Environmental Risk Assessment

Meggitt Aircraft Braking Systems, Coventry

Meggitt Aerospace Limited

Date: May 2019

Our Ref: JER1637

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Revision No.	Date	Reason for Change	Authors Initials
0	-	-	AG
1	15th October 2018	Internal Review	TC
2	31st October 2018	Internal Review	JS
3	8th November 2018	Client Review	OT
4	18th December 2018	Additional emissions points	TC
5	20th December 2018	Client Review	OT
6	10th May 2019	Updated Emissions Points References	TC

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1 Introduction

1.1.1 This Environmental Risk Assessment (ERA) has been carried out in support of an application for a variation to an environmental permit (BN7109IH). It includes an assessment of the risk to the environment and human health from the new thermal oxidiser unit, dust extraction units, cooling towers and LNG tank to be installed on the site, as well as for storage of raw materials associated with the permitted activities. The Environment Agency's (EAs) Risk Assessments for your environmental permit [1] covers a range of environmental risks. Those aspects relevant to the operation of the Meggitt Aircraft Braking Systems facility are covered within the following sections.

1.1.2 'Amenity and Accidents', 'Emissions to Air' and 'Global Warming Potential' will be supported by the H1 assessment software tool, which can be found in the Appendix to this Environmental Risk Assessment.

1.1.3 This document provides the relevant risk assessments covering the above aspects.

[1] https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

2 Amenity and Accidents

2.1.1 This section provides an assessment of risks to environmental amenity and from accidents that could arise from operation/use of the new thermal oxidiser unit, cooling towers, LNG tank and raw materials storage. The assessment has been completed in accordance with the EA's Risk Assessments for your environmental permit [1].

2.1.2 The scope of the assessment has covered the following aspects:

- odour;
- noise and vibration;
- fugitive emissions;
- visible emissions; and
- accidents.

2.1.3 For each of the above, the approach to the assessment has followed the following four stage process:

1. identify the hazards;
2. assess the risks (assuming that any control measures proposed are in place);
3. choose appropriate further measures to control these risks (if required); and
4. present the assessment of overall risk.

2.1.4 Results of the assessment are provided in the following tables.

Table 2.1 Assessment of odour risks

Table 2.2 Assessment of noise and vibration risks

Table 2.3 Assessment of fugitive emission risks

Table 2.4 Visible emissions

Table 2.5 Accidents risk assessment and management plan

2.1.5 In completing the assessment, prevention and control measures proposed by Meggitt Aerospace Ltd (MAL) are assumed to be in place. Where relevant, details of these measures are identified within the assessment.

Table 2.1: Odour risk assessment and management plan

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence.
Odour emissions from the permitted activities	Local residents (nearest receptors approx. 100 m from the proposed extension area; 15 m from the MAL site boundary). Industrial units located immediately adjacent to the installation.	Air	There are no significant sources of odour associated with the permitted activities and therefore odour management procedures are not required. There have not been any odour complaints received by the site. The proposed variation does not introduce any new materials or processes with the potential for significant odour. The Thermal Oxidiser destroys VOCs and therefore reduces the potential for any odorous emissions from the stack.	Very low	Minor odour annoyance (at worst)	Not significant

Table 2.2: Noise and vibration risk assessment and management plan

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence.
Noise from vehicle movements onsite and offloading (such as reverse warnings)	Local residents (nearest receptors approx. 100 m from the proposed extension area; 15 m from the MAL site). Industrial units located	Air	Noise from traffic has also not been considered as there is no significant increase in traffic movements linked to the permitted activities that are changing as a result of this variation. There will only be the additional traffic associated with raw materials delivery which will be periodic and therefore not significant.	Very low	Low	Not significant

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence.
	immediately adjacent to the installation.					
Noise from the CVD installation (interior)	Operatives working within the installation building. Local residents (nearest receptors approx. 100 m from the proposed extension area; 15 m from the MAL site). Industrial units located immediately adjacent to the installation.	Air	Plant machinery is fitted with appropriate noise suppression as far as is practicable and all operatives are supplied with appropriate hearing protection where required. Noise level monitoring is undertaken periodically as a management control measure for all plant, at operative positions and within the noise hazard areas. As noise levels exterior to the plant are not discernible from internal operations, there are no significant control measures employed in the form of acoustic panelling or process enclosure. The site has not received any noise complaints and there is not expected to be any significant increase in noise as a result of the proposed variation as the thermal oxidiser and furnace are situated within the CVD. The cooling towers are to be located further away from sensitive receptors than the current temporary cooling towers.	Low	Low	Not significant
Noise from CVD installation (exterior)	Local residents (nearest receptors approx. 100 m from the proposed extension area; 15 m from the MAL site). Industrial units located immediately adjacent to the installation.	Air	The main plant will be located within suitably constructed and clad buildings. This will include the new thermal oxidiser and furnace. Daily inspections and scheduled maintenance, with additional noise assessments undertaken periodically to determine fluctuations and identify if any further controls are necessary. In the event of a complaint, the complaints procedure will be followed to record and act on the complaint, and instigate appropriate action.	Low	Low	Not significant

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence.
Vibration from the plant	Local residents (nearest receptors approx. 100 m from the proposed extension area; 15 m from the MAL site). Industrial units located immediately adjacent to the installation.	Land	Significant vibration effects are not anticipated from the proposed changes subject to this variation, however, any vibration issues identified with the plant will be resolved during the commissioning process. In the event of a complaint, the complaints procedure will be followed to record and act on the complaint, and instigate appropriate action.	Low	Low	Not significant

Table 2.3: Fugitive emissions risk assessment and management plan

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence**.**
To Air / Water – land?						
OPAN storage in DAIPC building	Local residents (nearest receptors approx. 100 m from the proposed extension area; 15 m from the MAL site). Industrial units located	Air / Water	OPAN stored in sealed boxes within a building. Movement around site only permitted by trained forklift drivers. DAIPC building/containers locked when not in use and offer protection from impact (e.g. from movement of unauthorised vehicles), therefore emissions of dust are unlikely. The site has not received any dust complaints and it is	Low	Medium	Not significant

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence**.**
	immediately adjacent to the installation. Local water course (River Sowe)		unlikely that the proposals included in this variation shall increase the risk of dust emissions from the site. In the unlikely event that it is washed into surface water drainage or foul sewer, it is an inert substance with low environmental impact.			
LNG storage	Local residents (nearest receptors approx. 100 m from the proposed extension area; 15 m from the MAL site). Industrial units located immediately adjacent to the installation.	Air	Stored in vertical cryogenic tank on hardstanding, away from possible flames. LNG tank is protected by crash barriers and being situated in an area without any vehicle movements. A procedure is in place for the storage of chemicals. A procedure will be in place to ensure that any damaged or leaking containers are dealt with and to allow regular inspections for any signs of deterioration.	Low	Low	Not significant
Cooling Water Chemicals	Local water course (River Sowe)	Water / Drainage	The chemicals are stored within bunds in a building with impermeable floors and spillage kits. The volumes stored are in detailed in the main application. The site has a spillage procedure to ensure that any risk from spillages is minimised and they are cleaned up as soon as detected.	Low	Low	Not significant
Litter						
Waste – general waste from workers or waste from	Local residents (nearest receptors approx. 100 m from the proposed	Windblown to air	Good housekeeping procedures ensure all waste is contained within the appropriate bins or skips. Any unexpected spillage would be cleaned up immediately.	Low	Low/medium Nuisance to local	Not significant

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence**.**
processes (spent carbon black powder, bag filters, sweepings, furnace furniture, rejected OPAN segments and offcuts)	extension area; 15 m from the MAL site). Industrial units located immediately adjacent to the installation.		There shall be an increase in waste from the process due to the increase in capacity however, the above procedures shall ensure there is no increase risk as a result of the proposal contained in this variation.		receptors	
Pests						
Flies, and other pests or vermin in waste storage areas	Local residents (nearest receptors approx. 100 m from the proposed extension area; 15 m from the MAL site). Industrial units located immediately adjacent to the installation.	Air	Spent carbon black powder and bag filters, sweepings and furnace furniture will be stored in the carbon skip before disposal. Rejected OPAN segments and offcuts will be stored in yellow and black plastic bags in the lean-to shed before being sent to an external company for recycling. These wastes are not likely to attract pests as they are inert and inorganic. Pest control measures will be applied in accordance with recommendations from a specialist pest control advisor.	Low Good site management procedures and the nature of the waste products kept on site should prevent this occurring. Closest residential receptors located approx. 100 m from the site	Low Nuisance	Not significant

Table 2.4: Visible emissions

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence.
Plume from emission stacks	Local residents (nearest receptors approx. 100 m from the proposed extension area; 15 m from the MAL site). Industrial units located immediately adjacent to the installation.	Visual	Visible plumes are not anticipated to occur for the majority of operational time due to the temperature at which the treated flue gas exits the stack. The site has not previously had any issues with plume emissions from the currently installed thermal oxidiser and therefore this should not be an issue with the new thermal oxidiser as flue gases shall be at ~800^{o}C. There is no envisaged plume from the cooling towers.	Low	Low – Minor visual disturbance	Low

Table 2.5: Accidents risk assessment and management plan

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence.
Operator error	Air/Water/Land	Variable - dependent on nature of the error	Maintenance checks are carried out every day for key plant and equipment and will identify any operator error incidents. This will include checks on the new equipment proposed as part of this variation. All operational staff will be fully trained against the site operating procedures and what procedures to follow in the event of an operator error.	Low	Variable depending upon nature of incident	Not significant provided operating procedures are followed

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence.
			Training will include raising awareness of key plant parameters and the potential implications of failure to control operations as designed and the associated potential impact on the environment.			
Loss of power	None	N/A	Maintenance checks are carried out every day for key plant and equipment and will identify any loss of power. In the event of a loss of power to the site during non-operational periods the plant may not be able to start-up and therefore no operations can commence. Plant have safe automatic shutdown procedures. There are specified shut down procedures for furnace and high temperature facilities when a site wide loss of power occurs. The CVD control room has a generator for backup / electrical blackout to enable control of the furnace until power is restored.	N/A	N/A	N/A
Cooling water (treated water) – failure of containment	Local water course via drainage system	Water	Cooling towers are located on an impermeable surface within a bunded area.	Low	Low	Not significant
Cooling water treatment chemicals – failure of containment	Local water course.	Water	Primary containment raised above ground and visual inspection carried out every 6 months. Chemicals are stored in locked metal containers within a building on an impermeable surface. The chemicals are stored in a stand-alone purpose built chemical store which has an impermeable floor. The storage area is bunded with a secondary aco drain & pit. The chemical store is locked at all times. Site has a spillage procedure and spill kits located	Low	Medium	Not significant

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence.
			around the site. Staff are trained in use of chemicals and spillage procedures. Twice yearly shutdown of towers for cleaning and repairs. Cooling Towers will be enclosed in a bunded area.			
Loss of containment during storage or transfer of reagents, chemicals, fuels and oil	Water and land	Site drainage system via sewage treatment works or direct contact with land.	An emergency spillage management plan has been produced. The new bunds for the cooling towers will be visually checked each day to ensure that they are empty. All associated storage tank will be built of suitable materials which are resistant to the vessel content. All pipework will be raised above ground for visual inspection. All storage tanks and pipework shall be included in the maintenance programme. Bulk deliveries are overseen by a trained member of staff who will be responsible for checking that there is sufficient capacity in the storage vessel to receive the delivery. Staff shall be trained for delivery of LNG. OPAN stored in sealed boxes within a building. Movement around site only permitted by trained forklift drivers. DAIPC building/containers locked when not in use and offer protection from impact (e.g. from movement of unauthorised vehicles), therefore emissions of dust are unlikely. In the unlikely event that OPAN is washed into surface water drainage or foul sewer, it is an inert substance with low environmental impact. The site spill procedure shall be followed in the event of a spillage. Spill kits are available to contain and	Very Low – requires multiple failure events	Medium Contamination of local water course - dependent on quantity and material released	Not significant as long as delivery procedures are adhered to, and in the event of a spillage, the spill management plan is followed.

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence.
			clean up the spill. Solid raw materials (OPAN) will be cleaned using dry techniques. Incidents will be recorded and investigated appropriately according to the site incident procedure. Significant incidents will be reported to the EA in accordance with the requirements of the permit.			
Fire / Explosion	Air	Direct release of combustion gases to air	There is an increase risk from the storage of LNG, this shall be incorporated into the fire risk assessment. All key areas have had a fire risk assessment and suitable firefighting equipment is located at suitable areas within CVD. Emergency response and evacuation procedures are in place on the site. Dialling 555 alerts the on-site security and fire station who will attend the scene quickly to assess the fire. They will then call for external firefighting assistance if required. Key CVD processes will be shut down if required. Two people will monitor/control CVD furnaces through the control room, which is fire proof. The appropriate MSDSs for chemicals used and stored on site will be attached to the AMP and kept in an accessible location. Site plans and a master inventory of the substances used and stored on site will also be kept in an accessible location on site. Following the event, the cause will be investigated and the EA notified if necessary. Any spillages resulting from the fire will be dealt with as per the site spillage procedure.	Low	Low /Medium Uncontrolled release of combustion gases to air – impacts likely to be short term	Not significant

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence.
Failure to contain firewater	Local water course (River Sowe)	Surface water drainage system	Measures are in place to protect against a fire. Fire response systems should ensure a rapid response thereby addressing the fire at the earliest point to avoid fire spread and therefore minimising the potential volumes of fire waters. Firewater shall be contained on site where possible through the use of bunded areas and blocking drains etc. Site procedures will be updated once the relevant containment is in place.	Low – although plant not designed to contain firewater, the need to use firewater would be uncommon	Moderate – firewater would be discharged to surface water	Not significant
Failure of abatement (new thermal oxidiser / dust extraction)	Local residents (nearest receptors approx. 100 m from the proposed extension area; 15 m from the MAL site). Industrial units located immediately adjacent to the installation.	Air	All abatement plant is continuously monitored (i.e. reagent flow and consumption/bag filter pressure drops) and serviced regularly to ensure that it is operating as designed and that the reagent feed systems are working. Work instruction in place to ensure operators run abatement system correctly. There is planned cleaning and preventative maintenance every 1 week in 3. The new thermal oxidiser and dust extraction units shall be included in this work instruction. High-level pollutant alarms linked to the CEMS will be put in place. Automatic shutdown of process if abatement fails. The dust extraction units will not be fitted with CEMS or alarms, however, are regularly checked and monitored yearly. Visual checks are carried out to ensure there is no visible dust and also during routine maintenance. Abatement equipment serviced every 6 months. Operational staff will be trained in the actions to take in the event of control system alarms being triggered. All incidents/failures will be reported and investigated, and any recommendations will be followed up.	Low	Medium	Not significant

Hazard What has the potential to cause harm?	**Receptor** What is at risk? What do I wish to protect?	**Pathway** How can the hazard get to the receptor?	**Risk management** What measures will you take to reduce the risk? If it occurs – who is responsible for what?	**Probability of exposure** How likely is this contact?	**Consequence** What is the harm that can be caused?	**What is the overall risk?** What is the risk that still remains? The balance of probability and consequence.
Control of contractors	Air/water/land	Various	Contractors are required to provide work method statements before being approved. This will include the contractors installing the new plant and equipment proposed as part of this variation. New contractors attend a company-wide site induction. New contractors are provided with a complete set of MAL's 'Site Code of Practice and Regulations'. This covers the use of gas cylinders, waste storage & disposal, correct disposal of trade effluent, oil and chemical spillages, and oil and chemical bulk storage. The contractor induction will be regularly reviewed and updated if deemed necessary. Contractors will also be routinely audited against their method statements and MAL's requirements for contractors.	Low	Moderate	Low
Flooding	Local water course, structures on site; neighbouring land	Surface water drainage system	The Environment Agency indicative flood map shows that the site is within Flood Risk Zone 1, with 'low probability of flooding'. For this reason, a flood risk assessment was not deemed necessary. The plant layout and storage facilities for reagents and fuels are designed to ensure all materials are contained and in the event of a flood, materials would not be released. As part of the site's emergency procedures, the appropriate procedures for responding to, reporting and investigation in the event of a flood will be assessed.	Very Low	Medium Potential contamination of flood waters.	Not significant

3 Emissions to Air

3.1 Introduction

3.1.1 This section provides the relevant screening assessments of point source emissions to air from the installation as a whole including the emissions from operation of the new thermal oxidiser unit, removal of the current thermal oxidiser and other processes, as detailed in section 3.2. The assessment has been completed in accordance with the Environment Agency's Risk Assessments for your environmental permit [1].

3.1.2 The scope of the assessment has covered the following aspects:

- Release point characteristics;
- Air emissions inventory and mass flows;
- Emissions screening for further assessment;
- Photochemical Ozone Creation Potential (POCP).
- Global Warming Potential (GWP)

3.1.3 Air emissions screening using the H1 software has identified a subset of emissions whose significance warrants further modelling. The H1 tool can be found in Appendix A. The results of the additional modelling for the emissions identified and a range of other emissions are presented in the air quality report in Appendix 4 of the main application supporting information.

3.2 Emissions release point

3.2.1 Point-source emissions to air from the facility will be from multiple process stacks, with efflux velocities and normalised volumetric flow rates shown in Figure 3.1 below. The proposed variation requires the removal of an emission point (A1) for the old thermal oxidiser and the inclusion of a new emission point (A22) for the new thermal oxidiser and three new emissions points (A23 – A25) for dust extraction from the machining area.

3.2.2 The H1 screening assessment has considered both long-term and short term emissions at IED limits and current permit ELV's.

Figure 3.1: Air Release Points

Number	Description	Location or Grid Reference	Activity or Activities	Effective Height	Efflux Velocity	Total Flow
				metres	m/s	m3/hr
e.g.	A1	North stack		150	25	5,000
1	A10	433098, 282362	NG Boiler 1	0	5.3	4534
2	A11	433094, 282362	NG Boiler 2	0	4.9	4192
3	A12	433100, 282346	NG Boiler 3	0	5.7	4876
4	A13	433092, 282346	NG Boiler 4	0	4.9	4192
5	A14	432955, 282360	Cloth Cell Dust Extraction	0	10.2	16979
6	A15	433080, 282331	Heat Treatment Facility 1	0	13	9940
7	A16	433103, 282325	Heat Treatment Facility 2	0	8.7	13472
8	A19	433049, 282330	Machine Shop Dust Control Unit (	0	5.4	2956
9	A20	433052, 282330	Machine Shop Dust Control Unit (	0	3.6	1971
10	A21	433056, 282330	Machine Shop Dust Control Unit (	0	5.1	2792
11	A23	433067, 282328	Machine Shop Dust Control Unit (	0	14.3	10000
12	A24	433061, 282361	Machine Shop Dust Control Unit (	0	28.1	7000
13	A25	433062, 282361	Machine Shop Dust Control Unit (	0	28.1	7000
14	A22	432996, 282323	New LESNI RTO	0	11	9410

3.3 Emissions screening

3.3.1 Estimated emissions have been screened for significance against appropriate environmental standards for long-term and short-term exposure. Emissions standards are based on statutory air quality limits where available, and upon human health protection Environmental Assessment Levels (EALs) as given in H1 guidance.

3.3.2 Modelled concentrations have been included based on the data presented in the Air Quality Assessment (Appendix 4 of the main application supporting information).

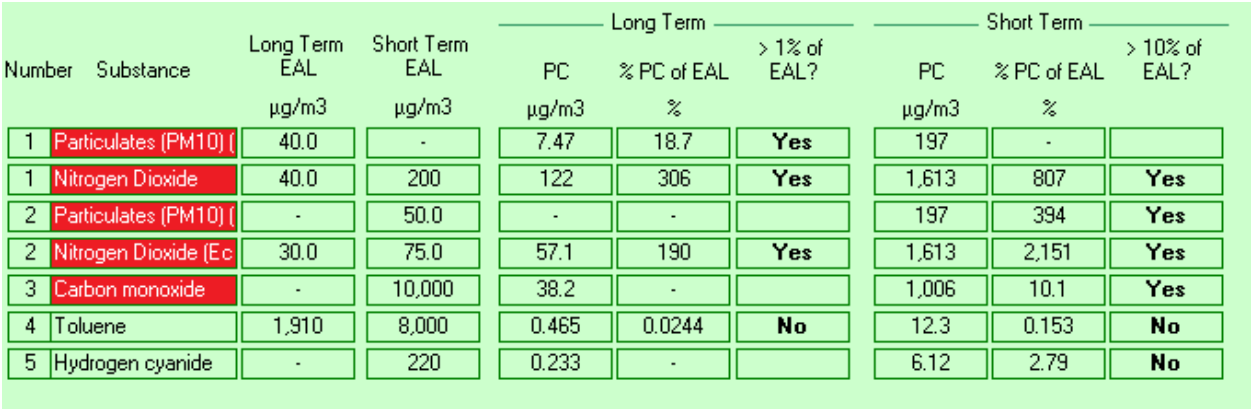
3.3.3 Process contributions (PCs) have been calculated using atmospheric dispersion modelling, details of which are given in Appendix 4 of the main application supporting information. Emissions which are lower than 1% of the relevant emissions standard for long-term exposure and lower than 10% of the relevant limit for short-term exposure are screened out as insignificant. Figure 3.2 below shows the output of the emissions screening using H1 and identifies that nitrogen dioxide, particulates (PM_{10}) and carbon monoxide are all potentially significant.

Figure 3.2: Air Impact Screening Stage One

				Long Term			Short Term		
Number	Substance	Long Term EAL	Short Term EAL	PC	% PC of EAL	> 1% of EAL?	PC	% PC of EAL	> 10% of EAL?
		µg/m3	µg/m3	µg/m3	%		µg/m3	%	
1	Particulates (PM10) [	40.0	-	7.47	18.7	**Yes**	197	-	
1	Nitrogen Dioxide	40.0	200	122	306	**Yes**	1,613	807	**Yes**
2	Particulates (PM10) [	-	50.0	-	-		197	394	**Yes**
2	Nitrogen Dioxide (Ec	30.0	75.0	57.1	190	**Yes**	1,613	2,151	**Yes**
3	Carbon monoxide	-	10,000	38.2	-		1,006	10.1	**Yes**
4	Toluene	1,910	8,000	0.465	0.0244	**No**	12.3	0.153	**No**
5	Hydrogen cyanide	-	220	0.233	-		6.12	2.79	**No**

3.3.4 A second stage of screening assesses the predicted environmental concentration (PEC) against emissions limits. Assumed background concentrations are taken from the air quality modelling, details of which are given in Appendix 4 of the main application supporting information. PECs which are lower than 70% of the relevant long-term emissions standard and lower than 20% of the relevant short-term standard minus 2 * the background concentration are screened out as insignificant, as shown in Figure 3.3 below. Those not screened out as insignificant are recommended for further detailed assessment. The results suggest there is a need for further assessment of the following pollutants: Nitrogen Dioxide and Particulates (PM_{10}). Detailed modelling has, in fact, been carried out for all expected emissions, and the results are given in Appendix 4 of the main application supporting information.

Figure 3.3: Air Impact Screening Stage Two



Number	Substance	Long Term EAL µg/m3	Short Term EAL µg/m3	Long Term PC µg/m3	Long Term % PC of EAL %	Long Term > 1% of EAL?	Short Term PC µg/m3	Short Term % PC of EAL %	Short Term > 10% of EAL?
1	Particulates (PM10) (	40.0	-	7.47	18.7	**Yes**	197	-	
1	Nitrogen Dioxide	40.0	200	122	306	**Yes**	1,613	807	**Yes**
2	Particulates (PM10) (	-	50.0	-	-		197	394	**Yes**
2	Nitrogen Dioxide (Ec	30.0	75.0	57.1	190	**Yes**	1,613	2,151	**Yes**
3	Carbon monoxide	-	10,000	38.2	-		1,006	10.1	**Yes**
4	Toluene	1,910	8,000	0.465	0.0244	**No**	12.3	0.153	**No**
5	Hydrogen cyanide	-	220	0.233	-		6.12	2.79	**No**

3.4 Photochemical ozone creation potential

3.4.1 The photochemical ozone creation potential (POCP) has been calculated in accordance with the H1 guidance. Three substances emitted to air by the facility are identified as having the potential to form ozone: nitrogen dioxide, carbon monoxide and toluene. The total POCP score for the facility is calculated as 101.32.

3.4.2 The facility will be controlled to ensure that IED limits for the POCP pollutants are met; Section 4 of the main application details the proposed measures for preventing and minimising the release of these pollutants and concludes that the proposed measures are BAT.

4 Global Warming Potential

4.1.1 The global warming potential (GWP) has been calculated in accordance with the H1 guidance. The total GWP score of 3,305.16 comprised two main sources: Carbon Dioxide emissions from combustion of natural gas in the boilers[2]; and electricity used by the boilers. It is worth noting that the boilers are not changing as a result of this variation application.

4.1.2 Of these sources, Carbon Dioxide emissions from the combustion of natural gas are by far the most significant, accounting for over 96% of the total GWP score calculated.

4.1.3 The use of LNG in directly replacing natural gas usage in the CVD is like for like quantities. As the gas is not combusted in this activity, the global warming potential is not included in this assessment.

4.1.4 The direct releases of Carbon Dioxide assume that only natural gas is burned, although the site is permitted to burn waste gas from the production process in the boiler plant. There is currently no data available in order to include burning of waste gas in the H1 assessment for inclusion in the permit variation.

4.1.5 Only a small percentage of the GWP is associated with emissions from import of electricity from the National Grid. This is essential to power the boilers and to ensure that the facility meets IED limits for emissions at all stages of operation.

[2] Conversion to MWh from m^3 as per guidance on https://www.gov.uk/guidance/gas-meter-readings-and-bill-calculation

5 Emissions to Sewer

5.1.1 This variation application seeks to include a new emission point to sewer associated with the new cooling towers. The new release point will replace the existing discharge to sewer from the installed cooling towers and will not increase the volume discharged, the nature of the release or change in the receiving treatment works. On this basis the environmental effect from the new discharge will be no greater than that from the permitted discharge and therefore an updated assessment of this release is not necessary.

6 Conclusions

6.1.1 The ERA report has been undertaken to assess the likelihood of risk from amenity and accidents, air emissions and global warming potential associated with the proposed variation to the MAL facility.

6.1.2 The results of the ERA have shown that the risk of odour, noise and vibration, fugitive emissions, visible plumes, and accidents ranges from ‘not significant’ to ‘low’.

6.1.3 Stack emissions to air for Toluene and Hydrogen Cyanide have been screened out to be insignificant. Nitrogen dioxide and particulate matter could not be screened out in the H1 assessment and further air quality dispersion modelling has been done,

6.1.4 The POCP for the facility is calculated as 101.32. The use of BAT minimises the POCP from the facility.

6.1.5 The total GWP score of 3,305 and is almost wholly contributed by carbon dioxide emissions from the combustion of natural gas.

6.1.6 The changes to the emissions to sewer will not change the impact on the receiving water compared to that currently permitted.

Glossary

AMP	Accident Management Plan
BAT	Best Available Techniques
CVD	Chemical Vapour Deposition
EAL	Environmental Assessment Level
ERA	Environmental Risk Assessment
GWP	Global Warming Potential
IED	Industrial Emissions Directive
LNG	Liquefied Natural Gas
OPAN	Oxidised Polyacrylonitrile
PC	Process Contribution
PEC	Predicted Environmental Concentration
POCP	Photochemical Ozone Creation Potential

Appendices

Appendix A

H1 Tool