

**Barrow-in-Furness Borough Council**

**POLLUTION PREVENTION AND CONTROL ACT 1999**  
**ENVIRONMENTAL PERMITTING (ENGLAND AND WALES) REGULATIONS 2010 (AS**  
**AMENDED)**

**Part B Permit with Introductory Note**

**Ref: PPC/B/05**

**BAE Systems Marine Limited**

**Installation Address:**  
BAE Systems Maritime - Submarines  
Bridge Road  
Barrow-in-Furness  
Cumbria  
LA14 1AF

**Application First Received: 5<sup>th</sup> July 1999**  
**Current Part B Permit Issued: 8<sup>th</sup> May 2015**

## EXPLANATORY NOTES

### *These notes do not form part of the Permit*

This Permit is issued under Regulation 13 of the Environmental Permitting (England & Wales) Regulations 2010 (2010 Regulations) to operate an installation carrying out one or more of the activities listed in Part B to Schedule 1 of those Regulations, to the extent authorised by the Permit.

The Permit includes conditions that have to be complied with. It should be noted that aspects of the operation of the installation which are not regulated by those conditions, are subject to the Operator using the best available techniques (BAT) for preventing or, where that is not practical, reducing emissions from the installation.

Article 2(11) of the IPPC Directive defines — “best available techniques” as follows:

- a) ‘Best available techniques’ shall mean 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.
- b) ‘techniques’ shall include both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned,
- c) ‘available’ techniques shall mean 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,
- d) ‘best’ shall mean most effective in achieving a high general level of protection of the environment as a whole.

In determining the best available techniques, special consideration should be given to the items listed in Annex IV.

### **Brief Description of the Installation Regulated by the Permit**

The installation involves the cleaning and painting of submarines/surface ships and associated equipment with solvent based products within enclosures in various locations around the ship yard. Shot-blasting may be carried out prior to painting in purpose built enclosures with no emission to external air or the shot blast facility. Adhesives coatings and coatings containing di-isocyanates are also used within the installation.

1) **Responsibility under Workplace Health and Safety Legislation** - This permit is given in relation to the requirements of Environmental Permitting Regulations 2010 and subordinate regulations. It must not be taken to replace any responsibilities you may have under workplace health and safety legislation.

2) **Other responsibilities** - This permit, in that it regulates only air pollution matters, does not absolve you of the responsibility of any other statutory requirement, such as any need to obtain planning permission, hazardous substances consent or Building Regulations approval from the Council. Discharge consents from the local sewerage undertaker or a waste disposal licence from the Environment Agency may still be required.

3) **Enforcement and Offences** - It is an offence to operate a regulated facility without a current permit. The operator will be liable to enforcement action where;

- a) a new activity (as defined within the Environmental Permitting (England & Wales) Regulations 2010) is carried on without a proper permit, and
- b) any of the conditions of the permit are breached.

4) **Subsistence Charge** - An annual fee (subsistence charge) due on 1st April each year (currently chargeable per activity per annum but subject to change by statutory instrument) is payable to Barrow-in-Furness Borough Council.

5) **Confidentiality** - The Permit requires the Operator to provide information to Barrow-in-Furness Borough Council. The Council will place the information onto the public registers in accordance with the requirements of the 2010 Regulations. If the Operator considers that any information provided is commercially confidential, it may apply to the Council to have such information withheld from the register as provided in the 2010 Regulations. To enable Barrow Borough Council to determine whether the information is commercially confidential, the Operator should clearly identify the information in question and should specify clear and precise reasons.

6) **Variations to the permit** - This Permit may be varied in the future. If at any time the activity, or any aspect of the activity regulated by the following conditions changes such that the conditions no longer reflect the activity and require alteration, the Regulator should be contacted.

7) **Surrender of the permit** - Where an Operator intends to cease the operation of an installation (in whole or in part) the regulator should be informed in writing, such notification must include the information specified in regulation 24 of the 2010 Regulations.

8) **Transfer of the permit or part of the permit** - Before the Permit can be wholly or partially transferred to another person, a joint application to transfer the Permit has to be made by both the existing and proposed holders, in accordance with Regulation 21 of the 2010 Regulations. A transfer will be allowed unless the Authority considers that the proposed holder will not be the person who will have control over the operation of the installation or will not ensure compliance with the conditions of the transferred Permit.

9) **Appeal against permit conditions** - Anyone who is aggrieved by the conditions attached to a Permit can appeal to the Secretary of State for the Environment, Food and Rural Affairs. Appeals must be made in accordance with the requirements of Regulation 31 and Schedule 6 of the 2010 Regulations.

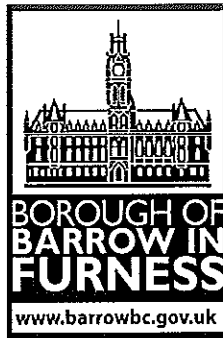
Appeals should be sent to the Secretary of State for the Environment, Food and Rural Affairs. The address is as follows:-

The Planning Inspectorate  
Environmental Appeals Administration  
Room 4/12 - Eagle Wing  
Temple Quay House  
2 the Square  
Temple Quay  
Bristol  
BS1 6PN

Please Note - an appeal brought under Regulation 31 paragraph (1) (b) and Schedule 6 in relation to the conditions in a permit will not suspend the effect of the conditions appealed against; the conditions must still be complied with. In determining an appeal against one or more conditions, the Act allows the Secretary of State in addition to quash any of the other conditions not subject to the appeal and to direct the regulator either to vary any of these other conditions or to add new conditions.

10) **Contact Details** - If you are required to contact the Environmental Protection Unit of the Environmental Health Department at Barrow-in-Furness Borough Council, please telephone 01229 876366 during office hours and ask for Geoff Dowker (Environmental Protection Officer).

**End of Explanatory Note**



**Permit reference: PPC/B/05**

Barrow-in-Furness Borough Council (the "regulator") in exercise of its powers under Regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010 (as amended), hereby permits

**BAE Systems Marine Limited ("the operator")**

whose registered office is

Warwick House  
PO Box 87  
Farnborough Aerospace Centre  
Farnborough  
Hampshire  
GU14 6YU

to operate an installation undertaking the cleaning and painting of units of submarines/surface ships and associated equipment and the use of adhesive coatings, as defined in sections 6.4 Part B and section 7 Part B (a) of Schedule 1 of the above Regulations, at

**BAE Systems Maritime – Submarines**  
Bridge Road  
Barrow-in-Furness  
Cumbria  
LA14 1AF

subject to the conditions of this Permit and within the boundary shown in red on the attached plan in Appendix A.

.....  
Environmental Health Manager  
An authorised officer of the Council

Date: 08<sup>th</sup> May 2015

## STANDARD CONDITIONS

### Best Available Techniques

1. The best available techniques shall be used to prevent or, where that is not practicable, reduce emissions from the installation in relation to any aspect of the operation of the installation which is not regulated by any other condition of this permit.

### Notification Procedure

2. If the operator proposes to make a change in operation of the installation, he must, at least 14 days before making the change, notify the regulator in writing. The notification must contain a description of the proposed change in operation. It is not necessary to make such a notification if an application to vary this permit has been made and the application contains a description of the proposed change. In this condition 'change in operation' means a change in the nature or functioning, or an extension, of the installation, which may have consequences for the environment.

## EMISSION LIMITS, MONITORING AND OTHER PROVISIONS

### Non VOC Emission Limits

3. The following emission limits shall apply to releases from contained sources.

Substance	Source	Emission Limits/Provisions	Type of Monitoring	Monitoring Frequency
Particulate Matter	See condition 5	50mg/Nm <sup>3</sup> as 30 minute mean	Manual extractive testing to BS ISO 9096:2003 or BS EN 13284-1 with averages taken over operating periods excluding start-up and shut-down	Annual

4. The reference conditions for the emission limits in condition 3 shall be 273.15K, 101.3kPa, without correction for water vapour content.
5. Emissions of particulate matter shall be tested according to the requirements in condition 3 at the following areas, when they are in operation:
  - a. Devonshire Dock Complex Main Paint Shop/Store (Spraybooth)
  - b. Devonshire Dock Complex Main Paint Shop/Store (Shot Blast Facility)
  - c. Devonshire Dock Complex Main Paint Shop/Store (Drying Facility)
  - d. Devonshire Dock Complex Main Paint Shop (D13)
  - e. Devonshire Dock Hall (DDH) D34
  - f. Devonshire Dock Hall (DDH) Paint Mixing Facility D24

- g. Ex Reactor Installation Facility (RIF)
- h. Acoustic Tiling Facility Dust Extraction System (DDH)
- i. Acoustic Tiling Facility Adhesive Mixing Area (DDH)
- j. Temporary enclosure external to DDH (adjacent to D22) (vent connected to DDH extraction system - see [d.] above)
- k. NAS Annex (temporary enclosure)
- l. NAS (temporary enclosure)
- m. Devonshire Dock Complex Wet Dock (temporary enclosure)
- n. Contractor's Self Contained Paint Mixing Facility at D00

**Reduction Scheme (No VOC abatement)**

- 6. The operator shall adopt the Solvent Reduction Scheme described in paragraphs 4.5 to 4.8 of PG 6/23 (11).
- 7. The installation shall comply with the target emission values in the table below. The 'target emission' shall be determined in accordance with the 'reduction scheme', detailed in Appendix B to this Permit.

<b>Target Emission Values for Coating (Painting) (Consumption below 15 tonnes)</b>
Total Mass of Solids x 0.6

<b>Target Emission Values for Adhesive Coating</b>
Total Mass of Solids x 1.2

**Solvent Management Plans**

- 8. The Operator shall produce two separate Solvent Management Plans for Coating (Painting) processes and Adhesive Coating Processes. These shall be updated annually, starting on 31 October 2006. The Solvent Management Plans shall be produced using the definitions and calculations set out in clauses 4.10, 4.11 and 4.12 of PG 6/23 (11). These are reproduced in Appendix C to this permit.

**Compliance with Reduction Scheme**

- 9. The annual actual solvent emission determined from the Solvent Management Plans shall be less than or equal to the Target Emission.
- 10. In addition to complying with the target emission, future reduction options shall also be considered and included in the annual report to the regulator.
- 11. The flexibility inherent in this compliance route shall not be taken to encourage:
  - a) The replacement of a low or no organic solvent coating system with a conventional high organic coating system.
  - b) The introduction of such a conventional high organic solvent coating system into a process/activity.
  - c) The introduction of such a conventional high organic solvent coating system onto a product where it was not in use before, or

- d) The introduction of high solids formulations which have no beneficial effect on the product but increase the solids used, except where a reduction in the overall VOC emissions can be demonstrated.

### **Designated Materials**

12. No materials designated Hazard Statement H340, H350, H350i, H360D or H360F shall be introduced without prior notification and permission of the Regulator.
13. Materials designated Hazard Statement H341 or H351 shall be controlled under contained conditions as far as technically and economically feasible to safeguard public health and the environment. Where the sum of the mass flows of all the discharges of all the compounds causing the designated labelling is greater or equal to 100 g/h, a limit value of 20 mg/Nm<sup>3</sup> for the mass sum of the individual compounds will apply. Annual manual extractive testing shall be in accordance with EN 13649

### **Other Provisions**

#### **Monitoring, Investigation and Recording**

14. The operator shall keep records of inspections, tests and monitoring, including all non-continuous monitoring, inspections and visual assessments. In such cases:
  - a. Current records shall be kept on site and made available to the regulator to examine and
  - b. Records shall be kept by the operator for at least two years.
15. The operator shall notify the regulator 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 methods to be used.
16. The results of non-continuous emission testing shall be forwarded to the regulator within 8 weeks of the completion of the sampling.
17. Adverse monitoring results from **any** monitoring activity (both continuous and non-continuous) shall be investigated by the operator as soon as the monitoring data has been obtained/ received. The operator shall:
  - a. Identify the cause and take any corrective action
  - b. Records as much detail as possible regarding the cause and extent of the problem, and the action taken by the operator to rectify the situation
  - c. Re-test to demonstrate compliance as soon as possible
  - d. Notify the regulator.

#### **Visible and Odorous Emissions**

18. All releases to air other than condensed water vapour, shall be free from persistent visible emissions.



19. All emissions to air shall be free from droplets.
20. There shall be no offensive odour beyond the site boundary, as perceived by the regulator.

### **Abnormal Events**

21. In the case of abnormal emissions, malfunction or breakdown leading to abnormal emissions, the operator must:
  - a. investigate immediately and take corrective action
  - b. adjust the process or activity to minimise those emissions; and
  - c. promptly record the events and actions taken.
22. The regulator shall be informed without delay:
  - a. if there is an emission that is likely to have an effect on the local community
  - b. in the event of the failure of key abatement plant.
23. In cases of non-compliance causing immediate danger to human health, the activity shall be suspended immediately. The following criteria shall be taken into account:
  - a. The toxicity of the substances being released
  - b. The amount released
  - c. The location of the installation; and
  - d. The sensitivity of the receptors.
24. The operator shall provide a list of key abatement plant and shall have a written procedure for dealing with its failure, in order to minimise any adverse effects.

### **Start up and Shut down**

25. All appropriate precautions shall be taken to minimise emissions during start-up and shut-down.

### **Efficient Capture of Emissions**

26. The introduction of dilution air to achieve emission limits is not permitted.

### **Calibration and Compliance Monitoring**

27. No result shall exceed the emission concentration limits specified, except where either:
  - a) data is obtained over at least 5 sampling hours in increments of 30 minutes or less; or
  - b) at least 20 results are obtained where sampling time increments of more than 30 minutes are involved; AND in the case of a) or b)

- c) no daily mean of all 30 minute mean emission concentrations shall exceed the specified emission concentration limits during normal operation (excluding start-up and shut-down); and
- d) no 30 minute mean emission concentration shall exceed twice the specified emission concentration limits during normal operation (excluding start-up and shut-down).

### **Sampling Provisions**

- 28. The operator shall ensure that adequate facilities for sampling are provided on vents or ducts.
- 29. Sampling points on new plant shall be designed to comply with the British or equivalent standards.

### **Installations with Two or More SED Activities**

- 30. As there are two SED activities within the installation, the operator shall:
  - a. As regards designated Hazard Statements H341 or H351, meet the requirements specified in Condition 13 for each activity individually;
  - b. As regards all other substances, either:
    - i) meet the requirements for each activity individually; or
    - ii) have total emissions not exceeding those that would have resulted had point (i) been applied.

NB When applying b) ii) above, the solvent management plan shall be calculated to determine total emissions from all activities concerned. That figure must then be compared with the total emissions from the installation that would have resulted had the requirements of Annex II of SED been met for each activity separately.

## **CONTROL TECHNIQUES**

### **VOC Control Techniques**

- 31. All potentially odorous waste materials shall be stored in suitable closed containers.
- 32. Coatings containing VOCs shall be stored in closed storage containers.
- 33. All measures shall be taken to minimise VOC emissions during mixing, i.e. use of covered or closed mixing vessels.
- 34. Emissions from the emptying of mixing vessels and transfer of materials shall be adequately contained, preferably by the use of closed transfer systems, e.g. use of closed mobile containers, containers with close fitting lids or preferably closed containers with pipeline delivery.

35. Cleaning operations involving VOCs shall be periodically reviewed, at least once every two years, to identify opportunities for reducing VOC emissions (e.g. cleaning steps that can be eliminated or alternative cleaning methods). The regulator shall be provided with a report stating the conclusions of the review.
36. Application of cleaning solvents shall be dispensed from a contained device when used on wipes.
37. When organic solvent is used on wipes:
  - a. pre-impregnated wipes shall be held within an enclosed container prior to use
  - b. where practicable, cleaning fluids containing no or low organic solvent cleaning content shall be used (with or without the addition of mechanical, chemical or thermal enhancements).
38. Where practicable fixed equipment shall be cleaned in-situ, and such equipment shall where practicable be kept enclosed whilst cleaning is carried out.
39. Where equipment is cleaned off-line, cleaning shall be carried out using enclosed cleaning systems, wherever possible. Enclosed cleaning systems shall be sealed to prevent emissions whilst in operation, except during purging at the end of the cleaning cycle. If this is not practicable, emissions shall be contained and vented.
40. Residual coating materials contained in parts of the application equipment shall be removed, where practicable, prior to cleaning.

#### **VOC Control Waste**

41. All reasonably practicable efforts shall be made to minimise the amount of residual organic solvent bearing material left in drums and other containers after use. All organic solvent contaminated waste shall be stored in waste containers.
42. Waste paint in tins shall be emptied into drums and then sealed and labelled, so waste handlers are aware of their contents and hazardous properties. Tins with very small amounts of paint residue shall be dried in the open air to avoid the creation of hazardous waste.
43. Nominally empty drums or drums containing waste contaminated with VOC awaiting disposal shall be stored in accordance with the requirements for full or new containers.
44. Prior to disposal, used wipes and other items contaminated with organic solvent shall be placed in a suitably labelled metal bin.

#### **General Control Techniques**

45. Dusty wastes shall be stored in closed containers and handled in a manner that avoids emissions.
46. Dry sweeping of dusty materials shall not normally be permitted unless there are environmental or health and safety risks in using alternative techniques.

47. Suitable organic solvent containment and spillage equipment shall be readily available in all organic solvent handling areas
48. A high standard of housekeeping shall be maintained.

## **AIR QUALITY**

### **Dispersion and Dilution from the Stack**

49. All emissions from:

- a. Devonshire Dock Complex Main Paint Shop/Store (Spraybooth)
- b. Devonshire Dock Complex Main Paint Shop/Store (Shot Blast Facility)
- c. Devonshire Dock Complex Main Paint Shop/Store (Drying Facility)
- d. Devonshire Dock Complex Main Paint Shop (D13)
- e. Devonshire Dock Hall (DDH) D34
- e. Devonshire Dock Hall (DDH) Paint Mixing Facility D24
- f. Ex Reactor Installation Facility (RIF)
- g. Acoustic Tiling Facility Dust Extraction System (DDH)
- h. Acoustic Tiling Facility Adhesive Mixing Area (DDH)
- i. Temporary enclosure external to DDH (adjacent to D22) (vent connected to DDH extraction system - see [d.] above)
- j. NAS Annex (temporary enclosure)
- k. NAS (temporary enclosure)
- l. Devonshire Dock Complex Wet Dock (temporary enclosure)
- m. Contractor's Self Contained Paint Mixing Facility at D00

shall be exhausted to the external air via the stacks specified in condition 50. The extract ventilation systems shall operate continually during all phases of the process operation.

50. The height and efflux velocity of stacks shall be as follows:

- a. Devonshire Dock Complex Main Paint Shop/Store (Spray Booth) – one stack 9.1 metres above ground level, 2.9 metres above apex of roof, with an efflux velocity of at least 15 m/s
- b. Devonshire Dock Complex Main Paint Shop/Store (Shot Blast Facility) - No requirement for minimum efflux velocity and stack height as stated in PG 6/23 (11) and PG6/32 (11)
- c. Devonshire Dock Complex Main Paint Shop/Store (Drying Facility) – one stack 5.3 metres above ground level, 0.8 metres above roof slope, with an efflux velocity of at least 11m/s
- d. Devonshire Dock Complex Main Paint Shop/Store (D13) – one stack 10 metres above ground level, 1 metre above building D12 gutter level, with an efflux velocity of at least 15 m/s
- e. Devonshire Dock Hall - 64 stacks all 45 metres above ground level, 6 metres below the apex of roof, with an efflux velocity of at least 4.5 m/s
- f. Devonshire Dock Hall (DDH) Paint Mixing Facility – one stack 5m metres above ground level
- g. Ex Reactor Installation Facility (RIF) - 19.5 metres above ground level, 1 metre

- above apex of roof, with an efflux velocity of at least 15 m/s
  - h. Acoustic Tiling Facility Dust Extraction System (DDH) - 8 metres above ground level, with an efflux velocity of at least 11 m/s
  - i. Acoustic Tiling Facility Adhesive Mixing Area (DDH) -45 metres above ground level, 6 metres below the apex of roof, with an efflux velocity of at least 4.5 m/s
  - j. Temporary enclosure external to DDH (adjacent to D22) (vent connected to DDH extraction system - see d) above)
  - k. NAS Annex (temporary enclosure) - 1 metre above apex of roof, with an efflux velocity of at least 15 m/s
  - l. NAS (temporary enclosure) - 1 metre above apex of roof, with an efflux velocity of at least 15 m/s
  - m. Devonshire Dock Complex Wet Dock (temporary enclosure) - 1 metre above deck of ship or bridge fin of a submarine, with an efflux velocity of at least 2 m/s
  - n. Contractor's Self Contained Paint Mixing Facility at D00 – 6 metres above ground level (only storage and mixing of paints)
51. Stacks shall not be fitted with any restriction at the final opening, such as a plate, cap or cowl, with the exception of a cone which may be necessary to increase the exit velocity of the emissions.
52. Stacks shall discharge vertically upwards, except those on Devonshire Dock Hall which can discharge horizontally due to the height of the building.
53. Before any stacks detailed in condition 50 are upgraded, replaced or repaired; heights and efflux velocities shall be agreed with the regulator.
54. Where the dispersion of pollutants discharged from any new stack (or vent) is necessary, the target exit velocity shall be 15m/s under normal operating conditions unless otherwise agreed in writing with the regulator. Where emissions consist of only air and particulate matter, this condition will not apply.
55. The regulator shall be informed in writing before a temporary enclosure is brought into use, and when it is dismantled.

## **APPROPRIATE MANAGEMENT SYSTEMS**

56. Spares and consumables – in particular, those subject to continual wear, shall be held on site, or shall be available at short notice from guaranteed suppliers, so that plant breakdowns can be rectified rapidly.
57. Staff at all levels shall receive necessary training and instruction in their duties relating to the control of the process emissions to air. Training shall include:-
- a. awareness of their responsibilities under the permit;
  - b. minimising emissions on start-up and shut-down; and
  - c. action to minimise emissions during abnormal conditions.
58. The operator shall maintain a statement of training requirements for each operational post and keep a record of the training received by each person whose actions may have an

impact on the environment. These documents shall be made available to the regulator on request.

59. Effective preventative maintenance shall be employed on all plant and equipment concerned with the control of emissions to air.
60. Records of the written maintenance programme shall be made available for inspection to the regulator on request.

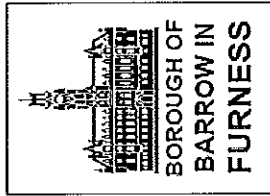
**In this permit, the following expressions shall have the following meaning:**

Authorised officer	An officer authorised to carry out duties under the 2010 Regulations and subordinate regulations.
Installation	Any reference to an installation shall be taken to include "mobile plant", stockpiles and associated roadways unless otherwise stated.
Logbook	Includes any means of storage of the required information as agreed by the regulator.
Operator	The person who has control over the operation of the installation. The installation need not be in operation for there to be an operator. The operator must demonstrably have the authority and ability to ensure compliance with the permit.
Regulator	Barrow-in-Furness Borough Council. The Environmental Protection Section of the Environmental Health Department, Town Hall, Duke Street, Barrow-in-Furness, Cumbria, LA14 2LD of this Council has responsibility for pollution control regulation.

**END OF PERMIT**

# APPENDIX A

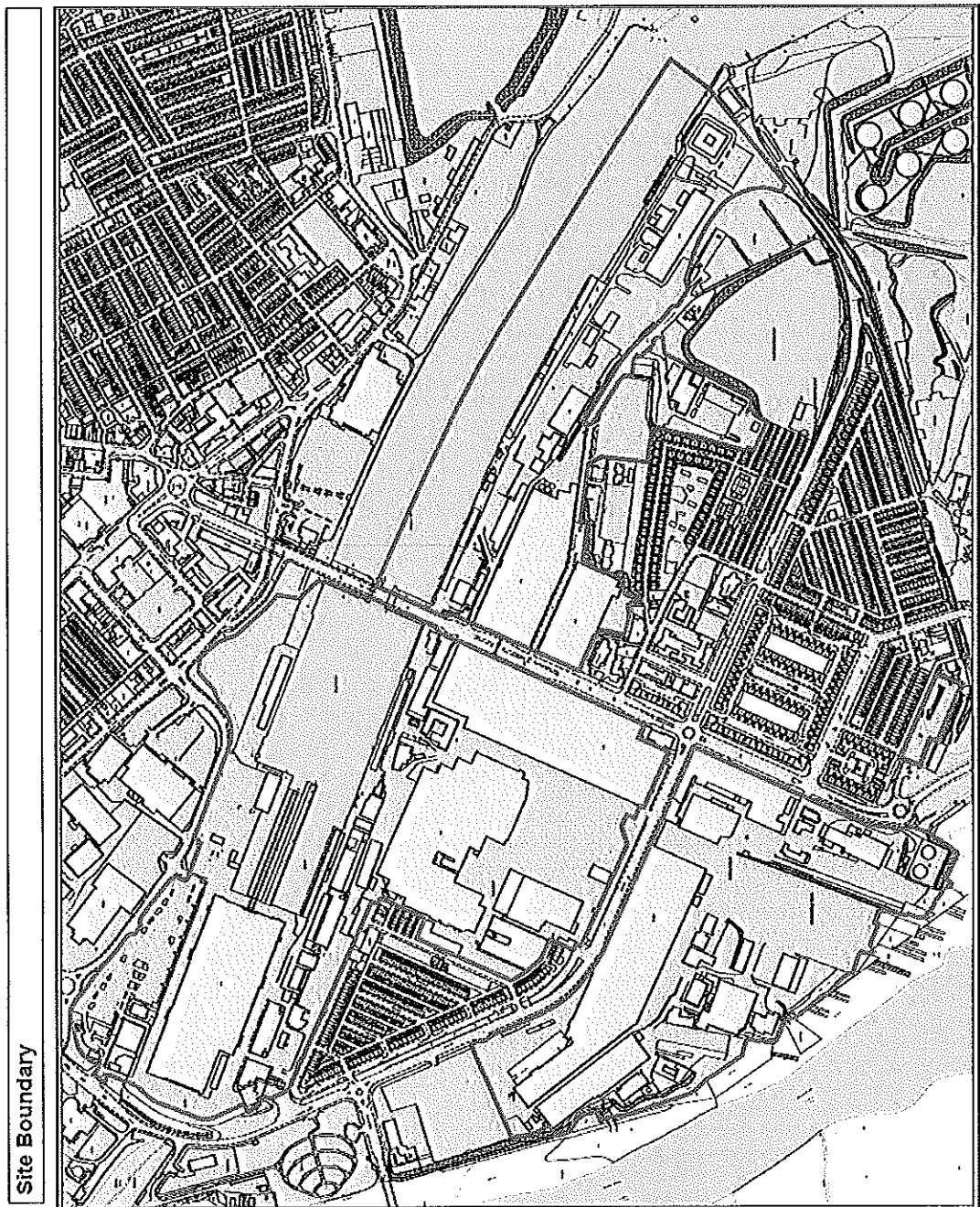
## Site Boundary



Scale : 1:5000  
Grid : None

Produced on : 05/05/2011

PRODUCED FOR EXTERNAL  
COUNCIL BUSINESS USE  
THIS COPY HAS BEEN PRODUCED  
SPECIFICALLY FOR THE PURPOSES  
OF STATUTORY AND REGULATORY  
REQUIREMENTS IMPOSED ON BARROW  
BOROUGH COUNCIL.  
THIS INFORMATION IS NOT TO BE  
CONSIDERED A CONTRACT AND IS  
ISSUED WITHOUT LIABILITY TO BARROW  
BOROUGH COUNCIL.  
Copyright © 2011, Ordnance Survey  
BARROW BOROUGH COUNCIL  
Licence No. JA100076831



Site Boundary

## APPENDIX B

### Reduction Scheme – No VOC Abatement (reproduced from PG6/23)

#### Solvent Reduction Scheme

4.5 The Reduction Scheme is the preferred method of preventing and minimising emissions of VOC, using non-abatement techniques such as:

- water borne coatings (low organic solvent content)
- higher solids content coatings
- powder coatings
- organic solvent free liquid coatings
- radiation cured coatings (for example, ultra violet and electron beam).

4.6 An operator may choose to use the Reduction Scheme for an installation to achieve emission reductions to a "Target Emission" equivalent to those which would have been achieved if the concentration emission limits had been applied.

The following scheme should operate for installations for which a constant solid content of product can be assumed and used to define the reference point for emission reductions.

The operator should forward an emission reduction plan, which includes in particular:

- mechanisms to decrease in the average solvent content of the total input; and/or
- systems to increase efficiency in the use of solids to achieve a reduction of the total emissions from the installation.

The Target Emission from an installation should be calculated by multiplying the total mass of solids in the quantity of coatings used in a year with the relevant figure given in Table 7 below. In determining the total mass of solids:

- solids are all materials in coatings that become solid as a result of curing, polymerisation, or the evaporation of the water or solvent (usually available from the supplier in g/l or non-volatile % mass by weight\*), and
- all ingredients other than water and organic solvents should be assumed to form part of the solid coating.
- in cases of doubt, the reference standard for the determination of non-volatile % mass by weight is BS EN ISO 3251 (also numbered BS 3900: B18). The test conditions may need to be adjusted for the particular conditions of use or when assessing chemically or radiation cured coatings, where otherwise volatile components react to form part of the dry solid coating.



Table 7: Reduction scheme: Target emission figures

Coating activity	5-15 tonnes solvent consumption	Total mass of solids x 0.6
	Over 15 tonnes	Total mass of solids x 0.37

### Compliance with Reduction Scheme

4.7 Compliance with Reduction Scheme is achieved if the annual actual solvent emission determined from the Solvent Management Plan is less than or equal to the Target Emission.

Where the annual actual solvent emission = I1-08-07-06 (-05 if abatement has been used). See paragraph 4.12 below.

4.8 The flexibility inherent in this compliance route should not be taken to encourage

- the replacement of a low or no organic solvent coating system with a conventional high organic solvent coating system, or
- the introduction of such a conventional high organic solvent coating system into a process/activity or
- the introduction of such a conventional high organic solvent coating system onto a product where it was not in use before, or
- the introduction of high solids formulations which have no beneficial effect on the product but increase the solids used, except where a reduction in the overall VOC emissions can be demonstrated.

Regulators should seek prior notification of any proposal to introduce such systems, which should include reasons why lower organic solvent systems are not considered technically appropriate or practicable.

## APPENDIX C

### Determination of Solvent Consumption

4.9 Construction of inventories of materials consumed and disposed of may involve the identification of individual organic solvents, or solids. This may give rise to an issue of commercial confidentiality. Information supplied must be placed on the public register, unless exclusion has been granted on the grounds of commercial confidentiality or national security. (Further information can be found in the appropriate chapter of the relevant General Guidance Manual).

4.10 A determination of the organic solvent consumption, the total mass of organic solvent inputs minus any solvents sent for reuse/recovery off-site, should be made and submitted to the regulator annually, preferably to coincide with the operators stocktaking requirements. This should be in the form of a mass balance in order to determine the annual actual consumption of organic solvent (C):

Where: C = I1- O8 (See Definitions, paragraph 4.12, below).

### Solvent Management Plan

4.11 Operators buy solvents to replace those lost during the process or included in the product. There are both environmental and cost savings from reducing the losses. The Solvent Emissions Directive requires a SMP to be produced to determine fugitive emissions (SED Box 5), identify future reduction options and give the public access to information about solvent consumption etc.

4.12 The SED provides guidance on what constitutes a solvent input and an output. This can be described more simply as needing data on:

#### Inputs

How much solvent is:

- Bought, whether in pure form or contained in products
- Recycled back into the process

#### Outputs

How much solvent is:

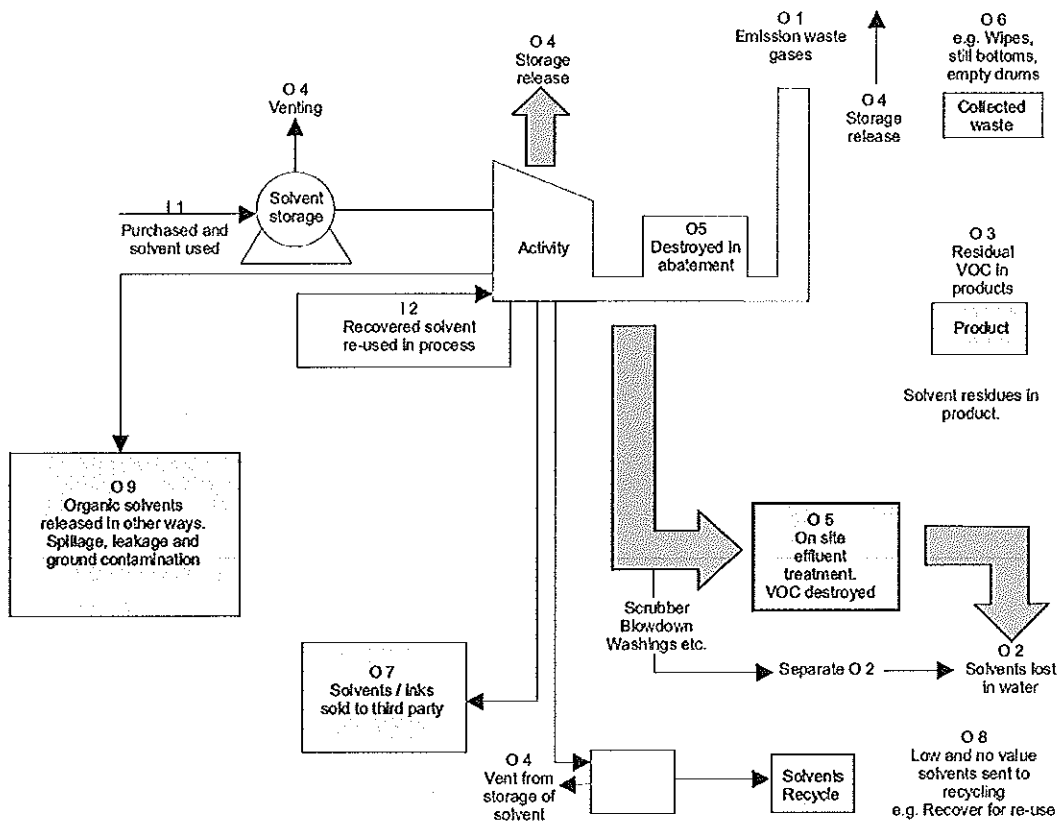
- Emitted to air, whether directly or via abatement equipment
- Discharged to water, whether directly or via water treatment
- Sent away in waste
- Lost by spills, leaks etc

- Leaving the installation in the product

There is guidance on the Business Link website about solvent management.

The definitions in Annex III of the SED are as follows and are shown diagrammatically below:

Solvent Management Plan Inputs and Outputs (PG Note 6/23 (11); Figure 4.1)



<p>Solvent Management Plan</p> <p>Consumption = I1 - O8</p> <p>Actual solvent emission = I1 - O5 - O6 - O7 - O8</p> <p>Fugitive emission (F) = I1 - O1 - O5 - O6 - O7 - O8</p> <p>OR</p> <p>Fugitive emission (F) = O2 + O3 + O4 + O9</p>	<p>Solvent Emissions Directive Activities</p> <p>Fugitive Emission Value =</p> $\frac{F}{I1 + I2} \times 100\%$ <p>Total emission = O1 + Fugitive emission (F)</p>
---	--

Inputs of Organic Solvent in the time frame over which the mass balance is being calculated (I)

I1 The quantity of organic solvents or their quantity in mixtures purchased which are used as input into the process/activity (including organic solvents used in the cleaning of equipment, but not those used for the cleaning of the products).

**I2** The quantity of organic solvents or their quantity in mixtures recovered and reused as solvent input into the process/activity. (The recycled solvent is counted every time it is used to carry out the activity.)

Outputs of Organic Solvents in the time frame over which the mass balance is being calculated (O)

- O1** Emissions in waste gases.
- O2** Organic solvents lost in water, if appropriate taking into account waste water treatment when calculating O5.
- O3** The quantity of organic solvents which remains as contamination or residue in products output from the process/activity.
- O4** Uncaptured emissions of organic solvents to air. This includes the general ventilation of rooms, where air is released to the outside environment via windows, doors, vents and similar openings.
- O5** Organic solvents and/or organic compounds lost due to chemical or physical reactions (including for example those which are destroyed, e.g. by thermal oxidation or other waste gas or waste water treatments, or captured, e.g. by adsorption, as long as they are not counted under O6, O7 or O8).
- O6** Organic solvents contained in collected waste.
- O7** Organic solvents, or organic solvents contained in mixtures, which are sold or are intended to be sold as a commercially valuable product.
- O8** Organic solvents contained in mixtures recovered for reuse but not as input into the process/activity, as long as not counted under O7.
- O9** Organic solvents released in other ways