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CONTAINMENT ASSESSMENT

Environmental and sustainability solutions provided to
RESOURCE RECYCLING SOLUTIONS LTD

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1.0 INTRODUCTION

1.1 Context

Walker Resource Management Limited (WRM) have been commissioned by Resource Recycling Solutions Limited (hereon referred as RRS), to provide an updated containment assessment in line with the sites proposed In-Vessel Composting (IVC) and Open Windrow Composting (OWC) related developments.

1.2 Site Description

RRS is a composting site, located at Iron House Farm, and primarily composting source segregated green bio-waste in open windrows and comingle food and green waste in an in-vessel composting system. Iron House Farm is located off Lancaster Road, in Out Rawcliffe, which is 17km south of Lancaster and 9km west of the M6. The main village of Out Rawcliffe is situated to the southwest at 3km. The site is situated within an area that is of agricultural use with some residential.

1.3 Site Location

Iron House Farm,
Lancaster Road,
Out Rawcliffe,
Preston,
Lancashire,
PR3 6BP

Grid Reference: 341162 (easting), 444756 (northing)

1.4 Professional Competence

WRM have been approved for the EA's list of trusted consultancies to undertake containment system assessments for the biowaste sector. WRM are trusted by the EA due to company's provision of start-to-end consultancy support and technical expertise for waste treatment sites across the UK. This has been further supported through the submission and review of the company's experience & competency within the required fields.

This report has been prepared with reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the Client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

1.5 Site Geology

The site is predominantly underlain with Sherwood Sandstone Group as illustrated in the surface geology map for the area surrounding the site (see Figure 1). This group comprises of sandstone, red, yellow and brown, part pebbly; conglomeratic in lower part; pebbles generally extra-formational quartz and quartzite, with some intra-formational clasts; subordinate red mudstone and siltstone. The geological classification is of a highly productive aquifer. The principal sandstone aquifer is up to 600m thick and yields up to 125 L/s. The site is also located in a Zone III (Total Catchment) Source Protection Zone.

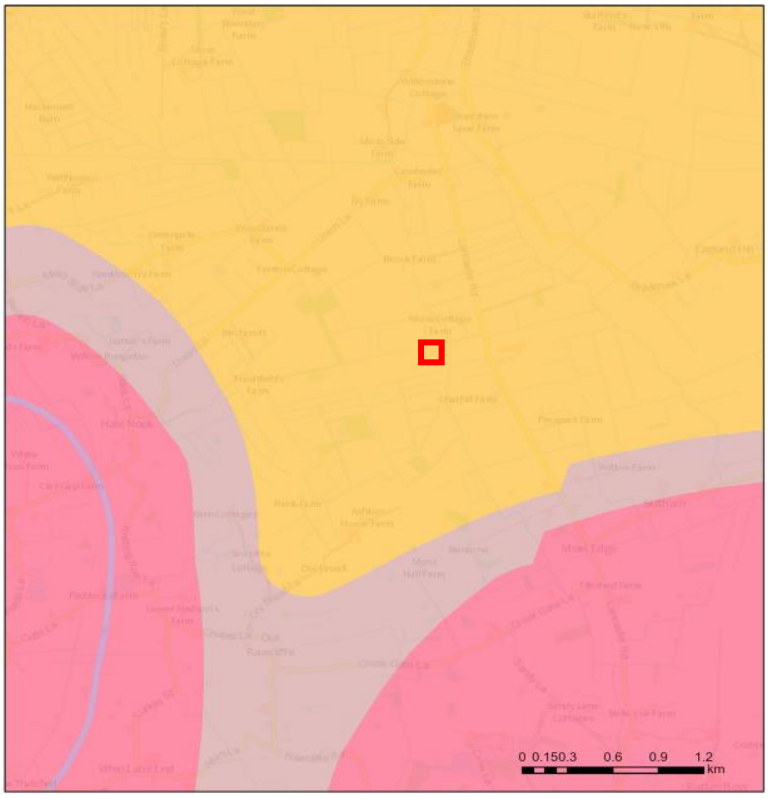

Figure 1 - Surface Geology Map of the Area Surrounding the Site.

Table 1 - Surface Geology Map Overview.

Map Colour Relevant to the Site Location	Rock Name	Rock Type	Age Range (Millions of year)
	Sherwood Sandstone Group	Sandstone and subordinate red mudstone & siltstone	Anisian Age & Induan Age 241.5 – 251.9

1.6 Rainfall Data

Monthly average rainfall for the nearest Met Office weather station (Myerscough[1], situated 4.8km from the site) is presented in Figure 2.

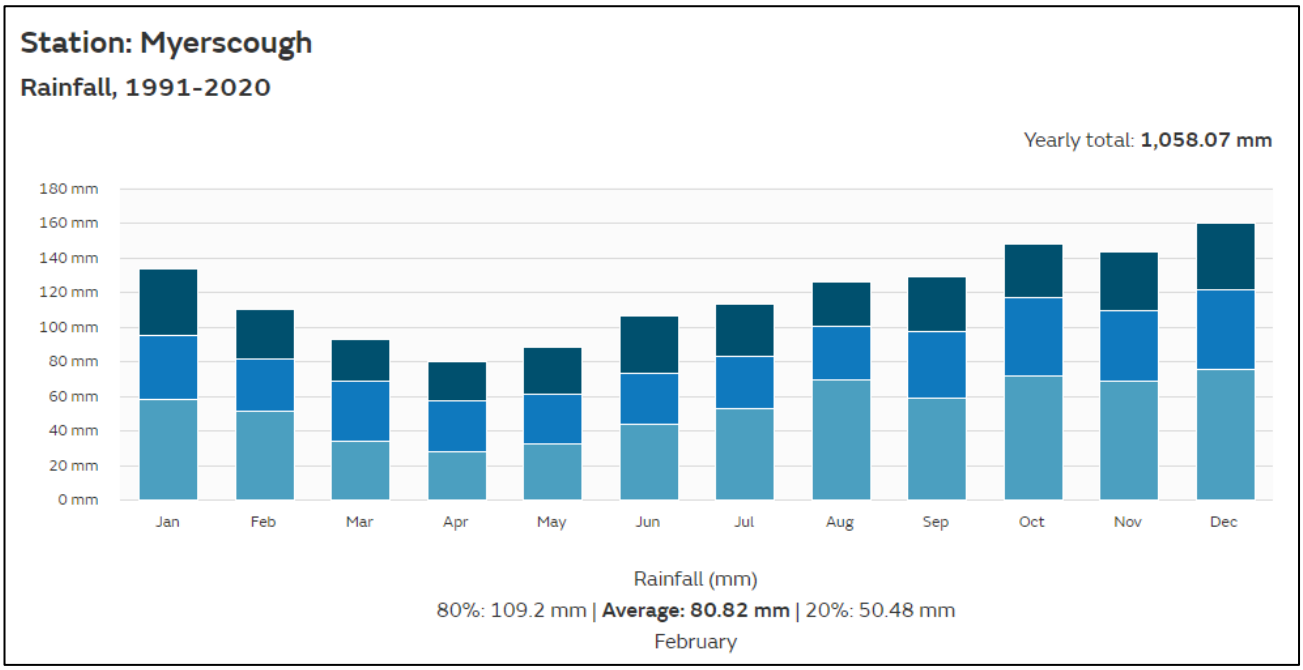

Figure 2 - Monthly Average Rainfall Data for the Site.

[1] Myerscough UK Climate Average, MET Office - https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcw435f21

2.0 CQAI ASSESSMENT

CQA International Limited (heron referred to as CQAI) undertook a review and assessment of primary and secondary containment in line with EA requirements outlined in the Regulation 61 (Schedule 1) notice issued to RRS. The assessment was undertaken at RRS's Iron House Farm Composting Facility, near Preston, Lancashire (the Site) on 19th July 2021.

The CQAI assessment has been carried out in compliance with industry best practice as defined by CIRIA C736 Report[2] - Containment systems for the prevention of pollution, secondary, tertiary and other measures for industrial and commercial premises, 2014 (hereon referred to as C736) which is widely accepted by the EA and planning authorities as the appropriate guidance document to assist owners and operators of industrial and commercial facilities to identify and manage the risks associated with storing substances (inventory) that may be flammable, combustible or hazardous to the environment.

The definition of containment systems assessed and modelled in the CQAI report are defined below:

- **Primary Containment** (i.e. storage) is the most important means of preventing major incidents involving loss of inventory. It is achieved by the equipment used to store or transfer it, such as storage tanks, intermediate bulk containers (IBCs), drums, pipework, valves, pumps and associated management and control systems. It also includes equipment that prevents the loss of primary containment under abnormal conditions, e.g., high-level alarms linked to shut-down systems.

- **Secondary Containment** minimises the consequences of a failure of the primary storage by preventing the uncontrolled spread of the inventory. Secondary containment is achieved by equipment that is external to and structurally independent of the primary storage, for example concrete or earth bunds around storage tanks, or the walls of a warehouse storing drums. Secondary containment may also provide storage capacity for firefighting and cooling water.

The recommendations included in the assessment, included, but were not limited to, providing additional containment due to site expansion and inspecting and repairing the concrete processing pad and drainage system.

[2]CIRIA C736 Report- CIRIA_report_C736__Containment_systems_for_the_prevention_of_pollution.pdf (gptenvironmental.co.uk)

2.1 CQAI Site Containment Assessment Overview

2.2 Primary Containment - Concrete Processing & Maturation Pad

Observation

The concrete pad was estimated to be 150mm thick and featured a foundation of recycled aggregates. Overall condition of the pad was deemed very good to satisfactory, with one defect relating to cracking in a heavily trafficked area of the site. These cracks were classified as infrequent & closed where observed. Secondly, construction joints of the pad had no apparent evidence of sealant and, detailed inspection of transverse & longitudinal joints were to be undertaken to confirm whether they are still functional with any missing or overly deteriorated seals replaced. Finally, partial containment surrounding the pad was provided by the retaining wall to the north however perimeter kerbing was noted as not be being present around the full site.

Recommendation

The site was required to undertake a detailed inspection proceeding clean down of the pad. Alongside filling of cracked concrete, application of sealant (e.g., epoxy resin) and areas which were overly damaged to be suitably remediated. In terms of kerbing CQAI advised to install kerbs around the perimeter to ensure run-off doesn't occur.

2.3 Primary Containment - Site Drainage System

Observation

The concrete pad was regarded to have sufficient fall to allow flow from the pad to the collection system and, this was supported by no evidence of standing water or leachate. However it was a hot dry day, so there could be potential leachate build up during wet weather. It was noted that surface drains were partially blocked during inspection.

Recommendation

The drainage system should be inspected as part of the sites inspection and maintenance procedures so they are all kept clear and free draining. Where modifications are to be undertaken such as incorporation of the leachate tank, the connecting drainage system should be cleaned out, inspected and fully understood at the point of upgrades to the site being undertaken.

2.4 Primary Containment - Leachate Storage Tank

Observation

At the time of the assessment leachate containment was provided by means of an above ground storage tank, this was filled by the sites drainage system. CQAI noted that proposals were in place for the tank to be replaced with a new large capacity tank, so detailed investigations were regarded as unnecessary. From a visual external inspection basis, the condition of the tank appeared to be good with no visible corrosion, impact damage or leaks.

Recommendation

Should the tank remain in commission for the leachate storage post August 2022 a more thorough assessment of the tank was to be undertaken.

2.5 Secondary Containment

Observations

The site had no specific secondary containment in its configuration.

Recommendations

Secondary containment was to be constructed around the new tank and, between the northern retaining wall and new tank, a wall was to be constructed with an access ramp to bypass the weighbridge. Therefore, incorporating the weighbridge into the containment system. Existing walls to the rear of the biomass shed were to be modified with seals added to the required elevations. Steel doors to the rear of the biomass shed were to be modified providing full containment to the required elevations. Seals were to be added to the northern retaining wall to required elevations. Relating to the highlighted wall height changes, any bund walls which could be subjected dynamic effects (surge from tank failure) should be extended to 5.60m AOD and, the secondary containment wall to the east and south of the new tank should be extended to 6.40m AOD. This was also recommended to be positioned 3.61m from the tank to prevent jetting overtopping the wall.

2.6 Tertiary Containment

Observations

At the time of the assessment there were no noted tertiary or remote storage facilities on or around the site.

2.7 Recommendations

CQAI did not mention any possible recommendations in line with incorporating tertiary containment features within the site.

3.0 IMPROVEMENT WORK DONE TO DATE

This section describes the improvement works which have been installed at the RRS composting facility. These improvement works follow the recommendations stated in CQAI Containment Appraisal. Table 2 below summarises each CQAI recommendation, and the following improvement works which have been completed at RRS' site.

Table 2 – Improvement Works Completed.

Containment Type	CQAI Recommendation	Date Completed	Commentary
Primary Containment	Perimeter containment kerbs are not present around the full site and their inclusion should be considered. These are required to divert all surface water to the surface water collection system. It is advisable to install containment kerbs around the entire slab perimeter to ensure run-off does not occur. Partial containment around the site is provided by the retaining wall to the north.	Q3 2023	Along the north border there has been further concrete containment added which extends to the edge of the site boundary. The new laid concrete falls towards the centre of the site, in the directions north to south fall and west to east, perpendicular to the site boundaries. A kerb is not required given the falls that have been put into place to accommodate leachate drainage.
	The surface water drains were partially blocked During inspection and should be inspected as part of the sites inspection and maintenance procedures to ensure they are all kept clear, free draining and not damaged.	Q3 2023	Daily check sheets in the quality management system (QMS) have been updated to include checks of site drains. These checks had been happening however they have since been added to the daily check sheets. The checks take place 3 times during the day, checking for blockages and the state of quality of the site drains, this

Containment Type	CQAI Recommendation	Date Completed	Commentary
			is recorded into a site record sheet in the QMS. Any issues are progressed up to the Site Manager.
	Transverse and longitudinal joint seals should be inspected to ensure they are still functional with any missing or overly deteriorated seals replaced.	Q1 2024	The joints have been and sealed with a suitable compound where necessary.
	Construction joints and cracks should be cleaned and filled with a suitable sealant, such as epoxy resin where practicable, otherwise the concrete should be replaced in areas where deterioration is deemed too great for remedial repairs.	Q1 2024	Cracks and joints have been cleaned and sealed with a suitable compound.
Secondary Containment	Existing walls to the rear of the biomass shed will be modified with seals added to above the required elevations.	Q1 2021	Seals have been added to the existing walls to the required levels.
	Steel doors to the rear of the biomass shed will be modified to provide full containment to the required elevations.	Q4 2021	Steel doors have been retrofitted to provide full containment to the required elevation.
	Secondary containment will be constructed around the new tank.	Q4 2020 / Q1 2021 / Q4 2023	Secondary containment has been constructed around the new tank, additional concrete was extended to the west of the site (Q4 2020), then additional concrete extended from the tank at the north of site (Q1 2021). The rest of the concrete extension is scheduled for the end of 2023.

4.0 WORKS OUTSTANDING

This section describes the improvement works which have not yet been installed at the RRS composting facility. These improvement works follow the recommendations stated in CQAI Containment Appraisal. Table 3 below summarises each CQAI recommendation, and the following improvement works which are set to be completed at RRS's site.

Table 3 – Improvement Works Set for Completion.

Containment Type	CQAI Recommendation	Date set for completion	Proposed action
Secondary Containment	Any bund walls which could be subjected to dynamic effects (surge from tank failure) should be extended to 5.60m AOD.	Q1 2024	Not completed due to imminent permit variation – subject to changes from the new permit variation and subsequent infrastructure changes and site plans. Design to be submitted for the containment by early 2024 and to be implemented following approval (within a 6-month timeframe).
	The secondary containment wall to the east and south of the new tank should be extended to 6.40m AOD and positioned 3.61m from the tank to prevent jetting overtopping the wall unless the tank is clad/covered in which case these requirements can be relaxed (though a 1m minimum height bund wall around the tank is recommended).	Q1 2024.	Not completed due to imminent permit variation – subject to changes from the new permit variation and subsequent infrastructure changes and site plans. Design to be submitted for the containment by early 2024 and to be implemented following approval (within a 6-month timeframe).

	Between the northern retaining wall and new tank secondary containment a wall will be constructed with an access ramp constructed to bypass the weighbridge. The weighbridge will be incorporated into the containment system.	Q1 2024 / Q4 2024	Weighbridge containment has been extended but not to satisfaction of the site manager. This extended containment is planned to be completed Q1 2024 and finished in Q4 2024.
All Containment	The installation of primary, secondary, or tertiary containment systems should be undertaken according to a specific detailed design including a technical specification, construction details and measures to tie-in to existing infrastructure. The design should include a high-level alarm to remotely warn that the freeboard level has been reached.	Q1 2024 / Q4 2024	Upon installation, all containment will be checked with a construction quality assurance (CQA) and a CQA contractor review will be implemented to confirm all works comply with CQA and CIRIA C736.

5.0 CONTAINMENT UPDATES FOR THE SITES PERMIT VARIATION

5.1 Context

RRS are undertaking a variation of the existing permit for the purpose of incorporating a standalone IVC area and extension of the current OWC area. These proposed developments will require new aspects of containment such as; an extension of the concrete pad, installation of leachate drainage channels & leachate tank's to accommodate for the additional waste throughput.

5.2 Updated Site Risk Assessment

In line with CIRIA guidance requirements containment systems are to be classified into one of three classes (Class 1 = low risk, Class 2 = medium risk and Class 3 = high risk) on the basis of a risk assessment. WRM has provided an risk assessment in relation to the proposed activities and shall be based on the source, pathway, receptor paradigm, together with an assessment of the likelihood of loss of containment. The resulting site risk rating is used to determine the class. The risk assessment and resulting classification for this site is addressed in Table 2 – Table 4 .

5.3 Source Risk Assessment

Table 4 presents the outcome of the source risk assessment and incorporates the feedstock, the process, and firefighting agents & cooling water spillages, to provide the overall hazard rating to the surrounding environment.

Table 4 – Source risk assessment for the site.

Material	Physical property	Quantity	Storage	Flammability	Corrosive	Ecotoxicity	Environmental Hazard Rating	Notes
Feedstock								
Green	Solid	<75,000 tonnes	Concrete Pad	Flammable	No	Low	L	Green waste requires biological treatment before being spread to land.
Comingled / Food Waste	Solid	<75,000 tonnes	Covered IVC Building	Flammable	Yes	High	H	Food waste requires biological treatment before being spread to land.
Wood Waste	Solid	<1,000 tonnes at any one time	Concrete Pad	Flammable	No	Low	L	Wood waste shredded prior to onward use.
Soil / concrete waste	Solid	<1,000 tonnes at any one time	Concrete Pad	Inflammable	No	Low	L	Waste screened and blended prior to create bespoke out of specification topsoil.

Material	Physical property	Quantity	Storage	Flammability	Corrosive	Ecotoxicity	Environmental Hazard Rating	Notes
Process								
Compost	Solid	75,000 tonnes	Covered Pad	Flammable	No	Low	L	Treated green & food waste manifest low ecotoxicity.
Firefighting Agents and Cooling Water Spillages								
Firefighting and cooling water contaminated by inventory	Liquid	>25m^3	N/A	Not Flammable	No	Low	L	Low ecotoxicity and minimal quantities.
Sources overall hazard rating							H	

5.4 Pathway Risk Assessment

Table 5 presents the outcomes of the pathway related risk assessment, the site layout and drainage, the geology and hydrology, mitigation present, climatic conditions, flammable material storage and overall location.

Table 5 - Pathway risk assessment for the site.

Pathway – The Route from Primary Containment to Receptor	Environmental Hazard Rating	Notes
Site Layout and Drainage		
If any of the site Inventory has a runoff time of a few minutes…	M	Run off time anticipated to take several hours to reach nearby human receptors (c.130m to the north) considering the topography and geology present.
If any of the site inventory has a runoff time of a few days…	M	Runoff time anticipated to take several minutes to reach the sensitive ecological receptor (Hale Rushes Watercourse) c.30m to the east, considering the topography, geology, and hydrology present at the location of the site.
Topography, Geology and Hydrology		
Site is at c.6.4m elevation, the closest human receptor is at c.5.4m elevation, and the closest ecological receptor (Hale Rushes Watercourse) is at c.5.5m.	M	Receptors include residential dwelling, water sources and the underlying geology.
Bedrock – Sherwood Sandstone Group – Sandstone and subordinate red mudstone & siltstone.	H	Present under the majority of the site.
Superficial – Tidal Flat Deposits (Clay & Silt) / Peat / Till Devenisian (Diamicton).	M	Mixture of 3No.of superficial deposits under the site.
Highly Productivity Aquifer – Sherwood Sandstone Group	H	Site is located above a highly productive aquifer. The principle sandstone aquifer is up to 600m thick and yields up to 125 L/s.
Groundwater Vulnerability	M	Mixture of medium and low groundwater vulnerability across the site.

Pathway – The Route from Primary Containment to Receptor	Environmental Hazard Rating	Notes
Ground Water Source Protection	M	Site is located in a Zone III (Total Catchment) Source Protection Zone.
Mitigation		
Secondary containment system is present around all liquid storage tanks.	L	A gravity drainage system, underground dirty water storage tanks and areas of sectional concrete wall.
Climatic Conditions		
Annual Rainfall – 1058mm	M	Annual average rainfall approximately 81mm per month and total of 1,058mm for the site and surrounding area. The site has been classified under Flood Zone 1, which determines low probability of flooding at the site.
Snow Accumulation	M	Local climate is temperate, with an average temperature of 9°.
Fire Fighting Water		
Inflammable materials normally present on site in large quantities	M	The waste and product materials present on the site are flammable. Therefore, quantities of firefighting water appropriate to the tonnage on site, are present as precautionary measure.
Location		
Marginal changes to elevation across the site.	L	The site's elevation is c.6.4m at the centre, with a 2m downward sloping gradient from west to east.
Pathway overall hazard rating	H	

5.5 Receptors Risk Assessment

Table 6 presents the outcome of the receptors related risk assessment, this is broken down into the following subsection: watercourse and bodies, habitation and other environmental designations. The overall rating from this assessment is incorporated at the base of the table and is factored into the final classification summary.

Table 6 - Receptor risk assessment for the site.

Receptors	Within	Environmental Hazard Rating	Notes
Watercourse and bodies			
Rivers above potable water supplier	100m	L	Not present within 100m of the site.
Aquifers used for public supply	150m	H	Site is located above a highly productive aquifer.
High quality waters	1000m	H	Hale Rushes Watercourse present withing c30m of the site.
Agricultural abstraction point	50m	L	Not present within 50m of the site.
High value ecosystems	1000m	L	Not present within 1000m of the site.
Recreation waters	50m	L	Not present within 50m of the site.

Receptors	Within	Environmental Hazard Rating	Notes
Small treatment works	50m	L	Not present within 50m of the site.
Habitation			
Dwelling	250m	M	Present within 130m of the site.
Workplace	250m	L	Not present within 250m of the site.
Other			
SSSI SPA SAC	1000m	L	Not present within 1000m of the site
RAMSAR Site	1000m	L	Not present within 1000m of the site.
Receptors overall hazard rating		M	

5.6 Site Risk and Classification

Based upon a site-based risk assessment the overall site hazard rating is classified as medium-high. This determines that the site requires a Class 2 containment system based upon CIRIA C736 requirements. The overview of the rating is presented in Table 7.

Table 7 - Overall site risk and classification for the site.

Source Risk Rating	Pathway Risk Rating	Receptor Risk Rating	Indicated Class of Secondary Containment Required
High	High	Medium	Class 2

5.7 IVC Waste Reception Area and Sanitisation Area

Concrete Pad

The IVC building is separated into a waste reception area and 4No. of IVC tunnels. To ensure adequate impermeability in line with the release of leachate from the sanitisation process, a concrete pad is to be installed throughout the building with similar thickness (c.150mm) and foundation material (recycled aggregates) as the existing OWC concrete pad. The joints of the pad will feature a suitable water-tight compound for the sealant.

Leachate Drainage

All leachate drainage channels for the waste reception in the IVC building will be cut into the concrete pad and will be lined with reinforced plastic with grating to ensure avoidance of cracking from vehicle movement. Grated channels in the waste reception area will direct leachate from south to north & east to west. The concrete pad also features falls ensuring leachate flows into the designated ‘dirty area’ channel and does not enter the APBR designated ‘clean area’ corridor that is situated in front of the tunnels. Leachate exits the building at the northwest corner of the IVC building into an enclosed external drainage channel to maintain ABPR and odour control. This external channel directs leachate to the leachate storage tank, which is located adjacent to the biofilter. The tank will be constructed of concrete and feature a corrugated steel cladding. Collected leachate is to be re-used when moistening of waste material is necessary.

Within the IVC tunnels a series of drainage channels run along the floor, these were previously mentioned as the reinforced plastic aeration frames. Leachate will flow from west to east up to the point of the tunnel entrance. A singular enclosed drainage channel runs along the front

of the tunnel entrance points. This leachate drainage channel runs south to north and then east to west along the northern edge of the northernmost IVC tunnel before exiting the building in a sealed drain and turning north again, directing leachate into the enclosed external drainage channel on the northwestern edge of the building. Leachate will then flow to the leachate storage tank.

The ABPR dirty area (waste reception) and ABPR clean areas (IVC tunnels & corridor) have dedicated drainage channels within the IVC building. This enables separation of processed and unprocessed materials preventing leachate related cross contamination between the area. A formalised clean down procedure of the clean area corridor will also take place each time un-sanitised material has been deposited in the tunnels (e.g., pressure washing of the concrete pad and shovel loaders). The implementation of these measures ensures RRS are adhering to ABPR regulatory requirements.

Concrete Walls, Roller Shutter Doors & Metal Doors

The IVC building is to be constructed of sectional concrete blocks, that will be sealed with a suitable water-tight compound for the sealant. The entrance point to the waste reception area of the building which is located at the northern point on the eastern side, will feature 2No. roller shutter doors big enough for Refuse Collection Vehicles (RCV's) to enter. South of those will be a double roller shutter specifically for a mobile shredder to access the building. Finally at the southern portion of the eastern edge, another roller shutter door will be in place where the IVC tunnels are located, the primary function will be for non-collection vehicles (e.g., shovel loaders) taking sanitised material out to the OWC area. All roller shutter doors will be manually operated. To ensure the tunnels are enclosed, the doors for the tunnels will be removable steel doors that can be hooked off by a tele handler. To ensure secure placement there will be grooves either side of the door frames. The combination of concrete walls and door systems will act to provide a suitable level of impermeability to prevent a potential flow of liquid exiting the building in a manner that would bypass the drainage system.

Rainwater Collection

the IVC building will feature a double pitched roof rainwater will flow to either a central or perimeter roof gully. These gullies are connected to series of drainpipes that are located around the perimeter of the building. The drainpipes will be connected to a drainage channel that directs the liquid to a plastic self-bunded rainwater collection tank adjacent to the biofilter. This tank is in place for recirculation purposes to moisten the biofilter when necessary, as captured leachate cannot be used due to the potential to inhibit the abatement

performance of the biofilter system. It will also be used to re-moisten material proceeding the batch formation phase, to avoid reinoculation that occur through the use of captured leachate.

Leachate Storage Tank

A concrete and corrugated steel-clad overground leachate storage tank is to be installed north of the biofilter in the northwestern corner of the IVC building. This will be constructed in line with CIRIA 736 containment standards to ensure sufficient watertightness and will have layer of secondary containment constructed around the tank (e.g. concrete sectional wall). The purpose is to provide storage for un-sanitised food or commingled waste derived leachate and, is to primarily remain segregated from the OWC system. However, an overfill system will be in place meaning it can be used alongside the other OWC leachate tanks in the event of a fire and the requirement to store firewater for the site.

5.8 OWC Process Area

Concrete Pad

In order to process IVC sanitised waste in windrows, in addition to the existing green waste composting, RRS will be extending the current OWC concrete pad. A new portion of concrete pad will be installed in place of the current product storage area, located on the southern edge of the site. It will extend all along the southern boundary of the site from the west to east. The pad will be composed of approximately 150mm thick concrete & recycled aggregates. The joints of the pad extension will feature a suitable water-tight compound for the sealant.

Leachate Drainage

The leachate drainage system will mirror the existing measures. The concrete will feature a fall from north to south that will direct leachate via gravitational flow to the existing central collection sump. Underground pumps will direct leachate to the overground OWC primary and secondary leachate & rainwater storage tanks.

Rainwater Collection

Rainwater that falls on the extended OWC area will be captured by the central drainage system and will be combined with the OWC derived leachate.

Leachate & Rainwater Storage Tank

A secondary overground leachate & rainwater storage tank has been installed next to the current 124m^3 primary leachate storage tank. The tank is constructed of concrete and clad with corrugated steel and has a capacity of 522m^3. It has been built in accordance with CIRIA

736 containment standards to ensure sufficient watertightness and a layer of secondary containment will also be constructed around tank (e.g., sectional concrete wall). The tank features an in-feed system that will enable liquid to flow from the existing primary storage tank once it has reached a high-level point. This captured leachate is to be used at the reception area to increase the moisture content of the feedstock material as necessary.

Kerbing

Where existing walls are not currently present a concrete kerbed system will be installed around the entire OWC processing area perimeter. With a kerbed system in place this will provide a sufficient barrier against leachate run off considering the increased throughput and, ensure directional flow to the central drainage points.

6.0 MAINTANENCE AND INSPECTION REGIME

RRS shall proactively maintain the work environment and site infrastructure in accordance with the sites Environmental permit conditions. Table 8 below provides an overview of all areas covered within the scope of this maintenance and inspection regime.

Table 8 - Maintenance and Inspection Regime

Infrastructure	Inspection Type	Inspection Procedure	Frequency of Inspection	Maintenance Procedure
Concrete Pad(s)	Detailed visual inspection of the concrete pad	Inspection of condition	Inspection occurs daily, with reoccurring checks throughout the working day and at the end of each day.	Maintenance required if the concrete pad has sustained damage i.e., repair cracking or joints with appropriate sealant
Drains and drainage channels	Check drains and drainage channels for blockages	Inspection of condition	Inspection occurs daily, with reoccurring checks throughout the working day and at the end of each day.	Remove blockages when discovered and report them to Site Manager
Bund Walls	Detailed visual inspection of bund walls	Inspection of condition	Inspection occurs daily, with reoccurring checks throughout the working day and at the end of each day.	Maintenance required if the bund walls are damaged and not to the appropriate height. Issues reported to Site Manager
Liquid Storage Tanks	Detailed Visual inspection of liquid storage tanks	Inspection of condition	Inspection occurs daily, with reoccurring checks throughout the working day and at the end of each day. Annual internal checks	Maintained required if liquid storage tanks are visually damaged. Issues are reported to Site Manager. Annual internal checks are logged and

Infrastructure	Inspection Type	Inspection Procedure	Frequency of Inspection	Maintenance Procedure
			occur on a per annum basis to check full health of tanks.	supervised by Site Manager and carried out by a contractor.
Roller doors & steel hinged doors	Detailed Visual inspection and operational check	Inspection of correct function and condition	Operational assessment occurs weekly, with visual inspections occurring daily on site.	Maintenance required if doors do not function properly and effectively. Issues are escalated to Site Manager.

7.0 RECOMMENDATIONS AND CONCLUSIONS FOR THE PERMIT VARIATION

The site appears overall to be well operated, and the proposed developments are being designed in accordance with relevant engineering principles.

7.1 Primary Containment

Both concrete pads for the OWC area and IVC area appear to have suitable designs with appropriate measures in place to ensure a robust standard of construction. The potential risk of failure of the primary containment is negligible. In terms of adhering to the outstanding CQAI recommendations these will be complete by 2024 Q4.

7.2 Secondary Containment

Through the proposed development secondary containment will be provided by 3No. liquid/leachate runoff collection tanks and concrete sectional walls, kerbing and roller shutter & metal hinged doors. Considering the capacity of the 3No. of leachate tanks on site the volume of the secondary containment is deemed sufficient. However formalised calculation to determine the volume of firewater that would be generated on site in the event of a fire should be produced.

7.3 Procedural

The inspection and maintenance regime should be incorporated into the standard operating procedures, with a formalised recording process in place. This will provide an evidence-based catalogue, that can be incorporated into and any future containment assessment for the site.