City of
Stoke-on-Trent

PUBLIC PROTECTION
PUBLIC HEALTH, PROTECTION AND WELLBEING DIRECTORATE

The Environmental Permitting (England and Wales) Regulations 2016

PERMIT

To operate a 'Schedule 13 SWIP'

DESIGNATED FOR LOCAL AUTHORITY CONTROL AT

Stoke Tyre Pyrolysis Facility
Campbell Road
Oakhill
Stoke-on-Trent
ST4 4EW

PERMIT REF. No. SOT 189

City of Stoke-on-Trent

Murfitts Industries Ltd ("the operator")

Permit number LA-IPPC / SOT 189

Introductory note

This introductory note does not form a part of the permit

Under the Environmental Permitting (England & Wales) Regulations 2016 (schedule 13) the following permit has been issued. It specifies the conditions and schedules that reflect the required compliance standard for environmental emissions based on the application dated 18.09.25, supporting materials ref: CRM 0180 001 PE R 006 Operational Techniques and Monitoring Plan, ref CRM.0180.001.PE.R.004 Environmental Risk Assessment and associated drawings and plans.

Description of process

Process Summary

The facility will process up to 11,388 tonnes per year of end-of-life tyre (ELT) crumb to produce tyre pyrolysis oil (TPO), syngas and recovered carbon black (rCB). The process is enclosed and operated under negative pressure to minimise fugitive emissions.

Receipt of Tyre Crumb

Tyre crumb will be delivered to the installation in reusable 1 tonne bags to a specification that requires crumb to be ~10 mm tyre crumb and free from steel and fibre.

Crumb will normally be supplied from Murfitts Industries' adjacent ELT processing facility, with alternative permitted Murfitts supplier facilities used as required.

A curtain-sided vehicle can deliver up to 24 tonnes to maintain continuity of operations when the material from the adjacent facility is not available.

The crumb is transferred from the bags into enclosed conveyors and a <1 m³ day bin, before being fed continuously into the pyrolysis plant.

Pyrolysis Process

The crumb is heated in electrically heated screws at approximately 450–500°C, causing it to break down into gaseous, liquid, and solid fractions.

The solid fraction undergoes a second pyrolysis stage at approximately 600–650°C to remove remaining volatile material.

The resulting solid is cooled to below 50°C and becomes raw recovered carbon black (rCB).

The gaseous products are sent to a condenser, where Tyre Pyrolysis Oil (TPO) is separated from syngas.

TPO and Syngas Processing
TPO is collected, filtered and cooled using a closed-loop cooling system before being transferred to storage tanks.

Syngas is extracted from the TPO collection tank, at the base of the condenser, passed through a fan condenser system and used as fuel in the site's combustion system.

After quality checks, TPO is removed from site by tanker and transferred to end users.

rCB processing
Raw rCB can either be exported from the site or pelletised on-site.

The rCB is screened, pneumatically conveyed and milled to achieve a uniform particle size. It is mixed with water and pelletised into particles approximately 0.125–2 mm in size.

A fluid-bed dryer reduces moisture to below 1%.

Dryer exhaust passes through a bag filter to control particulate emissions.

Production capacity is estimated to be approximately 4,200 tonnes per year of rCB pellets.

Syngas Combustion and Steam Generation
Syngas is burned in a combustion chamber, with natural gas used for start-up and as an ongoing supplementary fuel to ensure appropriate heat generation for steam raising.

The combustion chamber provides approximately 2 seconds residence time at 850°C after the final air injection.

Heat from combustion produces approximately 4.2 tonnes/hour of saturated steam at 20 barg.

Steam and boiler feedwater are supplied to the neighbouring Michelin facility.

A dump condenser provides an emergency means of condensing the steam when Michelin cannot accept the steam or demand is exceeded.

Flue Gas Treatment
Boiler flue gas, at approximately 180–200°C, is treated using sodium bicarbonate and activated carbon. The Sodium Bicarbonate neutralises acid gases, while activated carbon captures contaminants including heavy metals and flue-gas recirculation is used to control Nitrogen Oxides (NOx).

A bag filter removes the reaction products, ash and reagent residues.

The resulting filter cake/APC residues are sent to an appropriately permitted hazardous-waste facility.

An induced-draught fan maintains process pressure, and treated gases are discharged through a stack fitted with continuous emissions monitoring (CEMS).

Emergency Flare
An emergency flare is provided for start-up, shutdown and abnormal/emergency conditions. It is not intended for routine operation, and its operation will be recorded.

Utilities and environmental controls
Cooling is provided by a closed-loop water system, using corrosion inhibitors and ethylene glycol antifreeze.

Nitrogen, generated on site using a Pressure Swing Absorption (PSA) system, is used to prevent air entering the process and to prevent syngas escaping.

Boiler blowdown and condensate are transferred to the neighbouring Michelin site's infrastructure and discharged to the foul sewer under the adjacent site's trade effluent consent.

Uncontaminated surface-water runoff is collected in an underground attenuation system and discharged at a controlled rate to the River Trent.

A process diagram is included with drawings in Appendix 7.

The status log of a permit sets out the permitting history.

Details	Date
Schedule 13 Application	1.10.25
Duly Made	19.11.25
Permit Issued	15.10.26

End of introductory note

City of
Stoke-on-Trent

Permit

The Environmental Permitting (England and Wales) Regulations 2016

Stoke-on-Trent City Council in exercise of its powers under Schedule 13 of the Environmental Permitting (England and Wales) Regulations 2016 issues

Permit number: **SOT 189**

Issued to: **Murfitts Industries Ltd ("the operator")** whose registered office is:
Etel House
Avenue One
Letchworth Garden City
SG6 2HU

Company registration number: 04012599

to operate regulated facilities at:

Stoke Tyre Pyrolysis Facility
Campbell Road
Oakhill
Stoke-on-Trent
ST4 4EW

to the extent set out in the permit and conditions therein below

The Permit shall take effect from the 15th of October 2026 unless specific conditions provide for other implementation dates.

Signature:  Date:15/10/26

Jayne Hawe – Environmental Health Manager

Authorised on behalf of the regulator:

Public Protection
Stoke-on-Trent City Council
Glebe Street
Stoke-on-Trent
ST4 1HH

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Conditions

1 Management

1.1 General management

1.1.1 The operator shall manage and operate the activities:

a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and

b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.1.4 The operator shall comply with the following requirements for demonstrating technical competence as agreed with the regulator:

- Basic waste handling and storage techniques;
- Management of Advanced Thermal Treatment facilities;
- Demonstrate that the facility is operated in accordance with the manufacturer operating manual (and any updates arising from commissioning)

1.2 Energy Efficiency

1.2.1 The operator shall:

a) take appropriate measures to ensure that energy is used efficiently in the activities;

b) Where the facility changes or, at the request of the regulator, review whether there are suitable opportunities to improve the energy efficiency of the activities; and

c) take any further appropriate measures identified by a review.

1.3 Efficient use of waste and raw materials

1.3.1 The operator shall maintain records of raw materials, wastes and water used in the activities.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

1.4.1 The operator shall take appropriate measures to ensure that:

a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and

b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and

c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 Table S1.1 (the “activities”).

2.1.2 For the activities referenced in schedule 1, Table S1.1 waste authorised by this permit shall be clearly distinguished from any other waste on the site.

2.1.3 For the avoidance of doubt, only raw materials (or wastes) specified in Table S2.1 shall be processed.

2.1.4 The maximum throughput of the plant shall be 11388 tonnes per annum of waste to be co-incinerated.

2.1.5 The maximum quantity of ELT Crumb that shall be stored on site is 4 tonnes if the adjacent Murfitts processing facility is operational, to be stored inside the process building. If the adjacent facility is unavailable, the maximum quantity to be stored is 24 tonnes within an enclosed trailer on the site.

2.2 The Site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in red on the site plan in Schedule 7 to this permit.

2.3 Operating techniques

2.3.1 For the activities referenced in schedule 1, table S1.1 the activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Regulator.

2.3.2 If notified by the Regulator that the activities are giving rise to pollution, the operator shall submit to the Regulator for approval within the period specified, a revision of any plan or other documentation (“plan”) specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan , and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Regulator.

2.3.3 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.

2.3.4 Waste shall only be accepted if:

a) it is of a type and quantity listed in Schedule 2 table S2.1; and
b) it conforms to the description in the documentation supplied by the producer and holder.
c) It is handled and stored in a manner to prevent or to limit as far as practicable the pollution of air, soil, surface water and groundwater as well as other negative effects on the environment, odours and noise, and direct risks to human health

2.3.5 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:

a) the nature of the process producing the waste;
b) the composition of the waste;
c) the handling requirements of the waste;
d) the hazardous property associated with the waste, if applicable; and
e) the waste code of the waste.

2.3.6 The operator shall ensure that where waste produced by the activities it is handled and stored appropriately and, if sent to a landfill site, it meets the waste acceptance criteria for that landfill or disposal process.

2.3.7 Waste shall not be charged if:

a) the combustion chamber other specified temperature monitor temperature is below 850°C;
b) any backstop continuous emission limit value in schedule 3 table S3.1 is exceeded during abnormal operation (as defined in condition 2.3.10);
c) any continuous emission limit value in schedule 3 table S3.1 is exceeded, other than during abnormal operation;
d) continuous emission monitors to demonstrate compliance with any continuous emission limit value in schedule 3 table S3.1 are unavailable other than during abnormal operation; or
e) there is a stoppage, disturbance or failure of the activated carbon abatement system, other than during abnormal operation; or
f) continuous emission monitors to demonstrate compliance with the emission limit values for particulates, TOC or CO in schedule 3 are unavailable unless alternative techniques, as agreed in writing with the Regulator, are used to demonstrate compliance with those emission limit values.

2.3.8 The operator shall record the beginning and end of each period of “abnormal operation”.

2.3.9 During a period of “abnormal operation”, the operator shall restore normal operation of the failed equipment or replace the failed equipment as soon as possible.

2.3.10 The operator shall interpret the start of the period of “abnormal operation” as the earliest of the following:

a) a technically unavoidable stoppage, disturbance, or failure of continuous emission monitors.

b) a technically unavoidable stoppage, disturbance, or failure of the activated carbon abatement system.
c) Any other technically unavoidable stoppage, disturbance, or failure of the plant which is causing or could lead to an exceedance of an emission limit value in table S3.1.

2.3.11 The operator shall interpret the end of the period of "abnormal operation" as the earliest of the following:

a) when the failed equipment is repaired and brought back into normal operation;
b) when the operator initiates a shutdown of the waste combustion activity, as described in the application or as agreed in writing with the Regulator;
c) The failed equipment has not been repaired and brought back into normal operation and a single period of abnormal operation reaches a duration of 4 hours after the start of abnormal operation.

2.4 Pre-Operational Conditions

2.4.1 The operator shall comply with the pre-operational conditions specified in Schedule 1 table S1.3 before the Plant is brought into first use.

2.5 Improvement programme

2.5.1 The operator shall complete the improvements specified in schedule 1 tables S1.3 and S1.4 by the date specified in those tables unless otherwise agreed in writing by the Regulator.

2.5.2 Except in the case of an improvement which consists only of a submission to the Regulator, the operator shall notify the Regulator within 14 days of completion of each improvement.

3 Emissions and monitoring

3.1 Emissions to water, air or land

3.1.1 There shall be no point source emissions to air or water except from those sources and emission points listed in Schedule 3 table S3.1 (emissions to air) and S3.3 (emission to sewer)

3.1.2 The limits given in schedule 3, subject to condition 3.2.1, shall not be exceeded.

3.1.3 Monitoring and periodic sampling shall be carried out at in accordance with the requirements set out in Schedule 3 Tables S3.1 and S3.4.

3.1.4 The operator shall
a) maximise the availability and performance of equipment critical to the protection of the environment;

b) record all periods of other than normal operation, their cause and duration and where possible their effect on emissions.

3.1.5 There shall be no point source emissions to land.

3.2 Continuous Emissions and substances not controlled by emission limits

3.2.1 The limits for emissions to air apply as follows:

(a) The limits in table S3.1 shall not be exceeded except during periods of abnormal operation.
(b) The backstop ELV's in table S3.1 shall not be exceeded during abnormal operation (as defined in condition 2.3.10).

3.2.2 Where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3 table S3.1; the Continuous Emission Monitors shall be used such that;

(a) the values of the 95% confidence intervals of a single measured result at the daily emission limit value shall not exceed the following percentages of the emission limit values:
- Carbon monoxide 10%
- Sulphur dioxide 20%
- Oxides of nitrogen (NO & NO2 expressed as NO2) 20%
- Particulate matter 30%
- Total organic carbon (TOC) 30%
- Hydrogen chloride 40%
- Ammonia 40%
- Mercury 40%

(b) valid half-hourly average values or 10-minute averages shall be determined within the effective operating time (excluding the start-up and shut-down periods) from the measured values after having subtracted the value of the confidence intervals in condition 3.2.2 (a);
(c) where it is necessary to calibrate or maintain the monitor and this means that data are not available for a complete half-hour or 10-minute period, the half-hourly average or 10-minute average shall in any case be considered valid if measurements are available for a minimum of 20 minutes or 7 minutes during the half-hour or 10-minute period respectively. The number of half-hourly or 10-minute averages so validated shall not exceed 5 or 15 respectively per day;
(d) daily average values shall be calculated as follows:
  (i) the average of valid half hourly averages or 10-minute averages over calendar day excluding half hourly averages or 10-minute averages during periods of abnormal operation. The daily average value shall be considered valid if no more than five half-hourly average or fifteen 10-minute average values in any day have been determined not to be valid;
(e) no more than ten daily average values per year shall be determined not to be valid.

3.2.3 Emissions of periodically monitored substances shall be determined within the effective operating time (excluding the start-up and shut-down periods).

3.2.4 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.2.5 The operator shall:

a) if notified by the Regulator that the activities are giving rise to pollution, submit to the Regulator for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;

b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Regulator.

3.2.6 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Monitoring

3.3.1 The operator shall, unless otherwise agreed in writing by the Regulator, undertake the monitoring specified in the following tables in schedule 3 to this permit:

a) point source emissions specified in tables S3.1;

b) process monitoring specified in table S3.4;

3.3.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

3.3.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.3.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Regulator.

3.3.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 table S3.1 unless otherwise agreed in writing by the Regulator.

3.4 Odour

3.4.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Regulator, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.4.2 It shall not be a breach of the condition in a particular case if the operator can show that all reasonable steps have been taken and has exercised all due diligence to prevent the release of offensive odour.

3.4.3 The operator shall:

a) if notified by the Regulator that the activities are giving rise to pollution outside the site due to odour, submit to the Regulator for approval within the period specified, a revised odour management plan which identifies and minimises the risks of pollution from odour;

b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Regulator.

3.5 Noise and vibration

3.5.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Regulator, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.5.2 The operator shall:

a) if notified by the Regulator that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Regulator for approval within the period specified, a revised noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;

b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Regulator.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

a) be legible;

b) be made as soon as reasonably practicable;

c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

d) be retained, unless otherwise agreed in writing by the Regulator, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

i. off-site environmental effects; and

ii. matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Regulator.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Regulator using the contact details supplied in writing by the Regulator.

4.2.2 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Regulator, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

a) in respect of the parameters and emission points specified in schedule 4 table S4.1;
b) for the reporting periods specified in schedule 4 table S4.1 and giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.3 A report or reports on the performance of the activities over the previous year shall be submitted to the Regulator by 31 January (or other date agreed in writing by the Regulator) each year. The report(s) shall include as a minimum:
a) the annual production/treatment data set out in schedule 4 table S4.2; and
b) the performance parameters set out in schedule 4 table S4.3.

4.3 Notifications

4.3.1 In the event that:

a) the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—
   i) inform the Regulator,
   ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and
   iii) take the measures necessary to prevent further possible incidents or accidents as soon as practicable;
b) a breach of any permit condition occurs, the operator must record the event (and if necessary)—
   i) inform the Regulator, and
   ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;
c) a breach of permit condition occurs which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.

4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Where the Regulator has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Regulator when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Regulator at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Regulator shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

a) any change in the operator's trading name, registered name or registered office address; and
b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

a) the Regulator shall be notified at least 14 days before making the change; and
b) the notification shall contain a description of the proposed change in operation.

4.3.6 The Regulator shall be given at least 14 days' notice before implementation of any part of the site closure plan.

4.3.7 Where the operator has entered into a climate change agreement with the Government, the Regulator shall be notified within one month of:

a) a decision by the Secretary of State not to re-certify the agreement;
b) a decision by either the operator or the Secretary of State to terminate the agreement; and
c) any subsequent decision by the Secretary of State to recertify such an agreement.

4.4 Interpretation

4.4.1 In this permit the expressions listed in Schedule 6 shall have the meaning given in that schedule

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "immediately" in which case it may be provided by telephone

Schedule 1 – Operations

Table S1.1 activities

Table S1.1 activities	
Activity listed in Schedule 1 of the EP Regulations	**Description of specified activity**
Schedule 13 Waste Incineration <3 tonnes/hr	Thermal treatment by pyrolysis of tyre crumb from ELT to produce a gas, which is condensed and tyre pyrolysis oil removed. Remaining non condensable gas is combusted for use in a boiler to produce steam Flue gas cooling and treatment
Associated Activities	
Raw material reception and storage	Storage of liquid in bunded areas Storage of solids in dedicated buildings or trailer Receipt of tyre crumb and entry into pyrolysis facility
Storage, handling and dispatch of products and waste and other materials	Storage of Tyre pyrolysis oil (TPO) Storage of recovered carbon black
rCB milling and pelletising	Milling and pelletising of rCB
rCB Cooling and bagging	Cooling, bagging and storage of rCB for transfer off site
Cooling system	Various cooling processes
Combustion	Combustion of diesel in a generator. Utilised for <50 hours per annum and in the case of emergency / abnormal operations
Control and abatement systems for emissions to air	Abatement of releases to air
Dust Extraction and abatement	Treatment of waste gases

Table S1.2 Operating techniques

Table S1.2 Operating techniques and controls		
Description	***Parts**	**Date Produced**
Operating Techniques Management Plan ref: CRM 0180 001 PE R 006	Waste acceptance, storage and feed into process	September 2025
	Start up and shutdown procedures	
	Heat and Mass balance monitoring	
	Residue minimisation and disposal	
	Energy Balance	

	Combustion Temperature and residence time	September 2025
	Site security	
	Training and Competency	
	Environmental Management System	
	Decommissioning and closure plan	

*Or any updates to these documents as agreed with the Regulator.

Table S1.3 Pre-Operational Conditions

Table S1.3 Pre-Operational Conditions	
Reference	Requirement
PO1	Prior to the commencement of commissioning, the Operator shall submit to the Local Authority, and obtain the Local Authorities' written approval to it, a written commissioning plan, including timelines for completion, for approval by the Local Authority. The commissioning plan shall include the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the actions to be taken to protect the environment and report to the Local Authority in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved.
PO2	Within 3 months of the commencement of commissioning (or other date agreed in writing with the Local Authority) the Operator shall submit, for approval by the Local Authority, a methodology to validate the residence time, minimum temperature and oxygen content of the gases in the furnace whilst operating under normal load, minimum turn down and overload conditions.
PO3	Prior to the commencement of operation, the Operator shall submit to the Local Authority and obtain the Local Authorities' written approval an update to the Environmental Management System required by condition 1.1.1
PO4	The operator shall submit suitable a Fire Prevention Plan to the Regulator for approval.

Table S1.4 Improvement programme requirements

Table S1.4 Improvement programme requirements		
Reference	**Requirement**	**Date**
IP1	The operator shall notify the Local Authority of the proposed date(s) of any validation testing.	Notification at least 2 weeks prior to validation testing
IP2	During commissioning the operator shall carry out validation testing to validate the residence time, minimum temperature and oxygen content of the gases in the furnace whilst operating under normal load and most unfavourable operating conditions. The validation shall be to the methodology as approved through pre-operational condition PO2.	To be provided on completion of commissioning.

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Waste Types, Raw Materials and Fuels

Table S2.1 Raw Materials and fuels	
Raw Materials and fuel	**Description**
Tyre Crumb	19 12 04 Plastic and rubber, shredded or granulated rubber from end-of-life tyres only
Diesel	Diesel used in quenching/condensation process
Natural Gas	Mains gas

City of Stoke-on-Trent

Schedule 3 – Emissions and monitoring

Table S3.1 Point Source Emissions to Air – Emission limits and Monitoring Requirements

Emission point ref and location	Source	Parameter	Daily Average (mg/m^3)	Half Hourly Average 100% (mg/m^3) [1, 2]	Half Hour Average 97% (mg/m^3) [1, 2]	Backstop ELV / Emission Limit Value (mg/Nm^3) [2,3]	Averaging / sampling period	Continuous Monitoring Requirements	Periodic Monitoring Frequency (annual unless otherwise stated)	Periodic Monitoring Standard or Method
All Emissions Points	All	No visible emissions (other than steam or water vapour)	-	-	-	-		-	At least 1/day	Observation
A1	rCB pneumatic transport	Total Dust		10	-	-			Within 3 months of commissioning then Annual	EN 13284-1
A2	Boiler Exhaust	Carbon monoxide	75	150	N/A	150 (half hour average) 225 (10-minute average)		Yes EN 15267-1-2&-3 and EN 14181 10 minute and daily average	Within 3 months of commissioning then Annual	EN 15058
A2	Boiler Exhaust	Total Dust	15	45	15	225		Yes EN 15267-1,-2&-3 and EN 14181 30 minute and daily average	Within 3 months of commissioning then Annual	EN 13284-1
A2	Boiler Exhaust	Oxides of Nitrogen	300	600	300	-		Yes EN 15267-1,-2&-3 and EN 14181 30 minute and daily average	Within 3 months of commissioning then Annual	EN 14792

Table S3.1 Point source emissions to air – emission limits and monitoring requirements

Emission point ref and location	Source	Parameter	Daily Average (mg/m^3)	Half Hourly Average 100% (mg/m^3) [1, 2]	Half Hour Average 97% (mg/m^3) [1, 2]	Backstop ELV / Emission Limit Value (mg/Nm^3) [2,3]	Averaging / sampling period	Continuous Monitoring Requirements	Periodic Monitoring Frequency (annual unless otherwise stated)	Periodic Monitoring Standard or Method
A2	Boiler Exhaust	Sulphur Dioxide	75	300	75	-	Average over the sampling period	Yes EN 15267-1,-2&-3 and EN 14181 30 minute and daily average	Within 3 months of commissioning then 2 measurements a year thereafter	EN 14791
A2	Boiler Exhaust	Total Organic Carbon	15	30	15	30		Yes EN 15267-1,-2&-3 and EN 14181 30 minute and daily average	Within 3 months of commissioning then Annual	BS EN 12619
A2	Boiler Exhaust	Hydrogen Chloride	15	90	15	-	Average over the sampling period	Yes EN 15267-1,-2&-3 and EN 14181 30 minute and daily average	One Measurement every 3 months for the first 12 months of operation, 2 measurements a year thereafter	EN 1991
A2	Boiler Exhaust	Hydrogen Fluoride	1.5	6	3	3	Average over the sampling period	Yes EN 15267-1,-2&-3 and EN 14181 30 minute and daily average	One Measurement every 3 months for the first 12 months of operation, 2 measurements a year thereafter	ISO 15713 CEN TS 17340 (3)
A2	Boiler Exhaust	Dioxins and Furans (PCCD/F) [5]	-	-	-	0.1 ITEQ ng/Nm3	Average emission limit value over a sampling period of a minimum of 6	N/A	One Measurement every 3 months for the first 12 months of operation, 2	EN 1948 part 1,2 and 3

Table S3.1 Point source emissions to air – emission limits and monitoring requirements

Emission point ref and location	Source	Parameter	Daily Average (mg/m^3)	Half Hourly Average 100% (mg/m^3) [1, 2]	Half Hour Average 97% (mg/m^3) [1, 2]	Backstop ELV / Emission Limit Value (mg/Nm^3) [2,3]	Averaging / sampling period	Continuous Monitoring Requirements	Periodic Monitoring Frequency (annual unless otherwise stated)	Periodic Monitoring Standard or Method
							hours and a maximum of 8 hours		measurements a year thereafter	
A2	Boiler Exhaust	Cadmium and Thallium	-	-	-	Total 0.05	Average emission limit values [4] over a sampling period of a minimum of 30 minutes and a maximum of 8 hours. A minimum sampling period of 1 hour is recommended	N/A	One Measurement every 3 months for the first 12 months of operation, 2 measurements a year thereafter	EN 1435 and EN 13211
A2	Boiler Exhaust	Mercury	-	-	-	Total 0.05		N/A		EN 1435 and EN 13211
A2	Boiler Exhaust	Antimony, Arsenic, Lead, Chromium, Cobalt, Copper, Manganese, Nickel and Vanadium	-	-	-	Total 0.5		N/A		EN 1435 and EN 13211
A3	rCB Drying exhaust	Particulates Total Organic Carbon		10 30				N/A	Within 3 months of commissioning then Annual	EN 13284-1 BSEN 12619

1. The regulator shall choose which limit to apply following commissioning, either 100% compliance with the higher value or 97% compliance with the lower value.
2. In the case of CO emissions, 95% compliance with the 10-minute average of 225 mg/Nm^3 is an alternative to 100% compliance with the half hour limit of 150 mg/Nm^3. In which case, this will also be the backstop ELV. This will be agreed with the regulator following commissioning.
3. The backstop ELV applies during periods when the half hourly ELV is exceeded.
4. Average values cover also the gaseous and the vapour forms of the relevant heavy metal emissions as well as their compounds.

5. The emission limit value refers to the total concentration of dioxins and furans calculated in accordance with the toxic equivalence factors shown in table 3.1.1.

For the determination of the total concentration of dioxins and furans, the mass concentrations of the dibenzo-p-dioxins and dibenzofurans specified in table 3.1.1 shall be multiplied by the toxic equivalence factors set out in that table before summing.

Table 3.1.1 Equivalence factors for dibenzo-p-dioxins and dibenzofurans

Dibenzo-p-dioxins and dibenzofurans	Toxic equivalence factor
2,3,7,8 — Tetrachlorodibenzodioxin (TCDD)	1
1,2,3,7,8 — Pentachlorodibenzodioxin (PeCDD)	0.5
1,2,3,4,7,8 — Hexachlorodibenzodioxin (HxCDD)	0.1
1,2,3,6,7,8 — Hexachlorodibenzodioxin (HxCDD)	0.1
1,2,3,7,8,9 — Hexachlorodibenzodioxin (HxCDD)	0.1
1,2,3,4,6,7,8 — Heptachlorodibenzodioxin (HpCDD)	0.01
Octachlorodibenzodioxin (OCDD)	0.001
2,3,7,8 — Tetrachlorodibenzofuran (TCDF)	0.1
2,3,4,7,8 — Pentachlorodibenzofuran (PeCDF)	0.5
1,2,3,7,8 — Pentachlorodibenzofuran (PeCDF)	0.05
1,2,3,4,7,8 — Hexachlorodibenzofuran (HxCDF)	0.1
1,2,3,6,7,8 — Hexachlorodibenzofuran (HxCDF)	0.1
1,2,3,7,8,9 — Hexachlorodibenzofuran (HxCDF)	0.1
2,3,4,6,7,8 — Hexachlorodibenzofuran (HxCDF)	0.1
1,2,3,4,6,7,8 — Heptachlorodibenzofuran (HpCDF)	0.01
1,2,3,4,7,8,9 — Heptachlorodibenzofuran (HpCDF)	0.01
Octachlorodibenzofuran (OCDF)	0.001

Table S3.2 Point source Emissions to water– emission limits and monitoring requirements

The site has no *process discharges* to surface water.

Surface water and roof run-off is directed to a surface water system connected to a contained surface water system with over 30m^3 capacity. Overflow from the system is protected by a penstock valve.

Spillage containment and control of raw material/waste storage techniques identified in accordance with improvement programmes shall be implemented (see Table S1.3 above) shall be reviewed and implemented as part of demonstration of prevention of pollution of controlled waters.

Table S3.3 Point source Emissions to Sewer – emission limits and monitoring requirements

Table S3.3 Point source emissions to sewer, effluent treatment plant or other transfers off-site– emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit	Reference Period	Monitoring Frequency	Monitoring Standard
S1 (as shown on the plan in Schedule 7	Site process effluent Discharge to sewer	No parameters set	No limit set	-	-	-

Note: Effluent is discharged via legacy consents to effluent treatment plant on adjacent regulated site.

Table S3.4 Process Monitoring Requirements

Table S3.4 Process monitoring requirements				
Emission point reference or source or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
Operational Run-time hours	runtime	Monthly	Process data SCADA	Align to maintenance requirements
Steam Flow (multipoint)*	Flowrate (various)	Continuous	Process data SCADA	Process control ranges
Steam Temperature (multipoint)*	°C	Continuous	Process data SCADA	Process control ranges
Exit gas Temperature	°C	Continuous	Process data SCADA or CEMs	
Mass of waste daily throughput	kg/day kg/week	Day Week	Weighbridge	summary reports
Abnormal/Emergency operations*	Alarms/alerts		Process data SCADA/ CEMs/ other	Logged emergency incidents
Raw material usage	kg/annum	Annual	Process data SCADA Waste acceptance record	Purchase records
Energy consumption	Gas Oil Electricity	Annual	Process data SCADA	Purchase records
Mass of waste removed from site	kg/annum	Day Week	Waste management data	Align to transfer notes Duty of care (fate of waste)

*Note operational control monitoring are linked to process control SCADA system and key outcomes from Hazard Operability Studies. Location and types of devices e.g. pressure sensors will be determined following pre-commissioning and may be modified during commissioning to address any necessary changes.

Table S3.5 Land Monitoring Requirements

There are no land monitoring requirements for Schedule 13 Permits.

However, storage of waste should be contained within designated areas which are impervious and capable of fully containing the waste deposited in the area. Waste shall be processed and handled in accordance with condition 2.3.6 and within designated areas.

All waste deposited outside designated areas may be considered a pollution incident (see Condition 3.1.5 and notification requirements in Schedule 5) or spillage and managed according to spillage containment and clean up procedures.

Schedule 4 – Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data

Table S4.1 Reporting of monitoring data			
Parameter	**Emission or monitoring point/reference**	**Reporting period**	**Period begins**
Emissions to air Parameters as required by condition 3.1.3 3 monitoring points	A1 A2 A3	Every 12 months	1 January

Table S4.2 Annual production/treatment

Table S4.2: Annual production/treatment	
Parameter	**Units**
Quantity of tyre crumb treated	Tonnes / annum
Quantity of syngas produced	Tonnes / annum
Quantity of other fuels used	Tonnes / annum
Energy generated	MW / annum

*Unit of production refers to the mass of input waste for the period under consideration.

Table S4.3 Reporting forms

Table S4.3 Reporting forms		
Parameter	**Reporting form**	**Form version number and date**
Point source emissions to air	Emissions to Air Reporting Form, or other form as agreed in writing by the Regulator	Version 1, 07.10.26
Energy usage	Energy Usage Reporting Form, or other form as agreed in writing by the Regulator	Version 1, 07.10.26

Note: Whilst summary reporting of operational performance standards is not routinely required, it is recommended the site maintain onsite records of key process monitoring requirements (Table S3.4) for review specifically waste imported and waste removed from site.

Where no limits are stipulated, please provide 'Nil Return'

Schedule 5 – Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A Notification of abnormal operational conditions

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the breach of permit conditions not related to limits	
To be notified within 24 hours of detection	
Condition breached	
Date, time and duration of breach	
Details of the permit breach i.e. what happened including impacts observed.	
Measures taken, or intended to be taken, to restore permit compliance.	

(d) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B – to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

Schedule 6 – Interpretation

Term	Meaning
“Abatement equipment”	means that equipment dedicated to the removal of polluting substances from releases from the installation to air or water media.
“accident”	means an accident that may result in pollution
“application”	means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.
“Authorised officer”	means any person authorised by the Regulator under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.
“Background concentration”	means such concentration of that substance as is present in: • for emissions to surface water, the surface water quality up-gradient of the site; or • for emissions to sewer, the surface water quality upgradient of the sewage treatment works discharge.
“Calendar monthly mean”	means the value across a calendar month of all validated hourly means.
“CEM”	Continuous emission monitor
“ELT”	means End of Life Tyres
“EP Regulations”	means The Environmental Permitting (England and Wales) Regulations SI 2016 No.1154 (or any superseding legislation), and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations
“Emissions of substances not controlled by emission limits”	means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission or background concentration limit.
“Emissions to land”	includes emissions to groundwater.
“groundwater”	means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil. “Groundwater protection zones 1 have the meaning given in the document titled "Groundwater and 2” Protection: Policy and Practice" published by the Environment

	Agency in 2006 (or any superseding document).
“Hazardous Waste”	has the meaning given in the Hazardous Waste (England and Wales) Regulations 2005 No.894, the Hazardous Waste (Wales) Regulations 2005 No. 1806 (W.138), the List of Wastes (England) Regulations 2005 No.895 and the List of Wastes (Wales) Regulations 2005 No. 1820 (W.148) or any superseding legislation
“Industrial Emissions Directive”	means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016 (as amended).
“ISO” means	International Standards Organisation.
“MCERTS”	means the Environment Agency’s Monitoring Certification Scheme.
“Organic Compound"	means any compound containing at least the element carbon and one or more of hydrogen, halogens, oxygen, sulphur, phosphorus, silicon or nitrogen, with the exception of carbon oxides and inorganic carbonates and bicarbonates.
“Pollution”	shall have the same meaning as per section 2 of the EPR, in summary this means; harmful to human health, or quality of the environment, cause offence to man’s senses, result in damage to material property or impair or interfere with amenities or other legitimate uses of the environment;
“Quarter”	means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.
“Quarterly”	for reporting/sampling means after/during each 3-month period, January to March; April to June; July to September and October to December and, when sampling, with at least 2 months between each sampling date.
“Regulator”	Reference to the regulator means Stoke-on-Trent City Council. Regulatory functions for the regulator are discharged by duly authorised officers of Stoke-on-Trent City Council.
Raw rCB	Means raw recovered carbon black (char)
“SI”	means site inspector.
“Solvent Emissions Directive”	means Directive 1999/13/EC (as amended by Directive 2004/42/EC) on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations.
TPO	Means Tyre Pyrolysis Oil

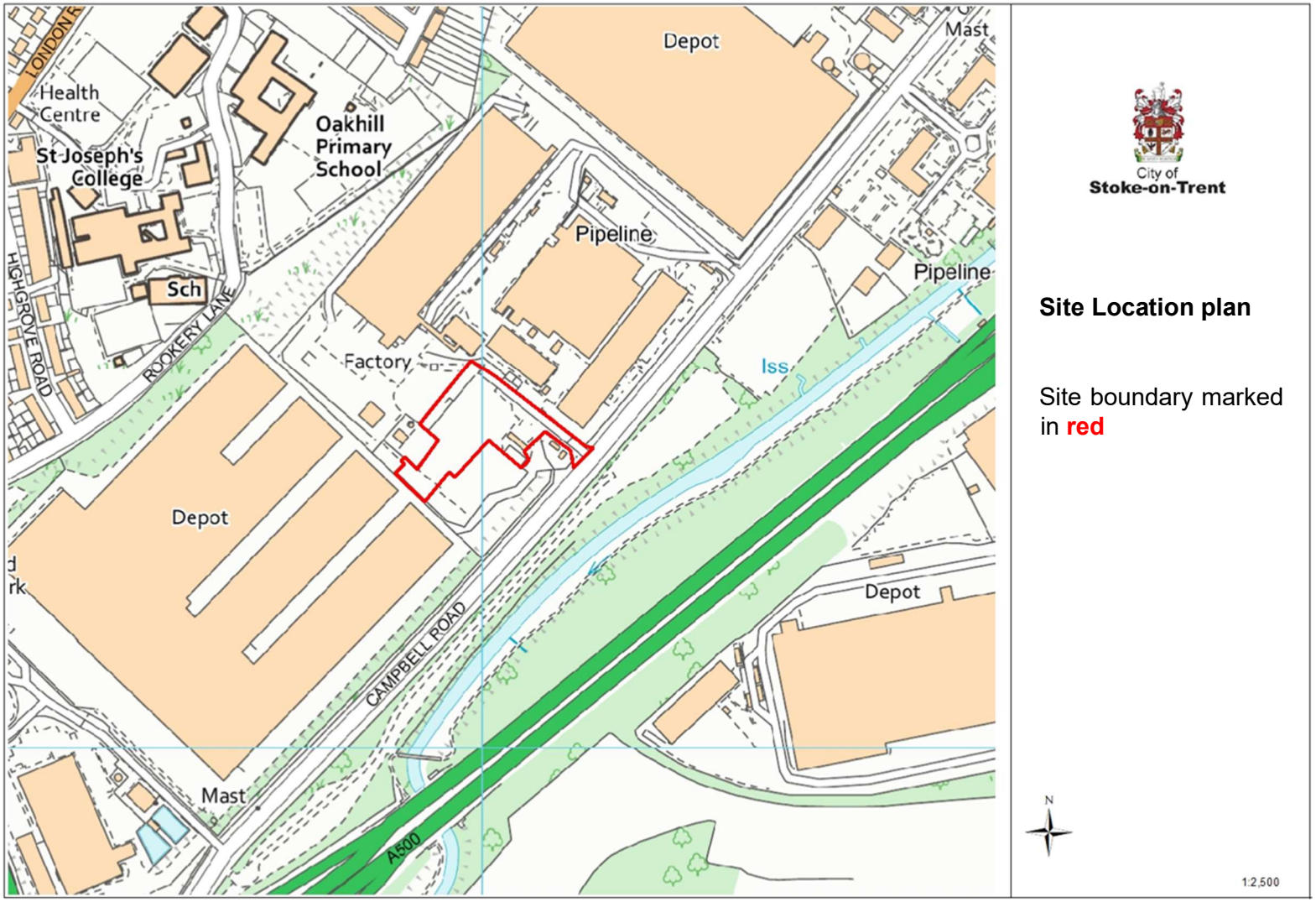
"Volatile Organic Compound" (VOC)	means any organic compound means any organic compound as well as the fraction of creosote, having at 293.15 K, a vapour pressure of 0.01 kPa or more, or having a corresponding volatility under the particular conditions of use.
"Waste code"	means the six-digit code referable to a type of waste in accordance with the List of Wastes (England) Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.
"Waste Framework Directive" or "WFD"	means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste.
"Waste Incineration Directive"	means Directive 2000/76/EC of The European Parliament and of The Council of 4 December 2000 on the incineration of waste.
"Year"	means calendar year ending 31 December.

Where a minimum limit is set for any emission parameter, for example mg/m^3, reference to exceeding the limit shall mean that the parameter shall not exceed that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

a) in relation to emissions from combustion processes, the concentration in dry air at a temperature of 273.15K, at a pressure of 101.3 kPa and with an oxygen content of 6% dry; and/or
b) in relation to emissions from non-combustion sources, the concentration at a temperature of 273K and at a pressure of 101.3 kPa, with no correction for water vapour content.

Schedule 7 – Site plans



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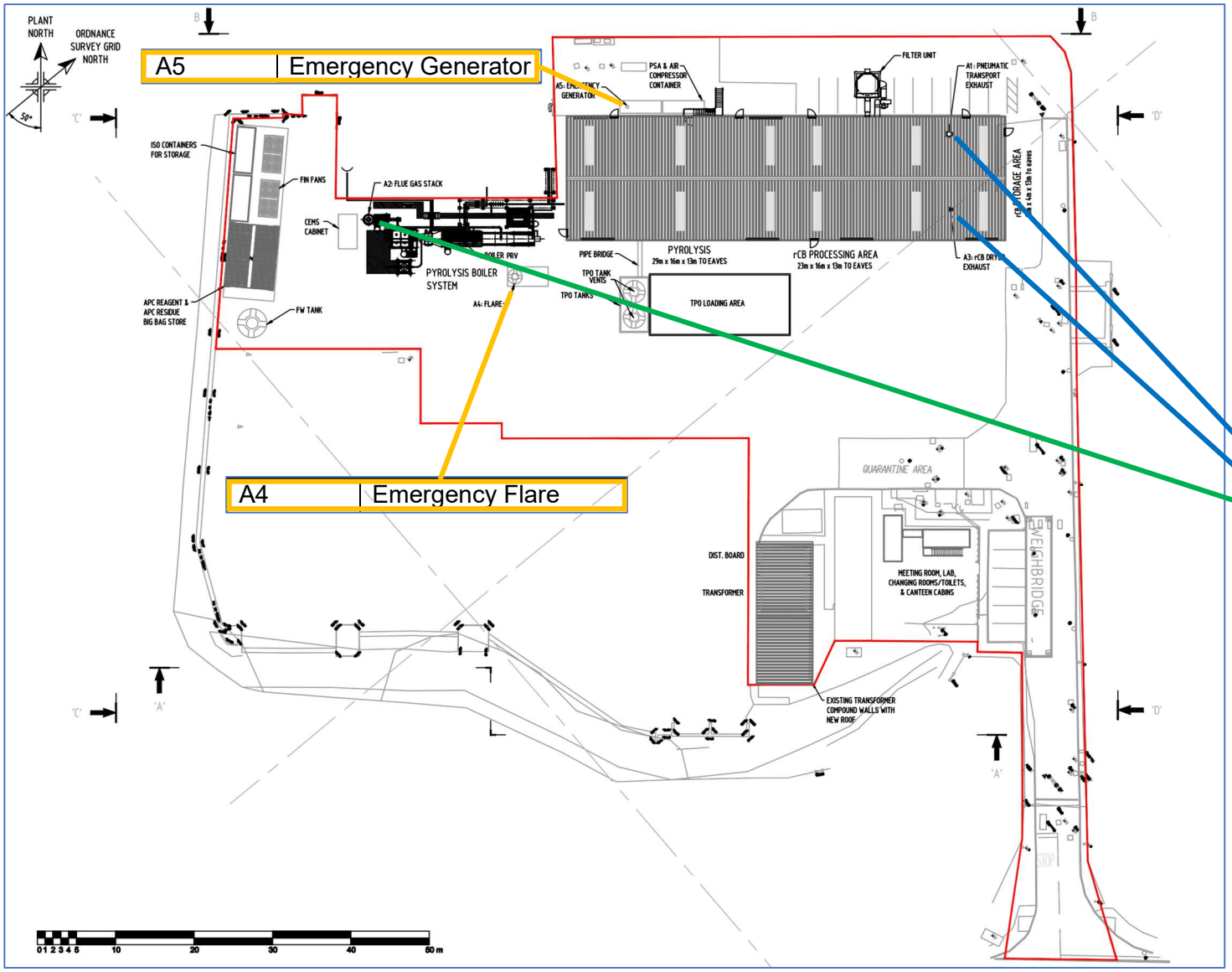
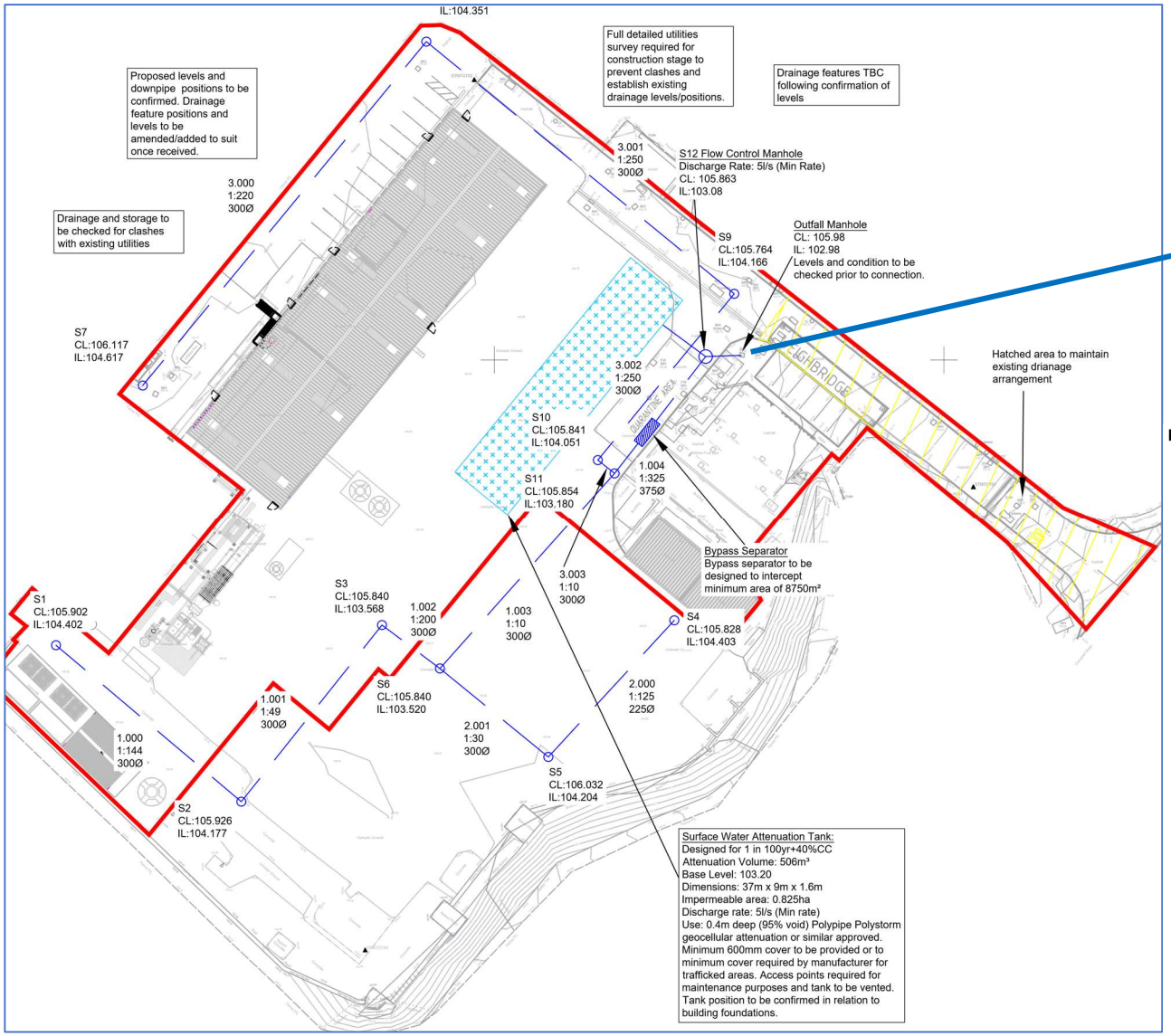
Site layout plan with Emission points to air



Emission point	Plant/Description
A1	rCB pneumatic transport
A3	rCB drying exhaust
A2	Boiler 1 Exhaust

Site layout plan with Sewer discharge point



Emission Point	Plant/Description
S1	Discharge to sewer

KEY:

- Site Boundary
- Surface Water Drainage Route*
- Surface Water Manhole

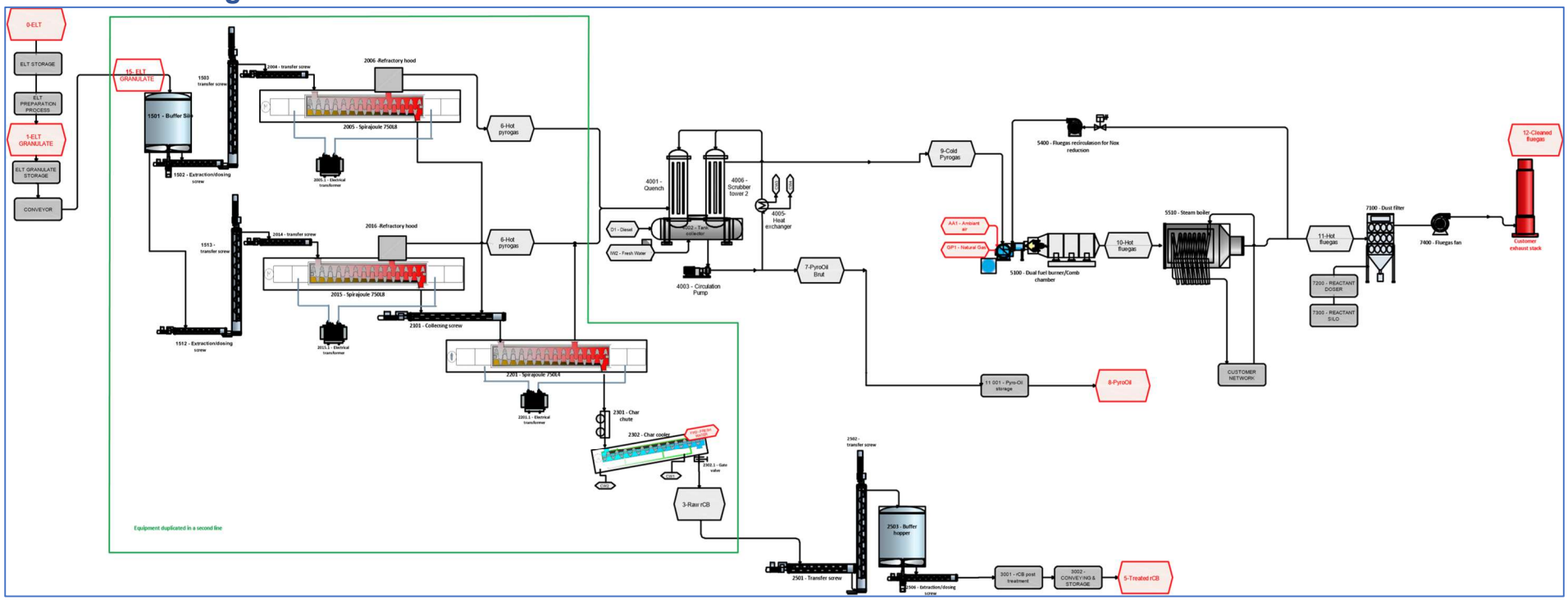
NOTES:

ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS AND DOCUMENTS ASSOCIATED WITH THIS PROJECT.

ALL EXISTING AND PROPOSED DIMENSIONS, LEVELS AND LOCATIONS TO BE CHECKED AND VERIFIED BY THE MAIN CONTRACTOR ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS AND ANY ANOMALIES REPORTED TO THE ENGINEER.

Process flow diagram



END OF PERMIT