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Application to Vary Environmental Permit EPR/BO2226IU – Greencore Prepared Meals Limited, Warrington

Project number:	2324121
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Disclaimer

Non-Technical Summary

The Greencore Prepared Meals Limited facility, located in Warrington (hereafter 'Site'), has identified an opportunity to improve the environmental quality and control of its process effluent discharged to sewer. A variation to the permit is therefore being applied for to include the installation of a new Effluent Treatment Plant (ETP).

The ETP installation will include a new solids removal screen, Dissolved Air Flotation (DAF) system, chemical dosing tanks, a balance tank, and sludge tanks; as well as utilising the existing below ground pits. These installations will meet company standards for environmental, asset protection and operational efficiency in line with Best Available Techniques (BAT).

Other than sludge and increased screened solids, there will be no other new waste steams created by the installation of the new plant. The Site will continue to operate at all times throughout the iterative process of installation and commissioning of the effluent process equipment. The change to operations will not result in any increase in production on Site.

1 What activities are you applying to vary?

Table 1a Types of Activities

Schedule 1 listed activities						
Installation Name	**Schedule 1 References**	**Description of the activity**	**Activity daily capacity**	**Annex IIA or IIB (disposal and recovery) codes**	**Hazardous waste treatment capacity**	**Non-hazardous waste treatment capacity**
Greencore Prepared Meals Limited, Warrington	Section 6.8 Part A(1)d(iii)(aa)	6.8 Treatment and processing of animal and vegetable raw material.	>75 tonnes/day	N/A	N/A	N/A
	Section 5.4 (A)1 (a) (ii)	5.4 Disposal of non-hazardous waste in a facility with a capacity of more than 50 tonnes per day by physico-chemical treatment; screening and settlement of solids from the liquid effluent prior to discharge to sewer and solid waste removal.	>50 tonnes/day	D9	N/A	N/A

Directly associated activities (See note 4)		
Name of DAA	Description of the DAA	
AR3	Steam Supply	
AR4	Surface water collection and discharge to public sewer	
AR5	Surface water collection and discharge to watercourse	
AR6	Waste storage and handling	
AR7	Refrigeration and chilling	
AR8	Storage and use of chemicals for cleaning and effluent treatment	
AR9	Raw materials storage and handling	
For installations that take waste	**Total storage capacity**	N/A
	Annual throughput (tonnes each year)	N/A

1b About the Proposed Changes

The Greencore Prepared Meals Limited facility, located in Warrington (hereafter 'Site'), has identified an opportunity to improve the environmental quality and control of its process effluent discharged to sewer. A variation to the permit is therefore being applied for to include the installation of a new Effluent Treatment Plant (ETP).

The ETP installation will include a new solids removal screen, a Dissolved Air Flotation (DAF) system, chemical dosing tanks, a balance tank, and sludge tanks; as well as utilising the existing below ground pits. This installation will meet company standards for environmental control, asset protection and operational efficiency in line with Best Available Techniques (BAT). Other than sludge and increased screened solids, there will be no other new waste steams created by the installation of the new plant. The Site will continue to operate at all times throughout the iterative process of installation and commissioning of the effluent process equipment.

This new ETP will reside fully within the currently permitted boundary, as outlined in Appendix 1 – Site Map. Detailed information on the effluent plant layout and functioning are shown in Appendix 2 – ETP Layout and Appendix 3 – ETP P&ID

The new plant allows for the treatment of all process wastewater generated by the facility. The design of the new plant has been undertaken by specialist contractors to be capable of treating and discharging a flow of up to 1500m^3/day within the consented limits outlined in the United Utilities (UU) discharge consent, provided in Appendix 4.

In order to maintain production throughout the installation, limit the disruption, and ensure compliance with the Site's consent conditions, the design and commissioning will be phased. All design, installation and commissioning works will be undertaken by a competent experienced specialist third party who will also provide operator training in addition to on-going maintenance support to the Site. Furthermore, there will be a dedicated internal resource employed for the day-to-day management, maintenance, monitoring, inspection, and operation of the ETP.

Other than forklifts in designated areas for the movement of IBCs, no vehicles will be permitted within the ETP area. There is a roadway adjacent to the ETP edge, an Armco barrier will be in place to prevent vehicle strike. The new balance tank and sludge tanks will be placed on new concrete plinths to further protect the tanks from vehicle strike. In the unlikely event of a spill, overtop or other loss of containment within the area, hardstanding in the area will be high integrity with all drainage in the area leading back to the ETP inlet sump.

Appendix 7 presents the containment Risk Assessment based on the proposed plant design and containment systems.

Effluent Treatment Plant Process Description

Influent to the ETP will be composed primarily of waste cleaning waters associated with hygiene (Clean In Place - CIP) operations, as well as drainage from external drains in the vicinity of the new ETP. Influent will be received in an existing concrete inlet sump (TF9). Two progressive cavity pumps adjacent and above ground on a duty / standby setup will pull wastewater from TF9 to a high-level screen. These pumps are controlled by level sensors within TF9 and are invertor controlled. This wastewater will pass through the rotating screen and solids above 2mm will be screen out.

Solids will pass down a chute into containers at the base which will be removed regularly by the Site team throughout the day and night. These screenings will be removed to an existing on-Site waste container which is covered. The screenings will be disposed of through the Sites approved waste contractor for anaerobic digestion.

Partially treated (screened) effluent will be pumped directly to a 352 m^3 capacity glass-fused-to-steel (GFS) vertical cylindrical balance tank, designed and constructed to BS EN ISO 28765:2016. The balance tank will be fitted with a glass-fibre (GRP) roof with a small vent to prevent pressure build up.

The balance tank will be double skinned / self-bunded to a volume equal to 110% of the tank capacity, the bund design and construction will align to CIRIA C736.

Once the level in the balance tank reaches a pre-set start level, two pumps (duty / standby) will transfer partially treated effluent to the serpentine flocculator before entering the DAF under invertor control. Both pumps will be fitted with pressure and temperature protection. Within the serpentine, pH is measured and adjusted with caustic and acid; coagulant and flocculant dosing will also be conducted. The acid, caustic and coagulant will be stored in 3.5m^3 tanks, these will be constructed of polypropylene and will be lidded with a small vent to prevent pressure build up. The tanks will be double skinned / self-bunded to a volume equal to 110% of the tank capacity, the bund design and construction will align to CIRIA C736. The flocculant will be housed in an IBC that will sit on an appropriately sized drip tray bund.

Once in the DAF, micro bubbles adhere to the flocs which then float to the surface as a sludge layer which is removed at the end of the DAF by travelling scrapers. Sludge removed by the DAF plant will be temporarily collected in a 2m^3 tank prior to being pumped to the two sludge tanks. The DAF unit will be lidded with a small vent.

The two 30m^3 sludge tanks will be constructed of polypropylene and will be lidded with a small vent to prevent pressure build up. The sludge tanks will be double skinned / self-bunded to a volume equal to 110% of the tank capacity, the bund design and construction will align to CIRIA C736. Pumped sludge will fill the tanks under balance to ensure even distribution of sludge. Compressed air will be injected into a base ring plate to prevent settlement on the base. Sludge will be removed by contracted tanker and disposed of away from Site by an approved waste contractor.

Treated effluent from the DAF will be gravity fed to an existing an existing concrete sump (TF10). Final effluent will be discharged from the existing discharge point (S1), via a composite sampler and MCERTS flow metre, for further treatment at UU's Warrington North wastewater treatment works.

The full plant will be operated by an integrated PLC controlled software system. Various high-level alarms within tanks and bunds and other sensors will automatically trigger alerts to on-Site engineering resources. Much of the plant can be shut down remotely. The ETP is designed to treat any foreseeable spill from production to within consented limits. However, in the unlikely event of a major unforeseen swing in effluent character, the ETP is able to contain enough wastewater (within TF9, TF10, the balance tank and drainage) to enable tankering contractors onto Site. A further approximately 150m^3 of buffer capacity is provided by a sacrificial curbed lorry loading area directly north of the ETP should the capacity of TF9 be exceeded. In the event of inability to discharge within consent, the Site would pause operations.

2 Emissions to Air, Water and Land

There are no changes to emission points to water or land as a result of this variation. Small vents will be fitted to the top of the balance tank, sludge tanks and chemical dosing tanks to enable air displacement. Emissions from these vents are not anticipated to damage local air quality as emission will compose of air. It is suggested that EPR/BO2226IU Table S3.1 is extended to show the following:

Table 2 – Emissions (releases)

Emission point ref	Source	Location	Parameter	Limit	Reference period	Monitoring frequency	Monitoring standard
A76	Air vent	Balance tank	N/A	N/A	N/A	N/A	N/A
A77 & 78	Air Vent	Sludge tanks	N/A	N/A	N/A	N/A	N/A
A79	Air vent	ETP chemical dosing tanks	N/A	N/A	N/A	N/A	N/A

3 Operating Techniques

3a Technical Standards

There is no proposed change to emissions points to surface water and sewer. This new ETP installation does present material changes to the way in which Site compliance with BAT 11 (Emissions to water - waste water buffer) and BAT 12 (Emissions to water – treatment) are assessed within the 2019 Food and Drink Sector BREF Regulation 61 submission. Appendix 5 summarises the change to responses that are relevant since the Regulation 61 submission.

A significant change that has occurred is related to the increased on-Site inventory of effluent treatment chemicals, as well as the risk posed from local losses of in treatment effluent. The Site will have effective controls to prevent losses to the environment, these are outlined in Section 3c and Section 8.

As part of its R61 submission a detailed surface water screening assessment was presented as required by the Water Framework Directive. This installation will improve the quality of discharged effluent and will not add either EA designated freshwater pollutants or any substances that are not readily removed during the wastewater treatment process. Therefore, this variation does not alter the conclusions of that assessment.

3a1 Superseded Documents

Operating Techniques in the current permit refers to responses provided in the original application document and subsequent variations. With the exception of the information presented within Section 1 above, the these are not superseded by this application.

3b General Requirements

Table 3b General Requirements

Are fugitive emissions an important issue?	No
Is odour an important issue?	Yes (Appendix 6)
Is noise and vibration an important issue?	No

3c Types and Amounts of Raw Materials

Relevant hazardous substances' are those substances or mixtures defined within Article 3 of Regulation (EC) No 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) which, as a result of their hazardousness, mobility, persistence and biodegradability (as well as other characteristics), are capable of contaminating soil or groundwater and are used, produced and/or released by the installation.

Table 3c lists the effluent storage and treatment chemical consumables used by the new effluent treatment process and assesses the risk as relevant hazardous substances. There are no other changes to type of amounts of raw materials as a result of this variation.

Table 3c Raw Materials Inventory

Material	Description	Maximum storage (m^3)	Throughput (m^3)	Environmental hazard	Relevant Hazardous Substance	Pathway from primary container loss to the environment	Containment measures	Actual Pollution Risk?
Screened Effluent (Balance tank)	Screened wastewater.	352	< 1500/day	Raw effluent releases to groundwater or freshwater ecosystems may cause environmental damage.	Yes	• Discharge from surface water drainage system • Vertical migration to ground and groundwater. • Overland flow from site boundary.	• Modern, high integrity lidded tanks. • Self-bunded to 110% capacity. • Tank and bund high level alarm systems. • Spill and delivery procedures. • Remote shutdown capabilities. • Vehicle strike protection by Armco. • Situated in area of robust hardstanding. • All adjacent drainage leads to inlet sump. • Routine inspection and planned preventative maintenance (PPM).	No
Skimmed sludge	Skimmed sludge from the DAF plant.	Two times 30	TBD	Sludge releases to groundwater or freshwater ecosystems may cause environmental damage.	Yes			No
Sodium Hydroxide 32%	Sodium hydroxide for effluent pH dosing.	3.5	TBD	Chemical not classed as environmentally hazardous. Large and/or frequent chemical spills or releases may cause environmental damage.	Yes			No
Sulphuric Acid 50 - 72%	Sulphuric acid for effluent pH dosing.	3.5	TBD	Chemical not classed as environmentally hazardous. Large and/or frequent chemical spills or releases may cause environmental damage.	Yes			No
Coagulant	Polyaluminium Chloride (PAC) used as a coagulant.	3.5	TBD	Low ecotoxicity.	No			No
Flocculant	Polymer used as a flocculant for effluent treatment.	1	TBD	Low Ecotoxicity.	No		• IBC housed on an appropriately sized drip tray bund. • Spill and delivery procedures. • Vehicle strike protection by Armco. • Situated in area of robust hardstanding. • All adjacent drainage leads to inlet sump. • Routine inspection and planned preventative maintenance (PPM).	No

3d Management Systems

The Site is part of Greencore Group PLC which seeks to align all its operations with the corporate commitments, policies, standards, and strategies issued by the Group. This includes effective governance at all production Sites to support regulatory compliance. In this regard, there will no change to the EMS.

The installation of the ETP will alter the scope of Site-specific environmental aspects and impacts, procedural controls, maintenance programmes, training material, and emergency responses. The Site will be risk assessing the new environmental aspects and impacts associated with the ETP. Following this will be an update to relevant local EMS documentation to effectively manage risk and adhere to the relevant standards required through environmental permitting.

4 Monitoring

4a Describe the measures you use for monitoring emissions

The operator will continue with the existing monitoring schedule as set out in the existing permit and Regulation 61 submission and does not propose any further monitoring.

4b Point source emissions to air only

As above.

5 Environmental Impact Assessment

5a Have your proposals been the subject of an EIA under Council Directive 85/337/EEC?

No

6 Resource Efficiency and Climate Change

6a Describe the basic measures for improving how energy efficient your activities are?

No change to the basic measures, as set out in the existing permit and Regulation 61 submission, are planned as a result of proposed changes.

6b Provide a breakdown of any changes to the energy your activities use and create

Electricity usage is expected to increase as a result of the proposed changes; however, the change is expected to be relatively small compared to existing utilities usage on Site. A dedicated electricity board will be in place for the new installation. Specific electricity use from the ETP will therefore be tracked and recorded. Following commissioning, the Site will seek to optimise the running of the installation to maximise efficiency in all areas, including electricity usage. The use of maintenance and inspection by internal and external resources to ensure the efficient operation of the plant will be a fundamental control to minimise excess energy usage. Furthermore, through the EMS driven continuous improvement philosophy, the Site will continuously consider opportunities for renewable energy generation opportunities.

No significant change to combustible fuels or water usage is anticipated from commissioning the ETP.

6c Have you entered into, or will you enter into, a climate change levy agreement?

No change as a result of proposed changes.

6d Tell us about, and justify your reasons for, the raw and other materials, other substances and water you will use

No change as a result of proposed changes.

6e Describe how you avoid producing waste in line with Council Directive 2008/98/EC on waste

No change as a result of proposed changes.

7 Installations that include a combustion plant (excluding waste incinerators)

No change as a result of proposed changes.

8 Environmental Risk Assessment

This variation will not alter the profile of the emissions to the environment, with the exception of the potential introduction of new odour sources as discussed below. The installation and operation of the new ETP will reduce the impact to the receiving environment. The new plant is not being installed to service an increase in production levels, but rather to give the Site more reliability and efficiency in the operation in the treatment of effluent prior to discharge. This variation does not include any other changes to the processes on Site.

The new plant will be installed in line with BAT requirements including primary, secondary, and tertiary containment design in line with CIRIA C736, high level indicators, and extension of existing procedures including delivery, PPM, and regular visual inspection. The installation of the ETP will alter scope of Site-specific environmental aspects and impacts, procedural controls, maintenance programmes, training material, and emergency responses. The Site will be risk assessing the new environmental aspects and impacts associated with the ETP. Following this will be an update to relevant EMS documentation to effectively manage risk and adhere to the relevant standards required through environmental permitting.

This assessment and update will cover the existing emergency/accident responses. The update will incorporate the changes to the Site infrastructure and potential emergency scenarios including overfilling, breach of delivery pipework or other loss of containment. Existing emergency plans will continue to apply.

Sensitive Ecological Receptors

The proximity of site to sensitive receptors such as Local Nature Reserves (LNR), Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC) and Special Protected Areas (SPA)'s determines the ecological sensitivity of the site. There are no SACs or SPAs within 2 km of the site, however, a SSSI is located within 2km to the south. Relevant ecological receptors are summarised below:

- 1.2km south - Paddington Meadows LNR.
- 1.2km south - Woolston Eyes SSSI.
- SAC 2.7km northeast – Manchester Mosses SAC and Risely Moss LNR and SSSI.
- 5.4km east - Rixton Clay Pits LNR, SSSI and SAC.

Impact of Emissions to Air

The variation will not present additional impact to air quality. See Section 2, Table 2.

Point Source Emissions to Sewer, Surface Water and Groundwater
Sections 3, Operating Techniques, outlines that there is no change in the risk to sewer, surface water and groundwater as a result of this variation. As summarised in the risk assessment below in Table 8.

Odour
The installation of the DAF, solids screening, effluent balancing, sludge storage and sludge removal activities may introduce new sources of odour. All design, installation and commissioning works will be undertaken by a competent experienced specialist third party who will also provide operator training in addition to on-going maintenance support to the Site. All steps have been taken at the design stage to reduce the potential for odour generation to cause nuisance beyond the Site boundary. The balance tanks and sludge tanks are both fitted with lids, with breather vent pipes to prevent pressurisation. The DAF is also covered. Screened solids will be collected in small bins and regularly removed to the existing covered food waste trailer.

The Site operates in accordance with an odour management plan (OMP) that is aligned to the EA's H4 guidance. The OMP has been updated to ensure its scope accounts for new the personnel responsibilities, sources of odour, control measures and the monitoring inspections that will be in place following commissioning of the plant. The updated OMP is included in Appendix 6. These changes are summarised as:

Source	Control Measure(s)	Monitoring
DAF Operation **Balance tank vent** **Sludge tank vents**	• Design stage controls including lidding/covering of all the main effluent treatment assets. • Routine inspection and planned preventative maintenance (PPM).	• Daily walkover monitoring of ETP odour. • Should odour nuisance be identified, engaging retained odour specialist to undertake third party monitoring.
Sludge offloading	• Relevant sludge offloading working practices and procedures. • The use of competent licenced contractors utilising tankers with odour control.	
Screened solids storage (*mixed into existing food waste stream*)	• Existing controls on waste container lidding and regular removal by licenced contractors.	

Following commissioning, the operators will follow routine monitoring protocols to assess whether odour nuisance may be caused beyond the Site boundary. Should odour be identified as causing environmental harm, corrective and preventative actions will be raised and managed through the internal SHEMS action tracking tool. Potential corrective actions could include, but are not limited to:

- Engaging third party odour monitoring specialists.
- Changes to operational practices.
- Infrastructural changes, such as consideration of abatement techniques.

With the aforementioned measures implemented, odour is not anticipated to cause significant nuisance beyond the Site boundary.

Noise
The variation is not anticipated to result in significant change to the noise profile of the Site and will not present additional noise nuisance risk.

The emphasis in the management of noise from the Site is on prevention during 'normal' day to day operations, and as such preventative maintenance, management, monitoring, and inspection of all routine potential sources of noise. No additional measures are considered necessary at this time.

Conclusion

The impact of the variation to the installation has been summarised in above and assessed in the overleaf Table 8 - Environmental Risk Assessment. The installation will continue to be managed sufficiently to present a low ongoing risk to the environment.

Table 8 – Environmental Risk Assessment

Hazard	Receptor	Pathway	Risk Management Technique	Probability of Exposure	Consequence (Severity)	Overall Residual Risk
Fugitive Emissions to surface water, sewer, and groundwater – loss of containment, leaks, and spills	Controlled Waters, Groundwater, UU Treatment Works	Drainage system; overground.	Modern, high integrity lidded tanks. Tank secondary containment through 110% capacity bunds. Tank and bund high level alarm systems. Remote shutdown capabilities. Vehicle strike protection by Armco. Situated in area of robust hardstanding. All adjacent drainage leads to inlet sump. Routine inspection and planned preventative maintenance (PPM). Delivery procedures. Spill procedures and training.	Low	High – major loss to groundwater or freshwater ecosystems may cause environmental damage.	Low – sufficient primary, secondary and tertiary containment, infrastructural controls, and operational controls to prevent loss to the environment.
Odour – operation of the ETP	Local human receptors	Airborne	Adherence to updated odour management plan. Design stage controls including lidding/covering of all the main effluent treatment assets. Routine inspection and PPM. Relevant sludge offloading working practices and procedures. The use of competent licenced contractors utilising tankers with odour control. Existing controls on waste container lidding and regular removal by licenced contractors. Daily walkover monitoring of ETP odour.	High	Medium	Low – With measures implemented, odour is not anticipated to cause significant nuisance beyond the Site boundary.
Emissions to air – routine operation of combustion plant	Local human/ecological receptors	Air dispersion	Selection, operation, and maintenance of combustion units in line with BAT for the sector.	High	Low	Low – no change to emissions profile. No additional measures are considered necessary at this time.
Noise – routine manufacturing operations	Local human/ecological receptors	Airborne	Adherence to existing noise management plan. PPM, management, monitoring, and inspection of all routine potential sources of noise.	High	Low	Low – limited change to noise profile of operations. No additional measures are considered necessary at this time.
Emissions to sewer from discharge point	UU Treatment Works	Sewerage drainage system	ETP designed to treat all foreseeable influent, including from raw material tank or CIP tank loss. ETP is able to contain wastewater within sumps and tanks to give time for tankering contractors onto Site. Further buffer capacity provided by sacrificial loading area. In the event of inability to discharge within consent, the Site would pause operations.	High	Low	Low – Site will continue to operate within existing consent levels.

Fossil fuel emissions – ETP electricity usage	Downstream air quality, climate change	Airborne from power plant	Small compared to existing utilities usage. ETP electricity use monitoring and recording. Post commissioning optimisation projects. EMS driven continuous improvement philosophy in efficiency and low carbon energy opportunities.	High	Low	Low
Fugitive Emissions to Air – dust, litter etc.	Local human/ecological receptors	Air dispersion	Housekeeping Standards	Low	Low	Negligible
Fugitive emissions to air – process	Local human/ecological receptors	Air dispersion	Specification and selection of equipment. PPM, monitoring, and inspection of all routine potential sources of emissions	Low	Low	Negligible
ETP natural gas usage.	Downstream air quality, climate change	Airborne from power plant	Negligible usage	Low	Low	Negligible
ETP towns water usage	Downstream impacts	Downstream	Negligible usage	Low	Low	Negligible

Appendix 1 – Site Map

Appendix 2 – Effluent Treatment Plant Layout

Appendix 3 - Effluent Treatment Plant P&ID

Appendix 4 UU Discharge Consent

Appendix 5 - R61 response tool – Warrington

Appendix 6 – Odour Management Plan

Appendix 8 - Waste Treatment BAT GC Warrington

Appendix 7 - Containment Design Risk Assessment

Scope

The following environmental risk assessment has been prepared with due regard to the guidelines set out in CIRIA report C736. The risk assessment appraises the source-pathway-receptor linkage to determine potential environmental hazards and pollutant linkages. The assessment methodology differs from the normal procedure of C736 as the appraisal is being performed as a design review rather than informing the design itself. This assessment intends to provide independent appraisal of the design to ensure that pollution prevention measures are appropriate.

Overview of Design Proposal

Purpose

The proposed treatment system comprises a new solids removal screen, Dissolved Air Flotation (DAF) system, chemical dosing tanks, a balance tank, and sludge tanks; as well as utilising the existing below ground pits. These installations will meet company standards for environmental, asset protection and operational efficiency in line with Best Available Techniques (BAT).

Containment Design Overview

Containment and the prevention of pollution is inherent within the new plant design, operation, and maintenance. Within the existing sumps and above ground balance tank, treatment liquors represent a chemically treated high COD effluent that could result in environmental harm in an event of uncontrolled release. Furthermore, the ETP will also contain sludge and dosing chemicals that also pose environmental risk. The following section provides and overview of the design principles and pollution prevention considerations.

The plant design includes the use of existing sumps and some existing drainage. EHS notes that the operator has performed engineer inspections on assets that will be re-used and re-purposed. The inspections have confirmed that they are considered fit for purpose and meet the design and pollution prevent requirements for the new installation.

For the remainder of the ETP, all tanks, vessels, pipework, and joints have been designed to meet the operational requirements of the process and will be installed and operated as per the manufacture's specification to operate within designed pressures and flows. The plant and equipment will be subject to normal manufacturer's testing and warranty prior to installation. As such, it is not considered that vessels would be at risk from catastrophic failure under normal operating conditions. Abnormal events such as vehicle strike that could cause catastrophic tank failure have been minimised due to the design of the plant to minimise vehicle interactions. This is supported by an engineered Armco barrier between the ETP and adjacent roadway.

All new tanks will be constructed in line with relevant quality standards, be lidded, be integrally bunded, utilise various tank and bund high level alarms and much of the ETP operations can be shut down remotely. In the unlikely event of a spill, overtop or other loss of containment within the area, hardstanding in the area will be high integrity with all drainage in the area leading back to the ETP inlet sump.

The plant will be operational 24hours per day, seven days per week. The plant will be fully supervised during operational hours via on-site trained operatives and remote control and alarm systems. The plant will be secure to ensure safe operation and to prevent unauthorised third party access.

The final discharge from the treatment system will be to public sewer under the existing discharge consent. The current consent requires spot samples to confirm compliance with discharge parameters. The new installation will provide composite sampling taken by an auto sampler. The discharge will be controlled via a flow meter. In the event of variance from normal operating conditions, the instrumentation will alarm. Discharge waters can then be diverted to the head of the treatment system.

The liquid inventory is neither flammable nor combustible. The risk of fire is therefore predominantly limited to electrical fires within the control system. These types of fires would be likely managed through dry powder or carbon dioxide extinguishers and not via a water feed supplied by fire hose or fire service appliances.

Environmental Risk Assessment

Sources

The following sources have been considered within this assessment:

Effluent treatment vessels (sumps, balance and sludge tanks, DAF)	Treatment liquors contained within vessels will comprise food production hygiene wastewater. This wastewater stream will contain high COD, TSS, FOG and be chemically dosed. These liquors are considered to present a **High Risk** to the environment in the event of uncontrolled release. The likelihood of losses is considered **Low** Risk. Potential losses will comprise localised loss to treatment liquor drains during normal monitoring and maintenance processes and potential losses from leaking pipes and pumps or spills. The likelihood of catastrophic tank failure is considered **Low**, unlikely to occur.
Process Chemicals	Process chemicals and additives required for the treatment process will externally store mini bulk storage tanks and IBCs. As well as internally stored CIP bulk tanks and drums. The following process chemicals will be stored at the Site: • Coagulant • Caustic • Acid • Polymer • Other CIP cleaning chemicals These treatment chemicals are considered to present a **Moderate to High Risk** to the environment. However, the likelihood of loss is considered to be **Low** given the secondary containment and other fugitive loss prevention measures outlined in this application.
Surface Water	Surface water will comprise predominantly rainwater but may also include wash down water. Consideration has been given to potential contamination of surface water by the inventory. The surface water is considered to be **Low to Moderate Risk**. The likelihood of uncontrolled release is considered **Low** given the drainage containment arrangements integral to the design
Fire Water	Fire water has been considered within this assessment. The liquid inventory is not considered to be a significant flammable risk and as such it is not considered that an incident of fire would result in significant fire water control measures being required at the Site. Localised electrical and control system fires would be managed via dry powder and carbon dioxide extinguishers. Fire water is therefore considered **Low Risk.**

Pathways

The following pathways have been considered within this assessment:

Site Layout and drainage	All plant to be sited on hardstanding with suitable reinforcement and foundations to prevent settlement, slab failure and cracking. Joints to be sealed with chemically resistant joint sealer where required and pipework intrusions to be appropriately engineered. Through use of sloping and curbing, all drainage in the vicinity of the ETP will lead back to the inlet sump TF9. Adequate buffer storage is provided by the sumps, tanks and sacrificial area to undertake measures prior to overspill to the surface water drainage network. **Low Risk**
Ground Conditions	According the BGS and EA Majic mapping, the Site is underlain by Superficial River Terrance Deposit Sands and gravels; this is considered a Secondary A Aquifer. The underlying bedrock geology comprises of undifferentiated Triassic sandstones, a principal aquifer. The Site is located in a Source Protection Zone. It is considered that surface release to ground could result in infiltration and migration to impact underlying soils and groundwater. **High Risk**
Groundwater Migration	Once into the subsurface, contaminants may migrate under hydraulic influence of groundwater. Groundwater is likely to be in hydraulic continuity with local controlled waters, these may be a be a pathway to the Mersey estuary. **Moderate – High Risk**
Untreated Discharge to Sewer	Discharge of treated effluent to sewer via the existing consent subject to compliance sampling. Discharge will be controlled by detection instrumentation installed in the discharge end that will divert discharge to the head of the system for treatment. Operations and maintenance plan to include servicing and maintenance of this instrumentation to ensure future operation. **Low Risk**

Receptors

The following receptors have been considered within this assessment:

Groundwater	According the BGS and EA Majic mapping, the Site is underlain by Superficial River Terrance Deposit Sands and gravels; this is considered a Secondary A Aquifer. The underlying bedrock geology comprises of undifferentiated Triassic sandstones, a principal aquifer. The Site is located in a Source Protection Zone. It is considered that surface release to ground could result in infiltration and migration to impact underlying soils and groundwater. **High Sensitivity**
Controlled waters	The local controlled waters receiving surface water discharge from Site is the Spittle Brook. This may be a far upstream tributary of the Mersey estuary. **Moderate – High Sensitivity**
UU Wastewater Treatment Works	Discharge of treated effluent to sewer via the existing consent subject to compliance sampling. Discharge will be controlled by detection instrumentation installed in the discharge end that will divert discharge to the head of the system for treatment. Operations and maintenance plan to

	include servicing and maintenance of this instrumentation to ensure future operation. **Low Sensitivity**

Overall Hazard Rating

Based on the above source-pathway-receptor appraisal, EHS consider that the sources present a **Moderate to High Risk** to the environment, with ground-based pathways potentially leading to **High – Moderately Sensitive** receptors.

However, the various infrastructural and procedural controls outlined in this application remonstrate that the likelihood of pollution occurring is very **Low**.

Events Leading to Release

The following section further appraises engineering and procedural controls that could lead to an accidental release of the inventory and how the risks will be mitigated within the design and operation.

Installation and Commissioning Failure

Installation and commissioning failures could result in uncontrolled inventory losses through system failure. This type of failure arises from incorrectly installed plant and equipment or defects within construction. As noted previously this risk shall be managed by the implementation of a robust commissioning and verification plan designed to inspect and test the installation prior to full capacity operation.

Operational Failure

Operational failures will be mitigated through compliance with the manufacturer's and designer specification for operations and compliance with the Operations and Maintenance plans. The plant shall be operated by trained personnel only and automatically monitored through control and safety failsafe devices installed throughout the system. The hazard and operability assessment prepared by the designer has considered operational failure within the design and included design considerations to mitigate risk of failure.

Structural failure

Structural failure might include breach of containment drainage, bunding, loss of integrity of sealants, pipes and joints and failure of concrete slabs. These considerations have been included with the design and design allowances will be made to mitigate risks of structural failure.

As noted previously, the plant, vessels, pipework and joints shall be installed and operated to the manufacturer's designed flow and pressures to ensure future integrity and mitigate the risk of catastrophic failure. Potential for tank and vessel failure is considered low due to manufacturer testing and warranties.

Abuse

Inappropriate use of tanks, vessels and pipework may result in potential uncontrolled loss of the inventory. The management methods have been considered above.

Vehicle Strike

Other than forklifts in designated areas for the movement of IBCs, no vehicles will be permitted within the ETP area. There is a roadway adjacent to the ETP edge, an Armco barrier will be in place to prevent vehicle strike. The new balance tank and sludge tanks will be placed on new concrete plinths to further protect the tanks from vehicle strike.

Vandalism

The plant compound will be managed as secure at all times to prevent unauthorised access. It will attend during normal working hours and out of hours security will be provided by the wider facility.

Fire / Explosion

The liquid inventory is not flammable or combustible and as such the risk of fire or explosion is considered low.

Geological Factors

There are no ground or mine instability risks identified for this Site. The civil design will consider normal soil parameters to ensure the slab and foundation design is appropriate. Plant and equipment shall be assessed during construction and operations phases to ensure that settlement does not fall outside of design parameters.

Ageing or Deterioration of Assets

Plant and equipment being used beyond its design life may result in pollution events. Plant and equipment being re-used or re-purposed for the future installation have been inspected by engineers to confirm that they are appropriate for use and will meet the design needs. During operations, the condition of all plant, vessels, pipework and joints shall be inspected in accordance with the Operations and Maintenance plan for the Site. Items of plant shall be repaired or replaced as required in accordance with manufactures specifications.

Mitigation Measures

A comprehensive set of environmental controls and fugitive release mitigations are outlined in this application, particularly in Sections 1 and 8. A summary of these measures includes:

- Design process – the plant design includes containment and controls to prevent the uncontrolled release of the inventory and surface waters.
- Management and controls – the system includes alarms and controls to manage the treatment process and ensure operation under the design process flows and pressures. The system will be attended during normal working hours and under automated control at all times. As noted previously there is a final sampling and testing step prior to the discharge of treated effluent and surface waters.
- Training and supervision – the plant will be supervised by trained plant engineers during normal working hours. The plant will be fitted with automated alarms and controls to monitoring system processes during normal and out of hours operation.
- Inspection and testing – the discharge of the treated effluent will be performed by automated composite sampling to confirm compliance with the discharge consent limits. The discharge end of the drainage system will be fitted with in-line instrumentation to provide a compliance check of quality.
- Emergency response – the plant will have an emergency response plan and operatives will be trained on the response procedures and implementation.

Conclusion

In summary, the review has found that the design has appropriately considered the hazards associated with the treatment of effluent that contains elevated constituents such as COD, TSS, FOG and dosing chemicals. The process has sufficient design and control to mitigate risks from tanks, vessels, pipework and joints and the drainage containment system is based on segregating waste streams comprising process liquor and surface waters.

The plant design has sufficient operative supervision, security and automated management control. Compliance checks at the discharge end exceed the currently agreed standards providing confidence in the quality of effluent discharged under the terms of the discharge consent. The discharge of surface waters will be appropriately protected by the controls embedded within the ETP pollution control measures.

The containment features are to be technically robust with installation contained within newly constructed bunds providing containment in accordance with CIRIA guidance. Containment design for the process chemicals and effluent tanks within the ETP have integrated secondary containment associated.

A commissioning and verification plan will be developed by the designer and installer to confirm that plant and equipment has been installed as per the design and manufacturers specification. This will ensure that defects are rapidly identified and remedied during commissioning to mitigate risk of future system failure and uncontrolled inventory release.

Future operations will performed in accordance with the Operations and Maintenance Plan. Any revisions to this plan or designed operations would require further environmental review to ensure that they do not present an unacceptable risk to the environment.