

**Environmental Permit (Variation)
BAE Systems (Operations) Limited,
Samlesbury Aerodrome, Balderstone, Lancashire, BB27LF, UK
Non-Technical Summary (NTS) (Permit No. EPR/BV0414IV)**

023-19232 | July 2023 | Revision 00



Introduction

This document has been prepared by BAE SYSTEMS (Operations) Limited (“BAE Systems”) and its environmental consultant Earth & Marine Environmental Consultants Ltd (“EAME”) in support of a permit variation as required under Regulation 20 of the *Environmental Permitting (England and Wales) Regulations 2016* (as amended) in relation to current activities and proposed activities to be undertaken at Samlesbury Aerodrome, Balderstone, Lancashire, BB27LF, UK (Permit No. EPR/BV0414IV).

This application is to vary an existing environmental permit in relation to operations and activities undertaken the site (*Figure 1*).

The document represents the Non-technical Summary report submitted as part of the variation package to the Environment Agency (EA) (EAME Project Ref. 023-1932).

BAE Systems

BAE Systems provides some of the world’s most advanced, technology-led defence, aerospace and security solutions. They employ a skilled workforce of 93,100 people in around 40 countries.

The Samlesbury site currently employs around 5,000 people involved in fuselage and component manufacture.

Additional information can be obtained from:
<https://www.baesystems.com/en-uk/home>

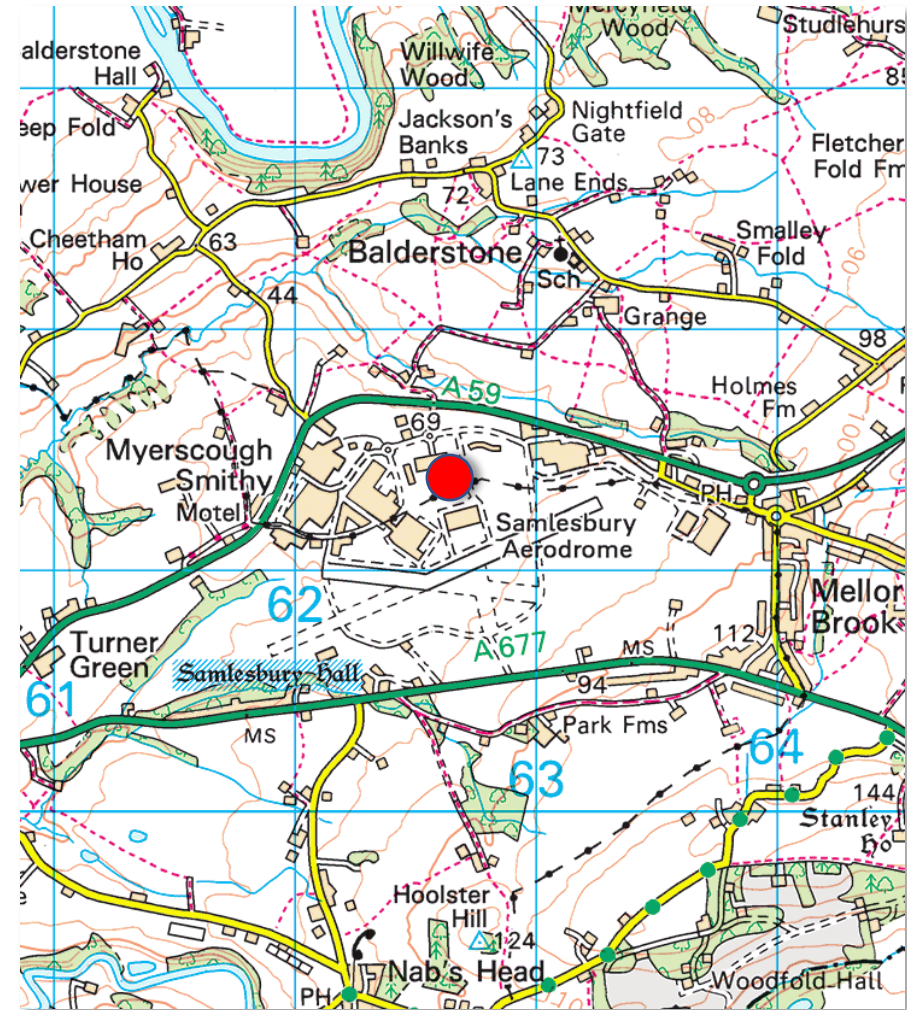


Figure 1: Site Location - Ordnance Survey Map Extract (1:50,000)

Ordnance Survey 1: 25,000 scale map with the permission of the Controller of Her Majesty’s Stationery Office, Crown Copyright Earth and Marine Environmental Consultants Ltd, Licence No. 100050755

CTF Proposed Changes

The proposed changes to the CTF include:

- **Installation** – A new (replacement) metal anodising process line located wholly within the Central Treatment Facility (CTF). The project will involve the use of pre-existing equipment (i.e. a previously installed (but not used) scrubber unit) located on the southern side of the CTF. The process line will be UK Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) compliant.
- **Decommissioning** – Post-commissioning/productionisation acceptance, the removal of the current permitted chromic acid metal anodising process line located wholly within the CTF building. This includes the removal of the two existing external scrubber units (AE1 and AE2) located on the western side of the CTF building.
- **Permit text update** – Update permit to remove all references to the ‘Clean and Pickle line’ following decommissioning of the process line during 2022. This includes the removal of air emission points AE3 and AE4 and all associated equipment.
- **Operational Improvements** – Significant capital investment is a revised tanker/chemical delivery area on the western side of the CTF building.
- **Modification of ETP storage** – The current effluent treatment plant (ETP) located within the CTF will be used (in part) for the treatment of rinse waters from the new (replacement) metal anodising process line.

1-Shed Proposed Changes

The proposed changes to 1-Shed include:

- **Permit text update** – Update permit to remove reference to organic solvent degreasing using Neu-Tri E (Trichloroethylene). Replacement solvent is now Perchloroethylene. There are no changes to the associated equipment and/or abatement systems.

Permit Boundary Changes

Due to the proposed changes outlined above the permit boundary associated with the CTF operations needs to be updated. No changes are proposed to the 1-Shed permit boundary.



Figure 2: Site and CTF permit boundary

S03 – Anodise Process Line (CTF)

Process Overview

Hexavalent chromium or Cr (VI) has been used in many industries, such as automotive and aerospace, because it's relatively easy to produce and has excellent corrosion-resistant properties. However, due to its toxicity and carcinogenic properties, all Cr (VI) plating will be banned in 2024.

The proposed replacement of the existing chromic acid anodising process line with a new Best available techniques (BAT) and UK REACH compliant) metal anodising process based on Thin Film Sulphuric Acid Anodising (TFSA).

The process line will be composed of 28 process stations. The stations are either related to loading/unloading, inspection, treatment, or rinsing (using de-ionised water).

Air Emissions

A single emission point to atmosphere is associated with the new anodise process line, emission point Ref. A10 (AE26). The fume scrubber is located on the southern side of the CTF building.

The use of a scrubber plant is considered a Best Available Technique (BAT).

Process Effluent

The effluent treatment plant (ETP) and storage tanks allow the CTF to recycle 65% of the waters (which are reused within the process) with the remaining 35% subject to treatment and disposal to sewer (via point TE1).

The use of a ETP is considered BAT.



Figure 3: 3D render of the new anodise process line

Decommissioning of Existing Plant

The existing Chromic acid anodising plant and all associated equipment (including the external air abatement scrubbers) will be subject to formal decommissioning and removal from site.

Process Improvements

As part of the ongoing improvements at the site (in-line with BAT) BAE Systems has redesigned and improved the tanker unloading area.

The previous procedure was for road tankers to park on the service road and the surrounding surface water drains to be sealed (during the delivery procedure) using drain covers. The primary issue with this approach was the limited containment capacity offered by the road kerbs in the event of a major loss of containment.

Containment Systems

The system has been designed to comply with current Construction Industry Research and Information Association (CIRIA) Guidance on the design of tanker offloading and loading facilities. The design has considered the compartment volume(s) of the road tankers that attend the site and the maximum loading and/or unloading rate. The management of firewater and/or rainwater volumes has not been directly considered within the design due to the available space, risk profile of the materials being handled and the proposed operational procedures for the use of the facility (i.e. it is primarily a temporary containment facility for use during loading/unloading only).

The design of the installation meets the required BAT standard and is considered a significant improvement over previous systems.



Figure 4: *Gated entrance to new tanker unloading bay*

Introduction

There are two Effluent Treatment plant (ETPs) associated with the permitted installation, one in 1-Shed and one in the CTF. The modifications to the CTF ETP are required due to the replacement of the current permitted Chromic acid anodise line.

No modifications are proposed to the ETP located within 1-Shed.

Process Changes

The CTF effluent plant currently produces de-ionised (DI) water for the process line rinse tanks and the adjacent 3B machine shop. It also treats the rinse waters from the process lines, this is either recycled back into the DI system or treated so it can be discharged into the on-site effluent system prior to discharge to sewer (under United Utilities consent).

The current DI water and effluent plant has insufficient capacity to cope with the requirements for the new anodise line. This permit variation will enable the DI water system to increase production from 15,000 litres/hr to 35,000 litres/hr with temporary storage within a new 60 m³ above ground storage tanks (AST).

In addition, six other ASTs will be upgraded, alongside the surrounding bund. All containment system will meet the current Best Available Technique (BAT) standard required by the EA.

Although the discharge volumes will increase to sewer the volumes and chemical characteristics will remain within the current compliance limits set out in the United Utilities consent.

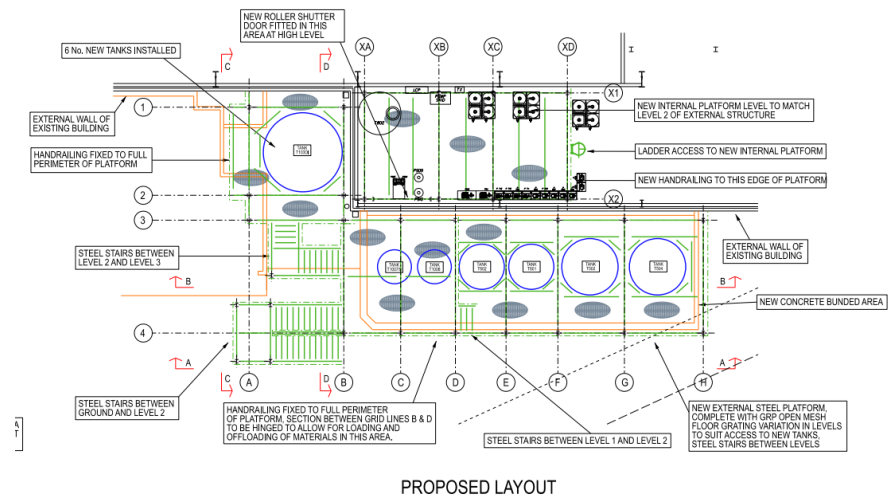


Figure 5: Revised ETP tank layout

S06 – Degreaser Process Change (1-Shed)

Process

Metal degreasing is the process of removing oils, greases, and other contaminants from metal surfaces. This is undertaken to prepare the metal prior to further treatment e.g. thermal processing, painting, plating, or welding, as these contaminants can cause detriment to metallurgical properties, adhesion and process performance.

Historical Substance

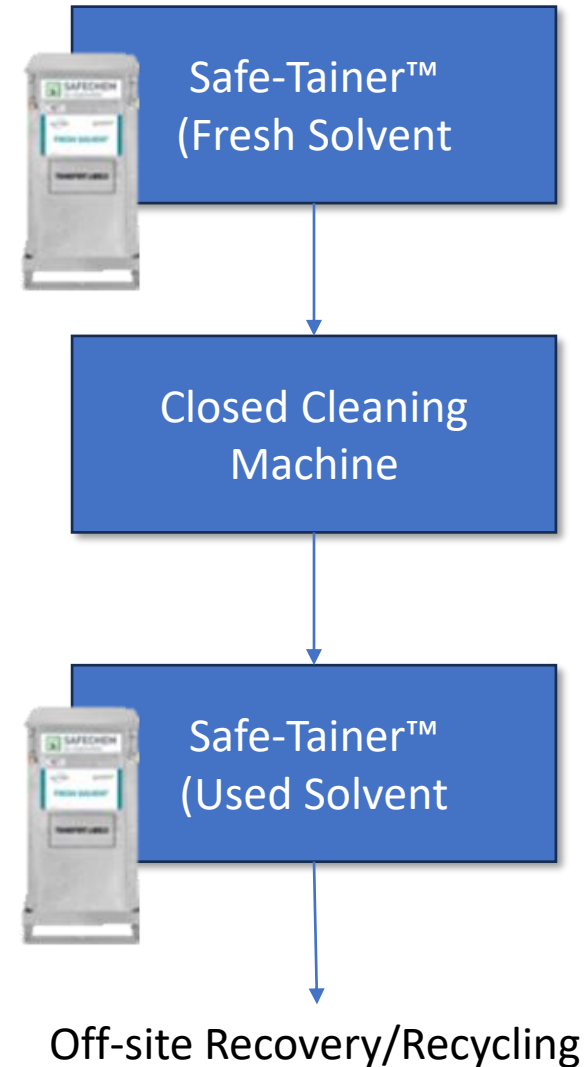
Trichloroethylene (TCE) was historical used throughout industry as a metal parts cleaning substance due to the solvency properties of the substance and applicability to different kinds of materials.

REACH

Identifying and reducing the risk posed by substances of very high concern (SVHC) is central to the UK REACH (registration, evaluation, authorisation, and restriction of chemicals) regulation.

Substitution

BAE Systems Samlesbury replaced TCE with Tetrachloroethylene otherwise known as Perchloroethylene (PERC) in 2020 due to the REACH restrictions. The use of PERC within the enclosed greaser is very low with less than 0.5 tonnes used annually.



S07 – Overall Process Management

Management Systems

BAE Systems has implemented and maintains an Environmental Management System (EMS) that is certified to ISO14001:2015 (Certificate No. 10375614).

The EMS continues to be maintained and is externally audited whilst delivering all indicative Best Available Technique (BAT) requirements for an effective management system. The current management systems will be updated to include the proposed.

BAE Systems also operates a certified ISO 45001:2018 Occupational health and safety management systems, a certified ISO9001:2015 quality management system and a certified ISO5001:2018 energy management system. These systems are fully applied to all activities including all permitted areas.

Operations and Maintenance

The site uses a "risk" based approach for assessing the criticality of site equipment in terms of Health, Safety, Environment and Manufacturing. As well as the criticality of the plant the equipment is given a priority which determines how quickly an unplanned failure of said equipment is responded to.

Unplanned and Emergency Events

As part of the variation BAE Systems has amended existing and developed new management system elements, in-line with EA BAT requirements to cover aspects such as Emergency Response.



Point Source Emissions

A single emission point to atmosphere is associated with the new anodise process line, emission point Ref. A10 (AE26). The fume scrubber is located on the southern side of the CTF building adjacent to the permitted PFD scrubber Ref. A5 (AE5).

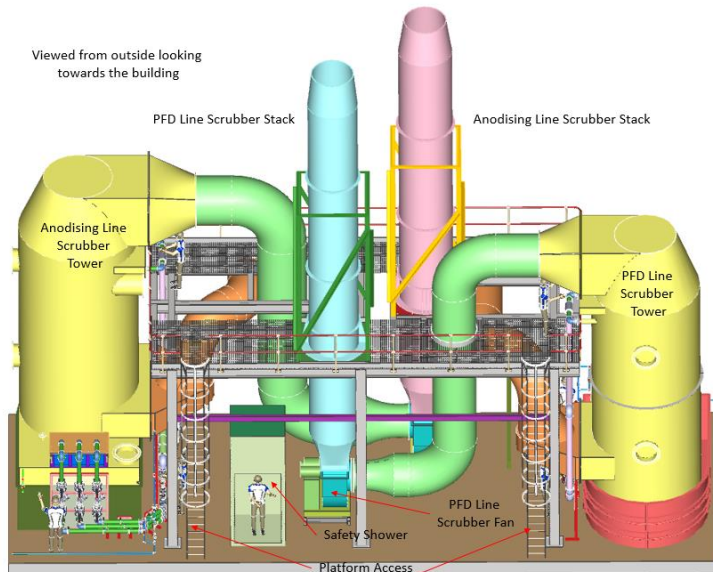


Figure 6: Air emission scrubber units

The abatement (scrubber with mist eliminator) meets the required BAT standard.

Improvement Action

To demonstrate conformance with BAT BAE Systems proposes the following action:

Following completion of the installation, BAE Systems shall undertake stack emission monitoring of emission point A10 (AE26) i.e. scrubber inlet and scrubber outlet for Oxides of Nitrogen (as NO₂), Hydrogen fluoride and Total Chromium, Chromium VI. Upon completion of the work, a written report shall be submitted to the Environment Agency.

Fugitive Emissions

All anodising activities are undertaken within the CTF building. Fugitive emissions are not seen as a potential issues for the installation.

Surface Water

There are no new point source emissions to surface water from the installation. All existing drainage systems on-site remain as is.

Sewer

There are no new point source emissions of process derived wastewater to sewer associated with the installation.

The discharge from the new anodise process line will enter and be treated using the current Effluent Treatment Plant (ETP).

Groundwater

There are no existing or new (direct) point source emissions to groundwater from the installation.

Discharge to Ground

There are no discharges to ground associated with the installation.

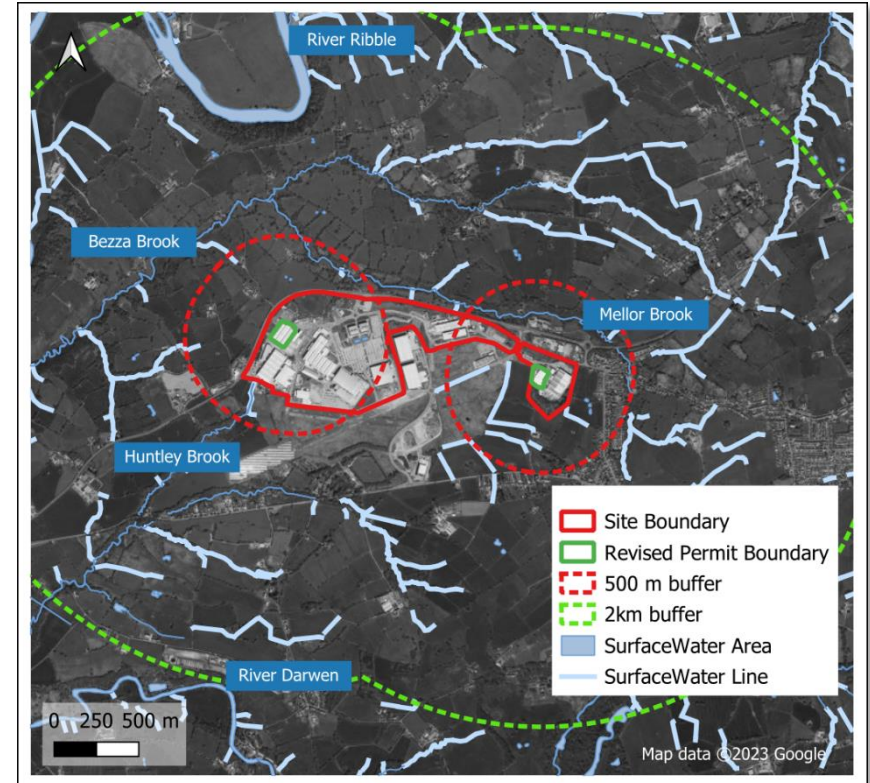


Figure 7: Surrounding surface water features

Introduction

The original IPPC application identified the primary potential sources of noise and vibration as the fume and dust extraction units and associated ventilation systems. The noise sources (associated with these pieces of equipment) are mainly fans, motors, and air movement from the extraction ducts.

Previous Assessment

An assessment, undertaken in accordance with BS4142:1997 'Method for rating industrial noise affecting mixed residential and industrial areas' (now updated), found that the noise attributable to the IPPC operations was of 'marginal significance or less'. The survey identified that the main potential source of noise (from BAE Systems) was emanating from outside the permitted installation (i.e. was associated with the 3B Machine Shop). Because of this noise attenuation equipment was installed on the 3B Machine Shop noise sources.

Noise Complaints

In 2021 there were complaints of a noise affecting residences on Branch Road, Mellor Brook. An investigation into the complaints found a strong tonal source emitted from the stack of the PFD scrubber unit (AE5). Remedial works have subsequently been carried out on the fan to reduce the problem tone. The provided report from PDA Acoustic Consultants details follow-up measurements taken to validate the remediation works. No further complaints have been received. All information has previously been provided to the EA.

Given that the PFD scrubber and anodise scrubber were designed by the same installer and installed at the same time there was potential that the same issue would be present on anodise scrubber (Ref. AE26 – EPR Ref. A10). As result, BAE Systems is proactively replacing the fan on the new anodise scrubber as part of the ongoing works (i.e. prior to operation).

Improvement Action

In-light of the previous issue BAE System proposes the following action:

Following completion of the installation, the Operator shall undertake noise monitoring at the nearest sensitive receptors. This shall include a full noise monitoring survey and assessment meeting the BS4142:2014 standard including details of local conditions e.g. meteorological conditions (wind direction) including 1/3rd octave and narrow band (FFT) measurements to identify any tonal elements or low frequency noise.

Upon completion of the work, a written report shall be submitted to the Environment Agency. If rating levels likely to cause complaints or disturbance at sensitive receptors are detected as a result of the installation operation, the report shall include an assessment of the most suitable abatement techniques, an estimate of the cost and a proposed timetable for their installation.

Introduction

In order to demonstrate that potential risks and emissions are controlled in-line with BAT a series of assessments have been undertaken.

Accidents and Unplanned Events

BAE Systems has undertaken a series of Hazard Identification Studies (HAZIDs) to identify potential health, safety and environmental (HSE) hazards early in the project. The findings and hazard ratings help to deliver effective management of major hazards and form part of the project risk register.

The facility also undertakes risk and impact assessments of all operations that form part of the certified Quality Environment Health and Safety (QEHS) management systems.

The facility is also operated as a Top Tier Control of Major Accident Hazard (COMAH) site. The site takes all necessary measures to prevent major accidents involving dangerous substances whilst also limiting the consequences to people and the environment of any major accidents.

Conclusion – All appropriate measures have been undertaken and incorporated into the process design and overarching QEHS management systems. The proposed systems have been assessed as meeting BAT.

Emissions to Air

The emissions to air from the point source emission point have been modelled using ADMS 6. ADMS 6 is an advanced new generation Gaussian plume dispersion model used to model the air quality impact of existing and proposed industrial installations.

Conclusion – The emissions from the installed BAT complaint scrubber are determined not to be of concern to human health or ecology.

Noise Assessments

Given the previous noise complaint and the applied corrective action (which was successfully applied) BAE Systems propose a noise survey once operations commence. This will be used to verify that the altered design of the scrubber fan has been successfully applied and that the local noise environment has not been impacted by the process change.

Conclusion – Previous issues has been adequately addressed. The proposed monitoring (post-commissioning) will demonstrate the performance of the system.

Emissions to Sewer

The treated effluents that are discharged to sewer have been assessed using the EA's H1 Environmental Risk Assessment tool. The findings of the H1 assessment demonstrate that the release to sewer remains acceptable. The discharge to sewer remains under the control of the United Utilities consent.

Conclusion – Discharges to sewer (treated rinse waters) remain acceptable.



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