# Attachment 3B – Proposed Activities

## Works Approval Application

Chairay Sustainable Plastics Co.

21 March 2025

→ **The Power of Commitment**

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# 1. Introduction

Chairay Sustainable Plastic Co. (Chairay) is the recipient of a grant from the Recycling Modernisation Fund (RMF), to support the development of new recyclable plastics reprocessing infrastructure to recycle polyolefin and polyester plastics (such as PET, HDPE and polypropylene) in the Perth metropolitan region.

Chairay are proposing to establish a mixed plastics reprocessing facility, for the purpose of processing Polyethylene Terephthalate (PET), High-Density Polyethylene (HDPE), Polypropylene (PP), and mixed plastics (MP) that are not of a single resin or polymer type. The facility will comprise of plastic mechanical sorting machinery and plastic flaking, washing and pelletising lines.

The new facility will have capacity to reprocess up to 15,000 tonnes per annum of recycled Polyethylene Terephthalate (PET), High-Density Polyethylene (HDPE), Polypropylene (PP) and mixed plastics (MP) that are not of a single resin or polymer type.

To develop reprocessing capacity as soon as possible, development of the facility has been divided into two phases, with:

– Phase 1 - to include MP sorting, HDPE, PP flaking, pelletising, and plastics storage.
– Phase 2 - expected to commence six months later and expand the footprint of the lease within the existing Warehouse A building to include PET flaking.

A Works Approval and Licence will be required for the facility as it will be a Prescribed Premises under Schedule 1 of the *Environmental Protection Regulations 1987*, with the facility's activities being categorised under the following Prescribed Premises activity and design capacity threshold:

| Category Number | Description | Category Production or Design Capacity | Proposed Design Capacity |
|---|---|---|---|
| 61A | Solid waste facility: premises (other than premises within category 67A) on which solid waste produced on other premises is stored, reprocessed, treated, or discharged onto land. | 1,000 tonnes or more per year | 15,000 tonnes/year |
| 62 | Solid waste depot: premises on which waste is stored, or sorted, pending final disposal or re-use. | 200 tonnes or more per year | 1,000 tonnes/year |

# 2. Proposed activities

The facility will be developed according to the timeline in Table 1.

*Table 1 Project development timeline*

| Phase | Commencement/completion |
|---|---|
| Installation/construction | Q2 2025 |
| Commissioning | Q2 2025 |
| Operation | Q3 2025 |

## 2.1 Installation/Construction

Key activities for site preparation will be:

– Installation of plastic processing machinery
– Installation of wastewater treatment plant
– Installation of drive-over bunds to prevent water runoff leaving the facility
– Installation of mobile equipment charging stations

### 2.1.1 Key Infrastructure and Equipment

Key Infrastructure and equipment that will be installed and operated on the Prescribed Premises are listed in Table 2.

*Table 2 Key infrastructure and equipment on Prescribed Premises*

| Infrastructure and equipment |
|---|
| 1 x Automatic sorting machine |
| 1 x Plastic recycling machine (pelletiser) |
| 1 x PET recycling machine (pelletiser) |
| 1 x HDPE recycling machine (pelletiser) |
| 1 x Automatic baling machine |
| 1 x Plastic washing system |
| Wastewater treatment plant (design flow = 30 $m^3$/day):<br>• 4 x 20,000 L collection tanks (80,000 L total volume)<br>• 1 x 5,000 L collection tank (5,000 L total volume)<br>• 1 x 4,000 L bacteria tank (4,000 L total volume)<br>• 1 x 2,000 L discharge tank (2,000 L total volume)<br>• 3 x 58,000 L activated sludge tanks (174,000 L total volume)<br>• 1 x 28,000 L sedimentation tank (28,000 L total volume)<br>• 1 x 1,100 L fine screen water tank (1,100 L total volume)<br>• 1 x 4,000 L mixing tank (4,000 L total volume)<br>• 1 x 5,000 L DAF flotation tans (5,000 L total volume)<br>• 1 x 1,000 L flotation collection tank (1,000 L total volume)<br>• 1 x 1,100 L dewatering filtrate collection tank (1,100 L total volume) |

| Infrastructure and equipment |
| --- |
| • 1 x 5,000 L sludge tank (5,000 L total volume)<br>• 1 x 400 L flotation sludge tank (400 L total volume) |
| Chemical storage tanks:<br>• 2 x 1,000 L polymer tanks (2,000 L total volume)<br>• 1 x 5,000 L NaOH tank (5,000 L total volume)<br>• 1 x 5,000 L PAC tank (5,000 L total volume) |
| 2 x Electric forklifts |
| 2 x Firefighting water supply tanks (300,000 L total capacity) - existing |
| Office and staff facilities |

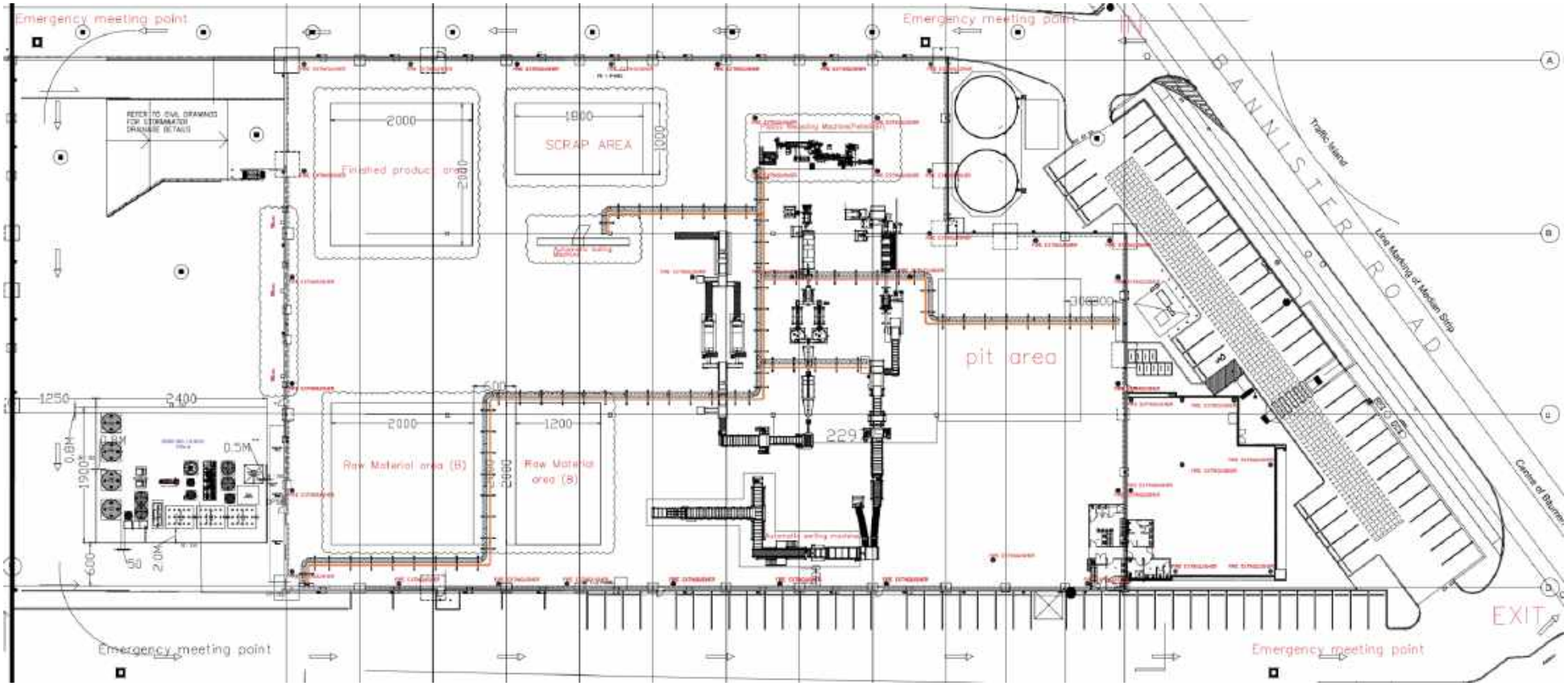


***Figure 1 Facility layout***

## 2.2 Commissioning

Commissioning of the facility is proposed to commence on Q2 2025. Please refer to the Environmental Commissioning Plan in Attachment 3A.

## 2.3 Operation

Standard operations on the site will occur from 8:00 am to 4:00 pm from Monday to Friday. The facility will employ approximately 20 staff.

### 2.3.1 Plastics acceptance

All plastic feedstock material will be sourced from the three existing metropolitan Material Recovery Facilities (MRFs) in WA (RRG, Cleanaway, and Veolia) as well as through the Container Deposit Scheme (WARRRL). The MRFs operate on a tender basis that ranges between 1 to 3 months and the WARRRL operates through an auction platform roughly each fortnight. Chairay will be actively tendering and bidding for all mixed plastics, HDPE, and PET from the MRF and CDS systems.

Plastic feedstock material sourced from the MRFs and the Container Deposit Scheme will be picked up by truck in a baled form (approx. 600 kg per bale) for delivery to the site where it will be temporarily stored (2.3.3) before processing.

### 2.3.2 Plastics processing

***Once delivered to the site, the raw plastic bales will go through a de-baling machine and be sorted to separate by material type and colour. Process diagrams are provided for the processing of PET (***

Figure  2) and HDPE (Figure 3).

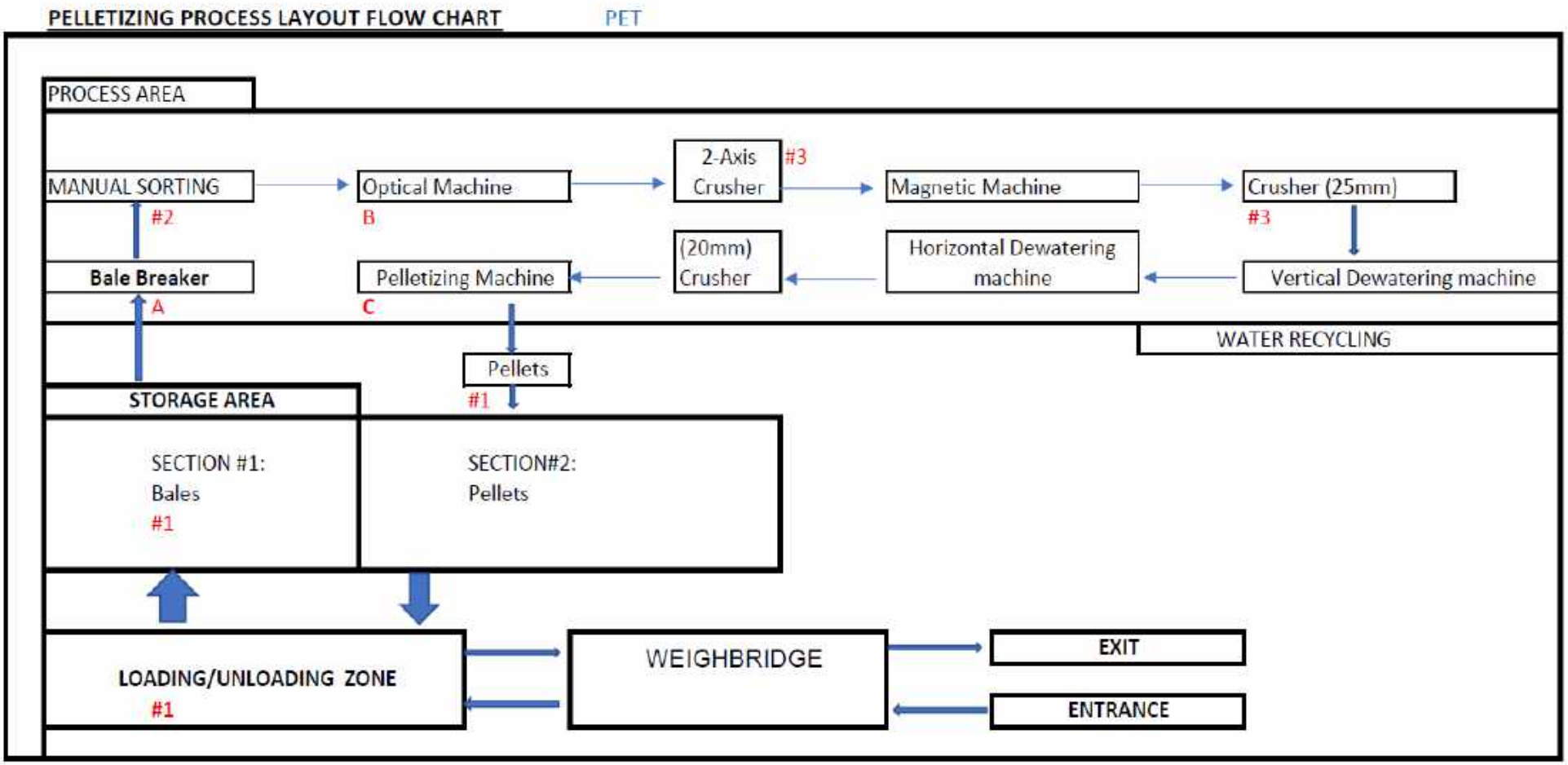


*Figure 2* *Process flow diagram for PET*

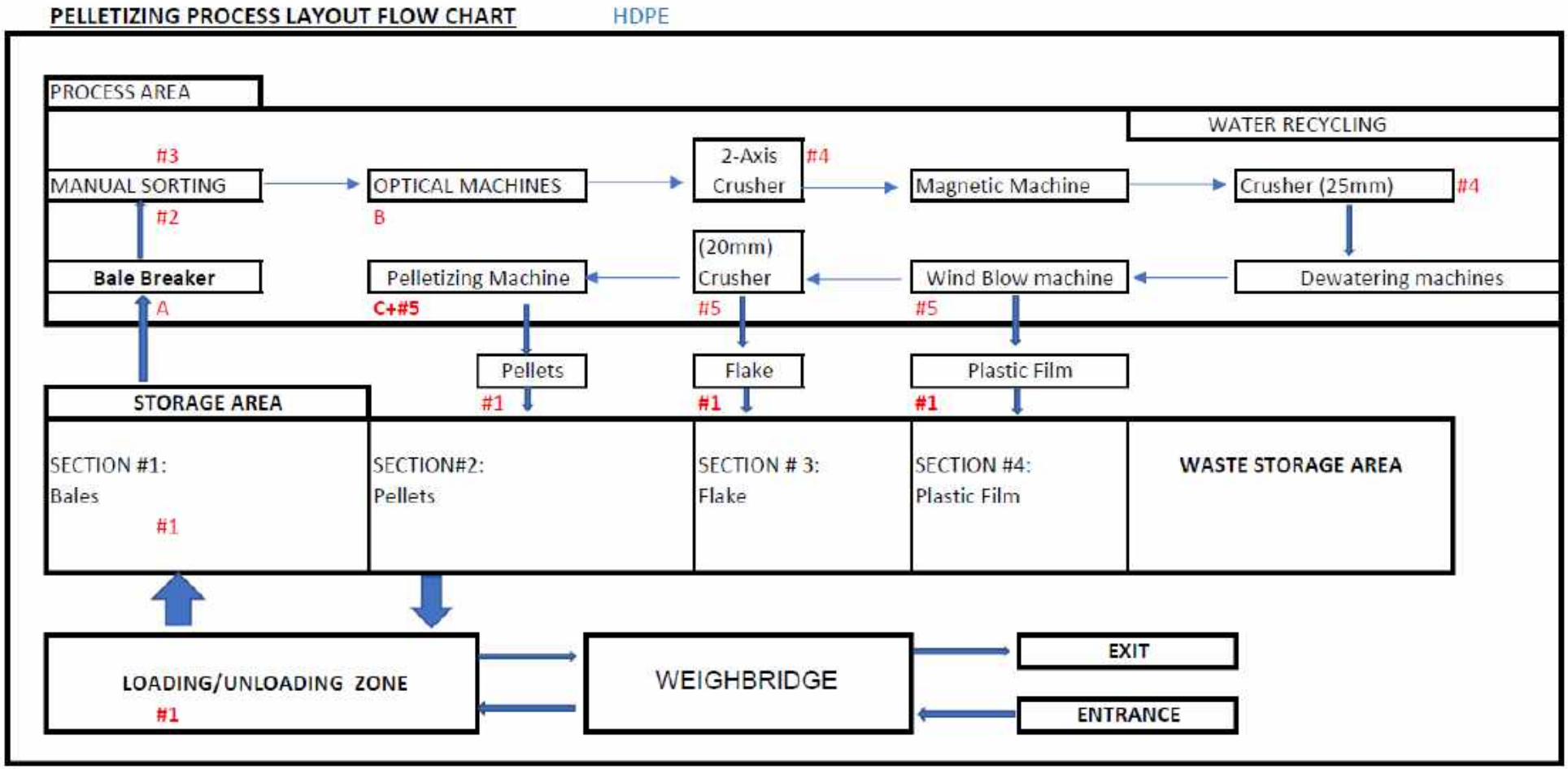


*Figure 3* *Process flow for HDPE*

#### 2.3.2.1 Materials throughput

Table 3 shows the proposed material throughput on the site. The site will process up to 15,000 tonnes of plastic material annually to produce 12,000 tonnes of plastic product for recycling. Waste streams produced on the site will consist of approx. 3,000 tonnes of residual non-recyclable plastic, as well as wastewater and sludge from the wastewater treatment plant (WWTP) used to treat process water.

***Table 3 Material volumes through-put on the site***

| Material | Annual volume/mass |
|---|---|
| **Inputs** | |
| High-density polyethylene (HDPE) | 3,600 t/year |
| Polyethylene terephthalate (PET) | 5,400 t/year |
| Mixed plastics (MP) | 6,000 t/year |
| Polypropylene (PP) | 3,000 t/year |
| Water consumption | 30 ML/year |
| **Outputs** | |
| *Product:* | |
| • HDPE pellets | 4,200 t/year |
| • PET pellets | 6,000 t/year |
| • PP flake (from MP) | 1,800 t/year |
| *Waste*: | |
| • Plastic residue | 3,000 t/year |
| • WWTP wastewater | 30 ML/year |
| • WWTP sludge (80% moisture content) | 600 t/year |

## 2.3.3 On-site storage

Up to 1,000 tonnes of plastic material will be stored within the warehouse building on the site at any time. This plastic will consist of plastic raw feedstock material, residual plastic waste for disposal, and finished plastic recycling products (Table 4). These materials will be temporarily stored inside the warehouse building at the locations depicted on the Facility Layout plan (Figure 1).

***Table 4 Breakdown of maximum volumes of material that will be stored on the site***

| Material | Storage |
|---|---|
| Baled plastic (raw material feedstock) | 500 tonnes |
| Loose plastics (raw material feedstock) | 200 tonnes |
| Residual plastics (waste) | 100 tonnes |
| Finished product (plastic pellets and flake) | 200 tonnes |
| Untreated wastewater | 272,000 L |
| Treated wastewater (immediate discharge to the sewer) | 5,300 L |
| WWTP sludge | 5,300 L |

## 2.3.4 Wastewater treatment

Chairay will be installing an activated sludge WWTP on the site that will treat process wastewater that will be generated (30 ML/year). The WWTP will operate on a batch treatment basis of eight hours of operation per workday and will involve the following treatment processes (Figure 4):

– Primary treatment – primary sedimentation, fine screening, oil-water separation, and the removal of suspended solids (SS) and oils from wastewater contaminants. Control measures include adjusting retention times, disk rotation speeds, and screen mesh sizes.
– Chemical treatment - will include wastewater neutralization (acid-base neutralization), coagulation, flocculation, and flotation to remove SS as well as BOD/COD. Control measures involve monitoring pH values, retention times, and mixing speeds, among others.
– Secondary treatment – will consist of a biological activated sludge process that will involve sedimentation primarily to remove BOD from the water. Control measures include monitoring dissolved oxygen levels, retention times, and the food-to-microorganism ratio, among others.
– Tertiary treatment – secondary treated wastewater will be passed through a ceramic membrane to further remove BOD and SS from the effluent.

To ensure optimal WWTP operational performance:

– Monitoring devices will be installed at the discharge point to include monitoring of flow rate, total SS (TSS), chemical oxygen demand (COD) and continuous recording of these parameters (with data stored on a computer). Additionally, an abnormality notification system will be established to alert in case of any irregularities.
– Water quality testing instruments will be procured to conduct functional tests on other wastewater treatment units.

Treated wastewater from the WWTP will be discharged to the sewer servicing the site. Chairay are currently in the process of obtaining a Trade Waste permit from the Water Corporation. The Wastewater Management Plan for the WWTP is provided in Attachment 8B.

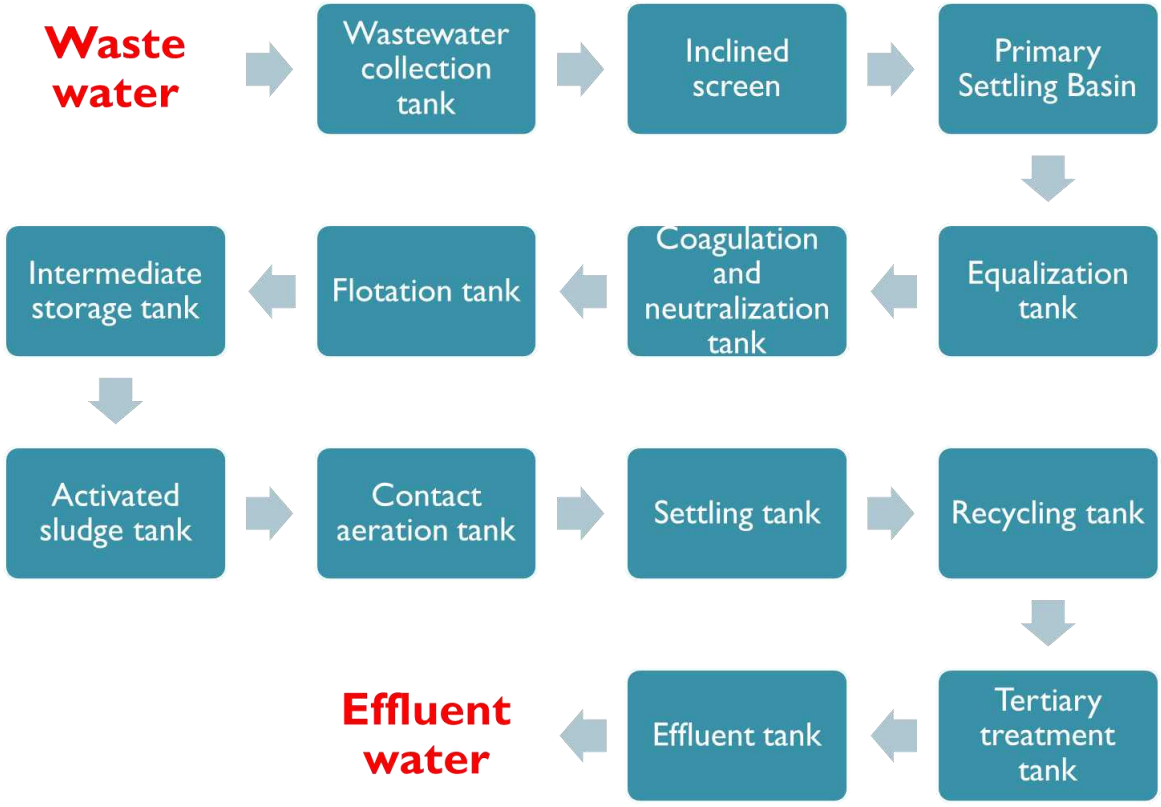


*Figure 4* *Process diagram of the WWTP*

## 2.3.5 Fire prevention and management system

A fire prevention and management system has been designed and installed in accordance with the Building Code of Australia (BCA) that requires that all buildings comply with the referenced Australian Standards, which was required for development approval from the City of Cannington.

However, recycling facilities have specific fire protection requirements due to the inherent risk of fire from the bulk storage of combustible recyclable materials on premises, that can release toxic contaminants when combusted. As such, the Department of Fire and Emergency Services (DFES) have released a Guidance Note (*GN04 – Fire Prevention and Management in a Recycling Facility*).

In consideration of Chairay's proposed operations, a site assessment (refer to Attachment 8A) was undertaken of the existing building design, installed features and current condition at Warehouse A, 204 Bannister Road against Guidance Note GN04 to identify any required modifications to the leased building to achieve GN04 compliance. The assessment findings indicated that the building design and installed fire prevention and management system largely satisfies the requirements outlined in the DFES Guideline. However, some requirements were found to only be partially met, or where deficiencies were identified, to have the capability to be met subject to the proposed engineering controls being implemented.

## 2.3.6 Site Stormwater Management

Stormwater runoff generated from the site (from hardstand and roofed areas) will be discharged to ground via two methods:

I. Infiltration via existing soak wells – several risers serve as both conveyance manholes and soak wells.

II. Grid stormwater detention and infiltration system – Ecobloc drainage cells are installed under the carpark facing Bannister Road.

Excess stormwater is understood to be discharged to the municipal stormwater network, with the connection located on Bannister Road in accordance with development approval from the City of Canning. Stormwater management design plans for the site are provided in Attachment 2.

As outlined in Section 2.3.5, fires at recycling facilities can release toxic contaminants from flammable materials which are entrained in fire fighting water used to suppress any potential or actual fire event. In the event of a fire emergency, fire water will not be discharged to ground but will be isolated and contained for removal off-site via vacuum truck (refer to Attachment 8A).

## 2.3.7 Contingency measures

### 2.3.7.1 Equipment failure

All equipment purchased for the proposal is "off the shelf" with readily available parts and processing elements are not complex or experimental in design. Any significant damage to equipment will be repairable/replaceable with support from the manufacturer if needed. In the event of equipment failure, the following contingency measures will be undertaken:

- Severity of the failure will be assessed, and an estimated duration of processing shut down determined.
- If it is established that processing cannot resume for an extended period, Chairay will temporarily stop receiving new raw materials and communicate the temporary suspension of material acceptance to suppliers, waste collection agencies and any other relevant parties.
- Existing inventory will be prioritised, maximising the utilisation of available processing capabilities

#### 2.3.7.2 Export failure

There are numerous markets available both locally and internationally for all processed materials. Chairay has signed a MOU with Primaplas, one of Australia's largest plastics distributors, for managing the offtake of all recycled materials.

Considerations for export failure have been made, however are deemed to be extremely low risk as the manufactured product is viewed internationally as a commodity and is highly price elastic. Clearing excess plastic pellets and flake stock in a short amount of time would be highly possible particularly as Chairay have access to well established markets through their directors relationships in Taiwan and the rest of South East Asia.

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