Local Authority Pollution Prevention and Control

Permit to operate an installation for the coating of metal surfaces

UK Battery Industrialisation Centre Rowley Road, Coventry CV8 3AL

Permit Reference: 81

Warwick District Council ("the Regulator") in accordance with Regulation 13 of the Environmental Permitting (England and Wales) Regulations 2016 (as amended) ("the Regulations") hereby permits: **UK Battery Industrialisation Centre Ltd**

Whose registered office is: **UK Battery Industrialisation Centre, Rowley Road, Baginton, Coventry, CV8 3AL**

to operate an installation for coating of metal surfaces as listed in Section 6.4 Part B paragraph(a) subparagraph(iv) of Schedule 1 of the Regulations and a solvent emission activity listed in paragraph 3(b) of Annex VII of the European Union Industrial Emissions Directive 2010

at: **UK Battery Industrialisation Centre, Rowley Road, Coventry CV8 3AL**

subject to compliance with the conditions of this permit.

Signed …….....

Marianne Rolfe Head of Community Protection
A person authorised to sign on behalf of the Council

Dated 16th January 2026

Address for correspondence:

Warwick District Council
Community Protection
Town Hall
Parade
Royal Leamington Spa
CV32 4AT

Installation Description

The general location of the installation is shown in Appendix 1.

The activity regulated by this permit is the application of a continuous film of coating to metal surfaces, using organic solvents, to make electrodes for batteries and the directly associated activities which may result in the release to air of volatile organic compounds or particulates.

The activity comprises of two manufacturing lines referred to as the Industrial Scale-up Line (ISL) and the Flexible Pilot Line (FPL).

The activity includes the production of both cathode and anode electrodes. Raw materials consisting of powders and liquids are mixed to create a unique electrode 'slurry' for the anode and cathode lines. The anode slurry liquid is composed almost exclusively of deionised water with trace elements of organic solvent material. The cathode slurry liquid is composed of an organic solvent called N Methyl-2-Pyrrolidone (NMP) with scope to use less harmful alternatives in the future.

Deliveries of organic solvent are stored in a bunded materials storage area. The NMP is pumped to mixing vessels through fixed piping and automated pumping. Mixing takes place in an airtight container. The slurry mixture is evenly spread across an aluminium sheet using a precision roller application process. The coated metallic sheets are dried by means of an electrically powered oven system, whereby the liquid NMP content of the coated slurry is vaporised. The emissions from the ISL are captured through a carbon scrubber stack before release via Emissions Point A1 as shown in Appendix 2.

The FPL uses N Methyl-2-Pyrrolidone (NMP) as well as ethanol, methanol, isopropyl alcohol, propyl acetate, and acetone in the production of electrodes. The emissions from the FPL are captured by a regenerative thermal oxidiser (RTO) and catalytic oxidation (CATOX) system before release via Emissions Point A2 as shown in Appendix 2.

The aim of the conditions within this permit is to control emissions of volatile organic compounds and particulates from the installation to atmosphere.

The technical documents and guidance used in the preparation of the conditions in this permit are:

- "Statutory guidance for coating of metal and plastic processes" Secretary of State Process Guidance Note PG 6/23 (11). Revised June 2014.

- Environmental Permitting: General Guidance Manual on Policy and Procedures for A2 and B Installations, Local Authority Pollution Prevention and Control. DEFRA. Revised April 2012.

- Environmental Permitting: Core Guidance for the Environmental Permitting (England and Wales) Regulations 2016. DEFRA. Revised March 2020

- Environment Agency Monitoring stack emissions: environmental permits. Revised March 2024.

Legislation

1. Pollution Prevention and Control Act 1999.

2. The Environmental Permitting (England and Wales) Regulations 2016 (as amended).

Definitions used in the conditions

Operator shall mean **UK Battery Industrialisation Centre Ltd.**

Regulator shall mean an authorised officer of **Warwick District Council**.

This permit has been prepared by:

Mr M Shirley, Senior Environmental Health Officer,
Telephone: 01926 456725

This permit consists of 16 pages

CONDITIONS

All conditions shall have immediate effect unless stated otherwise.

Duty to use the "Best available techniques"

1. The operator shall use the "best available techniques" for preventing or, where that is not practicable, reducing the emissions from the installation. This applies to any aspect of the operation of the installation not covered by the specific conditions in this permit.

   "Best available techniques" is defined in Article 2(11) of Directive 96/61/EC concerning integrated pollution prevention and control, which is reproduced below.

   "Best available techniques" means the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole; and for the purpose of this definition –

   "techniques" shall include both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned".

   "available techniques" means those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator;

   "best" means the most effective in achieving a high general level of protection of the environment as a whole.

Elimination and substitution of harmful substances

2. The regulated activity shall be reviewed annually by the operator to identify any steps that can be eliminated or substances which can be substituted to minimise emission of Volatile Organic Compounds (VOCs) from the installation. Without prejudice to the generality of the above, the operator will review the need for continued use of N Methyl-2-Pyrrolidone solvent and the feasibility of replacement by a less harmful solvent.

3. The review required by Condition 2 of this permit shall include consideration of the technical and economic feasibility of change. A record shall be made of the review and provided to the regulator on request.

Change

4. The operator shall notify the regulator at least 14 days in advance of any proposed change in the process, the materials, or other aspect of the installation that may affect emissions in order that the regulator may consider the need for any variation or amendment of this permit.

Emission limits and controls

5. The coating processes using organic solvent shall not be operated if the associated solvent recovery plant or emission abatement plant is not functioning.

6. All emissions to air, other than steam or water vapour, shall be colourless and free from persistent mist and droplets.

7. All emissions to air from the process shall be free from visible dust and fallout of dust beyond the site boundary.

8. All emissions to air from the process shall be free from visible smoke. During start up and shut down the emissions should not exceed the equivalent of Ringelmann Shade 1 as described in British Standard BS 2742.

9. All emissions shall be free from offensive odour beyond the process site boundary as perceived by the regulator.

10. **Releases to air** from the stacks serving the coating process shall not exceed the limits set out in the table below:

Table 1 – Emission limit values

Emission point	Source	Parameter	Concentration limit (including unit)[1]	Reference period	Type of monitoring	Monitoring frequency	Monitoring standard or method
A1 [as shown in Appendix 2]	ISL	N Methyl-2-Pyrrolidone (NMP)	20 mg/Nm^3 where actual mass emission is < 10 g/h or 2 mg/Nm^3 where actual mass emission is ≥10 g/h	Average over the sampling period	Periodic monitoring	On commissioning and thereafter at least four times per each financial year[2] in accordance with a monitoring strategy to be agreed in writing with the regulator.	BS EN 12619
A2 [as shown in Appendix 2]	FPL						
A2 [as shown in Appendix 2]	FPL	Carbon monoxide (CO)	100 mg/Nm^3	Average over the sampling period	Periodic monitoring	On commissioning and at least once per each financial year[2] in accordance with a monitoring strategy to be agreed in writing with the regulator.	EN 15058

A2 [as shown in Appendix 2]	FPL	Total Volatile Organic Compounds (TVOC)[3] (expressed as total mass of organic carbon)	50 mg/Nm^3	Average over the sampling period	Periodic monitoring [where mass emission is 0.1kg to 10 kg/h]	On commissioning and thereafter at least four times per each financial year[2] in accordance with a monitoring strategy to be agreed in writing with the regulator.	BS EN 12619
A2 [as shown in Appendix 2]	FPL	Oxides of Nitrogen (expressed as NO_2)	100 mg/Nm^3	Average over the sampling period	Periodic monitoring	On commissioning and thereafter at least four times per each financial year[2] in accordance with a monitoring strategy to be agreed in writing with the regulator.	BS EN 14792

[1] All emission concentrations shall be expressed at reference conditions 273.1 Kelvin (K), 101.3 kilo Pascals (kPa), without correction for water vapour content, unless stated otherwise.

[2] Financial year shall be interpreted as a 12-month period commencing on April 1st and ending on March 31st of the following year.

[3] The limit value specified for total volatile organic compounds (TVOCs) in Table 1 shall not apply to compounds that carry specific risk phrases such as those in Article 58 of Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control), and halogenated volatile organic compounds which are assigned or need to carry the hazard statements H341 or H351. The use of compounds matching this criteria shall be prohibited on both the ISL and FPL unless they are explicitly identified in Table 1.

Dispersion of emissions

11. Stacks and ductwork shall be leak-proof.

12. Stacks and ductwork shall be adequately insulated to minimise the cooling of waste gases and prevent liquid condensation on internal surfaces.

13. Stacks vents and process exhausts shall not be fitted with any restriction at the final outlet.

14. The operator shall operate the ISL condenser and activated carbon NMP emissions abatement system in accordance with each system's Operations & Maintenance (O&M) requirements. The operations shall be optimised to maximise recovery in the condenser, residence time in the activated carbon and resource efficiency. Documented operating procedures, inspection records and maintenance records shall be retained and made available upon request.

15. The exhaust stack and ductwork serving the ISL coating process shall be regularly inspected and cleaned to prevent the accumulation of condensate as part of a routine maintenance programme required by Condition 47 of this permit.

16. The exhaust stack serving the FPL coating process shall terminate at least 9 metres above ground level and achieve a minimum exit velocity of 10m/s during peak operating conditions so as to avoid down wash of the plume.

17. A system of interlocks shall be fitted to the RTO and FPL coating machines and shall be maintained at all operating times to prevent the operation of the coating machine if:

    a) The inlet fan to the RTO fails; or

    b) A gas burner fails or the gas supply is interrupted; or

    c) The temperature of the combustion chamber falls below 800°C; or

    d) A bypass valve is activated allowing the coating machine exhaust to discharge direct to atmosphere; or

    e) Urea continues to be injected when the catalytic oxidiser (CATOX) is idle; or

    f) The delivery of urea fails

18. The operator shall, before operating the process at the start of each new shift and at least once every day when the FPL is in use, ensure that:

    a) the burners in the regenerative thermal oxidiser (RTO) and catalytic oxidiser (CATOX) are operating correctly;

    b) the temperature probes and temperature recording devices in the RTO are operating correctly;

    c) the urea dosing system is operating correctly; and

    d) the minimum operating temperature of 800°C is established in the combustion chamber of the RTO.

19. Audible and visual alarms shall be fitted and maintained at all operating times to warn the operator of arrestment plant failure or malfunction. The operator shall investigate immediately every triggering of the alarm and shall record the incident as detailed in conditions 31 and 49 of this permit.

Non-continuous emission testing measurements

20. Emissions shall be tested on commissioning of the plant and thereafter at least four times a year in accordance with a monitoring strategy to be agreed in writing by the regulator. The monitoring strategy shall take account of the duration of operation of the plant and the need to verify effective operation of the solvent recovery system and abatement plant.

21. Emissions monitoring of total volatile organic compounds (TVOCs) shall be carried out in accordance with the main procedural requirements of BS EN 12619 with averages taken over operating periods, excluding start-up and shutdown. Where N Methyl-2-Pyrrolidone (NMP) is the main constituent of the emission, the readings shall be converted from total carbon to NMP by suitable calculation method.

OR in the alternative emissions monitoring of N Methyl-2-Pyrrolidone (NMP) shall be carried out in accordance with the requirements CEN/TS13649 with averages taken over operating periods, excluding start-up and shutdown.

Both the mass emission and the concentration shall be reported.

22. The operator shall ensure that adequate facilities for sampling are provided on vents or ducts. Without prejudice to the generality of the above "adequate facilities" includes safe means of access to the sampling port or ports, and a safe working platform for the insertion and removal of monitoring equipment.

23. The operator shall notify the regulator, in writing, at least 7 days before any periodic monitoring exercise to determine compliance with emission limit values. The operator shall state the provisional time and date of monitoring, pollutants to be tested and the method to be used.

24. The operator shall ensure the results of all non-continuous emission testing are forwarded to the regulator within 8 weeks of the completion of the sampling.

Fugitive emissions of solvent

25. Fugitive emissions of solvent shall be not greater than 20% of solvent input. This shall be calculated using the mass balance method set out in Part 7 of Annex Vll of the Industrial Emissions directive 2010/75/EU.

26. The operator shall draw up a solvent management plan as per Appendix 4 of this permit to assist in the calculation of fugitive emissions.

27. The operator shall keep a detailed inventory of the mass solvent consumption of the prescribed process to support calculation of the fugitive emission.

28. Fugitive emissions shall be calculated and submitted to the regulator for each manufacturing campaign unless that campaign extends beyond 12 months' duration in which case an annual calculation shall be made and submitted to the regulator.

29. The calculated fugitive emission, the mass solvent input, the underpinning mass balance calculations, and the supporting inventory for the reporting period shall be provided to the regulator not later than 20 working days from the end of the reporting period.

Abnormal operating conditions

30. Activity shall not continue in the event of breakdown of the abatement plant or solvent recovery plant.

31. When any adverse monitoring results are obtained, or malfunction or breakdown of plant leading to abnormal emissions occurs then the operator shall:

    a) identify the cause and take prompt corrective action;

    b) clearly record as much detail as possible regarding the cause and extent of the problem, and the remedial action taken;

    c) re-test to demonstrate compliance as soon as possible; and

d) inform the regulator of the steps taken and the re-test results

For the purpose of this condition, abnormal emissions shall be taken to be olfactory as well as visible emissions.

32. The Regulator shall be informed without delay:

a) if there is an emission which is likely to have an effect on the local community;

b) in the event of failure of key arrestment plant; and/or

c) in the event of operation of the emergency vent from the solvent system.

Materials handling and storage

33. The receipt, handling, and storage of organic solvents and other potentially odorous or harmful substances shall be carried out in such a way that emissions are prevented or minimised and rendered harmless.

34. All materials containing VOCs or other harmful materials shall be stored in suitable closed containers or bulk storage vessels, and, where appropriate, vented to suitable arrestment plant.

35. All chemical storage tanks and containers shall be completely contained by bunding that is sealed and resistant to the chemicals in storage and is capable of holding 110% of the capacity of the largest storage tank.

36. Where liquid spillages occur, they shall be immediately cleaned up and contaminated material shall be held in a closed labeled container. Sufficient supplies of decontaminant and suitable absorbent material shall be kept at all times.

37. Spillages of solids and dusty materials shall be cleared as soon as possible; solids by vacuum cleaning, wet methods or other appropriate techniques. Dry sweeping of dusty spillages is forbidden.

Cleaning

38. Arrangements shall be made for the dispatch, recycling, or re-use of all dirty solvents that have been used (e.g. for cleaning equipment) and all other liquid wastes that contain volatile organic compounds.

39. Where manual cleaning is unavoidable:

a) Cleaning solvents shall be kept in enclosed containers whilst not in use;

b) Wiping cloths or brushes shall be impregnated with cleaning solvent in a controlled manner, using a dispenser or similar device;

c) Used wiping cloths or brushes shall be stored in enclosed containers.

Management information and instructions, and training for staff

40. The operator shall have an appropriate person as the primary point of contact with the regulator and shall notify the regulator in writing of the name of that appointed person and their deputy. In the event of a different person being

appointed as the primary point of contact the operator shall inform the regulator without delay.

41. At all times while this permit is in force, a copy of the permit shall be kept posted at the location of the permitted process in such characters and in such position as to be conveniently read by persons having duties which are, or may be, affected by the matters set out in this permit.

42. The operator shall draw up a statement of the operator's arrangements to comply with the requirements of this permit and the organisation for implementation of those arrangements. The statement may refer to existing documented working procedures relevant to pollution control, written work instructions, and documented systems for training and maintenance. This statement of organisation and arrangements to comply with this permit must be brought to the attention of all staff with pollution control responsibilities. A copy of the statement shall be made available to the regulator upon request.

43. Without prejudice to the general requirements of condition 42 of this permit, the operator will provide to staff written procedures for operation of the plant to control emissions and actions to be taken in the event of abnormal operating conditions, failure of plant, controls or abatement plant, spillage of chemicals/waste chemicals, and uncontrolled emissions to atmosphere.

44. The operator shall maintain a statement of training requirements for each operational post and keep a record of training received by each person whose actions may have an effect on the environment. These documents shall be made available to the regulator upon request.

45. The operator shall put in place systems of supervision and auditing to ensure effective operation of their arrangements to comply with the requirements of this permit.

Maintenance

46. All ventilation infrastructure and the associated emissions abatement system will be subject to inspections, servicing, and maintenance in accordance with the manufacturer's recommendations.

47. The operator shall implement an effective planned preventative maintenance and calibration programme for all aspects of the activity including all plant, monitors, sensors, buildings, and the equipment concerned with the control of emissions to air. A written maintenance and calibration programme shall be made available to the regulator upon request and a record of such maintenance and calibration shall be made available for inspection to the regulator upon request.

48. The operator shall determine the lifespan of the media within the carbon scrubber stack serving the ISL through calculation and/or periodic monitoring. Thereafter, the operator shall ensure that the media is replenished in accordance with this calculated lifespan. Details of any calculations or monitoring data used in the determination of the media lifespan shall be kept in writing and provided to the regulator upon request.

Records

49. A record shall be kept of the following:

    a) Calculation of fugitive solvent emissions for each reporting period, the target fugitive emission and the actual fugitive emission for each period with the information used to determine fugitive emissions including the solvent inventory

    b) Reports of non-continuous emissions testing

    c) Reports of visual and olfactory assessments

    d) Maintenance works undertaken to comply with conditions 46 and 47 of this permit including records of maintenance and calibration (or referencing) of emissions monitoring equipment

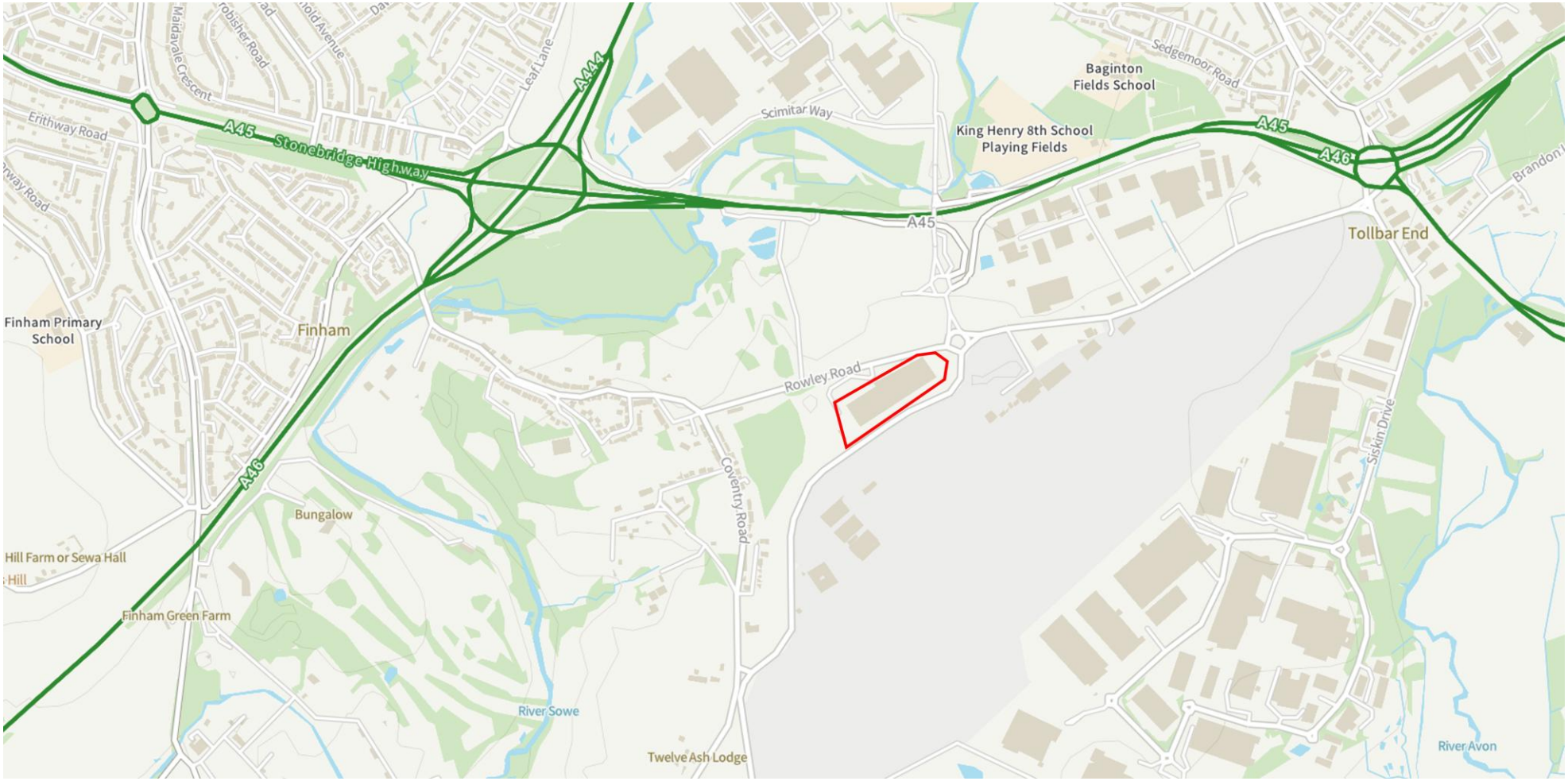
    e) Action taken against adverse results, malfunction, or breakdown of plant

    f) Statement of training requirements and training records

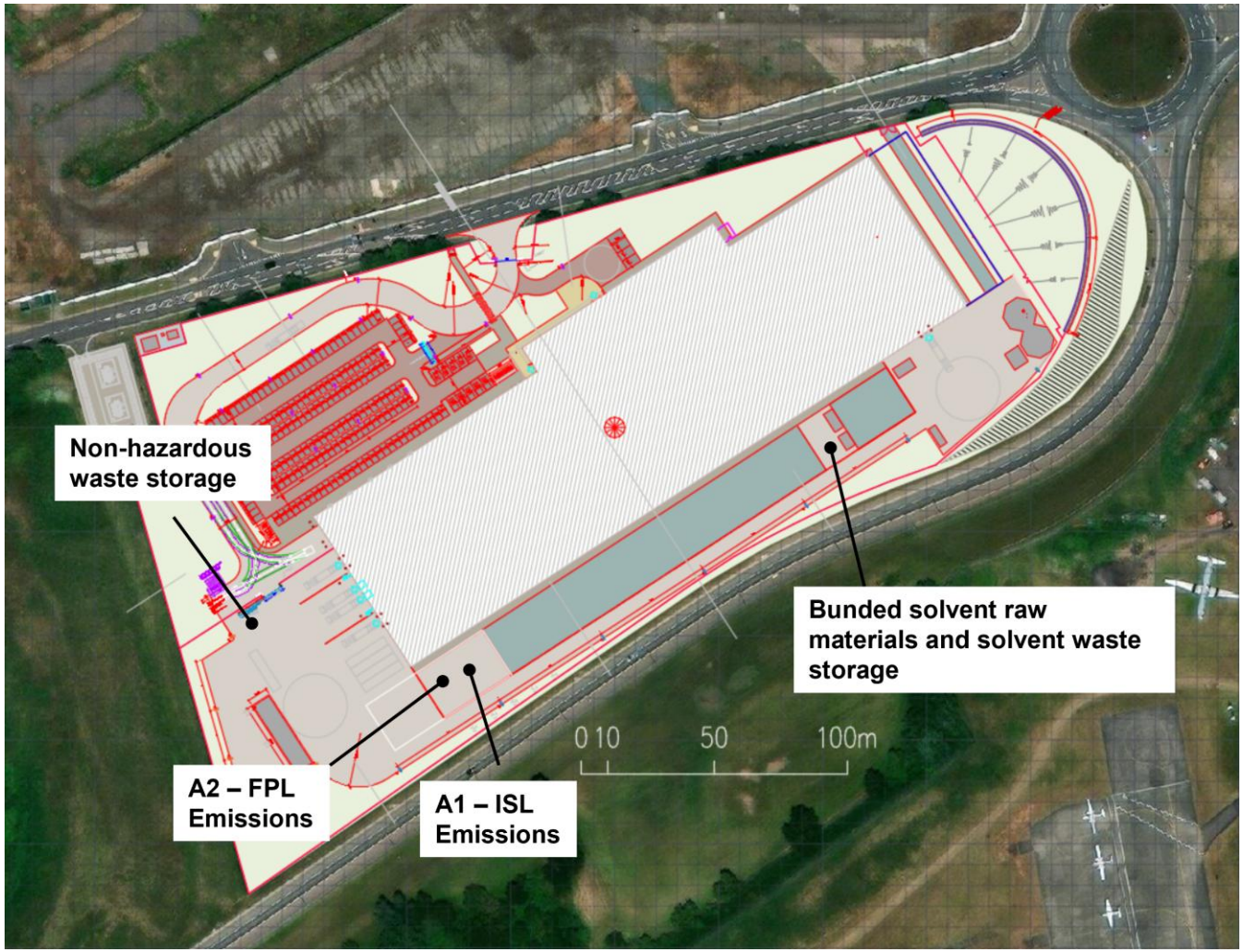
    g) Annual permit reviews as required by Condition 2 of this permit

50. The records required by condition 49 of this permit shall be kept by the operator for a minimum of five years and shall be made available to the regulator upon request. If any records are kept off-site they should be made available for inspection within one working week of any request by the regulator.

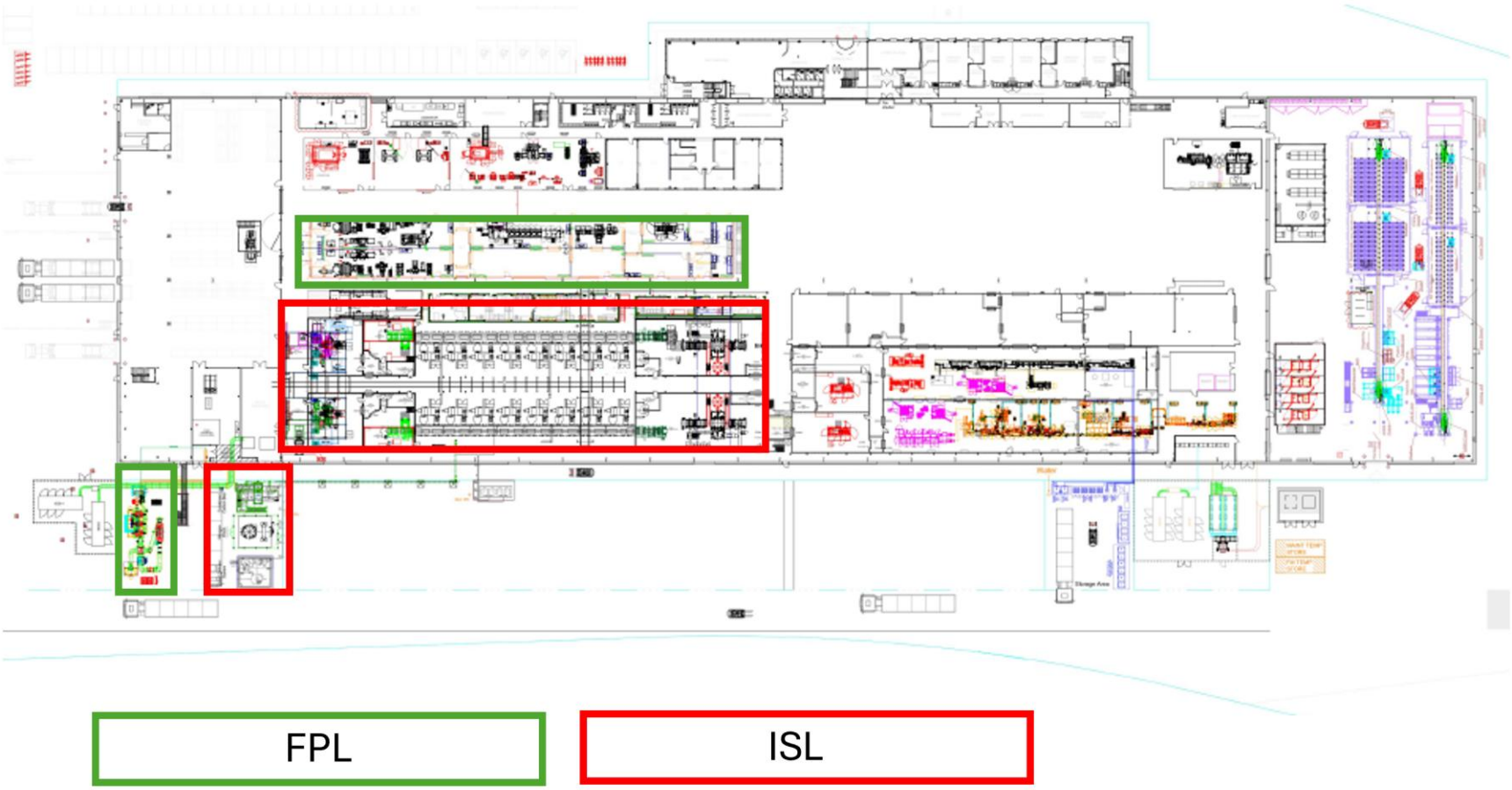
Appendix 1 - Location Plan



Appendix 2 – External site layout



Appendix 3 – Internal site layout



Appendix 4 - Fugitive emission calculation and solvent management plan

Compliance with the fugitive emission limit is achieved if the actual fugitive emission of solvent for the period, determined from the Solvent Management Plan, is less than or equal to 20% of the solvent input for the period.

The actual fugitive solvent emission (F) is calculated using the following formula:

$F = I_1 - O_1 - O_5 - O_6 - O_7 - O_8$

Where: I_1 = Solvent input

O_8 = Solvent sent for recovery

O_7 = Solvents sold to 3rd Party

O_6 = Residual solvents in empty containers, drums etc.

O_5 = Removed in abatement

O_1 = Emission in waste gasses

Solvent input (I_1) is calculated using the following formula:

$I_1 = IS + PS - FS$

Where:

IS = The mass of organic solvent in the initial stock at the start of the accounting period.

PS = The mass of organic solvent purchased during the accounting period.

FS = The mass of organic solvent in the final stock at the end of the accounting period.

Solvent management plan inputs and outputs

The solvent management plan provides definitions and calculations to demonstrate compliance with the VOC requirements of this permit. The use of standard definitions and calculations also ensures consistency of VOC compliance across installations within an industrial sector.

For more information on solvent management plans see PG6/23 (11)