East Pye Solar

Outline Battery Safety Management Plan

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Contents

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Executive Summary

This report has been prepared on behalf of East Pye Solar Limited (the 'Applicant') in relation to an application made to the Secretary of State (SoS) for the Department for Energy Security and Net Zero, under section 37 of the Planning Act 2008, seeking a Development Consent Order (DCO) for the East Pye Solar (the 'Scheme').

The Scheme is a nationally significant infrastructure project (NSIP) comprising a ground mounted solar photovoltaic electricity generating station with a total capacity exceeding 100 megawatts (MW) and associated development including Battery Energy Storage System (BESS). The DCO Application (including the **Environmental Statement (ES), Volume 1 [EN0110014/APP/6.1.1-6.1.20]**) assumes that the form of energy storage will be battery storage and as such, the Energy Storage Facility (as it is termed in the **draft DCO [EN0110014/APP/3.1]**), is often referred to as a 'BESS' throughout the DCO Application.

The Scheme comprises the construction, operation and maintenance, and decommissioning of a Solar photovoltaic (PV) electricity generating station with a total capacity exceeding 100 megawatts (MW) and associated development including a Battery Energy Storage System (BESS), up to three 132kV Project Substations and up to three 400kV Project Substations, Grid Connection Infrastructure and a new National Grid Substation. A description of the Scheme can be found in the **Environmental Statement (ES) Volume 1, Chapter 4 – The Scheme [EN0110014/APP/6.1.4]** and shown on the Indicative Masterplan is shown in **ES Volume 2, Figure 4.1 – Indicative Masterplan [EN0110014/APP/6.2.4.1]**.

The Scheme would be located within the Order Limits shown on the **Location Plan [EN0110014/APP/2.1]** and **Works Plan [EN0110014/APP/2.3]** submitted as part of the DCO Application and secured by Article 3 of the **draft DCO [EN0110014/APP/3.1]**.

The DCO Application proposes that the BESS for the Scheme will be located at the BESS Site, as shown within Work No.2 in **Works Plan [EN0110014/APP/2.3]** with the associated parameters and commitments described in the **Design Principles, Parameters and Commitments [EN0110014/APP/7.18]**.

The aim of this Outline Battery Safety Management Plan (oBSMP) is to outline the key fire safety provisions for the BESS proposed to be installed as part of the Scheme, including measures to reduce BESS failure risks and mitigate credible failure incident scenarios. This oBSMP provides a summary of the safety related information requirements which will be provided in advance of construction of the BESS. The purpose of this oBSMP is to identify how the Applicant will use good industry practice to reduce risk to life, property, and the environment from the BESS.

By way of a Requirement that is secured in the DCO, prior to the commencement of construction of the BESS, the Applicant will be required to prepare a Battery Safety Management Plan (BSMP) which must be in accordance with this oBSMP. As part of the BSMP, the Applicant will take into account the latest good practices for battery system failure prevention and detection, consequence modelling, risk analysis, and emergency response planning, as guidance continues to develop in the UK and around the world.

There are several battery storage technologies available to the Applicant. The generic system used for indicative planning purposes is representative of several current BESS designs comprising a 5 MWh BESS system integrating 12 battery racks. The exact technology and system chemistry type is still to be determined; however, it will be a lithium-ion battery cell type. The common types of this chemistry within the lithium-ion family are Lithium Nickel Manganese Cobalt Oxide (LiNiMnCoO2) known as “NMC” after the three key cathode materials or Lithium Iron Phosphate (LiFePO4) known as “LFP”. The final battery chemistry will be confirmed as part of the detailed design prior to the commencement of construction of the BESS.

For the purposes of this document, a concept design has been considered that uses a BESS system based upon LFP lithium-ion battery technology that is currently used on other solar projects being developed by the Applicant. This is considered to be a reasonable worst case for the purposes of the assessment in terms of BESS toxic gas emission potential (Hydrogen Fluoride production) and explosion risk (significant levels of hydrogen produced during thermal runaway).

As recommended in National Fire Chiefs Council (NFCC) revised guidelines (2026) (Ref 1), a Plume Study (BESS Fire Emissions Modelling) is included as **Appendix B** to this oBSMP has been conducted using the concept design to assess the environmental impact of a BESS thermal runaway incident to sensitive receptors within a 1km radius of the BESS area, to assess the potential to cause air quality impacts during a BESS fire. Concentrations of carbon monoxide (CO), formaldehyde, hydrogen chloride (HCl), hydrogen cyanide (HCN), hydrogen fluoride (HF), ammonia (NH_3), nitrogen dioxide (NO2) and particulates, were modelled using Atmospheric Dispersion Modelling Software (ADMS) to determine the effects of BESS fire emissions on human health. In line with NFCC recommendations, a high-level visibility assessment has also been undertaken using the modelled particulates results to determine the effect of BESS fire emissions on visibility to local transport links i.e. road network and railway.

The BESS will be designed in accordance with the UK and internationally recognised good practice guidance available at the time.

The overall approach is to follow the Health and Safety Executive’s (HSE) hierarchy of controls (Ref 2):

- Elimination;
- Substitution;
- Engineering Controls;
- Administrative Controls; and
- Personal Protective Equipment.

This oBSMP details the types of safety systems available on the market at present, along with risk reduction barriers which are likely to be incorporated into the system to be installed at the BESS compound . It is possible that by the time of construction that a new battery chemistry may be integrated but this would be fully tested and certified to the latest BESS safety standards and this will be reflected in the detailed BSMP approved by the relevant planning authority in consultation with Norfolk Fire and Rescue Service (NFRS) and the Environment Agency (EA).

A summary of the anticipated BESS failure safety provisions are as follows:

- The BESS will be designed, selected, and installed in accordance with international guidance, good practice, and related standards;
- Risk assessments will be carried out for the entire system and elements across the project lifecycle;
- The location of the BESS has been chosen to minimise impacts on offsite receptors (albeit this is inherent in the DCO Application, more particularly embedded mitigation for the Scheme, as it has been factored into the design process to date);
- Separation distances between components will be applied to minimise the chance of fire spread;
- Equipment will, where practicable, be selected to be fire limiting, such as selection of transformer oils with low flammability and non-combustible BESS enclosures with high levels of thermal insulation (fire and heat resistance). The BESS facility will be designed with multiple layers of protection to mitigate and minimise the probability of a fire or thermal runaway incident;
- In the case of the BESS design, it will integrate multiple layers of prevention and mitigation features to minimise the chances of a BESS failure incident (equipment failure / burning or gas venting thermal runaway scenario);
- All equipment will be monitored, maintained, and operated in accordance with manufacturer instructions and be compliant with requisite safety standards listed in Section 2.5 Relevant Guidance (UL, IEC, IEEE, NFPA, etc.);
- The BESS design will include integrated fire and explosion prevention and protection systems. Following key industry safety standards i.e. NFPA 855 (Ref 3), UL 9540 (Ref 4), BS EN IEC 62933-5-2 (Ref 5), and based on comprehensive UL 9540A (2025, 5th Edition) (Ref 6) testing. The selected BESS, as mandated under NFPA 855 (2026 Revision) (Ref 3), will have undertaken Large Scale Fire Testing (LSFT) as part of UL 9540A (Ref 6) tests and / or third party full scale destruction testing. This testing involves burning the full BESS system to validate safe equipment spacing and performance test active and passive mitigation systems integrated into the BESS design. A BESS system and site-specific Emergency Response Plan (ERP) will be developed at the detailed design stage, based on national and international best practice measures;
- 24/7 remote monitoring of the system via a dedicated control facility. The control facility will have the capability to shut the system down should the need arise and will also be responsible for implementing the ERP and acting as a point of contact for the emergency services; and
- Communication with the local fire and rescue services (Norfolk Fire and Rescue Service NFRS) with engagement early in the project and continuing across design

and construction phases. This will ensure robust emergency response planning, risk management planning and ensure all safety materials and equipment is available in an emergency for first responders.

1 Introduction

1.1 Scope of this Document

1.1.1 This oBSMP, produced on behalf of the Applicant, outlines the key fire safety provisions for the BESS proposed to be installed as part of the Scheme, including measures to reduce BESS failure risks and mitigate credible failure incident scenarios.

1.1.2 This document provides a summary of the safety related information requirements which will be provided in advance of construction of the BESS. The purpose of this oBSMP is to identify how the Applicant will use good industry practice to reduce risk to life, property, and the environment from the BESS.

1.2 Project Description

1.2.1 For the purposes of this document, a concept design has been considered that uses a BESS system based upon LFP lithium-ion battery technology that is currently used on other solar projects being developed by the Applicant. This is considered a reasonable worst case for the purposes of the assessment in terms of safety (toxic and explosive gas production risks).

1.2.2 The design of the BESS and its impact are controlled in several ways. Prior to the commencement of construction of the BESS, a BSMP (substantially in accordance with this oBSMP) is required to be submitted to the relevant planning authority and approved, in consultation with Norfolk Fire and Rescue Service (NFRS) and the Environment Agency (EA). This is secured by way of a Requirement in the Development Consent Order (DCO). The Applicant must operate the BESS in accordance with the approved BSMP. As part of preparation of the BSMP, the Applicant will incorporate the latest good practices for battery storage safety, failure detection and prevention, along with the emergency response planning, as guidance continues to develop in the UK and internationally.

1.2.3 While the operational phase of the Scheme is anticipated to be energised in 2031, reference to current measures and guidelines are included herein. However, this document will be updated prior to construction of the BESS to take account of prevailing standards, certifications, guidance, and testing requirements.

1.2.4 Further, pursuant to another Requirement of the DCO, the detailed design of the BESS must accord with the **Design Principles, Parameters and Commitments [EN0110014/APP/7.18]**. The design parameters and commitments contain controls over the BESS, which includes the energy storage capacity of the BESS will be a lithium-ion battery system.

1.2.5 The BESS design and system chemistry type is still to be determined, and the final battery chemistry will be confirmed as part of the detailed design prior to the commencement of the construction of the BESS.

1.2.6 The concept design consists of the BESS enclosures and the associated transformers, circuit breakers and inverters with an onsite control room. BESS enclosures and auxiliary systems, such as cooling, uninterruptible power supply (UPS), fire and gas detection, explosion protection mechanisms, suppression system, monitoring and control, will be designed in accordance with internationally recognised standards and good practice guidance available at the time.

1.2.7 Once operational, the plant will be designed to operate unmanned with access required for maintenance only, and with an operational life of up to 60 years.

1.3 Potential BESS Failure

1.3.1 Causes of battery cell failure which could lead to a thermal runaway event include manufacturing defects (contaminants / imperfections), electrical abuse (overcharging / over-discharging), and physical or mechanical damage (puncture / crushing).

1.3.2 BESS hazards for first responders in the unlikely situation of a battery failure and thermal runaway event depend on the BESS design but are typically defined as: fire hazards, explosion hazards, electrical hazards (shock or arc flash), and chemical hazards (i.e. the release of toxic gases).

1.3.3 Regardless of the type of failure or the cause, the main potential hazard is thermal runaway where a battery cell enters an uncontrolled self-heating state and ultimately, if not controlled, a significant flaming or battery gas venting incident and therefore this oBSMP focusses on reducing fire and explosion risks associated with the BESS and managing the hazard in the unlikely event that it occurs.

1.3.4 Other electrical systems than the batteries, which form part of the BESS, can carry fire risks. However, due to the extensive historic long-term deployment of other technology such as transformers, inverters and switchgear, these risks are better understood and regulated, through longstanding industry guidance and codes. Therefore, only the battery component of the BESS is addressed in this oBSMP.

1.4 Safety Objectives

1.4.1 The safety objectives for the design of the BESS are:

- To minimise the likelihood of a failure event. This is an overriding priority;
- To minimise the consequences should an event occur;

- To restrict any event to the BESS Site and minimise any impact on the surrounding areas;
- To automatically detect and begin to fight a fire as soon as possible;
- To ensure any personnel on are able to escape safely away from the BESS Compound;
- To ensure that firefighters can operate in reasonable safety where necessary;
- Final BESS design and layout should minimise the requirement for direct NFRS intervention in a thermal runaway incident i.e. direct hose streams or spray directly on BESS battery systems. NFRS intervention in worst case scenarios would typically be limited to boundary cooling of adjacent BESS and Energy Storage System (ESS) units to prevent the fire from spreading. This strategy should be finalised with NFRS and be clearly communicated in the Emergency Response Plan (ERP); and
- If the BESS system does not incorporate an automatic fire suppression system and is designed to safely burn out to remove the risk of stranded energy in the battery systems, then full scale free burn testing will have been conducted to demonstrate that loss will be safely limited to one enclosure without the intervention of the NFRS.

1.4.2 Final BESS design and layout will be validated through mandatory Large Scale Fire Testing (LSFT) and rigorous consequence modelling to minimise the requirement for any NFRS intervention in a thermal runaway incident. LSFT must establish minimum equipment spacing distances that demonstrate there is no fire propagation to adjacent BESS enclosures or ESS equipment. NFRS intervention in worst case scenarios would typically be limited to boundary cooling of adjacent BESS and ESS units to prevent the fire from spreading. This strategy will be finalised in consultation with NFRS and be clearly communicated in the ERP:

- To ensure that fire, smoke, and any release of toxic gases does not significantly impact site operatives, first responders, and the local community; and
- To ensure that firewater runoff is contained and tested before release or, if necessary, removed by tanker and treated offsite.

1.5 Potential BESS Failure

1.5.1 Guidance documents and standards considered by the Applicant have been used to inform the design of the Scheme.

1.5.2 There is currently limited UK specific guidance for BESS, however, the Applicant has incorporated good practice from around the world.

1.5.3 The Applicant has developed the BESS in accordance with all relevant legislation and good practice. This document takes into account the recommendations of the following good practice documentation used in the UK for similar sites, including:

- National Fire Chiefs Council (NFCC) Grid-Scale Battery Energy Storage System planning – Guidance for FRS (2026) (Ref 1);
- National Fire Protection Agency (NFPA) 855 (2026): Standard for the Installation of Stationary Energy Storage Systems (Ref 3);
- NFPA 68 (2023): Standard on Explosion Protection by Deflagration Venting (Ref 8);
- BS EN 14797 (2006): Explosion Venting Devices (Ref 13);
- NFPA 69 (2024): Standard on Explosion Prevention Systems (Ref 7);
- Underwriters Laboratories (UL) 9540A (2025) Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems (Ref 6);
- UL 1642 (2020): Standards for Lithium Batteries;
- UL 1973 (2022): Batteries for Use in Stationary and Motive Auxiliary Power Applications (Ref 11);
- UL 9540 3rd Edition (2023): Standard for Energy Storage Systems and Equipment (Ref 4);
- UL 2941 (2023) Outline of Investigation for Cybersecurity of Distributed Energy and Inverter-Based Resources (Ref 33);
- IEEE 2686 (2025) Standard: Recommended Practice for Battery Management Systems in Stationary Energy Storage Applications (Ref 26);
- FM DS 5-33 (2023) FM Global Datasheet. Lithium-Ion Battery Energy Storage Systems (Ref 15);
- UN 38.3: Recommendations on the Transport of Dangerous Goods – Manual of Tests and Criteria – (Lithium Metal and Lithium-Ion Batteries) (Ref 22);
- United Kingdom Power Networks (UKPN) Engineering Design Standard 07-0116: Fire Energy Storage Systems, 2016;
- DNV GL-Recommended Practice-0043: Safety, Operation and Performance of Grid-Connected Energy Storage Systems, 2017;

- Scottish and Southern Energy TG-PS-777: Limitation of Fire Risk in Substations, Technical Guide, 2019;
- BS 5839 Part 1 2017: Fire Detection and Fire Alarm Systems for Buildings;
- BS 9990: 2015: Non-automatic firefighting systems in buildings - Code of Practice (Ref 9);
- The Regulatory Reform (Fire Safety) Order (RRO) 2005;
- The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) Assessment (Ref 38);
- BS EN IEC 61936, Power installations exceeding 1 kV AC and 1,5 kV DC – AC;
- BS EN IEC 62619 (2022) Secondary cells and batteries containing alkaline or other non-acid electrolytes. Safety requirements for secondary lithium cells and batteries, for use in industrial applications (Ref 12);
- BS EN IEC 62933-5-2 (2020) Electrical Energy Storage (EES) systems. Part 5-2: Safety requirements for grid integrated EES systems. Electrochemical-based systems (Ref 5);
- BS EN IEC 62281: 2019 + A2:2023: Safety of primary and secondary lithium cells and batteries during transport;
- BS EN IEC 62477-1 (2022) Safety requirements for power electronic converter systems and equipment. General;
- BS EN 16009 (2011) Flameless Explosion Venting Devices;
- BS EN 14373 (2021) Explosion Suppression Systems;
- BS EN IEC 61000-6-2 (2016) Electromagnetic compatibility (EMC). Generic standards. Immunity standard for industrial environments;
- BS EN IEC 61000-6-4 (2018) Electromagnetic compatibility (EMC). Generic standards. Emission standard for industrial environments;
- CSA / ANSI C800:25: Testing protocol for energy storage system reliability and quality assurance program;
- Clean Energy Associates (2025): BESS Quality Risks. A summary of the most common Battery Energy Storage System manufacturing defects of 2024;
- European Association for Storage of Energy (2025): EASE Guidelines on Safety Best Practices for Battery Energy Storage Systems; and

- Department for Energy Security and Net Zero (2024): Health and Safety Guidance for Grid Scale Electrical Energy Storage Systems.

2 Consultation

2.1 Norfolk Fire and Rescue Service

2.1.1 The local fire and rescue service, NFRS, has been consulted during pre-application discussions and as part of statutory consultation. Engagement with NFRS will continue across the project lifecycle.

2.1.2 The Applicant and a representative from NFRS held a Teams Meeting on 7 February 2025 to introduce the Scheme and share preliminary indicative BESS plans.

2.1.3 The Applicant emailed NFRS on 5 March 2025 to confirm that the BESS safety measures are embedded into the Scheme as secured through this Outline BSMP and the measures included in the **Outline Operational Traffic Management Plan [EN0110012/APP/7.7]**. The Applicant shared a range of BESS safety materials for fire service training and education purposes, and a number of full-scale BESS destruction testing reports. The Applicant confirmed that NFCC guidance will be followed, and that any deviations will be fully discussed and agreed with NFRS.

2.1.4 The Applicant confirmed that they will share all requisite BESS safety and design documentation for the Scheme with NFRS, once available.

2.1.5 The Applicant has complied with NFCC guidelines (Ref 1) and engaged with NFRS during the pre-application stage and will ensure that the BSMP accounts for any subsequent revisions made to NFCC guidelines. Close consultation will continue with NFRS post-consent, should the Scheme be granted consent.

3 BESS Safety Requirements

3.1 Safe BESS Design

3.1.1 The BESS will be designed to address prevailing industry standards and good practice at a time of design and implementation. BESS system and components used to construct the facility will be certified to UL 9540 (2023) (Ref 4) and/or BS EN IEC 62933-5-2 (2020) (Ref 5) standards (or any future standards which supersede this).

3.1.2 As a minimum, the battery system will have completed unit or installation level UL 9540A (5th Edition) testing (Ref 6), the BESS enclosure will have completed LSFT to demonstrate that loss will be safely limited to one BESS enclosure without the intervention of fire fighters. UL 9540A (Ref 6) heat flux test data can establish safe distances between BESS enclosures and ESS equipment but will not be conclusive if full propagation of the battery system does not occur in the test.

3.1.3 NFPA 855 (2026) (Ref 3) currently provides the most comprehensive guidelines for BESS design and installation specifications. BESS design structural integrity will be demonstrated through full-scale destruction performance testing and / or by integrating rigorously tested NFPA 69 (explosion prevention) (Ref 7) and NFPA 68 (Explosion protection through deflagration venting) (Ref 8) features. NFPA 855 (2026 revision) mandates that LSFT which is full scale burn testing of the BESS system to validate safe equipment spacing, must be conducted and the BESS selected at detailed design must as a minimum have completed this testing under the UL 9540A (Ref 6) test program or an accredited third party LSFT test program i.e. CSA, DNV, TUV SUD, etc.

3.1.4 If the BESS design integrates hybrid systems, sparker system, Active Ignition Mitigation System (AIMS), or performance design explosion, protection systems should be validated through BESS full-scale destruction testing, lean gas mixture testing and requisite pressure testing required by NFPA and EN standards. Full-scale destruction testing validates all active and passive protection system integrated into a BESS enclosure.

3.1.5 If a BESS automatic fire suppression system or Thermal Runaway Propagation Prevention (TRPP) system (engineered to directly access cells within battery modules) is integrated within each BESS enclosure, this will be tested to a minimum of UL 9540A (Ref 6) unit level testing protocols or through significant scale third party fire and explosion testing. The suppression or TRPP system will be capable of operating effectively in conjunction with a gas exhaust / ventilation system to minimise deflagration risks. The system design must be capable to control or fully suppress a fire, without the direct intervention of NFRS. Fire suppression system performance should be benchmarked against free burn testing. An independent Fire Protection Engineer specialising in BESS will review all UL

9540A test results plus any additional fire and explosion test data which has been provided and validate the suppression system design.

3.1.6 BESS enclosure single use (noncontinuous operation) fire protection systems or systems without applicable codes and standards will be tested to UL 9540A installation level testing or through significant scale third party fire and explosion testing. The system design must be capable to control or fully suppress a fire, without the direct intervention of NFRS. Fire suppression system performance will be benchmarked against free burn testing. An independent Fire Protection Engineer specialising in BESS will review all UL 9540A test results plus any additional fire and explosion test data which has been provided and validate the suppression system design.

3.1.7 If the BESS design does not integrate automatic fire suppression systems and a dry pipe sprinkler or spray system is integrated, then NFCC (2026) revised guidance (Ref 1) will be followed. Connections to any dry pipe systems that are required to be installed on the BESS area should be installed in accordance with BS 9990 Non-automatic firefighting systems in buildings code of practice (Current Edition) (Ref 9) and should be identified in accordance with BS 3251 Indicator Plates for Fire Hydrants (Current Edition) (Ref 10). If a dry pipe system is integrated for the BESS, NFRS instantaneous connection points will be located at a safe distance from enclosures and clearly signed for NFRS response, in accordance with NFCC guidelines. Water supply for this type of system will be separate from the water supply designated for NFRS boundary cooling firefighting requirements.

3.1.8 If the BESS enclosure is a walk-in design (this is a very low probability because most BESS designs are cabinet systems that can be fully serviced without entering the enclosure), an automatic water fire suppression system must be installed. The suppression system must be capable to operate effectively in conjunction with a gas exhaust / ventilation system to minimise deflagration risks. System design and water supply requirements will be fully agreed with NFRS.

3.1.9 If the BESS system is designed to safely burn out without internal fire suppression systems (to remove the risk of stranded energy in the battery systems), LSFT and / or full-scale destruction performance testing will be conducted to demonstrate that loss will be safely limited to one BESS enclosure without the intervention of NFRS. UL 9540A (Ref 6) unit or installation level heat flux test data can also establish safe distances between enclosures and ESS equipment but will not be conclusive if full propagation of the battery system does not occur in the test.

3.1.10 As best practice, additional third party fire and explosion testing should be utilised by the BESS Original Equipment Manufacturer (OEM) to demonstrate that structural integrity is maintained and toxic gas emissions to the closest receptors are below relevant public health exposure limits when the battery system is fully consumed (burnt out). An independent Fire Protection Engineer specialising in BESS will review all UL 9540A test results and any additional third party fire and explosion test data which has been provided and share conclusions with NFRS i.e. the need for additional water supply for boundary cooling or a dry pipe sprinkler system.

3.1.11 In addition to this, good practice guidance for electrical sites within the UK has been consulted with regards to BESS area layouts and separation distances for the transformers and inverters.

3.1.12 Safety certifications and mitigation features typically found within battery module design, which the Applicant will commit to for the Scheme, include:

- Internal fuses;
- Liquid cooling system;
- Active thermal management system (TMS);
- Contactor at rack/string and bank level;
- Overcharge safety device;
- Internal passive protection products;
- Venting systems and gas channels; and
- Thermal or multi-sensor monitoring devices.

3.1.13 Battery cell certified to UL 1973 (Ref 11) and / or BS EN 62619 (Ref 12) and tested to UL 9540A unit or installation level for BESS designs (Ref 6).

3.1.14 Module design will be certified to UL 1973 (Ref 11) and / or BS EN 62619 (Ref 12) and tested to UL 9540A unit or installation level (Ref 6).

System Location

3.1.15 The BESS Site was selected for the location of the BESS owing to the proximity to the Point of Connection and access from Station Road. For the indicative design of the BESS layout, consideration was given to minimising landscape and visual, heritage and noise impacts from the BESS as far as practicable. The BESS would be located, at the closest point, approximately 200m from the closest residential property, 470m from the closest listed building and 50m from the closest Public Rights of Way (PRoW).

Site Layout

3.1.16 The illustrative BESS layout is provided in **Appendix A** and the final detailed BESS layout will provide separation between key system components or groups of key system components.

3.1.17 The BESS will be broken into discrete groups consisting of battery enclosures, inverters and transformers. Each group will be separated from the next. This separation will limit any fire that is not able to be contained to the affected group or part of the battery system and also allow emergency access in case of an intervention.

3.1.18 NFPA 855 (2026) (Ref 3) defines basic operation Health & Safety (H&S) protocols for all BESS designs which should be incorporated into ERPs:

- Potential debris impact radius is defined as 100 feet (ft) or 30.5 metres (m) i.e. this is a typical explosion risk safe exclusion zone radius as modelling and previous BESS incidents typically show 25m to be maximum radius; and
- Automatic building evacuation area is defined as 200ft or 61m from the affected BESS enclosure.

3.1.19 NFPA 855 (2023) (Ref 3) also defines five BESS hazard categories – hazards are assessed under both normal operating conditions and emergency/abnormal conditions:

- Fire and explosion hazards;
- Chemical hazards;
- Electrical hazards;
- Stored/stranded energy hazards; and
- Physical hazards.

3.1.20 The indicative minimum separation distance between the BESS enclosures and Order Limits is 85m at the nearest point.

3.1.21 The separation of the inverters and transformers will, depending on the architecture, be optimised at detailed design stage to minimise the likelihood of any spread of fire between adjacent components.

3.1.22 The layout of the Scheme's BESS provides adequate separation between enclosures, additional ESS equipment, and other key site structures and infrastructure. The UK NFCC 'Grid Scale Battery Energy Storage System planning – Guidance for FRS (2026) ' (Ref 1) will be followed at an indicative design stage, which comprises:

- To protect BESS enclosures from exterior risks, they shall be provided with impact protection to prevent damage to battery enclosures by vehicles or construction equipment and use Damage Limiting Construction (DLC) techniques;
- The illustrative BESS layout (**Appendix A**) conforms to NFPA 855 (2026) (Ref 3) standard allowing a separation distance of 2.5m between BESS blocks and 3.8m to ESS equipment, and 2.5m between adjacent and back-to-back BESS enclosures. This conforms to NFPA 855 (2026) (Ref

3) equipment spacing recommendations (if UL 9540A (Ref 6) testing shows propagation does not occur), and also in compliance with equipment spacing integration which exceeds the minimum equipment spacing distances from the illustrative BESS 5 MWh design validated through LSFT in 2025. This illustrative evidence based spacing is considered safe practice by the NFCC;

- NFCC guidelines allow reduced separation distances if suitable design features can be introduced. The BESS system selected at detailed design will have undertaken LSFT and utilised rigorous site specific consequence modelling reports to demonstrate that in the event of a BESS failure loss will be safely limited to one BESS enclosure without the intervention of NFRS;

- LSFT of the selected BESS design to establish minimum equipment spacing distances and site specific consequence modelling will provide a clear, evidence-based case for the final BESS area installation plans at the detailed design phase and will be agreed with NFRS. An independent Fire Protection Engineer specialising in BESS will validate all UL 9540A (Ref 6), LSFT, and / or third party test and site specific consequence modelling data which has been provided;

- The separation of the inverters and transformers will, depending on the architecture, be optimised at detailed design stage to minimise the likelihood of any spread of fire between adjacent components;

- If acoustic barriers are required to provide a noise attenuation solution for the BESS area, the structure will be non-combustible, and positioning will be agreed with NFRS to ensure that there is no impedance of emergency response operations. If required, Fire Dynamics Simulator (FDS) consequence modelling will be conducted to specify equipment distances and acoustic barrier positioning. An independent Fire Protection Engineer will review all data and validate final BESS area layout. The illustrative BESS layout integrates a minimum 3.5m spacing between BESS enclosures and acoustic barriers.

- Areas within 10m of BESS enclosures do not contain combustible vegetation and would not be planted with any new combustible vegetation wherever possible. Where this is not feasible, a full risk assessment would be conducted, and mitigation features applied if required by the NFRS. Any other vegetation on in close proximity to the BESS area would be kept in a condition such that they do not increase the risk of fire;

- The BESS enclosure would have an internal fire resistance rating of at least one hour (according to NFPA 855, BR 187 and FM Global Datasheet 5-33);

- The BESS area would be designed to integrate pressure fed (pump driven) fire hydrants fed from water tanks and / or water tanks depending on topography and final BESS design layout for firefighting. Water tanks will be located at least 10m from the nearest BESS enclosure. Water access points, whether hydrants or tank connections, would be located in consultation with the NFRS to provide redundancy and safe operating distances for firefighters; and

- Tanks and water outlets would be clearly labelled with appropriate signage and marked on BESS Site plans. Additionally, to avoid any mechanical damage, outlets and hard suction points would be safeguarded with bollards.

3.1.23 By adhering to the separation distances noted above, fire propagation risk will be adequately minimised to limit a fire event to a single BESS or ESS structure.

Battery System Enclosures

3.1.24 Battery enclosures will house the battery systems, electrochemical components and associated equipment. Being either one, or multiple enclosures joined, or close coupled to each other. They will be mounted on a concrete slab.

3.1.25 Each BESS enclosure will be installed by a certified and qualified installer. Each BESS enclosure will be UL 9540 (Ref 4) and / or BS EN IEC 62933-5-2 (Ref 5) certificated. Ingress protection testing of BESS enclosures will be conducted under UL9540 and/or IEC62933-5-2 certification of any BESS system. IEC Factory Acceptance Testing (FAT) or an independent manufacturing audit will be carried out to ensure the supplied BESS enclosures comply with the requisite certified ingress protection levels.

3.1.26 Ingress Protection (IP) ratings of BESS enclosures will be shared with NFRS at the detailed design stage so that risks associated with boundary cooling can be understood and implemented into the ERP. Potential boundary cooling water ingress points such as Heating, Ventilation and Air Cooling (HVAC) systems and deflagration vents will be considered as part of an incident response strategy.

3.1.27 BESS enclosure gas exhaust vents and deflagration panels must direct flaming or toxic gases away from site personnel or first responders in line with NFCC guidance (Ref 1), NFPA 68 (Ref 8) and BS EN 14797 (Ref 13) standards. Doors cannot be used as sole deflagration vents.

3.1.28 The BESS enclosures will be locked to prevent unauthorised access and, will have an internal fire resistance rating of at least one hour (according to NFPA 855 (Ref 3), BR 187 (Ref 14) and FM Global Datasheet 5-33 (Ref 15).

3.1.29 Where required, BESS enclosure walls will have a minimum one hour fire resistance rating to BS EN 13501-2 (Ref 16) and BS EN 1364-1 (Ref 17) standards.

Detection and Suppression systems

3.1.30 In order to achieve the safety objectives, the Scheme will employ monitoring systems that will help identify any abnormal operation and safely shutdown the system before it develops. These systems will be independent of the control systems and equipment that can cause the abnormal event and avoid the use of Safety Integrity Level (SIL) rated risk controls. Other measures will include:

- Thermal monitoring of the battery enclosures and automated cut-out beyond safe parameters;
- Battery liquid cooling systems with automated fail-safe operation (air cooling systems will not be considered for the BESS);
- Emergency Stop – both remote and local;
- In the event of a fire, the battery system and the transformers serving the BESS will be automatically electrically isolated when a fire is detected within a BESS enclosure. However, the batteries within the BESS enclosures will still hold charge in the event of a fire, even after the electrical system is isolated. It will not be possible to confirm that there is no residual risk from the energised batteries within the BESS enclosures, and this will inform the strategy for firefighting in the ERP drafted at the detailed design stage;
- The fire and gas detection system for the BESS will comply with NFPA 855 (2026) (Ref 3) and NFPA 69 (Ref 7) standards. This means that smoke, fire and gas detection equipment will be installed on the BESS Site. BESS multi-sensor equipment which measures combinations of air temperature, hydrogen, volatile organic compounds, overpressure, shock and vibration, and moisture ingress will also be considered if fully tested with the specific BESS design. The gas detection systems should have external BESS beacon and audible alert facility and annunciate at an approved remote 24/7 control centre. All fire detection systems should be installed and commissioned to BS EN 54 (Ref 18), BS EN 9999 (Ref 19), NFPA 855 (Ref 3) and NFPA 850 (Ref 20). The final BESS failure detection design will be validated by an independent Fire Protection Engineer under the responsibility of the Operations, Engineering and Maintenance Contractor prior to construction, and will be approved by NFRS;
- If the BESS design does not integrate internal fire and gas detection equipment in alignment with NFPA standards and instead monitors failure parameters through a local Supervisory Control and Data Acquisition (SCADA) system, then fire and explosion mitigation protection systems must be validated through full scale destruction testing and deflagration modelling i.e. Tesla Megapack 2XL design. The final fire detection design (BESS enclosure and BESS Site) should be validated

by an independent Fire Protection Engineer prior to construction and will be approved by NFRS;

- NFPA 855 (2026) (Ref 3) confirms that water is the most effective battery fire suppression agent. Therefore, a dedicated water-based suppression system may be provided within each BESS enclosure designed to control or fully suppress a fire, without the intervention of NFRS. The suppression system must be capable to operate effectively in conjunction with a gas exhaust / ventilation system to minimise deflagration risks;

- If a BESS automatic fire suppression system or TRPP system (engineered to directly access cells within battery modules) is integrated within each BESS enclosure, this will conform to NFPA 855 (Ref 3) standards and be tested to UL 9540A (Ref 6) protocols or through significant scale third party fire and explosion testing. The suppression or TRPP system will be capable of operating effectively in conjunction with a gas exhaust / ventilation system to minimise deflagration risks. The system design must be capable to control or fully suppress a fire, without the direct intervention of NFRS. Fire suppression system performance should be benchmarked against free burn testing. An independent Fire Protection Engineer specialising in BESS will review all UL 9540A test results plus any additional fire and explosion test data which has been provided and validate the suppression system design. System design and water supply requirements must be fully agreed with NFRS;

- If a BESS enclosure design does not integrate automatic fire suppression systems and a dry pipe sprinkler or spray system is integrated, then NFCC (2026) (Ref 1) revised guidance will be followed. Connections to any dry pipe systems that are required to be installed on the BESS Site should installed in accordance with BS 9990 Non-automatic firefighting systems in buildings code of practice (Current Edition) (Ref 9) and should be identified in accordance with BS 3251 Indicator Plates for Fire Hydrants (Current Edition) (Ref 10). If a dry pipe system is integrated for the BESS, NFRS instantaneous connection points will be located at a safe distance from BESS enclosures and clearly signed for NFRS response, in accordance with NFCC guidelines (Ref 1). Water supply for this type of system will be separate from the water supply designated for NFRS boundary cooling requirements;

- NFPA 855 (2026) (Ref 3) prohibits the use of clean agent or aerosol Fire Suppression Systems (FSS) within the BESS enclosures, unless a sprinkler or spray system is also integrated into a BESS enclosure. Clean agent and aerosol FSS cannot be the primary fire suppression method unless fire and explosion testing with the specific BESS design can demonstrate that use of such systems does not present a deflagration hazard. If an aerosol FSS is integrated into each BESS enclosure, then the system must be designed and certified to discharge specifically for an ‘electrical fault’ fire and shall not discharge in any thermal runaway scenario ensuring a gas exhaust system can remain in operation;

- BS EN 15276-1 and BS EN 15276-2 also state that aerosols are not to be used on fires involving a range of chemicals and materials including:
  - Chemicals capable of undergoing autothermal decomposition (e.g. some organic peroxides); and
  - Oxidising agents (e.g. nitric oxides and fluorine).
- The above substances are applicable to BESS Lithium-ion battery systems and preclude aerosols from consideration for BESS FSS;
- NFCC (2026) (Ref 1) revised guidance acknowledges that it is increasingly common for BESS enclosures to be designed without integrated automatic FSS because high levels of thermal insulation are integrated which allows enclosures to be closely spaced whilst preventing propagation of fire to adjacent BESS. As mandated in NFPA 855 (2026) (Ref 3), LSFT and / or full scale destruction testing to establish minimum equipment spacing distances coupled with rigorous site-specific consequence modelling will be conducted for the selected BESS design, validating equipment spacing to demonstrate that loss will be safely limited to one enclosure without the intervention of NFRS;
- BESS LSFT as defined in NFPA 855 (2026) (Ref 3) and conducted to UL or accredited third party testing protocols (CSA C800:25, TUV SUD, DNV, etc.) may only establish minimum safe equipment distances. Additional third party fire and explosion testing may be required to also demonstrate that BESS structural integrity can be maintained and toxic gas emissions to the closest receptors are below relevant public health exposure limits when the battery system is fully consumed (burnt out). An independent Fire Protection Engineer specialising in BESS will review all UL 9540A test results and any additional third party fire and explosion test data which has been provided; and
- A post-incident recovery plan shall be developed, as recommended by the NFCC guidance (Ref 1) that addresses the potential for reignition of BESS battery systems, as well as removal and disposal of damaged equipment. A fire watch will be present until all potentially damaged BESS batteries are removed from the area following a fire event. The water supply for suppression systems and / or firefighting will be replenished as quickly as feasible.

3.1.31 Other measures to minimise the risk and consequences of a BESS failure event that could be implemented include:

- As a minimum, a BESS Combustible Concentration Reduction (CCR) system will comply with NFPA 855 (2026) (Ref 3) / NFPA 69 (Ref 7) guidelines which require activation at no more than 10% of the Lower Explosive Limit (LEL) of the explosive gas(es). The CCR must ensure the prevention of a dangerous build-up of explosive gases (on average 25% LEL within the BESS). The CCR system shall be suitable for its intended use and the temperatures to which it will be exposed to during a thermal runaway event. The CCR is considered a critical safety system and must comply with Section 4.10 of NFPA 855 (Ref 3) concerning Emergency Power Supply Systems (EPSS) which requires emergency back-up power and system redundancy. Heating and cooling of the battery modules will be provided by an independent liquid cooling system which will be separate to any HVAC system providing climate control for the BESS enclosure. Backup power for the gas detection system must have a 24-hour duration in standby and 2 hours in alarm, as demonstrated via NFPA 72 (Ref 21) compliant battery calculations and required by NFPA 855 (Ref 3);

- Where suppression systems other than water based systems are contained within a BESS enclosure, the detection, logic solvers, and sequence of events for discharge shall not impede the CCR system performance. An independent Fire Protection Engineer must validate all requisite suppression system test and CCR performance reports and demonstrate no impact on CCR performance. The activation of a suppression system must not interfere with CCR system operation or inhibit its performance;

- When mechanical ventilation (CCR) is required to maintain concentrations below the required limits, it shall be interlocked, so that the system shuts down upon failure of the ventilation system. Where emergency ventilation is used to mitigate an explosion hazard, the disconnect for the ventilation system should be clearly marked to notify personnel or first responders to not disconnect the power supply to the ventilation system during an evolving incident;

- The CCR system shall also be designed to exhaust flames and gases safely outside the BESS enclosure, without compromising the safety of first responders. The CCR system shall be provided with suitable ember protection to prevent embers from penetrating BESS enclosures (HVAC, gas exhaust, deflagration panels). An NFPA 69 (Ref 7) compliance report should be provided to demonstrate the compliance of the CCR with NFPA 855 (Ref 3) explosion prevention system requirements;

- Explosion protection systems not covered directly by NFPA 68 (Ref 8) and 69 (Ref 7) standards are commonly referred to as performance design explosion mitigation systems; these include automatic doors or vents which open to ventilate explosive gas mixtures and / or relieve pressure. If the BESS design integrates hybrid systems, sparker system, Active Ignition Mitigation System (AIMS), or performance design explosion protection systems it should be validated through BESS free burn testing, lean gas mixture testing and requisite pressure testing required by NFPA and EN standards. Further, the BESS enclosure should have completed full UL 9540A testing or large-scale third party fire and explosion testing without pressure waves occurring or shrapnel being ejected. An independent Fire Protection Engineer specialising in BESS should review all UL 9540A (Ref 6) test results and any additional fire and explosion test and modelling data which has been provided; and

- The BESS enclosure will be designed to withstand overpressures generated by the battery system during thermal runaway. As a minimum, an explosion prevention system to NFPA 69 (Ref 7) standards will be integrated which should be complimented by an explosion protection system to NFPA 68 (Ref 8) and BS EN 14797 (Ref 13) standards. NFPA 68 (Ref 8) design key performance requirements are:
  - The enclosure strength shall exceed the vent opening pressure by a safety factor of over two (including the doors); and
  - The total vent size shall be selected such that the reduced deflagration pressure (Pred) is below two thirds (2/3) of the enclosure strength.
- Most LSFT test programs do not performance test BESS active protection systems. Therefore any BESS explosion prevention or control / protection system will be validated through additional full scale BESS destruction testing, lean gas mixture testing and requisite pressure testing required by NFPA and EN standards. An independent Fire Protection Engineer specialising in BESS should review all UL 9540A (Ref 6) test results and any additional fire and explosion test and modelling data which has been provided.

3.2 Safe BESS Construction

3.2.1 The BESS would be constructed in two distinct phases. Firstly, the civil works and balance of non-BESS plant and equipment construction would be started. Then at a suitable point, the BESS equipment would be delivered to be installed on the foundations and connected to the balance of plant.

3.2.2 The installation would be subject to pre-requisites such as a contractor emergency protocol detailing the actions to be taken in an emergency, including a construction ERP that would be coordinated with the relevant stakeholders and emergency services. In addition, installation would not take place until practical provisions were completed such as the water tanks being installed and filled for use in an emergency.

3.2.3 The transportation of the system from the factory will be a combination of sea and land freight. The system is certified for transportation in all potential environmental conditions. The equipment will be certified for transport to UN 38.3 (Ref 22). Transportation will be managed in accordance with the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) 2019 (Ref 23) and the UK guidance on the transport of dangerous goods ‘Moving Dangerous Goods Guidance’ Government webpage (Ref 24).

3.2.4 The appointed contractor will ensure the transported BESS equipment will be prepopulated with batteries and will have undergone Factory Acceptance Testing (FAT) to IEC 62933-5-2 (Ref 5) standards. Site Acceptance Tests (SAT) will follow IEC 62933-5-2 and IEEE 2962 (Ref 25) (in development) standards and protocols.

3.2.5 By following a logical sequence of works with each step being built upon the preceding one, the system can be safely assembled without risk and all mitigations against issues in place before the next step occurs.

3.3 Safe BESS Operation

Control Room

3.3.1 The BESS will be monitored by a control facility within the BESS Compound, as well as 24/7 monitoring by a remote control facility provided by the BESS manufacturer or operator:

- The control room (when operational) will be responsible for the security of the BESS Compound with state-of-the-art detection and monitoring systems. These can be repurposed in an emergency to support first responders;
- The control room will have the ability and authority to immediately shut the system down should the need arise;
- The control room (when operational) will be responsible for the implementation of the emergency plan acting as a point of contact to emergency services;
- Staff will be fully trained and familiar with the BESS technologies and will be responsible for alerting NFRS and, if required, for connecting NFRS with BESS incident Subject Matter Experts (SMEs);
- The 24/7 remote control facility will monitor the security of the BESS Compound, and monitoring and detection systems will be repurposed in an emergency to support first responders. NFPA 855 (2026) (Ref 3) defines the minimum monitoring and control standards;
- The 24/7 remote control facility will have the capability to immediately shut the system down should an incident occur, and the need arise. It can also implement the ERP, acting as a point of contact to the emergency services;
- In some circumstances it will be necessary to discharge the batteries to enable the first / second responders to deal with the incident. This capability could potentially be achieved through the 24/7 remote control facility. The precise methodology in this regard will be agreed in the ERP once the detailed design of the BESS is known. This will be prepared in conjunction with NFRS and is secured through this oBSMP; and

- Signage should be installed in a suitable and visible location on the outside of the BESS units, identifying the presence of a BESS system. Signage would be as per NFCC guidelines and will also include details of:
  - Relevant hazards posed i.e., the presence of High Voltage DC Electrical Systems is a risk; therefore their location should be identified;
  - The type of technology associated with the BESS;
  - Any suppression system fitted;
  - 24/7 Emergency Contact Information; and
  - Signs on the exterior of a building or enclosure will be sized such that at least one sign is legible at night at a distance of 30m or from the Order Limits, whichever is closer.

Control Architecture

3.3.2 NFPA 855 (2026) (Ref 3) stipulates that a Battery Management Systems (BMS) should at a minimum provide the following safety functions:

- High cell temperature trip to isolate the module or rack when detecting cell temperatures that exceed limits;
- Thermal runaway trip to isolate the battery system when a cell is detected to have entered a thermal runaway condition;
- Rack switch fail-to-trip to disconnect the rack if any failure is detected. Inverter / charger fail-to-trip to isolate the BESS enclosure at the breaker if the inverter / charger fails to respond to a trip command; and
- Inverter / charger fall-to-trip (supervisor level): This function initiates a trip command to an upstream breaker to isolate the ESS if the inverter / charger fails to respond to a trip command. The 'supervisor' level control system controls the entire system, including the combination of racks, the environmental support systems, and the charging / discharging status. The supervisor level should isolate the ESS if the inverter / charger fails to trip on an appropriate signal, or if communication is disrupted between the inverter / charger and the supervisor control.

3.3.3 Energy Management Systems (EMS) / BMS controls should as a minimum incorporate NFPA 855 (2026) (Ref 3) monitoring and control features and conform to the IEEE 2686 (2025) (Ref 26) standard: Recommended Practice for Battery Management Systems in Stationary Energy Storage Applications. Additional IEEE standards in development (IEEE P2688 (Ref 27) and IEEE P2962 (Ref 25) should also be adopted by the BESS system provider; these cover BESS data analytics, electrical controls and maintenance / replacement of battery components / systems.

3.3.4 If data analytics are not directly integrated by the BESS Original Equipment Manufacturer (OEM) or BESS integrator, the Applicant will ensure a data analytics package is integrated to provide a greater range of performance and safety data i.e. predict ageing of the cells in battery systems, alert BMS faults or malfunctions, identify electrical abuse during operations, alert the operator when modules need maintenance or decommissioning. Data analytics facilitate more accurate assessment of operating temperature variations, voltage anomalies, State of Charge (SOC) and State of Health (SOH). Data analytics can also monitor complimentary BESS safety features i.e. smoke and gas sensors, BESS multi-sensor equipment, ground fault detectors, etc.

3.3.5 Cybersecurity will form a fundamental part of the system design and architecture as there is an increasing focus in this area from national and international regulatory bodies. International standards such as BS EN IEC 62443 (Ref 28), UL 1741 (Ref 29), IEEE 1815 (Ref 30), and IEEE 1547.3 (Ref 31) will be consulted and guidance from national sources such as National Cybersecurity Centre inform the implementation and protection measures. Reference should be made to the Health and Safety Executive (HSE) Operational Guidance document OG86 (Ref 32).

3.3.6 UL 2941 (2023) 'Outline of Investigation for Cybersecurity of Distributed Energy and Inverter-Based Resources' (Ref 33) provides testable requirements for PV inverters, electric vehicle chargers, wind turbines, fuel cells and other resources essential to advancing grid operations. These new requirements prioritise cybersecurity enhancements for power systems that deal with high penetration inverter-based resources, including those interfacing with bulk power systems for periods of instantaneous high wind, solar and hybrid / storage generation. UL 2941 (Ref 33) promotes the necessity to have cybersecurity designed into new inverter-based resources (IBR) and distributed energy resource (DER) systems, and the BESS system supplier at the detailed design stage will conform to these requirements.

Security

3.3.7 The BESS Site security profile will be assessed by the Applicant's dedicated security team and the output from this assessment will inform the level of security measures used.

3.3.8 Where practical and required by NFRS or as a result of a risk assessment, the BESS area will have security fencing with a minimum of two points of ingress / egress for first responders and will be clearly signed, with incident emergency response contact details, clear identification of BESS area hazards, details of access arrangements such as key codes, which will be provided to the NFRS.

3.3.9 The BESS Site will also have Thermal Imaging Cameras to alert and locate fire risks and integrate high-definition CCTV with video analytics to alert and respond to unauthorised access.

Maintenance

3.3.10 The BESS will be maintained and operated by skilled personnel ensuring that the system is in optimal condition and that all parts of the system are fully serviced and functional at all times.

3.3.11 Routine maintenance will be undertaken on the BESS equipment every 6-12 months depending on the risk profile of equipment. This typically consists of a major maintenance period and a minor maintenance period. This will encompass the BESS and supporting equipment supplied by the Original Equipment Manufacturer including the fire protection and explosion prevention system. Minor maintenance is typically a visual inspection and rectification of any accumulated noncritical defects. All maintenance will be undertaken in a carefully controlled manner following the BESS Site safety rules and in accordance with the **Outline Operational Environmental Management Plan (Outline OEMP)** [**EN0110014/APP/7.2**] submitted as part of this DCO Application.

3.3.12 During operations, all works on the BESS Site will be controlled under safe systems of work. This will mean all work is risk assessed to protect both personnel and equipment. Therefore, safety systems such as fire systems will not be stopped or taken out of service without appropriate mitigation, following the system being made safe so far as is reasonably practicable, and only for the minimum time required to undertake any specific maintenance tasks.

3.3.13 The operations of the BESS will be managed in accordance with the **Outline OEMP**.

End of Life (battery replacement) / Disposal

3.3.14 Regarding the decommissioning of the BESS, the requirements will be determined at the procurement contract stage, with the contractor remaining clear that they are the producer of the battery components and the party placing the battery components on the UK market pursuant to the Waste Batteries and Accumulators Regulations 2009 (Ref 34) (or such equivalent regulations in force at the time of decommissioning) it has certain obligations in respect of battery disposal.

3.3.15 In the event of a defective battery module or cell being identified, the defective module shall be immediately placed out of service and be electrically disconnected from the system. A specific risk assessment shall be conducted prior to the removal of the defective module to ensure the safety of employees and contractors. Specific protocols for storage and removal will fully align with the supplier's maintenance, decommissioning, and warranty stipulations.

3.3.16 Once a defective module is safely discharged or removed in accordance with the specific risk assessment, it shall be stored in an approved protective container suitable for the safe storage of BESS battery components prior to being transported from the detective unit to a dedicated safe location for inspection by an authorised manufacturer's representative.

3.3.17 All components replaced during the defects notification and warranty period will be taken back and recycled.

3.3.18 The Applicant will follow the hierarchy of waste management through the life of the BESS as follows:

- Reduce – the lithium-ion batteries have finite life based on a number of factors, primarily the total number of cycles undertaken. The operation will attempt to manage the degradation by the selection of services and cycling that maximises the overall life. Consideration will be given to supplementation of the equipment or operation at a lower output;
- Recycle – The supplying manufacturer will have obligations under the Waste Batteries and Accumulators Regulations 2009 (Ref 34) (or such equivalent regulations in force at the time of decommissioning) and will be contractually obliged to offer a recycling service;
- Recovery – The recycling should allow any useful materials to be recovered and re-enter the supply chain; and
- Disposal – Any disposal of batteries shall be undertaken in compliance with all applicable laws and all regulatory requirements, product stewardship, registration disposal and recycling or take back requirement.

4 Firefighting

4.1 Fire Service Guidance

4.1.1 Fire guidance for the Fire Service for dealing with sites such as powerplants or substations is contained in the Fire Service Manual Volume 2 Fire Services Operations – Electricity (Ref 35).

4.1.2 The Fire Service Manual stipulates that in all cases involving electrical apparatus, it is essential to ensure, on arrival, that the apparatus is electrically isolated and safe to approach. This should be carried out by the operator at the premises concerned. It is strongly advised that electrical or associated equipment should not be touched or even approached unless it is confirmed to be isolated and safe.

4.1.3 BESS hazards for first responders and site operatives once a BESS failure event occurs depend on both the failure scenario and the BESS design but are typically defined as: fire, explosion, chemical hazards, carbon monoxide, carbon dioxide, hydrocarbon gases, and hydrogen. Full Personal Protective Equipment (PPE) should be worn, and operations should not generally be conducted within any identified blast exclusion zones (close proximity to doors and deflagration vents).

4.1.4 In the event of a BESS failure, the battery system and the transformers serving the BESS will be automatically electrically isolated when a burning or venting thermal runaway incident is detected within an enclosure. However, the batteries within the enclosures will still hold charge in the event of a fire, even after the electrical system is isolated. It will not be possible to confirm that there is no residual risk from the energised batteries within the enclosure, and this will inform the strategy for firefighting in the emergency plan.

4.1.5 Fire hydrants and connections to any dry pipe systems that are required to be installed on the BESS compound should be installed in accordance with BS 9990 (Nonautomatic firefighting systems in buildings - Code of Practice) (current edition) (Ref 9) and should be identified in accordance with BS 3251 Indicator Plates for Fire Hydrants (current edition) (Ref 10).

4.1.6 If a dedicated automatic water-based suppression system or TRPP system (engineered to directly access cells within battery modules) is provided within each BESS enclosure this will be tested at UL 9540A (Ref 6) installation level or through significant scale third party fire and explosion testing. The suppression or TRPP system will be capable of operating effectively in conjunction with a CCR system to minimise deflagration risks. The system design must be capable to control or fully suppress a fire, without the direct intervention of NFRS.

4.1.7 The Applicant has consulted NFCC guidelines and engaged with NFRS during the pre-application stage and will ensure that the detailed BSMP will include any subsequent revisions made to NFCC guidelines. Close consultation will continue with NFRS throughout the planning process.

4.2 Fire Service Access

4.2.1 Access will be designed such that emergency services will be able to access the BESS Site easily with roads being clearly laid out and signed in accordance with the following:

- The proposed access-route within the BESS Compound will be 4.5m with passing places integrated. There will be no dead-end access routes or extremes of grade (accessible in all weather conditions);
- Roads within the Order Limits will enable unobstructed access to the BESS area. Two separate NFRS access points to the BESS Site have been integrated to ensure firefighters do not have to drive through a smoke or gas plume to access the BESS; and
- Signage will be installed in a suitable and visible location on the outside of BESS enclosures identifying the presence of a BESS system. Safety signage will be installed in accordance with Health and Safety (Safety Signs and Signals) Regulations 1996 (Ref 36). Signage will include details of:
  - Relevant hazards posed;
  - The type of technology associated with the BESS;
  - Any suppression system fitted; and
  - 24/7 emergency contact information.

4.2.2 Signs on the exterior of a building or enclosure should be sized such that at least one sign is legible at night at a distance of 30m or from the Order Limits, whichever is closer.

4.2.3 A swept path analysis for emergency vehicles has been undertaken, and the roads have been confirmed as suitable for emergency vehicle access.

4.2.4 In accordance with latest NFCC revised guidance (2026) (Ref 1), the detailed BSMP will include a plan that shows all sensitive receptors within a 1km radius of the BESS Compound that could be affected by a fire. The plan will have a compass rose showing north and the prevailing wind direction.

4.2.5 A BESS Site plan will be provided at the detailed design stage to NFRS that may include, as relevant:

- The layout of buildings;
- Any areas where hazardous and flammable materials are stored on site (location of gas cylinders, process areas, chemicals, piles of combustible wastes, oil and fuel tanks);
- All permanent ignition sources within the Order Limits, with a minimum of 6m away from combustible and flammable waste;
- Any areas where combustible waste is being treated or stored including non-waste material;
- All separation distances;
- Any areas where combustible liquid wastes are being stored;
- Any area where depollution of end of life vehicles (ELVs) takes place;
- Any area where crushing, shredding, baling of metals or ELVs takes place;
- Main access routes for fire engines and alternative access;
- Access points around the perimeter of the BESS Site to assist firefighting;
- Hydrants and water supplies;
- Areas of natural and unmade ground;
- Drainage runs, pollution control features such as self-actuating valves, and firewater containment systems such as bunded or kerbed areas (this may be easier to show on a separate drainage plan);
- Storage areas with pile dimensions and fire walls (where applicable) – this includes wastes stored in a building, bunker, or containers – include indicative pile layouts and ensure it is geographically representative;
- The location of fixed plant or storage location of mobile plants when not in use;
- The location of spill kits;
- The quarantine area; and
- Anything site specific considered needing to be added.

4.3 Fire Water

4.3.1 The illustrative BESS layout in **Appendix A** shows the potential location for the water storage tanks for the BESS.

4.3.2 The BESS area will be designed to integrate firefighting to integrate pressure fed (pump driven) fire hydrants fed from water tanks. Hydrants will be located in consultation with NFRS to provide redundancy and safe operating distances for firefighters. They must be clearly marked with appropriate signage. They will be easily accessible to NFRS vehicles, and their siting should be considered as part of a risk assessed approach that considers potential fire development/impacts. Outlets and connections should be agreed with NFRS. Any outlets and hard suction points should be protected from mechanical damage (e.g. through use of bollards):

- The firefighting water requirement will be fully assessed at the detailed design stage based upon based upon analysis of LSFT of the BESS design, plus any additional fire and explosion test data provided by an independent Fire Protection Engineer;
- Water storage volumes will be fully agreed with NFRS. The BESS area will contain a minimum of two firefighting water storage tanks of no less than 230,000 litres in capacity, capable of delivering 1,900 litres per minute for 4 hours (exceeding NFCC guidance);
- Water storage will either be in sectional tanks, or cylindrical tanks, above or below ground;
- Where above ground, tanks will be supported on structural concrete slab foundations to a maximum depth of 1m;
- Fire hydrants and connections to any dry pipe systems that are installed in the BESS area will be in accordance with BS 9990 Non-automatic firefighting systems in buildings code of practice (Current Edition) (Ref 9) and should be identified in accordance with BS 3251 Indicator Plates for Fire Hydrants (Current Edition) (Ref 10);
- Scheme and BESS design principles and ERP content will ensure that the NFRS are expected to employ a defensive strategy i.e. only boundary cooling should be employed for cooling of adjacent BESS or associated supporting equipment. This ensures that environmental pollution risks are minimised. Boundary cooling typically involves firefighters directing water fog or spray pattern discharge to ensure the incident does not spread to adjacent BESS enclosures. NFCC guidance states: '*If it can be confirmed that the recommended firefighting tactic for the BESS is to defensively fire fight and boundary cool whilst allowing the BESS to consume itself, this will reduce the water requirements, and thus the drainage/environmental protection requirements significantly*'. A BESS design which may require direct NFRS firefighting engagement tactics will not be selected for this facility;

- The BESS scheme will integrate an external firefighting water capture drainage system. In the event of a fire, a system of automatically self-actuating valves at the outfalls from the BESS area will be closed, isolating the BESS area drainage from the wider environment. Following any fire event, retained water within the isolated drainage and containment system will be sampled and analysed to determine the presence and concentration of contaminants. No discharge will occur until appropriate testing has been completed. Where contamination is identified, the retained water will be removed from site by tanker and transported to an appropriately permitted facility for treatment and disposal. Where testing confirms that water quality is suitable for release, discharge will take place in a controlled manner and only following consultation and agreement with the relevant statutory authority. Any discharge of retained water to a watercourse, groundwater or surface water sewer will be subject to the relevant regulatory regime in force at the time. Where required, an Environmental Permit or other applicable consent will be obtained prior to discharge. No release will occur without prior approval from the relevant regulator, and all actions will be undertaken in accordance with applicable environmental permitting and pollution control legislation;; and
- If an internal BESS water based fixed suppression system (automatic or dry pipe) is integrated in the BESS enclosures, a dedicated water supply from separate water tanks and separate containment arrangement will be provided. Runoff from internal suppression systems has the potential to contain elevated pollutant concentrations and will therefore be managed independently of the external surface water system. Backflow prevention measures, including check valves or equivalent devices, will be incorporated to prevent contamination of potable water supplies in accordance with relevant regulations. Pollution analysis will be conducted before removing and treating offsite.

4.4 Emergency Planning

4.4.1 The BESS Site will have a robust and validated emergency plan, developed in consultation with NFRS.

4.4.2 Some example BESS design information which is anticipated to be shared with NFRS to establish a risk profile for first responders, are listed below:

- Battery chemistry integrated into BESS – can provide fire and explosive risk profile;
- Battery form factor (cylindrical, pouch, prismatic);
- Battery energy Wh / kWh – confirmation of new battery cell (second life cells will not be accepted);
- Battery module cooling system details (e.g., liquid cooling design, air cooling design) – cooling system capability assessment to stop or reduce

battery cell thermal runaway propagation. Air cooled designs will not be accepted;

- Battery module vent or gas exhaust specifications;
- Battery module kWh energy + number of cells contained in the module + battery circuitry details (number of cells in series vs number of cells in parallel);
- Direct suppression system details – direct module TRPP or rack level FSS integration;
- Rack design – number of modules and kWh energy, spacing between modules, passive protection features, gas exhaust features, electrical isolation functions, heat or thermal runaway sensor integration, etc;
- Rack configuration – spacing to adjacent racks, number of racks in BESS, spacing to walls, doors, gas vents and roof;
- Type of BESS enclosure design e.g., container or cabinet, CCR system gas exhaust / ventilation features, deflagration vent design features, BESS enclosure level fire protection and suppression system details (proof of testing with BESS design and test data), additional fire or explosion protection features i.e., thermal barriers;
- EMS / BMS data monitoring capabilities and incident response integration capacity;
- Number of BESS enclosures;
- Size and MWh capacity of each BESS enclosure;
- BESS and ESS equipment spacing; spacing to other equipment, boundaries, vegetation, roads or access routes, fire hydrants / water tanks, building structures, etc;
- Access routes, observation points, turning areas, FRS equipment and assets, water supply locations and capacity, drainage, and water capture design; and
- Definition and frequency of BESS equipment testing and maintenance requirements.

4.4.3 Digital provision of safety information and procedures must be provided to site operatives, first responders and SMEs during BESS incident response – hard copy printed materials must be available onsite (location to be agreed with NFRS). As a minimum content should include:

- Digital ERPs;
- Remote emergency shutoff procedures;

- SDS (Safety Data Sheets) / Hazardous material documentation;
- Maps or design drawings;
- Gas detection capabilities; could include multi-sensor data metrics e.g., Carbon Dioxide (CO2), Carbon Monoxide (CO), Hydrogen (H2), VOC off gas + overpressure + local temperatures;
- Fire protection system or TRPP system data e.g., temperature, alarming, suppression status, etc. – establish discharge warrantee clauses, emergency BESS venting procedures, discharge times, impact on ventilation and detection systems, etc;
- ERP training drills for site operatives + FRS engagement (site familiarisation + training drills) + SME engagement (fire protection experts or battery experts); and
- Other documentation as required by specific BESS project i.e., local response stipulations, contact information for nominated response personnel, community contacts, etc.

4.4.4 An ERP will be developed post DCO consent to facilitate effective and safe emergency response. It will follow the UK NFCC (Ref 1) and NFPA 855 (Ref 3) guidelines and will include as a minimum:

- How the fire service will be alerted and incident communications and monitoring capabilities;
- Facility description, including infrastructure details, operations, number of personnel, and operating hours;
- Site plan depicting key infrastructure;
    - Site access points, internal roads, agreed access routes, observation points, turning areas, etc;
    - Firefighting facilities (water tanks, pumps, booster systems, fire hydrants, fire hose reels etc);
    - Water supply locations and capacity; and
    - Drainage and water capture design and locations.
- Up-to-date contact details of the emergency response co-ordinator including the subject matter expert (SME) for the BESS Site;
- Safe access to and within the facility for emergency vehicles and responders, including to key site infrastructure and fire protection systems;

- Details and explanation of warning systems and alarms on site and locations of alarm annunciators with alarm details (smoke, gas, temperature);
- Hazards and potential risks at the facility and details of their proposed management;
- The role of the FRS at incidents involving a fire, thermal event or fire spreading to the Order limits;
- Emergency shutoff or isolator locations;
- A list of dangerous goods stored on the BESS Site;
- Site evacuation procedures;
- Site operation Emergency Management protocols - 4 phases: discovery, initial response / notification, incident actions, resolution and post incident actions / responses;
- Emergency procedures for all credible hazards and risks, including building, infrastructure and vehicle fire, wildfires, impacts on local respondents, impacts on transport infrastructure; and
- The operator will develop a post-incident recovery plan that addresses the potential for reignition of the BESS and de-energizing the system, as well as removal and disposal of damaged equipment.

4.4.5 The Applicant, during design development, as well as the operator once appointed, will work closely with NFRS to provide all relevant information on BESS and site design features to inform all necessary hazard and risk analysis studies and assist in the development of comprehensive Risk Management Plan (RMP) and ERP.

4.4.6 Information will be supplied as early as possible in the detailed design stage to allow an initial appraisal of the BESS to be made. This information will be provided to NFRS with appropriate evidence provided to support any claims made on performance, and with appropriate standards cited for installation. Such information should also be made available to NFRS for inclusion in Site Specific Risk Information (SSRI) records.

4.4.7 A RMP shall be developed with NFRS post consent at the detailed design stage which, as a minimum, will provide advice in relation to potential emergency response implications including:

- The hazards and risks to the facility and their proposed management;
- Any safety issues for firefighters responding to emergencies at the BESS facility;

- Safe access to and within the facility for emergency vehicles and responders, including to key site infrastructure and fire protection systems. Establishment of response times and site arrival protocols;
- The adequacy of proposed fire detection and suppression systems e.g., water supply on-site; and
- Natural and built infrastructure and on-site processes that may impact or delay effective emergency response i.e., firefighting water runoff capture.

4.5 Firefighting Consequences

4.5.1 As the BESS will not have personnel access into the enclosures, there is unlikely to be any immediate threat to life; only infrastructure which forms part of the Scheme.

4.5.2 NFRS in foreseeable and credible emergency response scenarios would most likely adopt a defensive firefighting strategy by using water on neighbouring areas such as battery enclosures and structures to cool down and prevent further fire spread. The selected BESS design will have undertaken LSFT to demonstrate thermal insulation protection capabilities of the BESS enclosure design, validate equipment spacing distances, and demonstrate that deflagrations do not occur and / or can be safely constrained. In accordance with NFCC guidance (Ref 1), the Order limits will be maintained to prevent a fire spreading to the BESS or inadvertently fire loading, by providing a 'bridge' or path between BESS enclosures to transmit flaming or radiant heat.

4.5.3 As recommended in NFCC revised guidance (2026) (Ref 1) it is not anticipated that firefighting techniques will require direct hose streams or spray directly on battery systems and will be limited to boundary cooling of adjacent BESS enclosures and supporting equipment to prevent the fire from spreading. IP ratings of BESS enclosures will be shared with NFRS so that risks associated with boundary cooling can be understood. This strategy will be finalised with the NFRS at the detailed design stage and be clearly communicated in the ERP.

4.5.4 The emergency services would most likely commit to fighting fire by using water on neighbouring areas such as battery enclosures, trees, and structures to cool down and prevent further fire spread.

4.5.5 A fire affecting the BESS has the potential to mobilise pollutants in surface water runoff. As set out in **ES Volume 1, Chapter 9: Water Environment [EN0110014/APP/6.1.9]** and **ES Volume 3, Appendix 9.1: Flood Risk Assessment [EN0110014/APP/6.3.9.1]**, the BESS drainage system will be designed to isolate and contain such flows to prevent pollution of the surrounding environment. Fire water runoff will be managed as a discrete drainage catchment using a positive drainage system lined with an impermeable membrane with isolation between the outlet of the drainage system and the flow control device. Isolation will be capable of automatic activation (from the BESS fire alarm system) during an incident, with manual override provided as a secondary control. The approach is performance based, isolation capability and controlled management of runoff, including incident response and firewater, with the detailed configuration to be confirmed at detailed design stage.

4.5.6 Isolation controls shall be subject to a documented inspection, testing and maintenance regime. This shall include defined test frequency in the approved Battery Storage Safety Management Plan, an inspection checklist, record keeping of tests and inspections, defined remedial actions where defects are identified, and an escalation procedure where a test failure is recorded.

4.5.7 The surface water drainage system will be designed to attenuate runoff from the 1 in 100 annual probability +45% allowance for climate change storm event. This capacity is expected to accommodate a reasonable worst-case scenario involving firewater runoff combined with a 1 in 10-year storm event.

4.5.8 In line with guidance from the NFCC, firefighting water systems are expected to deliver a flow rate of 1,900 litres per minute for a minimum of two hours. The BESS Compound will contain a minimum of two firefighting water storage units of no less than 230,000 litres in capacity, capable of delivering 1,900 litres per minute for 4 hours (exceeding NFCC guidance). This equates to a total volume of 456 cubic metres (m^3) (1,900 l/min × 240 min = 456,000 litres). Accordingly, the drainage design will provide sufficient capacity the 1 in 100 annual probability +45% allowance for climate change event plus the $456m^3$ firewater volume. The containment system will therefore provide storage for this volume in combination with the defined rainfall allowance. This reflects the operational philosophy that the isolation valve will be closed during a fire event and open during normal conditions. Final containment volumes and detailed hydraulic design will be confirmed at detailed design stage and agreed with NFRS.

4.5.9 Following any fire event, retained water within the isolated drainage and containment system will be sampled and analysed to determine the presence and concentration of contaminants. No discharge will occur until appropriate testing has been completed. Where contamination is identified, the retained water will be removed from site by tanker and transported to an appropriately permitted facility for treatment and disposal. Where testing confirms that water quality is suitable for release, discharge will take place in a controlled manner and only following consultation and agreement with the relevant statutory authority. Any discharge of retained water to a watercourse, groundwater or surface water sewer will be subject to the relevant regulatory regime in force at the time. Where required, an Environmental Permit or other applicable consent will be obtained prior to discharge. No release will occur without prior approval from the relevant regulator, and all actions will be undertaken in accordance with applicable environmental permitting and pollution control legislation.

4.5.10 The Plume Study in **Appendix B** assesses the battery fire emission impacts on air quality at six worst case fire locations (using the illustrative BESS design in **Appendix A**) on sensitive receptors within a 1km radius of the BESS Site. Typically, a BESS fire would be a relatively short-term incident. The Plume Study therefore compared predicted concentrations against Acute Exposure Guidance Levels (AEGLs) and Emergency Response Planning Guidelines (ERPGs) which are relevant to short term releases, in addition to National Air Quality Objectives (NAQOs). AEGLs are expressed as concentrations of a substance above which it is predicted that the general population could experience, including susceptible individuals:

- Level 1 - Notable discomfort, irritation, or certain asymptomatic non-sensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure;
- Level 2 - Irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape; and
- Level 3 - Life-threatening health effects or death

4.5.11 The results of the risk assessment indicated that no Air Quality Assessment Levels (AQALs) were approached at any residential receptors, however under the worst-case meteorological conditions, HF concentrations were predicted to be in excess of the 1-hour mean, 4-hour mean and 8-hour mean AEGLs, and CO concentrations were predicted to be in excess of the 8-hour mean NAQO, along three Public Rights of Way (PRoWs). The predicted maximum PM_{10} concentrations were all well below the 8-hour HSE Workplace Exposure Limit (WEL).

4.5.12 A risk assessment of potential impact on visibility has also been undertaken for nearby road and rail receptors. The predicted visibility distances are greater than safe stopping distances for roads and rail within a 1km radius of the BESS area.

4.5.13 Based on the factors of distance to the nearest property and the anticipated short-term nature of a fire incident, the assessment in **Appendix B** concludes that there will not be adverse effects at the closest residential receptor locations because of a BESS fire incident. Notwithstanding, at the detailed design stage a BESS system and site specific Plume Analysis study will be conducted to assess the environmental impact of a BESS incident to sensitive receptors within a 1km radius. Toxic gas emissions to sensitive receptors must be below relevant public health exposure limit guidelines when the battery system of a BESS is fully consumed (burnt out). Production of particulate matter (PM) and a visibility impact assessment on transport links within a 1km radius of the BESS area will also be included. The ERP produced at the detailed design stage (template outlined in Section 4.4.4) will incorporate all necessary emergency response procedures and actions based upon thermal runaway test data supplied by the BESS system provider.

4.5.14 The ERP could contain the following measures or protocols relating to air quality for sensitive receptors located downwind from a fire plume. As part of preparation of the detailed BSMP, the Applicant will incorporate the latest good practices for battery storage safety, failure detection and prevention, along with the emergency response planning, as guidance continues to develop in the UK and internationally:

- Notification of potentially affected residents including advice on the health effects of smoke and ways to reduce exposure (e.g. close windows and stay indoors) in the event of a BESS fire;
- Should there be a BESS fire in close proximity to a Public Right of Way (PROW) or Bridleway, the site operator is to determine wind direction from the BESS area weather station and seek to close a PROW or Bridleway, if deemed necessary;

5 Pre-construction Information Requirements

5.1 Summary

5.1.1 The detailed design stage of the Scheme will consider the lifecycle of the battery system from installation to decommissioning. At the detailed design stage, the selected BESS design will have completed LSFT to fully inform inputs for risk assessment tools which will be utilised together with detailed consequence modelling to provide a comprehensive site operations and emergency response safety audit.

5.1.2 The battery system mitigation measures adopted in the BSMP will reflect the latest BESS safety codes and standards applicable at that stage. Mitigation measures will be discussed and coordinated with NFRS.

5.1.3 As stipulated in NFPA 855 (2026) (Ref 3), a Failure Modes and Effects Analysis (FMEA) of the BESS (BS EN IEC 60812 (Ref 37)) or Layer of Protection Analysis (LOPA) of the BESS will be conducted to lay the foundation for predictive maintenance requirements and complement the fault indicator capabilities of the BMS data analytics system. This key analysis minimises the probability of a BESS failure in relation to the specific BESS system and site design and analyses key mitigation solutions to minimise the impact of a BESS failure in the unlikely event that this would occur. These types of risk analysis provide confidence to demonstrate that under day-to-day operation there is a low risk of a BESS failure incident, and in the event of an incident the credible hazards are understood and have been evaluated both at the illustrative and detailed design stages to demonstrate that the risk to site operatives, first responders, and the local population remains very low.

5.1.4 Comprehensive Hazard Mitigation Analysis (HMA) will be conducted by a BESS specialist independent Fire Protection Engineer following NFPA 855 (2026) (Ref 3) guidelines and recommendations to cover BESS system and site-specific safety issues. Typically, the main components of an HMA are:

- BESS information (design and site layout);
- Code analysis (BESS safety and fire standards);
- UL 9540A testing (Ref 6), LSFT, third party fire and explosion test results, consequence modelling (heat flux analysis, NFPA 68 (Ref 8) deflagration analysis, etc.) reports; and
- Failure Modes and Effects Analysis (FMEA).

5.1.5 A range of studies will be undertaken, with a primary focus on fire and explosion risk including (but not limited to) risk analysis and management tools to inform the overall design solution include:

- Hazard and Operability Analysis (‘HAZOP’);
- Hazard Identification (‘HAZID’);
- Fire Risk Analysis (FRA);
- Explosion Risk Analysis (ERA); and
- Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) (Ref 38).

5.1.6 Additional BESS system risk analysis reports frequently provided by Tier 1 BESS manufacturers or BESS integrators can inform key risk analysis studies (listed in paragraphs 5.1.4 and 5.1.5) and provide NFRS with detailed insights into capability of BESS system hazard mitigation systems (burning and venting thermal runaway scenarios) and provide guidance for evaluating site-specific equipment spacing templates. A non-exhaustive list of reports are listed below:

- NFPA 69 (Ref 7) Explosion Prevention Compliance report;
- Deflagration analysis report;
- FDS gas ventilation analysis report;
- Heat flux and flame tilt analysis report;
- LSFT or full scale destruction test report;
- Firefighting water analysis report;
- UL 9540A (Ref 6) test interpretation reports;
- BESS design ERP templates; and
- Decommissioning plan templates.

5.1.7 If the BESS system supplied differs from the specification considered for risk assessments and consequence modelling, then a full safety audit will be repeated for the new BESS system specification. These studies will be completed and signed off before construction commences.

5.1.8 The detailed design stage will determine the approach to addressing the following specific requirements, which will be updated prior to construction of the BESS and submitted to the relevant planning authority as a detailed BSMP prior to the commencement of construction of the BESS. The BSMP must include:

- The detailed design, including drawings of the BESS;
- A statement on the battery system specifications, including fire detection and suppression systems;
- A statement on operational procedures and training requirements, including emergency operations;
- A statement on the overall compliance of the system with applicable legislation;
- An environmental risk assessment to ensure that the potential for indirect risks (e.g., through leakage or other emissions) is understood and mitigated; and
- ERPs covering construction, operation and decommissioning phases will be developed once a construction team, and an operator have been appointed. These plans will be developed in consultation NFRS and other local emergency services to include the adequate provision of firefighting equipment onsite and ensure that fire, smoke, and any release of toxic gases from a thermal runaway incident does not significantly affect site operatives, first responders, and the local community.

5.1.9 Provision of the above information will demonstrate prior to construction that all the considerations and requirements in this document have been addressed, and the BESS installation is safe.

5.1.10 Safe decommissioning of the BESS will be addressed prior to decommissioning of the Scheme in accordance with the **Outline Decommissioning Environmental Plan** [**EN0110014/APP/7.3**] submitted as part of the DCO Application.

6 Conclusion

6.1 Summary

6.1.1 This oBSMP has demonstrated in a systematic way the mitigation of the safety risks posed by the BESS in the Scheme.

6.1.2 The Applicant is committed to developing a BESS incorporating equipment which provides optimal levels of performance and safety during its lifecycle.

6.1.3 This oBSMP demonstrates that the Applicant has relevant experience of BESS systems and that the relevant stakeholders have been consulted for the DCO Application. Safety will be inherent in the overall design, minimising the risk of a BESS failure event occurring, and reducing the impact of such an event should it occur.

6.1.4 The implementation of the oBSMP is secured through a Requirement in Schedule 2 of the DCO. This stipulates that a detailed Battery Safety Management Plan (BSMP) is to be submitted to and approved by the relevant planning authority in consultation with NFRS, the EA, prior to the commencement of the works for the BESS. The BMSP will be substantially in accordance with this oBSMP.

References

Ref 1 National Fire Chiefs Council (NFCC) Grid-Scale Battery Energy Storage System planning – Guidance for FRS (2026).

Ref 2 https://www.hse.gov.uk/ppe/managing-risk-using-ppe.htm

Ref 3 NFPA 855 (2026): Standard for the Installation of Stationary Energy Storage Systems.

Ref 4 UL 9540 3rd Edition (2023): Standard for Energy Storage Systems and Equipment.

Ref 5 BS EN IEC 62933-5-2 (2020) Electrical Energy Storage (EES) systems. Part 5-2: Safety requirements for grid integrated EES systems. Electrochemical-based systems

Ref 6 Underwriters Laboratories, UL 9540A (2025) Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems

Ref 7 NFPA 69 (2024): Standard on Explosion Prevention Systems.

Ref 8 NFPA 68 (2023): Standard on Explosion Protection by Deflagration Venting.

Ref 9 BS 9990: 2015: Non-automatic firefighting systems in buildings - Code of practice

Ref 10 https://www.en-standard.eu/bs-3251-1976-specification-indicator-plates-for-fire-hydrants-and-emergency-water-supplies/?srsltid=AfmBOoo8UrVn7Z3uHAw-XeV48m6ev4C9Fy42pNs5y_ZyoOZk2CC0x2yA

Ref 11 UL 1973 (2022): Batteries for Use in Stationary and Motive Auxiliary Power Applications.

Ref 12 BS EN IEC 62619 (2022) Secondary cells and batteries containing alkaline or other non-acid electrolytes. Safety requirements for secondary lithium cells and batteries, for use in industrial applications.

Ref 13 BS EN 14797 (2006): Explosion venting devices.

Ref 14 Richard Chitty (2014) External fire spread: building separation and boundary distances (BR 187 2nd edition).

Ref 15 FM DS 5-33 (2023) FM Global Datasheet. Lithium-Ion Battery Energy Storage Systems.

Ref 16 BS EN 13501-2:2023 – TC: Fire classification of construction products and building elements - Classification using data from fire resistance and/or smoke control tests, excluding ventilation services

Ref 17 BS EN 1364- 1: Fire resistance tests for non-loadbearing elements (walls)

Ref 18 BS EN 54: fire detection & alarm systems

Ref 19 BS 9999:2017 – TC: Fire safety in the design, management and use of buildings.

Ref 20 NFPA 850 (2020): Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations

Ref 21 NFPA 72 (2025): National Fire Alarm and Signaling Code®

Ref 22 UN 38.3: Recommendations on the Transport of Dangerous Goods – Manual of Tests and Criteria – (Lithium Metal and Lithium-Ion Batteries).

Ref 23 https://unece.org/transport/publications/european-agreement-concerning-international-carriage-dangerous-goods-road

Ref 24 https://www.gov.uk/guidance/moving-dangerous-goods

Ref 25 https://standards.ieee.org/ieee/2962/10402/

Ref 26 IEEE 2686 (2025) standard: Recommended Practice for Battery Management Systems in Stationary Energy Storage Applications.

Ref 27 https://standards.ieee.org/ieee/2688/10536/

Ref 28 BS EN IEC 62443-2-1:2024: Security for industrial automation and control systems - Security program requirements for IACS asset owners.

Ref 29 UL 1741 (2021): Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources

Ref 30 IEEE 1815 (2012): IEEE Standard for Electric Power Systems Communications-Distributed Network Protocol (DNP3)

Ref 31 IEEE 1547.3 (2023): IEEE Guide for Cybersecurity of Distributed Energy Resources Interconnected with Electric Power Systems

Ref 32 https://www.hse.gov.uk/foi/internalops/og/og-0086.pdf

Ref 33 UL 2941 (2023): Outline of Investigation for Cybersecurity of Distributed Energy and Inverter-Based Resources.

Ref 34 UK Statutory Instruments (2009) The Waste Batteries and Accumulators Regulations 2009.

Ref 35 Fire and Emergency Planning Directorate (1998) Fire Service Manual Volume 2: Fire Service Operations, Electricity.

Ref 36 https://www.hse.gov.uk/pubns/books/l64.htm

Ref 37 BS EN IEC 60812:2018 – TC: Failure modes and effects analysis (FMEA and FMECA)

Ref 38 The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) Assessment

Abbreviations

Abbreviation/Term	Definition
AEGL	Acute Exposure Guideline Levels, describe the human health effects from once-in-a-lifetime, or rare, exposure to airborne chemicals. Used by emergency responders when dealing with chemical spills or other catastrophic exposures, AEGLs are set through a collaborative effort of the public and private sectors worldwide.
AIMS or sparker systems	Active Ignition Mitigation System, an explosion protection system designed to safely ignite explosive gases within the BESS enclosure and vent flames through deflagration venting systems to prevent structural damage to the BESS. Sparker systems work on similar principles to ignite explosive gases at very low LEL levels.
Battery System	Refers to the components inside the BESS container (cells, modules, electronic boards, cables, etc.).
BESS	Battery Energy Storage System.
BESS Enclosure or unit	Refers to the enclosed structure surrounding the BESS
BESS Compound	Refers to the BESS area / site within the security fencing and entry / exit gates.
BSMP	Battery Safety Management Plan.
BMS	Battery Management System, a system that monitors, controls, and optimizes performance of an individual or multiple battery modules in an energy storage system and has the ability to control the disconnection of the module(s) from the system in the event of abnormal conditions. This system can be completely independent of the EMS.
Cell	The basic functional electrochemical unit containing an assembly of electrodes, electrolyte, separators, container, and terminals. It is a source of electrical energy by direct conversion of chemical energy (UL Definition).
CCR system	Combustible Concentration Reduction systems are gas exhaust systems which comply with NFPA 855 (2026) guidelines which require activation at no more than 10% of the Lower Explosive Limit (LEL) of the explosive gas(es). The CCR must ensure the prevention of a dangerous build-up of explosive gases (on average 25% LEL within the BESS enclosure).
CO	Carbon Monoxide

Abbreviation/Term	Definition
Data Analytics (DA)	Integrated directly into BMS or integrated as bolt on additional monitoring and control system.
Deflagration	Subsonic propagation of the combustion zone.
EA	Environment Agency, (within England) responsible for: regulating major industry and waste, treatment of contaminated land, water quality and resources, fisheries, inland river, estuary and harbour navigations, conservation and ecology.
Electrolyte	Lithium salts e.g. Lithium hexafluorophosphate, dissolved in organic solvents.
EPRI	Electric Power Research Institute, US based organisation conducting BESS safety research in the following key areas: safety practices, safety hazards, community safety & resilience.
EMS	Energy Management System, is a system that monitors, controls, and optimizes the performance of an energy storage system and has the ability to control the disconnection of the energy storage system in the event of abnormal conditions.
ERA	Explosion Risk Assessment.
ERP	Emergency Response Plan, at minimum (NFPA 855, 2026), the ERP shall include the following: procedures for safe operational shutdown, inspection testing and maintenance, BESS response procedures, fire response procedures, safety data sheets, emergency contract information, FRS operations and response procedures, etc.
E-Stop	Emergency Stop facility for BESS battery system. This function should be capable to be triggered remotely (24/7 monitoring) and locally on site (site control room and / or BESS areas).
ESS	Energy Storage System refers to electrical equipment required for power generation.
FAT	Factory Acceptance Tests (BS EN IEC 62933-5-2 standard).
Fire Suppression System	Internal BESS active fire protection system.
FMEA	Failure Modes and Effects Analysis (BS EN IEC 60812 standard).
FPE	Fire Protection Engineer.
FRA	Fire Risk Assessment, a process to characterize the risk associated with BESS fire that addresses the fire scenarios of concern, probability, and potential consequences.
FSS	Fire Suppression System.

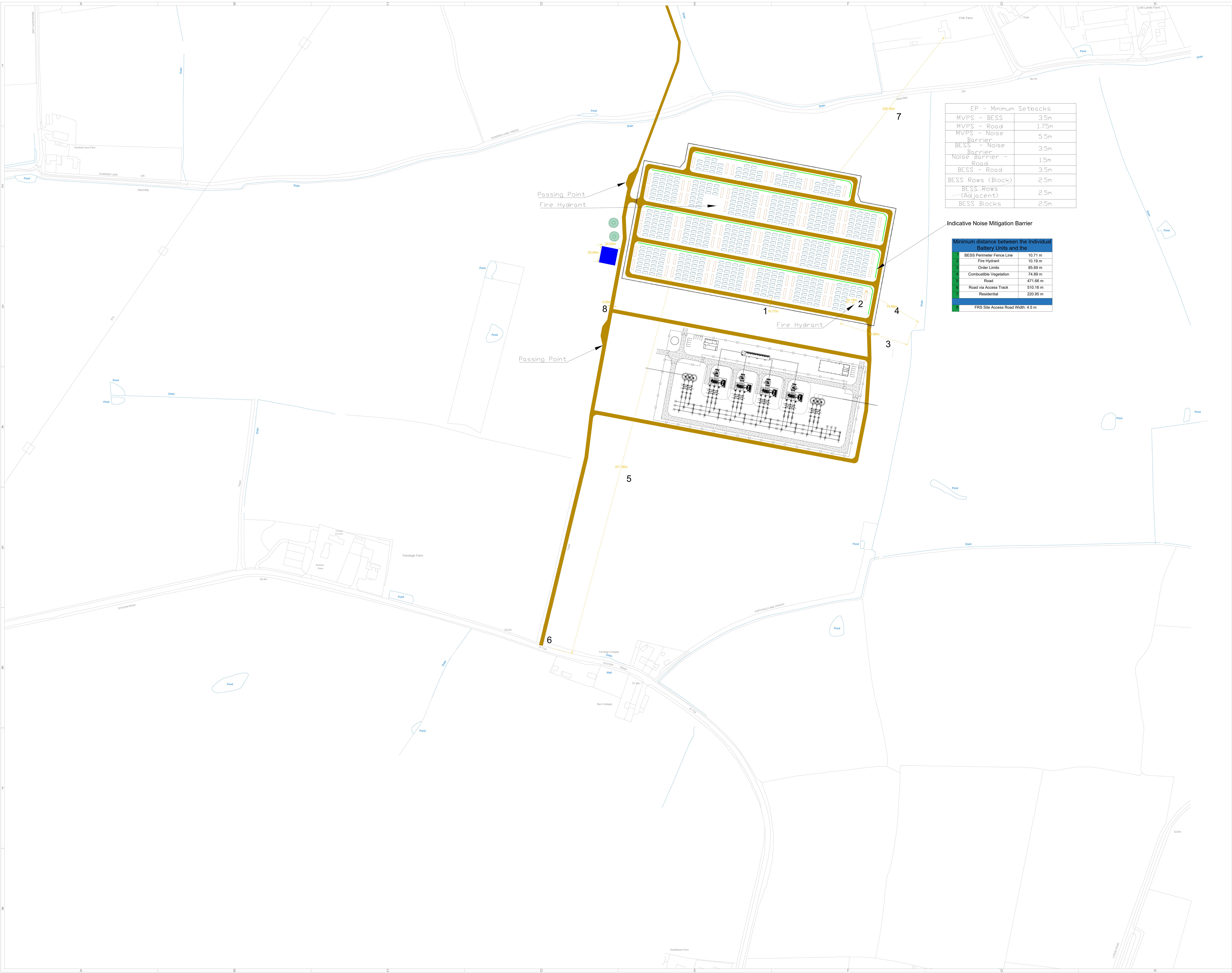
Abbreviation/Term	Definition
Gas exhaust system	Explosion prevention system designed to vent explosive gases from the BESS enclosure.
HAZID	Hazard Identification Study, a systematic and structured analysis to identify hazards early in the design or operational phase of a project.
HAZOP	Hazard and Operability Analysis, a systematic approach to determining potential problems that may be uncovered by reviewing the safety of designs and revisiting existing processes and operations.
HCl	Hydrogen chloride, can be formed during the burning of plastics. Upon contact with water, it forms hydrochloric acid. Both hydrogen chloride and hydrochloric acid are corrosive.
Heat Flux Analysis	This type of analysis is usually conducted using FDS CFD modelling of the ignition of flammable gases resulting from thermal runaway events within the BESS enclosure and ignition of the modules, under various scenarios and configurations.
Heating and Cooling System (HVAC)	System which regulates temperature and humidity within the BESS enclosure. Commonly referred to as HVAC.
HF	Hydrogen fluoride is an inorganic compound. It is a poisonous, colourless gas or liquid that dissolves in water to yield an aqueous solution termed hydrofluoric acid.
HMA	Hazard Mitigation Analysis, evaluation of potential BESS failure modes and safety-related consequences attributed to the failures.
HRR	Heat Release Rate, the rate at which fire releases energy, generally measured in Kilowatts for BESS fire testing. This is essential for the prediction of fire cascading effects (propagation effects) in general to flammable materials in the environment and particular to adjacent cells in a battery system.
HSE	UK Health and Safety Executive
IEC	International Electrotechnical Commission. Key BESS safety standards are IEC 62282, IEC 62433, IEC 62619, IEC 63933, IEC 63056.
IEEE	Institute of Electrical & Electronics Engineers. Key BESS safety standards are IEEE 1679.1, IEEE 1815, IEEE 2686, IEEE 2688, IEEE 2962, IEEE 3189.
IP ratings	Ingress Protection ratings, developed by the IEC which grade the resistance of a BESS enclosure or battery module against the intrusion of dust or liquids.

Abbreviation/Term	Definition
kWh	Kilowatt hours, measurement of energy storage capacity, maximum amount of battery energy that can be discharged.
LEL/LFL	Lower Explosive Limit / Lower Flammable Limit, minimum concentration of fuel that can support a flame; fuel/air mixtures below the LEL / LFL are too lean to propagate a flame.
LFP	Lithium Ferro Phosphate / Lithium Iron Phosphate cathode material, more commonly referred to as the battery chemistry.
LOPA	Layer of Protection Analysis (LOPA) is a risk assessment method used to determine the likelihood of a scenario occurring based on existing safeguards in order to protect against identified hazard scenarios and to identify any potential shortfall in the risk reduction required to meet predetermined, risk-based criteria.
LSFT	Large Scale Fire Testing
Mitigation	Measures including any process, activity, or design to avoid, prevent, reduce, or, if possible, offset any identified significant adverse effects on the environment.
Module	A subassembly that is a component of a BESS that consists of a group of cells or electrochemical capacitors connected together either in a series and/or parallel configuration (sometimes referred to as a block) with or without protective devices and monitoring circuitry (UL definition).
MWh	Megawatt hours, measurement of energy storage capacity, maximum amount of battery energy that can be discharged,1 MWh = 1000 KWh.
NFCC	UK National Fire Chiefs Council.
NFPA	The National Fire Protection Association (NFPA) is an international non-profit organisation devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards. Key BESS codes and standards are NFPA 855, NFPA 68, and NFPA 69.
NFRS	Norfolk Fire and Rescue Service
NO2	Nitrogen dioxide is a gaseous air pollutant composed of nitrogen and oxygen and is one of a group of related gases called nitrogen oxides (NOx). Nitrogen dioxide causes a range of harmful effects on the lungs.
Off-Gassing	The event in which the battery cell emits volatile organic compounds (VOC) signalling electrolyte breakdown as a precursor to thermal runaway.

Abbreviation/Term	Definition
Overpressure	Transient air pressure, such as the shock wave from an explosion which is greater than the surrounding atmospheric pressure.
PHRR	The peak heat release rate defines the maximum release rate of heat during the combustion process. PHRR occurs when the decomposition process is occurring at its fastest rate; and the peak value is considered a reliable measure of the maximum flammability and flashover potential of a material.
Plume Analysis	Site specific dispersion modelling and risk analysis for toxic gases potentially emitted during thermal runaway by BESS systems.
PM_{10}	Particulate matter - small airborne particles less than 10 µm in diameter
PROW	Public Right of Way
Rack	Unit for housing multiple modules connected in series, can include their management system (BMS).
SAT	Site Acceptance Tests (BS EN IEC 62933-5-2 standard).
SME	Subject Matter Expert, normally incident response, or BESS decommissioning specialists.
SOC	State of Charge (Battery).
SOH	State of Health (Battery data can be provided by Data Analytics / BMS).
SSRI	Site Specific Risk Assessments, kept on file by local FRS to inform first response strategies.
THR	Total Heat Release is a measure of the amount of heat energy evolved by a battery cell during its burning time. It is expressed in terms of energy or also as surface area normalized energy.
TR (Thermal Runaway)	Thermal Runaway, incident when an electrochemical cell's temperature increases at an accelerating rate in an uncontrollable fashion (exothermic) sufficient to result in damage to the cell. The thermal runaway progresses when the cell's generation of heat is at a higher rate than the heat it can dissipate. This may lead to fire, explosion and gas and smoke evolution (UL definition).
TRPP	Thermal Runaway Propagation Prevention system, engineered to directly access cells within battery modules (NFPA 855 & UL 9540A definition)
UEL / UFL	Upper Explosive Limit / Upper Flammable Limit, maximum concentration of fuel that can support

Abbreviation/Term	Definition
	a flame; fuel/air mixtures above the UEL / UFL are too rich to propagate a flame.
UKHSA	The UK Health Security Agency (UKHSA) is responsible for protecting every member of every community from the impact of infectious diseases, chemical, biological, radiological and nuclear incidents and other health threats.
UL	UL Solutions is a global safety science company. Key BESS and battery safety standards and testing include UL 1642, UL 1741, UL 1973, UL 9540, UL 9540A.
Unit	UL 9540A terminology: A frame, rack, or enclosure that consists of a functional BESS which includes components and subassemblies such as cells, modules, battery management systems, ventilation devices and other ancillary equipment.
VOC	Volatile Organic Compounds, electrolyte solvent off-gas released from battery cell as a precursor to thermal runaway.
WEL	Workplace Exposure Limit (HSE)

Appendix A Illustrative BESS Layout



EP - Minimum Setbacks	
MVPS - BESS	3.5m
MVPS - Road	1.75m
MVPS - Noise Barrier	5.5m
BESS - Noise Barrier	3.5m
Noise Barrier - Road	1.5m
BESS - Road	3.5m
BESS Rows (Block)	2.5m
BESS Rows (Adjacent)	2.5m
BESS Blocks	2.5m

Minimum distance between the Individual Battery Units and the		
1	BESS Perimeter Fence Line	10.71 m
2	Fire Hydrant	10.19 m
3	Order Limits	85.69 m
4	Combustible Vegetation	74.89 m
5	Road	471.66 m
6	Road via Access Track	510.16 m
7	Residential	220.95 m
8	FRS Site Access Road Width: 4.5 m	

General Legend:

- Development Area
- Fence
- Access Track
- PCS/Transformer Units
- ESS Units
- Water Supply
- Noise Barrier
- Fire Hydrant
- Fire Service - Command & Control

Project:	East Pye Solar Farm
Project Location:	TBC
Ownership:	East Pye Solar Farm Ltd
Document Title:	BESS Layout
Sheet format:	A1 "841 x 594"
Scale:	1:2000

Document amendments:			Comments:
v.1	02/10/2025	A.C.	Illustrative Layout
v.2	11/11/2025	A.C.	Illustrative Layout
v.3	15/12/2025	A.C.	Noise Barrier Update
v.4	09/01/2026	A.C.	Swept Path/Fire Hydrant Update

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Appendix B Plume Study

East Pye Solar

Appendix B: Battery Energy Storage System (BESS) Fire – Emissions to Air Risk Assessment

Revision 1

March 2026

Planning Inspectorate Reference: EN0110014

Document Reference: APP/7.5

APFP Regulation 5(2)(q)

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Executive Summary

This BESS fire emissions to air risk assessment has been prepared on behalf of East Pye Solar Limited (the 'Applicant') in relation to an application made to the Secretary of State (SoS) for the Department for Energy Security and Net Zero, under section 37 of the Planning Act 2008, seeking a Development Consent Order (DCO) for the East Pye Solar (the 'Scheme').

The Scheme comprises the construction, operation and maintenance, and decommissioning of a Solar photovoltaic (PV) electricity generating station with a total capacity exceeding 100 megawatts (MW) and associated development including a Battery Energy Storage System (BESS), up to three 132kV Project Substations and up to three 400kV Project Substations, Grid Connection Infrastructure and a new National Grid Substation. A description of the Scheme can be found in **Environmental Statement (ES) Volume 1, Chapter 4 – The Scheme [EN0110014/APP/6.1.4]**. The BESS is proposed within **Work No.2** in **Works Plan [EN0110014/APP/2.3]** with the associated parameters and commitments described in the **Design Principles, Parameters and Commitments [EN0110014/APP/7.18]**.

The Scheme would be located within the **Order Limits** (shown on the **Location Plan [EN0110014/APP/2.1]** and **Works Plan [EN0110014/APP/2.3]** submitted as part of the DCO Application and secured by Article 3 of the **draft DCO [EN0110014/APP/3.1]**). The Order Limits contain all elements of the Scheme comprising the Solar PV Arrays, 132kV and 400kV Project Substations, the National Grid Substation, the BESS, Grid Connection Infrastructure, interconnecting cables within the Cable Route Corridor (CRC), Mitigation and Enhancement Areas and Highway Works. A description of the Order Limits is provided in the **ES Volume 1, Chapter 3 – The Order Limits [EN0110014/APP/6.1.3]**.

As recommended in 2026 National Fire Chiefs Council (NFCC) Grid Scale Energy Storage System Planning – Guidance for Fire and Rescue Services (Ref 1), a fire emissions risk to air assessment has been prepared to inform the Outline Battery Safety Management Plan (Outline BSMP) produced by the Applicant, which outlines the key safety provisions in the event of a BESS fire in relation to air pollutant emissions.

The assessment considers the risk of air quality impacts resulting from a BESS thermal runaway incident (or 'fire') on sensitive receptors within a 1km radius of the BESS Site (the 'Study Area'). Pollutant concentrations have been modelled using Atmospheric Dispersion Modelling Software (ADMS) to determine the risk of impacts of BESS fire emissions in relation to the most relevant Air Quality Assessment Levels (AQALs) for emergency responders. A visibility assessment has also been undertaken to determine the potential risk of impacts of modelled particulate matter concentrations associated with BESS fire emissions on visibility to the local road and rail network.

There are several battery storage technologies available to the Applicant. As outlined in the Outline BSMP, the exact technology and system chemistry type is still to be determined; however, for the purposes of this assessment a concept design has been considered that uses a BESS system based upon lithium iron phosphate (LFP) lithium-ion battery technology that is currently used on other BESS systems associated with solar projects being developed by the Applicant. This is a reasonable worst case for the purposes of the risk assessment in terms of BESS air pollutant and toxic gas emission potential (in particular, hydrogen fluoride (HF) production).

Two scenarios have been modelled: a core scenario derived from the maximum emission concentrations recorded in the Wartsila GridSolv Bespoke Unit testing report (Ref 2) for a 1.5 MWh BESS unit, and a sensitivity scenario where the derived BESS fire emissions have been doubled to represent the 5MWh BESS units proposed as part of the BESS.

The results of the risk assessment indicate that none of the relevant Air Quality Assessment Levels (AQALs) are approached at any residential receptors. However, under the worst-case meteorological conditions, hydrogen fluoride (HF) concentrations are predicted to be in excess of the 8-hour mean Acute Exposure Guideline Limit (AEGL) and, in the sensitivity scenario only, the 1-hour mean HF, 4-hour mean HF and 8-hour mean carbon monoxide (CO) concentrations are predicted to be in excess of the relevant AQALs, along three Public Rights of Way (PRoWs).

To mitigate this potential risk associated with elevated short-term HF and CO concentrations, it is recommended that the Emergency Response Plan (ERP) considers inclusion of the following measures in the event of a fire:

- The Applicant should liaise with emergency services regarding whether public access to the Tivetshall St Margaret Footpath 3 (located 60m east of the BESS Units based on the indicative BESS layout) should be temporarily restricted during a BESS fire;
- The Applicant should liaise with emergency services regarding whether public access to Great Moulton Restricted Bridleway 18 (approximately 90m north east of the BESS Unit based on the indicative BESS layout) should be restricted in the event of a BESS fire; and
- The Applicant should liaise with emergency services regarding whether public access to Great Moulton Restricted Bridleway 19 (approximately 40m north of the BESS Unit locations based on the indicative BESS layout) should be restricted in the event of a BESS fire.

The requirement for these measures can be reviewed at the detailed design phase when further information is expected to be available on the emissions associated with the selected BESS. It is possible that the BESS Units taken forward will have lower HF and CO emissions in the event of a fire than those modelled in this risk assessment and therefore the measures above may not be necessary at the time of operation.

A risk assessment of potential impact on visibility has also been undertaken for nearby road and rail receptors. The predicted visibility distances are greater than safe stopping distances for roads and rail.

1 Introduction

1.1 Project Description

1.1.1 A fire emissions to air risk assessment has been prepared on behalf of East Pye Solar Limited (the 'Applicant') in relation to an application made to the Secretary of State (SoS) for the Department for Energy Security and Net Zero, under section 37 of the Planning Act 2008, seeking a Development Consent Order (DCO) for the East Pye Solar (the 'Scheme').

1.1.2 The Scheme comprises the construction, operation and maintenance, and decommissioning of a Solar photovoltaic (PV) electricity generating station with a total capacity exceeding 100 megawatts (MW) and associated development including a Battery Energy Storage System (BESS), up to three 132kV Project Substations and up to three 400kV Project Substations, Grid Connection Infrastructure and a new National Grid Substation. A description of the Scheme can be found in **Environmental Statement (ES) Volume 1, Chapter 4 – The Scheme [EN0110014/APP/6.1.4]**.

1.1.3 The Scheme would be located within the Order Limits (shown on the **Location Plan [EN0110014/APP/2.1]** and **Works Plan [EN0110014/APP/2.3]** submitted as part of the DCO Application and secured by Article 3 of the **draft DCO [EN0110014/APP/3.1]**). The Order Limits contain all elements of the Scheme comprising the Solar PV Arrays, 132kV and 400kV Project Substations, the National Grid Substation, the BESS, Grid Connection Infrastructure, interconnecting cables within the Cable Route Corridor (CRC), Mitigation and Enhancement Areas and Highway Works.

1.1.4 The BESS is proposed within **Work No.2** in **Works Plan [EN0110014/APP/2.3]** with the associated parameters and commitments described in the **Design Principles, Parameters and Commitments [EN0110014/APP/7.18]**.

1.1.5 The assessment informs the Outline Battery Safety Management Plan (Outline BSMP) produced by the Applicant which outlines the key safety provisions in the event of a BESS fire at the Scheme in relation to air pollutant emissions.

1.2 Scope of Assessment

1.2.1 In accordance with the National Fire Chiefs Council (NFCC) 2026 Grid Scale Energy Storage System Planning – Guidance for Fire and Rescue Services (Ref 1), emission modelling has been undertaken to understand the risk of air quality impacts on human receptors should a BESS fire occur at the Order Limits, and to inform mitigation measures included in the Outline BSMP.

1.2.2 As advised by the UK Health Security Agency (UKHSA) for similar BESS fire studies, the main air pollutants of concern associated with a BESS fire are particulate matter (PM_{10}) in terms of risk of impact on visibility and nitrogen oxides (NO_x), carbon monoxide (CO), formaldehyde (HCHO), hydrogen cyanide (HCN), hydrogen fluoride (HF), ammonia (NH_3) and hydrogen chloride (HCl) in terms of risk of impacts on human receptors.

1.2.3 Notwithstanding the above, additional air pollutants reported in the Wartsila GridSolv Quantum Cube Bespoke Unit testing report (Ref 2) (hereafter referred to as 'the GridSolv testing report') have also been modelled for completeness and are presented in **Appendix E** .

1.2.4 The BESS design and system chemistry type is still to be determined and the final battery chemistry will be confirmed as part of the detailed design prior to the commencement of construction of the BESS. For the purposes of this assessment, a concept design has been considered that uses a SolBank 3.0 (Ref 3) BESS system based upon LFP lithium-ion battery technology which is similar to BESS Units currently used on other BESS associated with solar projects being developed by the Applicant. This is considered to be a reasonable worst case for the purposes of the assessment in terms of the risk of BESS toxic gas emission potential (in particular, HF production).

1.2.5 A glossary of terms used in this assessment is provided at the end of this assessment.

2 Methodology

2.1 Introduction

2.1.1 The assessment methodology detailed in the following sections has been applied to ascertain the potential risk of impacts of emissions to air to identify the potential magnitude of impacts compared to the relevant air quality assessment levels (AQALs) (outlined in **Appendix A** of this report) and whether or not additional mitigation is required.

2.2 Study Area

2.2.1 In accordance with NFCC guidelines (Ref 1), a Study Area of 1km from the BESS Site has been assessed, which covers the area in which the greatest risk of potential impacts is considered likely to occur. The sensitive human receptor locations considered in this assessment include residential properties and Public Rights of Way (PRoWs) as presented in **Appendix B** and illustrated in **Figure 1** below. Receptors have also been included along major roads and railway lines in the vicinity of the BESS Site (see **Figure 2**) to inform the visibility risk assessment.

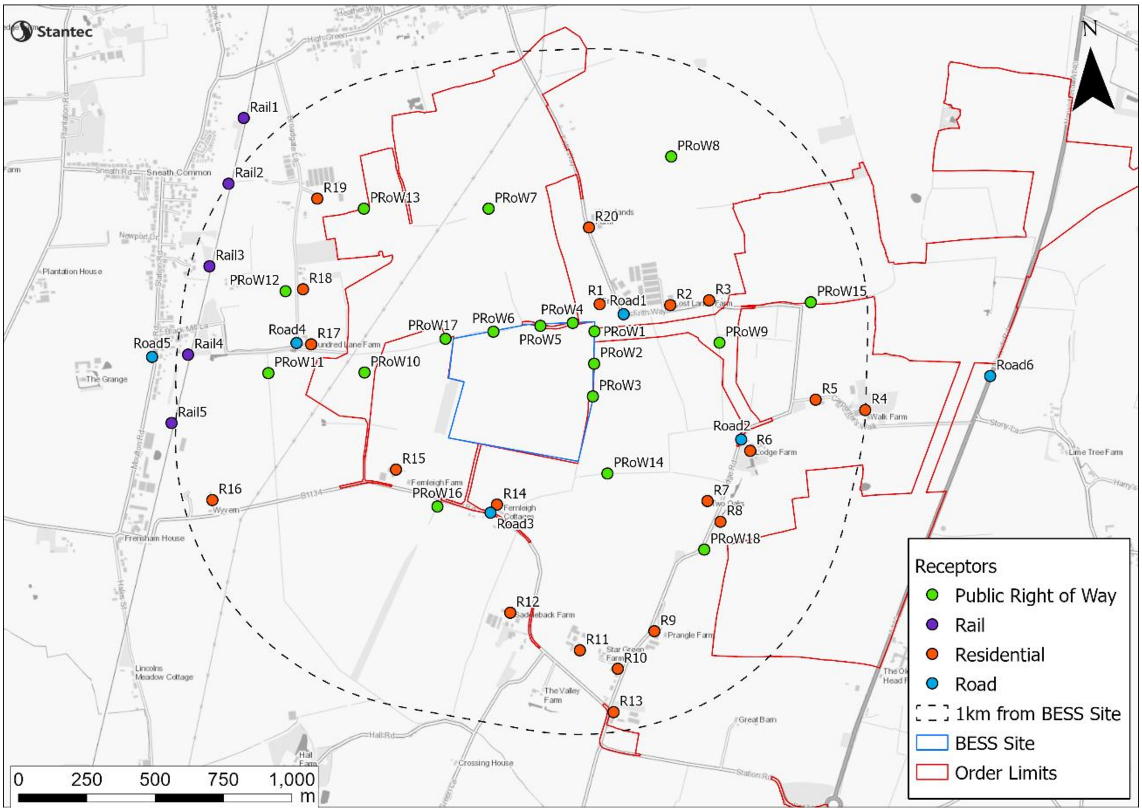

Figure 1: Modelled Receptor Locations.
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2.3 Relevant Air Quality Assessment Levels

2.3.1 This risk assessment aims to clarify impacts associated with a unplanned/emergency scenario, therefore a review of Acute Exposure Guideline Limits (AEGLs) and Emergency Response Planning Guidelines (ERPGs), along with Workplace Exposure Limits (WELs) and National Air Quality Objectives (NAQOs) - collectively referred to as Air Quality Assessment Levels (AQALs) - has been undertaken for relevant pollutants identified in the GridSolv testing report (Ref 2).

2.3.2 An overview of the AQALs considered relevant to this assessment is provided below. The AQALs considered in this risk assessment have been presented in **Appendix A**, along with a methodology for unit conversion and a summary of the most relevant AQALs per pollutant (see **Table A.5** and **A.6**).

2.3.3 While the relevant AQALs presented in **Appendix A** are those routinely used to assess the risk of air quality impacts to human health associated with BESS fires, an additional assessment against the Environment Agency's Environmental Assessment Levels (Ref 4) has also been provided in **Appendix F** for context.

2.3.4 The battery system is assumed to be at 100% State of Charge (SoC) which is likely to result in a short burn duration at high temperatures resulting in peak emissions. Due to the short burn duration, it is assumed that 1-hour, 4-hour and 8-hour averaging periods at peak emission rates are most relevant when assessing the potential risk of air quality impacts resulting from a BESS fire and have therefore been considered in this assessment. Longer averaging periods such as 24-hour mean and annual mean have not been assessed as the peak emissions associated with the highest temperatures are not expected to be sustained for such lengths of time. The short-term averaging periods assessed are considered to represent worst-case air quality impacts from a BESS fire.

Acute Exposure Guideline Limits

2.3.5 The US Environmental Protection Agency (USEPA) has published AEGLs (Ref 6) that are more relevant for releases (usually accidental) of chemicals in the air and used by emergency responders. AEGLs are derived for short exposure periods for the general public, with AEGLs levels equating to the severity of effect as follows:

- AEGL-1 – notable discomfort, irritation, or certain asymptomatic non-sensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure;
- AEGL-2 – irreversible or other series, long-lasting adverse health effects or an impaired ability to escape; and

- AEGL-3 – life-threatening health effects or death.

2.3.6 Pollutant concentrations below the AEGL-1 represents exposure levels that could produce mild and progressively increasing but transient and non-disabling effects.

2.3.7 The AEGLs considered within this assessment are presented in **Table A.1**.

Emergency Response Planning Guidelines

2.3.8 ERPGs (Ref 7) are developed by the Emergency Response Planning committee of the American Industrial Hygiene Association and estimate concentrations of hazardous airborne pollutants at which most people will start to experience significant health effects. ERPGs are only available for 1-hour averaging periods and, similarly to AEGLs, ERPGs are split into three tiers as follows:

- ERPG-1: the maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing more than mild, transient adverse health effects or without perceiving a clearly defined objectionable odour;
- ERPG-2 – the maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experience or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action; and
- ERPG-3 – the maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.

2.3.9 The ERPGs considered within this assessment are presented in **Table A.2**.

National Air Quality Objectives

2.3.10 The Air Quality (England) Regulations 2000 (AQR) defined NAQOs (a combination of concentration-based thresholds, averaging periods and compliance dates) for a limited range of pollutants. Subsequent amendments have been made to the AQR to include a wider range of pollutants as defined in European Union (EU) Directives.

2.3.11 These amendments were consolidated by the Air Quality Standards Regulations 2010 (AQSR) (with subsequent amendments most notably in 2016 and for the devolved administrations), which transposed the EU's Directive on ambient air quality and cleaner air for Europe (EU Directive 2008/50/EC), with subsequent amendments via the Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 and the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020.

2.3.12 A summary of the relevant NAQOs is presented in **Table A.3**.

Workplace Exposure Limits

2.3.13 The Health and Safety Executive (HSE) WELs (Ref 5) have been used to assess significance of PM_{10} and carbon dioxide (CO_2) in the absence of any other relevant short-term exposure guidelines. WELs are UK occupational exposure limits that represent concentrations of hazardous airborne substances set to protect the health of workers. WELs are provided in averaging periods of 15-minutes and 8-hours. For the purposes of this assessment, the 15-minute WEL has been applied to the 1-hour model outputs.

2.3.14 The WELs considered within this assessment are presented in **Table A.4**.

2.4 Assessing BESS Fire Emissions

2.4.1 Pollutant emissions during a hypothetical BESS fire have been modelled using the ADMS 6 atmospheric dispersion model. It has been assumed that only one BESS Unit will fail (referred to as the ‘initiating unit’) given the large-scale fire testing and site-specific consequence modelling will validate equipment spacing distances to ensure a fire will not propagate to neighbouring units.

2.4.2 To capture a worst-case scenario at each sensitive receptor, six sub-scenarios have been assessed with the initiating unit located at six worst-case locations across the maximum parameter of the BESS, as shown in the **Works Plan [EN011014/APP/2.3]**. The locations of the six initiating units are shown in **Figure 2** below.

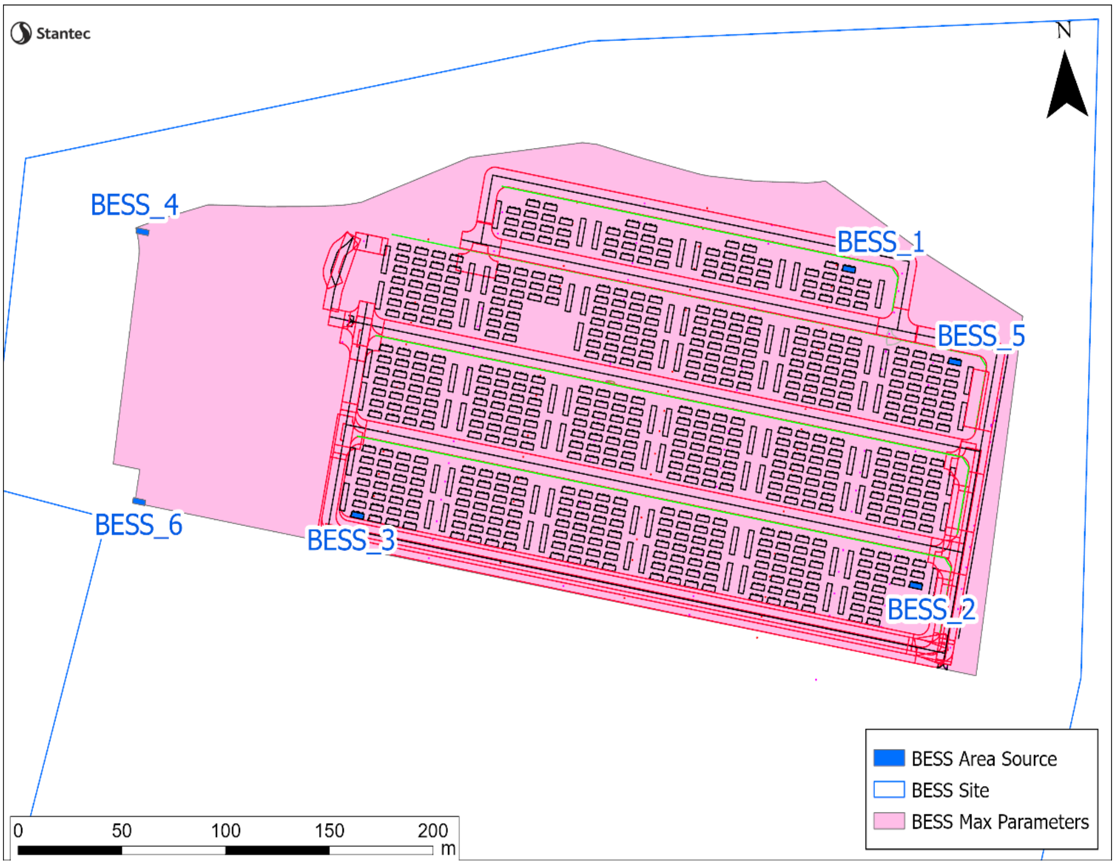

Figure 2: Locations of Modelled Initiating Units.
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2.4.3 The initiating unit has been modelled as an area source with a nominal velocity of 1 m/s. Testing reports suggests that BESS fires can reach peak temperatures in excess of 1,200-1,400°C. These peak temperatures represent a maximum number of cells simultaneously burning and will only be sustained for a limited timeframe (typically 1-3 hours depending on the specific BESS design). As a conservative assumption, it has assumed that the temperature of the fire in this assessment is 800°C as a lower temperature will result in poorer dispersion of air pollutants.

2.4.4 The model has been run with five years of hourly sequential meteorological data from the Tibenham meteorological station which is considered to be the most appropriate observation-based data for the Study Area given it has good data capture and is located approximately 3km west of the BESS Site, with an elevation difference of approximately 7m. Data from 2021 to 2025 have been used, with the maximum results from any of the modelled years reported. Wind roses for the 2021-2025 meteorological data are provided in **Appendix B**.

2.4.5 Pollutant concentrations have been predicted for a range of worst-case discrete locations of relevant exposure (as presented in **Appendix B** and **Figure 1**), as well as across a 4km x 4km ground level (1.5m) Cartesian grid with 10m spacing.

2.4.6 The parameters used in the model setup are set out in **Appendix B**. It has been assumed that emissions are released at 2.9m above ground level i.e., from the top of the initiating unit.

Derivation of Emission Rates

Core Scenario

2.4.7 There is currently limited data available on emission rates released during a BESS fire. As agreed with the Fire Safety consultant for the Scheme, the maximum concentrations reported in the Wartsila GridSolv testing report (Ref 2) (reproduced in **Table 2.1** below) have been used to derive potential emission rates for this risk assessment. This testing report was based on a BESS Unit using LFP lithium-ion battery cells. Each shelf contained a single module comprising 52 cells. The total battery capacity of the BESS Unit was approximately 1.5 MWh, with the battery charged to 100% SoC.

Table 2.1: Maximum Pollutant Concentrations Measured above the initiating Unit Error! Bookmark not defined.*

Pollutant	Maximum concentration (ppm)	Maximum concentration (µg/m^3)
Carbon monoxide (CO)	3,061.0	3,506,692
Formaldehyde (HCHO)	77.8	95,556
Hydrogen chloride (HCl)	114.4	170,594
Hydrogen cyanide (HCN)	54.5	60,251
Hydrogen fluoride (HF)	575.6	471,074
Ammonia (NH_3)	23.7	16,508
Nitrogen dioxide (NO_2)	2.0	3,764

*Pollutants measured in the GridSolv testing report without AEGLs have been excluded from this assessment.

2.4.8 Concentrations of PM_{10} were not measured as part of the GridSolv testing report. In the absence of suitable data, it has been assumed that the PM_{10} emissions released during a BESS fire would be equivalent to that released during a diesel fire i.e. 250 ppm as per the Axminster Energy Hub Plume Assessment Study prepared by DNV for Clearstone Energy (Ref 8).

2.4.9 The pollutant concentrations shown in **Table 2.1** above were measured using a sensor located above the mid-point of the initiating unit. This measurement point was included above each initiating unit within the model setup and utilised as a verification point via ‘inverse dispersion modelling’ to derive the pollutant emission rate.

2.4.10 A unitary emission rate was applied in the dispersion model and the 1-hour, 4-hour and 8-hour average model outputs predicted at the verification point were compared to the maximum measured concentrations in the GridSolv testing report to derive a verification factor for each pollutant for each averaging period for each initiating unit. These factors were then applied to the relevant model outputs when deriving pollutant concentrations at discrete and gridded receptors.

Sensitivity Scenario

2.4.11 The initiating unit in the GridSolv testing report had a capacity of approximately 1.5 MWh, however, the indicative BESS Units to be used by the Applicant for the Scheme have a capacity of 5 MWh and contain triple the number of individual battery cells. Emissions released during a BESS fire are expected to be higher for a 5 MWh BESS unit than a 1.5 MWh unit and this has been accounted for via a sensitivity scenario.

2.4.12 The Fire Safety consultant has advised that BESS fire emission rates do not increase linearly with battery capacity or number of cells within a BESS Unit. Peak emissions are instead driven by the number of cells simultaneously burning and the resultant temperatures the BESS Unit fire would generate. To estimate emissions associated with a 5 MWh capacity BESS Unit, the maximum pollutant concentrations recorded in the GridSolv testing report have been doubled. This ensures a robust assessment as recent testing reports for similar 5 MWh capacity BESS units have measured peak HF concentrations in the region of 800-900 ppm (i.e. approximately 140-160% of those measured in the core scenario).

Results Processing

2.4.13 The Process Contribution (PC) to pollutant concentrations from the BESS fire emissions have been added to the relevant estimated background concentration (see **Table 2.2**) to provide the Predicted Environmental Concentration (PEC). The results of this assessment are presented in **Appendix C** for the core scenario and **Appendix D** for the sensitivity scenario.

Background Concentrations

2.4.14 The background concentrations applied in this assessment are presented in **Table 2.2** below. It has been assumed that the short-term (1-hour, 4-hour and 8-hour) background concentration is twice the estimated long-term (annual mean) background concentration in accordance with Environment Agency guidance (Ref 4).

2.4.15 Where appropriate backgrounds are not available for pollutants due to an absence of background monitoring and/or modelling data, it has been assumed that background concentrations would be minimal, particularly in comparison to the predicted PC associated with a BESS fire. Background concentrations for these pollutants have therefore been assumed to be 0 µg/m^3.

Table 2.2: Applied Background Concentrations

Pollutant	Annual Mean Background Concentration (µg/m^3)	Short-term Background Concentration (µg/m^3)	Source
CO	231-238	464-476	DEFRA 2001 based background maps (Ref 9)
Formaldehyde	10	20	UKHSA Formaldehyde: Toxicology Overview (Ref 11)
HCl	0.21	0.42	UKEAP: Acid Gases & Aerosol Network Stoke Ferry Monitoring Station 2025 (Ref 12)
HCN	0	0	No appropriate backgrounds available*
HF	0.5	1.0	EPAQS Guidelines for Halogen and Hydrogen Halides in Ambient Air (Ref 13)
NH_3	4.2	8.3	Automatic Urban and Rural Network (AURN) Chilbolton Observatory 2025 (Ref 12)
NO_2	9.2	18.4	AURN Norwich Lakenfields 2025 (Ref 12)
PM_{10}	12.1	24.2	AURN Norwich Lakenfields 2025 (Ref 12)

* It should be noted that the predicted PECs presented in Appendices C and D for HCN do not exceed 15% of the AQAL. As such, it is considered that the addition of a background concentration would not give rise to an exceedance of an AQAL and the absence of background data is not a significant limitation of this assessment.

Risk of Impact

2.4.16 The predicted PECs have been compared against the relevant AQALs identified for each pollutant to determine the risk of impact and mitigation requirements.

2.5 Visibility Risk Assessment

2.5.1 A visibility risk assessment has also been undertaken using modelled PM_{10} concentrations to determine the potential risk of impacts of BESS fire particulate matter emissions on visibility along nearby roads and railway lines.

2.5.2 In accordance with Klote and Milke's Principles of Smoke Management (Ref 15), visibility distances have been calculated using the following equation:

$$\textbf{Equation 1}: S = \frac{k}{\alpha_m m_p}$$

Where S = visibility (m), k = proportionality constant, α_m = specific extinction coefficient (m^2/g) and m_p = mass concentration of particulate (g/m^3) (Ref 15).

2.5.3 Equation 1 is typically used for calculating visibility through smoke produced by building fires and can account for varying conditions such as the type of fire and extent of illumination. Given the similarities of a building fire and a BESS fire, this equation is considered appropriate for this risk assessment.

2.5.4 The proportionality constant is dependent on the colour of the smoke, the lighting, and the visual acuity of the observer. A proportionality constant of 3 has been used in this assessment which represents visibility of 'building components in reflecting light' (i.e. non-light emitting objects). A specific extinction coefficient of 7.6 m^2/g has been used in this assessment which represents flaming combustion. This provides a robust assessment as the extinction coefficient for smouldering combustion is lower and would result in greater visibility distances.

2.5.5 There are a range of factors that could affect visibility beyond the PM_{10} concentrations, such as meteorological conditions and time of day, and therefore the results of the visibility risk assessment should be treated as indicative.

2.6 Assumptions and Limitations

2.6.1 There are many components that contribute to the uncertainty in the predicted concentrations and resultant risk. The model used in this assessment is dependent upon the emissions data that have been input which have inherent uncertainties associated with them, which is largely a result of the limited data currently available for BESS fires. There is additional uncertainty as the model is required to simplify real-world conditions into a series of algorithms. The assumptions and limitations of the risk assessment have been summarised below:

- The BESS design and system chemistry type for the Scheme is still to be determined, and the final battery chemistry will be confirmed as part of the detailed design prior to the commencement of construction of the BESS. For the purposes of this assessment, a concept design using SolBank 3.0 5.0 MWh units has been considered. This is a BESS system based upon LFP lithium-ion battery technology and is similar to that currently used on other solar projects being developed by the Applicant. This is considered a reasonable worst case for the purposes of the risk assessment in terms of safety (toxic and explosive gas production risks).

- In the event of a BESS fire, it is assumed that there would be complete propagation between cells, modules and racks within the initiating unit, resulting in all cells within a single BESS unit catching fire. However, it is assumed that the fire would remain isolated to a single BESS Unit given that large-scale fire testing and site-specific consequence modelling will validate equipment spacing distances to ensure a fire will not propagate to neighbouring units.

- It is assumed that the initiating unit is at 100% SoC, resulting in a short burn duration at high temperature and the greatest peak emissions.

- It is assumed that the peak concentrations recorded in the GridSolv testing report are equivalent to 1-hour, 4-hour and 8-hour mean measurements for the purposes of this assessment. This is very worst-case and it assumes that peak emission concentrations would be released continuously for an 8-hour period.

- It is assumed that the battery module liquid cooling system will not cool the cells during a battery fire, and a temperature of 800°C would remain throughout an 8-hour period where peak emissions would be released. This is considered a conservative assumption given temperatures of 1,200 – 1,400 °C are now being recorded at the peak of 5 MWh BESS fires which would result in improved air pollutant dispersion.

- It has been assumed that the PM_{10} emissions released during a BESS fire would be equivalent to that of a diesel fire in absence of relevant monitoring data.

- Averaging periods shorter than 1-hour have not been assessed due to the ADMS-6 model allowing only hourly meteorological data to be utilised. However, the 10-minute and 30-minute AEGLs are typically less stringent than the 1-hour AEGLs, therefore comparing model outputs to the 1-hour AEGL is considered a robust assessment.

- Building downwash cannot be taken into account in the ADMS-6 model when using area sources. Although this is a limitation of the model setup, there are no significant buildings in the vicinity of the initiating unit that are likely to significantly alter the dispersion parameters.

- The use of inverse dispersion modelling to derive an emission rate at a single verification point for 1-hour, 4-hour and 8-hour averaging periods to determine pollutant emissions is subject to large uncertainties.

- The indicative BESS layout presented in **Appendix A** of the Outline BSMP has been used to identify worst-case BESS Units to the north, east and south of BESS Compound. The maximum parameters of the **Work Plan [EN011014/APP/2.3]** have been used to represent the maximum western extent of the BESS Compound.

2.6.2 Despite these limitations and uncertainties, it is considered that the worst-case assessment of emission rates in the sensitivity scenario ensures a robust risk assessment of potential BESS fire emission impacts.

3 Air Quality Risk Assessment

3.1 Core Scenario Results

Maximum 1-Hour Pollutant Concentrations

3.1.1 Predicted 1-hour mean concentrations for all pollutants in the core scenario are presented in **Appendix C**.

3.1.2 There are no predicted exceedances of the relevant 1-hour AQALs at any modelled residential receptors or PRoWs for all pollutants assessed. The maximum PEC relevant to a 1-hour AQAL is predicted for HF at PRoW2 (Tivetshall St. Margaret Footpath 3), with a total predicted PEC of 512.7 µg/m^3, or 63% of the 1-hour AQAL (AEGL-1 of 818 µg/m^3).

Maximum 4-Hour Pollutant Concentrations

3.1.3 Predicted 4-hour mean concentrations for all pollutants in the core scenario are presented in **Appendix C**.

3.1.4 There are no predicted exceedances of the relevant 4-hour AQALs for all pollutants assessed. However, the maximum predicted PEC relevant to a 4-hour AQAL is 800.2 µg/m^3 for HF, which equates to 98% of the 4-hour AQAL (AEGL-1 of 818 µg/m^3). This is predicted at PRoW4 (Great Moulton Restricted Byway 19).

Maximum 8-Hour Pollutant Concentrations

3.1.5 Predicted 8-hour mean concentrations for all pollutants in the core scenario are presented in **Appendix C**.

3.1.6 There are no predicted exceedances of the relevant 8-hour AQALs at any modelled residential receptors or PRoWs for all pollutants, with the exception of HF.

3.1.7 A maximum 8-hour HF concentration of 1153.4 µg/m^3 was predicted at Tivetshall St. Maragaret Footpath 3 (receptor PRoW2). This equates to 141% of the 8-hour HF AQAL (AEGL-1 of 818 µg/m^3). There are no predicted 8-hour mean HF exceedances of the AQAL at any other PRoWs or residential receptors in the Study Area.

3.2 Sensitivity Scenario Results

Maximum 1-Hour Pollutant Concentrations

3.2.1 A sensitivity scenario has also been assessed whereby emissions associated with the BESS fire have been doubled to account for the prospective 5 MWh BESS Units, rather than 1.5 MWh units reported in the GridSolv testing report. Predicted 1-hour mean concentrations for all pollutants in the sensitivity scenario are presented in **Appendix D**.

3.2.2 There are no predicted exceedances of the relevant 1-hour mean AQALs at any modelled residential receptors or PRoWs for all pollutants, with the exception of HF.

3.2.3 A maximum 1-hour HF concentration of 1024.5 µg/m^3 was predicted at Tivetshall St. Maragaret Footpath 3 (receptor PRoW2). This equates to 125% of the 1-hour mean HF AQAL (AEGL-1 of 818 µg/m^3). There are no further exceedances of the 1-hour mean HF AQAL at any other PRoWs or residential receptors in the Study Area.

Maximum 4-Hour Pollutant Concentrations

3.2.4 Predicted 4-hour mean concentrations for all pollutants in the sensitivity scenario are presented in **Appendix D**.

3.2.5 There are no predicted exceedances of the relevant 4-hour mean AQALs at any modelled residential receptors or PRoWs for all pollutants, with the exception of HF.

3.2.6 A maximum 4-hour HF concentration of 1599.3 µg/m^3 was predicted at Tivetshall St. Maragaret Footpath 3 (receptor PRoW2). This equates to 196% of the 4-hour mean HF AQAL (AEGL-1 of 818 µg/m^3). There are further exceedances of the 4-hour mean HF AQAL at PRoW3, PRoW6 and PRoW17, representing the Tivetshall St. Margaret Footpath 3 and Great Moulton Restricted Bridleways 18 and 19.

Maximum 8-Hour Pollutant Concentrations

3.2.7 Predicted 8-hour mean concentrations for all pollutants in the core scenario are presented in **Appendix D**.

3.2.8 There are no predicted exceedances of the relevant 8-hour AQALs at any modelled residential receptors or PRoWs for all pollutants, with the exception of HF and CO.

3.2.9 A maximum 8-hour CO concentration of 17,629 µg/m³ was predicted at Tivetshall St. Maragaret Footpath 3 (receptor PRoW2). This equates to 176% of the 8-hour mean CO AQAL (NAQO of 10,000 µg/m³). There are further exceedances of the 8-hour mean CO AQAL at PRoW3 and PRoW17, representing the Tivetshall St. Margaret Footpath 3 and Great Moulton Restricted Bridleways 18 and 19.

3.2.10 A maximum 8-hour HF concentration of 2305.8 µg/m³ was predicted at Tivetshall St. Maragaret Footpath 3 (receptor PRoW2). This equates to 282% of the 8-hour mean HF AQAL (AEGL-1 of 818 µg/m³). There are further exceedances of the 8-hour mean HF AQAL at PRoW1, PRoW3 - PRoW6 and PRoW17, representing the Tivetshall St. Margaret Footpath 3 and Great Moulton Restricted Bridleways 18 and 19.

3.2.11 **Figure 3** below shows the predicted area of exceedance of the 8-hour mean HF AQAL in the sensitivity scenario across the six separate BESS fire scenarios.

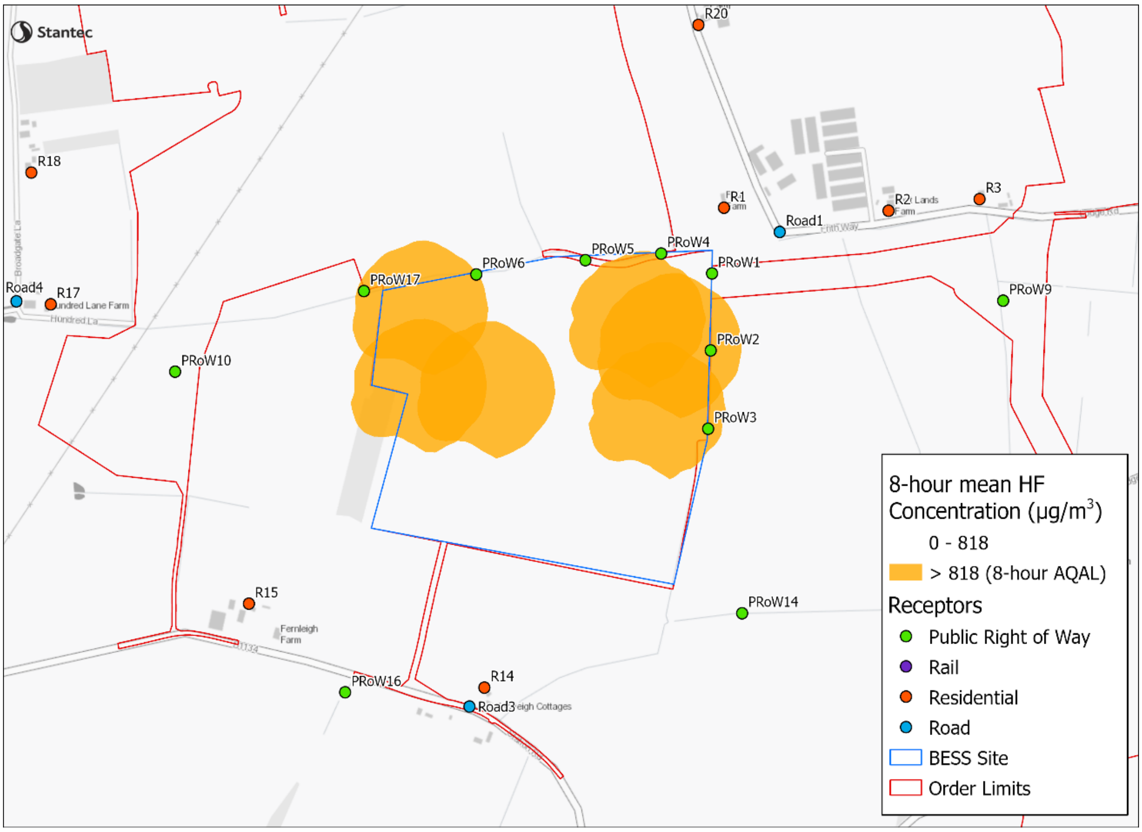

Figure 3: Predicted 8-hour mean HF PECs in the Sensitivity Scenario.
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3.2.12 It should be noted that this assessment is worst-case as it assumes that peak emission concentrations would be released continuously for an 8-hour period.

3.3 Summary

3.3.1 Based on the results of both the core and sensitivity scenario, there are not predicted to be any exceedances of the relevant 1-hour, 4-hour and 8-hour mean AQALs at any modelled residential receptors. However, under the worst-case meteorological conditions, 8-hour mean HF concentrations are predicted to be in excess of the AQAL and, in the sensitivity scenario only, the 1-hour mean HF, 4-hour mean HF and 8-hour mean CO concentrations are predicted to be in excess of the relevant AQALs, along three PRoWs.

3.3.2 Given the predicted elevated short-term HF and CO concentrations near the BESS Site, it is recommended that the ERP considers the following measures:

- The Applicant should liaise with emergency services regarding whether public access to Tivetshall St Margaret Footpath 3 (approximately 60m east of the BESS Unit locations based on the indicative BESS layout) should be restricted in the event of a BESS fire;
- The Applicant should liaise with emergency services regarding whether public access to Great Moulton Restricted Bridleway 18 (approximately 90m north east of the BESS Unit locations based on the indicative BESS layout) should be restricted in the event of a BESS fire; and
- The Applicant should liaise with emergency services regarding whether public access to Great Moulton Restricted Bridleway 19 (approximately 40m north of the BESS Unit locations based on the indicative BESS layout) should be restricted in the event of a BESS fire.

3.3.3 The requirement for these measures can be reviewed at the detailed design phase when further information is expected to be available on the emissions associated with the selected BESS Unit. It is possible that the BESS Units taken forward will have lower HF and CO emissions in the event of a fire than those modelled in this risk assessment and therefore the measures above may not be necessary at the time of operation.

4 Visibility Risk Assessment

4.1.1 A risk assessment of impact of smoke on visibility has been undertaken in accordance with Equation 1 from the Principles of Smoke Management (Ref 15). Visibility distances have been calculated at receptors on nearby roads and railway line, which are presented for the sensitivity scenario in **Table 4.1** below.

Table 4.1: Visibility Distances at Road and Rail Receptors in the Sensitivity Scenario

Receptor	Distance from the Worst-Case Initiating Unit (m)	Maximum PM_{10} PC (μg/m^3)	Short-term PM_{10} Background Concentration (μg/m^3)	Maximum PM_{10} PEC (μg/m^3)	Visibility (m)
Road1 – Frith Way	250	86.7	24.2	67.6	3,559
Road2 – Lodge Road	650	26.4	24.2	37.4	7,808
Road3 – Station Road	480	36.8	24.2	42.6	6,466
Road4 – Broadgate Lane	630	30.4	24.2	39.4	7,235
Road5 – Moulton Road	1,160	19.7	24.2	34.0	8,993
Road6 – A140 Ipswich Road	1,510	16.0	24.2	32.2	9,808
Rail1 – Norwich to Diss Railway Line	1,170	15.9	24.2	32.2	9,842
Rail2 – Norwich to Diss Railway Line	1,060	17.3	24.2	32.8	9,522
Rail3 – Norwich to Diss Railway Line	990	19.8	24.2	34.1	8,974
Rail4 – Norwich to Diss Railway Line	1,020	20.9	24.2	34.6	8,754
Rail5 – Norwich to Diss Railway Line	1,090	18.4	24.2	33.4	9,266

4.1.2 All predicted visibility distances are greater than 5km and well within safe stopping distances for both roads (Ref 16) and rail (Ref 17).

5 Conclusion

5.1 Summary

5.1.1 A fire emissions to air risk assessment has been undertaken to understand the potential air quality impacts on human receptors should a BESS fire occur and to inform mitigation measures included in the Outline BSMP.

5.1.2 Predicted concentrations have been assessed against relevant AQALs, including AEGLs, ERPGs, NAQOs and WELs.

5.1.3 Two scenarios have been modelled: a core scenario based on maximum emission concentrations recorded in the GridSolv testing report and a sensitivity scenario whereby emission rates have been doubled to account for greater capacity BESS Units.

5.1.4 The results of the risk assessment indicate that none of the applied AQALs are approached at any residential receptors. However, under the worst-case meteorological conditions, HF concentrations are predicted to be in excess of the AQAL and, in the sensitivity scenario only, the 1-hour mean HF, 4-hour mean HF and 8-hour mean CO concentrations are predicted to be in excess of the relevant AQALs, along three PRoWs.

5.1.5 To mitigate this potential risk associated with elevated short-term HF and CO concentrations, it is recommended that the Emergency Response Plan (ERP) considers inclusion of the following measures in the event of a fire:

- The Applicant should liaise with emergency services regarding whether public access to Tivetshall St Margaret Footpath 3 (approximately 60m east of the BESS Unit locations based on the indicative BESS layout) should be temporarily restricted in the event of a BESS fire;
- The Applicant should liaise with emergency services regarding whether public access to Great Moulton Restricted Bridleway 18 (approximately 90m north east of the BESS Unit locations based on the indicative BESS layout) should be restricted in the event of a BESS fire; and
- The Applicant should liaise with emergency services regarding whether public access to Great Moulton Restricted Bridleway 19 (approximately 40m north of the BESS Unit locations based on the indicative BESS layout) should be restricted in the event of a BESS fire.

5.1.6 The requirement for these measures can be reviewed at the detailed design phase when further information is expected to be available on the emissions associated with the selected BESS Unit. It is possible that the BESS Units taken forward will have lower HF and CO emissions in the event of a fire than those modelled in this risk assessment and therefore the measures above may not be necessary at the time of operation.

5.1.7 A risk assessment of the potential impact on visibility has also been undertaken for nearby road and rail receptors. The predicted visibility distances are greater than safe stopping distances for roads and rail.

Abbreviations

Abbreviation/Term	Definition
ADMS	Atmospheric Dispersion Modelling Software
AEGL	Acute Exposure Guideline Limit
AQAL	Air Quality Assessment Level
AURN	Automatic Urban and Rural Network
BESS	Battery Energy Storage System
CO	Carbon monoxide
CO_2	Carbon dioxide
CRC	Cable Route Corridor
C_3H_8	Propane
DCO	Development Consent Order
DEFRA	Department for Environment, Food and Rural Affairs
EAL	Environment Assessment Level
EPAQS	Expert Panel on Air Quality Standards
ERP	Emergency Response Plan
ERPG	Emergency Response Planning Guidelines
EtO	Ethylene oxide
HBr	Hydrogen bromide
HCHO	Formaldehyde
HCl	Hydrogen chloride
HCN	Hydrogen cyanide
HF	Hydrogen fluoride
HSE	Health and Safety Executive
H_2SO4	Sulphuric Acid
LFP	Lithium Iron Phosphate
MeOH	Methanol
NAQO	National Air Quality Objective

Abbreviation/Term	Definition
NH_3	Ammonia
NOAA	National Oceanic and Atmospheric Administration
NO_2	Nitrogen dioxide
OBSMP	Outline Battery Safety Management Plan
PC	Process Contribution
PEC	Predicted Environmental Concentration
PM_{10}	Particulate matter - small airborne particles less than 10 µm in diameter
PRoW	Public Right of Way
SoC	State of Charge
SoS	Secretary of State
UKEAP	United Kingdom Eutrophying and Acidifying Network
USEPA	United States Environmental Protection Agency
WEL	Workplace Exposure Limit

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Appendix A Relevant Air Quality Assessment Levels

Acute Exposure Guideline Limits

Table A.1: AEGLs for BESS Fire Assessment Pollutants

Pollutant	Acute Exposure Guideline Limit (µg/m^3)								
	1-hour			4-hour			8-hour		
	AEGL-1	AEGL-2	AEGL-3	AEGL-1	AEGL-2	AEGL-3	AEGL-1	AEGL-2	AEGL-3
NO_2	941	22,582	37,636	941	15,431	26,345	941	12,608	20,700
CO	None	95,085	378,049	None	37,805	171,840	None	30,931	148,928
HF	818	19,642	36,010	818	9,821	18,005	818	9,821	18,005
HCl	2,684	32,807	149,121	2,684	16,403	38,771	2,684	16,403	38,771
HCN	2,211	7,849	16,583	1437	3,869	9,507	1,106	2,764	7,296
NH_3	20,896	111,444	766,176	20,896	76,618	363,088	20,896	76,618	271,644
HCHO	1,105	17,195	68,780	1,105	17,195	42,988	1,105	17,195	42,988
NO_2	0.5	12	20	0.5	8.2	14	0.5	6.7	11
CO	None	83	330	None	33	150	None	27	130
HF	1	24	44	1	12	22	1	12	22
HCl	1.8	22	100	1.8	11	26	1.8	11	26
HCN	2	7.1	15	1.3	3.5	8.6	1	2.5	6.6

Pollutant	Acute Exposure Guideline Limit (µg/m³)								
	1-hour			4-hour			8-hour		
	AEGL-1	AEGL-2	AEGL-3	AEGL-1	AEGL-2	AEGL-3	AEGL-1	AEGL-2	AEGL-3
NH_3	30	160	1,100	30	110	550	30	110	390
HCHO	0.9	14	56	0.9	14	35	0.9	14	35

Emergency Response Planning Guidelines

Table A.2: ERPGs for BESS Fire Assessment Pollutants

Pollutant	1-hour Mean Emergency Response Planning Guidelines					
	ERPG-1		ERPG-2		ERPG-3	
	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm
NO_2	1,882	1	28,227	15	56,454	30
CO	229,121	200	400,961	350	572,802	500
HF	1,637	2	16,368	20	40,920	50
HCl	4,474	3	29,824	20	223,681	150
HCN	None		11,055	10	27,638	25
NH_3	17,413	25	104,479	150	1,044,785	1,500
HCHO	1,228	1	12,282	10	49,129	40

National Air Quality Objectives

Table A.3: NAQOs for BESS Fire Assessment Pollutants

Pollutant	Averaging Period	National Air Quality Objective (µg/m³)	National Air Quality Objective (ppm)
NO_2	1-hour mean	200 (not to be exceeded more than 18 times a year)	0.1 (not to be exceeded more than 18 times a year)
CO	8-hour mean	10,000	8.7

Workplace Exposure Limits

Table A.4: WELs for BESS Fire Assessment Pollutants

Pollutant	Averaging Period	Workplace Exposure Limits (µg/m³)	Workplace Exposure Limits (ppm)
PM (Respirable Dust)	8-hour mean	4,000	N/A*

*Regulated by mass concentration only.

Summary of Applied AQALs

Table A.5: Applied AQAL Per Pollutant

Pollutant	Applied AQAL (µg/m³)					
	1-hour mean	Source	4-hour mean	Source	8-hour mean	Source
CO	95,085	AEGL-2	37,805	AEGL-2	10,000	NAQO
HCHO	1,105	AEGL-1	1,105	AEGL-1	1,105	AEGL-1
HCl	2,684	AEGL-1	2,684	AEGL-1	2,684	AEGL-1
HCN	2,211	AEGL-1	1,437	AEGL-1	1,106	AEGL-1
HF	818	AEGL-1	818	AEGL-1	818	AEGL-1
NH_3	17,413	ERPG-1	20,896	AEGL-1	20,896	AEGL-1
NO_2	200	NAQO	941	AEGL-1	941	AEGL-1
PM_{10}	None		None		4,000	WEL

Unit Conversion

The AQALs have been converted from parts per million (ppm) to µg/m^3 using the following conversion rate:

Equation 2: $$AQAL\ (\mu g m^{-3}) = \frac{AQAL\ (ppm) \times Molecular\ Weight \times 1000}{24.45}$$

The molecular weights used in the conversion are outlined in **Table A.6** below.

Table A.6: Molecular Weights used in Unit Conversion

Pollutant	Averaging Period
NO_2	46.01
CO	28.01
HF	20.01
HCl	36.46
HCN	27.03
NH_3	17.03
HCHO	30.03

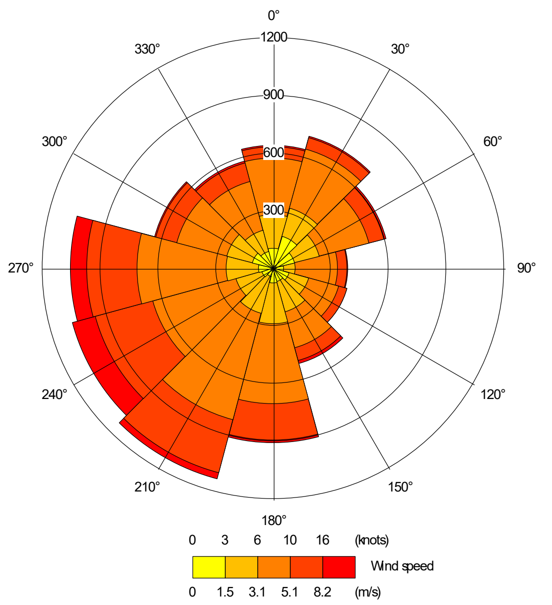
Appendix B Model Inputs

Summary of Model Inputs

Table B.1: Summary of Model Inputs

Parameter	Input
Meteorological Data	2021-2025 hourly meteorological data from the Tibenham meteorological station has been used in the model.
ADMS	Version 6.0.2.7
Velocity	1 m/s
BESS Unit Dimensions	6058 (L) x 2438 (W) x 2896 (H) mm
Height of Emission Release	3.58 m
Temperature	800°C
Latitude	52.5°
Surface Roughness	A value of 0.3 for 'parkland, open suburbia' was used to represent both the modelled area and the meteorological station site.
Minimum Monin-Obukhov length	A value of 10 for 'small towns < 50,000' was used to represent both the modelled area and the meteorological station site.

Wind Roses



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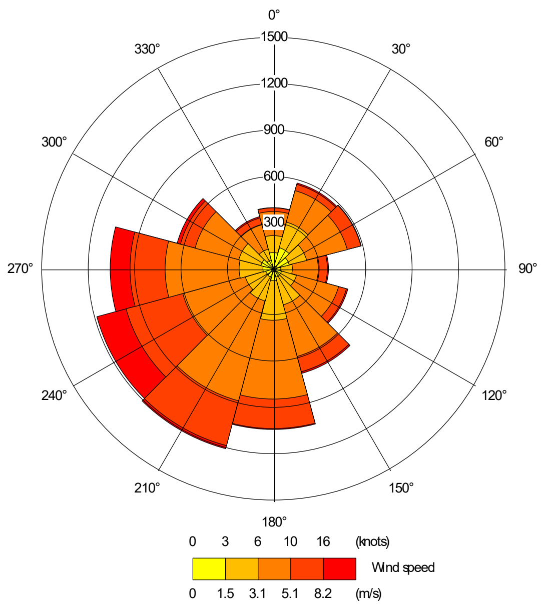

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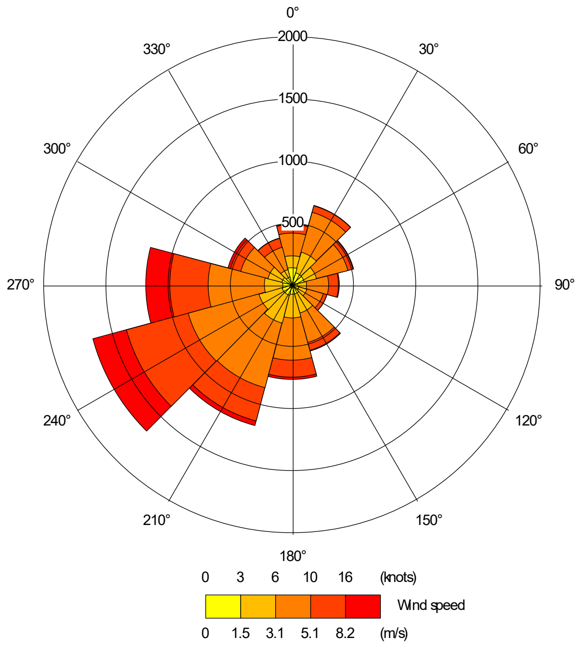

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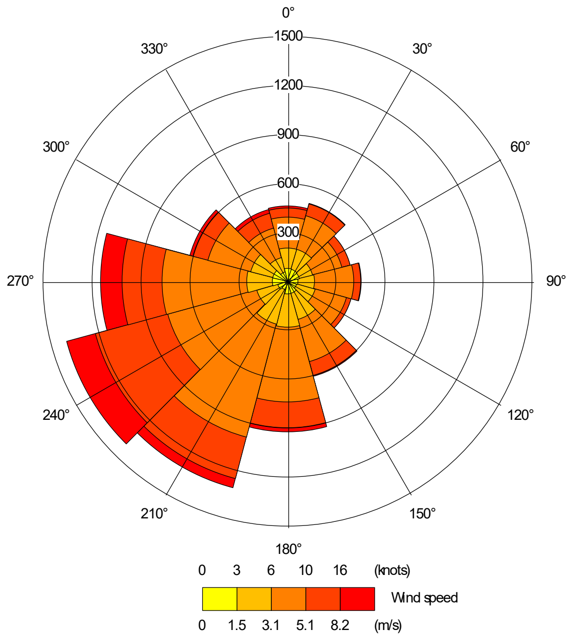

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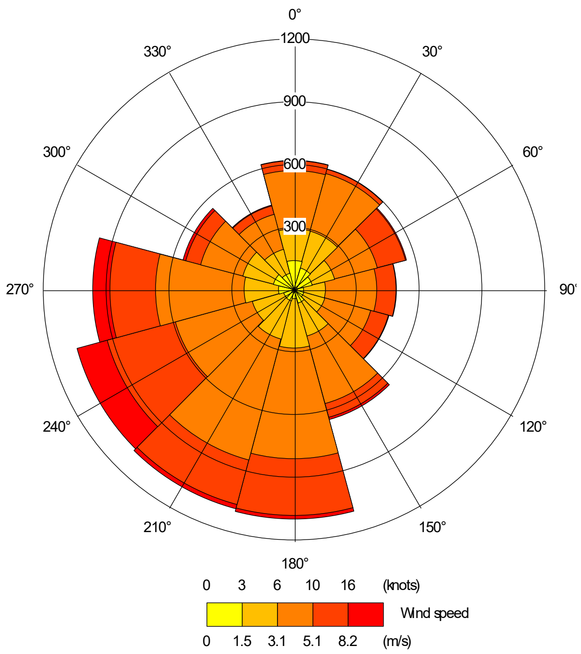

2025

Modelled Receptor Locations

Table B.2: Modelled Receptor Locations

Receptor Name	Receptor Location	X Co-ordinate	Y Co-ordinate	Height (m)
Residential Receptors				
R1	Frith Farm	617501.2	288830.5	4.5
R2	Lostlands Farm	617759.1	288826.4	1.5
R3	Willows Farm	617901.7	288844.2	1.5
R4	Walk Farm	618472.6	288442.2	4.5
R5	Walk Farm Lodge	618291.4	288480.2	1.5
R6	Lodge Farm	618052.2	288293.3	4.5
R7	Kingfisher Cottage	617894.8	288108.8	4.5
R8	Lodge Road Dwelling	617943.2	288033.8	4.5
R9	Prangle Farm	617700.5	287632.3	1.5
R10	Ketts	617566.6	287494.9	4.5
R11	Chestnut Farm	617428.1	287562.9	4.5
R12	Saddleback Farm	617173.0	287700.5	4.5
R13	Thistle Barn	617551.2	287337.0	4.5
R14	Fernleigh Cottages	617125.1	288096.3	4.5
R15	Archers Farm	616755.5	288224.6	4.5
R16	Station Road Dwelling	616083.6	288113.2	1.5
R17	Hundred Lane Farm	616444.6	288683.0	4.5
R18	Oak Farm	616414.5	288884.8	4.5
R19	Broadgate Lodge Farm	616467.5	289216.0	1.5
R20	Woodlands Farm	617461.0	289110.9	1.5
Public Rights of Way Receptors				
PRoW1	Tivetshall St Margaret FP3	617481.9	288729.9	1.5
PRoW2	Tivetshall St Margaret FP3	617480.3	288612.2	1.5
PRoW3	Tivetshall St Margaret FP3	617475.9	288492.6	1.5
PRoW4	Great Moulton RB19	617402.2	288760.7	1.5
PRoW5	Great Moulton RB19	617283.5	288750.5	1.5
PRoW6	Great Moulton RB19	617112.1	288728.7	1.5

Receptor Name	Receptor Location	X Co-ordinate	Y Co-ordinate	Height (m)
PRoW7	Great Moulton FP14	617094.1	289179.3	1.5
PRoW8	Great Moulton FP12	617762.3	289370.1	1.5
PRoW9	Tivetshall St Margaret FP5	617938.7	288688.5	1.5
PRoW10	Tivetshall St Margaret FP2	616639.8	288579.6	1.5
PRoW11	Tivetshall St Margaret FP1	616287.6	288577.4	1.5
PRoW12	Great Moulton FP18	616351.3	288877.9	1.5
PRoW13	Great Moulton FP16	616638.1	289180.0	1.5
PRoW14	Tivetshall St Margaret FP4	617529.4	288210.0	1.5
PRoW15	Tivetshall St Margaret RB6	618273.7	288837.1	1.5
PRoW16	Tivetshall St Margaret FP11	616906.6	288088.8	1.5
PRoW17	Great Moulton RB18	616936.2	288703.3	1.5
PRoW18	Tivetshall St Margaret BR9	617883.4	287931.2	1.5

Table B.3: Modelled Receptor Locations – Plume Visibility Risk Assessment

Receptor Name	Receptor Location	X Co-ordinate	Y Co-ordinate	Height (m)
Road Receptors				
Road1	Frith Way	617588.5	288793.8	1.5
Road2	Lodge Road	618019.0	288335.0	1.5
Road3	Station Road	617101.4	288067.1	1.5
Road4	Broadgate Lane	616391.2	288687.5	1.5
Road5	Moulton Road	615862.3	288637.1	1.5
Road6	A140 Ipswich Road	618930.2	288567.2	1.5
Rail Receptors				
Rail1	Norwich to Diss Railway Line	616197.6	289511.1	1.5
Rail2	Norwich to Diss Railway Line	616142.4	289271.1	1.5
Rail3	Norwich to Diss Railway Line	616072.4	288969.0	1.5
Rail4	Norwich to Diss Railway Line	615994.3	288644.8	1.5
Rail5	Norwich to Diss Railway Line	615934.2	288394.6	1.5

Appendix C Modelling Results – Air Quality Risk Assessment: Core Scenario

Table C.1: Predicted Carbon Monoxide (CO) Concentrations

Receptor	Predicted CO Concentrations (µg/m^3)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit
R1	751	1223	1%	BESS1	1174	1646	4%	BESS1	1699	2171	22%	BESS1
R2	349	821	1%	BESS5	523	995	3%	BESS5	742	1214	12%	BESS5
R3	229	701	1%	BESS1	339	811	2%	BESS1	450	922	9%	BESS2
R4	151	623	1%	BESS5	221	693	2%	BESS1	250	722	7%	BESS2
R5	158	630	1%	BESS1	239	711	2%	BESS1	288	760	8%	BESS2
R6	197	669	1%	BESS2	284	756	2%	BESS2	345	817	8%	BESS2
R7	197	669	1%	BESS2	332	804	2%	BESS2	408	880	9%	BESS2
R8	173	645	1%	BESS2	285	757	2%	BESS2	370	842	8%	BESS2
R9	153	617	1%	BESS2	226	690	2%	BESS2	257	721	7%	BESS2
R10	148	612	1%	BESS2	242	706	2%	BESS2	292	756	8%	BESS2
R11	148	612	1%	BESS5	230	694	2%	BESS4	218	682	7%	BESS6
R12	153	617	1%	BESS6	237	701	2%	BESS4	293	757	8%	BESS6
R13	134	598	1%	BESS3	219	683	2%	BESS2	262	726	7%	BESS2
R14	297	769	1%	BESS3	464	936	2%	BESS3	587	1059	11%	BESS6
R15	322	788	1%	BESS6	541	1007	3%	BESS6	693	1159	12%	BESS6
R16	145	611	1%	BESS4	186	652	2%	BESS4	204	670	7%	BESS4
R17	241	707	1%	BESS4	320	786	2%	BESS6	437	903	9%	BESS6
R18	198	664	1%	BESS4	292	758	2%	BESS4	407	873	9%	BESS4
R19	154	622	1%	BESS6	210	678	2%	BESS6	270	738	7%	BESS4
R20	280	756	1%	BESS1	441	917	2%	BESS1	653	1129	11%	BESS1
PRoW1	1481	1953	2%	BESS5	2302	2774	7%	BESS5	3166	3638	36%	BESS5
PRoW2	3809	4281	5%	BESS5	5949	6421	17%	BESS5	8578	9050	91%	BESS5
PRoW3	2677	3149	3%	BESS2	4703	5175	14%	BESS2	6530	7002	70%	BESS2
PRoW4	1890	2362	2%	BESS1	3009	3481	9%	BESS1	4302	4774	48%	BESS1
PRoW5	1680	2152	2%	BESS1	2600	3072	8%	BESS1	3768	4240	42%	BESS1
PRoW6	2004	2476	3%	BESS4	3464	3936	10%	BESS4	4722	5194	52%	BESS4

Receptor	Predicted CO Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW7	247	723	1%	BESS4	430	906	2%	BESS4	598	1074	11%	BESS4
PRoW8	166	642	1%	BESS1	239	715	2%	BESS2	320	796	8%	BESS1
PRoW9	281	753	1%	BESS5	377	849	2%	BESS5	483	955	10%	BESS5
PRoW10	365	831	1%	BESS6	545	1011	3%	BESS4	755	1221	12%	BESS4
PRoW11	171	637	1%	BESS6	229	695	2%	BESS6	292	758	8%	BESS4
PRoW12	167	633	1%	BESS4	247	713	2%	BESS4	345	811	8%	BESS4
PRoW13	186	654	1%	BESS4	266	734	2%	BESS4	344	812	8%	BESS4
PRoW14	411	883	1%	BESS2	687	1159	3%	BESS2	946	1418	14%	BESS2
PRoW15	169	641	1%	BESS1	229	701	2%	BESS1	282	754	8%	BESS1
PRoW16	253	719	1%	BESS6	405	871	2%	BESS6	533	999	10%	BESS6
PRoW17	2455	2921	3%	BESS4	4300	4766	13%	BESS4	5632	6098	61%	BESS4
PRoW18	169	633	1%	BESS2	246	710	2%	BESS2	283	747	7%	BESS2
AQAL	**95,085**				**37,805**				**10,000**			

Table C.2: Predicted Formaldehyde (HCHO) Concentrations

Receptor	Predicted HCHO Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	20.5	40.5	4%	BESS1	32.0	52.0	5%	BESS1	46.3	66.3	6%	BESS1
R2	9.5	29.5	3%	BESS5	14.2	34.2	3%	BESS5	20.2	40.2	4%	BESS5
R3	6.2	26.2	2%	BESS1	9.2	29.2	3%	BESS1	12.3	32.3	3%	BESS2
R4	4.1	24.1	2%	BESS5	6.0	26.0	2%	BESS1	6.8	26.8	2%	BESS2
R5	4.3	24.3	2%	BESS1	6.5	26.5	2%	BESS1	7.8	27.8	3%	BESS2
R6	5.4	25.4	2%	BESS2	7.7	27.7	3%	BESS2	9.4	29.4	3%	BESS2
R7	5.4	25.4	2%	BESS2	9.0	29.0	3%	BESS2	11.1	31.1	3%	BESS2
R8	4.7	24.7	2%	BESS2	7.8	27.8	3%	BESS2	10.1	30.1	3%	BESS2
R9	4.2	24.2	2%	BESS2	6.2	26.2	2%	BESS2	7.0	27.0	2%	BESS2
R10	4.0	24.0	2%	BESS2	6.6	26.6	2%	BESS2	8.0	28.0	3%	BESS2
R11	4.0	24.0	2%	BESS5	6.3	26.3	2%	BESS4	5.9	25.9	2%	BESS6
R12	4.2	24.2	2%	BESS6	6.5	26.5	2%	BESS4	8.0	28.0	3%	BESS6

Receptor	Predicted HCHO Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R13	3.6	23.6	2%	BESS3	6.0	26.0	2%	BESS2	7.1	27.1	2%	BESS2
R14	8.1	28.1	3%	BESS3	12.6	32.6	3%	BESS3	16.0	36.0	3%	BESS6
R15	8.8	28.8	3%	BESS6	14.7	34.7	3%	BESS6	18.9	38.9	4%	BESS6
R16	4.0	24.0	2%	BESS4	5.1	25.1	2%	BESS4	5.6	25.6	2%	BESS4
R17	6.6	26.6	2%	BESS4	8.7	28.7	3%	BESS6	11.9	31.9	3%	BESS6
R18	5.4	25.4	2%	BESS4	8.0	28.0	3%	BESS4	11.1	31.1	3%	BESS4
R19	4.2	24.2	2%	BESS6	5.7	25.7	2%	BESS6	7.3	27.3	2%	BESS4
R20	7.6	27.6	3%	BESS1	12.0	32.0	3%	BESS1	17.8	37.8	3%	BESS1
PRoW1	40.3	60.3	5%	BESS5	62.7	82.7	7%	BESS5	86.3	106.3	10%	BESS5
PRoW2	103.8	123.8	11%	BESS5	162.1	182.1	16%	BESS5	233.8	253.8	23%	BESS5
PRoW3	72.9	92.9	8%	BESS2	128.2	148.2	13%	BESS2	177.9	197.9	18%	BESS2
PRoW4	51.5	71.5	6%	BESS1	82.0	102.0	9%	BESS1	117.2	137.2	12%	BESS1
PRoW5	45.8	65.8	6%	BESS1	70.9	90.9	8%	BESS1	102.7	122.7	11%	BESS1
PRoW6	54.6	74.6	7%	BESS4	94.4	114.4	10%	BESS4	128.7	148.7	13%	BESS4
PRoW7	6.7	26.7	2%	BESS4	11.7	31.7	3%	BESS4	16.3	36.3	3%	BESS4
PRoW8	4.5	24.5	2%	BESS1	6.5	26.5	2%	BESS2	8.7	28.7	3%	BESS1
PRoW9	7.7	27.7	3%	BESS5	10.3	30.3	3%	BESS5	13.2	33.2	3%	BESS5
PRoW10	9.9	29.9	3%	BESS6	14.8	34.8	3%	BESS4	20.6	40.6	4%	BESS4
PRoW11	4.7	24.7	2%	BESS6	6.2	26.2	2%	BESS6	8.0	28.0	3%	BESS4
PRoW12	4.6	24.6	2%	BESS4	6.7	26.7	2%	BESS4	9.4	29.4	3%	BESS4
PRoW13	5.1	25.1	2%	BESS4	7.2	27.2	2%	BESS4	9.4	29.4	3%	BESS4
PRoW14	11.2	31.2	3%	BESS2	18.7	38.7	4%	BESS2	25.8	45.8	4%	BESS2
PRoW15	4.6	24.6	2%	BESS1	6.2	26.2	2%	BESS1	7.7	27.7	3%	BESS1
PRoW16	6.9	26.9	2%	BESS6	11.0	31.0	3%	BESS6	14.5	34.5	3%	BESS6
PRoW17	66.9	86.9	8%	BESS4	117.2	137.2	12%	BESS4	153.5	173.5	16%	BESS4
PRoW18	4.6	24.6	2%	BESS2	6.7	26.7	2%	BESS2	7.7	27.7	3%	BESS2
AQAL	**1,105**				**1,105**				**1,105**			

Table C.3: Predicted Hydrogen Chloride (HCl) Concentrations

Receptor	Predicted HCl Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	36.5	37.0	1%	BESS1	57.1	57.5	2%	BESS1	82.7	83.1	3%	BESS1
R2	17.0	17.4	1%	BESS5	25.4	25.9	1%	BESS5	36.1	36.5	1%	BESS5
R3	11.1	11.5	< 1%	BESS1	16.5	16.9	1%	BESS1	21.9	22.3	1%	BESS2
R4	7.4	7.8	< 1%	BESS5	10.8	11.2	< 1%	BESS1	12.2	12.6	< 1%	BESS2
R5	7.7	8.1	< 1%	BESS1	11.6	12.0	< 1%	BESS1	14.0	14.4	1%	BESS2
R6	9.6	10.0	< 1%	BESS2	13.8	14.2	1%	BESS2	16.8	17.2	1%	BESS2
R7	9.6	10.0	< 1%	BESS2	16.2	16.6	1%	BESS2	19.8	20.3	1%	BESS2
R8	8.4	8.8	< 1%	BESS2	13.8	14.3	1%	BESS2	18.0	18.4	1%	BESS2
R9	7.4	7.9	< 1%	BESS2	11.0	11.4	< 1%	BESS2	12.5	12.9	< 1%	BESS2
R10	7.2	7.6	< 1%	BESS2	11.8	12.2	< 1%	BESS2	14.2	14.6	1%	BESS2
R11	7.2	7.6	< 1%	BESS5	11.2	11.6	< 1%	BESS4	10.6	11.0	< 1%	BESS6
R12	7.5	7.9	< 1%	BESS6	11.5	12.0	< 1%	BESS4	14.2	14.7	1%	BESS6
R13	6.5	6.9	< 1%	BESS3	10.6	11.1	< 1%	BESS2	12.8	13.2	< 1%	BESS2
R14	14.5	14.9	1%	BESS3	22.6	23.0	1%	BESS3	28.6	29.0	1%	BESS6
R15	15.7	16.1	1%	BESS6	26.3	26.7	1%	BESS6	33.7	34.1	1%	BESS6
R16	7.1	7.5	< 1%	BESS4	9.0	9.5	< 1%	BESS4	9.9	10.3	< 1%	BESS4
R17	11.7	12.1	< 1%	BESS4	15.6	16.0	1%	BESS6	21.3	21.7	1%	BESS6
R18	9.6	10.1	< 1%	BESS4	14.2	14.6	1%	BESS4	19.8	20.2	1%	BESS4
R19	7.5	7.9	< 1%	BESS6	10.2	10.6	< 1%	BESS6	13.1	13.5	1%	BESS4
R20	13.6	14.0	1%	BESS1	21.5	21.9	1%	BESS1	31.8	32.2	1%	BESS1
PRoW1	72.0	72.5	3%	BESS5	112.0	112.4	4%	BESS5	154.0	154.4	6%	BESS5
PRoW2	185.3	185.7	7%	BESS5	289.4	289.8	11%	BESS5	417.3	417.7	16%	BESS5
PRoW3	130.2	130.7	5%	BESS2	228.8	229.2	9%	BESS2	317.6	318.1	12%	BESS2
PRoW4	92.0	92.4	3%	BESS1	146.4	146.8	5%	BESS1	209.3	209.7	8%	BESS1
PRoW5	81.7	82.1	3%	BESS1	126.5	126.9	5%	BESS1	183.3	183.7	7%	BESS1
PRoW6	97.5	97.9	4%	BESS4	168.5	168.9	6%	BESS4	229.7	230.1	9%	BESS4
PRoW7	12.0	12.5	< 1%	BESS4	20.9	21.3	1%	BESS4	29.1	29.5	1%	BESS4
PRoW8	8.1	8.5	< 1%	BESS1	11.6	12.1	< 1%	BESS2	15.6	16.0	1%	BESS1
PRoW9	13.7	14.1	1%	BESS5	18.3	18.8	1%	BESS5	23.5	23.9	1%	BESS5
PRoW10	17.8	18.2	1%	BESS6	26.5	26.9	1%	BESS4	36.7	37.1	1%	BESS4
PRoW11	8.3	8.8	< 1%	BESS6	11.1	11.6	< 1%	BESS6	14.2	14.6	1%	BESS4
PRoW12	8.1	8.6	< 1%	BESS4	12.0	12.4	< 1%	BESS4	16.8	17.2	1%	BESS4

Receptor	Predicted HCl Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW13	9.1	9.5	< 1%	BESS4	12.9	13.3	< 1%	BESS4	16.7	17.2	1%	BESS4
PRoW14	20.0	20.4	1%	BESS2	33.4	33.9	1%	BESS2	46.0	46.4	2%	BESS2
PRoW15	8.2	8.6	< 1%	BESS1	11.1	11.6	< 1%	BESS1	13.7	14.1	1%	BESS1
PRoW16	12.3	12.7	< 1%	BESS6	19.7	20.1	1%	BESS6	25.9	26.4	1%	BESS6
PRoW17	119.5	119.9	4%	BESS4	209.2	209.6	8%	BESS4	274.0	274.4	10%	BESS4
PRoW18	8.2	8.7	< 1%	BESS2	12.0	12.4	< 1%	BESS2	13.8	14.2	1%	BESS2
AQAL	**2,684**				**2,684**				**2,684**			

Table C.4: Predicted Hydrogen Cyanide (HCN) Concentrations

Receptor	Predicted HCN Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	12.9	12.9	1%	BESS1	20.2	20.2	1%	BESS1	29.2	29.2	3%	BESS1
R2	6.0	6.0	< 1%	BESS5	9.0	9.0	1%	BESS5	12.7	12.7	1%	BESS5
R3	3.9	3.9	< 1%	BESS1	5.8	5.8	< 1%	BESS1	7.7	7.7	1%	BESS2
R4	2.6	2.6	< 1%	BESS5	3.8	3.8	< 1%	BESS1	4.3	4.3	< 1%	BESS2
R5	2.7	2.7	< 1%	BESS1	4.1	4.1	< 1%	BESS1	4.9	4.9	< 1%	BESS2
R6	3.4	3.4	< 1%	BESS2	4.9	4.9	< 1%	BESS2	5.9	5.9	1%	BESS2
R7	3.4	3.4	< 1%	BESS2	5.7	5.7	< 1%	BESS2	7.0	7.0	1%	BESS2
R8	3.0	3.0	< 1%	BESS2	4.9	4.9	< 1%	BESS2	6.4	6.4	1%	BESS2
R9	2.6	2.6	< 1%	BESS2	3.9	3.9	< 1%	BESS2	4.4	4.4	< 1%	BESS2
R10	2.5	2.5	< 1%	BESS2	4.2	4.2	< 1%	BESS2	5.0	5.0	< 1%	BESS2
R11	2.5	2.5	< 1%	BESS5	4.0	4.0	< 1%	BESS4	3.7	3.7	< 1%	BESS6
R12	2.6	2.6	< 1%	BESS6	4.1	4.1	< 1%	BESS4	5.0	5.0	< 1%	BESS6
R13	2.3	2.3	< 1%	BESS3	3.8	3.8	< 1%	BESS2	4.5	4.5	< 1%	BESS2
R14	5.1	5.1	< 1%	BESS3	8.0	8.0	1%	BESS3	10.1	10.1	1%	BESS6
R15	5.5	5.5	< 1%	BESS6	9.3	9.3	1%	BESS6	11.9	11.9	1%	BESS6
R16	2.5	2.5	< 1%	BESS4	3.2	3.2	< 1%	BESS4	3.5	3.5	< 1%	BESS4
R17	4.1	4.1	< 1%	BESS4	5.5	5.5	< 1%	BESS6	7.5	7.5	1%	BESS6
R18	3.4	3.4	< 1%	BESS4	5.0	5.0	< 1%	BESS4	7.0	7.0	1%	BESS4

Receptor	Predicted HCN Concentrations (µg/m^3)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit
R19	2.7	2.7	< 1%	BESS6	3.6	3.6	< 1%	BESS6	4.6	4.6	< 1%	BESS4
R20	4.8	4.8	< 1%	BESS1	7.6	7.6	1%	BESS1	11.2	11.2	1%	BESS1
PRoW1	25.4	25.4	1%	BESS5	39.6	39.6	3%	BESS5	54.4	54.4	5%	BESS5
PRoW2	65.5	65.5	3%	BESS5	102.2	102.2	7%	BESS5	147.4	147.4	13%	BESS5
PRoW3	46.0	46.0	2%	BESS2	80.8	80.8	6%	BESS2	112.2	112.2	10%	BESS2
PRoW4	32.5	32.5	1%	BESS1	51.7	51.7	4%	BESS1	73.9	73.9	7%	BESS1
PRoW5	28.9	28.9	1%	BESS1	44.7	44.7	3%	BESS1	64.7	64.7	6%	BESS1
PRoW6	34.4	34.4	2%	BESS4	59.5	59.5	4%	BESS4	81.1	81.1	7%	BESS4
PRoW7	4.3	4.3	< 1%	BESS4	7.4	7.4	1%	BESS4	10.3	10.3	1%	BESS4
PRoW8	2.8	2.8	< 1%	BESS1	4.1	4.1	< 1%	BESS2	5.5	5.5	< 1%	BESS1
PRoW9	4.8	4.8	< 1%	BESS5	6.5	6.5	< 1%	BESS5	8.3	8.3	1%	BESS5
PRoW10	6.3	6.3	< 1%	BESS6	9.4	9.4	1%	BESS4	13.0	13.0	1%	BESS4
PRoW11	2.9	2.9	< 1%	BESS6	3.9	3.9	< 1%	BESS6	5.0	5.0	< 1%	BESS4
PRoW12	2.9	2.9	< 1%	BESS4	4.2	4.2	< 1%	BESS4	5.9	5.9	1%	BESS4
PRoW13	3.2	3.2	< 1%	BESS4	4.6	4.6	< 1%	BESS4	5.9	5.9	1%	BESS4
PRoW14	7.1	7.1	< 1%	BESS2	11.8	11.8	1%	BESS2	16.3	16.3	1%	BESS2
PRoW15	2.9	2.9	< 1%	BESS1	3.9	3.9	< 1%	BESS1	4.8	4.8	< 1%	BESS1
PRoW16	4.3	4.3	< 1%	BESS6	7.0	7.0	< 1%	BESS6	9.2	9.2	1%	BESS6
PRoW17	42.2	42.2	2%	BESS4	73.9	73.9	5%	BESS4	96.8	96.8	9%	BESS4
PRoW18	2.9	2.9	< 1%	BESS2	4.2	4.2	< 1%	BESS2	4.9	4.9	< 1%	BESS2
AQAL	**2,211**				**1,437**				**1,106**			

Table C.5: Predicted Hydrogen Fluoride (HF) Concentrations

Receptor	Predicted HF Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	100.9	101.9	12%	BESS1	157.7	158.7	19%	BESS1	228.3	229.3	28%	BESS1
R2	46.9	47.9	6%	BESS5	70.2	71.2	9%	BESS5	99.6	100.6	12%	BESS5
R3	30.7	31.7	4%	BESS1	45.5	46.5	6%	BESS1	60.5	61.5	8%	BESS2
R4	20.3	21.3	3%	BESS5	29.7	30.7	4%	BESS1	33.6	34.6	4%	BESS2
R5	21.2	22.2	3%	BESS1	32.1	33.1	4%	BESS1	38.6	39.6	5%	BESS2
R6	26.4	27.4	3%	BESS2	38.2	39.2	5%	BESS2	46.3	47.3	6%	BESS2
R7	26.4	27.4	3%	BESS2	44.6	45.6	6%	BESS2	54.8	55.8	7%	BESS2
R8	23.2	24.2	3%	BESS2	38.2	39.2	5%	BESS2	49.7	50.7	6%	BESS2
R9	20.5	21.5	3%	BESS2	30.3	31.3	4%	BESS2	34.5	35.5	4%	BESS2
R10	19.9	20.9	3%	BESS2	32.6	33.6	4%	BESS2	39.2	40.2	5%	BESS2
R11	19.9	20.9	3%	BESS5	30.9	31.9	4%	BESS4	29.3	30.3	4%	BESS6
R12	20.6	21.6	3%	BESS6	31.9	32.9	4%	BESS4	39.3	40.3	5%	BESS6
R13	17.9	18.9	2%	BESS3	29.4	30.4	4%	BESS2	35.2	36.2	4%	BESS2
R14	39.9	40.9	5%	BESS3	62.3	63.3	8%	BESS3	78.9	79.9	10%	BESS6
R15	43.3	44.3	5%	BESS6	72.7	73.7	9%	BESS6	93.1	94.1	12%	BESS6
R16	19.5	20.5	3%	BESS4	25.0	26.0	3%	BESS4	27.4	28.4	3%	BESS4
R17	32.4	33.4	4%	BESS4	43.0	44.0	5%	BESS6	58.8	59.8	7%	BESS6
R18	26.6	27.6	3%	BESS4	39.3	40.3	5%	BESS4	54.7	55.7	7%	BESS4
R19	20.7	21.7	3%	BESS6	28.1	29.1	4%	BESS6	36.2	37.2	5%	BESS4
R20	37.6	38.6	5%	BESS1	59.3	60.3	7%	BESS1	87.8	88.8	11%	BESS1
PRoW1	198.9	199.9	24%	BESS5	309.3	310.3	38%	BESS5	425.3	426.3	52%	BESS5
PRoW2	511.7	512.7	63%	BESS5	799.2	800.2	98%	BESS5	1152.4	1153.4	**141%**	BESS5
PRoW3	359.6	360.6	44%	BESS2	631.8	632.8	77%	BESS2	877.1	878.1	**107%**	BESS2
PRoW4	253.9	254.9	31%	BESS1	404.3	405.3	50%	BESS1	577.9	578.9	71%	BESS1
PRoW5	225.6	226.6	28%	BESS1	349.3	350.3	43%	BESS1	506.2	507.2	62%	BESS1
PRoW6	269.2	270.2	33%	BESS4	465.3	466.3	57%	BESS4	634.3	635.3	78%	BESS4
PRoW7	33.2	34.2	4%	BESS4	57.7	58.7	7%	BESS4	80.3	81.3	10%	BESS4
PRoW8	22.3	23.3	3%	BESS1	32.1	33.1	4%	BESS2	43.0	44.0	5%	BESS1
PRoW9	37.8	38.8	5%	BESS5	50.7	51.7	6%	BESS5	64.8	65.8	8%	BESS5
PRoW10	49.0	50.0	6%	BESS6	73.2	74.2	9%	BESS4	101.4	102.4	13%	BESS4
PRoW11	23.0	24.0	3%	BESS6	30.7	31.7	4%	BESS6	39.2	40.2	5%	BESS4
PRoW12	22.5	23.5	3%	BESS4	33.2	34.2	4%	BESS4	46.3	47.3	6%	BESS4

Receptor	Predicted HF Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW13	25.1	26.1	3%	BESS4	35.7	36.7	4%	BESS4	46.2	47.2	6%	BESS4
PRoW14	55.2	56.2	7%	BESS2	92.3	93.3	11%	BESS2	127.1	128.1	16%	BESS2
PRoW15	22.7	23.7	3%	BESS1	30.8	31.8	4%	BESS1	37.8	38.8	5%	BESS1
PRoW16	34.0	35.0	4%	BESS6	54.4	55.4	7%	BESS6	71.6	72.6	9%	BESS6
PRoW17	329.9	330.9	40%	BESS4	577.6	578.6	71%	BESS4	756.6	757.6	93%	BESS4
PRoW18	22.8	23.8	3%	BESS2	33.1	34.1	4%	BESS2	38.0	39.0	5%	BESS2
AQAL	**818**				**818**				**818**			

Exceedances of the AQAL are shown in bold.

Table C.6: Predicted Ammonia (NH_3) Concentrations

Receptor	Predicted NH_3 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	3.5	11.8	< 1%	BESS1	5.5	13.8	< 1%	BESS1	8.0	16.3	< 1%	BESS1
R2	1.6	9.9	< 1%	BESS5	2.5	10.8	< 1%	BESS5	3.5	11.8	< 1%	BESS5
R3	1.1	9.4	< 1%	BESS1	1.6	9.9	< 1%	BESS1	2.1	10.4	< 1%	BESS2
R4	0.7	9.0	< 1%	BESS5	1.0	9.3	< 1%	BESS1	1.2	9.5	< 1%	BESS2
R5	0.7	9.0	< 1%	BESS1	1.1	9.4	< 1%	BESS1	1.4	9.7	< 1%	BESS2
R6	0.9	9.2	< 1%	BESS2	1.3	9.6	< 1%	BESS2	1.6	9.9	< 1%	BESS2
R7	0.9	9.2	< 1%	BESS2	1.6	9.9	< 1%	BESS2	1.9	10.2	< 1%	BESS2
R8	0.8	9.1	< 1%	BESS2	1.3	9.6	< 1%	BESS2	1.7	10.0	< 1%	BESS2
R9	0.7	9.0	< 1%	BESS2	1.1	9.4	< 1%	BESS2	1.2	9.5	< 1%	BESS2
R10	0.7	9.0	< 1%	BESS2	1.1	9.4	< 1%	BESS2	1.4	9.7	< 1%	BESS2
R11	0.7	9.0	< 1%	BESS5	1.1	9.4	< 1%	BESS4	1.0	9.3	< 1%	BESS6
R12	0.7	9.0	< 1%	BESS6	1.1	9.4	< 1%	BESS4	1.4	9.7	< 1%	BESS6
R13	0.6	8.9	< 1%	BESS3	1.0	9.3	< 1%	BESS2	1.2	9.5	< 1%	BESS2
R14	1.4	9.7	< 1%	BESS3	2.2	10.5	< 1%	BESS3	2.8	11.1	< 1%	BESS6
R15	1.5	9.8	< 1%	BESS6	2.5	10.8	< 1%	BESS6	3.3	11.6	< 1%	BESS6
R16	0.7	9.0	< 1%	BESS4	0.9	9.2	< 1%	BESS4	1.0	9.3	< 1%	BESS4
R17	1.1	9.4	< 1%	BESS4	1.5	9.8	< 1%	BESS6	2.1	10.4	< 1%	BESS6

Receptor	Predicted NH_3 Concentrations (µg/m^3)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit
R18	0.9	9.2	< 1%	BESS4	1.4	9.7	< 1%	BESS4	1.9	10.2	< 1%	BESS4
R19	0.7	9.0	< 1%	BESS6	1.0	9.3	< 1%	BESS6	1.3	9.6	< 1%	BESS4
R20	1.3	9.6	< 1%	BESS1	2.1	10.4	< 1%	BESS1	3.1	11.4	< 1%	BESS1
PRoW1	7.0	15.3	< 1%	BESS5	10.8	19.1	< 1%	BESS5	14.9	23.2	< 1%	BESS5
PRoW2	17.9	26.2	< 1%	BESS5	28.0	36.3	< 1%	BESS5	40.4	48.7	< 1%	BESS5
PRoW3	12.6	20.9	< 1%	BESS2	22.1	30.4	< 1%	BESS2	30.7	39.0	< 1%	BESS2
PRoW4	8.9	17.2	< 1%	BESS1	14.2	22.5	< 1%	BESS1	20.3	28.6	< 1%	BESS1
PRoW5	7.9	16.2	< 1%	BESS1	12.2	20.5	< 1%	BESS1	17.7	26.0	< 1%	BESS1
PRoW6	9.4	17.7	< 1%	BESS4	16.3	24.6	< 1%	BESS4	22.2	30.5	< 1%	BESS4
PRoW7	1.2	9.5	< 1%	BESS4	2.0	10.3	< 1%	BESS4	2.8	11.1	< 1%	BESS4
PRoW8	0.8	9.1	< 1%	BESS1	1.1	9.4	< 1%	BESS2	1.5	9.8	< 1%	BESS1
PRoW9	1.3	9.6	< 1%	BESS5	1.8	10.1	< 1%	BESS5	2.3	10.6	< 1%	BESS5
PRoW10	1.7	10.0	< 1%	BESS6	2.6	10.9	< 1%	BESS4	3.6	11.9	< 1%	BESS4
PRoW11	0.8	9.1	< 1%	BESS6	1.1	9.4	< 1%	BESS6	1.4	9.7	< 1%	BESS4
PRoW12	0.8	9.1	< 1%	BESS4	1.2	9.5	< 1%	BESS4	1.6	9.9	< 1%	BESS4
PRoW13	0.9	9.2	< 1%	BESS4	1.3	9.6	< 1%	BESS4	1.6	9.9	< 1%	BESS4
PRoW14	1.9	10.2	< 1%	BESS2	3.2	11.5	< 1%	BESS2	4.5	12.8	< 1%	BESS2
PRoW15	0.8	9.1	< 1%	BESS1	1.1	9.4	< 1%	BESS1	1.3	9.6	< 1%	BESS1
PRoW16	1.2	9.5	< 1%	BESS6	1.9	10.2	< 1%	BESS6	2.5	10.8	< 1%	BESS6
PRoW17	11.6	19.9	< 1%	BESS4	20.2	28.5	< 1%	BESS4	26.5	34.8	< 1%	BESS4
PRoW18	0.8	9.1	< 1%	BESS2	1.2	9.5	< 1%	BESS2	1.3	9.6	< 1%	BESS2
AQAL	**17,413**				**20,896**				**20,896**			

Table C.7: Predicted Nitrogen Dioxide (NO_2) Concentrations

Receptor	Predicted NO_2 Concentrations (µg/m^3)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit
R1	0.8	19.2	10%	BESS1	1.3	19.7	2%	BESS1	1.8	20.2	2%	BESS1
R2	0.4	18.8	9%	BESS5	0.5	18.9	2%	BESS5	0.8	19.2	2%	BESS5
R3	0.2	18.6	9%	BESS1	0.4	18.8	2%	BESS1	0.5	18.9	2%	BESS2

Receptor	Predicted NO_2 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R4	0.2	18.6	9%	BESS5	0.2	18.6	2%	BESS1	0.3	18.7	2%	BESS2
R5	0.2	18.6	9%	BESS1	0.3	18.7	2%	BESS1	0.3	18.7	2%	BESS2
R6	0.2	18.6	9%	BESS2	0.3	18.7	2%	BESS2	0.4	18.8	2%	BESS2
R7	0.2	18.6	9%	BESS2	0.4	18.8	2%	BESS2	0.4	18.8	2%	BESS2
R8	0.2	18.6	9%	BESS2	0.3	18.7	2%	BESS2	0.4	18.8	2%	BESS2
R9	0.2	18.6	9%	BESS2	0.2	18.6	2%	BESS2	0.3	18.7	2%	BESS2
R10	0.2	18.6	9%	BESS2	0.3	18.7	2%	BESS2	0.3	18.7	2%	BESS2
R11	0.2	18.6	9%	BESS5	0.2	18.7	2%	BESS4	0.2	18.6	2%	BESS6
R12	0.2	18.6	9%	BESS6	0.3	18.7	2%	BESS4	0.3	18.7	2%	BESS6
R13	0.1	18.5	9%	BESS3	0.2	18.6	2%	BESS2	0.3	18.7	2%	BESS2
R14	0.3	18.7	9%	BESS3	0.5	18.9	2%	BESS3	0.6	19.0	2%	BESS6
R15	0.3	18.8	9%	BESS6	0.5	18.9	2%	BESS6	0.7	19.1	2%	BESS6
R16	0.2	18.6	9%	BESS4	0.2	18.6	2%	BESS4	0.2	18.6	2%	BESS4
R17	0.3	18.7	9%	BESS4	0.3	18.7	2%	BESS6	0.5	18.9	2%	BESS6
R18	0.2	18.6	9%	BESS4	0.3	18.7	2%	BESS4	0.4	18.8	2%	BESS4
R19	0.2	18.6	9%	BESS6	0.2	18.6	2%	BESS6	0.3	18.7	2%	BESS4
R20	0.3	18.7	9%	BESS1	0.5	18.9	2%	BESS1	0.7	19.1	2%	BESS1
PRoW1	1.6	20.0	10%	BESS5	2.3	20.7	2%	BESS5	3.4	21.8	2%	BESS5
PRoW2	4.1	22.5	11%	BESS5	4.1	22.5	2%	BESS5	9.2	27.6	3%	BESS5
PRoW3	2.9	21.3	11%	BESS2	5.0	23.5	2%	BESS2	7.0	25.4	3%	BESS2
PRoW4	2.0	20.4	10%	BESS1	3.2	21.6	2%	BESS1	4.6	23.0	2%	BESS1
PRoW5	1.8	20.2	10%	BESS1	2.8	21.2	2%	BESS1	4.0	22.4	2%	BESS1
PRoW6	2.2	20.6	10%	BESS4	3.7	22.1	2%	BESS4	5.1	23.5	2%	BESS4
PRoW7	0.3	18.7	9%	BESS4	0.5	18.9	2%	BESS4	0.6	19.0	2%	BESS4
PRoW8	0.2	18.6	9%	BESS1	0.3	18.7	2%	BESS2	0.3	18.7	2%	BESS1
PRoW9	0.3	18.7	9%	BESS5	0.4	18.8	2%	BESS5	0.5	18.9	2%	BESS5
PRoW10	0.4	18.8	9%	BESS6	0.6	19.0	2%	BESS4	0.8	19.2	2%	BESS4
PRoW11	0.2	18.6	9%	BESS6	0.2	18.6	2%	BESS6	0.3	18.7	2%	BESS4
PRoW12	0.2	18.6	9%	BESS4	0.3	18.7	2%	BESS4	0.4	18.8	2%	BESS4
PRoW13	0.2	18.6	9%	BESS4	0.3	18.7	2%	BESS4	0.4	18.8	2%	BESS4
PRoW14	0.4	18.8	9%	BESS2	0.7	19.1	2%	BESS2	1.0	19.4	2%	BESS2
PRoW15	0.2	18.6	9%	BESS1	0.2	18.7	2%	BESS1	0.3	18.7	2%	BESS1
PRoW16	0.3	18.7	9%	BESS6	0.4	18.8	2%	BESS6	0.6	19.0	2%	BESS6
PRoW17	2.6	21.0	11%	BESS4	4.6	23.0	2%	BESS4	6.0	24.4	3%	BESS4
PRoW18	0.8	18.6	9%	BESS2	0.3	18.7	2%	BESS2	0.3	18.7	2%	BESS2

Receptor	Predicted NO_2 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
AQAL	**200**				**941**				**941**			

Table C.8: Predicted Particulate Matter (PM_{10}) Concentrations

Receptor	Predicted PM_{10} Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	53.5	77.7	N/A	BESS1	83.7	107.9	N/A	BESS1	121.1	145.3	4%	BESS1
R2	24.9	49.1	N/A	BESS5	37.3	61.5	N/A	BESS5	52.9	77.1	2%	BESS5
R3	16.3	40.5	N/A	BESS1	24.2	48.4	N/A	BESS1	32.1	56.3	1%	BESS2
R4	10.8	35.0	N/A	BESS5	15.8	40.0	N/A	BESS1	17.8	42.0	1%	BESS2
R5	11.2	35.4	N/A	BESS1	17.0	41.2	N/A	BESS1	20.5	44.7	1%	BESS2
R6	14.0	38.2	N/A	BESS2	20.3	44.5	N/A	BESS2	24.6	48.8	1%	BESS2
R7	14.0	38.2	N/A	BESS2	23.7	47.9	N/A	BESS2	29.1	53.3	1%	BESS2
R8	12.3	36.5	N/A	BESS2	20.3	44.5	N/A	BESS2	26.4	50.6	1%	BESS2
R9	10.9	35.1	N/A	BESS2	16.1	40.3	N/A	BESS2	18.3	42.5	1%	BESS2
R10	10.6	34.8	N/A	BESS2	17.3	41.5	N/A	BESS2	20.8	45.0	1%	BESS2
R11	10.6	34.8	N/A	BESS5	16.4	40.6	N/A	BESS4	15.5	39.7	1%	BESS6
R12	10.9	35.1	N/A	BESS6	16.9	41.1	N/A	BESS4	20.9	45.1	1%	BESS6
R13	9.5	33.7	N/A	BESS3	15.6	39.8	N/A	BESS2	18.7	42.9	1%	BESS2
R14	21.2	45.4	N/A	BESS3	33.1	57.3	N/A	BESS3	41.9	66.1	1%	BESS6
R15	23.0	47.2	N/A	BESS6	38.6	62.8	N/A	BESS6	49.4	73.6	1%	BESS6
R16	10.4	34.6	N/A	BESS4	13.2	37.4	N/A	BESS4	14.5	38.7	1%	BESS4
R17	17.2	41.4	N/A	BESS4	22.8	47.0	N/A	BESS6	31.2	55.4	1%	BESS6
R18	14.1	38.3	N/A	BESS4	20.8	45.0	N/A	BESS4	29.0	53.2	1%	BESS4
R19	11.0	35.2	N/A	BESS6	14.9	39.1	N/A	BESS6	19.2	43.4	1%	BESS4
R20	20.0	44.2	N/A	BESS1	31.5	55.7	N/A	BESS1	46.6	70.8	2%	BESS1
PRoW1	105.6	129.8	N/A	BESS5	164.1	188.3	N/A	BESS5	225.7	249.9	6%	BESS5
PRoW2	271.6	295.8	N/A	BESS5	424.1	448.3	N/A	BESS5	611.6	635.8	7%	BESS5
PRoW3	190.8	215.0	N/A	BESS2	335.3	359.5	N/A	BESS2	465.5	489.7	4%	BESS2
PRoW4	134.8	159.0	N/A	BESS1	214.5	238.7	N/A	BESS1	306.7	330.9	8%	BESS1

Receptor	Predicted PM_{10} Concentrations (µg/m^3)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit
PRoW5	119.7	143.9	N/A	BESS1	185.4	209.6	N/A	BESS1	268.6	292.8	7%	BESS1
PRoW6	142.9	167.1	N/A	BESS4	246.9	271.1	N/A	BESS4	336.6	360.8	3%	BESS4
PRoW7	17.6	41.8	N/A	BESS4	30.6	54.8	N/A	BESS4	42.6	66.8	1%	BESS4
PRoW8	11.8	36.0	N/A	BESS1	17.1	41.3	N/A	BESS2	22.8	47.0	1%	BESS1
PRoW9	20.1	44.3	N/A	BESS5	26.9	51.1	N/A	BESS5	34.4	58.6	1%	BESS5
PRoW10	26.0	50.2	N/A	BESS6	38.8	63.0	N/A	BESS4	53.8	78.0	1%	BESS4
PRoW11	12.2	36.4	N/A	BESS6	16.3	40.5	N/A	BESS6	20.8	45.0	1%	BESS4
PRoW12	11.9	36.1	N/A	BESS4	17.6	41.8	N/A	BESS4	24.6	48.8	1%	BESS4
PRoW13	13.3	37.5	N/A	BESS4	18.9	43.1	N/A	BESS4	24.5	48.7	1%	BESS4
PRoW14	29.3	53.5	N/A	BESS2	49.0	73.2	N/A	BESS2	67.4	91.6	2%	BESS2
PRoW15	12.0	36.2	N/A	BESS1	16.3	40.5	N/A	BESS1	20.1	44.3	1%	BESS1
PRoW16	18.0	42.2	N/A	BESS6	28.9	53.1	N/A	BESS6	38.0	62.2	1%	BESS6
PRoW17	175.1	199.3	N/A	BESS4	306.6	330.7	N/A	BESS4	401.5	425.7	2%	BESS4
PRoW18	12.1	36.3	N/A	BESS2	17.6	41.8	N/A	BESS2	20.2	44.4	1%	BESS2
AQAL	**None**				**None**				**4,000**			

Appendix D Modelling Results – Air Quality Risk Assessment: Sensitivity Scenario

Table D.1: Predicted Carbon Monoxide (CO) Concentrations

Receptor	Predicted CO Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	1502	1974	2%	BESS1	2348	2820	7%	BESS1	3398	3870	39%	BESS1
R2	698	1170	1%	BESS5	1045	1517	4%	BESS5	1483	1955	20%	BESS5
R3	458	930	1%	BESS1	678	1150	3%	BESS1	900	1372	14%	BESS2
R4	302	774	1%	BESS5	442	914	2%	BESS1	500	972	10%	BESS2
R5	315	787	1%	BESS1	477	949	3%	BESS1	575	1047	10%	BESS2
R6	394	866	1%	BESS2	568	1040	3%	BESS2	690	1162	12%	BESS2
R7	394	866	1%	BESS2	664	1136	3%	BESS2	815	1287	13%	BESS2
R8	346	818	1%	BESS2	569	1041	3%	BESS2	740	1212	12%	BESS2
R9	305	769	1%	BESS2	451	915	2%	BESS2	513	977	10%	BESS2
R10	296	760	1%	BESS2	485	949	3%	BESS2	584	1048	10%	BESS2
R11	296	760	1%	BESS5	460	924	2%	BESS4	436	900	9%	BESS6
R12	307	771	1%	BESS6	475	939	2%	BESS4	586	1050	10%	BESS6
R13	267	731	1%	BESS3	437	901	2%	BESS2	524	988	10%	BESS2
R14	595	1067	1%	BESS3	928	1400	4%	BESS3	1174	1646	16%	BESS6
R15	644	1110	1%	BESS6	1082	1548	4%	BESS6	1386	1852	19%	BESS6
R16	291	757	1%	BESS4	371	837	2%	BESS4	408	874	9%	BESS4
R17	482	948	1%	BESS4	640	1106	3%	BESS6	875	1341	13%	BESS6
R18	397	863	1%	BESS4	585	1051	3%	BESS4	815	1281	13%	BESS4
R19	309	777	1%	BESS6	419	887	2%	BESS6	539	1007	10%	BESS4
R20	560	1036	1%	BESS1	883	1359	4%	BESS1	1307	1783	18%	BESS1
PRoW1	2961	3433	4%	BESS5	4605	5077	13%	BESS5	6332	6804	68%	BESS5
PRoW2	7619	8091	9%	BESS5	11898	12370	33%	BESS5	17157	17629	**176%**	BESS5
PRoW3	5354	5826	6%	BESS2	9407	9879	26%	BESS2	13059	13531	**135%**	BESS2
PRoW4	3781	4253	4%	BESS1	6019	6491	17%	BESS1	8604	9076	91%	BESS1
PRoW5	3359	3831	4%	BESS1	5200	5672	15%	BESS1	7536	8008	80%	BESS1
PRoW6	4008	4480	5%	BESS4	6927	7399	20%	BESS4	9444	9916	99%	BESS4

Receptor	Predicted CO Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW7	495	971	1%	BESS4	860	1336	4%	BESS4	1196	1672	17%	BESS4
PRoW8	331	807	1%	BESS1	479	955	3%	BESS2	641	1117	11%	BESS1
PRoW9	563	1035	1%	BESS5	754	1226	3%	BESS5	965	1437	14%	BESS5
PRoW10	730	1196	1%	BESS6	1090	1556	4%	BESS4	1510	1976	20%	BESS4
PRoW11	343	809	1%	BESS6	458	924	2%	BESS6	584	1050	10%	BESS4
PRoW12	335	801	1%	BESS4	495	961	3%	BESS4	689	1155	12%	BESS4
PRoW13	373	841	1%	BESS4	531	999	3%	BESS4	689	1157	12%	BESS4
PRoW14	822	1294	1%	BESS2	1375	1847	5%	BESS2	1892	2364	24%	BESS2
PRoW15	338	810	1%	BESS1	458	930	2%	BESS1	563	1035	10%	BESS1
PRoW16	506	972	1%	BESS6	810	1276	3%	BESS6	1067	1533	15%	BESS6
PRoW17	4911	5377	6%	BESS4	8600	9066	24%	BESS4	11264	11730	**117%**	BESS4
PRoW18	339	803	1%	BESS2	493	957	3%	BESS2	566	1030	10%	BESS2
AQAL	**95,085**				**37,805**				**10,000**			

Exceedances of the AQAL are shown in bold.

Table D.2: Predicted Formaldehyde (HCHO) Concentrations

Receptor	Predicted HCHO Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	40.9	60.9	6%	BESS1	64.0	84.0	8%	BESS1	92.6	112.6	10%	BESS1
R2	19.0	39.0	4%	BESS5	28.5	48.5	4%	BESS5	40.4	60.4	5%	BESS5
R3	12.5	32.5	3%	BESS1	18.5	38.5	3%	BESS1	24.5	44.5	4%	BESS2
R4	8.2	28.2	3%	BESS5	12.0	32.0	3%	BESS1	13.6	33.6	3%	BESS2
R5	8.6	28.6	3%	BESS1	13.0	33.0	3%	BESS1	15.7	35.7	3%	BESS2
R6	10.7	30.7	3%	BESS2	15.5	35.5	3%	BESS2	18.8	38.8	4%	BESS2
R7	10.7	30.7	3%	BESS2	18.1	38.1	3%	BESS2	22.2	42.2	4%	BESS2
R8	9.4	29.4	3%	BESS2	15.5	35.5	3%	BESS2	20.2	40.2	4%	BESS2
R9	8.3	28.3	3%	BESS2	12.3	32.3	3%	BESS2	14.0	34.0	3%	BESS2
R10	8.1	28.1	3%	BESS2	13.2	33.2	3%	BESS2	15.9	35.9	3%	BESS2
R11	8.1	28.1	3%	BESS5	12.5	32.5	3%	BESS4	11.9	31.9	3%	BESS6

Receptor	Predicted HCHO Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R12	8.4	28.4	3%	BESS6	12.9	32.9	3%	BESS4	16.0	36.0	3%	BESS6
R13	7.3	27.3	2%	BESS3	11.9	31.9	3%	BESS2	14.3	34.3	3%	BESS2
R14	16.2	36.2	3%	BESS3	25.3	45.3	4%	BESS3	32.0	52.0	5%	BESS6
R15	17.6	37.6	3%	BESS6	29.5	49.5	4%	BESS6	37.8	57.8	5%	BESS6
R16	7.9	27.9	3%	BESS4	10.1	30.1	3%	BESS4	11.1	31.1	3%	BESS4
R17	13.1	33.1	3%	BESS4	17.5	37.5	3%	BESS6	23.8	43.8	4%	BESS6
R18	10.8	30.8	3%	BESS4	15.9	35.9	3%	BESS4	22.2	42.2	4%	BESS4
R19	8.4	28.4	3%	BESS6	11.4	31.4	3%	BESS6	14.7	34.7	3%	BESS4
R20	15.3	35.3	3%	BESS1	24.1	44.1	4%	BESS1	35.6	55.6	5%	BESS1
PRoW1	80.7	100.7	9%	BESS5	125.5	145.5	13%	BESS5	172.5	192.5	17%	BESS5
PRoW2	207.6	227.6	21%	BESS5	324.2	344.2	31%	BESS5	467.5	487.5	44%	BESS5
PRoW3	145.9	165.9	15%	BESS2	256.3	276.3	25%	BESS2	355.9	375.9	34%	BESS2
PRoW4	103.0	123.0	11%	BESS1	164.0	184.0	17%	BESS1	234.4	254.4	23%	BESS1
PRoW5	91.5	111.5	10%	BESS1	141.7	161.7	15%	BESS1	205.4	225.4	20%	BESS1
PRoW6	109.2	129.2	12%	BESS4	188.8	208.8	19%	BESS4	257.3	277.3	25%	BESS4
PRoW7	13.5	33.5	3%	BESS4	23.4	43.4	4%	BESS4	32.6	52.6	5%	BESS4
PRoW8	9.0	29.0	3%	BESS1	13.0	33.0	3%	BESS2	17.5	37.5	3%	BESS1
PRoW9	15.3	35.3	3%	BESS5	20.6	40.6	4%	BESS5	26.3	46.3	4%	BESS5
PRoW10	19.9	39.9	4%	BESS6	29.7	49.7	4%	BESS4	41.1	61.1	6%	BESS4
PRoW11	9.3	29.3	3%	BESS6	12.5	32.5	3%	BESS6	15.9	35.9	3%	BESS4
PRoW12	9.1	29.1	3%	BESS4	13.5	33.5	3%	BESS4	18.8	38.8	4%	BESS4
PRoW13	10.2	30.2	3%	BESS4	14.5	34.5	3%	BESS4	18.8	38.8	4%	BESS4
PRoW14	22.4	42.4	4%	BESS2	37.5	57.5	5%	BESS2	51.5	71.5	6%	BESS2
PRoW15	9.2	29.2	3%	BESS1	12.5	32.5	3%	BESS1	15.4	35.4	3%	BESS1
PRoW16	13.8	33.8	3%	BESS6	22.1	42.1	4%	BESS6	29.1	49.1	4%	BESS6
PRoW17	133.8	153.8	14%	BESS4	234.3	254.3	23%	BESS4	306.9	326.9	30%	BESS4
PRoW18	9.2	29.2	3%	BESS2	13.4	33.4	3%	BESS2	15.4	35.4	3%	BESS2
AQAL	**1,105**				**1,105**				**1,105**			

Table D.3: Predicted Hydrogen Chloride (HCl) Concentrations

Receptor	Predicted HCl Concentrations (µg/m^3)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit
R1	73.1	73.5	3%	BESS1	114.2	114.6	4%	BESS1	165.3	165.7	6%	BESS1
R2	33.9	34.4	1%	BESS5	50.9	51.3	2%	BESS5	72.2	72.6	3%	BESS5
R3	22.3	22.7	1%	BESS1	33.0	33.4	1%	BESS1	43.8	44.2	2%	BESS2
R4	14.7	15.1	1%	BESS5	21.5	21.9	1%	BESS1	24.3	24.7	1%	BESS2
R5	15.3	15.7	1%	BESS1	23.2	23.6	1%	BESS1	28.0	28.4	1%	BESS2
R6	19.2	19.6	1%	BESS2	27.6	28.1	1%	BESS2	33.5	34.0	1%	BESS2
R7	19.2	19.6	1%	BESS2	32.3	32.7	1%	BESS2	39.7	40.1	1%	BESS2
R8	16.8	17.2	1%	BESS2	27.7	28.1	1%	BESS2	36.0	36.4	1%	BESS2
R9	14.9	15.3	1%	BESS2	22.0	22.4	1%	BESS2	25.0	25.4	1%	BESS2
R10	14.4	14.8	1%	BESS2	23.6	24.0	1%	BESS2	28.4	28.8	1%	BESS2
R11	14.4	14.8	1%	BESS5	22.4	22.8	1%	BESS4	21.2	21.6	1%	BESS6
R12	14.9	15.3	1%	BESS6	23.1	23.5	1%	BESS4	28.5	28.9	1%	BESS6
R13	13.0	13.4	< 1%	BESS3	21.3	21.7	1%	BESS2	25.5	25.9	1%	BESS2
R14	28.9	29.4	1%	BESS3	45.2	45.6	2%	BESS3	57.1	57.5	2%	BESS6
R15	31.3	31.8	1%	BESS6	52.6	53.1	2%	BESS6	67.4	67.9	3%	BESS6
R16	14.1	14.6	1%	BESS4	18.1	18.5	1%	BESS4	19.8	20.3	1%	BESS4
R17	23.4	23.9	1%	BESS4	31.2	31.6	1%	BESS6	42.6	43.0	2%	BESS6
R18	19.3	19.7	1%	BESS4	28.4	28.9	1%	BESS4	39.6	40.1	1%	BESS4
R19	15.0	15.4	1%	BESS6	20.4	20.8	1%	BESS6	26.2	26.7	1%	BESS4
R20	27.2	27.6	1%	BESS1	42.9	43.4	2%	BESS1	63.6	64.0	2%	BESS1
PRoW1	144.1	144.5	5%	BESS5	224.0	224.4	8%	BESS5	308.0	308.5	11%	BESS5
PRoW2	370.6	371.1	14%	BESS5	578.8	579.2	22%	BESS5	834.7	835.1	31%	BESS5
PRoW3	260.5	260.9	10%	BESS2	457.6	458.1	17%	BESS2	635.3	635.7	24%	BESS2
PRoW4	183.9	184.3	7%	BESS1	292.8	293.2	11%	BESS1	418.6	419.0	16%	BESS1
PRoW5	163.4	163.8	6%	BESS1	253.0	253.4	9%	BESS1	366.6	367.0	14%	BESS1
PRoW6	195.0	195.4	7%	BESS4	337.0	337.4	13%	BESS4	459.4	459.8	17%	BESS4
PRoW7	24.1	24.5	1%	BESS4	41.8	42.2	2%	BESS4	58.2	58.6	2%	BESS4
PRoW8	16.1	16.5	1%	BESS1	23.3	23.7	1%	BESS2	31.2	31.6	1%	BESS1
PRoW9	27.4	27.8	1%	BESS5	36.7	37.1	1%	BESS5	47.0	47.4	2%	BESS5
PRoW10	35.5	35.9	1%	BESS6	53.0	53.4	2%	BESS4	73.4	73.9	3%	BESS4
PRoW11	16.7	17.1	1%	BESS6	22.3	22.7	1%	BESS6	28.4	28.8	1%	BESS4
PRoW12	16.3	16.7	1%	BESS4	24.1	24.5	1%	BESS4	33.5	34.0	1%	BESS4

Receptor	Predicted HCl Concentrations (µg/m^3)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit
PRoW13	18.1	18.6	1%	BESS4	25.9	26.3	1%	BESS4	33.5	33.9	1%	BESS4
PRoW14	40.0	40.4	2%	BESS2	66.9	67.3	3%	BESS2	92.0	92.4	3%	BESS2
PRoW15	16.4	16.8	1%	BESS1	22.3	22.7	1%	BESS1	27.4	27.8	1%	BESS1
PRoW16	24.6	25.0	1%	BESS6	39.4	39.8	1%	BESS6	51.9	52.3	2%	BESS6
PRoW17	238.9	239.3	9%	BESS4	418.4	418.8	16%	BESS4	548.0	548.4	20%	BESS4
PRoW18	16.5	16.9	1%	BESS2	24.0	24.4	1%	BESS2	27.6	28.0	1%	BESS2
AQAL	**2,684**				**2,684**				**2,684**			

Table D.4: Predicted Hydrogen Cyanide (HCN) Concentrations

Receptor	Predicted HCN Concentrations (µg/m^3)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit
3%	25.8	25.8	1%	BESS1	40.3	40.3	3%	BESS1	58.4	58.4	5%	BESS1
1%	12.0	12.0	1%	BESS5	18.0	18.0	1%	BESS5	25.5	25.5	2%	BESS5
1%	7.9	7.9	< 1%	BESS1	11.6	11.6	1%	BESS1	15.5	15.5	1%	BESS2
1%	5.2	5.2	< 1%	BESS5	7.6	7.6	1%	BESS1	8.6	8.6	1%	BESS2
1%	5.4	5.4	< 1%	BESS1	8.2	8.2	1%	BESS1	9.9	9.9	1%	BESS2
1%	6.8	6.8	< 1%	BESS2	9.8	9.8	1%	BESS2	11.8	11.8	1%	BESS2
< 1%	6.8	6.8	< 1%	BESS2	11.4	11.4	1%	BESS2	14.0	14.0	1%	BESS2
< 1%	5.9	5.9	< 1%	BESS2	9.8	9.8	1%	BESS2	12.7	12.7	1%	BESS2
< 1%	5.2	5.2	< 1%	BESS2	7.8	7.8	1%	BESS2	8.8	8.8	1%	BESS2
1%	5.1	5.1	< 1%	BESS2	8.3	8.3	1%	BESS2	10.0	10.0	1%	BESS2
< 1%	5.1	5.1	< 1%	BESS5	7.9	7.9	1%	BESS4	7.5	7.5	1%	BESS6
< 1%	5.3	5.3	< 1%	BESS6	8.2	8.2	1%	BESS4	10.1	10.1	1%	BESS6
< 1%	4.6	4.6	< 1%	BESS3	7.5	7.5	1%	BESS2	9.0	9.0	1%	BESS2
1%	10.2	10.2	< 1%	BESS3	15.9	15.9	1%	BESS3	20.2	20.2	2%	BESS6
1%	11.1	11.1	1%	BESS6	18.6	18.6	1%	BESS6	23.8	23.8	2%	BESS6
< 1%	5.0	5.0	< 1%	BESS4	6.4	6.4	< 1%	BESS4	7.0	7.0	1%	BESS4
< 1%	8.3	8.3	< 1%	BESS4	11.0	11.0	1%	BESS6	15.0	15.0	1%	BESS6

Receptor	Predicted HCN Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
< 1%	6.8	6.8	< 1%	BESS4	10.0	10.0	1%	BESS4	14.0	14.0	1%	BESS4
< 1%	5.3	5.3	< 1%	BESS6	7.2	7.2	1%	BESS6	9.3	9.3	1%	BESS4
1%	9.6	9.6	< 1%	BESS1	15.2	15.2	1%	BESS1	22.5	22.5	2%	BESS1
5%	50.9	50.9	2%	BESS5	79.1	79.1	6%	BESS5	108.8	108.8	10%	BESS5
6%	130.9	130.9	6%	BESS5	204.4	204.4	14%	BESS5	294.8	294.8	27%	BESS5
3%	92.0	92.0	4%	BESS2	161.6	161.6	11%	BESS2	224.4	224.4	20%	BESS2
7%	65.0	65.0	3%	BESS1	103.4	103.4	7%	BESS1	147.8	147.8	13%	BESS1
6%	57.7	57.7	3%	BESS1	89.3	89.3	6%	BESS1	129.5	129.5	12%	BESS1
2%	68.9	68.9	3%	BESS4	119.0	119.0	8%	BESS4	162.3	162.3	15%	BESS4
1%	8.5	8.5	< 1%	BESS4	14.8	14.8	1%	BESS4	20.5	20.5	2%	BESS4
1%	5.7	5.7	< 1%	BESS1	8.2	8.2	1%	BESS2	11.0	11.0	1%	BESS1
1%	9.7	9.7	< 1%	BESS5	13.0	13.0	1%	BESS5	16.6	16.6	1%	BESS5
1%	12.5	12.5	1%	BESS6	18.7	18.7	1%	BESS4	25.9	25.9	2%	BESS4
< 1%	5.9	5.9	< 1%	BESS6	7.9	7.9	1%	BESS6	10.0	10.0	1%	BESS4
< 1%	5.8	5.8	< 1%	BESS4	8.5	8.5	1%	BESS4	11.8	11.8	1%	BESS4
< 1%	6.4	6.4	< 1%	BESS4	9.1	9.1	1%	BESS4	11.8	11.8	1%	BESS4
1%	14.1	14.1	1%	BESS2	23.6	23.6	2%	BESS2	32.5	32.5	3%	BESS2
1%	5.8	5.8	< 1%	BESS1	7.9	7.9	1%	BESS1	9.7	9.7	1%	BESS1
1%	8.7	8.7	< 1%	BESS6	13.9	13.9	1%	BESS6	18.3	18.3	2%	BESS6
1%	84.4	84.4	4%	BESS4	147.8	147.8	10%	BESS4	193.5	193.5	17%	BESS4
< 1%	5.8	5.8	< 1%	BESS2	8.5	8.5	1%	BESS2	9.7	9.7	1%	BESS2
AQAL	**2,211**				**1,437**				**1,106**			

Table D.5: Predicted Hydrogen Fluoride (HF) Concentrations

Receptor	Predicted HF Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	201.8	202.8	25%	BESS1	315.4	316.4	39%	BESS1	456.5	457.5	56%	BESS1
R2	93.7	94.7	12%	BESS5	140.4	141.4	17%	BESS5	199.3	200.3	24%	BESS5
R3	61.5	62.5	8%	BESS1	91.1	92.1	11%	BESS1	120.9	121.9	15%	BESS2

Receptor	Predicted HF Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R4	40.6	41.6	5%	BESS5	59.4	60.4	7%	BESS1	67.1	68.1	8%	BESS2
R5	42.3	43.3	5%	BESS1	64.1	65.1	8%	BESS1	77.3	78.3	10%	BESS2
R6	52.9	53.9	7%	BESS2	76.3	77.3	9%	BESS2	92.6	93.6	11%	BESS2
R7	52.9	53.9	7%	BESS2	89.2	90.2	11%	BESS2	109.5	110.5	14%	BESS2
R8	46.4	47.4	6%	BESS2	76.5	77.5	9%	BESS2	99.4	100.4	12%	BESS2
R9	41.0	42.0	5%	BESS2	60.6	61.6	8%	BESS2	68.9	69.9	9%	BESS2
R10	39.8	40.8	5%	BESS2	65.1	66.1	8%	BESS2	78.4	79.4	10%	BESS2
R11	39.8	40.8	5%	BESS5	61.8	62.8	8%	BESS4	58.5	59.5	7%	BESS6
R12	41.2	42.2	5%	BESS6	63.8	64.8	8%	BESS4	78.7	79.7	10%	BESS6
R13	35.9	36.9	5%	BESS3	58.7	59.7	7%	BESS2	70.5	71.5	9%	BESS2
R14	79.9	80.9	10%	BESS3	124.7	125.7	15%	BESS3	157.7	158.7	19%	BESS6
R15	86.5	87.5	11%	BESS6	145.3	146.3	18%	BESS6	186.2	187.2	23%	BESS6
R16	39.1	40.1	5%	BESS4	49.9	50.9	6%	BESS4	54.8	55.8	7%	BESS4
R17	64.7	65.7	8%	BESS4	86.0	87.0	11%	BESS6	117.5	118.5	14%	BESS6
R18	53.3	54.3	7%	BESS4	78.5	79.5	10%	BESS4	109.4	110.4	14%	BESS4
R19	41.4	42.4	5%	BESS6	56.3	57.3	7%	BESS6	72.4	73.4	9%	BESS4
R20	75.2	76.2	9%	BESS1	118.6	119.6	15%	BESS1	175.6	176.6	22%	BESS1
PRoW1	397.8	398.8	49%	BESS5	618.6	619.6	76%	BESS5	850.6	851.6	**104%**	BESS5
PRoW2	1023.5	1024.5	**125%**	BESS5	1598.3	1599.3	**196%**	BESS5	2304.8	2305.8	**282%**	BESS5
PRoW3	719.2	720.2	88%	BESS2	1263.7	1264.7	**155%**	BESS2	1754.3	1755.3	**215%**	BESS2
PRoW4	507.9	508.9	62%	BESS1	808.5	809.5	99%	BESS1	1155.8	1156.8	**141%**	BESS1
PRoW5	451.2	452.2	55%	BESS1	698.6	699.6	86%	BESS1	1012.4	1013.4	**124%**	BESS1
PRoW6	538.5	539.5	66%	BESS4	930.6	931.6	**114%**	BESS4	1268.7	1269.7	**155%**	BESS4
PRoW7	66.5	67.5	8%	BESS4	115.5	116.5	14%	BESS4	160.6	161.6	20%	BESS4
PRoW8	44.5	45.5	6%	BESS1	64.3	65.3	8%	BESS2	86.1	87.1	11%	BESS1
PRoW9	75.6	76.6	9%	BESS5	101.3	102.3	13%	BESS5	129.7	130.7	16%	BESS5
PRoW10	98.1	99.1	12%	BESS6	146.4	147.4	18%	BESS4	202.8	203.8	25%	BESS4
PRoW11	46.1	47.1	6%	BESS6	61.5	62.5	8%	BESS6	78.4	79.4	10%	BESS4
PRoW12	45.0	46.0	6%	BESS4	66.4	67.4	8%	BESS4	92.6	93.6	11%	BESS4
PRoW13	50.1	51.1	6%	BESS4	71.4	72.4	9%	BESS4	92.5	93.5	11%	BESS4
PRoW14	110.4	111.4	14%	BESS2	184.7	185.7	23%	BESS2	254.1	255.1	31%	BESS2
PRoW15	45.3	46.3	6%	BESS1	61.5	62.5	8%	BESS1	75.7	76.7	9%	BESS1
PRoW16	68.0	69.0	8%	BESS6	108.8	109.8	13%	BESS6	143.3	144.3	18%	BESS6
PRoW17	659.7	660.7	81%	BESS4	1155.3	1156.3	**141%**	BESS4	1513.2	1514.2	**185%**	BESS4
PRoW18	45.5	46.5	6%	BESS2	66.2	67.2	8%	BESS2	76.1	77.1	9%	BESS2

Receptor	Predicted HF Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
AQAL	**818**				**818**				**818**			

Exceedances of the most stringent AQAL are highlighted in bold.

Table D.6: Predicted Ammonia (NH_3) Concentrations

Receptor	Predicted NH_3 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	7.1	15.4	< 1%	BESS1	11.1	19.4	< 1%	BESS1	16.0	24.3	< 1%	BESS1
R2	3.3	11.6	< 1%	BESS5	4.9	13.2	< 1%	BESS5	7.0	15.3	< 1%	BESS5
R3	2.2	10.5	< 1%	BESS1	3.2	11.5	< 1%	BESS1	4.2	12.5	< 1%	BESS2
R4	1.4	9.7	< 1%	BESS5	2.1	10.4	< 1%	BESS1	2.4	10.7	< 1%	BESS2
R5	1.5	9.8	< 1%	BESS1	2.2	10.5	< 1%	BESS1	2.7	11.0	< 1%	BESS2
R6	1.9	10.2	< 1%	BESS2	2.7	11.0	< 1%	BESS2	3.2	11.5	< 1%	BESS2
R7	1.9	10.2	< 1%	BESS2	3.1	11.4	< 1%	BESS2	3.8	12.1	< 1%	BESS2
R8	1.6	9.9	< 1%	BESS2	2.7	11.0	< 1%	BESS2	3.5	11.8	< 1%	BESS2
R9	1.4	9.7	< 1%	BESS2	2.1	10.4	< 1%	BESS2	2.4	10.7	< 1%	BESS2
R10	1.4	9.7	< 1%	BESS2	2.3	10.6	< 1%	BESS2	2.7	11.1	< 1%	BESS2
R11	1.4	9.7	< 1%	BESS5	2.2	10.5	< 1%	BESS4	2.1	10.4	< 1%	BESS6
R12	1.4	9.7	< 1%	BESS6	2.2	10.5	< 1%	BESS4	2.8	11.1	< 1%	BESS6
R13	1.3	9.6	< 1%	BESS3	2.1	10.4	< 1%	BESS2	2.5	10.8	< 1%	BESS2
R14	2.8	11.1	< 1%	BESS3	4.4	12.7	< 1%	BESS3	5.5	13.8	< 1%	BESS6
R15	3.0	11.3	< 1%	BESS6	5.1	13.4	< 1%	BESS6	6.5	14.8	< 1%	BESS6
R16	1.4	9.7	< 1%	BESS4	1.7	10.1	< 1%	BESS4	1.9	10.2	< 1%	BESS4
R17	2.3	10.6	< 1%	BESS4	3.0	11.3	< 1%	BESS6	4.1	12.4	< 1%	BESS6
R18	1.9	10.2	< 1%	BESS4	2.8	11.1	< 1%	BESS4	3.8	12.1	< 1%	BESS4
R19	1.5	9.8	< 1%	BESS6	2.0	10.3	< 1%	BESS6	2.5	10.8	< 1%	BESS4
R20	2.6	10.9	< 1%	BESS1	4.2	12.5	< 1%	BESS1	6.2	14.5	< 1%	BESS1
PRoW1	13.9	22.2	< 1%	BESS5	21.7	30.0	< 1%	BESS5	29.8	38.1	< 1%	BESS5
PRoW2	35.9	44.2	< 1%	BESS5	56.0	64.3	< 1%	BESS5	80.8	89.1	< 1%	BESS5
PRoW3	25.2	33.5	< 1%	BESS2	44.3	52.6	< 1%	BESS2	61.5	69.8	< 1%	BESS2

Receptor	Predicted NH_3 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW4	17.8	26.1	< 1%	BESS1	28.3	36.6	< 1%	BESS1	40.5	48.8	< 1%	BESS1
PRoW5	15.8	24.1	< 1%	BESS1	24.5	32.8	< 1%	BESS1	35.5	43.8	< 1%	BESS1
PRoW6	18.9	27.2	< 1%	BESS4	32.6	40.9	< 1%	BESS4	44.5	52.8	< 1%	BESS4
PRoW7	2.3	10.6	< 1%	BESS4	4.0	12.3	< 1%	BESS4	5.6	13.9	< 1%	BESS4
PRoW8	1.6	9.9	< 1%	BESS1	2.3	10.6	< 1%	BESS2	3.0	11.3	< 1%	BESS1
PRoW9	2.6	11.0	< 1%	BESS5	3.6	11.9	< 1%	BESS5	4.5	12.8	< 1%	BESS5
PRoW10	3.4	11.7	< 1%	BESS6	5.1	13.4	< 1%	BESS4	7.1	15.4	< 1%	BESS4
PRoW11	1.6	9.9	< 1%	BESS6	2.2	10.5	< 1%	BESS6	2.7	11.0	< 1%	BESS4
PRoW12	1.6	9.9	< 1%	BESS4	2.3	10.6	< 1%	BESS4	3.2	11.5	< 1%	BESS4
PRoW13	1.8	10.1	< 1%	BESS4	2.5	10.8	< 1%	BESS4	3.2	11.5	< 1%	BESS4
PRoW14	3.9	12.2	< 1%	BESS2	6.5	14.8	< 1%	BESS2	8.9	17.2	< 1%	BESS2
PRoW15	1.6	9.9	< 1%	BESS1	2.2	10.5	< 1%	BESS1	2.7	11.0	< 1%	BESS1
PRoW16	2.4	10.7	< 1%	BESS6	3.8	12.1	< 1%	BESS6	5.0	13.3	< 1%	BESS6
PRoW17	23.1	31.4	< 1%	BESS4	40.5	48.8	< 1%	BESS4	53.0	61.3	< 1%	BESS4
PRoW18	1.6	9.9	< 1%	BESS2	2.3	10.6	< 1%	BESS2	2.7	11.0	< 1%	BESS2
AQAL	17,413				20,896				20,896			

Table D.7: Predicted Nitrogen Dioxide (NO_2) Concentrations

Receptor	Predicted NO_2 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	1.6	20.0	10%	BESS1	2.5	20.9	2%	BESS1	3.6	22.1	2%	2%
R2	0.7	19.2	10%	BESS5	1.0	19.4	2%	BESS5	1.6	20.0	2%	2%
R3	0.5	18.9	9%	BESS1	0.7	19.1	2%	BESS1	1.0	19.4	2%	2%
R4	0.3	18.7	9%	BESS5	0.5	18.9	2%	BESS1	0.5	18.9	2%	2%
R5	0.3	18.7	9%	BESS1	0.5	18.9	2%	BESS1	0.6	19.0	2%	2%
R6	0.4	18.8	9%	BESS2	0.6	19.0	2%	BESS2	0.7	19.1	2%	2%
R7	0.4	18.8	9%	BESS2	0.7	19.1	2%	BESS2	0.9	19.3	2%	2%
R8	0.4	18.8	9%	BESS2	0.6	19.0	2%	BESS2	0.8	19.2	2%	2%
R9	0.3	18.7	9%	BESS2	0.5	18.9	2%	BESS2	0.6	19.0	2%	2%

Receptor	Predicted NO_2 Concentrations (µg/m^3)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit
R10	0.3	18.7	9%	BESS2	0.5	18.9	2%	BESS2	0.6	19.0	2%	2%
R11	0.3	18.7	9%	BESS5	0.5	18.9	2%	BESS4	0.5	18.9	2%	2%
R12	0.3	18.7	9%	BESS6	0.5	18.9	2%	BESS4	0.6	19.0	2%	2%
R13	0.3	18.7	9%	BESS3	0.5	18.9	2%	BESS2	0.6	19.0	2%	2%
R14	0.6	19.0	10%	BESS3	1.0	19.4	2%	BESS3	1.3	19.7	2%	2%
R15	0.7	19.1	10%	BESS6	0.9	19.3	2%	BESS6	1.5	19.9	2%	2%
R16	0.3	18.7	9%	BESS4	0.4	18.8	2%	BESS4	0.4	18.8	2%	2%
R17	0.5	18.9	9%	BESS4	0.6	19.0	2%	BESS6	0.9	19.3	2%	2%
R18	0.4	18.8	9%	BESS4	0.6	19.0	2%	BESS4	0.9	19.3	2%	2%
R19	0.3	18.7	9%	BESS6	0.4	18.8	2%	BESS6	0.6	19.0	2%	2%
R20	0.6	19.0	10%	BESS1	0.9	19.4	2%	BESS1	1.4	19.8	2%	2%
PRoW1	3.2	21.6	11%	BESS5	4.6	23.0	2%	BESS5	6.8	25.2	3%	3%
PRoW2	8.2	26.6	13%	BESS5	8.2	26.6	3%	BESS5	18.4	36.8	4%	4%
PRoW3	5.7	24.2	12%	BESS2	10.1	28.5	3%	BESS2	14.0	32.4	3%	3%
PRoW4	4.1	22.5	11%	BESS1	6.5	24.9	3%	BESS1	9.2	27.6	3%	3%
PRoW5	3.6	22.0	11%	BESS1	5.6	24.0	3%	BESS1	8.1	26.5	3%	3%
PRoW6	4.3	22.7	11%	BESS4	7.4	25.8	3%	BESS4	10.1	28.5	3%	3%
PRoW7	0.5	18.9	9%	BESS4	0.9	19.3	2%	BESS4	1.3	19.7	2%	2%
PRoW8	0.4	18.8	9%	BESS1	0.5	18.9	2%	BESS2	0.7	19.1	2%	2%
PRoW9	0.6	19.0	10%	BESS5	0.8	19.2	2%	BESS5	1.0	19.4	2%	2%
PRoW10	0.8	19.2	10%	BESS6	1.2	19.6	2%	BESS4	1.6	20.0	2%	2%
PRoW11	0.4	18.8	9%	BESS6	0.5	18.9	2%	BESS6	0.6	19.0	2%	2%
PRoW12	0.4	18.8	9%	BESS4	0.5	18.9	2%	BESS4	0.7	19.1	2%	2%
PRoW13	0.4	18.8	9%	BESS4	0.6	19.0	2%	BESS4	0.7	19.1	2%	2%
PRoW14	0.9	19.3	10%	BESS2	1.5	19.9	2%	BESS2	2.0	20.4	2%	2%
PRoW15	0.4	18.8	9%	BESS1	0.5	18.9	2%	BESS1	0.6	19.0	2%	2%
PRoW16	0.5	18.9	9%	BESS6	0.8	19.2	2%	BESS6	1.1	19.5	2%	2%
PRoW17	5.3	23.7	12%	BESS4	9.2	27.6	3%	BESS4	12.1	30.5	3%	3%
PRoW18	0.4	18.8	9%	BESS2	0.5	18.9	2%	BESS2	0.6	19.0	2%	2%
AQAL	**200**				**941**				**941**			

Table D.8: Predicted Particulate Matter (PM_{10}) Concentrations

Receptor	Predicted PM_{10} Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	107.1	131.3	N/A	BESS1	167.4	191.6	N/A	BESS1	242.3	266.5	7%	BESS1
R2	49.7	73.9	N/A	BESS5	74.5	98.7	N/A	BESS5	105.8	130.0	3%	BESS5
R3	32.6	56.8	N/A	BESS1	48.3	72.5	N/A	BESS1	64.2	88.4	2%	BESS2
R4	21.6	45.8	N/A	BESS5	31.5	55.7	N/A	BESS1	35.6	59.8	1%	BESS2
R5	22.5	46.7	N/A	BESS1	34.0	58.2	N/A	BESS1	41.0	65.2	2%	BESS2
R6	28.1	52.3	N/A	BESS2	40.5	64.7	N/A	BESS2	49.2	73.4	2%	BESS2
R7	28.1	52.3	N/A	BESS2	47.3	71.5	N/A	BESS2	58.1	82.3	2%	BESS2
R8	24.6	48.8	N/A	BESS2	40.6	64.8	N/A	BESS2	52.8	77.0	2%	BESS2
R9	21.8	46.0	N/A	BESS2	32.2	56.4	N/A	BESS2	36.6	60.8	2%	BESS2
R10	21.1	45.3	N/A	BESS2	34.6	58.8	N/A	BESS2	41.6	65.8	2%	BESS2
R11	21.1	45.3	N/A	BESS5	32.8	57.0	N/A	BESS4	31.1	55.3	1%	BESS6
R12	21.9	46.1	N/A	BESS6	33.8	58.0	N/A	BESS4	41.7	65.9	2%	BESS6
R13	19.0	43.2	N/A	BESS3	31.2	55.4	N/A	BESS2	37.4	61.6	2%	BESS2
R14	42.4	66.6	N/A	BESS3	66.2	90.4	N/A	BESS3	83.7	107.9	3%	BESS6
R15	45.9	70.1	N/A	BESS6	77.1	101.3	N/A	BESS6	98.8	123.0	3%	BESS6
R16	20.7	44.9	N/A	BESS4	26.5	50.7	N/A	BESS4	29.1	53.3	1%	BESS4
R17	34.3	58.5	N/A	BESS4	45.7	69.9	N/A	BESS6	62.4	86.6	2%	BESS6
R18	28.3	52.5	N/A	BESS4	41.7	65.9	N/A	BESS4	58.1	82.3	2%	BESS4
R19	22.0	46.2	N/A	BESS6	29.9	54.1	N/A	BESS6	38.4	62.6	2%	BESS4
R20	39.9	64.1	N/A	BESS1	62.9	87.1	N/A	BESS1	93.2	117.4	3%	BESS1
PRoW1	211.1	235.3	N/A	BESS5	328.3	352.5	N/A	BESS5	451.4	475.6	12%	BESS5
PRoW2	543.1	567.3	N/A	BESS5	848.2	872.4	N/A	BESS5	1223.2	1247.4	31%	BESS5
PRoW3	381.7	405.9	N/A	BESS2	670.6	694.8	N/A	BESS2	931.0	955.2	24%	BESS2
PRoW4	269.5	293.7	N/A	BESS1	429.1	453.3	N/A	BESS1	613.4	637.6	16%	BESS1
PRoW5	239.5	263.7	N/A	BESS1	370.7	394.9	N/A	BESS1	537.3	561.5	14%	BESS1
PRoW6	285.8	310.0	N/A	BESS4	493.9	518.1	N/A	BESS4	673.3	697.5	17%	BESS4
PRoW7	35.3	59.5	N/A	BESS4	61.3	85.5	N/A	BESS4	85.3	109.5	3%	BESS4
PRoW8	23.6	47.8	N/A	BESS1	34.1	58.3	N/A	BESS2	45.7	69.9	2%	BESS1
PRoW9	40.1	64.3	N/A	BESS5	53.8	78.0	N/A	BESS5	68.8	93.0	2%	BESS5
PRoW10	52.0	76.2	N/A	BESS6	77.7	101.9	N/A	BESS4	107.6	131.8	3%	BESS4
PRoW11	24.4	48.6	N/A	BESS6	32.6	56.8	N/A	BESS6	41.6	65.8	2%	BESS4
PRoW12	23.9	48.1	N/A	BESS4	35.3	59.5	N/A	BESS4	49.2	73.3	2%	BESS4

Receptor	Predicted PM_{10} Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW13	26.6	50.8	N/A	BESS4	37.9	62.1	N/A	BESS4	49.1	73.3	2%	BESS4
PRoW14	58.6	82.8	N/A	BESS2	98.0	122.2	N/A	BESS2	134.9	159.1	4%	BESS2
PRoW15	24.1	48.3	N/A	BESS1	32.7	56.9	N/A	BESS1	40.2	64.4	2%	BESS1
PRoW16	36.1	60.3	N/A	BESS6	57.8	82.0	N/A	BESS6	76.0	100.2	3%	BESS6
PRoW17	350.1	374.3	N/A	BESS4	613.1	637.3	N/A	BESS4	803.0	827.2	21%	BESS4
PRoW18	24.2	48.4	N/A	BESS2	35.1	59.3	N/A	BESS2	40.4	64.6	2%	BESS2
AQAL	**None**				**None**				**4,000**			

Appendix E Additional Pollutant Modelling Results

The GridSolv testing report recorded maximum concentrations of several additional air pollutants beyond those typically advised to be assessed by UKHSA for similar BESS fire studies. The risk of air quality impacts from the additional pollutants that have corresponding AEGLs has been assessed below for completeness. Where not specified below, the methodology for the assessment of additional pollutants remains the same as that presented in Section 2.

Relevant Air Quality Assessment Levels

Acute Exposure Guideline Limits

Table E.1: AEGLs for BESS Fire Assessment Pollutants

Pollutant	Acute Exposure Guideline Limit (µg/m³)								
	1-hour			4-hour			8-hour		
	AEGL-1	AEGL-2	AEGL-3	AEGL-1	AEGL-2	AEGL-3	AEGL-1	AEGL-2	AEGL-3
1,3-butadiene	1,482,221	11,725,031	48,669,939	1,482,221	7,521,718	30,971,779	1,482,221	5,973,129	15,043,436
COS	None	13,5149	368,589	None	83,547	233,440	None	56,517	117,948
EtO	None	81,074	360,327	None	25,223	113,503	None	14,233	63,057
H_2SO4	200	8,700	160,000	200	8,700	110,000	200	8,700	93,000
HBr	3,309	132,368	397,104	3,309	33,092	102,585	3,309	16,546	49,638
MeOH	694,528	2,751,902	9,435,092	445,546	956,613	3,145,031	353,816	681,423	2,096,687
C_3H_8	9,919,571	30,660,491	59,517,423	9,919,571	30,660,491	59,517,423	9,919,571	30,660,491	59,517,423
1,3-butadiene	670	5,300	22,000	670	3,400	14,000	670	2,700	6,800

Pollutant	Acute Exposure Guideline Limit (µg/m³)								
	1-hour			4-hour			8-hour		
	AEGL-1	AEGL-2	AEGL-3	AEGL-1	AEGL-2	AEGL-3	AEGL-1	AEGL-2	AEGL-3
COS	None	55	150	None	34	95	None	23	48
EtO	None	45	200	None	14	63	None	7.9	35
H_2SO4	0.05	2.2	39.9	0.05	2.2	27.4	0.05	2.2	23.2
HBr	1	40	120	1	10	31	1	5	15
MeOH	530	2,100	7,200	340	730	2,400	270	520	1,600
C_3H_8	5,500	17,000	33,000	5,500	17,000	33,000	5,500	17,000	33,000

Emergency Response Planning Guidelines

Table E.2: ERPGs for BESS Fire Assessment Pollutants

Pollutant	1-hour Mean Emergency Response Planning Guidelines					
	ERPG-1		ERPG-2		ERPG-3	
	µg/m³	ppm	µg/m³	ppm	µg/m³	ppm
1,3-butadiene	22,123	10	1,106,135	500	11,061,350	5,000
EtO	None		90,082	50	900,818	500
H_2SO4	2,000	0.5	10,000	2.5	120,000	29.9
MeOH	262,086	200	1,310,429	1,000	6,552,147	5,000

Workplace Exposure Limits

Table E.3: WELs for BESS Fire Assessment Pollutants

Pollutant	Averaging Period	Workplace Exposure Limits (µg/m^3)	Workplace Exposure Limits (ppm)
CO_2	15-minute mean (applied to 1-hour model outputs)	27,000,000	15,000
	8-hour mean	9,000,000	5,000

Summary of Applied AQALs

Table E.4: Applied AQAL Per Pollutant

Pollutant	Applied AQAL (µg/m^3)					
	1-hour mean	Source	4-hour mean	Source	8-hour mean	Source
1,3-butadiene	22,123	ERPG-1	1,482,221	AEGL-1	1,482,221	AEGL-1
CO_2	27,000,000	WEL	None		9,000,000	WEL
COS	135,419	AEGL-2	83,547	AEGL-2	56,517	AEGL-2
EtO	81,074	AEGL-2	25,223	AEGL-2	14,233	AEGL-2
H_2SO4	200	AEGL-1	200	AEGL-1	200	AEGL-1
HBr	3,309	AEGL-1	3,309	AEGL-1	3,309	AEGL-1
MeOH	262,086	ERPG-1	445,546	AEGL-1	353,816	AEGL-1
C_3H_8	9,919,571	AEGL-1	9,919,571	AEGL-1	9,919,571	AEGL-1

Unit Conversion

The AQALs have been converted from parts per million (ppm) to µg/m^3 using the following conversion rate:

Equation 2: $$AQAL\ (\mu g m^{-3}) = \frac{AQAL\ (ppm) \times Molecular\ Weight \times 1000}{24.45}$$

The molecular weights used in the conversion are outlined in **Table E.5** below.

Table E.5: Molecular Weights used in Unit Conversion

Pollutant	Averaging Period
1,3-butadiene	54.09
CO_2	44.01
COS	60.08
EtO	44.05
H_2SO4	98.08
HBr	80.91
MeOH	32.04
C_3H_8	44.10

Derivation of Emission Rates

Core Scenario

Emission rates for the additional pollutants have been derived using the same methodology outlined in section 2.4 and are presented in **Table E.6** below.

Table E.6: Maximum pollutant concentrations measured above the initiating unit Error! Bookmark not defined.* **- Additional Pollutants**

Pollutant	Maximum concentration (ppm)	Maximum concentration (µg/m^3)
1,3 butadiene	12.4	27,432
Carbon dioxide (CO_2)	24,468.9	44,044,020
Carbonyl sulphide (COS)	0.6	1,474
Ethylene oxide (EtO)	0.4	721
Sulphuric acid (H_2SO4)	0.1	401

Pollutant	Maximum concentration (ppm)	Maximum concentration (µg/m³)
Hydrogen bromide (HBr)	15.4	50,962
Methanol (MeOH)	1.8	2,359
Propane (C_3H_8)	2.4	4,329

*Pollutants measured in the GridSolv testing report without AEGLs have been excluded from this assessment.

Sensitivity Scenario

As per the methodology presented in Section 2.4, emission rates have been doubled in the sensitivity scenario to account for the greater capacity BESS Units proposed as part of the Scheme compared to those described in the GridSolv testing report.

Background Concentrations

The background concentrations applied to the additional pollutants are presented in **Table E.7** below. It has been assumed that the short-term (1-hour, 4-hour and 8-hour) background concentration is twice the estimated long-term (annual mean) background concentration in accordance with Environment Agency guidance (Ref 4).

Where appropriate backgrounds are not available for pollutants due to an absence of background monitoring and/or modelling data, it has been assumed that background concentrations would be minimal, particularly in comparison to the predicted PC associated with a BESS fire. Background concentrations for these pollutants have therefore been assumed to be 0 µg/m³.

Table E.7: Applied Background Concentrations

Pollutant	Annual Mean Background Concentration (µg/m³)	Short-term Background Concentration (µg/m³)	Source
1,3-butadiene	0.08	0.17	DEFRA 2001 based background maps (Ref 9)
CO_2	774,000	1,548,000	National Oceanic & Atmospheric Administration (NOAA) Mauna Loa Global Monitoring Laboratory 2026 (Ref 10)
COS	0	0	No appropriate backgrounds available*
Ethylene oxide	0	0	No appropriate backgrounds available*
H_2SO4	0	0	No appropriate backgrounds available*
HBr	0	0	No appropriate backgrounds available*
MeOH	6.8	13.6	Air Quality Expert Group Non-Methane Volatile Organic

Pollutant	Annual Mean Background Concentration (µg/m^3)	Short-term Background Concentration (µg/m^3)	Source
			Compounds in the UK Report (Ref 14)
Propane	5.0	10.1	AURN London Marylebone 2025 (Ref 12)

* It should be noted that the predicted PECs presented in this appendix for these pollutants do not exceed 15% of the AQAL. As such, it is considered that the addition of a background concentration would not give rise to an exceedance of an AQAL and the absence of background data is not a significant limitation of this assessment.

Results

Core Scenario

Table E.8: Predicted 1,3-butadiene Concentrations

Receptor	Predicted 1,3-butadiene Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	5.9	6.0	<1%	BESS1	9.2	9.4	<1%	BESS1	13.3	13.5	<1%	BESS1
R2	2.7	2.9	<1%	BESS5	4.1	4.3	<1%	BESS5	5.8	6.0	<1%	BESS5
R3	1.8	2.0	<1%	BESS1	2.7	2.8	<1%	BESS1	3.5	3.7	<1%	BESS2
R4	1.2	1.4	<1%	BESS5	1.7	1.9	<1%	BESS1	2.0	2.1	<1%	BESS2
R5	1.2	1.4	<1%	BESS1	1.9	2.0	<1%	BESS1	2.2	2.4	<1%	BESS2
R6	1.5	1.7	<1%	BESS2	2.2	2.4	<1%	BESS2	2.7	2.9	<1%	BESS2
R7	1.5	1.7	<1%	BESS2	2.6	2.8	<1%	BESS2	3.2	3.4	<1%	BESS2
R8	1.4	1.5	<1%	BESS2	2.2	2.4	<1%	BESS2	2.9	3.1	<1%	BESS2
R9	1.2	1.4	<1%	BESS2	1.8	1.9	<1%	BESS2	2.0	2.2	<1%	BESS2
R10	1.2	1.3	<1%	BESS2	1.9	2.1	<1%	BESS2	2.3	2.4	<1%	BESS2
R11	1.2	1.3	<1%	BESS5	1.8	2.0	<1%	BESS4	1.7	1.9	<1%	BESS6
R12	1.2	1.4	<1%	BESS6	1.9	2.0	<1%	BESS4	2.3	2.5	<1%	BESS6
R13	1.0	1.2	<1%	BESS3	1.7	1.9	<1%	BESS2	2.1	2.2	<1%	BESS2
R14	2.3	2.5	<1%	BESS3	3.6	3.8	<1%	BESS3	4.6	4.8	<1%	BESS6
R15	2.5	2.7	<1%	BESS6	4.2	4.4	<1%	BESS6	5.4	5.6	<1%	BESS6
R16	1.1	1.3	<1%	BESS4	1.5	1.6	<1%	BESS4	1.6	1.8	<1%	BESS4
R17	1.9	2.0	<1%	BESS4	2.5	2.7	<1%	BESS6	3.4	3.6	<1%	BESS6
R18	1.6	1.7	<1%	BESS4	2.3	2.5	<1%	BESS4	3.2	3.4	<1%	BESS4
R19	1.2	1.4	<1%	BESS6	1.6	1.8	<1%	BESS6	2.1	2.3	<1%	BESS4
R20	2.2	2.4	<1%	BESS1	3.5	3.6	<1%	BESS1	5.1	5.3	<1%	BESS1
PRoW1	11.6	11.8	<1%	BESS5	18.0	18.2	<1%	BESS5	24.8	24.9	<1%	BESS5
PRoW2	29.8	30.0	<1%	BESS5	46.5	46.7	<1%	BESS5	67.1	67.3	<1%	BESS5
PRoW3	20.9	21.1	<1%	BESS2	36.8	37.0	<1%	BESS2	51.1	51.2	<1%	BESS2
PRoW4	14.8	15.0	<1%	BESS1	23.5	23.7	<1%	BESS1	33.7	33.8	<1%	BESS1
PRoW5	13.1	13.3	<1%	BESS1	20.3	20.5	<1%	BESS1	29.5	29.6	<1%	BESS1
PRoW6	15.7	15.8	<1%	BESS4	27.1	27.3	<1%	BESS4	36.9	37.1	<1%	BESS4

Receptor	Predicted 1,3-butadiene Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW7	1.9	2.1	<1%	BESS4	3.4	3.5	<1%	BESS4	4.7	4.8	<1%	BESS4
PRoW8	1.3	1.5	<1%	BESS1	1.9	2.0	<1%	BESS2	2.5	2.7	<1%	BESS1
PRoW9	2.2	2.4	<1%	BESS5	3.0	3.1	<1%	BESS5	3.8	3.9	<1%	BESS5
PRoW10	2.9	3.0	<1%	BESS6	4.3	4.4	<1%	BESS4	5.9	6.1	<1%	BESS4
PRoW11	1.3	1.5	<1%	BESS6	1.8	2.0	<1%	BESS6	2.3	2.4	<1%	BESS4
PRoW12	1.3	1.5	<1%	BESS4	1.9	2.1	<1%	BESS4	2.7	2.9	<1%	BESS4
PRoW13	1.5	1.6	<1%	BESS4	2.1	2.2	<1%	BESS4	2.7	2.9	<1%	BESS4
PRoW14	3.2	3.4	<1%	BESS2	5.4	5.5	<1%	BESS2	7.4	7.6	<1%	BESS2
PRoW15	1.3	1.5	<1%	BESS1	1.8	2.0	<1%	BESS1	2.2	2.4	<1%	BESS1
PRoW16	2.0	2.1	<1%	BESS6	3.2	3.3	<1%	BESS6	4.2	4.3	<1%	BESS6
PRoW17	19.2	19.4	<1%	BESS4	33.6	33.8	<1%	BESS4	44.1	44.2	<1%	BESS4
PRoW18	1.3	1.5	<1%	BESS2	1.9	2.1	<1%	BESS2	2.2	2.4	<1%	BESS2
AQAL	22,123				1,482,221				1,482,221			

Table E.9: Predicted Carbon Dioxide (CO_2) Concentrations

Receptor	Predicted CO_2 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	9434	1557434	6%	BESS1	14744	1562744	N/A	BESS1	21342	1569342	17%	BESS1
R2	4381	1552381	6%	BESS5	6566	1554566	N/A	BESS5	9316	1557316	17%	BESS5
R3	2873	1550873	6%	BESS1	4257	1552257	N/A	BESS1	5654	1553654	17%	BESS2
R4	1899	1549899	6%	BESS5	2777	1550777	N/A	BESS1	3139	1551139	17%	BESS2
R5	1979	1549979	6%	BESS1	2997	1550997	N/A	BESS1	3612	1551612	17%	BESS2
R6	2472	1550472	6%	BESS2	3569	1551569	N/A	BESS2	4331	1552331	17%	BESS2
R7	2472	1550472	6%	BESS2	4170	1552170	N/A	BESS2	5120	1553120	17%	BESS2
R8	2170	1550170	6%	BESS2	3574	1551574	N/A	BESS2	4648	1552648	17%	BESS2
R9	1918	1549918	6%	BESS2	2835	1550835	N/A	BESS2	3223	1551223	17%	BESS2
R10	1861	1549861	6%	BESS2	3044	1551044	N/A	BESS2	3667	1551667	17%	BESS2
R11	1861	1549861	6%	BESS5	2891	1550891	N/A	BESS4	2737	1550737	17%	BESS6
R12	1926	1549926	6%	BESS6	2980	1550980	N/A	BESS4	3677	1551677	17%	BESS6

Receptor	Predicted CO_2 Concentrations (µg/m^3)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit
R13	1678	1549678	6%	BESS3	2745	1550745	N/A	BESS2	3294	1551294	17%	BESS2
R14	3735	1551735	6%	BESS3	5829	1553829	N/A	BESS3	7373	1555373	17%	BESS6
R15	4045	1552045	6%	BESS6	6795	1554795	N/A	BESS6	8706	1556706	17%	BESS6
R16	1827	1549827	6%	BESS4	2333	1550333	N/A	BESS4	2561	1550561	17%	BESS4
R17	3025	1551025	6%	BESS4	4022	1552022	N/A	BESS6	5493	1553493	17%	BESS6
R18	2490	1550490	6%	BESS4	3671	1551671	N/A	BESS4	5116	1553116	17%	BESS4
R19	1938	1549938	6%	BESS6	2632	1550632	N/A	BESS6	3387	1551387	17%	BESS4
R20	3515	1551515	6%	BESS1	5544	1553544	N/A	BESS1	8207	1556207	17%	BESS1
PRoW1	18598	1566598	6%	BESS5	28918	1576918	N/A	BESS5	39765	1587765	18%	BESS5
PRoW2	47845	1595845	6%	BESS5	74719	1622719	N/A	BESS5	107746	1655746	18%	BESS5
PRoW3	33623	1581623	6%	BESS2	59076	1607076	N/A	BESS2	82011	1630011	18%	BESS2
PRoW4	23742	1571742	6%	BESS1	37797	1585797	N/A	BESS1	54031	1602031	18%	BESS1
PRoW5	21095	1569095	6%	BESS1	32657	1580657	N/A	BESS1	47326	1595326	18%	BESS1
PRoW6	25172	1573172	6%	BESS4	43504	1591504	N/A	BESS4	59308	1607308	18%	BESS4
PRoW7	3108	1551108	6%	BESS4	5399	1553399	N/A	BESS4	7510	1555510	17%	BESS4
PRoW8	2081	1550081	6%	BESS1	3005	1551005	N/A	BESS2	4025	1552025	17%	BESS1
PRoW9	3535	1551535	6%	BESS5	4737	1552737	N/A	BESS5	6062	1554062	17%	BESS5
PRoW10	4585	1552585	6%	BESS6	6843	1554843	N/A	BESS4	9481	1557481	17%	BESS4
PRoW11	2154	1550154	6%	BESS6	2875	1550875	N/A	BESS6	3665	1551665	17%	BESS4
PRoW12	2102	1550102	6%	BESS4	3106	1551106	N/A	BESS4	4330	1552330	17%	BESS4
PRoW13	2342	1550342	6%	BESS4	3338	1551338	N/A	BESS4	4324	1552324	17%	BESS4
PRoW14	5161	1553161	6%	BESS2	8634	1556634	N/A	BESS2	11880	1559880	17%	BESS2
PRoW15	2120	1550120	6%	BESS1	2876	1550876	N/A	BESS1	3538	1551538	17%	BESS1
PRoW16	3178	1551178	6%	BESS6	5087	1553087	N/A	BESS6	6698	1554698	17%	BESS6
PRoW17	30840	1578840	6%	BESS4	54007	1602007	N/A	BESS4	70739	1618739	18%	BESS4
PRoW18	2129	1550129	6%	BESS2	3094	1551094	N/A	BESS2	3557	1551557	17%	BESS2
AQAL	**27000000**				**None**				**9000000**			

Table E.10: Predicted Carbonyl Sulphide (COS) Concentrations

Receptor	Predicted COS Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	0.3	0.3	<1%	BESS1	0.5	0.5	<1%	BESS1	0.7	0.7	<1%	BESS1
R2	0.1	0.1	<1%	BESS5	0.2	0.2	<1%	BESS5	0.3	0.3	<1%	BESS5
R3	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS1	0.2	0.2	<1%	BESS2
R4	0.1	0.1	<1%	BESS5	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS2
R5	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS2
R6	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R7	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.2	0.2	<1%	BESS2
R8	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.2	0.2	<1%	BESS2
R9	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R10	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R11	0.1	0.1	<1%	BESS5	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS6
R12	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS6
R13	0.1	0.1	<1%	BESS3	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R14	0.1	0.1	<1%	BESS3	0.2	0.2	<1%	BESS3	0.2	0.2	<1%	BESS6
R15	0.1	0.1	<1%	BESS6	0.2	0.2	<1%	BESS6	0.3	0.3	<1%	BESS6
R16	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4
R17	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS6	0.2	0.2	<1%	BESS6
R18	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.2	0.2	<1%	BESS4
R19	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS4
R20	0.1	0.1	<1%	BESS1	0.2	0.2	<1%	BESS1	0.3	0.3	<1%	BESS1
PRoW1	0.6	0.6	<1%	BESS5	1.0	1.0	<1%	BESS5	1.3	1.3	<1%	BESS5
PRoW2	1.6	1.6	<1%	BESS5	2.5	2.5	<1%	BESS5	3.6	3.6	<1%	BESS5
PRoW3	1.1	1.1	<1%	BESS2	2.0	2.0	<1%	BESS2	2.7	2.7	<1%	BESS2
PRoW4	0.8	0.8	<1%	BESS1	1.3	1.3	<1%	BESS1	1.8	1.8	<1%	BESS1
PRoW5	0.7	0.7	<1%	BESS1	1.1	1.1	<1%	BESS1	1.6	1.6	<1%	BESS1
PRoW6	0.8	0.8	<1%	BESS4	1.5	1.5	<1%	BESS4	2.0	2.0	<1%	BESS4
PRoW7	0.1	0.1	<1%	BESS4	0.2	0.2	<1%	BESS4	0.3	0.3	<1%	BESS4
PRoW8	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS1
PRoW9	0.1	0.1	<1%	BESS5	0.2	0.2	<1%	BESS5	0.2	0.2	<1%	BESS5
PRoW10	0.2	0.2	<1%	BESS6	0.2	0.2	<1%	BESS4	0.3	0.3	<1%	BESS4
PRoW11	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS4
PRoW12	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4

Receptor	Predicted COS Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW13	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4
PRoW14	0.2	0.2	<1%	BESS2	0.3	0.3	<1%	BESS2	0.4	0.4	<1%	BESS2
PRoW15	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS1
PRoW16	0.1	0.1	<1%	BESS6	0.2	0.2	<1%	BESS6	0.2	0.2	<1%	BESS6
PRoW17	1.0	1.0	<1%	BESS4	1.8	1.8	<1%	BESS4	2.4	2.4	<1%	BESS4
PRoW18	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
AQAL	**135,149**				**83,547**				**56,517**			

Table E.11: Predicted Ethylene Oxide (EtO) Concentrations

Receptor	Predicted EtO Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	0.2	0.2	<1%	BESS1	0.2	0.2	<1%	BESS1	0.3	0.3	<1%	BESS1
R2	0.1	0.1	<1%	BESS5	0.1	0.1	<1%	BESS5	0.2	0.2	<1%	BESS5
R3	< 0.1	< 0.1	<1%	BESS1	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS2
R4	< 0.1	< 0.1	<1%	BESS5	< 0.1	< 0.1	<1%	BESS1	0.1	0.1	<1%	BESS2
R5	< 0.1	< 0.1	<1%	BESS1	< 0.1	< 0.1	<1%	BESS1	0.1	0.1	<1%	BESS2
R6	< 0.1	< 0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R7	< 0.1	< 0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R8	< 0.1	< 0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R9	< 0.1	< 0.1	<1%	BESS2	< 0.1	< 0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R10	< 0.1	< 0.1	<1%	BESS2	< 0.1	< 0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R11	< 0.1	< 0.1	<1%	BESS5	< 0.1	< 0.1	<1%	BESS4	< 0.1	< 0.1	<1%	BESS6
R12	< 0.1	< 0.1	<1%	BESS6	< 0.1	< 0.1	<1%	BESS4	0.1	0.1	<1%	BESS6
R13	< 0.1	< 0.1	<1%	BESS3	< 0.1	< 0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R14	0.1	0.1	<1%	BESS3	0.1	0.1	<1%	BESS3	0.1	0.1	<1%	BESS6
R15	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS6
R16	< 0.1	< 0.1	<1%	BESS4	< 0.1	< 0.1	<1%	BESS4	< 0.1	< 0.1	<1%	BESS4
R17	< 0.1	< 0.1	<1%	BESS4	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS6
R18	< 0.1	< 0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4

Receptor	Predicted EtO Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R19	< 0.1	< 0.1	<1%	BESS6	< 0.1	< 0.1	<1%	BESS6	0.1	0.1	<1%	BESS4
R20	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS1
PRoW1	0.3	0.3	<1%	BESS5	0.5	0.5	<1%	BESS5	0.7	0.7	<1%	BESS5
PRoW2	0.8	0.8	<1%	BESS5	1.2	1.2	<1%	BESS5	1.8	1.8	<1%	BESS5
PRoW3	0.6	0.6	<1%	BESS2	1.0	1.0	<1%	BESS2	1.3	1.3	<1%	BESS2
PRoW4	0.4	0.4	<1%	BESS1	0.6	0.6	<1%	BESS1	0.9	0.9	<1%	BESS1
PRoW5	0.3	0.3	<1%	BESS1	0.5	0.5	<1%	BESS1	0.8	0.8	<1%	BESS1
PRoW6	0.4	0.4	<1%	BESS4	0.7	0.7	<1%	BESS4	1.0	1.0	<1%	BESS4
PRoW7	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4
PRoW8	< 0.1	< 0.1	<1%	BESS1	< 0.1	< 0.1	<1%	BESS2	0.1	0.1	<1%	BESS1
PRoW9	0.1	0.1	<1%	BESS5	0.1	0.1	<1%	BESS5	0.1	0.1	<1%	BESS5
PRoW10	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS4	0.2	0.2	<1%	BESS4
PRoW11	< 0.1	< 0.1	<1%	BESS6	< 0.1	< 0.1	<1%	BESS6	0.1	0.1	<1%	BESS4
PRoW12	< 0.1	< 0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4
PRoW13	< 0.1	< 0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4
PRoW14	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.2	0.2	<1%	BESS2
PRoW15	< 0.1	< 0.1	<1%	BESS1	< 0.1	< 0.1	<1%	BESS1	0.1	0.1	<1%	BESS1
PRoW16	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS6
PRoW17	0.5	0.5	<1%	BESS4	0.9	0.9	<1%	BESS4	1.2	1.2	<1%	BESS4
PRoW18	< 0.1	< 0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
AQAL	**81,074**				**25,223**				**14,233**			

Table E.12: Predicted Sulphuric Acid (H_2SO_4) Concentrations

Receptor	Predicted H_2SO_4 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	0.1	0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS1	0.2	0.2	< 1%	BESS1
R2	< 0.1	< 0.1	< 1%	BESS5	0.1	0.1	< 1%	BESS5	0.1	0.1	< 1%	BESS5
R3	< 0.1	< 0.1	< 1%	BESS1	< 0.1	< 0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS2
R4	< 0.1	< 0.1	< 1%	BESS5	< 0.1	< 0.1	< 1%	BESS1	< 0.1	< 0.1	< 1%	BESS2
R5	< 0.1	< 0.1	< 1%	BESS1	< 0.1	< 0.1	< 1%	BESS1	< 0.1	< 0.1	< 1%	BESS2
R6	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS2
R7	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS2
R8	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS2
R9	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS2
R10	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS2
R11	< 0.1	< 0.1	< 1%	BESS5	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS6
R12	< 0.1	< 0.1	< 1%	BESS6	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS6
R13	< 0.1	< 0.1	< 1%	BESS3	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS2
R14	< 0.1	< 0.1	< 1%	BESS3	0.1	0.1	< 1%	BESS3	0.1	0.1	< 1%	BESS6
R15	< 0.1	< 0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS6
R16	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS4
R17	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS6
R18	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS4
R19	< 0.1	< 0.1	< 1%	BESS6	< 0.1	< 0.1	< 1%	BESS6	< 0.1	< 0.1	< 1%	BESS4
R20	< 0.1	< 0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS1
PRoW1	0.2	0.2	< 1%	BESS5	0.3	0.3	< 1%	BESS5	0.4	0.4	< 1%	BESS5
PRoW2	0.4	0.4	< 1%	BESS5	0.7	0.7	< 1%	BESS5	1.0	1.0	< 1%	BESS5
PRoW3	0.3	0.3	< 1%	BESS2	0.5	0.5	< 1%	BESS2	0.7	0.7	< 1%	BESS2
PRoW4	0.2	0.2	< 1%	BESS1	0.3	0.3	< 1%	BESS1	0.5	0.5	< 1%	BESS1
PRoW5	0.2	0.2	< 1%	BESS1	0.3	0.3	< 1%	BESS1	0.4	0.4	< 1%	BESS1
PRoW6	0.2	0.2	< 1%	BESS4	0.4	0.4	< 1%	BESS4	0.5	0.5	< 1%	BESS4
PRoW7	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS4	0.1	0.1	< 1%	BESS4
PRoW8	< 0.1	< 0.1	< 1%	BESS1	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS1
PRoW9	< 0.1	< 0.1	< 1%	BESS5	< 0.1	< 0.1	< 1%	BESS5	0.1	0.1	< 1%	BESS5
PRoW10	< 0.1	< 0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS4	0.1	0.1	< 1%	BESS4
PRoW11	< 0.1	< 0.1	< 1%	BESS6	< 0.1	< 0.1	< 1%	BESS6	< 0.1	< 0.1	< 1%	BESS4
PRoW12	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS4

Receptor	Predicted H_2SO_4 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW13	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS4
PRoW14	< 0.1	< 0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2
PRoW15	< 0.1	< 0.1	< 1%	BESS1	< 0.1	< 0.1	< 1%	BESS1	< 0.1	< 0.1	< 1%	BESS1
PRoW16	< 0.1	< 0.1	< 1%	BESS6	< 0.1	< 0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS6
PRoW17	0.3	0.3	< 1%	BESS4	0.5	0.5	< 1%	BESS4	0.6	0.6	< 1%	BESS4
PRoW18	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS2	< 0.1	< 0.1	< 1%	BESS2
AQAL	**200**				**200**				**200**			

Table E.13: Predicted Hydrogen Bromide (HBr) Concentrations

Receptor	Predicted HBr Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	10.9	10.9	<1%	BESS1	17.1	17.1	1%	BESS1	24.7	24.7	1%	BESS1
R2	5.1	5.1	<1%	BESS5	7.6	7.6	<1%	BESS5	10.8	10.8	<1%	BESS5
R3	3.3	3.3	<1%	BESS1	4.9	4.9	<1%	BESS1	6.5	6.5	<1%	BESS2
R4	2.2	2.2	<1%	BESS5	3.2	3.2	<1%	BESS1	3.6	3.6	<1%	BESS2
R5	2.3	2.3	<1%	BESS1	3.5	3.5	<1%	BESS1	4.2	4.2	<1%	BESS2
R6	2.9	2.9	<1%	BESS2	4.1	4.1	<1%	BESS2	5.0	5.0	<1%	BESS2
R7	2.9	2.9	<1%	BESS2	4.8	4.8	<1%	BESS2	5.9	5.9	<1%	BESS2
R8	2.5	2.5	<1%	BESS2	4.1	4.1	<1%	BESS2	5.4	5.4	<1%	BESS2
R9	2.2	2.2	<1%	BESS2	3.3	3.3	<1%	BESS2	3.7	3.7	<1%	BESS2
R10	2.2	2.2	<1%	BESS2	3.5	3.5	<1%	BESS2	4.2	4.2	<1%	BESS2
R11	2.2	2.2	<1%	BESS5	3.3	3.3	<1%	BESS4	3.2	3.2	<1%	BESS6
R12	2.2	2.2	<1%	BESS6	3.4	3.4	<1%	BESS4	4.3	4.3	<1%	BESS6
R13	1.9	1.9	<1%	BESS3	3.2	3.2	<1%	BESS2	3.8	3.8	<1%	BESS2
R14	4.3	4.3	<1%	BESS3	6.7	6.7	<1%	BESS3	8.5	8.5	<1%	BESS6
R15	4.7	4.7	<1%	BESS6	7.9	7.9	<1%	BESS6	10.1	10.1	<1%	BESS6
R16	2.1	2.1	<1%	BESS4	2.7	2.7	<1%	BESS4	3.0	3.0	<1%	BESS4
R17	3.5	3.5	<1%	BESS4	4.7	4.7	<1%	BESS6	6.4	6.4	<1%	BESS6

Receptor	Predicted HBr Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R18	2.9	2.9	<1%	BESS4	4.2	4.2	<1%	BESS4	5.9	5.9	<1%	BESS4
R19	2.2	2.2	<1%	BESS6	3.0	3.0	<1%	BESS6	3.9	3.9	<1%	BESS4
R20	4.1	4.1	<1%	BESS1	6.4	6.4	<1%	BESS1	9.5	9.5	<1%	BESS1
PRoW1	21.5	21.5	1%	BESS5	33.5	33.5	1%	BESS5	46.0	46.0	1%	BESS5
PRoW2	55.4	55.4	2%	BESS5	86.5	86.5	3%	BESS5	124.7	124.7	4%	BESS5
PRoW3	38.9	38.9	1%	BESS2	68.4	68.4	2%	BESS2	94.9	94.9	3%	BESS2
PRoW4	27.5	27.5	1%	BESS1	43.7	43.7	1%	BESS1	62.5	62.5	2%	BESS1
PRoW5	24.4	24.4	1%	BESS1	37.8	37.8	1%	BESS1	54.8	54.8	2%	BESS1
PRoW6	29.1	29.1	1%	BESS4	50.3	50.3	2%	BESS4	68.6	68.6	2%	BESS4
PRoW7	3.6	3.6	<1%	BESS4	6.2	6.2	<1%	BESS4	8.7	8.7	<1%	BESS4
PRoW8	2.4	2.4	<1%	BESS1	3.5	3.5	<1%	BESS2	4.7	4.7	<1%	BESS1
PRoW9	4.1	4.1	<1%	BESS5	5.5	5.5	<1%	BESS5	7.0	7.0	<1%	BESS5
PRoW10	5.3	5.3	<1%	BESS6	7.9	7.9	<1%	BESS4	11.0	11.0	<1%	BESS4
PRoW11	2.5	2.5	<1%	BESS6	3.3	3.3	<1%	BESS6	4.2	4.2	<1%	BESS4
PRoW12	2.4	2.4	<1%	BESS4	3.6	3.6	<1%	BESS4	5.0	5.0	<1%	BESS4
PRoW13	2.7	2.7	<1%	BESS4	3.9	3.9	<1%	BESS4	5.0	5.0	<1%	BESS4
PRoW14	6.0	6.0	<1%	BESS2	10.0	10.0	<1%	BESS2	13.7	13.7	<1%	BESS2
PRoW15	2.5	2.5	<1%	BESS1	3.3	3.3	<1%	BESS1	4.1	4.1	<1%	BESS1
PRoW16	3.7	3.7	<1%	BESS6	5.9	5.9	<1%	BESS6	7.8	7.8	<1%	BESS6
PRoW17	35.7	35.7	1%	BESS4	62.5	62.5	2%	BESS4	81.8	81.8	2%	BESS4
PRoW18	2.5	2.5	<1%	BESS2	3.6	3.6	<1%	BESS2	4.1	4.1	<1%	BESS2
AQAL	**3,309**				**3,309**				**3,309**			

Table E.14: Predicted Methanol (MeOH) Concentrations

Receptor	Predicted MeOH Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	0.5	14.1	< 1%	BESS1	0.8	14.4	< 1%	BESS1	1.1	14.8	< 1%	BESS1
R2	0.2	13.9	< 1%	BESS5	0.4	14.0	< 1%	BESS5	0.5	14.1	< 1%	BESS5
R3	0.2	13.8	< 1%	BESS1	0.2	13.9	< 1%	BESS1	0.3	13.9	< 1%	BESS2

Receptor	Predicted MeOH Concentrations (μg/m^3)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (μg/m^3)	Max PEC (μg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (μg/m^3)	Max PEC (μg/m^3)	PEC as % of AQAL	Worst BESS Unit	Max PC (μg/m^3)	Max PEC (μg/m^3)	PEC as % of AQAL	Worst BESS Unit
R4	0.1	13.7	< 1%	BESS5	0.1	13.8	< 1%	BESS1	0.2	13.8	< 1%	BESS2
R5	0.1	13.7	< 1%	BESS1	0.2	13.8	< 1%	BESS1	0.2	13.8	< 1%	BESS2
R6	0.1	13.8	< 1%	BESS2	0.2	13.8	< 1%	BESS2	0.2	13.9	< 1%	BESS2
R7	0.1	13.8	< 1%	BESS2	0.2	13.9	< 1%	BESS2	0.3	13.9	< 1%	BESS2
R8	0.1	13.7	< 1%	BESS2	0.2	13.8	< 1%	BESS2	0.2	13.9	< 1%	BESS2
R9	0.1	13.7	< 1%	BESS2	0.2	13.8	< 1%	BESS2	0.2	13.8	< 1%	BESS2
R10	0.1	13.7	< 1%	BESS2	0.2	13.8	< 1%	BESS2	0.2	13.8	< 1%	BESS2
R11	0.1	13.7	< 1%	BESS5	0.2	13.8	< 1%	BESS4	0.1	13.8	< 1%	BESS6
R12	0.1	13.7	< 1%	BESS6	0.2	13.8	< 1%	BESS4	0.2	13.8	< 1%	BESS6
R13	0.1	13.7	< 1%	BESS3	0.1	13.8	< 1%	BESS2	0.2	13.8	< 1%	BESS2
R14	0.2	13.8	< 1%	BESS3	0.3	13.9	< 1%	BESS3	0.4	14.0	< 1%	BESS6
R15	0.2	13.8	< 1%	BESS6	0.4	14.0	< 1%	BESS6	0.5	14.1	< 1%	BESS6
R16	0.1	13.7	< 1%	BESS4	0.1	13.8	< 1%	BESS4	0.1	13.8	< 1%	BESS4
R17	0.2	13.8	< 1%	BESS4	0.2	13.8	< 1%	BESS6	0.3	13.9	< 1%	BESS6
R18	0.1	13.8	< 1%	BESS4	0.2	13.8	< 1%	BESS4	0.3	13.9	< 1%	BESS4
R19	0.1	13.7	< 1%	BESS6	0.1	13.8	< 1%	BESS6	0.2	13.8	< 1%	BESS4
R20	0.2	13.8	< 1%	BESS1	0.3	13.9	< 1%	BESS1	0.4	14.1	< 1%	BESS1
PRoW1	1.0	14.6	< 1%	BESS5	1.5	15.2	< 1%	BESS5	2.1	15.8	< 1%	BESS5
PRoW2	2.6	16.2	< 1%	BESS5	4.0	17.6	< 1%	BESS5	5.8	19.4	< 1%	BESS5
PRoW3	1.8	15.4	< 1%	BESS2	3.2	16.8	< 1%	BESS2	4.4	18.0	< 1%	BESS2
PRoW4	1.3	14.9	< 1%	BESS1	2.0	15.7	< 1%	BESS1	2.9	16.5	< 1%	BESS1
PRoW5	1.1	14.8	< 1%	BESS1	1.7	15.4	< 1%	BESS1	2.5	16.2	< 1%	BESS1
PRoW6	1.3	15.0	< 1%	BESS4	2.3	16.0	< 1%	BESS4	3.2	16.8	< 1%	BESS4
PRoW7	0.2	13.8	< 1%	BESS4	0.3	13.9	< 1%	BESS4	0.4	14.0	< 1%	BESS4
PRoW8	0.1	13.7	< 1%	BESS1	0.2	13.8	< 1%	BESS2	0.2	13.8	< 1%	BESS1
PRoW9	0.2	13.8	< 1%	BESS5	0.3	13.9	< 1%	BESS5	0.3	14.0	< 1%	BESS5
PRoW10	0.2	13.9	< 1%	BESS6	0.4	14.0	< 1%	BESS4	0.5	14.1	< 1%	BESS4
PRoW11	0.1	13.7	< 1%	BESS6	0.2	13.8	< 1%	BESS6	0.2	13.8	< 1%	BESS4
PRoW12	0.1	13.7	< 1%	BESS4	0.2	13.8	< 1%	BESS4	0.2	13.9	< 1%	BESS4
PRoW13	0.1	13.8	< 1%	BESS4	0.2	13.8	< 1%	BESS4	0.2	13.9	< 1%	BESS4
PRoW14	0.3	13.9	< 1%	BESS2	0.5	14.1	< 1%	BESS2	0.6	14.3	< 1%	BESS2
PRoW15	0.1	13.7	< 1%	BESS1	0.2	13.8	< 1%	BESS1	0.2	13.8	< 1%	BESS1
PRoW16	0.2	13.8	< 1%	BESS6	0.3	13.9	< 1%	BESS6	0.4	14.0	< 1%	BESS6
PRoW17	1.7	15.3	< 1%	BESS4	2.9	16.5	< 1%	BESS4	3.8	17.4	< 1%	BESS4
PRoW18	0.1	13.7	< 1%	BESS2	0.2	13.8	< 1%	BESS2	0.2	13.8	< 1%	BESS2

Receptor	Predicted MeOH Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
AQAL	**262,086**				**445,546**				**353,816**			

Table E.15: Predicted Propane (C_3H_8) Concentrations

Receptor	Predicted C_3H_8 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	0.9	11.0	< 1%	BESS1	1.4	11.5	< 1%	BESS1	2.1	12.2	< 1%	BESS1
R2	0.4	10.5	< 1%	BESS5	0.6	10.7	< 1%	BESS5	0.9	11.0	< 1%	BESS5
R3	0.3	10.3	< 1%	BESS1	0.4	10.5	< 1%	BESS1	0.6	10.6	< 1%	BESS2
R4	0.2	10.2	< 1%	BESS5	0.3	10.3	< 1%	BESS1	0.3	10.4	< 1%	BESS2
R5	0.2	10.3	< 1%	BESS1	0.3	10.4	< 1%	BESS1	0.4	10.4	< 1%	BESS2
R6	0.2	10.3	< 1%	BESS2	0.4	10.4	< 1%	BESS2	0.4	10.5	< 1%	BESS2
R7	0.2	10.3	< 1%	BESS2	0.4	10.5	< 1%	BESS2	0.5	10.6	< 1%	BESS2
R8	0.2	10.3	< 1%	BESS2	0.4	10.4	< 1%	BESS2	0.5	10.5	< 1%	BESS2
R9	0.2	10.2	< 1%	BESS2	0.3	10.3	< 1%	BESS2	0.3	10.4	< 1%	BESS2
R10	0.2	10.2	< 1%	BESS2	0.3	10.4	< 1%	BESS2	0.4	10.4	< 1%	BESS2
R11	0.2	10.2	< 1%	BESS5	0.3	10.3	< 1%	BESS4	0.4	10.4	< 1%	BESS6
R12	0.2	10.2	< 1%	BESS6	0.3	10.4	< 1%	BESS4	0.4	10.4	< 1%	BESS6
R13	0.2	10.2	< 1%	BESS3	0.3	10.3	< 1%	BESS2	0.7	10.8	< 1%	BESS2
R14	0.4	10.4	< 1%	BESS3	0.6	10.6	< 1%	BESS3	0.9	10.9	< 1%	BESS6
R15	0.4	10.5	< 1%	BESS6	0.7	10.7	< 1%	BESS6	0.7	10.8	< 1%	BESS6
R16	0.2	10.2	< 1%	BESS4	0.2	10.3	< 1%	BESS4	0.5	10.6	< 1%	BESS4
R17	0.3	10.4	< 1%	BESS4	0.4	10.5	< 1%	BESS6	0.5	10.5	< 1%	BESS6
R18	0.2	10.3	< 1%	BESS4	0.4	10.4	< 1%	BESS4	0.5	10.6	< 1%	BESS4
R19	0.2	10.2	< 1%	BESS6	0.3	10.3	< 1%	BESS6	0.4	10.5	< 1%	BESS4
R20	0.3	10.4	< 1%	BESS1	0.5	10.6	< 1%	BESS1	0.8	10.9	< 1%	BESS1
PRoW1	1.8	11.9	< 1%	BESS5	2.8	12.9	< 1%	BESS5	3.9	14.0	< 1%	BESS5
PRoW2	4.7	14.8	< 1%	BESS5	7.3	17.4	< 1%	BESS5	10.6	20.6	< 1%	BESS5
PRoW3	3.3	13.4	< 1%	BESS2	5.8	15.9	< 1%	BESS2	8.1	18.1	< 1%	BESS2
PRoW4	2.3	12.4	< 1%	BESS1	3.7	13.8	< 1%	BESS1	5.3	15.4	< 1%	BESS1

Receptor	Predicted C_3H_8 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW5	2.1	12.1	< 1%	BESS1	3.2	13.3	< 1%	BESS1	4.7	14.7	< 1%	BESS1
PRoW6	2.5	12.5	< 1%	BESS4	4.3	14.3	< 1%	BESS4	5.8	15.9	< 1%	BESS4
PRoW7	0.3	10.4	< 1%	BESS4	0.5	10.6	< 1%	BESS4	0.7	10.8	< 1%	BESS4
PRoW8	0.2	10.3	< 1%	BESS1	0.3	10.4	< 1%	BESS2	0.4	10.5	< 1%	BESS1
PRoW9	0.3	10.4	< 1%	BESS5	0.5	10.5	< 1%	BESS5	0.9	11.0	< 1%	BESS5
PRoW10	0.5	10.5	< 1%	BESS6	0.7	10.7	< 1%	BESS4	0.9	11.0	< 1%	BESS4
PRoW11	0.2	10.3	< 1%	BESS6	0.3	10.3	< 1%	BESS6	0.4	10.4	< 1%	BESS4
PRoW12	0.2	10.3	< 1%	BESS4	0.3	10.4	< 1%	BESS4	0.4	10.5	< 1%	BESS4
PRoW13	0.2	10.3	< 1%	BESS4	0.3	10.4	< 1%	BESS4	0.5	10.5	< 1%	BESS4
PRoW14	0.5	10.6	< 1%	BESS2	0.8	10.9	< 1%	BESS2	1.2	11.2	< 1%	BESS2
PRoW15	0.2	10.3	< 1%	BESS1	0.3	10.3	< 1%	BESS1	0.7	10.7	< 1%	BESS1
PRoW16	0.3	10.4	< 1%	BESS6	0.5	10.6	< 1%	BESS6	2.8	12.9	< 1%	BESS6
PRoW17	3.0	13.1	< 1%	BESS4	5.3	15.4	< 1%	BESS4	7.0	17.0	< 1%	BESS4
PRoW18	0.2	10.3	< 1%	BESS2	0.3	10.4	< 1%	BESS2	0.3	10.4	< 1%	BESS2
AQAL	9,919,571				9,919,571				9,919,571			

Sensitivity Scenario

Table E.16: Predicted 1,3-butadiene Concentrations

Receptor	Predicted 1,3-butadiene Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	11.8	11.9	<1%	BESS1	18.4	18.5	<1%	BESS1	26.6	26.8	<1%	BESS1
R2	5.5	5.6	<1%	BESS5	8.2	8.3	<1%	BESS5	11.6	11.8	<1%	BESS5
R3	3.6	3.7	<1%	BESS1	5.3	5.5	<1%	BESS1	7.0	7.2	<1%	BESS2
R4	2.4	2.5	<1%	BESS5	3.5	3.6	<1%	BESS1	3.9	4.1	<1%	BESS2
R5	2.5	2.6	<1%	BESS1	3.7	3.9	<1%	BESS1	4.5	4.7	<1%	BESS2
R6	3.1	3.2	<1%	BESS2	4.4	4.6	<1%	BESS2	5.4	5.6	<1%	BESS2
R7	3.1	3.2	<1%	BESS2	5.2	5.4	<1%	BESS2	6.4	6.5	<1%	BESS2

Receptor	Predicted 1,3-butadiene Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R8	2.7	2.9	<1%	BESS2	4.5	4.6	<1%	BESS2	5.8	6.0	<1%	BESS2
R9	2.4	2.6	<1%	BESS2	3.5	3.7	<1%	BESS2	4.0	4.2	<1%	BESS2
R10	2.3	2.5	<1%	BESS2	3.8	4.0	<1%	BESS2	4.6	4.7	<1%	BESS2
R11	2.3	2.5	<1%	BESS5	3.6	3.8	<1%	BESS4	3.4	3.6	<1%	BESS6
R12	2.4	2.6	<1%	BESS6	3.7	3.9	<1%	BESS4	4.6	4.7	<1%	BESS6
R13	2.1	2.3	<1%	BESS3	3.4	3.6	<1%	BESS2	4.1	4.3	<1%	BESS2
R14	4.7	4.8	<1%	BESS3	7.3	7.4	<1%	BESS3	9.2	9.4	<1%	BESS6
R15	5.0	5.2	<1%	BESS6	8.5	8.6	<1%	BESS6	10.8	11.0	<1%	BESS6
R16	2.3	2.4	<1%	BESS4	2.9	3.1	<1%	BESS4	3.2	3.4	<1%	BESS4
R17	3.8	3.9	<1%	BESS4	5.0	5.2	<1%	BESS6	6.8	7.0	<1%	BESS6
R18	3.1	3.3	<1%	BESS4	4.6	4.7	<1%	BESS4	6.4	6.5	<1%	BESS4
R19	2.4	2.6	<1%	BESS6	3.3	3.4	<1%	BESS6	4.2	4.4	<1%	BESS4
R20	4.4	4.5	<1%	BESS1	6.9	7.1	<1%	BESS1	10.2	10.4	<1%	BESS1
PRoW1	23.2	23.3	<1%	BESS5	36.0	36.2	<1%	BESS5	49.5	49.7	<1%	BESS5
PRoW2	59.6	59.8	<1%	BESS5	93.1	93.2	<1%	BESS5	134.2	134.4	<1%	BESS5
PRoW3	41.9	42.1	<1%	BESS2	73.6	73.8	<1%	BESS2	102.2	102.3	<1%	BESS2
PRoW4	29.6	29.7	<1%	BESS1	47.1	47.3	<1%	BESS1	67.3	67.5	<1%	BESS1
PRoW5	26.3	26.4	<1%	BESS1	40.7	40.8	<1%	BESS1	59.0	59.1	<1%	BESS1
PRoW6	31.4	31.5	<1%	BESS4	54.2	54.4	<1%	BESS4	73.9	74.0	<1%	BESS4
PRoW7	3.9	4.0	<1%	BESS4	6.7	6.9	<1%	BESS4	9.4	9.5	<1%	BESS4
PRoW8	2.6	2.8	<1%	BESS1	3.7	3.9	<1%	BESS2	5.0	5.2	<1%	BESS1
PRoW9	4.4	4.6	<1%	BESS5	5.9	6.1	<1%	BESS5	7.6	7.7	<1%	BESS5
PRoW10	5.7	5.9	<1%	BESS6	8.5	8.7	<1%	BESS4	11.8	12.0	<1%	BESS4
PRoW11	2.7	2.8	<1%	BESS6	3.6	3.7	<1%	BESS6	4.6	4.7	<1%	BESS4
PRoW12	2.6	2.8	<1%	BESS4	3.9	4.0	<1%	BESS4	5.4	5.6	<1%	BESS4
PRoW13	2.9	3.1	<1%	BESS4	4.2	4.3	<1%	BESS4	5.4	5.6	<1%	BESS4
PRoW14	6.4	6.6	<1%	BESS2	10.8	10.9	<1%	BESS2	14.8	15.0	<1%	BESS2
PRoW15	2.6	2.8	<1%	BESS1	3.6	3.8	<1%	BESS1	4.4	4.6	<1%	BESS1
PRoW16	4.0	4.1	<1%	BESS6	6.3	6.5	<1%	BESS6	8.3	8.5	<1%	BESS6
PRoW17	38.4	38.6	<1%	BESS4	67.3	67.4	<1%	BESS4	88.1	88.3	<1%	BESS4
PRoW18	2.7	2.8	<1%	BESS2	3.9	4.0	<1%	BESS2	4.4	4.6	<1%	BESS2
AQAL	**22,123**				**1,482,221**				**1,482,221**			

Table E.17: Predicted Carbon Dioxide (CO_2) Concentrations

Receptor	Predicted CO_2 Concentrations ($\mu g/m^3$)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC ($\mu g/m^3$)	Max PEC ($\mu g/m^3$)	PEC as % of AQAL	Worst BESS Unit	Max PC ($\mu g/m^3$)	Max PEC ($\mu g/m^3$)	PEC as % of AQAL	Worst BESS Unit	Max PC ($\mu g/m^3$)	Max PEC ($\mu g/m^3$)	PEC as % of AQAL	Worst BESS Unit
R1	18868	1566868	6%	BESS1	29488	1577488	N/A	BESS1	42685	1590685	18%	BESS1
R2	8762	1556762	6%	BESS5	13131	1561131	N/A	BESS5	18632	1566632	17%	BESS5
R3	5747	1553747	6%	BESS1	8515	1556515	N/A	BESS1	11308	1559308	17%	BESS2
R4	3799	1551799	6%	BESS5	5554	1553554	N/A	BESS1	6277	1554277	17%	BESS2
R5	3957	1551957	6%	BESS1	5994	1553994	N/A	BESS1	7223	1555223	17%	BESS2
R6	4944	1552944	6%	BESS2	7138	1555138	N/A	BESS2	8661	1556661	17%	BESS2
R7	4945	1552945	6%	BESS2	8339	1556339	N/A	BESS2	10240	1558240	17%	BESS2
R8	4340	1552340	6%	BESS2	7149	1555149	N/A	BESS2	9295	1557295	17%	BESS2
R9	3837	1551837	6%	BESS2	5669	1553669	N/A	BESS2	6446	1554446	17%	BESS2
R10	3722	1551722	6%	BESS2	6087	1554087	N/A	BESS2	7334	1555334	17%	BESS2
R11	3723	1551723	6%	BESS5	5781	1553781	N/A	BESS4	5474	1553474	17%	BESS6
R12	3852	1551852	6%	BESS6	5960	1553960	N/A	BESS4	7354	1555354	17%	BESS6
R13	3356	1551356	6%	BESS3	5489	1553489	N/A	BESS2	6587	1554587	17%	BESS2
R14	7470	1555470	6%	BESS3	11657	1559657	N/A	BESS3	14747	1562747	17%	BESS6
R15	8091	1556091	6%	BESS6	13590	1561590	N/A	BESS6	17411	1565411	17%	BESS6
R16	3653	1551653	6%	BESS4	4666	1552666	N/A	BESS4	5121	1553121	17%	BESS4
R17	6050	1554050	6%	BESS4	8045	1556045	N/A	BESS6	10986	1558986	17%	BESS6
R18	4980	1552980	6%	BESS4	7343	1555343	N/A	BESS4	10233	1558233	17%	BESS4
R19	3875	1551875	6%	BESS6	5263	1553263	N/A	BESS6	6773	1554773	17%	BESS4
R20	7030	1555030	6%	BESS1	11088	1559088	N/A	BESS1	16414	1564414	17%	BESS1
PRoW1	37196	1585196	6%	BESS5	57835	1605835	N/A	BESS5	79530	1627530	18%	BESS5
PRoW2	95690	1643690	6%	BESS5	149437	1697437	N/A	BESS5	215491	1763491	20%	BESS5
PRoW3	67246	1615246	6%	BESS2	118152	1666152	N/A	BESS2	164021	1712021	19%	BESS2
PRoW4	47485	1595485	6%	BESS1	75594	1623594	N/A	BESS1	108063	1656063	18%	BESS1
PRoW5	42189	1590189	6%	BESS1	65314	1613314	N/A	BESS1	94653	1642653	18%	BESS1
PRoW6	50344	1598344	6%	BESS4	87008	1635008	N/A	BESS4	118615	1666615	19%	BESS4
PRoW7	6217	1554217	6%	BESS4	10798	1558798	N/A	BESS4	15020	1563020	17%	BESS4
PRoW8	4162	1552162	6%	BESS1	6011	1554011	N/A	BESS2	8050	1556050	17%	BESS1
PRoW9	7069	1555069	6%	BESS5	9474	1557474	N/A	BESS5	12125	1560125	17%	BESS5
PRoW10	9170	1557170	6%	BESS6	13687	1561687	N/A	BESS4	18963	1566963	17%	BESS4
PRoW11	4307	1552307	6%	BESS6	5750	1553750	N/A	BESS6	7331	1555331	17%	BESS4
PRoW12	4205	1552205	6%	BESS4	6211	1554211	N/A	BESS4	8659	1556659	17%	BESS4

Receptor	Predicted CO_2 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW13	4685	1552685	6%	BESS4	6675	1554675	N/A	BESS4	8648	1556648	17%	BESS4
PRoW14	10323	1558323	6%	BESS2	17268	1565268	N/A	BESS2	23760	1571760	17%	BESS2
PRoW15	4240	1552240	6%	BESS1	5753	1553753	N/A	BESS1	7076	1555076	17%	BESS1
PRoW16	6356	1554356	6%	BESS6	10175	1558175	N/A	BESS6	13396	1561396	17%	BESS6
PRoW17	61680	1609680	6%	BESS4	108014	1656014	N/A	BESS4	141478	1689478	19%	BESS4
PRoW18	4257	1552257	6%	BESS2	6189	1554189	N/A	BESS2	7115	1555115	17%	BESS2
AQAL	**27000000**				**None**				**9000000**			

Table E.18: Predicted Carbonyl Sulphide (COS) Concentrations

Receptor	Predicted COS Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	0.6	0.6	<1%	BESS1	1.0	1.0	<1%	BESS1	1.4	1.4	<1%	BESS1
R2	0.3	0.3	<1%	BESS5	0.4	0.4	<1%	BESS5	0.5	0.5	<1%	BESS5
R3	0.2	0.2	<1%	BESS1	0.3	0.3	<1%	BESS1	0.4	0.4	<1%	BESS2
R4	0.1	0.1	<1%	BESS5	0.2	0.2	<1%	BESS1	0.2	0.2	<1%	BESS2
R5	0.1	0.1	<1%	BESS1	0.2	0.2	<1%	BESS1	0.2	0.2	<1%	BESS2
R6	0.2	0.2	<1%	BESS2	0.2	0.2	<1%	BESS2	0.2	0.2	<1%	BESS2
R7	0.2	0.2	<1%	BESS2	0.2	0.2	<1%	BESS2	0.2	0.2	<1%	BESS2
R8	0.1	0.1	<1%	BESS2	0.2	0.2	<1%	BESS2	0.2	0.2	<1%	BESS2
R9	0.1	0.1	<1%	BESS2	0.2	0.2	<1%	BESS2	0.2	0.2	<1%	BESS2
R10	0.1	0.1	<1%	BESS2	0.2	0.2	<1%	BESS2	0.2	0.2	<1%	BESS2
R11	0.1	0.1	<1%	BESS5	0.2	0.2	<1%	BESS4	0.2	0.2	<1%	BESS6
R12	0.1	0.1	<1%	BESS6	0.2	0.2	<1%	BESS4	0.2	0.2	<1%	BESS6
R13	0.1	0.1	<1%	BESS3	0.2	0.2	<1%	BESS2	0.2	0.2	<1%	BESS2
R14	0.3	0.3	<1%	BESS3	0.2	0.2	<1%	BESS3	0.3	0.3	<1%	BESS6
R15	0.3	0.3	<1%	BESS6	0.2	0.2	<1%	BESS6	0.3	0.3	<1%	BESS6
R16	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4
R17	0.2	0.2	<1%	BESS4	0.2	0.2	<1%	BESS6	0.2	0.2	<1%	BESS6
R18	0.2	0.2	<1%	BESS4	0.1	0.1	<1%	BESS4	0.2	0.2	<1%	BESS4

Receptor	Predicted COS Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R19	0.1	0.1	<1%	BESS6	0.2	0.2	<1%	BESS6	0.2	0.2	<1%	BESS4
R20	0.2	0.2	<1%	BESS1	0.4	0.4	<1%	BESS1	0.5	0.5	<1%	BESS1
PRoW1	1.2	1.2	<1%	BESS5	1.8	1.8	<1%	BESS5	2.6	2.6	<1%	BESS5
PRoW2	3.2	3.2	<1%	BESS5	2.2	2.2	<1%	BESS5	3.0	3.0	<1%	BESS5
PRoW3	2.3	2.3	<1%	BESS2	1.1	1.1	<1%	BESS2	1.5	1.5	<1%	BESS2
PRoW4	1.6	1.6	<1%	BESS1	2.5	2.5	<1%	BESS1	3.6	3.6	<1%	BESS1
PRoW5	1.4	1.4	<1%	BESS1	2.2	2.2	<1%	BESS1	3.2	3.2	<1%	BESS1
PRoW6	1.7	1.7	<1%	BESS4	0.8	0.8	<1%	BESS4	1.1	1.1	<1%	BESS4
PRoW7	0.2	0.2	<1%	BESS4	0.3	0.3	<1%	BESS4	0.4	0.4	<1%	BESS4
PRoW8	0.1	0.1	<1%	BESS1	0.2	0.2	<1%	BESS2	0.3	0.3	<1%	BESS1
PRoW9	0.2	0.2	<1%	BESS5	0.3	0.3	<1%	BESS5	0.4	0.4	<1%	BESS5
PRoW10	0.3	0.3	<1%	BESS6	0.2	0.2	<1%	BESS4	0.3	0.3	<1%	BESS4
PRoW11	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS6	0.2	0.2	<1%	BESS4
PRoW12	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.2	0.2	<1%	BESS4
PRoW13	0.2	0.2	<1%	BESS4	0.2	0.2	<1%	BESS4	0.2	0.2	<1%	BESS4
PRoW14	0.3	0.3	<1%	BESS2	0.3	0.3	<1%	BESS2	0.5	0.5	<1%	BESS2
PRoW15	0.1	0.1	<1%	BESS1	0.2	0.2	<1%	BESS1	0.2	0.2	<1%	BESS1
PRoW16	0.2	0.2	<1%	BESS6	0.2	0.2	<1%	BESS6	0.3	0.3	<1%	BESS6
PRoW17	2.1	2.1	<1%	BESS4	0.4	0.4	<1%	BESS4	0.5	0.5	<1%	BESS4
PRoW18	0.1	0.1	<1%	BESS2	0.2	0.2	<1%	BESS2	0.2	0.2	<1%	BESS2
AQAL	**135,149**				**83,547**				**56,517**			

Table E.19: Predicted Ethylene Oxide (EtO) Concentrations

Receptor	Predicted EtO Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	0.3	0.3	<1%	BESS1	0.5	0.5	<1%	BESS1	0.7	0.7	<1%	BESS1
R2	0.1	0.1	<1%	BESS5	0.2	0.2	<1%	BESS5	0.3	0.3	<1%	BESS5
R3	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS1	0.2	0.2	<1%	BESS2
R4	0.1	0.1	<1%	BESS5	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS2
R5	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS2
R6	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R7	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.2	0.2	<1%	BESS2
R8	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.2	0.2	<1%	BESS2
R9	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R10	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R11	0.1	0.1	<1%	BESS5	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS6
R12	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS6
R13	0.1	0.1	<1%	BESS3	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
R14	0.1	0.1	<1%	BESS3	0.2	0.2	<1%	BESS3	0.2	0.2	<1%	BESS6
R15	0.1	0.1	<1%	BESS6	0.2	0.2	<1%	BESS6	0.3	0.3	<1%	BESS6
R16	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4
R17	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS6	0.2	0.2	<1%	BESS6
R18	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.2	0.2	<1%	BESS4
R19	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS4
R20	0.1	0.1	<1%	BESS1	0.2	0.2	<1%	BESS1	0.3	0.3	<1%	BESS1
PRoW1	0.6	0.6	<1%	BESS5	0.9	0.9	<1%	BESS5	1.3	1.3	<1%	BESS5
PRoW2	1.6	1.6	<1%	BESS5	2.4	2.4	<1%	BESS5	3.5	3.5	<1%	BESS5
PRoW3	1.1	1.1	<1%	BESS2	1.9	1.9	<1%	BESS2	2.7	2.7	<1%	BESS2
PRoW4	0.8	0.8	<1%	BESS1	1.2	1.2	<1%	BESS1	1.8	1.8	<1%	BESS1
PRoW5	0.7	0.7	<1%	BESS1	1.1	1.1	<1%	BESS1	1.5	1.5	<1%	BESS1
PRoW6	0.8	0.8	<1%	BESS4	1.4	1.4	<1%	BESS4	1.9	1.9	<1%	BESS4
PRoW7	0.1	0.1	<1%	BESS4	0.2	0.2	<1%	BESS4	0.2	0.2	<1%	BESS4
PRoW8	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS1
PRoW9	0.1	0.1	<1%	BESS5	0.2	0.2	<1%	BESS5	0.2	0.2	<1%	BESS5
PRoW10	0.2	0.2	<1%	BESS6	0.2	0.2	<1%	BESS4	0.3	0.3	<1%	BESS4
PRoW11	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS6	0.1	0.1	<1%	BESS4
PRoW12	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4

Receptor	Predicted EtO Concentrations ($\mu g/m^3$)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC ($\mu g/m^3$)	Max PEC ($\mu g/m^3$)	PEC as % of AQAL	Worst BESS Unit	Max PC ($\mu g/m^3$)	Max PEC ($\mu g/m^3$)	PEC as % of AQAL	Worst BESS Unit	Max PC ($\mu g/m^3$)	Max PEC ($\mu g/m^3$)	PEC as % of AQAL	Worst BESS Unit
PRoW13	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4	0.1	0.1	<1%	BESS4
PRoW14	0.2	0.2	<1%	BESS2	0.3	0.3	<1%	BESS2	0.4	0.4	<1%	BESS2
PRoW15	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS1	0.1	0.1	<1%	BESS1
PRoW16	0.1	0.1	<1%	BESS6	0.2	0.2	<1%	BESS6	0.2	0.2	<1%	BESS6
PRoW17	1.0	1.0	<1%	BESS4	1.8	1.8	<1%	BESS4	2.3	2.3	<1%	BESS4
PRoW18	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2	0.1	0.1	<1%	BESS2
AQAL	**81,074**				**25,223**				**14,233**			

Table E.20: Predicted Sulphuric Acid (H_2SO_4) Concentrations

Receptor	Predicted H_2SO_4 Concentrations ($\mu g/m^3$)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC ($\mu g/m^3$)	Max PEC ($\mu g/m^3$)	PEC as % of AQAL	Worst BESS Unit	Max PC ($\mu g/m^3$)	Max PEC ($\mu g/m^3$)	PEC as % of AQAL	Worst BESS Unit	Max PC ($\mu g/m^3$)	Max PEC ($\mu g/m^3$)	PEC as % of AQAL	Worst BESS Unit
R1	0.2	0.2	< 1%	BESS1	0.3	0.3	< 1%	BESS1	0.4	0.4	< 1%	BESS1
R2	0.1	0.1	< 1%	BESS5	0.1	0.1	< 1%	BESS5	0.2	0.2	< 1%	BESS5
R3	0.1	0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS2
R4	< 0.1	< 0.1	< 1%	BESS5	0.1	0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS2
R5	< 0.1	< 0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS2
R6	< 0.1	< 0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2
R7	< 0.1	< 0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2
R8	< 0.1	< 0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2
R9	< 0.1	< 0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2
R10	< 0.1	< 0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2
R11	< 0.1	< 0.1	< 1%	BESS5	0.1	0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS6
R12	< 0.1	< 0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS4	0.1	0.1	< 1%	BESS6
R13	< 0.1	< 0.1	< 1%	BESS3	< 0.1	< 0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2
R14	0.1	0.1	< 1%	BESS3	0.1	0.1	< 1%	BESS3	0.1	0.1	< 1%	BESS6
R15	0.1	0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS6	0.2	0.2	< 1%	BESS6
R16	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS4	< 0.1	< 0.1	< 1%	BESS4
R17	0.1	0.1	< 1%	BESS4	0.1	0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS6
R18	< 0.1	< 0.1	< 1%	BESS4	0.1	0.1	< 1%	BESS4	0.1	0.1	< 1%	BESS4

Receptor	Predicted H_2SO_4 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R19	< 0.1	< 0.1	< 1%	BESS6	< 0.1	< 0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS4
R20	0.1	0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS1
PRoW1	0.3	0.3	< 1%	BESS5	0.5	0.5	< 1%	BESS5	0.7	0.7	< 1%	BESS5
PRoW2	0.9	0.9	< 1%	BESS5	1.4	1.4	< 1%	BESS5	2.0	2.0	1%	BESS5
PRoW3	0.6	0.6	< 1%	BESS2	1.1	1.1	< 1%	BESS2	1.5	1.5	1%	BESS2
PRoW4	0.4	0.4	< 1%	BESS1	0.7	0.7	< 1%	BESS1	1.0	1.0	< 1%	BESS1
PRoW5	0.4	0.4	< 1%	BESS1	0.6	0.6	< 1%	BESS1	0.9	0.9	< 1%	BESS1
PRoW6	0.5	0.5	< 1%	BESS4	0.8	0.8	< 1%	BESS4	1.1	1.1	1%	BESS4
PRoW7	0.1	0.1	< 1%	BESS4	0.1	0.1	< 1%	BESS4	0.1	0.1	< 1%	BESS4
PRoW8	< 0.1	< 0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS1
PRoW9	0.1	0.1	< 1%	BESS5	0.1	0.1	< 1%	BESS5	0.1	0.1	< 1%	BESS5
PRoW10	0.1	0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS4	0.2	0.2	< 1%	BESS4
PRoW11	< 0.1	< 0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS4
PRoW12	< 0.1	< 0.1	< 1%	BESS4	0.1	0.1	< 1%	BESS4	0.1	0.1	< 1%	BESS4
PRoW13	< 0.1	< 0.1	< 1%	BESS4	0.1	0.1	< 1%	BESS4	0.1	0.1	< 1%	BESS4
PRoW14	0.1	0.1	< 1%	BESS2	0.2	0.2	< 1%	BESS2	0.2	0.2	< 1%	BESS2
PRoW15	< 0.1	< 0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS1	0.1	0.1	< 1%	BESS1
PRoW16	0.1	0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS6	0.1	0.1	< 1%	BESS6
PRoW17	0.6	0.6	< 1%	BESS4	1.0	1.0	< 1%	BESS4	1.3	1.3	1%	BESS4
PRoW18	< 0.1	< 0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2	0.1	0.1	< 1%	BESS2
AQAL	**200**				**200**				**200**			

Table E.21: Predicted Hydrogen Bromide (HBr) Concentrations

Receptor	Predicted HBr Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	21.8	21.8	1%	BESS1	34.1	34.1	1%	BESS1	49.4	49.4	1%	BESS1
R2	10.1	10.1	< 1%	BESS5	15.2	15.2	<1%	BESS5	21.6	21.6	1%	BESS5
R3	6.6	6.6	< 1%	BESS1	9.9	9.9	<1%	BESS1	13.1	13.1	<1%	BESS2
R4	4.4	4.4	< 1%	BESS5	6.4	6.4	<1%	BESS1	7.3	7.3	<1%	BESS2

Receptor	Predicted HBr Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R5	4.6	4.6	< 1%	BESS1	6.9	6.9	<1%	BESS1	8.4	8.4	<1%	BESS2
R6	5.7	5.7	< 1%	BESS2	8.3	8.3	<1%	BESS2	10.0	10.0	<1%	BESS2
R7	5.7	5.7	< 1%	BESS2	9.6	9.6	<1%	BESS2	11.8	11.8	<1%	BESS2
R8	5.0	5.0	< 1%	BESS2	8.3	8.3	<1%	BESS2	10.8	10.8	<1%	BESS2
R9	4.4	4.4	< 1%	BESS2	6.6	6.6	<1%	BESS2	7.5	7.5	<1%	BESS2
R10	4.3	4.3	< 1%	BESS2	7.0	7.0	<1%	BESS2	8.5	8.5	<1%	BESS2
R11	4.3	4.3	< 1%	BESS5	6.7	6.7	<1%	BESS4	6.3	6.3	<1%	BESS6
R12	4.5	4.5	< 1%	BESS6	6.9	6.9	<1%	BESS4	8.5	8.5	<1%	BESS6
R13	3.9	3.9	< 1%	BESS3	6.4	6.4	<1%	BESS2	7.6	7.6	<1%	BESS2
R14	8.6	8.6	< 1%	BESS3	13.5	13.5	<1%	BESS3	17.1	17.1	1%	BESS6
R15	9.4	9.4	< 1%	BESS6	15.7	15.7	<1%	BESS6	20.1	20.1	1%	BESS6
R16	4.2	4.2	< 1%	BESS4	5.4	5.4	<1%	BESS4	5.9	5.9	<1%	BESS4
R17	7.0	7.0	< 1%	BESS4	9.3	9.3	<1%	BESS6	12.7	12.7	<1%	BESS6
R18	5.8	5.8	< 1%	BESS4	8.5	8.5	<1%	BESS4	11.8	11.8	<1%	BESS4
R19	4.5	4.5	< 1%	BESS6	6.1	6.1	<1%	BESS6	7.8	7.8	<1%	BESS4
R20	8.1	8.1	< 1%	BESS1	12.8	12.8	<1%	BESS1	19.0	19.0	1%	BESS1
PRoW1	43.0	43.0	1%	BESS5	66.9	66.9	2%	BESS5	92.0	92.0	3%	BESS5
PRoW2	110.7	110.7	3%	BESS5	172.9	172.9	5%	BESS5	249.3	249.3	8%	BESS5
PRoW3	77.8	77.8	2%	BESS2	136.7	136.7	4%	BESS2	189.8	189.8	6%	BESS2
PRoW4	54.9	54.9	2%	BESS1	87.5	87.5	3%	BESS1	125.0	125.0	4%	BESS1
PRoW5	48.8	48.8	1%	BESS1	75.6	75.6	2%	BESS1	109.5	109.5	3%	BESS1
PRoW6	58.3	58.3	2%	BESS4	100.7	100.7	3%	BESS4	137.2	137.2	4%	BESS4
PRoW7	7.2	7.2	< 1%	BESS4	12.5	12.5	<1%	BESS4	17.4	17.4	1%	BESS4
PRoW8	4.8	4.8	< 1%	BESS1	7.0	7.0	<1%	BESS2	9.3	9.3	<1%	BESS1
PRoW9	8.2	8.2	< 1%	BESS5	11.0	11.0	<1%	BESS5	14.0	14.0	<1%	BESS5
PRoW10	10.6	10.6	< 1%	BESS6	15.8	15.8	<1%	BESS4	21.9	21.9	1%	BESS4
PRoW11	5.0	5.0	< 1%	BESS6	6.7	6.7	<1%	BESS6	8.5	8.5	<1%	BESS4
PRoW12	4.9	4.9	< 1%	BESS4	7.2	7.2	<1%	BESS4	10.0	10.0	<1%	BESS4
PRoW13	5.4	5.4	< 1%	BESS4	7.7	7.7	<1%	BESS4	10.0	10.0	<1%	BESS4
PRoW14	11.9	11.9	< 1%	BESS2	20.0	20.0	1%	BESS2	27.5	27.5	1%	BESS2
PRoW15	4.9	4.9	< 1%	BESS1	6.7	6.7	<1%	BESS1	8.2	8.2	<1%	BESS1
PRoW16	7.4	7.4	< 1%	BESS6	11.8	11.8	<1%	BESS6	15.5	15.5	<1%	BESS6
PRoW17	71.4	71.4	2%	BESS4	125.0	125.0	4%	BESS4	163.7	163.7	5%	BESS4
PRoW18	4.9	4.9	< 1%	BESS2	7.2	7.2	<1%	BESS2	8.2	8.2	<1%	BESS2
AQAL	**3,309**				**3,309**				**3,309**			

Table E.22: Predicted Methanol (MeOH) Concentrations

Receptor	Predicted MeOH Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	1.0	14.6	< 1%	BESS1	1.6	15.2	< 1%	BESS1	2.3	15.9	< 1%	BESS1
R2	0.5	14.1	< 1%	BESS5	0.7	14.3	< 1%	BESS5	1.0	14.6	< 1%	BESS5
R3	0.3	13.9	< 1%	BESS1	0.5	14.1	< 1%	BESS1	0.6	14.2	< 1%	BESS2
R4	0.2	13.8	< 1%	BESS5	0.3	13.9	< 1%	BESS1	0.3	14.0	< 1%	BESS2
R5	0.2	13.8	< 1%	BESS1	0.3	13.9	< 1%	BESS1	0.4	14.0	< 1%	BESS2
R6	0.3	13.9	< 1%	BESS2	0.4	14.0	< 1%	BESS2	0.5	14.1	< 1%	BESS2
R7	0.3	13.9	< 1%	BESS2	0.4	14.1	< 1%	BESS2	0.5	14.2	< 1%	BESS2
R8	0.2	13.9	< 1%	BESS2	0.4	14.0	< 1%	BESS2	0.5	14.1	< 1%	BESS2
R9	0.2	13.8	< 1%	BESS2	0.3	13.9	< 1%	BESS2	0.3	14.0	< 1%	BESS2
R10	0.2	13.8	< 1%	BESS2	0.3	14.0	< 1%	BESS2	0.4	14.0	< 1%	BESS2
R11	0.2	13.8	< 1%	BESS5	0.3	13.9	< 1%	BESS4	0.3	13.9	< 1%	BESS6
R12	0.2	13.8	< 1%	BESS6	0.3	13.9	< 1%	BESS4	0.4	14.0	< 1%	BESS6
R13	0.2	13.8	< 1%	BESS3	0.3	13.9	< 1%	BESS2	0.4	14.0	< 1%	BESS2
R14	0.4	14.0	< 1%	BESS3	0.6	14.3	< 1%	BESS3	0.8	14.4	< 1%	BESS6
R15	0.4	14.1	< 1%	BESS6	0.7	14.4	< 1%	BESS6	0.9	14.6	< 1%	BESS6
R16	0.2	13.8	< 1%	BESS4	0.2	13.9	< 1%	BESS4	0.3	13.9	< 1%	BESS4
R17	0.3	14.0	< 1%	BESS4	0.4	14.1	< 1%	BESS6	0.6	14.2	< 1%	BESS6
R18	0.3	13.9	< 1%	BESS4	0.4	14.0	< 1%	BESS4	0.5	14.2	< 1%	BESS4
R19	0.2	13.8	< 1%	BESS6	0.3	13.9	< 1%	BESS6	0.4	14.0	< 1%	BESS4
R20	0.4	14.0	< 1%	BESS1	0.6	14.2	< 1%	BESS1	0.9	14.5	< 1%	BESS1
PRoW1	2.0	15.6	< 1%	BESS5	3.1	16.7	< 1%	BESS5	4.3	17.9	< 1%	BESS5
PRoW2	5.1	18.8	< 1%	BESS5	8.0	21.6	< 1%	BESS5	11.5	25.2	< 1%	BESS5
PRoW3	3.6	17.2	< 1%	BESS2	6.3	20.0	< 1%	BESS2	8.8	22.4	< 1%	BESS2
PRoW4	2.5	16.2	< 1%	BESS1	4.0	17.7	< 1%	BESS1	5.8	19.4	< 1%	BESS1
PRoW5	2.3	15.9	< 1%	BESS1	3.5	17.1	< 1%	BESS1	5.1	18.7	< 1%	BESS1
PRoW6	2.7	16.3	< 1%	BESS4	4.7	18.3	< 1%	BESS4	6.4	20.0	< 1%	BESS4
PRoW7	0.3	14.0	< 1%	BESS4	0.6	14.2	< 1%	BESS4	0.8	14.4	< 1%	BESS4
PRoW8	0.2	13.9	< 1%	BESS1	0.3	14.0	< 1%	BESS2	0.4	14.1	< 1%	BESS1
PRoW9	0.4	14.0	< 1%	BESS5	0.5	14.1	< 1%	BESS5	0.6	14.3	< 1%	BESS5
PRoW10	0.5	14.1	< 1%	BESS6	0.7	14.4	< 1%	BESS4	1.0	14.6	< 1%	BESS4
PRoW11	0.2	13.9	< 1%	BESS6	0.3	13.9	< 1%	BESS6	0.4	14.0	< 1%	BESS4

Receptor	Predicted MeOH Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW12	0.2	13.9	< 1%	BESS4	0.3	14.0	< 1%	BESS4	0.5	14.1	< 1%	BESS4
PRoW13	0.3	13.9	< 1%	BESS4	0.4	14.0	< 1%	BESS4	0.5	14.1	< 1%	BESS4
PRoW14	0.6	14.2	< 1%	BESS2	0.9	14.6	< 1%	BESS2	1.3	14.9	< 1%	BESS2
PRoW15	0.2	13.9	< 1%	BESS1	0.3	13.9	< 1%	BESS1	0.4	14.0	< 1%	BESS1
PRoW16	0.3	14.0	< 1%	BESS6	0.5	14.2	< 1%	BESS6	0.7	14.3	< 1%	BESS6
PRoW17	3.3	16.9	< 1%	BESS4	5.8	19.4	< 1%	BESS4	7.6	21.2	< 1%	BESS4
PRoW18	0.2	13.9	< 1%	BESS2	0.3	14.0	< 1%	BESS2	0.4	14.0	< 1%	BESS2
AQAL	**262,086**				**445,546**				**353,816**			

Table E.23: Predicted Propane (C_3H_8) Concentrations

Receptor	Predicted C_3H_8 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	1.9	11.9	< 1%	BESS1	2.9	13.0	< 1%	BESS1	4.2	14.3	< 1%	BESS1
R2	0.9	10.9	< 1%	BESS5	1.3	11.3	< 1%	BESS5	1.8	11.9	< 1%	BESS5
R3	0.6	10.6	< 1%	BESS1	0.8	10.9	< 1%	BESS1	1.1	11.2	< 1%	BESS2
R4	0.4	10.4	< 1%	BESS5	0.5	10.6	< 1%	BESS1	0.6	10.7	< 1%	BESS2
R5	0.4	10.4	< 1%	BESS1	0.6	10.6	< 1%	BESS1	0.7	10.8	< 1%	BESS2
R6	0.5	10.5	< 1%	BESS2	0.7	10.8	< 1%	BESS2	0.9	10.9	< 1%	BESS2
R7	0.5	10.5	< 1%	BESS2	0.8	10.9	< 1%	BESS2	1.0	11.1	< 1%	BESS2
R8	0.4	10.5	< 1%	BESS2	0.7	10.8	< 1%	BESS2	0.9	11.0	< 1%	BESS2
R9	0.4	10.4	< 1%	BESS2	0.6	10.6	< 1%	BESS2	0.6	10.7	< 1%	BESS2
R10	0.4	10.4	< 1%	BESS2	0.6	10.7	< 1%	BESS2	0.7	10.8	< 1%	BESS2
R11	0.4	10.4	< 1%	BESS5	0.6	10.6	< 1%	BESS4	0.7	10.8	< 1%	BESS6
R12	0.4	10.4	< 1%	BESS6	0.6	10.6	< 1%	BESS4	0.7	10.8	< 1%	BESS6
R13	0.3	10.4	< 1%	BESS3	0.5	10.6	< 1%	BESS2	1.4	11.5	< 1%	BESS2
R14	0.7	10.8	< 1%	BESS3	1.1	11.2	< 1%	BESS3	1.7	11.8	< 1%	BESS6
R15	0.8	10.9	< 1%	BESS6	1.3	11.4	< 1%	BESS6	1.4	11.4	< 1%	BESS6
R16	0.4	10.4	< 1%	BESS4	0.5	10.5	< 1%	BESS4	1.1	11.1	< 1%	BESS4
R17	0.6	10.7	< 1%	BESS4	0.8	10.8	< 1%	BESS6	1.0	11.0	< 1%	BESS6

Receptor	Predicted C_3H_8 Concentrations (µg/m³)											
	1-hour mean				4-hour mean				8-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R18	0.5	10.5	< 1%	BESS4	0.7	10.8	< 1%	BESS4	1.0	11.1	< 1%	BESS4
R19	0.4	10.4	< 1%	BESS6	0.5	10.6	< 1%	BESS6	0.9	10.9	< 1%	BESS4
R20	0.7	10.7	< 1%	BESS1	1.1	11.1	< 1%	BESS1	1.6	11.7	< 1%	BESS1
PRoW1	3.7	13.7	< 1%	BESS5	5.7	15.7	< 1%	BESS5	7.8	17.9	< 1%	BESS5
PRoW2	9.4	19.5	< 1%	BESS5	14.7	24.7	< 1%	BESS5	21.2	31.2	< 1%	BESS5
PRoW3	6.6	16.7	< 1%	BESS2	11.6	21.7	< 1%	BESS2	16.1	26.2	< 1%	BESS2
PRoW4	4.7	14.7	< 1%	BESS1	7.4	17.5	< 1%	BESS1	10.6	20.7	< 1%	BESS1
PRoW5	4.1	14.2	< 1%	BESS1	6.4	16.5	< 1%	BESS1	9.3	19.4	< 1%	BESS1
PRoW6	4.9	15.0	< 1%	BESS4	8.6	18.6	< 1%	BESS4	11.7	21.7	< 1%	BESS4
PRoW7	0.6	10.7	< 1%	BESS4	1.1	11.1	< 1%	BESS4	1.5	11.5	< 1%	BESS4
PRoW8	0.4	10.5	< 1%	BESS1	0.6	10.6	< 1%	BESS2	0.8	10.8	< 1%	BESS1
PRoW9	0.7	10.8	< 1%	BESS5	0.9	11.0	< 1%	BESS5	1.8	11.9	< 1%	BESS5
PRoW10	0.9	11.0	< 1%	BESS6	1.3	11.4	< 1%	BESS4	1.9	11.9	< 1%	BESS4
PRoW11	0.4	10.5	< 1%	BESS6	0.6	10.6	< 1%	BESS6	0.7	10.8	< 1%	BESS4
PRoW12	0.4	10.5	< 1%	BESS4	0.6	10.7	< 1%	BESS4	0.9	10.9	< 1%	BESS4
PRoW13	0.5	10.5	< 1%	BESS4	0.7	10.7	< 1%	BESS4	0.9	11.0	< 1%	BESS4
PRoW14	1.0	11.1	< 1%	BESS2	1.7	11.8	< 1%	BESS2	2.3	12.4	< 1%	BESS2
PRoW15	0.4	10.5	< 1%	BESS1	0.6	10.6	< 1%	BESS1	1.3	11.4	< 1%	BESS1
PRoW16	0.6	10.7	< 1%	BESS6	1.0	11.1	< 1%	BESS6	5.7	15.8	< 1%	BESS6
PRoW17	6.1	16.1	< 1%	BESS4	10.6	20.7	< 1%	BESS4	13.9	24.0	< 1%	BESS4
PRoW18	0.4	10.5	< 1%	BESS2	0.6	10.7	< 1%	BESS2	0.7	10.8	< 1%	BESS2
AQAL	**9,919,571**				**9,919,571**				**9,919,571**			

Summary

There are not predicted to be any exceedances of the relevant 1-hour, 4-hour and 8-hour mean AQALs at any modelled receptors for the additional pollutants in both the core and sensitivity scenarios.

Appendix F Assessment Against Environmental Assessment Levels

Introduction

The Environment Agency has derived and published benchmarked values known as Environmental Assessment Levels (EALs) (Ref 4) for airborne pollutants commonly released by industrial sources. The EALs represent concentrations in ambient air with no appreciable risk or minimal risk to human health.

The Environment Agency states that '*although EALs do not carry any statutory basis, they are a benchmark for risk to public health. Levels higher than the EALs should be viewed as unacceptable*'.

Although the UKHSA do not routinely require assessment of EALs for BESS fire emission studies, an additional assessment against the EALs has also been provided below to understand the risk of air quality impacts below the AEGL. A predicted concentration in excess of the EAL but below the AEGL-1 represents a risk to human health that is not negligible but would also not be expected to cause notable discomfort.

The EALs considered within this assessment are presented in **Table F.1**.

Table F.1: EALs for BESS Fire Assessment Pollutants

Pollutant	Averaging Period	Environmental Assessment Levels (µg/m^3)	Environmental Assessment Levels (ppm)
CO	1-hour mean	30,000	26.2
HF	1-hour mean	160	0.2
HCl	1-hour mean	750	0.5
NH_3	1-hour mean	2,500	3.6

Results - Core Scenario

Table F.2: Predicted Carbon Monoxide (CO) Concentrations

Receptor	Predicted CO Concentrations (µg/m^3) 1-hour mean			
	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit
R1	751	1223	4%	BESS1
R2	349	821	3%	BESS5
R3	229	701	2%	BESS1

Receptor	Predicted CO Concentrations (µg/m³) 1-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R4	151	623	2%	BESS5
R5	158	630	2%	BESS1
R6	197	669	2%	BESS2
R7	197	669	2%	BESS2
R8	173	645	2%	BESS2
R9	153	617	2%	BESS2
R10	148	612	2%	BESS2
R11	148	612	2%	BESS5
R12	153	617	2%	BESS6
R13	134	598	2%	BESS3
R14	297	769	3%	BESS3
R15	322	788	3%	BESS6
R16	145	611	2%	BESS4
R17	241	707	2%	BESS4
R18	198	664	2%	BESS4
R19	154	622	2%	BESS6
R20	280	756	3%	BESS1
PRoW1	1481	1953	7%	BESS5
PRoW2	3809	4281	14%	BESS5
PRoW3	2677	3149	10%	BESS2
PRoW4	1890	2362	8%	BESS1
PRoW5	1680	2152	7%	BESS1
PRoW6	2004	2476	8%	BESS4
PRoW7	247	723	2%	BESS4
PRoW8	166	642	2%	BESS1
PRoW9	281	753	3%	BESS5
PRoW10	365	831	3%	BESS6
PRoW11	171	637	2%	BESS6
PRoW12	167	633	2%	BESS4
PRoW13	186	654	2%	BESS4
PRoW14	411	883	3%	BESS2
PRoW15	169	641	2%	BESS1
PRoW16	253	719	2%	BESS6
PRoW17	2455	2921	10%	BESS4
PRoW18	169	633	2%	BESS2
1-hour EAL	**30,000**			

Table F.3: Predicted Hydrogen Chloride (HCl) Concentrations

Receptor	Predicted HCl Concentrations (µg/m³)			
	1-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	36.5	37.0	5%	BESS1
R2	17.0	17.4	2%	BESS5
R3	11.1	11.5	2%	BESS1
R4	7.4	7.8	1%	BESS5
R5	7.7	8.1	1%	BESS1
R6	9.6	10.0	1%	BESS2
R7	9.6	10.0	1%	BESS2
R8	8.4	8.8	1%	BESS2
R9	7.4	7.9	1%	BESS2
R10	7.2	7.6	1%	BESS2
R11	7.2	7.6	1%	BESS5
R12	7.5	7.9	1%	BESS6
R13	6.5	6.9	1%	BESS3
R14	14.5	14.9	2%	BESS3
R15	15.7	16.1	2%	BESS6
R16	7.1	7.5	1%	BESS4
R17	11.7	12.1	2%	BESS4
R18	9.6	10.1	1%	BESS4
R19	7.5	7.9	1%	BESS6
R20	13.6	14.0	2%	BESS1
PRoW1	72.0	72.5	10%	BESS5
PRoW2	185.3	185.7	25%	BESS5
PRoW3	130.2	130.7	17%	BESS2
PRoW4	92.0	92.4	12%	BESS1
PRoW5	81.7	82.1	11%	BESS1
PRoW6	97.5	97.9	13%	BESS4
PRoW7	12.0	12.5	2%	BESS4
PRoW8	8.1	8.5	1%	BESS1
PRoW9	13.7	14.1	2%	BESS5
PRoW10	17.8	18.2	2%	BESS6
PRoW11	8.3	8.8	1%	BESS6
PRoW12	8.1	8.6	1%	BESS4
PRoW13	9.1	9.5	1%	BESS4

Receptor	Predicted HCl Concentrations (µg/m³) 1-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW14	20.0	20.4	3%	BESS2
PRoW15	8.2	8.6	1%	BESS1
PRoW16	12.3	12.7	2%	BESS6
PRoW17	119.5	119.9	16%	BESS4
PRoW18	8.2	8.7	1%	BESS2
1-hour EAL	**750**			

Table F.4: Predicted Hydrogen Fluoride (HF) Concentrations

Receptor	Predicted HF Concentrations (µg/m³) 1-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	100.9	101.9	64%	BESS1
R2	46.9	47.9	30%	BESS5
R3	30.7	31.7	20%	BESS1
R4	20.3	21.3	13%	BESS5
R5	21.2	22.2	14%	BESS1
R6	26.4	27.4	17%	BESS2
R7	26.4	27.4	17%	BESS2
R8	23.2	24.2	15%	BESS2
R9	20.5	21.5	13%	BESS2
R10	19.9	20.9	13%	BESS2
R11	19.9	20.9	13%	BESS5
R12	20.6	21.6	13%	BESS6
R13	17.9	18.9	12%	BESS3
R14	39.9	40.9	26%	BESS3
R15	43.3	44.3	28%	BESS6
R16	19.5	20.5	13%	BESS4
R17	32.4	33.4	21%	BESS4
R18	26.6	27.6	17%	BESS4
R19	20.7	21.7	14%	BESS6
R20	37.6	38.6	24%	BESS1
PRoW1	198.9	199.9	**125%**	BESS5
PRoW2	511.7	512.7	**320%**	BESS5
PRoW3	359.6	360.6	**225%**	BESS2

Receptor	Predicted HF Concentrations (µg/m³)			
	1-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW4	253.9	254.9	**159%**	BESS1
PRoW5	225.6	226.6	**142%**	BESS1
PRoW6	269.2	270.2	**169%**	BESS4
PRoW7	33.2	34.2	21%	BESS4
PRoW8	22.3	23.3	15%	BESS1
PRoW9	37.8	38.8	24%	BESS5
PRoW10	49.0	50.0	31%	BESS6
PRoW11	23.0	24.0	15%	BESS6
PRoW12	22.5	23.5	15%	BESS4
PRoW13	25.1	26.1	16%	BESS4
PRoW14	55.2	56.2	35%	BESS2
PRoW15	22.7	23.7	15%	BESS1
PRoW16	34.0	35.0	22%	BESS6
PRoW17	329.9	330.9	**207%**	BESS4
PRoW18	22.8	23.8	15%	BESS2
1-hour EAL	**160**			

Exceedances of the most stringent EAL are highlighted in bold.

Table F.5: Predicted Ammonia (NH_3) Concentrations

Receptor	Predicted NH_3 Concentrations (µg/m³)			
	1-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	3.5	11.8	< 1%	BESS1
R2	1.6	9.9	< 1%	BESS5
R3	1.1	9.4	< 1%	BESS1
R4	0.7	9.0	< 1%	BESS5
R5	0.7	9.0	< 1%	BESS1
R6	0.9	9.2	< 1%	BESS2
R7	0.9	9.2	< 1%	BESS2
R8	0.8	9.1	< 1%	BESS2
R9	0.7	9.0	< 1%	BESS2
R10	0.7	9.0	< 1%	BESS2
R11	0.7	9.0	< 1%	BESS5
R12	0.7	9.0	< 1%	BESS6
R13	0.6	8.9	< 1%	BESS3

Receptor	Predicted NH_3 Concentrations (µg/m³)			
	1-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R14	1.4	9.7	< 1%	BESS3
R15	1.5	9.8	< 1%	BESS6
R16	0.7	9.0	< 1%	BESS4
R17	1.1	9.4	< 1%	BESS4
R18	0.9	9.2	< 1%	BESS4
R19	0.7	9.0	< 1%	BESS6
R20	1.3	9.6	< 1%	BESS1
PRoW1	7.0	15.3	1%	BESS5
PRoW2	17.9	26.2	1%	BESS5
PRoW3	12.6	20.9	1%	BESS2
PRoW4	8.9	17.2	1%	BESS1
PRoW5	7.9	16.2	1%	BESS1
PRoW6	9.4	17.7	1%	BESS4
PRoW7	1.2	9.5	< 1%	BESS4
PRoW8	0.8	9.1	< 1%	BESS1
PRoW9	1.3	9.6	< 1%	BESS5
PRoW10	1.7	10.0	< 1%	BESS6
PRoW11	0.8	9.1	< 1%	BESS6
PRoW12	0.8	9.1	< 1%	BESS4
PRoW13	0.9	9.2	< 1%	BESS4
PRoW14	1.9	10.2	< 1%	BESS2
PRoW15	0.8	9.1	< 1%	BESS1
PRoW16	1.2	9.5	< 1%	BESS6
PRoW17	11.6	19.9	1%	BESS4
PRoW18	0.8	9.1	< 1%	BESS2
1-hour EAL	**2,500**			

There are no predicted exceedances of the 1-hour mean EALs at any modelled residential receptors or PRoWs for CO, HCl and NH_3.

A maximum 1-hour HF concentration of 512.7 µg/m³ was predicted along Tivetshall St. Margaret Footpath 3 (receptor PRoW2). This concentration equates to 320% of the 1-hour mean HF EAL of 160 µg/m³.

Exceedances of the 1-hour HF EAL are also predicted at further sections of Tivertshall St. Margaret Footpath 3 (PRoW1 and PRoW3) and Great Moulton Restricted Bridleway 19 (PRoW 4 - PRoW6).

Figure 4 below shows the predicted area of exceedance of the 1-hour HF EAL in the core scenario across all six modelled BESS Unit fires.

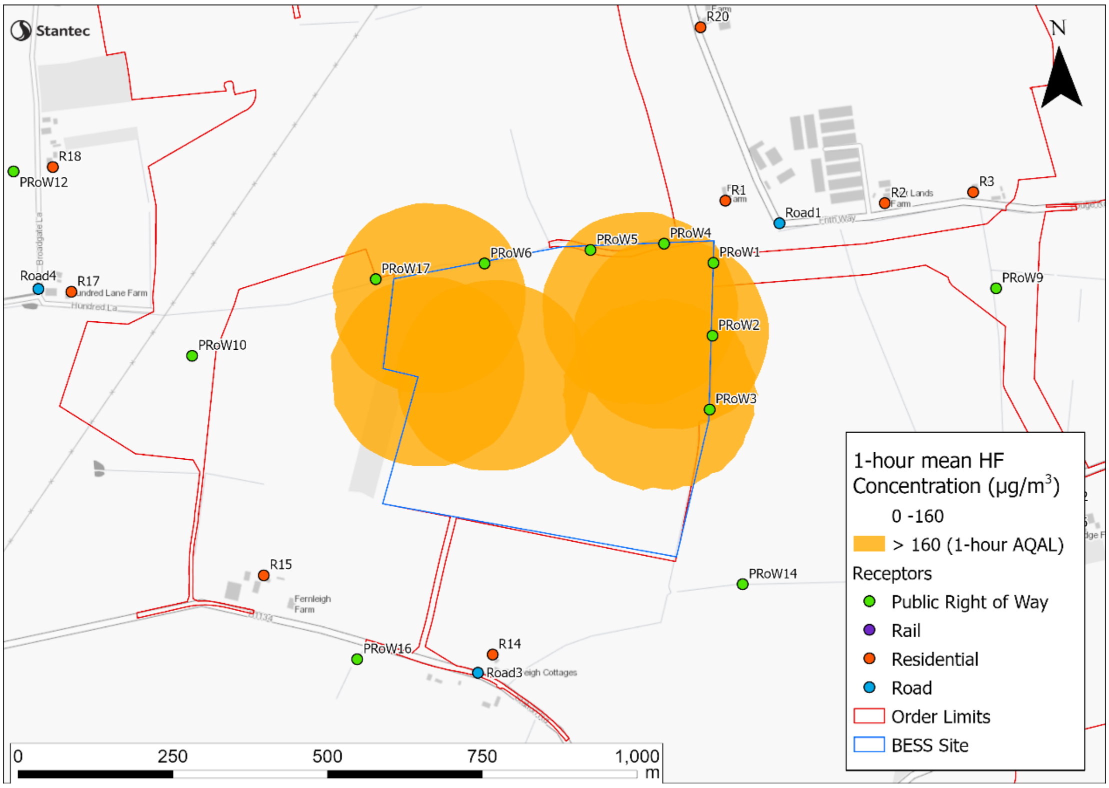

Figure 4: Predicted 1-hour mean HF PECs in the Core Scenario.
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Results - Sensitivity Scenario

Table F.6: Predicted Carbon Monoxide (CO) Concentrations

Receptor	Predicted CO Concentrations (µg/m^3)			
	1-hour mean			
	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit
R1	1502	1974	7%	BESS1
R2	698	1170	4%	BESS5
R3	458	930	3%	BESS1
R4	302	774	3%	BESS5
R5	315	787	3%	BESS1
R6	394	866	3%	BESS2
R7	394	866	3%	BESS2
R8	346	818	3%	BESS2
R9	305	769	3%	BESS2
R10	296	760	3%	BESS2

Receptor	Predicted CO Concentrations (µg/m³)			
	1-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R11	296	760	3%	BESS5
R12	307	771	3%	BESS6
R13	267	731	2%	BESS3
R14	595	1067	4%	BESS3
R15	644	1110	4%	BESS6
R16	291	757	3%	BESS4
R17	482	948	3%	BESS4
R18	397	863	3%	BESS4
R19	309	777	3%	BESS6
R20	560	1036	3%	BESS1
PRoW1	2961	3433	11%	BESS5
PRoW2	7619	8091	27%	BESS5
PRoW3	5354	5826	19%	BESS2
PRoW4	3781	4253	14%	BESS1
PRoW5	3359	3831	13%	BESS1
PRoW6	4008	4480	15%	BESS4
PRoW7	495	971	3%	BESS4
PRoW8	331	807	3%	BESS1
PRoW9	563	1035	3%	BESS5
PRoW10	730	1196	4%	BESS6
PRoW11	343	809	3%	BESS6
PRoW12	335	801	3%	BESS4
PRoW13	373	841	3%	BESS4
PRoW14	822	1294	4%	BESS2
PRoW15	338	810	3%	BESS1
PRoW16	506	972	3%	BESS6
PRoW17	4911	5377	18%	BESS4
PRoW18	339	803	3%	BESS2
1-hour EAL	**30,000**			

Table F.7: Predicted Hydrogen Chloride (HCl) Concentrations

Receptor	Predicted HCl Concentrations (µg/m^3)			
	1-hour mean			
	Max PC (µg/m^3)	Max PEC (µg/m^3)	PEC as % of AQAL	Worst BESS Unit
R1	73.1	73.5	10%	BESS1
R2	33.9	34.4	5%	BESS5
R3	22.3	22.7	3%	BESS1
R4	14.7	15.1	2%	BESS5
R5	15.3	15.7	2%	BESS1
R6	19.2	19.6	3%	BESS2
R7	19.2	19.6	3%	BESS2
R8	16.8	17.2	2%	BESS2
R9	14.9	15.3	2%	BESS2
R10	14.4	14.8	2%	BESS2
R11	14.4	14.8	2%	BESS5
R12	14.9	15.3	2%	BESS6
R13	13.0	13.4	2%	BESS3
R14	28.9	29.4	4%	BESS3
R15	31.3	31.8	4%	BESS6
R16	14.1	14.6	2%	BESS4
R17	23.4	23.9	3%	BESS4
R18	19.3	19.7	3%	BESS4
R19	15.0	15.4	2%	BESS6
R20	27.2	27.6	4%	BESS1
PRoW1	144.1	144.5	19%	BESS5
PRoW2	370.6	371.1	49%	BESS5
PRoW3	260.5	260.9	35%	BESS2
PRoW4	183.9	184.3	25%	BESS1
PRoW5	163.4	163.8	22%	BESS1
PRoW6	195.0	195.4	26%	BESS4
PRoW7	24.1	24.5	3%	BESS4
PRoW8	16.1	16.5	2%	BESS1
PRoW9	27.4	27.8	4%	BESS5
PRoW10	35.5	35.9	5%	BESS6
PRoW11	16.7	17.1	2%	BESS6
PRoW12	16.3	16.7	2%	BESS4
PRoW13	18.1	18.6	2%	BESS4
PRoW14	40.0	40.4	5%	BESS2

Receptor	Predicted HCl Concentrations (µg/m³)			
	1-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW15	16.4	16.8	2%	BESS1
PRoW16	24.6	25.0	3%	BESS6
PRoW17	238.9	239.3	32%	BESS4
PRoW18	16.5	16.9	2%	BESS2
1-hour EAL	**750**			

Table F.8: Predicted Hydrogen Fluoride (HF) Concentrations

Receptor	Predicted HF Concentrations (µg/m³)			
	1-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	201.8	202.8	**127%**	BESS1
R2	93.7	94.7	59%	BESS5
R3	61.5	62.5	39%	BESS1
R4	40.6	41.6	26%	BESS5
R5	42.3	43.3	27%	BESS1
R6	52.9	53.9	34%	BESS2
R7	52.9	53.9	34%	BESS2
R8	46.4	47.4	30%	BESS2
R9	41.0	42.0	26%	BESS2
R10	39.8	40.8	26%	BESS2
R11	39.8	40.8	26%	BESS5
R12	41.2	42.2	26%	BESS6
R13	35.9	36.9	23%	BESS3
R14	79.9	80.9	51%	BESS3
R15	86.5	87.5	55%	BESS6
R16	39.1	40.1	25%	BESS4
R17	64.7	65.7	41%	BESS4
R18	53.3	54.3	34%	BESS4
R19	41.4	42.4	27%	BESS6
R20	75.2	76.2	48%	BESS1
PRoW1	397.8	398.8	**249%**	BESS5
PRoW2	1023.5	1024.5	**640%**	BESS5
PRoW3	719.2	720.2	**450%**	BESS2
PRoW4	507.9	508.9	**318%**	BESS1
PRoW5	451.2	452.2	**283%**	BESS1

Receptor	Predicted HF Concentrations (µg/m³)			
	1-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
PRoW6	538.5	539.5	**337%**	BESS4
PRoW7	66.5	67.5	42%	BESS4
PRoW8	44.5	45.5	28%	BESS1
PRoW9	75.6	76.6	48%	BESS5
PRoW10	98.1	99.1	62%	BESS6
PRoW11	46.1	47.1	29%	BESS6
PRoW12	45.0	46.0	29%	BESS4
PRoW13	50.1	51.1	32%	BESS4
PRoW14	110.4	111.4	70%	BESS2
PRoW15	45.3	46.3	29%	BESS1
PRoW16	68.0	69.0	43%	BESS6
PRoW17	659.7	660.7	**413%**	BESS4
PRoW18	45.5	46.5	29%	BESS2
1-hour EAL	**160**			

Exceedances of the most stringent EAL are highlighted in bold.

Table F.9: Predicted Ammonia (NH_3) Concentrations

Receptor	Predicted NH_3 Concentrations (µg/m³)			
	1-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R1	7.1	15.4	1%	BESS1
R2	3.3	11.6	< 1%	BESS5
R3	2.2	10.5	< 1%	BESS1
R4	1.4	9.7	< 1%	BESS5
R5	1.5	9.8	< 1%	BESS1
R6	1.9	10.2	< 1%	BESS2
R7	1.9	10.2	< 1%	BESS2
R8	1.6	9.9	< 1%	BESS2
R9	1.4	9.7	< 1%	BESS2
R10	1.4	9.7	< 1%	BESS2
R11	1.4	9.7	< 1%	BESS5
R12	1.4	9.7	< 1%	BESS6
R13	1.3	9.6	< 1%	BESS3
R14	2.8	11.1	< 1%	BESS3
R15	3.0	11.3	< 1%	BESS6

Receptor	Predicted NH_3 Concentrations (µg/m³)			
	1-hour mean			
	Max PC (µg/m³)	Max PEC (µg/m³)	PEC as % of AQAL	Worst BESS Unit
R16	1.4	9.7	< 1%	BESS4
R17	2.3	10.6	< 1%	BESS4
R18	1.9	10.2	< 1%	BESS4
R19	1.5	9.8	< 1%	BESS6
R20	2.6	10.9	< 1%	BESS1
PRoW1	13.9	22.2	1%	BESS5
PRoW2	35.9	44.2	2%	BESS5
PRoW3	25.2	33.5	1%	BESS2
PRoW4	17.8	26.1	1%	BESS1
PRoW5	15.8	24.1	1%	BESS1
PRoW6	18.9	27.2	1%	BESS4
PRoW7	2.3	10.6	< 1%	BESS4
PRoW8	1.6	9.9	< 1%	BESS1
PRoW9	2.6	11.0	< 1%	BESS5
PRoW10	3.4	11.7	< 1%	BESS6
PRoW11	1.6	9.9	< 1%	BESS6
PRoW12	1.6	9.9	< 1%	BESS4
PRoW13	1.8	10.1	< 1%	BESS4
PRoW14	3.9	12.2	< 1%	BESS2
PRoW15	1.6	9.9	< 1%	BESS1
PRoW16	2.4	10.7	< 1%	BESS6
PRoW17	23.1	31.4	1%	BESS4
PRoW18	1.6	9.9	< 1%	BESS2
1-hour EAL	**2,500**			

There are no predicted exceedances of the 1-hour EALs at any modelled residential receptors or PRoWs for CO, HCl or NH_3.

A maximum 1-hour HF concentration of 1024.5 µg/m³ was predicted at Tivetshall St. Maragaret Footpath 3 (receptors PRoW1-3). This equates to 640% of the 1-hour HF EAL of 160 µg/m³.

Exceedances of the 1-hour HF EAL are also predicted at Great Moulton Restricted Bridleways 18 and 19 (PRoW4 - PRoW6 and PRoW17), as well as at the closest residential receptor R1 (Frith Farm).

Figure 5 below shows the predicted area of exceedance of the 1-hour mean HF EAL in the sensitivity scenario across all six modelled BESS unit fires.

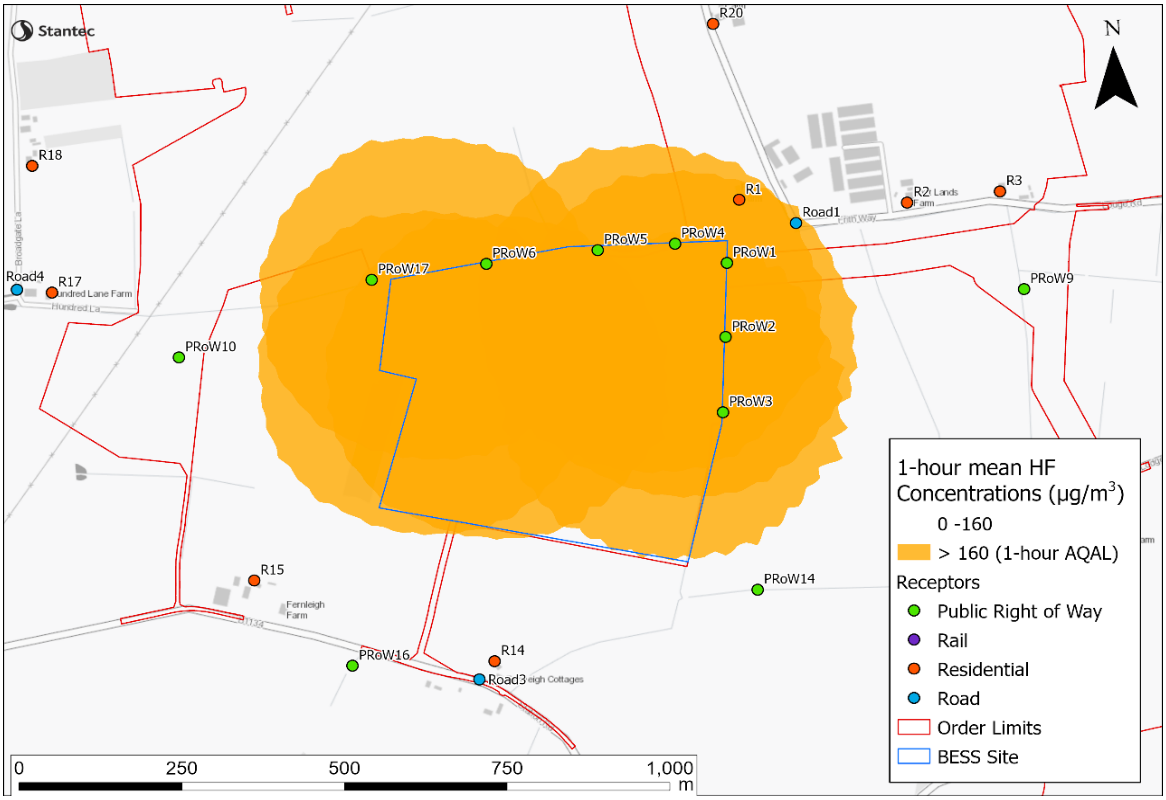

Figure 5: Predicted 1-hour mean HF PECs in the Sensitivity Scenario.

Summary

Although there are predicted exceedances of the 1-hour mean HF EAL in both the core and sensitivity scenarios, there are no predicted exceedances of the AQAL applied in the main risk assessment (AEGL-1 of 818 µg/m^3) in the Study Area with the exception of sections of the adjacent PRoWs which has been addressed within Section 3.

The AEGLs are defined to represent human health effects from once-in-a-lifetime, or rare, exposure to airborne chemicals. As a BESS fire is an emergency scenario that is considered highly unlikely, it is considered most appropriate to define mitigation against the AEGL as per Section 3.