appendix C.

5. Consultation

5.1. Consultation plan

A consultation plan was prepared, outlining activities to be undertaken before submission of the EIS, during the public consultation period and after approval. A copy of the consultation plan is provided with the Consultation Report at Appendix D.

The key activities for the pre-submission stage included:

- Preparation of a fact sheet to provide to interested parties;
- Webpage hosted on Jackson Environment and Planning website;
- Letters to nearby properties and other key stakeholders;
- Web-based information session.

It should be noted that the web-based information session was cancelled due to a lack of response.

5.2. Consultation with government agencies

Through the SEARs process, input has been provided from;

- Port Stephens Council;
- NSW Environment Protection Authority;
- Biodiversity and Conservation Division, DPIE;
- Water – Strategic Relations, DPIE;
- Transport for NSW;
- Fire & Rescue NSW; and
- Rural Fire Service NSW.

In addition, letters inviting input were sent to the following agencies:

- Department of Planning, Industry and Environment - Environment, Energy and Science Group;
- Department of Planning, Industry and Environment - Water Group;
- Environment Protection Authority;
- Fire and Rescue NSW;
- Rural Fire Service;
- Transport for NSW;
- Hunter Water;
- SafeWork NSW;
- Port Stephens Council;
- Department of Planning, Industry and Environment - Biodiversity and Conservation Division; and
- Department of Planning, Industry and Environment - Industry Assessments.

5.3. Consultation with nearby properties

A letter was sent to all properties within 500m of the proposed development (see Figure 5.1). The letter included the project Fact Sheet, an invitation to participate in the online information session and an invitation to provide feedback via email. A total of 44 Lots were identified within the consultation area, which corresponds to 38 mailing addresses, as some premises occupy multiple lots. All efforts were made to identify the occupant of the premises. Where sites were empty, unoccupied and/or the letters were returned, the landowner was identified by land title search. Landowners were then contacted by mail.

Table 5.1. Aerial map showing 500m radius around the proposed development site.

Date	Revision	Drawn By	Site description	Client	REMONDIS Australia Pty Ltd
13/05/2020	Revision A	J. Lethlean	21D and 21F School Drive, and Lot 301 / DP634536	Project	Tomago Resource Recovery Facility
				Title	Project consultation area
				Scale	Not shown
				Source	Esri

Jackson Environment and Planning Pty Ltd
Strategy | Infrastructure | Compliance | Procurement
A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060
E: admin@jacksonenvironment.com.au
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W: http://www.jacksonenvironment.com.au

5.4. Consultation with other interested parties

Letters outlining the project and requesting a meeting to discuss the project were send to the Mayor of Port Stephen Council and the Member for Port Stephens, Kate Washington MP. No response was received.

It should be noted that consultation with local Aboriginal groups was undertaken by specialists as part of the Aboriginal Cultural and Heritage study. Details of that consultation is provided in Section 12 and the report in Appendix K.

5.5. Stakeholder feedback

Only one stakeholder provided feedback during the pre-submission stage of the project. The feedback is summarised in Table 5.1.

Table 5.1. Summary of consultation outcomes.

Stakeholder	Issues raised	Response
Redicrete 21B School Drive, Tomago	Redicrete dispatch loads of concrete from their facility, with peak times of 5am – 11am. Concern was expressed that additional traffic in the area would delay concrete trucks leaving the facility and the area, which would adversely impact the concrete.	The feedback was provided to the traffic consultant. Impact on traffic in the area caused by the proposed development would be minimal. It is expected that Redicrete trucks would not be delayed by REMONDIS's operations.
DPIE – Biodiversity & Conservation Division	Refer to comment provided through SEARs process.	Comments addressed in EIS.
NSW EPA	Refer to comment provided through SEARs process.	Comments addressed in EIS.
Port Stephens Council	Refer to comment provided through SEARs process.	Comments addressed in EIS.
Transport for NSW	Refer to comment provided through SEARs process.	Comments addressed in EIS.
Rural Fire Service	Refer to comment provided through SEARs process.	Comments addressed in EIS.
Hunter Water	• EIS to describe expected water demands • Site is adjacent to Tomago Sandbeds and is a source of drinking water. Water quality is of paramount importance. • EIS should assess wastewater needs and ensure arrangements are adequate. • EIS should demonstrate stormwater management system will divert contaminated stormwater away from drinking water catchment. • Proponent will need to submit a hydraulic design assessment to Hunter Water.	Comments addressed in EIS, specifically Soil and Water Management Plan.

5.6. Future consultation

As outlined in the Consultation Plan, REMONDIS Australia Pty Ltd intends to conduct additional consultation and engagement during the EIS exhibition period. This will include public information sessions, in addition to DPIE's own processes.

5.7. Conclusion

Only one submission was received in response to the consultation process, from a nearby business. The main concern was in relation to increased levels of traffic in the area would delay concrete trucks leaving the facility and the area, which would adversely impact the concrete. According to the Traffic impact Assessment (refer to Section 9 and the report in Appendix H) additional traffic in the area would be minimal and the Redicrete trucks would not be delayed by REMONDIS 's operations. The site operators will need to remain mindful of how these issues impact neighbouring properties.

6. Waste Minimisation and Management

A Waste Minimisation and Management Plan was prepared by Jackson Environment and Planning Pty Ltd. A brief summary of the plan is provided in this Section. The full Waste Management Plan is provided as Appendix E.

Waste management practices outlined below address the economic, environmental and safety imperatives during the construction phase and into the operational phase. These enhanced management practices also produce triple bottom line benefits including financial efficiencies, sustainable construction methods and a safe work site for the duration of the construction process.

These positive outcomes will be achieved through thorough planning and procurement of exacting measurements reducing upfront costs of construction and preventing the generation of waste.

The benefits of the management practices outlined in the plans will be realised from the outset by both the business and the broader community in the form of reduced costs of disposal, reduced costs of legal liability and common good through:

- Minimising waste by manufacturing building components off site to design specifications;
- Maximising recovery of valuable resources;
- Exercising due diligence for safe disposal of waste; and
- Providing a safe worksite.

6.1. Methodology

The waste management plan was compiled using the following steps:

- Estimate waste stream types and amounts based on the site activities – during both construction and operational phases;
- Identify management options for each waste stream suitable within the regulatory framework; and
- Select most appropriate waste management option for each waste stream, aiming to recover as much waste as possible.

6.2. Existing environment

The current site is unoccupied. Therefore, there are currently no waste management systems on the site.

6.3. Impact assessment

6.3.1. Demolition phase

The development phase of the project does not involve the demolition of any built structures on 21D or 21F School Drive, Tomago.

6.3.2. Construction phase

The construction of the Tomago Resource Recovery Facility and Truck Parking Depot will generate construction waste. typical construction activities would include:

- Clearing of vegetation and grubbing for the proposed truck parking depot on 21F School Drive;
- Earthworks and installation of a weighbridge on 21D School Drive; and
- Installation of above ground mechanical and electrical plant and equipment Installation for sorting and processing waste withing the buildings on 21D School Drive, Tomago.

The waste streams generated on site during the construction phase is summarised in Table 6.1 below.

Trees/shrubs removed during initial works will be mulched and surface applied to exposed soil surface outside of the immediate construction area for soil erosion control in accordance with Appendix D of Landcom (2004) *Managing Urban Stormwater – Soils and Construction*. All vegetation will be fully recycled and re-used on-site as erosion control mulch.

Soil is the main waste material that will generated during the construction phase, for the construction of the Truck Parking Depot (refer to Figure 6.1) which will be disposed of lawfully. Classification of excavated material will be undertaken according to the NSW EPA *Waste Classification Guidelines Part 1: Classifying Waste* (2014). This soil will be placed in labelled hook lift bins and sent off-site for lawful disposal. Otherwise soil that is suitable for re-use in construction will be segregated, stored in hook lift bins and transported to sites that require ENM for construction.

Minor amounts of concrete, timber, metal and plastics will be generated during the construction of the truck parking depot and weighbridge. These wastes will be segregated to maximise recycling and stored separately in hook lift bins and will be transported off-site for recycling at a lawful facility.

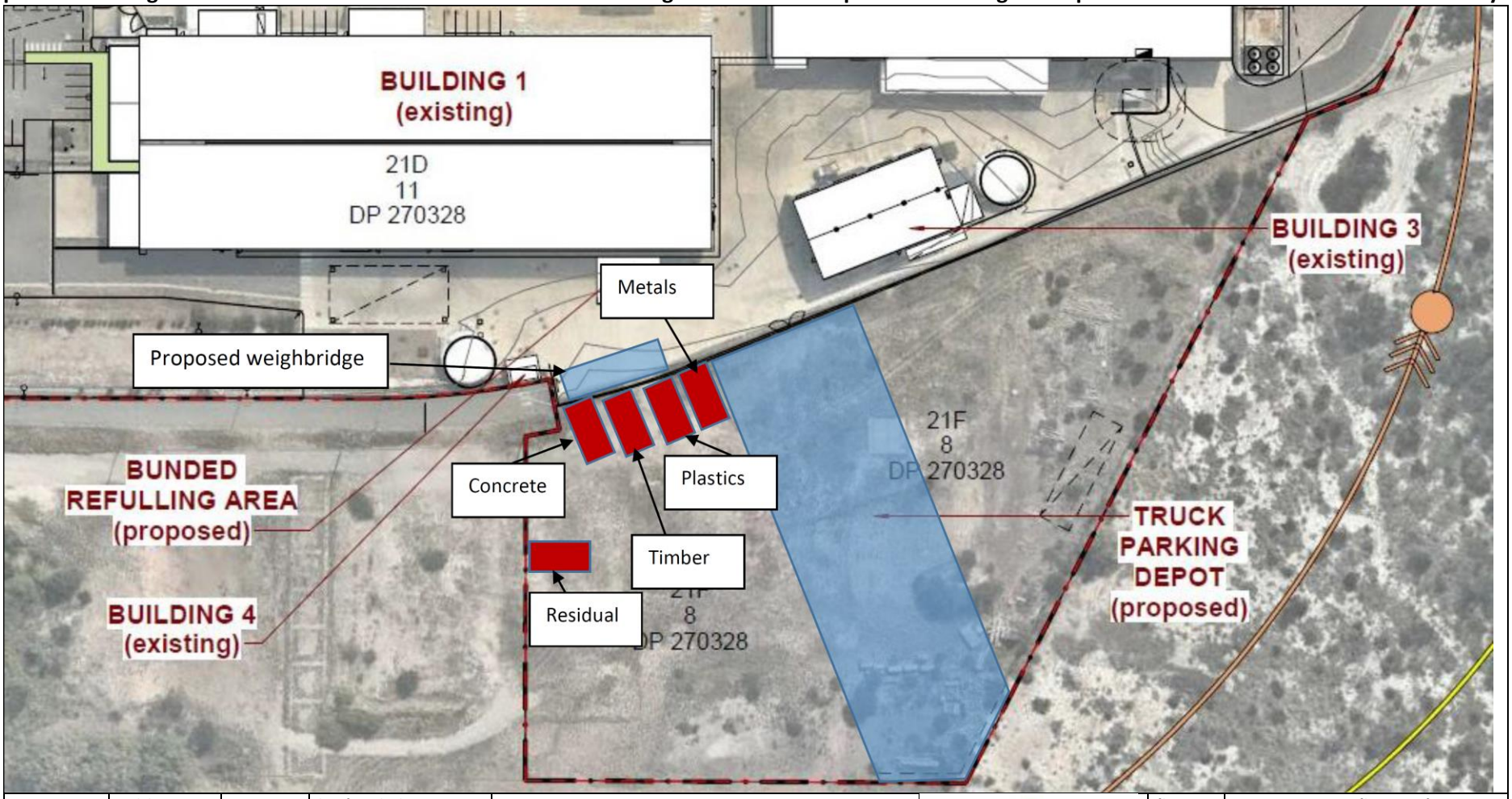
The overall waste recovery rate during the construction phase will be >97%.

Residual waste will be collected in a separate hook lift bin and regularly removed from the site for disposal in a licensed landfill. Other recovered materials will be sent to EPA licenced recycling facilities in the region.

Table 6.1. Estimated waste generation during the construction phase.

Waste Type	Waste Identified	Waste Description	Reuse/recycling /Disposal Method	Suggest Receiving Facility	Tonnes	Recycling rate
General Solid Waste (non-putrescible)	Woody garden organics	Tree stumps and branches, as well as some grasses. These will be mulched and used on-site around the perimeter of the site for soil erosion control	On-site recycling	Use on-site as an erosion control mulch	20	100%
	Soil	Earthworks spoil to prepare the truck parking area and weighbridge construction areas.	Off-site disposal	Summerhill Landfill – Newcastle or licenced facility as appropriate	2,000	100%
	Construction waste	Timber, packaging, metal, asphalt, concrete, glass, plastic, rubber, plasterboard, ceramics, bricks from the installation of foundations and underground services and above mechanical and electrical plant and equipment	Off-site recycling	Central Waste Station - Kurri	100	95%
	Grit, sediment, litter and gross pollutants	Collected in, and removed from, stormwater treatment devices and/or stormwater management systems	Off-site disposal	Summerhill Landfill - Newcastle	50	0%
	Site office waste	Paper, cardboard and co-mingled recycling.	Off-site recycling	REMONDIS - Thornton	10	100%
Hazardous	Waste oils, fuels, lubricants and chemicals	Waste oils and containers that previously contained Class 1, 3, 4, 5 or 8 substances used for construction plant	Off-site recycling / disposal	REMONDIS - Thornton	0.5	0%
General Solid Waste (putrescible)	Site office waste	Generated from worker's lunches.	Off-site disposal	Summerhill Landfill - Newcastle	0.5	0%
TOTAL Amount of waste generated (tonnes)					2,181	
TOTAL Amount of waste recycled (tonnes)					2125	
Overall recycling rate					97.4%	

Figure 6.1. Plan showing the area to be excavated during construction works (blue boxes). Areas for placement of waste storage and recycling bins during the construction phase are also given. Red boxes indicate bins that will be used during the construction phase for sorting and separation of materials for either off-site recycling or disposal.



Date	Revision	Drawn By	Site description
18/08/20	Revision A	R. Loemker	21D School Drive Tomago (Lot 11, DP270328) and 21F School Drive (Lot 8, DP270328)

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Client	REMONDIS Australia Pty Ltd
Project	Waste Management Plan
Title	Construction works
Scale	N/A
Source	EJE Architecture

6.3.3. Operational phase – resource recovery

The site operations will generate very little waste itself. The vast bulk of "waste" materials will be brought onto site for processing or for aggregation and off-site transport to other facilities for recycling. While some material will be non-recyclable "residual" waste, most material will be recovered, sorted and moved off site for further processing / recycling.

The recycling operations will be established within existing buildings on the Site, which were approved under Major Project MP 10_003 and will process up to 98,201 tonnes of solid and liquid waste materials per annum. The overall waste recovery rate during the operation phase will be more than 96%.

Each recycling operation will be established in discreet parts of the existing industrial warehousing. A summary of the waste materials processed in each operation is provided in Table 6.2.

Table 6.2. Summary of the waste materials processed in each operation within the Tomago Resource Recovery Facility.

Recycling process	Types of materials to be received and processed	Source	Waste classification	Annual tonnage projections (tonnes pa)	Sorted product (tpa)	Sorted and recovered product output (tpa)	Residual waste (tpa)
Materials Recovery Facility (MRF)	Paper / cardboard Plastics Glass Timber / wood Mixed dry general waste	Commercial and Industrial waste collections Construction waste	General solid waste (non-putrescible)	31,000	Fines Ferrous metal Concrete/brick/tile RDF	11,470 620 3,100 15,500	310
Cardboard Baling Facility (CBF)	Cardboard	Businesses	General solid waste (non-putrescible)	30,000	Cardboard	28,500	1,500
Drill Mud Recycling Facility (DMRF)	Drill mud (soil and water mixture)	Industry	Category 1 trackable liquid waste	5,000	Wastewater Engineering Fill	2,500 2,500	0
Packaged Food Recycling Plant (PFRP)	Packaged food products	Businesses Industry	General solid waste (non-putrescible) General solid waste (putrescible)	2,000	Paper/ cardboard Plastics Glass Ferrous metal Non-ferrous metals Wastewater Food organics	60 60 60 60 60 1,300 360	40
Garden Organics Primary Processing (GOPP)	Woody garden organics	Households Businesses	General solid waste (non-putrescible)	5,000	Timber/ wood mulch	4,500	500
Metals Recycling (MR)	Ferrous metals Non-ferrous metals	Households Businesses	General solid waste (non-putrescible)	4,000	Ferrous metal Non-ferrous metals	1,800 2,000	200
Copper Processing area (CP)	Copper wire	Businesses	General solid waste (non-putrescible)	1,000	Copper wire Plastics	500 500	0

Recycling process	Types of materials to be received and processed	Source	Waste classification	Annual tonnage projections (tonnes pa)	Sorted product (tpa)	Sorted and recovered product output (tpa)	Residual waste (tpa)
Hazardous Waste Recycling Facility (HWRF)	Drained Oil filters, rags and absorbent material (hydrocarbons)	Businesses Industry	General solid waste (non-putrescible)	500	Drained Oil filters, rags and absorbent material	0	500
	Containers & drums of controlled waste residues	Businesses Industry	Category 1 trackable solid waste (N100)	500	Containers & drums of controlled waste residues	500	0
	Contaminated Soils	Businesses Industry	Category 1 trackable solid waste (N120)	12,000	Contaminated Soils	12,000	0
	Lead Acid Batteries	Businesses Industry	Category 1 trackable solid waste (D220)	500	Lead Acid Batteries	500	0
	Waste Mineral Oils	Businesses Industry	Category 1 trackable liquid waste (J100)	6,000	Waste Mineral Oils	6,000	0
	Oily water/Coolant etc	Businesses Industry	Category 1 trackable liquid waste (J120)	300	Oily water/Coolant etc	300	0
	Batteries (Li-ion/NiCad/etc)	Businesses Industry	General solid waste (non-putrescible)	1	Batteries (Li-ion/NiCad/etc)	1	0
	Fluoro Tubes	Businesses Industry	General solid waste (non-putrescible)	50	Fluoro Tubes	50	0
	Gyproc	Businesses Industry	General solid waste (non-putrescible)	200	Gyproc	200	0

Recycling process	Types of materials to be received and processed	Source	Waste classification	Annual tonnage projections (tonnes pa)	Sorted product (tpa)	Sorted and recovered product output (tpa)	Residual waste (tpa)
	Used Fire extinguishers and Pressure Vessels/Rams etc	Businesses Industry	General solid waste (non-putrescible)	50	Used Fire extinguishers and Pressure Vessels/Rams etc	50	0
	Residual Solvents / Thinners / Paints	Businesses Industry	Category 1 trackable liquid waste (J100)	50	Residual Solvents / Thinners / Paints	50	0
	E-waste	Businesses Industry	General solid waste (non-putrescible)	50	E-waste	50	0
TOTALS				**98,201**		**95,651**	**3,050**
TOTAL Amount of waste processed (tonnes)							**98,201**
TOTAL Amount of waste recycled (tonnes)							**95,151**
TOTAL Amount of waste landfilled (tonnes)							**3,050**
Overall recycling rate							**97.4%**

6.3.3.1. Liquid waste and fuel storage

To support the truck parking depot operations and recycling operations, storage tanks for fuels, liquid wastes and waste oils will be provided. These self-bunded and secure storage tanks will be constructed outdoors, with awnings and appropriate bunding to contain any spills which can be easily cleaned. An overview of these storage facilities in provided in Table 6.3.

Table 6.3. Storage tanks for fuels, liquid wastes and waste oils.

Storage tank	Self-bunded storage tank volume (L)
Tank 1 – Waste oil	54,000
Tank 2 – Waste oil	67,000
Tank 3 – Oily water / coolant	20,000
Tank 4 – Oily water / coolant	20,000
Tank 5 – Fuel / AdBlue for refuelling vehicles and equipment	60,000
Tank 6 – Liquid food waste from Packaged Food Recycling Plant (PFRP)	20,000
Tank 7 – Drill mud liquid storage tank	50,000

6.3.3.2. Products recovered

The Tomago Resource Recovery Facility will recycle an expected 96.9% of all incoming waste (or 95,151 tonnes per annum). The remainder of the waste received will be disposed at a lawful landfill (~3,050 tonnes per annum). The major products expected to be manufactured by the facility include paper and cardboard (~28,500 tonnes per year), followed by RDF (15,500 tonnes per year), contaminated soils (12,000 tonnes per annum) and recovered fines (11,470 tonnes per annum). These five products make up ~69% of all materials sorted within the operation.

An overview of the assumptions and mass flows through the facility is given in Table 6.4.

Table 6.4. Summary of the products / waste export forecasts for the Tomago Resource Recovery Facility.

Product or waste exported from site	Product or Waste Source	Percentage of Source	Source tonnage projections (tpa)	Product tonnage projections (tpa)	Percentage of Product tonnage projections	Suggested Destination(s)
Paper / cardboard	Cardboard Baling Facility Packaged Food Recycling Plant	95.0% 3.0%	28,500 60	28,560	29.1%	• Opal - Port Botany • Visy - Smithfield / Tumut
Plastics	Copper Processing area Packaged Food Recycling Plant	50.0% 3.0%	500 60	560	0.6%	• Visy - Smithfield • Astron Sustainability - Ingleburn
Glass	Packaged Food Recycling Plant	3.0%	60	60	0.1%	• JR Richards, Tuncurry
Ferrous metals	Materials Recovery Facility Metals Recycling Packaged Food Recycling Plant	2.0% 45.0% 3.0%	620 1,800 60	2,480	2.5%	• InfraBuild- Hexham • Sims - Kooragang • Sell & Parker - Carrington
Non-ferrous metals	Metals Recycling Packaged Food Recycling Plant	50.0% 3.0%	2,000 60	2,060	2.1%	• Sims- Kooragang • Circular Metals - Weston
RDF	Materials Recovery Facility	50.0%	15,500	15,500	15.8%	• Domestic and overseas exports
Concrete/brick/tile	Materials Recovery Facility	10.0%	3,100	3,100	3.2%	• Central Waste Station - Kurri • Benedict Recycling - Mayfield
Fines	Materials Recovery Facility	37.0%	11,470	11,470	11.7%	• Benedict Recycling - Mayfield
Engineering fill	Drill Mud Recycling Facility	50.0%	2,500	2,500	2.5%	• TBA*
Timber / wood mulch	Garden Organics Primary Processing	90.0%	4,500	4,500	4.6%	• REMONDIS Lake Macquarie Organics Resource Recovery Facility
Copper wire	Copper Processing area	50.0%	500	500	0.5%	• InfraBuild - Hexham

Product or waste exported from site	Product or Waste Source	Percentage of Source	Source tonnage projections (tpa)	Product tonnage projections (tpa)	Percentage of Product tonnage projections	Suggested Destination(s)
Containers & drums of controlled waste residues	Hazardous Waste Recycling Facility	2.5%	500	500	0.5%	• ETS - Rutherford
Contaminated Soils	Hazardous Waste Recycling Facility	59.4%	12,000	12,000	12.2%	• Suez- Raymond Terrace / Kemps Creek
Lead Acid Batteries	Hazardous Waste Recycling Facility	2.5%	500	500	0.5%	• InfraBuild- Hexham
Waste Mineral Oils	Hazardous Waste Recycling Facility	29.7%	6,000	6,000	6.1%	• Southern Oil - Wagga Wagga
Oily water/Coolant etc	Hazardous Waste Recycling Facility	1.5%	300	300	0.3%	• Cleanaway - Kooragang
Batteries (Li-ion / NiCad / etc)	Hazardous Waste Recycling Facility	0.0%	1	1	0.001%	• ETS - Minto
Fluoro Tubes	Hazardous Waste Recycling Facility	0.2%	50	50	0.1%	• ETS - Minto
Gyproc	Hazardous Waste Recycling Facility	1.0%	200	200	0.2%	• REGYP - Kurnell
Used Fire extinguishers and Pressure Vessels / Rams etc	Hazardous Waste Recycling Facility	0.2%	50	50	0.1%	• AusSafe Metals - Gosford
Residual Solvents / Thinners / Paints	Hazardous Waste Recycling Facility	0.2%	50	50	0.1%	• ETS - Minto
E-waste	Hazardous Waste Recycling Facility	0.2%	50	50	0.1%	• InfraBuild- Hexham
Wastewater	Drill Mud Recycling Facility Packaged Food Recycling Plant	50.0% 65.0%	2,500 1,300	3,800	3.9%	• Hunter Water
Food waste	Packaged Food Recycling Plant	18.0%	360	360	0.4%	• REMONDIS Lake Macquarie Organics Resource Recovery Facility

Product or waste exported from site	Product or Waste Source	Percentage of Source	Source tonnage projections (tpa)	Product tonnage projections (tpa)	Percentage of Product tonnage projections	Suggested Destination(s)
Residual Waste	Materials Recovery Facility Hazardous Waste Recycling Facility Metals Recycling Garden Organics Primary Processing Cardboard Baling Facility Packaged Food Recycling Plant	1.0% 2.5% 5.0% 10.0% 5.0% 2.0%	310 500 200 500 1,500 40	3,050	3.1%	• Suez - Raymond Terrace / Kemps Creek • Summerhill Landfill - Newcastle
TOTALS			**98,201**	**98,201**		
TOTAL Amount of waste processed (tonnes)						**98,201**
TOTAL Amount of waste recycled (tonnes)						**95,151**
TOTAL Amount of waste landfilled (tonnes)						**3,050**
Overall recycling rate						**96.9%**

* REMONDIS are in negotiations with licensed recycling facilities to receive these recovered products.

6.3.3.3. Quality specifications and standards for manufactured products

Manufacturing products to meet the EPA's Resource Recovery Orders under the *Protection of the Environment Operations (Waste) Regulation* 2014 is critical to ensure all products can be used in a manner lawfully that protects human health and the environment. These are given in Table 6.5.

Table 6.5. Selected products to be manufactured and sold from the Tomago Resource Recovery Facility, including relevant regulatory requirements and industry specifications / standards.

Product or waste exported from site	EPA Resource Recovery Order
RDF	NSW Energy from Waste Policy Statement
Concrete/brick/tile	*Recovered Aggregate Order 2014*
Fines	*The Recovered Fines Order 2014*
Engineering Fill	*The treated drilling mud order* 2014
Timber / wood mulch	*The mulch order* 2016
Gyproc	*The recovered plasterboard order* 2014

6.3.3.4. Resource recovery criteria for energy recovery facilities

The proposed Facility has been designed to recover residual materials with calorific value to be manufactured into fuel. Energy recovery facilities may only receive feedstock from waste processing facilities or collection systems that meet the criteria outlined in Table 1 of the *NSW Energy from Waste Policy Statement*. This table has been replicated below (Table 6.6). Relevant sections have been underlined and bolded.

The Materials Recovery Facility will receive up to 31,000 tonnes, consisting of approximately:

- 18,600 tonnes per annum of commercial and industrial mixed general solid waste (non-putrescible); and
- 12,400 tonnes per annum of construction building waste from residential and commercial construction (non-putrescible).

It has been assumed that 50% (9,300 tpa) of the commercial and industrial mixed general solid waste will be from businesses without a separate collection system for all relevant waste streams. Therefore, in accordance with Table 6.6, up to 50% by weight (4,650 tpa) of this waste stream received at the MRF is allowed for energy recovery.

It has been assumed that the other 50% (9,300 tpa) of the commercial and industrial mixed general solid waste will be from businesses with a separate collection system for all relevant waste streams. Therefore, in accordance with Table 4.6, 100% by weight (9,300 tpa) of the waste stream received at the MRF is allowed for energy recover.

In accordance with Table 6.6, 25% (3,100 tpa) of the 12,400 tonnes per annum of construction building waste received at the MRF is allowed for energy recovery.

Based on this, the total amount of residual waste received at the MRF, that is allowed for energy recovery, is 17,050 tpa. REMONDIS proposes to process up to 15,500 tpa of residual waste for energy recovery which is compliant with the *NSW Energy from Waste Policy Statement*.

Table 6.6. Resource recovery criteria for energy recovery facilities (Table 1 of the NSW Energy from Waste Policy Statement).

Waste stream	Processing facility	Percentage residual waste allowed for energy recovery
Mixed municipal waste (MSW)	Facility processing mixed MSW waste where a council has separate collection systems for dry recyclables and food and garden waste	No limit by weight of the waste stream received at a processing facility
	Facility processing mixed MSW waste where a council has separate collection systems for dry recyclables and garden waste	Up to 40% by weight of the waste stream received at a processing facility
	Facility processing mixed MSW waste where a council has a separate collection system for dry recyclables	Up to 25% by weight of the waste stream received at a processing facility
Mixed commercial and industrial waste (C&I)	**Facility processing mixed C&I waste**	**Up to 50% by weight of the waste stream received at a processing facility**
	Facility processing mixed C&I waste where a business has separate collection systems for all relevant waste streams	**No limit by weight of the waste stream received at a processing facility**
Mixed construction and demolition waste (C&D)	**Facility processing mixed C&D waste**	**Up to 25% by weight of the waste stream received at a processing facility**
Residuals from source-separated materials		
Source-separated recyclables from MSW	Facility processing source- separated recyclables from MSW	Up to 10% by weight of the waste stream received at a processing facility
Source-separated garden waste	Facility processing garden waste	Up to 5% by weight of the waste stream received at a processing facility
Source-separated food waste (or food and garden waste)	Facility processing source- separated food or source-separated food and garden waste	Up to 10% by weight of the waste stream received at a processing facility
Separated waste streams		
Waste stream	Feedstock able to be used at an energy recovery facility	
Waste wood	Residual wood waste sourced directly from a waste generator e.g. manufacturing facility	
Textiles	Residual textiles sourced directly from a waste generator	
Waste tyres	End-of-life tyres	
Biosolids	Used only in a process to produce a char for land application	
Source-separated food and garden organics	Used only in a process to produce a char for land application	

6.3.3.5. Waste storage, identification, and stockpile heights

All waste materials and processed products will be stored in separate concrete bays with three sides or in dedicated hook lift bins. Storage of incoming waste in dedicated areas and sorted materials and products in dedicate bays helps in inventory control, good housekeeping, reduces potential for cross contamination and is critical for quality control.

All bays and waste storage bins will be marked and identified as per the site layout plans (refer to Figure 2.3, Figure 2.4 and architectural plans in Appendix B).

Stockpiles sizes are limited by the size of dedicate bays. Similarly, stockpile heights are limited by the height of concrete bays and hook lift bins. Maximum stockpile heights for the Tomago Resource Recovery Facility are based on best practice guidelines by the NSW Fire and Rescue and South Australian Environmental Protection Agency in order manage fire, dust and odour:

- Stockpiles of waste materials in the designated waste storage area will be limited to 3m. Height guidance will be provided within the 4m height of the concrete bay walls;
- Where stockpiles of sorted waste materials or residual waste are contained in hook lift bins, the height of waste in these bins will not exceed the rim of the bin;
- Cardboard bales in one tonne blocks will be stored to a maximum height of 4m in Building 1 within the dedicated cardboard bale storage area.

6.3.3.6. Maximum amount of waste and product stored on site (authorised amount)

Under Clause 10B of the *Protection of the Environment Operations (Waste) Regulation* 2014, operators of licensed resource recovery facilities are required to not exceed the storage of a certain amount of waste and processed products (from waste) on site at any one point in time. This is referred to the 'Authorised Amount'. Exceedance of the Authorised Amount triggers the requirement for payment of the Waste and Environment Levy for tonnages of waste and product held on site (above the Authorised Amount). This regulatory measure encourages operators of resource recovery facilities to manage the inventory of waste and products held on site to avoid potential risks and hazards to the environment, public safety and human health.

An assessment of the storage capacity of the site based on designated areas for waste receival, sorting, storage and manufactured products is given in Table 6.7 for Building 1 and Table 6.8 for Building 2.

The analysis found that that Building 1 can safety store, in separate designated areas, up to 1,684 tonnes (or 5,822 m^3) of waste and processed products at any one point in time (Table 6.7) and Building 2 can safety store, in separate designated areas, up to 1,817 tonnes (or 4,500m^3) of waste and processed products at any one point in time (Table 6.8).

The analysis in Table 6.7 suggests that combustible materials and products make up 1,473 tonnes or 5,627 m^3 of waste held on-site at any one point in time in Building 1. This makes up 87.4% by volume of all waste materials and products held in Building 1.

Table 6.7. Analysis of the storage capacity for Building 1 for waste materials and processed products, based on the site operational layout in Figure 2.3.

Bay/Area	System / Waste	Floor Area (m^2)	Volume (m^3)	Density (tonnes/m^3)	Amount (tonnes)	Percentage combustible[1]	Combustible Waste (m^3)	Combustible Waste (Tonnes)
Waste Inputs								
Bay 1	MRF input	1,264	420	0.298[1]	125	78%	328	98
Area 4	OCC tipping	174	525	0.055[2]	29	100%	525	29
Area 7	Wood pallet input	177	530	0.156[2]	83	100%	530	83
Bay 7	Cardboard loose	881	640	0.055[2]	35	100%	640	35
Products								
Bay 2	Recovered fines	16	48	0.17[2]	8	0%	0	0
Bay 3	Shredded wood	1,626	35	0.25[1]	9	100%	34	9
Bay 4	Heavy	18	55	0.83[2]	46	0%	0	0
Bay 5	RDF loose	1,561	100	0.29[1]	29	100%	100	29
Bay 6	Plastics	437	130	0.17[2]	22	100%	130	22
Bin 4	PVC mixed	6	10	0.18[1]	2	100%	10	2
Area 1	Cardboard Baled Storage	264	790	0.13[2]	103	100%	790	109
Area 3	OCC BSO	434	1,300	0.60[1]	780	100%	1,300	780
Area 6	RDF loose	326	980	0.29[1]	284	100%	980	284
Area 8	Bale wrapper	87	260	0.5[2]	130	100%	260	130
Total estimated site storage capacity (tonnes)								**1,684**
Quantity of materials considered non-combustible (tonnes)								**211**
Quantity of potentially combustible materials capable of being stored (tonnes)								**1,473**

[1] Data from ACOR Consultants (WA) Pty Ltd (2020) *Fire Safety Report*. Report prepared for REMONDIS Australia Pty Ltd.
[2] Data from NSW EPA (2015) *Disposal-based audit Commercial and industrial waste stream in the regulated areas of New South Wales*.

The analysis in Table 6.8 suggests that combustible materials and products make up 256 tonnes or 866 m^3 of waste held on-site at any one point in time in Building 2. This makes up 14.1 % by volume of all waste materials and products held in Building 2.

Table 6.8. Analysis of the storage capacity for Building 2 for waste materials and processed products, based on the site operational layout in Figure 3.3.

Bay/Area	System / Waste	Floor Area (m^2)	Volume (m^3)	Density (tonnes/m^3)	Amount (tonnes)	Percentage combustible[1]	Combustible Waste (m^3)	Combustible Waste (Tonnes)
Waste Inputs								
Area 1	Packaged food recycling plant	881	1,760	0.5[2]	905	0.5%	9	5
Area 2	Garden organics primary processing (GOPP)	367	735	0.2[2]	167	100%	735	167
Area 3	Copper processing area (CPA)	252	505	0.1[2]	70	0.5%	3	0
Area 4	Hazardous waste materials recycling (HWMR)	378	570	0.7[1]	399	21%	120	84
Area 5	Metal Recycling Facility	441	880	0.2[1]	176	0%	0	0
Area 6	Drill mud recycling facility (DMRF)	734	50[3]	2.0[4]	100	0%	0	0
Total estimated site storage capacity								**1,817**
Quantity of materials considered non-combustible								**1,561**
Quantity of potentially combustible materials capable of being stored								**256**

[1] Data from ACOR Consultants (WA) Pty Ltd (2020) *Fire Safety Report*. Report prepared for REMONDIS Australia Pty Ltd.
[2] Data from NSW EPA (2015) *Disposal-based audit Commercial and industrial waste stream in the regulated areas of New South Wales*.
[3] Based on a total capacity of 50,000L (Tank 7).
[5] Assumed density based on 100% mud.

It is therefore proposed that the facility will seek to store up to 3,500 tonnes of waste (and products) at any one point of time, and this should be considered by the NSW EPA in issuing a licence for the operation (following planning consent) under Schedule 1 of the *Protection of the Environment Operations Act* 1997.

6.3.4. Operational phase – office and administration

The office operations associated with the Tomago Resource Recovery Facility will generate waste from office administration and staff lunch activities. Whilst waste generation from these activities are considered minor, they need to be appropriately managed to ensure that waste is minimum and recycled in accordance with the waste hierarchy in the NSW Government's *Waste Avoidance and Resource Recovery Strategy 2014-2021* and the *Waste Avoidance and Resource Recovery Act* 2011.

The operation will generate minimal waste as part of the office operations. However, a full co-mingled recycling system will be introduced into the office. Co-mingled recycling and general waste will be stored in separate bins in the waste storage area and emptied into the on-site residual waste bins.

An overview of waste generation and recycling estimates as part of the office operations is provided in Table 6.9. Waste generation and recycling estimates are from NSW EPA (2012) *Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities.* Overall, it is estimated that the office operations will recycle more than 98.5% of all waste generated.

Table 6.9. Waste and recycling measures for waste generated by office operations.

Key Waste Stream	Volume of waste generated per day per 100m^2 floor area (for offices) (m^3)	Weekly waste generation (based on a 7-day working week and office floor area of 600m^2) (m^3)	Bulk density (t/m^3)*	Estimated tonnages per year (tonnes)	Segregation Areas / Containers	Reuse / Recycling / Disposal Method	Waste Type (NSW EPA Pre-classified Waste)	Suggested Receiving Facility	Recycling rate (%)
Co-mingled recycling: plastic / glass containers / metal cans / paper and cardboard	0.025	1.05	0.63	34.4	1.5m^3 front lift bin (serviced weekly)	Off-site recycling	General waste (non-putrescible)	Solo Resource Recovery – Gateshead	100%
General waste (non recyclable residual waste)	0.015	0.63	1.3	42.6	660L general waste bin (serviced weekly)	On-site recycling	General waste (non-putrescible)	REMONDIS Resource Recovery Facility - Tomago	97%
Food waste	0.005	0.2	0.5	5.5	240L organics waste bin (serviced weekly)	Off-site recycling	General waste (putrescible)	REMONDIS Lake Macquarie Organics Resource Recovery Facility	100%
Waste generated (tonnes per year)				82.5					
Waste recycled (tonnes per year)				81.2					
Overall recycling rate				98.5%					

6.4. Environmental risk assessment

A risk assessment has been undertaken to identify the level of risk that construction and operations activities may present to waste management.

The following points summarise the key activities identified in the risk assessment relevant to waste management for demolition, construction works and operation of the Facility:

- Litter (e.g. food waste, packaging) from site amenities reaching local waterways;
- Leakage of effluent from site amenities;
- Leakage of vehicles duration site civil works;
- Excess packaging material deliveries increasing waste generated;
- Inappropriate reuse or disposal of waste items which may be hazardous;
- Fuel and oil spills during operational plant and equipment maintenance; and
- The location and storage of waste on site prior to reuse or disposal.

6.5. Environmental control measures

Table 6.10 provides the environmental control measures and safeguards that will be implemented in order to minimise waste generated during the construction and operation phases of the Facility.

Table 6.10. Environmental control measures.

Control Measures and Safeguards	Timing	Responsibility
Waste management and minimisation will form part of the induction program (which includes environmental due diligence training). All Project and site personnel will be trained in the requirements of this document including minimising wastes, recognising which types of materials are recyclable and their obligations to use recycling facilities provided on site.	Prior to starting on site / Ongoing	Operations Manager
Clearly assign and communicate responsibilities to ensure that those involved in the construction are aware of their responsibilities in relation to the waste management plan	Prior to starting on site / Ongoing	Operations Manager
Engage and educate personnel on how the various elements of the waste management plan will be implemented	Prior to starting on site / Ongoing	Operations Manager
Specific locations for waste management (e.g. sorting area locations, recycling bin locations, material stockpile locations) will be established on site and signposted appropriately.	Weekly checks	Operations Manager
Waste management areas will be adequately managed to prevent sediment runoff and dust generation.	Daily	Operations Manager
Construction Method Statements (CMS) will include practices to minimise waste generation and to maximise recycling and reuse of materials including oils, greases, lubricants, timber, glass, and metal.	Prior to start of construction and ongoing	Operations Manager
Packaging minimisation and reuse initiatives will be implemented as part of the procurement.	Ongoing	Operations Manager
Development of an unexpected finds environmental procedure should any contamination be found during construction works.	Prior to starting on site	Operations Manager
Spill kit to be present on site in the case of any fuel leaks of plant and equipment during the construction phase of the development	Prior to start of demolition	Operations Manager
Segregated waste disposal containers for the collection and recycling/disposal of all waste streams generated during the construction and operation phases will be provided onsite. Waste disposal containers will have clear signage and instructions for use to avoid cross-contamination. No rubbish shall be disposed of on site.	Daily	Operations Manager
Waste will be disposed to an appropriate licensed facility. A Waste Management Register of all waste collected for disposal and / recycling, including amounts, data and time and details and location of disposal will be maintained at all times.	Daily	Operations Manager
All waste being transported off site must be covered. The transportation must be appropriately licensed to carry that material.	Daily	Operations Manager

Control Measures and Safeguards	Timing	Responsibility
Storage of all hazardous substances and dangerous goods will be in accordance with SDS requirements in a bunded area. Solid and hazardous wastes will be contained and separated from inert waste.	Daily	Operations Manager
Any hazardous will be managed and handled by an appropriately licensed contractor and transported for disposal to a licensed facility approved site	Daily	Operations Manager
Any material contaminated by spills i.e. fuel, oil, lubricants etc., including empty fuel, oil and chemical containers, will be stored in a sealed secure container within a bunded area and will be transported to a waste disposal site approved by the NSW EPA to accept such material.	Daily	Operations Manager
Incompatible wastes will not be mixed.	Daily	Operations Manager
Storage areas would be located away from waterways and the stormwater system.	Daily	Operations Manager
Biodegradable products will be used wherever practicable.	Daily	Operations Manager
Regular collection of wastes will ensure air emissions are at a satisfactory level. Inappropriate waste and wastewater management systems will be regularly inspected and audited.	Daily	Operations Manager
Conduct regular litter patrols to ensure litter is effectively controlled on site.	Daily	Operations Manager

6.6. Conclusion

The construction of the Tomago Resource Recovery Facility and Truck Parking Depot will generate construction waste. Typical construction activities would include:

- Clearing of vegetation and grubbing for the proposed truck parking depot on 21F School Drive;
- Earthworks and installation of a weighbridge on 21D School Drive; and
- Installation of above ground mechanical and electrical plant and equipment Installation for sorting and processing waste withing the buildings on 21D School Drive, Tomago.

Trees/shrubs removed during initial works will be mulched and surface applied to exposed soil surface outside of the immediate construction area for soil erosion control in accordance with Appendix D of Landcom (2004) Managing Urban Stormwater – Soils and Construction. All vegetation will be fully recycled and re-used on-site as erosion control mulch.

Contaminated soil is the main waste material that will generated during the construction phase, for the construction of the Truck Parking Depot (refer to Figure 6.1) which will be disposed of lawfully. Classification of excavated material will be undertaken according to the NSW EPA Waste Classification Guidelines Part 1: Classifying Waste (2014). This soil will be placed in labelled hook lift bins and sent off-site for lawful disposal. Otherwise soil that is suitable for re-use in construction will be segregated, stored in hook lift bins and transported to sites that require ENM for construction.

The site operations will generate little waste itself. The vast bulk of "waste" materials will be brought onto site for processing or for aggregation and off-site transport to other facilities for recycling. While some material will be non-recyclable "residual" waste, most material will be recovered, processed and sold as products.

The recycling operations will be established within existing buildings on the Site, which were approved under Major Project MP 10_003 and will process up to 98,201 tonnes of solid and liquid waste materials per annum. The Tomago Resource Recovery Facility will recycle an expected 97.4% of all incoming waste (or 95,151 tonnes per annum). The remainder of the waste received will be disposed at a lawful landfill (~3,050 tonnes per annum). The major products expected to be manufactured by the facility include paper and cardboard (~28,500 tonnes per year), followed by RDF (15,500 tonnes per year), contaminated soils (12,000 tonnes per annum) and recovered fines (11,470 tonnes per annum). These five products make up ~69% of all products manufactured.

The proposed Facility has been designed to recover residual materials with calorific value to manufacture a fuel. Energy recovery facilities may only receive feedstock from waste processing facilities or collection systems that meet the criteria outlined in Table 1 of the *NSW Energy from Waste Policy Statement*.

The Materials Recovery Facility will receive up to 31,000 tonnes, consisting of approximately:

- 18,600 tonnes per annum of commercial and industrial mixed general solid waste (non-putrescible); and
- 12,400 tonnes per annum of construction building waste from residential and commercial construction (non-putrescible).

All waste materials and processed products will be stored in separate concrete bays with three sides or in dedicated hook lift bins. Storage of incoming waste in dedicated areas and sorted materials and products in dedicate bays helps in inventory control, good housekeeping, reduces potential for cross contamination and is critical for quality control.

REMONDIS seek authorisation to store up to 3,500 tonnes of material (both waste and product) at any one time under the proposed consent.

The proposed development will increase and expand recycling infrastructure in Port Stephens and the greater Hunter area and will make an important contribution to key result areas, including:

- Increase recycling for both commercial and industrial (C&I) and construction and demolition (C&D); and
- Divert more waste from landfill.

The proposed facility will also make an important contribution towards the recycling targets as set out in the *NSW Waste Avoidance and Resource Recovery Strategy* 2014-21.

7. Air Quality

7.1. Introduction

Air Noise Environment prepared the Air Quality Impact Assessment (AQIA) for the project to assess the air quality and greenhouse gas impacts associated with the development.

The AQIA has been prepared in accordance with the following guidelines:

- *NSW Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (2017);
- *NSW Assessment and Management of Odour from Stationary Sources in NSW* (November 2006); and
- Generic Guidance and Optimum Model Setting for the Calpuff Modelling System for Inclusion into the 'Approved Methods for the Modelling and Assessments of Air Pollutants in NSW, Australia'.

This section summarises the findings of the AQIA. The AQIA report is contained in Appendix F. This section should be read in conjunction with Appendix F.

7.2. Air emission sources – Operations

The key air quality indicators identified for operational phase of the proposed waste management facility are associated with particulate/dust emissions (described by Total Suspended Particulates (TSP), PM_{10} and $PM_{2.5}$) and odour emissions. The potential for particulate emissions is associated with material unloading and handling, material sorting, shredding and truck movements over paved surfaces. The potential for odour emissions are associated with the Food De-packaging Plant, Drill Mud Recycling Facility (soil and water mixture), Garden Organics Primary Processing and waste oil unloading near the heavy vehicle workshop.

Particulate emissions are also associated with the construction phase of the proposed development. However, impacts from the construction phase are considered to be minimal as construction is anticipated to occur over a short duration. As the operation will utilise existing buildings, the potential for emissions will be limited. Particulate emissions are expected to be low for the truck park area given the small area and short duration of works. Therefore, construction air quality impacts are expected to be low.

Table 7.1 presents expected air and odour emission sources associated with the operation of the proposed resource recovery facility and truck parking depot.

Table 7.1. Operational Emission Sources.

Source	Throughput (tonnes /year)	Description
Material Recovery Facility	31,000	The material recovery facility will receive general solid waste (non-putrescible) including plastics, glass, timber, mixed dry general waste, paper and cardboard. Collection vehicles will deliver waste to a bunded concrete inspection bay in building 1. Gross physical contaminants will be removed by a mobile telehandler and placed into a waste disposal bin. Waste will be loaded into a hopper for sorting by material type (paper/cardboard, plastics, aluminum, steel and glass). The following equipment will sort the material further: screens, near infrared sorter, magnet, conveyors, shredders and balers. Baled paper/cardboard, steel, aluminum, plastics, glass and refuse derived fuel (shredded loose or baled plastic, paper and cardboard) will be stored onsite in the product storage area for transfer offsite. Expected emissions include particulates from material unloading and handling, sorting and shredding. Particulate emissions from the Material Recovery Facility have been included in the air quality modelling.
Cardboard baling facility	30,000	The facility will receive separated cardboard from businesses. Collection vehicles will deliver waste to building 1 for unloading. Trucks will then manoeuvre cardboard to the concrete bunker cardboard receival area. Cardboard will be spread using a telehandler to remove contaminants. Removed contaminates will be placed in a general waste bin for disposal off site. A Bobcat or front-end loaded will be used to load the cardboard baler. The cardboard is to be baled in a hydraulic brake press and secured via steel wire into one tonne blocks. Baled cardboard will be stored on site before transport off site. Expected emissions include particulates from material handling. Particulate emissions from the Cardboard baling facility are considered to be minimal, however due to the large throughput, material handling emissions have been included in the air quality modelling.
Drill Mud Recycling Facility	5,000	The Drill Mud Recycling Facility will receive drill mud including soil and water mixture from industry (category 1 trackable liquid waste). Drill mud is a mixture of water, clays, fluid loss control additives, density control additives and viscosifiers. Drill mud will be received from various commercial activities including hydro excavation, exploration drilling and horizontal boring. Drill mud will be transferred by liquid tanker to the drill mud facility in building 2. Tanker trucks will be pumped into a bunded 50,000 L holding tank. The contents of the holding tank will be pumped at a specific rate into a centrifuge to separate solids. Dewatered solids will be transferred into a hook lift bin and moved to the drill mud storage area for compliance testing. The remaining liquid (supernatant) will be pumped to a 50,000 L holding tank for testing. The supernatant may be transferred offsite for treatment or recycling. Expected emissions include odour emissions from the holding tank, centrifuge dewatered solids bin and supernatant holding tank. Particulate emissions are expected to be minimal based on the moist nature of the operations.
Packaged Food Recycling Plant	2,000	The facility will receive packaged food products from business and industry. Waste materials received include putrescible and non-putrescible general solid waste. Collection vehicles carrying packaged food on pallets will deliver to building 2. Onsite trucks will man oeuvre the pallets to the Packaged Food Recycling Plant to be stored in the bunded storage bay. Forklifts will transfer the contents of the pallets into a receiving hopper of the food de-packaging unit. The de-packaging unit 'chops and squeezes' the food or drink item to separate the food contents from its packaging. The liquidised food is pumped into a 20,000 L on site liquid food waste holding tank. The holding tank will be pumped out as required and transported offsite. Plastics removed during the de-packaging will be stored in a hook lift bin and transferred to the Materials Recycling Facility for processing.

Source	Throughput (tonnes /year)	Description
		The de-packaging unit and food waste holding tank will be vented via an odour control unit, such as an activated carbon system. Expected emissions include odour emissions from the liquid food waste holding tanks and particulates from material handling. Odour emissions from the Packaged Food Recycling Plant are considered to be most significant relative to other sources on site and have been included in the air quality modelling. Particulate emissions are considered to be minimal but included in the modelling nonetheless.
Garden Organics Primary Processing	5,000	The facility will receive woody garden organics from residential and business sources. Collection vehicles will unload the garden organics to building 2. Trucks will then manoeuvre the woody garden organics to the concrete bunker receival area of the Garden Organics Primary Processing facility. Garden organics will be spread with a telehandler to remove any contamination prior to transfer to the pre-processing storage bunker. The de-contaminated garden organics will be loaded using a telehandler or front end loaded into a shredding plant. The shredding plant will grind the garden organics. Shredded garden organics will be moved to a storage bunker for regular transport offsite. Expected emissions include odour emissions from garden waste shredding and particulates from material handling and shredding. Odour emissions from the Garden Organics Primary Processing have been included in the air quality modelling. Particulate emissions are also considered to be significant and have been included in the air quality modelling.
Metals Recycling	4,000	Both ferrous and non-ferrous materials from residential and business sources are to be received by the facility. Trucks will manoeuvre the Metal Recycling waste to the concrete bunker of the Metal Recycling area. Materials will be spread by a telehandler to remove contaminants. Materials will be cut with a shear and placed into a baling area or directly into hook lift bins for transfer off site. Minimal emissions are expected from the metals recycling process and therefore the metals recycling facility has not been considered in the modelling.
Copper Processing Area	1,000	The facility will receive copper wire from mine sites, building and communications centres. Collection trucks will deliver the copper wires to building 2 where trucks will manoeuvre the received wires to the concrete bunker of the Copper Processing Area. Cables will be spread with a material handler to remove contaminated materials. Cables will subsequently be cut with a shear and placed in separate storage bins for the copper and plastics for offsite transport. Minimal emissions are expected from the Copper Processing Area and therefore the facility has not been considered in the modelling.
Hazardous waste recycling facility	20,201	The hazardous waste recycling facility will receive a range of solid and liquid waste materials containing chemicals and oils will be collected from mining and manufacturing sources in the Hunter region. Materials will be aggregated and stored according to chemical group in building 2 where appropriate materials will be hand sorted and bunded into closed containers by material category type. Material categories include: drained oil filters (general solid waste), containers & drums containing controlled waste residues (Category 1 trackable solid waste N100), contaminated soils(Category 1 trackable solid waste N120), lead acid batteries (Category 1 trackable solid waste D220), batteries (general solid waste), fluorescent tubes (general solid waste), Gyproc (general solid waste), used fire extinguishers and pressure vessels (general solid waste), and E-waste. Periodically, vehicles will enter the Hazardous Waste Materials Recycling Facility to collect aggregate materials for processing offsite. Liquid waste including Waste mineral oils (Category 1 trackable solid waste J100), oily water (Category 1 trackable solid waste J120), residual solvents (Category 1 trackable solid waste N100), thinners and paints will be delivered to the HWMR area in tankers or specialised containers on collection trucks. Liquid waste will be

Source	Throughput (tonnes /year)	Description
		unloaded into a bunded storage area for assessment and classification. Liquid waste will subsequently be decanted into holding tanks which will be periodically emptied and transported off site for treatment. Minimal emissions are expected from the hazardous waste recycling facility as the facility is for the storage of materials only, before transport offsite for further processing. The decanting of liquid into holding tanks is not expected to result in significant odour emissions as the liquid will be pumped and not manually decanted. Furthermore, the pumping is proposed to occur within building 2 and not external to the atmosphere. Therefore, odour and particulate emissions have not been modelled.
Haul Route	171 truck movements per day	The onsite haul route includes semi-trailers and rigid trucks delivering waste and collecting waste for transfer to offsite processing. All haul routes are proposed to be paved. Particulate emissions are associate with haul routes have a potential to be significant due to the large number of truck movements per day and have been included in the modelling.
Truck Parking Depot	-	To support the truck parking depot storage tanks for fuels, liquid waste and waste oils are proposed for the site. The self-bunded tanks are proposed to be constructed outdoors. Emissions from the Truck Parking Depot and storage tanks are considered to be minimal and have not been considered in the modelling.
Maintenance Workshop	-	A maintenance workshop is proposed for the site for vehicle maintenance to the REMONDIS truck collection fleet. The workshop will store fuels, oils and cleaning chemicals. All maintenance operations are proposed to occur within the workshop building. Emissions from the maintenance workshop are expected to be minimal. Emissions from the waste oil unloading to the rear of the workshop have been included in the modelling. Odour and VOC emissions are expected to be associated with the unloading process.

7.3. Existing environment

7.3.1.1. Existing emission sources

The subject site and surroundings are currently zoned General Industry under the *Port Stephens Local Environment Plan* 2013. A survey of existing industry within 500 m buffer of the property boundary has been completed. There is anticipated to be an overlap with odour and particulate sources with surrounding industries. However, given the large number of surrounding industries and difficulty of obtaining detailed information for each industry, a cumulative assessment of the surrounding industry is not considered practical.

It is noted that the results of the air dispersion modelling show that contribution of the proposed operations to local pollutant concentrations is very low and the modelling has considered background monitoring data from the Mayfield station (which is close to existing industry in the Newcastle area).

A buffer zone of 4 km exists for the Tomago Aluminium smelting facility. The facility was constructed in 1983 and has expanded over time. Currently the facility has three potlines each containing 280 pots and operates at a capacity of 580,000 tonnes per year. The 4 km buffer zone was introduced during the approval process for the third potline and aims to reduce sensitive uses around the aluminium smelter and associated infrastructure. Any proposed development within the buffer zone with the potential to increase sulphur concentrations must be assessed cumulatively with the Tomago Aluminium facility. There are expected to be some sulphur emissions from the diesel machinery (i.e. forklifts, loaders and material handlers) and trucks operating on site[3].

7.3.1.2. Proposed emission sources

All Major Projects and Development Applications in Tomago with the potential to overlap on pollutants from the proposed facility have been reviewed. The proposed aluminium extrusion facility at 606 Tomago Road and SPL pot lining facility at 638 Tomago Road are noted to emit sulphur emissions. The emissions of sulphur from the diesel machinery at the proposed development is expected to be low and therefore cumulative impacts for the aluminium extrusion facility and pot lining facility have not been considered. The approved transport depot and galvanising plant are noted to be over 1 km from the proposed development, therefore cumulative dust and odour emissions as a result of the proposed development are expected to be low and have not been considered further. The proposed gas fired power station is located over 2 km away from the proposed development. Overlapping pollutants for the power station include particulate matter. Cumulative impacts have not been considered further, given the large separation distance to the proposed gas fired power station.

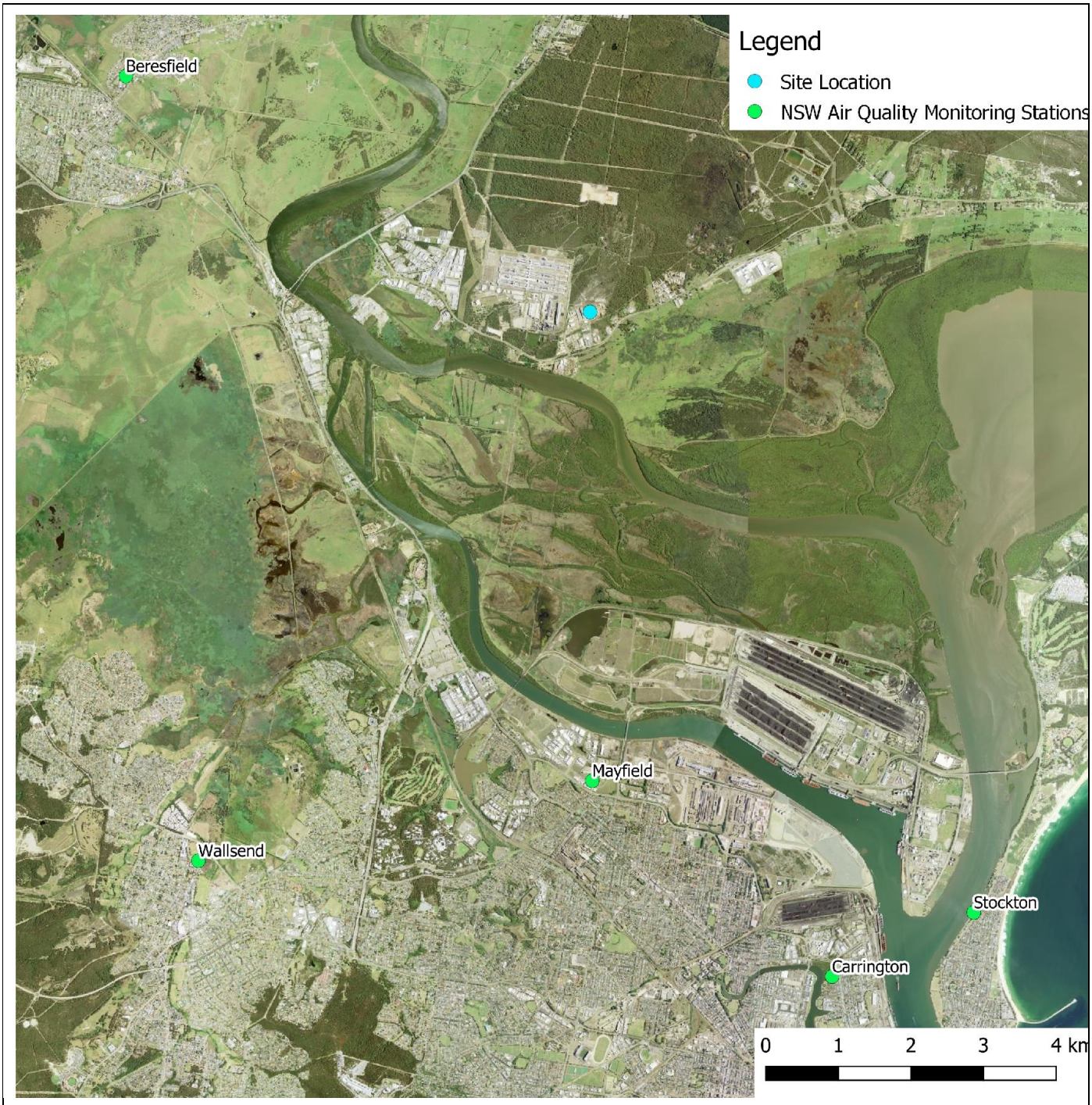
7.4. Background air quality monitoring

Besides contribution from the industrial area of Tomago, ambient particulate concentrations in the Hunter region area are defined by local traffic, coal mining and coal fired power plants. To allow for the assessment of cumulative pollutant concentrations, the assessment has considered ambient concentrations from the New South Wales Office of Environment and Heritage air quality monitoring stations at Beresfield, Wallsend, Mayfield, Carrington, Stockton and Newcastle.

The location of the New South Wales Office of Environment and Heritage monitoring stations considered in this assessment are presented in Figure 7.1.

[3] Predicted SO_2 emissions from the trucks and diesel machinery onsite are low with an estimate of < 1 kg emitted per year for the haul route and 16 kg per year for the diesel machinery. This is based on the equipment specifications and sulfur dioxide emission factors from the National Pollution Inventory Emission Technique Manual for Combustion (Version 3).

Figure 7.1. NSW OEH Monitoring Station Locations.



Date	Revision	Drawn By	Site description	Client	REMONDIS Australia Pty Ltd
26/08/2020	Revision A	R. Loemker	21D & 21F School Drive, Tomago	Project	Tomago Resource Recovery Facility
				Title	NSW OEH Monitoring Station Locations
				Scale	As shown
				Source	Air Noise Environment

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Table 7.2 presents the ambient monitoring data from the nearby NSW OEH Monitoring Stations.

Table 7.2. Ambient 2017 – 2019 monitoring data from NSW OEH Monitoring Stations

Monitoring Station	Measured Concentration (µg/m³)					
	$PM_{2.5}$		PM_{10}		SO_2	
	24-hour	Annual Average	24-hour	Annual Average	24-hour	Annual Average
Beresfield	9.4	9.5	22.4	22.4	4.4	4.4
Wallsend	8.4	8.3	20.1	20.0	3.9	3.8
Mayfield	9.0	9.0	27.4	27.3	4.4	4.4
Carrington	9.2	9.3	27.7	27.6	5.8	5.8
Stockton	10.9	10.9	39.5	39.5	8.5	8.5
Adopted Background	24-hourly background from Mayfield has been adopted	9.0	24-hourly background from Mayfield has been adopted	27.3	5.4	5.4

To provide an assessment of cumulative PM_{10} and $PM_{2.5}$ impacts, the background concentrations from the Mayfield air quality monitoring station has been adopted (in the absence of site-specific data). Mayfield has been selected as the station is considered to be representative of the site with nearby industrial and residential land uses. For the year 2019 at the Mayfield station, there are noted to be 37 exceedances to the PM_{10} criteria and 6 exceedances to $PM_{2.5}$ criteria. The annual average criteria for both PM_{10} and $PM_{2.5}$ are also noted to be exceeded at the Mayfield station. As the criteria is being exceeded prior to the proposed development going ahead, best practice measures are to be adopted to minimise impacts of the proposed development.

A contemporaneous assessment has been completed to determine whether the number of 24-hour exceedances would increase at the modelled sensitive receptors as a result of the proposed development operations . Monitoring data from the Mayfield station has been analysed against the predict ed cumulative pollutant concentrations (Mayfield station plus concentrations as a result of the proposed development) for each sensitive receptor to determine if the number of exceedances increases.

7.5. Assessment criteria

The results of the modelling have been compared to ambient air quality goals defined in the NSW Approved Methods for the *Modelling and Assessment of Air Pollutants in New South Wale*s (2017). Table 7.3 summarises the air quality criteria.

Table 7.3. Air Quality Criteria.

Compound	Air Quality Criteria (µg/m³)	Averaging Period
TSP	90	Annual
PM_{10}	50	24-hour
	25	Annual
$PM_{2.5}$	25	24-hour
	8	Annual

Compound	Air Quality Criteria (µg/m^3)	Averaging Period
SO_2	570	1 hour
	228	24-hour
	60	Annual
Toluene	360	1 hour
Xylenes	190	1 hour
Benzene	29	1 hour
Cumene	21	1 hour
Ethylbenzene	8000	1 hour
Trimethylbenzene	2200	1 hour

In addition to the above, odour from the proposed facility has been assessed in accordance with the odour criteria presented in *NSW Assessment and Management of Odour from Stationary Sources in NSW* (November 2008). The document comprises of two parts – a technical framework (which defines the criteria) and technical notes (that discuss assessment methodologies). In the policy document, the OEH note that odour assessment criteria need to be designed to take into account the range of sensitivities to odours within the community, and to provide additional protection for individuals with a heightened response to odours. Therefore, the odour assessment criteria allows for population size, cumulative impacts, anticipated odour levels during adverse meteorological conditions and community expectations of amenity.

The nearest residential or community uses are located in isolated areas at least 500 metres from the site. Despite the isolated nature of sensitive receptors, a conservative 2 OU criterion has been adopted for the sensitive receptors.

For comparison to the assessment criteria, impacts in odour units are reported as peak concentrations (i.e. approximately one second average) and as the 99th percentile of predicted concentration based on a Level 3 odour assessment methodology.

7.6. Meteorological modelling

7.6.1. Modelling methodology

Atmospheric dispersion modelling involves the mathematical simulation of the dispersion of air contaminants in the environment. The modelling utilises a range of information to estimate the dispersion of pollutants released from a source including:

- Meteorological data for surface and upper air winds, temperature and pressure profiles, as well as humidity, rainfall, cloud cover and ceiling height information;
- Emissions parameters including source location and height, source dimensions and physical parameters (e.g. exit velocity and temperature) along with pollutant mass emission rates;
- Terrain elevations and land use both at the source and throughout the surrounding region;
- the location, height and width of any obstructions (such as buildings or other structures) that could significantly impact on the dispersion of the plume; and
- Sensitive receptor locations and heights.

For the purpose of the assessment, meteorological modelling has been undertaken using TAPM (The Air Pollution Model) and CALMET to predict localised meteorological conditions. The meteorological data derived from these

models has been used as an input for the CALPUFF dispersion modelling. The full methodology is provided in the AQIA report which is contained in Appendix F.

7.6.2. Meteorological predictions

A review of the predicted data set indicates that the outcomes of CALMET model are suitable for predicting potential air quality impacts from the proposed development. Key meteorological parameters including wind field, stability class and temperature are considered to be representative of the subject site and surrounding area based on a comparison to measured data.

7.7. Air Emissions Data

7.7.1. Dust emission factors

Table 7.5 presents emission factors sourced from the US EPA AP42 literature. Assumptions in selecting or deriving emission factors are also presented in the last column of Table 7.5.

Table 7.5. Particulate Emission Factors.

Activity	Units	TSP	PM_{10}	$PM_{2.5}$	Reference	Comments
Materials Recovery Facility						
Material unloading	kg/Mg	0.00041	0.00019	0.00003	Ref 2, Eqn 1	Assumes 5% moisture content, 2.6 m/s wind based on measured wind speed at Mayfield (factored down to a height of 2. m)
Material handling	kg/Mg	0.00041	0.00019	0.00003	Ref 2, Eqn 1	Assumes 5% moisture content, 2.6 m/s wind based on measured wind speed at Mayfield (factored down to a height of 2. m)
Material transfer to process line	kg/Mg	0.00041	0.00019	0.00003	Ref 2, Eqn 1	Assumes 5% moisture content, 2.6 m/s wind based on measured wind speed at Mayfield (factored down to a height of 2. m)
Screening Binder Bivitec	kg/Mg	0.01250	0.00430	0.000025	Ref 3	Screening - uncontrolled
Fine-shredder Metso M&J 1550	kg/Mg	0.00270	0.00120	0.000400	Ref 3	Tertiary crushing - uncontrolled
Shredder Metso M&J 4000s	kg/Mg	0.00270	0.00120	0.00040	Ref 3	Tertiary crushing - uncontrolled
Cardboard Baling						
Material handling	kg/Mg	0.00018	0.00009	0.00001	Ref 2, Eqn 1	Assumes 9% moisture content, 2.6 m/s wind based on measured wind speed at Mayfield (factored down to a height of 2. m)
Food Depackaging Plant						
Material handling	kg/Mg	0.00391	0.00185	0.00028	Ref 2, Eqn 1	Assumes 1% moisture content, 2.6 m/s wind based on measured wind speed at Mayfield (factored down to a height of 2. m)
Garden Organics Primary Processing						
Material unloading	kg/Mg	0.00016	0.00007	0.00001	Ref 2, Eqn 1	Assumes 10% moisture content, 2.6 m/s wind based on measured wind speed at Mayfield (factored down to a height of 2. m)
Material handling	kg/Mg	0.00016	0.00007	0.00001	Ref 2, Eqn 1	Assumes 10% moisture content, 2.6 m/s wind based on measured wind speed at Mayfield (factored down to a height of 2. m)
Shredder Metso M&J 4000s	kg/Mg	0.00270	0.00120	0.00040	Ref 3	Tertiary crushing - uncontrolled
Haul Routes						
Haul route – Onsite Haul Truck	g/VKT	706	136	33	Ref 1 Eqn 1	Silt content of 7.4% as per Table 13.2.2-4 of Ref 3, and average (empty, full) truck weight of 33 tonnes. 7.4% silt content represents the silt content for solid waste.

7.7.2. Particulate emission rates

7.7.2.1. Overview

The following sections present details of input data used to derive particulate emission rates from the emission factors.

7.7.2.2. Estimated emissions

In order to derive maximum emission rates (g/s, for the maximum facility processing rate) for the proposed resource recovery facility operations, the following client information has been considered (Table 7.6 and Table 7.7).

Table 7.6. A summary of calculated average and daily maximum throughputs is provided below (as supplied by REMONDIS).

	Materials Recovery Facility	Cardboard Baling	Food-Depackaging Plant	Garden Organics Primary Processing	Units
Client Forecast					
Annual Throughput	31000	30000	2000	5000	tpa
Daily Throughput	84.9	82.2	5.5	13.7	T per day
Per Hour	3.5	3.4	0.2	0.6	T per hour
Worst-case Daily Assumed					
Per Day	127.4	123.3	8.2	20.6	T per day
Per Hour	5.3	5.1	0.3	0.9	T per hour

Table 7.7. Truck movement estimations (as supplied by REMONDIS).

Road Source	Trucks Per Day		Trucks Per Hour	
	Client Forecast	Worst-Case	Client Forecast	Worst-Case
Semi-Trailer	10	15.0	0.4	0.6
Rigid Truck	164.0	246.0	6.8	10.3

Table 7.8 presents the emission rates derived for the resource recovery facility for a worst-case operating day.

Source IDs are also provided in Column 1 and have been used in the air dispersion modelling. Sources have been run in separate groups according to the source type. The results for each source group have then been added in CALSUM to provide total predicted particulate concentrations in the surrounding area. Some air emission sources have been combined as one source in the modelling based on their close proximity to each other.

Table 7.8. Proposed Particulate Estimated Emission Rates (g/s) – Average Daily Throughput.

Source ID	Activity	Factoring Value	Factoring Unit	Mitigation Reduction	Mitigation Modelled	TSP	PM_{10}	$PM_{2.5}$	Operating Time
Material Recovery Facility									
V1	Material unloading	5.3	tonnes/hr	0%	None	0.00061	0.00029	0.00004	24 Hours
V1	Material handling	5.3	tonnes/hr	0%	None	0.00061	0.00029	0.00004	24 Hours
V1	Material transfer to process line	5.3	tonnes/hr	0%	None	0.00061	0.00029	0.00004	24 Hours
V1	Screening Binder Bivitec	5.3	tonnes/hr	0%	None	0.00061	0.00029	0.00004	24 Hours
V1	Fine-shredder Metso M&J 1550	5.3	tonnes/hr	0%	None	0.0040	0.00177	0.00052	24 Hours
V1	Shredder Metso M&J 4000s	5.3	tonnes/hr	0%	None	0.0040	0.00177	0.00052	24 Hours
Cardboard Baling									
V2	Material handling	5.1	tonnes/hr	0%	None	0.00026	0.00012	0.00002	24 Hours
Food Depackaging plant									
V3	Material handling	0.3	tonnes/hr	0%	None	0.00037	0.00018	0.00003	24 Hours
Garden Organics Primary Processing									
V4	Material unloading	0.9	tonnes/hr	0%	None	0.00004	0.00002	0.000003	24 Hours
V4	Material handling	0.9	tonnes/hr	0%	None	0.00004	0.00002	0.000003	24 Hours
V4	Fine-shredder Metso M&J 1550	0.9	tonnes/hr	0%	None	0.00064	0.00029	0.000084	24 Hours
Haul Routes									
L1	Onsite Haul Truck – Rigid Truck	4.5	VKT/hour	0%	None	0.00201	0.00039	0.0000934	24 Hours
L2	Onsite Haul Truck – Semi Trailer	0.0913	VKT/hour	0%	None	0.00012	0.000024	0.0000057	24 Hours
L3	Onsite Haul Truck – Semi Trailer	0.069	VKT/hour	0%	None	0.00012	0.000024	0.0000057	24 Hours

7.7.3. Odour emissions rates

Odour emissions have been modelled for the food depackaging plant, drill mud recovery facility, garden organics primary processing and waste oil unloading. In the absence of suitable odour data for food waste, data from grease trap unloading into a storage tank has been adopted. It is noted that the grease trap unloading data presents a conservative approach for odour emissions from the food de-packaging plant (in the absence of more realistic data). An odour control unit is also proposed for the food de-packaging plant. However, as further conservatism, raw grease trap (uncontrolled) odour data has been considered. General specifications for the odour control unit are provided in Appendix E of the AQIA report which is contained in Appendix F of this EIS.

Table 7.9 presents the adopted emissions rates for the modelled odour sources.

Table 7.9. Odour Emissions.

Source ID	Activity	OUV/s	Source	Source ID
P1	Food De-packaging Plant	1000	OUV/s	Uncontrolled odour emissions from grease trap unloading into a storage tank, previously completed by Air Noise Environment at a liquid waste facility.
P2	Drill Mud Recovery Facility	517.38[a]	OUV/s	Based on the highest sample undertaken by Airlabs Environmental of a liquid collection recycling truck in September 2013[b]. This data represents the odour concentration of the raw liquid drill mud material that would be transferred to the holding tanks.
P3	Waste Oil Unloading	72[b]	OUV/s	Based on previous sampling undertaken by Air Noise Environment for liquid waste facilities in Brisbane and Sydney. These facilities also involved the treatment of industrial oily water or used oil.
A1	Garden Organics Primary Processing	0.134	$OU/m^2/s$	An odour emission rate of 0.134 $OU/m^2/s$ has been adopted based on sampling completed by PAE Holmes of Greenwaste areas at an existing landfill at Eastern Creek. To derive a total odour emission rate (OUV/s), a waste area of 180 m^2, (roughly half the total floor area of the Garden Organic Primary Processing area) has been considered

[a] Emission rates based on estimated venting flow rate of 5 m/s and diameter of 0.5 m.
[b] Emission rates based on estimated venting flow rate of 0.01 m^3/s. This is based on the fact that 12 m^3 of liquid would be unloaded over a period of 20 minutes, and that the amount of air forced out of the tank is equivalent to the volume of liquid unloaded.
[c] Stephenson Environmental Management Australia, Modification to DA for Gross Pollution Trap & Stormwater Waste Recycling Depot – 5-6 Sleigh Place Wetherill Park NSW. Statement of Environmental Effects. 27 April 2018.

7.7.3.1. VOC emissions

VOC emissions are associated with the proposed waste oil unloading activity (source P3). VOC emissions for waste oil unloading have been based on previous sampling undertaken by Air Noise Environment for liquid waste facilities in Brisbane and Sydney, involving the treatment of industrial oily water or used oil. Table 7.10 presents the VOC emissions data considered in the modelling. The emission rates are associated during unloading activity when emissions are at a maximum.

Table 7.10. Modelled VOC Emission Data (Waste Oil Venting).

Pollutant	Measured Concentration	Modelled Emission Rate
Benzene	46.3 mg/Nm^3	0.000463 g/s
Toluene	335.8 mg/Nm^3	0.003358 g/s
Ethylbenzene	20.8 mg/Nm^3	0.000208 g/s

Pollutant	Measured Concentration	Modelled Emission Rate
Xylene	100.4 mg/Nm^3	0.001004 g/s
Cumene	3.6 mg/Nm^3	0.000036 g/s
Trimethylbenzene	15.8 mg/Nm^3	0.000158 g/s

7.7.3.2. Sulfur Emissions

Sulfur-related emissions (sulfur dioxide) from the truck routes and onsite machinery have been considered in the assessment. Emissions rates have been sourced from the NPI Emission estimation technique manual for Combustion Engines. Emissions rates have been calculated based on:

- Distance: 0.439 km
- Operating hours: 8760 hours/year
- Speed: 10 km/hour
- Fuel efficiency: 0.6 L/km
- 174 vehicle movements per day
- Continuous operations of heavy machinery assumed at 100% loading factor.

Power ratings for the onside machinery have been calculated based on the power ratings specific to each piece of equipment.

Table 7.11 presents the sulfur emissions data considered in the modelling. It is noted that the NPI manual does not specify fluoride emissions for diesel industrial vehicles or heavy vehicles as the fluoride content of diesel is unknown, and there are no readily available emission factors from other literature. It is expected that fluoride emissions from the diesel equipment would be negligible and therefore, have not been modelled.

Table 7.11. Modelled sulfur emissions.

Source ID	Description	SO_2 Emissions Factor (kg/kWh)	SO_2 Emissions Factor (Kg/m^3)	SO_2 Emissions Rate (g/s)	SO_2 Emissions Rate (g/s/m)
L1	Heavy vehicles	-	0.017	-	0.00002
P4	Liebherr L514	0.0000075	-	0.00016	-
P5	Caterpillar IT38G	0.0000075	-	0.00028	-
P6	Liebherr LH22	0.000008	-	0.00023	-
P7	Caterpillar 319D	0.000008	-	0.00021	-
P8	Linde H25D	0.000008	-	0.00007	-
P9	Nissan FD25T	0.000008	-	0.00007	-

7.8. Air dispersion modelling

CALPUFF has been used to model to emission sources for the proposed resource recovery facility and truck parking depot. Volume, area and road sources have been adopted in CALPUFF to represent the range of air emission sources. Area sources have been used for all surface areas. Line sources have been used for all haul routes. Point sources have been used for vented odour and VOC emissions. All other emission sources have been modelled as volume sources. Please refer to Section 7.4 of the Air Quality Assessment (Appendix F).

7.9. Predicted results

Table 7.12 presents the predicted results for the worst-case throughput operating day for each of the 5 sensitive receptors.

Predicted odour concentrations at the sensitive receptors are noted to be well below the adopted 2 OU criteria. It therefore noted that there are unlikely to be cumulative impacts as a result of the proposed development. It is noted that the neighbouring properties are not considered to be sensitive uses given they are occupied by industrial uses. Nonetheless, the predicted odour concentrations at the property boundary are noted to be a maximum of 5.2 OU, below the maximum criteria of 7 OU adopted for residential receptors within the NSW.

It is noted that cumulative predictions exceed the annual average criteria for both PM_{10} and $PM_{2.5}$ (Table 2.13). This exceedance is due to the annual background concentrations of annual PM_{10} and $PM_{2.5}$ being above the criteria. The predicted cumulative 24-hour average of PM_{10} and $PM_{2.5}$ are noted to also exceed the air criteria. Where exceedances are already occurring, the NSW Approved Modelling Methods guideline requires that no additional exceedances be occurring as a result of a new development and that a demonstration of best practice measures is implemented as far as practicable.

A contemporaneous assessment has been completed for PM_{10} and $PM_{2.5}$ to determine whether the number of exceedances would increase as a result of the predicted concentrations from the proposed development. The predicted 24-hour average time series has been extracted from CALPUFF to determine whether the number of 24-hour exceedances would increase at the modelled sensitive receptors with the proposed development in operations. It is noted that no additional exceedances of the 24-hour average criteria are predicted at the modelled sensitive receptors as a result of the proposed development.

It is also noted that conservative modelling assumptions have been adopted, such as emissions factors not accounting for activities occurring within buildings and emissions factors being used for material handling and processing from the mining industry. It is therefore noted pollutant concentrations from the development are likely to be lower in practice.

With regards to the TAC buffer area, the predicted sulfur dioxide concentrations are less than 1% of the relevant ambient air quality criteria (i.e. 0 .1 0.3% of the criteria). On this basis, it is concluded that the potential impacts of the proposed operations onto the TAC buffer area are expected to be negligible. As discussed earlier, it is noted that fluoride emissions are not expected as part of the site operations.

Overall, the contribution of the proposed development to the local and regional air quality environment is expected to be low based on the findings of the air dispersion modelling.

Table 7.12. Predicted Air Modelling Results.

Predicted Ground Level Concentrations at Discrete Receptors (µg/m³)															
Receptor	SO_2	SO_2	SO_2	TSP	PM_{10}	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	Toluene	Xylene	Benzene	Cumene	Ethylbenzene	Trimethylbenzene	Odour
	1 Hour	24-hour	Annual	Annual	24-hour	Annual	24-hour	Annual	1 Hour	1 Hour	Annual	1 Hour	1 Hour	1 Hour	1-hour, 99th%ile
Source Only															
R1	0.3	0.1	0.01	0.8	1.6	0.1	0.4	0.04	0.08	0.03	0.01	0.00	0.01	0.00	0.1
R2	0.6	0.2	0.02	1.9	2.9	0.3	0.7	0.1	0.22	0.07	0.03	0.00	0.01	0.01	0.1
R3	0.7	0.2	0.03	2.8	4.2	0.5	1.0	0.1	0.32	0.09	0.04	0.00	0.02	0.01	0.1
R4	1.7	0.6	0.08	8.2	10.8	1.5	2.6	0.4	0.56	0.17	0.08	0.01	0.03	0.03	0.2
R5	0.8	0.2	0.02	2.0	4.0	0.4	1.0	0.1	0.29	0.09	0.04	0.00	0.02	0.01	0.1
Boundary Receptors									10.9	3.27	1.51	0.12	0.68	0.51	5.2
Cumulative (Background + Source Only)															
Adopted Background						27.3		9.0							-
R1						27.4		9.0							-
R2						27.6		9.1							-
R3						27.8		9.1							-
R4						28.8		9.4							-
R5						27.7		9.1							-
Boundary Receptors															
Criteria	570	228	60	90	50	25	25	8	360	190	29	21	8000	2200	2

Table 7.13. Predicted PM10 and PM2.5 Cumulative Exceedances.

Location	24-hour PM_{10} exceedances	24-hour $PM_{2.5}$ exceedances
Mayfield (Measured)	37	6
R1	37	6
R2	37	6
R3	37	6
R4	37	6
R5	37	6
Outcome	**No additional exceedances are predicted**	

7.10. Best practice measures

The air dispersion modelling shows compliance with the air quality goals using conservative modelling inputs. Although compliance is predicted for the proposed development, best practice measures are considered necessary to minimise particulate emissions in the area (for which background exceedances are already occurring).

In relation to particulate emissions, a best practice approach is proposed, whereby all processing operations will occur within enclosed warehouse buildings. These building structures will assist in containing emissions and wind-blown particulate emissions are expected to be negligible. Additionally, all haul routes are proposed to be paved, reducing particulate emissions further. Haul routes should be regularly cleaned (e.g. street sweeper) to minimise the silt loading content, which has impacts on the total particulate emissions from paved surfaces.

In relation to odour, despite the predicted odour concentrations being well below the odour criteria at the sensitive receptors and property boundary, an odour control system (such as activated carbon or similar) is proposed to reduce emissions from the Food Depackaging Plant (with an odour control efficiency around 97%). This will minimise impacts to the nearby sensitive receptors during normal operations and should upset conditions occur. It is also recommended that day-to-day management measures are adopted, such as:

- Implementation of a waste acceptance evaluation procedure to ensure all waste received on site meets the relevant criteria;
- Use of odour neutralisers;
- Availability of spill kits to allow for prompt containment of spills which could be odorous;
- Daily odour survey observations around the boundary of the site;
- Work procedures in the event of any particularly odorous loads (e.g. Use of odour neutraliser, identifying waste source and investigating possibility of diverting to another waste facility);
- Additional odour control system medium on-site at all times (e.g. Additional activated carbon to be stored on site).

7.11. Greenhouse gas assessment

This section provides an assessment of greenhouse gas emissions for proposed Resource Recovery Facility and Truck Parking Depot at Tomago. Estimations of annual greenhouse gas emissions during construction and operation have been estimated based on the methods outlined in the National Greenhouse Energy Reporting Act 2007 (NGER) and associated technical guidelines. GHG emissions are categorised into Scope 1, 2 and 3 emissions. Scope 1 emissions for the construction phase of project are related to fuel usage by construction equipment for the On-Site Detention basin and Truck Parking Depot. Diesel equipment will be used during construction, which includes an excavator, front end loader, bulldozer, grader, dump truck and roller. Scope 1 operational emissions include emissions from the following diesel machinery:

- 2 x Loaders used by Material Recovery Facility, Garden Organics Processing and metals recycling facility;
- Material handler used by Material Recovery Facility, Garden Organics Processing and metals recycling facility;
- Excavator used by the Material Recovery Facility; and
- 3 x Forklifts used by the Material Recovery Facility.

In relation to Scope 2, the proposed development will include the following electrical machinery:

- Materials Recovery Facility: shredders, sorting, conveyors, infrared, windshifter and magnet;
- Cardboard Baling Facility: baler;
- Food De-packaging Plant: hopper, conveyor and pump;
- Drill Mud Recycling Facility: pump and centrifuge;
- Hazardous Waste Recycling Facility: pallet scales and electric cable stripper;
- Copper Processing area: hydraulic cable shear and electric cable stripper; and
- Metals Recycling Facility: overhead crane (existing) and bale press (not additional to cardboard baler).

Scope 3 emissions have not been considered in this assessment.

7.11.1.1. Scope 2 emissions

The proposed development will utilise the main electricity grid for power. Based on the expected power usage, (542,582 kWh per year) and 0.81 CO_2-e kg/kWh emission factor for the New South Wales region, total emissions are estimated to be 439 CO_2-e tonnes/year.

7.11.1.2. Summary of emissions

Based on the estimated emissions presented above, the Project is not expected to trigger the NGER reporting threshold for a single facility of 25 kilo tonnes CO_2-e (25,000 tonnes CO_2-e) of greenhouse gases and 100,000 MJ of energy consumed.

7.11.2. GHG mitigation options

GHG emissions associated with the Project are primarily associated with the combustion of fuels, in particular diesel. Therefore, opportunities for reducing emissions are related to alternative fuel types used, use of low emissions technology (e.g. equipment with latest technology) and maintenance of equipment. In summary, opportunities for reducing GHG emissions for these sources include the followings:

- Minimising the use of fuel by selecting fuel efficient plant and equipment, operating vehicles and machinery in a fuel-efficient manner e.g. turning off idling equipment, and selecting construction techniques that utilise lower amounts of fuel;
- Implementation of a maintenance plan for all fuel and electrically powered equipment;
- Implementation of energy conservation practices by all staff (which can be enforced through appropriate training);

- use of solar panels.

7.12. Conclusion

An air quality assessment using air dispersion modelling has been undertaken for the proposed resource recovery facility and truck parking depot at Tomago. To assess the potential for air quality impacts, computational air dispersion modelling has been undertaken to predict particulate (TSP, PM_{10} and $PM_{2.5}$), VOC and odour concentrations at the nearest sensitive receptors. The conclusions of the assessment are summarised below:

- The nearest sensitive receptors are located to the south west and south east of the proposed development site. The nearest sensitive receptor is located at Tomago House, located approximately 500 metres to the south east of the site boundary.
- The main air emission sources for the site include haul routes, the Material Recovery Facility, Cardboard Baling Facility, Drill Mud Recycling Facility, Packaged Food Recycling Plant, Garden Organics Primary Processing Plant and waste oil unloading. Key air quality indicators for these sources include particulates and odour.
- The results of the modelling indicate full compliance for VOC and odour at the property boundary and nearby sensitive receptors by a significant margin. For particulates matter (PM_{10} and $PM_{2.5}$), background levels are already exceeding the air quality goals. Based on the modelling, no additional exceedances are predicted as a result of emissions from the proposed development.
- To minimise potential dust and odour emissions from the site, measures are proposed including buildings to enclose all material handling, shredding and sorting activities, paved truck routes and an odour control system on the Food De-packaging Plant.

Overall, the site represents a suitable location for the proposed resource recovery facility from an air quality perspective. Due to existing high background particulate concentrations in the region, it is proposed that best practice measures are adopted by the facility. The potential for particulate and odour impacts can be effectively managed by adopting these best practice measures to achieve an appropriate air quality outcome.

8. Noise and Vibration

8.1. Introduction

Waves Acoustic Consulting Pty Ltd prepared the Noise and Vibration Impact Assessment (NVIA) to assess the noise and vibration impacts associated with the development.

The NVIA has been prepared in accordance with the following guidelines:

- Noise from the operation of the proposal has been assessed in accordance with the *NSW Noise Policy for Industry* (NPI) (NSW EPA, 2017);
- Noise from additional traffic movements on the local road network has been assessed in accordance with the *NSW Road Noise Policy* (RNP) (NSW EPA, 2011);
- Vibration from the operation and construction of the proposal has been assessed in accordance with *Assessing Vibration: a technical guideline* (DEC 2006).
- Construction Noise Impacts have been assessed in accordance with the *NSW Interim Construction Noise Guideline (ICNG).*

This chapter summarises the findings of the Noise and Vibration Impact Assessment (NVIA). The Noise and Vibration Impact Assessment report is contained in Appendix G. This chapter should be read in conjunction with Appendix G.

8.2. Overview of the surrounding area

The Facility located inside the Tomago Aluminium Smelter Environmental Buffer Zone. This zone was established around the Smelter as a special environmental management zone where ambient levels of environmental impacts may be above Office of Environment and Heritage guideline values. The buffer zone boundaries lie at a radius of approximately 2 km to 4 km from the centre of the Smelter as indicated by the yellow-dashed line in Figure 8.1 below.

The buffer zone contains a large number of noise-generating industrial and commercial sites. In addition, there are some noise sensitive receivers such as residential, active recreation, passive recreation, and a caravan park.

Figure 8.1 below illustrates the Facility and the proximity of the industrial, commercial, and residential buildings in the surrounding area.

Table 8.1 below describes the nearest noise sensitive receivers inside and outside the Environmental Buffer Zone.

Table 8.1. Nearest Noise Sensitive Receivers – Inside and Outside the Environmental Buffer Zone.

Receiver Type	Description	Distance (m)	Direction
Inside the Environmental Buffer Zone			
Industrial	21 I School Drive, Tomago	15	West
	Tomago Smelter	220	North West
Commercial	21 B School Drive, Tomago	130	South West
	23 School Drive, Tomago	220	South
	37 School Drive, Tomago	230	South East
	47 School Drive, Tomago	430	East
Active Recreation	Tomago Bowling Club, 657 Tomago Road, Tomago	1530	South West
Passive Recreation	Hunter Wetlands National Park	1150	South
	Tomago House, Tomago Road, Tomago	450	South
	Tomago House Chapel, 423 Tomago Road, Tomago	430	South
Residential	Tomago Village Caravan Park, 819 Tomago Road, Tomago	2700	West
	Tomago Detention Centre, 587 Tomago Road, Tomago	1130	South West
	374 Tomago Road, Tomago	760	East
	362 Tomago Road, Tomago	890	East
	308 Tomago Road, Tomago	1400	East
	5 Graham Drive, Tomago	1860	North East
Outside the Environmental Buffer Zone			
Commercial	2137 Pacific Highway, Heatherbrae	3400	North West
Passive Recreation	Botanic Gardens, 2100 Pacific Highway, Heatherbrae	3000	North West
	Sandgate Cemetery, 116 Maitland Road, Sandgate	4900	South West
	Hunter Wetlands National Park	2700	South
Residential	175 Tomago Road, Tomago	2700	East
	2139 Pacific Highway, Heatherbrae	3400	North West
	Old Maitland Road, Hexham	3600	West
	Pacific Highway, Hexham	3900	South West
	Pacific Highway, Sandgate	4000	South West

8.3. Operational activities / equipment

Table 8.2 provides the proposed indoor operational activities and equipment for each building which have been used in this assessment.

Table 8.2. Proposed Indoor Operational Activities and Equipment.

Building No.	Operational Activities	Equipment Item	Make	Model	Capacity (tonnes)
Building 1	Materials Recovery Facility - MRF sorting and RDF production	Loader	Liebherr	L514	6
		Loader	Caterpillar	IT38G	7.6
		Material Handler	Liebherr	LH22	22
		Excavator	Caterpillar	319D	23
		Forklift	Toyota		2.5
		Forklift	Linde	H25D	2.5
		Forklift	Nissan	FD25T	2.5
		Pre-shredder	Metso	M&J 4000S	17.0
		Screen	Binder Bivitec	KRL/EDS 16600	16.8
		Windshifter	Redox	RSB 1600	11.1
		Fine shredder	Metso	M&J 1550	10.0
		Magnet	Steinert	MAGZ-55-CB1PC	20
		Conveyors	Brentwood	Various	20
		Near-Infrared	MSS	Sapphire	20
	Materials Recycling Facility - Cardboard baling	Baler	Bollegraf	HBC120S	22
Building 2	Food Depackaging Plant	Feed hopper and conveyor into separator	-	-	-
		Separator unit	-	-	-
		Conveyor for emptied packaging	-	-	-
		Conveyor for solid foods	-	-	-
		Pump for liquids	-	-	-
	Drill Mud Recycling Facility	Initial pit	-	-	-
		Pump or filter press	-	-	-
		Bunkers	-	-	-
		Buffer tanks	-	-	-
		Centrifuge	-	-	-
		Bunker storage walls (blocks)	-	-	-

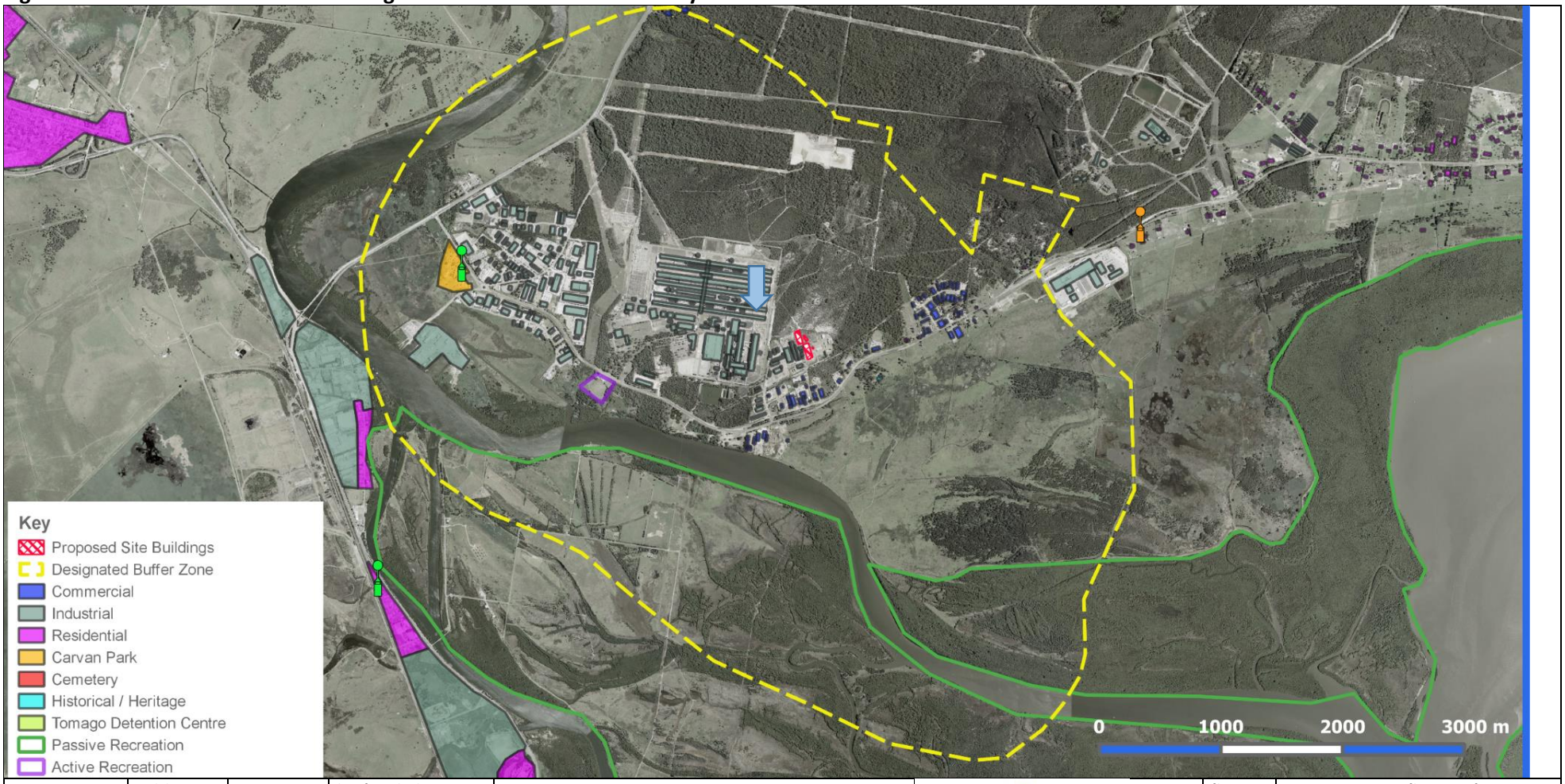
Building No.	Operational Activities	Equipment Item	Make	Model	Capacity (tonnes)
	Garden Organics Primary Processing	Loader (share with Building 1)	Liebherr	L514	6
		Material Handler (share with Building 1)	Liebherr	LH22	22
		Shredder (share with Building 1)	Metso	M&J 4000S	
	Hazardous Waste Recycling Facility	Pallet racking	N/A	N/A	N/A
		Pallet scales	Wedderburn	WS004SBH	N/A
		Elephants Foot Baler	Elephants Foot	Drum Crusher	N/A
		Forklift as per previous plant list	Toyota		2.5
	Copper Processing Area	Sorting table			
		Storage bins			
		Hydraulic cable shear	Daia	CR-100	N/A
		Electric cable stripper	Diebels	RMH 30	N/A
		Forklift and Material Handler as per previous plant list.	Toyota		2.5
	Metals Recycling Facility	Overhead crane (existing)	Demag	32/10T	32
		Material Handler with magnet/shear (share with Building 1)	Liebherr	LH22	22
		Forklift (share with Building 1)	Toyota		2.5
		Bale press (share with Building 1)	Elephants Foot	Drum Crusher	N/A
		Hook lift bins (share with Building 1)	Astec	15 cbm	N/A
		Front end loader (share with Building 1)	Liebherr	L514	6
Building 3	Heavy Vehicle Repair and Maintenance	Variety of drills, grinders, welders, hoists, pneumatic tools and hand tools	-	-	-

Table 8.3. provides the (estimated) overall and octave band sound pressure levels (reverberant) for the proposed indoor equipment associated with each building. These levels have been based on the Waves Consulting noise database for similar equipment and activities.

Table 8.3. Estimated Reverberant Sound Pressure Level of the Proposed Indoor Equipment.

Description	Overall LAeq (dB re 20 µPa)	Octave Band Centre Frequency (Hz) Leq (dB re 20 µPa)							
		63	125	250	500	1000	2000	4000	8000
Building 1	85	81	78	77	76	83	76	74	70
Building 2	89	91	90	87	84	85	82	78	70
Building 3	85	81	78	77	76	83	76	74	70

Figure 8.1. Site location and surrounding area. Site location indicated by blue arrow.



Date	Revision	Drawn By	Site description
11/08/2020	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536

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Client	REMONDIS Australia Pty Ltd
Project	Environmental Impact Assessment
Title	Overview of the Surrounding Area
Scale	As shown
Source	Waves Acoustic Consulting Pty Ltd

8.4. Operational hours

The proposed operational hours are summarised in Table 8.4.

Table 8.4. Summary of Operational Hours.

Operational Activity	Hours
Opening hours (staffed)	24 hrs / 7 days a week
Waste deliveries	
Waste processing	
Product transferred off-site	

The proposed operational hours means that all noise generating activities at the site occur during the night-time period as per the NSW NPI assessment periods. The worst-case noise impacts will therefore occur during the night-time periods when the operational noise criteria are at their lowest.

8.5. Operational traffic generation

The maximum future operation of the site is estimated to generate up to 348 vehicle trips per day i.e. 174 inbound and 174 outbound trips. Averaged over a 24-hour working day this equates to 15 vehicle movements (in or out) per hour. The breakdown of vehicle movements is summarised in Table 8.5 below.

Table 8.5. Summary of Vehicle Movements.

Vehicle Type	Number of Vehicle Movements (inbound / outbound)
Front lift trucks	30
Hook lift trucks	60
Rear lift trucks	9
Tanker trucks	20
SuperVac trucks	9
Walking floor trucks	6
Tautliner trucks	2
Hiab trucks	4
Merrell trucks	10
Workshop truck	10
Cardboard bale trucks - semi-trailers	10
Depackaging plant and Garden Organics	4
Total	**174**

Vehicles accessing and egressing the site will travel to and from the Pacific Highway via Tomago Road and School Drive.

8.6. Summary of potential noise impacts

8.6.1. Construction

The construction required at the site to prepare the development for operation is minimal. The construction scenarios include:

- Parking depot hardstand at the 21F School Drive site;
- Minor works to install the weighbridge at the 21D School Drive site; and
- Excavation of the OSD basin at the 21F School Drive site.

The overall time period for construction is anticipated to be 4 to 6 weeks. Table 8.6 illustrates the anticipated construction activities / plant items proposed during the construction works at the site.

Table 8.6. Proposed Construction Plant Information and Sound Power Levels LWA.

Construction Item	Make / Model	Capacity (tonnes)	Estimated Sound Power Level LWA (dB re 1pW)	No. of Days	Construction Scenario
Excavator	CAT 329F	~35	105	45	OSD basin construction, drainage infrastructure
Front end loader	Volvo L150	~35	108	45	Bulk movement of soil and loading trucks
Grader	-	~35	108	45	Truck depot pad bulk earthworks
Bulldozer	-	~35	110	45	Truck depot pad grading
Dump truck	-	~25	100	45	Import of road base and transport of excavated material off-site
Roller	-	~ 35	109	45	Truck depot pad construction

8.6.2. Operation

Potential noise impacts from operation of the proposed development which will be assessed in the NVIA include:

- Noise emission from the fixed noise sources associated with the development to any nearby sensitive receivers i.e. mechanical services and processing activities noise emission through the facade of the buildings.
- Noise emission from vehicle movements on site to any nearby sensitive receivers i.e. delivery trucks and forklifts.
- Additional noise emission from vehicle movements on the adjacent roads to any nearby sensitive receivers.

8.7. Summary of potential vibration impacts

The offset distances (in all directions) between any vibrationally intensive equipment and any sensitive receivers is large (> 100 m). The potential for vibration impacts due to the construction or operation of the development are effectively nil. All vibration criteria with respect to cosmetic damage to buildings and human comfort impacts will be satisfied as a result. No further consideration of vibration impacts is given.

8.8. Noise measurements

8.8.1. Unattended noise monitoring

To characterise the existing acoustic environment in the area, a survey of environmental noise levels was conducted from 11 June to Saturday 20 June 2020. The noise logger was installed adjacent to the residential property at 159 Tomago Road, Tomago, NSW (see Figure 8.1). Full details of the methodology used for the Noise and Vibration Impact Assessment is contained in the report in Appendix G.

8.8.2. Unattended noise monitoring results

To define the applicable environmental criteria at nearby noise sensitive receivers the measured data has been processed in accordance with the time periods stipulated by the EPA NSW *Noise Policy for Industry* (NPI). Table 8.7 details the background and ambient noise levels recorded during the NSW NPI daytime, evening, and night-time assessment periods.

The environmental noise in the area is typically dominated by road traffic on the surrounding local roads and distant industrial hum. Flora and fauna noise were also found to be contributing sources of noise in the environment.

8.8.3. Attended noise measurements

Attended measurements of ambient noise were taken at several representative locations on 11 June 2020. These have been used to determine the various noise sources that influence the existing noise environment. During each measurement, the observer noted the various noise sources and the contributing noise level. The noise environment at each of the attended monitoring locations is described Table 8.8.

The environmental noise in the area is typically dominated by industrial noise and road traffic on the nearby Tomago Road and the Pacific Highway and other surrounding local roads. Flora and fauna noise were also found to be contributing sources of noise in the environment.

Table 8.7. Measured Noise Levels Corresponding to NSW NPI Assessment Periods.

Date	LAF90 Background Noise Levels			LAeq Ambient Noise Levels		
	Day	Evening	Night	Day	Evening	Night
Thursday, 11 June 2020		42	38		59	58
Friday, 12 June 2020	41	40	37	64	60	56
Saturday, 13 June 2020	34	36	30	61	57	51
Sunday, 14 June 2020	40	36	35	62	58	59
Monday, 15 June 2020	43	38	37	64	67	60
Tuesday, 16 June 2020	40	36	37	63	59	58
Wednesday, 17 June 2020	40	39	36	62	59	58
Thursday, 18 June 2020	41	40	35	62	59	58
Friday, 19 June 2020	39	36	31	63	61	56
Saturday, 20 June 2020	37	32	31	62	57	52
RBL	**40**	**37**	**35**	-	-	-
Log Ave	-	-	-	**63**	**61**	**57**
Total Valid Periods	**9**	**10**	**10**	**9**	**10**	**10**
Total Invalid Periods	**1**	**0**	**0**	**1**	**0**	**0**
Total Periods	**10**	**10**	**10**	**10**	**10**	**10**

Note 1. For Monday to Saturday, Daytime 0700 to 1800 hrs, Evening 1800 to 2200 hrs, Night-time 2200 to 0700 hrs.
For Sundays and Public Holidays, Daytime 0800 to 1800 hrs, Evening 1800 to 2200 hrs, Night-time 2200 to 0800 hrs.

Note 2. The RBL noise level is representative of the *median background sound level* (in the absence of the source under consideration), or simply the background level.

Note 3. The L_{Aeq} is essentially the *average sound level*. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound of the same duration.

Table 8.8. Attended Noise Monitoring Results.

Measurement Location	Measured Noise Levels (dB re 20 µPa)			Character of the Ambient Noise
	LAeq	LAFMax	LAF90	
Unattended Logger adjacent to 159 Tomago Road, Tomago	64	80	46	Traffic noise from the Tomago Road, distant industrial noise and flora and fauna noise.
Adjacent to 2139 Pacific Highway, Heatherbrae.	68	75	61	Local traffic movements, traffic noise from the Pacific Highway, industrial noise and flora and fauna noise.
Adjacent to Old Maitland Road, Hexham.	72	81	61	Local traffic movements, traffic noise from the Pacific Highway, industrial noise and flora and fauna noise.
Adjacent to the Caravan Park at 819 Tomago Road, Tomago	66	77	53	Traffic noise from the Tomago Road, local industrial noise and flora and fauna noise.

8.9. Operational noise modelling

8.9.1. Operational scenarios

The proposed operational scenarios can be summarised as per Table 8.9 below. We note that all noise generating activities at the site occur during the night-time period (i.e. between 2200 hr and 0700 hrs) as per the NSW NPI assessment periods. The worst-case noise impacts will therefore occur during the night-time periods when the operational noise criteria are at their lowest.

Table 8.9. Proposed Operational Scenarios

Time of Day	Description of Operational Noise Sources in Worst-Case 15-minute Period
Day (0700 to 1800 hrs) Evening (1800 to 2200 hrs) Night-time (2200 to 0700 hrs)	**Materials Handling / Stockpiling** – Front end loader and excavator full load (i.e. max engine revs) operation for 50% of the time. Moving throughout the site between processing and stockpiling zones. **Processing**– constant processing activities inside the buildings with all facades and openings (louvres and doors) OPEN. **Deliveries / Truck Movements** – Up to three (3) B-Doubles / Semi articulated trucks and two (2) lift trucks moving throughout the site. Full load (i.e. max engine revs) operation for 50% of the time

8.9.2. Fixed operational noise source levels

The simulated worst-case fixed operational noise sources include:

- Processing activities inside the new buildings comprise:
    a. Internal reverberant sound pressure levels occur for up to 50% of the time in each building.
    b. The metal recycling facility in Building 2 has the sides of the canopy (to the east and west) permanently OPEN.
    c. All doors are OPEN during processing activities.
    d. All louvres are OPEN during processing activities.
    e. The minimum sound insulation performance of the building facade is assumed to be at least 25 dB Rw. This is a conservative assumption based on the 1 mm corrugated steel facade construction of all buildings on site.
- Mechanical services plant (medium sized AC plant) associated with the building offices operates 24 hrs a day 7 days a week with an estimated Sound Power Level of 80 dB LWA.

8.9.3. Mobile operational noise source levels

Mobile operational noise sources include:

- Delivery vehicles were modelled entering the site from School Drive and then moving around the site as per the site roads shown in Figure 8.1. For a worst-case noise assessment, the loudest vehicle has been assessed which is the B-Double truck with a typical Sound Power Level of 106 dB LWA. Delivery trucks were assumed to operate at full load (i.e. max engine revs) for 50% of the time while manoeuvring around the site.
- Permanent onsite vehicles which move between buildings 1 and 2 on the site. The vehicles were assumed to operate at full load (i.e. max engine revs) for 50% of the time. The permeant onsite vehicles include:
    f. Loader.
    g. Excavator.
    h. Materials Handler.

i. Forklift.

8.9.4. Corrections for Annoying Noise Characteristics

Where a noise source contains certain characteristics, such as tonality, intermittency, irregularity or dominant low-frequency content, there is evidence to suggest that it can cause greater annoyance than other noise at the same noise level. On the other hand, some sources may cause less annoyance where only a single event occurs for a limited duration.

The NPI identifies correction factors for annoying noise characteristics which must be applied to the predicted noise levels before assessing against the PNTLs. All of the noise sources in this report have been assessed, based on the noise data available, for annoying noise characteristics. The proposed operational noise sources are generally broadband in nature and have not demonstrated any annoying characteristics as per the definitions in Fact Sheet C of the NPI.

8.10. Predicted operational noise impacts

8.10.1. NSW Noise Policy for Industry

Noise modelling of the fixed and mobile noise sources has been used to predict the noise emissions from the typical operation of the facility to the surrounding sensitive receivers.

A selection of the predicted worst-case operational noise levels due to onsite noise sources are summarised and compared against the NPI project noise trigger levels in Table 8.10 below.

The noise contour maps for the day, evening and night-time periods are taken at 1.5 m elevation to simulate first storey receivers (i.e. typical residential receivers in the area). The noise contours show how the noise emission from the proposed development propagates into the surrounding environment.

Table 8.17 also demonstrates that the potential for noise impacts during the night-time which have potential for sleep disturbance events are nil. The sleep disturbance PNTLs are satisfied as result.

The PNTLs at all nearby passive recreational, active recreational, commercial and industrial receivers are also satisfied.

Since the PNTLs are satisfied at all nearby noise-sensitive receivers no mandatory operational noise mitigation measures are required as a result. However, to reduce the potential noise impacts even further, we recommend that existing doors are closed during the waste processing whenever practicable (note this recommendation is not required to achieve the PNTLs for the project and is at the discretion of the proponent).

Table 8.10. Predicted Operational Noise Levels Compared to PNTLs.

Location	Worst-Case LAeq,15m			PNTLs Exceedance LAeq,15m			LAeq,15m Sleep Disturbance
	Day	Eve	Night	Day	Eve	Night	
Industrial Inside EBZ				**68**	**68**	**68**	**-**
21 I School Drive, Tomago	<60	<60	<60	0	0	0	0
Tomago Smelter	<60	<60	<60	0	0	0	0
Commercial Inside EBZ				**63**	**63**	**63**	**-**
21B School Drive, Tomago	<50	<50	<50	0	0	0	0
23 School Drive, Tomago	<50	<50	<50	0	0	0	0
37 School Drive, Tomago	<50	<50	<50	0	0	0	0
49 School Drive, Tomago	<50	<50	<50	0	0	0	0
Passive Recreation Inside EBZ				**48**	**48**	**48**	**-**
Tomago House, Tomago Road, Tomago	<40	<40	<40	0	0	0	0
Tomago House Chapel, 423 Tomago Road, Tomago	<40	<40	<40	0	0	0	0
Hunter Wetlands National Park	<40	<40	<40	0	0	0	0
Active Recreation Inside EBZ				**53**	**53**	**53**	**-**
Tomago Bowling Club, 657 Tomago Road, Tomago	<40	<40	<40	0	0	0	0
Residential Inside EBZ				**45**	**42**	**40**	**40**
Tomago Detention Centre, 587 Tomago Road, Tomago	<30	<30	<30	0	0	0	0
Tomago Village Caravan Park, 819 Tomago Road, Tomago	<30	<30	<30	0	0	0	0
374 Tomago Road, Tomago	≤37	≤37	≤37	0	0	0	0
362 Tomago Road, Tomago	≤36	≤36	≤36	0	0	0	0
308 Tomago Road, Tomago	<30	<30	<30	0	0	0	0
5 Graham Drive, Tomago	<30	<30	<30	0	0	0	0
Passive Recreation Outside EBZ				**48**	**48**	**48**	**-**
Hunter Wetlands National Park	<30	<30	<30	0	0	0	0
Botanic Gardens 2100 Pacific Highway, Heatherbrae	<30	<30	<30	0	0	0	0
Sandgate Cemetery	<30	<30	<30	0	0	0	0

Location	Worst-Case LAeq,15m			PNTLs Exceedance LAeq,15m			LAeq,15m Sleep Disturbance
	Day	Eve	Night	Day	Eve	Night	
Residential Outside EBZ				**42**	**40**	**38**	**40**
175 Tomago Road, Tomago	<30	<30	<30	0	0	0	0
2139 Pacific Highway, Heatherbrae	<30	<30	<30	0	0	0	0
Old Maitland Road, Hexham	<30	<30	<30	0	0	0	0
Pacific Highway, Hexham	<30	<30	<30	0	0	0	0
Pacific Highway, Sandgate	<30	<30	<30	0	0	0	0

8.10.2. NSW Road Noise Policy

Any vehicles associated with the development will exit the site and join School Drive to travel through the industrial zone. At the end of School Drive the vehicles will join Tomago Road and continue to the Pacific Highway. Noise impacts inside the industrial zone due to these vehicle movements are negligible. However, as the vehicles exit the industrial zone, they may connect with the other transport routes along the Tomago Road and the Pacific Highway.

Comparing the applicable RNP criteria from Table 8.13 to the measured traffic noise along Tomago Road and the Pacific Highway from Table 8.8, we find that the RNP criteria are already likely to be exceeded. Based on this, the allowable increase in noise due to traffic from the proposed site must not exceed 2 dB as per the RNP requirements.

To calculate the traffic noise impacts generated by the operation of the development the existing road traffic volumes for Tomago Road and Pacific Highway (nearest impacted roads) are required. Existing traffic data for Tomago Road was supplied via the traffic assessment report by SECA solution (Refer to Section 9 and Appendix H). Existing traffic data for the Pacific Highway was obtained from the Roads and Maritimes Services (RMS) website *Traffic Volume Viewer*.

The increase in traffic volumes due to proposed operation of the site are taken from Table 8.5.

Table 8.11 summarises the predicted increase in noise levels on the nearest affected roads due to the traffic generated by the proposed development site.

Table 8.11. Summary of Traffic Noise Increases on Surrounding Roads (from available traffic data).

Road	Existing Traffic		Increase in Traffic (due to site)		Increase in Noise Levels dB
	Volume per Day	**Percentage Heavy Vehicles %**	**Volume per Day**	**Percentage Heavy Vehicles %**	
Tomago Road[1]	~9,320	12	348	100	<0.5
Pacific Highway[2]	42,589	4			<0.1

Note: 1. As per Seca peak hourly data with a conservative x10 factor to convert to estimated daily volumes.
2. 2020 data set taken 100 m south of Tomago Road / Pacific Highway junction.

Since the existing traffic noise levels on Tomago Road and the Pacific Highway already exceed the RNP criteria, all new traffic noise increases must satisfy the 2 dB increase criteria. Table 8.11 shows that the proposed development generates negligible additional traffic noise. The RNP criteria are satisfied as a result.

8.11. Construction noise and vibration assessment

8.11.1. Construction hours

For this project, the construction works would be undertaken in accordance with the Interim Construction Noise Guideline and would typically occur during the standard working hours between:

- 0700 to 1800 hrs Monday to Friday.
- 0800 to 1300 hrs on Saturdays.

There will be no construction works on Sundays or public holidays.

Where Out-of-Hours Works (OOHWs) are required (for emergency works, oversized equipment delivery, etc) they would be subject to separate approval on a case-by-case basis.

8.11.2. Noise management levels for construction activities

The ICNG requires proposal specific Noise Management Levels (NMLs) to be established for noise affected receivers. In the event construction noise levels are predicted to be above the NMLs, all feasible and reasonable work practices are investigated to minimise noise emissions.

Having investigated all feasible and reasonable work practices, if construction noise levels are still predicted to exceed the NMLs then the potential noise impacts would be managed via site specific construction noise management plans, to be prepared in the detailed design phase.

The ICNG provides an approach for determining $L_{Aeq,15min}$ NMLs at residential receivers by applying the measured $L_{AF90,15min}$ rating background noise levels (RBL), as described in Table 8.12.

Table 8.12. Determination of NMLs for Residential Receivers.

Time of Day	NML LAeq,15min	Time of Day
Standard hours Monday to Friday 0700 to 1800 hrs Saturday 0800 to 1300 hrs No work on Sundays or public holidays	RBL + 10 dB	The **noise affected level** represents the point above which there may be some community reaction to noise. Where the predicted or measured LAeq,15min is greater than the noise affected level, the proponent should apply all feasible and reasonable work practises to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	≥ 75 dB (Highly Noise Affected)	The **highly noise affected level** represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restructuring the hours that the very noisy activities can occur, taking into account: ▪ Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools or mid-morning or mid-afternoon for works near residences. ▪ If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended hours	RBL + 5 dB	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practises have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.

Note 1: Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

Note 2: The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the NSW Noise Policy for Industry (NPI).

Where construction would be undertaken during the night-time period the potential for sleep disturbance should be assessed. However, this project will not conduct any construction works during the night-time period. Therefore, construction related sleep disturbance impacts will be nil and considered no further in this assessment. Table 8.13 includes the applicable fixed NMLs for the other noise sensitive receivers which are potentially affected by construction on the site.

Table 8.13. Construction NMLs for Residential Receivers.

Receiver	Time of Day	Construction NMLs LAeq,15min (dB)		
		Standard Hours	Out-of-Hours	Highly Noise Affected
Residential	Day	50	45	75
	Evening	N/A	42	75
	Night-time	N/A	40	75
Passive Recreation	Day	60	60	75
	Evening	N/A	60	75
	Night-time	N/A	60	75
Active Recreation	Day	65	65	75
	Evening	N/A	65	75
	Night-time	N/A	65	75
Commercial	Day	65	65	75
	Evening	N/A	65	75
	Night-time	N/A	65	75
Industrial	Day	75	75	75
	Evening	N/A	75	75
	Night-time	N/A	75	75

8.11.3. Construction traffic noise

When trucks and other vehicles are operating within the boundaries of the various construction sites, road vehicle noise contributions are included in the overall predicted LAeq,15min construction site noise emissions and then compared against the NMLs. When construction related traffic moves onto the public road network a different noise assessment methodology is appropriate, as vehicle movements would be regarded as 'additional road traffic' rather than as part of the construction site.

The ICNG does not provide specific guidance in relation to acceptable noise levels associated with construction traffic. For assessment purposes, guidance is taken from the RNP; however, it is noted that these are taken as noise goals only and are not mandatory.

One of the objectives of the RNP is to apply relevant permissible noise increase criteria to protect sensitive receivers against excessive decreases in amenity as the result of a proposal. In assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

On this basis, construction traffic NMLs set at 2 dB above the existing road traffic noise levels during the daytime and night-time periods are considered appropriate to identify the onset of potential noise impacts. For any increase of more than 2 dB then consideration should be given to applying feasible and reasonable noise mitigation measures to reduce the noise impacts and preserve acoustic amenity.

8.11.4. Construction vibration

An example of the recommended safe working distances for vibrationally intensive plant is provided in Table 8.14.

Table 8.14. Recommended Safe Working Distances for Vibration Intensive Plant.

Plant Item	Rating / Description	Safe Working Distance	
		Cosmetic Damage[1]	Human Response[2]
Vibratory Roller	< 50 kN (Typically 1-2 tonnes)	5 m	15 m to 20 m
	< 50 kN (Typically 2-4 tonnes)	6 m	20 m
	< 50 kN (Typically 4-6 tonnes)	12 m	40 m
	< 50 kN (Typically 7-13 tonnes)	15 m	100 m
	< 50 kN (Typically 13-18 tonnes)	20 m	100 m
	< 50 kN (Typically > 18 tonnes)	25 m	100 m
Large Hydraulic Hammer	1600 kg – 18 to 34t excavator	22 m	73 m
Vibratory Pile Driver	Sheet piles	2 m to 20 m	20 m
Pile Boring	≤ 800 mm	2 m (nominal)	N/A
Jackhammer	Handheld	1 m (nominal)	Avoid contact with structure

Note 1: Referenced from British Standard BS 7385 Part 2-1993.
Note 2: Referenced from Assessing Vibration: A Technical Guideline.

The typical offset distance between any vibrationally intensive construction plant and the nearest residential receivers is > 100 m. Comparing the residential offset distance to the safe working distances shows that all residential receivers are located much further away than the safe working distances. Therefore, the potential for vibration impacts due to the construction of the development is effectively nil. All vibration criteria with respect to cosmetic damage to buildings and human comfort impacts will be satisfied. No further consideration of vibration impacts is given in this assessment as a result.

8.12. Construction noise modelling

8.12.1. Construction scenarios and noise sources

The construction required at the site to prepare the development for operation is minimal. The construction scenarios include:

- Parking depot hardstand at the 21F School Drive site
- Minor works to install the weighbridge at the 21D School Drive site.
- Excavation of the OSD basin.

The overall time period for construction is anticipated to be 4 to 6 weeks. Table 8.15 illustrates the anticipated construction activities / plant items proposed during the construction works at the site.

Table 8.15. Proposed Construction Plant Information and Sound Power Levels LWA.

Construction Item	Capacity (tonnes)	Estimated Sound Power Level LWA (dB re 1pW)	No. of Days	Construction Scenario
Excavator	~35	105	45	OSD basin construction, drainage infrastructure
Front end loader	~35	108	45	Bulk movement of soil and loading trucks
Grader	~35	108	45	Truck depot pad bulk earthworks
Bulldozer	~35	110	45	Truck depot pad grading
Dump truck	~25	100	45	Import of road base and transport of excavated material off-site
Roller	~ 35	109	45	Truck depot pad construction

The ICNG recommends that the realistic worst-case or conservative noise levels from the source should be predicted for assessment locations representing the most noise-exposed residences or other sensitive land uses. For most construction activities, it is expected that the construction noise levels would frequently be lower than predicted as the intensity of use and location of the construction equipment will vary throughout the site and throughout the day.

To simulate a realistic worst-case construction scenario the model will assume that all equipment is present on site and that each piece of equipment is operating at full load for 50% of the time.

8.12.2. Construction traffic volumes

The proposed construction traffic movements are summarised in Table 8.16.

Table 8.16. Summary of Construction Traffic Volumes.

Type of Vehicle	Total Vehicles per Day
B - Double Truck	4

8.13. Predicted construction noise impacts

The following section details the assessment of potential airborne noise impacts associated with the construction of the proposal. Construction noise goals have been determined based on the relevant government guidelines and industry standards. Potential noise levels have been predicted at sensitive receivers for the proposed construction activities and where levels are above the goals, feasible and reasonable impact mitigation measures are considered.

8.13.1. Construction noise impacts from on-site noise sources

The typical $L_{Aeq,15m}$ noise levels at the surrounding noise sensitive receivers are provided in Table 8.17 and are representative of the 'noisiest' construction periods allowing for the simultaneous operation of noise intensive construction equipment.

During standard construction hours no exceedances of the NMLs are predicted at all the noise sensitive receivers surrounding the site both inside and outside the Environmental Buffer Zone. This assessment has only considered construction activities inside standard construction hours. Where this is not possible then any OOHWs would be subject to separate approval on a case-by-case basis.

Noise levels are not predicted to exceed 75 dB LAeq,15m at any receivers. Therefore, no receivers are found to be highly noise affected as per the ICNG.

8.13.1.1. Standard mitigation measures

When construction noise levels are predicted to exceed the NMLs the ICNG recommends that construction noise mitigation measures should be considered, where reasonable and feasible. Standard construction noise mitigation measures include the following:

- Avoiding the coincidence of noisy plant working simultaneously close together would result in reduced noise emissions.
- Equipment which is used intermittently is to be shut down when not in use.
- Where possible, equipment with directional noise emissions should be oriented away from sensitive receivers.
- Regular compliance checks on the noise emissions of all plant and machinery used for the proposal would indicate whether noise emissions from plant items were higher than predicted. This also identifies defective silencing equipment on the items of plant.
- Non-tonal reversing alarms should be used on all items of plants and heavy vehicles used for construction.

This assessment found no exceedances of the NMLs surrounding the site. However, we note that the above standard mitigation measures are good practise and should be implemented whenever practicable.

Table 8.17. Predicted Construction Noise Levels.

Location	Worst-Case LAeq,15m			NMLs Exceedance LAeq,15m		
	Day	Eve	Night	Day	Eve	Night
Industrial Inside EBZ				**75**	**75**	**75**
21 I School Drive, Tomago	<50	<50	<50	0	0	0
Tomago Smelter	<50	<50	<50	0	0	0
Commercial Inside EBZ				**65**	**65**	**63**
21B School Drive, Tomago	<50	<50	<50	0	0	0
23 School Drive, Tomago	<50	<50	<50	0	0	0
37 School Drive, Tomago	<50	<50	<50	0	0	0
49 School Drive, Tomago	<50	<50	<50	0	0	0
Passive Recreation Inside EBZ				**60**	**60**	**60**
Tomago House, Tomago Road, Tomago	<40	<40	<40	0	0	0
Tomago House Chapel, 423 Tomago Road, Tomago	<40	<40	<40	0	0	0
Hunter Wetlands National Park	<40	<40	<40	0	0	0
Active Recreation Inside EBZ				**65**	**65**	**63**
Tomago Bowling Club, 657 Tomago Road, Tomago	<40	<40	<40	0	0	0
Residential Inside EBZ				**50**	**50**	**50**
Tomago Detention Centre, 587 Tomago Road, Tomago	<40	<40	<40	0	0	0
Tomago Village Caravan Park, 819 Tomago Road, Tomago	<40	<40	<40	0	0	0
374 Tomago Road, Tomago	<40	<40	<40	0	0	0
362 Tomago Road, Tomago	<40	<40	<40	0	0	0
308 Tomago Road, Tomago	<40	<40	<40	0	0	0
5 Graham Drive, Tomago	<40	<40	<40	0	0	0
Passive Recreation Outside EBZ				**60**	**60**	**60**
Hunter Wetlands National Park	<40	<40	<40	0	0	0
Botanic Gardens 2100 Pacific Highway, Heatherbrae	<40	<40	<40	0	0	0
Sandgate Cemetery	<40	<40	<40	0	0	0

Location	Worst-Case LAeq,15m			NMLs Exceedance LAeq,15m		
	Day	Eve	Night	Day	Eve	Night
Residential Outside EBZ				50	50	50
175 Tomago Road, Tomago	<40	<40	<40	0	0	0
2139 Pacific Highway, Heatherbrae	<40	<40	<40	0	0	0
Old Maitland Road, Hexham	<40	<40	<40	0	0	0
Pacific Highway, Hexham	<40	<40	<40	0	0	0
Pacific Highway, Sandgate	<40	<40	<40	0	0	0

8.13.2. Construction noise impacts from construction traffic

To calculate the traffic noise impacts generated by the construction of the development the existing road traffic volumes for Tomago Road and Pacific Highway (nearest impacted roads) are required. Existing traffic data for Tomago Road was supplied via the traffic assessment report by SECA solution (refer to Appendix H). Existing traffic data for the Pacific Highway was obtained from the Roads and Maritimes Services (RMS) website *Traffic Volume Viewer*.

Table 8.18 summarises the predicted increase in noise levels on Tomago Road and the Pacific Highway due to the construction traffic generated by the proposed development site.

Table 8.18. Summary of Construction Traffic Noise Increases on Surrounding Roads (from available traffic data)

Road	Existing Traffic		Increase in Traffic (due to site)		Increase in Noise Levels dB
	Volume per Day	Percentage Heavy Vehicles %	Volume per Day	Percentage Heavy Vehicles %	
Tomago Road[1]	~9,320	12	4	100	<0.1
Pacific Highway[2]	42,589	4			<0.1

Note: 1. As per Seca peak hourly data with a conservative x10 factor to convert to estimated daily volumes.
2. 2020 data set taken 100 m south of Tomago Road / Pacific Highway junction.

Table 8.18 shows that the proposed development generates negligible additional traffic noise. The RNP 2 dB increase criteria are satisfied as a result.

8.14. Conclusion

Waves Consulting conducted a noise and vibration impact assessment of the proposed development at 21D & 21F School Drive, Tomago, NSW. This assessment has investigated the worst-case noise emissions associated with the construction and operation of the facility.

This assessment has demonstrated that the predicted noise emissions from the site to the surrounding environment are low. The proposed development satisfies the Project Noise Trigger Levels (PNTLs) of the *NSW Noise Policy for Industry* (NPI) during all time periods at all nearby noise-sensitive receivers. No operational mitigation measures are required at the site.

The sleep disturbance impacts from the operational noise events generated by the site where investigated in this assessment. The proposed development satisfies the sleep disturbance trigger levels at all nearby sensitive receivers.

The existing traffic noise levels on the nearby affected roads already likely exceed the RNP criteria. Therefore, all new traffic noise increases must satisfy the RNP 2 dB increase criteria. Table 8.18 of this assessment shows that the

proposed development generates negligible additional traffic noise. The *NSW Road Noise Policy* (RNP) criteria are satisfied as a result.

The construction noise impacts have been assessed in accordance with the *NSW Interim Construction Noise Guidelines* (ICNG). During standard construction hours no exceedances of the NMLs are predicted at the closest residential receivers. No receivers were found to be 'highly noise affected' as per the ICNG. Standard noise mitigation measures are not required for the construction phase.

Construction traffic noise levels must satisfy the RNP 2 dB increase criteria. Table 8.25 of this assessment shows that the construction traffic generates negligible additional traffic noise. The NSW Road Noise Policy (RNP) criteria are satisfied as a result.

The offset distances (in all directions) between the vibrationally intensive equipment and any sensitive receivers is large (> 100 m). The potential for vibration impacts due to the construction or operation of the development are effectively nil. All vibration criteria with respect to cosmetic damage to buildings and human comfort impacts will be satisfied as a result.

It is concluded that the proposed Resource Recovery Facility and Truck Parking Depot is a complying development with respect to noise and vibration impacts and is therefore suitable for construction and operation.

9. Traffic and Transport

9.1. Introduction

Seca Solution Pty Ltd were engaged to conduct a Traffic Impact Assessment to assess the potential impacts of the project on the road network as a result of the proposed development. The scope of Traffic Impact Assessment is to review the external traffic movements associated with the proposed development and provide advice on the operation and capacity of key intersections in the locality.

The Traffic Impact Assessment Report is contained in Appendix H. This chapter should be read in conjunction with Appendix H.

In preparing Traffic Impact Assessment, the following guides and publications have been considered:

- Roads Maritime Services (RMS) *Guide to Traffic Generating Developments*, Version 2.2 Dated October 2002
- Austroads Guide to Traffic Management Part 12: *Traffic Impacts of Project*
- Austroads Guide to Road Design Part 4A: *Unsignalised and Signalised Intersections*
- *Port Stephens Development Control* Plan 2014
- *Port Stephens Local Environmental Plan* 2013
- AS2890.1:2004 *Parking Facilities Part 1: off-street car parking*

9.2. Existing environment - Traffic flows

9.2.1. Peak hour flows

Traffic surveys were undertaken during the morning (6:00am to 8:30am) and afternoon (2:00pm to 5:00pm) on Tuesday 6th February 2018, reflecting typical busy periods for the Tomago Industrial area.

The peak traffic demands along Tomago Road between Old Punt Road and the Pacific Highway are eastbound in the AM and westbound in the PM, with 1,198 and 1,151 vehicles respectively. The Guide to Traffic Generating Developments provides advice on urban road peak hour flows per direction. For one lane per direction the peak traffic flows (1,198 vehicles) along Tomago Road are classified as Level of Service (LoS) D. This indicates that drivers are restricted in their freedom to select desired speed and to manoeuvre within the traffic stream during this peak traffic flow period.

The peak demands on Old Punt Road are for 374 vehicles northbound in the AM peak and 357 vehicles southbound in the PM peak, indicating a LoS A with the limit for LoS B being 380 vehicles per hour based on RMS guidelines.

Traffic data has also been collected at the intersection of Tomago Road and McIntyre Road. This survey was completed on Monday 6 July 2020, with the morning peak being between 7:30 AM and 8:30 PM, based on the survey period between 7:30 and 9:30 AM. For the PM peak, the survey extended between 3:00 and 5:30 PM with the peak hour being 3:30 to 4:30 PM.

9.2.2. Daily traffic flows

Peak hour flows typically represent 10% of the daily traffic volumes. Taking the average of the total AM and PM peak hour traffic flows this equates to the following daily traffic volumes:

- Daily flows along Tomago Road (west of Old Punt Road) in the order of 15,800 vehicles per day.
- Daily flows on Tomago Road to the west of McIntyre Road being in the order of 7,500 vehicles per day.
- Daily flows along Old Punt Road (north of Tomago Road) are in the order of 4,600 vehicles per day.

TfNSW sample classifier data is available on Tomago Road, 180 metres north-west of Old Punt Road (Station Id: 05590). Data recorded in 2010 (the most recent data supplied) shows weekday daily flows of 13,401 vehicles evenly distributed in both directions with 12% heavy vehicles. Based on the 2018 daily traffic volumes of 15,780 vehicles obtained from the survey data, there has been a 17.8% increase in traffic flows along Tomago Road in this location between 2010 and 2018 (in the order of 2.2% per annum).

There is also a permanent counter installed on the Pacific Highway, 380 metres south-west of Tomago Road (Station Id: 05001). Data from 2018 indicates weekday daily traffic flows in this location of 52,680 vehicles per day. The weekday daily flows recorded along the Pacific Highway in 2010 were 43,801 vehicles per day, equating to a 20.3% increase in traffic flows between 2010 and 2018 (in the order of 2.5% per annum).

9.2.3. Daily traffic flow distribution

In the morning peak, the dominant movement is to the east along Tomago Road. This would represent employees for the extensive range of developments in the area including through traffic to Williamtown airport and the RAAF base. Traffic flows are tidal with the majority of vehicles observed to travel westbound along Tomago Road in the PM.

Based on the AM and PM survey data, traffic flows along Old Punt Road to the north of Tomago Road also experience a tidal pattern with a northbound bias in the morning peak and a southbound bias in the evening peak.

9.2.4. Heavy vehicle flows

Based on the traffic survey data at the roundabout controlled intersection of Tomago Road and Old Punt Road, heavy vehicle movements represented just under 12% (195 heavy vehicles) of the total vehicle flows in the AM and around 8% (140 heavy vehicles) in the PM.

Given the industrial development positioned along Tomago Road and Old Punt Road there is a requirement for these roads to provide vehicular access to accommodate a demand for a range of heavy vehicles up to and including B-double combinations.

9.3. Proposed development

9.3.1. Design vehicles for access and circulation requirements

Port Stephens Council requires all vehicles to enter and exit the site in a forward direction. The on-site traffic management plan will cater for this requirement. Truck sizes will vary with the typical refuse truck being a 12.5 metres rigid and larger trucks for specialist material and removal of product being 19 m semi-trailers. A fuel truck will also access the site which will be a 19 metre semi-trailer.

9.3.2. Access location

Access to the development is proposed off School Drive via the existing gated access.

9.3.3. Sight distance

The site access is via the existing access road at the northern end of School Drive and provides a good safe access with good visibility for vehicles entering and exiting the site.

The key intersection impacted upon by the project is the intersection of Tomago Road and McIntyre Road. This is a simple T intersection on Tomago Road with Tomago Road being the priority intersection. Tomago Road in this location provides a straight alignment to maximise sight lines and road safety. The speed limit in this location is 80 km/h. Under Austroads Guidelines, the sight distance requirement is 181 metres desirable and 170 metres minimum. The sight lines have been assessed on site and exceed 200 metres in both directions.

9.3.4. Service vehicle access

The design of the internal access road would allow appropriate circulation for service vehicles, which will typically be similar in size or smaller than the vehicles that will be operating. All service vehicles will be able to enter and exit the site in a forward direction.

Specialist machinery will be used on site for moving waste, with this equipment being based on site permanently and not needing to be removed. These vehicles will be service on site as required.

9.3.5. Queuing at entrances

No vehicle queues are anticipated at the new access road for the project when operational, with no potential hold point along the access road for at least 120 metres, allowing free flow into the site. Access to Public Transport

Only a small number of bus services operate through the locality. This reflects the minimal local demand for these services. There are no formal pedestrian pathways and pedestrians are able to walk along the road verge and reserve where required. It is considered that there will be no demands for access to the site from public transport.

9.3.6. Circulation

9.3.6.1. Pattern of circulation

The internal driveways and layout allow for appropriate circulation for the specific end user and in accordance with the requirements of Port Stephens Council DCP and AS2890. Refer to Appendix D of the Traffic Impact Assessment Report (Appendix H) for Autoturn simulation demonstrating access to all bays within the buildings.

9.3.6.2. Parking proposed supply

The project shall utilise the existing parking supply on site, with 66 parking spaces provided on site for staff parking demands. There is also a space for 9 rigid trucks to be parked adjacent to Building 1. This will provide parking for 24 rigid trucks and 9 semi-trailers for overnight parking demands associated with the project needs. One of the existing buildings will also be used for parking 6 rigid trucks overnight.

The peak on-site staff number is 63 requiring 63 parking spaces. This includes the sales staff who are not on site for the majority of the day. The on-site parking provision is 66 which shall accommodate this peak parking demand.

The project shall provide a dedicated parking area for trucks associated with the project. All trucks shall be parked up overnight on site with a site-specific management plan to control the movement of these trucks. The parking area allows for the parking of all trucks for the site and access has been assessed with Autoturn to confirm that the layout can accommodate these trucks.

Port Stephens Council DCP does not specify a parking rate for this type of land use. However, industrial uses would typically allow 1 parking space per employee with sufficient parking to cater for shift changeover and the operational requirements of the facility. The parking provision on site will meet this requirement to allow for all staff vehicles to be parked on site.

9.4. Transportation analysis

9.4.1. Staff movements

The operational stage may have up to 60 staff at any time including management, administration, and maintenance personnel on rotating shifts. Minimal visitors are expected, and with no general public access permitted there are no other traffic demands. The facility will be open 24 hours a day and 7 days week, with the core staff located on site during normal working hours 7 days a week.

9.4.1.1. Heavy vehicle movements

Heavy vehicles will include inbound waste product via trucks together with sorted outbound material. There will be 174 inbound and 174 outbound truck movements per day generated by the project. The inbound material is carried in a mixture of 12.5 metre rigid trucks, 19 metre semi-trailers and truck and dog combinations. Outbound material is removed via a mixture of 19 metre tankers and semi-trailers.

9.4.2. Impact on road safety

It is considered that the additional traffic volumes associated with the project would have an acceptable impact on traffic safety in the locality, which accommodates high traffic demands during the peak periods as well as currently carrying heavy vehicles associated with industrial use in this location.

It is also noted that the former use on the site was for industrial use, which included heavy vehicle movements in and out of the site.

The majority of traffic would have an origin/destination along the Pacific Highway with all traffic accessing Tomago Road via the existing intersection of Tomago Road and McIntyre Road. This intersection allows for all turning movements and the historic accident data shows that there has been one minor accident near this intersection. The intersection is located on a straight section of road, offering good visibility for all drivers approaching this intersection. Whilst there is no sheltered right turn, the existing traffic demands for this right turn are very low (7 in the AM peak and 4 in the PM peak from the surveys completed by Seca Solution) there is a sealed shoulder that allows for through traffic movements. The project will have 90% of the traffic movements being a left turn into McIntyre Road and 90% right turn out, providing a minor increase only in this right turn demand.

The other intersections impacted upon by the project is the roundabout controlled intersection of Tomago Road and Old Punt Road together with the signal-controlled intersection of Tomago Road and the Pacific Highway. Both of these intersections are well laid out and provide a safe and acceptable layout for road users.

It can be seen that when the M1 to Raymond Terrace road upgrade is provided, the access route can alter to allow for the new link road, as well as allow for ongoing use of the traffic signals on Old Punt Road/Pacific Highway and Tomago Road/Pacific Highway. This road upgrade is being designed in accordance with Austroads Guidelines with the design to accommodate heavy vehicle movements associated with the existing industrial users along Tomago Road. It is therefore considered that this road upgrade will provide a safe and appropriate access for heavy vehicles.

9.4.3. Impact of generated traffic

9.4.3.1. Impact on daily traffic flows

The additional daily traffic that would be generated during the peak construction phase of the development is considered to be low, at less than 100 vehicles per day. This would be similar or less than the previous use on the site and will have an acceptable impact upon the local road network.

For the operational stage of the project, the predicted vehicle movements are:

- Staff movements based on 60 staff would be 60 inbound and 60 outbound per day;
- Inbound waste transport 160 outbound and 160 outbound per day;
- Outbound sorted waste transport 14 inbound and 14 outbound per day.

This would give a total of 234 vehicles inbound and 234 vehicles outbound (60 light and 174 heavy each way).

The current traffic flows along Tomago Road to the immediate west of McIntyre Road are 7,500 vehicles per day, indicating that with the development traffic this would increase by around 6% over the existing volumes. These flows are spread out over a number of hours, with limited cross over of inbound and outbound movements.

Traffic associated with the project can then disperse over 3 alternative routes to access the Pacific Highway beyond Tomago:

- North via the new link road to connect to the Pacific Highway north towards Raymond Terrace and beyond;
- Via the existing traffic signal-controlled intersection of Tomago Road and the Pacific Highway to head towards Newcastle; and
- Via the new link road to connect direct to the M1 to Raymond Terrace road link.

Overall, the operational traffic would have a minimal impact on daily traffic flows. It is noted that the M12RT project would see traffic volumes along the Pacific Highway decrease significantly, thereby having a positive impact upon traffic flows in this locality.

9.4.3.2. Peak hour impacts on intersections

The key intersections of the Pacific Highway / Old Punt Road and the Pacific Highway / Tomago Road are controlled by traffic signals, which offer the highest level of road safety and control for drivers. It is considered these intersections have the capacity to cater for the increased flows associated with the operation of the development in a safe manner. In the future, the M12RT project would see significant improvements in the operational efficiency of these intersections having removed significant through traffic.

Table 9.1. shows that nearly all of the trucks leave the site between 4 and 6 AM, when the background traffic flows are relatively low along Tomago Road as well as the arterial road network. Less than 10 trucks are expected to leave the site between 6 and 7 AM. For the returning trucks, the peak period is between 3 to 6 PM.

Table 9.1. The predicted hourly traffic flows associated with the project.

Collection vehicle type - in-bound waste collection vehicles	Approx time of departure from depot	Approx time return to depot
Front lift trucks (30 trucks)	2:00 (10%); 4:00 to 5:00 (90%)	14:00 to 15:00 (10%); 15:00 to 17:00 (90%)
Hook lift trucks (3 with dog trailers which if connected become 19m) (60 trucks)	5:00-6:00	16:00-18:00
Rear lift trucks (9 trucks)	2:00 (33%); 4:00 to 6:00 (67%)	14:00 (33%); 16:00 to 18:00 (67%)
Tanker trucks (1 x tanker dog/trailer to be connected to 1 HRV (20 trucks)	5:00 to 6:00	16:00 to 18:00
SuperVac trucks (includes transfer of liquids offsite) (9 trucks)	5:00 to 7:00	16:00 to 18:00
Walking floor trucks (6 trucks)	6:00	18:00
Tautliner trucks (includes hazardous waste transfers off-site) (2 trucks)	5:00	18:00
Hiab trucks (4 trucks)	6:00	17:00
Merrell trucks (10 trucks)	5:00 to 6:00	16:00 to 18:00
Workshop truck	5:00	18:00
TOTAL		
Collection vehicle type - out-bound vehicles transporting product and waste off site	**Approx. arrival times during day**	
Cardboard bale trucks - semi-trailers (10 trucks)	6:00 to 6:00	
Food from depackaging plant and Garden Organics (4 trucks)	8:00 to 5:00	

Seca Solution have previously completed traffic surveys at the intersection of the Pacific Highway / Old Punt Road on 20th February 2020, during the morning (6-9am) and afternoon (3-5pm). The AM peak hour was determined as 7:30-8:30am, whilst the PM peak was determined as 3:15-4:15pm. This intersection was modelled using Sidra for the existing situation and the results of this assessment are summarised below.

The Sidra results show that the signalised intersection of the Pacific Highway and Old Punt Road is currently operating at overall LoS A in the AM peak and LoS B in the PM peak.

The operation of this intersection sees the majority of green time given to the southbound movements on the Pacific Highway, given this leg sees the highest demands. The survey data indicates a range of cycle times across the AM in the order of 55 seconds to almost 5 minutes, with the phase allowing for the right turn onto Old Punt Road and the separate phase allowing for the right turn out being vehicle actuated and only occurring when there is demand for

these. Cycle times also vary in the PM, however the higher demands on the side road see the phases allowing turn movements to occur more frequently.

As outlined above, the cycle time varies depending on the demands at this intersection. For the purpose of this modelling, the cycle time was determined via the 'Optimum Cycle Time' function in Sidra, with a minimum of 60 seconds and a maximum of 150 seconds applied. The modelling determined a 110 second cycle time for the AM existing scenario, with the PM modelling applying a 70 second cycle time.

It can be seen that the delays on Old Punt Road can be relatively high, due to the bias in the operation of these traffic signals. However, the queues provided by Sidra reflect the queues observed on site, with the low flows providing a of less than 40 metres. It is considered that the minor increase in trucks exiting this intersection to head north on the Pacific Highway associated with the project shall have a minor and acceptable impact upon the overall operation of this intersection.

For the signal-controlled intersection of Tomago Road and the Pacific Highway, observations on site show that there is a high right turn demand into Tomago Road in the morning period, associated with inbound staff movements to the various industrial sites in the Tomago area. At this time, the left turn out of Tomago is low and the trucks associated with the project would be able to turn out at the same time as this heavy right turn into Tomago Road and have no impact upon the operation of this intersection in the morning period.

Similarly, in the afternoon period, there is a heavy left turn demand out of Tomago Road associated with the staff movements leaving the Tomago area in the afternoon. The traffic signals stop the southbound movements on the Pacific Highway to allow for this heavy left turn demand as well as permit the right turn into Tomago Road at the same time. The increased demands associated with the project site on this right turn movement in the PM peak is relatively low and shall not impact upon the overall operation of this intersection.

Of greater note, the proposed upgrade of the Pacific Highway at this location allows for the removal of the majority of through traffic movements at this location, which will significantly increase the capacity at these traffic signals. Recent community consultation indicates that this project could commence in 3 years' time. Until this upgrade is completed, it is considered that the additional truck movements associated with this project shall have a minor and acceptable impact upon the overall operation of this signal-controlled intersection.

9.4.3.2.1. Sidra modelling – McIntyre Road and Tomago Road

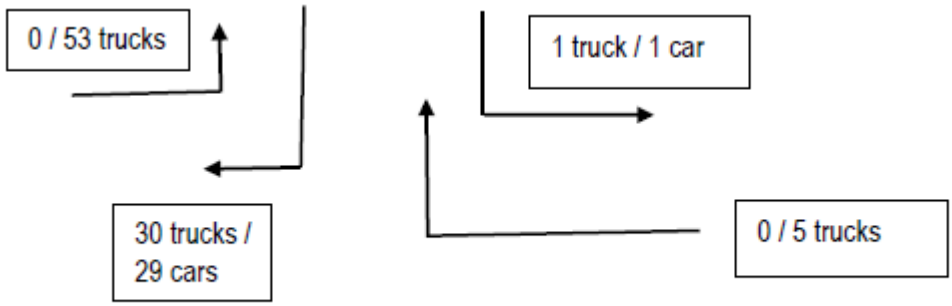
Sidra modelling has been completed for the T intersection of McIntyre Road and Tomago Road to assess its capacity to support the increased traffic demands associated with the proposed development. Three scenarios were considered in the modelling:

- Existing situation;
- Allowing for the additional traffic associated with the proposed operations; and
- Future design year allowing for 2.5% annual growth along Tomago Road over 10 years.

The results confirm the observations on site, with minor delays for all road users. Note that whilst there is no dedicated right turn lane for vehicles turning into McIntyre Road, drivers westbound on Tomago Road slow and pass any vehicle propped waiting to turn right into McIntyre Road and accordingly experience a minor delay only associated with slowing down.

The predicted traffic flows for the project show that the vast majority of the trucks have left the site by 7 AM and as such do not impact on the operation of this intersection. In the afternoon peak, there will however be some trucks returning to the site, with these being a left turn into the site only. There would also be some staff leaving at this time. In the PM peak there is the potential for 58 trucks to be returning to the site – for the AM peak, to ensure a robust assessment, a value of 30 trucks has been assumed to be leaving the site (50% of the PM) to ensure the right turn out of McIntyre Road can operate satisfactorily. In the AM, there will be no staff movements whilst in the PM peak it has been assumed that 30 staff could be leaving the site. This is summarised in Figure 9.5.

Figure 9.5. Assumed traffic generation at Tomago Road / McIntyre Road (AM/PM).



For the current design year of 2020, the intersection will perform well with minor increases in delays, mainly for the traffic turning right out of McIntyre Road in the PM peak. For the future design of 2030, the Sidra modelling shows a potential issue for the right turn out of McIntyre Road in the PM peak. However, there has been no adjustment for the gap acceptance for this right turn out from the default of 7 seconds. Adjusting this gap acceptance to 6 seconds, which is a valid assumption, the level of service for this right turn out improves to B.

From this modelling, it is considered that the existing controls at this intersection will continue to allow for safe access to the site and the overall operation of this intersection will remain good. Whilst the background growth on Tomago Road may increase delays over the next 10 years, driver behaviour at this location will allow for safe turning movements and acceptable delays and queues. The Sidra modelling indicates the queues on McIntyre Road in 2030 may be in the order of 23.5m. School Drive is some 26m back from the hold line on McIntyre Road and as such these queues will not impact vehicles wishing to turn right into School Drive in the afternoon peak period.

The other key intersection potentially impacted upon is the roundabout controlled intersection of Tomago Road and Old Punt Road. This intersection has been modelled with Sidra for the current 2018 flows as well as the future design year of 2028 allowing for 2.5% growth per annum on all traffic movements. The results for the future design year that the roundabout will continue to operate well. It is therefore considered that the additional traffic demands associated with the project shall have a minor impact upon the overall operation of this roundabout.

It is noted that the road network in this location will also alter with the construction of the M1 to Raymond Terrace road upgrade, with a new link road provided that will allow for traffic from the subject site to bypass this roundabout when heading north or towards Maitland.

Overall, the intersection of Tomago Road and Old Punt Road provides sufficient spare capacity to support the proposed development.

9.4.3.3. Impact of construction traffic

The construction traffic associated with the project will be low and as such will have a minor impact upon the operation of the local road network. All construction work would be contained within the site with parking associated with construction staff to be managed within the site, given the large site area. The site will require the movement of heavy vehicles in and out of the site which would need to be safely managed.

9.4.4. Public transport

9.4.4.1. Options for improving services

It is considered that the development would not require the provision of any upgrade of public transport.

9.4.4.2. Pedestrian access to bus stops

No upgrade is required as a result of this development given the minimal local demand for bus services in the area.

9.5. Conclusions

From the site survey work undertaken and the review of the proposed development and associated plans against the requirements of the *Guide to Traffic Generating Developments* and Austroads *Guide to Traffic Management*, it is considered that this project is acceptable with regards to traffic, parking and access.

The project will allow for a re-use of an existing industrial building and will allow for the development of a waste resource management centre. Traffic flows that will be generated by the project have been determined based upon similar sites operated by REMONDIS and this report has assessed the impact of this additional traffic on the local road network. The key intersection that could be impacted upon by the project is that connecting McIntyre Road to Tomago Road. Sidra modelling has been completed for this intersection and shows that whilst some delays may occur in 2030, driver behaviour will continue to allow for safe traffic movements and acceptable delays and minor queues.

The other intersections impacts include the roundabout controlled intersection of Tomago Road and Old Punt Road and the Sidra modelling demonstrates that this will continue to operate very well with minor delays / congestion for the future design year of 2028 and beyond. It is noted that the planned upgrade to provide the M1 to Raymond Terrace Road link will significantly alter the traffic patterns in this location, with new grade separated links and a new link road from Tomago Road that will bypass the roundabout at Tomago Road / Old Punt Road. Whilst no timeframe is confirmed for this road upgrade planning is well advanced and partial funding has been provided.

Parking for the project will utilise the existing on-site provision and will satisfy the demands associated with staff. A dedicated parking area will be provided for the trucks to park on site overnight and has been assessed with Autoturn to ensure that these vehicles can safely enter and exit the layover area. The operation of this area will be enforced through an on-site traffic management plan.

Overall, it is concluded that the project shall have an acceptable impact upon the road network.

10. Biodiversity

10.1. Introduction

Wildthing Environmental Consultants were engaged to conduct a Biodiversity Development Assessment to determine the impact the proposed development would have on biodiversity, avoid and mitigate impacts and calculate the biodiversity offset requirement. The Biodiversity Development Assessment Report (BDAR) has been prepared in accordance with the Biodiversity Assessment Methodology (BAM). This section summarises the findings of the BDAR. The Biodiversity Development Assessment Report is contained in Appendix I. This chapter should be read in conjunction with Appendix I.

This BDAR has two broad stages consistent with the BAM methodology:

Stage 1 – Biodiversity Assessment:

- Assessment of site context features;
- Assessment of native vegetation; and
- Assessment of threatened species and populations.

Stage 2 – Impact Assessment:

- Avoid and minimise impacts on biodiversity values;
- Consider impact and offset thresholds; and
- Determine and calculate offset requirements.

Assessment was also undertaken having regard to Matters of National Environmental Significance (MNES) listed under the *Commonwealth Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act), the *NSW Biosecurity Act* 2015 and relevant State Environmental Planning Policies.

Fieldwork undertaken by Wildthing Environmental Consultants was carried out under the NPWS Scientific Investigation Licence SL 100345 and under Animal Care and Ethics Approval: Animal Research Authority Issue by the Director General of NSW Agriculture (File No. TRIM 13/251) for the Fauna Survey for Biodiversity and Impact Assessment.

All aspects of this biodiversity assessment have been undertaken in accordance with the BAM. This BDAR has been prepared by Accredited Assessor Kylie Bridges (BAAS20005) and reviewed by Accredited Assessor Daryl Harman (BAAS17074).

10.2. Biodiversity assessment

This Section of the report describes the landscape context, including the landscape features present within the study area and a 1500 metre buffer from the edge of the study area, as required by the BAM.

10.2.1. Ibra Bioregion & Subregion

Interim Biogeographic Regionalisation for Australia (IBRA) Bioregions are large, geographically distinct areas of land with common characteristics such as geology, landform patterns, climate, ecological features, and flora and fauna communities. The majority of the study area is located within the NSW North Coast IBRA Bioregion and the Karuah Manning IBRA Subregion.

10.2.2. NSW Landscape Region

The study area falls within the Sydney - Newcastle Barriers and Beachers BioNet Landscape (formerly Mitchell Landscapes) (OEH 2016a).

10.2.3. Rivers and streams

The study area is located within the Hunter Central Rivers Catchment. According to the NSW Government SEED mapping there are no prescribed streams, rivers or dams within the study area.

10.2.4. Wetlands

No important wetlands as defined in the Biodiversity Assessment Method Operational Manual – Stage 1 were found to be present within the study area or occur downstream/adjacent to the study area. No RAMSAR listed wetlands were present within the vicinity of the study area.

10.2.5. Connectivity features

The site is connected to a large area of disturbed and intact vegetation surrounded by industrial development. The area of vegetation is bounded by the Pacific Highway in the west and north connecting to the township of Heatherbrae in the far north, Masonite Road in the east and Tomago Road in the south. Tilligerry State Conservation Area is located on the eastern side of Masonite Road. The area of vegetation has many interconnecting tracks traversing the vegetation as part of the industrial development. The site is on the southern fringe of this large area of vegetation and had previously been bounded by a security mesh wire fence. The fence is currently in a degraded condition, with evidence of smaller macropods entering the site under and between the wire.

10.2.6. Geology topography and soils

According to the Soil Landscapes of the Newcastle 1:100000 Sheet the majority of the study area occurs on Disturbed Terrain which consists of level plain to hummocky terrain, extensively disturbed by human activity, including complete disturbance, removal or burial of soil. The north western and north eastern corners of the site occur on Tea Gardens Variant a (tna) Pleistocene sandsheets with wet heath forest. This soil landscape consists of Pleistocene beach ridges and sandsheets consisting of marine and aeolian quartz sands on the Tomago Coastal Plain. Soils consist of deep, well drained Humus Podzols on ridges with deep, poorly drained Peaty/Humus Podzols in swales and deep, very poorly drained Acid Peats in swamps.

10.2.7. High and outstanding biodiversity areas

The NSW Biodiversity Values Map was consulted on 18 May 2020, at this time it was observed that the site does not contain areas of biodiversity value within the development area. There are currently no declared areas of Outstanding Biodiversity Value under the NSW Biodiversity Conservation Regulation 2017 associated with the site.

10.2.8. Native vegetation extent in the buffer area

The Biodiversity Assessment Method Operational Manual Stage 1 (OEH 2018f) defines 'Native Vegetation Cover' as:

> *The amount of native vegetation (woody and non-woody vegetation including regrowth and plantations comprised of plants native to New South Wales) that is estimated to remain in the landscape proximal to the assessment area. It is used:*
>
> - *as a filter by the Calculator to predict threatened species likely to occur or use habitat on a site; and*

- *to define the intrinsic rate of increase in species richness and plant cover as part of the assessment of future vegetation condition on a biodiversity stewardship site*

Native vegetation extent within a 1500m buffer from the edge of the site was estimated from review of aerial mapping interpretation utilising Nearmap aerial imagery (Nearmap 2020).

Native vegetation cover within the buffer area (including the survey area) was determined as the sum of all areas of mapped native vegetation that are likely to be derived from the mapped woodland communities. Approximately 316.66ha of native vegetation was mapped within the 828.88ha buffer area. Native vegetation cover within the buffer area is approximately 38.2%.

10.2.9. Cleared areas

Areas not containing native vegetation within the landscape buffer include roads, agricultural lands, existing development, and waterbodies and waterways (natural and man-made).

10.2.10. Differences between mapped vegetation extent and aerial imagery

There were no significant differences between the mapped vegetation extent and that present within recent available aerial imagery dated 15 June 2020.

10.3. Subject site context

This section describes the vegetation extent present within the subject site, as required by the BAM (OEH, 2019). The habitats and vegetation within the subject site are a small subset of the wider landscape. A full inventory of the flora and fauna species identified within the subject site is provided in the BDAR in Appendix I.

10.3.1. Native vegetation extent in the subject site

It was determined that the study area was composed of 7.82 % of native vegetation.

- Area of study area: 4.09 ha
- Native vegetation extent: 0.32 ha
- Non-native vegetation: 0.96 ha
- Planted gardens: 0.17 ha

10.3.2. Cleared areas and native vegetation

The property 21D contains two large sheds and one smaller shed with associated infrastructure, including storage tanks. The majority of the groundcover consisted of concrete, hardstand and a tarred parking area. Gardens and maintained introduced vegetated groundcover were located within the southern portion of the Lot.

Property 21F is mostly vegetated with a small concrete pad in the centre of the Lot. Large cinder blocks, poles, tyres and other debris was scattered within the northern portion of the Lot.

10.3.3. Differences between mapped vegetation extent and aerial imagery

Aerial imagery used within this report was taken on 15 June 2020 (Nearmap, 2020). During the survey period of June and July 2020 native vegetation extent and internal ecotone boundaries between communities were 'ground truthed' and mapped during fieldwork using a handheld Geographic Positioning System (GPS). Given the recent aerial imagery

available, there were no notable differences between vegetation extent displayed in the aerial imagery and the vegetation extent found when ground trothed during surveys.

10.4. Plant community types

This Section describes the attribution of vegetation community profile descriptors to vegetation surveyed within the study area in accordance the NSW Plant Community Types (PCTs) held within the NSW BioNet Vegetation Information System (BioNet VIS) database.

10.4.1. Plant Community Type (PCT) assessment method

Past surveys conducted within the locality as well as database searches were reviewed to inform the vegetation investigations. In addition, a search was undertaken of the BioNet VIS Database (OEH 2019h) and NSW SEED mapping to access existing vegetation mapping information within the subject site. Based on the results of the background review and the requirements of the BAM with respect to this BDAR, appropriate surveys were designed for the subject site. The vegetation base map was used to guide a floristic assessment of the subject site. Supplementary iterations and amendments were made to the base map throughout the fieldwork period, in accordance with Section 5.2 of the BAM, via hand-held GPS units and aerial photo interpretation. Iterations to the base map were based on observation of broad vegetation composition, landform, physiography and on quantitative data collection through identification of all plants encountered to the species level.

The vegetation types observed were compared to the base map and cross-referenced with the community profile descriptors (and diagnostic species tests) held within the BioNet VIS Database (OEH 2018h) with an assessment of consistency being conducted.

10.4.2. PCT'S identified within the site

With the exception of a small amount of landscaping within the vicinity of the car park in the south of 21D, vegetation within the study area was confined to the 1.28ha 21F within the north-east. This area of vegetation has been subject to a high degree of disturbance. Historical photography shows that in 1954 the entire study area was covered by thick native vegetation (JME Environmental, 2020). By 1974 the site had been cleared for sand mining (JME Environmental, 2020). Post sand mining the site has been used by Allco Steel then has also been used for storage of materials. The majority of this area was composed of introduced species, however native vegetation in the form of shrubs and ground covers was present along the north-west and western boundary.

Taking into consideration the native species composition within the site and that occurring within the locality One Plant Community Type (PCT) was determined to be present, being PCT 1647 – Red Bloodwood – Smooth-barked Apple heathy woodland on coastal sands of the Central and lower North Coast. This PCT was uniform in condition within the site and did not require further stratification into vegetation zones.

The remainder of vegetation within the development area could not be assigned a PCT as they largely consisted of introduced flora species.

10.5. Vegetation zones

This Section describes the attribution of vegetation zones to the PCT identified within Section 10.8 of this report. Designation of vegetation zones was undertaken accordance with the methodology for vegetation integrity assessment outlined within Section 5.3 of the BAM.

One PCT was identified within the subject site:

- PCT 1647 – Red Bloodwood – Smooth-barked Apple heathy woodland on coastal sands of the Central and lower North Coast.

This PCT was further stratified into separate vegetation zones bases on current condition state or other environmental variables. The random meander, overview inspection and detailed floristic plot have been used to inform the stratification of this PCT into vegetation zones. PCT1647 was stratified on the basis of the broad presence/absence of key strata over the study area.

One vegetation zone was present and attributed with a vegetation zone ID, which is:

- PCT 1647 – Disturbed

Vegetation zone 1649 - Disturbed is not a TEC, however it is associated with some threatened species habitat. As such, with a vegetation integrity score of 12.1 (i.e. ≤17), further assessment of habitat suitability for ecosystem credit species associated with this vegetation zone is not required.

10.5.1. Patch size

Native vegetation within the site is connected to a large area of disturbed and intact vegetation surrounded by industrial development. The area of vegetation is bounded by the Pacific Highway in the west and north connecting to the township of Heatherbrae in the far north, Masonite Road in the east and Tomago Road in the south. Tilligerry State Conservation Area is located on the eastern side of Masonite Road. Therefore, the Vegetation Zone located within the site has been associated with a patch size class of ≥100ha.

10.6. Ecosystem credit species

Ecosystem credit species are threatened species where the likelihood of occurrence of a species or elements of the species' habitat can be predicted by habitat surrogates and landscape features, or for which targeted survey has a low probability of detection. Targeted survey is not required for these species.

The BAM methodology defines a two-step process of habitat suitability assessment for ecosystem credit species, these are:

1) identify ecosystem credit species for assessment; and
2) assessment the habitat constraints and vagrant species on the subject land

These steps have been carried out and summarised in Section 8 of the BDAR (Appendix I) and it has been determined that no further assessment is required given the vegetation community zone within the impact area has a vegetation integrity score of 12.1, which is ≤17.

10.7. Species credit species

This Section identifies and assesses the suitability of habitat present within the subject site for species credit species. Species credit species are threatened species where the likelihood of occurrence of a species or elements of suitable habitat for the species cannot be confidently predicted by vegetation surrogates and landscape features and can be reliably detected by survey. The BAM assessment defines a six-step process for identifying habitat suitability for species credit species. These steps have been carried out and summarised in Section 8 of the BDAR (Appendix I).

10.7.1. Flora survey methodology

Targeted surveys were used in accordance with the *NSW Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (Working Draft*), *NSW Guide to Surveying Threatened Plants State of New South Wales* and the *Draft survey guidelines for Australia's threatened orchids*. Each target threatened flora species was allocated areas of potential habitat. All vegetation communities considered to be habitat for the target species, such as *Callistemon linearifolia* (Netted Bottlebrush) were searched. A parallel field traverse (i.e. parallel transects) was undertaken within the study area. Surveys were conducted along parallel line transects approximately 5 metres apart.

Transects were conducted along a straight path using the tracks on a GPS to guide the surveyors. Required survey times were stated in the BAM Candidate species report.

10.7.2. Fauna survey methodology

The fauna survey was initiated with an assessment of the potential use of the study area by any species credit species. Subsequently, the confirmation of the fauna species list, by way of on-site observation and recording, was carried out as described in Section 8.5.3 of the BDAR (Appendix I). The survey was carried out using the Department of Environment and Conservation's (NSW) Threatened Biodiversity Survey and Assessment Guidelines – Working Draft.

10.7.3. Survey results

10.7.3.1. Flora survey results

The field survey including past surveys have identified approximately 94 plant species occurring within the Study Area. No species credit species or any other listed threatened flora species was recorded within the study area during the survey. A full list of flora species observed during the survey is contained in Appendix A of the BDAR (Appendix I).

10.7.3.2. Fauna survey results

A full list of fauna species observed during the survey is contained in Appendix B of the BDAR (Appendix I). Table 10.1 summarises the findings of the fauna survey

Table 10.1. Summary of the fauna survey results.

Survey	Summary of findings	Comments
Amphibian Survey	No amphibian species were recorded on site during surveys.	Although no suitable habitat for Amphibians was located within the site, calls associated with *Crinia signifera* (Common Eastern Froglet), *Limnodynastes peronii* (Striped Marsh Frog) and the threatened *Crinia tinnula* (Wallum Froglet) was heard calling approximately just over 200m east of the study area.
Reptile Survey	One species of reptile, *Ctenotus robustus* (Striped Skink) was observed within 21F.	This species is not listed as threatened under State of National legislation.
Diurnal Avifaunal Survey	The site was found to contain limited habitat for a number of avifauna species. Species recorded included *Corvus coronoides* (Australian Raven), *Neochmia temporalis* (Red-browed Finch), *Rhipidura leucophrys* (Willie Wagtail), and *Falco cenchroides* (Nankeen Kestrel).	No State or Nationally listed threatened avifauna species were found to be utilising the site during surveys.
Microchiropteran Bat Call Survey	Two species of microchiropteran bat, *Chalinolobus gould*ii (Gould's Wattled Bat) and *Vespadelus* sp. likely *vulturnus* were recorded within the study area.	Neither of these microchiropteran bat species are listed as threatened under State or National legislation.
Nocturnal Avifaunal and Mammal Call Playback Survey	There were no responses as a result of playback calls played during any surveys.	
Spotlighting Survey	During July 2020 spotlighting surveys no fauna species were observed within the study area.	

Camera Trapping Survey	No fauna species were recorded during the camera trap survey.	
Incidental Observations and Secondary Indications	Scats and footprints consistent with that of a macropod were found near the northern boundary fence of 21F. These Scats and prints were most likely from *Macropus rufogriseus* (Red-necked Wallaby);	
	Footprints consistent with the introduced *Vulpes* (European Red Fox) were observed within the study area.	
	Oryctolagus cuniculus (European Rabbit) was observed within the during the August survey.	

Due to time constraints, one Species Credit Species were assumed present within the study area as fieldwork for this BDAR was undertaken outside of the survey period for these species. Species Credits required to be retired to offset the impacts of the project include:

- 1 species credit for impacts on *Uperoleia mahonyi*

A description of the ecology of this species and the defined habitat constraint for this species has been provided in Table 10.2. The species polygon for these species is mapped in Figure 10.3.

Table 10.2. Species Credit Species located on site Ecology and Polygon within the site.

Species	BC Act	SAII Entity	Description	Habitat Constraint	Biodiversity Concern/ risk Weighting	Method used to Confirm Presence	Number and location of individuals recorded	Species Polygon Unit of Measure
Uperoleia Mahonyi Mahony's Toadlet	V	No	It is a small (males 30 mm, female 32 mm) frog. This species is most easily distinguished from other Uperoleia species by a black and white belly pattern that appears marbled or blotched (rather than numerous small dots or specs) and the lack of colour patch below the knee. Groin and thigh colour patches are orange.	N/A	2	Assumed present	N/A	0.32

Figure 10.3. Species polygon for Species Credit Species

Date	Revision	Drawn By	Site description	Client	REMONDIS Australia Pty Ltd
12/08/2020	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536	Project	Environmental Impact Assessment
				Title	Species Polygons
				Scale	Not to Scale
				Source	Wildthing Environmental Consultants

Jackson Environment and Planning Pty Ltd
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A: 119 Willoughby Rd, Crows Nest NSW 2065
E: admin@jacksonenvironment.com.au
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10.8. Impact assessment

10.8.1. Planning and detailed design

The proponent has considered biodiversity values present within the site in the planning and detailed design stages of the development layout to avoid, where possible, direct impacts to identified biodiversity values. The proposed development has been positioned in consultation with Wildthing Environmental Consultants to avoid, where possible, biodiversity values. Native vegetation within the site has been subject to past disturbance and was found to be in a disturbed condition.

No further recommendations of avoidance/minimisation were relevant to this phase of the development.

The final layout and location of the proposed development has not been able to completely avoid all biodiversity values. Biodiversity values which cannot be avoided within the scope of the development have been detailed in this section.

10.8.2. Construction

Construction of the truck parking depot will require removal of 0.1ha of native vegetation. No additional native vegetation is likely to be required to be removed within the development area.

Table 10.3 provides recommendations for further avoidance and minimisation strategies during the construction phase have been detailed below.

Table 10.3. Further avoidance and minimisation strategies for the construction phase.

Nature of Potential Impact	Avoidance/minimisation Strategy Proposed	Timing	Responsibility
Clearing of native vegetation	The clearing boundary should be clearly marked to avoid removal of additional native vegetation.	Prior to and during vegetation clearing	Construction site manager
Inadvertent impact to biodiversity values	Priority will be given during construction to avoid any inadvertent impact to significant biodiversity values within the study area. Avoidance measures should include the following: • all material stockpiles, vehicle parking and machinery storage will be located within cleared areas proposed for clearing, and not in areas of native vegetation that are to be retained; • implementation of temporary stormwater controls during construction and to ensure that discharges outside the development footprint are consistent with existing conditions and do not impact the stream located within the site.	Prior to and during vegetation clearing	Construction site manager
Clearing of fauna habitat, resulting in fauna injury and/or mortality	There are no habitat trees located within the site. Any animals injured during construction should be taken immediately to a Vet for treatment. Any animals suspected to require rehabilitation would be delivered post-veterinary care to an appropriate animal rehabilitator.	During vegetation clearing	Construction site manager
Minimise weed infestations	The following measures should be implemented to prevent exotic plant material from entering/exiting the development area; • no imported/exported material to be permitted unless it has been inspected and confirmed to be free of dirt and mud which may contain weed seeds and vegetative material such as bulbs, root fragment, tubers or rhizomes;	Prior to and during vegetation clearing	Site manager

Nature of Potential Impact	Avoidance/minimisation Strategy Proposed	Timing	Responsibility
	• vehicles and machinery to be clean of soils, vegetation and seeds that have been brushed off or washed down prior to entering the study area; and • A clean down register to be maintained at the entry/exit of the study area		

10.8.3. Operation

A table defining recommendations for further avoidance and minimisation strategies during the operation phase has been detailed below (Table 10.4). The residual impact predicted to occur after considering the avoidance and minimisation strategy above has been detailed below.

Table 10.4. Further avoidance and minimisation strategies for the operation phase.

Nature of Potential Impact	Avoidance/minimisation Strategy Proposed	Timing	Responsibility
Avoiding operational impacts on flora and fauna	Vehicles should not drive off the designated parking area into vegetation within the study area to reduce impact to resident fauna and flora within the study area during the operations phase.	For life of operational phase	Site Manager
Assisting injured fauna	Any animals injured during operations should be taken immediately to the Motto Farm Veterinary Hospital for treatment. Any animals suspected to require rehabilitation would be delivered post-veterinary care to an appropriate animal rehabilitator associated with Wildlife in Need of Care Phone 1300 946 295).	For life of operational phase	Site Manager
Minimise weed infestations	The following measures should be implemented to prevent exotic plant material from entering/exiting the study area: • no imported/exported material to be permitted unless it has been inspected and confirmed to be free of dirt and mud which may contain weed seeds and vegetative material such as bulbs, root fragment, tubers or rhizomes; • vehicles and machinery to be clean of soils, vegetation and seeds that have been brushed off or washed down prior to entering the study area; • A clean down register to be maintained at the entry of the study area; and • Trucks are not to drive off the designated parking area onto vegetation within the site.	For life of operational phase	Site Manager
Treat existing weed infestations	As a part of maintenance within the study area any high threat weeds known to occur will be controlled in accordance with appropriate DPI guidelines. Guidelines for the treatment of high threat weeds can be sourced within the DPI website (DPI, 2018).	For life of operational phase	Site Manager
Reduce impacts of artificial lighting	Any artificial lighting used for security at night should be angled/directed downwards to avoid excessive light pollution affecting adjacent habitat.	For life of operational phase	Site Manager

10.9. Assessment of residual impacts

10.9.1. Direct residual impacts

The construction phase of the proposed development has the potential to directly impact biodiversity values. This would occur through impacts such as vegetation clearance. These impacts will be permanent and will occur from the outset of the development works. Mitigation measures outlined in Table 10.4 above will help to minimise the potential impacts to biodiversity values that remain present within the study area.

The direct impacts arising from the project include:

- The removal of up to 0.1 ha of Vegetation Zone 1647_Disturbed;
- The removal of up to 0.1 ha of habitat assumed present for 1 Species Credit Species, *Uperoleia mahonyi.*

10.9.2. Indirect residual impacts

Indirect impacts occur when the proposal or activities relating to the construction or operation of the proposal affect native vegetation, threatened ecological communities and threatened species habitat beyond the development footprint. Impacts may also result from changes to land-use patterns. Table 10.5 provides an assessment of the potential indirect residual impacts on the study area and adjacent vegetation in accordance with Section 9.1.4.2 of the BAM.

Table 10.5. Indirect Impact Assessment.

Indirect Impact	Assessment/ Likelihood of Occurrence
Inadvertent impacts on adjacent habitat or vegetation	The proposed development has the potential to result in inadvertent impacts on adjacent retained habitat or vegetation. However, the mitigation measures described above will minimise the likelihood of occurrence of this indirect impact during the construction phase of the project.
Reduced viability of adjacent habitat due to edge effects	The proposal will likely result in an increase in edge effects impacting upon retained vegetation patches as it will result in new environmental conditions to develop along the edges of cleared environments. It is considered that establishment of weeds and modification of habitat attributes (i.e. noise and water runoff) are the most likely tangible impacts that may arise from the proposal. Such conditions often result in the simplification of biodiversity values. Although native vegetation within the study area was in a disturbed condition, the proposed development has the potential to increase edge effects to surrounding native vegetation.
Reduced viability of adjacent habitat due to noise, dust or light spill	The proposal has the potential to result in impact to fauna habitat due to noise and light spill from the proposal, however this is not expected to have a significant impact.
Transport of weeds and pathogens from the site to adjacent vegetation	The proposal has the potential to result in an increase of weed spread within the study area and adjacent vegetation. However, the mitigation measures described above will minimise the likelihood of occurrence of this indirect impact during the construction phase of the project.
Increased risk of starvation, exposure and loss of shade or shelter	This is unlikely to occur as the proposed development will not substantially modify vegetation within the study area or surrounding habitat such that a significant loss in foraging, hunting and shelter resources would occur.
Loss of breeding habitats	The proposal is not likely to result in the loss of breeding habitats.
Trampling of threatened flora species	Staff access to native vegetation located within 21F should be minimised. The proposal is unlikely to have a significant impact on threatened flora species from trampling.

Indirect Impact	Assessment/ Likelihood of Occurrence
Inhibition of nitrogen fixation and increased soil salinity	The proposal will not result in the removal of a substantial area of native vegetation, there are also large patches of vegetation, both within and adjacent to the study area, that will not be impacted. As such it is not considered likely that nitrogen fixation or soil salinity will be impacted.
Fertiliser drift	The proposal is unlikely to increase fertiliser drift within the study area.
Rubbish dumping	Appropriate waste disposal practices are to be observed during the construction and operational phases of the proposed development. Adequate waste disposal areas such as bins are to be provided for staff
Wood collection	The proposal is unlikely to increase wood collection within the study area
Bush rock removal and disturbance	The proposal is unlikely to increase bush rock removal or disturbance within the study area.
Increase in predatory species populations	There is no proposed change to land use that will likely lead to an increase in predatory species populations.
Increase in pest animal populations	There is no proposed change to land use that will likely lead to an increase in pest animal populations.
Increased risk of fire	There is no proposed change to land use that will likely lead to an increased risk of fire.
Disturbance to specialist breeding and foraging habitat, e.g. Beach nesting for shorebirds	No specialist breeding habitat occurs within the development area.
Fragmentation of movement corridor	It is recommended that no barbed-wire fencing be used as a result of the proposal

10.9.3. Prescribed impacts

Prescribed impacts are the impacts on biodiversity values which are not related to, or are in addition to, native vegetation clearing and habitat loss (Section 6.7 of the BAM). In general, these types of impacts identify habitat or features of the environment that are irreplaceable. Assessment of prescribed biodiversity impacts are outlined and addressed in Table 10.6 below.

Table 10.6. Prescribed Impacts Assessment.

Indirect Impact	Assessment/ Likelihood of Occurrence
Impacts of development on the habitat of threatened species or ecological communities associated with karst, caves, crevices, cliffs and other features of geological significance.	No karst, caves, crevices, cliffs and other features of geological significance will be impacted by the proposed works
Impacts of development on the habitat of threatened species or ecological communities associated with rocks.	The proposal is unlikely to increase rock removal or disturbance within the study area.
Impacts of development on the habitat of threatened species or ecological communities associated with human made structures.	No human made structures likely to provide habitat for threatened species will be impacted by the proposed development.
Impacts of development on the habitat of threatened species or ecological communities associated with non-native vegetation.	Non-native vegetation within the development area study area was composed primarily of weeds such as Coolatai Grass. This vegetation type is well represented within the wider landscape and is unlikely to provide significant habitat resources for a specific resident population of threatened fauna or flora.
Impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range.	The proposed development is unlikely to result in inducing vegetation fragmentation or impacting the connectivity of different areas of habitat.

Indirect Impact	Assessment/ Likelihood of Occurrence
Impacts of the development on movement of threatened species that maintains their life cycle	The movement of threatened species throughout the study area is not expected to be adversely affected given the recommendations of avoidance and minimisation of impacts.
Impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including subsidence or upsidence resulting from underground mining or other development)	There are no waterbodies within the vicinity of the study area. The proposal is unlikely to impact water quality within the study area. An onsite stormwater detention area is proposed to be constructed within 21F to collect excess stormwater generated by the proposal.
Impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	Vehicle strikes on threatened species have the potential to occur from the increased amount of vehicle traffic which will arise within the study area.

10.9.4. Impacts to groundwater dependent ecosystems

The proposed development is not associated with any mapped Groundwater Dependent Ecosystems (GDEs), nor will it require significant subsurface penetration or aquifer interference activity and as such, will not impact upon GDEs.

10.9.5. Serious and irreversible impacts (SAII)

No threatened matter consistent with a SAII candidate species identified as likely to occur or to contain significant habitat within the study area is likely to be impacted by the proposed development.

10.9.6. Adaptive management strategy

No adaptive management strategy is proposed for the development.

10.10. Biodiversity credits

10.10.1. Impacts requiring offsets under the Biodiversity Offsets Scheme

One (1) species credit for impacts on *Uperoleia mahonyi.* A total of the offset credits required to be retired, as generated by the BAM-CC, has been provided in Appendix F of the BDAR (Appendix I). The credits will be offset by payment into the Biodiversity Conservation Fund (BCF) to satisfy an offset obligation.

10.11. Weeds

Four priority weed species listed under the *Biosecurity Act* 2015 were identified on site and are listed below:

- *Chrysanthemoides monilifer*a subsp. rotundata (Bitou Bush);
- *Cortaderia species* (Pampas Grass);
- *Lantana camara* (Lantana); and
- *Senecio madagascariensis* (Fireweed).

It is recommended that these priority weeds as well as other introduced species be controlled as part of routine weed control within the study area.

10.12. Matters of National Environmental Significance

Table 10.7 summarises the assessments that have been made to determine whether or not the proposed development will have or is likely to have a significant impact on a matter of National Environmental Significance.

Table 10.7 Matters of National Environmental Significance.

Matters of National Environmental Significance	Impact
World Heritage properties	The study area is not affected by World Heritage listing, nor is it likely to impact upon any World Heritage area.
Wetlands recognised under the Ramsar convention as having international significance	The study area is located north of the Hunter Estuary Wetlands Ramsar site. The proposed project is not likely to have a significant impact on this Ramsar site.
Listed threatened species and communities	The ecological community located within the site was not consistent with any nationally listed threatened ecological communities. No nationally listed species were recorded on site during surveys. Although degraded, 21F was also considered to contain some suitable habitat for *Psuedomys novaehollandiae* which has been recorded nearby (Wildthing Environmental Consultants, 2013). No other nationally listed species were recorded within the study area
Migratory species protected under international agreements	it is unlikely that any of listed migratory species would be significantly impacted by the development
Nuclear activities	The proposal does not involve any type of nuclear activity
The Commonwealth marine environment	The proposal does not involve the modification of the Commonwealth marine environment

10.13. Conclusion

The Biodiversity Development Assessment Report (BDAR) was prepared to address requirements of the Secretary's Environmental Assessment Requirements (SEARs) for the proposed Resource Recovery Facility, School Drive, Tomago NSW.

This BDAR has been prepared in accordance with the Biodiversity Assessment Methodology (BAM) by Wildthing Environmental Consultants to identify the potential impacts of the proposed development on biodiversity values within the subject site.

This assessment has been completed in accordance with the Biodiversity Assessment Method (BAM) and includes:

Stage 1 – Biodiversity Assessment

- assessment of site context features;
- assessment of native vegetation; and
- assessment of threatened species and populations

Stage 2 – Impact Assessment

- avoid and minimise impacts on biodiversity values;
- consider impact and offset thresholds; and
- determine and calculate offset requirements

In addition, assessment was also undertaken having regard to Matters of National Environmental Significance (MNES) listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), the NSW Biosecurity Act 2015 and relevant State Environmental Planning Policies.

Taking into consideration the native species composition within the site and that occurring within the locality One Plant Community Types (PCT) was determined to be present, being PCT 1647 – Red Bloodwood – Smooth-barked Apple heathy woodland on coastal sands of the Central and lower North Coast. PCT 1647 occurring within 21F was found to be highly disturbed and consisted of a few native shrubs with a largely introduced groundcover. No upper stratum was

present. This PCT was uniform in condition within the site and did not require further stratification into vegetation zones. The PCT was given the Vegetation Zone name PCT 1647_Disturbed.

The development footprint has been positioned on an area of land that has been subject to a number of disturbances from past industrial development activities.

The direct impacts arising from the project include:

- The removal of up to 0.1 ha of Vegetation Zone PCT 1647_Disturbed; and
- The removal of up to 0.1 ha of habitat assumed present for 1 Species Credit Species *Uperoleia mahonyi*.

Considerations have been made to the Commonwealth *Environment Protection and Biodiversity Conservation (EPBC) Act (*1999). It was determined that there would be not significant matters of national significance and no referrals should be required.

No Ecosystem Credits are required to be retired as a vegetation integrity score of 12.1 (i.e. ≤17) was given for the PCT zone 1647 located within the study area.

Due to time constraints, a total of two Species Credit Species were assumed present within the study area as fieldwork for this BDAR was undertaken outside of the survey period for these species.

Species Credits required to be retired to offset the impacts of the project include:

- 1 species credit for impacts on *Uperoleia mahonyi*

To avoid and minimise potential impacts of the project on biodiversity, a series of mitigation and management measures have been identified and detailed within the report.

11. Soil and Water

A Soil and Water Management Plan, including a stormwater management plan, was prepared by Northrop Consulting Engineers. This section provides a summary of that report. The full report is available at Appendix J. The Stormwater Management Plan is included in the civil engineering plans at Appendix B.

11.1. Methodology

In accordance with Section B4 of *Port Stephens Council Development Control Plan* 2013 (DCP), the stormwater management strategy has considered the following items:

- Onsite Detention;
- Water Quality;
- Stormwater Harvesting;
- Drinking Water Catchment; and
- Riparian Corridors

The methodology used to inform the Soil and Water Management Plan is provided at Appendix J.

11.2. Existing environment

The existing facility located on 21D School Drive was previously used for wire and cable manufacturing. The site consists of an existing stormwater drainage network including detention and infiltration tanks and water quality treatment devices. Detailed design drawings and Stormwater Design Report were previously prepared by GHD in 2012. The report outlined that detention was provided by the below ground infiltration tanks to limit post-development peak flow to equivalent or less than the pre-developed peak flow for all storm events up to the 1% AEP.

The existing stormwater treatment system constructed on 21D School Drive consists of rainwater tanks, below ground infiltration tanks and secondary and tertiary proprietary treatment devices. Two separate water quality treatment trains have been provided, which both containing the following:

- Humeceptor STC-5 – This system utilises hydrodynamic and gravitational separation to effectively remove total suspended solids and entrained hydrocarbons from runoff.
- Humes Jellyfish HF-1800 – This system utilises filtration membrane to remove floatables, litter, oil, debris, total suspended solids, silt sized particles and a high percentage of particulate- bound pollutants including phosphorous, nitrogen, metals and hydrocarbon.

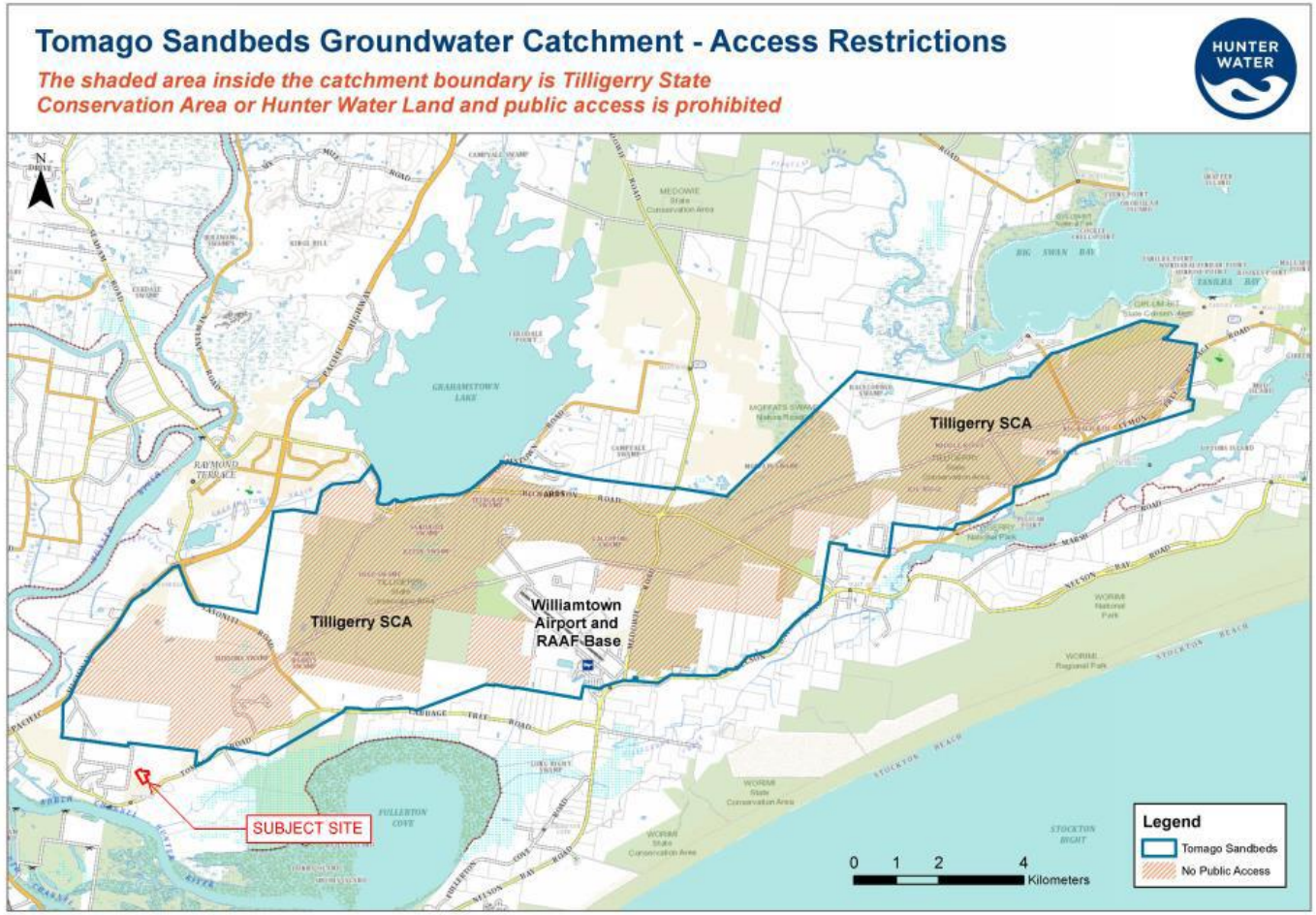
The existing development contains two 100kL rainwater reuse tanks which are fed by the roofs of the two main buildings. The existing treatment train has been assessed (see Section 2.2.1 of Appendix J) and is considered adequate as it meets the load reduction targets required by Port Stephens Council in their DCP guidelines (Schedule E1).

A review of Hunter Waters Guidelines for development in the drinking water catchment has identified that the subject site is not located in a drinking water catchment. Figure 11.1 shows the defined catchment extents for the Tomago Sandbeds including the access restrictions as defined by Hunter Water. The subject site is not within the defined catchment extent and is located approximately 650m from the nearest catchment border.

A number of measures will be implemented as part of the development to ensure contaminated water does not reach the groundwater catchment. These are given in Section 2.4 of the Soil and Water Management Plan (Appendix J).

A review of information available from Council and via Six Maps indicate that the subject site is not located in the vicinity of a riparian corridor. This was confirmed via subsequent visits to site.

Figure 11.1. MUSIC Modelling results



Date	Revision	Drawn By	Site description	Jackson Environment and Planning Pty Ltd		Client	REMONDIS Australia Pty Ltd
23/11/2020	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536	Strategy | Infrastructure | Compliance | Procurement A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060 E: admin@jacksonenvironment.com.au T: 02 8056 1849 W: http://www.jacksonenvironment.com.au	JACKSON ENVIRONMENT AND PLANNING STRATEGY | INFRASTRUCTURE | COMPLIANCE | PROCUREMENT	Project	Environmental Impact Assessment
						Title	Tomago Sandbeds Groundwater
						Scale	As shown
						Source	JM Environments

The site is currently serviced by an Envirocycle M23 on-site sewer treatment system. AWTS Maintenance Services Pty Ltd performed a condition assessment of the existing sewer and advised that the system was found to be in reasonable condition and provided recommendations to replace or repair broken or failed components.

The system has a treatment capacity of 4.5-5kL/day with a 1L/s peak treatment rate. Treated water is then stored onsite in a separate holding tank and periodically taken offsite via a pump-out truck. No onsite disposal methods are currently utilised for the existing development, and there are no proposals to utilise onsite disposal for the proposed development.

11.3. Assessment

11.3.1. Water quality

The additional stormwater treatment infrastructure to be installed as part of the proposed development has been designed to accommodate future expansion at the site, specifically development of the remainder of 21F School Drive. However, for the purposes of this section, only the immediate development is considered.

The performance of the proposed stormwater management strategy for the new development was assessed against the reduction targets using the conceptual design software MUSIC (Version 6).

A number of factors were identified in order to select the most appropriate stormwater quality improvement devices (SQIDs). In addition to the practical constraints, maintenance, operability and aesthetics were considered.

The proposed treatment train incorporates:

- Primary treatment via proprietary pit filter inserts, (OceanGuard or approved equivalent) with additional oil absorbent pillows;
- Secondary & tertiary treatment via proprietary filter cartridges (Ocean Protect Psorb filter or approved equivalent); and
- The MUSIC modelling results for the above-mentioned treatment strategy are shown in Table 11.1.

Table 11.1. MUSIC Modelling results.

Pollutant Criteria	Reduction Target (%)	Sources (kg/yr)	Residual Load (kg/yr)	Achieved Reduction (%)
Total Suspended Solids (TSS)	90	4120	297	92.8
Total Phosphorous (TP)	60	1.87	0.65	65.2
Total Nitrogen (TN)	45	7.58	4.05	46.5
Gross Pollutants	**90**	**4.76**	**0**	**100**

Table 11.1 shows that the proposed stormwater quality management strategy will achieve the required load reduction targets.

11.3.2. Water conservation

The existing development contains two 100kL rainwater reuse tanks which are fed by the roofs of the two main buildings. The harvested rainwater will be used for toilet flushing and irrigation of the landscaped area.

The total reuse demand is estimated to be approximately 4.5kL/day. Based on the water balance calculations, the expected reuse demand for the site will be supplied by the reuse tanks with above an 80% reuse efficiency. This is typical of reuse efficiency adopted in best engineering practice.

11.3.3. Flood Risk Assessment

A Flood Certificate was obtained from Port Stephens Council for the subject. The site has been identified to be located in a flood prone area. However, the site is not a 'flood control lot' for the purposes of the State Environmental Planning Policy 2008. A Flood Planning Level (FPL) is not applicable for the subject site with the Probable Maximum Flood (PMF) level listed as 6.3m AHD.

In accordance with B5.6 of the Port Stephens Council DCP (2014) the development is located within the minimal risk flood hazard category, which applies to critical emergency response and recovery facilities or vulnerable development types such as aged care and childcare facilities. The subject development does not fall within these classifications.

In accordance with the DCP, a detailed flood study is not required for developments located outside the 1% AEP flood extents. As the site is only impacted by events greater than the 1% AEP, a detailed flood impact model has not been developed, however a qualitative assessment was still undertaken.

The proposed industrial development does not include any habitable rooms, and thus is not required to meet the requirements for a habitable room as outlined in Section B5.5 of the PSC DCP. As previously identified, a Flood Planning level (FPL) is not applicable to the site development thus negating the need for electrical fixtures to be located above the FPL for non-habitable rooms.

A storage area is provided by the second storey of the existing buildings that will enable the storage of goods above the PMF flood level.

The proposed truck depot will require fill to construct the pavement to the finished design levels. This will raise the surface levels locally by approximately 100-500mm. It is our opinion that for the minor degree of filling required, the proposed development will not substantially impede the flow of floodwater and will not contribute to significant flooding or ponding of water on adjacent properties.

The 5% AEP flood level is not applicable for this site and as such the finished surface level for the truck depot has been deemed acceptable.

11.3.4. Sewer

The proposed development is anticipated to employ a total of 76 employees. The expected sewer demands for the development are estimated to be less than or equivalent to the previous site use, which employed a total of 119 employees. The existing sewer system is deemed to have sufficient capacity for the expected sewer loads for the proposed development.

Should it be observed that the system is undersized, there are a number of options to augment the existing system. This can be achieved by providing additional onsite storage tanks for the temporary storage of pre and post treatment water, or by increasing the frequency of which the treated sewage is removed from site.

11.3.5. Groundwater

A previous assessment for the groundwater was undertaken by. The GHD report detailed investigations into the potential of groundwater contamination, groundwater characteristics for the site as well as an assessment on the potential impacts to Groundwater Dependent Ecosystems.

Their findings concluded that there were no significant ground water issues identified.

Additional groundwater assessment was undertaken by JM Environments as part of their Remedial Action Plan (dated 29/10/20). EHO Consulting performed an Environmental Site Assessment for lots 21F & 21G School Drive, Tomago. The objective of the assessment was to determine potential risks to sensitive receptors from the Contaminate of

Concern (COCs) in groundwater. The assessment recorded the presence of chromium, copper and zinc in concentrations exceeding the adopted site acceptance criteria and exceeding background concentrations. It concluded that given the proposed redevelopment will involve the site surface being cleared of vegetation and covered with a low-permeability cap, the risk associated with exposure to contaminated groundwater to on-site ecological receptors to be negligible, and to off-site receptors to be low.

11.4. Mitigation Measures

All waste handling and storage will be under cover and within bunded areas. Each of the main buildings (Buildings 1, 2 and 3) will have internal concrete bunds to contain any leaks or spills within them. They will also contain any fire water, if necessary.

A stormwater capture and treatment system will be installed to treat water from the truck parking depot. This will supplement the existing stormwater treatment system, which treats stormwater from the existing paved area.

The following is a summary of the water quality treatment devices that have been utilised in the proposed treatment train.

- OceanGuard Pit Filter Insert – Runoff captured by the hardstand will pass through a filter insert that will aid in the capture of gross pollutants, sediment, litter and oils. An oil absorbent pillow will also be installed as part of the filter insert, which will assist in the capture of small amounts of hydrocarbons or oils that would otherwise enter the stormwater system.
- Ocean Protect Psorb Filter Cartridges – Proprietary filter cartridges will filter stormwater runoff capturing and removing fine sediment, as well as nutrients including phosphorous and nitrogen.

Additional preventative measures are proposed to be implemented onsite to contain any potential diesel spills. An emergency shutoff valve will be installed for the new stormwater system that will contain any oil or diesel spills and prevent them from entering the stormwater infiltration system.

Details of the stormwater capture and treatment system are provided in the Soil and Water Management Plan at Appendix J.

11.5. Conclusion

A Soil and Water Management Plan, including a stormwater management plan, was prepared by Northrop Consulting Engineers. The proposed stormwater management design presented has been prepared to comply with *Port Stephens Council's DCP* 2013, as well as industry best practice. The design philosophy is based on the principle of at source treatment, to reduce conveyance infrastructure to manage water quantity and quality aspects.

The outcomes of the preliminary stormwater management strategy indicate that detention measures can be adopted to attenuate post developed flows to pre-developed rates. In addition to this, through the adoption of WSUD principals, the water quality reduction targets can be achieved.

Based on the investigation and concept design, it is considered that the proposed development can adequately manage and address all items surrounding stormwater runoff, and soil and water management.

The Soil and Water Management Plan is available at Appendix J.

12. Heritage

12.1. Introduction

Heritage Now conducted an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed development. The purpose of the ACHA was to identify Aboriginal cultural heritage values through consultation with Registered Aboriginal Parties (RAPs). The ACHA enables those values to be respected throughout the process through the identification of appropriate mitigation measures to avoid and/or minimise harm to Aboriginal cultural heritage and values.

The ACHA has been prepared in accordance with, but not limited to, the *National Parks and Wildlife Act* 1974, the *National Parks and Wildlife Regulations* 2009, the Environmental Planning and Assessment *Act* 1979, *Port Stephens Local Environmental Plan* 2013.

The following guidelines and codes of practice have been used in preparing the ACHA report:

- Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW;
- Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW; and
- Aboriginal Cultural Heritage Consultation Requirements for Proponents.

This chapter summarises the findings of the ACHA. The ACHA report is contained in Appendix K. This chapter should be read in conjunction with Appendix K.

12.2. Aboriginal consultation

Aboriginal Consultation has been undertaken for the project in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010b) and will be referred to as the 'Aboriginal Consultation Requirements'. The four stages of Aboriginal consultation were undertaken, and additional documentation is available in Appendix 1 of the ACHA (Appendix K)

12.3. Registered aboriginal parties

Requests for information on knowledge holders were sent to the Heritage NSW Hunter and Central Coast Office, the Worimi Local Aboriginal Land Council, the Registrar of Aboriginal Owners, Native Title Services, the Port Stephens Council and the Hunter office of Local Land Services.

Based on the information collected from government agencies, invitations for expressions of interest were sent to each knowledge holder to become a Registered Aboriginal Party (RAP) for the Project. A public notice was placed in the Port Stephens Examiner local newspaper.

Ten Aboriginal representatives nominated to become RAPs for the Project (Table 12.1).

Table 12.1. Registered Aboriginal Parties.

Organisation/Individual	Representative Name/s
A1 Indigenous Services	Carolyn Hickey
Didge Ngunawal Clan	Paul Boyd and Lilly Carroll
Mur-Roo-Ma Inc	Anthony Anderson and Bec Young
Nur-Run-Gee Pty Ltd	Leonard Anderson
Worimi Local Aboriginal Land Council	Jamie Merrick
Worimi Traditional Owners Indigenous Corporation	Candy Lee Tower
Individual	Carol Ridgeway-Bissett
Individual	Steve Talbott
Individual	Robert Syron
Confidential Registration	-

12.4. Responses to assessment methodology

In accordance with Stages 2 and 3, details of the project and the assessment methodology was sent out to the RAPs and opportunities for feedback were provided (Table 12.2). Opportunities for feedback were also provided during the fieldwork.

Table 12.2. Responses to Assessment Methodology by Registered Aboriginal Parties.

Organisation/Individual	Representative Name/s	Response summary
Mur-Roo Ma Inc	Anthony Anderson and Rebecca Young	Agreed with methodology
Confidential Registration	-	Agreed with methodology

12.5. Heritage context

12.5.1. Historic records of aboriginal occupation

The Aboriginal people of Tomago are the Worimi people who spoke the Gathang language. The word 'Tomago' is said to derive from a Gathang word meaning 'sweet water', referring to the ground water resources in the Tomago sand beds. The traditional lands of the Worimi were bound by four rivers, the Hunter River to the south, Manning River to the north, and the Allyn and Patterson Rivers to the West. The neighbouring Aboriginal groups were the Awabakal to the south, Birpai to the north, Wonnarua to the south west and the Geawegal to the north west.

12.5.2. Regional archaeological background

Aboriginal occupation in Tomago has been dated to over 14,000 years. This date comes from a cultural layer identified in the Moffats Swamp Dune, north west of Tomago. Within the Port Stephens Council LGA many Worimi sites have been identified including 37 recorded ceremonial sites, 115 camp sites and 97 middens. Table 12.3 outlines a selection of different aspects of material culture and archaeological evidence types which may be present within the locality and the status of the sites identified in the AHIMS search.

Table 12.3. AHIMS summary.

Corrected Site Types	Destroyed	Partially Destroyed	Valid	Total
Artefact/s		2	16	18
Artefact scatter	3		8	11
PAD			4	4
Isolated find			3	3
Art			1	1
Scarred tree			1	1
PAD + Artefact		1		1
Total	**3**	**3**	**33**	**39**
Percent	**7.69%**	**7.69%**	**84.62%**	**100%**

Heritage reports relevant to the Project Area have been reviewed to develop an understanding of the previous assessments that have been undertaken and the implications for Aboriginal site patterning.

The review found that the most common site type in the Tomago area are surface artefact sites including scatters and isolated finds. These sites tend to occur on land that is slightly elevated and at a short distance from a water source. Artefacts are most likely to be made of tuff or silcrete. Almost all sites are found within 500 m of a stream or swamp lands. The Project Area is approximately 400 m from a water source.

Swamp dunes are also a particularly sensitive landform, with dunes such as Moffats Swamp containing some of the highest artefact densities and oldest known dates for the region. The second most common site type are PADS. Where intact dune deposits occur within a short distance to water, Potential Archaeological Deposit (PADs) may be present. There is a PAD identified just 80 m from the Project Area (AHIMS #38-4-1139)

Other site types identified in the region include scarred trees, although they appear to be a rarer site type. The presence of a scarred tree in the Project Area appears unlikely due to the present use as an industrial site, however if older growth trees are present there is potential for scarred trees to occur.

Art sites have also been identified, but as they represent only 2.56% of sites identified in the AHIMS search, they are also considered a rare site type for the region

Therefore, the site type most likely to appear in the Project Area are surface artefacts. Flakes are the most common artefact type found and tuff is the most frequently identified material type. There is potential for surface artefacts in the Project Area based on its elevation and distance from water.

12.6. Archaeological survey

An archaeological survey was completed on 10 July 2020. The Project Area was surveyed in one survey unit as the overall landscape was similar throughout. The survey focused on the currently undeveloped portion of the Project Area.

Table 12.4 provides a summary of the archaeological survey.

Table12.4 Survey Coverage.

Survey unit	Landform	Survey Unit Area (m^2)	Visibility (%)	Exposure (%)	Effective Coverage Area (m^2)	Sample Fraction (%)	Number of Sites Identified
1	Coastal Plain	48455	50	50	11113.75	25	0

The surveyed area had been largely disturbed through previous land use for sandmining and steelwork industrial processes resulting in substantial modification. There was modern rubbish and debris found on large parts of the surface.

12.6.1. Aboriginal sites identified

No Aboriginal Sites were identified.

12.6.2. Aboriginal consultation

The RAPs who participated in the survey agreed that the Project Area has been heavily disturbed by previous land use and that the land within the Project Area was not archaeologically sensitive. They noted the landscape becomes increasingly more sensitive towards the Hunter River and that multiple sites have been found nearby where land has been less disturbed. Additionally, they identified that the land north of the Project Area boundary was less disturbed and that further investigation would be required there if the project were to extend beyond the current northern boundary.

12.6.3. Summary

No Aboriginal sites were identified and the RAPs who attended the survey agreed that the Project Area was not archaeologically sensitive.

12.7. Significance assessment and aboriginal cultural values

Identifying the Aboriginal cultural values is part of the significance assessment process and is guided by the Burra Charter and the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW*.

Within this significance assessment, Aboriginal cultural values are captured within social, historical and aesthetic values. The archaeological values are contained within scientific values. Archaeological (scientific) values relate to whether the Project Area can contribute to the understanding of Aboriginal culture.

Feedback received has indicated that areas closer to the Hunter River and north of the Project boundary are more likely to contain evidence for Aboriginal occupation and thus would be more culturally sensitive. There are no specific cultural values associated with the Project Area, but it is important within the general context of the surrounding landscape.

12.7.1. Summary

No sites Aboriginal sites, Aboriginal cultural values or archaeological values were identified in the Project Area.

12.8. Impact assessment

No Aboriginal sites were identified during site inspection. There will be no impacts to Aboriginal sites.

12.9. Mitigation measures

The below strategies have been developed to mitigate potential and inadvertent harm and/or loss of Aboriginal cultural values as a result of the proposed works.

- All on-site personnel are to be made aware of their obligations under the *National Parks and Wildlife Act* 1974, this includes protection of Aboriginal sites and the reporting of any new Aboriginal, or suspected Aboriginal, heritage sites. This may be done through an onsite induction or other suitable format.
- In the unlikely event that Aboriginal or suspected Aboriginal archaeological material is uncovered during the development, then works in that area are to stop and the area cordoned off. The project manager is to contact the heritage consultant to make an assessment as to whether the material is classed as Aboriginal object/s under the National Parks and Wildlife Act and advise on the required management and mitigation measures. Works are not to re-commence in the cordoned off area until heritage clearance has been given and/or the required management and mitigation measures have been implemented.

12.10. Conclusion

No Aboriginal sites will be impacted by the proposed works and thus no further archaeological investigations are required. It is recommended that all on-site personnel are made aware of their obligations under the *National Parks and Wildlife Act* 1974 and that the procedure for assessment and management is implemented in the unlikely event that Aboriginal sites are identified during construction.

13. Statement of Heritage

Heritage Now conducted a Statement of Heritage Impact for the proposed development. The assessment is required as part of the Environmental Impact Statement and Development Application process.

The Statement of Heritage has been prepared in accordance with the relevant Heritage Division guidelines, including, but not limited to:

- Assessing Heritage Significance;
- Statements of Heritage Impact.

The Statement of Heritage Impact includes:

- An overview of the heritage significance of features concerning the project proposal
- What impact the proposed works will have on that significance
- What measures have been proposed to mitigate

This chapter summarises the findings of the Statement of Heritage Impact. The Statement of Heritage Impact report is contained in Appendix L. This chapter should be read in conjunction with Appendix L.

13.1. Legislative context

Non-Indigenous heritage in NSW is protected under the *Heritage Act* 1977 (the Heritage Act) and the *Environmental Planning & Assessment Act* 1979 (the EP&A Act). With regard to heritage items of State significance, the State Heritage Register is maintained under Part 3A of the Heritage Act and comprises a list of places and objects of particular importance to the people of NSW. Heritage items may be valued by particular groups in the community such as Aboriginal communities, religious groups or people with a common ethnic background. Local heritage items are registered by local councils in accordance with the EP&A Act and listed in Local Environmental Plans.

Archaeological material is protected under the relics provision of the *Heritage Act* 1977, it includes any deposit, artefact, or material evidence that:

a. *Related to the settlement of the area that comprises New South Wales, not being of Aboriginal settlement, and*
b. *Is of State or local significance*

Items that do not meet these criteria are known as 'moveable objects' or 'works'. Moveable objects are defined simply as items that are not relics; works can refer to past evidence of infrastructure that is buried and therefore archaeological in nature. Examples of works may include but are not limited to former road surfaces or infrastructure associated with rail or trams. Exposure of such items does not trigger the reporting obligations under the relics provisions of the Heritage Act (Division 9).

Section 57 and Section 60 of the Heritage Act state that exemptions or permits may be required when excavating land in NSW when an interim heritage order, or listing on the State Heritage Register applies to a place, building, work, relic, moveable object, precinct, or land within the proposal. Where works are minor in nature and will have minimal impact on the heritage significance of a place, a Section 57 exemption may be granted.

If works are not exempt under Section 57, a permit under Section 60 would be required to carry out activities to an item listed on the State Heritage Register or to which an Interim Heritage Order applies, where any land will be disturbed or excavated in NSW that is likely to contain archaeological material.

Section 139 and 140 of the Heritage Act state that an excavation permit is required in certain circumstances, including where there is reasonable cause to suspect that a relic (not listed on an Interim Heritage Order or the State Heritage Register) may be discovered, exposed, moved or damaged, or where a relic has already been discovered or exposed.

The Heritage Council may issue exceptions to this section where an archaeological assessment approved by the Heritage Council has indicated that there is little potential for relics to occur.

13.2. Heritage listings and other relevant instruments and guidelines

Items of national significance are listed on the National Heritage List is administered by the Australian Heritage Council under the *Australian Heritage Council Act* 2003 and in accordance with the *Environmental Protection and Biodiversity Conservation Act* 1999.

The State Heritage Register (SHR) contains items of state heritage significance and is administered by the *NSW Heritage Council under the NSW Heritage Act* 1977.

Items of local significance are protected under the *Port Stephens Local Environmental Plans* 2013.

The Heritage Listings in Tomago are summarised in Table 13.1. There are two local heritage listings (I103 and I104) and a State Heritage Register listing which incorporates both I103 and I104 which are located approximately 350 metres from the Project Area. The local heritage listing map shows I103 and I104 as combined area.

Table 13.1. Summary of Heritage Listings.

Listing	Item	Significance	Item Number
LEP	Tomago House	State	I103
LEP	Tomago House Chapel	Stage	I104
SHR	Tomago House and Chapel	State	00207

13.2.1. Statement of significance

The following statement of Statement of Significance is taken from the State Heritage Register:

> *"…The principal heritage significance of Tomago House relates to its association with the Windeyer family. The house was the family home for 150 years of one of the most eminent legal families in New South Wales. It was built in a style and to a standard which befitted the social status of the Windeyers in the early years of expansion and development in the colony. It is one of the most important houses of the 1840s to survive largely unaltered in a geographical context which is also intact…"*

13.2.2. Development control plan

The built heritage provisions are contained within sections B8.A to B8.4 of the *Port Stephens Development Control Plan* 2014. These provisions relate to listed heritage items or properties within heritage conservation areas. The Project Area as it is located over 350 m from the nearest heritage item - Tomago House and Chapel – and thus these heritage provisions do not apply.

13.2.3. Site visit and physical assessment

The site was inspected on 10 July 2020. The purpose of the visit was to determine if there were any unlisted heritage items or areas of archaeological sensitivity within the Project Area. No built heritage items were identified, and no historical archaeological deposits were identified.

13.3. Assessment of heritage impact

The Project Area lies within the historical boundary of Richard Windeyer's property. Windeyer was one of the earliest settlers and pioneers in Tomago. However, there are no items of heritage significance within the Project Area.

There are no heritage items or historical archaeological deposits in the Project Area.

13.4. Mitigation measures

No specific mitigation measures are needed for historic built or archaeological heritage.

In general, all on-site personnel are to be made aware of their obligations under the NSW Heritage Act 1977, including the reporting of any historic, or suspected historic material. This may be done through an onsite induction or other suitable format.

13.5. Conclusion

There are no heritage items within the Project Area.

All on-site personnel are to be made aware of their obligations under the *NSW Heritage Act* 1977, including the reporting of any historic, or suspected historic material. This may be implemented through an onsite induction or other suitable format.

14. Contaminated Site Assessment

JM Environments undertook a contaminated site assessment for the proposed development of the Tomago Resource Recovery Facility and Truck Parking Depot. The contaminated site assessment involved a Preliminary Site Investigation (PSI) in March 2020 followed by a Detailed Site Investigation (DSI) in May 2020. Based on the results of the contaminated site assessment, a Remedial Action Plan was prepared for the site.

This chapter summarises the contaminated site assessment. The full Preliminary Site Investigation (Appendix M1), Detailed Site Investigation (Appendix M2), and Remedial Action Plan (Appendix M3) reports are contained in Appendix M. This chapter should be read in conjunction with Appendix M1-M3.

14.1. Methodology

A Contaminated Site Assessment was conducted by MB Engineering Solutions Pty Ltd on behalf of the previous site owner, with three reports produced on soil contamination assessment for Lot 11 (21D School Drive) between 2012 and 2017. The original site assessment was utilised as the basis for the current analysis, with subsequent testing being complementary.

A Preliminary Site Investigation (PSI) of 21D, 21F and 21G School Drive Tomago was undertaken in March 2020. The scope of the PSI was as follows.

- Review of previous contamination assessments;
- Review of published information and government records;
- Drilling and sampling of two boreholes in the western part of the 21D School Drive in the vicinity of a hydrocarbon storage trench;
- Excavation and sampling of 23 test pits in the eastern part of the site 21G School Drive Tomago (Lots 7 and 8); and
- Laboratory analysis.

The PSI found small quantities of asbestos and elevated heavy metal concentrations in the investigation area. Subsequently, a Detailed Site Investigation (DSI) was conducted of 21D and 21F School Drive, Tomago, in May 2020. The scope of the DSI was as follows.

- Review of previous assessments regarding the site;
- Review of published information related to soils, acid sulfate soils, geology and hydrogeology;
- Review of previous site ownership (land titles search);
- Review of historical aerial photography over the past 60 years;
- Interviews with people familiar with the history of the site;
- Review of the site's Section 10.7 Certificate;
- Review of NSW EPA notices under the Contaminated Land Management Act 1997 (the CLM Act) and the Protection of the Environment Operations Act 1997 (the POEO Act);
- Search of WaterNSW groundwater database for records of nearby registered groundwater bores;
- Review of the above information, and identification of potential Areas of Environmental Concern (AECs) and Chemicals of Concern (COCs);
- Site walkover;
- Field work including the collection of soil samples - two boreholes on 21D School Drive and 15 test pits on 21F School Drive;
- Laboratory analysis;
- Tabulation of analytical results (including previous assessments); and

- Preparation of a report.

A Remedial Action Plan was prepared, based on the results of the contaminated site assessment. The methodology for preparing the Remedial Action Plan was as follows.

- Review and summary of the Detailed Site Assessment;
- Summary of available suitable remediation technologies;
- Development of a suitable remediation strategy for the site;
- Development of remediation validation methodology, criteria and outcomes;
- Establishment of WHS measures to be undertaken during remedial works to protect the
- health and safety of the general public and the environment; and
- Preparation of a RAP (this document) for the proposed redevelopment.

14.2. Existing environment

14.2.1. Site history summary

JM Environments reported that the site had been cleared for sand mining sometime between 1954 and 1974. The site was used for steel and aluminium manufacturing from prior to 1987 to 2017. It was considered possible that sandblasting had taken place on the site, associated with the manufacture of metal products.

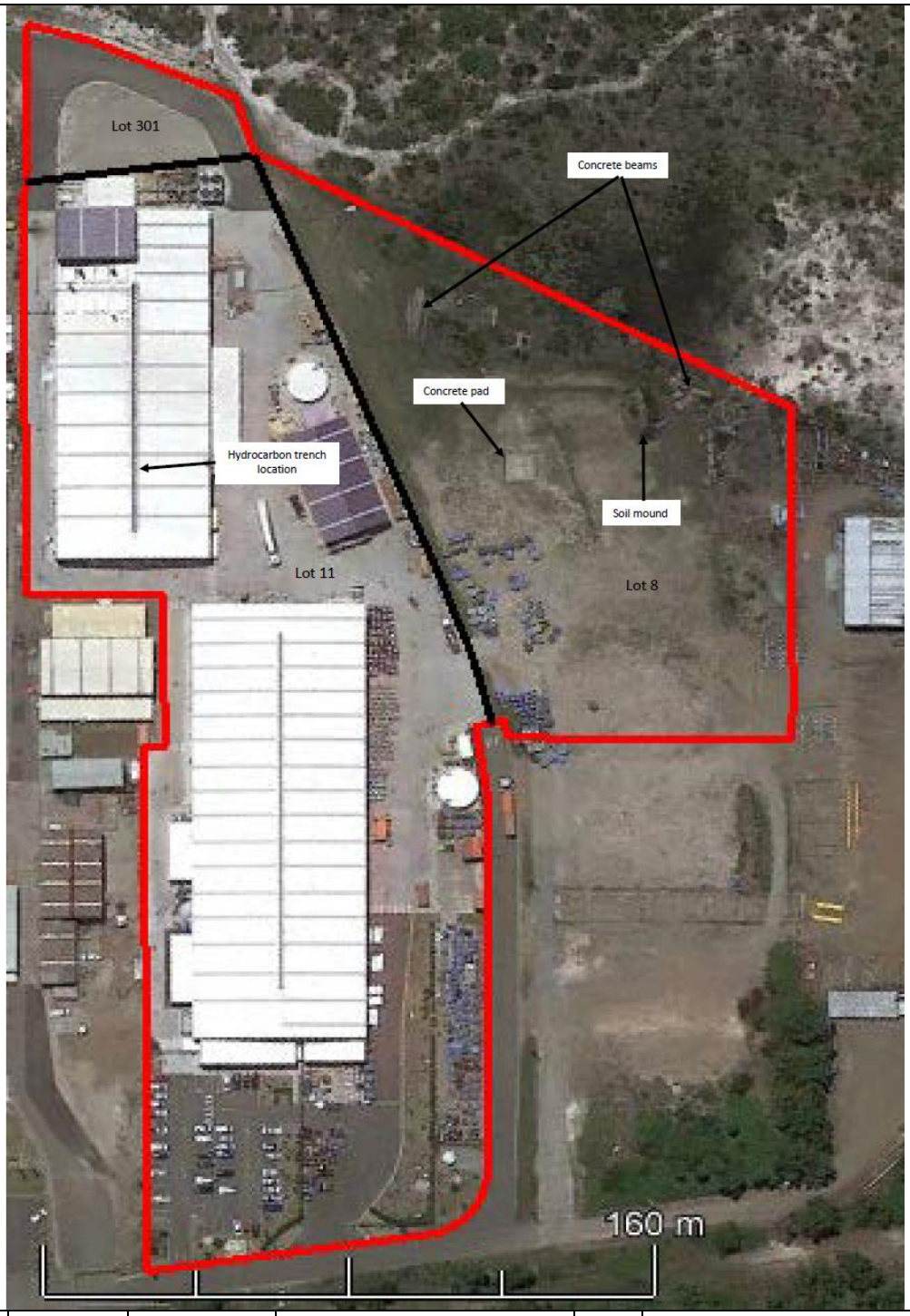
14.2.2. Site description

JM Environments reported that the site is mostly flat and divided into two parts (see Figure 14.1). The western part of the 21D School Drive was paved, with the exception of some small gardens on the southern boundary. 21D School Drive contained two large metal-clad sheds, and some smaller buildings and water tanks. Downpipes from the buildings, and gratings in the car parks and traffic areas in 21D School Drive, led to an underground stormwater infiltration system.

The eastern part of 21F School Drive was unpaved, and sparsely covered with grass and other low vegetation. The surface of 21F School Drive comprised dark grey sand, with common road base gravel and rock.

Much of the site appeared to have been covered by fill, comprising dark grey to dark brown gravelly sand, to a depth of >1m in parts. White to grey brown sand intersected at the bottom of test pits and boreholes was interpreted as representing in-situ, natural material.

Figure 14.1 Aerial view of site features.



Date	Revision	Drawn By	Site description	Client	REMONDIS Australia Pty Ltd
27/08/2020	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536	Project	Environmental Impact Assessment
				Title	Aerial view of site features
				Scale	As shown
				Source	JM Environments

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14.3. Site contamination assessment

JM Environments incorporated the findings of an Excavated Natural Material (ENM) Assessment conducted by MB Engineering Solutions Pty Ltd (MBES) in 2013 (herein referred to as MBE2017). Combined, the assessment included 50 systematic sampling points (test pits and boreholes), situated to provide coverage across the site. This number of sampling points satisfies the NSW Environment Protection Authority (EPA) *Sampling Design Guidelines* (1995) recommendation for the characterisation of a site 4ha in area. Seven targeted sampling points were also located in the vicinity of a hydrocarbon trench in the eastern part of the site (see Figure 14.1).

Sampling locations are shown in Figure 14.2.

14.4. Site contamination status

JM Environments reported that concrete beams and concrete-filled tyres had been stockpiled in the northeast part of the site (Figure 14.1).

The chemical contamination is summarised in this section and reported in more detail in Contaminated Site Assessment Report and Remediation Action Plan (Appendix M).

Total recoverable hydrocarbons (TRH) were not detected at concentrations exceeding the laboratory limit of reporting (LOR), with the exception of two samples collected from MBE2017 TP34 and one from JME20005 TP9. In a sample collected from 2 metres below ground level (mbgl) at TP34, TRH F2 was detected at a concentration of 490mg/kg, which exceeds the adopted ecological screening level (ESL) but does not exceed the adopted management limit.

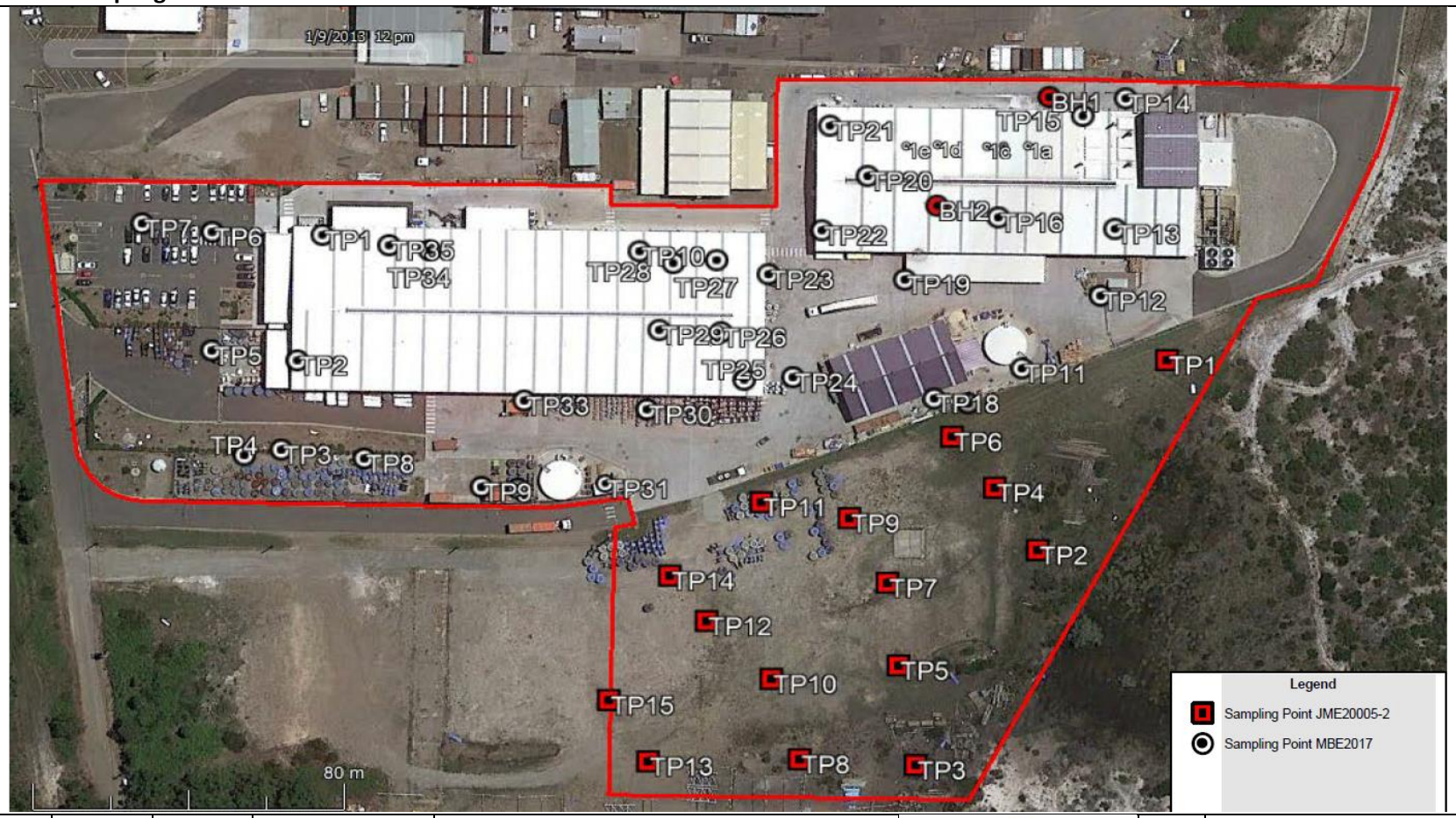
Heavy metals were detected in several samples in 21F School Drive, at concentrations which exceeded adopted DGVs. Observed exceedances included:

- Lead exceeded 250% of the adopted human health investigation level (HIL) in a surface sample collected from TP8 (see Figure 14.3);
- Cadmium and arsenic exceeded adopted EILs in surface samples collected from TP5, TP7 and TP8 (see Figure 14.3);
- Zinc exceeded the adopted ecological investigation level (EIL) in 17 samples from across 21F School Drive, as well as one sample from MBE2017 TP34, in 21D School Drive (see Figure 14.4);
- Copper exceeded the adopted EIL in five samples from along the eastern boundary of the site (see Figure 14.5).

Groundwater was intersected at approximately 2.4mbgl.

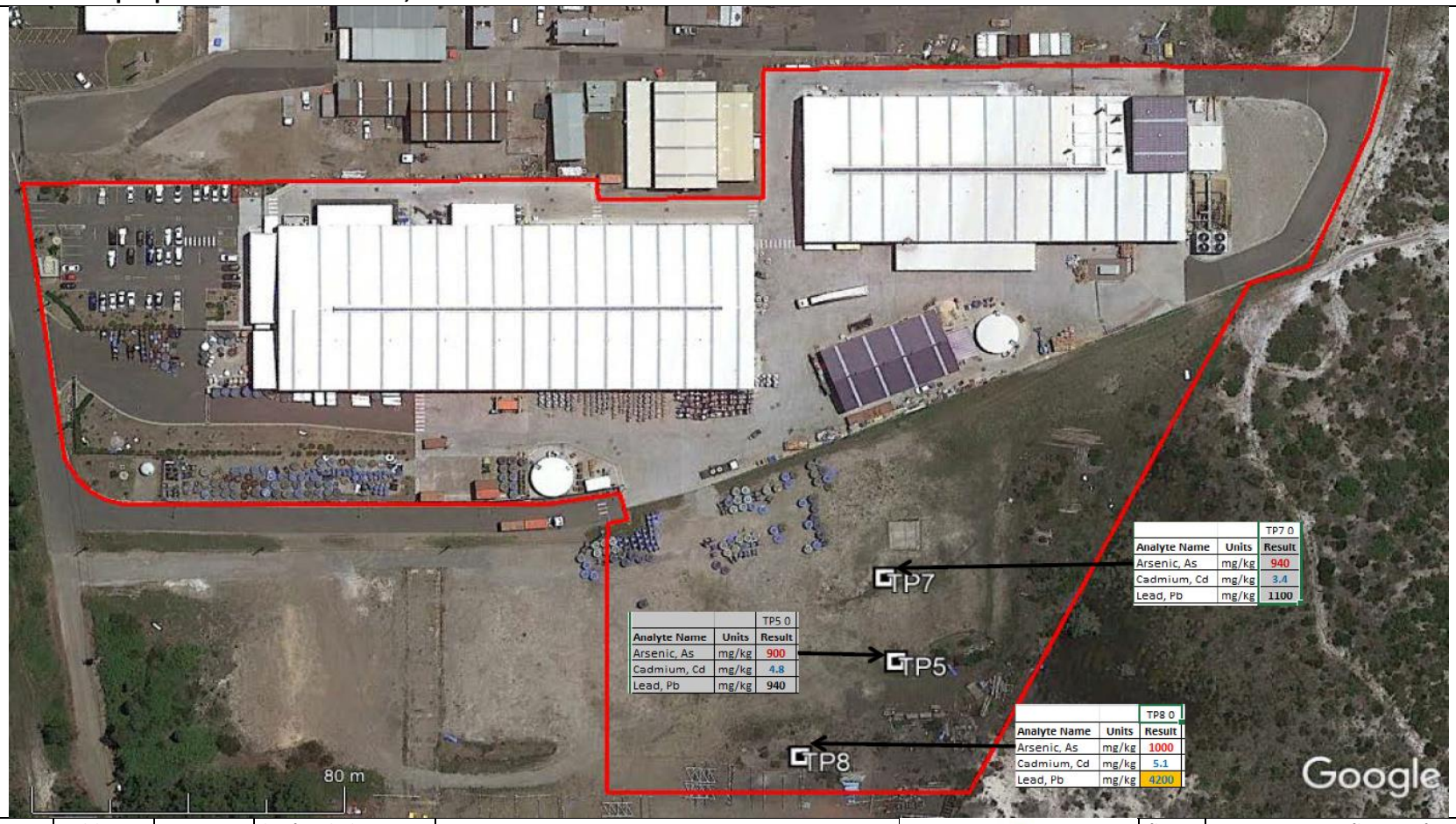
The groundwater assessment found that chromium, copper and zinc were detected in some wells at concentrations exceeding adopted ecological investigation levels, and exceeding background concentrations (Appendix M3). The assessment considered that under the proposed remediation and redevelopment, the risk associated with exposure to contaminated groundwater to on-site ecological receptors would be negligible, and to off-site receptors would be low.

Figure 14.2. Sampling locations.



Date	Revision	Drawn By	Site description	Jackson Environment and Planning Pty Ltd		Client	REMONDIS Australia Pty Ltd
27/08/2020	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536	Strategy | Infrastructure | Compliance | Procurement A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060 E: admin@jacksonenvironment.com.au T: 02 8056 1849 W: http://www.jacksonenvironment.com.au	JACKSON ENVIRONMENT AND PLANNING STRATEGY | INFRASTRUCTURE | COMPLIANCE | PROCUREMENT	Project	Environmental Impact Assessment
						Title	Sampling locations
						Scale	As shown
						Source	JM Environments

Figure 14.3. Sample points with elevated As, Cd and Pb concentrations.



Analyte Name	Units	TP5 0 Result
Arsenic, As	mg/kg	900
Cadmium, Cd	mg/kg	4.8
Lead, Pb	mg/kg	940

Analyte Name	Units	TP7 0 Result
Arsenic, As	mg/kg	940
Cadmium, Cd	mg/kg	3.4
Lead, Pb	mg/kg	1100

Analyte Name	Units	TP8 0 Result
Arsenic, As	mg/kg	1000
Cadmium, Cd	mg/kg	5.1
Lead, Pb	mg/kg	4200

Date	Revision	Drawn By	Site description
27/08/2020	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536

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Client	REMONDIS Australia Pty Ltd
Project	Environmental Impact Assessment
Title	Elevated As, Cd, Pb concentrations
Scale	As shown
Source	JM Environments

Figure 14.4. Sample points with Zinc exceedances.

Date	Revision	Drawn By	Site description
27/08/2020	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536

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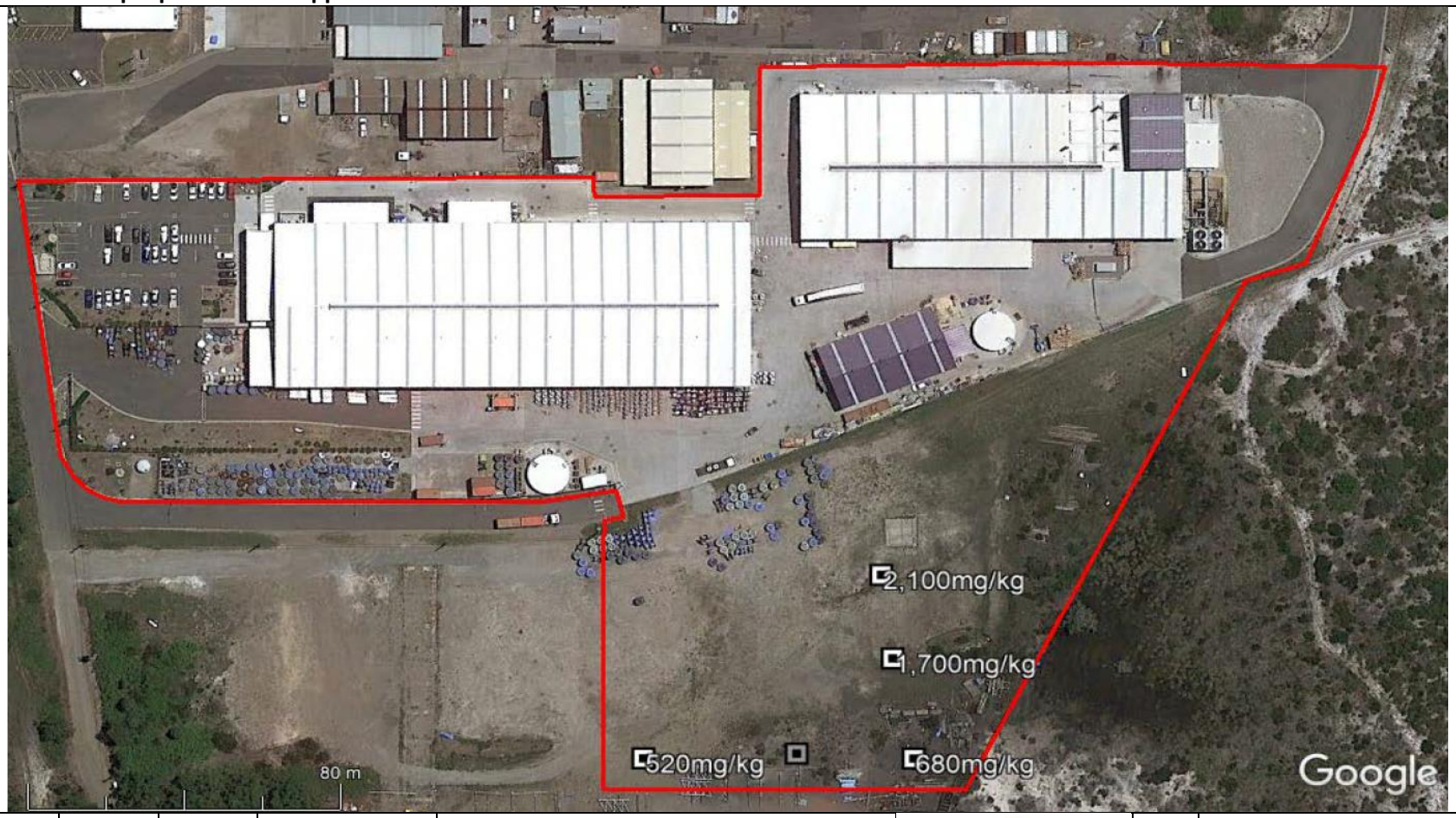
Client	**REMONDIS Australia Pty Ltd**
Project	Environmental Impact Assessment
Title	Zinc exceedances
Scale	As shown
Source	JM Environments

Figure 14.5. Sample points with Copper exceedances.



Date	Revision	Drawn By	Site description	Jackson Environment and Planning Pty Ltd		Client	REMONDIS Australia Pty Ltd
27/08/2020	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536	Strategy | Infrastructure | Compliance | Procurement A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060 E: admin@jacksonenvironment.com.au T: 02 8056 1849 W: http://www.jacksonenvironment.com.au		Project	Environmental Impact Assessment
						Title	Copper exceedances
						Scale	As shown
						Source	JM Environments

14.5. Assessment

Soils on the site were observed to comprise mostly sand. Fill, comprising brown to black sand, and containing some plastic, road base gravel, brick, concrete, metal and rocks, was observed to a depth of approximately 0.5 - 1mbgl across much of the site. Elevated zinc and copper concentrations in this material were considered to be consistent with the use of sandblasting in the metal manufacturing process.

Below the fill, grey brown sand interpreted as being in-situ, natural material appeared to be largely uncontaminated.

Elevated cadmium, arsenic and lead concentrations were observed in dark sandy material collected from three test pits in the northeast corner of the site. It is noted that these analytes are commonly found at high concentrations in slag. It was considered possible that slag had been deposited on the surface in limited areas of the site.

The western part of 21D School Drive was covered by concrete pavement 0.2m thick. JME considers this to be sufficient to prevent an exposure pathway between zinc and TRH contamination (detected in TP34 at concentrations exceeding ecological guideline values) and potential sensitive receptors.

A north-south concrete-lined trench, understood to have been used for hydrocarbon storage, was observed in a large shed in the northwest corner of the site. Hydrocarbon contamination was not observed in samples collected from this area, indicating that significant contamination of soils in this area had not been caused by leaks from the trench.

JME considers that concrete and asphalt pavement over 21D School Drive provides sufficient isolation of zinc and TRH contamination identified in MBE2017 TP34. It is therefore considered that the lateral extent of remediation required relates to surface fill, identified in JME2005-2 to depths between 0.5mbgl and 1.0mbgl, in 21F School Drive, an area of approximately 1.25ha.

14.6. Source zone characteristics

14.6.1. Primary contaminant sources

JME considered potential sources of impact on the site to include:

- Use of the site for manufacture of metal products (potentially including sandblasting operations);
- A hydrocarbon storage trench in the northwest corner of the site; and
- Potential importation of uncontrolled fill.

14.6.2. Identified contaminants of concern

Based on the results of this assessment, contaminants of concern on the site were considered to include heavy metals (arsenic, cadmium, copper, lead and zinc).

14.6.3. Areas of environmental concern

AECs on the site were considered to include fill across the surface of 21F School Drive.

14.6.4. Contaminant transport mechanisms

Primary transport mechanisms on the site were considered to include:

- Wind transport of fine surface material;
- Surface water flow; and
- Percolation of stormwater through permeable sediments into groundwater, and groundwater migration towards the Hunter River.

14.6.5. Contaminant exposure pathways

For contaminated soil to pose a risk to a receptor, a complete exposure pathway must exist between the source of impact and the receptor. A complete exposure pathway consists of the following elements:

- A source and mechanism for release;
- A storage and/or transport medium (e.g. contaminants stored in fine soil types and transported into the atmosphere as dust);
- An exposure point, where the receptor comes in contact with the contamination; and
- An exposure route (e.g. inhalation).

Potential exposure pathways on the site were considered to include:

Metabolisation by the local ecology;

- Dermal contact, incidental ingestion and inhalation of dust by workers on the site and neighbouring premises; and
- Off-site migration of groundwater potentially impacting hydraulically down-gradient surface water users and ecology.

14.6.6. Identification of receptors at risk

Potential receptors were considered to include:

- Future workers and visitors to the site;
- Local ecology;
- Groundwater; and
- Down-gradient surface water (Hunter River) users and ecology.

14.7. Mitigation measures

On-site or off-site treatment of contaminated material was not deemed to be a technically feasible option to destroy heavy metal contamination on the site, as the estimated cost of disposal of all contaminated fill from the site was considered prohibitive.

21F School Drive will be used for vehicle parking. This will necessitate the importation of road base material to form a suitable surface for these activities.

Accordingly, JME recommends capping of the site to manage risks posed by remaining contaminants, by preventing a direct exposure pathway between contaminated fill, and users of the proposed redevelopment.

A low-permeability cap is considered to be an appropriate remediation method for heavy metal, contamination of the site. A cap would be intended to isolate future users of the site from contaminated material, and to prevent its migration off site via stormwater infiltration and groundwater flow. A low-permeability cap of compacted road base material would inhibit the infiltration of rainwater; combined with an underground stormwater drainage system this would limit the amount of water percolating through contaminated soils, and reduce the potential for groundwater to be contaminated (groundwater was observed beneath the site at depths greater than the extent of contaminated fill).

As the capping layer would be achieved via the construction of a parking surface pad, there would be limited additional specific remediation measures required.

Specifically, the remedial strategy will comprise the following:

- Removal of anthropogenic waste from the northern end of 21F School Drive;
- Placement of a geofabric marker layer under the capping fill, to provide geotechnical support for the road base as well as to act as a visual marker for potential future excavations;
- Importation of road base to form a capping layer of at least 0.5m thickness; and
- Installation of stormwater drainage system.

Since the remedial plan does not remove contamination from the site, there is an ongoing commitment required to manage the contamination remaining on site. This commitment will be addressed via a Long-Term Environmental Management Plan (LTEMP), as discussed in Section 10 of the Remedial Action Plan (Appendix M).

14.8. Conclusion

It is proposed to remediate the eastern part of 21F School Drive via a cap and contain strategy. It is considered that the emplacement of 0.5m of suitable imported material as a working surface, and associated in-ground stormwater management, will remove a potential exposure pathway between contaminated fill and surface ecological and human receptors, as well as reducing the potential for groundwater contamination.

It is considered that existing asphalt and concrete pavements over the site's western part of 21D School Drive already provide an effective barrier between contaminated soil and potential receptors.

JME considers that the site may be considered suitable for its proposed redevelopment and ongoing industrial land use, pending successful implementation of remedial measures as detailed in the Remedial Action Plan, and the preparation and implementation of an LTEMP.

15. Bushfire Risk

15.1. Introduction

Newcastle Bushfire Consulting undertook a bushfire assessment for the proposed development of the Tomago Resource Recovery Facility and Truck Parking Depot.

The study was undertaken to establish suitable bushfire mitigation measures for the proposed development pursuant to the requirements of Section 4.14 of the *Environmental Planning and Assessment Act* 1979.

The bushfire assessment has been prepared in accordance with the following guidelines:

- *Environmental Planning and Assessment Act,* 1979;
- *Planning for Bush Fire Protection* (NSW Rural Fire Service, 2019); and
- Australian Standard 3959:2018 *Construction of buildings in bushfire-prone areas*.

This chapter summarises the bushfire assessment. The full bushfire assessment report is contained in Appendix N. This chapter should be read in conjunction with Appendix N.

15.2. Existing environment

15.2.1. Bushfire prone land

The site is classified as bushfire prone land in accordance with Port Stephens Council's Bushfire Prone Land Map. However, aerial imagery and a site inspection have revealed that the Bushfire Prone Land Map is inaccurate with respect to the current bushfire hazard.

Therefore, the major vegetative threats have been determined using Keith (2004[4]) to derive vegetation structures listed in NSW Rural Fire Service's *Planning for Bush Fire Protection* (2019). Primary Vegetation Structures have been identified in Figure 15.1 and separation distances are provided in Table 15.2.

15.2.2. Vegetation

The site is predominantly grassland with a small number of scattered shrubs. The site is surrounded by established industrial development to the west and south.

The vegetation to the immediate north and northwest of the site is heavily fragmented with significant areas of exposed sand located between low coastal heath less than 0.5 metres in height. There are large expanses of grass located east and south of the site.

A dry sclerophyll forest is located south of the site. The upper stratum is dominated by eucalypts with a low-density canopy bordering on woodland in some areas. There is an understorey of grasses and native shrubs. An access trail is located on the northern boundary of the forest.

15.2.3. Slope

The site has a gentle relief rising slightly from south to north. North of the site is level to slightly upslope while south of the site is 1° to 5° downslope.

The effective slopes have been identified in Figure 15.1 and the ranges are shown in Table 15.1.

[4] Keith D. (2004) "Ocean Shores to Desert Dunes", Department of Environment and Conservation, Sydney.

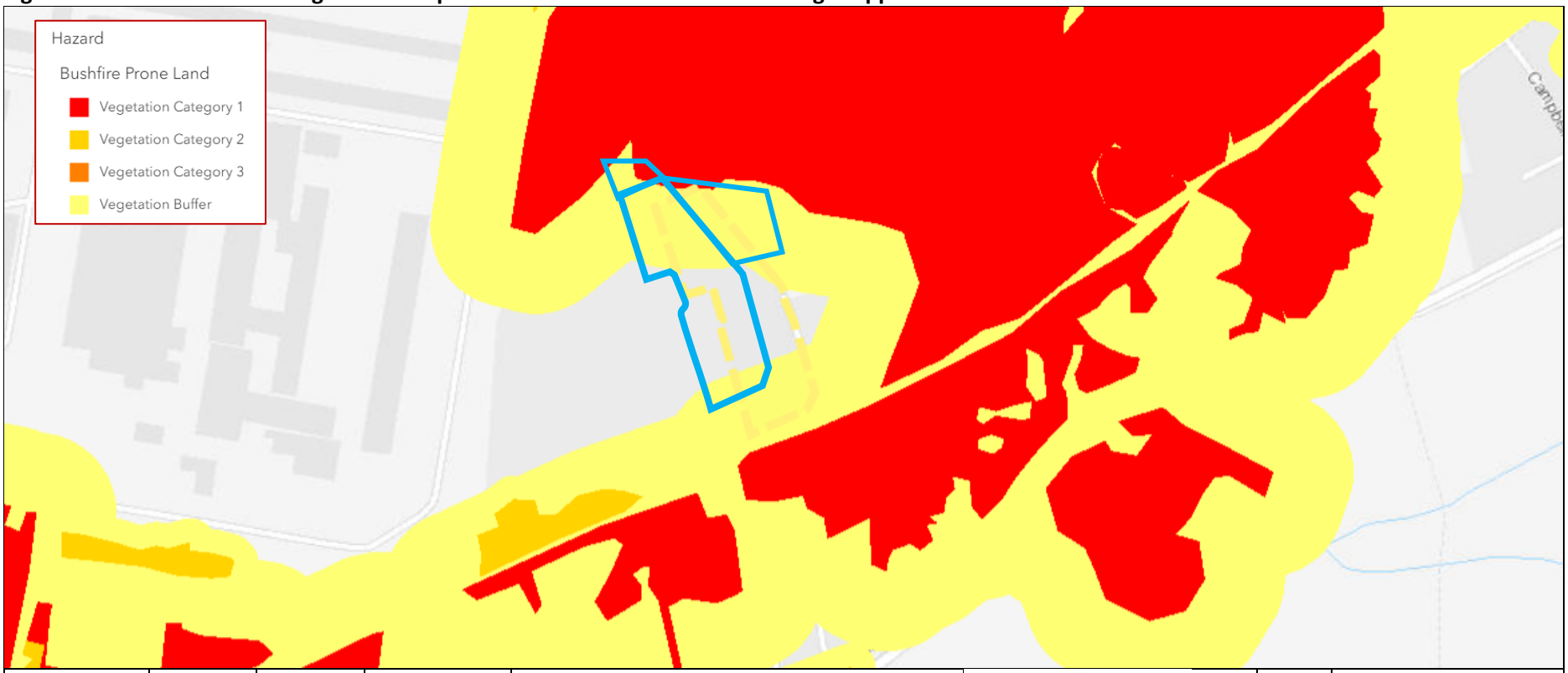
15.2.4. Utility services and infrastructure

The utility services and infrastructure at the site are summarised in Table 15.1.

Table 15.2. Utility services and infrastructure.

Utility service / Infrastructure	Description
Water	A reticulated water supply and street hydrant access is available providing coverage of the development in accordance with AS 2419.1: 2005.
Electrical	The existing electrical supply to the local area is via overhead electrical transmission lines. issued by Energy Australia (NS179, April 2002). Onsite power supply is underground.
Gas	All buildings are outside the flame zone and require no specific building upgrades
Access	Property access is by way of School Drive providing access from the public road system directly to the private land, giving fire fighters access to the building. The existing property access roads comply with section 7 of Planning for Bush Fire Protection (2019) and are capable of vehicle movement for vehicles larger than a medium rigid vehicle.

Figure 15.1. Bushfire Prone Vegetation Map for 21D and 21F School Drive Tomago. Approximate site boundaries are shown in blue.



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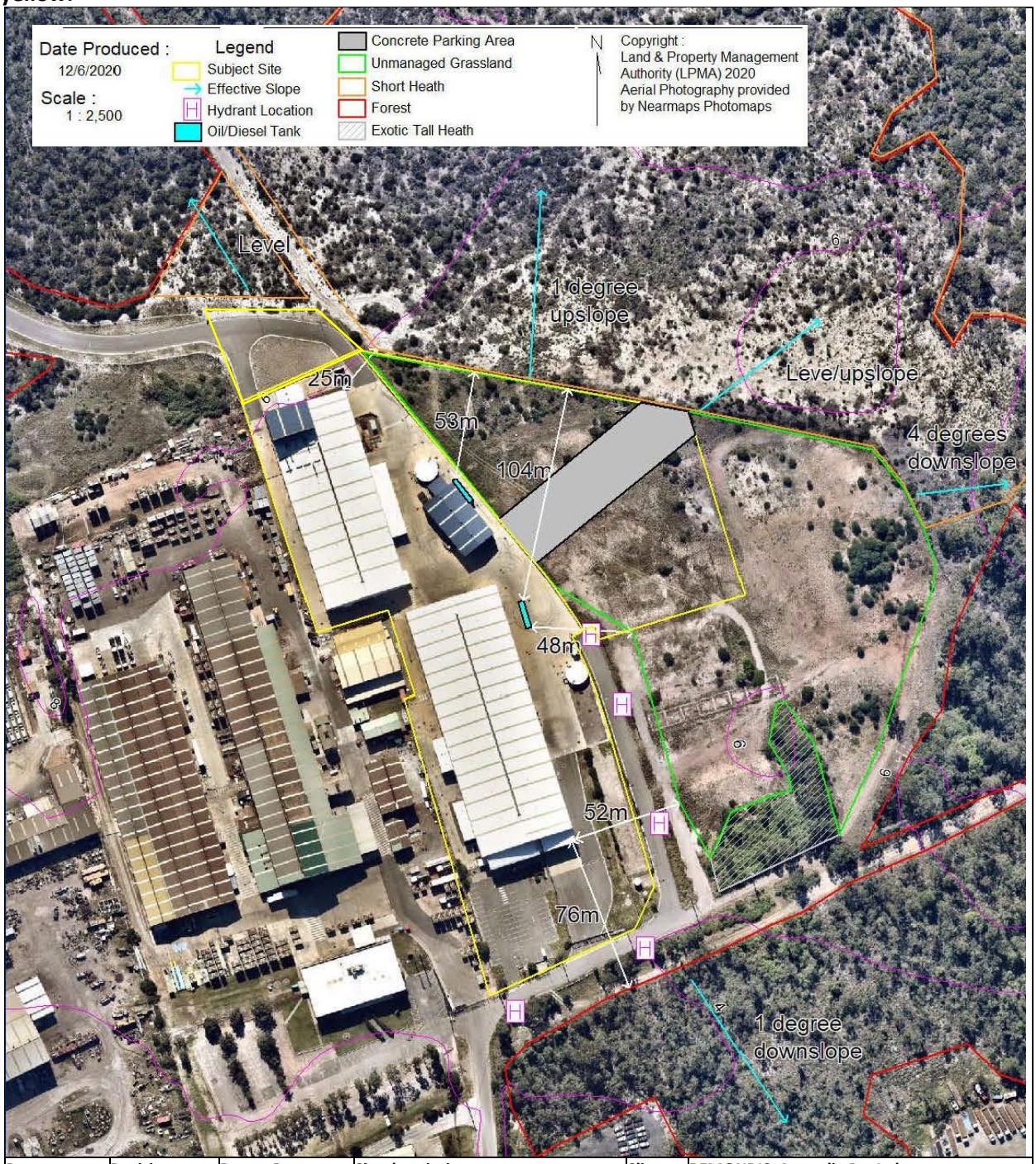
18/06/2020	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536	Strategy | Infrastructure | Compliance | Procurement A: Suite 102, Level 1, 25-29 Berry St, North Sydney NSW 2060 E: admin@jacksonenvironment.com.au T: 02 8056 1849 W: http://www.jacksonenvironment.com.au	Project	Environmental Impact Assessment
					Title	Bushfire Prone Land Map
					Scale	As shown
					Source	Port Stephens LEP

Figure 15.3. Site Constraint Map for 21D and 21F School Drive Tomago Approximate site boundaries are shown in yellow.



Date	Revision	Drawn By	Site description	Client	REMONDIS Australia Pty Ltd
18/06/2020	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536	Project	Environmental Impact Assessment
				Title	Site Constraint Map
				Scale	1:2500
				Source	Newcastle Bushfire Consulting

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15.3. Bushfire threat assessment

15.3.1. Bushfire attack levels

A Bushfire Attack Level (BAL) is a means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact. It is measured in increments of radiant heat (expressed in kilowatts/m^2). There are six bushfire attack levels in total, these are:

- BAL Flame Zone;
- BAL 40;
- BAL 29;
- BAL 19;
- BAL 12.5; and
- BAL Low.

The Bushfire attack levels and relevant construction levels in accordance with the *Planning for Bush Fire Protection* (2019) have been summarised in Table 15.2 which provides the bushfire threat assessment for the existing infrastructure.

Table 15.2 Bushfire threat assessment to existing buildings.

Boundary	North	East	South	West
Vegetation Structure	Short Heath	Grassland	Forest	Maintained Lands
Asset Protection Zone	25 metres	52 metres	76 metres	140 metres
Accurate Slope Measure	1-degree upslope	Level	1-degree downslope	N/A
Slope Range	Level/Upslope	Level/Upslope	1 to 5 degrees downslope	N/A
AS3959 (2018) Bushfire Attack Level (BAL)	BAL-12.5	N/A	BAL-12.5	BAL-LOW

15.4. Commercial and industrial development compliance

Where no residential component is included, commercial and industrial development is addressed through the aims and objectives of *Planning for Bush Fire Protection* (2019).

The aim of *Planning for Bush Fire Protection* (2019) is to use the NSW development assessment system to provide for the protection of human life (including firefighters) and to minimise impacts on property from the threat of bush fire, while having due regard to development potential, onsite amenity and protection of the environment.

The aims and objectives of *Planning for Bush Fire Protection* (2019) and how compliance is achieved is addressed in Table 15.3 below.

Table 15.3. Compliance with the aims and objectives of *Planning for Bush Fire Protection* (2019).

Aims and objectives	Compliance assessment
Afford occupants of any building adequate protection from exposure to a bush fire.	Multiple building exits are available, located away from the bushland threat. Evacuation planning in the event of bushfire should clearly indicate to building users safe evacuation procedure.
Provide for a defendable space to be located around buildings.	Defendable space is available around all buildings and the proposed truck parking area. In the event of bush fire, firefighters will have direct access to the bushland via the open areas onsite and the internal road network which will support firefighting efforts. In the event a fire-front impacts on the building, defendable space is available around the building from where the fire could be fought.
Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings.	All buildings are outside the flame zone and require no specific building upgrades
Ensure that appropriate operational access and egress for emergency service personnel and occupants is available	The property access to the facility offers compliance with Planning for Bush Fire Protection access requirements
Provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ)	The building manager shall maintain landscaping and fuel management in accordance with Appendix 4 of Planning for Bush Fire Protection and the NSW Rural Fire Service's document Standards for Asset Protection Zones
Ensure that utility services are adequate to meet the needs of firefighters.	Significant hydrant network is already available through the site.

15.5. Potential ignition sources during operation

The following potential ignition sources are identified that could affect the occurrence and growth of a fire:

- Equipment faults, such as electrical short circuit or fuel leak on a machine;
- Lightning strike;
- Hazard reduction burn;
- Intentional arson; and
- Lit cigarettes or matches being carelessly thrown on the ground.

The varying stages of the development will involve clearing of bushland with limited opportunity for fire to start if machinery is maintained and the bushland is not burned.

1.1.1. Storage oil and diesel storage

Three portable tanks are proposed with the oil tanks being located 53 metres off the northern short heath and the diesel fuel tank being located more than 100 metres from bushland. Both tanks are constructed to AS1692:2006 *Steel tanks for flammable and combustible liquids* and AS1940:2017 *The storage and handling of flammable and combustible liquids*. Both tanks are double layer 5mm steel with the manufacturer's recommendations on maintenance of site upkeep included in Appendix 2 of bushfire assessment report (Appendix N). The emergency management plan should consider the potential of leakage and fire within both tanks to ensure building integrity is not lost.

15.6. Mitigation measures

Based upon an assessment of the plans and information received for the proposal, it is recommended that development consent be granted subject to the following conditions:

1. At the commencement of building works and in perpetuity, the entire property shall be managed as an inner protection area (IPA) as outlined within Appendix 4 of *Planning for Bush Fire Protection* (2019) and the NSW Rural Fire Service's document Standards for Asset Protection Zones.
2. Landscaping is to be undertaken in accordance with Appendix 4 of *Planning for Bush Fire Protection* (2019) and managed and maintained in perpetuity.
3. It is recommended that the property owner and occupants familiarise themselves with the relevant bushfire preparation and survival information provided by the New South Wales Rural Fire Service.
4. The building manager shall have emergency evacuation plans prepared for the workplace with specific consideration of bushfire evacuation and management planning.

15.7. Conclusion

The final recommendation is that the proposed development offers compliance with *Planning for Bush Fire Protection* (2019). There is potential for bushfire attack at this site and a list of recommendations has been included in this section to reduce that risk.

16. Chemicals and Fuels

16.1. Introduction

The main areas for storing chemicals on-site will be the Hazardous Waste Recycling Facility, within Building 2. The facility will accept the following wastes for recycling:

- Drained oil filters, rags and absorbent material (hydrocarbons);
- Containers & drums of controlled waste residues;
- Contaminated soils;
- Lead acid batteries;
- Batteries (Li-ion/NiCad/etc);
- Fluoro tubes;
- Gyproc;
- Use fire extinguishers and pressure vessels/rams etc; and
- E-waste.

The facility will also accept a range of trackable liquid wastes for aggregation. This will include:

- Waste Mineral Oils;
- Oily water/Coolant etc; and
- Residual Solvents/Thinners/Paints.

The facility will primarily sort and aggregate these wastes for further processing at appropriate facilities off site.

In addition, approximately 60,000L of diesel fuel will be stored on site to fuel the transport vehicles.

Table 16.1 below provides a summary of the liquid waste and fuel storage capacity at the site.

Table 16.1. Liquid waste and fuel storage capacity at the site.

Storage tank	Self-bunded storage tank volume (L)
Tank 1 – Waste oil	54,000
Tank 2 – Waste oil	67,000
Tank 3 – Oily water / coolant	20,000
Tank 4 – Oily water / coolant	20,000
Tank 5 – Fuel / AdBlue for refuelling vehicles and equipment	60,000
Tank 6 – Liquid food waste from Packaged Food Recycling Plant (PFRP)	20,000
Tanks 7 – Drill mud liquid storage tank	50,000

The volumes of solid hazardous waste are listed in the Waste Management Plan at Appendix E.

16.2. Assessment

All hazardous wastes will be unloaded, handled and loaded within Building 2, which is an enclosed building with bunding to capture any major spills. In addition, spill kits and "absorbent sausages" will be strategically placed around the site to quickly deal with any spills. The risk of hazardous wastes contaminating stormwater is very low.

The diesel fuel will be stored in a self-bunding tank. The tank will be covered with an awning to prevent any minor spills contaminating stormwater when it rains.

The risk assessment provided in Chapter 15 indicates that the small volumes of hazardous materials stored on site result in a low-medium risk to the environment.

16.3. Mitigation Measures

A number of mitigation measures will be implemented to minimise any potential harm to the surrounding environment. These include:

- All liquid wastes, chemicals and fuels to be handled and stored under cover in bunded areas;
- All staff working in areas with liquid wastes to be properly trained and wear PPE at all times;
- MSDS sheets, where available, to be readily accessible for all chemicals on site;
- Chemical spill kits and "absorbent sausages" to be kept on site and readily accessible near liquid waste and chemical storage;
- Firefighting equipment to be accessible and regularly inspected.

The Pollution Incident Response Management Plan for the site is provided in Appendix O.

16.4. Conclusion

Storage of all liquid wastes, chemicals and fuels will be under cover in bunded areas. Preventative and mitigating measures will be in place. Provided proposed storage and handling protocols are adhered to, the impact of the chemicals and fuels to be stored on site will be minimal.

17. Hazard and Risk Assessment

A Preliminary Hazard Analysis and Environmental Risk Assessment has been performed to identify key potential impacts of the development, as well as potentially offensive or hazardous issues that need to be considered as part of the EIS process.

The assessment has been performed according to AS/NZS ISO 31000: 2009 *Risk Management – Principles and Guidelines* and the Preliminary Hazardous Analysis has been informed by the *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33* (NSW Department of Planning, 2011)[5]. We have also considered the following guidelines published by the NSW Department of Planning in 2011:

- *Hazardous Industry Planning Advisory Paper No 2 - Fire Safety Study Guidelines*[6]
- *Hazardous Industry Planning Advisory Paper No 3 - Risk Assessment*[7]
- *Hazardous Industry Planning Advisory Paper No 4 - Risk Criteria for Land Use Safety Planning*[8]
- *Hazardous Industry Planning Advisory Paper No 6 - Hazard Analysis*[9].

17.1. Scope

The assessment has been performed to identify the risks posed to people, property and the environment, and to identify potential hazardous and offensive issues that need to be addressed as part of the development to ensure compliance with SEPP 33. The assessment also considers off-site risks to people, property and the environment (in the presence of controls) arising from atypical and abnormal hazardous events and conditions (i.e. equipment failure, operator error and external events). The hazard treatment measures that have been proposed assist in producing a 'low' level of risk in accordance with the risk acceptance criteria.

[5] NSW Department of Planning (2011). Hazardous and Offensive Development Application Guidelines - Applying SEPP 33. Published by the NSW Department of Planning. Internet publication: http://www.planning.nsw.gov.au/en/Policy-and-Legislation/~/media/3609822D91344221BA542D764921CFC6.ashx

[6] NSW Department of Planning (2011). Hazardous Industry Planning Advisory Paper No 2 - Fire Safety Study Guidelines. Published by the NSW Department of Planning. Internet publication: http://www.planning.nsw.gov.au/Policy-and-Legislation/~/media/CCC734E980C4427DB95D319DF073C41A.ashx

[7] NSW Department of Planning (2011). Hazardous and Offensive Development Application Guidelines- Risk Criteria for Land Use Safety Planning. Published by NSW Department of Planning. Internet publication: http://www.planning.nsw.gov.au/Policy-and-Legislation/~/media/0D39F08E7889409BBA1FA88D5FB859FD.ashx

[8] NSW Department of Planning (2011). Hazardous Industry Planning Advisory Paper No 4 - Risk Criteria for Land Use Safety Planning. Published by the NSW Department of Planning. Internet publication: http://www.planning.nsw.gov.au/Policy-and-Legislation/~/media/0D39F08E7889409BBA1FA88D5FB859FD.ashx

[9] NSW Department of Planning (2011). Hazardous Industry Planning Advisory Paper No 6 - Hazard Analysis. Published by NSW Department of Planning. Internet publication: http://www.planning.nsw.gov.au/Policy-and-Legislation/~/media/3ACC37BE3EFE4BAAB3EBA5872AFBA8BD.ashx

17.2. Methodology

The NSW Department of Planning (2011) in the *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33* sets out a process for screening potentially hazardous materials that are stored on site as part of a proposed development.

Potential risk typically of holding certain types of hazardous materials on site depends on:

- the properties of the substance(s) being handled or stored;
- the conditions of storage or use;
- the quantity involved;
- the location with respect to the site boundary; and
- the surrounding land uses.

Risk screening needs to be undertaken as part of the SEPP 33 guidelines based on an estimate of the consequences of fire, explosion or toxic release from material(s) being handled. It takes into account information from the proponent on the properties of the materials, quantity, type of storage or use, and location.

The methodology used to inform preliminary hazard analysis and environmental risk assessment has included the following steps:

- Identify and screen the hazards associated with the project;
- Examine the maximum reasonable consequence of identified events;
- Qualitatively estimate the likelihood of events;
- Proposed risk treatment measures;
- Qualitatively assess risks to the environment, member of the public and their property arising from atypical and abnormal events and compare these to applicable qualitative criteria;
- Recommend further risk treatment measures if considered warranted; and
- Qualitatively determine the residual risk assuming the implementation of the risk treatment measures.

It is important to note that this preliminary hazard analysis and environmental risk assessment has been undertaken at an early stage of the proposed development to help inform key issues to be considered in the EIS. All hazards need to be identified, and an assessment of the resultant risk levels on a cumulative basis is also undertaken as part of the study.

17.2.1. Risk management

The environmental risk assessment has been informed by AS/NZ 31000: 2009 *Risk Management Principles and Guidelines* and *Hazardous Industry Planning Advisory Paper No 3 - Risk Assessment* (NSW Department of Planning, 2011). The risk management process has been informed by the following elements:

- Establish the context;
- Identify the risks;
- Analyse the risks;
- Evaluate the risks; and
- Treat risks.

17.2.2. Risk criteria

The following principles have been adopted to identify and assess risk in this study. This has been informed by the *Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning* (NSW Department of Planning, 2011).

- The avoidance of all avoidable risks;
- The risk from a major hazard should be reduced wherever practicable, even where the likelihood of exposure is low;
- The effects of significant events should, wherever possible be contained within the site boundary; and
- Where the risk from an existing installation is already high, further development should not pose any incremental risk.

17.2.3. Qualitative measurement of consequence, likelihood and risk

To undertake a qualitative risk assessment, it is useful to describe the levels of consequence of a particular event, and the likelihood or probability of such an event occurring. Risk assessment criteria have been developed in AS/NZS ISO 31000: 2009 which allows the risk assessor to develop risk criteria during the establishment of the context.

In according with AS/NZS ISO 31000: 2009, Table 17.1 and Table 17.2 have been reviewed as part of establishing the context of the project. These tables were considered to be consistent with the specific objectives of the preliminary hazard analysis and environmental risk assessment.

Table 17.1. Qualitative measures of probability.

Event	Likelihood	Description
A	Almost certain	Happens often
B	Likely	Could easily happen
C	Possible	Could happen and has occurred elsewhere
D	Unlikely	Has not happened yet but could
E	Rare	Conceivable, but only in extreme circumstances

Table 17.2. Qualitative measures of maximum reasonable consequence.

Event	People	Environment	Asset / Production
1	Multiple fatalities	Extreme environmental harm (e.g. widespread catastrophic impact on environmental values of an area)	More than $1B loss or production delay
2	Permanent total disabilities, single fatality	Major environmental harm (e.g. widespread substantial impact on environmental values of an area)	$100M to $1B or production delay
3	Minor injury or health effects (e.g. major lost workday case / permanent disability)	Serious environmental harm (e.g. widespread and considerable impact on environmental values of an area)	$5M - $100M loss or production delay
4	Minor injury or health effects (e.g. restricted work or minor lost workday case)	Material environmental harm (e.g. localised and considerable impact on environmental values of an area)	$250K to $5M loss or production delay
5	Slight injury or health effects (e.g. first aid / minor medical treatment needed)	Minimum environmental harm (e.g. minor impact on environmental values of an area)	Less than $250K or production delay

Combining the probability and consequence tables, Table17.3 provides a qualitative risk analysis matrix to assess risk levels.

Table 17.3. Qualitative risk analysis matrix used in this preliminary hazard analysis and environmental risk assessment.

Consequence	Probability[1]				
	A	B	C	D	E
1	1 (H)	2 (H)	4 (H)	7 (M)	11 (M)
2	3 (H)	5 (H)	8 (M)	12 (M)	16 (L)
3	6 (H)	9 (M)	13 (M)	17 (L)	20 (L)
4	10 (M)	14 (M)	18 (L)	21 (L)	23 (L)
5	15 (M)	19 (L)	22 (L)	24 (L)	25 (L)

[1] Legend – L: low; M: Moderate; H: high; Risk numbering: 1 – highest; 25 – lowest risk. Colour coding: Green: tolerable risk; orange: ALARP – as low as reasonably practicable; red: intolerable risk.

Risk acceptance criteria for the project have been formulated following consideration of the *Hazardous Industry Planning Advisory Paper No 4 - Risk Criteria for Land Use Safety Planning* (NSW Department of Planning and Environment, 2011d) and AS/NZS ISO 31000 2009 – *Risk Management Principles and Guidelines.*

In assessing the tolerability of risk from potentially hazardous development, both qualitative and quantitative aspects need to be considered. Relevant general principles considered in this study as documented in the *Hazardous Industry Planning Advisory Paper No 4 - Risk Criteria for Land Use Safety Planning* (NSW Department of Planning, 2011):

- The avoidance of all avoidable risks;
- The risk from a major hazard should be reduced wherever practicable, even where the likelihood of exposure is low;
- The effects of significant events should, wherever possible be contained within the site boundary; and
- Where the risk from an existing installation is already high, further development should not pose any incremental risk.

17.3. Project summary

REMONDIS proposes to use the existing buildings at 21D School Drive for the receipt and processing of up to 98,201 tonnes per annum of solid and liquid waste materials. Waste materials include dry non-putrescible waste materials from domestic sources, commercial and industrial sources. It will also receive within this total a small amount of putrescible waste materials from the depackaging of food, such as drinks and packaged food items. The facility will also receive and recycle liquid wastes such as drill muds from hydro-excavation and oily wastes from mining and industrial activities across the region.

Each recycling operation will be established in discreet parts of the existing industrial warehousing, and collectively, the Tomago Resource Recovery Facility will provide a wide range of recycling services through:

- A fully integrated Materials Recovery Facility for sorting and processing:
  - Commercial and industrial mixed general solid waste (non-putrescible) (60%); and
  - Construction building waste from residential and commercial construction (non-putrescible) (40%);
- A Cardboard Baling Facility for source separated cardboard collected from businesses;

- A Drill Mud Recycling Facility for drill muds sourced from the civil, construction and mining industries;
- A Packaged Food Recycling Plant, which will accept packaged foods and drinks, separating the food contents and packaging for recycling;
- A Garden Organics Primary Processing plant, which will receive, decontaminate and shred woody garden organics for off-site composting;
- A Hazardous Waste Recycling Facility, for sorting and aggregating a range of spent solid materials and liquids containing oils and chemicals;
- A Copper Processing area; and
- A Metals Recycling Facility.

A truck parking depot will be established on the adjacent vacant lot referred to as 21F School Drive. A full site description and detailed overview of current and proposed operations is given in Section 2.

17.4. Hazardous materials

The bulk of potentially hazardous materials that will be stored within the Hazardous Waste Recycling Facility of the Tomago Resource Recovery Facility will include spent liquids containing oils and chemicals collected from mining and manufacturing in the Hunter. Specifically, the site will classify, accept, sorting, process, store and transport off-site the following wastes for recycling / disposal:

- Waste oil;
- Oily water / engine coolant;
- Fire extinguishers (CO_2, dry chemical powder, foam);
- Batteries (lead acid);
- Batteries (lithium, nickel-metal hydride);
- Fluorescent globes and tubes;
- Water based paint and paint related products;
- Oil based paint and paint related products;
- Solvents / thinners;
- Liquid food waste from Packaged Food Recycling Plant;
- Drill mud liquid;
- Paper and cardboard

The facility will also store up to 60,000 litres of diesel with AdBlue additive for refuelling facility vehicles, plant and equipment.

These materials will be stored at a number of locations. The SEPP 33 thresholds are described in Table 17.4. below. The Facility will be designed and operated to not exceed the thresholds for waste storage.

Table 17.4. Risk screening analysis of potentially hazardous materials held on site as part of the development.

Material / potential pollutant	Storage location *	Dangerous Goods Class[1]	Packing Group[3]	Maximum quantity on site	Screening method[4]	Threshold[5]	Notes	Potentially hazardous development?
Waste oil	Tank 1	C2[2]	III	54,000 L	n/a	n/a	Not classified as a dangerous good	No
Waste oil	Tank 2	C2[2]	III	67,000 L	n/a	n/a	Not classified as a dangerous good	No
Oily water / coolant	Tank 3	n/a	n/a	20,000 L	n/a	n/a	Not classified as a dangerous good	No
Oily water / coolant	Tank 4	n/a	n/a	20,000 L	n/a	n/a	Not classified as a dangerous good	No
Diesel / AdBlue for refuelling vehicles and equipment	Tank 5	3	III	60,000 L	n/a	n/a	Below threshold based on quantity stored and location of storage (>8m from lot boundary)	No
Liquid food waste from Packaged Food Recycling Plant	PFRP	n/a	n/a	20,000 L	n/a	n/a	Not classified as a dangerous good	No
Drill mud liquid storage tank	DMRF	n/a	n/a	50,000 L	n/a	n/a	Not classified as a dangerous good	No
Fire extinguishers (CO_2, dry chemical powder, foam	HWRF	2.2	III	10 tonnes	n/a	n/a	Non-flammable, non-toxic gases and are not considered to be potentially hazardous with respect to off-site risk.	No
Batteries (lead acid)	HWRF	8	II	5 tonnes	Table 3	25 tonnes	Below threshold	No
Batteries (lithium, nickel-metal hydride)	HWRF	9	II	5 tonnes	Table 6	No limit	No limit	No
Fluorescent globes and tubes	HWRF	6.1	II	1 tonne	Table 3	2.5 tonnes	Below threshold	No
Water based paint and paint related products	HWRF	n/a	n/a	0.5 tonnes	n/a	n/a	Not classified as a dangerous good	No
Oil based paint and paint related products	HWRF	3	II	0.5 tonnes	Table 1	5 tonnes	Below threshold	No
Paper and cardboard	CBF	n/a	n/a	30,000 tonnes	n/a	n/a	Not a dangerous good but is potentially flammable	No

[1] Dangerous Good Class:

- Class 2.1 Dangerous Goods are classified as 'flammable gases';
- Class 2.2 Dangerous Goods are classified as 'non-flammable, non-toxic gases';

- Class 3 Dangerous Goods are classified as 'flammable liquids';
- Class 6 Dangerous Goods are classified as 'toxic substances'
- Class 7 Dangerous Goods are classified as 'radioactive';
- Class 8 Dangerous Goods are classified as 'corrosive';
- Class 9 Dangerous Goods are classified as 'miscellaneous dangerous goods and articles';

[2]Combustible Liquid: "Any liquid other than a flammable liquid that has a flashpoint, and that has a fire point less than its boiling point":

- C1: Combustible liquid with flashpoint >60.5°C <150°C
- C2: Combustible liquid with flashpoint >150°C

[3] Packing Group

- Packing Group I is a group of dangerous goods that are classified as 'substances presenting high danger'
- Packing Group II is a group of dangerous goods that are classified as 'substances presenting medium danger'
- Packing Group III is a group of dangerous goods that are classified as 'substances presenting lower danger'

[4] Screening method is the methodology used to assess dangerous goods in the NSW Department of Planning (2011) *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33*.

[5] Where dangerous goods are stored on-site which exceed the nominated thresholds as per Department of Planning (2011) *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33*, the proposed development is considered to be hazardous and requires detailed assessment under SEPP 33.

* refer to Figure 2.2. for tank locations

17.4.1. Diesel

Diesel with a flashpoint < 60 °C is classified as a Dangerous Good Class 3 Packaging Group 3 (flammable liquids). Diesel fuel will be stored in a dedicated fuel storage area for the purpose of fuelling of diesel-fuelled plant on-site. In the event of a spill, diesel is damaging to soils and aquatic ecosystems and fires can occur if it is ignited (flash point 61 to 150°C).

The risks associated with this proposed development include diesel storage and use. The use of diesel will be in accordance with the requirements of AS 1940: 2017 - The storage and handling of flammable and combustible liquids49. The diesel stored in the fuel storage area will be appropriately bunded to ensure any spills are contained.

A self-bunded diesel fuel tank with a maximum volume of 60,000L for the storage of diesel fuel will be installed to service the mobile plant and wood shredder/s. The proposed tank is an AdBlue™ Logitank Blue LTBL 60 (or equivalent). The container has a safe fill level of 55,600L as recommended by the manufacturer. The self-bunded container has dimensions of 12,192 mm length, 2,438 mm wide and 2,896 mm high.

The proposed location of the tank is shown in site layout at Appendix B – Site plans. The tank will be located in the eastern side of Building 1, at least 20m from the north and western boundaries.

The site is expected to use approximately up to 25,000 L of diesel fuel per fortnight to service the on-site equipment. Refilling of the tank once a fortnight, depending on need, in a single semi-trailer (delivering maximum of 30,000L for each load).

Across an entire year, the tank will be refilled a total of 26 times with a total annual volume of diesel expected to be up to 0.65ML.

The proposed development may be potentially hazardous if the number of generated traffic movements (for significant quantities of hazardous materials entering or leaving the site) is above the annual or weekly cumulative vehicle movements shown in Table 2 of Department of Planning (2011) *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33*. These thresholds for potentially hazardous development are >60 (diesel) deliveries per week or >1,000 (diesel) deliveries per annum. As the proposed delivery schedule is only once per fortnight, the use of the proposed AdBlue™ Logitank Blue LTBL 60 (or equivalent) self-bunded fuel tank is not considered potentially hazardous development.

An assessment of the proposed portable AdBlue™ Logitank Blue LTBL 60 (or equivalent) has been performed under SEPP33 with specific reference to Department of Planning (2011) *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33*. Risk screening was performed according to Section 7 of these guidelines (specifically under Table 1, Table 3 and Figure 9 of the guidelines). Under these guidelines, development considered as 'potentially hazardous' needs to be more fully assessed through a Preliminary Hazardous Assessment to determine whether the development poses an unacceptable risk to neighbouring land uses and may not be appropriate development.

Given the proposed 60,000 L (~53 tonne) above ground diesel storage tank is located 20m from the eastern boundary, and that the neighbouring property will be owned and operated by REMONDIS and zoned IN1 General Industrial (operated as a truck parking depot), the proposed development and tank installation falls outside 'potentially hazardous development' as per the SEPP33 Guidelines (this occurs when the tank is positioned <8m to a boundary). As a consequence, a Preliminary Hazard Assessment is not required.

17.4.2. Batteries

Lead acid batteries will be placed by directly onto bunded pallets. As lead acid batteries provide a feasible ignition source the bunded pallet will be positioned away from oil-based paint and used oil.

Lead acid batteries are sent to recyclers where the lead, acid and plastic are recovered and recycled.

Lithium ion batteries can be potentially an ignition source, so these batteries will be stored in a sealed Hazmat container accordance with the Dangerous Goods Code and AS/NZS 4681:2000 - *The storage and handling of Class 9 (miscellaneous) dangerous goods and articles*.

17.4.3. Fluorescent globes and tubes

Fluorescent tubes and globes will be placed in various receptacles designed to minimise breakage and prevent the release of mercury to the environment during storage, handling and transport.

Fluorescent tubes and globes contain mercury. Fluorescent tubes and globe will be stored and sent to specialist recyclers who crush the tubes to separate the phosphor powder from the glass. They feed the powder through receiving containers, where it is filtered to capture fugitive mercury emissions. The mercury is then separated by distillation and sold for a range of industrial uses. The remaining glass and metals are also recycled.

17.4.4. Paint and paint related products

Paints and paint related products including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base, paint thinners and reducing compounds will be stored in bunded storage areas, as either solvent or oil-based and water based. Storage receptacles will be provided to ensures safe separation of water-based paint from oil-based paints.

Solvent-based paints may also contain toxic metals, such as lead; these paints will be stored separately as Class 6 Toxic Substances.

Paints will be sent off site for recycling where they will be mixed with other waste solvents and used as an alternative to fuel in cement kilns. The metal containers will be recycled.

17.4.5. Paper and cardboard

The proposed development will result in the receipt of cardboard for baling and recycling on-site. As the facility is operated principally as a transfer station, materials received on-site are generally baled, blocked and exported off-site the same day or the next day.

Whilst cardboard is not classified as dangerous goods according to the Dangerous Goods Code, these materials are combustible if exposed to a prolonged ignition source and are a possible fire risk. Up to 1,000 tonnes of loose and baled products will be stored in the processing warehouse at any one point in time.

Though materials are stored in a dry state, and are less flammable when fully baled, strict procedures are in place at the premises to avoid any hot work during operations and smoking is strictly prohibited in all parts of the site. Surrounding land uses are not considered to be a fire risk, and the likelihood that fire could spread and impact on the proposed development is considered to be low.

In addition, the proposed development will involve the installation of bunding around the warehouse to contain firewater in the unlikely event of fire and installation of a stormwater isolation valve system to contain firewater on-site and prevent release of contaminated firewater to the council stormwater system.

17.5. Further hazard identification, scenarios, consequence, likelihood analysis and risk assessment

To help understand further hazards possible as part of the proposed development, a series of potential worst-case scenarios have been assessed to determine possible consequences, likelihood and risk. The NSW Department of Planning's (2011) *Hazardous Industry Planning Advisory Paper No 6 - Hazard Analysis* has been used to assist in guiding this analysis.

As per the above guidelines, this assessment has qualitatively assessed the impacts of the largest possible event on people, plant and the environment. The worst-case scenarios reflect any foreseeable factors that could exacerbate the severity of an accident, including abnormal process conditions, out of hours manning levels, and the potential for control measures to be disabled or rendered inoperable by the accident.

The worst-case scenarios we have assessed include the following:

- Vehicle collision on entry to the site, resulting in fire and possible death;
- Leaks / spills on vehicle entry to the site, with potential impacts on stormwater and fire risk;
- Vehicle theft and malicious damage, leading to equipment failure and injury to person(s);
- Leaks / spills in processing Facility, with potential impacts on stormwater and fire risk;
- Vehicle theft and malicious damage in processing Facility, leading to equipment failure and injury to person(s);
- Vehicle collision between delivery vehicles with other on-site vehicles through driver error, or pedestrian, resulting in possible fire or death near the product storage shed;
- Excess dust and build-up of electrostatic electricity causing spark and fire;
- Equipment breakdown and excess stock stored in the facility increases risk of vehicle collision or fire;
- Leakage of fuel and oil containers in workshop, potentially igniting and/or moving into stormwater, through human error or malicious act;
- Fire caused by ignition source (e.g. cigarette, hot work such as welding) and flammable materials in workshop (e.g. fuels, oils) catch fire due to spark from cigarette or hot work.

Prevention and treatment measures to reduce the likelihood and resulting consequences from these worst-case scenarios are mapped out in Table 17.5 below. Note that a risk rating category has been prepared to understand the significance of these risks – on the environment and human health. Note that the risk ratings estimated as part of the qualitative analysis are specified after implementation of the risk prevention, treatment and detection measures.

Table 17.5. Hazard identification, scenario, consequence, prevention/treatment measures and risk rating table.

Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
Entry to site						
Vehicle collision	Possible collision of delivery vehicles with other on-site vehicles through driver error, or pedestrian, resulting in possible fire or death	Fire possible outside of the Facility, potentially spreading across the site. Possible impacts on stormwater from discharge of fire water.	• Ensure vehicle speed limits and regular driver education • Firefighting equipment • Emergency management / response plan • Pollution incident response management plan / Environmental management plan • Traffic management plan • Work health and safety plan • Hazardous material management plan • Operator and driver training • Spill response equipment and training • Contact emergency services (NSW Fire Service)	Possible (C)	3	13 (Moderate risk)
Leak / spill	Vehicle collision / damage causes spill / leak of hazardous material	Collision causes leakage of vehicle fuel or oil onto handstand and possible stormwater impacts and a fire risk	• Ensure vehicle speed limits and regular driver education • Firefighting equipment • Emergency management / response plan • Pollution incident response management plan / Environmental management plan • Traffic management plan • Work health and safety plan • Hazardous material management plan • Operator and driver training	Possible (C)	5	22 (Low risk)

Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
			• Spill response equipment and training • Emergency response • Communications • Spill containment and sweeping of hardstand • Contact emergency services (NSW Fire Service)			
Vehicle theft / malicious damage	Vehicle or material within truck stolen	Components of a truck are stolen and leads to equipment failure and possible safety risk to staff	• Ensure staff compliance with site security measures • Emergency management / response plan • Traffic management plan • Work health and safety plan • Contact emergency services (Police) • Site security / limited access	Possible (C)	5	22 (Low risk)
Within the Facility						
Leak / spill	Vehicle collision / damage causes spill / leak of hazardous material	Collision causes leakage of vehicle fuel or oil onto handstand and possible stormwater impacts and a fire risk	• Ensure vehicle speed limits and regular driver education • Firefighting equipment • Emergency management / response plan • Pollution incident response management plan / Environmental management plan • Traffic management plan • Work health and safety plan • Hazardous material management plan • Operator and driver training	Possible (C)	5	22 (Low risk)

Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
			• Spill response equipment and training • Emergency response • Communications • Spill containment and sweeping of hardstand • Contact emergency services (NSW Fire Service)			
Theft / malicious damage	Vehicle or material within truck stolen	Components of a truck are stolen and leads to equipment failure and possible safety risk to staff	• Ensure staff compliance with site security measures • Emergency management / response plan • Traffic management plan • Work health and safety plan • Contact emergency services (Police) • site security / limited access • Contact emergency services (NSW Police)	Unlikely (D)	5	24 (Low risk)
Vehicle collision	Possible collision of delivery vehicles with other on-site vehicles through driver error, or pedestrian, resulting in possible fire or death	Fire possible in Facility, potentially spreading to other parts of the site	• Ensure vehicle speed limits and regular driver education • Firefighting equipment • Emergency management / response plan • Pollution incident response management plan / Environmental management plan • Traffic management plan • Work health and safety plan • Hazardous material management plan	Possible (C)	3	13 (Moderate risk)

Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
			• Operator and driver training • Spill response equipment and training • Contact emergency services (NSW Fire Service)			
Excess dust causing fire	Fire caused by excess dust and build-up of electrostatic electricity or spark and fire	Excess build-up of dust during operations, and spark through electrostatic electricity or spark through electrical failure	• Ensure staff compliance with hot work procedures • Regular machinery maintenance and safety inspections • Dust minimisation practices • Firefighting equipment • Emergency management / response plan • Pollution incident response management plan / Environmental management plan • Traffic management plan • Work health and safety plan • Hazardous material management plan • Operator and driver training • Spill response equipment and training • Contact emergency services (NSW Fire Service)	Possible (C)	3	13 (Moderate risk)
Equipment breakdown and excess stockpiling	Excess stock increases stored in Facility increases risk of vehicle collision or fire	Collision of vehicles due to constrained operational area, possible fire as a result	• Cease receipt of Waste on the site and divert trucks to other facilities • Firefighting equipment • Emergency management / response plan	Unlikely (D)	5	24 (Low risk)

Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
			• Pollution incident response management plan / Environmental management plan • Traffic management plan • Work health and safety plan • Hazardous material management plan • Operator and driver training • Spill response equipment and training • Contact emergency services (NSW Fire Service)			
Storage of fuels and hydrocarbons	Leakage of fuel	Spill of fuel, and potentially ignite and/or move into stormwater, through human error or malicious act	• Ensure fuels stored in fully bunded container. • Staff training on safe storage of fuel. • Emergency management / response plan • Pollution incident response management plan / Environmental management plan • Traffic management plan • Work health and safety plan • Hazardous material management plan • Spill response equipment and training • Emergency response • Communications • Spill containment and sweeping of hardstand	Possible (C)	4	18 (Low risk)

Facility / event	Cause / comment	Possible scenarios, results & consequences	Prevention, Treatment Measures and Detection Protection Required	Likelihood	Consequence	Risk rating and category (after treatment measures)[1]
			• Contact emergency services (NSW Fire Service)			
Fire	Fire caused by ignition source (e.g. cigarette)	Flammable waste is ignited through contact with an ignition source (e.g. cigarette, battery spark etc.)	• Ensure strict non-smoking policy is enforced at all times • Firefighting equipment • Emergency management / response plan • Pollution incident response management plan / Environmental management plan • Traffic management plan • Work health and safety plan • Hazardous material management plan • Operator and driver training • Spill response equipment and training • Contact emergency services (NSW Fire Service)	Possible (C)	3	13 (Moderate risk)

Risk rankings: 1, highest risk; 25, lowest risk. Colour coding: Green: tolerable risk; orange: ALARP – as low as reasonably practicable; red: intolerable risk.

17.6. Conclusion

As a result of this analysis, it is suggested that the worst-case scenarios modelled with risk prevention, treatment and detection measures are all moderate or low risks. All risks are low except those that involve fire caused by vehicle collisions, excess dust and some other form of ignition.

The proposed development is not considered a potentially hazardous development as per the SEPP 33 Guidelines, therefore, no further Preliminary Hazard Analysis or Multi-Level Risk Assessment has been performed.

18. Fire Safety

A Fire Safety Study for the proposed development was conducted by ACOR Pty Ltd. The study is summarised in this section. The full report is available at Appendix P.

18.1. Methodology

The Fire Safety Summary assessed the proposed development for its compliance with the *National Construction Code Volume 1* (2019) and NSW Fire & Rescue (2020) *Fire Safety Guideline – Fire safety in waste facilities*. The Fire Safety Study was conducted in accordance with the NSW *Hazardous Industry Planning Advisory Paper No 2: Fire Safety Study Guidelines.*

The scope of the study included:

- Identification of fire hazards and the consequences of possible fire incidents;
- Fire prevention strategies and measures;
- Analysis of the requirements for fire detection and protection;
- Identification of the specific measures to be implemented;
- Calculation of firefighting water supply and demand;
- Containment of contaminated firefighting water; and
- First aid fire protection requirements.

Details of the methodology are provided in the full report.

18.2. Existing environment

The site is currently unoccupied. The existing buildings and infrastructure will be used in the new development.

18.2.1. Building 1 (21D)

The existing Building 1 has an operational floor area of approximately 5,325m^2 and a gross internal volume of approximately 52,700m^3, of which the rafter volume contributes 33,280m^3. The building is not fitted with smoke hazard management infrastructure. The building is fitted with an automatic fire sprinkler system and six (6) dual fire hydrants [FH1 to FH6]. The building is also fitted with six (6) fire hose reels [FHR1 to FHR6]. The building is constructed from steel frame and zincalume cladding and the walls are non-fire rated.

The building is fitted with five (5) roller doors (2 @ 8m x 4.7m, 2 @ 6m x 4.5m, 1 @ 8m x 4.6m) for access and ventilation.

18.2.2. Building 2 (21D)

The existing Building 2 has an operational floor area of approximately 3,239m^2 and a gross internal volume of approximately 35,653m^3, of which the rafter volume contributes approximately 18,910m^3. The building is not fitted with sprinklers or smoke hazard management infrastructure. The building will be fitted with an automatic fire sprinkler system and is fitted with three (3) dual fire hydrants [FH4, FH7 and FH10, although FH10 is located under an awning and is non-compliant].

The building is fitted with five (5) roller doors (5 @ 5.5m x 4.4m) for access and ventilation.

18.2.3. Building 3 (21D)

The existing Building 3 has an operational floor area of approximately 568m^2 and a gross internal volume of approximately 4,031m3, of which the rafter volume contributes 1,842m^3. Building 3 will be used as a heavy vehicle workshop. The building is fitted with one (1) fire hose reel [FHR7] and can access fire hydrant FH5. A waste oil tank is located external, at the northeast corner of Building 3. The building is constructed from steel frame and zincalume cladding and the walls are non-fire rated.

The building is fitted with four (4) roller doors (4 @ 5m x 4m) for access and ventilation.

18.2.4. Overnight Truck parking Area (21F)

The overnight truck parking area is proposed to accommodate 24 x rigid trucks and 9 x semi-trailers.

The location is not anticipated to be a fire load under all normal operating scenarios. The site can be service by fire hydrant FH5. All vehicles are fitted with 4.5kg DCP fire extinguishers.

18.3. Assessment

The proposed REMONDIS development at School Drive, Tomago will store significant fire loads within both Building 1 (15,300GJ) and Building 2 (15,000GJ). A smaller fire load is contained in two storage tanks outside Building 3 (2,900GJ).

The three buildings have large buffers to the east (50m to 150m), south (40m to 200m) and north (25m to 150m) of the premises. The west boundary is close to both Building 1 (11m) and Building 2 (7m). Building 3 is effectively buffered by the presence of the other two buildings along the west boundary.

Both Building 1 and Building 2 would be classified as incidental high hazard storage, due to the intermittent quantities of plastics stored on site. However, as the 'íncidental' classification may change, both buildings will require sprinkler systems compliant with AS 2118.1:2017 high hazard classification.

Both Building 1 and Building 2 are classified as Incidental High Hazard storage with fire protection based on Ordinary Hazard 3 occupancies (OH3-bbb) under AS 2118.1:2017. Building 1 has an automatic sprinkler system installed. Building 2 will have an automatic sprinkler system installed to the same standard as Building 1. Both buildings will require their fire detection, alarm and notification equipment to be upgraded to current AS 4428, including direct notification to the Tarro fire station, approximately eight (8) minutes response time.

It is anticipated that a fire event will be detected and quickly brought under control by activation of the automatic sprinkler system. In the unlikely event that the sprinkler system fails to activate, ACOR has modelled thermal radiation contours resulting from fire events within any of the proposed fire load compartments. Fire water will be collected within bunded compound to be installed around the internal perimeter of each building.

Although the likelihood of a fire in a warehouse is estimated as 6.7 x 10^{-5} per year, the likelihood of a fire in a warehouse where an automatic sprinkler system fails to activate is estimated as 5.2 x 10^{-6} per year. ACOR has used the more conservative likelihood number for calculation of risk.

The Health and Safety Executive (HSE, United Kingdom) and the Netherlands Organisation for Applied Scientific Research (TNO) have identified that a thermal exposure than 3600 TDU is unlikely to cause clothing to self-combust and would therefore result in thermal radiation damage to only 20 per cent of a human body. Assuming third degree burns to 20 per cent of the body is regarded as generating an individual fatality risk of 1.4 x 10^{-1}. As a consequence, the individual fatality risk has been estimated as 9.4 x 10^{-6} per year. This risk is less than the acceptable individual fatality risk for an industrial site proposed by HIPAP 4 criteria (5.0 x 10^{-5} per year). Similarly, as the exposed burn area

is 20 per cent, the individual risk of injury has been estimated as 1.4×10^{-5}. This risk is less than the acceptable individual injury risk proposed by HIPAP 4 criteria (5.0×10^{-5} per year).

The risk of damage to structures, resulting from thermal radiation exposure of 23kW/m^2, does not extend beyond the premises boundary.

The risk of injury from explosive overpressure (7kPa) does not extend beyond the premises boundary.

This fire safety study and risk assessment has identified that the proposed facility can operate with acceptable risk to persons and property, based on HIPAP 4 criteria.

18.4. Mitigation Measures

The following mitigation measures were recommended in the Fire Safety Study:

- Access for fire brigade vehicles and firefighters:
    - It has been noted by both BMG (2020) and Affinity Fire Engineering (2020) that emergency vehicle access around the northern end of Building 2 is not deemed to satisfy BCA cl. C2.4, in that the perimeter road is greater than 18 metres from the building in certain locations; and
- Fire safety in waste facilities:
    - Building 1 will be fitted with ridgeline exhaust fans capable of extracting smoke at the rate of 18m^3/s within 10 minutes of the fire reaching steady heat release;
    - Building 1 will have a minimum 10mm high perimeter bund around the inside of the building;
    - Building 2 will be fitted with ridgeline exhaust fans capable of extracting smoke at the rate of 17m^3/s within 6 minutes of the fire reaching steady heat release;
    - Building 2 will have a minimum 16mm high perimeter bund around the inside of the building;
    - Building 3 will be fitted with ridgeline exhaust fans capable of extracting smoke at the rate of 26m^3/s that are interlocked with the fire alarm;
    - Building 3 will have a minimum 5mm high perimeter bund around the inside of the building;
    - Internal stockpiles will be arranged to allow for six (6) metres unobstructed access around internal stockpiles; and
    - Internal stockpiles will have a maximum volume of 1000m^3.

It is further recommended that REMONDIS :

- Provide an emergency tipping area, such as the undeveloped areas on Site 21F, at least 10 metres from parked vehicles and within a 70 metre radius of hydrant FH5;
- Use portable infrared detectors to check for thermal hotspots;
- Install fixed infrared cameras with audible alarm at five (5) identified high fire load locations;
- Install automatic sprinkler system in Building 2;
- Building 2 will require the installation of 4 x 36m (DN19) fire hose reels adjacent personal access doors to ensure coverage of the building internal floor area;
- 2A 60B(E) 9 kg powder fire extinguishers will be installed on all the vehicles working in the vicinity of the fire compartments;
- 5 x 2A 60B(E) 9 kg powder fire extinguishers to be inside the recycling plant;
- Lithium batteries must be stored in accordance with the Dangerous Goods Code and AS/NZS 4681:2000 *The storage and handling of Class 9 (miscellaneous) dangerous goods and articles*; and
- Plastics will be removed on a regular basis to ensure that individual storage areas, no greater than 20m^2 and 2 metres high, are separated from adjoining storages by no less than 2.4 metres.

18.5. Conclusion

A Fire Safety Study for the proposed development was conducted by ACOR Pty Ltd.

The report identified the fire hazards at the site, assessed the risks and recommended a range of mitigation measures to minimise fire risk.

Subject to implementation of the mitigating measures and preventative practices, fire safety study and risk assessment has identified that the proposed facility can operate with acceptable risk to persons and property, based on HIPAP 4 criteria.

The Fire Safety Study report is available at Appendix P.

19. Visual Impact

19.1. Introduction

Moir Landscape Architecture conducted a Visual Impact Assessment (VIA) for the proposed development. The purpose of the VIA was to assess the landscape character and visual setting of the proposed development as well as assess the potential visual impacts.

The following documents have been used in preparing the VIA report:

- *Port Stephens Council Landscape Technical Specification* (May 2014).
- *Port Stephens Development Control Plan* 2014.
- *Port Stephens Local Environmental Plan* 2013.

This chapter summarises the findings of the VIA. The VIA report is contained in Appendix Q. This chapter should be read in conjunction with Appendix Q.

19.2. Port Stephens Council Landscape Technical Specification

The *Port Stephens Council landscape technical specification* provides objectives and specifications for the landscape design of an industrial subdivision. Objectives include:

- Improved amenity of the Industrial development;
- Minimise the visual impact and noise pollution to nearby road/ transport corridors;
- Provide amenity areas for staff;
- Efficient use of the landscape with minimal disturbance to the local environment;
- Integrate existing landscape features or architecture into the proposed development;
- Reduce energy consumption by microclimate regulation; and
- Reduce airborne pollution by reducing the heat island effect.

The requirements of the Port Stephens Council landscape technical specification include:

- A minimum of 20% of the site must have deep soil planting, areas less than 1.5m wide is not included in this calculation.
- Landscaping to be provided on Lot frontages.
- Areas with setbacks are to be landscaped with the exception of driveways and pedestrian crossings.
- Planting must be integrated to the car park design. A minimum of 30% shade must be attained over a 15-year period.
- Landscape works are to provide adequate screening from the street. Landscaping must provide shade to the east and west of poorly insulated buildings.
- Design public access with signage and entrance ways in mind.
- Screen storage areas to alleviate dust nuisance.
- Retain and protect remnant trees where possible.

19.3. Background

A Visual Impact Assessment is used to identify and determine the value, significance and sensitivity of a landscape. The Visual Impact Assessment involves a systematic evaluation of the visual environment pertaining to the site and using value judgements based on community responses to scenery.

The assessment was undertaken in July 2020 and in the stages as described below. The first stage of the process involved and objective assessment of the relative aesthetic value of the landscape, defined as visual quality and expressed as high, medium or low. This assessment generally relates to variety, uniqueness, prominence and naturalness of the landform, vegetation and water forms within each character type and specifically:

- Determination of the landscape sensitivity and its ability to absorb different types of development on the basis of physical and environmental character.
- An assessment of viewer sensitivity to change. This includes how different groups of people view the landscape (for example, a resident as opposed to a tourist), and how many people are viewing and from how far.
- The undertaking of a viewpoint analysis to identify areas likely to be affected by development of the site and a photographic survey using a digital camera and a handheld GPS unit to record position and altitude.
- An assessment of visual impacts and the preparation of recommendations for impact mitigation. Suggestions are made for suitable development patterns that would maintain the areas visual quality.

The second stage of the assessment involves a quantitative approach. The quantification of the visual impacts is defined by methods including:

- Preparation of photomontages depicting the proposed development and recommended mitigation measures.

The purpose of the above methodology is to reduce the amount of subjectivity entering into visual impact assessment and to provide sufficient data to allow for third party verification of results.

19.4. Definitions

19.5. Landscape character assessment

The landscape character of a site refers to the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how this is perceived by people. It reflects how particular combinations of geology, landform, soils, vegetation, land use and human settlement create a particular sense of place for different areas within the landscape.

The landscape character of the site has been assessed at a local and site scale following a desktop analysis and on-site investigation.

19.5.1. Visual sensitivity

Visual sensitivity is a measure of how critically a change to the existing landscape is viewed by people from different areas. The assessment is based on the number of people affected, land use, and the distance of the viewer from the proposed development.

Generally, the following principles apply:

- Visual sensitivity decreases as the viewer distance increases;
- Visual sensitivity decreases as the viewing time decreases; and
- Visual sensitivity can also be related to viewer activity (e.g. a person viewing an affected site whilst engaged in recreational activities will be more strongly affected by change than someone passing a scene in a car travelling to a desired destination.

19.5.2. Visual effect

Visual effect is the interaction between a proposed development and the existing visual environment. It is often expressed as the level of visual contrast of the proposed development against its setting or background in which it is viewed.

- Low visual effect: occurs when a proposed development blends in with its existing viewed landscape due to a high level of integration of one or several of the following: form, shape, pattern, line, texture or colour. It can also result from the use of effective screening often using a combination of landform and landscaping.
- Moderate visual effect: occurs where a proposed development is visible and contrasts with its viewed landscape however, there has been some degree of integration (e.g. good siting principles employed, retention of significant existing vegetation, provision of screen landscaping, appropriate colour selection and/or suitably scaled development).
- High visual effect: results when a proposed development has a high visual contrast to the surrounding landscape with little or no natural screening or integration created by vegetation or topography.

19.5.3. Visual impact

Visual impact is the combined effect of visual sensitivity and visual effect. Various combinations of visual sensitivity and visual effect will result in high, moderate and low overall visual impacts.

19.6. Landscape character

Lot 21F shares a boundary with Lot 21D, currently separated by a boundary fence. The site does not have any existing buildings and is currently vacant. Apart from the boundary with Lot 21D, the site is surrounded by vacant industrial land with native vegetation. Buildings from Lot 21D dominate views from the site. These buildings are large, industrial in nature surrounded by concrete.

Most of the site is heavily modified with little native vegetation remaining on site. Debris from previous building activity is visible in various locations. Vegetation consists predominantly of grasses with some larger mid storey shrubs in clumps.

Surrounding Lots are also zoned for industrial use, although currently undeveloped. Vegetation on surrounding Lots providing screening from School Drive and Tomago Road.

19.7. Viewpoint analysis

A total of three viewpoints were recorded as part of the field work process. The viewpoints were taken from publicly accessible roads surrounding the site. The viewpoints which have been included represent the areas from where the development would appear most prominent, either based on the degree of exposure or the number of people likely to be affected (refer to Table 19.1).

A panoramic photograph was taken at eye level from each viewpoint, towards The Site. Photographs were taken with a Canon EOS 5D Mark IV Full Frame digital SLR through a 50mm fixed focal lens to best represent the perspective of the human eye. The visual impact of the viewpoint was then assessed both on site and with the topographic and aerial information to ensure accuracy. Viewpoint photographs and analysis is included in the following section.

Table 19.1. Viewpoint Analysis.

Viewpoint	Location	Viewpoint Description	Potential Visual Impact	Photograph
01	School Drive	View from private access road south west of Lot 21D looking north east towards Lot 21D with Lot 21F behind the existing buildings.	The proposed truck parking depot will be located behind the existing buildings. Due to the existing industrial land use, the proposal will not contrast with the existing land use.	

Viewpoint	Location	Viewpoint Description	Potential Visual Impact	Photograph
02	School Drive	View from School Drive looking north West towards Lot 21F Small trees visible in the fore to mid-ground with industrial buildings visible in the background.	The proposed truck parking depot will be located behind the existing vegetation and not visible.	

Viewpoint	Location	Viewpoint Description	Potential Visual Impact	Photograph
03	Tomago boat launch	View from Tomago boat launch looking north east towards the project site. Individual shade tree associated with the car park visible in the foreground and trees adjacent to Tomago Road visible in the background.	The proposed truck parking depot will be located behind the existing vegetation and not visible	

19.8. Overview of viewpoint analysis

A summary of the viewpoint analysis is provided in Table 19.2.

Table 19.2. Viewpoint visual impact summary.

Viewpoint	Visual Sensitivity	Visual Effect	Potential Visual Impact
VP01	Low	Low	Low
VP02	Low	Low	Low
VP03	Low	Low	Low

19.9. Assessment of visual impacts

Overall, the proposed truck parking depot will only be visible from the entrance to the site via a private access road. Vegetation and existing buildings screen the proposal from public areas. There is potential for future developments to remove vegetation currently screening the project site. However, the project is in keeping with the existing land use.

19.10. Mitigation measures

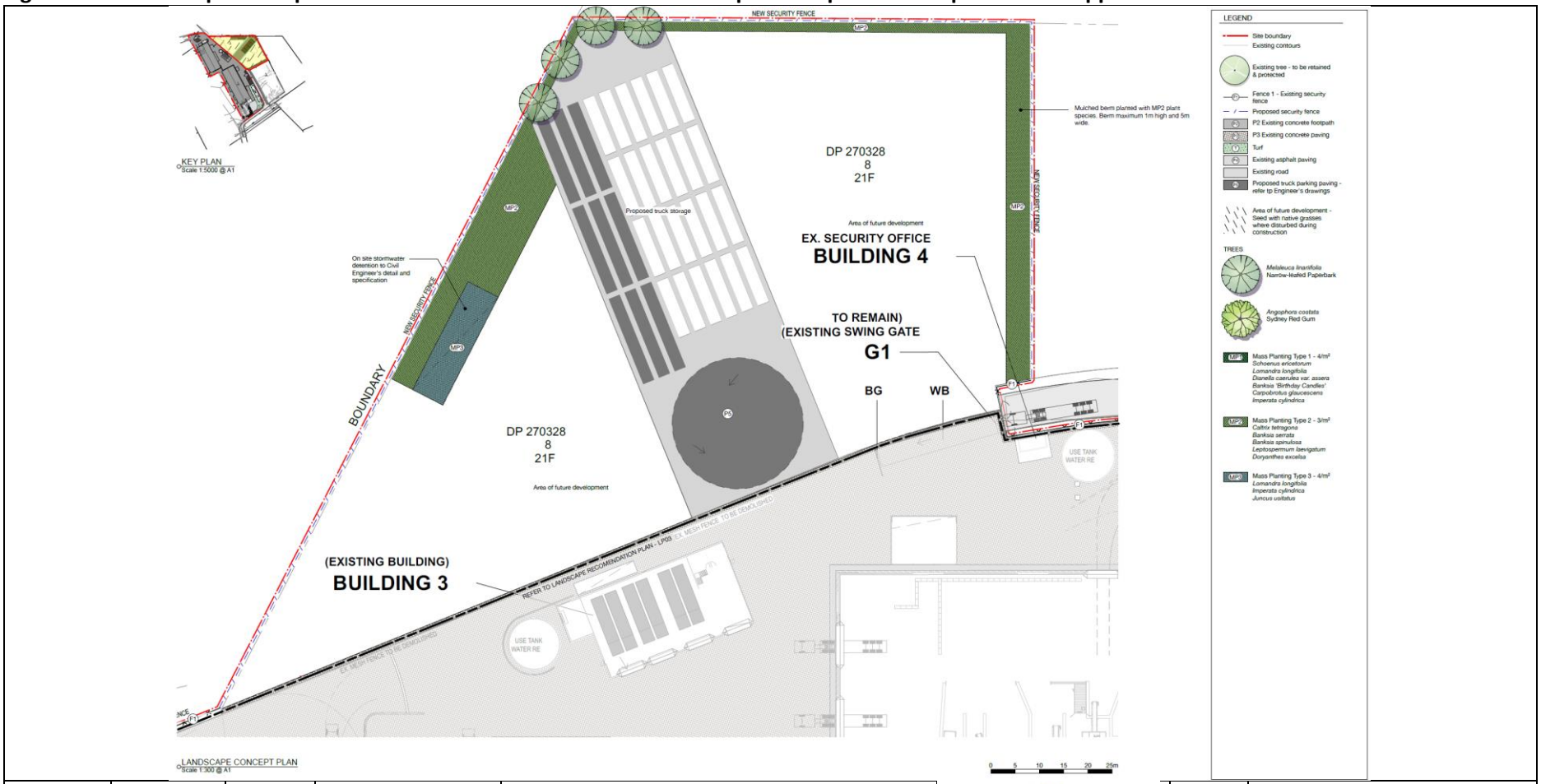
The following mitigation measures seek to achieve a better visual integration of the proposed development within the existing landscape character of the area. When adjacent Lots become developed, existing screening may be removed, the proposed mitigation measures will help mitigate the visual impact of the proposed development from adjacent Lots. Th

The following recommendations will assist considerably in ensuring that potential impacts are reduced:

- A raised planted buffer area along the southern boundary will help mitigate impacted views from Lots sharing the access road.
- Screen planting along the eastern boundary provide an improved interface between the proposed truck parking depot and future development.
- Seeding native grass in areas not currently envisioned for development may reduce possible dust pollution.

Figure 19.1 and Figure 19.2 shows the proposed landscaping for 21D and 21F School Drive as part of the mitigation measures for visual impact. Detailed Landscape Concept Plans are provided in Appendix R and have been developed to meet the objectives of the *Port Stephens Development Control Plan* 2014.

Figure 19.1. Landscape concept Plan – 21F School Drive. Detailed Landscape Concept Plans are provided in Appendix R.



Date	Revision	Drawn By	Site description
18/08/20	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536

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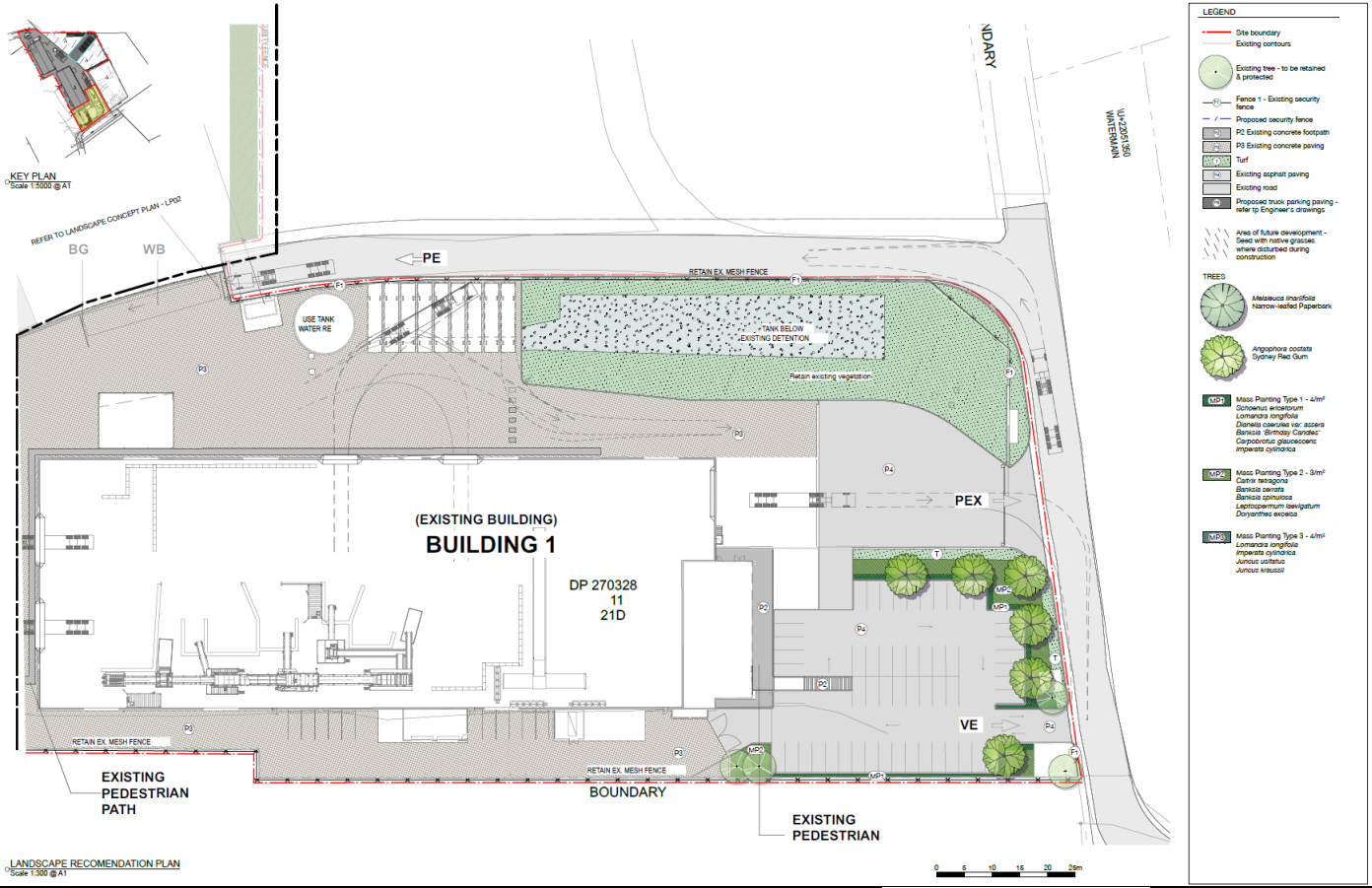
Client	**REMONDIS Australia Pty Ltd**
Project	Environmental Impact Statement
Title	Landscape concept Plan – 21F
Scale	N/A
Source	Moir Landscape Architecture

Figure 19.2. Landscape concept Plan – 21D School Drive. Detailed Landscape Concept Plans are provided in Appendix R.



Date	Revision	Drawn By	Site description
18/08/20	Revision A	R. Loemker	21D and 21F School Drive, and Lot 301 / DP634536

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Client	REMONDIS Australia Pty Ltd
Project	Environmental Impact Statement
Title	Landscape concept Plan – 21D
Scale	N/A
Source	Moir Landscape Architecture

19.11. Landscape compliance

Moir Landscape Architecture prepare a landscape compliance assessment for 21D School Drive. The compliance assessment compared to the objectives and requirements as laid out by *Port Stephens Development Control Pla*n 2014 to the existing site conditions. Recommendations have also been made to comply with the objectives and specifications of the *Port Stephens Council Landscape Technical Specification* (2014).

19.11.1. Relevant landscape technical specifications

Relevant objectives of the *Port Stephens Council Landscape Technical Specification* (2014) for industrial subdivision include:

- Improved amenity of the Industrial development.
- Minimise the visual impact and noise pollution to nearby road/ transport corridors.
- Provide amenity areas for staff.
- Efficient use of the landscape with minimal disturbance to the local environment.
- Integrate existing landscape features or architecture into the proposed development.
- Reduce energy consumption by microclimate regulation
- Reduce airborne pollution by reducing the heat island effect.

Landscape requirements to meet objectives include:

- A minimum of 20% of the site must have deep soil planting, areas less than 1.5m wide is not included in this calculation.
- Landscaping to be provided on Lot frontages.
- Areas with setbacks are to be landscaped with the exception of driveways and pedestrian crossings.
- Planting must be integrated to the car park design. A minimum of 30% shade must be attained over a 15-year period.
- Landscape works are to provide adequate screening from the street. Landscaping must provide shade to the east and west of poorly insulated buildings.
- Design public access with signage and entrance ways in mind.
- Screen storage areas to alleviate dust nuisance.
- Retain and protect remnant trees where possible.

19.11.2. Description of the existing conditions

21D, School Drive, Tomago has three buildings on the site with predominantly hard surfaces surrounding these. The lot is located on a corner of the private access road and School Drive. The Lot fronts the road on two sides with car parking located on the southern boundary. Along the south eastern road frontage, a below ground storage tank is located with a narrow-grassed area adjacent to it. Few trees exist in the current landscape, being very small in size and not contributing to shade on site. Ornamental hedges are located close to the entrance with no screen planting or significant shade trees.

Currently the total landscaped area for Lot 21D is 1, 467 m^2 from a total of 27, 977m^2. This equates to 5.2% of the total area currently landscaped in some form.

19.11.3. Existing conditions

In the current condition, 21D School Drive does not meet with all the landscape objectives and specifications as set out in the *Port Stephens Development Control Plan* 2014. Opportunity exist to improve the current conditions to be more in line with the *Port Stephens Development Control Plan* 2014 and improve the development to contribute more towards the greater Tomago area.

Table 19.3 provides a summary of the compliance assessment include recommendation to improve the current conditions to be more in line with the *Port Stephens Development Control Plan* 2014.

Table 19.3. Landscape Compliance Summary 21D School Drive, Tomago.

No.	*Port Stephens Council Landscape Technical Specification* Objectives / Requirements	Current	Recommendations
1	Improve amenity of Industrial development.	Lacks shade around the existing car park. Poor visual appeal due to lack of landscaping.	Additional tree planting along road verge. Lack of tree canopy shade contributes to heat island effect. Tree planting to Lot frontages.
2	Minimise the visual impact and noise pollution to nearby road/ transport corridors.	Opportunity for tree planting along the perimeter.	Tree planting along boundary of property. Little opportunity exists on site for staff breakout area.
3	Provide amenity areas for staff.	None	Site already developed.
4	Efficient use of the landscape with minimal disturbance to the local environment.	NA	Site already developed; no action required.
5	Integrate existing landscape features or architecture into the proposed development.	Lacks integration between buildings and landscape	Additional tree planting adjacent to building.
6	Reduce energy consumption by microclimate regulation.	NA	Site already developed; no action required.
7	Reduce airborne pollution by reducing the heat island effect.		Plant additional trees to increase shade and reduce heat.
8	A minimum of 20% of the site must have deep soil planting. Areas less than 1.5m wide is not included in the calculation.	6% of site deep root planting	Ensure deep root planting along the Lot frontage and parking area.
9	Landscaping is to be provided on Lot frontages.	Yes	Tree planting along the road verge.
10	Areas with setbacks are to be landscaped with the exception of driveways and pedestrian crossings.	NA	Design for driveways and footpaths.
11	Planting must be integrated to the car park design. A minimum of 30% shade must be attained over a 15-year period.	Little shade trees in current landscape	No trees currently contribute to shading the car parking area. Plant shade trees around the car park area to increase the shade.
12	Landscape works are to provide adequate screening from the street. Landscaping must provide shade to the east and west of poorly insulated buildings.	No screening or shade allowed for	Shade trees around existing buildings would not be possible due to the use and nature of the business.
13	Design public access with signage and entrance ways in mind.	Turf verge with signage clearly visible	No action required.
14	Screen storage areas to alleviate dust nuisance.	NA	Site already developed; no action required.
15	Retain and protect remnant trees where possible.	NA	No action required.

19.11.4. Summary

Due to the already existing infrastructure, as well as the nature of the intended use of the site, limited opportunity exists to improve existing conditions.

Amenity for the larger industrial area has been improved by additional planting proposed along the site frontage (refer to Detailed Landscape Concept Plans in Appendix R). This also increases the shade cover and minimises the visual impact of the development from the road. The additional tree planting proposed for the parking area will provide some shaded parking and reduce heat when mature.

Implementation of the Detailed Landscape Concept Plans (Appendix R) still does not fully comply with the *Port Stephens Development Control Pla*n 2014 as summarised in the following areas. Justification for this non-compliances are also provided:

19.11.4.1. Amenity area is not provided for staff

Due to the existing nature of the site as well as the proposed function and operation, opportunity, and space to include meaningful amenity is not viable. Areas available for amenity also presents a safety risk in relation to interactions with truck movements at the front of the site.

19.11.4.2. Minimum tree planting

The *Port Stephens Development Control Pla*n 2014 requirements state that a minimum of 20% of the site must have deep soil planting. Current and proposed landscaping will result in approximately 6% of the site with deep soil planting. Due to the existing infrastructure and intended use of the site, no additional landscape areas have been proposed.

The *Port Stephens Development Control Pla*n 2014 requirements also state that a minimum of 30% shade cover must be attained over a 15-year period in the car parking area. Due to the existing layout, light positions and number of car parking bays required, this is not achievable. Due to the existing nature of the buildings and surrounds, it is not possible to add trees to the east and west of the buildings. Where opportunity exist, trees have been added to the parking area frontage (refer to Detailed Landscape Concept Plans in Appendix R).

As a result of the existing layout and nature of the site, the focus of the Detailed Landscape Concept Plans have been recommended to improve the existing planted areas. Emphasis has been placed on the inclusion of tree planting. The *Angophora costata* proposed is of a scale suitable to the development and existing buildings. It is suitable for the area and would contribute to the surrounding area by screening buildings and provide additional shade.

Considering this, REMONDIS will rely on Clause 11(a) of the *State Environmental Planning Policy (State and Regional Development)* 2011 to override this requirement and use a lower level of landscaping. Clause 11(a) of the *State Environmental Planning Policy (State and Regional Development)* 2011 states that the requirements of development control plans (whether made before or after the commencement of this Policy) do not apply to State significant development.

19.12. Conclusion

The proposed development is not likely to alter the existing visual character of the area. The existing landscape is industrial in nature with large scale infrastructure part of the landscape character.

In addition, due to the site set back from public roads, as well as being screened by existing buildings and Tomago Aluminium, it is unlikely that the proposed truck parking depot will be visible from public roads. As a result, impacts assessed were low.

Mitigation measures are aimed at improving the integration of the proposed development with future development that is likely to occur in future. Considering the existing character of the landscape, the land use, and the number of viewers that the visual impacts associated with the proposal are acceptable within this location.

Due to the already existing infrastructure, as well as the nature of the intended use of the site, limited opportunity exists to improve existing conditions. Implementation of the Detailed Landscape Concept Plans (Appendix R) does not fully comply with the *Port Stephens Development Control Pla*n 2014, however REMONDIS will rely on Clause 11(a) of the *State Environmental Planning Policy (State and Regional Development)* 2011 to override this requirement and use a lower level of landscaping.

20. Compilation of mitigation measures

20.1. Introduction

A wide range of mitigation measures to prevent or minimise environmental impacts which may be generated by the proposal have been detailed throughout this EIS. This Section of the report is a compilation of the recommended mitigation measures. Implementation of these measures would be considered necessary to minimise impacts and maximise positive outcomes on the physical, social and economic environments of the local area and wider region.

20.2. Objective

The objective of this Section of the EIS is to outline how the recommended environmental protection measures will be implemented and managed in an integrated manner to demonstrate that the proposal is capable of complying with statutory obligations under EPA licenses or approvals. This includes the environmental management and cleaner production principles which will be followed when planning, designing, establishing and operating the proposal.

20.3. Cleaner production principals

Cleaner production is a practical method for protecting human and environmental health. This is achieved through the continuous application of an integrated, preventive environmental strategy towards processes, products and services. Cleaner production increases the overall efficiency of products and services and reduce damage and risks for humans and the environment. A proactive approach to the reduction in the risk and consequence of potential environmental impacts at the source results is a decreased reliance on reactive environmental mitigation measures.

The cleaner production techniques that are applicable to the ongoing operations of the project include:

- Selecting and using the most appropriate technology and materials to reduce the quantity of resources used and to minimise the amount of waste generated;
- Improved operation and maintenance practices to reduce the quantity of resources used and to minimise the amount of waste generated;
- Employing processes that are efficient in their consumption of energy, materials and natural resources and reduce greenhouse gas emissions;
- Selecting energy efficient plant and equipment for use in the facility;
- Reuse of captured stormwater as the primary source of water for the site;
- Safely disposing of any residual wastes and process residues;
- Promoting the safe use, handling, recycling and disposal of waste products through an understanding of their life cycle.

Where cleaner production principles can no more remove environmental risk or consequence, mitigation strategies must be considered to ensure the remaining potential environmental harm is reduced to the lowest risk level possible.

20.4. Mitigation Strategies

Without appropriate environmental management measures being incorporated in the design of the Project and the contractual arrangements associated with the proposed works, there will be the potential for adverse impacts on the environment. Effective implementation is necessary to ensure the Project has minimal impact on the physical, social, and economic environments of the local area and wider region. Table 20.1 summarises the mitigation measures identified in this EIS to ameliorate impacts and safeguard the environment so that the desired environmental outcomes are achieved for the various components of the project for design, construction, and operation.

Table 20.1. Summary of mitigation strategies.

Issue	Mitigation Strategy
Waste	• Waste management and minimisation will form part of the induction program (which includes environmental due diligence training). All Project and site personnel will be trained in the requirements of this document including minimising wastes, recognising which types of materials are recyclable and their obligations to use recycling facilities provided on site; • Clearly assign and communicate responsibilities to ensure that those involved in the construction are aware of their responsibilities in relation to the waste management plan; • Engage and educate personnel on how the various elements of the waste management plan will be implemented; • Specific locations for waste management (e.g. sorting area locations, recycling bin locations, material stockpile locations) will be established on site and signposted appropriately; • Waste management areas will be adequately managed to prevent sediment runoff and dust generation; • Construction Method Statements (CMS) will include practices to minimise waste generation and to maximise recycling and reuse of materials including oils, greases, lubricants, timber, glass, and metal; • Packaging minimisation and reuse initiatives will be implemented as part of the procurement; • Development of an unexpected finds environmental procedure should any contamination be found during construction works; • Spill kit to be present on site in the case of any fuel leaks of plant and equipment during the construction phase of the development; • Segregated waste disposal containers for the collection and recycling/disposal of all waste streams generated during the construction and operation phases will be provided onsite. Waste disposal containers will have clear signage and instructions for use to avoid cross-contamination. No rubbish shall be disposed of on site; • Waste will be disposed to an appropriate licensed facility. A Waste Management Register of all waste collected for disposal and / recycling, including amounts, data and time and details and location of disposal will be maintained at all times; • All waste being transported off site must be covered. The transportation must be appropriately licensed to carry that material; • Storage of all hazardous substances and dangerous goods will be in accordance with SDS requirements in a bunded area. Solid and hazardous wastes will be contained and separated from inert waste; • Any hazardous will be managed and handled by an appropriately licensed contractor and transported for disposal to a licensed facility approved site; • Any material contaminated by spills i.e. fuel, oil, lubricants etc., including empty fuel, oil and chemical containers, will be stored in a sealed secure container within a bunded area and will be transported to a waste disposal site approved by the NSW EPA to accept such material; • Incompatible wastes will not be mixed; • Storage areas would be located away from waterways and the stormwater system; • Biodegradable products will be used wherever practicable; • Regular collection of wastes will ensure air emissions are at a satisfactory level. Inappropriate waste and wastewater management systems will be regularly inspected and audited; • Conduct regular litter patrols to ensure litter is effectively controlled on site;

Issue	Mitigation Strategy
Air quality	• All waste tipping, sorting, processing and storage will occur indoors at all times; • Implement a waste acceptance evaluation procedure to ensure all waste received on site meets the relevant criteria; • Use odour neutralisers; • Availability of spill kits to allow for prompt containment of spills which could be odorous; • Daily odour survey observations around the boundary of the site; • Work procedures in the event of any particularly odorous loads (e.g. Use of odour neutraliser, identifying waste source and investigating possibility of diverting to another waste facility); • Additional odour control system medium on-site at all times (e.g. Additional activated carbon to be stored on site).
Greenhouse gas	• Minimise the use of fuel by selecting fuel efficient plant and equipment, operating vehicles and machinery in a fuel-efficient manner e.g. turning off idling equipment, and selecting construction techniques that utilise lower amounts of fuel; • Implement a maintenance plan for all fuel and electrically powered equipment; • Implement energy conservation practices by all staff (which can be enforced through appropriate training); • Use solar panels.
Noise and vibration	• Avoid the coincidence of noisy plant working simultaneously close together would result in reduced noise emissions; • Equipment which is used intermittently is to be shut down when not in use; • Where possible, equipment with directional noise emissions should be oriented away from sensitive receivers; • Regular compliance checks on the noise emissions of all plant and machinery used for the proposal would indicate whether noise emissions from plant items were higher than predicted. This also identifies defective silencing equipment on the items of plant; • Non-tonal reversing alarms should be used on all items of plants and heavy vehicles used for construction; • Existing doors are closed during the waste processing whenever practicable (note this measure is not required to achieve the Project Noise Trigger Levels for the project and is at the discretion of the proponent).

Biodiversity (construction)	• The clearing boundary should be clearly marked to avoid removal of additional native vegetation.
	• Priority will be given during construction to avoid any inadvertent impact to significant biodiversity values within the study area. Avoidance measures should include the following:
	  ○ All material stockpiles, vehicle parking and machinery storage will be located within cleared areas proposed for clearing, and not in areas of native vegetation that are to be retained;
	  ○ Implementation of temporary stormwater controls during construction and to ensure that discharges outside the development footprint are consistent with existing conditions and do not impact the stream located within the site;
	• Any animals injured during construction should be taken immediately to a Vet for treatment. Any animals suspected to require rehabilitation would be delivered post-veterinary care to an appropriate animal rehabilitator;
	• The following measures should be implemented to prevent exotic plant material from entering/exiting the development area;

Issue	Mitigation Strategy
	○ No imported/exported material to be permitted unless it has been inspected and confirmed to be free of dirt and mud which may contain weed seeds and vegetative material such as bulbs, root fragment, tubers or rhizomes; ○ Vehicles and machinery to be clean of soils, vegetation and seeds that have been brushed off or washed down prior to entering the study area; and • A clean down register to be maintained at the entry/exit of the study area.
Biodiversity (operation)	• Vehicles should not drive off the designated parking area into vegetation within the study area to reduce impact to resident fauna and flora within the study area during the operations phase; • Any animals injured during operations should be taken immediately to the Motto Farm Veterinary Hospital for treatment. Any animals suspected to require rehabilitation would be delivered post-veterinary care to an appropriate animal rehabilitator associated with Wildlife in Need of Care Phone 1300 946 295); • The following measures should be implemented to prevent exotic plant material from entering/exiting the study area: ○ No imported/exported material to be permitted unless it has been inspected and confirmed to be free of dirt and mud which may contain weed seeds and vegetative material such as bulbs, root fragment, tubers or rhizomes; ○ Vehicles and machinery to be clean of soils, vegetation and seeds that have been brushed off or washed down prior to entering the study area; ○ A clean down register to be maintained at the entry of the study area; and ○ Trucks are not to drive off the designated parking area onto vegetation within the site; • As a part of maintenance within the study area any high threat weeds known to occur will be controlled in accordance with appropriate DPI guidelines. Guidelines for the treatment of high threat weeds can be sourced within the DPI website; • Any artificial lighting used for security at night should be angled/directed downwards to avoid excessive light pollution affecting adjacent habitat.
Soil and water	• All waste handling and storage will be under cover and within bunded areas. • Each of the main buildings (Buildings 1, 2 and 3) will have internal bunds to contain any leaks or spills within them. They will also contain any fire water, if necessary. • A stormwater capture and treatment system will be installed to treat water from the truck parking depot. This will supplement the existing stormwater treatment system, which treats stormwater from the existing paved area. The following water quality treatment devices will be utilised: ○ OceanGuard Pit Filter Insert – Runoff captured by the hardstand will pass through a filter insert that will aid in the capture of gross pollutants, sediment, litter and oils. An oil absorbent pillow will also be installed as part of the filter insert, which will assist in the capture of small amounts of hydrocarbons or oils that would otherwise enter the stormwater system. ○ Ocean Protect Psorb Filter Cartridges – Proprietary filter cartridges will filter stormwater runoff capturing and removing fine sediment, as well as nutrients including phosphorous and nitrogen. • An emergency shutoff valve will be installed for the new stormwater system that will contain any oil or diesel spills and prevent them from entering the stormwater infiltration system.

Issue	Mitigation Strategy
Heritage	• All on-site personnel are to be made aware of their obligations under the *National Parks and Wildlife Act* 1974, this includes protection of Aboriginal sites and the reporting of any new Aboriginal, or suspected Aboriginal, heritage sites. This may be done through an onsite induction or other suitable format; • All on-site personnel are to be made aware of their obligations under the *NSW Heritage Act* 1977, including the reporting of any historic, or suspected historic material. This may be done through an onsite induction or other suitable format; • In the unlikely event that Aboriginal or suspected Aboriginal archaeological material is uncovered during the development, then works in that area are to stop and the area cordoned off. The project manager is to contact the heritage consultant to make an assessment as to whether the material is classed as Aboriginal object/s under the National Parks and Wildlife Act and advise on the required management and mitigation measures. Works are not to re-commence in the cordoned off area until heritage clearance has been given and/or the required management and mitigation measures have been implemented;
Bushfire	• At the commencement of building works and in perpetuity, manage an inner protection area (IPA) for the entire property as outlined within Appendix 4 of *Planning for Bush Fire Protection* (2019) and the NSW Rural Fire Service's *Standards for Asset Protection Zones*; • Undertake landscaping in accordance with Appendix 4 of *Planning for Bush Fire Protection* (2019) and manage and maintain in perpetuity; • Property owner and occupants to familiarise themselves with the relevant bushfire preparation and survival information provided by the New South Wales Rural Fire Service; • Implement emergency evacuation plans prepared for the workplace with specific consideration of bushfire evacuation and management planning;
Contamination	• Implement remedial measures as detailed in the Remedial Action Plan, • Prepare and implement a Long-Term Environmental Management Plan.
Chemicals and fuels and pollution incidents	• All liquid wastes, chemicals and fuels to be handled and stored under cover in bunded areas; • All staff working in areas with liquid wastes to be properly trained and wear PPE at all times; • MSDS sheets, where available, to be readily accessible for all chemicals on site; • Chemical spill kits and “absorbent sausages” to be kept on site and readily accessible near liquid waste and chemical storage; • Firefighting equipment to be accessible and regularly inspected.

Fire safety	• Access for fire brigade vehicles and firefighters:
	  ○ It has been noted by both BMG (2020) and Affinity Fire Engineering (2020) that emergency vehicle access around the northern end of Building 2 is not deemed to satisfy BCA cl. C2.4, in that the perimeter road is greater than 18 metres from the building in certain locations; and
	• Fire safety in waste facilities:
	  ○ Building 1 will be fitted with ridgeline exhaust fans capable of extracting smoke at the rate of 18m^3/s within 10 minutes of the fire reaching steady heat release;
	  ○ Building 1 will have a minimum 10mm high perimeter bund around the inside of the building;
	  ○ Building 2 will be fitted with ridgeline exhaust fans capable of extracting smoke at the rate of 17m^3/s within 6 minutes of the fire reaching steady heat release;

Issue	Mitigation Strategy
	○ Building 2 will have a minimum 16mm high perimeter concrete bund around the inside of the building; ○ Building 3 will be fitted with ridgeline exhaust fans capable of extracting smoke at the rate of 26m^3/s that are interlocked with the fire alarm; ○ Building 3 will have a minimum 5mm high perimeter concrete bund around the inside of the building; ○ Internal stockpiles will be arranged to allow for six (6) metres unobstructed access around internal stockpiles; and ○ Internal stockpiles will have a maximum volume of 1000m^3. • It is further recommended that REMONDIS : ○ Provide an emergency tipping area, such as the undeveloped areas on Site 21F, at least 10 metres from parked vehicles and within a 70 metre radius of hydrant FH5; ○ Use portable infrared detectors to check for thermal hotspots; ○ Install fixed infrared cameras with audible alarm at five (5) identified high fire load locations; ○ Install automatic sprinkler system in Building 2; ○ Building 2 will require the installation of 4 x 36m (DN19) fire hose reels adjacent personal access doors to ensure coverage of the building internal floor area; ○ 2A 60B(E) 9 kg powder fire extinguishers will be installed on all the vehicles working in the vicinity of the fire compartments; ○ 5 x 2A 60B(E) 9 kg powder fire extinguishers to be inside the recycling plant; ○ Lithium batteries must be stored in accordance with the Dangerous Goods Code and AS/NZS 4681:2000 The storage and handling of Class 9 (miscellaneous) dangerous goods and articles; and ○ Plastics will be removed on a regular basis to ensure that individual storage areas, no greater than 20m^2 and 2 metres high, are separated from adjoining storages by no less than 2.4 metres.
Visual impact	• Preferably plant native trees and large shrubs along the boundary to help screen the proposed development from future development of adjacent Lots; • Ensure the proposed development is offset from the boundary to allow screen planting; • Plant native trees along the road verge of 21D to reduce views to the proposed development from future development.

20.5. Environmental management system

Adopting an Environmental Management System (EMS) and a monitoring program, for both the construction and operational phases, is an important component of the proposal to demonstrate REMONDIS 's commitment to implementing the measures outlined in this EIS.

To ensure an integrated approach, the EMS will include Environmental Management Plans (EMPs), specifically created to address the management and mitigation of the following environmental issues, as compiled in the table above. These sub plans include:

- Waste;
- Air Quality;
- Noise and Vibration;
- Traffic;
- Biodiversity;
- Water Quality;
- Heritage;
- Bushfire Risk;
- Chemicals and Fuels;
- Visual Impact; and
- Work health and safety.

The key objectives of the EMPs will be to ensure:

- Works are carried out in accordance with relevant environmental statutory requirements and relevant non-statutory policy, as detailed throughout this EIS;
- Works are carried out in accordance with the goals and requirements presented in this EIS;
- Works are carried out in such a way as to minimise the likelihood of environmental degradation;
- Works are carried out in such a way as to manage the impact of the works on neighbouring properties;
- All employees engaged in the works comply with the terms and conditions of the EMPs;
- Clear procedures for management of environmental impacts, including corrective actions;
- Continual improvement of environmental management; and
- Responsibilities and reporting requirements to ensure compliance with the EMP.

The EMPs will be prepared following assessment and approval of the Project and will serve as working documents to be used throughout the detailed design, construction and operational stages. They will be integrated into REMONDIS's existing management systems, procedures and plans for its activities within the facility, to ensure consistency in approach.

Each EMP developed for the site will contain, but not be limited to, the following information:

- Goals and objectives;
- Licenses, permits, approvals and statutory requirements;
- Lists of required actions, timing and responsibilities (including relevant environmental authorities);
- Operational procedures for preventing environmental impacts;
- Reporting requirements and procedures;
- Corrective and preventative action procedures;
- Procedures and forms for documentation and reporting of issues;
- Standard specifications for incorporating environmental safeguards;
- Environmental awareness and environmental management training and education requirements

- Guidelines for emergencies;
- Surveillance, review and auditing procedures for modification of the EMPs;
- Complaint procedures;
- Maintenance and monitoring programs; and
- Quality assurance procedures.

Adherence to the EMPs will enable environmental safeguards and mitigation measures to be effectively implemented and sustainable work practices adopted for the entire Project. This also demonstrates the KSSS's commitment to preventing environmental pollution, minimising the impact of the proposal on the environment and complying with all relevant legislation.

20.6. Environmental monitoring and reporting

Environmental monitoring will be a fundamental component of the Operational EMPs for the proposed development.

Monitoring programs will be developed and presented in EMPs, in accordance with the conditions of approval and Licence requirements.

Monitoring requirements will be focused on ensuring compliance with the relevant environmental sub-plans, for example:

- Visually monitoring dust generation from work zones to ensure that excessive dust is not being produced;
- Monitoring noise and vibration generation from work zones to ensure that excessive noise and vibration is not being produced; and
- Monitoring stockpiling heights.

Monitoring requirements will also be focused on ensuring current mitigation/management systems remain fit for purpose and are in good working order to ensure they will remain effective.

Operational monitoring may also result from investigative monitoring or regulatory compliance monitoring, such as conducting investigative noise monitoring in response to specific complaints.

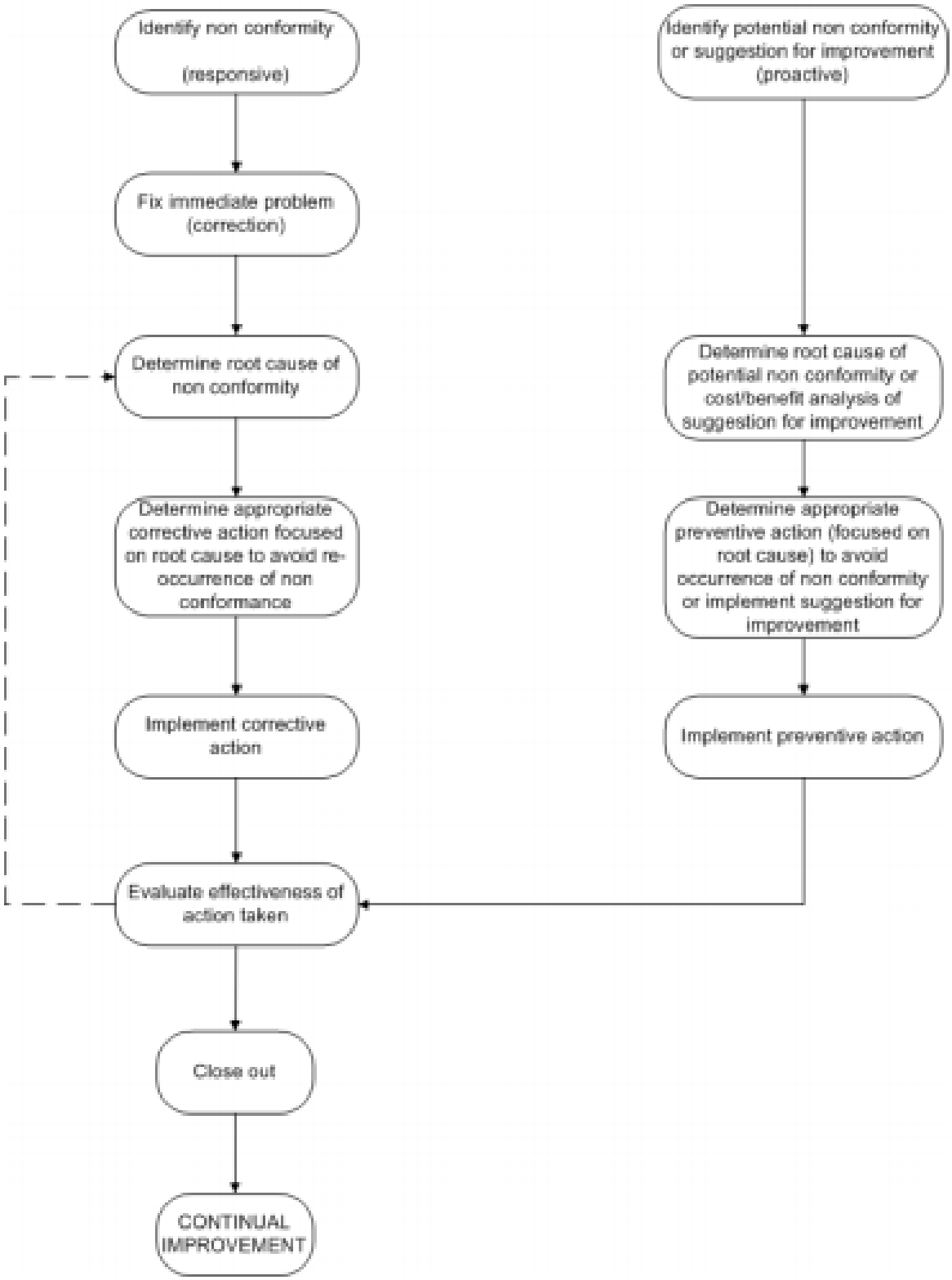
Environmental performance reporting is a key decision support tool that provides management with the information to make meaningful and positive change. Reporting requirements will be details in the EMPs for the relevant implementation phases.

The identification of actual and potential non-conformities contributes to continual improvement of the environmental management system through corrective action and preventive action, respectively. If the reports identify any shortcomings in the way that the construction activities or the operations are being conducted, or in the performance of environmental control structures, the necessary changes will be made to the EMPs to reflect these changes. The NSW EPA will receive all relevant reports and prompt notification of any incidents or deviations in performance as well as updated EMPs as required.

20.7. Environmental auditing and continual improvement

Environmental system audits will be conducted in accordance with a schedule nominated in the EMP. This will include a schedule of independent audits by accredited external auditors. Quantified and unquantified information contained in the EIS will be assessed to ensure that the construction and operational phases of the Project meet acceptable environmental standards. Audits will be based on available information and observations. Environmental audits will also assess the Project against any Conditions of Approval imposed by statutory authorities. The register that is completed during compliance audits becomes a record of the evaluation of compliance. All detected non-compliances will be followed up with corrective actions as per the flow chart below.

Figure 20.1. Non-compliance corrective actions flow chart.



Actual and potential non-conformities identified and suggestions for improvement are made by the following means:

- Internal audit;
- External audit;
- Site inspections;
- Feedback from external parties;
- Complaints from customers or other stakeholders;
- Suggestions for improvement from staff and contractors;
- Occurrence of environmental emergencies and accidents;
- Testing of emergency preparedness and response; and
- Management review.

The above flowchart illustrates the organisation's process for non-conformity, corrective action and preventive action, through:

- Identifying actual and potential environmental nonconformities;
- Recording suggestions for improvement;
- Taking appropriate action to correct non-conformities and mitigate environmental impacts;
- Taking corrective action to avoid recurrence of non- conformities; and
- Taking preventive action to avoid occurrence of non-conformity.

REMONDIS or their environmental representative will be responsible for maintaining a register of environmental nonconformity and suggestions for improvement to environmental management. Each record is associated with a corrective and/or preventive action. Corrective and preventive action will require a change environmental management documentation in a continual process for document control.

This process has the ultimate goal of driving continual improvement.

20.8. Conclusion

The objective of this Section of the EIS is to outline how the recommended environmental protection measures will be implemented and managed in an integrated manner to demonstrate that the proposal is capable of complying with statutory obligations under EPA licenses or approvals.

This Section described the mitigation measures to be implemented for potential impacts of the proposal that have been identified throughout this EIS. This Chapter provides an outline of the proposed environmental management measures, and additional strategies, including cleaner production principles, which will be followed when planning, designing, establishing and operating the proposal. These measures and processes will be incorporated into EMPs and monitoring programs to ensure a commitment to implementing the requirements of relevant legislation outlined in this EIS. Monitoring the efficacy of those measures will inform a process to drive continual improvement.

21. Cumulative Impact Assessment

21.1. Introduction

This cumulative impact assessment addresses the cumulative environmental impacts of the proposed development. A cumulative impacts assessment is an environmental assessment that examines both the positive and negative environmental impacts of a proposal where there is a clustering of a land use type. A cumulative impact on the environment results from the incremental impact of human activities with consideration to the historic, current, and foreseeable planned activities for a particular area. Cumulative impacts from a cluster of premises will vary between locations but typically cumulative impacts are a product of the location, the number and type of facilities present in the vicinity, the way they are managed, and the capacity of the local environment to accommodate these facilities.

The proposed development is not considered to make a significant contribution to cumulative impacts due to the mitigation measures that will be put in place to manage environmental impacts, which is in addition to the numerous long-term cumulative benefits of the proposed development, including a contribution to the attainment of waste management objectives including the aims and objectives of relevant legislation around the management of problem wastes, illegal dumping and waste to landfill targets.

21.2. Objective

This cumulative impacts assessment aims to achieve the following objectives:

- Identify the extent that the receiving environment is already stressed by existing development and background levels of emissions to which this proposal will contribute;
- Assess the impact of the proposal against the long-term air, noise and water quality objectives for the area;
- Identified infrastructure requirements flowing from the proposal; and
- Assess the likely impacts from such additional infrastructure and measures reasonably available to the proponent to contain such requirements or mitigate their impacts.

21.3. Assessment of stress level of existing environment

The proposed development is located inside the Tomago Aluminium Smelter Environmental Buffer Zone. This zone was established around the Smelter as a special environmental management zone where ambient levels of environmental impacts may be above OEH guideline values. The buffer zone boundaries lie at a radius of approximately 2 km to 4 km from the centre of the Smelter.

The buffer zone contains a large number of industrial and commercial sites. In addition, there are some sensitive receivers such as residential, active recreation, passive recreation and a caravan park. Receivers inside and outside the buffer zone will have different existing industrial impacts, particularly noise, traffic and air quality.

21.4. Assessment of the long-term impact of the proposal

As identified within the respective Sections and technical studies, the proposal developments environmental impacts, such air, noise and traffic meet all relevant environmental legislation, policies and objectives. The following Sections provide a summary of the key long-term environmental impacts of the proposal.

21.4.1. Traffic

The key intersection that could be impacted upon by the project is that connecting McIntyre Road to Tomago Road. However, modelling completed for this intersection shows that whilst some delays may occur in 2030, driver behaviour will continue to allow for safe traffic movements and acceptable delays and minor queues.

The other intersections impacts include the roundabout controlled intersection of Tomago Road and Old Punt Road and the modelling demonstrates that this will continue to operate very well with minor delays / congestion for the future design year of 2028 and beyond. The planned upgrade to provide the M1 to Raymond Terrace Road link will significantly alter the traffic patterns in this location, with new grade separated links and a new link road from Tomago

21.4.2. Noise and vibration

The predicted noise emissions from the site to the surrounding environment are low. The proposed development satisfies the Project Noise Trigger Levels of the NSW Noise Policy for Industry during all time periods at all nearby noise-sensitive receivers.

The sleep disturbance impacts from the operational noise events generated by the site satisfies the sleep disturbance trigger levels at all nearby sensitive receivers.

The proposed development generates negligible additional traffic noise and the NSW Road Noise Policy (RNP) criteria are satisfied as a result.

No receivers were found to be 'highly noise affected' as per the NSW Interim Construction Noise Guidelines. Therefore, there are no impacts predicted for the closest residential receivers during standard construction hours.

The offset distances (in all directions) between the vibrationally intensive equipment and any sensitive receivers is large (> 100 m). The potential for vibration impacts due to the construction or operation of the development are effectively nil. All vibration criteria with respect to cosmetic damage to buildings and human comfort impacts will be satisfied as a result.

Therefore, with respect to noise and vibration, cumulative impacts are considered low.

21.4.3. Air quality

The 4km buffer zone around Tomago Aluminium smelting facility was introduced during the approval process for the third potline and aims to reduce sensitive uses around the aluminium smelter and associated infrastructure. Any proposed development within the buffer zone with the potential to increase sulphur concentrations must be assessed cumulatively with the Tomago Aluminium facility. There are expected to be some sulphur emissions from the diesel machinery (i.e. forklifts, loaders and material handlers) and trucks on the proposed development. However, given the low emissions of sulphur from the proposed development, cumulative impacts are considered negligible.

A proposed gas fired power station, currently under assessment is located over 2 km away from the proposed development. Overlapping pollutants for the power station include particulate matter. However, given the large separation distance to the proposed gas fired power station, cumulative impacts are considered negligible.

Predicted odour concentrations at the sensitive receptors are noted to be well below the adopted 2 OU criteria, therefore there are unlikely to be cumulative impacts as a result of the proposed development.

21.4.4. Biodiversity

Impact to vegetation is confined to 21F School Drive where a paved and bunded overnight truck parking area and Onsite Stormwater Detention area are to be constructed. The native species composition occurring within the locality includes One Plant Community Types, being PCT 1647 – Red Bloodwood – Smooth-barked Apple heathy woodland on coastal sands of the Central and lower North Coast. PCT 1647 occurring within 21F was found to be highly disturbed and consisted of a few native shrubs with a largely introduced groundcover. The PCT was given the Vegetation Zone name PCT 1647_Disturbed.

The direct impacts arising from the project include:

- The removal of up to 0.1 ha of Vegetation Zone PCT 1647_Disturbed;
- The removal of up to 0.1 ha of habitat for 1 Species Credit Species *Uperoleia mahonyi* (assumed present)

There are no habitat trees located within the site and no significant habitat features, such as tree hollows and hollow logs were located within the development footprint. The proposed development will not substantially modify vegetation within the study area or surrounding habitat such that a significant loss in foraging, hunting and shelter resources would occur. Non-native vegetation within the development area study area was composed primarily of weeds such as Coolatai Grass. This vegetation type is well represented within the wider landscape and is unlikely to provide significant habitat resources for a specific resident population of threatened fauna or flora.

The proposal has the potential to result in an increase of weed spread within the study area and adjacent vegetation. However, the mitigation measures will minimise the likelihood of occurrence of this indirect impact.

The development footprint has been positioned on an area of land that has been subject to a number of disturbances from past industrial development activities. A series of mitigation and management measures have been identified to avoid and minimise potential impacts of the project on biodiversity.

21.4.5. Soil

The lateral extent of contamination relates to surface fill, to depths between 0.5mbgl and 1.0mbgl, in 21F School Drive, an area of approximately 1.25ha.This area is intended for use as vehicle parking which will necessitate the importation of road base material to form a suitable surface for these activities.

A low-permeability cap is considered to be an appropriate remediation method for heavy metal, contamination of the site to prevent a direct exposure pathway between contaminated fill, and users of the proposed redevelopment. The cap would be intended to isolate future users of the site from contaminated material, and to prevent its migration off site via stormwater infiltration and groundwater flow. A low-permeability cap of compacted road base material would inhibit the infiltration of rainwater; combined with an underground stormwater drainage system this would limit the amount of water percolating through contaminated soils, and reduce the potential for groundwater to be contaminated.

The site is considered suitable for the proposed redevelopment and ongoing industrial land use, pending successful implementation of remedial measures as detailed in the Remedial Action Plan, and the preparation and implementation of a Long-Term Environmental Management Plan.

This risk of soil contamination resulting from the development is low. The impact is expected to be minimal and will not impact the surrounding area.

21.4.6. Soil and water

The outcomes of the preliminary stormwater management strategy indicates that detention measures can be adopted to attenuate post developed flows to pre-developed rates. In addition to this, through the adoption of WSUD principals, the water quality reduction targets can be achieved.

Based on the investigation and concept design, it is considered that the proposed development can adequately manage and address stormwater runoff, and soil and water management locally and not impact the surrounding area.

21.4.7. Bushfire

There is potential for bushfire attack at this site and a list of recommendations has been included to reduce that risk. However, the proposed development is not likely to increase the level of bushfire risk to the surrounding areas.

21.4.8. Heritage

No Aboriginal sites or potential archaeological deposit were identified during the survey. No further archaeological investigation is required for the Project Area. The impact is expected to be minimal and will not impact the surrounding area.

21.4.9. Visual impact

The proposed Resource Recovery Facility will utilise the exiting industrial warehouses on the site, therefore, there is no impact on the surrounding area from a visual point of view. Minor landscaping will be incorporated into the development to soften the visual impacts of the warehouses.

The proposed truck parking depot will only be visible from the entrance to the site via a private access road. Vegetation and existing buildings screen the proposal from public areas. The proposed development is not likely to alter the existing visual character of the area. The existing landscape is industrial in nature with large scale infrastructure part of the landscape character. In addition, due to the site set back from public roads, as well as being screened by existing buildings and Tomago Aluminium, it is unlikely that the proposed truck parking depot will be visible from public roads. As a result, cumulative impacts are low.

21.5. Infrastructure requirements flowing from the proposal

No additional infrastructure is required to support the development.

21.6. Conclusion

Overall, the cumulative impact of the proposed development is expected to be minimal. The potential for adverse impacts will be mitigated by a range of measures, as listed in Section 20.

Appendix A – Secretary's Environmental Assessment Requirements (SEAR 10447)

Appendix B – Site Plans, Architectural Drawings and Survey

Appendix C – Capital Investment Value

Appendix D – Consultation report and responses

Appendix E – Waste Management Plan

Appendix F – Air Quality Impact Assessment

Appendix G – Noise and Vibration Impact Assessment

Appendix H – Traffic Impact Assessment

Appendix I – Biodiversity Development Assessment Report

Appendix J – Soil and Water Management Plan

Appendix K – Aboriginal Cultural Heritage Assessment Report

Appendix L – Statement of Heritage Impact

Appendix M – Contaminated Site Assessment Reports and Remedial Action Plan

Appendix N – Bushfire Assessment Report

Appendix O – Pollution Incident Response Management Plan

Appendix P – Fire Safety Report

Appendix Q – Visual Impact Assessment Report

Appendix R – Landscape Concept Plan

Appendix S – Section 10.7 Planning Certificate

Appendix T – Emergency Plan

Appendix U – Agency requirements for the EIS

Appendix V – Owners Consent Letter

Appendix W – Boundary Adjustment Progress Letter