

**This licence was amended on 21<sup>st</sup> January 2010 under Section 96(1) of the Environmental Protection Agency Acts, 1992 to 2007. The details of Amendment A must be read in conjunction with this licence. The amendment document is entitled “Technical Amendment A”.**

**This licence was amended on 2nd March 2011 under Section 96(1) of the Environmental Protection Agency Acts, 1992 to 2007. The details of Amendment B must be read in conjunction with this licence. The amendment document is entitled “Amendment B”.**



Headquarters  
P.O. Box 3000  
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County Wexford  
Ireland

## INTEGRATED POLLUTION PREVENTION & CONTROL LICENCE

<b>Licence Register Number:</b>	746
<b>Licensee:</b>	Intel Ireland Limited
<b>Location of Installation:</b>	Collinstown Industrial Park Leixlip County Kildare

ENVIRONMENTAL PROTECTION AGENCY ACTS, 1992 AND 2003

**INTEGRATED POLLUTION PREVENTION AND CONTROL  
LICENCE**

Decision of Agency, under Section 83(1) of the Environmental Protection Agency Acts, 1992 and 2003.

Reference number in  
Register of licences: 746

Further to notice dated 13th October 2005, the Agency in exercise of the powers conferred on it by the Environmental Protection Agency Acts, 1992 and 2003, for the reasons hereinafter set out, hereby grants a licence to

Intel Ireland Limited, Collinstown Industrial Park, Leixlip, County Kildare,

to carry on the following activities

Principal Activity:

13.2 The manufacture of integrated circuits and printed circuit boards;

Related Activities:

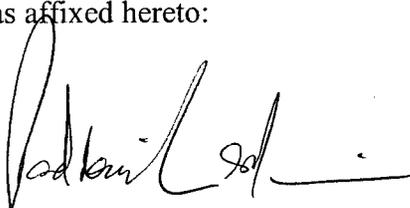
2.1 The operation of combustion installations with a rated thermal input equal to or greater than 50MW;

12.2.1 The surface treatment of products using organic solvents, in particular for coating, cleaning, with a consumption capacity of more than 200 tonnes per year;

at Collinstown Industrial Park, Leixlip, County Kildare, subject to the conditions as set out.

GIVEN under the Seal of the Agency this 21st day of December 2005.

PRESENT when the seal of the Agency  
was affixed hereto:



Director/Authorised Person



# ***INTRODUCTION***

This introduction is not part of the licence and does not purport to be a legal interpretation of the licence.

Intel Ireland Limited carries out the manufacture of integrated circuits in three wafer fabrication facilities (known as FAB 10, FAB 14 and FAB 24) on their site in Leixlip, County Kildare. The site was licensed under Reg. No. 207 in 1997 and was issued a new licence Reg. 589 in 2002 to accommodate the operation of FAB 24.

This application for a new licence is to allow the company to further expand the site by constructing a further 192,000 square feet of cleanroom. This is planned in two stages:

FAB 24-2 – 60,000 sq.ft.

FAB 24-3 – 132,000 sq.ft.

The licence sets out in detail the conditions under which Intel Ireland Limited will operate and manage this installation.



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## *Glossary of Terms*

All terms in this licence should be interpreted in accordance with the definitions in the Environmental Protection Agency Acts 1992 and 2003, (the Acts), unless otherwise defined in this section.

<b>Adequate lighting</b>	20 lux measured at ground level.
<b>AER</b>	Annual Environmental Report.
<b>Agreement</b>	Agreement in writing.
<b>Annually</b>	All or part of a period of twelve consecutive months.
<b>Attachment</b>	Any reference to Attachments in this licence refers to attachments submitted as part of this licence application.
<b>Application</b>	The application by the licensee for this licence.
<b>Appropriate facility</b>	A waste management facility, duly authorised under relevant law and technically suitable.
<b>BAT</b>	Best Available Techniques.
<b>Bi-annually</b>	All or part of a period of six consecutive months.
<b>Biennially</b>	Once every two years.
<b>BOD</b>	5 day Biochemical Oxygen Demand.
<b>CEN</b>	Comité Européen De Normalisation – European Committee for Standardisation.
<b>COD</b>	Chemical Oxygen Demand.
<b>Construction and Demolition Waste</b>	Wastes that arise from construction, renovation and demolition activities: Chapter 17 of the EWC or as otherwise may be agreed.
<b>Containment boom</b>	A boom which can contain spillages and prevent them from entering drains or watercourses or from further contaminating watercourses.
<b>Daily</b>	During all days of plant operation, and in the case of emissions, when emissions are taking place; with at least one measurement on any one day.
<b>Day</b>	Any 24 hour period.
<b>Daytime</b>	0800 hrs to 2200 hrs.
<b>dB(A)</b>	Decibels (A weighted).
<b>DO</b>	Dissolved Oxygen.
<b>Documentation</b>	Any report, record, result, data, drawing, proposal, interpretation or other document in written or electronic form which is required by this licence.
<b>Drawing</b>	Any reference to a drawing or drawing number means a drawing or drawing number contained in the application, unless otherwise specified in this licence.
<b>EMP</b>	Environmental Management Programme.



<b>Emission Limits</b>	Those limits, including concentration limits and deposition rates established in <i>Schedule B</i> of this licence.
<b>Environmental Damage</b>	Has the meaning given it in Directive 2004/35/EC.
<b>EPA</b>	Environmental Protection Agency.
<b>European Waste Catalogue (EWC)</b>	A harmonised, non-exhaustive list of wastes drawn up by *the European Commission and published as Commission Decision 2000/532/EC and any subsequent amendment published in the Official Journal of the European Community.
<b>FAB</b>	A semi-conductor fabrication (manufacture) facility.
<b>Facility</b>	Any site or premises used for the purposes of the recovery or disposal of waste.
<b>Fortnightly</b>	A minimum of 24 times per year, at approximately two week intervals.
<b>Fugitive Emission</b>	As defined in the Solvents Directive 1999/13/EC.
<b>GC/MS</b>	Gas Chromatography/Mass Spectroscopy.
<b>Green waste</b>	Waste wood (excluding timber), plant matter such as grass cuttings, and other vegetation.
<b>Heavy Metals</b>	This term is to be interpreted as set out in "Parameters of Water Quality, Interpretation and Standards" published by the Agency in 2001. ISBN 1-84095-015-3.
<b>HFO</b>	Heavy Fuel Oil.
<b>Hours of Operation</b>	The hours during which the installation is authorised to be operational.
<b>ICP</b>	Inductively Coupled Plasma Spectroscopy.
<b>Incident</b>	The following shall constitute an incident for the purposes of this licence: <ul style="list-style-type: none"><li>a) an emergency;</li><li>b) any emission which does not comply with the requirements of this licence;</li><li>c) any exceedence of the daily duty capacity of the waste handling equipment;</li><li>d) any trigger level specified in this licence which is attained or exceeded; and,</li><li>e) any indication that environmental pollution has, or may have, taken place.</li></ul>
<b>Installation</b>	A stationary technical unit or plant where the activity concerned referred to in the First Schedule of EPA Acts 1992 and 2003 is or will be carried on, and shall be deemed to include any directly associated activity, which has a technical connection with the activity and is carried out on the site of the activity.
<b>IPPC</b>	Integrated Pollution Prevention & Control.
<b>K</b>	Kelvin.



<b>kPa</b>	Kilo Pascals.
<b>Leq</b>	Equivalent continuous sound level.
<b>Licensee</b>	Intel Ireland Limited, Collinstown Industrial Park, Leixlip, County Kildare.
<b>List I</b>	As listed in the EC Directives 76/464/EEC and 80/68/EEC and amendments.
<b>List II</b>	As listed in the EC Directives 76/464/EEC and 80/68/EEC and amendments.
<b>Local Authority</b>	Kildare County Council.
<b>Maintain</b>	Keep in a fit state, including such regular inspection, servicing, calibration and repair as may be necessary to adequately perform its function.
<b>Mass Flow Limit</b>	An Emission Limit Value which is expressed as the maximum mass of a substance which can be emitted per unit time.
<b>Mass Flow Threshold</b>	A mass flow rate, above which, a concentration limit applies.
<b>Monthly</b>	A minimum of 12 times per year, at approximately monthly intervals.
<b>Night-time</b>	2200 hrs to 0800 hrs.
<b>Noise Sensitive Location (NSL)</b>	Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other installation or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.
<b>Oil Separator</b>	Device installed according to the International Standard I.S.EN 858-2:2002 (Separator systems for light liquids, (e.g. oil and petrol)-Part 2: Selection of nominal size, installation, operation and maintenance.
<b>PER</b>	Pollution Emission Register.
<b>Quarterly</b>	All or part of a period of three consecutive months beginning on the first day of January, April, July or October.
<b>Regional Fisheries Board</b>	Eastern Regional Fisheries Board.
<b>RCTO</b>	Rotor Concentrator Thermal Oxidiser.
<b>Sanitary Authority</b>	Kildare County Council.
<b>Sanitary Effluent</b>	Waste water from installation toilet, washroom and canteen facilities.
<b>Sample(s)</b>	Unless the context of this licence indicates to the contrary, samples shall include measurements by electronic instruments.
<b>SOP</b>	Standard Operating Procedure.

<b>Standard Method</b>	A National, European or internationally recognised procedure (eg, I.S. EN, ISO, CEN, BS or equivalent), as an in-house documented procedure based on the above references, a procedure as detailed in the current edition of "Standard Methods for the Examination of Water and Wastewater", (prepared and published jointly by A.P.H.A., A.W.W.A & W.E.F), American Public Health Association, 1015 Fifteenth Street, N.W., Washington DC 20005, USA; or, an alternative method as may be agreed by the Agency.
<b>Storm Water</b>	Rain water run-off from roof and non-process areas.
<b>The Agency</b>	Environmental Protection Agency.
<b>TA Luft</b>	Technical Instructions on Air Quality Control - TA Luft in accordance with art. 48 of the Federal Immission Control Law (BImSchG) dated 15 March 1974 (BGBl. I p.721). Federal Ministry for Environment, Bonn 1986, including the amendment for Classification of Organic Substances according to section 3.1.7 TA.Luft, published in July 1997.
<b>TOC</b>	Total Organic Carbon.
<b>Trade Effluent</b>	Trade Effluent has the meaning given in the water pollution Acts 1977 and 1990.
<b>Trigger Level</b>	A parameter value, the achievement or exceedance of which requires certain actions to be taken by the licensee.
<b>Weekly</b>	During all weeks of plant operation, and in the case of emissions, when emissions are taking place; with at least one measurement in any one week.
<b>WWTP</b>	Waste Water Treatment Plant.

## ***Decision & Reasons for the Decisions***

### ***Reasons for the Decision***

The Agency is satisfied, on the basis of the information available, that subject to compliance with the conditions of this licence, any emissions from the activity will comply with and will not contravene any of the requirements of Section 83(5) of the Environmental Protection Agency Acts, 1992 and 2003.

In reaching this decision the Environmental Protection Agency has considered the application and supporting documentation received from the applicant, all submissions and objections received and the reports of its inspectors.

### ***Part I Schedule of Activities Licensed***

In pursuance of the powers conferred on it by the Environmental Protection Agency Acts, 1992 and 2003, the Agency hereby grants a licence to:

Intel Ireland Limited, Collinstown Industrial Park, Leixlip, County Kildare,

under Section 83(1) of the said Acts to carry on the following activities:

Principal Activity:

13.2 The manufacture of integrated circuits and printed circuit boards;

Related Activities:

2.1 The operation of combustion installations with a rated thermal input equal to or greater than 50MW;

12.2.1 The surface treatment of products using organic solvents, in particular for coating, cleaning, with a consumption capacity of more than 200 tonnes per year;

at Collinstown Industrial Park, Leixlip, County Kildare, subject to the following twelve Conditions, with the reasons therefor and associated schedules attached thereto.

### ***Part II Schedule of Activities Refused***

None of the proposed activities as set out in the licence application have been refused.

## Part III Conditions

### Condition 1. Scope

- 1.1 Activities at this installation shall be limited as set out in *Schedule A: Limitations*.
- 1.2 The installation shall be controlled, operated, and maintained and emissions shall take place as set out in this licence. All programmes required to be carried out under the terms of this licence, become part of this licence.
- 1.3 For the purposes of this licence, the installation is the area of land outlined in bold on Drawing No. Intel-SB of the application. Any reference in this licence to "installation" shall mean the area thus outlined in bold. The licensed activities shall be those carried on only within the area outlined.
- 1.4 No alteration to, or reconstruction in respect of, the activity or any part thereof which would, or is likely to, result in
- (a) a material change or increase in:
- The nature or quantity of any emission,
  - The abatement/treatment or recovery systems,
  - The range of processes to be carried out,
  - The fuels, raw materials, intermediates, products or wastes generated, or
- (b) any changes in:
- Site management infrastructure or control with adverse environmental significance,
- shall be carried out or commenced without prior notice to, and without the agreement of, the Agency.
- 1.5 This licence is for the purposes of IPPC licensing under the EPA Acts, 1992 and 2003 only and nothing in this licence shall be construed as negating the licensee's statutory obligations or requirements under any other enactments or regulations.
- 1.6 This licence has been granted in substitution for licence granted to the licensee on 8 February 2002 and bearing Register No. 589. The previous licence (Reg. No. 589) is replaced by this new licence.

*Reason:* To clarify the scope of this licence.

### Condition 2. Management of the Installation

- 2.1 Installation Management
- 2.1.1 The licensee shall employ a suitably qualified and experienced installation manager who shall be designated as the person in charge. The installation manager or a nominated, suitably qualified and experienced, deputy shall be present on the installation at all times during its operation or as otherwise required by the Agency.
- 2.1.2 The licensee shall ensure that personnel performing specifically assigned tasks shall be qualified on the basis of appropriate education, training and experience, as required and shall be aware of the requirements of this licence.

## 2.2 Environmental Management System (EMS)

2.2.1 The licensee shall maintain an Environmental Management System (EMS). The EMS shall be updated on an annual basis.

2.2.2 The EMS shall include as a minimum the following elements:

2.2.2.1 Management and Reporting Structure.

2.2.2.2 Schedule of Environmental Objectives and Targets.

The licensee shall maintain a Schedule of Environmental Objectives and Targets. The Schedule shall as a minimum provide for a review of all operations and processes, including an evaluation of practicable options, for energy and resource efficiency, the use of cleaner technology, cleaner production, and the prevention, reduction and minimisation of waste, and shall include waste reduction targets. The Schedule shall include time frames for the achievement of set targets and shall address a five-year period as a minimum. The Schedule shall be reviewed annually and amendments thereto notified to the Agency for agreement as part of the Annual Environmental Report (AER).

2.2.2.3 Environmental Management Programme (EMP)

The licensee shall maintain an EMP, including a time schedule, for achieving the Environmental Objectives and Targets prepared under Condition 2.2.2.2. It shall include:

- (a) designation of responsibility for targets;
- (b) the means by which they may be achieved;
- (c) the time within which they may be achieved.

The EMP shall be reviewed annually and amendments thereto notified to the Agency for agreement as part of the Annual Environmental Report (AER) (Condition 11.7).

A report on the programme, including the success in meeting agreed targets, shall be prepared and submitted to the Agency as part of the AER. Such reports shall be retained on-site for a period of not less than seven years and shall be available for inspection by authorised persons of the Agency.

2.2.2.4 Documentation

- (i) The licensee shall maintain an environmental management documentation system which shall be to the satisfaction of the Agency.
- (ii) The licensee shall issue a copy of this licence to all relevant personnel whose duties relate to any condition of this licence.

2.2.2.5 Corrective Action

The licensee shall maintain procedures to ensure that corrective action is taken should the specified requirements of this licence not be fulfilled. The responsibility and authority for initiating further investigation and corrective action in the event of a reported non-conformity with this licence shall be defined.

#### 2.2.2.6 Awareness and Training

The licensee shall maintain procedures for identifying training needs, and for providing appropriate training, for all personnel whose work can have a significant effect upon the environment. Appropriate records of training shall be maintained.

#### 2.2.2.7 Communications Programme

The licensee shall maintain a Public Awareness and Communications Programme to ensure that members of the public are informed, and can obtain information at the installation, at all reasonable times, concerning the environmental performance of the installation.

*Reason: To make provision for management of the activity on a planned basis having regard to the desirability of ongoing assessment, recording and reporting of matters affecting the environment.*

### **Condition 3. Infrastructure and Operation**

- 3.1 The licensee shall establish all infrastructure referred to in this licence prior to the commencement of the licensed activities or as required by the conditions of this licence.
- 3.2 Installation Notice Board
- 3.2.1 The licensee shall provide and maintain an Installation Notice Board on the installation so that it is legible to persons outside the main entrance to the installation. The minimum dimensions of the board shall be 1200 mm by 750 mm.
- 3.2.2 The board shall clearly show:-
- a) the name and telephone number of the installation;
  - b) the normal hours of opening;
  - c) the name of the licence holder;
  - d) an emergency out of hours contact telephone number;
  - e) the licence reference number; and
  - f) where environmental information relating to the installation can be obtained.
- 3.3 The licensee shall install on all emission points such sampling points or equipment, including any data-logging or other electronic communication equipment, as may be required by the Agency. All such equipment shall be consistent with the safe operation of all sampling and monitoring systems.
- 3.4 Sampling equipment shall be operated and maintained such that sufficient sample is collected to meet both internal monitoring requirements and those of the Agency. A separate composite sample or homogeneous sub-sample (of sufficient volume as advised) should be refrigerated immediately after collection and retained as required for EPA use.
- 3.5 The licensee shall clearly label and provide safe and permanent access to all on-site sampling and monitoring points and where practicable to off-site sampling and monitoring points, with the agreement of landowner, as required by the Agency.

### 3.6 Tank and Drum Storage Areas

- 3.6.1 All tank and drum storage areas shall be rendered impervious to the materials stored therein.
- 3.6.2 All tank and drum storage areas shall, as a minimum, be bunded, either locally or remotely, to a volume not less than the greater of the following:-
- (i) 110% of the capacity of the largest tank or drum within the bunded area; or
  - (ii) 25% of the total volume of substance which could be stored within the bunded area.
- 3.6.3 All drainage from bunded areas shall be diverted for collection and safe disposal.
- 3.6.4 All inlets, outlets, vent pipes, valves and gauges must be within the bunded area.
- 3.6.5 The integrity and water tightness of all new bunding structures and their resistance to penetration by water or other materials stored therein shall be tested and demonstrated by the licensee prior to their use. This testing shall be carried out in accordance with any guidance published by the Agency.
- 3.6.6 The integrity and water tightness of all bunding structures and their resistance to penetration by water or other materials stored therein shall be tested and demonstrated by the licensee at least once every three years. This testing shall be carried out in accordance with any guidance published by the Agency.

- 3.7 The licensee shall have in storage an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spillage at the installation. Once used the absorbent material shall be disposed of at an appropriate facility.

### 3.8 Silt Traps and Oil Separators

- 3.8.1 The licensee shall install and maintain silt traps and oil separators at the installation to ensure that all storm water discharges from the installation pass through a silt trap and oil separator prior to discharge.

### 3.9 Firewater Retention

- 3.9.1 Within six months of the commencement of operations at FAB 24-2 and FAB 24-3 respectively, the licensee shall carry out a risk assessment to determine if the fire-water retention facilities on-site are adequate in relation to the risk which exists for the release of contaminated fire-water. This assessment may build on previous reports submitted to the Agency and the licensee shall consult with the Agency as to the additional information required. The licensee shall submit the assessment and a report to the Agency on the findings and recommendations of the assessment within one month of completion of the assessment.
- 3.9.2 In the event that a significant risk exists for the release of contaminated fire-water, the licensee shall, based on the findings of the risk assessment, prepare and implement, with the agreement of the Agency, a suitable risk management programme. The risk management programme shall be fully implemented within three months from date of notification by the Agency.

- 3.9.3 The licensee shall have regard to the Environmental Protection Agency Draft Guidance Note to Industry on the Requirements for Fire-Water Retention Facilities when implementing Conditions 3.9.1 and 3.9.2 above.
- 3.10 All pump sumps, storage tanks or other treatment plant chambers from which spillage of environmentally significant materials might occur in such quantities as are likely to breach local or remote containment or separator, shall be fitted with high liquid level alarms (or oil detectors as appropriate) prior to use.
- 3.11 All wellheads, whose locations are shown on Map Figure 4.6, Attachment F.5.4 of the licence application shall be adequately protected to prevent contamination or physical damage.
- 3.12 The licensee shall maintain in a prominent location on the site a wind sock, or other wind direction indicator, which shall be visible from the public roadway outside the site.

*Reason: To provide for appropriate operation of the installation to ensure protection of the environment.*

## Condition 4. Interpretation

- 4.1 Emission limit values for emissions to atmosphere in this licence shall be interpreted in the following way:
- 4.1.1 Continuous Monitoring:
- (i) No 24 hour mean value shall exceed the emission limit value.
  - (ii) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.
  - (iii) No 30 minute mean value shall exceed twice the emission limit value.
- 4.1.2 For Non-Continuous Monitoring
- (i) For any parameter where, due to sampling/analytical limitations, a 30 minute sample is inappropriate, a suitable sampling period should be employed and the value obtained therein shall not exceed the emission limit value.
  - (ii) For flow, no hourly or daily mean value, calculated on the basis of appropriate spot readings, shall exceed the relevant limit value.
  - (iii) For all other parameters, no 30 minute mean value shall exceed the emission limit value.
  - (iv) Mass flow thresholds refer to a rate of discharge expressed in units of kg/h, above which the concentration emission limit value applies. Mass flow threshold rates shall be determined on the basis of a single 30 minute measurement (i.e. the concentration determined as a 30 minute average shall be multiplied by an appropriate measurement of flow and the result shall be expressed in units of kg/h).
  - (v) Mass flow limits shall be calculated on the basis of the concentration, determined as an average over the specified period, multiplied by an appropriate measurement of flow. No value, so determined, shall exceed the mass flow limit value.

- 4.2 The concentration and volume flow limits for emissions to atmosphere specified in this licence shall be achieved without the introduction of dilution air and shall be based on gas volumes under standard conditions of :-
- 4.2.1 In the case of non-combustion gases:  
Temperature 273K, Pressure 101.3 kPa (no correction for oxygen or water content).
- 4.2.2 In the case of combustion gases:  
Temperature 273K, Pressure 101.3 kPa, dry gas; 3% oxygen for liquid and gas fuels; 18% oxygen for thermal oxidisers.
- 4.3 Emission limit values for emissions to sewer in this licence shall be interpreted in the following way:-
- 4.3.1 Continuous monitoring:
- (i) No flow value shall exceed the specified limit.
  - (ii) No pH value shall deviate from the specified range.
  - (iii) No temperature value shall exceed the limit value.
- 4.3.2 Composite Sampling:
- (i) No pH value shall deviate from the specified range.
  - (ii) For parameters other than pH and flow, eight out of ten consecutive composite results, based on flow proportional composite sampling, shall not exceed the emission limit value. No individual result similarly calculated shall exceed 1.2 times the emission limit value.
- 4.3.3 Discrete Sampling  
For parameters other than pH and temperature, no grab sample value shall exceed 1.2 times the emission limit value.
- 4.4 Where the ability to measure a parameter is affected by mixing before emission, then, with agreement from the Agency, the parameter may be assessed before mixing takes place.
- 4.5 Noise from the installation shall not give rise to sound pressure levels (Leq,T) measured at any noise sensitive location that exceed the specified limit values by more than 2 dB(A).

*Reason: To clarify the interpretation of limit values fixed under the licence.*

## Condition 5. Emissions

- 5.1 No specified emission from the installation shall exceed the emission limit values set out in *Schedule B: Emission Limits* of this licence. There shall be no other emissions of environmental significance.
- 5.2 The licensee shall ensure that the activities shall be carried out in a manner such that emissions including odours do not result in significant impairment of, and/or significant interference with amenities or the environment beyond the installation boundary.
- 5.3 Emissions to Sewer
- 5.3.1 No substance shall be discharged in a manner, or at a concentration which, following initial dilution, causes tainting of fish or shellfish.

- 5.3.2 The licensee shall at no time discharge or permit to be discharged into the sewer any liquid, matter or thing which is or may be liable to set or congeal at average sewer temperature or is capable of giving off any inflammable or explosive gas or any acid, alkali or other substance in sufficient concentration to cause corrosion to sewer pipes, penstock and sewer fittings or the general integrity of the sewer.
- 5.3.3 The licensee shall ensure that the effluent discharge shall not contain petroleum spirits or organic solvents (including chlorinated organic solvents) which would give rise to flammable or explosive vapours in the sewer.
- 5.3.4 No substance shall be present in such concentrations as would constitute a danger to sewer maintenance personnel working in the sewerage system, or as would be damaging to the sewer fabric or as would interfere with the biological functioning of the downstream wastewater treatment works.
- 5.3.5 No emission to sewer shall take place which gives rise to any reaction within the sewer or to the liberation of by-products which may be of environmental significance.
- 5.3.6 Non-trade effluent (e.g. firewater, accidental spillage) which occurs on-site shall not be discharged to the sewer without the prior authorisation of the Sanitary Authority.
- 5.3.7 The trade effluent discharge shall not contain any compounds which would give rise to odour problems at Leixlip Effluent Treatment Plant, if stripped out.
- 5.3.8 The licensee shall establish a programme for the reduction of emissions of fluoride to sewer. The licensee shall agree the timeframes and reduction targets with the Agency within six months of the date of grant of this licence.

*Reason: To provide for the protection of the environment by way of control and limitation of emissions and to provide for the requirements of the Sanitary Authority in accordance with Section 99E of the EPA Acts 1992 and 2003.*

## Condition 6. Control and Monitoring

- 6.1 The licensee shall carry out such sampling, analyses, measurements, examinations, maintenance and calibrations as set out below and as in accordance with *Schedule C* of this licence:
- 6.1.1 Analysis shall be undertaken by competent staff in accordance with documented operating procedures.
- 6.1.2 Such procedures shall be assessed for their suitability for the test matrix and performance characteristics determined.
- 6.1.3 Such procedures shall be subject to a programme of Analytical Quality Control using control standards with evaluation of test responses.
- 6.1.4 Where analysis is sub-contracted it shall be to a competent laboratory.
- 6.2 All automatic monitors and samplers shall be functioning at all times (except during maintenance and calibration) when the activity is being carried on unless alternative sampling or monitoring has been agreed in writing by the Agency for a limited period. In the event of the malfunction of any continuous monitor, the licensee shall contact the Agency as soon as practicable, and alternative sampling and monitoring

facilities shall be put in place. Agreement for the use of alternative equipment, other than in emergency situations, shall be obtained from the Agency.

- 6.3 Monitoring and analysis equipment shall be operated and maintained as necessary so that monitoring accurately reflects the emission or discharge.
- 6.4 All treatment/abatement and emission control equipment shall be calibrated and maintained, in accordance with the instructions issued by the manufacturer/supplier or installer.
- 6.5 The frequency, methods and scope of monitoring, sampling and analyses, as set out in this licence, may be amended with the agreement of the Agency following evaluation of test results.
- 6.6 The integrity and water tightness of all underground pipes and tanks and their resistance to penetration by water or other materials carried or stored therein shall be tested and demonstrated by the licensee at least once every three years and reported to the Agency on each occasion. A written record of all integrity tests and any maintenance or remedial work arising from them shall be maintained by the licensee.
- 6.7 Fugitive Emissions
- 6.7.1 Fugitive emission losses shall not exceed 15 % of total solvent input.
- 6.7.2 The licensee shall maintain a fugitive emissions programme in order to achieve the limit specified in Condition 6.7.1. The programme shall be extended to include any new processes or functional areas as these come into operation. The programme shall be reviewed annually in accordance with any relevant guidelines in Council Directive 1999/13/EC or as issued by the Agency and shall be submitted as part of the AER.
- 6.8 Thermal Oxidiser Operation
- 6.8.1 Waste solvent in the liquid phase shall not be used as a fuel for any thermal oxidiser on-site.
- 6.8.2 Chlorinated solvent vapours shall not be allowed to enter any thermal oxidiser on-site.
- 6.9 Thermal Oxidiser Shut-down
- In the event of any of the following:
- (a) the failure of any piece of control equipment related to the thermal oxidiser or failure of any continuous monitor related to operating parameters or emissions of the thermal oxidiser, where a contingency plan, previously agreed with the Agency, is not implemented;
- (b) the failure of the thermal oxidiser to achieve the operating parameters and emission limit values given in *Schedules B.1* and *C.1*; or
- (c) where a by-pass is initiated;
- the relevant processes shall, subject to Condition 6.17 and Condition 6.19 of this licence, be shut down as soon as practicable and in a manner consistent with safety and the protection of the environment. All emissions of contaminated exhaust air through the by-pass shall be notified to the Agency in accordance with the requirements of Condition 11 of this licence.
- 6.10 Use of gas oil (maximum sulphur content 0.1%) as an emergency fuel
- 6.10.1 Gas oil may be used on-site as a boiler fuel only in the event of an unplanned accidental interruption to the natural gas supply or for test purposes. Such use shall be restricted to a maximum of 12 boilers at a time for no more than 31 days per annum.

- 6.10.2 Gas oil shall not be used as an emergency fuel outside the constraints specified in Condition 6.10.1 without the prior written agreement of the Agency.
- 6.10.3 In the event of gas oil use on site as an emergency fuel for boilers under Condition 6.10.2, ambient monitoring for nitrogen dioxide shall be carried out as per *Schedule C.6.1* of this licence.
- 6.11 All on-site emergency electrical generators shall be used for unplanned emergency and test purposes only or as agreed with the Agency in writing. The testing of generators shall be minimised as far as possible without comprising the need for emergency preparedness and shall be no more frequent than once every two weeks. Records of generator use for test and emergency purposes shall be maintained on site. The licensee shall maintain a testing programme for the generators as agreed with the Agency.
- 6.12 The licensee shall review the locations for ambient air quality monitoring and vegetation sampling to be carried out in accordance with *Schedule C.6*. This review shall have reference to the results of air dispersion modelling carried out in support of the licence application. The licensee shall submit a proposal for monitoring locations to the Agency for approval within six months of the date of commencement of operations at FAB 24-2 and FAB 24-3 respectively.
- 6.13 Process Effluent
- 6.13.1 Trade effluent from all FABs shall be discharged to a balance tank or series of balance tanks with a capacity which corresponds to not less than two hours retention time at peak flow, prior to being discharged to Kildare County Council's foul sewer.
- 6.13.2 Any surface water arising from areas where barrels or containers are stored or washed shall be discharged to a sump. This effluent may be discharged to sewer if it does not exceed the emission limit values specified in *Schedule B.3* of this licence.
- 6.13.3 Where a ferricyanide waste stream arises, it shall be discharged to a dedicated cyanide destruction unit. The resulting treated effluent stream shall then be discharged to an acid waste neutralisation system.
- 6.13.4 The licensee shall provide and maintain an inspection chamber in a suitable position in connection with each pipe through which trade effluent is being discharged. Each such inspection chamber or manhole shall be constructed and maintained by the licensee so as to permit the taking of samples of the discharge.
- 6.13.5 The licensee shall permit authorised persons of the Agency and the Sanitary Authority to inspect, examine and test, at all reasonable times, any works and apparatus installed in connection with the trade effluent and to take samples of the trade effluent.
- 6.13.6 The acute toxicity of the undiluted combined final trade effluent arising from all operational FABs to at least four aquatic species from different trophic levels shall be determined by standardised and internationally accepted procedures and carried out by a competent laboratory. The name of the laboratory and the scope of testing to be undertaken shall be submitted, in writing, to the Agency, within six months of the date of commencement of operations in FAB 24-2 and FAB 24-3 respectively. Once the testing laboratory and the scope of testing have been agreed by the Agency, the Agency shall decide when this testing is to be carried out and copies of the complete reports shall be submitted by the licensee to the Agency within six weeks of completion of the testing.
- 6.13.7 Having identified the most sensitive species outlined in Condition 6.13.6, subsequent compliance toxicity monitoring on the two most sensitive species shall be carried out in accordance with *Schedule C.3.2* by the

laboratory agreed with the Agency. The Agency shall decide when this testing is to be carried out and copies of the complete reports shall be submitted by the licensee to the Agency within six weeks of completion of the testing.

- 6.13.8 A representative sample of effluent shall be screened for the presence of organic compounds on an annual basis.
- 6.14 Storm water
- 6.14.1 A visual examination of the storm water discharge shall be carried out daily. A log of such inspections shall be maintained.
- 6.14.2 The drainage system, bunds, silt traps and oil separators shall be inspected weekly, desludged as necessary and properly maintained at all times. All sludge and drainage from these operations shall be collected for safe disposal.
- 6.14.3 The licensee shall maintain procedures for the setting of warning and action levels for the pH of all surface water discharges and a response programme for when such action levels are reached.
- 6.14.4 In the event that any analyses or observations made on the quality or appearance of surface water run-off should indicate that contamination has taken place, the licensee shall:
- (i) carry out an immediate investigation to identify and isolate the source of the contamination;
  - (ii) put in place measures to prevent further contamination and to minimise the effects of any contamination on the environment;
  - (iii) notify the Agency as soon as is practicable.
- 6.15 Noise
- 6.15.1 The licensee shall carry out a noise survey of the site operations annually. The survey programme shall be undertaken in accordance with the methodology specified in the 'Environmental Noise Survey Guidance Document' as published by the Agency.
- 6.15.2 The licensee shall maintain, calibrate and operate a continuous noise monitor at location labelled "R-view Mon" on Figure F.5.5 of the licence application. This location shall be reviewed within six months of the date of commencement of activities at FAB 24-2 and FAB 24-3 respectively and any amendment to the location of the continuous monitor shall be agreed with the Agency.
- 6.16 Pollution Emission Register (PER)
- 6.16.1 The licensee shall prepare and maintain a PER for the site. The substances to be included in the PER shall be agreed by the Agency each year by reference to the list specified in the Agency's AER Guidance Note. The PER shall be prepared in accordance with any relevant guidelines issued by the Agency and shall be submitted as part of the AER.
- 6.17 Test Programme
- 6.17.1 The licensee shall prepare, to the satisfaction of the Agency, a test programme for abatement equipment installed after the date of grant of this licence. This programme shall be submitted to the Agency, prior to implementation.
- 6.17.2 This programme, following agreement with the Agency, shall be completed within three months of the commencement of operation of the abatement equipment.

- 6.17.3 The criteria for the operation of the abatement equipment as determined by the test programme, shall be incorporated into the standard operating procedures as approved by the Agency in *Schedule B*.
- 6.18 The test programme shall include as a minimum, the following:
- 6.18.1 Establish all criteria for operation, control and management of the abatement equipment to ensure compliance with the emission limit values specified in this licence.
- 6.18.2 Assess the performance of any monitors on the abatement system and establish a maintenance and calibration programme for each monitor.
- 6.18.3 A report on the test programme shall be submitted to the Agency within one month of completion.
- 6.19 The licensee shall within three months of the date of grant of this licence agree with the Agency a set of criteria and procedures for the shutting down of affected processes where a failure of relevant abatement equipment takes place and/or where a by-pass of emissions from an affected process takes place.

*Reason: To provide for the protection of the environment by way of treatment and monitoring of emissions and to provide for the requirements of the Sanitary Authority in accordance with Section 99E of the EPA Acts 1992 and 2003.*

## **Condition 7. Resource Use and Energy Efficiency**

- 7.1 The licensee shall carry out an audit of the energy efficiency of the site within one year of the date of grant of this licence. The audit shall be carried out in accordance with the guidance published by the Agency; "Guidance Note on Energy Efficiency Auditing". The energy efficiency audit shall be repeated at intervals as required by the Agency.
- 7.2 The audit shall identify all opportunities for energy use reduction and efficiency and the recommendations of the audit will be incorporated into the Schedule of Environmental Objectives and Targets under Condition 2 above.
- 7.3 The licensee shall update the existing study on the feasibility of providing for the combined generation of heat and power, within six months of the grant of this licence. The update of the study shall take into account the installation of boilers A248 and A253 in FAB 24 energy centre, and be submitted to the Agency within a month of its completion.
- 7.4 The licensee shall identify opportunities for reduction in the quantity of water used on site including recycling and reuse initiatives, wherever possible. Reductions in water usage shall be incorporated into Schedule of Environmental Objectives and Targets.
- 7.5 The licensee shall undertake an assessment of the efficiency of use of raw materials in all processes, having particular regard to the reduction in waste generated. The assessment should take account of best international practice for this type of activity. Where improvements are identified, these shall be incorporated into the Schedule of Environmental Objectives and Targets.

*Reason: To provide for the efficient use of resources and energy in all site operations.*

## Condition 8. Materials Handling

- 8.2 Disposal or recovery of waste shall only take place in accordance with the conditions of this licence and in accordance with the appropriate National and European legislation and protocols.
- 8.3 Waste sent off-site for recovery or disposal shall be transported only by an authorised waste contractor. The waste shall be transported only from the site of the activity to the site of recovery/disposal in a manner which will not adversely affect the environment and in accordance with the appropriate National and European legislation and protocols.
- 8.4 The licensee shall ensure that waste prior to transfer to another person shall be classified packaged and labelled in accordance with National, European and any other standards which are in force in relation to such labelling.
- 8.5 Waste shall be stored in designated areas, protected as may be appropriate, against spillage and leachate run-off. The waste is to be clearly labelled and appropriately segregated.
- 8.6 No waste classified as green list waste in accordance with the EU Transfrontier Shipment of Waste Regulations (Council Regulation EEC No. 259/1993, as amended) shall be consigned for recovery without the agreement of the Agency.
- 8.7 Waste for disposal/recovery off-site shall be analysed in accordance with *Schedule C* of this licence.
- 8.8 Unless approved in writing by the Agency the licensee is prohibited from mixing a hazardous waste of one category with a hazardous waste of another category or with any other non-hazardous waste.

*Reason: To provide for the appropriate handling of materials and the protection of the environment.*

## Condition 9. Accident Prevention and Emergency Response

- 9.1 The licensee shall maintain a documented Accident Prevention Policy which addresses the hazards on-site, particularly in relation to the prevention of accidents with a possible impact on the environment. This Procedure shall be reviewed annually and updated as necessary.
- 9.2 The licensee shall maintain a documented Emergency Response Procedure which addresses any emergency situation which may originate on-site. This Procedure shall include provision for minimising the effects of any emergency on the environment. This procedure shall be reviewed annually and updated as necessary.
- 9.3 In the event of an incident the licensee shall immediately:-
- (i) isolate the source of any such emission;
  - (ii) carry out an immediate investigation to identify the nature, source and cause of the incident and any emission arising therefrom;
  - (iii) evaluate the environmental pollution, if any, caused by the incident;
  - (iv) identify and execute measures to minimise the emissions/malfunction and the effects thereof;
  - (v) identify the date, time and place of the incident:

- (vi) provide a proposal to the Agency for its agreement within one month of the incident occurring or as otherwise agreed with the Agency to:-
- identify and put in place measures to avoid reoccurrence of the incident; and
  - identify and put in place any other appropriate remedial action.

*Reason: To provide for the protection of the environment.*

## **Condition 10. Decommissioning & Residuals Management**

- 10.1 Following termination, or planned cessation for a period greater than six months, of use or involvement of all or part of the site in the licensed activity, the licensee shall, to the satisfaction of the Agency, decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.
- 10.2 Residuals Management Plan:
- 10.2.1 The licensee shall maintain a fully detailed and costed plan for the decommissioning or closure of the site or part thereof.
- 10.2.2 The plan shall be reviewed annually and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the agreement of the Agency.
- 10.3 The Residuals Management Plan shall include as a minimum, the following:-
- 10.3.1 A scope statement for the plan.
- 10.3.2 The criteria which define the successful decommissioning of the activity or part thereof, which ensures minimum impact on the environment.
- 10.3.3 A programme to achieve the stated criteria.
- 10.3.4 Where relevant, a test programme to demonstrate the successful implementation of the decommissioning plan.
- 10.3.5 Details of costings for the plan and a statement as to how these costs will be underwritten.
- 10.4 A final validation report to include a certificate of completion for the residuals management plan, for all or part of the site as necessary, shall be submitted to the Agency within three months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment.

*Reason: To make provision for the proper closure of the activity ensuring protection of the environment.*

## Condition 11. Notifications, Records and Reports

- 11.1 The licensee shall notify the Agency by both telephone and either facsimile or electronic mail, if available, to the Agency's Office of Environmental Enforcement, East/North East Region, EPA, McCumiskey House, Richview, Dublin 14, or to such other Agency office as may be specified by the Agency, as soon as practicable after the occurrence of any of the following:
- 11.1.1 Any release of environmental significance to atmosphere from any potential emission point, including bypasses.
  - 11.1.2 Any emission which does not comply with the requirements of this licence.
  - 11.1.3 Any malfunction or breakdown of key control equipment or monitoring equipment set out in *Schedule C: Control & Monitoring* which is likely to lead to loss of control of the abatement system.
  - 11.1.4 Any incident with the potential for environmental contamination of surface water or groundwater, or posing an environmental threat to air or land, or requiring an emergency response by the Local Authority.
- The licensee shall include as part of the notification, date and time of the incident, summary details of the occurrence, and where available, the steps taken to minimise any emissions.
- 11.2 In the event of any incident which relates to discharges to sewer, having taken place, the licensee shall notify the Local and Sanitary Authority as soon as practicable, after such an incident.
- 11.3 The licensee shall make a record of any incident. This record shall include details of the nature, extent, and impact of, and circumstances giving rise to, the incident. The record shall include all corrective actions taken to; manage the incident, minimise wastes generated and the effect on the environment, and avoid recurrence. The licensee shall as soon as practicable following incident notification, submit to the Agency the incident record.
- 11.4 The licensee shall record all complaints of an environmental nature related to the operation of the activity. Each such record shall give details of the date and time of the complaint, the name of the complainant and give details of the nature of the complaint. A record shall also be kept of the response made in the case of each complaint.
- 11.5 The licensee shall record all sampling, analyses, measurements, examinations, calibrations and maintenance carried out in accordance with the requirements of this licence and all other such monitoring which relates to the environmental performance of the installation.
- 11.6 The licensee shall as a minimum keep the following documents at the site:-
- (i) the licences relating to the installation;
  - (ii) the current EMS for the installation;
  - (iii) the previous year's AER for the installation;
  - (iv) records of all sampling, analyses, measurements, examinations, calibrations and maintenance carried out in accordance with the requirements of this licence and all other such monitoring which relates to the environmental performance of the installation;
  - (v) relevant correspondence with the Agency;

- (vi) an up to date site drawings/plans showing the location of key process and environmental infrastructure, including monitoring locations and emission points

and this documentation shall be available to the Agency for inspection at all reasonable times.

- 11.7 The licensee shall submit to the Agency, by the 31<sup>st</sup> March of each year, an AER covering the previous calendar year. This report, which shall be to the satisfaction of the Agency, shall include as a minimum the information specified in *Schedule D* and shall be prepared in accordance with any relevant guidelines issued by the Agency.
- 11.8 A log detailing the usage of all cooling water and boiler treatment chemicals shall be kept by the licensee and submitted to the Sanitary Authority on an annual basis.
- 11.9 A full record, which shall be open to inspection by authorised persons of the Agency at all times, shall be kept by the licensee on matters relating to the waste management operations and practices at this site. This record shall be maintained on a monthly basis and shall, as a minimum, contain details of the following:
- (i) The tonnages and EWC Code for the waste materials sent off-site for disposal/recovery.
  - (ii) The names of the agent and carrier of the waste, and their waste collection permit details, if required (to include issuing authority and vehicle registration number).
  - (iii) Details of the ultimate disposal/recovery destination facility for the waste and its appropriateness to accept the consigned waste stream, to include its permit/licence details and issuing authority, if required.
  - (iv) Written confirmation of the acceptance and disposal/recovery of any hazardous waste consignments sent off-site.
  - (v) Details of all wastes consigned abroad for Recovery and classified as 'Green' in accordance with the EU Transfrontier Shipment of Waste Regulations (Council Regulation EEC No. 259/1993, as amended). The rationale for the classification must form part of the record.
  - (vi) Details of any rejected consignments.
  - (vii) Details of any approved waste mixing.
  - (viii) The results of any waste analyses required under *Schedule C*.
  - (ix) The tonnages and EWC Code for the waste materials recovered/disposed on-site.

Reason: To provide for the collection and reporting of adequate information on the activity.



## Condition 12. Financial Charges and Provisions

### 12.1 Agency Charges

12.1.1 The licensee shall pay to the Agency an annual contribution of €25,276, or such sum as the Agency from time to time determines, having regard to variations in the extent of reporting, auditing, inspection, sampling and analysis or other functions carried out by the Agency, towards the cost of monitoring the activity as the Agency considers necessary for the performance of its functions under the Environmental Protection Agency Acts, 1992 and 2003. The first payment shall be a pro-rata amount for the period from the date of this licence to the 31st day of December, and shall be paid to the Agency within one month from the date of the licence. In subsequent years the licensee shall pay to the Agency such revised annual contribution as the Agency shall from time to time consider necessary to enable performance by the Agency of its relevant functions under the Environmental Protection Agency Acts, 1992 and 2003, and all such payments shall be made within one month of the date upon which demanded by the Agency.

12.1.2 In the event that the frequency or extent of monitoring or other functions carried out by the Agency needs to be increased the licensee shall contribute such sums as determined by the Agency to defraying its costs in regard to items not covered by the said annual contribution.

### 12.2 Sanitary Authority Charges

12.2.1 The licensee shall pay to the Sanitary Authority 48 cent per cubic metre of trade effluent discharged to the foul sewer or such sum as may be determined from time to time, having regard to the variations in the cost of providing drainage, the variation in effluent reception and treatment costs, and the cost of monitoring the trade effluent. Payment to be made annually on demand.

### 12.3 Environmental Liabilities

12.3.1 The licensee shall as part of the AER provide an annual statement as to the measures taken or adopted at the site in relation to the prevention of environmental damage, and the measures in place in relation to the underwriting of costs for remedial actions following anticipated events (including closure) or accidents/incidents, as may be associated with the carrying on of the activity.

*Reason: To provide for adequate financing for monitoring and financial provisions for measures to protect the environment and to provide for the requirements of the Sanitary Authority in accordance with Section 99E of the EPA Acts 1992 and 2003.*

## SCHEDULE A: Limitations

There are no limitations on the installation specified in the Schedule.

## SCHEDULE B: Emission Limits

### B.1 Emissions to Air

#### B.1.1 Boiler Emissions

Emission Point Reference No.:	Location:	Minimum discharge height above ground:	Boiler rating:	Emission Limit Value <sup>Note 1</sup>	
				Nitrogen oxides (as NO <sub>2</sub> )	Carbon monoxide
A01	FAB 10 Energy Centre	9 m	3.5 MW	180 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A03	FAB 10 Energy Centre	9 m	5.9 MW	180 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A04	FAB 10 Energy Centre	10 m	5.9 MW	180 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A05	FAB 10 Energy Centre	10 m	5.9 MW	180 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A06	FAB 10 Energy Centre	10 m	5.9 MW	180 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A101	FAB 14 Energy Centre	19 m	8.7 MW	170 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A102	FAB 14 Energy Centre	19 m	8.7 MW	170 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A103	FAB 14 Energy Centre	19 m	8.7 MW	170 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A104	FAB 14 Energy Centre	19 m	8.7 MW	170 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A201	FAB 24 Energy Centre	21 m	8.7 MW	150 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A202	FAB 24 Energy Centre	21 m	8.7 MW	150 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A203	FAB 24 Energy Centre	21 m	8.7 MW	150 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A204	FAB 24 Energy Centre	21 m	8.7 MW	150 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A205	FAB 24 Energy Centre	21 m	8.7 MW	150 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A248	FAB 24 Energy Centre	21 m	8.7 MW	150 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A253	FAB 24 Energy Centre	21 m	8.7 MW	150 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A301	FAB 24-3 Energy Centre	19 m	8.7 MW	150 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A302	FAB 24-3 Energy Centre	19 m	8.7 MW	150 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A303	FAB 24-3 Energy Centre	19 m	8.7 MW	150 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A304	FAB 24-3 Energy Centre	19 m	8.7 MW	150 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>
A305	FAB 24-3 Energy Centre	19 m	8.7 MW	150 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>

**Note 1:** These limits do not apply to the running of boilers on gas oil which is subject to Condition 6.10.

**B.1.2 Acid Gas Scrubbers:**

**Emission Point Reference No's.:** A07, A08, A10, A14, A15, A16, A20, A22, A23 (At any one time emissions shall occur from no more than eight of these stacks).

**Location:** FAB 10 Scrubbers.

**Volume to be emitted from each listed emission point:** Maximum rate per hour: 78,895 m<sup>3</sup>  
Minimum efflux velocity: 5 m/s

**Minimum discharge height:** 28.5 m above ground

Parameter	Emission Limit Value
Total Fluorides	27.5 g/hr
Hydrofluoric acid (Gaseous) (as HF)	0.27 mg/m <sup>3</sup>
Total acids (as HCl)	4 mg/m <sup>3</sup>



**Emission Point Reference No's.:** A105, A106, A107, A108, A109, A110, A111 (At any one time emissions shall occur from no more than six of these stacks).

**Location:** FAB 14 Scrubbers.

**Volume to be emitted from each listed emission point:** Maximum rate per hour: 86,655 m<sup>3</sup>  
Minimum efflux velocity: 8.5 m/s

**Minimum discharge height:** 29.1 m above ground

Parameter	Emission Limit Value
Total Fluorides	30.3 g/hr
Hydrofluoric acid (Gaseous) (as HF)	0.27 mg/m <sup>3</sup>
Total acids (as HCl)	4 mg/m <sup>3</sup>



**Emission Point Reference No's.:** Main header: A206, A207, A208, A209.  
 Bridge header: A210, A211, A212, A213.

**Location:** FAB 24 Scrubbers.

**Volume to be emitted from each listed emission point:** Maximum rate per hour: 64,570 m<sup>3</sup>  
 Minimum efflux velocity: 7.6 m/s

**Minimum discharge height:** 29.1 m above ground

Parameter	Emission Limit Value
<b>Total Fluorides</b>	
- 3 stacks per header discharging	19.3 g/hr
- 4 stacks per header discharging	14.5 g/hr
<b>Hydrofluoric acid (Gaseous) (as HF)</b>	0.27 mg/m <sup>3</sup>
<b>Total acids (as HCl)</b>	4 mg/m <sup>3</sup>



**Emission Point Reference No's.:** A249, A250, A251, A252

**Location:** FAB 24-2 Scrubbers.

**Volume to be emitted from each listed emission point:** Maximum rate per hour: 87,070 m<sup>3</sup>  
 Minimum efflux velocity: 10.2 m/s

**Minimum discharge height:** 34.1 m above ground

Parameter	Emission Limit Value
<b>Total Fluorides</b>	
- 3 stacks discharging	26 g/hr
- 4 stacks discharging	19.5 g/hr
<b>Hydrofluoric acid (Gaseous) (as HF)</b>	0.27 mg/m <sup>3</sup>
<b>Total acids (as HCl)</b>	4 mg/m <sup>3</sup>



**Emission Point Reference No's.:** A306, A307, A308  
**Location:** FAB 24-3a Scrubbers.

**Volume to be emitted from each listed emission point:**  
 Maximum rate per hour: 87,070 m<sup>3</sup>  
 Minimum efflux velocity: 10.2 m/s

**Minimum discharge height:** 34.1 m above ground

Parameter	Emission Limit Value
<b>Total Fluorides</b>	
- 2 stacks discharging	26 g/hr
- 3 stacks discharging	17.3 g/hr
<b>Hydrofluoric acid (Gaseous) (as HF)</b>	0.27 mg/m <sup>3</sup>
<b>Total acids (as HCl)</b>	4 mg/m <sup>3</sup>



**Emission Point Reference No's.:** A309, A310, A311  
**Location:** FAB 24-3b Scrubbers.

**Volume to be emitted from each listed emission point:**  
 Maximum rate per hour: 87,070 m<sup>3</sup>  
 Minimum efflux velocity: 10.2 m/s

**Minimum discharge height:** 34.1 m above ground

Parameter	Emission Limit Value
<b>Total Fluorides</b>	
- 2 stacks discharging	26 g/hr
- 3 stacks discharging	17.3 g/hr
<b>Hydrofluoric acid (Gaseous) (as HF)</b>	0.27 mg/m <sup>3</sup>
<b>Total acids (as HCl)</b>	4 mg/m <sup>3</sup>



**B.1.3 RCTOs**

**Emission Point Reference No's.:** A56, A112, A217, A313, A315

**Location:** RCTO Concentrator exhausts.

Emission Point Reference	Location	Volume to be emitted-maximum rate per hour (m <sup>3</sup> )	Minimum discharge ht. above ground, (m)	Emission Limit Values <sup>Note 1, Note 2</sup> (mg/m <sup>3</sup> )		
				TA Luft Organics Class I	TA Luft Organics Class II	TA Luft Organics Class III
A56	FAB 10	40,000	28.5	5	20	50
A112 <sup>Note 3</sup>	FAB 14	39,600	23.6	5	20	50
A217	FAB 24	120,000	29.1	5	20	50
A313	FAB 24-3a	60,000	29.1	5	20	50
A315	FAB 24-3b	60,000	29.1	5	20	50

**Note 1:** Where organic substances of several classes are emitted simultaneously, in addition to the above individual limits, the sum of the concentrations of Classes I, II and III shall not exceed the Class III limits.

**Note 2:** In the event of a by-pass of an associated thermal oxidiser a limit of 75 mg/m<sup>3</sup> (expressed as Carbon) shall apply.

**Note 3:** From date of commencement of operation of RCTO.



Emission Point Reference No.:	Location:	Minimum discharge height:
A57	RCTO oxidiser exhaust in FAB 10	28.5 m above ground
A139, A140 <sup>Note 1</sup>	RCTO oxidiser exhaust in FAB 14	28 m above ground
A214, A215, A216	RCTO oxidiser exhausts in FAB 24	29.1 m above ground
A312a, A312b <sup>Note 1</sup>	RCTO oxidiser exhausts in FAB 24-3a	29.1 m above ground
A314a, A314b <sup>Note 1</sup>	RCTO oxidiser exhausts in FAB 24-3b	29.1 m above ground

**Volume to be emitted:** Maximum rate per hour: 2,000 m<sup>3</sup>

Parameter	Emission Limit Value
T.A. Luft Organics Class I	5 mg/m <sup>3</sup>
Total Organics (as C)	50 mg/m <sup>3</sup>
Carbon monoxide	600 mg/m <sup>3</sup>
Nitrogen oxides (as NO <sub>2</sub> )	200 mg/m <sup>3</sup>

**Note 1:** The emission rate from any FAB (either from a single RCTO oxidiser exhaust or from a combination of RCTO exhausts) shall not exceed 2,000 m<sup>3</sup> per hour.



**B.1.4 Solvent Exhaust - Kreha (until replaced by RCTO)**

**Emission Point Reference No.:** A112  
**Location:** FAB 14 Solvent Exhaust.  
**Volume to be emitted:** Maximum rate per hour: 39,600 m<sup>3</sup>  
**Minimum discharge height:** 23.6 m above ground

Parameter	Emission Limit Value <sup>Note 1</sup> Until 31 March 2013
<b>Until 31 March 2013</b>	
- TA Luft Organics Class I	20 mg/m <sup>3</sup>
- TA Luft Organics Class II	100 mg/m <sup>3</sup>
- TA Luft Organics Class III	150 mg/m <sup>3</sup> <sup>Note 2</sup>
<b>From 1 April 2013</b>	
- Total Carbon (as C)	75 mg/m <sup>3</sup>

**Note 1:** Where organic substances of several classes are emitted simultaneously, in addition to the above individual limits, the sum of the concentrations of Classes I, II and III shall not exceed the Class III limits.

**Note 2:** This limit also applied in the event of a by-pass of the Kreha.



**B.1.5 Ammonia Exhausts**

Emission Point Reference No.	Location:	Maximum Volume to be emitted (m <sup>3</sup> /hr)
A220, A247	FAB 24 Ammonia Exhausts	20,400
A317, A318	FAB 24-3 Ammonia Exhausts	20,400

**Minimum discharge height:** 29.1 m above ground

Parameter	Emission Limit Value
Ammonia	30 mg/m <sup>3</sup>



**B.1.6 Speciality Exhausts**

**Emission Point Reference No.:** A26  
**Location:** FAB 10 Speciality Exhaust.  
**Volume to be emitted:** Maximum rate per hour: 2,500 m<sup>3</sup>  
**Minimum discharge height:** 28.3 m above ground

Parameter	Emission Limit Value
TA Luft Inorganic Dust Particles Class I	0.2 mg/m <sup>3</sup>
TA Luft Inorganic Dust Particles Class II	0.2 mg/m <sup>3</sup>
TA Luft Inorganic Dust Particles Class III	0.2 mg/m <sup>3</sup>
Total Dusts	20 mg/m <sup>3</sup>



**Emission Point Reference No.:** A116  
**Location:** FAB 14 Speciality Exhaust.  
**Volume to be emitted:** Maximum rate per hour: 1,800 m<sup>3</sup>  
**Minimum discharge height:** 29.1 m above ground

Parameter	Emission Limit Value
TA Luft Inorganic Dust Particles Class I	0.2 mg/m <sup>3</sup>
TA Luft Inorganic Dust Particles Class II	0.2 mg/m <sup>3</sup>
TA Luft Inorganic Dust Particles Class III	0.2 mg/m <sup>3</sup>
Total Dusts	20 mg/m <sup>3</sup>



**Emission Point Reference No's.:** A137, A138  
**Location:** FAB 14 Speciality Exhausts.  
**Volume to be emitted:** Maximum rate per hour: 12,780 m<sup>3</sup>  
**Minimum discharge height:** 26 m above ground

Parameter	Emission Limit Value
TA Luft Inorganic Dust Particle Class I	0.05 mg/m <sup>3</sup>
TA Luft Inorganic Dust Particles Class II	0.2 mg/m <sup>3</sup>
TA Luft Inorganic Dust Particles Class III	0.2 mg/m <sup>3</sup>
Total Dusts	20 mg/m <sup>3</sup>



Emission Point Reference No.	Location:	Maximum Volume to be emitted (m <sup>3</sup> per hour)
A218	FAB 24 Speciality Exhausts	16,910
A219	FAB 24 Speciality Exhausts	680

Minimum discharge height: 20.5 m above ground.

Parameter	Emission Limit Value
TA Luft Inorganic Dust Particles Class I	0.05 mg/m <sup>3</sup>
TA Luft Inorganic Dust Particles Class II	0.2 mg/m <sup>3</sup>
TA Luft Inorganic Dust Particles Class III	0.2 mg/m <sup>3</sup>
Total Dusts	20 mg/m <sup>3</sup>



Emission Point Reference No.	Location:	Maximum Volume to be emitted (m <sup>3</sup> per hour)
A254	FAB 24-2 Speciality Exhaust	16,910
A316	FAB 24-3 Speciality Exhaust	16,910

Minimum discharge height: 20.5 m above ground.

Parameter	Emission Limit Value
TA Luft Inorganic Dust Particles Class I	0.05 mg/m <sup>3</sup>
TA Luft Inorganic Dust Particles Class II	0.1 mg/m <sup>3</sup>
TA Luft Inorganic Dust Particles Class III	0.1 mg/m <sup>3</sup>
Total Dusts	20 mg/m <sup>3</sup>



**B.2 Emissions to Water**

There are no Emissions to Water of environmental significance.

**B.3 Emission to Sewer**

<b>Emission Point Reference No.:</b>	SE-1	
<b>Emission to:</b>	Sanitary Authority Foul Sewer.	
<b>Location:</b>	298992E, 237128N	
<b>Volume to be emitted:</b>	Maximum in any one day:	16,500 m <sup>3</sup>
	Maximum rate per hour:	720 m <sup>3</sup>
	Maximum rate per second:	200 litres

Parameter	Emission Limit Value	
Temperature	30°C (max.)	
pH	6-9.5	
	Daily mean concentration mg/l	Daily mean loading kg/day
<b>BOD</b>	Not applicable	1,350
<b>COD</b>	Not applicable	2,700
<b>Suspended Solids</b>	Not applicable	2,700
<b>Total Dissolved Solids</b>	Not applicable	60,570
<b>Total Nitrogen (as N)</b>	Not applicable	540
<b>Total Phosphorus (as P)</b>	Not applicable	67.5
<b>Fluoride</b>		
- until 29 June 2006	Not applicable	200
- from 30 June 2006 <sup>Note 1</sup>	Not applicable	160
<b>Cyanide</b>	0.1	1.35
<b>Arsenic</b>	0.1	1.35
<b>Copper</b>	0.3	4.05
<b>Chromium</b>	0.1	1.35
<b>Nickel</b>	0.2	2.70
<b>Tin</b>	0.4	5.40
<b>Lead</b>		
- until 29 June 2006	0.4	5.40
- from 30 June 2006	0.4	1.6
<b>Total Heavy Metals</b> <sup>Note 2</sup>	Not applicable	13.50

**Note 1:** Further reductions in fluoride discharges to sewer to be achieved in accordance with Condition 5.3.8 of this licence.

**Note 2:** The sum of arsenic, copper, chromium, nickel, tin and lead.

**B.4. Noise Emissions**

Daytime dB(A) $L_{Aeq}$ (15 minutes)	Night-time dB(A) $L_{Aeq}$ (15 minutes)
55 <sup>Note 1</sup>	45 <sup>Note 1</sup>

**Note 1:** There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive location.



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## SCHEDULE C: Control & Monitoring

### C.1.1 Control of Emissions to Air

#### C.1.1.1 Acid gas scrubbers

**Emission Point Reference No.'s:** A07, A08, A10, A14, A15, A16, A20, A22, A23  
 A105, A106, A107, A108, A109, A110, A111  
 A206, A207, A208, A209, A210, A211, A212, A213  
 A249, A250, A251, A252  
 A306, A307, A308, A309, A310, A311

**Description of Treatment:** Acid gas scrubbers.

Control Parameter	Monitoring	Key Equipment <sup>Note 1</sup>
pH	Continuous	pH sensor and transmitter
Conductivity	Continuous	Conductivity sensor and transmitter

**Note 1:** The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.



#### C.1.1.2 RCTOs

**Emission Point Reference No.'s:** A56, A57  
 A112, A139, A140  
 A214, A215, A216, A217  
 A312a, A312b, A313, A314a, A314b, A315

**Description of Treatment:** RCTO unit.

Control Parameter	Monitoring	Key Equipment <sup>Note 1</sup>
Airflow (inlet to concentrator and zeolite regeneration air)	Continuous	Differential pressure gauge
Oxidiser temperature	Continuous	Thermocouple/temperature probe
Desorption air temperature	Continuous	Thermocouple/temperature probe
Fuel gas flow	Continuous	Flow transmitter
Burner flame operation	Continuous	Flame rod
TOC concentration	Continuous	Flame ionisation detector

**Note 1:** The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.



**C.1.1.3 Solvent Exhaust - Kreha (until replaced by RCTO)**

**Emission Point Reference No.:** A112  
**Description of Treatment:** Carbon adsorption unit.

Control Parameter	Monitoring	Key Equipment <sup>Note 1</sup>
Airlift blower speed	Continuous	Blower fan
Desorption temperature	Continuous	Desorber heater
Chilled water temperature	Continuous	Heat exchanger
Nitrogen flow	Continuous	Nitrogen supply from nitrogen plant

**Note 1:** The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.



**C.1.1.4 Ammonia exhausts**

**Emission Point Reference No.'s:** A220, A247, A317, A318  
**Description of Treatment:** Ammonia scrubbers.

Control Parameter	Monitoring	Key Equipment <sup>Note 1</sup>
pH	Continuous	pH sensor and transmitter
Conductivity	Continuous	Conductivity sensor and transmitter

**Note 1:** The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.



**C.1.1.5 Speciality exhausts**

**Emission Point Reference No.'s:** A26, A116, A137, A138, A218, A219, A254, A316  
**Description of Treatment:** HEPA filters.

Control Parameter	Monitoring	Key Equipment <sup>Note 1</sup>
Pressure drop across pre-filters	Differential pressure	Manometer
Pressure drop across HEPA filters	Differential pressure	Manometer

**Note 1:** The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.



**C.1.2 Monitoring of Emissions to Air****C.1.2.1 Boilers**

**Emission Point Reference No.'s:** A01, A03, A04, A05, A06  
 A101, A102, A103, A104  
 A201, A202, A203, A204, A205, A248, A253  
 A301, A302, A303, A304, A305

Parameter	Monitoring Frequency	Analysis Method/Technique
Nitrogen oxides (as NO <sub>2</sub> )	Annually	Combustion gas analyser
Carbon monoxide	Annually	Combustion gas analyser

**C.1.2.2 Acid gas scrubbers**

**Emission Point Reference No.'s:** A07, A08, A10, A14, A15, A16, A20, A22, A23  
 A105, A106, A107, A108, A109, A110, A111  
 A206, A207, A208, A209, A210, A211, A212, A213  
 A249, A250, A251, A252  
 A306, A307, A308, A309, A310, A311

Parameter	Monitoring Frequency	Analysis Method/Technique
Total Fluorides	Quarterly	Ion-selective electrode
Hydrofluoric acid (Gaseous) (as HF)	Quarterly	Ion-selective electrode
Total acids (as HCl)	Quarterly	pH back-titration

**C.1.2.3 RCTOs**

**Emission Point Reference No.'s:** A56, A112 <sup>Note 1</sup>, A217, A313, A315

Parameter	Monitoring Frequency	Analysis Method/Technique
Total Organics (as C)	Continuous	Flame ionisation detector
TA Luft Organics Class I	Quarterly	GC-MS
TA Luft Organics Class II	Quarterly	GC-MS
TA Luft Organics Class III	Quarterly	GC-MS

**Note 1:** From date of commencement of operation of RCTO.

Emission Point Reference No.'s: A57, A139 <sup>Note 1</sup>, A140 <sup>Note 1</sup>, A214, A215, A216, A312a, A312b, A314a, A314b

Parameter	Monitoring Frequency	Analysis Method/Technique
Total Organics (as C)	Continuous	Flame ionisation detector
TA Luft Organics Class I	Quarterly	GC-MS
NO <sub>x</sub>	Continuous	Infra-red analyser
SO <sub>x</sub>	Continuous	Infra-red analyser
CO	Continuous	Infra-red analyser
Oxygen	Continuous	Electrochemical cell or paramagnetic analyser
Temperature	Continuous	Temperature probe

Note 1: From date of commencement of operation of RCTO.

#### C.1.2.4 Solvent Exhaust - Kreha (until replaced by RCTO)

Emission Point Reference No.: A112

Parameter	Monitoring Frequency	Analysis Method/Technique
Total Organics (as C)	Continuous	Flame ionisation detector
TA Luft Organics Class I	Quarterly	GC-MS
TA Luft Organics Class II	Quarterly	GC-MS
TA Luft Organics Class III	Quarterly	GC-MS

#### C.1.2.5 Ammonia scrubber exhausts

Emission Point Reference No.'s: A220, A247, A317, A318

Parameter	Monitoring Frequency	Analysis Method/Technique
Ammonia	Annual	Ion-selective electrode

**C.1.2.6 Speciality exhausts**

Emission Point Reference No.'s: A26, A116, A137, A138, A218, A219, A254, A316

Parameter	Monitoring Frequency	Analysis Method/Technique
TA Luft Inorganic Dusts	Bi-annually	Gravimetric/ICP-AES
Total Dusts	Bi-annually	Gravimetric/ICP-AES

**C.2.1 Control of Emissions to Water**

There are no Emissions to Water of environmental significance.

**C.2.2 Monitoring of Emissions to Water**

There are no Emissions to Water of environmental significance.

**C.2.3 Monitoring of Storm Water Emission**

Emission Point Reference No.: SW-1

Parameter	Monitoring Frequency	Analysis Method/Technique
Flow	Continuous	Flow meter
pH	Continuous	pH electrode/meter
COD	Weekly <sup>Note 1</sup>	Standard Method
TOC	Weekly <sup>Note 1</sup>	Standard Method
Conductivity	Weekly <sup>Note 1</sup>	Standard Method
Heavy metals <sup>Note 2</sup>	Bi-annually <sup>Note 1</sup>	Atomic absorption/ICP
Visual Inspection	Daily	Sample and examine for colour and odour

**Note 1:** All samples shall be collected on a 24 hour flow proportional composite sampling basis.

**Note 2:** The sum of arsenic, chromium, copper, nickel, lead, tin and cobalt.

**C.3.1 Control of Emissions to Sewer**

**Emission Point Reference No.:** SE-1

**Description of Treatment:** Waste Water Treatment: Acid waste neutralisation system

**Equipment:**

Control Parameter	Monitoring	Key Equipment <sup>Note 1</sup>
pH	Continuous	pH probe, acid/alkali dosing pumps
Flow	Continuous	Flow meter

**Note 1:** The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.



**Emission Point Reference No.:** SE-1

**Description of Treatment:** Waste Water Treatment: Fluoride reduction system

**Equipment:**

Control Parameter	Monitoring	Key Equipment <sup>Note 1</sup>
pH	Continuous	pH probe and meter
Fluoride	Per batch	Selective ion meter or sample titration

**Note 1:** The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.



**Emission Point Reference No.:** SE-1

**Description of Treatment:** Waste Water Treatment: Phosphate reduction system

**Equipment:**

Control Parameter	Monitoring	Key Equipment <sup>Note 1</sup>
pH	Continuous	pH probe and meter
Phosphate	Per batch	Spectrophotometer or titration

**Note 1:** The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.



**Emission Point Reference No.:** SE-1

**Description of Treatment:** Waste Water Treatment: Ferricyanide destruction system

**Equipment:**

Control Parameter	Monitoring	Key Equipment <sup>Note 1</sup>
pH	Continuous	pH probe and meter
Temperature	Continuous	Thermocouple and display
Pressure	Continuous	Pressure gauge
Cyanide concentration	Continuous	To be agreed with the Agency

**Note 1:** The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.



**Emission Point Reference No.:** SE-1

**Description of Treatment:** Waste Water Treatment: C4 waste treatment system

**Equipment:**

Control Parameter	Monitoring	Key Equipment <sup>Note 1</sup>
pH	Continuous	pH probe and controller
Flow	Continuous	Flow meter
Pressure drop	Continuous	Pressure gauge

**Note 1:** The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.



**Emission Point Reference No.:** SE-1

**Description of Treatment:** Waste Water Treatment: Slurry copper waste treatment system

**Equipment:**

Control Parameter	Monitoring	Key Equipment <sup>Note 1</sup>
pH	Continuous	pH probe and controller
Conductivity	Continuous	Conductivity meter
Flow	Continuous	Flow meter
Pressure drop	Continuous	Pressure gauge and manometer
Turbidity	Continuous	Turbidity meter
Copper	Sequential	Colorimeter analyser

**Note 1:** The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.



**Emission Point Reference No.:** SE-1

**Description of Treatment:** Waste Water Treatment: Concentrated copper waste recovery system

**Equipment:**

Control Parameter	Monitoring	Key Equipment <sup>Note 1</sup>
pH	Continuous	pH probe and controller
Copper	Sequential	Colorimeter analyser

**Note 1:** The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.



**Emission Point Reference No.:** SE-1

**Description of Treatment:** Waste Water Treatment: Ammonia waste treatment system

**Equipment:**

Control Parameter	Monitoring	Key Equipment <sup>Note 1</sup>
pH	Continuous	pH probe and controller
Conductivity	Continuous	Conductivity meter
Temperature	Continuous	Temperature probe
Differential pressure across scrubber media	Continuous	Pressure gauge and manometer
Scrubber liquor flow rate	Continuous	Flow indicator and sight glass
Ammonia	Continuous	Online analyser
Oxygen	Continuous	Online analyser

**Note 1:** The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.



### C.3.2 Monitoring of Emissions to Sewer

Emission Point Reference No.: SE-1

Parameter	Monitoring Frequency	Analysis Method/Technique
Flow	Continuous	On-line flow meter with recorder
Temperature	Continuous	On-line temperature meter with recorder
pH	Continuous	pH electrode/meter and recorder
Biochemical Oxygen Demand	Weekly <sup>Note 1</sup>	Standard Method
Chemical Oxygen Demand	Weekly <sup>Note 1</sup>	Standard Method
Suspended Solids	Weekly <sup>Note 1</sup>	Standard Method
Sulphates	Weekly <sup>Note 1</sup>	Standard Method
Total Dissolved Solids	Weekly <sup>Note 1</sup>	Standard Method
Nitrates (as N)	Weekly <sup>Note 1</sup>	Standard Method
Ammonia (as N)	Weekly <sup>Note 1</sup>	Standard Method
Total Nitrogen (as N)	Weekly <sup>Note 1</sup>	Standard Method
Total Phosphorus (as P)	Weekly <sup>Note 1</sup>	Standard Method
Fluoride	Weekly <sup>Note 1</sup>	Standard Method
Cyanide	Weekly <sup>Note 1</sup>	Standard Method
Arsenic	Weekly <sup>Note 1</sup>	Atomic Absorption/ICP
Copper	Weekly <sup>Note 1</sup>	Atomic Absorption/ICP
Chromium	Weekly <sup>Note 1</sup>	Atomic Absorption/ICP
Nickel	Weekly <sup>Note 1</sup>	Atomic Absorption/ICP
Tin	Weekly <sup>Note 1</sup>	Atomic Absorption/ICP
Lead	Weekly <sup>Note 1</sup>	Atomic Absorption/ICP
Cobalt	Monthly <sup>Note 1</sup>	Atomic Absorption/ICP
Total Heavy Metals <sup>Note 2</sup>	Weekly <sup>Note 1</sup>	Atomic Absorption/ICP
Toxicity <sup>Note 3</sup>	As may be required	To be agreed by the Agency
Organic Compounds <sup>Note 4</sup>	Annually	GC-FID or GC-MS

**Note 1:** All samples shall be collected on a 24 hour flow proportional composite sampling basis.

**Note 2:** The sum of arsenic, chromium, copper, nickel, lead and tin.

**Note 3:** The number of toxic units (Tu) = 100/x hour EC/LC<sub>50</sub> in percentage vol/vol so that higher Tu values reflect greater levels of toxicity. For test regimes where species death is not easily detected, immobilisation is considered equivalent to death.

**Note 4:** Screening for priority pollutant list substances. (such as US EPA volatile and/or semi-volatile compounds). This analysis shall include those organic solvents in use in the process, which are likely through normal process operations to be diverted to the waste water streams.

**C.4 Waste Monitoring**

Waste Class	Frequency	Parameter	Method
Mixed liquid solvent waste	Per shipment	Major components	Gas chromatography/ material usage records
Concentrated copper waste	Per shipment	Copper concentration	Ion-selective chromatography
Concentrated lead waste	Per shipment	Lead concentration	Ion-selective chromatography
Other <sup>Note 1</sup>			

Note 1: Analytical requirements to be determined on a case by case basis.

**C.5 Noise Monitoring**

Location	Grid Reference	Frequency
NM01	297924791, 237364538	Annual
NM02	298244842, 237956879	Annual
NM03	298689064, 237683918	Annual
NM04	299284371, 237836572	Annual
NM05	299386369, 236784609	Annual
NM06	299363905, 236552869	Annual
NM07	299363373, 236552536	Annual
Continuous monitor as per Condition 6.15.2		Continuous

**C.6 Ambient Monitoring**

**C.6.1 Air Monitoring**

Location: To be agreed with the Agency in accordance with Condition 6.12.

Parameter	Monitoring Frequency	Analysis Method/Technique
Oxides of nitrogen	Continuous	Chemiluminescent analyser
Nitrogen Dioxide	Bi-annual	Diffusion tubes
Total Fluoride	Bi-annual	Ion-selective electrode
Total Acidity	Bi-annual	pH titration

**C.6.2 Vegetation Monitoring**

**Location:** To be agreed with the Agency in accordance with Condition 6.12.

Parameter	Monitoring Frequency	Analysis Method/Technique
Fluoride	Quarterly	Visual assessment Ion-selective electrode



**C.6.3 Groundwater Monitoring**

**Location:** MW1-MW20

Parameter	Monitoring Frequency	Analysis Method/Technique
pH	Biannually	pH electrode/meter
COD	Biannually	Standard Method
Nitrate	Biannually	Standard Method
Total Ammonia	Biannually	Standard Method
Total Nitrogen	Biannually	Standard Method
Conductivity	Biannually	Standard Method
Chloride	Biannually	Standard Method
Fluoride	Biannually	Standard Method
Organohalogens <sup>Note 1</sup>	Biannually	GC-MS

**Note 1:** Screening for priority pollutant list substances (such as US EPA volatile and/or semi-volatile compounds).



**C.6.4 Receiving Water Monitoring**

Location: RW1, RW2, RW3, RW4, RW5

Parameter	Monitoring Frequency	Analysis Method/Technique
pH	Bi-annually	pH electrode/meter
Conductivity	Bi-annually	Conductivity meter
Temperature	Bi-annually	Thermometer
DO	Bi-annually	Standard Method
BOD	Bi-annually	Standard Method
Suspended solids	Bi-annually	Standard Method
Nitrate	Bi-annually	Standard Method
Nitrite	Bi-annually	Standard Method
Ammonium	Bi-annually	Standard Method
Chloride	Bi-annually	Standard Method
Fluoride	Bi-annually	Ion-selective electrode
Total Phosphorous	Bi-annually	Standard Method
Heavy metals <sup>Note 1</sup>	Bi-annually	Atomic absorption/ICP

Note 1: The sum of arsenic, chromium, copper, nickel, lead, tin and cobalt.

**C.6.5 Ambient Water Monitoring**

Location: Mineral spring at Louisa Bridge

Parameter	Monitoring Frequency	Analysis Method/Technique
pH	Annually	pH electrode/meter
Conductivity	Annually	Conductivity meter
Temperature	Annually	Thermometer
TOC	Annually	Standard Method
Major anions: nitrate, nitrite, chloride, sulphate, fluoride	Annually	Standard Method
Major cations: calcium, magnesium, sodium, potassium, ammonia	Annually	Standard Method
Heavy metals: iron, manganese, copper, tin, chromium, lead, nickel, cobalt	Annually	Atomic absorption/ICP

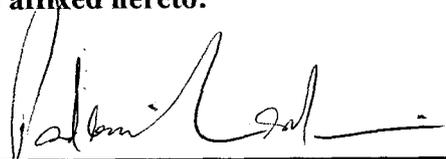
# SCHEDULE D: Annual Environmental Report

Annual Environmental Report Content <sup>Note 1</sup>
Emissions from the installation.
Waste management record.
Resource consumption summary.
Complaints summary.
Schedule of Environmental Objectives and Targets
Environmental management programme – report for previous year
Environmental management programme – proposal for current year
Pollution emission register – report for previous year
Pollution emission register – proposal for current year
Fugitive emissions programme report and review
Noise monitoring report summary
Ambient monitoring summary
Tank and pipeline testing and inspection report
Reported incidents summary
Energy efficiency audit report summary
Report on the assessment of the efficiency of use of raw materials in processes and the reduction in waste generated.
Report on progress made and proposals being developed to minimise water demand and the volume of trade effluent discharge.
Reports on financial provision made under this licence, management and staffing structure of the installation, and a programme for public information
Review of residuals management plan
Statement of measures in relation to prevention of environmental damage and remedial actions (Environmental Liabilities)
Any other items specified by the Agency.

**Note 1:** Content may be revised subject to the agreement of the Agency.

Sealed by the seal of the Agency on this the 21<sup>st</sup> day of December, 2005.

**PRESENT when the seal of the Agency was affixed hereto:**



**Director/Authorised Person**

