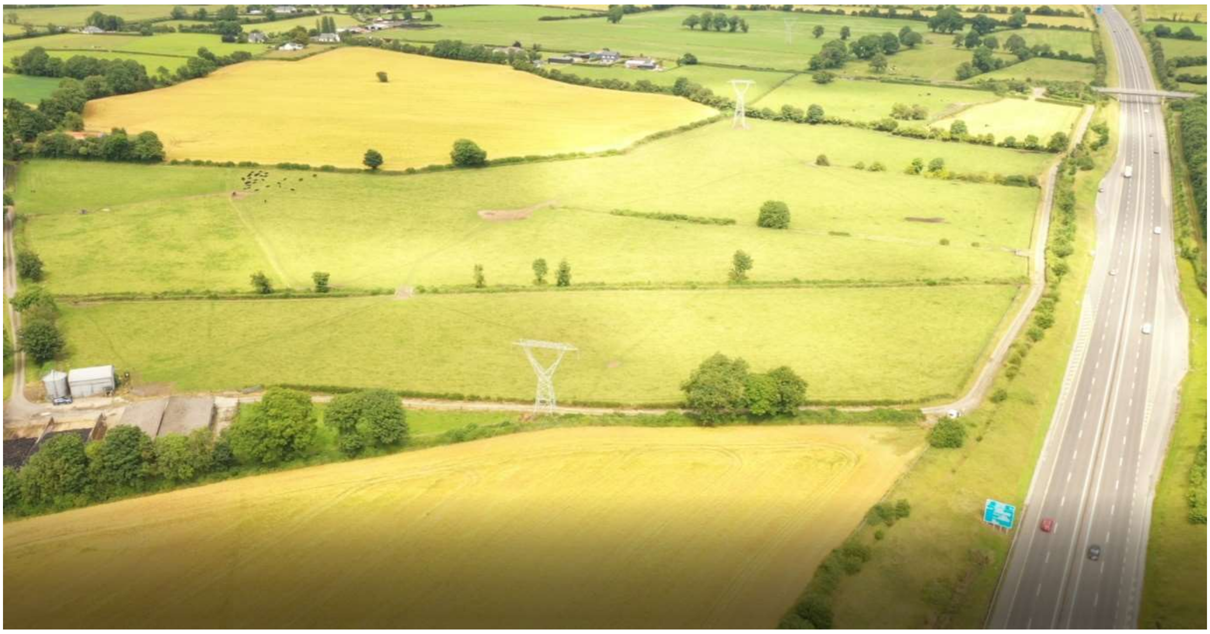
CLIENT:	LUMCLOON ENERGY LIMITED
PROJECT NAME:	LEL CASTLELOST
PROJECT DETAILS:	PROPOSED DEVELOPMENT OF THE LEL FLEXGEN CASTLELOST, LEL ESS CASTLELOST, & LEL GIS CASTLELOST PROJECTS AT KILTOTAN & COLLINSTOWN AND OLDTOWN, ROCHFORTBRIDGE, COUNTY WESTMEATH
DOCUMENT:	ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) (VOLUME 3 - APPENDICES)



DATE	SEPTEMBER 2021
PROJECT REF.	SEP-0347

Appendix 1.1

Landowner Consent Letters

Colinstown Farm

Rochfortbridge

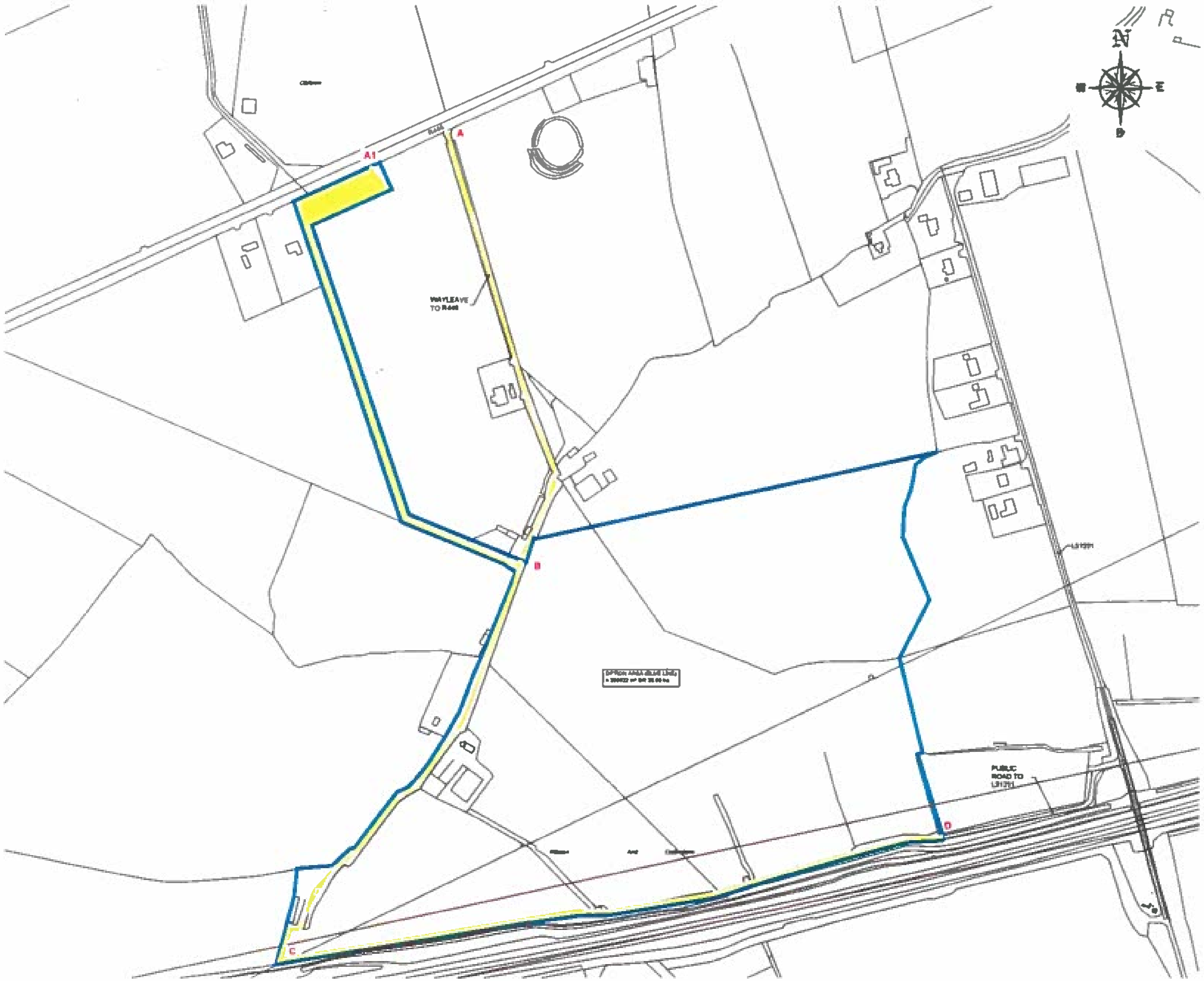
County Westmeath

I, **LIAM GAVIN** of Collinstown Farm, Rochfortbridge, County Westmeath, **DO HEREBY CONSENT** to Lumcloon Energy Limited making an application for planning permission on my lands situate at Collinstown Farm, Rochfortbridge, County Westmeath, being the property outlined in blue on the map attached hereto

Dated this 18th day of May - 2021

SIGNED: Liam Gavin

LIAM GAVIN



NOTES

Rev.	Modifications	By	Date
P1	REVIEW ISSUE	BB	14.04.21
P2	REVIEW ISSUE	BB	11.05.21

HALSTON

Email: info@halston.ie
Tel: 094 9010111

IHUB BUILDING
WESTPORT ROAD
CASTLEBAR
CO. MAYO.
F23 K162

Client	LUMCLOON ENERGY
Project	LEL FLEXGEN, CASTLELOST CO. WESTMEATH
Title	PROPOSED SITE LAYOUT OPTIONS
Stage	PLANNING

Drawn: BB	Checked: WD	Approved: CS	
Date	Apr 2021		
Scale	1:2000 (A1)		
Sheet	1 of 1	Sheet Size	A1
Job No.	SEP-0347	Rev	P2
Dwg. No.	0347-PL-000		

WESTMEATH COUNTY COUNCIL
Comhairle Chontae na hIarmhí

Mr. Nigel Reams,
Lumcloon Energy Ltd.,
Parsons House,
56 Axis Business Park,
Tullamore,
Co Offaly.
R35 K744

20th August 2021.

Re: Letter of consent for Lumcloon Energy limited to include Westmeath County Council owned lands in the townland of Kiltotan and Collinstown, Castlelost, Co Westmeath in a planning application.

Dear Mr. Reams,

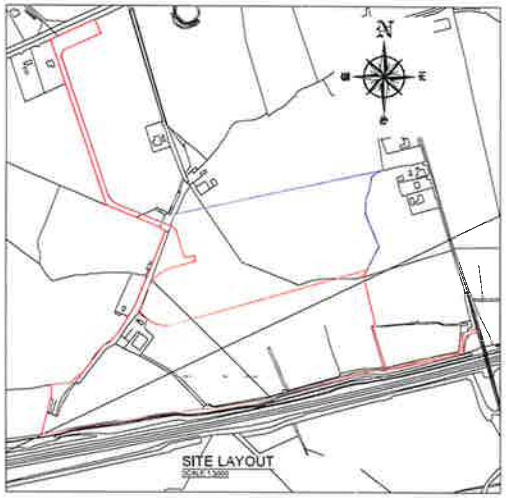
Westmeath County Council consent to Lumcloon Energy Ltd. including Council owned lands at Kiltotan and Collinstown, Castlelost, Co. Westmeath, as an emergency access, in their planning application.

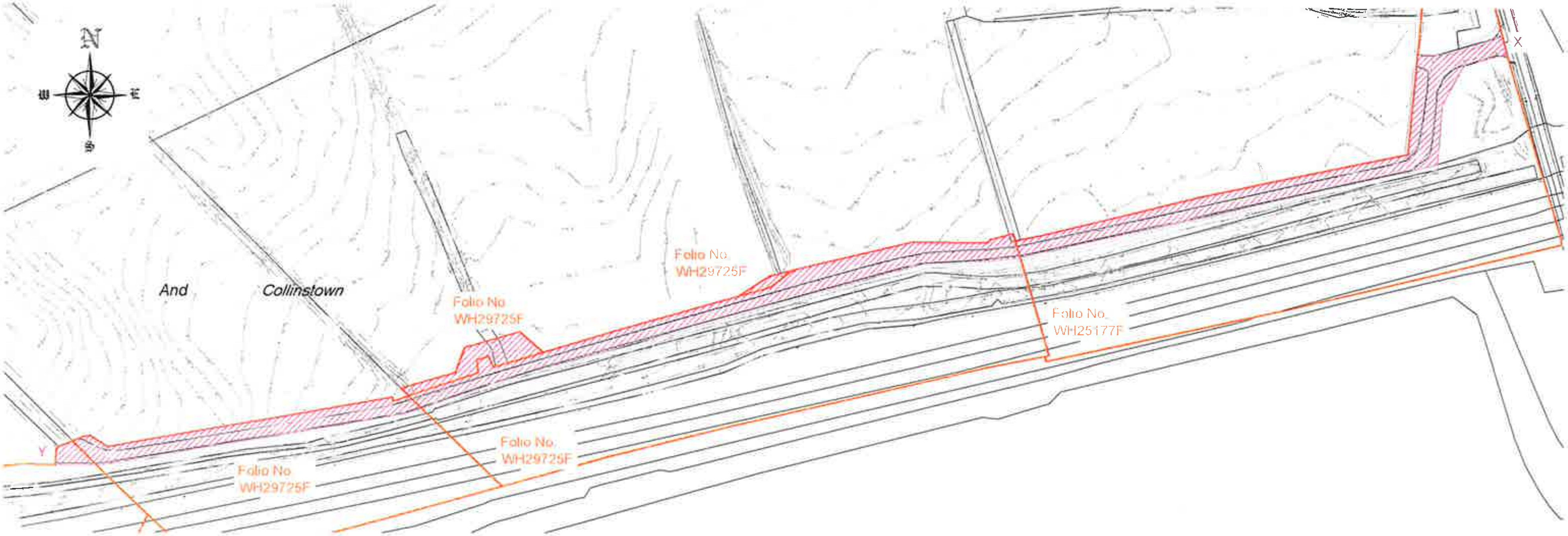
These lands, being that part of lands contained in Folio No. WH29725F and WH25177F are displayed on the attached **Drawing No. 0347-PL-2000** marked **'X to Y'** and consist of a farm access road which was constructed as part of the M6 motorway, off the L51251.This letter of consent is solely to facilitate the making of the planning application, is without prejudice to the Council's consideration or determination of such planning application or to the Council's requirements in relation to the use and re-instatement of our said lands in the event that the proposed development may be permitted and does proceed.

Yours sincerely,

Pat Gallagher
Chief Executive

Áras an Chontae
Mullingar, County Westmeath | An Muileann gCearr, Contae na hIarmhí | N91 FH4N
tel: 044 9332000 | fax: 044 9342330 | email: info@westmeathcoco.ie | web: www.westmeathcoco.ie





NOTES
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS

Rev	Modifications	By	Date
P1	PLANNING ISSUE	BB	19.0a.21

LEGEND
CONSENT BOUNDARY
FOLIO BOUNDARY

HALSTON
Email: info@halston.ie
Tel: 094 9010111

IHUB BUILDING
WESTPORT ROAD
CASTLEBAR
CO. MAYO.
F23 K162

Client	LUMCLOON ENERGY
Project	LEL FLEXGEN, CASTLELOST CO. WESTMEATH
Title	ACCESS ROAD LOCAL AUTHORITY CONSENT
Stage	PLANNING

Drawn	Checked	Approved
BB	WD	CS
Date	Aug 2021	
Scales	1:750 (A1)	
Sheet	1 of 1	Sheet Size A1
Job No.	SEP-0347	Rev P1
Dwg. No.	0347-PL-2000	

Appendix 1.2

Pre-application Consultation (SID) Acknowledgement Letter from ABP

Our Case Number: ABP-311276-21

Your Reference: Lumcloon Energy Limited (LEL)

An Bord Pleanála

Halston
IHUB
Westport Road
Castlebar
Co. Mayo
F23K162

Date: 07 September 2021

Re: Proposed 220kV Gas Insulated Switchgear (GIS) Substation
Kiltotan & Collinstown, Rochfortbridge, Co. Westmeath

Dear Sir / Madam,

An Bord Pleanála has received your request to enter into pre-application consultations under section 182E of the Planning and Development Act, 2000, as amended in respect of the above mentioned proposed development. A receipt for the fee lodged is enclosed.

Please be advised that the amendments introduced by the Planning and Development (Amendment) Act, 2010 provide for the Board to recover its costs in conducting pre-application consultations. These costs together with costs incurred by the Board in determining any application made to it will be included in the Board's decision. The Board will offset any application fees paid by the applicant against its costs.

Further advice or details in relation to the above will be provided by the Board at pre-application consultation meetings (if held). The Board will revert to you in due course in respect of the request.

If you have any queries in the meantime please contact the undersigned officer of the Board.

Please quote the above mentioned An Bord Pleanála reference number in any correspondence with the Board.

Yours faithfully,

p.p. E. R

Niamh Thornton
Executive Officer
Direct Line: 01-8737247

VC01

Appendix 1.3

Proposed Project Site Layouts within Development Lands

Appendix 4.1

COMAH - Environmental Risk Assessment (ERA)

HALSTON LUMCLOON ENERGY COMAH SUPPORT

LEL Flexgen Castlelost Environmental Risk Assessment

Halston Environmental and Planning Limited

Report No.: , Rev. 1
Document No.: 1246458
Date: 2021-09-20

DNV

Project name:	Halston Lumcloon Energy COMAH support	DNV Services UK Limited
Report title:	LEL Flexgen Castlelost Environmental Risk Assessment	
Customer:	Halston Environmental and Planning Limited, IHub Building Westport Road Castlebar F23 K162 Co. Mayo Ireland	Applicon House, Exchange St. Stockport SK3 0EY United Kingdom Tel: GB 440 60 13 95
Customer contact:	Colm Staunton	
Date of issue:	2021-09-20	
Project No.:	10305155	
Organisation unit:	Aberdeen SHE Risk	
Report No.:	, Rev. 1	
Document No.:	1246458	

Applicable contract(s) governing the provision of this Report: 1236811

Objective:

To carry out an environmental risk assessment of the proposed development of a 275MW Gas-Fired Back-Up (Flexible) Generator, a 220kV Electricity Substation and a 65MW Battery Energy Storage System (BESS) on lands at Kiltotan, Collinstown Oldtown, Co. Westmeath.

Prepared by:	Verified by:	Approved by:
	PP	PP
Tomilola Owolabi Senior Consultant	Mark Hopwood Senior Principal Consultant	Mark Hopwood Senior Principal Consultant

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Keywords:

ERA, CDOIF, Environmental, COMAH, Ireland, Lumcloon, Flexgen, Castlelost, generation

Rev. No.	Date	Reason for Issue	Prepared by	Verified by	Approved by
0	24/08/2021	First issue	T Owolabi	M Hopwood	M Hopwood
1	20/09/2021	Final issue	T Owolabi	M Hopwood	M Hopwood

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Appendix A MATTE Tolerability Tables

1 EXECUTIVE SUMMARY

This report presents the Environmental Risk Assessment for the 275MW Gas-Fired Back-Up (Flexible) Generator, a 220kV Electricity Substation and a 65MW Battery Energy Storage System (BESS) proposed development on lands at Kiltotan, Collinstown Oldtown, Co. Westmeath.

The ERA methodology follows the Source-Pathway-Receptor model outlined in the Chemical and Downstream Oil Industries Forum (CDOIF) Guideline on Environmental Risk Tolerability for COMAH Establishments (Ref. /2/). Two sources of environmental risk were identified – diesel approximately 4082 tonnes stored in two liquid fuel tanks with a capacity of 2400m^3 each and vanadium electrolyte solution in 264 modules each holding 136 tonnes of vanadium electrolyte solution.

One Source-Pathway-Receptor trio with MATTE potential was identified as the release of approximately 2028 tonnes of diesel stored in 2400m^3 liquid fuel tank capacity impacting on the Mongagh River.

The overall unmitigated level of risk posed by the establishment from the release of diesel to the Mongagh was found to be in the tolerable if ALARP (TifALARP) on the CDOIF risk matrix. Following the identification of the control measures in place and their probability of failure on demand, it was found that the level of mitigated risk posed by the establishment to the Mongagh River falls into the Broadly Acceptable region.

The release of vanadium electrolyte solution scenario was ruled out and not considered to have the potential to result in a MATTE because it is noted that from the safety data sheet of vanadium electrolyte solution that even though the eco-toxic properties are not available, it is not a surface water pollutant. Also, sulphuric acid and orthophosphoric acid which form part of the vanadium electrolyte solution are not expected to result in MATTEs as the acid will react with soil / ground components in any impacted receptors.

2 INTRODUCTION

Lumcloon Energy Limited has proposed to develop a 275MW Gas-Fired Back-Up (Flexible) Generator, a 220kV Electricity Substation and a 65MW Battery Energy Storage System (BESS) on lands at Kiltotan, Collinstown Oldtown, Co. Westmeath, see Figure 4-1. The development proposal will be designed and configured to provide economic, reliable and low emissions power to the electricity grid. The gas-fired back-up generator will replace existing older diesel fired generators and the overall project is designed to support further integration of variable non-dispatchable renewable generators. As per the Commission for Regulations of Utilities in Ireland secondary fuel stock obligations, the site is required to hold secondary fuel stock in this case diesel for the site development.

Lumcloon Energy Limited (LEL) is to produce an environmental risk assessment (ERA) as part of its COMAH HSE submission. The Health and Safety Authority (HSA) can request it to see the ERA. Halston Environmental and Planning Limited is supporting Lumcloon Energy Limited in the submission and DNV has been subcontracted by Halston Environmental and Planning Limited to carry out the ERA in support of the application.

The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations") (Ref. /1/), implement the Seveso III Directive (2012/18/EU) and aim to prevent and mitigate the effects of major accidents involving dangerous substances which can cause serious harm to people and/or the environment, with the overall objective of providing a high level of protection in a consistent and effective manner. The site development qualifies as a "lower tier" site under the COMAH Regulations 2015 as it holds quantities of dangerous substances above threshold quantities specified in Schedule 1 of the COMAH Regulations 2015 (Ref. /1/).

The ERA outlined in this document has been undertaken in accordance with the Chemical and Downstream Oil Industries Forum (CDOIF) Guideline on Environmental Risk Tolerability for COMAH Establishments (Ref. /2/), the Guide to the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (Ref. /3/) and the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Enforcement Regulations, 2008 (Ref. /4/). The CDOIF guideline for carrying out ERAs is an industry wide accepted methodology.

An Environmental Impact Assessment (EIA) was conducted for the site in May 2021 as part of the feasibility study on the project. The scope of the EIA includes environmental baseline data on the surrounding natural and man-made environmental receptors surrounding the site and forms the basis of the pathway and receptor components of this ERA.

3 RISK ASSESSMENT METHODOLOGY

3.1 What is a Major Accident to the Environment?

It is not possible to provide a scientific definition of changes in the environment caused by an event at an establishment that would constitute a major accident to the environment. However, the more extensive the areas and quantities of natural and semi-natural resource damaged, the longer the effects are likely to last, and the more intense or severe these effects, then the more likely it is that the event will be regarded as a major accident to the environment by the competent authority. Moreover, if the event affects nationally or internationally sites designated for nature conservation purposes then the event is likely to be regarded as a major accident at lower thresholds than those that apply to other designated areas, amenity areas, the wider countryside or the more common types of agricultural land. As a general rule, the specific threshold levels that apply to other designated sites, scarce habitats and more widespread habitats vary in relation to the importance of the particular type of site.

In the most general terms, major accident hazards to the environment will be those where events have the potential to: (i) pose knock-on threats to human health by contamination of food or drinking water or impacts on sewage treatment regimes; (ii) affect large areas of land designated for conservation, amenity or planning purposes. Note that large in an ecological sense may include extensive agglomerations of fragmented habitats; (iii) be long-term or persistent and/or inhibit natural processes of regeneration; (iv) be severe by causing significant permanent or long-term damage to the ecosystem (direct, indirect, or knock-on), such as reduced breeding success of protected species, or reduced biodiversity of protected habitats (including local or national extinctions of protected species), or destruction/reduction in quality of a significant proportion of the area of a rare habitat (Ref. /5/).

3.2 Environmental Risk Assessment Approach

DNV's environmental risk assessment methodology follows the Source-Pathway-Receptor model that is outlined in the CDOIF (Ref. /2/) and DETR Guidelines (Ref. /5/). The assessment involves the following steps which are described below:

1. **Source-pathway-receptor assessment -** The first stage involves a detailed assessment of the materials stored on site, identification of the natural and man-made receptors surrounding the site and the pathways leading from the site to these receptors.

2. **Determination of the severity and duration of harm to receptors** – to determine the consequence level for each unmitigated liquid, gaseous and ignited release event, the severity levels, S1, S2, S3 and S4 for significant, severe, major and catastrophic respectively were established.

Three approaches are used to determine the severity of harm caused by liquid releases. These include an oil slick approach and an LC_{50} approach for releases on water and analysis of a representative pool diameter for releases on land. These are described later in Section 3.2.1. For particular species, the severity of harm is based on an estimate of the proportion of the national population which is affected, if a release impacts the receptor where the species is resident. Once established, these severity levels are then compared with the likely duration of harm D1, D2, D3 and D4 for short term, medium term, long term and very long term respectively to establish a consequence level between A and D as shown in the matrix presented in Figure 3-1. The reference tables from the CDOIF guidelines (Ref. /2/) used to establish the consequence levels and the duration of harm categories associated with each MAH scenario are shown in Appendix A. The method used for predicting the duration of harm caused by the release scenarios to the environmental receptors is presented in Section 3.2.2.

Severity of Harm	**4**		C	D	D
	3		B	C	D
	2		A	B	C
	1		***Sub-MATTE Harm***		
		1	**2**	**3**	**4**
		Harm Duration Category			

Frequency at which the CDOIF consequence level is reached or exceeded	**Frequency per receptor per establishment per year**	
	Intolerable (greater than)	**Broadly Acceptable (less than)**
A	1.0 E-02	1.0 E-04
B	1.0 E-03	1.0 E-05
C	1.0 E-04	1.0 E-06
D	1.0 E-05	1.0 E-07

Figure 3-1: Method and matrix for determining MATTE consequence level and corresponding receptor frequency tolerability thresholds

3. **Quantification of unmitigated risk to receptors –** the frequencies of the unmitigated occurrences of any scenarios qualifying as MATTEs are determined using site specific or generic quantitative risk assessment (QRA) data. This includes similar releases of the material which could follow the same pathway to the receptor. These frequencies are aggregated to determine the total unmitigated risk posed to each receptor by the establishment. A comparison of the unmitigated risk posed to each receptor against the criteria in the risk matrix presented in Figure 3-2 to establish whether the risk is intolerable, tolerable if as low as reasonably practicable (TifALARP) or broadly acceptable.

	Frequency per establishment per receptor per year						
Frequency at which CDOIF Consequence Level is equalled or exceeded	10^{-8} - 10^{-7}	10^{-7} - 10^{-6}	10^{-6} - 10^{-5}	10^{-5} - 10^{-4}	10^{-4} - 10^{-3}	10^{-3} - 10^{-2}	$>10^{-2}$
D- MATTE						Intolerable	
C- MATTE				TifALARP			
B - MATTE	Broadly Acceptable						
A- MATTE							
Sub MATTE	Tolerability not considered by CDOIF						

Figure 3-2: CDOIF Risk Matrix

4. **Quantification of mitigated risk to receptors –** the frequencies of the unmitigated MATTE scenarios are multiplied by the probability of failure on demand (PFD) of any relevant protection layers on the site. These mitigated frequencies are aggregated to determine the total mitigated risk posed to each receptor by the establishment. The mitigated risks posed to each receptor are again compared to the criteria in the risk matrix presented in Figure 3-2 to establish whether the risk is intolerable, TifALARP or broadly acceptable.
5. **ALARP demonstrations if necessary -** Operators may be required to conduct a ALARP demonstration if the mitigated level of risk posed by the establishment to any of the surrounding receptors is found to be intolerable or TifALARP.

3.2.1 Determining Severity of Harm to Receptors

Harm to Water Receptors

Two approaches are used to determine the severity of harm caused by a liquid release to a water based environmental receptor. These are based on a lethal concentration (LC_{50}) of material in the receptor and the critical thickness of an oil slick. The type of approach applied depends on the properties of the material being released. For releases onto land, an approach based on a representative diameter for liquid pool is used.

If a release can reach a receptor where particular species can be found, the severity of harm is assessed using the MATTE tolerability tables in Appendix A.

1. LC_{50} Approach

An LC_{50} approach can be used to determine the severity of harm caused by water soluble substances which can exert toxic effects on aquatic life. The median lethal concentration, LC_{50} (lethal concentration, 50%) is the concentration of a substance required to kill half of the members of a tested population after a specified test duration. The value may be obtained by direct observation or from interpolation. LC_{50} values are a useful indicator of the substance’s ecotoxicity with lower values indicative of increased toxicity. LC_{50} values can therefore define maximum allowable toxicant concentrations. As a general rule the longer the exposure time for a particular species, the lower the LC_{50} value. The reason for this observation is that it takes time for the compound to penetrate the bodies of test organisms to affect harm.

The following simple equation is then used to determine the minimum amount of material which could credibly cause a MATTE scenario:

$$\text{Mass of material for MATTE potential} = \text{Area of receptor} \times \text{Water depth} \times LC_{50} \text{ value} \qquad (1)$$

2. Oil Slick Approach

The fate and behaviour of oil in the marine environment depends on many processes including dissolution, emulsification, oxidation and destruction, physical transport and the marine environment. According to “Offshore Environment” (Ref. /6/), it is stated that an oil slick with a thickness of less than 0.1 mm in the marine environment will tend to disintegrate into separate fragments and spread over larger and more distant areas. It is therefore assumed that a critical thickness greater than or equal to 0.1 mm is feasible for an oil slick that has the potential to cause a MATTE.

To calculate the minimum volume of material required to cause a MATTE to a receptor, the critical thickness of 0.1 mm is multiplied by the defined minimum threshold area for a MATTE in the receptor (Ref. /2/).

In addition, the way in which an oil slick breaks up and dissipates depends largely on how persistent the oil is. Light products such as kerosene tend to evaporate, dissipate quickly and naturally and rarely need cleaning up. Such products are termed non-persistent oils. Persistent oils, such as many crude oils, break up and dissipate more slowly and usually require a clean-up response. An oil slick usually drifts in the same direction as the wind, and as it does, it dissipates and thins.

Harm to Land Receptors

Liquid spills on land surfaces will spread to form pools, the extent of which will depend on a number of factors such as the ground surface and topography.

Low viscosity liquids (e.g. light distillates) spilt on concrete are assumed to spread to form pools with a uniform thickness of 5 mm. DNV's Safeti software is used for quantified risk assessment and sets this thickness value as a default for pools. This value is used for releases to areas of made ground within the site area. Liquids with higher viscosities (e.g. middle distillates and crude / heavy oils) that are spilt on concrete are assumed to spread to form pools with a uniform thickness of 20 mm. If liquid hydrocarbons are spilt onto unmade ground that is covered with vegetation they will form pools with significantly greater thicknesses due to the liquid hold-up provided by the vegetation. A value of 50 mm has been assumed in the case where crude oil is spilt onto unmade ground.

Harm to Soil and Groundwater Receptors

Liquids which are released to permeable ground will migrate downwards through the soil and potentially into groundwater layers due to the effect of gravity and capillary forces. For hydrocarbon releases, the depth and size of the plume depends on (Ref. /7/):

1. Properties of the hydrocarbon material – heavier hydrocarbons show lower rates of permeation through the soil due to their higher viscosity and tendency to adsorb to soil particles. On the other hand, BTEX (benzene, toluene, ethylbenzene and xylene) have lowest soil sorption coefficients and move quickly through the soil;

2. Properties of the soil – porosity and permeability are the two most important factors which influence liquid flow through the ground. Soils such as sand with high porosities and permeabilities allow for the fastest rates of permeation.

Hydrocarbons that have been released into the ground break down over time due to vaporisation and the action of bacteria in the soil. The length of time that the hydrocarbons remain in the ground depends on the molecular weight of the compound, with heavier hydrocarbons being more resistant to degradation than lighter ones. Hydrocarbons also degrade more quickly in hot and humid climates. In general, sub-surface hydrocarbon releases tend to degrade quite quickly – a field study of a crude oil spill site in India indicated that up to 75% of the hydrocarbons could be degraded within a year (Ref. /7/).

Accurately predicting the subsurface spread of hydrocarbons is difficult even with complex modelling solutions. DNV will employ a simplified semi-quantitative approach to determine the severity and duration of harm of releases. This approach will involve the following steps:

1. Determine if the released hydrocarbons have the potential to permeate through the soil layer and enter the groundwater layer depending on the properties of the released material and the properties and thickness of the soil layer.

2. If the hydrocarbon release can permeate into the groundwater layer, any BTX components and light hydrocarbons present in the material will be assumed to be able to spread indefinitely in the groundwater until they occupy a volume with a concentration greater than the legal or recommended concentration of the pollutant in question. It will be assumed that middle distillates and heavy hydrocarbons will not be able to spread easily within the groundwater layers due to their higher viscosities. The following simple equation is then used to determine the minimum amount of material which could credibly cause a MATTE scenario:

   Mass of material for MATTE potential = Groundwater area x Groundwater table depth x Legal limit of pollutant (2)

3.2.2 Determining Duration of Harm

The overall receptor tolerability for MATTE, as defined in Figure 3-1, is dependent on the level of harm caused by the incident and also the duration of that harm. A supporting document to the CDOIF guidance has been produced by ENVIRON titled ‘Environmental Recovery Guide’ - Supporting Guide to the Environmental Risk Tolerability for COMAH Establishments Guideline’ (Ref. /8/). This document lays out a straightforward method for determining harm duration for any environmental release based on the chemical and receptor type under analysis. The guidance in the document is based on a review of around 300 case studies of environmental incidents in the CDOIF related industries and a review of monitoring studies of the Exxon Valdez incident.

The environmental recovery guidance document provides two flow charts, which are based on water habitats and land habitats, allowing the assessor to determine the harm duration. The flowcharts contain all 60 of the chemicals listed in the COMAH Regulations and split these substances by their ability to be broken down or dispersed in the natural environment. The flowchart then splits up different habitat (receptor) types by their ability to regenerate and their environmental sensitivity i.e. a river is classed as a different type of habitat to a coral reef. A harm duration category is then selected, for each potential MATTE event, based on the categories of chemical and habitat.

The recovery flowchart for water and land receptors is provided in Figure 3-3 and Figure 3-4 respectively. The method presented in Figure 3-3 is not applicable for firewater, so engineering judgement was used to determine the harm duration category.

The recovery time for each particular species is taken as the breeding lifecycle. The harm duration category is selected based on the relevant water or land habitat flowchart provided in Figure 3-3 or Figure 3-4.

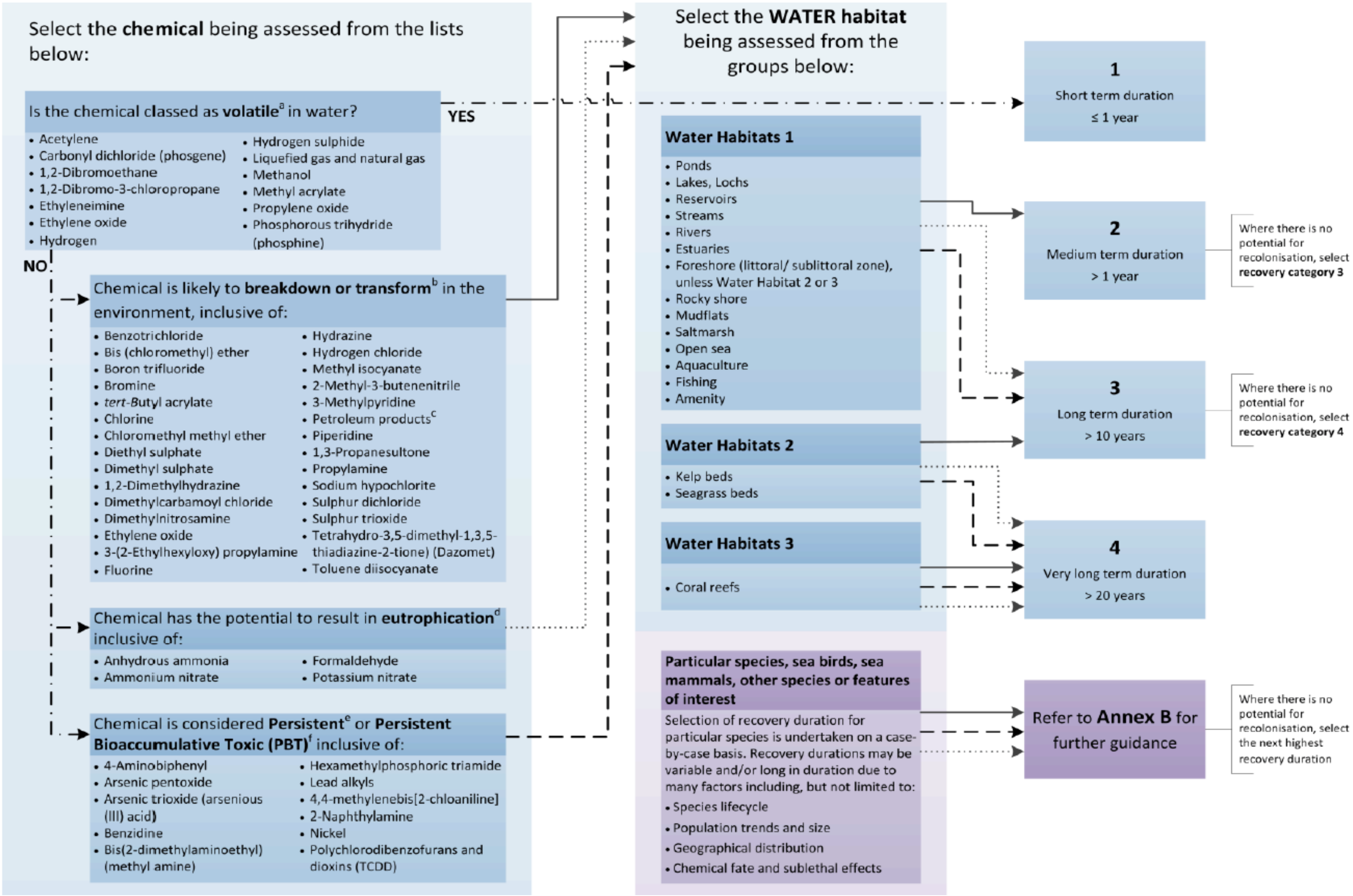

Figure 3-3: Recovery flowchart for water receptors (Ref. /8/)

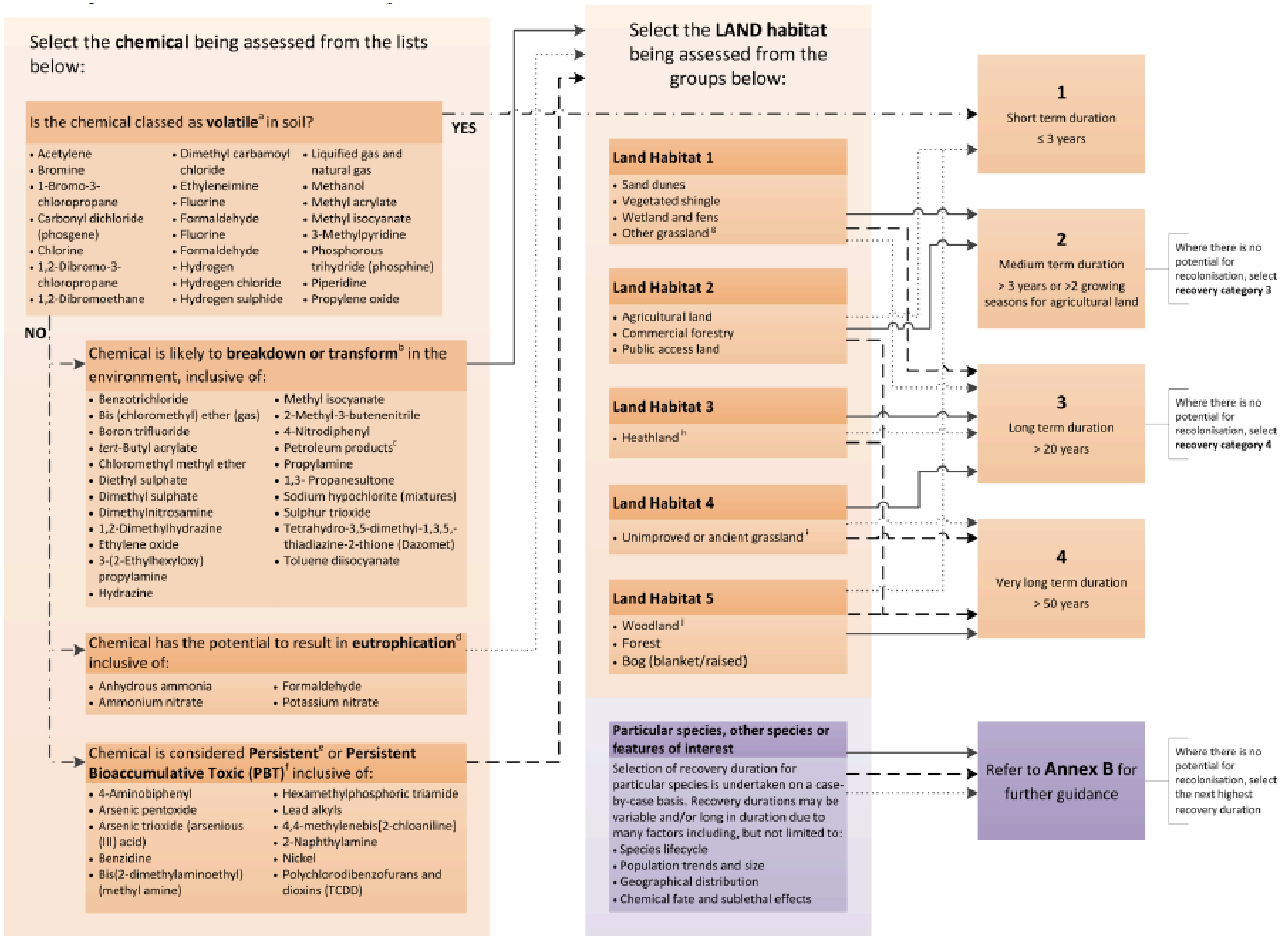

Figure 3-4: Recovery flowchart for land receptors (Ref. /8/)

4 SITE DESCRIPTION

The site development is located on a 51-acre site at Kiltotan and Collinstown, Oldtown, Co. Westmeath, see Figure 4-1 for site location and Figure 4-2 for site layout plan.

The site development compromises 3 projects. The descriptions of the projects are detailed in the EIA briefing Document (Ref. /9/) and summarised below:

- LEL Flexgen Castlelost Project: Proposed gas-fired reserve generator of 275MW electrical capacity. The project will combust natural gas supplied from the Gas Networks Ireland (GNI) transmission system. The proposal includes the installation of five dry low emission (DLE) gas turbines, associated stack(s), raw water/fire water tank, fire water retention basin, back-up fuel tank, emergency generator, gas receiving station (AGI), low, medium and high voltage transformers, customer control room and all ancillary electrical plant and delivery systems. GNI will separately manage the process of delivering the underground gas transmission pipeline to the proposed site.
- LEL GIS Castlelost Project: Proposed 220kV Gas Insulated Switchgear (GIS) Electrical Substation. The project will involve installation of two 220 kV underground circuits forming a connection to the existing Shannonbridge-Maynooth 220 kV overhead line (located within the development boundary) and two 220 kV underground circuits and associated low voltage and communication underground cabling connecting the proposed substation with electricity transformers to the adjacent reserve gas-fired generator (LEL Flexgen Castlelost Project) and LEL ESS Castlelost Project) sites, and all associated and ancillary site development works. The GIS substation itself includes a two storey, 17m high building (housing electrical switchgear, a battery room, a workshop room, and WC), transformer bay(s), access roadway and all ancillary site development works.
- LEL ESS Castlelost Project: Proposed Energy Storage System (ESS) using vanadium flow battery (VFB) technology and synchronous condenser. The battery energy storage system (BESS) will comprise a cluster of battery modules positioned within a dedicated BESS outdoor compound. Each module will consist of a battery container (6.1m long container) housing pumps and heat exchangers positioned on top of two tank (electrolyte) enclosures (12.2m long containers). An associated battery management system (BMS) and medium voltage power station (MVPS) enclosure will also form part of the battery module. The BMS will monitor and control electrolyte circulation and the MVPS is provided to condition the power generated. The synchronous condenser comprises a rotating generator positioned within a building. The generator is connected to the transmission system via a step-up transformer. When the generator has reached an operating speed that is synchronous to the system frequency, It is synchronised with the transmission network and acts as a motor providing reactive and short circuit power to the electricity network. A customer (IPP) building will also be installed within the ESS compound, and it will house electrical switchgear, store, control room, welfare facilities and administration facilities.

DNV

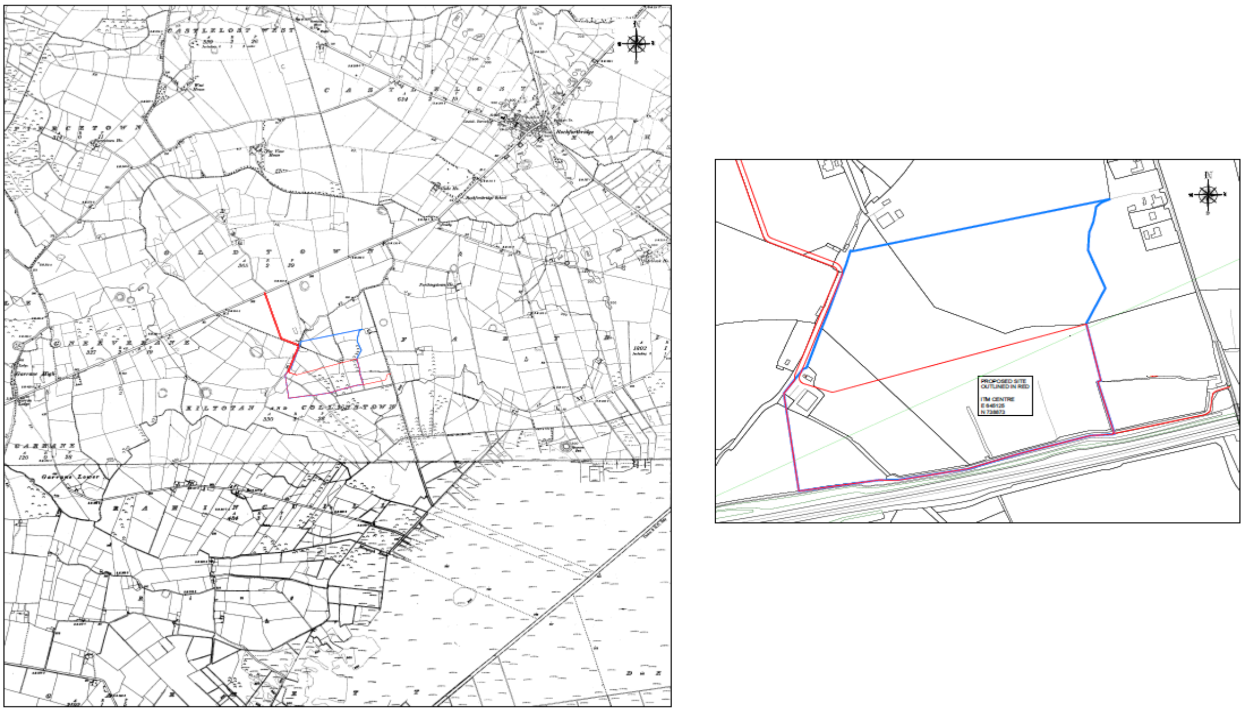

Figure 4-1 Site Location Plan

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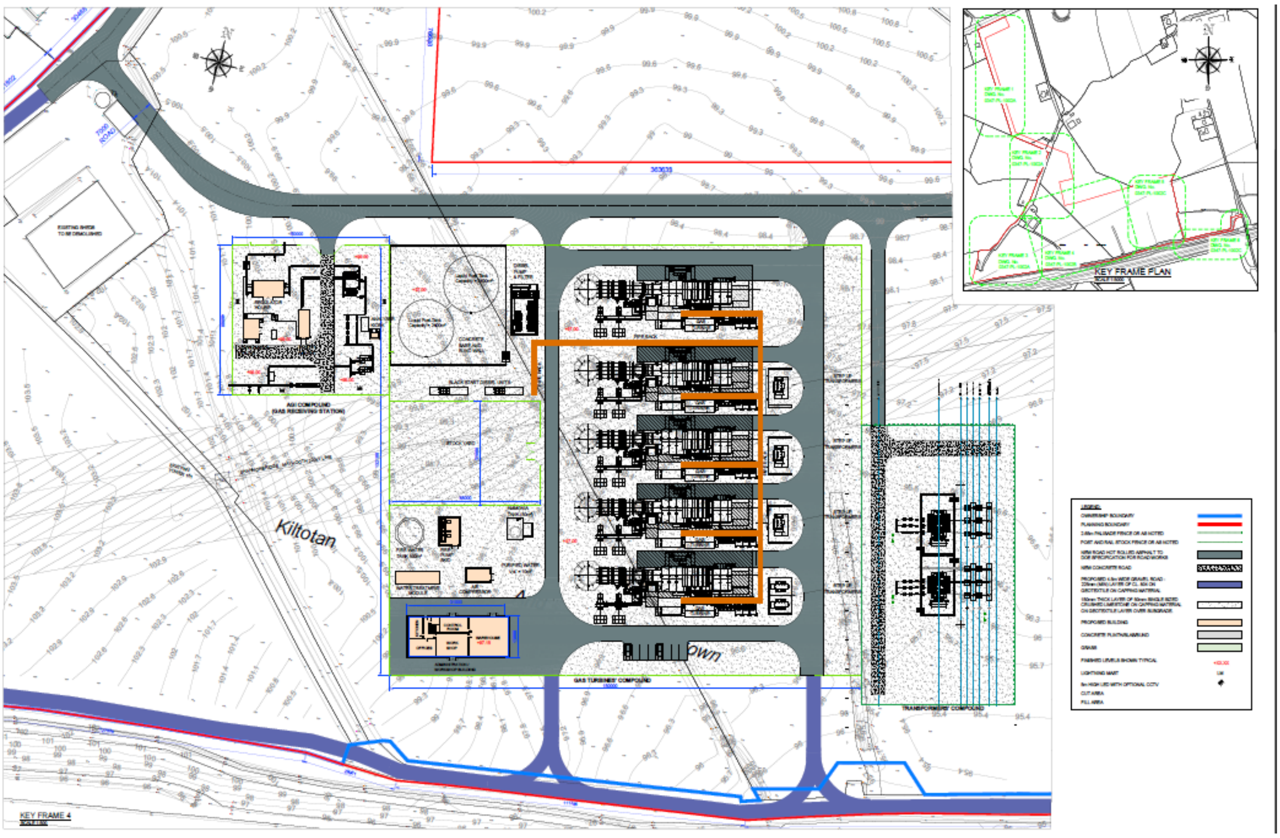

Figure 4-2 Site Layout Plan

5 BASELINE DESCRIPTION OF THE LOCAL ENVIRONMENT

The site setting descriptions are detailed in the EIA briefing Document (Ref. /9/) and summarised in the following sections.

5.1 Topography

The site development is within agricultural pastures and located between roads R446 (N6) and M6. The site is at approximately 100m AOD. A 220kV Shannonbridge-Maynooth OH line traverses the site and a Gas Transmission Line is approximately 4.5km north of the site.

5.2 Geology

There are a number of shallow dug wells shown to be present on the site in Kiltotan that were installed in 1996. There is a well drilled within the site to a depth of 60.9m bgl (installed with 150mm casing). The bedrock was proven at 12.2m bgl and yield was determined as being 76.3m3/d.

Open well is shown to be present on adjoining lands to the south east of the site. No karst feature has been identified on or in the immediate surrounds of the site.

The bedrock aquifer is of the Dinantian Pure Unbedded Limestone – Waulsortian Limestone (Massive unbeded limestone) (Ref. /9/). A bedrock aquifer fault is shown to be present trending north-east south-west in the south eastern area of the site.

5.3 Soil and Sediment

The soils on the site development are classed as fine loamy drift with limestones (Eton association) of moderate drainage. Peat has been identified near the southern boundary of the site (Ref. /9/). The subsoils are classed as limestone tills (Carboniferous) (Ref. /9/).

The field to the south of site boundary was in tillage while the field to the north is in pasture.

5.4 Groundwater

The site is located in an aquifer classed as being of moderate vulnerability and located within a locally important aquifer which is of moderate productivity.

There are no groundwater drinking water protection areas within, or close to, the proposed site development (Ref. /9/).

The site is located within groundwater body classified as Athbody GWB (IE_EA_G-001), under the water framework directives classified as within the Boyne Catchment (WFD) and under the river sub basin classified as within the Yellow(Castlejordan)_SC-010 sub catchment and Castlejordan_020 River Sub basin (Ref. /9/).

5.5 Hydrology

There are several drainage ditches in the southern area of the site. The Mongagh River is located approximately 500m south of the site.

There is no record of flooding at the site. Westmeath Strategic Flood Risk Assessment shows one small, isolated occurrence of “PFRA Pluvial Extreme” near the western boundary of the site (Ref. /9/).

5.6 Cultural Heritage

There are two ringforts (raths) near the site.

- Ringfort (WM033-061) located in pasture on gentle low rise of ground with good views in all directions from the site.

- Ringfort (WM033-066) located approximately 370m to the south-south west of the site.

5.7 Biodiversity, Flora and Fauna

There are no Natura 2000 sites within or immediately close to the site. The closest ecological designated sites are as follows:

- Cloncrow Bog (New Forest) Natural Heritage Area (NHA) Site Code 000677 is located 3km west of the lands.
- Lough Ennell SAC and Proposed Natural Heritage Area (pNHA) site code 000685, located 6km north west of the lands.
- Raheenmore Bog SAC and pNHA site code 00582, located approximately 6km south of the lands.
- Milltownpass Bog NHA site code 002323, located approximately 7km north east of the lands.
- Black Castle Bog NHA site code 000570, located 12.5km south east of the lands.

5.8 Landscape and Visual

The site development is located in area classed as Lough Ennell and South Eastern Corridor in the WCDP 2021-2027. The Character Area comprises pastureland of mixed productivity. Lough Ennell is situated to the western side of this Landscape Character Area (LCA) and is designated as an Area of High Amenity, SPA and SAC (Ref. /9/).

A number of preserved views are listed from the R446 between Tyrrellspass and Rochfortbridge. The area around Lough Ennell and particularly to the south of the lake is characterised by scrub land with a mixture of marsh, bog and poor pastureland. There is also a large tract of bog to the east of Rochfortbridge and Milltownpass along the county boundary. The bog areas in this LCA are mainly exploited but some have been left intact. This area has many old demesnes, which are easily recognisable in the landscape with the existence of fine mature hardwood trees and estate walls in some cases (Ref. /9/).

Settlements within this landscape have developed mainly along the main road network. These include Kinnegad, Milltownpass, Rochfortbridge, and Tyrrellspass along the former N6. Recreational areas have been developed on the shores of Lough Ennell including Ladestown, Lilliput and Tudenham. The M6 traverses the southern part of the LCA. The N52 By-Pass has also added to the transport corridor around Mullingar (Ref. /9/).

5.9 Air Quality and Climate

The Air Quality Index Region is the Rural East- Zone ID 81 with Air Quality Index is 3 - Good (EPA May 2021, Ref. /10/). The Air Zone is Zone D (Rural Ireland) has a scientific score of 0 (EPA, 2015, Ref. /10/) and the Closest Air Quality Monitoring Sites to the site development is Mullingar-Clonmore which monitors PM10, CO, SO2, NOx, Benzene.

6 SOURCE TERM

All of the materials handled on the site must be identified and assessed in order to determine whether they have the potential to cause a MATTE to any of the environmental receptors surrounding the site. In this section, the identified materials are assessed in a preliminary substance screening step in which materials are screened out if their release quantities or parameters related to their behaviour in the environment (e.g. ecotoxicity, degradability, water solubility, etc.) are deemed insufficient to result in environmental harm.

The materials present on the site have been identified as secondary fuel (diesel) and vanadium electrolyte solution. The material parameters are detailed in Table 6-1.

6.1 Preliminary Substance Screening

A preliminary substance screening process is conducted using the following criteria:

1. Where the material does not have any physical, chemical, toxic or eco-toxic properties that could adversely affect the environment following a release, the material is screened out.
2. Where the material does not meet a minimum inventory criterion of 250 litres (equivalent to a single barrel), the material is screened out. The 250 litre minimum inventory criterion has been set based on engineering judgement.

The ERA considers the worst-case unignited catastrophic (full-inventory) failures of the liquid fuel tanks (diesel) stored on site and module of vanadium electrolyte held on site along with firewater inventories. All releases are assumed to be unignited for the purposes of the preliminary substance screening.

There is the potential for ignited release of natural gas as per LEL Flexgen Castlelost Project - Proposed gas-fired back-up generator of 275MW electrical capacity which will combust natural gas supplied from the GNI transmission system. This is discussed in Sections 9.2 and 9.3.

The proposed 220kV Gas Insulated Switchgear (GIS) Electrical Substation may contain a greenhouse gas such as sulphur hexafluoride which is identified as is non-flammable and non-toxic gas and unlikely to cause a MATTE.

Based on the secondary fuel obligations and the project proposal of five turbines being installed, with each unit consuming 3.5kg fuel per second, the calculated tonnage of diesel is 4,082.4 tonnes at 90% of the unit's capacity on its primary fuel. The site has two liquid fuel tanks with a capacity of 2400m^3 each. The calculated tonnage of diesel stored in each tank is calculated as 2028 tonnes based on a diesel density of 845 kg/m^3.

For vanadium electrolyte solution, it is calculated that approximately 36,000 tonnes will be stored on site based on 264 modules each holding of 136 tonnes of vanadium electrolyte solution.

6.2 Summary of Representative MATTE Scenarios

The representative scenario is the release of approximately 2028 tonnes of diesel stored in one of the liquid fuel tank on the site. This is the worst-case unignited catastrophic (full-inventory) release scenario. The release of diesel representative scenario will be assessed to determine whether it has the potential to cause a MATTE to one of the identified environmental receptors surrounding the site.

The release of vanadium electrolyte solution scenario (release of 136 tonnes of vanadium electrolyte solution from one of the modules) has been ruled out and is not considered to have the potential to result in a MATTE because it is noted that from the safety data sheet of vanadium electrolyte solution that even though the eco-toxic properties are not available, the safety data sheet indicates that vanadium electrolyte solution is not a marine pollutant so is unlikely to be a surface water pollutant. Vanadium oxide sulphate eco-toxic properties are also not available, but it has been noted that it should not be discharged to the environment via drains. Also, sulphuric acid and orthophosphoric acid are not expected to result in MATTEs as the acid will react with soil / ground components in any impacted receptors. The soils on the site development are classed as fine loamy drift with limestones. The acids will react with the carbonate from the limestone to form hydrogen carbonate ions, which are very soluble in water and may start dissolving the limestone or form carbonic acid which will decompose to form carbon dioxide and eventually bubbles off into the atmosphere.

Table 6-1 List of Materials Held on Site with Chemical Properties

Material	CAS No.	Composition	Solubility in Water	Other Physical and Chemical Properties	Toxicity	Aquatic Toxicity	Degradability	Bioaccumulation	Comment
Diesel		Mixture of C9-C25 hydrocarbons	Insoluble	State (ambient conditions): liquid Boiling point: 170-390 ºC Flash point: 55-75 ºC Density: 820-845 kg/m^3 Flammability: flammable	Rat (inhalation): LC_{50} 4.1 mg/L (4 h)	Invertebrates: *Daphnia magna* (water flea): EL_{50} (48 h) 68 mg/l Fish: LL_{50} (96 h) 65 mg/l	Biodegradable	Not expected to bioaccumulate	Spillages may penetrate the soil and accumulate in sediments.
Vanadium Electrolyte Solution	Sulphuric acid: 7664-93-9 Vanadium oxide sulphate: 27774-13-6 Divanadium tris(sulphate): 13701-70-7 Orthophosphoric acid 7664-38-2	Sulphuric acid (10-20%) Vanadium oxide sulphate (10-20%) Divanadium tris(sulphate) (10-20%) Orthophosphoric acid (1-10%)	Miscible in all proportions	Boiling point/range°C: >100 Melting point/range°C: <-15 Relative density: 1.4 pH: <1	Sulphuric Acid 100%: Rat (ORL): LD50 2140mg/kg Orthophosphoric acid 100%: Rat (ORL): LD50 1530mg/kg Relevant effect for mixture is acute toxicity (harmful)	Not identified as a marine pollutant	No available data on persistence and degradability:	No available data on bioaccumulative potential	Spillage may penetrate soil as and react with soil / ground components

7 PATHWAY TERM

The pathways describe how unignited and ignited releases can potentially make their way offsite and into the surrounding environment via air, water and land pathways. At this stage of the assessment, it is assumed that no mitigation measures (for example bunds and tertiary containment) are in place.

7.1 Releases to Atmosphere

For substances that are released to atmosphere, the pathway of dispersion through air and subsequent deposition is viable. Atmospheric release scenarios include:

1. Transmission of thermal radiation, flame and overpressure through the atmosphere.
2. Dispersion and subsequent deposition of gaseous/vapour releases (including fire plume gases) through the atmosphere.
3. Atmospheric deposition of solids/liquids (for example from boilover events).

7.2 Releases to Water

There are no scenarios which may result in the release of materials from the site directly into water bodies as the site is located some 500 m away from the nearest water body, the Mongagh River.

7.3 Releases to Ground

For scenarios that result in releases with the potential for environmental damage that are transported by land, the existence of a complete source-pathway-receptor linkage is more complex and the pathway component of the linkage may be scenario location specific. The following land pathways have been considered:

1. Overland flow of the substance from point of release to receptor. This is more likely to occur where the ground at the point of release is impermeable, either through the presence of made ground or natural conditions.
2. Throughflow of material through the ground – the substance is released onto permeable ground and then flows laterally through the sub-surface over a short distance to surrounding environmental receptors. In this case, the soil layer would be considered to be both a receptor and a pathway.
3. Groundwater flow – the substance is released onto permeable ground and percolates through the surface layers into groundwater. Further dispersion through the groundwater may then occur, potentially leading to the exposure of more distant environmental receptors. In these cases, the groundwater can be both a receptor and a pathway.
4. Flow of released material offsite via the drainage system.

A discussion on whether the abovementioned land pathways present credible pathways that can result in the transportation of released material from specific points of release on site to any of the surrounding environmental receptors is given in the subsections below

7.3.1 Overland Flow

Released liquids will be able to reach the surrounding environmental receptors via overland flow if the gradient of the land slopes in the direction of the receptors, the flow pathway is not excessively long and there are no significant impediments to flow (e.g. vegetation).

The site development is within agricultural pastures and the overall topography of the site has been considered to be flat. Any liquid releases are therefore expected to spread out form circular pools around their point of release.

7.3.2 Throughflow and Groundwater Flow

The site area is largely paved with concrete and asphalt surfaces which are considered to be impervious to liquid spills. The two liquid fuel tanks storing diesel have a bund which is sized in accordance with EPA requirements i.e., 110% of the capacity of the largest tank or drum within the bunded area, or 25% of the total volume of the substance which could be stored within the bunded area (whichever is greater). However, there are areas outside of the tank bunds through which liquids can permeate. Where bund overtopping may occur, diesel is not expected to percolate quickly through the ground due to the viscosity dependence on outside temperature.

7.3.3 Releases via Site Drainage System and Foul Treatment System

The structure of the site's drainage system is assessed to determine if there is a potential for collected material to be discharged offsite and into any of the surrounding receptors.

Released liquid of diesel and firewater will involve collection and infiltration to ground and flow to a below ground fire wastewater retention tank to contain fire wastewater that arises from any fire suppression activity. In addition, there are a number of interceptors (oil/water separators) upgradient of infiltration which could be overwhelmed. Any overwhelming which occurs will follow the flow path discussed in Section 7.3.1 and 7.3.2. The fire wastewater retention tank routes the wastewater to the Foul Treatment System for further treatment prior to discharge.

It is assumed that a flow pathway from the site to the Mongagh River via the drainage system and the Foul Treatment System therefore exists.

8 RECEPTOR TERM

The receptors which are located nearest to the site development are considered to be at the highest risk of harm from unignited and ignited releases. An overview of the sensitive features that are found in the receptors that have been identified to be at the highest risk of harm from the site are given in the subsections below.

8.1 Mongagh River

The Mongagh River flows from west to east (i.e. rises near Tyrrellspass and Rochforthbridge and flows through Co. Westmeath before joining with the Yellow River just upstream of Clongall Bridge, near Castlejordan). The total length of the river is approximately 19 km. For the purposes of this assessment, the river is assumed to have a basin size of 40 km^2 and a discharge rate less than 11, 230 m^3/day (based on Yellow River discharge rate, Ref. /11/).

8.2 Agricultural Land

The site development is within agricultural pastures and releases from the site may impact the agricultural pastures assumed to 200 ha of land surrounding the site. The field to the south of this field is tillage while the field to the north is in pasture.

8.3 Soil

The soil located below the site area within agricultural pastures is considered as a separate environmental receptor as per the CDOIF Guidelines (Ref./3/). This receptor group refers to the material at the earth's surface to a depth of 1 m.

8.4 Groundwater

The site development is located above an aquifer classed as being of moderate vulnerability and located within a locally important aquifer. The bedrock is moderately productive in local zones.

The flow of groundwater in the area is assumed to be from west to east to north, in line with the Mongagh River flow direction. There are no groundwater drinking water protection areas within, or close to, the proposed site development lands (Ref. /9/). There is a well within the site drilled to a depth of 60.9m bgl (installed with 150mm casing). Bedrock was proven at 12.2m bgl and yield determined as being 76.3m3/d.

For the purposes of this assessment, a single groundwater receptor with a depth of 12 m will be considered with properties equivalent to the Dinantian Pure Unbedded Limestone – Waulsortian Limestone aquifer.

8.5 Heritage Sites

There are two ringforts (raths) near the site, one Ringfort (WM033-061) located in pasture on gentle low rise of ground with good views in all directions from the site and Ringfort (WM033-066) located approximately 370m to the south-south west of the site.

8.6 Designated Areas

There are no Natura 2000 sites within or immediately close to the site. The closest ecological designated site is Cloncrow Bog (New Forest) NHA Site Code 000677 is located 3km west of the sile. Lough Ennell SAC and pNHA site code 000685 is located 6km north west of the site and Raheenmore Bog SAC and pNHA site code 00582 is located approximately 6km south of the site.

8.7 Summary of Receptors at Risk of Harm from Site

The environmental receptors that have been deemed to be at potential risk of harm from operations at the site are listed in Table 8-1 below. Details on the size and CDOIF designation of each receptor are also provided.

Table 8-1: Environmental receptors which may potentially be affected by Site Development

Receptor ID	Receptor Name	Size	CDOIF Designation
R1	Mongagh River	19 km length with basin size of 40 km^2 (assumed width of 5m)	Fresh and estuarine water habitats
R2	Agricultural Land	200 ha	Widespread Habitat – non-designated Land
R3	Soil	N/A	Soil or sediment
R4	Dinantian Pure Unbedded Limestone – Waulsortian Limestone aquifer	12 m depth	Not a groundwater source of drinking water
R5	Ringfort (WM033-061)	N/A	Built environment
R6	Ringfort (WM033-066)	N/A	Built environment
R7	Cloncrow Bog NHA	132 ha	Designated Area
R8	Lough Ennell SAC	1719 ha	Designated Area
R9	Raheenmore Bog SAC	182 ha	Designated Area

9 DETERMINING MATTE POTENTIAL

The MATTE potentials of the unmitigated liquid and unignited gaseous release scenarios are determined in this section. The first step taken was to establish which of the surrounding receptors can be affected and then it was checked whether the quantity of material that is predicted to reach the receptor is sufficient to cause a MATTE. If the potential for a MATTE exists, the level of harm caused to the affected receptor is determined by establishing the severity of harm caused and the likely duration of harm of the effects of the release on the impacted receptor.

9.1 Unignited Liquid Scenario

The first step taken was to determine whether the released liquid have the potential to affect the surrounding environmental receptors by establishing whether flow pathways exist between the sources and receptors. The severity of harm caused to the affected receptors by the released material was then determined using the approaches described in Section 3.2.1 (LC_{50} approach, oil slick approach, etc.). The duration of harm caused to the affected receptors was then determined using the approach outlined in Section 3.2.2. The severity and duration of harm were then used to establish the MATTE consequence level to each receptor between A and D as shown in the matrix presented in Figure 3-1.

The representative unignited liquid scenario is the release of approximately 2028 tonnes of diesel stored in 2400m^3 liquid fuel tank capacity identified in the preliminary screening stage. The scenario is assessed to determine if there is a potential for a MATTE to any of the surrounding receptors. This scenario examines the release of diesel following a catastrophic failure of 2400m^3 tank and represents the largest worst case single release of diesel. Details of the maximum releasable inventory and pool radius are presented in Table 9-1 below.

Table 9-1: Scenario of Diesel Release Details

Scenario Description	Release Location	Worst Case Quantity Released		Pool Radius (m)
		m^3	Tonnes	
Catastrophic failure of one diesel tank	Fuel Tank Bund Area	2400	2028	391

The surface of the site is considered to be flat and the release is expected to spread out in a circular pool with an assumed thickness of 20 mm from its point of origin. A conservative assumption has been made for the purposes of simplification that there will be no flash-off of any of the light components in the released material and there will be no reduction in the mass of liquid. The released material may potentially impact the following environmental receptors:

- **R1 Mongagh River** – in the absence of containment measures i.e., the bund, the released diesel is expected to spread across the surface of the site until it is infiltrated to the below ground fire wastewater retention tank or intercepted via upgradient of infiltration. The diesel will be then routed to the Foul Treatment System and, if it is not intercepted there, into the Mongagh River where it is assumed to be discharged to. No direct flow of the released material into the Mongagh River is expected to occur due to the distance of the site to Mongagh River.

- **R2 Agricultural Land and R3 Soil** – the released diesel is not expected to flow far enough to impact the agricultural land or its soil. Therefore, no significant environmental harm to these receptors is expected to occur.

- **R4 Groundwater –** some of the released diesel will spread to areas of unmade ground and the well on the site. However, the material is expected to permeate into the ground slowly due to its high viscosity. This will allow the majority of the spill to be cleaned up before a significant volume can permeate into the ground. A small percentage of the released diesel will enter the sub-surface but this is expected to remain above the groundwater layer due to the low solubility of its components in water. Therefore, no significant environmental harm to this receptor is expected to occur.

The potential environmental harm to the Mongagh River (R1) is discussed in the following sub-section and the findings are summarised in Table 9-2.

9.1.1 Potential Impacts on R1 – Mongagh River

A release of diesel into the waters of the Mongagh River may potentially cause harm via the formation of an oil slick on the surface of the water. Thus, the oil slick approach has been used to assess the potential level of environmental harm. The length of the Mongagh River that would be covered if a slick of slop oil spread evenly across the width of the river with a thickness of 0.1 mm was calculated as:

$$Length\ of\ river\ affected\ (m) = \frac{Volume\ released\ (m^3)}{Slick\ thickness\ (m) \times Width\ of\ River\ (m)} \qquad (9.1)$$

The calculations show that a release of 2400m^3 of diesel will cover the entire 19 km stretch of the Mongagh River with a 0.1 mm slick which constitutes a severity level of 3 (Major) as per Table A-1. It is expected that it will be possible to remove the majority of the released oil from the water in the river within a year. However, it is expected that due to the very high release volume, a significant quantity of the released oil may mix with sediments and vegetation on the banks of the river and create effects which last longer than 1 year. A medium-term duration of harm (>1 year) was therefore selected as per Table A-2. The overall consequence level is therefore a level B MATTE.

Table 9-2: MATTE Assessment results for Release of Diesel Scenario

Receptor	Minimum Area Required for MATTE	Min. Release Quantity Required for MATTE	Area Affected by Full Inventory Release	Severity Rating	Duration Category	MATTE Consequence Level
R1 – Mongagh River (oil slick approach)	2 km	8.45 te	19 km	3	2	B

9.1.2 Releases of Firewater

Firewater systems present on site will provide an immediate response to events that involve fires. The release of firewater will be assumed to only occur following releases of flammable materials or occurrences of fires on the site.

Firewater itself does not have the potential to cause environmental harm. However, firewater run-off from the site can contain combusted and un-combusted forms of the substances involved in the fire. The application of firewater can increase the potential for the release of diesel to reach the surrounding receptors via run-off from the site and it is assumed that the flow pathways will remain the same. It is difficult to estimate exactly how much further release of diesel will spread if firewater is applied simultaneously. It is expected that the spill radii will increase slightly but not significantly enough to cause an increase in the MATTE levels determined previously.

9.2 Ignited Scenario

Environmental receptors can be harmed by ignited events, either as a result of direct flame engulfment or, outside the flame, by short or long-term exposure to elevated levels of thermal radiation transmitted through the atmosphere. Overpressure generated by an explosion can also result in environmental impacts.

A variety of consequence types are considered including jet fire, flash fire, fireball, pool fire and vapour cloud explosion. The consequence types and the potentially affected receptors are presented in Table 9-3.

The assessment show that the only ignited consequence types that have the potential to impact the surrounding environmental receptors are:

- Flash fires – flash fires may impact the Agricultural Land (R2). However, any land or vegetation which is burnt is expected to recover within a year which will avoid the potential for a MATTE being realised;
- Overpressure events – an overpressure of 0.1 bar is typically strong enough to break glass on buildings but is not strong enough to cause harm to flora and fauna and generally predict that stronger overpressure levels are not expected to extend for significant distances.

Therefore, it is assumed that no ignited scenarios have the potential to impact on the Ringfort (R5 and R6).Ignited events from the site are therefore not expected to result in any MATTEs to the surrounding receptors.

Table 9-3: Receptors potentially impacted by ignited events

Consequence Type	Receptors Potentially Affected	Notes
Jet fire	-	Consequence effects not expected to impact any of the surrounding receptors.
Flash fire	R2	Affected receptors are expected to recover in <1 year. No potential for MATTE.
Fireball	-	Consequence effects not expected to impact any of the surrounding receptors.
Pool fire	-	Consequence effects not expected to impact any of the surrounding receptors.
Vapour cloud expansion (0.1 bar)	R2	No harm to flora or fauna expected to be caused by an overpressure of 0.1 bar.

9.3 Combustion Products

Combustion products are the materials produced as a result of the decomposition of the material involved in a fire including intermediate breakdown products, smoke and particulates. The likely fall-out products following a fire or explosion will mainly be limited to CO, CO_2, H_2O and a number of partially oxidised products such as soot and smoke etc. Polycyclic Aromatic Hydrocarbons (PAHs) may also be produced during the combustion of natural gas.

Soot formation is expected to be an issue with fires involving solid or liquid fuels such as crude oil. Soot is generated by the incomplete combustion of hydrocarbons and it can be transported as fine particulates through the air. Particulate matter is also expected to be produced if the fire from an ignited event burns the ground, vegetation or other structures on or off the site.

There is a wide spectrum of particle sizes released during a fire. Smaller sized particles tend to travel further distances than the larger sized particles. In general, within a few kilometres of the site, material with diameters of a few millimetres to even centimetres will settle. Particles with diameters of a few to tens of micrometres may be transported up to ten kilometres away from the source (Ref. /12/). Particles may be deposited directly on to land or surface water sources, or washed out of the atmosphere by precipitation and indirectly deposited. The extent of environmental damage will depend on the meteorological conditions (e.g. the wind direction, wind speed, atmospheric stability and rainfall) and generally decreases non-linearly with distance from the site of the release.

Wind direction will influence the likely environmental receptors; the wind speed will influence the dispersion rate and the extent that a material is carried downwind. Similarly, rainfall can have differing impacts on an atmospheric release. The reactivity and solubility of a material will influence whether it is likely to undergo hydrolysis or deposition through precipitation. Deposition onto land could result in soil contamination or percolation into groundwater causing contamination. The properties of the material, such as its persistence and ecotoxicity will also influence the extent of environmental damage. Soot can also impact surface water receptors either via direct deposition or via land run-off.

Any fall-out, which reaches the surrounding receptors, may result in some short-term impacts but particle degradation is likely to occur relatively quickly. Therefore, a release of combustion products via the atmosphere is unlikely to result in a MATTE.

10 FREQUENCY ASSESSMENT OF UNMITIGATED CONSEQUENCES

The frequency assessment follows the approach defined in Section 6.2 of the CDOIF guidance (Ref. /2/). It is undertaken by assigning an unmitigated event frequency to the release of diesel scenario that has the potential to cause a MATTE to the Mongagh River. The unmitigated event frequency for the release of diesel is used to establish the unmitigated risk posed by the establishment to the identified receptor.

10.1 Unmitigated Scenario Frequency and Risk Summary

The unmitigated event frequency for the release of diesel scenario identified to have the potential to cause a MATTE is summarised in Table 10-1. The sources of the frequency data used is also stated in the table.

Table 10-1: Unmitigated event frequencies for each potential MATTE scenario

Scenario Description	Receptor	MATTE Consequence Level	Frequency (event per year)	Source of Frequency data
Release of Diesel	R1 – Mongagh River	B	1.5E-04	Calculated using Table 2.2 Atmospheric Storage Tank Fire Frequencies for Large bund fire (full bund area), assuming 25 year tank life (Ref. /13/).

The unmitigated event frequency is the total unmitigated risk posed by the establishment to the receptor identified. The establishment risk to the receptor is plotted against the CDOIF tolerability criteria for event frequency per receptor per year in Figure 10-1 and found to be in the tolerable if ALARP (TifALARP) on the CDOIF risk matrix.

	Frequency per establishment per receptor per year (unmitigated)						
Frequency at which CDOIF Consequence Level is equalised or exceeded (events/year)	10^{-8} - 10^{-7}	10^{-7} - 10^{-6}	10^{-6} - 10^{-5}	10^{-5} - 10^{-4}	10^{-4} - 10^{-3}	10^{-3} - 10^{-2}	$>10^{-2}$
D - MATTE							
C - MATTE							
B - MATTE				**R1**			
A - MATTE							
Sub-MATTE	Tolerability not considered by CDOIF						

Figure 10-1: Unmitigated frequency per establishment per receptor per year

11 MITIGATED FREQUENCIES

The layers of protection in place to prevent the release scenario from reaching the surrounding environmental receptors are considered, in order to determine the mitigated levels of risk from the site. The mitigated frequency of harm caused to the surrounding environmental receptors is calculated by multiplying the unmitigated frequency by the probability of failure on demand (PFD) values of any layers of protection which may potentially stop the release from making its way to the receptor.

A description of the relevant layers of protection in place to prevent the scenario identified as having the potential to cause a MATTE to the surrounding receptor is given below.

11.1 Release Impacting R1 – Mongagh River

The layers of protection relevant to releases from the site which have been identified to have the potential to cause MATTEs to the Mongagh Rivel are:

- Tank bund.
- Fire wastewater retention tank.
- Foul Treatment System.

A description and the PFD values allocated to each of these layers of protection are provided in the table below.

Table 11-1: Layers of protection relevant to preventing releases to the Mongagh River

Layer of Protection	Description	PFD
Tank bund	The diesel fuel tanks surrounded by a concrete bund which provide capacity for 110% of the contents of the tanks. Tank releases may breach the containment provided by the bund following a structural failure of the bund walls, overtopping of the bund walls or if the bund drain valve has been left open.	0.01 (Ref. /14/)
Fire wastewater retention tank	The catastrophic failure of one of the diesel fuel tanks will result in the release of a very large volume of diesel which has the potential to spread and form a pool from the release point. Collection and infiltration to the below ground fire wastewater retention tank occurs around the site. In addition, there are a number of interceptors (oil/water separators) upgradient of the infiltration points which are also routed to the fire wastewater retention tank. There is outlet flow from the fire water waste retention tank to the foul treatment system which is expected to be limited and will give the operators adequate time to close the valves on the outlet lines before a significant quantity of the hydrocarbon liquids have been released.	0.3 (Ref. /14/)
Foul Treatment System	All effluent from the fire wastewater retention tank will be routed to the foul treatment system where it will be treated prior to discharge into the Mongagh River. It is unlikely that the foul treatment system would be able to remove a large slug of hydrocarbons from the effluent stream under normal operations but it is expected that the operators and process instrumentation along with the long residence times in the foul treatment system would allow for the hydrocarbon material to be detected and action taken to treat the effluent before it can be discharged to the Mongagh River.	0.05*

(Ref. /14/) for a probability of error of 0.01/opportunity for an operator that is well trained with no stress. Assumed a PFD of 0.05 to be more conservative.

Event tree illustrates the layers of protection that are in place to prevent the release of diesel from causing a MATTE in the Mongagh River are shown in Figure 11-1. The event tree is used to calculate the risk reduction factors that the layers of protection expected to provide to reduce the unmitigated frequencies of the scenarios.

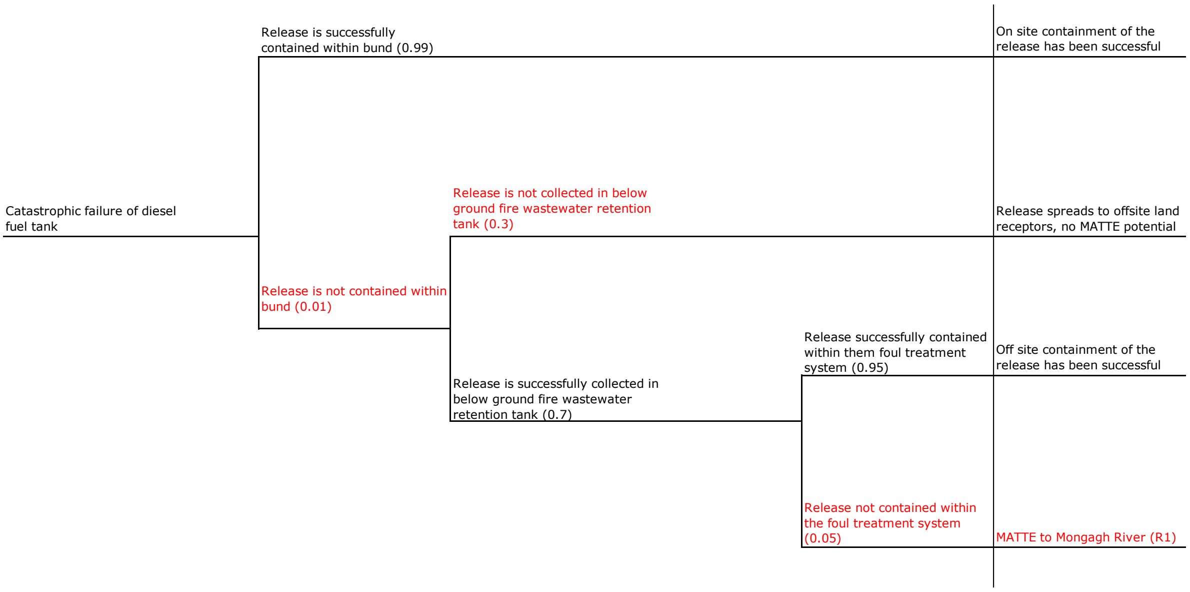

Figure 11-1: Event tree for catastrophic failure of diesel tank in bunded area

11.2 Mitigated Event Frequency Calculations

The mitigated event frequency for the MATTE scenario was calculated by multiplying the unmitigated event frequency by the risk reduction factor associated with the layers of protection in place for the scenario.

Table 11-2: Mitigated event frequencies for each potential MATTE scenario

Receptor	Scenario Description	MATTE Consequence Level	Unmitigated Frequency (per year)	Risk Reduction Factor	Mitigated Frequency (per year)
R1 – Mongagh River	Release of Diesel	B	1.5E-04	3.50E-04	5.25E-08

11.3 Mitigated Risk Summary

The mitigated event frequency for release of diesel scenario as reported in Table 11-2 is used to establish the mitigated risk posed by the establishment to the identified receptor.

The mitigated establishment risk per receptor per consequence level is summarised in Table 11-3. The establishment risk to the identified receptor was then plotted against the CDOIF tolerability criteria for event frequency per receptor per year in Figure 11-2 and found to be in the Broadly Acceptable Region of the CDOIF risk matrix.

Table 11-3: Mitigated establishment risk

Receptor	**MATTE Consequence Level**	**Total Mitigated MATTE Frequency (events/year)**
R1 – Mongagh River	B	5.25E-08

	Frequency per establishment per receptor per year (mitigated)						
Frequency at which CDOIF Consequence Level is equalised or exceeded (events/year)	10^{-8} - 10^{-7}	10^{-7} - 10^{-6}	10^{-6} - 10^{-5}	10^{-5} - 10^{-4}	10^{-4} - 10^{-3}	10^{-3} - 10^{-2}	$>10^{-2}$
D - MATTE							
C - MATTE							
B - MATTE	**R1**						
A - MATTE							
Sub-MATTE	Tolerability not considered by CDOIF						

Figure 11-2: Mitigated frequency per establishment per receptor per year

12 CONCLUSIONS

One Source-Pathway-Receptor trio with MATTE potential was identified as the release of approximately 2028 tonnes of diesel stored in 2400m^3 liquid fuel tank capacity impacting on the Mongagh River.

The overall unmitigated level of risk posed by the establishment from the release of diesel to the Mongagh was found to be in the tolerable if ALARP (TifALARP) on the CDOIF risk matrix. Following the identification of the control measures in place and their probability of failure on demand, it was found that the level of mitigated risk posed by the establishment to the Mongagh River falls into the Broadly Acceptable region.

The release of vanadium electrolyte solution scenario was ruled out and not considered to have the potential to result in a MATTE because it is noted that from the safety data sheet of vanadium electrolyte solution that even though the eco-toxic properties are not available, the safety data sheet indicates that vanadium electrolyte solution is not a surface water pollutant. Also, sulphuric acid and orthophosphoric acid which form part of the vanadium electrolyte solution are not expected to result in MATTEs as the acid will react with soil / ground components in any impacted receptors.

13 REFERENCES

/1/ The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), Health and Safety Authority, 2015

/2/ Guideline – Environmental Risk Tolerability for COMAH Establishments, Version 2.0, Chemical and Downstream Oil Industries Forum.

/3/ A Guide to the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015

/4/ The REACH Enforcement Regulations 2008, European Parliament No. 1906/2006.

/5/ Guidance on the Interpretation of Major Accident to the Environment for the Purpose of the COMAH Regulations 1999, Department of the Environment, Transport and the Region (DETR), 1999.

/6/ Oil Spills in the Sea, Offshore Environment, S. Patin. Available at: http://www.offshore-environment.com/oil.html.

/7/ Behaviour of Hydrocarbons in the Subsurface, Pennsylvania Department of Environmental Protection. Available at: http://files.dep.state.pa.us/EnvironmentalCleanupBrownfields/LandRecyclingProgram/LandRecyclingProgramPortalFiles/CSSAB/2004/fprg_chap3.pdf

/8/ Supporting Guide to the Environmental Risk Tolerability for COMAH Establishments Guideline - Environmental Recovery Guide, ENVIRON, 2015.

/9/ LEL FLEXGEN (CASTLELOST) Kiltotan & Collinstown and Oldtown, Co Westmeath EIA Briefing Document, May 2021.

/10/ https://www.epa.ie/our-services/licensing/air/

/11/ https://en.wikipedia.org/wiki/Yellow_River_(County_Offaly)

/12/ Using Science to Create a Better Place – Review of Emission Factors for Incident Fires, Environment Agency, 2009.

/13/ OGP Risk Assessment Data Directory, Storage Incident Frequencies, Report No 434-3, March 2010

/14/ CCPS LOPA guidance by DNV, 2010

APPENDIX A
MATTE Tolerability Tables

Table A-1: Severity of harm criteria for environmental receptors (Ref. /2/)

Row	Receptor Type	Severity of Harm				Reference to	Comments
		Significant *While this level of harm might be significant pollution, it is not considered a MATTE.*	**Severe** *DETR Criteria – the lowest level of harm that might be considered MATTE.*	**Major**	**Catastrophic**	*Corresponding Harm/Duration/ Recovery row in Table A-2*	*The 'Severe' to 'Catastrophic' levels of harm are considered to be included as 'Serious' with respect to the COMAH definition of a major accident.* *Receptors include:*
	Severity Level →	**1**	**2**	**3**	**4**		
1	Designated Land/Water Sites (Nationally important)	<0.5ha or <10%	>0.5ha or 10-50% of site area, associated linear feature or population	>50% of site area, associated linear feature population	*N/A*	Land or Surface Water	NNR, SSSI, MNR
2	Designated Land/Water Sites (Internationally important)	<0.5ha or <5% (<5% LF/Pop)	>0.5ha or 5-25% of site area or 5-25% of associated linear feature or population	25-50% of site area, associated linear feature or population	>50% of site area, associated linear feature or population	Land or Surface Water	SAC, SPA, RAMSAR
3	Other Designated Land	<10ha or <10%	10-100ha or 10-50% of land	>100ha or >50% of land	*N/A*	Land	ESA, AONB, National Park, etc.
4	Scarce Habitat	<2ha or <10%	2-20ha or 10-50% of habitat	>20ha or >50% of habitat	*N/A*	Land or Surface Water	BAP habitats, geological features

Row	Receptor Type	**Severity of Harm**				**Reference to**	**Comments**
Row	**Receptor Type**	**Significant** *While this level of harm might be significant pollution, it is not considered a MATTE.*	**Severe** *DETR Criteria – the lowest level of harm that might be considered MATTE.*	**Major**	**Catastrophic**	*Corresponding Harm/Duration/ Recovery row in Table A-2*	*The 'Severe' to 'Catastrophic' levels of harm are considered to be included as 'Serious' with respect to the COMAH definition of a major accident.* *Receptors include:*
	Severity Level →	**1**	**2**	**3**	**4**		
5	Widespread Habitat – Non-designated Land	<10ha	Contamination of 10-100ha of land, preventing growing of crops, grazing of domestic animals or renders the area inaccessible to the public because of possible skin contact with dangerous substances. Alternatively, contamination of 10ha or more of vacant land.	100 – 1000ha (applied as per text under 'Severe')	>1000ha (applied as per text under 'Severe')	Land	Land/water used for agriculture, forestry, fishing or aquaculture
6	Widespread Habitat – Non-designated Water		Contamination of aquatic habitat which prevents fishing or aquaculture or renders is inaccessible to the public.	*N/A*	*N/A*	Surface Water	Land/water used for agriculture, forestry, fishing or aquaculture

Row	Receptor Type	Severity of Harm				Reference to	Comments
		Significant *While this level of harm might be significant pollution, it is not considered a MATTE.*	**Severe** *DETR Criteria – the lowest level of harm that might be considered MATTE.*	**Major**	**Catastrophic**	*Corresponding Harm/Duration/ Recovery row in Table A-2*	*The 'Severe' to 'Catastrophic' levels of harm are considered to be included as 'Serious' with respect to the COMAH definition of a major accident.* *Receptors include:*
	Severity Level →	**1**	**2**	**3**	**4**		
7	Source of Public or Private Drinking Water (Groundwater or Surface Water)	Interruption of drinking water supply <1000 person-hours or For England & Wales only <1ha SPZ	Interruption of drinking water supplied from a ground or surface source (where persons affected x duration in hours [at least 2] >1,000) or For England & Wales only 1-10ha of SPZ where drinking water standards are breached	>1 x 10^7 person-hours interruption of drinking water (a town of ~100,000 people losing supply for month) or For England & Wales only 10-100ha SPZ drinking water standards breached	>1 x 10^9 person-hours interruption of drinking (~1 million people losing supply for 1 month) or For England & Wales only >100ha SPZ drinking water standards breached	Groundwater body or Surface Water Public Drinking Water Source	In England the area of groundwater, used for public drinking water, at risk from pollution is mapped using Source Protection Zones (SPZs). In Scotland, there is not an equivalent mapping of SPZs and only the interruption criteria should be used.

Row	Receptor Type	Severity of Harm				Reference to	Comments
		Significant *While this level of harm might be significant pollution, it is not considered a MATTE.*	**Severe** *DETR Criteria – the lowest level of harm that might be considered MATTE.*	**Major**	**Catastrophic**	*Corresponding Harm/Duration/ Recovery row in Table A-2*	*The 'Severe' to 'Catastrophic' levels of harm are considered to be included as 'Serious' with respect to the COMAH definition of a major accident.* *Receptors include:*
	Severity Level →	**1**	**2**	**3**	**4**		
8	Groundwater Body (non-Drinking Water Source)	<1ha	1-100ha of groundwater body where the WFD status has been lowered	100-10,000ha	>10,000ha	Groundwater body or Surface Water Public Drinking Water Source	UKTAG has determined that to qualify as a body of groundwater, an aquifer must be capable of supplying 10m^3 per day or 50 people (on a continuous basis) and that such aquifers/groundwater bodies have future resource value which must be protected. Groundwater Bodies have been identified and mapped in accordance with guidance under the Water Framework Directive – see 3.2.3 and Appendix 3 for further information
9	Other Groundwater (outside of groundwater bodies)	Groundwater not a pathway to another receptor.	*Where the groundwater is a pathway for another receptor assess against relevant criteria for the receptor.*			*N/A*	

Row	Receptor Type	Severity of Harm				Reference to	Comments
		Significant *While this level of harm might be significant pollution, it is not considered a MATTE.*	**Severe** *DETR Criteria – the lowest level of harm that might be considered MATTE.*	**Major**	**Catastrophic**	*Corresponding Harm/Duration/ Recovery row in Table A-2*	*The 'Severe' to 'Catastrophic' levels of harm are considered to be included as 'Serious' with respect to the COMAH definition of a major accident.* *Receptors include:*
	Severity Level →	**1**	**2**	**3**	**4**		
10	Soil or sediment (i.e. as receptor rather than purely a pathway)	Contamination not leading to environmental damage (as per ELD), or not significantly, affecting overlying water quality.	Contamination of 10-100ha of land etc. as per Widespread Habitat; Contamination sufficient to be deemed environmental damage (Environmental Liability Directive)	Contamination of 100-1000ha of land, as per Widespread Habitat; Contamination rendering the soil immediately hazardous to humans (e.g. skin contact) or the living environment, but remediation available.	Contamination of >1000ha of land, as per Widespread Habitat; Contamination rendering the soil immediately hazardous to humans (e.g. skin contact) or the living environment and remediation difficult or impossible.	Land	
11	Built environment	Damage below a level at which designation of importance would be withdrawn.	Damage sufficient for designation of importance to be withdrawn.	Feature of built environment subject to designation of importance entirely destroyed.	*N/A*	Built environment	This is limited to Grade 1 / Cat A Listed buildings, scheduled ancient monuments, conservation area, etc.
12	Various receptors. Should not be used to identify and assess MATTE.	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	Refer to DETR. Standards relating to continuous emissions, contained in other EU legislation.

Row	Receptor Type	**Severity of Harm**				**Reference to**	**Comments**
Row	**Receptor Type**	**Significant** *While this level of harm might be significant pollution, it is not considered a MATTE.*	**Severe** *DETR Criteria – the lowest level of harm that might be considered MATTE.*	**Major**	**Catastrophic**	*Corresponding Harm/Duration/ Recovery row in Table A-2*	*The 'Severe' to 'Catastrophic' levels of harm are considered to be included as 'Serious' with respect to the COMAH definition of a major accident.* *Receptors include:*
	Severity Level →	**1**	**2**	**3**	**4**		
12	Particular species (Note – these criteria apply nationally – i.e. England, Wales, Scotland)	Loss of <1% of animal or <5% of plant ground cover in a habitat.	Loss of 1-10% of animal or 5-50% of plant ground cover.	Loss of 10-90% of animal or 50-90% of plant ground cover.	Total loss (>90%) of animal or plant ground cover.	Land	
14	Marine	<2ha littoral or sub-littoral zone, <100ha of open sea benthic community, <100 dead sea birds (<500 gulls), <5 dead/significantly impaired sea mammals.	2-20ha littoral or sub-littoral zone, 100-1000ha of open sea benthic community, 100-1000 dead sea birds (500-5000 gulls), 5-50 dead/significantly impaired sea mammals.	20-200ha littoral or sub-littoral zone, 100-10,000ha of open sea benthic community, 1000-10,000 dead sea birds (5,000-50,000 gulls), 50-500 dead/significantly impaired sea mammals.	>200ha littoral and sub-littoral zone, >1000ha of open sea benthic community, >10000 dead sea birds (>50000 gulls), >500 dead/significantly impaired sea mammals.	Surface Water	

Row	Receptor Type	Severity of Harm				Reference to	Comments
		Significant *While this level of harm might be significant pollution, it is not considered a MATTE.*	**Severe** *DETR Criteria – the lowest level of harm that might be considered MATTE.*	**Major**	**Catastrophic**	*Corresponding Harm/Duration/ Recovery row in Table A-2*	*The 'Severe' to 'Catastrophic' levels of harm are considered to be included as 'Serious' with respect to the COMAH definition of a major accident.* *Receptors include:*
	Severity Level →	**1**	**2**	**3**	**4**		
15	Fresh and estuarine water habitats	Impact below that of Severity level 2	WFD Chemical or ecological status lowered by one class for 2-10km of watercourse or 2-20ha or 10-50% area of estuaries or ponds. Plus interruption of drinking supplies, as per DETR Table 6.	WFD Chemical ecological status lowered by one class for 10-200km of watercourse or 20-200ha or 50-90% area of estuaries and ponds. Plus interruption of drinking water supplies, as per DETR Table 6.	WFD Chemical or ecological status lowered by one class for >200km of watercourse or >200ha or >90% area of estuaries and ponds. Plus interruption of drinking water supplies, as per DETR Table 6.	Surface Water	

Table A-2: Duration / recovery criteria (based on unmitigated consequence) (Ref. /2/)

Description	**Short term**	**Medium term**	**Long term**	**Very long term**
	Harm with such short recovery is not considered a MATTE.			
Harm Duration Category →	**1**	**2**	**3**	**4**
LAND	≤ 3 years	> 3 years or > 2 growing seasons for agricultural land	> 20 years	> 50 years
SURFACE WATER (ALL EXCEPT PUBLIC OR PRIVATE DRINKING WATER SOURCE)	≤ 1 year	> 1 year	> 10 years	> 20 years
GROUNDWATER BODY OR SURFACE WATER PUBLIC OF PRIVATE DRINKING WATER SOURCE	*N/A*	Harm affecting non-public drinking water source.	Harm affecting public drinking water source or SPZ.	*N/A*
BUILT ENVIRONMENT	Can be repaired in < 3 years, such that its designation can be reinstated.	Can be repaired in > 3 years, such that its designation can be reinstated.	Feature destroyed, cannot be rebuilt, all features except world heritage site.	Feature destroyed, cannot be rebuilt, world heritage site

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Appendix 7.1

Flood Risk Assessment Report

LEL Flexgen Castlelost
LEL GIS Castlelost
LEL ESS Castlelost
Kiltotan, Collinstown and Oldtown
Co. Westmeath
Flood Risk Assessment

FRA Report

September 21

2021s0994

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Revision History

Revision Ref / Date Issued	Amendments	Issued to
S3-P01 13 Sept 2021	Initial issue	Halston EPL Ltd
A3-C01 20 Sept 2021	Minor updates	Halston EPL Ltd

Contract

This report describes work commissioned by Colm Staunton, on behalf of Halston EPL Ltd, by an email dated 13/09/2021. Ben Murphy and Ross Bryant of JBA Consulting carried out this work.

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Abbreviations

1D .... One Dimensional (modelling)
2D .... Two Dimensional (modelling)
AEP .... Annual Exceedance Probability
CFRAM .... Catchment Flood Risk Assessment and Management
DoEHLG .... Department of the Environment, Heritage and Local Government
FARL .... FEH index of flood attenuation due to reservoirs and lakes
FB .... Freeboard
FFL .... Finish Floor Levels
FRA .... Flood Risk Assessment
FSR .... Flood Studies Report
FSU .... Flood Studies Update
GSI .... Geological Survey of Ireland
LHB .... Left Hand Bank
OPW .... Office of Public Works
PFRA .... Preliminary Flood Risk Assessment
RFI .... Request for Further Information
RHB .... Right Hand Bank
RR .... Rainfall-Runoff
SAAR .... Standard Average Annual Rainfall (mm)
SFRA .... Strategic Flood Risk Assessment
URBEXT .... FEH index of fractional urban extent
WL .... Water Level

1 Introduction

Under the Planning System and Flood Risk Management Guidelines for Planning Authorities (DoEHLG & OPW, 2009) proposed development must undergo a Flood Risk Assessment to ensure sustainability and effective management of flood risk.

1.1 Terms of Reference and Scope

JBA Consulting was appointed by Halston EPL Ltd to prepare a Flood Risk Assessment (FRA) for the LEL Flexgen Castlelost Project which consists of a 275MWe reserve gas fired generator, the LEL GIS Castlelost Project which is the gas insulated switchgear (GIS) substation and the LEL ESS Castlelost Project includes the battery energy storage system (BESS) and synchronous condenser (Syncon) located in Kiltotan, Collinstown and Oldtown, Co. Westmeath.

1.2 Flood Risk Assessment; Aims and Objectives

This study is being completed to inform the future development of the site as it relates to flood risk. It aims to identify, quantify and communicate to Planning Authority officials and other stakeholders the risk of flooding to land, property and people and the measures that would be recommended to manage the risk.

The objectives of this FRA are to:

- Identify potential sources of flood risk;
- Confirm the level of flood risk and identify key hydraulic features;
- Assess the impact that the proposed development has on flood risk;
- Develop appropriate flood risk mitigation and management measures which will allow for the long-term development of the site.

Recommendations for development have been provided in the context of the OPW / DECLG planning guidance, "The Planning System and Flood Risk Management". A review of the likely effects of climate change, and the long-term impacts this may have on any development has also been undertaken.

For general information on flooding, the definition of flood risk, flood zones and other terms see 'Understanding Flood Risk' in Appendix A.

1.3 Development Proposal

The proposed development summaries are provided below:

LEL Flexgen Castlelost: Proposed gas-fired reserve generator of 275MW electrical capacity. The project will combust natural gas supplied from the Gas Networks Ireland (GNI) transmission system. The proposal includes the installation of five (5no.) dry low emission (DLE) gas turbines, associated stack(s), raw water/fire water tank, fire water retention basin, back-up fuel tank, emergency generator, gas receiving station (AGI), low, medium and high voltage transformers, customer control room, and all ancillary electrical plant and delivery systems. GNI will separately manage the process of delivering the underground gas transmission pipeline to the proposed site.

LEL GIS Castlelost Project: Proposed 220kV Gas Insulated Switchgear (GIS) Electrical Substation. The project will involve installation of two (2 no.) 220 kV underground circuits forming a connection to the existing Shannonbridge-Maynooth 220 kV overhead line (located within the development boundary) and two (2no.) 220 kV underground circuits and associated low voltage and communication underground cabling connecting the proposed substation with electricity transformers on the adjacent reserve gas-fired generator (Project 1) and ESS (Project 3) sites, and all associated and ancillary site development works. The GIS substation itself includes a two storey, 17m high building (housing electrical switchgear, a battery room, a workshop room, and WC), transformer bay(s), access roadway and all ancillary site development works.

LEL ESS Castlelost Project: Proposed Energy Storage System (ESS) using vanadium flow battery (VFB) technology and synchronous condenser. The battery energy storage system (BESS) will comprise a cluster of battery modules positioned within a dedicated BESS outdoor compound. Each module will consist of (i) a battery container (6.1m long container) housing pumps and heat exchangers positioned on top of two (ii) tank (electrolyte) enclosures (12.2m long containers).

An associated battery management system (BMS) and medium voltage power station (MVPS) enclosure will also form part of the battery module. The BMS will monitor and control electrolyte circulation and the MVPS is provided to condition the power generated. The synchronous condenser comprises a rotating generator positioned within a building.

The generator is connected to the transmission system via a step-up transformer. When the generator has reached an operating speed that is synchronous to the system frequency, it is synchronised with the transmission network and acts as a motor providing reactive and short circuit power to the electricity network. A customer (IPP) building will also be installed within the ESS compound, and it will house electrical switchgear, store, control room, welfare facilities and administration facilities.

The layout of the proposed development is provided in Figure 1-1.

1.4 Report Structure

Section 2 of this report gives an overview of the study location and associated watercourses. Section 3 contains background information and initial assessment of flood risk. Site-specific mitigation measures are outlined in Section 4, while conclusions are provided in Section 5.

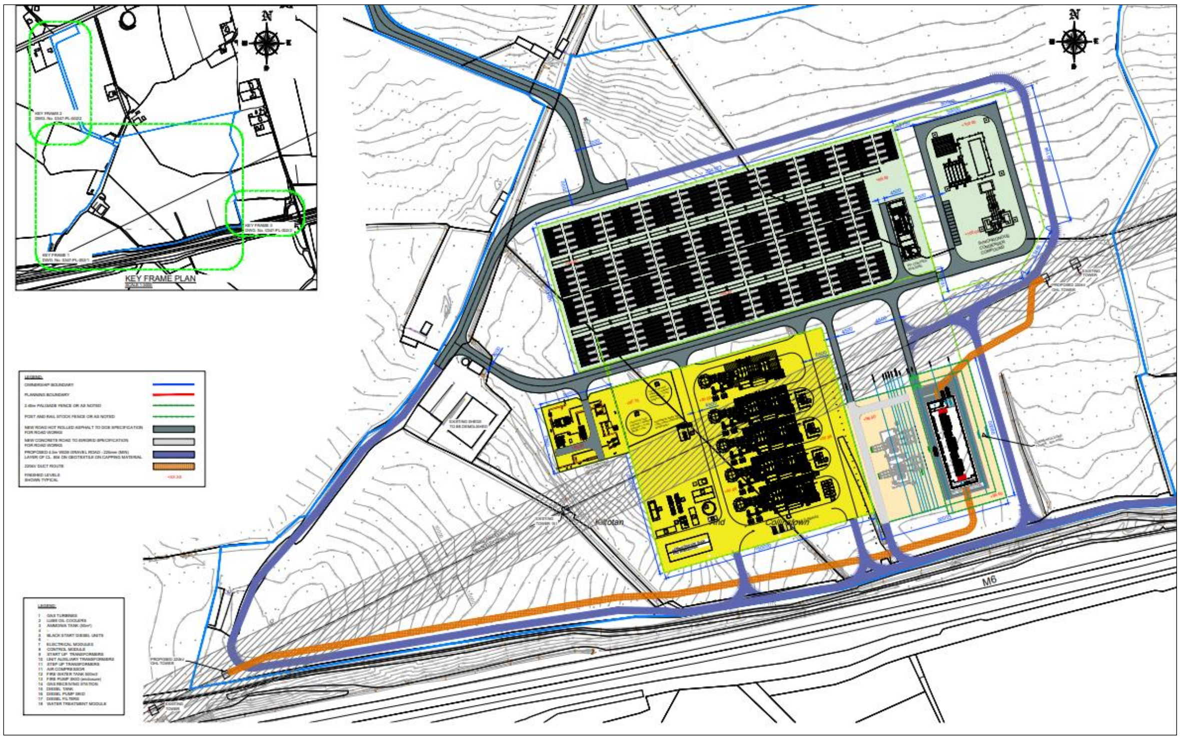


Figure 1-1: Proposed site layout

2 Site Background

This section describes the watercourses, geology and wider geographical area of Rochfortbridge, Co. Westmeath.

2.1 Location

The site is located c. 1.9km south west of Rochfortbridge, Co. Westmeath. The lands are greenfield. The M6 motorway runs along the site's southern boundary. There are existing residential properties bordering the site boundary to the north east, north west and west. Access to the site is via the regional road R446.

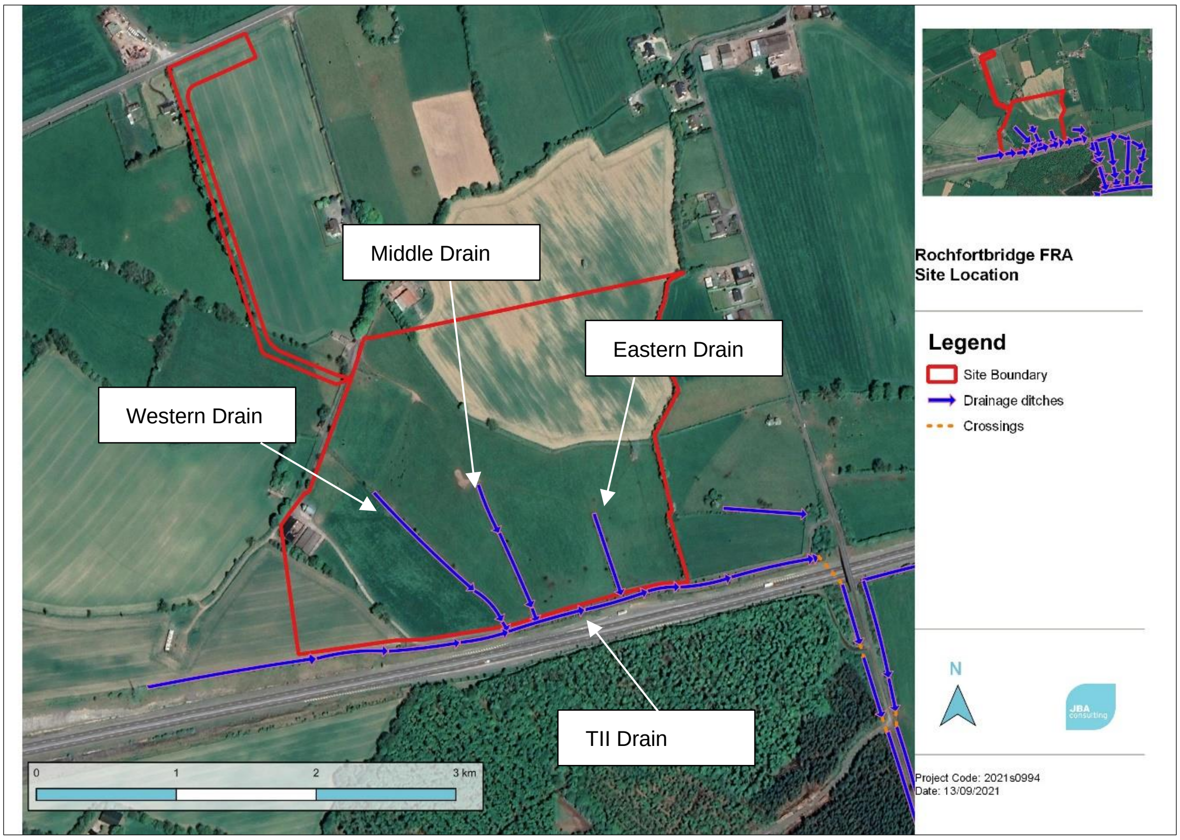


Figure 2-1: Site location (source; Google Satellite)

2.2 Watercourses

There are no significant hydrological features identified within or near the site. However, some surface water drains were identified within the site boundary, three drains (referred to as the western, middle and eastern drains) originate within the site boundary and run in a southerly direction before flowing in culvert under an access road and then into a TII drain that runs along the crest of the motorway cutting in an easterly direction in an oversized grassy channel before meeting a headwall and culvert that goes under the M6 in a southerly direction.

2.3 Site Visit

A site visit was conducted on 17/08/2021 to observe the drains within the site boundary and find connections to drainage ditch that runs from west to east, immediately north of the M6 Motorway.

The furthest drain to the west within the site boundary is approximately 1m deep and 4m wide. A 350mm diameter circular concrete pipe connects this surface water drain to the drainage ditch immediately north of the M6.

The middle surface water drain within the site boundary is approximately 1/1.5m deep and 4m wide. A 400mm diameter concrete pipe connects this surface water drain under the access track at this location to the drainage ditch immediately north of the M6.

The furthest drain to the east within the site boundary is approximately 1m deep and 5m wide. A 400mm diameter pipe also connects this surface water drain to the drainage ditch immediately north of the M6.

The TII drainage ditch that runs from west to east immediately north of the M6 is approximately 2.5/3m deep and 8m wide. A 530mm diameter concreate pipe with a headwall allows flow under the M6 motorway.

All drainage channels were dry on the day of the site visit, it is expected that the channels would only convey flow after significant rainfall events or periods of prolonged wet weather. Figure 2-2 below presents some photos of the drains from the site visit.

Figure 2-2 Site Visit Photographs

Western Drain (view to north)

Middle Drain (view to north)

Eastern Drain (view to north)

	
TII Drain (view to west)	TII headwall and inlet

2.4 Local Site and Topography

There is a significant slope across the site, with a maximum site level of 105.3m AOD at the north-west corner of the site and a minimum site level of 93.5m AOD at the south east corner of the site.

2.5 Site Geology

The Geological Survey of Ireland (GSI) groundwater and geological maps of the site were reviewed. The subsoils present under the site are cutover/cutaway peat, deep well drained mineral (mainly basic) and a small intersection of mineral poorly drained (mainly basic). The underlying bedrock is classified as the Waulsortian Limestones which is described as massive unbedded lime-mudstone.

The associated groundwater vulnerability is classified as 'Moderate' for the site.

There are no karst features within or near the site. These classifications are based on relevant hydrogeological characteristics of the underlying geological materials.

There are no alluvial soils within the site that would indicate previous flooding.

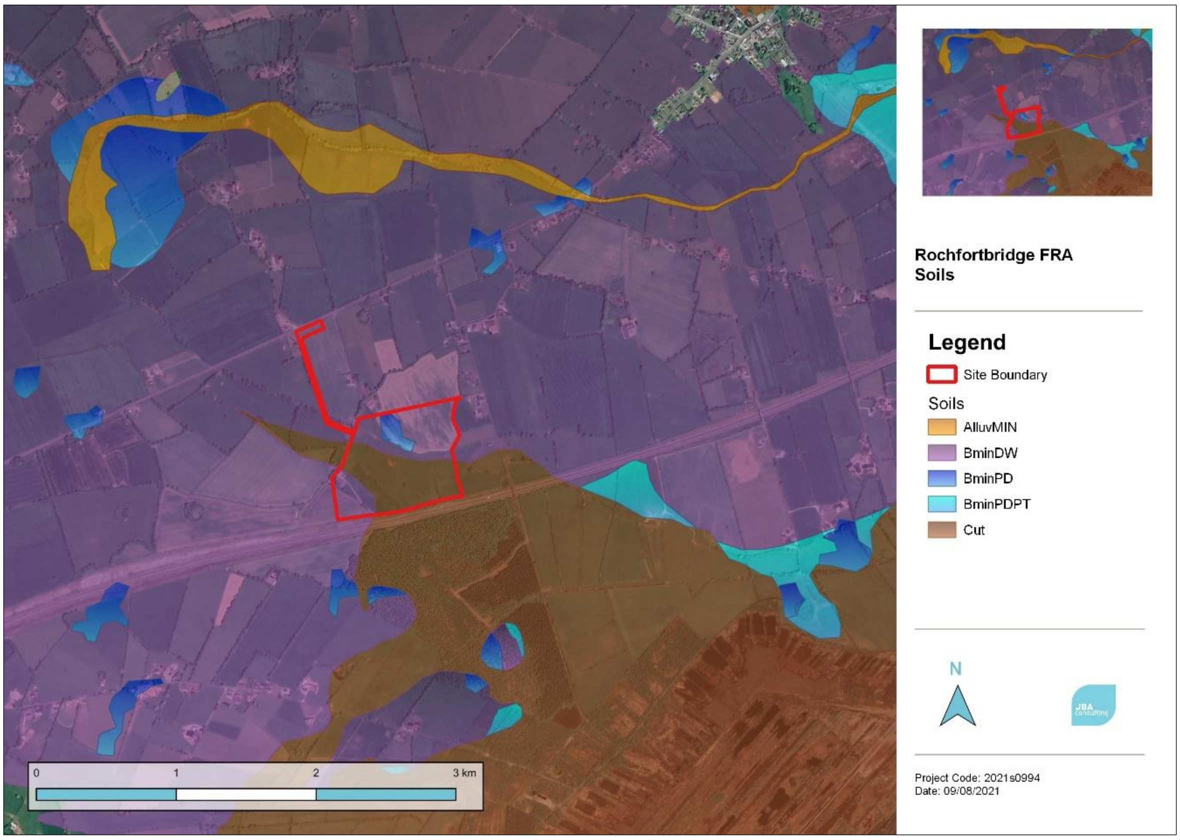


Figure 2-3: Site soils (source; GSI Database)

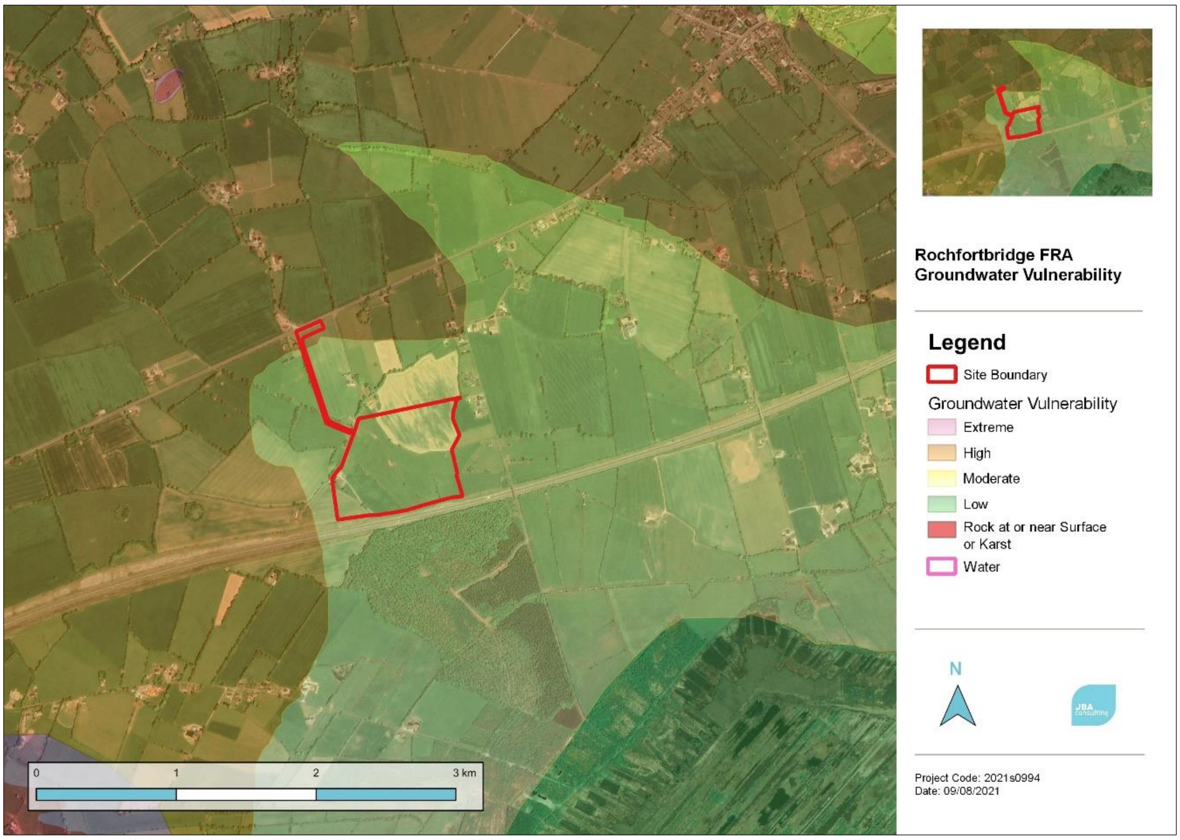


Figure 2-4: Groundwater vulnerability (source; GSI Database)

3 Flood Risk Identification

An assessment of the potential for and scale of flood risk at the site is conducted using historical and predictive information. This identifies any sources of potential flood risk to the site and reviews historic flood information. The findings from the flood risk identification stage of the assessment are provided in the following sections.

3.1 Flood History

A number of sources of flood information were reviewed to establish any recorded flood history at, or near the site. This includes the OPW's website, http://www.floodinfo.ie and general internet searches.

3.1.1 Floodmaps.ie

The OPW host a National Flood Information Portal, www.floodinfo.ie, which highlights areas at risk of flooding through the collection of recorded data and observed flood events. See Figure 3-1 for historic flood events in the area.

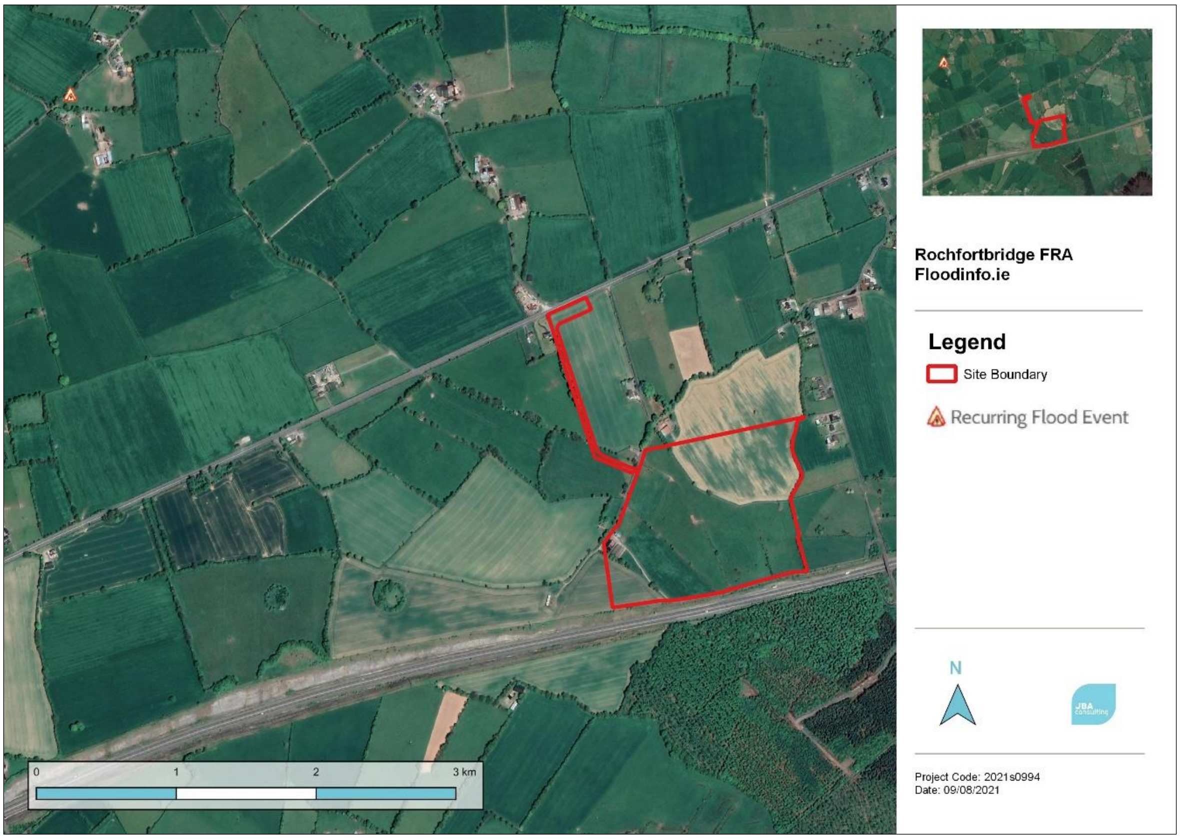


Figure 3-1: Floodinfo.ie

Review of Figure 3-1 shows no flood events within the site boundary. A recurring flood event is located c. 1.9km north west of the site location.

- K3.Piercetown, Tyrrellspass – Localised Low lying area floods after heavy rain every year. Road is liable to flood. Flood Id = 2682

3.1.2 Internet Searches

An internet search was conducted to gather information about whether the site was affected by flooding previously. No flooding incidents were recorded at the site.

3.2 Predicative Flooding

The area has been a subject of one predicative flood mapping study:

- National Indicative Fluvial Mapping (NIFM)

3.2.1 OPW NIFM

The Office of Public Works recently published the NIFM data which included all watercourses on the EPA watercourse layer excluding:

- any section of watercourse with an upstream catchment area of less than 5km^2,
- any section of watercourse for which flood spatial data has been produced under the National CFRAM Programme bar a 500m overlap at the upstream boundary of the National CFRAM Programme spatial data.

Therefore, as there is no significant hydrological feature in close proximity to the site, it has not been included in the NIFM.

3.3 Flood Sources

The initial stage of a Flood Risk Assessment requires the identification and consideration of probable sources of flooding. Following the initial phase of this Flood Risk Assessment, it is possible to summarise the level of potential risk posed by each source of flooding. The flood sources are described below.

3.3.1 Fluvial

All available sources of historic flooding have been researched as part of the FRA. There is no main river near the site, however there are some surface water drains. The CFRAM and NIFM flood modelling does not cover minor surface water drains.

3.3.2 Tidal

As the site is significantly inland it is not tidally influenced.

3.3.3 Pluvial/ Surface Water

Pluvial flooding is the result of rainfall-generated overland flows that arise before run-off can enter a watercourse or sewer. It is particularly sensitive to increases in hard-standing ground/urbanised areas and is usually associated with rainfall events of high intensity. Any increase in hardstanding area on the site will result in an increase in potential surface water ponding.

The surface water drains within the site perform a drainage function and help to remove high groundwater levels or excess rainfall from the site. They are typically dry and do not convey permanent flow. It is expected that only under prolonged periods of rainfall or after high intensity rainfall events would the channels receive any flow. This is clearly evidenced by the heavily vegetated nature of the base of all the drains.

3.3.4 Groundwater

Groundwater flooding results from high sub-surface water levels that impact upper levels of the soil strata and overland areas that are usually dry. The groundwater vulnerability has been classified as 'Moderate' by the GSI groundwater vulnerability maps. Review of the gsi.ie web-portal confirms that there are no known karst features in the area and there is no predicted or historic groundwater or surface water flooding.

In summary, there is no known risk of groundwater flooding in this area. Having reviewed the GSI data, groundwater flooding will be not be considered and has been screened out at this stage.

4 Flood Risk Assessment

This section of the report will:

- Summarise flood risk to the site.
- Recommend mitigation measures that reduce flood risk to the site and surrounding areas.
- Confirm that the above measures are in line with the Planning System and Flood Risk Management Guidelines.

4.1 Flood Risk

Fluvial flood risk to the proposed site is low, and the site is located in Flood Zone C.

The only potential source of risk to the site would be from pluvial flooding where rainfall is flowing overland to reach the surface water drains or if the surface water drains overflowed. Given the ground conditions and slope across the site the risk of flooding from pluvial/surface water is low. Drains are predominantly dry and originate within the site, draining away from the site and into the oversized TII drain. There are no isolated low spots within the site to catch surface water.

Standard mitigation measures (stormwater design) will be effective in managing risk and these are set out in the following sections.

4.2 Mitigation

4.2.1 Surface Water Management

Details are provided under separate cover for the LEL Flexgen Castlelost Project, the LEL GIS Castlelost Project and the LEL ESS Castlelost Project (see ECC documents and drawings under the wider application). The work includes infilling of the existing surface water drainage channels and the provision of a new stormwater network under a SuDS management train that percolates all stormwater to groundwater. The Development will comply with the Greater Dublin Strategic Drainage Study, Volume 2, New Development Policy. Soakaways are designed in accordance with BRE365.

In particular;

- Roof runoff from the buildings and hardstanding areas as shown on the surface water drainage drawing shall be intercepted at source and shall flow to a stone filled soakaway, the stone media of the soakaway shall provide filtration thus improving the quality of the water.
- All roads shall drain to the filter drains running parallel with the proposed access road and shown on the drainage drawings . This system shall allow runoff to filter down through the stone media providing filtering and delay and storage action. This stone shall be wrapped in a permeable membrane allowing runoff to infiltrate into the surrounding soils thus providing reduction action.
- As all runoff is being intercepted at source and infiltrating directly into the subsoils, typical flow restriction mechanisms such as a hydrobrake or typical attenuation systems such as underground cells shall not be required.

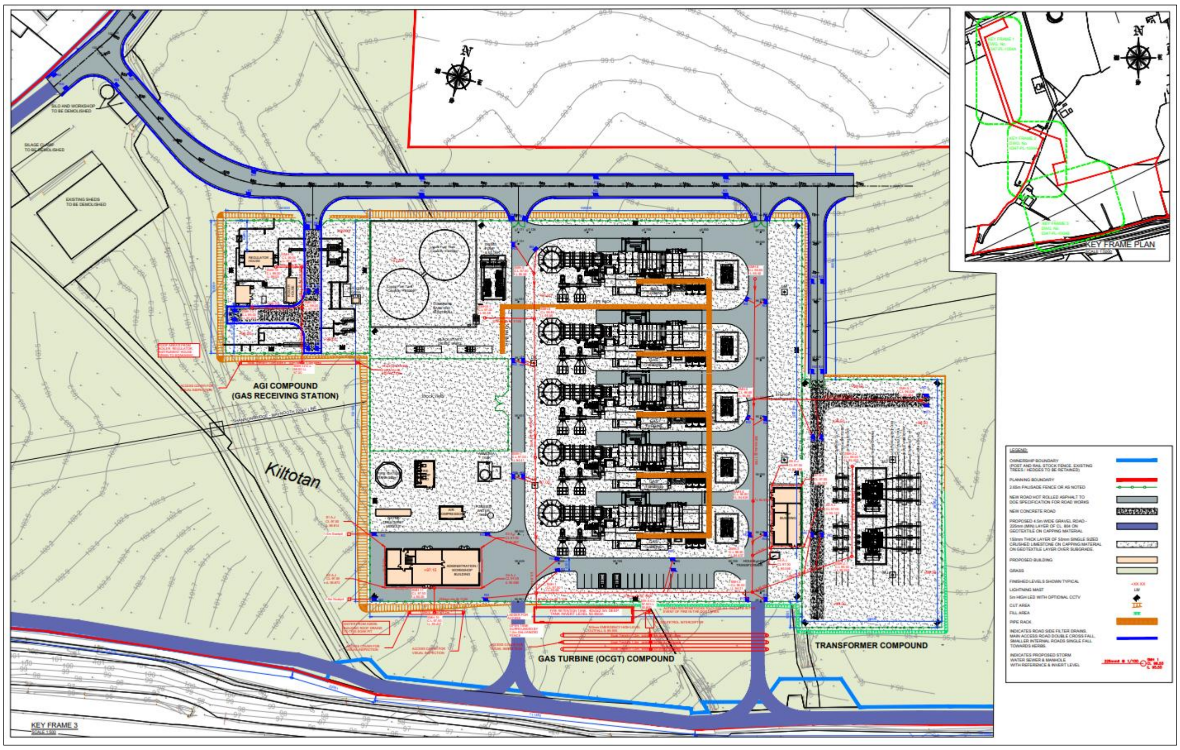


Figure 4-1: LEL Flexgen Castlelost Project Drainage Layout

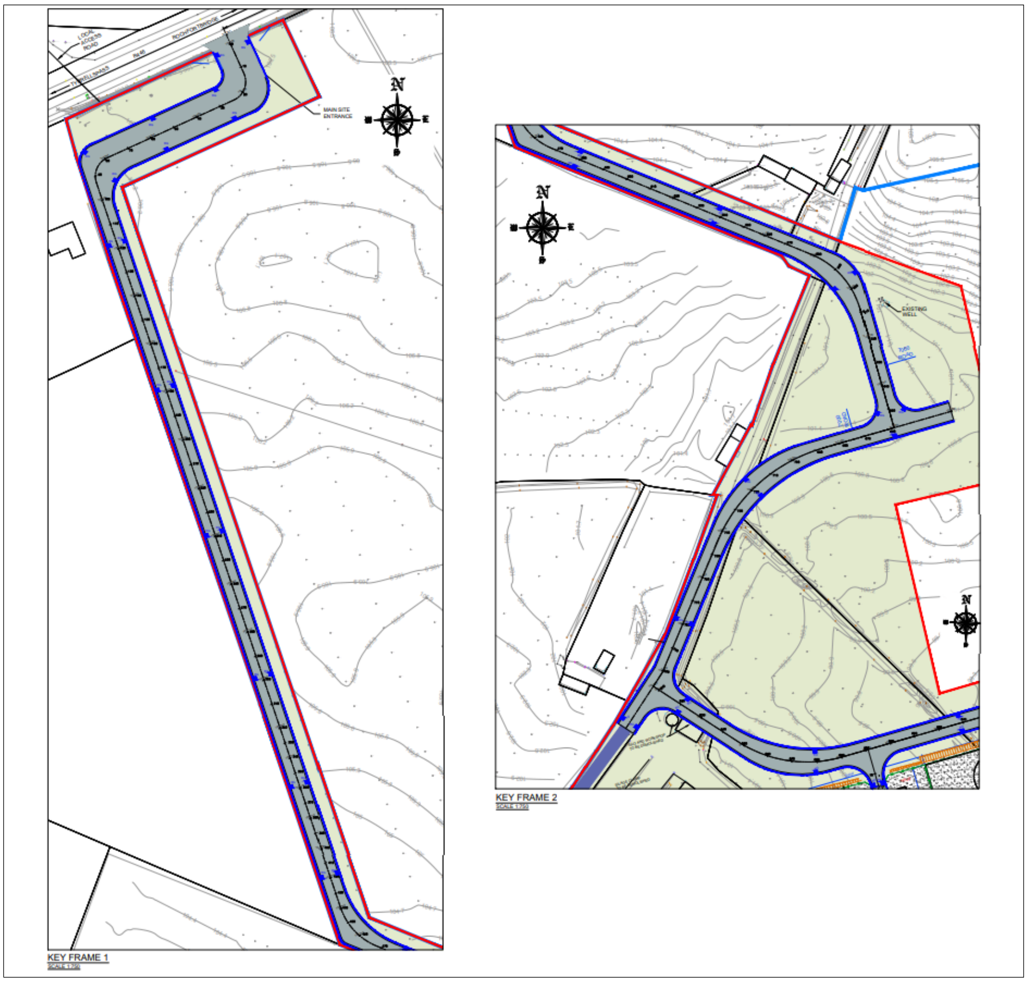


Figure 4-2: Proposed access road filter drains

4.2.2 Building Levels

To avoid the risk of potential stormwater exceedance entering buildings the FFLs should be raised 150mm above surrounding hardstanding.

4.2.3 Access

Access to the development is from within Flood Zone C and risk is low.

4.3 Residual Risk

Residual risks are defined as risks that remain after all risk avoidance, substitution and mitigation measures have been taken. The flood risk assessment identifies the following as the main sources of residual risk to the proposed development:

- Climate Change
- Stormwater exceedance

4.3.1 Climate Change

In accordance with the OPW guidelines, it is necessary to assess the risk associated with climate change, which under the medium range future scenario (MFRS) corresponds with an increase in rainfall of 20% for the 1% AEP Flood event. In the design of the stormwater system the GDSDS has been followed and climate change impacts have been taken into account.

4.3.2 Exceedance

As explained in Section 4.2.2 building levels in site are recommended to be raised 150mm above surrounding hardstanding levels to minimise the risk of any exceedance flows entering buildings.

5 Conclusion

JBA Consulting has undertaken a Flood Risk Assessment for the LEL Flexgen Castlelost Project, the LEL GIS Castlelost Project and the LEL ESS Castlelost Project located in Kiltotan, Collinstown and Oldtown, Co. Westmeath.

From reviewing the available sources of flooding, the site has been shown to reside in Flood Zone C and is at low risk of inundation from fluvial, coastal and groundwater sources. There are several surface water drains within the site boundary that connect to a larger surface water drain immediately north of the M6 motorway. A site visit was conducted and clarified that all surface water drains were dry and risk from these features is low.

The principal risk to the site is from the impermeable construction materials causing rapid runoff and stormwater flooding during significant rainfall events. To mitigate this risk a stormwater design that includes a SuDS management train has been incorporated. The details of this are provided under separate cover within the Planning Application phases, however the principal is that the system is design in accordance with the GDSDS and all stormwater is infiltrated on-site within soakaways that are designed in accordance with BRE365.

Residual risks have been identified as potential impacts of climate change and potential failure of the stormwater system. The proposed mitigation measures for the development adequately protect against potential flooding.

In summary, the site is shown to lie in Flood Zone C and therefore, the LEL Flexgen Castlelost Project, the LEL GIS Castlelost Project and the LEL ESS Castlelost Project are appropriate for development at this location. The Flood Risk Assessment was undertaken in accordance with 'The Planning System and Flood Risk Management' guidelines and agrees with the core principle contained within.

Appendices

A Appendix - Understanding Flood Risk

Flood Risk is generally accepted to be a combination of the likelihood (or probability) of flooding and the potential consequences arising. Flood Risk can be expressed in terms of the following relationship:

Flood Risk = Probability of Flooding x Consequences of Flooding

A.1 Probability of Flooding

The likelihood or probability of a flood event (whether tidal or fluvial) is classified by its Annual Exceedance Probability (AEP) or return period years, a 1% AEP flood 1 in 100 chance of occurring in any given year. In this report, flood frequency will primarily be expressed in terms of AEP, which is the inverse of the return period, as shown in the table below and explained above. This can helpful when presenting results to members of the public who may associate the concept of return period with a regular occurrence rather than an average recurrence interval and is the terminology which will be used throughout this report.

Table: Conversion between return periods and annual exceedance probabilities

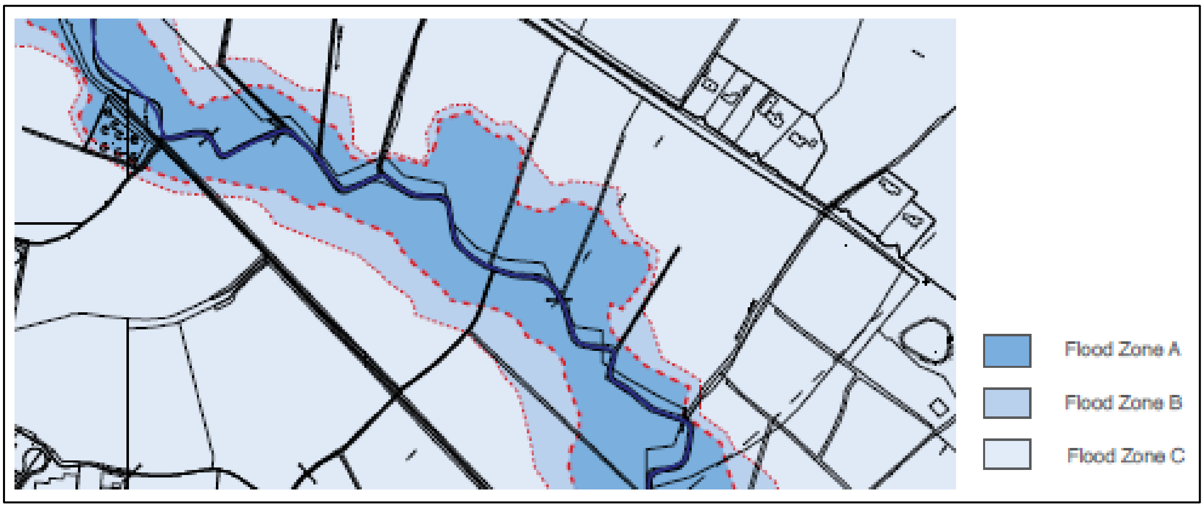
Return period (years)	Annual exceedance probability (%)
2	50
10	10
50	2
100	1
200	0.5
1000	0.1

A.2 Flood Zones

Flood Zones are geographical areas illustrating the probability of flooding. For the purpose of the Planning Guidelines, there are 3 types of levels of flood zones, A, B and C.

Zone	Description
Flood Zone A	Where the probability of flooding is highest, greater than 1% (1 in 100) from river flooding or 0.5% (1 in 200) for coastal/ tidal Flooding
Flood Zone B	Moderate probability of flooding, between 1% and 0.1% from rivers and between 0.5% and 0.1% from coastal/ tidal.
Flood Zone C	Lowest probability of flooding, les than 0.1% from both rivers and coastal/ tidal.

It is important to note that the definition of the flood zones is based on an undefended scenario and does not take into account the presence of flood protection structures such as flood walls or embankments. This is to allow for the fact that there is a residual risk of flooding behind the defences will be maintained in perpetuity.



A.3 Consequences of Flooding

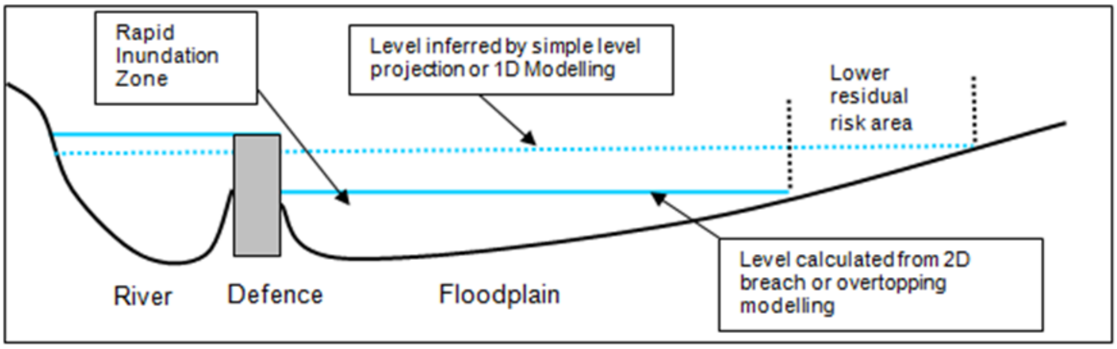
Consequences of flooding depend on the Hazards caused by flooding (depth of water, speed of flow. Rate of onset, duration, wave-action effects, water quality) and the vulnerability of receptors (type of development, nature, e.g. age-structure of the population, presence and reliability of mitigation measures etc.)

The 'Planning System and Flood Risk Management' provides three vulnerability categories, based on type of development, nature, which are detailed in Table X of the Guidelines, and are summarised as:

- **Highly vulnerable**, including residential properties, essential infrastructure and emergency service facilities
- **Less vulnerable**, such as retail and commercial and local transport infrastructure, such as changing rooms.
- **Water compatible**, including open space, outdoor recreation and associated essential infrastructure, such as changing rooms.

A.4 Residual Risk

The presence of flood defences, by their very nature, hinder the movement of flood water across the floodplain and prevent flooding unless river levels rise above the defence crest level or a breach occurs. This known as residual risk:



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JBA Consulting Engineers and Scientists Limited
Registration number 444752

Appendix 8.1

Baseline Air Quality Data

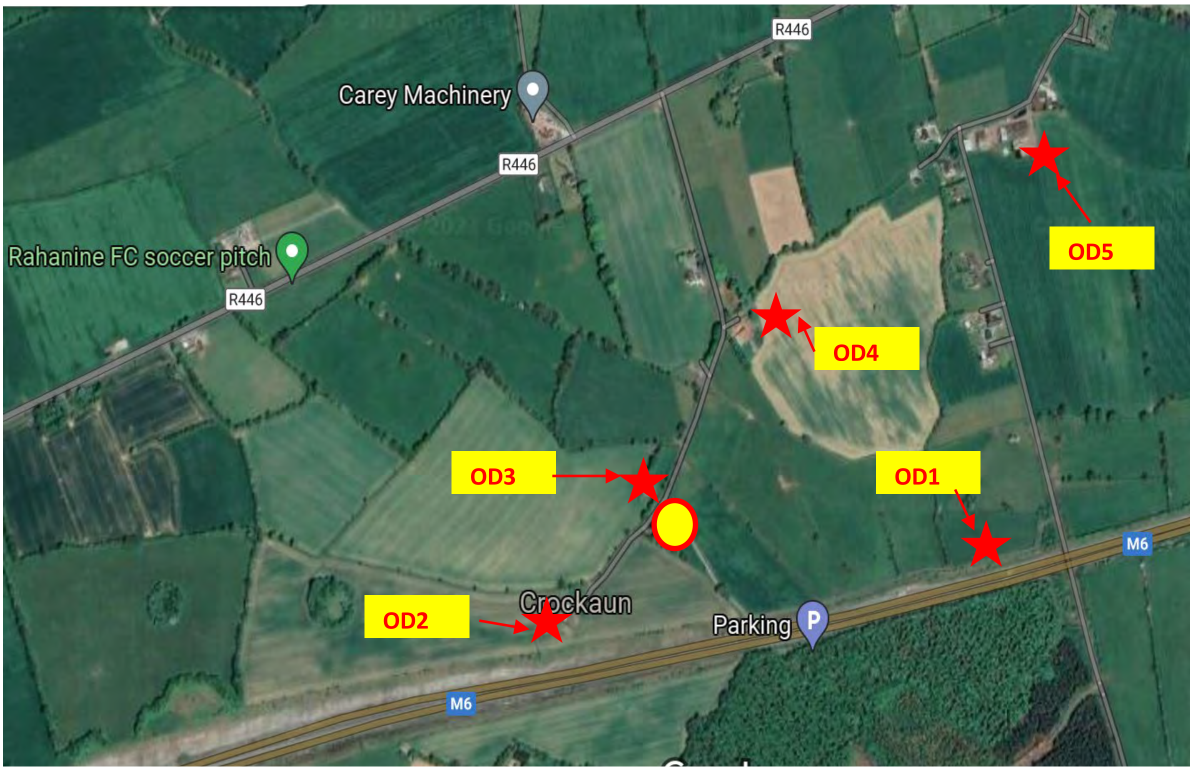
Appendix 8.1

BASELINE AIR QUALITY SURVEY

DIFFUSION TUBE SURVEY OF NITROGEN OXIDES

t m s environment ltd

TMS Environment Ltd, 53 Broomhill Drive, Tallaght, Dublin 24



Diffusion Tube Locations	★
Continuous NOx Monitor	●

tms environment ltd

53 Broomhill Drive, Tallaght, Dublin 24
Tel: +353-1-4626710

Client	Halston / Lumcloon Energy Ltd
Project	FlexGen Castlelost
Figure Ref	Figure A8.1.1
Title	Baseline Air Quality survey locations

gradko environmental
(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

2187

LABORATORY ANALYSIS REPORT

NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY

REPORT NUMBER P05147R
BOOKING IN REFERENCE P05147
DESPATCH NOTE 87533
CUSTOMER TMS Environmental Attn: Imelda Shanahan
53 Broomhill Drive
Tallaght
Dublin 24

Ireland
DATE SAMPLES RECEIVED 20/07/2021
JOB NUMBER 28644

Location	Sample Number	Exposure Data Date On*	Date Off*	Time* (hr.)	µg/m³ *	ppb *	µg NO_2 on tube
OD1 Event #2	1788617	02/07/2021	16/07/2021	336.23	5.12	2.67	0.13
OD2 Event #2	1788618	02/07/2021	16/07/2021	336.23	4.50	2.35	0.11
OD3 Event #2	1788619	02/07/2021	16/07/2021	336.22	3.11	1.62	0.08
OD4 Event #2	1788620	02/07/2021	16/07/2021	336.17	3.97	2.07	0.10
OD5 Event #2	1788621	02/07/2021	16/07/2021	336.17	3.93	2.05	0.10
Blank Event #2	1788622	02/07/2021	16/07/2021	336.12	0.57	0.30	0.01
Laboratory Blank				336.23	0.20	0.11	0.005

Comment: Results are not blank subtracted
Results have been corrected to a temperature of 293 K (20°)
Overall M.U. ±9.7% **Limit of Detection** 0.030µgNO_2
The reported expanded uncertainty is based on a standard uncertainty multiplied by a factor of *k*=2, providing a level of confidence of approximately 95%. Uncertainty of measurement has not been applied to the reported results.

Tube Preparation: 20% TEA / Water
Analysed on UV CARY3
Analyst Name Lauren Rose
Report Checked By Adam Robinson
Date of Analysis 30/07/2021
Date of Report 30/07/2021

Analysis carried out in accordance with documented in-house Laboratory Method GLM7

REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
Signed............
L. Gates, Laboratory Manager

gradko environmental
(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

ilac-MRA UKAS TESTING 2187

LABORATORY ANALYSIS REPORT

NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY

REPORT NUMBER P05440R
BOOKING IN REFERENCE P05440
DESPATCH NOTE 87533
CUSTOMER TMS Environmental Attn: Imelda Shanahan
53 Broomhill Drive
Tallaght
Dublin 24

Ireland
DATE SAMPLES RECEIVED 06/08/2021
JOB NUMBER 28644

Location	Sample Number	Exposure Data Date On*	Date Off*	Time* (hr.)	µg/m³ *	ppb *	µg NO_2 on tube
OD1 Event #3	1788623	16/07/2021	30/07/2021	338.13	7.65	3.99	0.19
OD2 Event #3	1788624	16/07/2021	30/07/2021	338.10	6.31	3.29	0.16
OD3 Event #3	1788625	16/07/2021	30/07/2021	337.95	6.11	3.19	0.15
OD4 Event #3	1788626	16/07/2021	30/07/2021	338.12	6.10	3.19	0.15
OD5 Event #3	1788627	16/07/2021	30/07/2021	338.32	7.00	3.65	0.17
Blank Event #3	1788628	16/07/2021	30/07/2021	338.38	0.33	0.17	0.01
Laboratory Blank				338.38	0.12	0.06	0.003

Comment: Results are not blank subtracted
Exposure times were calculated from start and finish times given on the exposure sheet.
Results have been corrected to a temperature of 293 K (20°)
Overall M.U. ±9.7% **Limit of Detection** 0.031µgNO_2
The reported expanded uncertainty is based on a standard uncertainty multiplied by a factor of *k*=2, providing a level of confidence of approximately 95%. Uncertainty of measurement has not been applied to the reported results.

Tube Preparation: 20% TEA / Water
Analysed on UV CARY2
Analyst Name Chris Andrew
Report Checked By Adam Robinson

Date of Analysis 12/08/2021
Date of Report 13/08/2021

Analysis carried out in accordance with documented in-house Laboratory Method GLM7

REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
Signed..
L. Gates, Laboratory Manager

gradko environmental
(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

2187

LABORATORY ANALYSIS REPORT

NITROGEN DIOXIDE IN DIFFUSION TUBES BY U.V.SPECTROPHOTOMETRY

REPORT NUMBER P05831R
BOOKING IN REFERENCE P05831
DESPATCH NOTE 87533
CUSTOMER TMS Environmental Attn: Imelda Shanahan
53 Broomhill Drive
Tallaght
Dublin 24

Ireland
DATE SAMPLES RECEIVED 17/08/2021
JOB NUMBER 28644

Location	Sample Number	Exposure Data Date On*	Date Off*	Time* (hr.)	µg/m³ *	ppb *	µg NO_2 on tube
OD1 Event #4	1788629	30/07/2021	13/08/2021	336.45	6.01	3.14	0.15
OD2 Event #4	1788631	30/07/2021	13/08/2021	336.67	6.17	3.22	0.15
OD3 Event #4	1788630	30/07/2021	13/08/2021	336.45	3.48	1.81	0.09
OD4 Event #4	1788632	30/07/2021	13/08/2021	336.38	3.11	1.62	0.08
OD5 Event #4	1788633	30/07/2021	13/08/2021	335.80	3.15	1.65	0.08
Blank Event #4	1788634			336.67	0.74	0.38	0.02
Laboratory Blank				336.67	0.08	0.04	0.002

Comment: Results are not blank subtracted
Exposure times were calculated from start and finish times given on the exposure sheet.
Results have been corrected to a temperature of 293 K (20°)
Overall M.U. ±9.7% **Limit of Detection** 0.030µgNO_2
The reported expanded uncertainty is based on a standard uncertainty multiplied by a factor of *k*=2, providing a level of confidence of approximately 95%. Uncertainty of measurement has not been applied to the reported results.

Tube Preparation: 20% TEA / Water — Analysed on UV CARY3
Analyst Name Lauren Rose — **Report Checked By** Jon Hall

Date of Analysis 01/09/2021 — **Date of Report** 02/09/2021

Analysis carried out in accordance with documented in-house Laboratory Method GLM7

REPORT OFFICIALLY CHECKED

Gradko International Ltd
This signature confirms the authenticity of these results
Signed..........
L. Gates, Laboratory Manager

Appendix 8.2

Aermod Dispersion Modelling Outputs

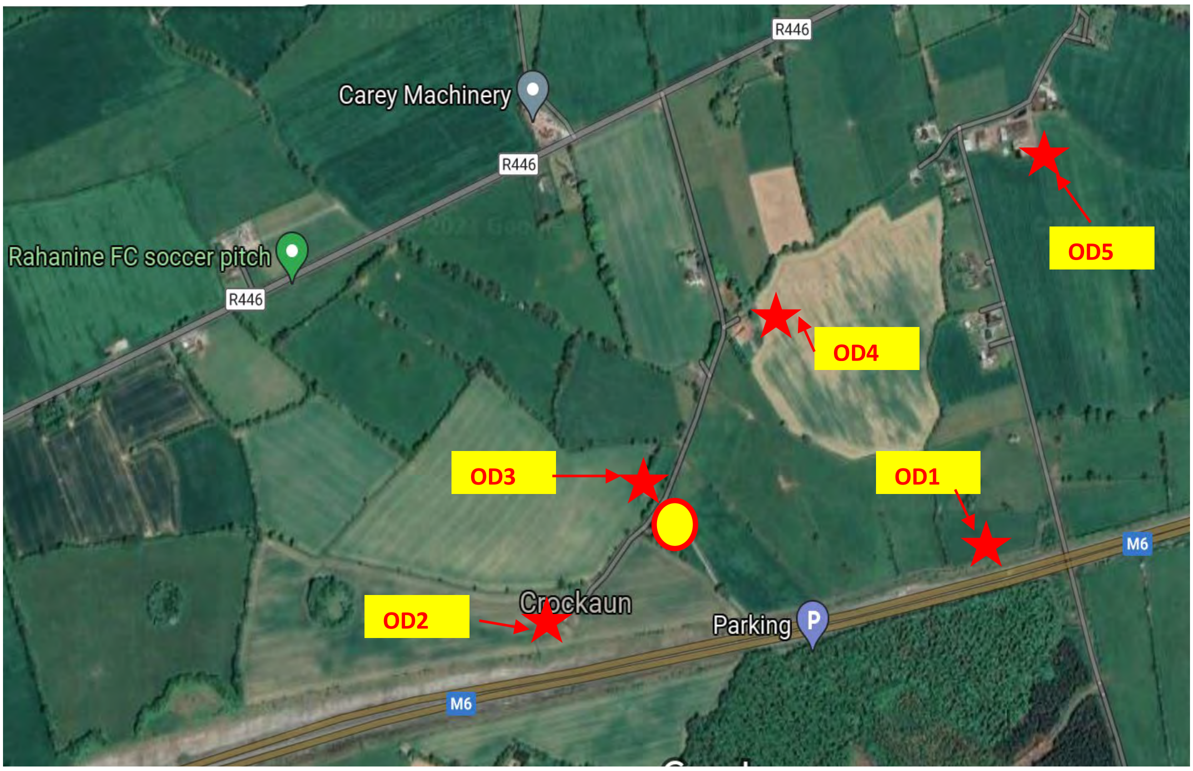
Appendix 8.2

BASELINE AIR QUALITY SURVEY

CONTINUOUS SURVEY OF NITROGEN OXIDES

t m s environment ltd

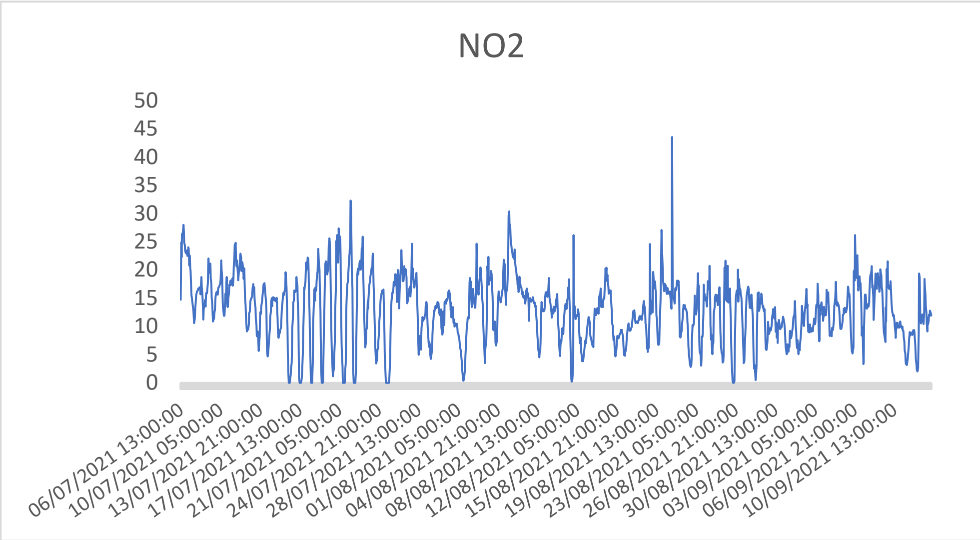
TMS Environment Ltd, 53 Broomhill Drive, Tallaght, Dublin 24



Diffusion Tube Locations

Continuous NOx Monitor

tms environment ltd		Client	Halston / Lumcloon Energy Ltd
		Project	FlexGen Castlelost
		Figure Ref	Figure A8.1.1
53 Broomhill Drive, Tallaght, Dublin 24 Tel: +353-1-4626710		Title	Baseline Air Quality survey locations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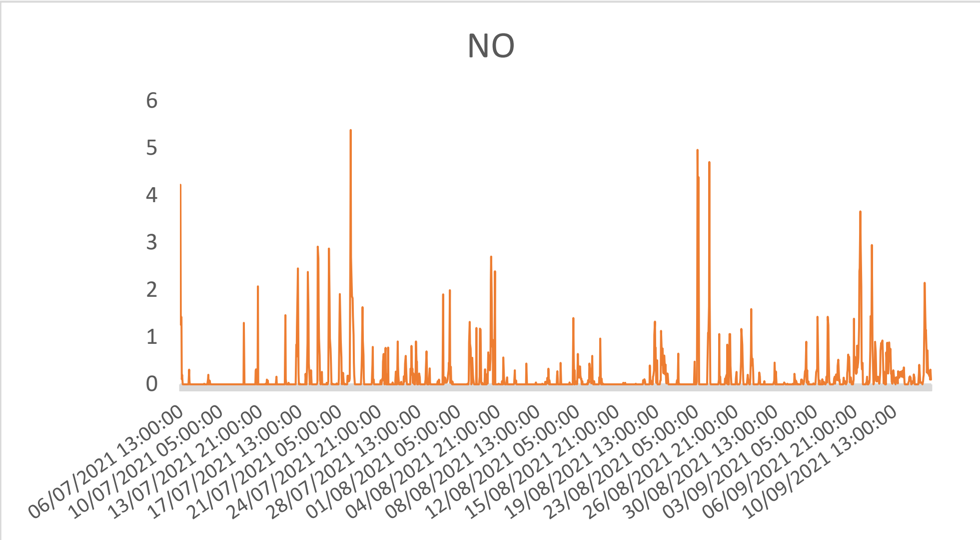
10/09/2021 13:00:00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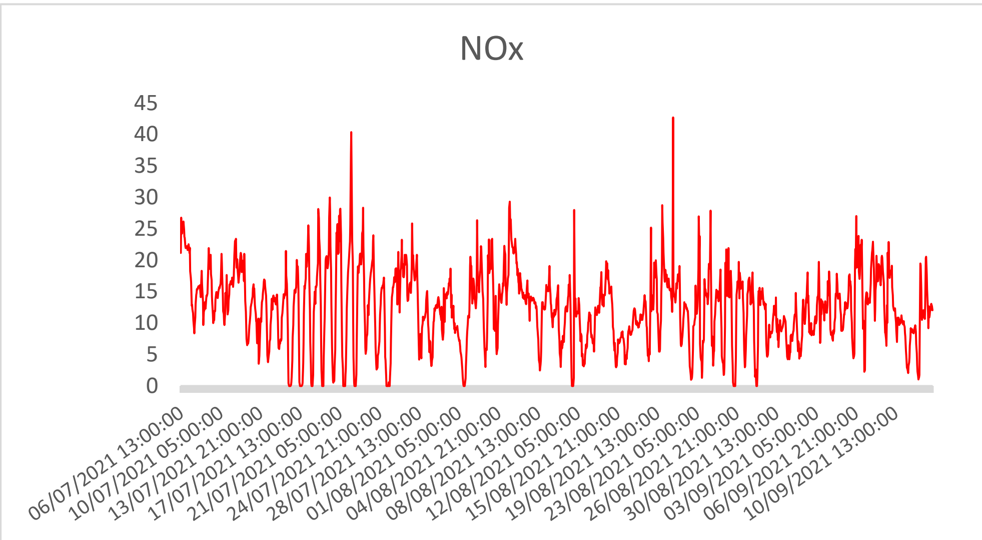
03/09/2021 05:00:00
06/09/2021 21:00:00
10/09/2021 13:00:00


NOx
45
40
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06/07/2021 13:00:00
10/07/2021 05:00:00
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19/08/2021 13:00:00
23/08/2021 05:00:00
26/08/2021 21:00:00
30/08/2021 13:00:00
03/09/2021 05:00:00
06/09/2021 21:00:00
10/09/2021 13:00:00

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
06/07/2021 13:00:00	14.73	4.22	21.18
06/07/2021 14:00:00	24.88	1.26	26.8
06/07/2021 15:00:00	22.24	1.42	24.24
06/07/2021 16:00:00	26.36	0.11	25.42
06/07/2021 17:00:00	26.43	0.2	25.64
06/07/2021 18:00:00	26.68	0	25.98
06/07/2021 19:00:00	28.01	0	26.17
06/07/2021 20:00:00	26.83	0	24.96
06/07/2021 21:00:00	24.87	0	23.72
06/07/2021 22:00:00	24.43	0	23.56
06/07/2021 23:00:00	23.46	0	22.26
07/07/2021 00:00:00	22.99	0	21.97
07/07/2021 01:00:00	22.96	0	22.12
07/07/2021 02:00:00	22.93	0	22.09
07/07/2021 03:00:00	23.46	0	22.23
07/07/2021 04:00:00	22.5	0	21.63
07/07/2021 05:00:00	22.82	0	22.02
07/07/2021 06:00:00	24.03	0	22.56
07/07/2021 07:00:00	23.72	0	22.16
07/07/2021 08:00:00	20.77	0.31	21.16
07/07/2021 09:00:00	22.6	0.08	21.98
07/07/2021 10:00:00	20.38	0	18.28
07/07/2021 11:00:00	19.88	0	17.27
07/07/2021 12:00:00	18.11	0	16.48
07/07/2021 13:00:00	15.39	0	12.78
07/07/2021 14:00:00	15.08	0	12.9
07/07/2021 15:00:00	14.18	0	12.2
07/07/2021 16:00:00	13.58	0	11.58
07/07/2021 17:00:00	12.72	0	10.46
07/07/2021 18:00:00	11.57	0	9.24
07/07/2021 19:00:00	10.6	0	8.38
07/07/2021 20:00:00	11.25	0	9.54
07/07/2021 21:00:00	12.52	0	10.96
07/07/2021 22:00:00	14.19	0	13.04
07/07/2021 23:00:00	15.16	0	14.51
08/07/2021 00:00:00	15.65	0	14.83
08/07/2021 01:00:00	16.17	0	15.42
08/07/2021 02:00:00	16.26	0	15.39
08/07/2021 03:00:00	16.44	0	15.62
08/07/2021 04:00:00	16.68	0	15.86
08/07/2021 05:00:00	16.69	0	15.85
08/07/2021 06:00:00	16.73	0	15.64
08/07/2021 07:00:00	16.95	0	16.03
08/07/2021 08:00:00	16.89	0	15.45
08/07/2021 09:00:00	15.69	0	14.16
08/07/2021 10:00:00	16.91	0	15.79
08/07/2021 11:00:00	18.76	0	18.34
08/07/2021 12:00:00	16.89	0	16.27
08/07/2021 13:00:00	15.75	0	15.29
08/07/2021 14:00:00	14.24	0	13.52
08/07/2021 15:00:00	11.21	0	9.69
08/07/2021 16:00:00	13.09	0	12.22
08/07/2021 17:00:00	13.31	0	12.03
08/07/2021 18:00:00	13.77	0.01	13.05
08/07/2021 19:00:00	14.68	0	13.38

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
08/07/2021 20:00:00	13.52	0	12.32
08/07/2021 21:00:00	15.37	0	13.77
08/07/2021 22:00:00	15.91	0	14.41
08/07/2021 23:00:00	15.86	0	14.29
09/07/2021 00:00:00	16.25	0	14.73
09/07/2021 01:00:00	17.68	0	16.28
09/07/2021 02:00:00	20.4	0.11	19.72
09/07/2021 03:00:00	22.06	0.2	21.97
09/07/2021 04:00:00	19.46	0	18.63
09/07/2021 05:00:00	20.09	0	19.23
09/07/2021 06:00:00	20.39	0.08	20
09/07/2021 07:00:00	21.11	0.01	20.88
09/07/2021 08:00:00	18.48	0	17.82
09/07/2021 09:00:00	17.54	0	16.87
09/07/2021 10:00:00	15.04	0	14.25
09/07/2021 11:00:00	13.84	0	13.12
09/07/2021 12:00:00	12.12	0	11.41
09/07/2021 13:00:00	10.87	0	10.04
09/07/2021 14:00:00	11.3	0	10.68
09/07/2021 15:00:00	11.3	0	10.5
09/07/2021 16:00:00	12.65	0	11.95
09/07/2021 17:00:00	12.85	0	11.92
09/07/2021 18:00:00	15.09	0	13.73
09/07/2021 19:00:00	15.71	0	14.67
09/07/2021 20:00:00	15.92	0	14.98
09/07/2021 21:00:00	16.13	0	14.76
09/07/2021 22:00:00	15.67	0	14.18
09/07/2021 23:00:00	15.65	0	13.98
10/07/2021 00:00:00	16.49	0	15.02
10/07/2021 01:00:00	16.87	0	15.27
10/07/2021 02:00:00	16.99	0	15.74
10/07/2021 03:00:00	17.13	0	15.6
10/07/2021 04:00:00	17.49	0	15.88
10/07/2021 05:00:00	17.59	0	16.29
10/07/2021 06:00:00	18.45	0	17.19
10/07/2021 07:00:00	21.67	0	21.02
10/07/2021 08:00:00	19.99	0	19.53
10/07/2021 09:00:00	18.39	0	17.39
10/07/2021 10:00:00	15.61	0	14.57
10/07/2021 11:00:00	13.45	0	11.89
10/07/2021 12:00:00	12.65	0	11.47
10/07/2021 13:00:00	11.86	0	10.16
10/07/2021 14:00:00	11.89	0	9.7
10/07/2021 15:00:00	13.2	0	11.44
10/07/2021 16:00:00	15.77	0	14.83
10/07/2021 17:00:00	15.53	0	14.31
10/07/2021 18:00:00	15.86	0	14.82
10/07/2021 19:00:00	18.72	0	17.66
10/07/2021 20:00:00	14.08	0	12.51
10/07/2021 21:00:00	13.41	0	11.4
10/07/2021 22:00:00	13.79	0	12.08
10/07/2021 23:00:00	14.98	0	13.61
11/07/2021 00:00:00	15.92	0	14.56
11/07/2021 01:00:00	17.41	0	16.13
11/07/2021 02:00:00	17.22	0	16.02

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
11/07/2021 03:00:00	17.84	0	16.47
11/07/2021 04:00:00	18.13	0	16.68
11/07/2021 05:00:00	17.54	0	16.19
11/07/2021 06:00:00	17.39	0	16.18
11/07/2021 07:00:00	18.21	0	17.27
11/07/2021 08:00:00	18.51	0	17.16
11/07/2021 09:00:00	17.23	0	15.8
11/07/2021 10:00:00	18.36	0	17.21
11/07/2021 11:00:00	20.63	0	18.96
11/07/2021 12:00:00	22.3	0	20.75
11/07/2021 13:00:00	24.49	0	23.07
11/07/2021 14:00:00	24.47	0	23.06
11/07/2021 15:00:00	24.8	0	23.43
11/07/2021 16:00:00	21.78	0	20.28
11/07/2021 17:00:00	20.61	0	18.86
11/07/2021 18:00:00	21.67	0	20.18
11/07/2021 19:00:00	20.14	0	18.6
11/07/2021 20:00:00	19.18	0	17.36
11/07/2021 21:00:00	18.2	0	16.44
11/07/2021 22:00:00	19.7	0	17.67
11/07/2021 23:00:00	19.87	0	17.92
12/07/2021 00:00:00	21.2	0	19.38
12/07/2021 01:00:00	22.56	0	20.73
12/07/2021 02:00:00	22.87	0	21.2
12/07/2021 03:00:00	22.17	0	20.64
12/07/2021 04:00:00	19.84	0	18.11
12/07/2021 05:00:00	19.82	0	18.45
12/07/2021 06:00:00	21.36	0	19.94
12/07/2021 07:00:00	20.92	0	19.36
12/07/2021 08:00:00	19.63	0	18.18
12/07/2021 09:00:00	18.38	0	16.68
12/07/2021 10:00:00	20.25	1.3	21.05
12/07/2021 11:00:00	17.66	0	16.33
12/07/2021 12:00:00	15.37	0	13.55
12/07/2021 13:00:00	13.73	0	11.8
12/07/2021 14:00:00	11.9	0	9.64
12/07/2021 15:00:00	9.94	0	7.49
12/07/2021 16:00:00	9.11	0	6.5
12/07/2021 17:00:00	9.38	0	6.8
12/07/2021 18:00:00	9.47	0	6.78
12/07/2021 19:00:00	9.47	0	7.11
12/07/2021 20:00:00	10.25	0	7.9
12/07/2021 21:00:00	12.34	0	9.64
12/07/2021 22:00:00	12.54	0	10.14
12/07/2021 23:00:00	13.46	0	11.34
13/07/2021 00:00:00	14.46	0	12.51
13/07/2021 01:00:00	14.95	0	13.06
13/07/2021 02:00:00	14.96	0	13.26
13/07/2021 03:00:00	15.3	0	13.73
13/07/2021 04:00:00	15.92	0	14.24
13/07/2021 05:00:00	16.84	0	15.53
13/07/2021 06:00:00	17.52	0	16.17
13/07/2021 07:00:00	16.56	0	14.82
13/07/2021 08:00:00	16.94	0	15.54
13/07/2021 09:00:00	14.98	0	13

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
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13/07/2021 11:00:00	13.32	0	11.44
13/07/2021 12:00:00	11.18	0.29	10.32
13/07/2021 13:00:00	10.26	0.32	10.16
13/07/2021 14:00:00	8.25	0	6.83
13/07/2021 15:00:00	8.96	0	7.38
13/07/2021 16:00:00	9.13	0	8.6
13/07/2021 17:00:00	8.49	2.07	10.72
13/07/2021 18:00:00	5.65	0	3.53
13/07/2021 19:00:00	6.67	0	4.79
13/07/2021 20:00:00	8.18	0	6.42
13/07/2021 21:00:00	11.48	0	9.52
13/07/2021 22:00:00	12.5	0	10.77
13/07/2021 23:00:00	12.21	0	10.2
14/07/2021 00:00:00	13.59	0	12.23
14/07/2021 01:00:00	14.27	0	13.34
14/07/2021 02:00:00	14.79	0	13.84
14/07/2021 03:00:00	15.49	0	14.71
14/07/2021 04:00:00	16.61	0	15.75
14/07/2021 05:00:00	17.37	0	16.59
14/07/2021 06:00:00	17.6	0	16.96
14/07/2021 07:00:00	17.67	0	16.81
14/07/2021 08:00:00	16.95	0	15.88
14/07/2021 09:00:00	15.64	0	14.88
14/07/2021 10:00:00	14.88	0.01	14.41
14/07/2021 11:00:00	13.17	0	12.83
14/07/2021 12:00:00	8.75	0	8.22
14/07/2021 13:00:00	5.58	0.1	4.91
14/07/2021 14:00:00	4.66	0	3.79
14/07/2021 15:00:00	5.1	0.08	4.25
14/07/2021 16:00:00	6.4	0	4.7
14/07/2021 17:00:00	7.33	0	5.49
14/07/2021 18:00:00	8.92	0	7.08
14/07/2021 19:00:00	9.64	0	7.47
14/07/2021 20:00:00	11.64	0	9.77
14/07/2021 21:00:00	12.65	0	11.02
14/07/2021 22:00:00	14.36	0	12.98
14/07/2021 23:00:00	15.01	0	13.89
15/07/2021 00:00:00	13.6	0	12.14
15/07/2021 01:00:00	14.98	0	13.91
15/07/2021 02:00:00	15.19	0	14.38
15/07/2021 03:00:00	14.87	0	13.72
15/07/2021 04:00:00	14.68	0	13.49
15/07/2021 05:00:00	15.08	0	14.07
15/07/2021 06:00:00	14.8	0	13.58
15/07/2021 07:00:00	14.48	0	13.08
15/07/2021 08:00:00	14.43	0	12.96
15/07/2021 09:00:00	14.55	0	13.47
15/07/2021 10:00:00	15.08	0.16	14.58
15/07/2021 11:00:00	13.95	0	13.3
15/07/2021 12:00:00	11.43	0	10.25
15/07/2021 13:00:00	9.18	0	7.62
15/07/2021 14:00:00	8	0	6.05
15/07/2021 15:00:00	8.36	0	5.88
15/07/2021 16:00:00	8.84	0	6.59

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
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15/07/2021 18:00:00	9.38	0	7.42
15/07/2021 19:00:00	9.6	0	7.19
15/07/2021 20:00:00	9.98	0	7.47
15/07/2021 21:00:00	12.79	0	10.87
15/07/2021 22:00:00	13.64	0	11.61
15/07/2021 23:00:00	14.04	0	12.33
16/07/2021 00:00:00	15.49	0	13.8
16/07/2021 01:00:00	15.89	0	14.63
16/07/2021 02:00:00	15.59	0	13.92
16/07/2021 03:00:00	16.05	0	14.57
16/07/2021 04:00:00	16.27	0	14.41
16/07/2021 05:00:00	17	0	15.59
16/07/2021 06:00:00	19.58	1.46	21.49
16/07/2021 07:00:00	17.84	0.11	17.54
16/07/2021 08:00:00	16.85	0	16.25
16/07/2021 09:00:00	14.3	0	14.12
16/07/2021 10:00:00	9.7	0	8.99
16/07/2021 11:00:00	4.96	0	4.23
16/07/2021 12:00:00	1.3	0	0.43
16/07/2021 13:00:00	0	0.03	0
16/07/2021 14:00:00	0	0	0
16/07/2021 15:00:00	0	0	0
16/07/2021 16:00:00	0.56	0	0
16/07/2021 17:00:00	1.41	0	0.18
16/07/2021 18:00:00	2.62	0	0.62
16/07/2021 19:00:00	3.42	0	1.51
16/07/2021 20:00:00	5.87	0	4.05
16/07/2021 21:00:00	9.77	0	7.75
16/07/2021 22:00:00	11.63	0	9.7
16/07/2021 23:00:00	14.26	0	12.68
17/07/2021 00:00:00	14.54	0	13.48
17/07/2021 01:00:00	16.34	0	15.28
17/07/2021 02:00:00	16.27	0	14.82
17/07/2021 03:00:00	16.1	0	14.84
17/07/2021 04:00:00	16.21	0	15.55
17/07/2021 05:00:00	16.28	0	15.64
17/07/2021 06:00:00	18.76	0.84	20.05
17/07/2021 07:00:00	17.84	0.59	18.75
17/07/2021 08:00:00	17.19	1.21	19.04
17/07/2021 09:00:00	14.5	1.99	17.55
17/07/2021 10:00:00	11.72	2.45	15.46
17/07/2021 11:00:00	5.75	0.22	5.94
17/07/2021 12:00:00	0.95	0	0.62
17/07/2021 13:00:00	0	0	0
17/07/2021 14:00:00	0.05	0.01	0
17/07/2021 15:00:00	0	0	0
17/07/2021 16:00:00	0	0	0
17/07/2021 17:00:00	0.57	0	0
17/07/2021 18:00:00	1.15	0	0.19
17/07/2021 19:00:00	2.42	0	0.51
17/07/2021 20:00:00	5.33	0	3.56
17/07/2021 21:00:00	8.78	0	6.71
17/07/2021 22:00:00	12.94	0	11.5
17/07/2021 23:00:00	16.9	0	15.91

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
18/07/2021 00:00:00	16.51	0	15.46
18/07/2021 01:00:00	17.66	0	16.62
18/07/2021 02:00:00	17.78	0	17.08
18/07/2021 03:00:00	21.29	0.22	21.04
18/07/2021 04:00:00	19.91	0	19.01
18/07/2021 05:00:00	20.4	0	19.88
18/07/2021 06:00:00	21.1	0.22	21.43
18/07/2021 07:00:00	22.18	0.87	23.52
18/07/2021 08:00:00	21.92	2.38	25.57
18/07/2021 09:00:00	19.63	1.59	22.07
18/07/2021 10:00:00	16.26	0.44	16.94
18/07/2021 11:00:00	12.12	0.21	12.13
18/07/2021 12:00:00	8.14	0	6.99
18/07/2021 13:00:00	3.46	0.06	3.4
18/07/2021 14:00:00	0.36	0.12	0.49
18/07/2021 15:00:00	0	0.3	0
18/07/2021 16:00:00	0	0	0
18/07/2021 17:00:00	0	0	0
18/07/2021 18:00:00	3.5	0	1.75
18/07/2021 19:00:00	10.29	0	8.28
18/07/2021 20:00:00	13.46	0	11.79
18/07/2021 21:00:00	15.57	0	13.39
18/07/2021 22:00:00	16.61	0	15.02
18/07/2021 23:00:00	14.54	0	13.1
19/07/2021 00:00:00	16.88	0	15.83
19/07/2021 01:00:00	16.31	0	15.67
19/07/2021 02:00:00	16.69	0	16.06
19/07/2021 03:00:00	18.04	0	17.38
19/07/2021 04:00:00	19.5	0	18.92
19/07/2021 05:00:00	19.61	0.04	19.48
19/07/2021 06:00:00	23.74	2.91	28.19
19/07/2021 07:00:00	22.62	2.66	26.68
19/07/2021 08:00:00	21.26	1.46	23.48
19/07/2021 09:00:00	20.07	0.97	21.56
19/07/2021 10:00:00	16.8	0.6	17.73
19/07/2021 11:00:00	12.82	0.09	12.62
19/07/2021 12:00:00	7.46	0	6.61
19/07/2021 13:00:00	2.58	0.08	2.52
19/07/2021 14:00:00	0	0.07	0
19/07/2021 15:00:00	0	0.26	0
19/07/2021 16:00:00	0	0	0
19/07/2021 17:00:00	0.24	0	0
19/07/2021 18:00:00	6.59	0	4.51
19/07/2021 19:00:00	10.33	0	8.95
19/07/2021 20:00:00	12.43	0	10.91
19/07/2021 21:00:00	18.57	0	17.27
19/07/2021 22:00:00	21.04	0	19.96
19/07/2021 23:00:00	21.53	0	20.42
20/07/2021 00:00:00	21.39	0	20.67
20/07/2021 01:00:00	20.3	0	19.44
20/07/2021 02:00:00	19.17	0.03	18.71
20/07/2021 03:00:00	19.53	0	19.07
20/07/2021 04:00:00	20.05	0	19.52
20/07/2021 05:00:00	21.81	0.05	21.48
20/07/2021 06:00:00	24.47	1.47	26.71

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
20/07/2021 07:00:00	25.62	2.87	30.02
20/07/2021 08:00:00	24.99	1.81	27.76
20/07/2021 09:00:00	20.77	0.97	22.25
20/07/2021 10:00:00	17.16	0.75	18.31
20/07/2021 11:00:00	12.11	0.54	12.91
20/07/2021 12:00:00	6.66	0	6.23
20/07/2021 13:00:00	4.7	0	3.97
20/07/2021 14:00:00	2.26	0	0.86
20/07/2021 15:00:00	1.19	0.01	0.54
20/07/2021 16:00:00	1.9	0	0.8
20/07/2021 17:00:00	2.49	0	0.77
20/07/2021 18:00:00	4.84	0	3.24
20/07/2021 19:00:00	7.3	0	5.78
20/07/2021 20:00:00	12.65	0	11.6
20/07/2021 21:00:00	16.39	0	15.19
20/07/2021 22:00:00	25.12	0	24.4
20/07/2021 23:00:00	24.34	0	23.8
21/07/2021 00:00:00	26.19	0.02	25.77
21/07/2021 01:00:00	22.81	0	22.48
21/07/2021 02:00:00	21.29	0	21.02
21/07/2021 03:00:00	21.76	0	21.22
21/07/2021 04:00:00	27.38	0	27.07
21/07/2021 05:00:00	23.19	0.12	23.09
21/07/2021 06:00:00	26.02	1.32	28.04
21/07/2021 07:00:00	25.31	1.91	28.23
21/07/2021 08:00:00	22.1	1.27	24.04
21/07/2021 09:00:00	15.06	0.92	16.48
21/07/2021 10:00:00	7.15	0.57	8.03
21/07/2021 11:00:00	5.16	0.01	4.73
21/07/2021 12:00:00	2.87	0	2.71
21/07/2021 13:00:00	0	0.15	0
21/07/2021 14:00:00	0	0.24	0
21/07/2021 15:00:00	0	0.05	0
21/07/2021 16:00:00	0	0	0
21/07/2021 17:00:00	0	0	0
21/07/2021 18:00:00	2.1	0.01	1.79
21/07/2021 19:00:00	3.41	0	2.73
21/07/2021 20:00:00	8.64	0	8.1
21/07/2021 21:00:00	13.52	0	12.3
21/07/2021 22:00:00	16.66	0	15.42
21/07/2021 23:00:00	17.45	0	16.78
22/07/2021 00:00:00	17.98	0.18	18.12
22/07/2021 01:00:00	19.34	0.18	19.62
22/07/2021 02:00:00	20.3	0.11	20.36
22/07/2021 03:00:00	22.39	0.06	22.25
22/07/2021 04:00:00	22.87	0.08	22.99
22/07/2021 05:00:00	25.58	0.12	25.71
22/07/2021 06:00:00	32.27	2.96	36.79
22/07/2021 07:00:00	32.2	5.38	40.41
22/07/2021 08:00:00	24.61	2.69	28.71
22/07/2021 09:00:00	19.83	2.12	23.07
22/07/2021 10:00:00	16.68	1.86	19.52
22/07/2021 11:00:00	7.42	1.82	10.22
22/07/2021 12:00:00	2.56	1.45	4.6
22/07/2021 13:00:00	0	1.04	0.55

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
22/07/2021 14:00:00	0	0.45	0
22/07/2021 15:00:00	0	0.2	0
22/07/2021 16:00:00	0	0	0
22/07/2021 17:00:00	0	0	0
22/07/2021 18:00:00	2.19	0	1.83
22/07/2021 19:00:00	7.4	0	6.49
22/07/2021 20:00:00	14.77	0	14.24
22/07/2021 21:00:00	19.1	0	17.71
22/07/2021 22:00:00	20.21	0	19.04
22/07/2021 23:00:00	19.19	0	18.02
23/07/2021 00:00:00	19.9	0	18.94
23/07/2021 01:00:00	20.16	0	19.6
23/07/2021 02:00:00	21.26	0	20.89
23/07/2021 03:00:00	21.65	0	21.1
23/07/2021 04:00:00	20.18	0	19.38
23/07/2021 05:00:00	20.05	0	19.35
23/07/2021 06:00:00	21.55	0	21.03
23/07/2021 07:00:00	23.87	0.34	24.29
23/07/2021 08:00:00	23.79	0.61	24.72
23/07/2021 09:00:00	25.89	1.63	28.37
23/07/2021 10:00:00	20.83	0.92	22.23
23/07/2021 11:00:00	16.39	0.62	17.33
23/07/2021 12:00:00	12.77	0.14	12.99
23/07/2021 13:00:00	9.66	0	9.4
23/07/2021 14:00:00	6.96	0	6.11
23/07/2021 15:00:00	6.25	0	5.1
23/07/2021 16:00:00	7.05	0	5.86
23/07/2021 17:00:00	9.31	0	7.78
23/07/2021 18:00:00	9.65	0	8.21
23/07/2021 19:00:00	11.37	0	9.91
23/07/2021 20:00:00	14.54	0	12.89
23/07/2021 21:00:00	13.2	0	11.27
23/07/2021 22:00:00	14.86	0	13.32
23/07/2021 23:00:00	16.77	0	15.26
24/07/2021 00:00:00	17.45	0	16.2
24/07/2021 01:00:00	17.97	0	16.95
24/07/2021 02:00:00	18.83	0	17.99
24/07/2021 03:00:00	19.12	0	18.28
24/07/2021 04:00:00	20	0	19.08
24/07/2021 05:00:00	20.41	0	19.62
24/07/2021 06:00:00	20.39	0.04	20.27
24/07/2021 07:00:00	22.48	0.41	23.05
24/07/2021 08:00:00	22.89	0.79	24
24/07/2021 09:00:00	17.52	0.04	17.35
24/07/2021 10:00:00	15.81	0.1	15.73
24/07/2021 11:00:00	11.66	0	11.31
24/07/2021 12:00:00	9.68	0	9.21
24/07/2021 13:00:00	6.6	0	6.2
24/07/2021 14:00:00	4.5	0	3.47
24/07/2021 15:00:00	3.45	0	2.61
24/07/2021 16:00:00	3.92	0	2.84
24/07/2021 17:00:00	4.23	0	2.92
24/07/2021 18:00:00	5.92	0	4.82
24/07/2021 19:00:00	6.03	0	5.26
24/07/2021 20:00:00	7.43	0	6.08

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
24/07/2021 21:00:00	8.86	0	7.12
24/07/2021 22:00:00	10.9	0	9.58
24/07/2021 23:00:00	12.39	0	11.33
25/07/2021 00:00:00	13.8	0	13.1
25/07/2021 01:00:00	14.8	0.07	14.62
25/07/2021 02:00:00	15.52	0.09	15.61
25/07/2021 03:00:00	15.88	0	15.51
25/07/2021 04:00:00	16.39	0.04	15.97
25/07/2021 05:00:00	15.84	0.12	16.02
25/07/2021 06:00:00	16.27	0.09	16.25
25/07/2021 07:00:00	16.55	0.48	17.27
25/07/2021 08:00:00	13.99	0.64	14.96
25/07/2021 09:00:00	8.77	0.36	9.31
25/07/2021 10:00:00	4.84	0	4.64
25/07/2021 11:00:00	3.51	0.54	4.12
25/07/2021 12:00:00	0.7	0.77	1.61
25/07/2021 13:00:00	0	0.01	0
25/07/2021 14:00:00	0	0	0
25/07/2021 15:00:00	0	0.21	0
25/07/2021 16:00:00	0	0	0
25/07/2021 17:00:00	0	0	0
25/07/2021 18:00:00	0	0.78	0.59
25/07/2021 19:00:00	0	0	0
25/07/2021 20:00:00	0.57	0	0
25/07/2021 21:00:00	2.98	0	1.51
25/07/2021 22:00:00	4.91	0	3.6
25/07/2021 23:00:00	8.86	0	7.44
26/07/2021 00:00:00	13.24	0	12.54
26/07/2021 01:00:00	14.49	0	14.15
26/07/2021 02:00:00	15.48	0	14.93
26/07/2021 03:00:00	16	0	15.74
26/07/2021 04:00:00	15.92	0.04	15.72
26/07/2021 05:00:00	16.71	0	16.39
26/07/2021 06:00:00	17.91	0	17.32
26/07/2021 07:00:00	17.22	0	16.55
26/07/2021 08:00:00	17.58	0	16.62
26/07/2021 09:00:00	19.17	0	18.62
26/07/2021 10:00:00	19.26	0	18.71
26/07/2021 11:00:00	18.43	0.27	18.56
26/07/2021 12:00:00	16.95	0	16.26
26/07/2021 13:00:00	14.3	0	12.99
26/07/2021 14:00:00	16.86	0	16.26
26/07/2021 15:00:00	20	0.91	21.34
26/07/2021 16:00:00	16.62	0.38	17
26/07/2021 17:00:00	16	0.19	16
26/07/2021 18:00:00	13.2	0	11.72
26/07/2021 19:00:00	15.42	0	14.36
26/07/2021 20:00:00	18.91	0	18.45
26/07/2021 21:00:00	19.33	0	18.71
26/07/2021 22:00:00	21.15	0.03	20.71
26/07/2021 23:00:00	23.52	0.05	23.25
27/07/2021 00:00:00	19.63	0	18.9
27/07/2021 01:00:00	20.04	0	19.42
27/07/2021 02:00:00	18.01	0	17.41
27/07/2021 03:00:00	18	0	17.29

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
27/07/2021 04:00:00	18.17	0	17.84
27/07/2021 05:00:00	20.66	0.17	20.87
27/07/2021 06:00:00	19.32	0.05	19.3
27/07/2021 07:00:00	19.56	0.21	19.87
27/07/2021 08:00:00	20.19	0.44	20.86
27/07/2021 09:00:00	19.71	0.6	20.63
27/07/2021 10:00:00	18.7	0.4	19.22
27/07/2021 11:00:00	14.86	0.05	14.43
27/07/2021 12:00:00	14.11	0	13.52
27/07/2021 13:00:00	14.49	0	13.68
27/07/2021 14:00:00	15.66	0	14.96
27/07/2021 15:00:00	15.9	0	15.43
27/07/2021 16:00:00	16.6	0	16.19
27/07/2021 17:00:00	16.72	0	16.3
27/07/2021 18:00:00	17.05	0	16.49
27/07/2021 19:00:00	15.28	0	14.79
27/07/2021 20:00:00	16.72	0.33	17.14
27/07/2021 21:00:00	18.92	0.3	19.38
27/07/2021 22:00:00	24.64	0.81	25.85
27/07/2021 23:00:00	18.39	0.2	18.68
28/07/2021 00:00:00	20.32	0.33	20.82
28/07/2021 01:00:00	18.8	0.03	18.69
28/07/2021 02:00:00	17.79	0.23	18.08
28/07/2021 03:00:00	16.88	0.02	16.79
28/07/2021 04:00:00	17.01	0	16.86
28/07/2021 05:00:00	17.91	0	17.53
28/07/2021 06:00:00	18.1	0	18.02
28/07/2021 07:00:00	18.89	0.3	19.26
28/07/2021 08:00:00	19.46	0.91	20.86
28/07/2021 09:00:00	17.21	0.43	17.75
28/07/2021 10:00:00	15.08	0.48	15.67
28/07/2021 11:00:00	11.64	0	11.12
28/07/2021 12:00:00	8.7	0.07	8.49
28/07/2021 13:00:00	4.96	0	4.2
28/07/2021 14:00:00	7.04	0.06	5.9
28/07/2021 15:00:00	7.36	0.23	6.66
28/07/2021 16:00:00	8.32	0.15	8.26
28/07/2021 17:00:00	6.58	0	5.67
28/07/2021 18:00:00	5.9	0	4.42
28/07/2021 19:00:00	8.33	0	7.6
28/07/2021 20:00:00	9.86	0	9.23
28/07/2021 21:00:00	10.75	0	9.99
28/07/2021 22:00:00	11.65	0	11.03
28/07/2021 23:00:00	10.96	0	10.44
29/07/2021 00:00:00	11.16	0	10.58
29/07/2021 01:00:00	11.46	0	10.93
29/07/2021 02:00:00	11.39	0	10.91
29/07/2021 03:00:00	11.97	0	11.29
29/07/2021 04:00:00	12.22	0	11.89
29/07/2021 05:00:00	13.7	0.1	13.65
29/07/2021 06:00:00	14.34	0.34	14.84
29/07/2021 07:00:00	14.07	0.7	15.14
29/07/2021 08:00:00	13.03	0.41	13.53
29/07/2021 09:00:00	10.09	0	9.86
29/07/2021 10:00:00	9.17	0.07	9.18

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
29/07/2021 11:00:00	7.16	0	6.87
29/07/2021 12:00:00	6.37	0	5.37
29/07/2021 13:00:00	7.23	0.13	7.2
29/07/2021 14:00:00	6.71	0.34	7.01
29/07/2021 15:00:00	5.06	0.04	4.7
29/07/2021 16:00:00	4.24	0	3.21
29/07/2021 17:00:00	4.51	0	3.29
29/07/2021 18:00:00	5.14	0	4.12
29/07/2021 19:00:00	5.71	0	4.56
29/07/2021 20:00:00	8.46	0	7.5
29/07/2021 21:00:00	10.95	0	10.21
29/07/2021 22:00:00	11.08	0	10.34
29/07/2021 23:00:00	12.8	0	12.38
30/07/2021 00:00:00	12.58	0	11.97
30/07/2021 01:00:00	12.88	0	12.22
30/07/2021 02:00:00	13.54	0	12.78
30/07/2021 03:00:00	13.63	0	12.85
30/07/2021 04:00:00	13.63	0	12.92
30/07/2021 05:00:00	13.24	0	12.43
30/07/2021 06:00:00	13.71	0	13
30/07/2021 07:00:00	14.33	0	13.87
30/07/2021 08:00:00	14.27	0.07	14.15
30/07/2021 09:00:00	14.09	0	13.5
30/07/2021 10:00:00	13.12	0	12.53
30/07/2021 11:00:00	12.47	0.1	12.35
30/07/2021 12:00:00	11.99	0	11.41
30/07/2021 13:00:00	12.15	0	11.3
30/07/2021 14:00:00	11.83	0	10.46
30/07/2021 15:00:00	13.04	0	12.61
30/07/2021 16:00:00	9.81	0	8.98
30/07/2021 17:00:00	8.89	0	7.81
30/07/2021 18:00:00	8.55	0	7.37
30/07/2021 19:00:00	9.17	0	8.55
30/07/2021 20:00:00	12.68	1.9	15.58
30/07/2021 21:00:00	11.21	0	10.27
30/07/2021 22:00:00	10.25	0.1	10.23
30/07/2021 23:00:00	14.3	0.1	14.45
31/07/2021 00:00:00	14.46	0.15	14.59
31/07/2021 01:00:00	14.41	0.13	14.36
31/07/2021 02:00:00	14.04	0.03	13.92
31/07/2021 03:00:00	14.83	0.07	14.89
31/07/2021 04:00:00	14.56	0.04	14.49
31/07/2021 05:00:00	14.76	0.05	14.64
31/07/2021 06:00:00	15.18	0.1	15.26
31/07/2021 07:00:00	16.12	0.18	16.39
31/07/2021 08:00:00	15.58	0.29	16.03
31/07/2021 09:00:00	16.38	0.46	17.09
31/07/2021 10:00:00	15.82	0.34	16.3
31/07/2021 11:00:00	15.62	1.99	18.67
31/07/2021 12:00:00	12.86	0.03	12.49
31/07/2021 13:00:00	14.2	0.37	14.53
31/07/2021 14:00:00	11.61	0.1	10.89
31/07/2021 15:00:00	12.49	0.01	11.62
31/07/2021 16:00:00	12.12	0	11.05
31/07/2021 17:00:00	13.43	0.06	12.75

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
31/07/2021 18:00:00	11.62	0	10.51
31/07/2021 19:00:00	10.66	0	9.04
31/07/2021 20:00:00	11.23	0	9.99
31/07/2021 21:00:00	9.96	0	8.45
31/07/2021 22:00:00	10.35	0	9.12
31/07/2021 23:00:00	10.53	0	9.26
01/08/2021 00:00:00	10.34	0	8.98
01/08/2021 01:00:00	10.08	0	9.17
01/08/2021 02:00:00	10.45	0	9.56
01/08/2021 03:00:00	9.68	0	8.52
01/08/2021 04:00:00	8.86	0	7.96
01/08/2021 05:00:00	8.7	0	7.49
01/08/2021 06:00:00	8.18	0	7.14
01/08/2021 07:00:00	8.28	0	7.31
01/08/2021 08:00:00	7.21	0	6.29
01/08/2021 09:00:00	6.34	0	5.49
01/08/2021 10:00:00	5.88	0	4.99
01/08/2021 11:00:00	5.66	0	4.58
01/08/2021 12:00:00	4.8	0	3.92
01/08/2021 13:00:00	3.62	0	2.47
01/08/2021 14:00:00	2.32	0	1.45
01/08/2021 15:00:00	1.12	0	0.24
01/08/2021 16:00:00	0.43	0	0
01/08/2021 17:00:00	0.38	0	0
01/08/2021 18:00:00	0.76	0	0
01/08/2021 19:00:00	1.44	0	0.32
01/08/2021 20:00:00	2.51	0	1.19
01/08/2021 21:00:00	4.66	0	3.16
01/08/2021 22:00:00	6.9	0	5.74
01/08/2021 23:00:00	8.36	0	7.5
02/08/2021 00:00:00	9.47	0	8.57
02/08/2021 01:00:00	10.57	0	10
02/08/2021 02:00:00	11.46	0.01	11.16
02/08/2021 03:00:00	11.64	0	11.23
02/08/2021 04:00:00	11.37	0	10.91
02/08/2021 05:00:00	12.3	0.08	12.13
02/08/2021 06:00:00	17.77	0.88	19.12
02/08/2021 07:00:00	18.57	1.32	20.59
02/08/2021 08:00:00	17.47	0.86	18.78
02/08/2021 09:00:00	17.95	0.75	19.09
02/08/2021 10:00:00	15.23	0.38	15.67
02/08/2021 11:00:00	13.39	0	13.14
02/08/2021 12:00:00	14.27	0.05	14.27
02/08/2021 13:00:00	16.26	0.56	17.12
02/08/2021 14:00:00	16.64	0.21	16.91
02/08/2021 15:00:00	15.8	0.11	15.76
02/08/2021 16:00:00	14.25	0.02	13.84
02/08/2021 17:00:00	14.07	0	13.73
02/08/2021 18:00:00	13.33	0	12.89
02/08/2021 19:00:00	13.32	0	12.38
02/08/2021 20:00:00	14.78	0	14.05
02/08/2021 21:00:00	18.6	0	18.19
02/08/2021 22:00:00	24.65	1.19	26.39
02/08/2021 23:00:00	16.92	0	16.31
03/08/2021 00:00:00	16.64	0	16.29

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
03/08/2021 01:00:00	16.52	0	15.88
03/08/2021 02:00:00	15.65	0	14.9
03/08/2021 03:00:00	17.09	0	16.56
03/08/2021 04:00:00	18.23	0	18.19
03/08/2021 05:00:00	18.65	0.16	18.47
03/08/2021 06:00:00	20.45	1.18	22.26
03/08/2021 07:00:00	20.11	1.16	21.88
03/08/2021 08:00:00	19.16	0.51	19.93
03/08/2021 09:00:00	17.11	0.04	16.97
03/08/2021 10:00:00	15.37	0	15.13
03/08/2021 11:00:00	14.05	0.03	13.84
03/08/2021 12:00:00	12.09	0	11.29
03/08/2021 13:00:00	10.18	0	9.3
03/08/2021 14:00:00	7.37	0	6.1
03/08/2021 15:00:00	6.3	0	5.28
03/08/2021 16:00:00	3.5	0	3.02
03/08/2021 17:00:00	5.74	0.32	5.95
03/08/2021 18:00:00	6.46	0	5.94
03/08/2021 19:00:00	6.83	0	5.74
03/08/2021 20:00:00	9.07	0	7.61
03/08/2021 21:00:00	14.75	0	13.55
03/08/2021 22:00:00	20.65	0.22	20.84
03/08/2021 23:00:00	18.3	0.02	18.23
04/08/2021 00:00:00	22.3	0.68	23.34
04/08/2021 01:00:00	17.41	0.37	17.97
04/08/2021 02:00:00	18.12	0.38	18.7
04/08/2021 03:00:00	18.16	0.61	19.06
04/08/2021 04:00:00	18.19	0.3	18.61
04/08/2021 05:00:00	18.69	0.53	19.5
04/08/2021 06:00:00	19.8	2.21	23.18
04/08/2021 07:00:00	19.28	2.7	23.41
04/08/2021 08:00:00	17.57	1.7	20.16
04/08/2021 09:00:00	15.24	0.8	16.48
04/08/2021 10:00:00	12.92	0.94	14.21
04/08/2021 11:00:00	9.41	0	9.04
04/08/2021 12:00:00	9.83	0.74	10.41
04/08/2021 13:00:00	9.28	0	8.77
04/08/2021 14:00:00	10.88	0.05	10.58
04/08/2021 15:00:00	10.77	2.39	14.35
04/08/2021 16:00:00	7.12	0	6.21
04/08/2021 17:00:00	6.59	0	5.06
04/08/2021 18:00:00	7	0	5.48
04/08/2021 19:00:00	7.65	0	6.04
04/08/2021 20:00:00	10.74	0	9.71
04/08/2021 21:00:00	13.61	0	12.68
04/08/2021 22:00:00	15.43	0	14.98
04/08/2021 23:00:00	16.17	0.01	16.17
05/08/2021 00:00:00	15.14	0.01	14.92
05/08/2021 01:00:00	15	0	14.39
05/08/2021 02:00:00	14.67	0	13.81
05/08/2021 03:00:00	14.25	0	13.4
05/08/2021 04:00:00	14.3	0	13.25
05/08/2021 05:00:00	15.35	0	14.64
05/08/2021 06:00:00	15.7	0	14.91
05/08/2021 07:00:00	16.52	0.07	16.4

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
05/08/2021 08:00:00	16.63	0	15.92
05/08/2021 09:00:00	19.07	0	18.38
05/08/2021 10:00:00	21.79	0.57	22.32
05/08/2021 11:00:00	21.37	0.16	21.54
05/08/2021 12:00:00	20.94	0.03	20.94
05/08/2021 13:00:00	16.94	0	16.14
05/08/2021 14:00:00	16	0	14.88
05/08/2021 15:00:00	13.79	0	12.92
05/08/2021 16:00:00	16.14	0	14.92
05/08/2021 17:00:00	16.5	0.06	16.16
05/08/2021 18:00:00	17.01	0.15	17.09
05/08/2021 19:00:00	18.34	0	17.64
05/08/2021 20:00:00	23.38	0	22.07
05/08/2021 21:00:00	29.62	0	28.37
05/08/2021 22:00:00	30.36	0	29.33
05/08/2021 23:00:00	27.88	0	26.69
06/08/2021 00:00:00	27.98	0	26.48
06/08/2021 01:00:00	26.27	0	24.73
06/08/2021 02:00:00	24.87	0	23.33
06/08/2021 03:00:00	24.19	0	22.53
06/08/2021 04:00:00	23.52	0	22.11
06/08/2021 05:00:00	23.02	0	22.04
06/08/2021 06:00:00	22.32	0	21.19
06/08/2021 07:00:00	22.26	0	21.09
06/08/2021 08:00:00	22.86	0	22.04
06/08/2021 09:00:00	21.95	0	21.27
06/08/2021 10:00:00	23.62	0.03	23.44
06/08/2021 11:00:00	21.77	0.3	22.23
06/08/2021 12:00:00	21.04	0.03	20.86
06/08/2021 13:00:00	20	0.02	19.49
06/08/2021 14:00:00	19.82	0.08	19.71
06/08/2021 15:00:00	18.32	0	17.59
06/08/2021 16:00:00	18.97	0	18.62
06/08/2021 17:00:00	17.41	0	16.53
06/08/2021 18:00:00	17.22	0	16.31
06/08/2021 19:00:00	16.1	0	14.73
06/08/2021 20:00:00	16.54	0	15.24
06/08/2021 21:00:00	18.8	0	17.96
06/08/2021 22:00:00	17.91	0	16.7
06/08/2021 23:00:00	17.45	0	16.35
07/08/2021 00:00:00	17	0	15.59
07/08/2021 01:00:00	16.89	0	15.21
07/08/2021 02:00:00	16.3	0	14.88
07/08/2021 03:00:00	15.62	0	14.04
07/08/2021 04:00:00	16.11	0	14.84
07/08/2021 05:00:00	15.27	0	13.93
07/08/2021 06:00:00	15.07	0	13.86
07/08/2021 07:00:00	15.36	0	14.4
07/08/2021 08:00:00	15.42	0	14.43
07/08/2021 09:00:00	14.56	0	13.41
07/08/2021 10:00:00	14.03	0	13.03
07/08/2021 11:00:00	15.03	0	14.12
07/08/2021 12:00:00	16.25	0	15.41
07/08/2021 13:00:00	16.7	0.44	16.81
07/08/2021 14:00:00	15.23	0	14.12

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
07/08/2021 15:00:00	15.51	0	14.7
07/08/2021 16:00:00	15.84	0	14.69
07/08/2021 17:00:00	14.88	0	13.54
07/08/2021 18:00:00	11	0	10.36
07/08/2021 19:00:00	14.4	0	13.2
07/08/2021 20:00:00	14.77	0	13.62
07/08/2021 21:00:00	15.02	0	14.23
07/08/2021 22:00:00	14.42	0	13.62
07/08/2021 23:00:00	14.4	0	13.7
08/08/2021 00:00:00	14.48	0	13.58
08/08/2021 01:00:00	14.75	0	14
08/08/2021 02:00:00	14.67	0	14.05
08/08/2021 03:00:00	15.16	0	13.99
08/08/2021 04:00:00	14.49	0	13.68
08/08/2021 05:00:00	14.07	0	13.15
08/08/2021 06:00:00	14.16	0	13.34
08/08/2021 07:00:00	14.22	0	13.35
08/08/2021 08:00:00	13.48	0	12.38
08/08/2021 09:00:00	13.62	0	12.74
08/08/2021 10:00:00	12.29	0.04	12.14
08/08/2021 11:00:00	10.82	0	9.42
08/08/2021 12:00:00	9.93	0	8.73
08/08/2021 13:00:00	8.36	0	7.39
08/08/2021 14:00:00	6.93	0	5.55
08/08/2021 15:00:00	5.79	0	4.09
08/08/2021 16:00:00	5.39	0	3.52
08/08/2021 17:00:00	4.53	0	2.48
08/08/2021 18:00:00	5.2	0	3.37
08/08/2021 19:00:00	5.82	0	4.07
08/08/2021 20:00:00	7.31	0	5.58
08/08/2021 21:00:00	12.7	0	11.38
08/08/2021 22:00:00	14.32	0	13.35
08/08/2021 23:00:00	13.88	0	13.35
09/08/2021 00:00:00	12.76	0.01	12.44
09/08/2021 01:00:00	12.68	0	12.29
09/08/2021 02:00:00	13.03	0	12.62
09/08/2021 03:00:00	12.67	0	12.14
09/08/2021 04:00:00	12.93	0	12.19
09/08/2021 05:00:00	13.41	0	12.71
09/08/2021 06:00:00	15.05	0	14.53
09/08/2021 07:00:00	16.04	0.05	16.08
09/08/2021 08:00:00	15.54	0	15.11
09/08/2021 09:00:00	16.07	0	15.71
09/08/2021 10:00:00	15.32	0.07	15.26
09/08/2021 11:00:00	15.25	0.06	15.06
09/08/2021 12:00:00	15.42	0.14	15.17
09/08/2021 13:00:00	16.37	0.02	16.27
09/08/2021 14:00:00	18.57	0.33	19.08
09/08/2021 15:00:00	16.38	0	16.02
09/08/2021 16:00:00	14.99	0.09	14.62
09/08/2021 17:00:00	14.34	0	13.18
09/08/2021 18:00:00	13.98	0	12.86
09/08/2021 19:00:00	12.77	0	10.98
09/08/2021 20:00:00	12.54	0	10.81
09/08/2021 21:00:00	11.55	0	9.38

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
09/08/2021 22:00:00	12.18	0	10.63
09/08/2021 23:00:00	13.02	0	11.59
10/08/2021 00:00:00	12.35	0	11.03
10/08/2021 01:00:00	13.45	0	12.12
10/08/2021 02:00:00	13.48	0	12.1
10/08/2021 03:00:00	12.69	0	11.34
10/08/2021 04:00:00	12.82	0	11.68
10/08/2021 05:00:00	13.45	0	12.27
10/08/2021 06:00:00	14.57	0	13.81
10/08/2021 07:00:00	14.97	0	14.24
10/08/2021 08:00:00	15.39	0	14.86
10/08/2021 09:00:00	15.74	0.19	16.02
10/08/2021 10:00:00	11.76	0.28	12.11
10/08/2021 11:00:00	10.49	0	9.05
10/08/2021 12:00:00	8.89	0	7.29
10/08/2021 13:00:00	6.87	0	5.22
10/08/2021 14:00:00	5.91	0	4.39
10/08/2021 15:00:00	4.74	0	3.04
10/08/2021 16:00:00	6.48	0	4.68
10/08/2021 17:00:00	7.63	0.45	7.15
10/08/2021 18:00:00	7.31	0	6.01
10/08/2021 19:00:00	8.34	0	6.59
10/08/2021 20:00:00	9.69	0	7.96
10/08/2021 21:00:00	9.07	0	7.46
10/08/2021 22:00:00	8.66	0	6.99
10/08/2021 23:00:00	10.17	0	8.73
11/08/2021 00:00:00	11.39	0	10.11
11/08/2021 01:00:00	12.65	0	11.71
11/08/2021 02:00:00	13.43	0	12.41
11/08/2021 03:00:00	13.96	0	12.65
11/08/2021 04:00:00	13.88	0	12.61
11/08/2021 05:00:00	13.06	0	11.86
11/08/2021 06:00:00	13.54	0	12.48
11/08/2021 07:00:00	14.56	0	14.08
11/08/2021 08:00:00	15.12	0	14.4
11/08/2021 09:00:00	16.88	0	16.14
11/08/2021 10:00:00	15.97	0	14.6
11/08/2021 11:00:00	18.33	0	17.66
11/08/2021 12:00:00	15.31	0	14.11
11/08/2021 13:00:00	11.71	0.04	11.41
11/08/2021 14:00:00	8.02	0	7.37
11/08/2021 15:00:00	3.23	0	1.46
11/08/2021 16:00:00	0.75	0	0
11/08/2021 17:00:00	0.2	0	0
11/08/2021 18:00:00	0.45	0	0
11/08/2021 19:00:00	1.1	0	0
11/08/2021 20:00:00	2.99	0	1.31
11/08/2021 21:00:00	26.15	1.4	28
11/08/2021 22:00:00	13.1	0.6	13.57
11/08/2021 23:00:00	13.58	0	13.1
12/08/2021 00:00:00	13.52	0.3	13.92
12/08/2021 01:00:00	11.3	0	11.03
12/08/2021 02:00:00	11.3	0.06	11.25
12/08/2021 03:00:00	11.91	0.06	11.87
12/08/2021 04:00:00	11.8	0.02	11.78

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
12/08/2021 05:00:00	11.93	0	11.57
12/08/2021 06:00:00	12.22	0.01	12.02
12/08/2021 07:00:00	13.03	0.64	14
12/08/2021 08:00:00	12.29	0.36	12.83
12/08/2021 09:00:00	10.69	0.18	10.94
12/08/2021 10:00:00	8.78	0.14	8.5
12/08/2021 11:00:00	7.02	0.38	7.09
12/08/2021 12:00:00	8.04	0.38	8.34
12/08/2021 13:00:00	7.99	0.19	7.99
12/08/2021 14:00:00	5.41	0.1	4.71
12/08/2021 15:00:00	5.11	0.12	5.13
12/08/2021 16:00:00	3.83	0	3.31
12/08/2021 17:00:00	4.28	0.07	4.04
12/08/2021 18:00:00	3.85	0	3.13
12/08/2021 19:00:00	4.43	0	3.36
12/08/2021 20:00:00	4.88	0	3.52
12/08/2021 21:00:00	5.97	0	4.86
12/08/2021 22:00:00	6.51	0	5.33
12/08/2021 23:00:00	7.55	0	6.61
13/08/2021 00:00:00	7.08	0	6
13/08/2021 01:00:00	7	0	6.28
13/08/2021 02:00:00	8.73	0	8.02
13/08/2021 03:00:00	9.26	0	8.87
13/08/2021 04:00:00	10.34	0.02	10.14
13/08/2021 05:00:00	10.7	0	10.28
13/08/2021 06:00:00	11.65	0.09	11.68
13/08/2021 07:00:00	11.61	0.07	11.65
13/08/2021 08:00:00	11.2	0.04	11.07
13/08/2021 09:00:00	10.63	0.44	11.3
13/08/2021 10:00:00	8.59	0.32	8.75
13/08/2021 11:00:00	7.88	0.26	7.7
13/08/2021 12:00:00	7.97	0.26	8.13
13/08/2021 13:00:00	7.46	0.02	7.35
13/08/2021 14:00:00	7	0.07	6.83
13/08/2021 15:00:00	6.64	0.6	7.4
13/08/2021 16:00:00	6.65	0.11	6.62
13/08/2021 17:00:00	6.35	0	5.5
13/08/2021 18:00:00	9.35	0	8.81
13/08/2021 19:00:00	11.38	0.07	11.16
13/08/2021 20:00:00	13.16	0	12.54
13/08/2021 21:00:00	12.14	0	11.52
13/08/2021 22:00:00	12.52	0	12.02
13/08/2021 23:00:00	12.01	0	11.31
14/08/2021 00:00:00	12.4	0	11.73
14/08/2021 01:00:00	13.11	0	12.57
14/08/2021 02:00:00	13.27	0	12.78
14/08/2021 03:00:00	12.91	0	12.24
14/08/2021 04:00:00	12.21	0	11.63
14/08/2021 05:00:00	12.94	0	12.35
14/08/2021 06:00:00	15.16	0	14.66
14/08/2021 07:00:00	15.61	0.15	15.74
14/08/2021 08:00:00	15.56	0.11	15.69
14/08/2021 09:00:00	16.73	0.97	18.12
14/08/2021 10:00:00	14.9	0.02	14.78
14/08/2021 11:00:00	13.39	0	12.9

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
14/08/2021 12:00:00	14.43	0.12	14.58
14/08/2021 13:00:00	14.53	0	14.44
14/08/2021 14:00:00	13.39	0	12.65
14/08/2021 15:00:00	14.63	0.01	14.4
14/08/2021 16:00:00	15.04	0	14.51
14/08/2021 17:00:00	14.88	0	14.43
14/08/2021 18:00:00	16.24	0	15.55
14/08/2021 19:00:00	18.14	0	17.74
14/08/2021 20:00:00	20.3	0	19.84
14/08/2021 21:00:00	19.12	0	18.29
14/08/2021 22:00:00	20.39	0	19.53
14/08/2021 23:00:00	18.07	0	16.98
15/08/2021 00:00:00	19.14	0	18.45
15/08/2021 01:00:00	17.88	0	16.97
15/08/2021 02:00:00	16.97	0	16.1
15/08/2021 03:00:00	15.81	0	14.72
15/08/2021 04:00:00	16.42	0	15.65
15/08/2021 05:00:00	15.98	0	15.27
15/08/2021 06:00:00	16.09	0	15.04
15/08/2021 07:00:00	16.38	0	15.84
15/08/2021 08:00:00	15	0	14.24
15/08/2021 09:00:00	14.07	0	12.92
15/08/2021 10:00:00	12.36	0	11.75
15/08/2021 11:00:00	10.42	0	9.42
15/08/2021 12:00:00	10.1	0	8.79
15/08/2021 13:00:00	8.45	0	6.85
15/08/2021 14:00:00	7.57	0	5.66
15/08/2021 15:00:00	8.18	0	6.84
15/08/2021 16:00:00	6.71	0	5.12
15/08/2021 17:00:00	4.99	0	3.07
15/08/2021 18:00:00	4.69	0	2.98
15/08/2021 19:00:00	4.99	0	3.25
15/08/2021 20:00:00	5.94	0	4.47
15/08/2021 21:00:00	6.72	0	5.33
15/08/2021 22:00:00	8.33	0	7.44
15/08/2021 23:00:00	8.23	0	7.12
16/08/2021 00:00:00	7.85	0	6.81
16/08/2021 01:00:00	8.1	0	6.86
16/08/2021 02:00:00	7.98	0	7.11
16/08/2021 03:00:00	8.59	0	7.55
16/08/2021 04:00:00	8.64	0	7.65
16/08/2021 05:00:00	8.91	0	7.83
16/08/2021 06:00:00	9.42	0	8.56
16/08/2021 07:00:00	9.32	0	8.36
16/08/2021 08:00:00	9.41	0	8.68
16/08/2021 09:00:00	8.89	0	7.73
16/08/2021 10:00:00	8.42	0	7.59
16/08/2021 11:00:00	8.17	0	7.18
16/08/2021 12:00:00	6.55	0.03	6.17
16/08/2021 13:00:00	4.92	0	3.48
16/08/2021 14:00:00	5.25	0	4.05
16/08/2021 15:00:00	4.78	0	3.43
16/08/2021 16:00:00	5.72	0.03	4.87
16/08/2021 17:00:00	5.64	0	4.32
16/08/2021 18:00:00	6.58	0	5.3

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
16/08/2021 19:00:00	7.57	0	6.06
16/08/2021 20:00:00	8.88	0	7.88
16/08/2021 21:00:00	9.54	0	8.66
16/08/2021 22:00:00	9.89	0	9.04
16/08/2021 23:00:00	10.53	0	9.5
17/08/2021 00:00:00	9.57	0	8.55
17/08/2021 01:00:00	9.3	0	8.39
17/08/2021 02:00:00	9.23	0	8.14
17/08/2021 03:00:00	9.27	0	8.2
17/08/2021 04:00:00	9.46	0	8.47
17/08/2021 05:00:00	9.68	0	8.8
17/08/2021 06:00:00	9.92	0	8.9
17/08/2021 07:00:00	10.59	0	9.88
17/08/2021 08:00:00	11.59	0	11.23
17/08/2021 09:00:00	12.32	0	11.94
17/08/2021 10:00:00	12.73	0	12.35
17/08/2021 11:00:00	12.68	0	12.31
17/08/2021 12:00:00	12.84	0	12.11
17/08/2021 13:00:00	11.62	0	10.93
17/08/2021 14:00:00	10.95	0	9.87
17/08/2021 15:00:00	10.59	0	9.75
17/08/2021 16:00:00	10.83	0.01	10.34
17/08/2021 17:00:00	10.88	0	9.64
17/08/2021 18:00:00	10.88	0	10
17/08/2021 19:00:00	10.79	0	9.28
17/08/2021 20:00:00	10.59	0	9.34
17/08/2021 21:00:00	11.11	0	9.95
17/08/2021 22:00:00	11.08	0	10.04
17/08/2021 23:00:00	11.69	0	10.77
18/08/2021 00:00:00	11.81	0	11.4
18/08/2021 01:00:00	11.83	0	11.34
18/08/2021 02:00:00	11.42	0	10.54
18/08/2021 03:00:00	11.3	0	10.57
18/08/2021 04:00:00	11.16	0	10.52
18/08/2021 05:00:00	11.64	0	11.05
18/08/2021 06:00:00	12.29	0	11.6
18/08/2021 07:00:00	12.95	0	12.35
18/08/2021 08:00:00	13.77	0.09	13.74
18/08/2021 09:00:00	14.48	0.03	14.44
18/08/2021 10:00:00	13.71	0.07	13.7
18/08/2021 11:00:00	13.31	0.11	13.43
18/08/2021 12:00:00	12.34	0.07	12.33
18/08/2021 13:00:00	10.52	0	9.62
18/08/2021 14:00:00	9.88	0	9.25
18/08/2021 15:00:00	8.41	0	7.51
18/08/2021 16:00:00	6.04	0	4.81
18/08/2021 17:00:00	6.63	0	5.58
18/08/2021 18:00:00	5.46	0	3.94
18/08/2021 19:00:00	6.56	0	5.83
18/08/2021 20:00:00	6.15	0	5.01
18/08/2021 21:00:00	10.86	0	9.55
18/08/2021 22:00:00	13.71	0	12.85
18/08/2021 23:00:00	24.58	0.4	25.19
19/08/2021 00:00:00	12.15	0.01	11.88
19/08/2021 01:00:00	14.53	0.08	14.47

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
19/08/2021 02:00:00	13.47	0.02	13.21
19/08/2021 03:00:00	13.53	0	13.25
19/08/2021 04:00:00	12.47	0.06	12.15
19/08/2021 05:00:00	13.85	0	13.37
19/08/2021 06:00:00	19.64	0.16	19.66
19/08/2021 07:00:00	17.97	0.18	18.12
19/08/2021 08:00:00	16.83	0.29	17.28
19/08/2021 09:00:00	17.43	1.05	19.03
19/08/2021 10:00:00	17.96	1.33	20
19/08/2021 11:00:00	16.61	0.67	17.64
19/08/2021 12:00:00	15.8	0.78	17
19/08/2021 13:00:00	11.96	0.03	11.8
19/08/2021 14:00:00	11.21	0.18	11.44
19/08/2021 15:00:00	9.21	0.51	9.97
19/08/2021 16:00:00	7.7	0	6.97
19/08/2021 17:00:00	6.72	0	5.46
19/08/2021 18:00:00	6.75	0	5.47
19/08/2021 19:00:00	7.12	0	5.86
19/08/2021 20:00:00	9.69	0	8.7
19/08/2021 21:00:00	11.46	0	10.37
19/08/2021 22:00:00	14.66	0.09	14.64
19/08/2021 23:00:00	18.54	0.09	18.53
20/08/2021 00:00:00	27.07	1.13	28.8
20/08/2021 01:00:00	24.96	0.74	26.09
20/08/2021 02:00:00	22.87	0.41	23.5
20/08/2021 03:00:00	20.02	0.76	21.19
20/08/2021 04:00:00	17.99	0.44	18.64
20/08/2021 05:00:00	16.89	0.24	17.22
20/08/2021 06:00:00	16.23	0.23	16.59
20/08/2021 07:00:00	17.55	0.61	18.5
20/08/2021 08:00:00	17.18	0.37	17.75
20/08/2021 09:00:00	17.38	0.21	17.69
20/08/2021 10:00:00	17.1	0.42	17.74
20/08/2021 11:00:00	16.12	0.07	16.14
20/08/2021 12:00:00	15.75	0.02	15.66
20/08/2021 13:00:00	16.79	0.15	17
20/08/2021 14:00:00	16.77	0.23	17.12
20/08/2021 15:00:00	15.98	0.2	16.28
20/08/2021 16:00:00	15.77	0	15.34
20/08/2021 17:00:00	15.88	0	15.23
20/08/2021 18:00:00	15.99	0	15.45
20/08/2021 19:00:00	16.22	0	15.46
20/08/2021 20:00:00	15.1	0	14.18
20/08/2021 21:00:00	14.39	0	13.36
20/08/2021 22:00:00	13.15	0	11.82
20/08/2021 23:00:00	15.62	0	14.65
21/08/2021 00:00:00	43.54	0	42.74
21/08/2021 01:00:00	16.14	0	15.23
21/08/2021 02:00:00	15.04	0	14.35
21/08/2021 03:00:00	15.15	0	14.21
21/08/2021 04:00:00	14.91	0	14.35
21/08/2021 05:00:00	14.06	0	13.27
21/08/2021 06:00:00	14.66	0	13.81
21/08/2021 07:00:00	16.75	0	16.32
21/08/2021 08:00:00	16.72	0	15.96

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
21/08/2021 09:00:00	16.42	0	15.51
21/08/2021 10:00:00	17.8	0	17.04
21/08/2021 11:00:00	18.11	0.09	17.78
21/08/2021 12:00:00	17.4	0.08	17.47
21/08/2021 13:00:00	17.64	0	16.7
21/08/2021 14:00:00	18.08	0.65	19.07
21/08/2021 15:00:00	16.67	0	16.02
21/08/2021 16:00:00	11.71	0.01	10.94
21/08/2021 17:00:00	8.27	0	6.67
21/08/2021 18:00:00	8.02	0	6.33
21/08/2021 19:00:00	8.23	0	6.64
21/08/2021 20:00:00	9	0	7.5
21/08/2021 21:00:00	9.14	0	7.91
21/08/2021 22:00:00	10.37	0	9.53
21/08/2021 23:00:00	11.36	0	10.61
22/08/2021 00:00:00	12.49	0	11.9
22/08/2021 01:00:00	13.79	0	13.34
22/08/2021 02:00:00	13.08	0	12.68
22/08/2021 03:00:00	13.42	0	12.91
22/08/2021 04:00:00	13.73	0	13.02
22/08/2021 05:00:00	13.33	0	12.57
22/08/2021 06:00:00	13.02	0	12.28
22/08/2021 07:00:00	13	0	12.41
22/08/2021 08:00:00	12.44	0	11.9
22/08/2021 09:00:00	12.45	0	11.95
22/08/2021 10:00:00	10.75	0	9.9
22/08/2021 11:00:00	9.23	0	8.29
22/08/2021 12:00:00	6.56	0	5
22/08/2021 13:00:00	4.78	0	3.13
22/08/2021 14:00:00	4.4	0	2.79
22/08/2021 15:00:00	3.67	0	1.74
22/08/2021 16:00:00	3.07	0	1
22/08/2021 17:00:00	2.81	0	1.17
22/08/2021 18:00:00	3.11	0	1.4
22/08/2021 19:00:00	4.07	0	2.18
22/08/2021 20:00:00	7.41	0	5.91
22/08/2021 21:00:00	10.24	0	9.49
22/08/2021 22:00:00	10.03	0	9.66
22/08/2021 23:00:00	10.26	0	9.74
23/08/2021 00:00:00	10.61	0	10.33
23/08/2021 01:00:00	11.31	0	10.93
23/08/2021 02:00:00	15.46	0.48	15.98
23/08/2021 03:00:00	12.71	0	11.92
23/08/2021 04:00:00	12.3	0	11.51
23/08/2021 05:00:00	12.1	0	11.5
23/08/2021 06:00:00	13.05	0	12.69
23/08/2021 07:00:00	13.78	0.05	13.78
23/08/2021 08:00:00	16.32	1.51	18.62
23/08/2021 09:00:00	19.41	4.96	26.99
23/08/2021 10:00:00	17.05	3.04	21.71
23/08/2021 11:00:00	17.14	4.38	23.84
23/08/2021 12:00:00	7.51	0	6.74
23/08/2021 13:00:00	5.71	0	4.54
23/08/2021 14:00:00	5.17	0	4.19
23/08/2021 15:00:00	5.09	0	3.92

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
23/08/2021 16:00:00	3.03	0	1.3
23/08/2021 17:00:00	4.17	0	2.44
23/08/2021 18:00:00	8.18	0	7.23
23/08/2021 19:00:00	8.16	0	6.86
23/08/2021 20:00:00	8.73	0	7.3
23/08/2021 21:00:00	12.35	0	11.39
23/08/2021 22:00:00	17.36	0	16.98
23/08/2021 23:00:00	15.58	0	15.09
24/08/2021 00:00:00	15.74	0	15.38
24/08/2021 01:00:00	14.68	0	14.43
24/08/2021 02:00:00	15.09	0	14.77
24/08/2021 03:00:00	14.59	0	14.21
24/08/2021 04:00:00	14.54	0	14.03
24/08/2021 05:00:00	13.53	0	13.05
24/08/2021 06:00:00	14.96	0	14.51
24/08/2021 07:00:00	18.01	0.39	18.55
24/08/2021 08:00:00	17.75	1.09	19.43
24/08/2021 09:00:00	17.12	1.02	18.7
24/08/2021 10:00:00	16.6	1.66	19.14
24/08/2021 11:00:00	20.74	4.7	27.93
24/08/2021 12:00:00	15.73	1.88	18.59
24/08/2021 13:00:00	10.25	0.03	9.97
24/08/2021 14:00:00	7.64	0	6.42
24/08/2021 15:00:00	8.52	0	7.91
24/08/2021 16:00:00	6.82	0	5.8
24/08/2021 17:00:00	5.07	0	3.25
24/08/2021 18:00:00	6.68	0	5.39
24/08/2021 19:00:00	7.05	0	5.59
24/08/2021 20:00:00	11.73	0	10.26
24/08/2021 21:00:00	12.62	0	11.36
24/08/2021 22:00:00	13.36	0	12.5
24/08/2021 23:00:00	14.98	0	14.46
25/08/2021 00:00:00	15.61	0	15.33
25/08/2021 01:00:00	14.74	0	14.33
25/08/2021 02:00:00	14.51	0	14.05
25/08/2021 03:00:00	15.55	0	15.12
25/08/2021 04:00:00	14.7	0	14.1
25/08/2021 05:00:00	13.75	0	13.47
25/08/2021 06:00:00	14.36	0	13.91
25/08/2021 07:00:00	14.78	0	14.54
25/08/2021 08:00:00	16.1	0.1	16.16
25/08/2021 09:00:00	16.93	1.06	18.54
25/08/2021 10:00:00	12.95	0.15	13.01
25/08/2021 11:00:00	9.11	0.16	9.16
25/08/2021 12:00:00	6.37	0	4.78
25/08/2021 13:00:00	5.85	0	4.29
25/08/2021 14:00:00	5.28	0	3.75
25/08/2021 15:00:00	5.07	0	3.95
25/08/2021 16:00:00	3.63	0	1.76
25/08/2021 17:00:00	3.75	0	1.87
25/08/2021 18:00:00	4.69	0	3.02
25/08/2021 19:00:00	10.66	0	9.45
25/08/2021 20:00:00	20.39	0	19.61
25/08/2021 21:00:00	15.39	0	14.32
25/08/2021 22:00:00	21.62	0.12	21.73

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
25/08/2021 23:00:00	14.7	0.08	14.71
26/08/2021 00:00:00	15.06	0.16	15.3
26/08/2021 01:00:00	14.5	0.2	14.79
26/08/2021 02:00:00	14.44	0.01	14.24
26/08/2021 03:00:00	20.72	0.84	21.97
26/08/2021 04:00:00	14.89	0	14.58
26/08/2021 05:00:00	14.23	0	14.1
26/08/2021 06:00:00	15.22	0	14.89
26/08/2021 07:00:00	16.22	0.5	16.98
26/08/2021 08:00:00	16.71	1.06	18.33
26/08/2021 09:00:00	13.9	1.06	15.52
26/08/2021 10:00:00	10.29	0.39	10.88
26/08/2021 11:00:00	6.54	0.12	6.46
26/08/2021 12:00:00	4.07	0	3.25
26/08/2021 13:00:00	1.68	0	0.61
26/08/2021 14:00:00	0.44	0	0
26/08/2021 15:00:00	0	0	0
26/08/2021 16:00:00	0	0	0
26/08/2021 17:00:00	0	0	0
26/08/2021 18:00:00	0.33	0	0
26/08/2021 19:00:00	5.99	0	4.6
26/08/2021 20:00:00	11.84	0	10.42
26/08/2021 21:00:00	14.97	0	14.49
26/08/2021 22:00:00	15.42	0.13	15.58
26/08/2021 23:00:00	16.33	0.26	16.65
27/08/2021 00:00:00	16.36	0.03	16.35
27/08/2021 01:00:00	16.06	0	15.94
27/08/2021 02:00:00	20.04	0	19.76
27/08/2021 03:00:00	14.36	0	13.95
27/08/2021 04:00:00	18.33	0	18
27/08/2021 05:00:00	17.55	0	16.99
27/08/2021 06:00:00	15.72	0	15.46
27/08/2021 07:00:00	16.62	0.03	16.4
27/08/2021 08:00:00	15.59	0.12	15.75
27/08/2021 09:00:00	15.38	0.48	16.11
27/08/2021 10:00:00	14.84	1.17	16.62
27/08/2021 11:00:00	12.32	1.06	13.94
27/08/2021 12:00:00	10.32	0.83	11.59
27/08/2021 13:00:00	7.4	0.52	8.19
27/08/2021 14:00:00	5.58	0.08	5.67
27/08/2021 15:00:00	3.5	0	2.96
27/08/2021 16:00:00	3.82	0	3.15
27/08/2021 17:00:00	6.3	0	5.89
27/08/2021 18:00:00	8.73	0	8.1
27/08/2021 19:00:00	10.2	0	8.93
27/08/2021 20:00:00	12.57	0	11.26
27/08/2021 21:00:00	15.57	0	14.61
27/08/2021 22:00:00	15.67	0	15.23
27/08/2021 23:00:00	16.6	0.05	16.66
28/08/2021 00:00:00	16.61	0.2	16.93
28/08/2021 01:00:00	17.06	0.13	17.26
28/08/2021 02:00:00	16.47	0.04	16.3
28/08/2021 03:00:00	14.89	0.02	14.78
28/08/2021 04:00:00	13.33	0	13
28/08/2021 05:00:00	15.16	0	15

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
28/08/2021 06:00:00	13.23	0.12	13.24
28/08/2021 07:00:00	15.36	0.64	16.34
28/08/2021 08:00:00	15.63	1.59	18.05
28/08/2021 09:00:00	14.06	0.65	15.05
28/08/2021 10:00:00	12.86	0.4	13.47
28/08/2021 11:00:00	11.16	0.54	11.99
28/08/2021 12:00:00	6.85	0.26	7.19
28/08/2021 13:00:00	4.09	0	3.38
28/08/2021 14:00:00	2.45	0	1.47
28/08/2021 15:00:00	3.14	0	2.64
28/08/2021 16:00:00	1.64	0	0.96
28/08/2021 17:00:00	0.49	0	0
28/08/2021 18:00:00	0.8	0	0
28/08/2021 19:00:00	3.04	0	1.39
28/08/2021 20:00:00	7.66	0	6.39
28/08/2021 21:00:00	14.49	0	13.95
28/08/2021 22:00:00	15.91	0	15.12
28/08/2021 23:00:00	15.23	0	14.71
29/08/2021 00:00:00	16.01	0.03	15.62
29/08/2021 01:00:00	12.71	0.11	12.87
29/08/2021 02:00:00	13.41	0.25	13.8
29/08/2021 03:00:00	14.83	0.16	15.01
29/08/2021 04:00:00	14.06	0	13.91
29/08/2021 05:00:00	14.86	0	14.62
29/08/2021 06:00:00	15.8	0	15.57
29/08/2021 07:00:00	15.14	0	14.67
29/08/2021 08:00:00	13.94	0	13.26
29/08/2021 09:00:00	13.37	0	12.93
29/08/2021 10:00:00	13.58	0	13.4
29/08/2021 11:00:00	12.96	0	12.56
29/08/2021 12:00:00	12.62	0	12.22
29/08/2021 13:00:00	13.07	0.07	13.09
29/08/2021 14:00:00	9.89	0	9.24
29/08/2021 15:00:00	7.36	0	6.67
29/08/2021 16:00:00	6.02	0	4.79
29/08/2021 17:00:00	5.82	0	4.66
29/08/2021 18:00:00	6.08	0	4.95
29/08/2021 19:00:00	7.22	0	5.91
29/08/2021 20:00:00	8.72	0	7.52
29/08/2021 21:00:00	10.81	0	9.76
29/08/2021 22:00:00	9.27	0	8.17
29/08/2021 23:00:00	8.68	0	7.7
30/08/2021 00:00:00	9.09	0	8.29
30/08/2021 01:00:00	9.69	0	8.63
30/08/2021 02:00:00	9.52	0	8.44
30/08/2021 03:00:00	9.34	0	8.41
30/08/2021 04:00:00	9.7	0	8.87
30/08/2021 05:00:00	10.56	0	10.13
30/08/2021 06:00:00	11.77	0	11.35
30/08/2021 07:00:00	12.4	0	11.73
30/08/2021 08:00:00	13.09	0	12.77
30/08/2021 09:00:00	12.86	0.01	12.54
30/08/2021 10:00:00	11.7	0.03	11.37
30/08/2021 11:00:00	11.35	0.08	11.23
30/08/2021 12:00:00	13.44	0.46	14.12

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
30/08/2021 13:00:00	10.75	0	10.36
30/08/2021 14:00:00	9.07	0	8.61
30/08/2021 15:00:00	10.67	0.27	10.69
30/08/2021 16:00:00	8.05	0	7.31
30/08/2021 17:00:00	10.23	0	9.69
30/08/2021 18:00:00	7.07	0	6.19
30/08/2021 19:00:00	9.71	0	8.71
30/08/2021 20:00:00	10.24	0	9.28
30/08/2021 21:00:00	11.14	0	10.46
30/08/2021 22:00:00	10.3	0	9.73
30/08/2021 23:00:00	9.71	0	8.96
31/08/2021 00:00:00	9.5	0	8.67
31/08/2021 01:00:00	9.74	0	8.98
31/08/2021 02:00:00	9.92	0	9.24
31/08/2021 03:00:00	9.93	0	9.4
31/08/2021 04:00:00	10.58	0	9.95
31/08/2021 05:00:00	10.94	0	10.3
31/08/2021 06:00:00	11.69	0	11.14
31/08/2021 07:00:00	11.42	0	10.79
31/08/2021 08:00:00	10.91	0	10.62
31/08/2021 09:00:00	10.47	0.04	10.27
31/08/2021 10:00:00	9.21	0.02	9.15
31/08/2021 11:00:00	7.65	0.01	7.45
31/08/2021 12:00:00	6.4	0	5.79
31/08/2021 13:00:00	5.57	0	4.68
31/08/2021 14:00:00	5.08	0	4.24
31/08/2021 15:00:00	5.18	0	4.45
31/08/2021 16:00:00	6.86	0.01	6.52
31/08/2021 17:00:00	5.77	0	4.98
31/08/2021 18:00:00	5.51	0	4.26
31/08/2021 19:00:00	6.2	0	5.36
31/08/2021 20:00:00	6.4	0	5.39
31/08/2021 21:00:00	8.82	0	8
31/08/2021 22:00:00	9.25	0	8.16
31/08/2021 23:00:00	8.16	0	7.42
01/09/2021 00:00:00	7.9	0	7.16
01/09/2021 01:00:00	8.53	0	7.9
01/09/2021 02:00:00	9.06	0	8.7
01/09/2021 03:00:00	9.35	0	8.75
01/09/2021 04:00:00	10.25	0.01	9.88
01/09/2021 05:00:00	11.5	0	11.09
01/09/2021 06:00:00	11.91	0	11.4
01/09/2021 07:00:00	11.73	0	11.2
01/09/2021 08:00:00	14.52	0.22	14.79
01/09/2021 09:00:00	12.77	0.08	12.8
01/09/2021 10:00:00	10.54	0	10.22
01/09/2021 11:00:00	9.05	0.08	8.9
01/09/2021 12:00:00	7.02	0.06	6.64
01/09/2021 13:00:00	6.17	0	5.53
01/09/2021 14:00:00	7.57	0	7.12
01/09/2021 15:00:00	7.12	0.01	6.67
01/09/2021 16:00:00	5.09	0	4.37
01/09/2021 17:00:00	6.52	0	5.94
01/09/2021 18:00:00	6.65	0	5.7
01/09/2021 19:00:00	5.75	0	4.73

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
01/09/2021 20:00:00	6.87	0	5.76
01/09/2021 21:00:00	8.01	0	6.8
01/09/2021 22:00:00	8.71	0	8.04
01/09/2021 23:00:00	11.34	0.1	11.41
02/09/2021 00:00:00	13.62	0.1	13.72
02/09/2021 01:00:00	12.74	0.07	12.8
02/09/2021 02:00:00	11.88	0.07	11.96
02/09/2021 03:00:00	10.81	0	10.43
02/09/2021 04:00:00	10.1	0	9.89
02/09/2021 05:00:00	11.1	0.05	11.04
02/09/2021 06:00:00	12.28	0.12	12.35
02/09/2021 07:00:00	13.27	0.28	13.7
02/09/2021 08:00:00	13.84	0.26	14.23
02/09/2021 09:00:00	15.28	0.34	15.73
02/09/2021 10:00:00	16.66	0.9	18.05
02/09/2021 11:00:00	13.29	0.04	13.21
02/09/2021 12:00:00	13.92	0.3	14.38
02/09/2021 13:00:00	11.1	0.03	11.1
02/09/2021 14:00:00	9.07	0	8.53
02/09/2021 15:00:00	9.55	0.06	9.46
02/09/2021 16:00:00	8.96	0	8.26
02/09/2021 17:00:00	9.34	0	8.59
02/09/2021 18:00:00	10.37	0	10.01
02/09/2021 19:00:00	9.06	0	8.08
02/09/2021 20:00:00	9.08	0	8.24
02/09/2021 21:00:00	9.12	0	8.2
02/09/2021 22:00:00	9.12	0	8.36
02/09/2021 23:00:00	9.74	0	8.77
03/09/2021 00:00:00	9.14	0	8.13
03/09/2021 01:00:00	9.94	0	9.25
03/09/2021 02:00:00	10.71	0.02	10.18
03/09/2021 03:00:00	11.35	0.01	11.09
03/09/2021 04:00:00	10.5	0	10.06
03/09/2021 05:00:00	10.43	0	9.95
03/09/2021 06:00:00	10.86	0	10.49
03/09/2021 07:00:00	13.08	0.04	12.8
03/09/2021 08:00:00	13.82	0.26	14.18
03/09/2021 09:00:00	13.46	0.28	13.89
03/09/2021 10:00:00	14.23	0.33	14.73
03/09/2021 11:00:00	17.55	1.43	19.74
03/09/2021 12:00:00	15.48	1.02	17.05
03/09/2021 13:00:00	9.95	0.17	10.16
03/09/2021 14:00:00	7.33	0	6.87
03/09/2021 15:00:00	7.77	0	7.19
03/09/2021 16:00:00	13.7	0.08	13.78
03/09/2021 17:00:00	12.08	0	11.45
03/09/2021 18:00:00	13.53	0	13.29
03/09/2021 19:00:00	14.29	0	13.48
03/09/2021 20:00:00	13.67	0	12.93
03/09/2021 21:00:00	13.24	0	12.91
03/09/2021 22:00:00	12.77	0.11	12.9
03/09/2021 23:00:00	11	0	10.42
04/09/2021 00:00:00	12.17	0.01	11.91
04/09/2021 01:00:00	13.5	0.05	13.48
04/09/2021 02:00:00	12.82	0.01	12.73

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
04/09/2021 03:00:00	11.97	0.02	11.77
04/09/2021 04:00:00	12.18	0	11.74
04/09/2021 05:00:00	12.01	0	11.64
04/09/2021 06:00:00	12.88	0.04	12.8
04/09/2021 07:00:00	16.47	0.16	16.71
04/09/2021 08:00:00	14.34	0.04	14.38
04/09/2021 09:00:00	14.53	0.56	15.39
04/09/2021 10:00:00	16.04	1.43	18.24
04/09/2021 11:00:00	14.08	1.25	15.99
04/09/2021 12:00:00	11.95	0.61	12.87
04/09/2021 13:00:00	9.24	0.03	9.07
04/09/2021 14:00:00	8.32	0.04	8.11
04/09/2021 15:00:00	9.1	0	8.54
04/09/2021 16:00:00	8.58	0	8.2
04/09/2021 17:00:00	8.4	0	7.56
04/09/2021 18:00:00	8.27	0	7.21
04/09/2021 19:00:00	9.73	0	8.84
04/09/2021 20:00:00	9.32	0	8.31
04/09/2021 21:00:00	9.37	0	8.69
04/09/2021 22:00:00	10.6	0	10.1
04/09/2021 23:00:00	11.13	0.03	10.86
05/09/2021 00:00:00	13.66	0.12	13.79
05/09/2021 01:00:00	14.45	0.16	14.71
05/09/2021 02:00:00	14.93	0.01	14.75
05/09/2021 03:00:00	17.89	0.09	17.85
05/09/2021 04:00:00	15.82	0.21	16.14
05/09/2021 05:00:00	13.95	0.15	14.18
05/09/2021 06:00:00	13.64	0.14	13.87
05/09/2021 07:00:00	14.25	0.09	14.37
05/09/2021 08:00:00	13.95	0.39	14.54
05/09/2021 09:00:00	13.89	0.52	14.69
05/09/2021 10:00:00	13.36	0.37	13.93
05/09/2021 11:00:00	12.47	0.07	12.36
05/09/2021 12:00:00	11.48	0.1	11.36
05/09/2021 13:00:00	9.58	0	8.82
05/09/2021 14:00:00	9.6	0	8.86
05/09/2021 15:00:00	9.58	0	8.82
05/09/2021 16:00:00	9.84	0	8.94
05/09/2021 17:00:00	10.14	0	9.34
05/09/2021 18:00:00	10.95	0	10.14
05/09/2021 19:00:00	12.05	0	11.47
05/09/2021 20:00:00	12.14	0	11.42
05/09/2021 21:00:00	13.11	0.14	13.32
05/09/2021 22:00:00	12.33	0.01	12.17
05/09/2021 23:00:00	13.3	0.08	13.27
06/09/2021 00:00:00	12.55	0.06	12.54
06/09/2021 01:00:00	13.07	0.06	13.02
06/09/2021 02:00:00	12.53	0	12.34
06/09/2021 03:00:00	12.92	0.02	12.63
06/09/2021 04:00:00	13.36	0.04	13.25
06/09/2021 05:00:00	14.81	0.24	15.16
06/09/2021 06:00:00	17.06	0.3	17.52
06/09/2021 07:00:00	16.8	0.63	17.78
06/09/2021 08:00:00	15.39	0.53	16.19
06/09/2021 09:00:00	15.82	0.58	16.71

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
06/09/2021 10:00:00	15.21	0.37	15.77
06/09/2021 11:00:00	12.13	0.04	12.07
06/09/2021 12:00:00	10.25	0.1	10.14
06/09/2021 13:00:00	7.6	0.15	7.75
06/09/2021 14:00:00	6.22	0.06	5.87
06/09/2021 15:00:00	5.6	0	4.95
06/09/2021 16:00:00	5.22	0	4.39
06/09/2021 17:00:00	5.51	0	4.79
06/09/2021 18:00:00	6.35	0	5.18
06/09/2021 19:00:00	19.75	0.1	19.69
06/09/2021 20:00:00	19.88	1.39	21.78
06/09/2021 21:00:00	18.11	0.42	18.74
06/09/2021 22:00:00	26.15	0.58	27.03
06/09/2021 23:00:00	19.9	0.55	20.75
07/09/2021 00:00:00	18.56	0.23	18.91
07/09/2021 01:00:00	20.57	0.22	20.9
07/09/2021 02:00:00	22.26	0.25	22.64
07/09/2021 03:00:00	22.61	0.82	23.86
07/09/2021 04:00:00	17.71	0.35	18.25
07/09/2021 05:00:00	16.34	0.46	17.03
07/09/2021 06:00:00	16.89	0.56	17.74
07/09/2021 07:00:00	17.83	1.21	19.67
07/09/2021 08:00:00	18.83	2.4	22.49
07/09/2021 09:00:00	17.22	2.46	20.99
07/09/2021 10:00:00	17.66	3.66	23.26
07/09/2021 11:00:00	15.14	2.96	19.67
07/09/2021 12:00:00	12.16	2.06	15.32
07/09/2021 13:00:00	8.37	0.47	9.08
07/09/2021 14:00:00	9.95	0.32	10.43
07/09/2021 15:00:00	8.96	0.45	9.66
07/09/2021 16:00:00	3.3	0	2.26
07/09/2021 17:00:00	3.64	0	2.53
07/09/2021 18:00:00	9.71	0	8.66
07/09/2021 19:00:00	14.16	0	13.45
07/09/2021 20:00:00	15.63	0	14.75
07/09/2021 21:00:00	15.64	0	14.92
07/09/2021 22:00:00	15.04	0	14.75
07/09/2021 23:00:00	13.24	0.03	13.19
08/09/2021 00:00:00	13.11	0.01	12.95
08/09/2021 01:00:00	13.56	0.16	13.67
08/09/2021 02:00:00	13.63	0	13.44
08/09/2021 03:00:00	14.01	0.06	13.99
08/09/2021 04:00:00	13.46	0	13.24
08/09/2021 05:00:00	14.15	0.05	14.16
08/09/2021 06:00:00	16.27	0.03	16.22
08/09/2021 07:00:00	18.55	0.1	18.66
08/09/2021 08:00:00	19.15	0.71	20.25
08/09/2021 09:00:00	18.99	1.44	21.19
08/09/2021 10:00:00	19.84	1.14	21.59
08/09/2021 11:00:00	20.67	1.5	22.97
08/09/2021 12:00:00	16.87	2.95	21.38
08/09/2021 13:00:00	17.26	0.81	18.5
08/09/2021 14:00:00	15.15	0.54	15.65
08/09/2021 15:00:00	11.14	0	10.39
08/09/2021 16:00:00	12.26	0.01	12.1

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
08/09/2021 17:00:00	15.22	0.07	15.22
08/09/2021 18:00:00	16.24	0.15	16.36
08/09/2021 19:00:00	19.36	0.9	20.72
08/09/2021 20:00:00	17.15	0.69	18.21
08/09/2021 21:00:00	16.89	0.42	17.54
08/09/2021 22:00:00	16.65	0.07	16.64
08/09/2021 23:00:00	18.8	0.06	18.76
09/09/2021 00:00:00	19.42	0.07	19.41
09/09/2021 01:00:00	18.87	0.16	19.11
09/09/2021 02:00:00	18.55	0.09	18.65
09/09/2021 03:00:00	17.18	0.08	17.17
09/09/2021 04:00:00	16.11	0.01	16.01
09/09/2021 05:00:00	17.15	0.04	17.02
09/09/2021 06:00:00	20.09	0.25	20.48
09/09/2021 07:00:00	19.62	0.71	20.71
09/09/2021 08:00:00	19.1	0.87	20.44
09/09/2021 09:00:00	17.15	0.76	18.32
09/09/2021 10:00:00	16.33	0.88	17.68
09/09/2021 11:00:00	14.9	0.93	16.32
09/09/2021 12:00:00	11.85	0.73	12.97
09/09/2021 13:00:00	10.04	0.22	10.16
09/09/2021 14:00:00	9.08	0.02	8.5
09/09/2021 15:00:00	8.24	0.27	8.37
09/09/2021 16:00:00	7.93	0.04	7.44
09/09/2021 17:00:00	7.24	0	6.38
09/09/2021 18:00:00	13.38	0.02	12.89
09/09/2021 19:00:00	10.89	0	10.05
09/09/2021 20:00:00	20.19	0.68	21.24
09/09/2021 21:00:00	16.89	0.39	17.5
09/09/2021 22:00:00	21.54	0.88	22.89
09/09/2021 23:00:00	17.28	0.23	17.64
10/09/2021 00:00:00	16.88	0.23	17.23
10/09/2021 01:00:00	17.15	0.32	17.64
10/09/2021 02:00:00	16.6	0.89	17.97
10/09/2021 03:00:00	17.2	0.76	18.36
10/09/2021 04:00:00	17.25	0.49	18
10/09/2021 05:00:00	18.01	0.75	19.16
10/09/2021 06:00:00	15.4	0.22	15.73
10/09/2021 07:00:00	14.05	0.26	14.45
10/09/2021 08:00:00	12.67	0.05	12.71
10/09/2021 09:00:00	12.38	0.01	12.16
10/09/2021 10:00:00	11.82	0.14	12.03
10/09/2021 11:00:00	11.79	0.3	12.24
10/09/2021 12:00:00	11.98	0.24	12.35
10/09/2021 13:00:00	10.99	0.16	11.23
10/09/2021 14:00:00	10.1	0.03	10.1
10/09/2021 15:00:00	9.06	0.08	8.72
10/09/2021 16:00:00	7.95	0	7.02
10/09/2021 17:00:00	9.22	0.14	9.29
10/09/2021 18:00:00	10.66	0.15	10.88
10/09/2021 19:00:00	10.54	0.15	10.73
10/09/2021 20:00:00	10.66	0.15	10.88
10/09/2021 21:00:00	9.79	0.02	9.69
10/09/2021 22:00:00	10.17	0.28	10.58
10/09/2021 23:00:00	10.01	0.16	10.25

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
11/09/2021 00:00:00	9.79	0.14	9.98
11/09/2021 01:00:00	9.88	0.14	10.07
11/09/2021 02:00:00	10.88	0.26	11.25
11/09/2021 03:00:00	10.35	0.24	10.73
11/09/2021 04:00:00	10.05	0.18	10.31
11/09/2021 05:00:00	9.92	0.27	10.33
11/09/2021 06:00:00	9.61	0.16	9.84
11/09/2021 07:00:00	9.94	0.25	10.31
11/09/2021 08:00:00	9.3	0.29	9.75
11/09/2021 09:00:00	9.21	0.15	9.43
11/09/2021 10:00:00	8.15	0.19	8.45
11/09/2021 11:00:00	7.34	0.36	7.89
11/09/2021 12:00:00	5.77	0.04	5.62
11/09/2021 13:00:00	5.23	0	4.86
11/09/2021 14:00:00	3.85	0	2.94
11/09/2021 15:00:00	3.32	0	2.79
11/09/2021 16:00:00	3.45	0	2.62
11/09/2021 17:00:00	3.14	0	2.08
11/09/2021 18:00:00	4.08	0	3.21
11/09/2021 19:00:00	4.55	0	3.73
11/09/2021 20:00:00	5.26	0	4.55
11/09/2021 21:00:00	6.68	0.03	6.42
11/09/2021 22:00:00	7.83	0.07	7.75
11/09/2021 23:00:00	8.97	0.15	9.2
12/09/2021 00:00:00	8.39	0.17	8.62
12/09/2021 01:00:00	8.49	0.11	8.58
12/09/2021 02:00:00	8.85	0.15	9.03
12/09/2021 03:00:00	8.89	0	8.71
12/09/2021 04:00:00	8.78	0	8.49
12/09/2021 05:00:00	8.46	0.06	8.37
12/09/2021 06:00:00	8.93	0.02	8.65
12/09/2021 07:00:00	9.32	0.07	9.25
12/09/2021 08:00:00	9.35	0.04	9.31
12/09/2021 09:00:00	9.35	0.21	9.68
12/09/2021 10:00:00	8.46	0.15	8.62
12/09/2021 11:00:00	6.92	0	6.7
12/09/2021 12:00:00	5.51	0	5.2
12/09/2021 13:00:00	4.16	0	3.41
12/09/2021 14:00:00	3.2	0	2.32
12/09/2021 15:00:00	2.25	0	1.58
12/09/2021 16:00:00	2.05	0	1.05
12/09/2021 17:00:00	2.25	0	1.4
12/09/2021 18:00:00	2.67	0	1.78
12/09/2021 19:00:00	9.08	0	8.49
12/09/2021 20:00:00	19.35	0.23	19.51
12/09/2021 21:00:00	18.64	0.41	19.26
12/09/2021 22:00:00	14.95	0.19	15.23
12/09/2021 23:00:00	11.22	0.03	11.23
13/09/2021 00:00:00	10.54	0.04	10.53
13/09/2021 01:00:00	11.01	0.04	11.04
13/09/2021 02:00:00	12.01	0.04	12.03
13/09/2021 03:00:00	12.13	0.02	12.05
13/09/2021 04:00:00	11.65	0	11.46
13/09/2021 05:00:00	10.78	0.06	10.82
13/09/2021 06:00:00	10.44	0.15	10.66

TimeStamp	NO2 (ug/m^3)	NO (ug/m^3)	NOx (ug/m^3)
13/09/2021 07:00:00	12.46	0.2	12.77
13/09/2021 08:00:00	18.43	1.26	20.35
13/09/2021 09:00:00	17.27	2.15	20.55
13/09/2021 10:00:00	15.54	1.44	17.74
13/09/2021 11:00:00	13.62	1.13	15.35
13/09/2021 12:00:00	12.39	1.15	14.14
13/09/2021 13:00:00	10.63	0.66	11.64
13/09/2021 14:00:00	9.1	0.25	9.18
13/09/2021 15:00:00	11.57	0.72	12.68
13/09/2021 16:00:00	10.37	0.39	10.95
13/09/2021 17:00:00	10.9	0.22	11.24
13/09/2021 18:00:00	12.03	0.29	12.46
13/09/2021 19:00:00	11.83	0.18	12.07
13/09/2021 20:00:00	12.81	0.19	13.09
13/09/2021 21:00:00	12.61	0.1	12.74
13/09/2021 22:00:00	12.29	0.31	12.77
13/09/2021 23:00:00	11.92	0.1	12.07
	12.9	0.2	12.4

Appendix 8.3

Construction Dust Assessment

Appendix 8.3

CONSTRUCTION DUST ASSESSMENT

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A8.3 Construction Dust Assessment

A8.3.1 Introduction

The air quality impacts of construction dust and vehicle emissions have been considered following the Institute of Air Quality Management (2014) *'Guidance on the assessment of dust from demolition and construction'*. Individual considerations for four activities are included in the guidance: demolition, earthworks, construction and track-out. The aim of the assessment is to determine the risk of dust impacts from each construction activity in order to identify the level of required mitigation. First, the magnitude of dust emissions is determined based on various factors followed by the sensitivity of the area(s) surrounding the construction site to specific dust impacts. Finally, these factors are combined to determine the overall risk of dust impacts.

A8.3.2 Assessment Methodology

The four construction activities have been assessed on the basis of the area sensitivity and the emission magnitude. The dust emission magnitude is based on the scale of the anticipated works and should be classified as Small, Medium, or Large. Dust emissions are defined according to the scale and nature of the work for each activity, as shown in Table A8.3.1 below.

The two types of sensitive receptors that may be impacted by dust from construction activities, as defined by IAQM (2014), are human and ecological. These are defined as, "*a location that may be affected by dust emissions during demolition and construction. Human receptors include locations where people spend time and where property may be impacted by dust. Ecological receptors are habitats that might be sensitive to dust*".

The guidance refers to human receptors as those properties that may be subject to adverse impacts of dust or PM_{10} over a time period relevant to the air quality Standard. Specific properties include, dwellings, cultural heritage collections, food manufacturers, etc. According to IAQM (2014) a single dwelling is classified as one receptor, whereas a school counts as 100. In addition, relevant designated (ecological) sites and their sensitivity to dust impacts, have been also considered. Designated sites include nature sites that have special status as protected areas because of their natural importance.

Receptor sensitivity is defined by a number of factors including:

- specific sensitivities of those receptors;
- number of receptors;

- proximity to construction site;
- background PM_{10} concentrations; and
- site-specific factors.

The sensitivity of key receptors to each construction-related activity is determined for each of the following dust impacts:

- dust soiling;
- human health impacts; and
- impacts on ecological receptors.

The sensitivity of an area to the potential impacts of each activity is defined at various distances from the work site depending on the sensitivity and number of receptors. IAQM categorises these in several distance bands for different impacts at 20, 50, 100, 200 and 350 m. Receptor sensitivity to dust soiling is assessed for only four IAQM distance bands, whereas sensitivity to human health impacts is assessed for all five. Tables A8.3.2, A8.3.3 and A8.3.4 define the levels of sensitivity of areas at different distances for each of the impacts listed above.

Table A8.3.1: Quantitative determination of the magnitude of dust emissions for demolition & construction activities

Activity	Dust Emission Magnitude	
Demolition	Large	Total building volume >50,000 m^3, potentially dusty construction material (e.g. concrete), on- site crushing and screening, demolition activities >20 m above ground level;
	Medium	Total building volume 20,000 m^3 – 50,000 m^3, potentially dusty construction material, demolition activities 10-20 m above ground level; and
	Small	Total building volume <20,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.
Earthworks	Large	Total site area >10,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes;
	Medium	Total site area 2,500 m^2 – 10,000 m^2, moderately, dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m - 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes; and
	Small	Total site area <2,500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <20,000 tonnes, earthworks during wetter months.
Construction	Large	Total building volume >100,000 m^3, on site concrete, batching, sandblasting;
	Medium	Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and
	Small	Total building volume <25,000 m^3, construction material with low potential for dust release _(e.g. metal cladding or timber).
Track-out	Large	>50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m;
	Medium	10-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m; and
	Small	<10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m.

Source: Institute of Air Quality Management (IAQM), Guidance on the assessment of dust from demolition and construction, 2014

Table A8.3.2: Area sensitivity to the effects of dust soiling

Receptor sensitivity	Number of Receptors	Distance from the Source, m			
		<20	**<50**	**<100**	**<350**
High	>100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Source: Institute of Air Quality Management, Guidance on the assessment of dust from demolition and construction, 2014

The sensitivity of the area to human health impacts is determined not only by the number of receptors within various distance bands from the site, but also by background PM_{10} concentrations. Estimated PM_{10} concentrations were obtained for each area studied; the base year pollutant concentrations are considered the worst case, assuming improvements in air quality following stricter regulation in the future.

Ecological impacts of construction activities must be considered for designated sites within 20 and 50m from the works following Table A8.3.4. Construction and demolition impacts on designated sites may include physical changes that can affect photosynthetic processes, or chemical changes to the soil that may lead to plant loss. Impacts are often reversible after work ceases. Designated sites near the Scheme have been identified and are considered for impacts.

The two parts of the construction assessment, dust emissions magnitude and area sensitivities, will be combined in order to determine the overall risk of impacts with no applied mitigation, for each construction activity within each zone. Table A8.3.5 below provides a view of the levels considered. The level of risk determined by this table will determine the level of mitigation to be followed at the construction site.

Emissions from construction vehicles also need to be considered as they are a potential source of both NO_2 and PM_{10}. According to the IAQM guidance, where high numbers of vehicle movements, especially lorries, are expected to be generated over a long period of time (i.e. one year or more) in the same location, the impact of construction phase traffic should be also considered and assessed using the same methodology described for operational impacts.

Table A8.3.3: Area sensitivity to human health impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentrations	Number of receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Source: Institute of Air Quality Management, Guidance on the assessment of dust from demolition and construction, 2014

Table A8.3.4. Area sensitivity to ecological impacts

Receptor sensitivity	Number of receptors	Distance from the Source, m	
		<20	<50
High	>100	High	High
	10-100	High	Medium
	1-10	Medium	Low
Medium	>1	Medium	Low
Low	>1	Low	Low

Source: Institute of Air Quality Management, Guidance on the assessment of dust from demolition and construction, 2014

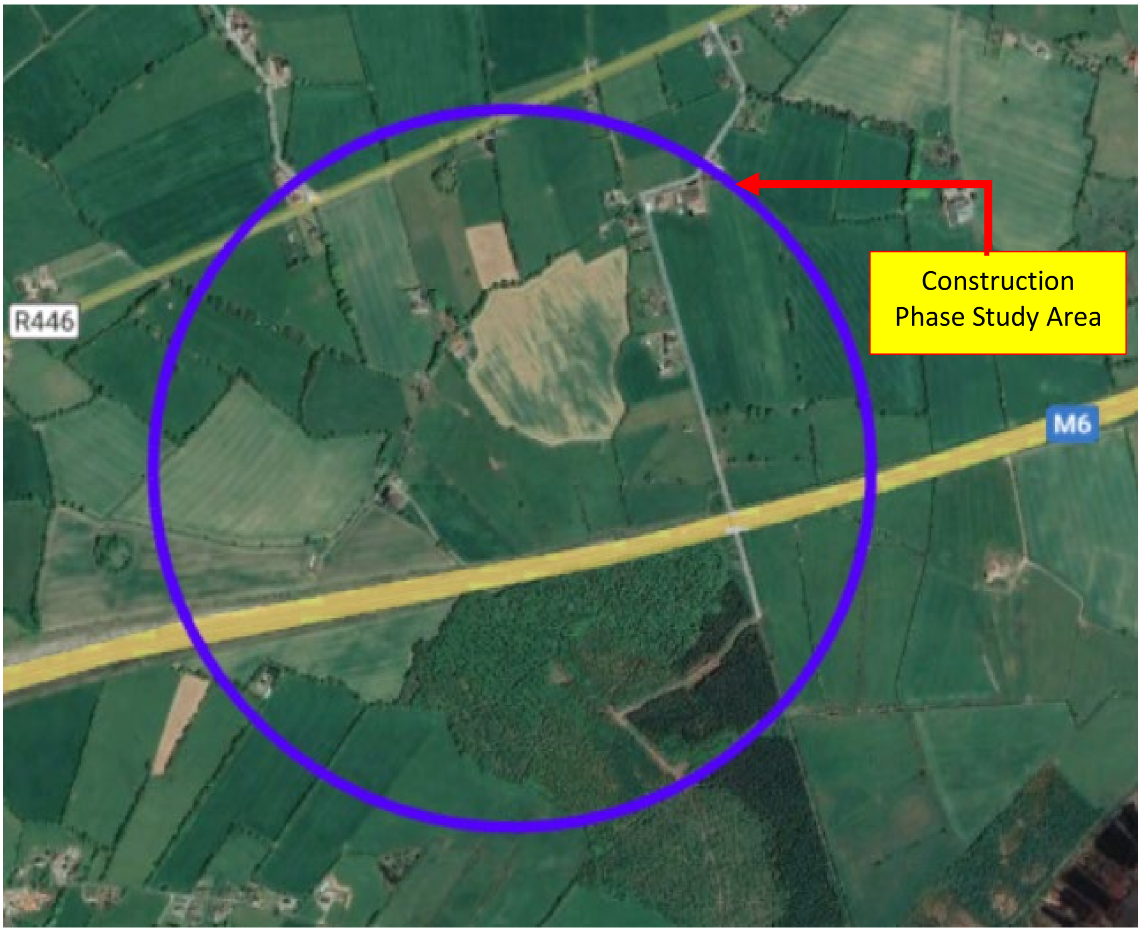
Table A8.3.5. Risk of impacts from each activity

Sensitivity of area	Dust Emission Magnitude		
	Large	**Medium**	**Small**
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks and Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Track-out			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

A8.3.3 Study Area

The study area for the Construction Phase air quality impact assessment was defined according to the Institute of Air Quality Management 'Guidance on the assessment of dust from demolition and construction' (IAQM 2014), and includes sensitive receptors (e.g. houses, schools and hospitals) that are located within 350m of construction activities. This study area is shown in Figure A8.1. The IAQM Guidance requires that the assessment considers receptors located in bands of 20m, 50m, 100m, 200m and 350m of the Construction Site. The 350m radius is shown schematically in Figure A8.1.

Figure A8.1 Construction Phase Study Area



Appendix 8.4

Castlelost Dispersion Model

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25
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DISPERSION MODELLING ASSESSMENT OF AIR QUALITY IMPACTS OF PROPOSED FLEXGEN POWER GENERATION PLANT AT CASTLELOST

Report Ref. 28644

TMS Environment Ltd.

15th September 2021

Approved By: Imelda Shanahan

Dr Imelda Shanahan

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Appendix I Gridded and Sensitive Receptor Locations

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1.0 INTRODUCTION AND SCOPE

This report deals with an assessment of the potential impacts on air quality of emission to atmosphere from the proposed Flexgen facility at Castlelost. The purpose of the report is to provide information in relation to the quantitative assessment of air quality impacts associated with the emissions from the facility. The report presents the results of air quality dispersion modelling to evaluate the impact of potential emissions from the facility on ambient air quality, human health and ecosystems.

2.0 DESCRIPTION OF PROCESS AND SOURCES OF EMISSIONS TO ATMOSPHERE

2.1 Site location

The facility is located on lands at Kiltotan, Collinstown Oldtown, Co. Westmeath as shown in Figure 1 .

Figure 1 Site location

The applicant, Lumcloon Energy Limited (LEL), propose to develop a 275MW Gas-Fired Back-Up (Flexible) Generator, a 220kV Electricity Substation and a 65MW Battery Energy Storage System (BESS).

2.2 Process Description

The overall proposed development for which planning permission is sought comprises three elements – the Flexgen gas-fired generation, the GIS Electrical Substation and the proposed Energy Storage System (ESS) using vanadium flow battery (VFB) technology and synchronous condenser technology. The Flexgen project will combust natural gas supplied from the Gas Networks Ireland (GNI) transmission system in five (5 No.) dry low emission (DLE) gas turbines and associated infrastructure. GNI will separately manage the process of managing and delivering the underground natural gas pipeline to the proposed site.

The Electrical Substation project will involve installation of two (2 No.) 220 kV underground circuits forming a connection to the existing Shannonbridge-Maynooth 220 kV overhead line (located within the development boundary) and two (2 No.) 220 kV underground circuits and associated low voltage and communication underground cabling connecting the proposed substation with electricity transformers on the adjacent reserve gas-fired generator (Project 1) and ESS (Project 3) sites, and all associated and ancillary site development works. The GIS substation itself includes a two storey, 17m high building and associated ancillary site development works.

The proposed Energy Storage System (ESS) using vanadium flow battery (VFB) technology and synchronous condenser includes a battery energy storage system (BESS) which will comprise a cluster of battery modules positioned within a dedicated BESS outdoor compound. Each module will consist of a battery container housing pumps and heat exchangers positioned on top of two enclosures. A customer (IPP) building will also be installed within the ESS compound, and it will house electrical switchgear, store, control room, welfare facilities and administration facilities.

2.2 Sources and characteristics of emissions to atmosphere

The most significant potential impacts are emissions of combustion gases such as CO, SO_2 and NO_2 from the gas turbines and associated back up and emergency units.

Sulfur dioxide emissions originate from the sulfur in the fuel used in the combustion process. Since natural gas is the principal fuel to be used sulfur dioxide emissions will be negligible for normal operating conditions. Nitrogen oxides are also present in the emission stream as a result of the combustion process. Much of the emissions are in the form of nitrogen oxide (NO) which is expected to be substantially oxidised to nitrogen dioxide in the atmosphere. Nitrogen oxide emissions from sources using natural gas as fuel are significantly lower than the emissions associated with other fuels. For the Flexgen project, low emission DLE burners will be employed and additionally an SCR abatement system utilising ammonia is proposed to further reduce the nitrogen oxide emissions.

Particulate matter and carbon monoxide may also arise from the combustion process in the emission stream but only in minor amounts. Again, natural gas is a very clean fuel and particulate emissions are predicted to be very low.

There is the potential for a number of greenhouse gas emissions to atmosphere which may give rise to CO_2 emissions.

There is a requirement to run the turbines using gas oil to ensure that there is always a guaranteed energy supply and emissions to atmosphere from the use of gas oil are the same as those associated with natural gas combustion. Emissions when using gas oil will be slightly higher for sulfur dioxide since there is a higher sulfur content in the fuel but the same limits for nitrogen oxides will continue to apply for the diesel fuel usage scenario.

In addition to considering the actual or expected emissions that are released to atmosphere, the requirements of the Large Combustion Plant Regulations, European Union (Large Combustion Plants) Regulations are also considered. The relevant Emission Limit Values from the Regulations are the maximum emissions that will be permitted from the proposed facility and therefore these represent the worst case emissions scenario for the assessment.

The potential emissions to atmosphere include particulates (including fine particulate matter PM_{10} and $PM_{2.5}$), nitrogen oxides (NO_x), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), carbon dioxide (CO_2), water vapour. The pollutants of particular concern include NO_2 and NO_x, and SO_2 all of which have specific standards to be achieved, and it is these pollutants that are modelled to assess the impact of emissions from the combustion plant on air quality in the vicinity of the development.

3.0 AIR QUALITY IMPACT ASSESSMENT METHODOLOGY

3.1 Impact assessment methodology

The impact of emissions to atmosphere on air quality is assessed using a dispersion modelling assessment approach. This approach involves computation of predicted incremental contributions to ground level concentrations of pollutants over defined averaging intervals as a result of emissions from the combustion plant. The predictions are then compared with relevant Air Quality Standards to determine whether the impact on air quality meets the requirements of the Standards. The general approach is summarised as follows:

- Review of local air quality data in the area surrounding the site;
- Review of the nearest building arrangements and locations of human receptors in the area;
- Identification of non-statutory ecological receptors within 2 km of the site and statutory ecological receptors within 10 km of the site;
- Dispersion modelling of combustion plant emissions to predict process contributions (PCs) at identified sensitive receptors for comparison against relevant Air Quality Standards;

Guidance on air emissions risk assessments was published by the UK Government for developments which require an environmental permit under the Environmental Permitting (as Amended) Regulations 2016 (EPR). For those emissions that cannot be screened out the guidance states that detailed modelling must be carried out of the emissions. The screening assessment screened out emissions of particulate matter (including PM_{10} and $PM_{2.5}$) as insignificant. Nitrogen oxides, carbon monoxide and sulfur dioxide were considered relevant as they are regulated pollutants and a detailed dispersion modelling assessment was carried out for those pollutants.

Guidance has also been issued by the EPA in the AG4 Guidance Note and this Guidance was followed in the assessment.

3.2 Impact assessment criteria

The assessment of impact significance is based on a comparison of predicted impacts with air quality standards and guidelines, and consideration of the magnitude and duration of the potential impact.

Air Quality Standards in Ireland have been defined to ensure compliance with EC Directives; they are developed at different levels for different purposes. European legislation on air quality has been framed in terms of two categories, limit values and guide values. Limit values are concentrations that cannot be exceeded and are based on WHO guidelines for the protection of human health. Guide values are set as a long-term precautionary measure for the protection of human health and the environment. The WHO guidelines differ from EU air quality standards in that they are primarily set to protect public health from the effects of air pollution, whereas Air Quality Standards are recommended by governments, and other factors such as socio-economic factors, may be considered in setting the standards.

The Clean Air for Europe (CAFE) Directive (Council Directive 2008/50/EC) is an amalgamation of the Air Quality Framework Directive and its subsequent daughter Directives and sets out limit and target values for named air quality parameters. The fourth daughter Directive (European Parliament 2004) also sets out limit values to be met for certain air quality parameters. The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). The 4th Daughter Directive was transposed by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I. no. 58 of 2009).

The air quality standards and guidelines referenced in this report are summarized in Table 1. The Clean Air for Europe (CAFE) Directive (Council Directive 2008/50/EC) was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). This Directive and the Irish Regulations set out the main standards against which the potential impact of the development on air quality are assessed.

In addition to the Air Quality Standards Regulations and the Directive Standards, it is also appropriate to consider the World Health Organisation (WHO) Guidelines. These guidelines were developed by the WHO to provide appropriate air quality targets worldwide, based on the latest health information available. The air quality guidelines for particulate matter (PM_{10}), nitrogen dioxide and sulfur dioxide, and $PM_{2.5}$ are considered in this report (WHO, 2005; updated in 2008). While the WHO Guidelines are not mandatory, they represent current informed opinion on the levels to which we should be aspiring in order to minimise adverse health impacts of air pollution. The WHO guidelines referenced in this report are summarized in Table 2.

3.2 Dispersion Model Selection

Computerised mathematical dispersion models are used to predict the incremental additions to ground level concentrations of relevant criteria pollutants as a result of emissions from a given development. A detailed modelling assessment was undertaken using the US EPA Model AERMOD Prime, AERMOD Version 19191, which is the current regulatory version of this Model. AERMOD is currently the most widely used air quality modelling tool and has been widely used in studies of this type in relation to regulated facilities.

The model computes average ground-level concentrations of pollutants emitted from either elevated or ground-level emission sources. Separate utilities associated with the dispersion modelling software allow computation of ground-level concentrations of pollutants over defined statistical averaging periods, and additional features permit suitable consideration to be given to building downwash effects and the effects of elevated terrain in the vicinity of the plant.

Table 1 Air Quality Standards Regulations 2011 (based on EU Clean Air For Europe [CAFE] Directive 2008/50/EC)

Pollutant	EU Regulation	Limit Type	Margin of Tolerance	Value
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	None	200 µg/m^3 NO_2
		Annual limit for protection of human health	None	40 µg/m^3 NO_2
		Annual limit for protection of vegetation	None	30 µg/m^3 $NO + NO_2$
Sulfur Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 24 times/year	150 µg/m^3	350 µg/m^3
		Daily limit for protection of human health - not to be exceeded more than 3 times/year	None	125 µg/m^3
		Annual & Winter limit for the protection of human health and ecosystems	None	20 µg/m^3
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50%	50 µg/m^3
		Annual limit for protection of human health	20%	40 µg/m^3
Particulate Matter (as $PM_{2.5}$)	2008/50/EC	Annual limit for protection of human health (Stage 1)	20% from June 2008. Decreasing linearly to 0% by 2015	25 µg/m^3
		Annual limit for protection of human health (Stage 2)	None To be achieved by 2020	20 µg/m^3
Carbon Monoxide	2008/50/EC	8-hour limit (on a rolling basis) for protection of human health	60%	10 mg/m^3 (8.6 ppm)

NOTE
The Air Quality Standards Regulations 2011 (SI 180 of 2011) transposed EU Directive 2008/50/EC (CAFE) into Irish law.

Table 2 WHO Air Quality Standards

Pollutant	Limit Type	Value
Nitrogen Dioxide	Hourly limit for protection of human health	200 µg/m^3
	Annual limit for protection of human health	40 µg/m^3
Sulfur Dioxide	Daily limit for protection of human health	20 µg/m^3
	10-minute limit for protection of human health	500 µg/m^3
Particulate matter (as PM_{10})	24-hour limit for protection of human health	50 µg/m^3
	Annual limit for protection of human health	20 µg/m^3
Particulate matter (as $PM_{2.5}$)	24-hour limit for protection of human health	25 µg/m^3
	Annual limit for protection of human health	10 µg/m^3

3.3 Dispersion Model Assumptions and Limitations

The inherent assumptions of the dispersion Model and associated limitations are summarised as follows.

- The model is based on a five-year meteorological dataset collected from the nearest meteorological stations. Since the meteorological data are not collected at the specific facility location being assessed, this is a limitation of the Model. This is not a significant factor for the current study as the data was sourced from a nearby recording station which is considered representative of the site.
- The model assumes steady-state meteorological conditions that are invariant over the entire model space for each hour modelled, and as such, has reduced accuracy in areas where significant variations in meteorological conditions exist. For instance, AERMOD cannot be used to incorporate highly variable wind patterns caused by changes in terrain elevations, and modelling across complex terrains may result in over-predictions. This is not a significant factor for the current study.
- AERMOD is the Gaussian model recommended by the US EPA for short-range transport of pollutants, up to 50 km from the source. At distances beyond 50 km, steady-state Gaussian plume models like AERMOD tend to over-estimate pollutant ground concentrations, because the model maintains constant wind patterns that are unlikely to persist over long distances. This is not considered significant for the current study due to the relatively low stack height and emission rates and the anticipated dispersion pattern.
- The model cannot be used to model reactive pollutants (e.g., ozone). This is not significant for the current study.

An evaluation of the impact of these limitations concluded that there is no significant adverse impact on the reliability of the Model for the current study.

3.3 Dispersion Modelling Protocol

3.3.1 Dispersion Model Inputs

Evaluation of the impact of a proposed development on air quality using dispersion modelling requires information on the following:

- Emissions characteristics
- Site layout and topography
- Meteorological data
- Averaging intervals
- Receptor locations

Of these, the most significant input parameters are the emissions characteristics and the site layout and topography and surrounding terrain features.

3.3.2 Emissions Characteristics and special treatments

Emission characteristics predicted for the emission sources are summarised in Table 3. Information on dimensions and physical characteristics of the main emission sources was obtained from the developer and from a consideration of the nature and scale of the processes that will be carried out at the plant, the chemical composition of the fuels, information supplied by the manufacturers of the plant, and consideration of the levels of emissions that would normally be expected from a plant of this type.

The worst possible emissions scenario is one where the maximum permissible emission rates from the plant occur. For the purposes of modelling and air quality impact assessment, the maximum possible emission values were used in accordance with relevant Guidance. The maximum permissible emission limits are the Large Combustion Plant Emission Limit Values for nitrogen oxides (Section 2.2), carbon monoxide and sulfur dioxide. The maximum potential sulfur dioxide (SO_2) emission rates are derived from the fuel usage rate and permissible sulfur content. Best practice guidance requires that the impact assessment must represent a worst-case emissions scenario, thereby determining the maximum potential impact of plant emissions on ground level concentrations of pollutants in the vicinity of the plant.

The emissions to atmosphere arise due to the combustion process. The five (No) Open Cycle Gas Turbines (OCGT) are intended to run on natural gas but provision is made to use diesel as a back-up fuel for emergencies. Consequently both scenarios are considered in the assessment. In addition, the Black Start Diesel Units may be required in emergency situations to start the turbines in which case they would be used to start the first turbine which will then be used for the remaining starts; their operation is therefore very limited.

The dispersion model considered a number of possible operating scenarios as follows.

(i) Flexgen OCGT Operating Scenario #1: Natural gas fuel (Normal Operation)

A conservative assumption of 1000 operating hours per year was made with units expected to run for much shorter times. An assumption of 2 hours operation per day during the morning (06:00 – 08:00) or evening (16:00 – 19:00) peak demand periods was made. The turbines start very quickly and reach steady state normal operation in approximately 10 minutes. The assessment assumes that 30% of the operating hours are start-up or shut down for the purpose of modelling. The use of diesel fuel is tested every month and a run time of 2 hours per month is assumed for the testing.

(ii) Flexgen OCGT Operating Scenario #1: Natural gas fuel (Worst Case)

A conservative assumption of full time operation using natural gas as fuel was made to ensure that all worst case meteorological conditions were investigated. This is an unrealistic scenario and is not expected to occur. However the test is a useful sensitivity test to test the sensitivity of the model predictions to the meteorological conditions for the short term one-hour averaging periods.

(iii) Flexgen OCGT Operating Scenario #2: Diesel fuel (Worst Case)

A conservative assumption of full time operation of the turbines using diesel as fuel was made to consider what would occur in the event of a national gas distribution network outage and to ensure that all worst case meteorological conditions were investigated. This is an unrealistic scenario and is not expected to occur. However the test is a sensitivity test to test the sensitivity of the model predictions to the meteorological conditions for the short term one-hour averaging periods and to the use of diesel instead of natural gas.

(iv) Diesel Black Start Units

These units will run only in emergencies and will be tested once each year. For the purpose of this assessment a Model run was executed with the units operating once a year for 8 hours. This run was assimilated into all of the main operating scenarios.

These operating scenarios represent conservative approaches and will lead to an overestimate of the predicted ambient concentrations beyond the site boundary. The stack height for the assessment was determined to be 30m and the detailed assessment as reported in Appendix III also considered alternative stack heights.

In most combustion processes, NO_x is emitted almost totally in the form of nitric oxide (NO). Nitrogen oxides are very reactive and also contribute, due to the formation of nitrogen dioxide from nitric oxide, to the phenomenon of photochemical ozone formation. These transformations are generally of greatest concern in the areas where the highest ozone concentrations occur – for example, in rural areas in late afternoon in summer time. Unless photochemical dispersion models are used for the assessment of impacts associated with the release of nitrogen oxides from point emissions sources, then assumptions must be made regarding the rate and extent of conversion of NO to NO_2. For the current study, Guidance from the EPA taken from the Air Dispersion Modelling Guidance Note AG4 was followed whereby default annual ratio of 1.00 and a default 1-hour NO_2/NO_X ratio of 0.50 was used for the conversion of NO_X to NO_2.

The EPA Guidance notes that a site-specific ratio at the point of maximum concentration may be used if extensive continuous monitoring data (one-year or greater) is available at this location, but the site-specific ratio will only be valid for locations which are a similar distance from the source as the monitoring station. The limited on-site data suggests a ratio close to 1 for the long term data which is consistent with the EPA default values.

Table 3 Flex Gen Stack and emission characteristics

Emission Point	Stack Co-ordinates		Stack Height, m	Exit Diameter, m	Exit Area, m^2
OCGT #1	645011	738903	25	4.5	15.904
OCGT #2	645018	738881	25	4.5	15.904
OCGT #3	645024	738861	25	4.5	15.904
OCGT #4	645030	738841	25	4.5	15.904
OCGT #5	645036	738820	25	4.5	15.904
Black Start Diesel 1	644974	738861	4.755	0.3	-
Black Start Diesel 2	644991	738866	4.755	0.3	-

ITM Coordinate system

Table 4 Process emissions data for proposed Flex Gen plant

Emission Point	Fuel Type	Temperature K	Flow Nm^3/hour	Exit velocity m/sec	NO_x Emission		CO Emission		SO_2 Emission	
					mg/Nm^3	g/sec	mg/Nm^3	g/sec	mg/Nm^3	g/sec
Flexgen OCGT #1-#5	Natural gas (Start-up)	723.15	263,710	13.69	35	2.56	40	2.93	-	-
Flexgen OCGT #1-#5	Natural gas (Normal operation)	727.15	454,907	23.62	35	4.42	40	5.05	-	-
Flexgen OCGT #1-#5	Diesel (Start-up)	723.15	263,710	13.69	90	6.59	100	7.33	66	4.83
Flexgen OCGT #1-#5	Diesel (Normal operation)	727.15	454,907	23.62	90	11.37	100	12.64	66	8.34

Notes:
1. Flex Gen assumed to operate at baseload output at ISO temperature 15ºC.
2. Flex Gen start up duration 10 minutes; model conservatively assumes 0.33 hr duration.
3. Flex Gen conservatively assumed to run for 1000 hours per year with 33% of the hours modelled as start up.
4. Flex Gen assumed to run on diesel for 1000 hours per year.
5. SO_2 emissions are negligible for natural gas combustion

3.3.3 Site Layout and Topography

The layout and area of the site and the dimensions of the various buildings on site were taken from the drawings of the site. Topographical information was obtained from a site survey and from Ordnance Survey maps and from digital terrain data. Building downwash effects might be expected as a result of the proximity of the buildings on site to the plant stack. These effects were modelled using the modelling facility, BPIP, which is part of the AERMOD modelling suite.

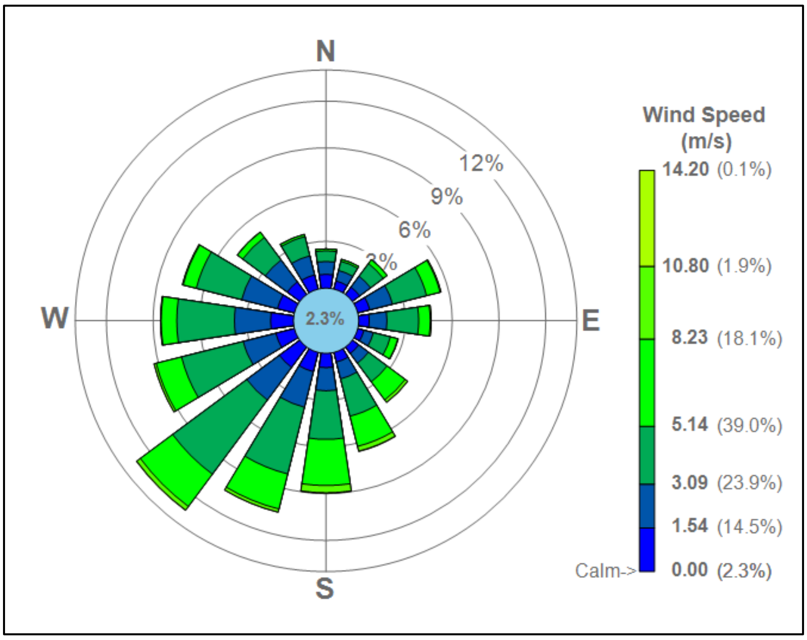
The presence of complex terrain features can lead to significantly higher ambient concentrations than would occur in the absence of terrain features, especially if there is a significant relative difference in elevation between the source and off-site receptors. International Guidance suggests that when modelling in a region of flat terrain, no digital mapping of terrain will be necessary. General guidance is that digital mapping of terrain should be conducted where terrain features are greater than 10% of the effective stack height within 5km of the stack (for effective stack heights of 100m or less). From a review it is concluded that digital terrain data is required to ensure that a reliable assessment is completed. This data was acquired and used in the dispersion model.

3.3.4 Meteorological Data

The magnitude of potential impacts of emissions from the facility will be substantially influenced by the local meteorological conditions, in particular by wind speed and direction and also by precipitation rates. Comprehensive monitoring data is available for Mullingar which is located approximately 16km north of the facility. The wind roses are presented in Appendix II and a representative windrose for 2016 - 2020 is shown in Figure 2. The dominant wind direction is from the south west quadrant.

For the purpose of obtaining information about the climatological conditions at the site, five years of meteorological data for the period 2016 - 2020 was analysed. This data was selected for use in the dispersion modelling study for the facility, and is expected to be a reliable indicator of conditions at the site. Analysis of the monitoring data shows that the dominant wind direction is from the S-SW-W quadrant, with in excess of 50% of wind directions in this quadrant. Individual Windroses for each of the years 2016 - 2020 are presented in Appendix II.

Figure 2 2016 - 2020 composite Windrose for Mullingar



3.3.5 Averaging Intervals

The dispersion model was used to predict the incremental additions to ground level concentrations of the main pollutants emitted from the plant over defined averaging periods. These averaging periods were chosen to allow direct comparison of predicted ground level concentrations with the relevant assessment criteria as outlined in Table 5. In particular, 1-hour, 24-hour and annual average ground level concentrations (GLCs) of various pollutants were calculated at various distances from the site; percentiles of these average GLCs were also computed for comparison with the relevant Air Quality Standards.

3.3.6 Receptor Locations

Three nested uniform cartesian receptor grids centred on the site were used for the modelling domain as follows:

- A coarse outer grid of 10 km x 10 km of 1681 receptors with a spacing of 250 meters was used to cover the whole study area
- A fine inner grid of 4 km x 4 km of 6,561 receptors (81 x 81 receptors with a spacing of 50 meters) was used to better characterise the zones where the maximum predicted air quality impact from the Project emissions are expected.
- A fine inner grid of 1km x 1km of 1681 receptors with 25m receptor spacing was also constructed.

In line with expectations, the highest predicted ground level concentrations occur at the receptors closer to the source.

Sensitive receptors in the vicinity of the plant were also input to the Model to evaluate the impact on air quality at those sensitive locations. These sensitive receptors are shown in Appendix I as well as maps showing the nested receptor grids.

3.4 Background ambient air quality

The site is located in agricultural fields immediately south west of Rochfortbridge. The M6 Motorway runs east-west along the southern boundary of the site. The dominant influences on air quality in the area are emissions from domestic heating and traffic. Emissions from traffic sources are expected to be the principal contributors to ambient air quality in the vicinity of the site.

The main substances which are of interest in terms of existing air quality are sulfur dioxide, nitrogen oxides (nitric oxide, NO and nitrogen dioxide NO_2, collectively referred to as NO_x), fine particulate matter including PM_{10} and $PM_{2.5}$ which could originate from combustion sources and traffic. Carbon monoxide is also potentially of interest, and benzene may also be of interest from traffic sources. There are no significant new substances expected to be present in emissions released from the proposed development relative to the existing situation.

A description of existing levels of the various substances in ambient air is required to allow completion of the evaluation of air quality impacts associated with the development. The available data from the National Ambient Air Quality Network is a reliable data set for consideration in this study.

The Environmental Protection Agency (EPA) and local authorities maintain and operate a number of ambient air quality monitoring stations throughout Ireland in order to implement EU Directives and to assess the country's compliance with national air quality standards. Ireland's small population and generally good air quality means that a relatively small number of monitoring stations are sufficient across the country for the purposes of implementing the EU Air Directives. For ambient air quality management and monitoring in Ireland, four zones, A, B, C and D are defined in the Air Quality Standards (AQS) Regulations (S.I. No. 180 of 2011) and are defined as follows:

- Zone A: Dublin Conurbation.
- Zone B: Cork Conurbation.
- Zone C: 24 cities and large towns. Includes Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee, Dundalk, Navan, Newbridge, Mullingar, Letterkenny, Celbridge and Balbriggan, Portlaoise, Greystones and Leixlip.
- Zone D: Rural Ireland, i.e. the remainder of the State excluding Zones A, B &C.

The subject site is considered to be located in Zone D and is considered a rural location site for assessment purposes. Air Quality Data from representative air monitoring stations in Zone D are therefore considered representative of air quality at the subject site. The EPA publishes Ambient Air Quality Reports every year which details the air quality in each of the four zones. The most recent report, published by the EPA in 2020, is the Air Quality in Ireland 2019, which contains monitoring data collected during 2019.

The EPA maintains monitoring stations in a number of rural locations including Castlebar, Claremorris, Emo, Enniscorthy, Kilkitt and Longford to monitor rural background air quality. Other monitoring stations have operated at various times and some new stations have been added to the network, but long-term data is available for the above stations. Data from the Air Quality Monitoring Annual reports for 2017 - 2019 was reviewed and a summary of the data for representative stations for the three most recent years is presented for each parameter of interest in Table 5.

The approach taken is to take the average of the three most recent years for each of the Zone D rural stations detailed above and the averages of the values for the stations are reported in Table 5. This is the data set which is used in the assessment of the potential impact of the proposed development on air quality.

It is noted from the data that existing ambient air quality is good for all health-related pollutants. All concentration levels are well within the EU Standards for all parameters of interest.

Table 5 Summary baseline air quality data (2017 - 2019)

Data set	**Parameter and averaging interval**		**Concentration µg/m³**
Rural background	Nitrogen dioxide NO_2	*Annual Mean, µg/m³*	4.9
Rural background	Nitrogen oxides, NO_x	*Annual Mean, µg/m³*	6.7
Rural background	Particulate Matter PM_{10}	*Annual Mean, µg/m³*	11.7
Rural background	Particulate Matter $PM_{2.5}$	*Annual Mean, µg/m³*	8.9
Rural background	Sulfur dioxide, SO_2	*Annual Mean, µg/m³*	1.8
Rural background	Carbon Monoxide CO	*Annual Mean 8-hour, mg/m³*	Note 2
Rural background	Benzene	*Annual Mean, µg/m³*	0.21

NOTE

1. Data summarised from the EPA Annual Ambient Air Quality Monitoring Reports 2016 to 2018.
2. No Zone D measurements recorded during this interval but a value of 0.1 m*g/m³ was recorded for Zone C.*

3.5 Site specific ambient air quality monitoring

A survey of air quality in the area of the site was carried out during July - September 2021. The survey consisted of deployment of a series of diffusion tubes to measure ambient nitrogen oxides at 5 locations in the vicinity of the site. A continuous monitoring survey of nitrogen oxides (NO, NO_2 and NO_x) was also undertaken at one of these locations. A summary of the- results is presented in Table 6 and Table 7. The results are consistent with expectations in that the levels are generally low and are clearly influenced by emissions from traffic on the motorway. The results are seen to decrease with increasing distance from the motorway. All of the monitoring results are compliant with the annual mean air quality standard for nitrogen oxides and the results are consistent with the longer term EPA monitoring data for rural locations. The EPA monitoring data is generally lower for the annual mean than the values recorded in this survey which is not surprising given the limited duration of this survey. The longer term EPA data is likely to be more representative of the annual average concentrations and is therefore selected for use in this assessment. The data from the continuous monitoring survey is a useful benchmark, it confirms the dominant influence of traffic emissions on air quality at the site and also provides valuable information on the variation in concentration at distances removed from the motorway.

Table 6 Diffusion tube NOx survey

Location	**02 – 16 July 2021**	**16 – 30 July 2021**	**30 July – 13 Aug 2021**	**Average µg/m^3**
OD1	5.12	7.65	6.01	6.26
OD2	4.50	6.31	6.17	5.66
OD3	3.11	6.11	3.48	4.23
OD4	3.97	6.10	3.11	4.39
OD5	3.93	7.10	3.15	4.73

Table 7 Continuous monitoring survey for NOx

Location	07 July 2021 to 13 Sep 2021		
	NO_2, µg/m^3	NO, µg/m^3	NOx, µg/m^3
OD3 Survey average	12.9	0.2	12.4

4.0 DISPERSION MODELLING PREDICTIONS

4.1 Modelling predictions

Model executions were completed to assess the incremental additions to ground level concentrations of NO_2 and NO_x and SO_2 over specified averaging intervals to allow comparison of the predictions with the relevant Air Quality Standards, which have been defined for all of these pollutants as set out in Table 3. These pollutants have been selected as a screening analysis identified these as the most sensitive parameters for assessing the impact on air quality of the emissions.

The detailed modelling predictions (using meteorological data for 2016 – 2020) are presented in Appendix III. In each case, the maximum predicted Process Contribution to ground level concentrations is shown in the Tables. In addition, the predicted impact on air quality taking account of the existing background levels is also assessed with the calculation of the Predicted Environmental Concentration (PEC). Representative isopleths showing the distribution of emissions from the plant are shown in Appendix III to show the outputs from the model in a map format.

4.2 Assessment of air quality impact on human health

4.2.1 Introduction

A summary of the dispersion modelling results for the maximum predicted Process Contributions using the worst case meteorological year is presented in Table 8a, 8b, Table 9a, 9 and Table 10a, 10b, 10c. The results are presented for three operating scenarios as described in section 3.3.2. The modelling predictions for these potential operating scenarios indicate that the operation of the boilers will not exceed the Air Quality Standards. As is evident from the contour plots presented in Appendix III, the highest predicted PCs are close to the facility with concentrations reducing with distance from the source as expected. A detailed discussion of the results is presented in the following sections.

4.2.1 Flexgen Impact Assessment for Normal Operation on Natural Gas

The most sensitive pollutant is nitrogen dioxide so the detailed discussion presented here is for nitrogen dioxide; results for carbon monoxide are also presented as this is also a regulated pollutant under the Large Combustion Plant Directive. All other substances are emitted at lower concentrations and the impacts are less significant. The results of the runs are presented in Table 8a for NO_2 and in Table 8b for CO.

The modelling predictions show that the predicted concentrations are all significantly lower than the relevant air quality standard. For the most sensitive pollutant, nitrogen dioxide, the predicted ambient concentrations expressed as the Process Contribution for the 99.8-percentile of 1-hour concentrations will not exceed 0.61% of the air quality standard.

The cumulative air quality impact expressed in terms of the Predicted Environmental Concentration (PEC) is assessed by considering the background air quality in the area and the incremental contribution to ambient concentrations from the proposed process. The modelling predictions indicate that the cumulative impact of the operation of the turbines with existing activities will not exceed the Air Quality Standards. As is evident from the contour plot presented in Figure 8.5, the highest predicted Process Contributions (PCs) are close to the facility with concentrations reducing with distance from the source as expected.

Table 8.a Predicted NO_2 concentrations for Normal Operation on Natural Gas

Meteorological data	Averaging interval	Process Contribution (PC) µg/m^3	Background concentration µg/m^3	Predicted Environmental Concentration (PEC) µg/m^3	Air Quality Standard µg/m^3	PC as % of Air Quality Standard
2016	99.8th %ile of 1-hour means	0.43	9.8	10.2	200	0.22%
	Annual mean	0.22	4.9	5.1	40	0.55%
2017	99.8th %ile of 1-hour means	0.44	9.8	10.2	200	0.22%
	Annual mean	0.24	4.9	5.1	40	0.60%
2018	99.8th %ile of 1-hour means	1.22	9.8	11.0	200	0.61%
	Annual mean	0.29	4.9	5.2	40	0.73%
2019	99.8th %ile of 1-hour means	0.32	9.8	10.1	200	0.16%
	Annual mean	0.21	4.9	5.1	40	0.53%
2020	99.8th %ile of 1-hour means	0.32	9.8	10.1	200	0.16%
	Annual mean	0.23	4.9	5.1	40	0.58%

NOTE

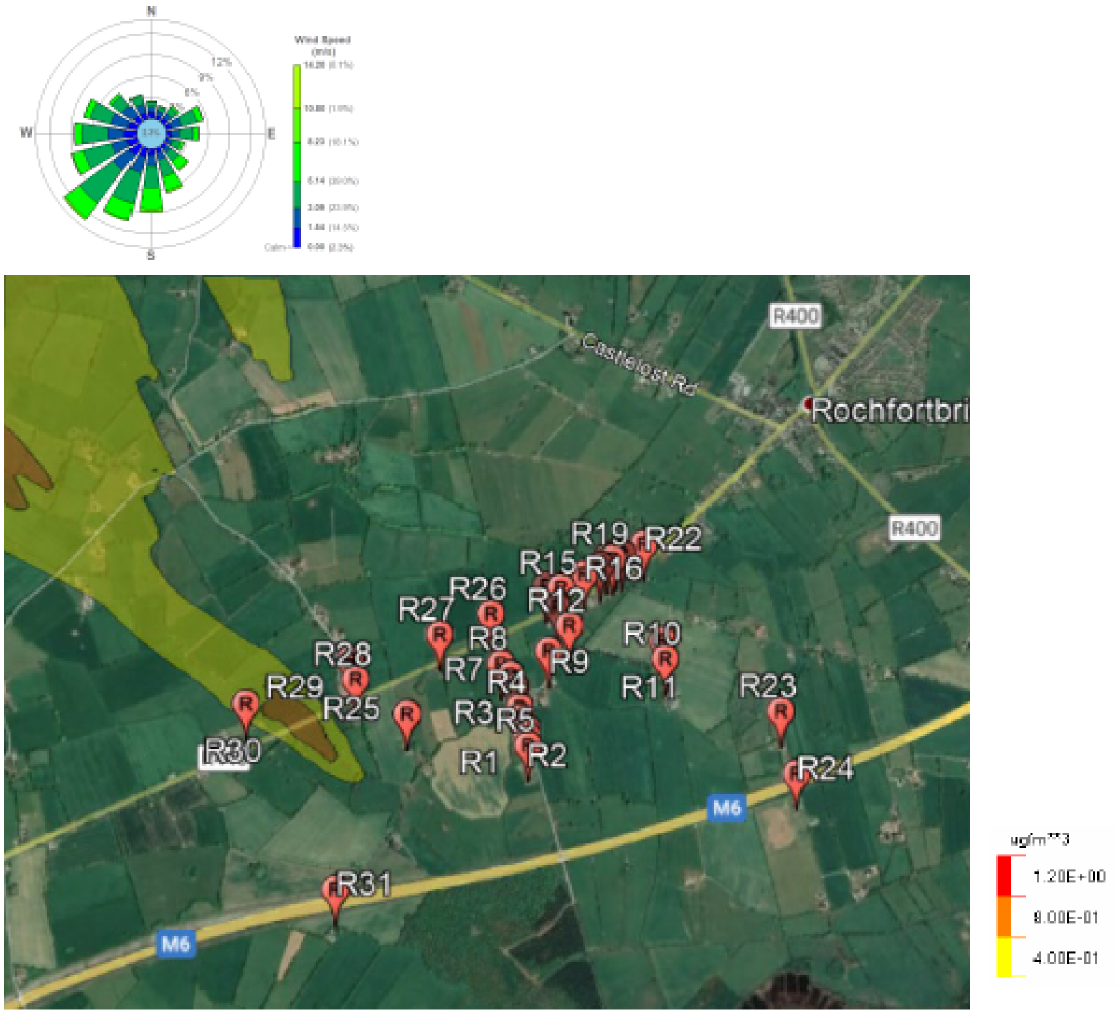
The background concentration is the annual mean when evaluating annual or daily predictions. The background concentration is twice the annual mean when evaluating hourly predictions.

Table 8b Predicted CO concentrations for Normal Operation on Natural Gas

Meteorological data	Averaging interval	Process Contribution (PC) µg/m^3	Background concentration µg/m^3	Predicted Environmental Concentration (PEC) µg/m^3	Air Quality Standard µg/m^3	PC as % of Air Quality Standard
2016	Maximum 8-hour mean	29.7	100	129.7	10,000	0.30%
2017	Maximum 8-hour mean	27	100	127.0	10,000	0.27%
2018	Maximum 8-hour mean	30.4	100	130.4	10,000	0.30%
2019	Maximum 8-hour mean	19.7	100	119.7	10,000	0.20%
2020	Maximum 8-hour mean	19.7	100	119.7	10,000	0.20%

NOTE

The background concentration is the annual mean when evaluating annual or daily predictions. The background concentration is twice the annual mean when evaluating hourly predictions.



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Client	Halston / Lumcloon Energy Ltd
Project	FlexGen Castlelost
Figure Ref	Figure 8.5
Title	99.8-%ile of 1-hour NO_2 concentrations for Normal Operation on Natural Gas

4.2.2 Flexgen Impact Assessment for Worst Case Operation on Natural Gas

Results are presented for nitrogen dioxide and carbon monoxide as both are regulated pollutants under the Large Combustion Plant Directive. All other substances are emitted at lower concentrations and the impacts are less significant. The results of the runs are presented in Table 9a for NO_2 and in Table 9b for CO.

The modelling results show that even if the plant were to run full time on natural gas, which is not proposed, the predicted ambient concentrations for the most sensitive pollutant, nitrogen dioxide, expressed as the Process Contribution will not exceed 9.1% of the air quality standard for the 99.8 percentile of one-hour concentrations.

The cumulative air quality impact expressed in terms of the Predicted Environmental Concentration (PEC) is assessed by considering the background air quality in the area and the incremental contribution to ambient concentrations from the proposed process. The modelling predictions indicate that the cumulative impact of the operation of the turbines with existing activities will not exceed the Air Quality Standards. As is evident from the contour plot presented in Figure 8.6, the highest predicted Process Contributions (PCs) are close to the facility with concentrations reducing with distance from the source as expected.

4.2.3 Flexgen Impact Assessment for Worst Case Operation on Diesel

Results are presented for nitrogen dioxide and for carbon monoxide as both are regulated pollutants under the Large Combustion Plant Directive. Results are also presented for sulfur dioxide as the sulfur content of diesel is higher than that in natural gas although the emission are still relatively low. The results of the runs are presented in Table 10a for NO_2, Table 10b for CO and in Table 10c for SO_2.

The modelling results show that even if the plant were to run full time on diesel, which is not proposed, the predicted ambient concentrations for the most sensitive pollutant, nitrogen dioxide, expressed as the Process Contribution will not exceed 9.7% of the air quality standard for the 99.8 percentile of one-hour concentrations.

The cumulative air quality impact expressed in terms of the Predicted Environmental Concentration (PEC) is assessed by considering the background air quality in the area and the incremental contribution to ambient concentrations from the proposed process. The modelling predictions indicate that the cumulative impact of the operation of the turbines with existing activities will not exceed the Air Quality Standards.

Table 9a Predicted NO_2 concentrations for Worst Case Operation on Natural Gas

Meteorological data	Averaging interval	Process Contribution (PC) µg/m³	Background concentration µg/m³	Predicted Environmental Concentration (PEC) µg/m³	Air Quality Standard µg/m³	PC as % of Air Quality Standard
2016	99.8th %ile of 1-hour means	16.6	9.8	26.4	200	8.30%
	Annual mean	0.42	4.9	5.3	40	1.05%
2017	99.8th %ile of 1-hour means	18.2	9.8	28.0	200	9.10%
	Annual mean	0.35	4.9	5.3	40	0.88%
2018	99.8th %ile of 1-hour means	15.6	9.8	25.4	200	7.80%
	Annual mean	0.31	4.9	5.2	40	0.78%
2019	99.8th %ile of 1-hour means	15.6	9.8	25.4	200	7.80%
	Annual mean	0.26	4.9	5.2	40	0.65%
2020	99.8th %ile of 1-hour means	15.6	9.8	25.4	200	7.80%
	Annual mean	0.29	4.9	5.2	40	0.73%

NOTE

The background concentration is the annual mean when evaluating annual or daily predictions. The background concentration is twice the annual mean when evaluating hourly predictions.

Table 9b Predicted CO concentrations for Worst Case Operation on Natural Gas

Meteorological data	Averaging interval	Process Contribution (PC) µg/m³	Background concentration µg/m³	Predicted Environmental Concentration (PEC) µg/m³	Air Quality Standard µg/m³	PC as % of Air Quality Standard
2016	Maximum 8-hour mean	29.7	100	129.7	10,000	0.30%
2017	Maximum 8-hour mean	27	100	127.0	10,000	0.27%
2018	Maximum 8-hour mean	30.4	100	130.4	10,000	0.30%
2019	Maximum 8-hour mean	34.5	100	134.5	10,000	0.35%
2020	Maximum 8-hour mean	24.4	100	124.4	10,000	0.24%

NOTE

The background concentration is the annual mean when evaluating annual or daily predictions. The background concentration is twice the annual mean when evaluating hourly predictions.

Table 10a Predicted NO_2 concentrations for Unrealistic Worst Case Operation on Diesel

Meteorological data	Averaging interval	Process Contribution (PC) µg/m³	Background concentration µg/m³	Predicted Environmental Concentration (PEC) µg/m³	Air Quality Standard µg/m³	PC as % of Air Quality Standard
2016	99.8th %ile of 1-hour means	16.1	9.8	25.9	200	8.05%
	Annual mean	0.28	4.9	5.2	40	0.70%
2017	99.8th %ile of 1-hour means	16.4	9.8	26.2	200	8.20%
	Annual mean	0.36	4.9	5.3	40	0.90%
2018	99.8th %ile of 1-hour means	19.4	9.8	29.2	200	9.70%
	Annual mean	0.28	4.9	5.2	40	0.70%
2019	99.8th %ile of 1-hour means	16.4	9.8	26.2	200	8.20%
	Annual mean	0.26	4.9	5.2	40	0.65%
2020	99.8th %ile of 1-hour means	16.3	9.8	26.1	200	8.15%
	Annual mean	0.25	4.9	5.2	40	0.63%

NOTE

The background concentration is the annual mean when evaluating annual or daily predictions. The background concentration is twice the annual mean when evaluating hourly predictions.

Table 10b Predicted CO concentrations for Unrealistic Worst Case Operation on Diesel

Meteorological data	Averaging interval	Process Contribution (PC) µg/m³	Background concentration µg/m³	Predicted Environmental Concentration (PEC) µg/m³	Air Quality Standard µg/m³	PC as % of Air Quality Standard
2016	Maximum 8-hour mean	84.9	100	184.9	10,000	0.85%
2017	Maximum 8-hour mean	77.2	100	177.2	10,000	0.77%
2018	Maximum 8-hour mean	160	100	260.0	10,000	1.60%
2019	Maximum 8-hour mean	98.6	100	198.6	10,000	0.99%
2020	Maximum 8-hour mean	69.7	100	169.7	10,000	0.70%

NOTE

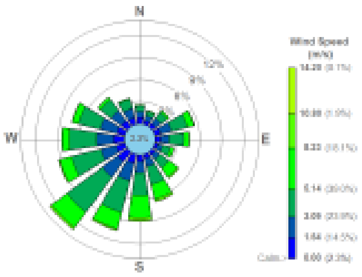
The background concentration is the annual mean when evaluating annual or daily predictions. The background concentration is twice the annual mean when evaluating hourly predictions.

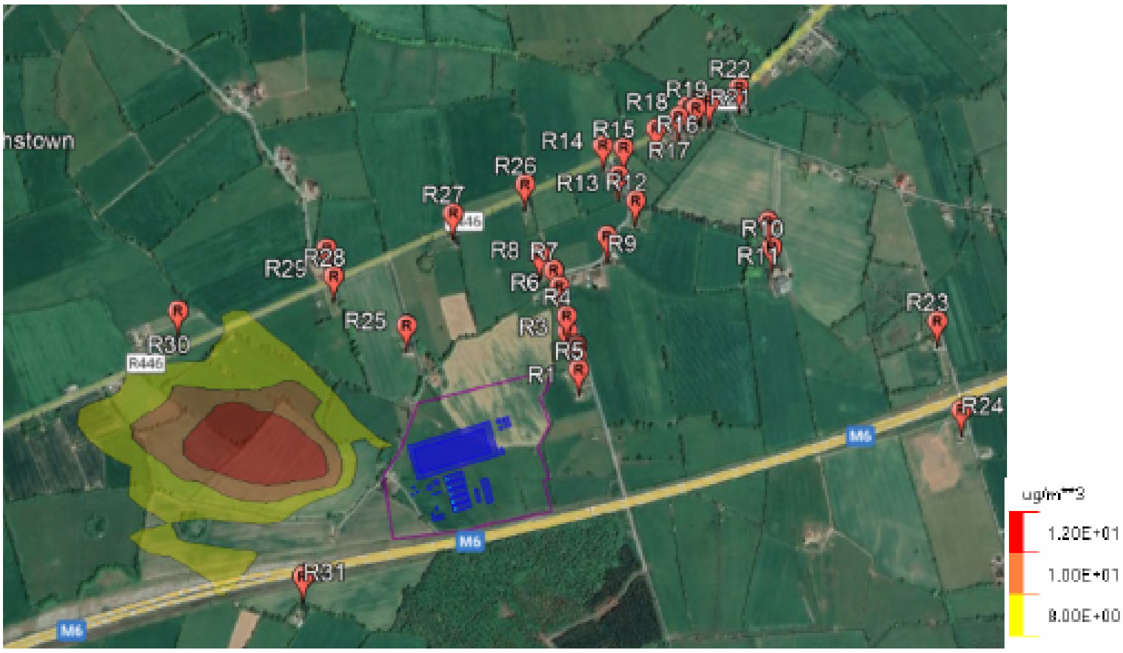
Table 10c Predicted SO_2 concentrations for Unrealistic Worst Case Operation on Diesel

Meteorological data	Averaging interval	Process Contribution (PC) µg/m³	Background concentration µg/m³	Predicted Environmental Concentration (PEC) µg/m³	Air Quality Standard µg/m³	PC as % of Air Quality Standard
2016	99.7th %ile of 1-hour means	35.2	3.6	38.8	350	10.06%
	99.2 %ile of 24-hour means	7.7	1.8	9.5	125	6.16%
	Annual mean	0.42	1.8	2.2	20	2.10%
2017	99.7th %ile of 1-hour means	38.1	3.6	41.7	350	10.89%
	99.2 %ile of 24-hour means	11.8	1.8	13.6	125	9.44%
	Annual mean	0.79	1.8	2.6	20	3.95%
2018	99.7th %ile of 1-hour means	54.4	3.6	58.0	350	15.54%
	99.2 %ile of 24-hour means	19.1	1.8	20.9	125	15.28%
	Annual mean	0.52	1.8	2.3	20	2.60%
2019	99.7th %ile of 1-hour means	42.3	3.6	45.9	350	12.09%
	99.2 %ile of 24-hour means	19.1	1.8	20.9	125	15.28%
	Annual mean	0.4	1.8	2.2	20	2.00%
2020	99.7th %ile of 1-hour means	20.5	3.6	24.1	350	5.86%
	99.2 %ile of 24-hour means	9.7	1.8	11.5	125	7.76%
	Annual mean	0.38	1.8	2.2	20	1.90%

NOTE

The background concentration is the annual mean when evaluating annual or daily predictions. The background concentration is twice the annual mean when evaluating hourly predictions.





tms environment ltd 53 Broomhill Drive, Tallaght, Dublin 24 Tel: +353-1-4626710	Client	Halston / Lumcloon Energy Ltd
	Project	FlexGen Castlelost
	Figure Ref	Figure 8.6
	Title	99.8-%ile of 1-hour NO_2 concentrations for Conservative Worst Case Operation on Natural Gas

4.2.4 Impact of emissions on ecosystems

The impact of nitrogen oxides (NOx) emissions on sensitive ecosystems was assessed by modelling the NOx emissions from the worst case gas scenario with the turbines operating full time on natural gas. The impact predictions are presented in Table 11.

Table 11 Predicted NO_x concentrations for Worst Case Operation on Natural Gas

Meteorological data	Averaging interval	Process Contribution (PC) µg/m^3	Background concentration µg/m^3	Predicted Environmental Concentration (PEC) µg/m^3	Air Quality Standard µg/m^3	PC as % of Air Quality Standard
2016	Annual mean	0.32	6.7	7.02	30	23.4%
2017	Annual mean	0.41	6.7	7.11	30	23.7%
2018	Annual mean	1.1	6.7	7.8	30	26.0%
2019	Annual mean	0.51	6.7	7.21	30	24.0%
2020	Annual mean	0.30	6.7	7	30	23.3%

NOTE

The background concentration is the annual mean when evaluating annual or daily predictions.

The maximum predicted Process Contributions are considered with the background concentrations to arrive at a PEC. The background concentration selected is for the areas closest to the site where maximum predicted PCs arise which is likely to be conservative given the surrounding land uses and the dominating influence of traffic from the motorway on ambient air quality.

The results indicate that the cumulative impact of the proposed development with existing activities will not exceed the air quality standard. The results therefore indicate that the emissions from the facility will not exert a significant adverse impact on ecosystems. The maximum values predicted for the representative ecological receptors identified in section 3.3 are even lower than the values quoted in Table 11; the actual predictions for the ecological receptors are presented in Appendix III.

4.3 Assessment of cumulative impact Predicted Environmental Concentrations (PEC)

The cumulative air quality impact expressed in terms of the Predicted Environmental Concentration (PEC) is assessed by considering the background air quality in the area. The background concentration is the annual mean when evaluating annual or daily predictions and is taken as twice the annual mean when evaluating hourly or daily predictions.

The results are presented in Tables 8 - 10 for three operating scenarios. The modelling predictions for these potential operating scenarios indicate that the cumulative impact of the operation of the sources with existing activities will not exceed the Air Quality Standards. As is evident from the contour plots presented in Appendix II, the highest predicted PCs are close to the facility with concentrations reducing with distance from the source as expected.

4.4 Sensitivity analysis

Sensitivity checks on the modelling assumptions were checked as follows:

- Meteorological data selection
- Stack height
- Influence of terrain

The detailed results of those assessments are presented with the detailed modelling results in Appendix III.

5.0 CONCLUSIONS

The impact of emissions to atmosphere has been investigated using a dispersion modelling approach. The assessment considered a stack height of 30m and demonstrated that this stack height is adequate to ensure the effective dispersion of the emissions. The assessment shows that the predicted concentrations are not predicted to exceed the Air Quality Standards for the normal and conservative worst-case operating scenarios assessed. There is therefore predicted to be no significant adverse impact on human health or on ecosystems as a result of the emissions.

Appendix I

Gridded and sensitive receptors

Figure 1 Sensitive Receptors Map

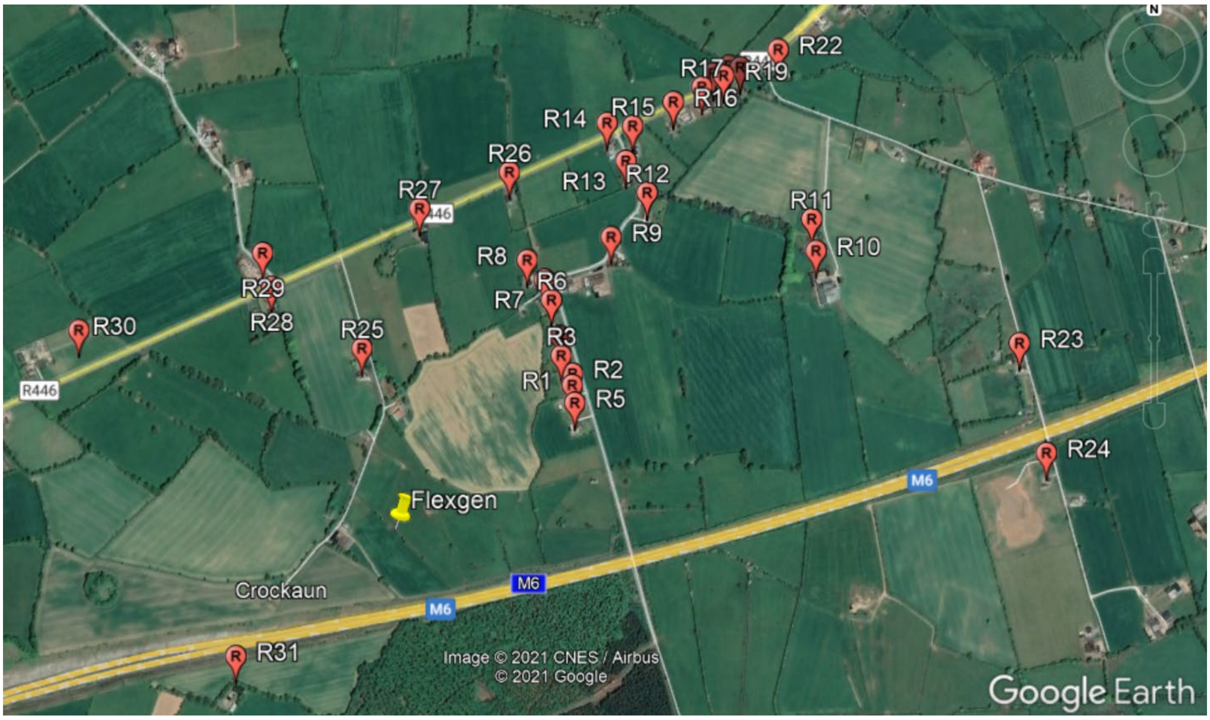


Table 1 Ecological and Human Sensitive Receptor locations

Sen. Rcpt.	Dsc. Rcpt.	Description	UTM	
			East(m)	North(m)
1	1	Residential	611861.00	5918187.00
2	2	Residential	611861.00	5918214.00
3	3	Residential	611833.00	5918256.00
4	4	Residential	611830.00	5918301.00
5	5	Residential	611868.00	5918145.00
6	6	Residential	611807.00	5918387.00
7	7	Residential	611789.00	5918435.00
8	8	Residential	611747.00	5918480.00
9	9	Residential	611945.00	5918539.00
10	10	Residential	612432.00	5918518.00
11	11	Residential	612420.00	5918593.00
12	12	Residential	612028.00	5918646.00
13	13	Residential	611976.00	5918720.00
14	14	Residential	611929.00	5918809.00
15	15	Residential	611990.00	5918803.00
16	16	Residential	612085.00	5918862.00
17	17	Residential	612152.00	5918899.00
18	18	Residential	612178.00	5918932.00
19	19	Residential	612203.00	5918927.00
20	20	Residential	612215.00	5918951.00
21	21	Residential	612242.00	5918948.00
22	22	Residential	612331.00	5918992.00
23	23	Residential	612920.00	5918311.00
24	24	Residential	612990.00	5918053.00
25	25	Residential	611360.00	5918262.00
26	26	Residential	611700.00	5918687.00
27	27	Residential	611489.00	5918596.00
28	28	Residential	611142.00	5918402.00
29	29	Commercial	611119.00	5918482.00
30	30	Community	610687.00	5918289.00
31	31	Residential	611078.00	5917527.00

Figure 2 Ecological receptors

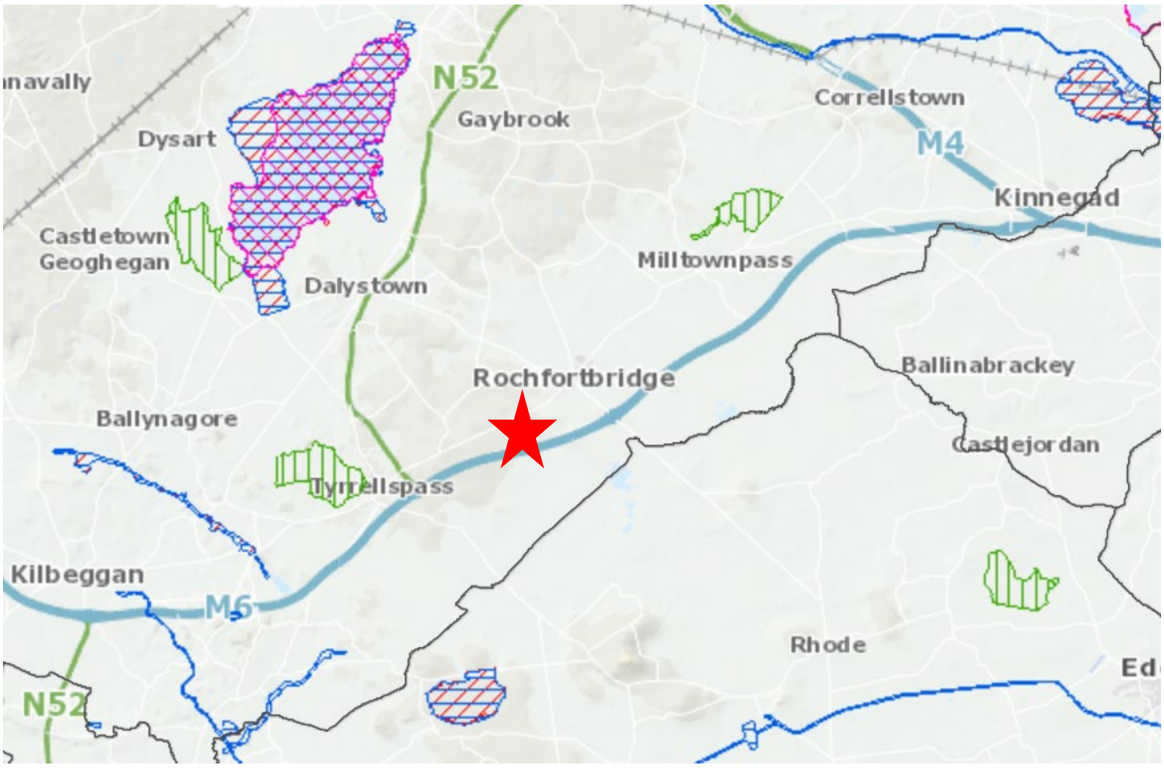
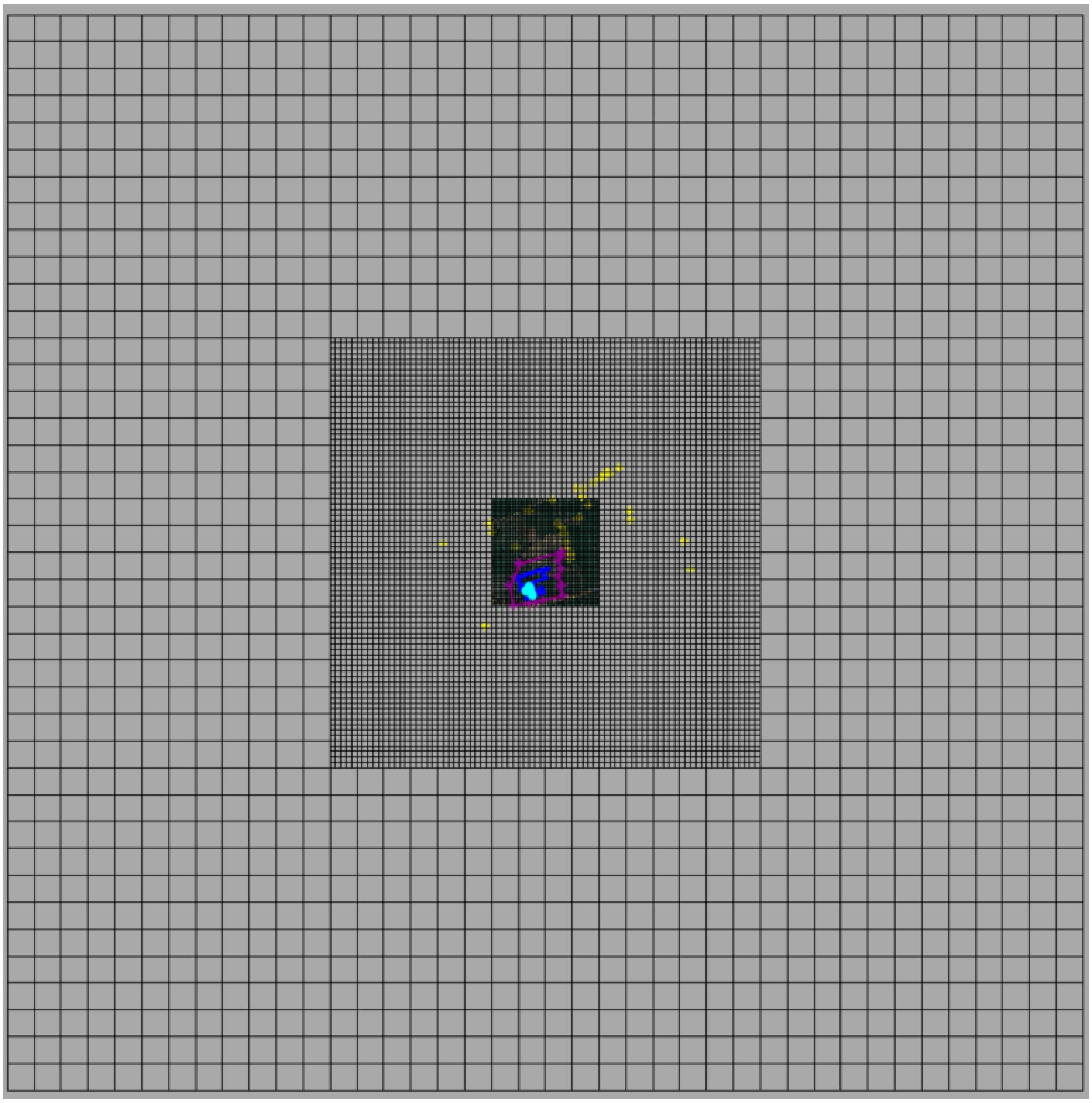
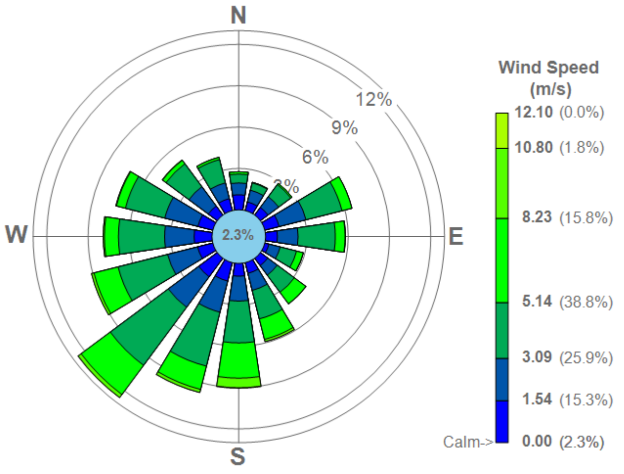


Figure 3 Gridded Receptors

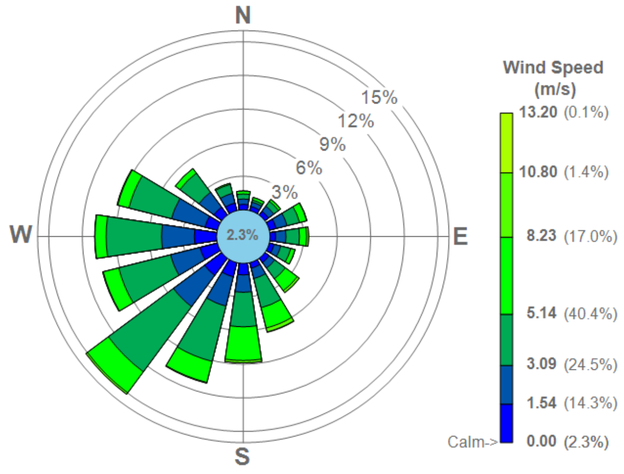


Appendix II

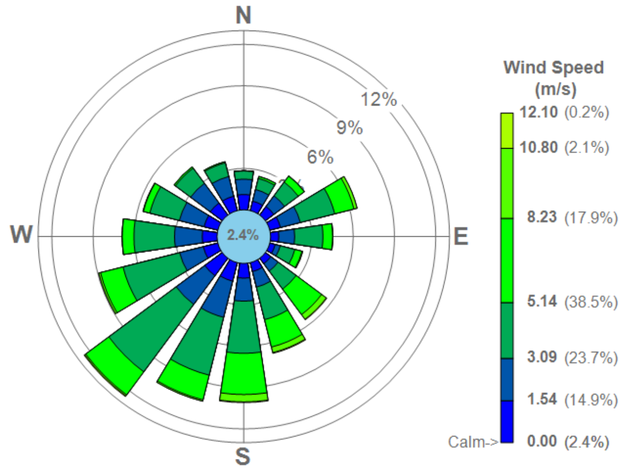
Windroses for Mullingar



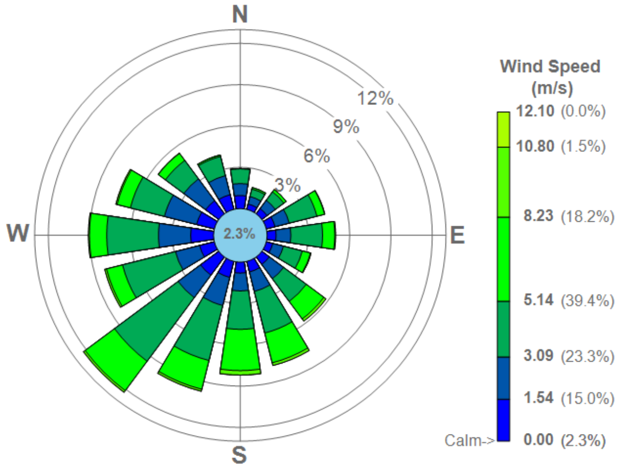
2016



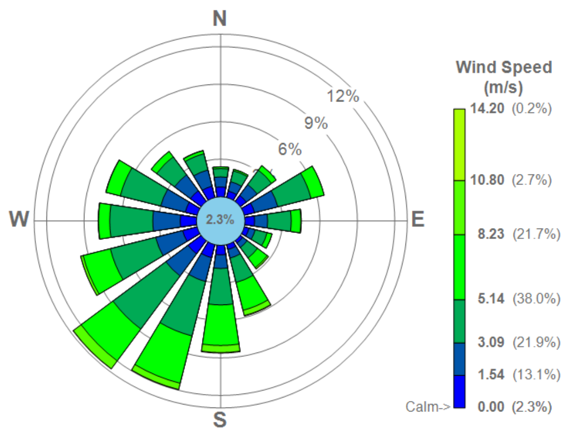
2017



2018



2019



2020

Notes	
Client	Halston / Lumcloon Energy Ltd
Project	FlexGen Castlelost
Figure Ref	Figure 2
Title	Windroses for Mullingar

tms environment ltd
53 Broomhill Drive, Tallaght, Dublin 24
Tel: +353-1-4626710

Appendix III

Detailed modelling predictions

Figure AIII.1 Isopleth showing the 99.8th percentile 1-hour NO2 (2018)

Normal Operation on Gas

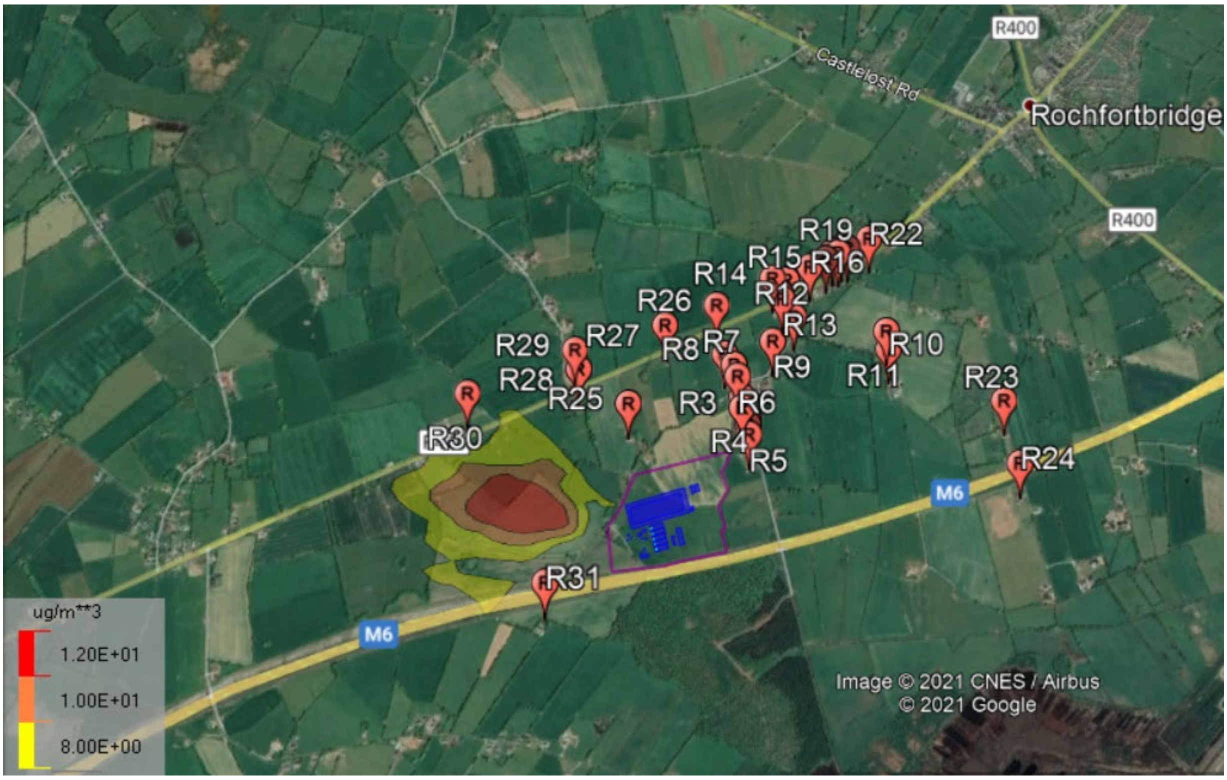


Figure AIII.2 Isopleth showing the Annual Mean NO2 (2018)

Normal Operation on Gas

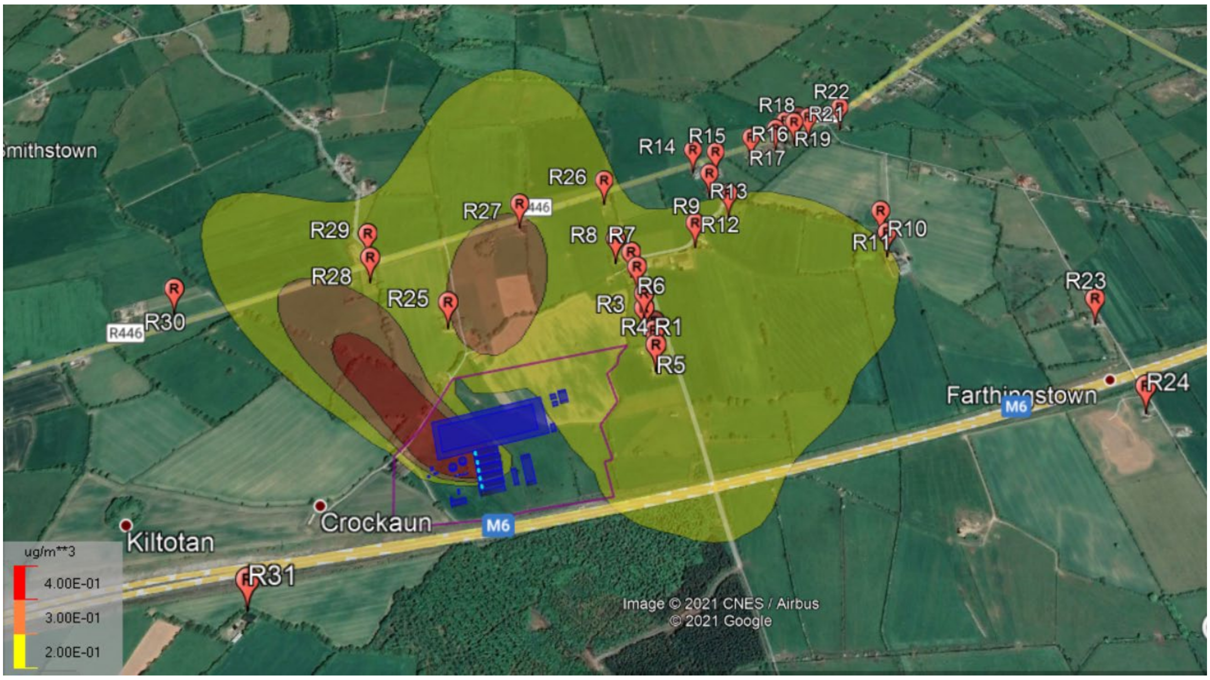


Figure AIII.3 Isopleth showing the 8-hour rolling mean CO (2018)

Normal Operation on Gas

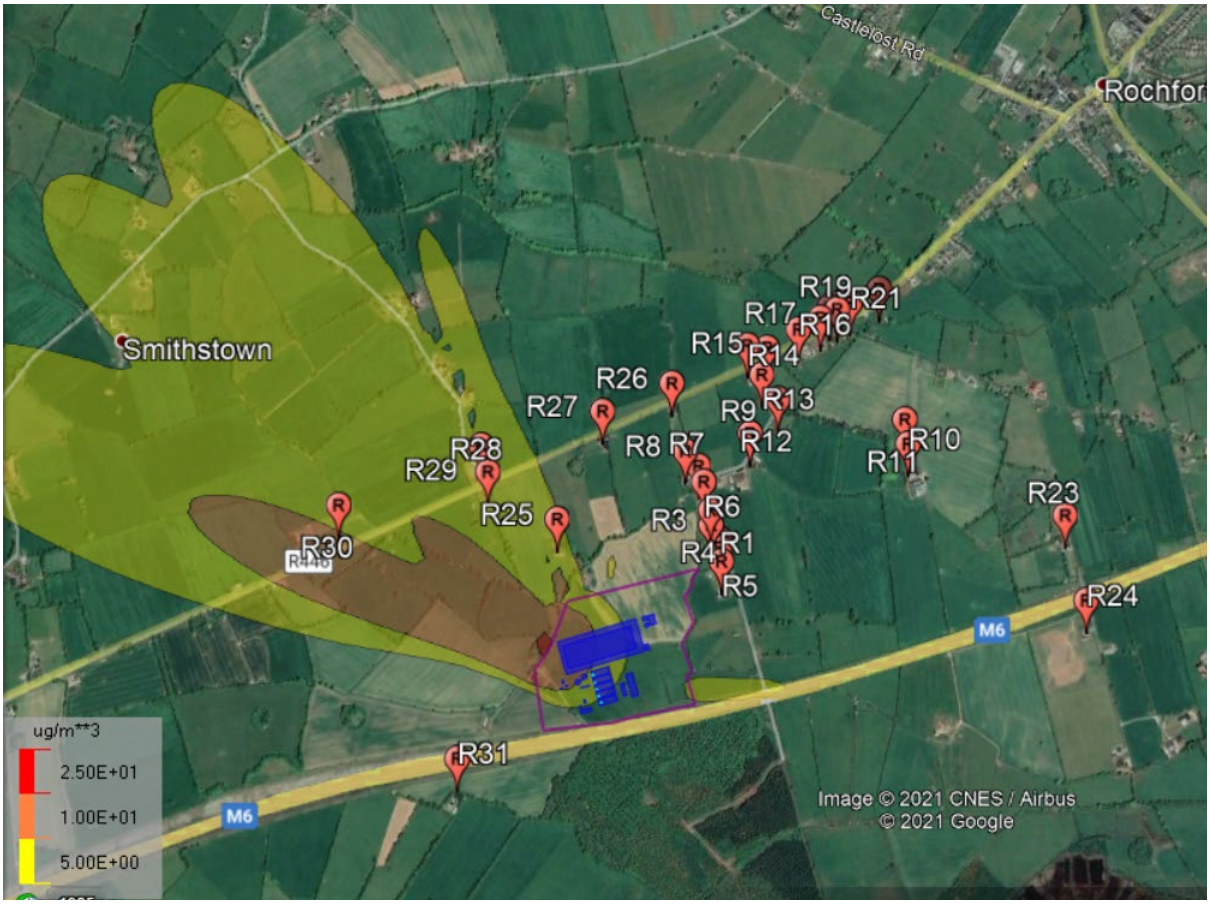


Table AIII.1 Predicted NO_2 concentrations for Worst Case Operation on Natural Gas

Meteorological data	Averaging interval	Process Contribution (PC) µg/m^3	Background concentration µg/m^3	Predicted Environmental Concentration (PEC) µg/m^3	Air Quality Standard µg/m^3	PC as % of Air Quality Standard
Mullingar 2016	99.8th %ile of 1-hour means	16.6	9.8	26.4	200	8.30%
	Annual mean	0.42	4.9	5.3	40	1.05%
Knock 2016	99.8th %ile of 1-hour means	18.6	9.8	28.4	200	9.30%
	Annual mean	0.24	4.9	5.1	40	0.60%
Dublin Airport 2016	99.8th %ile of 1-hour means	35.7	9.8	45.5	200	17.85%
	Annual mean	0.31	4.9	5.2	40	0.78%
	Annual mean	16.6	9.8	26.4	200	8.30%

NOTE

The background concentration is the annual mean when evaluating annual or daily predictions. The background concentration is twice the annual mean when evaluating hourly predictions.

Table AIII.2 Predicted NO_2 concentrations for Worst Case Operation on Natural Gas

Meteorological data	Averaging interval	Process Contribution (PC) µg/m³	Background concentration µg/m³	Predicted Environmental Concentration (PEC) µg/m³	Air Quality Standard µg/m³	PC as % of Air Quality Standard
Stack height 25m						
2016	99.8th %ile of 1-hour means	17.6	9.8	27.4	200	8.80%
	Annual mean	0.42	4.9	5.3	40	1.05%
2017	99.8th %ile of 1-hour means	18	9.8	27.8	200	9.00%
	Annual mean	0.33	4.9	5.2	40	0.83%
2018	99.8th %ile of 1-hour means	15.8	9.8	25.6	200	7.90%
	Annual mean	0.31	4.9	5.2	40	0.78%
2019	99.8th %ile of 1-hour means	18.1	9.8	27.9	200	9.05%
	Annual mean	0.26	4.9	5.2	40	0.65%
2020	99.8th %ile of 1-hour means	16.6	9.8	26.4	200	8.30%
	Annual mean	0.29	4.9	5.2	40	0.73%
Stack height 30m						
2016	99.8th %ile of 1-hour means	16.6	9.8	26.4	200	8.30%
	Annual mean	0.42	4.9	5.3	40	1.05%
2017	99.8th %ile of 1-hour means	18.2	9.8	28.0	200	9.10%
	Annual mean	0.35	4.9	5.3	40	0.88%
2018	99.8th %ile of 1-hour means	15.6	9.8	25.4	200	7.80%
	Annual mean	0.31	4.9	5.2	40	0.78%
2019	99.8th %ile of 1-hour means	15.6	9.8	25.4	200	7.80%
	Annual mean	0.26	4.9	5.2	40	0.65%
2020	99.8th %ile of 1-hour means	15.6	9.8	25.4	200	7.80%
	Annual mean	0.29	4.9	5.2	40	0.73%

NOTE

Appx III.3 Normal Operation on Gas 30m max 1-hour NO2

2020 Met Data

Pollutant: NO2, Type: CONC (ug/m**3) 1ST HIGH 1-HR AVG., Group: ALL

Sen. Rcpt. #	Dsc. Rcpt. #	Description	UTM		Conc.	Date
			East(m)	North(m)		YYMMDDHH
1	1	Residential	611861.00	5918187.00	2.65593	19100406
2	2	Residential	611861.00	5918214.00	2.16317	19100406
3	3	Residential	611833.00	5918256.00	0.9753	19100406
4	4	Residential	611830.00	5918301.00	0.64008	19031606
5	5	Residential	611868.00	5918145.00	2.94862	19100406
6	6	Residential	611807.00	5918387.00	1.52904	19031606
7	7	Residential	611789.00	5918435.00	1.79829	19031607
8	8	Residential	611747.00	5918480.00	1.58696	19061707
9	9	Residential	611945.00	5918539.00	0.8581	19031606
10	10	Residential	612432.00	5918518.00	0.97525	19100407
11	11	Residential	612420.00	5918593.00	0.94978	19053007
12	12	Residential	612028.00	5918646.00	0.60128	19031606
13	13	Residential	611976.00	5918720.00	1.06839	19031607
14	14	Residential	611929.00	5918809.00	1.39777	19061707
15	15	Residential	611990.00	5918803.00	0.97197	19031607
16	16	Residential	612085.00	5918862.00	0.63465	19031607
17	17	Residential	612152.00	5918899.00	0.37595	19060907
18	18	Residential	612178.00	5918932.00	0.37356	19060907
19	19	Residential	612203.00	5918927.00	0.38841	19060907
20	20	Residential	612215.00	5918951.00	0.38219	19060907
21	21	Residential	612242.00	5918948.00	0.38588	19060907
22	22	Residential	612331.00	5918992.00	0.4923	19053007
23	23	Residential	612920.00	5918311.00	0.06781	19052607
24	24	Residential	612990.00	5918053.00	1.04639	19030906
25	25	Residential	611360.00	5918262.00	0.70113	19022206
26	26	Residential	611700.00	5918687.00	1.92768	19061707
27	27	Residential	611489.00	5918596.00	2.3985	19081607
28	28	Residential	611142.00	5918402.00	3.05308	19072507
29	29	Commercial	611119.00	5918482.00	2.53452	19072507
30	30	Community	610687.00	5918289.00	9.57274	19041407
31	31	Residential	611078.00	5917527.00	0.47674	19050807

Appx III.4 Normal Operation on Gas 30m max 11-hour NO2

2019 Met Data

Pollutant: NO2, Type: CONC (ug/m**3) 1ST HIGH 1-HR AVG., Group: ALL

Sen. Rcpt. #	Dsc. Rcpt. #	Description	UTM		Conc.	Date
			East(m)	North(m)		YYMMDDHH
1	1	Residential	611861.00	5918187.00	2.65593	19100406
2	2	Residential	611861.00	5918214.00	2.16317	19100406
3	3	Residential	611833.00	5918256.00	0.9753	19100406
4	4	Residential	611830.00	5918301.00	0.64008	19031606
5	5	Residential	611868.00	5918145.00	2.94862	19100406
6	6	Residential	611807.00	5918387.00	1.52904	19031606
7	7	Residential	611789.00	5918435.00	1.79829	19031607
8	8	Residential	611747.00	5918480.00	1.58696	19061707
9	9	Residential	611945.00	5918539.00	0.8581	19031606
10	10	Residential	612432.00	5918518.00	0.97525	19100407
11	11	Residential	612420.00	5918593.00	0.94978	19053007
12	12	Residential	612028.00	5918646.00	0.60128	19031606
13	13	Residential	611976.00	5918720.00	1.06839	19031607
14	14	Residential	611929.00	5918809.00	1.39777	19061707
15	15	Residential	611990.00	5918803.00	0.97197	19031607
16	16	Residential	612085.00	5918862.00	0.63465	19031607
17	17	Residential	612152.00	5918899.00	0.37595	19060907
18	18	Residential	612178.00	5918932.00	0.37356	19060907
19	19	Residential	612203.00	5918927.00	0.38841	19060907
20	20	Residential	612215.00	5918951.00	0.38219	19060907
21	21	Residential	612242.00	5918948.00	0.38588	19060907
22	22	Residential	612331.00	5918992.00	0.4923	19053007
23	23	Residential	612920.00	5918311.00	0.06781	19052607
24	24	Residential	612990.00	5918053.00	1.04639	19030906
25	25	Residential	611360.00	5918262.00	0.70113	19022206
26	26	Residential	611700.00	5918687.00	1.92768	19061707
27	27	Residential	611489.00	5918596.00	2.3985	19081607
28	28	Residential	611142.00	5918402.00	3.05308	19072507
29	29	Commercial	611119.00	5918482.00	2.53452	19072507
30	30	Community	610687.00	5918289.00	9.57274	19041407
31	31	Residential	611078.00	5917527.00	0.47674	19050807

Appx III.5 Normal Operation on Gas 30m max 1-hour NO2

2018 Met Data

Pollutant: NO2, Type: CONC (ug/m3) 1ST HIGH 1-HR AVG., Group: ALL**

Sen. Rcpt. #	Dsc. Rcpt. #	Description	UTM		Conc.	Date
			East(m)	North(m)		YYMMDDHH
1	1	Residential	611861.00	5918187.00	0.18137	18061607
2	2	Residential	611861.00	5918214.00	0.19218	18061307
3	3	Residential	611833.00	5918256.00	1.15906	18121807
4	4	Residential	611830.00	5918301.00	1.93018	18121807
5	5	Residential	611868.00	5918145.00	0.42853	18061407
6	6	Residential	611807.00	5918387.00	1.95294	18121807
7	7	Residential	611789.00	5918435.00	0.72169	18121807
8	8	Residential	611747.00	5918480.00	0.74997	18101206
9	9	Residential	611945.00	5918539.00	1.11895	18121807
10	10	Residential	612432.00	5918518.00	0.57428	18061407
11	11	Residential	612420.00	5918593.00	0.21214	18061607
12	12	Residential	612028.00	5918646.00	0.74846	18121807
13	13	Residential	611976.00	5918720.00	0.49516	18061507
14	14	Residential	611929.00	5918809.00	0.46501	18061507
15	15	Residential	611990.00	5918803.00	0.48837	18061507
16	16	Residential	612085.00	5918862.00	0.42734	18061507
17	17	Residential	612152.00	5918899.00	0.36319	18061507
18	18	Residential	612178.00	5918932.00	0.3501	18061507
19	19	Residential	612203.00	5918927.00	0.31606	18061507
20	20	Residential	612215.00	5918951.00	0.31554	18061507
21	21	Residential	612242.00	5918948.00	0.27601	18061507
22	22	Residential	612331.00	5918992.00	0.25544	18061307
23	23	Residential	612920.00	5918311.00	3.75019	18061407
24	24	Residential	612990.00	5918053.00	0.60696	18061407
25	25	Residential	611360.00	5918262.00	6.87384	18121806
26	26	Residential	611700.00	5918687.00	2.07668	18100906
27	27	Residential	611489.00	5918596.00	2.35285	18110307
28	28	Residential	611142.00	5918402.00	8.61195	18011306
29	29	Commercial	611119.00	5918482.00	7.87727	18051107
30	30	Community	610687.00	5918289.00	16.00581	18112707
31	31	Residential	611078.00	5917527.00	2.33772	18030207

Appx III.6 Normal Operation on Gas 30m max one hour NO2

2017 Met Data

Pollutant: NO2, Type: CONC (ug/m3) 1ST HIGH 1-HR AVG., Group: ALL**

Sen. Rcpt. #	Dsc. Rcpt. #	Description	UTM		Conc.	Date
			East(m)	North(m)		YYMMDDHH
1	1	Residential	611861.00	5918187.00	0.46772	17060707
2	2	Residential	611861.00	5918214.00	0.45433	17060707
3	3	Residential	611833.00	5918256.00	0.56355	17060507
4	4	Residential	611830.00	5918301.00	0.87673	17112307
5	5	Residential	611868.00	5918145.00	0.44286	17060707
6	6	Residential	611807.00	5918387.00	1.86279	17112307
7	7	Residential	611789.00	5918435.00	1.67151	17112307
8	8	Residential	611747.00	5918480.00	2.10966	17022507
9	9	Residential	611945.00	5918539.00	1.44807	17112307
10	10	Residential	612432.00	5918518.00	0.49279	17060707
11	11	Residential	612420.00	5918593.00	0.57908	17060707
12	12	Residential	612028.00	5918646.00	1.04499	17112307
13	13	Residential	611976.00	5918720.00	1.09669	17112307
14	14	Residential	611929.00	5918809.00	1.40738	17061507
15	15	Residential	611990.00	5918803.00	0.89645	17061507
16	16	Residential	612085.00	5918862.00	0.85669	17061607
17	17	Residential	612152.00	5918899.00	0.85875	17060507
18	18	Residential	612178.00	5918932.00	0.8634	17060507
19	19	Residential	612203.00	5918927.00	0.91164	17060507
20	20	Residential	612215.00	5918951.00	0.90049	17060507
21	21	Residential	612242.00	5918948.00	0.91815	17060507
22	22	Residential	612331.00	5918992.00	0.88173	17060507
23	23	Residential	612920.00	5918311.00	0.27156	17061207
24	24	Residential	612990.00	5918053.00	2.11738	17022306
25	25	Residential	611360.00	5918262.00	2.62292	17012606
26	26	Residential	611700.00	5918687.00	2.22352	17061107
27	27	Residential	611489.00	5918596.00	2.11493	17051607
28	28	Residential	611142.00	5918402.00	8.05768	17092207
29	29	Commercial	611119.00	5918482.00	8.69765	17092207
30	30	Community	610687.00	5918289.00	6.38628	17020906
31	31	Residential	611078.00	5917527.00	1.36564	17021206

Appx III.7 Normal Operation on Gas 30m max one hour NO2

2016 Met Data

Pollutant: NO2, Type: CONC (ug/m3) 1ST HIGH 1-HR AVG., Group: ALL**

Sen. Rcpt. #	Dsc. Rcpt. #	Description	UTM		Conc.	Date
			East(m)	North(m)		YYMMDDHH
1	1	Residential	611861.00	5918187.00	11.62584	16012906
2	2	Residential	611861.00	5918214.00	12.63272	16012906
3	3	Residential	611833.00	5918256.00	9.75072	16012906
4	4	Residential	611830.00	5918301.00	5.42853	16012906
5	5	Residential	611868.00	5918145.00	14.52542	16012907
6	6	Residential	611807.00	5918387.00	2.79161	16020106
7	7	Residential	611789.00	5918435.00	0.97613	16070107
8	8	Residential	611747.00	5918480.00	0.68509	16070107
9	9	Residential	611945.00	5918539.00	2.44571	16020106
10	10	Residential	612432.00	5918518.00	4.09703	16012907
11	11	Residential	612420.00	5918593.00	3.07071	16012907
12	12	Residential	612028.00	5918646.00	1.76915	16020106
13	13	Residential	611976.00	5918720.00	1.42202	16070107
14	14	Residential	611929.00	5918809.00	0.97477	16070107
15	15	Residential	611990.00	5918803.00	1.29652	16070107
16	16	Residential	612085.00	5918862.00	1.40901	16070107
17	17	Residential	612152.00	5918899.00	1.37516	16070107
18	18	Residential	612178.00	5918932.00	1.36082	16070107
19	19	Residential	612203.00	5918927.00	1.31728	16070107
20	20	Residential	612215.00	5918951.00	1.3158	16070107
21	21	Residential	612242.00	5918948.00	1.23449	16070107
22	22	Residential	612331.00	5918992.00	1.0137	16070107
23	23	Residential	612920.00	5918311.00	0.09859	16062707
24	24	Residential	612990.00	5918053.00	0.22812	16061407
25	25	Residential	611360.00	5918262.00	1.35298	16091206
26	26	Residential	611700.00	5918687.00	3.58362	16012606
27	27	Residential	611489.00	5918596.00	7.01578	16012607
28	28	Residential	611142.00	5918402.00	2.61112	16100306
29	29	Commercial	611119.00	5918482.00	3.18046	16100306
30	30	Community	610687.00	5918289.00	8.76032	16081907
31	31	Residential	611078.00	5917527.00	0.12395	16052407

Appendix 10.1

Noise Impact Assessment Monitoring Data & Certificates

CERTIFICATE OF CALIBRATION

ISSUED BY **Cirrus Research plc**

DATE OF ISSUE **29 July 2020** CERTIFICATE NUMBER **144313**

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Approved signatory
M.Berezovskis
Electronically signed:

Sound Level Meter : IEC 61672-3:2013

Instrument information

Manufacturer:	Cirrus Research plc	Notes:
Model:	CR:171C	
Serial number:	G301705	
Class:	1	
Firmware version:	5.4.2889	

Test summary

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.
Periodic tests were performed in accordance with procedures from IEC 61672-3:2013.

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because (a) evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to determine that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Notes

CERTIFICATE OF CALIBRATION

Environmental conditions

The following conditions were recorded at the time of the test:

Pressure: 101.25 kPa Temperature: 20.8 °C Humidity: 46.8 %

Test equipment

Equipment	Manufacturer	Model	Serial number
Signal Generator	TTi	TGA1241	439193
Attenuator	Cirrus Research	ZE:952	80379
Environmental Monitor	Comet	T7510	17963955

Additional instrument information

Instruction manual:

Reference level range: Single range

Pattern approval: No

Source of pattern approval: -

Preamplifier

Model: MV:200F

Serial number: 10489F

Microphone

Model: MK:224

Serial number: 213012D

Test results summary

Test	Result
Internal settings adjustment	Complies
Toneburst response	Complies
Electrical noise-floor	Complies
Linearity	Complies
Frequency weightings	Complies
Frequency and time weightings at 1 kHz	Complies
C-weighted peak	Complies
Overload indication	Complies
High level stability	Complies
Long-term stability	Complies

CERTIFICATE OF CALIBRATION

ISSUED BY **Cirrus Research plc**

DATE OF ISSUE **29 July 2020** CERTIFICATE NUMBER **144315**

Cirrus Research plc
Acoustic House
Bridlington Road
Hunmanby
North Yorkshire
YO14 0PH
United Kingdom

Approved signatory
M.Berezovskis
Electronically signed:

Sound Calibrator : IEC 60942:2003

Instrument information

Manufacturer:	Cirrus Research plc	**Notes:**
Model:	CR:515	
Serial number:	93328	
Class:	1	

Test summary

The sound calibrator detailed above has been calibrated to the published data as described in the operating manual and in the half-inch configuration. The procedures and techniques used are as described in IEC 60942:2003 Annex B – Periodic Tests and three determinations of the sound pressure level, frequency and total distortion were made.

The sound pressure level was measured using a WS2F condenser microphone type MK:224 manufactured by Cirrus Research plc.

The results have been corrected to the reference pressure of 101.33 kPa using the manufacturer's data.

The manufacturer's product information indicates that this model of sound calibrator has been formally pattern approved to IEC 60942:2003 Annex A to Class 1. This has been confirmed with the PhysikalischTechnische Bundesanstalt (PTB).

As public evidence was available, from a testing organisation responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the Class 1 requirements of IEC 60942:2003.

Notes:

CERTIFICATE OF CALIBRATION

Environmental conditions

The following conditions were recorded at the time of the test:

Pressure: 101.40 kPa
Temperature: 23.9 °C
Humidity: 50.9 %

Test equipment

Equipment	Manufacturer	Model	Serial number
Acoustic Calibrator	Bruel and Kjaer	4231	1795641
Distortion Meter	Keithley	2015	1175401
Multimeter	Fluke	8845A	9440017

Results

	Expected	Sample 1	Sample 2	Sample 3	Average	Deviation	Limits	Uncertainty
Level (dB)	94.00	94.00	94.02	93.97	**94.00**	0.00	±0.40	0.11 dB
Distortion (%)	< 3.00	1.36	1.30	1.25	**1.30**	1.30	+3.00	0.13 %
Frequency (Hz)	1000.0	1000.0	1000.0	1000.0	**1000.0**	0.0	±10.0	0.1 Hz

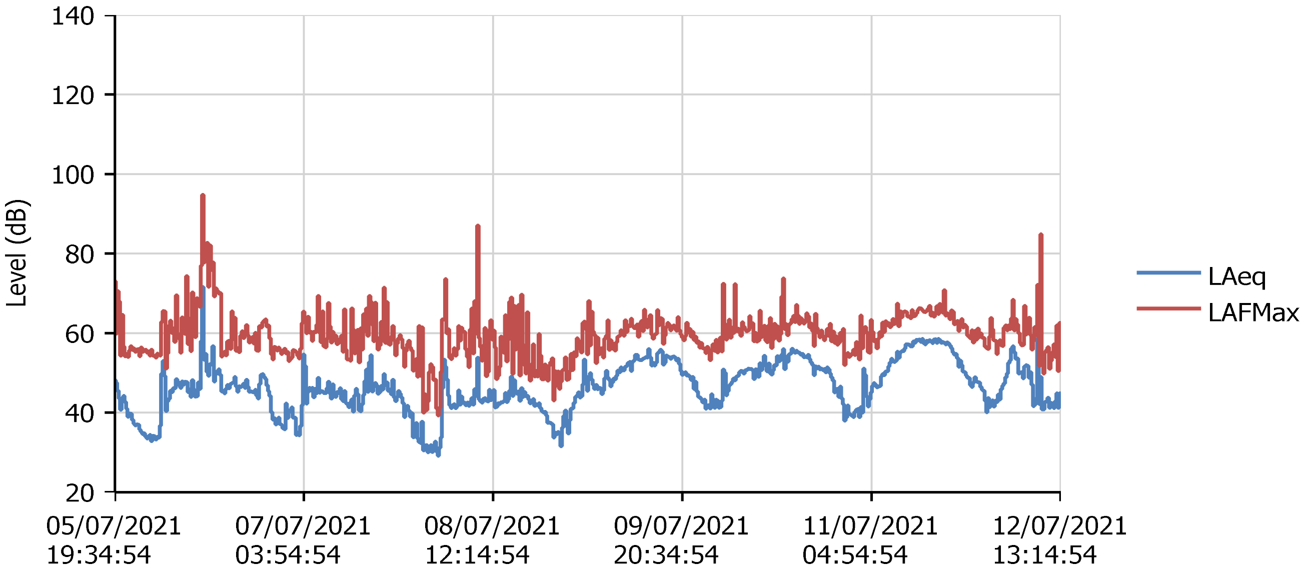
The measured quantities or deviations (as applicable), extended by the expanded combined uncertainty of measurement, must not exceed the corresponding tolerance.

End of results

Measurement List Report

Name SEP-0347 (NSR-101)
Start Time 05/07/2021 19:34:54
End Time 12/07/2021 13:15:01

Calibration Before	30/06/2021 13:23:04	Offset	-0.16 dB
Calibration After	13/07/2021 10:16:58	Offset	0.66 dB



Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
05/07/2021 19:34:54	05/07/2021 19:45:01	00:10:07	48.1	73.0	54.5	51.1	50.0	46.7	40.3	38.5	34.1
05/07/2021 19:45:01	05/07/2021 20:00:01	00:15:00	47.5	59.9	54.2	51.6	50.6	46.1	39.4	38.1	36.1
05/07/2021 20:00:01	05/07/2021 20:15:01	00:15:00	45.5	70.6	55.0	49.8	47.5	41.6	35.5	34.3	32.7
05/07/2021 20:15:02	05/07/2021 20:30:02	00:15:00	43.6	67.9	49.7	45.9	44.8	40.7	36.7	35.7	33.8
05/07/2021 20:30:01	05/07/2021 20:45:01	00:15:00	40.8	54.3	48.4	46.0	44.6	38.0	34.2	33.4	32.3
05/07/2021 20:45:01	05/07/2021 21:00:01	00:15:00	43.7	64.6	50.0	47.0	45.7	42.7	39.3	38.5	37.7
05/07/2021 21:00:01	05/07/2021 21:15:01	00:15:00	44.2	56.6	49.4	47.4	46.5	43.4	40.3	39.4	37.7
05/07/2021 21:15:02	05/07/2021 21:30:02	00:15:00	42.6	54.2	49.7	47.4	46.0	40.8	34.4	32.5	29.0
05/07/2021 21:30:01	05/07/2021 21:45:01	00:15:00	41.0	54.7	48.9	45.9	44.5	38.9	31.4	29.2	26.4
05/07/2021 21:45:01	05/07/2021 22:00:01	00:15:00	39.0	54.1	47.6	44.0	42.6	35.7	29.2	27.9	26.4
05/07/2021 22:00:01	05/07/2021 22:15:01	00:15:00	39.8	55.6	50.1	45.3	42.5	36.4	31.9	30.6	27.6
05/07/2021 22:15:01	05/07/2021 22:30:01	00:15:00	39.7	56.7	50.5	44.5	42.0	36.2	30.8	29.2	26.7
05/07/2021 22:30:01	05/07/2021 22:45:01	00:15:00	38.2	55.8	50.4	42.4	40.0	32.8	26.4	23.3	20.4

05/07/2021 22:45:01	05/07/2021 23:00:01	00:15:00	37.2	56.1	49.3	42.3	39.5	31.4	23.4	20.8	20.0
05/07/2021 23:00:01	05/07/2021 23:15:01	00:15:00	36.8	55.3	48.6	42.0	38.8	31.5	26.3	24.8	21.2
05/07/2021 23:15:01	05/07/2021 23:30:01	00:15:00	37.0	55.9	47.1	42.9	40.5	32.0	25.7	24.4	22.4
05/07/2021 23:30:01	05/07/2021 23:45:01	00:15:00	37.0	56.0	46.2	42.5	40.9	32.1	25.9	24.7	23.2
05/07/2021 23:45:01	06/07/2021 00:00:01	00:15:00	35.7	54.2	47.0	41.9	39.1	30.0	24.5	22.7	20.7
06/07/2021 00:00:01	06/07/2021 00:15:01	00:15:00	35.2	56.4	45.5	40.3	38.3	31.3	22.8	20.6	20.0
06/07/2021 00:15:01	06/07/2021 00:30:01	00:15:00	34.6	55.4	46.2	38.9	35.9	30.0	23.5	21.8	20.2
06/07/2021 00:30:01	06/07/2021 00:45:01	00:15:00	34.8	55.7	45.6	39.0	37.1	30.2	22.0	20.0	20.0
06/07/2021 00:45:01	06/07/2021 01:00:01	00:15:00	34.0	55.8	45.6	39.0	36.5	28.3	21.8	20.0	20.0
06/07/2021 01:00:01	06/07/2021 01:15:01	00:15:00	33.5	55.1	45.4	36.7	34.5	28.4	20.1	20.0	20.0
06/07/2021 01:15:01	06/07/2021 01:30:01	00:15:00	34.1	55.4	45.1	37.9	35.3	29.7	23.4	22.0	20.3
06/07/2021 01:30:01	06/07/2021 01:45:01	00:15:00	34.4	54.3	45.0	38.1	36.8	30.3	20.8	20.0	20.0
06/07/2021 01:45:01	06/07/2021 02:00:01	00:15:00	32.9	55.8	43.8	37.7	35.4	27.1	22.0	21.1	20.0
06/07/2021 02:00:01	06/07/2021 02:15:01	00:15:00	34.1	54.4	44.4	38.7	36.9	30.3	22.1	20.6	20.0
06/07/2021 02:15:01	06/07/2021 02:30:01	00:15:00	34.1	54.3	45.7	38.7	36.5	28.3	23.1	22.0	20.4
06/07/2021 02:30:01	06/07/2021 02:45:01	00:15:00	33.3	53.9	43.8	37.5	35.5	29.6	22.4	20.8	20.0
06/07/2021 02:45:01	06/07/2021 03:00:01	00:15:00	33.9	54.8	43.8	37.9	36.2	30.1	25.1	23.7	21.4
06/07/2021 03:00:01	06/07/2021 03:15:01	00:15:00	33.8	54.6	43.6	37.7	36.1	30.3	25.9	24.9	23.6
06/07/2021 03:15:01	06/07/2021 03:30:01	00:15:00	36.8	54.3	46.8	41.0	39.2	33.9	27.6	25.9	23.8
06/07/2021 03:30:01	06/07/2021 03:45:01	00:15:00	49.7	62.8	59.1	57.0	55.6	39.2	33.5	32.0	28.8
06/07/2021 03:45:01	06/07/2021 04:00:01	00:15:00	53.0	65.6	60.4	58.7	57.6	45.8	37.4	35.7	32.7
06/07/2021 04:00:01	06/07/2021 04:15:01	00:15:00	49.2	65.4	59.6	57.1	55.1	40.3	33.8	32.0	29.3
06/07/2021 04:15:01	06/07/2021 04:30:01	00:15:00	40.5	51.2	46.5	44.8	43.8	39.0	33.4	32.2	29.7
06/07/2021 04:30:02	06/07/2021 04:45:02	00:15:00	42.8	54.9	48.7	46.5	45.4	41.8	38.3	36.9	34.0
06/07/2021 04:45:01	06/07/2021 05:00:01	00:15:00	43.5	61.8	48.6	46.2	45.4	42.4	39.2	38.0	35.7
06/07/2021 05:00:01	06/07/2021 05:15:01	00:15:00	45.5	63.1	56.3	50.1	46.0	42.6	39.6	38.8	37.5
06/07/2021 05:15:01	06/07/2021 05:30:01	00:15:00	45.2	60.1	50.9	48.0	47.3	44.3	41.1	40.3	38.8
06/07/2021 05:30:01	06/07/2021 05:45:01	00:15:00	46.1	61.2	52.2	49.1	48.2	45.1	42.5	41.7	40.3
06/07/2021 05:45:01	06/07/2021 06:00:01	00:15:00	46.1	57.8	50.5	48.9	48.0	45.6	43.1	42.1	40.6
06/07/2021 06:00:01	06/07/2021 06:15:01	00:15:00	48.4	69.4	53.6	51.7	50.6	47.4	44.6	43.9	42.8
06/07/2021 06:15:02	06/07/2021 06:30:02	00:15:00	47.8	59.8	53.4	50.7	49.8	47.0	44.4	43.6	42.3
06/07/2021 06:30:01	06/07/2021 06:45:01	00:15:00	46.9	58.6	51.7	49.5	48.6	46.3	44.1	43.4	42.4
06/07/2021 06:45:01	06/07/2021 07:00:01	00:15:00	46.2	55.1	50.5	48.9	48.1	45.6	43.6	43.1	41.7
06/07/2021 07:00:01	06/07/2021 07:15:01	00:15:00	47.8	64.0	52.6	50.6	49.8	47.1	44.8	44.2	43.0

06/07/2021 07:15:02	06/07/2021 07:30:02	00:15:00	47.0	61.5	52.5	50.1	49.1	46.2	43.6	42.9	41.7
06/07/2021 07:30:01	06/07/2021 07:45:01	00:15:00	47.7	59.8	53.4	50.8	49.8	46.8	44.4	43.7	42.7
06/07/2021 07:45:01	06/07/2021 08:00:01	00:15:00	47.7	74.3	54.3	50.6	49.5	45.7	41.9	41.0	39.6
06/07/2021 08:00:01	06/07/2021 08:15:01	00:15:00	45.2	57.2	51.3	48.7	47.5	44.2	41.6	40.9	40.0
06/07/2021 08:15:01	06/07/2021 08:30:01	00:15:00	45.8	63.6	53.0	49.5	48.0	44.2	41.4	40.6	38.9
06/07/2021 08:30:01	06/07/2021 08:45:01	00:15:00	44.0	55.5	49.2	47.1	46.1	43.2	40.5	39.7	38.2
06/07/2021 08:45:01	06/07/2021 09:00:01	00:15:00	48.1	70.2	59.9	49.8	47.8	43.2	39.9	39.1	37.5
06/07/2021 09:00:01	06/07/2021 09:15:01	00:15:00	45.8	60.6	52.7	49.6	48.2	44.4	41.7	41.1	39.9
06/07/2021 09:15:01	06/07/2021 09:30:01	00:15:00	44.0	59.0	50.2	47.9	46.7	42.9	39.3	38.3	37.3
06/07/2021 09:30:01	06/07/2021 09:45:01	00:15:00	44.2	68.8	53.3	47.5	45.3	40.5	37.6	36.8	35.7
06/07/2021 09:45:01	06/07/2021 10:00:01	00:15:00	47.6	67.6	58.8	52.1	49.1	43.7	40.3	39.7	38.2
06/07/2021 10:00:01	06/07/2021 10:15:01	00:15:00	45.9	66.7	56.1	51.3	47.9	41.9	38.1	37.0	35.2
06/07/2021 10:15:02	06/07/2021 10:30:02	00:15:00	58.0	76.9	69.2	65.2	62.5	47.0	42.0	40.9	39.4
06/07/2021 10:30:01	06/07/2021 10:45:01	00:15:00	71.6	94.7	86.6	62.2	54.8	44.6	40.4	39.3	37.8
06/07/2021 10:45:01	06/07/2021 11:00:01	00:15:00	53.3	77.8	65.2	53.8	48.8	42.9	39.7	38.9	37.6
06/07/2021 11:00:01	06/07/2021 11:15:01	00:15:00	54.8	80.4	63.5	52.0	47.4	41.8	39.2	38.7	37.5
06/07/2021 11:15:01	06/07/2021 11:30:01	00:15:00	50.2	82.7	60.0	51.8	49.0	44.4	41.4	41.0	40.4
06/07/2021 11:30:01	06/07/2021 11:45:01	00:15:00	49.3	71.6	57.6	52.6	51.5	46.1	42.0	41.0	39.6
06/07/2021 11:45:01	06/07/2021 12:00:01	00:15:00	52.2	82.1	61.5	52.8	49.6	43.9	41.2	40.7	39.9
06/07/2021 12:00:01	06/07/2021 12:15:01	00:15:00	52.1	75.9	63.5	54.9	52.1	46.2	42.3	41.5	40.2
06/07/2021 12:15:01	06/07/2021 12:30:01	00:15:00	56.6	77.7	69.4	63.0	58.7	47.0	42.2	41.5	40.5
06/07/2021 12:30:01	06/07/2021 12:45:01	00:15:00	47.8	69.2	58.6	51.2	49.1	45.5	41.5	40.9	39.9
06/07/2021 12:45:01	06/07/2021 13:00:01	00:15:00	50.2	71.3	61.5	54.4	51.4	45.7	41.8	41.1	40.1
06/07/2021 13:00:01	06/07/2021 13:15:01	00:15:00	49.8	70.6	61.2	52.6	50.0	45.1	42.0	41.4	40.6
06/07/2021 13:15:01	06/07/2021 13:30:01	00:15:00	50.9	69.9	61.0	56.3	53.6	46.9	44.2	43.8	43.2
06/07/2021 13:30:01	06/07/2021 13:45:01	00:15:00	49.5	70.0	59.0	53.9	51.6	45.7	41.2	40.4	39.5
06/07/2021 13:45:01	06/07/2021 14:00:01	00:15:00	45.3	54.1	50.2	48.4	47.6	44.7	41.1	40.3	39.5
06/07/2021 14:00:01	06/07/2021 14:15:01	00:15:00	45.4	55.0	50.6	48.1	47.2	44.7	42.8	42.1	41.2
06/07/2021 14:15:01	06/07/2021 14:30:01	00:15:00	44.9	55.3	49.9	47.8	46.8	44.1	42.1	41.6	40.9
06/07/2021 14:30:02	06/07/2021 14:45:02	00:15:00	46.0	54.4	50.6	49.2	48.2	45.4	42.4	41.7	40.7
06/07/2021 14:45:01	06/07/2021 15:00:01	00:15:00	46.9	57.9	52.4	50.1	49.2	46.2	42.5	41.8	40.9
06/07/2021 15:00:01	06/07/2021 15:15:01	00:15:00	46.2	58.0	50.4	48.4	47.8	45.7	43.7	43.2	42.3
06/07/2021 15:15:01	06/07/2021 15:30:01	00:15:00	47.2	56.0	52.4	50.6	49.6	46.3	43.5	43.0	41.9
06/07/2021 15:30:02	06/07/2021 15:45:02	00:15:00	47.4	65.5	52.8	50.0	49.1	46.5	43.6	42.9	42.1

06/07/2021 15:45:01	06/07/2021 16:00:01	00:15:00	47.6	58.6	53.1	51.5	50.4	46.2	44.2	43.9	43.3
06/07/2021 16:00:01	06/07/2021 16:15:01	00:15:00	49.0	63.9	57.3	53.0	51.5	47.2	44.6	44.0	43.0
06/07/2021 16:15:01	06/07/2021 16:30:01	00:15:00	46.6	55.6	52.0	50.3	49.3	45.5	42.8	42.3	41.3
06/07/2021 16:30:02	06/07/2021 16:45:02	00:15:00	45.3	56.2	50.5	48.6	47.5	44.3	41.8	41.3	40.4
06/07/2021 16:45:01	06/07/2021 17:00:01	00:15:00	46.6	55.2	52.1	49.9	48.9	46.0	42.2	41.5	40.3
06/07/2021 17:00:01	06/07/2021 17:15:01	00:15:00	46.4	59.3	51.9	49.8	48.7	45.3	42.9	42.4	41.9
06/07/2021 17:15:01	06/07/2021 17:30:01	00:15:00	46.8	60.5	53.3	50.8	49.5	45.4	42.7	42.1	40.8
06/07/2021 17:30:02	06/07/2021 17:45:02	00:15:00	47.3	58.8	52.2	50.4	49.4	46.5	44.3	43.8	43.1
06/07/2021 17:45:01	06/07/2021 18:00:01	00:15:00	46.2	60.1	53.1	50.5	49.2	44.4	40.9	40.0	38.8
06/07/2021 18:00:01	06/07/2021 18:15:01	00:15:00	48.3	62.0	57.4	54.7	52.0	44.9	41.2	39.8	37.5
06/07/2021 18:15:02	06/07/2021 18:30:02	00:15:00	46.4	59.4	52.4	50.3	49.2	45.2	42.0	41.5	40.6
06/07/2021 18:30:01	06/07/2021 18:45:01	00:15:00	45.3	57.7	51.8	49.4	48.2	43.7	40.4	39.8	38.3
06/07/2021 18:45:01	06/07/2021 19:00:01	00:15:00	45.4	58.8	54.0	50.5	48.8	42.2	38.6	37.7	36.6
06/07/2021 19:00:01	06/07/2021 19:15:01	00:15:00	45.2	59.0	52.8	49.7	48.1	43.4	39.2	38.1	36.5
06/07/2021 19:15:02	06/07/2021 19:30:02	00:15:00	45.1	57.4	51.8	49.5	48.2	43.3	39.1	38.1	36.8
06/07/2021 19:30:01	06/07/2021 19:45:01	00:15:00	45.7	60.1	52.7	50.1	48.7	44.2	39.6	38.4	37.1
06/07/2021 19:45:01	06/07/2021 20:00:01	00:15:00	44.3	55.7	50.7	48.5	47.3	42.9	38.7	37.9	36.3
06/07/2021 20:00:01	06/07/2021 20:15:01	00:15:00	43.6	55.6	49.8	47.4	46.1	42.2	39.5	38.7	37.8
06/07/2021 20:15:02	06/07/2021 20:30:02	00:15:00	47.2	61.7	52.9	50.3	49.4	46.4	42.8	42.0	40.8
06/07/2021 20:30:01	06/07/2021 20:45:01	00:15:00	49.5	61.4	55.2	53.6	52.5	48.1	45.6	45.0	43.9
06/07/2021 20:45:01	06/07/2021 21:00:01	00:15:00	49.7	62.7	54.9	52.8	52.1	48.7	46.3	45.7	44.5
06/07/2021 21:00:01	06/07/2021 21:15:01	00:15:00	48.9	63.1	56.5	53.0	51.4	47.4	44.5	43.8	42.5
06/07/2021 21:15:02	06/07/2021 21:30:02	00:15:00	48.5	63.5	54.8	52.1	51.2	47.2	44.0	43.4	42.3
06/07/2021 21:30:01	06/07/2021 21:45:01	00:15:00	46.9	61.7	53.6	50.5	49.3	45.6	42.7	42.0	40.9
06/07/2021 21:45:01	06/07/2021 22:00:01	00:15:00	45.4	61.9	53.0	49.7	48.0	43.6	40.6	39.9	38.7
06/07/2021 22:00:01	06/07/2021 22:15:01	00:15:00	44.2	58.7	51.9	49.1	47.5	42.1	37.1	35.7	32.7
06/07/2021 22:15:02	06/07/2021 22:30:02	00:15:00	40.1	54.7	49.7	45.9	43.8	35.9	30.4	29.5	27.9
06/07/2021 22:30:01	06/07/2021 22:45:01	00:15:00	38.2	53.3	48.8	44.1	41.2	34.1	29.5	28.7	27.6
06/07/2021 22:45:01	06/07/2021 23:00:01	00:15:00	38.6	56.5	50.7	44.9	40.7	32.0	27.2	26.4	25.3
06/07/2021 23:00:01	06/07/2021 23:15:01	00:15:00	37.0	56.4	49.7	42.7	39.3	29.2	24.2	23.3	22.4
06/07/2021 23:15:02	06/07/2021 23:30:02	00:15:00	37.3	55.7	49.4	42.3	39.0	31.7	25.6	24.5	22.6
06/07/2021 23:30:01	06/07/2021 23:45:01	00:15:00	38.8	56.3	51.1	44.5	41.2	32.7	26.2	25.0	23.9
06/07/2021 23:45:01	07/07/2021 00:00:01	00:15:00	37.2	55.7	48.7	43.1	39.5	31.7	26.7	25.7	24.3
07/07/2021 00:00:01	07/07/2021 00:15:01	00:15:00	36.9	54.8	48.0	42.3	39.2	32.5	25.7	24.5	22.9

07/07/2021 00:15:02	07/07/2021 00:30:02	00:15:00	36.1	55.6	47.5	41.6	38.7	29.6	24.4	23.6	22.5
07/07/2021 00:30:01	07/07/2021 00:45:01	00:15:00	35.8	56.0	48.6	41.5	37.0	27.5	22.4	21.4	20.5
07/07/2021 00:45:01	07/07/2021 01:00:01	00:15:00	42.3	54.9	50.5	47.5	45.9	39.8	32.5	28.9	24.9
07/07/2021 01:00:01	07/07/2021 01:15:01	00:15:00	38.7	55.2	47.9	44.7	42.6	34.7	28.3	27.0	24.9
07/07/2021 01:15:02	07/07/2021 01:30:02	00:15:00	40.5	53.0	49.7	47.5	45.3	34.8	27.4	25.7	22.5
07/07/2021 01:30:01	07/07/2021 01:45:01	00:15:00	40.2	53.5	48.7	45.6	43.3	38.1	33.1	31.1	28.5
07/07/2021 01:45:01	07/07/2021 02:00:01	00:15:00	41.3	53.9	49.3	46.5	44.9	38.8	31.9	29.9	27.3
07/07/2021 02:00:01	07/07/2021 02:15:01	00:15:00	38.7	55.7	49.6	45.7	43.0	31.1	24.8	23.9	22.5
07/07/2021 02:15:02	07/07/2021 02:30:02	00:15:00	38.8	55.5	49.0	45.5	43.3	31.7	24.6	23.7	22.7
07/07/2021 02:30:01	07/07/2021 02:45:01	00:15:00	34.4	55.2	45.7	39.4	37.5	28.3	21.3	20.4	20.0
07/07/2021 02:45:01	07/07/2021 03:00:01	00:15:00	34.9	54.4	46.6	40.7	37.0	28.8	23.3	22.4	20.8
07/07/2021 03:00:01	07/07/2021 03:15:01	00:15:00	34.3	53.6	46.3	38.8	36.6	28.4	23.5	22.5	20.9
07/07/2021 03:15:02	07/07/2021 03:30:02	00:15:00	36.6	56.0	45.8	40.0	38.9	34.8	26.6	24.3	22.0
07/07/2021 03:30:01	07/07/2021 03:45:01	00:15:00	41.9	62.5	55.4	43.1	41.3	37.2	32.2	30.3	27.4
07/07/2021 03:45:01	07/07/2021 04:00:01	00:15:00	54.6	65.4	60.9	59.2	58.2	53.6	36.7	34.7	30.5
07/07/2021 04:00:01	07/07/2021 04:15:01	00:15:00	51.7	63.1	59.0	57.2	56.1	46.6	34.4	32.7	30.1
07/07/2021 04:15:02	07/07/2021 04:30:02	00:15:00	42.3	60.0	53.8	46.7	43.8	38.8	34.6	33.4	30.7
07/07/2021 04:30:01	07/07/2021 04:45:01	00:15:00	45.3	64.1	55.4	51.8	48.9	39.9	35.6	34.6	32.0
07/07/2021 04:45:01	07/07/2021 05:00:01	00:15:00	46.2	60.1	55.4	52.0	49.5	42.9	39.1	38.3	36.5
07/07/2021 05:00:01	07/07/2021 05:15:01	00:15:00	45.6	60.3	53.7	50.3	48.7	43.1	39.0	38.1	35.8
07/07/2021 05:15:02	07/07/2021 05:30:02	00:15:00	46.3	58.1	54.3	52.1	50.3	42.9	39.5	38.9	38.0
07/07/2021 05:30:01	07/07/2021 05:45:01	00:15:00	43.9	60.3	51.8	47.9	46.3	42.1	39.2	38.6	37.3
07/07/2021 05:45:01	07/07/2021 06:00:01	00:15:00	46.0	60.2	53.2	50.3	48.5	44.3	42.1	41.7	40.6
07/07/2021 06:00:01	07/07/2021 06:15:01	00:15:00	44.9	62.1	53.0	48.8	47.0	43.4	41.0	40.4	39.1
07/07/2021 06:15:02	07/07/2021 06:30:02	00:15:00	48.7	69.3	57.5	53.5	51.2	46.2	43.0	42.4	41.2
07/07/2021 06:30:01	07/07/2021 06:45:01	00:15:00	45.0	60.1	51.6	48.7	47.3	43.9	41.5	40.8	39.8
07/07/2021 06:45:01	07/07/2021 07:00:01	00:15:00	45.4	57.7	52.8	49.6	48.1	43.9	41.3	40.5	39.3
07/07/2021 07:00:02	07/07/2021 07:15:02	00:15:00	45.3	65.4	53.3	49.4	47.9	43.3	40.5	39.6	37.8
07/07/2021 07:15:01	07/07/2021 07:30:01	00:15:00	44.9	56.7	51.7	48.9	47.7	43.5	40.3	39.7	38.7
07/07/2021 07:30:01	07/07/2021 07:45:01	00:15:00	44.9	56.5	51.4	48.7	47.3	43.7	41.0	40.5	39.4
07/07/2021 07:45:01	07/07/2021 08:00:01	00:15:00	46.1	58.6	52.9	50.3	49.1	44.2	41.3	40.8	40.1
07/07/2021 08:00:02	07/07/2021 08:15:02	00:15:00	47.7	67.6	56.5	50.7	49.4	45.4	42.2	41.4	39.8
07/07/2021 08:15:01	07/07/2021 08:30:01	00:15:00	44.9	61.7	53.2	49.8	48.1	42.4	38.8	37.8	36.3
07/07/2021 08:30:01	07/07/2021 08:45:01	00:15:00	43.6	57.6	51.8	48.2	46.5	41.5	37.4	36.6	35.2

07/07/2021 08:45:01	07/07/2021 09:00:01	00:15:00	47.1	60.3	55.4	52.4	50.7	44.2	40.0	39.3	38.3
07/07/2021 09:00:02	07/07/2021 09:15:02	00:15:00	44.2	58.3	53.5	49.4	47.1	41.3	37.9	37.2	35.7
07/07/2021 09:15:01	07/07/2021 09:30:01	00:15:00	43.9	59.3	51.2	48.5	47.2	41.9	37.7	36.6	35.0
07/07/2021 09:30:01	07/07/2021 09:45:01	00:15:00	45.1	57.2	52.8	49.9	48.0	43.1	39.6	39.0	37.9
07/07/2021 09:45:01	07/07/2021 10:00:01	00:15:00	44.9	57.6	53.0	50.2	48.8	41.6	38.2	37.1	35.3
07/07/2021 10:00:02	07/07/2021 10:15:02	00:15:00	46.1	58.6	54.2	51.2	49.6	43.6	38.4	37.2	35.1
07/07/2021 10:15:01	07/07/2021 10:30:01	00:15:00	43.4	59.3	50.2	47.9	46.6	41.5	38.1	37.5	36.2
07/07/2021 10:30:01	07/07/2021 10:45:01	00:15:00	43.0	55.3	50.2	47.6	46.1	41.0	37.5	36.8	35.4
07/07/2021 10:45:02	07/07/2021 11:00:02	00:15:00	45.4	66.0	52.8	49.1	47.5	42.0	38.2	37.6	36.3
07/07/2021 11:00:01	07/07/2021 11:15:01	00:15:00	42.4	55.8	50.3	47.5	45.7	40.0	37.1	36.5	35.6
07/07/2021 11:15:01	07/07/2021 11:30:01	00:15:00	42.1	53.4	48.0	46.2	45.1	40.6	37.3	36.7	35.7
07/07/2021 11:30:01	07/07/2021 11:45:01	00:15:00	41.4	53.4	48.1	45.5	44.3	39.8	37.5	37.0	36.1
07/07/2021 11:45:02	07/07/2021 12:00:02	00:15:00	42.6	53.1	48.3	46.1	45.1	41.4	39.4	38.5	36.7
07/07/2021 12:00:01	07/07/2021 12:15:01	00:15:00	43.3	66.2	48.7	45.6	44.3	40.6	37.7	36.9	35.6
07/07/2021 12:15:01	07/07/2021 12:30:01	00:15:00	40.3	60.9	45.7	43.6	42.7	39.2	35.4	34.5	33.2
07/07/2021 12:30:01	07/07/2021 12:45:01	00:15:00	44.3	54.9	51.5	49.1	47.7	42.3	37.6	36.4	34.4
07/07/2021 12:45:01	07/07/2021 13:00:01	00:15:00	45.9	57.0	53.1	50.6	49.2	43.9	40.7	40.0	38.3
07/07/2021 13:00:01	07/07/2021 13:15:01	00:15:00	44.6	60.8	54.5	48.2	46.5	42.5	39.5	38.9	37.1
07/07/2021 13:15:01	07/07/2021 13:30:01	00:15:00	40.6	52.6	46.3	44.3	43.1	39.5	36.7	36.0	34.6
07/07/2021 13:30:01	07/07/2021 13:45:01	00:15:00	40.4	61.2	47.5	44.1	42.6	39.0	35.9	35.2	34.2
07/07/2021 13:45:01	07/07/2021 14:00:01	00:15:00	42.1	55.9	48.9	46.1	44.8	40.6	37.7	36.9	35.0
07/07/2021 14:00:01	07/07/2021 14:15:01	00:15:00	44.5	64.7	54.5	46.9	45.4	41.8	39.0	38.4	37.6
07/07/2021 14:15:01	07/07/2021 14:30:01	00:15:00	47.9	60.6	56.6	53.2	51.7	44.8	39.4	38.4	36.3
07/07/2021 14:30:01	07/07/2021 14:45:01	00:15:00	50.8	66.2	56.9	55.0	53.9	49.6	43.4	41.4	40.2
07/07/2021 14:45:01	07/07/2021 15:00:01	00:15:00	45.2	59.3	53.5	49.8	48.1	43.0	39.7	39.1	37.9
07/07/2021 15:00:01	07/07/2021 15:15:01	00:15:00	52.6	69.3	64.0	61.0	56.0	43.5	39.8	39.0	37.9
07/07/2021 15:15:01	07/07/2021 15:30:01	00:15:00	54.4	67.9	64.2	61.1	59.3	47.5	40.6	39.6	38.0
07/07/2021 15:30:01	07/07/2021 15:45:01	00:15:00	45.3	62.1	51.8	49.3	48.0	43.9	40.5	39.8	38.6
07/07/2021 15:45:01	07/07/2021 16:00:01	00:15:00	46.5	57.9	53.7	51.2	49.8	44.5	40.2	39.6	38.8
07/07/2021 16:00:01	07/07/2021 16:15:01	00:15:00	47.5	67.7	58.6	51.0	49.1	43.7	39.9	39.2	37.2
07/07/2021 16:15:01	07/07/2021 16:30:01	00:15:00	46.8	58.9	53.7	51.5	49.9	45.1	41.1	40.0	39.1
07/07/2021 16:30:01	07/07/2021 16:45:01	00:15:00	44.8	55.9	51.0	48.7	47.2	43.5	40.8	40.2	39.0
07/07/2021 16:45:01	07/07/2021 17:00:01	00:15:00	45.2	56.9	51.5	49.0	47.8	43.9	40.4	39.6	38.1
07/07/2021 17:00:01	07/07/2021 17:15:01	00:15:00	46.7	62.8	53.6	51.1	49.6	45.0	41.4	40.5	39.4

07/07/2021 17:15:01	07/07/2021 17:30:01	00:15:00	45.8	58.2	51.9	49.7	48.5	44.6	40.9	40.4	39.4
07/07/2021 17:30:01	07/07/2021 17:45:01	00:15:00	49.7	71.4	61.3	52.7	50.9	44.8	41.0	40.4	39.6
07/07/2021 17:45:01	07/07/2021 18:00:01	00:15:00	46.9	57.5	54.4	51.7	50.2	44.7	41.7	41.3	40.5
07/07/2021 18:00:01	07/07/2021 18:15:01	00:15:00	47.6	67.8	57.1	52.5	50.1	44.3	40.6	40.2	39.4
07/07/2021 18:15:01	07/07/2021 18:30:01	00:15:00	45.5	57.3	53.2	50.0	48.5	43.7	40.1	39.6	38.6
07/07/2021 18:30:01	07/07/2021 18:45:01	00:15:00	45.8	57.1	53.0	50.4	48.8	44.0	40.3	39.3	38.1
07/07/2021 18:45:01	07/07/2021 19:00:01	00:15:00	44.6	59.1	52.0	49.2	47.6	42.6	39.6	39.0	37.9
07/07/2021 19:00:01	07/07/2021 19:15:01	00:15:00	48.3	61.8	58.8	53.6	51.0	44.3	39.9	39.1	36.9
07/07/2021 19:15:01	07/07/2021 19:30:01	00:15:00	43.8	58.1	52.0	48.6	47.1	41.5	36.5	35.1	32.9
07/07/2021 19:30:01	07/07/2021 19:45:01	00:15:00	42.9	54.4	51.1	48.0	46.3	40.4	37.1	36.5	35.2
07/07/2021 19:45:01	07/07/2021 20:00:01	00:15:00	44.0	57.4	52.2	49.5	47.5	41.4	37.3	36.6	35.3
07/07/2021 20:00:01	07/07/2021 20:15:01	00:15:00	45.4	58.7	53.2	50.4	48.8	43.2	38.7	37.8	36.1
07/07/2021 20:15:01	07/07/2021 20:30:01	00:15:00	44.8	59.5	53.7	50.0	48.2	41.9	36.9	35.7	33.0
07/07/2021 20:30:01	07/07/2021 20:45:01	00:15:00	43.8	58.4	53.0	50.0	48.0	39.2	34.1	33.3	32.1
07/07/2021 20:45:02	07/07/2021 21:00:02	00:15:00	42.4	56.2	51.1	48.2	46.1	38.8	32.9	30.6	27.6
07/07/2021 21:00:01	07/07/2021 21:15:01	00:15:00	38.9	51.5	46.2	43.8	42.0	36.9	32.0	30.9	29.7
07/07/2021 21:15:01	07/07/2021 21:30:01	00:15:00	40.7	55.5	50.4	46.4	43.8	37.7	31.7	30.2	28.0
07/07/2021 21:30:01	07/07/2021 21:45:01	00:15:00	41.7	57.2	51.7	47.8	45.5	37.5	30.5	28.4	25.7
07/07/2021 21:45:02	07/07/2021 22:00:02	00:15:00	40.5	58.1	50.5	46.3	44.1	36.1	29.9	27.0	24.4
07/07/2021 22:00:01	07/07/2021 22:15:01	00:15:00	39.0	56.3	49.6	45.5	42.5	33.5	27.3	25.9	24.4
07/07/2021 22:15:01	07/07/2021 22:30:01	00:15:00	39.8	55.6	49.5	45.5	43.1	36.1	30.8	29.2	27.0
07/07/2021 22:30:01	07/07/2021 22:45:01	00:15:00	33.8	50.5	42.8	38.2	36.6	31.6	25.1	23.8	22.1
07/07/2021 22:45:01	07/07/2021 23:00:01	00:15:00	36.8	52.3	47.3	43.1	39.6	32.7	26.0	24.6	21.5
07/07/2021 23:00:01	07/07/2021 23:15:01	00:15:00	37.3	53.5	48.9	43.8	40.3	31.7	24.6	23.3	21.7
07/07/2021 23:15:01	07/07/2021 23:30:01	00:15:00	33.5	49.0	43.3	38.0	36.2	31.0	23.5	21.3	20.0
07/07/2021 23:30:01	07/07/2021 23:45:01	00:15:00	32.6	61.7	39.4	37.1	35.5	29.8	23.8	22.6	20.0
07/07/2021 23:45:01	08/07/2021 00:00:01	00:15:00	32.3	49.3	41.0	38.0	36.0	28.8	20.9	20.0	20.0
08/07/2021 00:00:01	08/07/2021 00:15:01	00:15:00	37.7	61.4	51.5	39.8	36.7	30.3	22.3	21.1	20.0
08/07/2021 00:15:01	08/07/2021 00:30:01	00:15:00	30.6	40.0	37.7	35.7	34.1	28.1	22.1	20.8	20.0
08/07/2021 00:30:01	08/07/2021 00:45:01	00:15:00	31.7	44.6	39.5	37.0	35.7	28.9	23.3	22.3	20.7
08/07/2021 00:45:01	08/07/2021 01:00:01	00:15:00	31.8	40.7	38.9	37.3	36.0	29.3	22.0	20.5	20.0
08/07/2021 01:00:01	08/07/2021 01:15:01	00:15:00	30.1	42.8	37.4	34.8	33.3	27.8	20.2	20.0	20.0
08/07/2021 01:15:01	08/07/2021 01:30:01	00:15:00	30.3	50.2	37.4	35.0	33.5	27.9	22.9	22.1	21.2
08/07/2021 01:30:01	08/07/2021 01:45:01	00:15:00	31.8	52.2	39.2	36.6	35.1	29.7	24.9	23.4	21.8

08/07/2021 01:45:01	08/07/2021 02:00:01	00:15:00	30.1	51.6	37.0	35.2	33.6	27.5	20.0	20.0	20.0
08/07/2021 02:00:01	08/07/2021 02:15:01	00:15:00	31.8	48.2	39.8	36.9	35.4	29.2	22.2	20.6	20.0
08/07/2021 02:15:01	08/07/2021 02:30:01	00:15:00	32.7	48.3	43.8	36.8	34.7	29.3	23.6	22.6	21.4
08/07/2021 02:30:02	08/07/2021 02:45:02	00:15:00	30.2	41.1	37.7	35.3	33.6	27.6	22.4	21.8	20.8
08/07/2021 02:45:01	08/07/2021 03:00:01	00:15:00	29.1	39.3	36.2	34.2	32.7	26.6	20.0	20.0	20.0
08/07/2021 03:00:01	08/07/2021 03:15:01	00:15:00	31.1	41.2	38.1	35.8	34.5	29.3	22.9	21.9	20.2
08/07/2021 03:15:01	08/07/2021 03:30:01	00:15:00	33.8	50.2	43.3	39.2	37.3	30.3	24.8	23.8	22.2
08/07/2021 03:30:02	08/07/2021 03:45:02	00:15:00	46.2	63.4	57.4	54.8	51.8	36.4	30.8	28.5	24.5
08/07/2021 03:45:01	08/07/2021 04:00:01	00:15:00	53.3	63.5	59.5	57.8	56.8	52.5	37.2	35.2	32.1
08/07/2021 04:00:01	08/07/2021 04:15:01	00:15:00	51.5	73.6	59.4	56.6	55.3	47.3	35.1	33.5	31.1
08/07/2021 04:15:01	08/07/2021 04:30:01	00:15:00	48.3	60.0	55.4	53.6	52.4	45.1	36.8	35.3	33.1
08/07/2021 04:30:02	08/07/2021 04:45:02	00:15:00	44.3	61.0	54.0	50.6	47.8	40.0	36.0	34.9	32.7
08/07/2021 04:45:01	08/07/2021 05:00:01	00:15:00	41.8	53.9	48.4	46.1	44.7	40.4	37.4	36.3	34.0
08/07/2021 05:00:01	08/07/2021 05:15:01	00:15:00	41.2	53.4	47.5	44.9	43.4	40.2	37.7	37.0	35.6
08/07/2021 05:15:01	08/07/2021 05:30:01	00:15:00	41.9	54.6	49.7	46.5	44.5	40.2	37.2	36.5	35.2
08/07/2021 05:30:02	08/07/2021 05:45:02	00:15:00	42.1	56.2	49.0	46.2	44.9	40.5	37.1	36.3	34.8
08/07/2021 05:45:01	08/07/2021 06:00:01	00:15:00	41.2	54.4	47.5	44.8	43.6	39.9	37.3	36.6	35.3
08/07/2021 06:00:01	08/07/2021 06:15:01	00:15:00	41.7	56.0	48.4	45.3	44.1	40.5	37.3	36.5	34.8
08/07/2021 06:15:01	08/07/2021 06:30:01	00:15:00	45.6	61.7	55.9	50.3	47.4	42.2	39.1	38.1	36.4
08/07/2021 06:30:02	08/07/2021 06:45:02	00:15:00	42.0	58.1	49.0	45.9	44.5	40.6	38.0	37.3	36.2
08/07/2021 06:45:01	08/07/2021 07:00:01	00:15:00	44.1	61.3	50.6	47.5	46.4	42.3	38.9	38.1	36.6
08/07/2021 07:00:01	08/07/2021 07:15:01	00:15:00	42.5	60.5	49.5	46.3	45.0	40.9	37.2	36.2	34.8
08/07/2021 07:15:01	08/07/2021 07:30:01	00:15:00	42.5	60.3	48.7	45.7	44.5	40.9	37.9	37.0	35.1
08/07/2021 07:30:02	08/07/2021 07:45:02	00:15:00	41.8	56.0	47.3	45.2	44.1	41.0	38.1	37.1	35.5
08/07/2021 07:45:01	08/07/2021 08:00:01	00:15:00	42.5	54.0	48.3	45.8	44.8	41.6	38.6	37.8	36.2
08/07/2021 08:00:01	08/07/2021 08:15:01	00:15:00	41.7	51.5	46.6	45.0	44.1	41.0	38.0	36.7	33.8
08/07/2021 08:15:01	08/07/2021 08:30:01	00:15:00	42.7	60.9	50.2	45.5	44.4	41.2	38.0	37.0	35.2
08/07/2021 08:30:02	08/07/2021 08:45:02	00:15:00	43.6	66.1	52.5	47.3	45.4	41.3	37.9	36.7	33.5
08/07/2021 08:45:01	08/07/2021 09:00:01	00:15:00	42.0	54.9	48.6	45.8	44.4	40.9	37.6	36.8	35.3
08/07/2021 09:00:01	08/07/2021 09:15:01	00:15:00	45.9	68.1	53.3	48.5	47.6	43.9	40.0	38.4	36.1
08/07/2021 09:15:01	08/07/2021 09:30:01	00:15:00	44.2	59.9	51.1	47.5	46.3	43.1	40.1	39.3	37.8
08/07/2021 09:30:02	08/07/2021 09:45:02	00:15:00	53.8	87.0	58.7	47.8	45.4	42.1	39.3	38.4	36.9
08/07/2021 09:45:01	08/07/2021 10:00:01	00:15:00	43.4	58.8	48.0	46.3	45.6	42.5	40.1	39.4	37.9
08/07/2021 10:00:01	08/07/2021 10:15:01	00:15:00	42.9	56.5	48.1	45.7	44.8	42.1	39.5	38.7	37.5

08/07/2021 10:15:01	08/07/2021 10:30:01	00:15:00	42.5	53.1	46.6	45.2	44.4	42.0	39.8	39.2	38.4
08/07/2021 10:30:02	08/07/2021 10:45:02	00:15:00	43.5	56.8	49.8	46.4	45.4	42.6	40.1	39.5	38.5
08/07/2021 10:45:01	08/07/2021 11:00:01	00:15:00	43.7	61.2	47.8	46.2	45.5	43.0	40.7	40.0	38.3
08/07/2021 11:00:01	08/07/2021 11:15:01	00:15:00	43.0	49.2	47.2	45.5	44.9	42.8	39.9	38.2	34.9
08/07/2021 11:15:01	08/07/2021 11:30:01	00:15:00	42.8	50.3	45.7	44.9	44.4	42.6	40.4	39.7	38.5
08/07/2021 11:30:02	08/07/2021 11:45:02	00:15:00	45.7	60.8	56.0	48.7	45.9	43.7	41.3	40.5	39.1
08/07/2021 11:45:01	08/07/2021 12:00:01	00:15:00	43.2	63.2	48.2	45.3	44.5	42.4	40.3	39.5	38.2
08/07/2021 12:00:01	08/07/2021 12:15:01	00:15:00	44.9	58.4	53.7	48.7	46.5	43.3	41.2	40.7	39.6
08/07/2021 12:15:01	08/07/2021 12:30:01	00:15:00	45.7	60.6	54.2	50.5	48.0	43.8	40.8	39.9	38.5
08/07/2021 12:30:02	08/07/2021 12:45:02	00:15:00	41.3	56.4	46.9	44.9	43.3	40.1	37.8	37.4	36.7
08/07/2021 12:45:01	08/07/2021 13:00:01	00:15:00	41.5	48.5	45.2	44.3	43.6	41.0	38.3	37.4	36.3
08/07/2021 13:00:01	08/07/2021 13:15:01	00:15:00	42.4	49.3	46.0	44.8	44.2	42.0	39.4	38.8	37.9
08/07/2021 13:15:01	08/07/2021 13:30:01	00:15:00	42.2	51.5	46.0	45.0	44.1	41.8	39.5	38.8	36.5
08/07/2021 13:30:01	08/07/2021 13:45:01	00:15:00	42.6	59.1	46.9	45.5	44.6	42.0	40.0	39.4	38.2
08/07/2021 13:45:01	08/07/2021 14:00:01	00:15:00	42.6	58.9	46.7	45.5	44.8	41.9	39.2	38.5	37.1
08/07/2021 14:00:01	08/07/2021 14:15:01	00:15:00	42.9	55.1	47.2	45.7	45.0	42.3	39.8	39.1	38.0
08/07/2021 14:15:01	08/07/2021 14:30:01	00:15:00	44.9	64.5	59.0	46.0	44.3	40.1	36.8	35.8	33.7
08/07/2021 14:30:01	08/07/2021 14:45:01	00:15:00	42.7	52.9	49.3	46.2	44.9	41.5	39.1	38.5	36.7
08/07/2021 14:45:02	08/07/2021 15:00:02	00:15:00	43.3	58.3	50.2	46.5	45.4	42.3	39.0	37.9	36.7
08/07/2021 15:00:01	08/07/2021 15:15:01	00:15:00	45.5	67.8	53.1	47.0	46.1	43.8	40.7	39.8	38.8
08/07/2021 15:15:01	08/07/2021 15:30:01	00:15:00	49.1	68.9	61.9	53.6	48.6	43.8	40.2	39.2	37.2
08/07/2021 15:30:02	08/07/2021 15:45:02	00:15:00	44.2	49.8	48.3	46.8	46.0	43.9	41.2	39.8	37.3
08/07/2021 15:45:02	08/07/2021 16:00:02	00:15:00	48.1	66.8	59.3	49.7	48.2	45.3	42.2	41.2	39.3
08/07/2021 16:00:01	08/07/2021 16:15:01	00:15:00	45.5	55.8	49.7	47.8	47.1	45.1	42.5	41.7	40.0
08/07/2021 16:15:01	08/07/2021 16:30:01	00:15:00	44.8	58.8	49.4	47.2	46.4	44.3	41.9	41.1	39.7
08/07/2021 16:30:01	08/07/2021 16:45:01	00:15:00	45.4	67.0	52.7	47.8	46.8	43.5	40.3	39.7	38.4
08/07/2021 16:45:02	08/07/2021 17:00:02	00:15:00	43.0	49.4	46.8	45.7	45.1	42.5	39.6	38.8	36.9
08/07/2021 17:00:01	08/07/2021 17:15:01	00:15:00	46.2	69.7	54.7	45.9	45.3	42.8	39.7	38.2	35.9
08/07/2021 17:15:01	08/07/2021 17:30:01	00:15:00	43.9	57.0	48.2	46.3	45.6	43.3	40.6	39.9	38.6
08/07/2021 17:30:01	08/07/2021 17:45:01	00:15:00	45.2	52.0	48.7	47.8	47.3	44.9	41.5	38.8	36.9
08/07/2021 17:45:02	08/07/2021 18:00:02	00:15:00	44.1	49.9	47.8	46.9	46.4	43.7	40.5	39.5	37.7
08/07/2021 18:00:01	08/07/2021 18:15:01	00:15:00	44.2	65.2	48.4	47.0	46.3	43.6	40.5	39.4	36.7
08/07/2021 18:15:01	08/07/2021 18:30:01	00:15:00	43.3	50.5	47.6	46.4	45.7	42.8	39.7	38.7	36.4
08/07/2021 18:30:02	08/07/2021 18:45:02	00:15:00	42.3	48.1	46.4	45.3	44.6	41.9	37.9	36.6	35.2

08/07/2021 18:45:01	08/07/2021 19:00:01	00:15:00	43.0	52.2	48.4	46.2	45.3	42.4	38.0	36.3	33.5
08/07/2021 19:00:01	08/07/2021 19:15:01	00:15:00	43.4	57.2	50.4	46.4	45.5	42.5	38.5	37.2	34.5
08/07/2021 19:15:01	08/07/2021 19:30:01	00:15:00	41.7	49.1	46.6	45.3	44.2	41.1	36.4	34.6	32.2
08/07/2021 19:30:02	08/07/2021 19:45:02	00:15:00	42.2	50.5	46.7	45.3	44.5	41.6	38.1	36.4	33.1
08/07/2021 19:45:01	08/07/2021 20:00:01	00:15:00	41.9	49.1	46.2	44.9	44.2	41.4	37.8	37.0	35.5
08/07/2021 20:00:01	08/07/2021 20:15:01	00:15:00	42.4	59.8	47.9	45.6	44.4	40.8	36.6	35.5	32.9
08/07/2021 20:15:01	08/07/2021 20:30:01	00:15:00	41.1	54.4	47.9	45.0	43.6	39.9	35.8	34.6	32.8
08/07/2021 20:30:02	08/07/2021 20:45:02	00:15:00	40.3	48.4	45.6	43.9	42.9	39.6	35.3	33.7	31.4
08/07/2021 20:45:01	08/07/2021 21:00:01	00:15:00	40.0	48.4	44.9	43.4	42.7	39.1	35.6	34.7	33.5
08/07/2021 21:00:01	08/07/2021 21:15:01	00:15:00	40.2	52.1	46.4	44.1	42.9	39.0	34.0	32.5	29.7
08/07/2021 21:15:01	08/07/2021 21:30:01	00:15:00	39.3	48.6	45.2	42.9	41.6	38.4	34.5	33.1	31.5
08/07/2021 21:30:02	08/07/2021 21:45:02	00:15:00	37.4	48.0	43.1	41.4	40.5	36.3	31.4	30.1	27.5
08/07/2021 21:45:01	08/07/2021 22:00:01	00:15:00	37.6	51.8	44.5	42.0	40.7	36.1	29.8	28.2	25.8
08/07/2021 22:00:01	08/07/2021 22:15:01	00:15:00	37.3	52.6	47.3	42.5	40.3	33.8	28.2	27.1	25.3
08/07/2021 22:15:01	08/07/2021 22:30:01	00:15:00	37.1	53.6	46.1	42.1	40.3	33.8	25.7	23.2	20.2
08/07/2021 22:30:02	08/07/2021 22:45:02	00:15:00	33.7	43.1	41.7	39.4	37.8	30.8	23.0	20.7	20.0
08/07/2021 22:45:01	08/07/2021 23:00:01	00:15:00	35.0	50.4	43.7	40.1	38.2	32.1	23.4	21.6	20.0
08/07/2021 23:00:01	08/07/2021 23:15:01	00:15:00	34.5	46.8	41.8	40.1	38.3	32.0	23.7	21.8	20.0
08/07/2021 23:15:01	08/07/2021 23:30:01	00:15:00	35.1	50.3	42.6	40.5	39.1	32.3	25.7	24.4	23.0
08/07/2021 23:30:02	08/07/2021 23:45:02	00:15:00	34.6	46.0	42.2	39.5	38.2	32.4	23.9	22.3	20.3
08/07/2021 23:45:01	09/07/2021 00:00:01	00:15:00	31.6	47.8	39.9	37.1	34.9	29.1	21.2	20.0	20.0
09/07/2021 00:00:01	09/07/2021 00:15:01	00:15:00	36.2	50.6	44.0	41.7	40.2	33.1	24.2	22.1	20.0
09/07/2021 00:15:01	09/07/2021 00:30:01	00:15:00	39.1	50.9	46.6	44.0	42.6	37.1	30.5	28.7	25.8
09/07/2021 00:30:02	09/07/2021 00:45:02	00:15:00	40.5	53.9	48.3	46.3	44.7	36.6	24.2	20.7	20.0
09/07/2021 00:45:01	09/07/2021 01:00:01	00:15:00	36.4	48.2	44.0	41.2	40.0	34.5	24.5	22.4	20.0
09/07/2021 01:00:01	09/07/2021 01:15:01	00:15:00	34.8	48.4	43.1	40.5	38.9	31.6	20.2	20.0	20.0
09/07/2021 01:15:01	09/07/2021 01:30:01	00:15:00	38.1	50.4	46.8	43.9	42.7	32.2	20.0	20.0	20.0
09/07/2021 01:30:01	09/07/2021 01:45:01	00:15:00	41.0	54.7	48.2	46.9	45.8	35.7	22.8	21.2	20.0
09/07/2021 01:45:01	09/07/2021 02:00:01	00:15:00	41.1	50.7	48.3	46.4	45.3	38.9	25.7	23.4	20.0
09/07/2021 02:00:01	09/07/2021 02:15:01	00:15:00	42.4	55.2	49.9	47.5	46.2	40.4	30.1	27.0	20.0
09/07/2021 02:15:01	09/07/2021 02:30:01	00:15:00	43.9	54.2	52.1	49.8	48.3	40.8	25.7	22.9	20.0
09/07/2021 02:30:01	09/07/2021 02:45:01	00:15:00	44.3	58.7	55.4	50.7	48.7	36.1	22.9	20.1	20.0
09/07/2021 02:45:01	09/07/2021 03:00:01	00:15:00	45.1	58.0	54.0	50.4	48.9	42.1	30.7	27.0	22.9
09/07/2021 03:00:01	09/07/2021 03:15:01	00:15:00	43.8	56.1	52.4	49.8	48.3	39.7	27.3	23.8	20.2

09/07/2021 03:15:01	09/07/2021 03:30:01	00:15:00	44.1	55.2	51.2	49.2	48.0	42.0	32.4	30.3	25.2
09/07/2021 03:30:01	09/07/2021 03:45:01	00:15:00	47.1	62.6	57.1	54.0	50.3	42.6	34.2	32.2	28.6
09/07/2021 03:45:01	09/07/2021 04:00:01	00:15:00	53.3	62.9	59.1	57.6	56.7	52.6	41.6	39.8	36.3
09/07/2021 04:00:01	09/07/2021 04:15:01	00:15:00	49.1	61.0	56.8	54.9	53.7	45.0	39.8	38.7	36.8
09/07/2021 04:15:01	09/07/2021 04:30:01	00:15:00	45.5	54.7	51.7	49.7	48.6	44.2	39.0	37.1	34.4
09/07/2021 04:30:02	09/07/2021 04:45:02	00:15:00	48.4	68.0	53.5	51.7	50.9	47.4	43.6	41.5	38.0
09/07/2021 04:45:01	09/07/2021 05:00:01	00:15:00	49.9	56.9	54.2	52.9	52.2	49.4	46.2	45.2	43.7
09/07/2021 05:00:01	09/07/2021 05:15:01	00:15:00	48.3	65.4	53.5	51.3	50.2	47.6	44.5	43.6	41.4
09/07/2021 05:15:01	09/07/2021 05:30:01	00:15:00	47.1	60.4	52.5	50.7	49.5	45.9	43.3	42.6	40.8
09/07/2021 05:30:01	09/07/2021 05:45:01	00:15:00	46.0	59.5	50.5	49.1	48.2	45.3	42.1	41.1	38.8
09/07/2021 05:45:01	09/07/2021 06:00:01	00:15:00	46.9	52.5	50.7	49.6	49.0	46.6	43.4	42.3	38.0
09/07/2021 06:00:01	09/07/2021 06:15:01	00:15:00	45.9	58.9	50.2	49.0	48.1	45.3	42.8	41.9	40.3
09/07/2021 06:15:02	09/07/2021 06:30:02	00:15:00	46.2	54.6	50.7	48.9	48.3	45.7	42.7	41.7	39.0
09/07/2021 06:30:01	09/07/2021 06:45:01	00:15:00	46.2	56.1	50.3	48.8	48.2	45.7	42.4	41.7	40.0
09/07/2021 06:45:01	09/07/2021 07:00:01	00:15:00	44.7	56.2	49.0	47.9	47.1	44.0	40.5	39.5	36.9
09/07/2021 07:00:01	09/07/2021 07:15:01	00:15:00	45.6	53.8	49.8	48.5	47.8	44.9	41.9	41.0	39.7
09/07/2021 07:15:02	09/07/2021 07:30:02	00:15:00	48.7	58.6	54.1	52.2	51.1	48.0	43.6	41.5	36.0
09/07/2021 07:30:01	09/07/2021 07:45:01	00:15:00	50.5	59.4	54.9	53.5	52.6	50.0	46.7	45.7	44.1
09/07/2021 07:45:01	09/07/2021 08:00:01	00:15:00	48.8	63.2	54.6	52.3	51.3	47.9	43.5	42.1	39.5
09/07/2021 08:00:01	09/07/2021 08:15:01	00:15:00	48.2	55.8	52.8	51.5	50.6	47.5	44.7	43.9	39.9
09/07/2021 08:15:01	09/07/2021 08:30:01	00:15:00	46.6	58.2	52.5	49.5	48.5	45.7	43.3	42.6	41.6
09/07/2021 08:30:01	09/07/2021 08:45:01	00:15:00	47.6	56.2	51.7	50.5	49.8	47.2	43.5	42.3	40.5
09/07/2021 08:45:01	09/07/2021 09:00:01	00:15:00	48.5	57.3	52.8	51.7	50.9	48.1	44.3	42.8	40.4
09/07/2021 09:00:01	09/07/2021 09:15:01	00:15:00	48.4	55.7	53.0	51.6	50.8	47.8	44.5	43.6	41.8
09/07/2021 09:15:01	09/07/2021 09:30:01	00:15:00	49.3	57.7	54.1	52.7	52.0	48.5	44.3	43.2	41.7
09/07/2021 09:30:01	09/07/2021 09:45:01	00:15:00	50.6	59.1	55.0	53.5	52.9	50.2	46.0	44.7	42.0
09/07/2021 09:45:01	09/07/2021 10:00:01	00:15:00	50.1	59.4	54.6	53.1	52.4	49.5	46.4	45.6	43.8
09/07/2021 10:00:01	09/07/2021 10:15:01	00:15:00	51.4	60.7	56.1	54.7	53.8	50.6	48.0	47.3	45.4
09/07/2021 10:15:01	09/07/2021 10:30:01	00:15:00	50.6	60.4	56.5	53.7	52.8	49.8	47.2	46.4	44.8
09/07/2021 10:30:01	09/07/2021 10:45:01	00:15:00	50.7	59.3	55.8	54.2	52.9	49.9	46.9	46.1	45.0
09/07/2021 10:45:01	09/07/2021 11:00:01	00:15:00	51.5	63.2	56.7	54.7	53.8	50.7	47.9	47.3	46.1
09/07/2021 11:00:01	09/07/2021 11:15:01	00:15:00	51.8	60.3	56.7	55.3	54.5	50.9	46.8	45.6	43.7
09/07/2021 11:15:01	09/07/2021 11:30:01	00:15:00	52.5	61.9	57.0	55.6	54.9	51.8	49.0	48.3	46.5
09/07/2021 11:30:01	09/07/2021 11:45:01	00:15:00	52.7	61.7	58.3	56.4	55.4	51.7	48.1	47.4	46.3

09/07/2021 11:45:01	09/07/2021 12:00:01	00:15:00	50.5	63.6	55.8	53.3	52.4	49.9	46.9	45.9	43.9
09/07/2021 12:00:01	09/07/2021 12:15:01	00:15:00	52.8	61.8	57.3	55.7	54.9	52.2	49.5	48.8	47.8
09/07/2021 12:15:01	09/07/2021 12:30:01	00:15:00	53.1	61.3	58.3	56.2	55.3	52.5	49.2	48.3	46.7
09/07/2021 12:30:01	09/07/2021 12:45:01	00:15:00	54.5	61.2	58.7	57.4	56.6	54.1	51.3	50.4	48.6
09/07/2021 12:45:01	09/07/2021 13:00:01	00:15:00	54.5	62.1	59.1	57.7	56.8	53.9	51.0	50.2	47.7
09/07/2021 13:00:01	09/07/2021 13:15:01	00:15:00	53.4	59.1	57.0	55.9	55.3	53.1	49.9	49.1	48.1
09/07/2021 13:15:02	09/07/2021 13:30:02	00:15:00	53.2	62.4	57.8	56.4	55.5	52.5	50.0	49.3	48.3
09/07/2021 13:30:01	09/07/2021 13:45:01	00:15:00	53.2	63.0	58.9	56.9	55.8	52.1	49.4	48.8	47.9
09/07/2021 13:45:01	09/07/2021 14:00:01	00:15:00	53.5	60.6	57.8	56.6	55.9	52.9	49.9	48.9	45.5
09/07/2021 14:00:01	09/07/2021 14:15:01	00:15:00	53.7	65.9	57.7	56.5	55.9	53.1	50.4	49.8	48.8
09/07/2021 14:15:02	09/07/2021 14:30:02	00:15:00	54.0	61.9	58.1	56.7	56.0	53.4	51.0	50.4	49.5
09/07/2021 14:30:01	09/07/2021 14:45:01	00:15:00	53.9	61.4	58.1	56.7	55.9	53.5	50.5	49.8	48.9
09/07/2021 14:45:01	09/07/2021 15:00:01	00:15:00	55.9	63.5	60.0	58.7	58.2	55.3	52.6	51.6	48.3
09/07/2021 15:00:01	09/07/2021 15:15:01	00:15:00	53.9	64.5	57.7	56.5	55.8	53.4	50.7	50.0	48.9
09/07/2021 15:15:02	09/07/2021 15:30:02	00:15:00	51.9	59.6	56.1	54.9	54.1	51.3	48.9	48.2	46.9
09/07/2021 15:30:01	09/07/2021 15:45:01	00:15:00	52.5	58.6	55.8	54.9	54.3	52.1	49.9	49.3	48.2
09/07/2021 15:45:01	09/07/2021 16:00:01	00:15:00	51.8	59.6	56.8	54.7	53.9	51.2	48.5	47.8	46.6
09/07/2021 16:00:01	09/07/2021 16:15:01	00:15:00	52.6	59.8	56.8	55.3	54.6	52.0	50.0	49.4	48.4
09/07/2021 16:15:02	09/07/2021 16:30:02	00:15:00	54.9	65.8	59.5	57.7	56.9	54.3	51.7	50.9	49.0
09/07/2021 16:30:01	09/07/2021 16:45:01	00:15:00	55.2	62.0	59.3	57.8	57.0	54.8	52.6	51.8	50.1
09/07/2021 16:45:01	09/07/2021 17:00:01	00:15:00	55.8	63.8	60.2	58.8	58.0	55.1	52.5	51.7	48.8
09/07/2021 17:00:01	09/07/2021 17:15:01	00:15:00	55.4	63.6	60.7	58.8	57.8	54.5	51.7	50.8	49.3
09/07/2021 17:15:02	09/07/2021 17:30:02	00:15:00	52.1	57.3	55.3	54.4	53.8	51.6	49.8	49.3	48.0
09/07/2021 17:30:01	09/07/2021 17:45:01	00:15:00	52.5	59.4	56.6	55.4	54.7	52.1	49.0	48.1	46.2
09/07/2021 17:45:01	09/07/2021 18:00:01	00:15:00	54.4	61.5	58.5	57.3	56.5	53.8	51.4	50.7	49.4
09/07/2021 18:00:01	09/07/2021 18:15:01	00:15:00	54.1	62.5	58.4	56.9	56.3	53.5	51.0	50.1	48.7
09/07/2021 18:15:01	09/07/2021 18:30:01	00:15:00	53.9	62.1	58.2	56.9	56.3	53.3	50.2	49.0	46.6
09/07/2021 18:30:01	09/07/2021 18:45:01	00:15:00	53.6	60.7	58.4	57.0	56.0	52.8	49.6	48.5	46.5
09/07/2021 18:45:01	09/07/2021 19:00:01	00:15:00	54.0	61.4	58.0	56.9	56.1	53.7	50.3	48.9	43.3
09/07/2021 19:00:01	09/07/2021 19:15:01	00:15:00	54.1	61.9	58.7	57.0	56.2	53.5	50.5	49.4	47.0
09/07/2021 19:15:02	09/07/2021 19:30:02	00:15:00	53.9	61.1	58.2	56.8	56.0	53.3	50.3	49.1	45.6
09/07/2021 19:30:01	09/07/2021 19:45:01	00:15:00	53.2	60.6	57.6	56.3	55.5	52.7	48.4	47.2	45.7
09/07/2021 19:45:01	09/07/2021 20:00:01	00:15:00	53.5	64.0	59.7	57.3	56.1	52.5	48.9	47.5	45.7
09/07/2021 20:00:01	09/07/2021 20:15:01	00:15:00	52.2	60.7	56.7	55.3	54.6	51.8	47.1	44.7	40.1

09/07/2021 20:15:02	09/07/2021 20:30:02	00:15:00	50.5	59.7	55.8	53.8	52.9	49.8	45.9	44.3	41.4
09/07/2021 20:30:01	09/07/2021 20:45:01	00:15:00	49.5	58.9	55.5	53.6	52.7	48.4	41.8	39.5	36.0
09/07/2021 20:45:01	09/07/2021 21:00:01	00:15:00	49.9	58.2	55.1	53.5	52.5	49.1	44.0	42.1	38.8
09/07/2021 21:00:01	09/07/2021 21:15:01	00:15:00	50.1	59.3	56.0	54.3	53.3	49.2	39.2	32.9	28.2
09/07/2021 21:15:02	09/07/2021 21:30:02	00:15:00	49.4	62.5	56.3	54.3	53.0	47.6	39.6	37.3	34.8
09/07/2021 21:30:01	09/07/2021 21:45:01	00:15:00	49.5	60.2	56.1	54.1	52.8	48.1	37.8	35.5	33.4
09/07/2021 21:45:01	09/07/2021 22:00:01	00:15:00	49.1	61.1	56.1	53.8	52.5	47.2	40.3	38.7	34.5
09/07/2021 22:00:01	09/07/2021 22:15:01	00:15:00	48.2	59.1	55.1	53.0	51.8	46.2	38.8	37.2	34.8
09/07/2021 22:15:02	09/07/2021 22:30:02	00:15:00	49.0	60.3	55.5	53.5	52.5	47.4	40.3	38.3	36.0
09/07/2021 22:30:01	09/07/2021 22:45:01	00:15:00	46.0	58.3	54.2	51.6	49.9	43.0	30.7	28.8	26.9
09/07/2021 22:45:01	09/07/2021 23:00:01	00:15:00	47.7	59.1	55.0	52.5	51.3	45.7	37.2	34.7	31.2
09/07/2021 23:00:02	09/07/2021 23:15:02	00:15:00	45.3	57.6	53.8	51.0	49.7	41.3	33.1	31.1	28.3
09/07/2021 23:15:01	09/07/2021 23:30:01	00:15:00	44.0	57.9	52.8	49.9	48.2	39.3	28.0	25.2	21.4
09/07/2021 23:30:01	09/07/2021 23:45:01	00:15:00	43.8	56.3	51.7	49.5	48.0	40.5	28.0	23.0	21.0
09/07/2021 23:45:01	10/07/2021 00:00:01	00:15:00	43.4	57.5	51.5	49.5	48.3	37.4	25.6	24.2	22.3
10/07/2021 00:00:01	10/07/2021 00:15:01	00:15:00	42.6	56.2	50.9	48.1	46.9	38.3	23.2	20.7	20.0
10/07/2021 00:15:01	10/07/2021 00:30:01	00:15:00	43.2	56.1	51.5	48.9	47.7	38.0	26.1	24.7	22.9
10/07/2021 00:30:01	10/07/2021 00:45:01	00:15:00	41.0	55.0	50.7	48.0	46.0	31.3	21.5	20.6	20.0
10/07/2021 00:45:01	10/07/2021 01:00:01	00:15:00	41.8	56.5	52.2	49.3	46.4	31.5	20.5	20.0	20.0
10/07/2021 01:00:02	10/07/2021 01:15:02	00:15:00	41.9	55.8	51.6	48.5	46.6	34.6	23.5	21.8	20.0
10/07/2021 01:15:01	10/07/2021 01:30:01	00:15:00	41.0	53.3	50.4	47.9	46.1	33.1	21.6	20.0	20.0
10/07/2021 01:30:01	10/07/2021 01:45:01	00:15:00	44.6	55.8	52.2	50.3	49.1	41.0	28.4	26.4	24.3
10/07/2021 01:45:01	10/07/2021 02:00:01	00:15:00	43.3	57.2	52.4	49.7	48.0	37.2	26.6	25.1	23.3
10/07/2021 02:00:02	10/07/2021 02:15:02	00:15:00	41.2	55.6	50.9	48.5	46.7	31.4	23.3	22.0	20.1
10/07/2021 02:15:01	10/07/2021 02:30:01	00:15:00	43.2	58.3	53.4	49.9	48.1	33.9	22.6	21.1	20.0
10/07/2021 02:30:01	10/07/2021 02:45:01	00:15:00	43.0	55.1	52.3	49.4	47.7	35.1	26.1	24.1	21.6
10/07/2021 02:45:02	10/07/2021 03:00:02	00:15:00	41.2	57.8	50.7	47.9	46.2	31.7	20.0	20.0	20.0
10/07/2021 03:00:01	10/07/2021 03:15:01	00:15:00	41.4	58.9	52.2	48.3	45.9	32.0	21.8	20.0	20.0
10/07/2021 03:15:01	10/07/2021 03:30:01	00:15:00	43.0	55.4	51.6	49.1	47.9	37.7	27.6	25.4	22.5
10/07/2021 03:30:01	10/07/2021 03:45:01	00:15:00	50.8	72.4	58.6	56.7	55.6	43.0	33.4	31.7	28.0
10/07/2021 03:45:02	10/07/2021 04:00:02	00:15:00	50.0	62.3	58.7	56.8	55.4	42.0	32.0	30.3	26.7
10/07/2021 04:00:01	10/07/2021 04:15:01	00:15:00	44.4	58.4	51.9	49.4	48.0	42.0	33.1	30.9	26.7
10/07/2021 04:15:01	10/07/2021 04:30:01	00:15:00	45.4	59.9	54.2	51.1	49.6	41.5	34.0	32.3	28.5
10/07/2021 04:30:01	10/07/2021 04:45:01	00:15:00	46.8	63.4	55.2	52.3	50.3	43.7	35.0	32.8	29.8

10/07/2021 04:45:02	10/07/2021 05:00:02	00:15:00	47.2	58.9	54.7	52.1	50.8	44.7	39.3	37.8	33.9
10/07/2021 05:00:01	10/07/2021 05:15:01	00:15:00	47.8	61.4	55.3	52.6	51.3	45.8	37.2	35.1	32.8
10/07/2021 05:15:01	10/07/2021 05:30:01	00:15:00	48.5	60.1	55.7	53.7	52.4	46.4	38.4	36.7	33.2
10/07/2021 05:30:01	10/07/2021 05:45:01	00:15:00	48.1	72.3	54.8	52.6	51.3	45.6	37.9	36.3	34.1
10/07/2021 05:45:02	10/07/2021 06:00:02	00:15:00	49.1	60.6	56.1	53.8	52.4	47.4	40.9	38.9	36.3
10/07/2021 06:00:01	10/07/2021 06:15:01	00:15:00	49.3	61.1	55.4	53.3	52.3	48.0	43.2	41.8	39.4
10/07/2021 06:15:01	10/07/2021 06:30:01	00:15:00	50.2	60.1	56.0	54.1	53.0	49.3	43.1	41.0	37.3
10/07/2021 06:30:01	10/07/2021 06:45:01	00:15:00	50.5	59.3	56.5	54.5	53.5	49.4	44.6	42.7	40.2
10/07/2021 06:45:02	10/07/2021 07:00:02	00:15:00	50.4	62.7	56.8	54.6	53.4	49.0	44.6	43.2	41.2
10/07/2021 07:00:01	10/07/2021 07:15:01	00:15:00	49.9	61.6	56.7	54.4	53.2	48.3	43.3	41.7	39.7
10/07/2021 07:15:01	10/07/2021 07:30:01	00:15:00	50.6	60.9	56.1	54.4	53.5	49.6	45.5	44.1	42.0
10/07/2021 07:30:01	10/07/2021 07:45:01	00:15:00	50.7	60.5	56.9	54.8	53.6	49.4	45.2	43.6	41.2
10/07/2021 07:45:02	10/07/2021 08:00:02	00:15:00	51.1	60.7	56.8	54.9	53.8	50.1	45.7	44.7	43.0
10/07/2021 08:00:01	10/07/2021 08:15:01	00:15:00	51.0	64.2	57.1	54.8	53.6	49.8	46.3	45.2	44.0
10/07/2021 08:15:01	10/07/2021 08:30:01	00:15:00	50.9	61.6	57.2	55.2	54.0	49.4	45.4	44.2	42.1
10/07/2021 08:30:01	10/07/2021 08:45:01	00:15:00	50.7	62.5	56.8	54.3	53.3	49.6	45.5	44.7	42.3
10/07/2021 08:45:02	10/07/2021 09:00:02	00:15:00	48.4	57.9	53.5	51.7	50.8	47.8	44.0	43.2	41.8
10/07/2021 09:00:01	10/07/2021 09:15:01	00:15:00	50.9	60.1	56.7	54.8	53.8	49.9	45.1	44.0	42.4
10/07/2021 09:15:01	10/07/2021 09:30:01	00:15:00	50.8	57.9	56.1	54.8	54.0	49.8	43.3	41.3	38.7
10/07/2021 09:30:01	10/07/2021 09:45:01	00:15:00	49.0	58.1	54.2	52.8	51.9	48.0	43.4	42.3	40.6
10/07/2021 09:45:02	10/07/2021 10:00:02	00:15:00	52.4	65.6	57.0	55.5	54.7	51.9	48.6	47.6	45.8
10/07/2021 10:00:01	10/07/2021 10:15:01	00:15:00	50.7	59.0	56.0	54.5	53.6	50.0	44.4	42.3	40.8
10/07/2021 10:15:01	10/07/2021 10:30:01	00:15:00	52.2	60.8	57.9	56.2	54.9	51.1	47.2	45.9	42.9
10/07/2021 10:30:01	10/07/2021 10:45:01	00:15:00	54.3	61.8	59.0	57.5	56.8	53.5	50.1	49.3	48.3
10/07/2021 10:45:02	10/07/2021 11:00:02	00:15:00	51.8	58.1	55.6	54.4	53.8	51.4	48.7	48.0	46.5
10/07/2021 11:00:01	10/07/2021 11:15:01	00:15:00	50.4	57.7	54.4	53.1	52.4	49.9	47.4	46.7	44.4
10/07/2021 11:15:01	10/07/2021 11:30:01	00:15:00	52.3	61.9	59.5	57.4	55.6	50.3	46.8	45.8	43.1
10/07/2021 11:30:01	10/07/2021 11:45:01	00:15:00	49.9	63.8	54.8	52.9	52.2	49.1	45.9	44.9	43.1
10/07/2021 11:45:01	10/07/2021 12:00:01	00:15:00	49.6	56.2	54.7	52.5	51.5	49.0	46.9	46.3	44.6
10/07/2021 12:00:01	10/07/2021 12:15:01	00:15:00	50.6	58.3	55.6	54.0	53.1	49.8	46.8	46.1	44.7
10/07/2021 12:15:01	10/07/2021 12:30:01	00:15:00	51.9	62.4	56.4	55.1	54.3	51.2	48.4	47.7	46.1
10/07/2021 12:30:01	10/07/2021 12:45:01	00:15:00	51.8	58.9	56.1	54.5	53.9	51.5	48.1	47.3	46.3
10/07/2021 12:45:01	10/07/2021 13:00:01	00:15:00	54.2	61.6	58.0	56.8	56.1	53.8	51.3	50.6	49.4
10/07/2021 13:00:01	10/07/2021 13:15:01	00:15:00	52.9	58.1	56.5	55.1	54.5	52.7	50.1	49.3	47.7

10/07/2021 13:15:01	10/07/2021 13:30:01	00:15:00	53.2	59.7	56.7	55.5	54.9	52.9	50.5	49.9	48.9
10/07/2021 13:30:01	10/07/2021 13:45:01	00:15:00	54.6	69.1	59.2	57.8	57.0	54.0	49.9	49.0	47.9
10/07/2021 13:45:01	10/07/2021 14:00:01	00:15:00	56.0	73.8	66.9	58.6	57.2	53.7	49.6	47.7	46.2
10/07/2021 14:00:01	10/07/2021 14:15:01	00:15:00	51.0	61.0	55.3	53.7	52.9	50.4	48.6	48.1	47.4
10/07/2021 14:15:01	10/07/2021 14:30:01	00:15:00	54.1	62.2	58.5	57.0	56.2	53.4	50.6	49.8	48.6
10/07/2021 14:30:01	10/07/2021 14:45:01	00:15:00	52.8	59.5	57.1	55.9	55.1	52.3	48.9	47.8	46.5
10/07/2021 14:45:01	10/07/2021 15:00:01	00:15:00	54.7	62.1	59.0	57.6	56.9	54.1	51.4	50.7	49.7
10/07/2021 15:00:01	10/07/2021 15:15:01	00:15:00	54.9	62.5	59.1	57.7	56.9	54.3	51.5	50.6	49.0
10/07/2021 15:15:01	10/07/2021 15:30:01	00:15:00	56.0	63.5	60.4	59.0	58.2	55.5	52.2	51.3	49.7
10/07/2021 15:30:01	10/07/2021 15:45:01	00:15:00	55.4	64.3	60.7	58.7	57.9	54.6	51.1	50.1	47.1
10/07/2021 15:45:01	10/07/2021 16:00:01	00:15:00	55.1	62.8	60.4	58.9	57.9	54.2	50.1	48.9	45.1
10/07/2021 16:00:01	10/07/2021 16:15:01	00:15:00	55.6	67.1	61.1	59.0	58.0	54.8	51.0	49.8	47.5
10/07/2021 16:15:01	10/07/2021 16:30:01	00:15:00	55.2	64.4	60.4	58.6	57.7	54.3	50.7	49.4	47.1
10/07/2021 16:30:01	10/07/2021 16:45:01	00:15:00	55.0	62.3	59.7	58.3	57.6	54.3	50.8	49.6	47.7
10/07/2021 16:45:01	10/07/2021 17:00:01	00:15:00	54.6	63.8	60.0	58.0	57.2	53.5	50.5	49.6	48.2
10/07/2021 17:00:02	10/07/2021 17:15:02	00:15:00	54.7	63.2	60.5	58.4	57.3	53.8	50.2	48.9	45.4
10/07/2021 17:15:01	10/07/2021 17:30:01	00:15:00	53.9	62.4	59.3	57.5	56.7	53.1	48.8	47.0	44.6
10/07/2021 17:30:01	10/07/2021 17:45:01	00:15:00	54.0	62.8	59.7	57.6	56.7	53.2	49.3	46.9	40.6
10/07/2021 17:45:01	10/07/2021 18:00:01	00:15:00	54.0	65.0	59.3	57.3	56.4	53.3	49.7	48.6	45.7
10/07/2021 18:00:02	10/07/2021 18:15:02	00:15:00	54.5	64.2	59.4	58.0	57.1	53.6	50.6	49.4	46.0
10/07/2021 18:15:01	10/07/2021 18:30:01	00:15:00	53.5	61.5	58.5	56.9	56.1	52.7	48.9	47.5	45.1
10/07/2021 18:30:01	10/07/2021 18:45:01	00:15:00	52.7	62.4	57.6	56.1	55.2	52.1	47.5	45.9	43.5
10/07/2021 18:45:02	10/07/2021 19:00:02	00:15:00	52.1	60.6	56.6	55.3	54.6	51.4	47.3	45.8	43.8
10/07/2021 19:00:01	10/07/2021 19:15:01	00:15:00	49.4	56.7	54.4	53.0	52.0	48.8	43.9	42.5	38.5
10/07/2021 19:15:01	10/07/2021 19:30:01	00:15:00	51.6	64.8	58.0	55.5	54.4	50.5	45.9	43.4	39.2
10/07/2021 19:30:01	10/07/2021 19:45:01	00:15:00	51.1	61.3	57.2	54.9	53.8	50.1	44.4	42.1	40.2
10/07/2021 19:45:02	10/07/2021 20:00:02	00:15:00	51.5	60.1	56.8	55.1	54.3	50.7	45.7	44.4	42.6
10/07/2021 20:00:01	10/07/2021 20:15:01	00:15:00	50.9	58.9	55.9	54.6	53.9	50.0	43.8	42.1	39.4
10/07/2021 20:15:01	10/07/2021 20:30:01	00:15:00	51.0	60.6	56.8	55.0	54.0	49.9	44.7	42.6	40.2
10/07/2021 20:30:01	10/07/2021 20:45:01	00:15:00	50.8	59.2	56.6	54.8	53.8	49.7	43.2	41.4	39.3
10/07/2021 20:45:02	10/07/2021 21:00:02	00:15:00	51.0	58.2	56.3	54.6	53.7	50.3	43.8	41.4	38.5
10/07/2021 21:00:01	10/07/2021 21:15:01	00:15:00	50.2	59.3	56.3	54.4	53.5	48.8	41.9	38.9	30.2
10/07/2021 21:15:01	10/07/2021 21:30:01	00:15:00	51.4	61.0	57.4	55.7	54.7	50.1	43.9	42.0	39.4
10/07/2021 21:30:01	10/07/2021 21:45:01	00:15:00	50.9	59.3	55.4	54.2	53.6	50.1	46.1	44.8	42.7

10/07/2021 21:45:02	10/07/2021 22:00:02	00:15:00	49.8	62.3	55.1	53.6	52.8	49.0	40.9	38.8	36.4
10/07/2021 22:00:01	10/07/2021 22:15:01	00:15:00	48.9	58.0	55.3	53.6	52.7	46.9	40.1	38.4	36.5
10/07/2021 22:15:01	10/07/2021 22:30:01	00:15:00	48.1	60.4	54.7	52.7	51.5	46.8	35.1	31.8	27.1
10/07/2021 22:30:01	10/07/2021 22:45:01	00:15:00	45.1	57.6	51.8	50.3	49.2	43.0	32.2	28.6	25.1
10/07/2021 22:45:02	10/07/2021 23:00:02	00:15:00	45.9	59.2	54.4	51.5	49.8	42.9	28.9	27.1	24.3
10/07/2021 23:00:01	10/07/2021 23:15:01	00:15:00	46.0	57.1	53.9	51.5	49.9	43.2	36.0	33.8	30.5
10/07/2021 23:15:01	10/07/2021 23:30:01	00:15:00	44.0	57.6	53.3	50.5	48.5	38.3	25.7	23.9	21.4
10/07/2021 23:30:01	10/07/2021 23:45:01	00:15:00	46.5	60.0	56.0	52.5	50.5	42.3	30.5	28.0	24.6
10/07/2021 23:45:02	11/07/2021 00:00:02	00:15:00	43.5	58.3	53.6	49.7	47.8	38.1	26.9	26.0	24.7
11/07/2021 00:00:01	11/07/2021 00:15:01	00:15:00	42.1	61.0	53.2	48.4	46.3	32.0	23.9	22.2	20.9
11/07/2021 00:15:01	11/07/2021 00:30:01	00:15:00	38.0	52.0	47.6	45.2	42.9	31.6	23.6	22.6	21.5
11/07/2021 00:30:01	11/07/2021 00:45:01	00:15:00	38.8	54.2	49.4	46.7	43.7	30.0	22.1	21.0	20.0
11/07/2021 00:45:02	11/07/2021 01:00:02	00:15:00	41.8	55.0	51.7	48.4	46.7	32.6	24.2	22.6	20.6
11/07/2021 01:00:01	11/07/2021 01:15:01	00:15:00	39.7	54.0	49.4	46.8	44.8	31.8	22.6	21.5	20.0
11/07/2021 01:15:01	11/07/2021 01:30:01	00:15:00	39.4	54.3	49.7	46.3	44.1	31.6	20.6	20.0	20.0
11/07/2021 01:30:01	11/07/2021 01:45:01	00:15:00	39.2	54.8	49.6	46.3	44.2	29.6	20.0	20.0	20.0
11/07/2021 01:45:01	11/07/2021 02:00:01	00:15:00	38.9	55.8	50.1	46.5	44.0	27.8	20.0	20.0	20.0
11/07/2021 02:00:01	11/07/2021 02:15:01	00:15:00	40.2	54.5	49.4	46.9	45.3	32.3	22.1	20.7	20.0
11/07/2021 02:15:01	11/07/2021 02:30:01	00:15:00	40.7	57.7	50.8	48.0	46.0	31.2	22.3	21.4	20.3
11/07/2021 02:30:01	11/07/2021 02:45:01	00:15:00	40.9	55.7	50.0	47.6	45.8	34.5	23.7	22.5	21.4
11/07/2021 02:45:01	11/07/2021 03:00:01	00:15:00	38.9	53.4	49.6	46.4	43.9	29.3	22.9	22.2	21.1
11/07/2021 03:00:01	11/07/2021 03:15:01	00:15:00	41.4	64.4	51.0	47.0	45.3	33.3	23.1	21.3	20.0
11/07/2021 03:15:01	11/07/2021 03:30:01	00:15:00	40.0	56.2	48.2	44.9	43.4	37.3	32.8	31.6	29.2
11/07/2021 03:30:02	11/07/2021 03:45:02	00:15:00	51.0	60.0	57.3	55.8	55.0	48.7	37.8	35.4	32.6
11/07/2021 03:45:01	11/07/2021 04:00:01	00:15:00	49.5	61.5	57.7	55.9	54.6	44.0	37.3	35.8	33.4
11/07/2021 04:00:01	11/07/2021 04:15:01	00:15:00	44.1	60.1	55.5	51.2	46.8	37.5	29.7	27.7	25.5
11/07/2021 04:15:01	11/07/2021 04:30:01	00:15:00	41.6	55.3	50.2	47.5	45.6	37.9	29.4	27.6	25.0
11/07/2021 04:30:02	11/07/2021 04:45:02	00:15:00	43.4	55.1	51.3	48.5	46.8	41.3	33.7	32.2	28.8
11/07/2021 04:45:01	11/07/2021 05:00:01	00:15:00	45.1	63.3	53.0	50.7	49.3	41.9	34.2	32.5	29.6
11/07/2021 05:00:01	11/07/2021 05:15:01	00:15:00	46.7	60.3	53.6	51.2	50.0	44.9	36.9	34.4	30.1
11/07/2021 05:15:01	11/07/2021 05:30:01	00:15:00	47.4	58.0	54.0	52.1	51.1	45.7	35.2	32.9	28.6
11/07/2021 05:30:02	11/07/2021 05:45:02	00:15:00	47.0	58.3	54.0	51.7	50.5	45.6	36.1	31.9	27.3
11/07/2021 05:45:01	11/07/2021 06:00:01	00:15:00	46.4	56.2	53.4	51.2	50.0	44.4	36.8	35.0	32.9
11/07/2021 06:00:01	11/07/2021 06:15:01	00:15:00	46.5	58.6	53.8	51.3	49.8	44.7	38.9	37.2	31.5

11/07/2021 06:15:01	11/07/2021 06:30:01	00:15:00	46.7	60.2	54.5	52.1	50.6	43.4	34.6	32.3	29.4
11/07/2021 06:30:02	11/07/2021 06:45:02	00:15:00	49.1	59.2	55.4	53.5	52.4	47.9	41.2	39.3	36.1
11/07/2021 06:45:01	11/07/2021 07:00:01	00:15:00	49.7	62.6	56.0	54.0	53.0	48.5	40.5	37.0	32.2
11/07/2021 07:00:01	11/07/2021 07:15:01	00:15:00	49.5	60.3	56.3	53.9	52.7	47.9	42.5	41.0	38.5
11/07/2021 07:15:02	11/07/2021 07:30:02	00:15:00	50.3	62.9	57.3	55.4	54.1	48.2	41.5	39.6	36.9
11/07/2021 07:30:02	11/07/2021 07:45:02	00:15:00	50.4	62.0	57.5	55.0	53.6	48.8	42.6	41.1	38.8
11/07/2021 07:45:01	11/07/2021 08:00:01	00:15:00	51.6	62.5	57.7	55.9	54.9	50.3	44.0	39.7	36.9
11/07/2021 08:00:01	11/07/2021 08:15:01	00:15:00	52.6	61.5	57.8	56.4	55.5	51.7	46.3	44.4	40.0
11/07/2021 08:15:01	11/07/2021 08:30:01	00:15:00	53.5	61.9	59.0	57.4	56.3	52.6	48.1	46.9	45.3
11/07/2021 08:30:02	11/07/2021 08:45:02	00:15:00	52.9	63.5	57.9	56.5	55.7	52.1	47.5	46.1	44.4
11/07/2021 08:45:01	11/07/2021 09:00:01	00:15:00	52.7	62.4	58.5	56.4	55.4	51.9	47.6	46.4	43.4
11/07/2021 09:00:01	11/07/2021 09:15:01	00:15:00	53.1	63.4	58.7	57.2	56.2	51.8	46.2	43.9	38.5
11/07/2021 09:15:01	11/07/2021 09:30:01	00:15:00	55.3	67.4	62.7	58.9	57.6	54.1	50.1	49.0	46.0
11/07/2021 09:30:01	11/07/2021 09:45:01	00:15:00	53.8	61.8	58.5	57.0	56.2	53.1	49.8	48.8	47.4
11/07/2021 09:45:01	11/07/2021 10:00:01	00:15:00	55.1	65.5	60.1	58.2	57.3	54.5	51.7	51.0	49.6
11/07/2021 10:00:01	11/07/2021 10:15:01	00:15:00	55.4	64.0	59.6	58.3	57.6	54.9	52.3	51.7	50.1
11/07/2021 10:15:01	11/07/2021 10:30:01	00:15:00	55.5	65.3	60.7	58.6	57.6	54.8	52.0	51.0	49.3
11/07/2021 10:30:01	11/07/2021 10:45:01	00:15:00	56.1	65.5	60.6	59.0	58.2	55.6	52.3	51.1	49.7
11/07/2021 10:45:01	11/07/2021 11:00:01	00:15:00	57.1	65.3	61.3	60.0	59.2	56.7	54.0	52.9	51.5
11/07/2021 11:00:01	11/07/2021 11:15:01	00:15:00	57.2	64.1	60.9	59.8	59.2	56.7	54.3	53.6	51.8
11/07/2021 11:15:01	11/07/2021 11:30:01	00:15:00	57.1	64.2	60.7	59.5	58.9	56.7	54.3	53.7	52.5
11/07/2021 11:30:01	11/07/2021 11:45:01	00:15:00	56.7	63.8	60.9	59.6	58.9	56.2	53.3	52.5	50.9
11/07/2021 11:45:01	11/07/2021 12:00:01	00:15:00	56.7	65.7	60.8	59.6	58.8	56.1	53.6	52.8	51.6
11/07/2021 12:00:01	11/07/2021 12:15:01	00:15:00	57.9	64.3	62.1	60.7	59.9	57.4	55.0	54.2	52.5
11/07/2021 12:15:01	11/07/2021 12:30:01	00:15:00	57.6	64.4	61.7	60.1	59.4	57.1	55.0	54.4	53.2
11/07/2021 12:30:01	11/07/2021 12:45:01	00:15:00	58.3	65.0	62.5	61.2	60.4	57.7	55.1	54.3	52.8
11/07/2021 12:45:01	11/07/2021 13:00:01	00:15:00	58.2	65.8	62.3	61.1	60.4	57.6	54.8	54.1	52.7
11/07/2021 13:00:01	11/07/2021 13:15:01	00:15:00	58.3	66.3	62.4	61.0	60.1	57.8	55.8	55.4	54.4
11/07/2021 13:15:01	11/07/2021 13:30:01	00:15:00	57.8	66.2	62.5	60.5	59.8	57.3	54.6	53.5	49.1
11/07/2021 13:30:01	11/07/2021 13:45:01	00:15:00	58.6	65.8	62.9	61.6	60.8	58.0	54.9	53.9	52.7
11/07/2021 13:45:01	11/07/2021 14:00:01	00:15:00	57.5	65.4	62.3	60.7	59.6	57.0	54.0	53.2	51.9
11/07/2021 14:00:01	11/07/2021 14:15:01	00:15:00	57.2	65.3	62.3	60.5	59.6	56.4	53.1	51.9	50.1
11/07/2021 14:15:01	11/07/2021 14:30:01	00:15:00	58.1	65.6	62.6	60.9	60.1	57.6	54.5	53.0	50.8
11/07/2021 14:30:02	11/07/2021 14:45:02	00:15:00	57.8	66.2	62.9	61.1	60.2	57.0	54.1	53.1	50.8

11/07/2021 14:45:01	11/07/2021 15:00:01	00:15:00	58.2	66.9	63.5	61.6	60.5	57.5	54.2	53.1	51.0
11/07/2021 15:00:01	11/07/2021 15:15:01	00:15:00	57.9	64.4	62.1	60.9	60.1	57.2	54.5	53.8	52.1
11/07/2021 15:15:01	11/07/2021 15:30:01	00:15:00	57.5	65.2	61.6	60.3	59.6	56.9	54.7	54.1	53.0
11/07/2021 15:30:01	11/07/2021 15:45:01	00:15:00	58.4	64.2	62.2	61.2	60.5	57.9	55.2	54.4	51.8
11/07/2021 15:45:01	11/07/2021 16:00:01	00:15:00	58.4	65.2	63.1	61.7	60.8	57.7	54.8	53.9	52.4
11/07/2021 16:00:01	11/07/2021 16:15:01	00:15:00	57.5	66.8	62.0	60.6	59.6	56.9	54.4	53.8	52.3
11/07/2021 16:15:01	11/07/2021 16:30:01	00:15:00	58.5	64.8	62.7	61.2	60.5	58.1	55.3	54.5	53.0
11/07/2021 16:30:01	11/07/2021 16:45:01	00:15:00	58.2	67.3	63.0	61.4	60.5	57.6	54.5	53.3	51.2
11/07/2021 16:45:01	11/07/2021 17:00:01	00:15:00	57.6	66.4	62.1	60.2	59.4	57.0	54.8	54.2	53.3
11/07/2021 17:00:01	11/07/2021 17:15:01	00:15:00	57.7	65.1	61.7	60.4	59.7	57.3	54.8	54.1	52.8
11/07/2021 17:15:01	11/07/2021 17:30:01	00:15:00	57.6	70.7	62.4	60.0	59.4	57.1	54.3	53.6	52.2
11/07/2021 17:30:01	11/07/2021 17:45:01	00:15:00	57.2	64.4	62.0	60.4	59.5	56.5	53.7	52.7	51.5
11/07/2021 17:45:01	11/07/2021 18:00:01	00:15:00	57.7	65.0	62.0	60.4	59.6	57.2	54.7	53.8	52.2
11/07/2021 18:00:01	11/07/2021 18:15:01	00:15:00	57.4	64.2	61.8	60.2	59.5	56.9	54.2	53.4	51.4
11/07/2021 18:15:01	11/07/2021 18:30:01	00:15:00	56.8	63.5	61.1	59.7	59.0	56.2	53.7	53.0	51.8
11/07/2021 18:30:02	11/07/2021 18:45:02	00:15:00	56.2	65.7	60.6	59.4	58.6	55.6	52.4	51.5	50.3
11/07/2021 18:45:01	11/07/2021 19:00:01	00:15:00	55.1	65.4	60.6	58.4	57.4	54.3	50.9	50.0	48.2
11/07/2021 19:00:01	11/07/2021 19:15:01	00:15:00	54.6	62.2	59.6	58.0	57.1	53.8	49.8	48.9	47.5
11/07/2021 19:15:01	11/07/2021 19:30:01	00:15:00	54.7	62.5	59.8	58.3	57.3	54.0	49.6	48.3	45.9
11/07/2021 19:30:01	11/07/2021 19:45:01	00:15:00	53.7	63.0	59.5	57.7	56.6	52.7	47.7	46.2	43.9
11/07/2021 19:45:01	11/07/2021 20:00:01	00:15:00	51.5	60.6	57.5	55.7	54.6	50.4	44.4	42.4	37.7
11/07/2021 20:00:01	11/07/2021 20:15:01	00:15:00	53.1	61.6	59.1	57.2	56.1	52.0	46.3	44.8	42.1
11/07/2021 20:15:01	11/07/2021 20:30:01	00:15:00	51.9	63.6	57.7	56.0	55.1	50.8	43.9	40.2	36.1
11/07/2021 20:30:01	11/07/2021 20:45:01	00:15:00	50.3	61.5	57.1	54.6	53.4	48.9	42.2	40.3	38.0
11/07/2021 20:45:01	11/07/2021 21:00:01	00:15:00	50.1	62.1	56.2	54.4	53.2	48.9	43.8	41.9	39.9
11/07/2021 21:00:01	11/07/2021 21:15:01	00:15:00	49.4	61.6	56.3	53.9	52.6	47.7	42.6	40.7	36.9
11/07/2021 21:15:02	11/07/2021 21:30:02	00:15:00	48.8	59.4	55.3	53.4	52.3	47.2	40.3	38.9	36.9
11/07/2021 21:30:01	11/07/2021 21:45:01	00:15:00	48.7	59.0	55.5	53.7	52.5	46.6	36.1	33.5	31.0
11/07/2021 21:45:01	11/07/2021 22:00:01	00:15:00	47.0	58.7	54.7	52.4	51.0	44.2	35.5	33.4	31.1
11/07/2021 22:00:01	11/07/2021 22:15:01	00:15:00	46.5	60.7	54.7	51.7	50.3	43.7	32.4	29.3	26.0
11/07/2021 22:15:01	11/07/2021 22:30:01	00:15:00	47.6	57.7	54.5	52.5	51.2	45.7	38.1	34.7	30.9
11/07/2021 22:30:01	11/07/2021 22:45:01	00:15:00	48.9	60.6	56.0	53.8	52.5	47.1	37.7	36.1	33.9
11/07/2021 22:45:01	11/07/2021 23:00:01	00:15:00	47.9	58.4	54.6	52.3	51.0	46.4	40.6	39.0	35.2
11/07/2021 23:00:01	11/07/2021 23:15:01	00:15:00	47.7	61.1	54.5	52.4	51.1	45.9	40.6	39.2	37.0

11/07/2021 23:15:02	11/07/2021 23:30:02	00:15:00	47.6	59.0	54.9	52.5	51.2	45.5	33.3	30.5	27.3
11/07/2021 23:30:01	11/07/2021 23:45:01	00:15:00	46.5	59.9	54.2	51.7	50.2	44.5	34.5	32.7	29.8
11/07/2021 23:45:01	12/07/2021 00:00:01	00:15:00	45.8	58.9	54.1	51.5	49.8	42.4	31.9	28.4	25.9
12/07/2021 00:00:01	12/07/2021 00:15:01	00:15:00	45.5	58.8	53.3	50.6	49.3	42.6	33.7	31.3	28.7
12/07/2021 00:15:02	12/07/2021 00:30:02	00:15:00	43.0	56.6	53.0	49.6	47.4	37.1	31.0	30.0	28.1
12/07/2021 00:30:01	12/07/2021 00:45:01	00:15:00	40.1	56.2	50.4	47.5	44.8	31.7	25.2	24.2	23.0
12/07/2021 00:45:01	12/07/2021 01:00:01	00:15:00	43.6	56.0	53.9	50.0	47.9	37.3	26.4	24.9	23.3
12/07/2021 01:00:01	12/07/2021 01:15:01	00:15:00	41.4	59.1	51.9	47.9	45.6	33.9	28.2	27.2	25.5
12/07/2021 01:15:02	12/07/2021 01:30:02	00:15:00	42.8	63.7	53.3	48.6	46.5	35.3	26.9	25.9	24.6
12/07/2021 01:30:01	12/07/2021 01:45:01	00:15:00	43.1	60.9	52.2	49.0	47.3	37.4	28.6	27.5	25.7
12/07/2021 01:45:01	12/07/2021 02:00:01	00:15:00	41.5	58.2	52.4	48.6	45.9	32.4	24.9	23.5	22.5
12/07/2021 02:00:02	12/07/2021 02:15:02	00:15:00	43.0	58.1	53.5	49.8	47.1	36.9	26.5	25.4	24.3
12/07/2021 02:15:01	12/07/2021 02:30:01	00:15:00	42.7	54.8	51.5	49.0	47.0	37.2	28.4	26.1	23.3
12/07/2021 02:30:01	12/07/2021 02:45:01	00:15:00	44.6	57.5	52.7	50.3	48.6	41.6	30.5	27.2	24.2
12/07/2021 02:45:01	12/07/2021 03:00:01	00:15:00	43.3	58.2	52.4	49.2	47.3	39.2	31.7	30.3	28.2
12/07/2021 03:00:02	12/07/2021 03:15:02	00:15:00	45.9	56.9	53.6	51.3	49.8	43.2	36.8	35.2	32.1
12/07/2021 03:15:01	12/07/2021 03:30:01	00:15:00	46.8	56.7	53.3	51.2	50.1	45.4	37.9	35.2	32.1
12/07/2021 03:30:01	12/07/2021 03:45:01	00:15:00	47.4	61.3	55.0	52.5	51.2	44.7	37.9	36.5	34.3
12/07/2021 03:45:01	12/07/2021 04:00:01	00:15:00	48.9	61.9	56.0	54.0	52.8	46.4	37.5	36.1	33.7
12/07/2021 04:00:02	12/07/2021 04:15:02	00:15:00	49.8	60.7	56.6	54.2	52.9	48.3	43.4	42.4	39.9
12/07/2021 04:15:01	12/07/2021 04:30:01	00:15:00	52.5	62.0	58.3	56.4	55.2	51.5	47.0	45.6	42.4
12/07/2021 04:30:01	12/07/2021 04:45:01	00:15:00	53.2	61.0	58.2	56.7	55.8	52.4	47.8	46.1	44.2
12/07/2021 04:45:01	12/07/2021 05:00:01	00:15:00	56.1	63.7	60.6	59.3	58.5	55.4	51.9	50.8	48.7
12/07/2021 05:00:02	12/07/2021 05:15:02	00:15:00	56.7	68.4	61.5	59.8	58.9	56.0	52.8	52.0	50.5
12/07/2021 05:15:01	12/07/2021 05:30:01	00:15:00	55.2	60.7	59.1	58.1	57.4	54.6	51.8	50.8	49.3
12/07/2021 05:30:01	12/07/2021 05:45:01	00:15:00	53.5	63.5	58.6	56.5	55.7	52.7	50.1	49.5	48.7
12/07/2021 05:45:01	12/07/2021 06:00:01	00:15:00	53.6	62.1	57.7	56.4	55.7	53.0	50.8	50.1	48.8
12/07/2021 06:00:02	12/07/2021 06:15:02	00:15:00	49.8	60.0	55.1	53.5	52.5	48.8	46.1	45.5	44.5
12/07/2021 06:15:01	12/07/2021 06:30:01	00:15:00	50.1	57.5	54.0	52.9	52.1	49.4	47.5	46.9	46.1
12/07/2021 06:30:01	12/07/2021 06:45:01	00:15:00	50.1	56.9	54.0	52.7	52.0	49.6	47.8	47.3	46.5
12/07/2021 06:45:01	12/07/2021 07:00:01	00:15:00	48.7	57.0	52.6	51.2	50.6	48.3	45.4	44.7	43.3
12/07/2021 07:00:02	12/07/2021 07:15:02	00:15:00	51.6	66.8	55.7	54.5	53.8	51.1	48.2	47.6	46.0
12/07/2021 07:15:01	12/07/2021 07:30:01	00:15:00	51.9	59.7	56.4	54.9	54.0	51.3	48.9	48.2	46.7
12/07/2021 07:30:01	12/07/2021 07:45:01	00:15:00	51.8	60.3	55.8	54.6	53.9	51.3	48.3	47.3	45.9

12/07/2021 07:45:01	12/07/2021 08:00:01	00:15:00	48.8	63.8	53.8	51.7	50.7	48.1	45.3	44.4	43.2
12/07/2021 08:00:01	12/07/2021 08:15:01	00:15:00	50.2	59.5	55.4	53.4	52.5	49.3	46.7	45.7	43.7
12/07/2021 08:15:01	12/07/2021 08:30:01	00:15:00	47.1	55.9	52.3	50.8	50.0	45.7	41.9	40.8	39.4
12/07/2021 08:30:01	12/07/2021 08:45:01	00:15:00	41.6	58.1	47.3	45.0	43.8	40.7	37.5	36.6	35.2
12/07/2021 08:45:01	12/07/2021 09:00:01	00:15:00	42.0	61.5	47.8	45.4	44.2	41.1	37.9	37.1	35.5
12/07/2021 09:00:01	12/07/2021 09:15:01	00:15:00	43.6	59.5	50.9	47.3	46.0	42.0	39.1	38.2	36.5
12/07/2021 09:15:01	12/07/2021 09:30:01	00:15:00	58.7	72.1	70.1	67.6	62.6	45.6	39.4	38.2	36.0
12/07/2021 09:30:01	12/07/2021 09:45:01	00:15:00	42.2	51.8	46.7	45.3	44.5	41.6	38.8	38.1	36.3
12/07/2021 09:45:02	12/07/2021 10:00:02	00:15:00	48.9	84.8	48.8	46.3	45.1	41.4	38.3	37.6	36.8
12/07/2021 10:00:01	12/07/2021 10:15:01	00:15:00	40.8	53.2	46.6	44.0	42.9	40.1	37.5	36.7	34.9
12/07/2021 10:15:01	12/07/2021 10:30:01	00:15:00	40.8	49.8	46.9	44.6	43.2	39.9	36.9	36.0	34.4
12/07/2021 10:30:01	12/07/2021 10:45:01	00:15:00	42.7	55.3	49.4	46.3	44.9	41.6	38.7	37.9	36.7
12/07/2021 10:45:02	12/07/2021 11:00:02	00:15:00	42.9	55.8	49.2	47.1	45.8	41.4	38.4	37.5	36.6
12/07/2021 11:00:01	12/07/2021 11:15:01	00:15:00	43.7	56.5	50.1	47.8	46.3	42.5	39.0	38.2	36.2
12/07/2021 11:15:01	12/07/2021 11:30:01	00:15:00	41.2	51.1	46.6	44.5	43.4	40.5	37.7	36.8	36.0
12/07/2021 11:30:01	12/07/2021 11:45:01	00:15:00	42.5	53.0	48.5	46.3	45.2	41.0	38.3	37.7	36.7
12/07/2021 11:45:02	12/07/2021 12:00:02	00:15:00	42.3	55.1	49.0	46.3	45.0	40.7	37.8	37.1	35.9
12/07/2021 12:00:01	12/07/2021 12:15:01	00:15:00	41.2	57.2	46.0	44.2	43.1	40.4	38.5	37.7	36.1
12/07/2021 12:15:01	12/07/2021 12:30:01	00:15:00	42.9	54.0	50.3	46.7	45.2	41.3	38.4	37.7	36.7
12/07/2021 12:30:01	12/07/2021 12:45:01	00:15:00	44.9	61.9	55.2	47.9	46.0	42.4	39.3	38.3	37.0
12/07/2021 12:45:02	12/07/2021 13:00:02	00:15:00	41.3	50.5	46.3	44.6	43.5	40.4	38.1	37.4	36.6
12/07/2021 13:00:01	12/07/2021 13:15:01	00:15:00	44.9	62.6	52.6	47.5	46.4	43.4	40.0	38.9	37.5

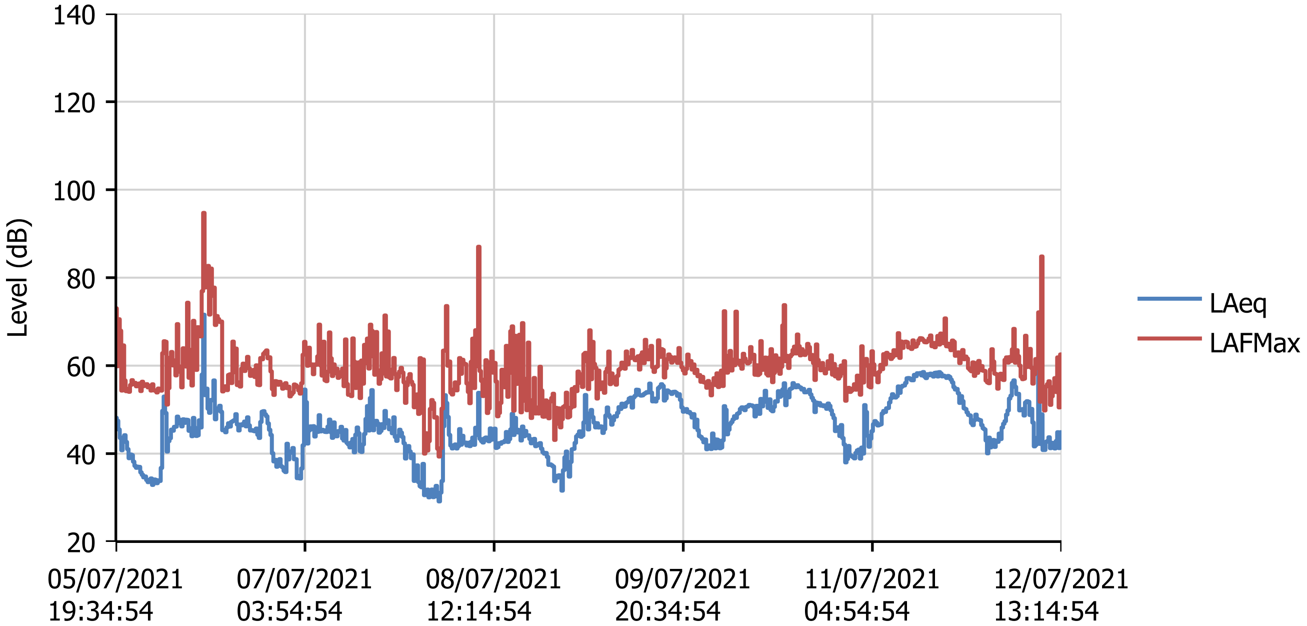
Cirrus Research plc

HALSTON

Measurement List Report

Name SEP-0347 (NSR-101)
Start Time 05/07/2021 19:34:54
End Time 12/07/2021 13:15:01

Calibration Before	30/06/2021 13:23:04	Offset	-0.16 dB



Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
05/07/2021 19:34:54	05/07/2021 19:45:01	00:10:07	48.1	73.0	54.5	51.1	50.0	46.7	40.3	38.5	34.1
05/07/2021 19:45:01	05/07/2021 20:00:01	00:15:00	47.5	59.9	54.2	51.6	50.6	46.1	39.4	38.1	36.1
05/07/2021 20:00:01	05/07/2021 20:15:01	00:15:00	45.5	70.6	55.0	49.8	47.5	41.6	35.5	34.3	32.7
05/07/2021 20:15:02	05/07/2021 20:30:02	00:15:00	43.6	67.9	49.7	45.9	44.8	40.7	36.7	35.7	33.8
05/07/2021 20:30:01	05/07/2021 20:45:01	00:15:00	40.8	54.3	48.4	46.0	44.6	38.0	34.2	33.4	32.3
05/07/2021 20:45:01	05/07/2021 21:00:01	00:15:00	43.7	64.6	50.0	47.0	45.7	42.7	39.3	38.5	37.7

ReportId

05/07/2021 21:00:01	05/07/2021 21:15:01	00:15:00	44.2	56.6	49.4	47.4	46.5	43.4	40.3	39.4	37.7
05/07/2021 21:15:02	05/07/2021 21:30:02	00:15:00	42.6	54.2	49.7	47.4	46.0	40.8	34.4	32.5	29.0
05/07/2021 21:30:01	05/07/2021 21:45:01	00:15:00	41.0	54.7	48.9	45.9	44.5	38.9	31.4	29.2	26.4
05/07/2021 21:45:01	05/07/2021 22:00:01	00:15:00	39.0	54.1	47.6	44.0	42.6	35.7	29.2	27.9	26.4
05/07/2021 22:00:01	05/07/2021 22:15:01	00:15:00	39.8	55.6	50.1	45.3	42.5	36.4	31.9	30.6	27.6
05/07/2021 22:15:01	05/07/2021 22:30:01	00:15:00	39.7	56.7	50.5	44.5	42.0	36.2	30.8	29.2	26.7
05/07/2021 22:30:01	05/07/2021 22:45:01	00:15:00	38.2	55.8	50.4	42.4	40.0	32.8	26.4	23.3	20.4
05/07/2021 22:45:01	05/07/2021 23:00:01	00:15:00	37.2	56.1	49.3	42.3	39.5	31.4	23.4	20.8	20.0
05/07/2021 23:00:01	05/07/2021 23:15:01	00:15:00	36.8	55.3	48.6	42.0	38.8	31.5	26.3	24.8	21.2
05/07/2021 23:15:01	05/07/2021 23:30:01	00:15:00	37.0	55.9	47.1	42.9	40.5	32.0	25.7	24.4	22.4
05/07/2021 23:30:01	05/07/2021 23:45:01	00:15:00	37.0	56.0	46.2	42.5	40.9	32.1	25.9	24.7	23.2
05/07/2021 23:45:01	06/07/2021 00:00:01	00:15:00	35.7	54.2	47.0	41.9	39.1	30.0	24.5	22.7	20.7
06/07/2021 00:00:01	06/07/2021 00:15:01	00:15:00	35.2	56.4	45.5	40.3	38.3	31.3	22.8	20.6	20.0
06/07/2021 00:15:01	06/07/2021 00:30:01	00:15:00	34.6	55.4	46.2	38.9	35.9	30.0	23.5	21.8	20.2
06/07/2021 00:30:01	06/07/2021 00:45:01	00:15:00	34.8	55.7	45.6	39.0	37.1	30.2	22.0	20.0	20.0
06/07/2021 00:45:01	06/07/2021 01:00:01	00:15:00	34.0	55.8	45.6	39.0	36.5	28.3	21.8	20.0	20.0
06/07/2021 01:00:01	06/07/2021 01:15:01	00:15:00	33.5	55.1	45.4	36.7	34.5	28.4	20.1	20.0	20.0
06/07/2021 01:15:01	06/07/2021 01:30:01	00:15:00	34.1	55.4	45.1	37.9	35.3	29.7	23.4	22.0	20.3
06/07/2021 01:30:01	06/07/2021 01:45:01	00:15:00	34.4	54.3	45.0	38.1	36.8	30.3	20.8	20.0	20.0
06/07/2021 01:45:01	06/07/2021 02:00:01	00:15:00	32.9	55.8	43.8	37.7	35.4	27.1	22.0	21.1	20.0
06/07/2021 02:00:01	06/07/2021 02:15:01	00:15:00	34.1	54.4	44.4	38.7	36.9	30.3	22.1	20.6	20.0
06/07/2021 02:15:01	06/07/2021 02:30:01	00:15:00	34.1	54.3	45.7	38.7	36.5	28.3	23.1	22.0	20.4
06/07/2021 02:30:01	06/07/2021 02:45:01	00:15:00	33.3	53.9	43.8	37.5	35.5	29.6	22.4	20.8	20.0
06/07/2021 02:45:01	06/07/2021 03:00:01	00:15:00	33.9	54.8	43.8	37.9	36.2	30.1	25.1	23.7	21.4
06/07/2021 03:00:01	06/07/2021 03:15:01	00:15:00	33.8	54.6	43.6	37.7	36.1	30.3	25.9	24.9	23.6
06/07/2021 03:15:01	06/07/2021 03:30:01	00:15:00	36.8	54.3	46.8	41.0	39.2	33.9	27.6	25.9	23.8

ReportId

06/07/2021 03:30:01	06/07/2021 03:45:01	00:15:00	49.7	62.8	59.1	57.0	55.6	39.2	33.5	32.0	28.8
06/07/2021 03:45:01	06/07/2021 04:00:01	00:15:00	53.0	65.6	60.4	58.7	57.6	45.8	37.4	35.7	32.7
06/07/2021 04:00:01	06/07/2021 04:15:01	00:15:00	49.2	65.4	59.6	57.1	55.1	40.3	33.8	32.0	29.3
06/07/2021 04:15:01	06/07/2021 04:30:01	00:15:00	40.5	51.2	46.5	44.8	43.8	39.0	33.4	32.2	29.7
06/07/2021 04:30:02	06/07/2021 04:45:02	00:15:00	42.8	54.9	48.7	46.5	45.4	41.8	38.3	36.9	34.0
06/07/2021 04:45:01	06/07/2021 05:00:01	00:15:00	43.5	61.8	48.6	46.2	45.4	42.4	39.2	38.0	35.7
06/07/2021 05:00:01	06/07/2021 05:15:01	00:15:00	45.5	63.1	56.3	50.1	46.0	42.6	39.6	38.8	37.5
06/07/2021 05:15:01	06/07/2021 05:30:01	00:15:00	45.2	60.1	50.9	48.0	47.3	44.3	41.1	40.3	38.8
06/07/2021 05:30:01	06/07/2021 05:45:01	00:15:00	46.1	61.2	52.2	49.1	48.2	45.1	42.5	41.7	40.3
06/07/2021 05:45:01	06/07/2021 06:00:01	00:15:00	46.1	57.8	50.5	48.9	48.0	45.6	43.1	42.1	40.6
06/07/2021 06:00:01	06/07/2021 06:15:01	00:15:00	48.4	69.4	53.6	51.7	50.6	47.4	44.6	43.9	42.8
06/07/2021 06:15:02	06/07/2021 06:30:02	00:15:00	47.8	59.8	53.4	50.7	49.8	47.0	44.4	43.6	42.3
06/07/2021 06:30:01	06/07/2021 06:45:01	00:15:00	46.9	58.6	51.7	49.5	48.6	46.3	44.1	43.4	42.4
06/07/2021 06:45:01	06/07/2021 07:00:01	00:15:00	46.2	55.1	50.5	48.9	48.1	45.6	43.6	43.1	41.7
06/07/2021 07:00:01	06/07/2021 07:15:01	00:15:00	47.8	64.0	52.6	50.6	49.8	47.1	44.8	44.2	43.0
06/07/2021 07:15:02	06/07/2021 07:30:02	00:15:00	47.0	61.5	52.5	50.1	49.1	46.2	43.6	42.9	41.7
06/07/2021 07:30:01	06/07/2021 07:45:01	00:15:00	47.7	59.8	53.4	50.8	49.8	46.8	44.4	43.7	42.7
06/07/2021 07:45:01	06/07/2021 08:00:01	00:15:00	47.7	74.3	54.3	50.6	49.5	45.7	41.9	41.0	39.6
06/07/2021 08:00:01	06/07/2021 08:15:01	00:15:00	45.2	57.2	51.3	48.7	47.5	44.2	41.6	40.9	40.0
06/07/2021 08:15:01	06/07/2021 08:30:01	00:15:00	45.8	63.6	53.0	49.5	48.0	44.2	41.4	40.6	38.9
06/07/2021 08:30:01	06/07/2021 08:45:01	00:15:00	44.0	55.5	49.2	47.1	46.1	43.2	40.5	39.7	38.2
06/07/2021 08:45:01	06/07/2021 09:00:01	00:15:00	48.1	70.2	59.9	49.8	47.8	43.2	39.9	39.1	37.5
06/07/2021 09:00:01	06/07/2021 09:15:01	00:15:00	45.8	60.6	52.7	49.6	48.2	44.4	41.7	41.1	39.9
06/07/2021 09:15:01	06/07/2021 09:30:01	00:15:00	44.0	59.0	50.2	47.9	46.7	42.9	39.3	38.3	37.3
06/07/2021 09:30:01	06/07/2021 09:45:01	00:15:00	44.2	68.8	53.3	47.5	45.3	40.5	37.6	36.8	35.7
06/07/2021 09:45:01	06/07/2021 10:00:01	00:15:00	47.6	67.6	58.8	52.1	49.1	43.7	40.3	39.7	38.2

ReportId

06/07/2021 10:00:01	06/07/2021 10:15:01	00:15:00	45.9	66.7	56.1	51.3	47.9	41.9	38.1	37.0	35.2
06/07/2021 10:15:02	06/07/2021 10:30:02	00:15:00	58.0	76.9	69.2	65.2	62.5	47.0	42.0	40.9	39.4
06/07/2021 10:30:01	06/07/2021 10:45:01	00:15:00	71.6	94.7	86.6	62.2	54.8	44.6	40.4	39.3	37.8
06/07/2021 10:45:01	06/07/2021 11:00:01	00:15:00	53.3	77.8	65.2	53.8	48.8	42.9	39.7	38.9	37.6
06/07/2021 11:00:01	06/07/2021 11:15:01	00:15:00	54.8	80.4	63.5	52.0	47.4	41.8	39.2	38.7	37.5
06/07/2021 11:15:01	06/07/2021 11:30:01	00:15:00	50.2	82.7	60.0	51.8	49.0	44.4	41.4	41.0	40.4
06/07/2021 11:30:01	06/07/2021 11:45:01	00:15:00	49.3	71.6	57.6	52.6	51.5	46.1	42.0	41.0	39.6
06/07/2021 11:45:01	06/07/2021 12:00:01	00:15:00	52.2	82.1	61.5	52.8	49.6	43.9	41.2	40.7	39.9
06/07/2021 12:00:01	06/07/2021 12:15:01	00:15:00	52.1	75.9	63.5	54.9	52.1	46.2	42.3	41.5	40.2
06/07/2021 12:15:01	06/07/2021 12:30:01	00:15:00	56.6	77.7	69.4	63.0	58.7	47.0	42.2	41.5	40.5
06/07/2021 12:30:01	06/07/2021 12:45:01	00:15:00	47.8	69.2	58.6	51.2	49.1	45.5	41.5	40.9	39.9
06/07/2021 12:45:01	06/07/2021 13:00:01	00:15:00	50.2	71.3	61.5	54.4	51.4	45.7	41.8	41.1	40.1
06/07/2021 13:00:01	06/07/2021 13:15:01	00:15:00	49.8	70.6	61.2	52.6	50.0	45.1	42.0	41.4	40.6
06/07/2021 13:15:01	06/07/2021 13:30:01	00:15:00	50.9	69.9	61.0	56.3	53.6	46.9	44.2	43.8	43.2
06/07/2021 13:30:01	06/07/2021 13:45:01	00:15:00	49.5	70.0	59.0	53.9	51.6	45.7	41.2	40.4	39.5
06/07/2021 13:45:01	06/07/2021 14:00:01	00:15:00	45.3	54.1	50.2	48.4	47.6	44.7	41.1	40.3	39.5
06/07/2021 14:00:01	06/07/2021 14:15:01	00:15:00	45.4	55.0	50.6	48.1	47.2	44.7	42.8	42.1	41.2
06/07/2021 14:15:01	06/07/2021 14:30:01	00:15:00	44.9	55.3	49.9	47.8	46.8	44.1	42.1	41.6	40.9
06/07/2021 14:30:02	06/07/2021 14:45:02	00:15:00	46.0	54.4	50.6	49.2	48.2	45.4	42.4	41.7	40.7
06/07/2021 14:45:01	06/07/2021 15:00:01	00:15:00	46.9	57.9	52.4	50.1	49.2	46.2	42.5	41.8	40.9
06/07/2021 15:00:01	06/07/2021 15:15:01	00:15:00	46.2	58.0	50.4	48.4	47.8	45.7	43.7	43.2	42.3
06/07/2021 15:15:01	06/07/2021 15:30:01	00:15:00	47.2	56.0	52.4	50.6	49.6	46.3	43.5	43.0	41.9
06/07/2021 15:30:02	06/07/2021 15:45:02	00:15:00	47.4	65.5	52.8	50.0	49.1	46.5	43.6	42.9	42.1
06/07/2021 15:45:01	06/07/2021 16:00:01	00:15:00	47.6	58.6	53.1	51.5	50.4	46.2	44.2	43.9	43.3
06/07/2021 16:00:01	06/07/2021 16:15:01	00:15:00	49.0	63.9	57.3	53.0	51.5	47.2	44.6	44.0	43.0
06/07/2021 16:15:01	06/07/2021 16:30:01	00:15:00	46.6	55.6	52.0	50.3	49.3	45.5	42.8	42.3	41.3

ReportId

06/07/2021 16:30:02	06/07/2021 16:45:02	00:15:00	45.3	56.2	50.5	48.6	47.5	44.3	41.8	41.3	40.4
06/07/2021 16:45:01	06/07/2021 17:00:01	00:15:00	46.6	55.2	52.1	49.9	48.9	46.0	42.2	41.5	40.3
06/07/2021 17:00:01	06/07/2021 17:15:01	00:15:00	46.4	59.3	51.9	49.8	48.7	45.3	42.9	42.4	41.9
06/07/2021 17:15:01	06/07/2021 17:30:01	00:15:00	46.8	60.5	53.3	50.8	49.5	45.4	42.7	42.1	40.8
06/07/2021 17:30:02	06/07/2021 17:45:02	00:15:00	47.3	58.8	52.2	50.4	49.4	46.5	44.3	43.8	43.1
06/07/2021 17:45:01	06/07/2021 18:00:01	00:15:00	46.2	60.1	53.1	50.5	49.2	44.4	40.9	40.0	38.8
06/07/2021 18:00:01	06/07/2021 18:15:01	00:15:00	48.3	62.0	57.4	54.7	52.0	44.9	41.2	39.8	37.5
06/07/2021 18:15:02	06/07/2021 18:30:02	00:15:00	46.4	59.4	52.4	50.3	49.2	45.2	42.0	41.5	40.6
06/07/2021 18:30:01	06/07/2021 18:45:01	00:15:00	45.3	57.7	51.8	49.4	48.2	43.7	40.4	39.8	38.3
06/07/2021 18:45:01	06/07/2021 19:00:01	00:15:00	45.4	58.8	54.0	50.5	48.8	42.2	38.6	37.7	36.6
06/07/2021 19:00:01	06/07/2021 19:15:01	00:15:00	45.2	59.0	52.8	49.7	48.1	43.4	39.2	38.1	36.5
06/07/2021 19:15:02	06/07/2021 19:30:02	00:15:00	45.1	57.4	51.8	49.5	48.2	43.3	39.1	38.1	36.8
06/07/2021 19:30:01	06/07/2021 19:45:01	00:15:00	45.7	60.1	52.7	50.1	48.7	44.2	39.6	38.4	37.1
06/07/2021 19:45:01	06/07/2021 20:00:01	00:15:00	44.3	55.7	50.7	48.5	47.3	42.9	38.7	37.9	36.3
06/07/2021 20:00:01	06/07/2021 20:15:01	00:15:00	43.6	55.6	49.8	47.4	46.1	42.2	39.5	38.7	37.8
06/07/2021 20:15:02	06/07/2021 20:30:02	00:15:00	47.2	61.7	52.9	50.3	49.4	46.4	42.8	42.0	40.8
06/07/2021 20:30:01	06/07/2021 20:45:01	00:15:00	49.5	61.4	55.2	53.6	52.5	48.1	45.6	45.0	43.9
06/07/2021 20:45:01	06/07/2021 21:00:01	00:15:00	49.7	62.7	54.9	52.8	52.1	48.7	46.3	45.7	44.5
06/07/2021 21:00:01	06/07/2021 21:15:01	00:15:00	48.9	63.1	56.5	53.0	51.4	47.4	44.5	43.8	42.5
06/07/2021 21:15:02	06/07/2021 21:30:02	00:15:00	48.5	63.5	54.8	52.1	51.2	47.2	44.0	43.4	42.3
06/07/2021 21:30:01	06/07/2021 21:45:01	00:15:00	46.9	61.7	53.6	50.5	49.3	45.6	42.7	42.0	40.9
06/07/2021 21:45:01	06/07/2021 22:00:01	00:15:00	45.4	61.9	53.0	49.7	48.0	43.6	40.6	39.9	38.7
06/07/2021 22:00:01	06/07/2021 22:15:01	00:15:00	44.2	58.7	51.9	49.1	47.5	42.1	37.1	35.7	32.7
06/07/2021 22:15:02	06/07/2021 22:30:02	00:15:00	40.1	54.7	49.7	45.9	43.8	35.9	30.4	29.5	27.9
06/07/2021 22:30:01	06/07/2021 22:45:01	00:15:00	38.2	53.3	48.8	44.1	41.2	34.1	29.5	28.7	27.6
06/07/2021 22:45:01	06/07/2021 23:00:01	00:15:00	38.6	56.5	50.7	44.9	40.7	32.0	27.2	26.4	25.3

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06/07/2021 23:00:01	06/07/2021 23:15:01	00:15:00	37.0	56.4	49.7	42.7	39.3	29.2	24.2	23.3	22.4
06/07/2021 23:15:02	06/07/2021 23:30:02	00:15:00	37.3	55.7	49.4	42.3	39.0	31.7	25.6	24.5	22.6
06/07/2021 23:30:01	06/07/2021 23:45:01	00:15:00	38.8	56.3	51.1	44.5	41.2	32.7	26.2	25.0	23.9
06/07/2021 23:45:01	07/07/2021 00:00:01	00:15:00	37.2	55.7	48.7	43.1	39.5	31.7	26.7	25.7	24.3
07/07/2021 00:00:01	07/07/2021 00:15:01	00:15:00	36.9	54.8	48.0	42.3	39.2	32.5	25.7	24.5	22.9
07/07/2021 00:15:02	07/07/2021 00:30:02	00:15:00	36.1	55.6	47.5	41.6	38.7	29.6	24.4	23.6	22.5
07/07/2021 00:30:01	07/07/2021 00:45:01	00:15:00	35.8	56.0	48.6	41.5	37.0	27.5	22.4	21.4	20.5
07/07/2021 00:45:01	07/07/2021 01:00:01	00:15:00	42.3	54.9	50.5	47.5	45.9	39.8	32.5	28.9	24.9
07/07/2021 01:00:01	07/07/2021 01:15:01	00:15:00	38.7	55.2	47.9	44.7	42.6	34.7	28.3	27.0	24.9
07/07/2021 01:15:02	07/07/2021 01:30:02	00:15:00	40.5	53.0	49.7	47.5	45.3	34.8	27.4	25.7	22.5
07/07/2021 01:30:01	07/07/2021 01:45:01	00:15:00	40.2	53.5	48.7	45.6	43.3	38.1	33.1	31.1	28.5
07/07/2021 01:45:01	07/07/2021 02:00:01	00:15:00	41.3	53.9	49.3	46.5	44.9	38.8	31.9	29.9	27.3
07/07/2021 02:00:01	07/07/2021 02:15:01	00:15:00	38.7	55.7	49.6	45.7	43.0	31.1	24.8	23.9	22.5
07/07/2021 02:15:02	07/07/2021 02:30:02	00:15:00	38.8	55.5	49.0	45.5	43.3	31.7	24.6	23.7	22.7
07/07/2021 02:30:01	07/07/2021 02:45:01	00:15:00	34.4	55.2	45.7	39.4	37.5	28.3	21.3	20.4	20.0
07/07/2021 02:45:01	07/07/2021 03:00:01	00:15:00	34.9	54.4	46.6	40.7	37.0	28.8	23.3	22.4	20.8
07/07/2021 03:00:01	07/07/2021 03:15:01	00:15:00	34.3	53.6	46.3	38.8	36.6	28.4	23.5	22.5	20.9
07/07/2021 03:15:02	07/07/2021 03:30:02	00:15:00	36.6	56.0	45.8	40.0	38.9	34.8	26.6	24.3	22.0
07/07/2021 03:30:01	07/07/2021 03:45:01	00:15:00	41.9	62.5	55.4	43.1	41.3	37.2	32.2	30.3	27.4
07/07/2021 03:45:01	07/07/2021 04:00:01	00:15:00	54.6	65.4	60.9	59.2	58.2	53.6	36.7	34.7	30.5
07/07/2021 04:00:01	07/07/2021 04:15:01	00:15:00	51.7	63.1	59.0	57.2	56.1	46.6	34.4	32.7	30.1
07/07/2021 04:15:02	07/07/2021 04:30:02	00:15:00	42.3	60.0	53.8	46.7	43.8	38.8	34.6	33.4	30.7
07/07/2021 04:30:01	07/07/2021 04:45:01	00:15:00	45.3	64.1	55.4	51.8	48.9	39.9	35.6	34.6	32.0
07/07/2021 04:45:01	07/07/2021 05:00:01	00:15:00	46.2	60.1	55.4	52.0	49.5	42.9	39.1	38.3	36.5
07/07/2021 05:00:01	07/07/2021 05:15:01	00:15:00	45.6	60.3	53.7	50.3	48.7	43.1	39.0	38.1	35.8
07/07/2021 05:15:02	07/07/2021 05:30:02	00:15:00	46.3	58.1	54.3	52.1	50.3	42.9	39.5	38.9	38.0

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07/07/2021 05:45:01	07/07/2021 06:00:01	00:15:00	46.0	60.2	53.2	50.3	48.5	44.3	42.1	41.7	40.6
07/07/2021 06:00:01	07/07/2021 06:15:01	00:15:00	44.9	62.1	53.0	48.8	47.0	43.4	41.0	40.4	39.1
07/07/2021 06:15:02	07/07/2021 06:30:02	00:15:00	48.7	69.3	57.5	53.5	51.2	46.2	43.0	42.4	41.2
07/07/2021 06:30:01	07/07/2021 06:45:01	00:15:00	45.0	60.1	51.6	48.7	47.3	43.9	41.5	40.8	39.8
07/07/2021 06:45:01	07/07/2021 07:00:01	00:15:00	45.4	57.7	52.8	49.6	48.1	43.9	41.3	40.5	39.3
07/07/2021 07:00:02	07/07/2021 07:15:02	00:15:00	45.3	65.4	53.3	49.4	47.9	43.3	40.5	39.6	37.8
07/07/2021 07:15:01	07/07/2021 07:30:01	00:15:00	44.9	56.7	51.7	48.9	47.7	43.5	40.3	39.7	38.7
07/07/2021 07:30:01	07/07/2021 07:45:01	00:15:00	44.9	56.5	51.4	48.7	47.3	43.7	41.0	40.5	39.4
07/07/2021 07:45:01	07/07/2021 08:00:01	00:15:00	46.1	58.6	52.9	50.3	49.1	44.2	41.3	40.8	40.1
07/07/2021 08:00:02	07/07/2021 08:15:02	00:15:00	47.7	67.6	56.5	50.7	49.4	45.4	42.2	41.4	39.8
07/07/2021 08:15:01	07/07/2021 08:30:01	00:15:00	44.9	61.7	53.2	49.8	48.1	42.4	38.8	37.8	36.3
07/07/2021 08:30:01	07/07/2021 08:45:01	00:15:00	43.6	57.6	51.8	48.2	46.5	41.5	37.4	36.6	35.2
07/07/2021 08:45:01	07/07/2021 09:00:01	00:15:00	47.1	60.3	55.4	52.4	50.7	44.2	40.0	39.3	38.3
07/07/2021 09:00:02	07/07/2021 09:15:02	00:15:00	44.2	58.3	53.5	49.4	47.1	41.3	37.9	37.2	35.7
07/07/2021 09:15:01	07/07/2021 09:30:01	00:15:00	43.9	59.3	51.2	48.5	47.2	41.9	37.7	36.6	35.0
07/07/2021 09:30:01	07/07/2021 09:45:01	00:15:00	45.1	57.2	52.8	49.9	48.0	43.1	39.6	39.0	37.9
07/07/2021 09:45:01	07/07/2021 10:00:01	00:15:00	44.9	57.6	53.0	50.2	48.8	41.6	38.2	37.1	35.3
07/07/2021 10:00:02	07/07/2021 10:15:02	00:15:00	46.1	58.6	54.2	51.2	49.6	43.6	38.4	37.2	35.1
07/07/2021 10:15:01	07/07/2021 10:30:01	00:15:00	43.4	59.3	50.2	47.9	46.6	41.5	38.1	37.5	36.2
07/07/2021 10:30:01	07/07/2021 10:45:01	00:15:00	43.0	55.3	50.2	47.6	46.1	41.0	37.5	36.8	35.4
07/07/2021 10:45:02	07/07/2021 11:00:02	00:15:00	45.4	66.0	52.8	49.1	47.5	42.0	38.2	37.6	36.3
07/07/2021 11:00:01	07/07/2021 11:15:01	00:15:00	42.4	55.8	50.3	47.5	45.7	40.0	37.1	36.5	35.6
07/07/2021 11:15:01	07/07/2021 11:30:01	00:15:00	42.1	53.4	48.0	46.2	45.1	40.6	37.3	36.7	35.7
07/07/2021 11:30:01	07/07/2021 11:45:01	00:15:00	41.4	53.4	48.1	45.5	44.3	39.8	37.5	37.0	36.1
07/07/2021 11:45:02	07/07/2021 12:00:02	00:15:00	42.6	53.1	48.3	46.1	45.1	41.4	39.4	38.5	36.7

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07/07/2021 12:00:01	07/07/2021 12:15:01	00:15:00	43.3	66.2	48.7	45.6	44.3	40.6	37.7	36.9	35.6
07/07/2021 12:15:01	07/07/2021 12:30:01	00:15:00	40.3	60.9	45.7	43.6	42.7	39.2	35.4	34.5	33.2
07/07/2021 12:30:01	07/07/2021 12:45:01	00:15:00	44.3	54.9	51.5	49.1	47.7	42.3	37.6	36.4	34.4
07/07/2021 12:45:01	07/07/2021 13:00:01	00:15:00	45.9	57.0	53.1	50.6	49.2	43.9	40.7	40.0	38.3
07/07/2021 13:00:01	07/07/2021 13:15:01	00:15:00	44.6	60.8	54.5	48.2	46.5	42.5	39.5	38.9	37.1
07/07/2021 13:15:01	07/07/2021 13:30:01	00:15:00	40.6	52.6	46.3	44.3	43.1	39.5	36.7	36.0	34.6
07/07/2021 13:30:01	07/07/2021 13:45:01	00:15:00	40.4	61.2	47.5	44.1	42.6	39.0	35.9	35.2	34.2
07/07/2021 13:45:01	07/07/2021 14:00:01	00:15:00	42.1	55.9	48.9	46.1	44.8	40.6	37.7	36.9	35.0
07/07/2021 14:00:01	07/07/2021 14:15:01	00:15:00	44.5	64.7	54.5	46.9	45.4	41.8	39.0	38.4	37.6
07/07/2021 14:15:01	07/07/2021 14:30:01	00:15:00	47.9	60.6	56.6	53.2	51.7	44.8	39.4	38.4	36.3
07/07/2021 14:30:01	07/07/2021 14:45:01	00:15:00	50.8	66.2	56.9	55.0	53.9	49.6	43.4	41.4	40.2
07/07/2021 14:45:01	07/07/2021 15:00:01	00:15:00	45.2	59.3	53.5	49.8	48.1	43.0	39.7	39.1	37.9
07/07/2021 15:00:01	07/07/2021 15:15:01	00:15:00	52.6	69.3	64.0	61.0	56.0	43.5	39.8	39.0	37.9
07/07/2021 15:15:01	07/07/2021 15:30:01	00:15:00	54.4	67.9	64.2	61.1	59.3	47.5	40.6	39.6	38.0
07/07/2021 15:30:01	07/07/2021 15:45:01	00:15:00	45.3	62.1	51.8	49.3	48.0	43.9	40.5	39.8	38.6
07/07/2021 15:45:01	07/07/2021 16:00:01	00:15:00	46.5	57.9	53.7	51.2	49.8	44.5	40.2	39.6	38.8
07/07/2021 16:00:01	07/07/2021 16:15:01	00:15:00	47.5	67.7	58.6	51.0	49.1	43.7	39.9	39.2	37.2
07/07/2021 16:15:01	07/07/2021 16:30:01	00:15:00	46.8	58.9	53.7	51.5	49.9	45.1	41.1	40.0	39.1
07/07/2021 16:30:01	07/07/2021 16:45:01	00:15:00	44.8	55.9	51.0	48.7	47.2	43.5	40.8	40.2	39.0
07/07/2021 16:45:01	07/07/2021 17:00:01	00:15:00	45.2	56.9	51.5	49.0	47.8	43.9	40.4	39.6	38.1
07/07/2021 17:00:01	07/07/2021 17:15:01	00:15:00	46.7	62.8	53.6	51.1	49.6	45.0	41.4	40.5	39.4
07/07/2021 17:15:01	07/07/2021 17:30:01	00:15:00	45.8	58.2	51.9	49.7	48.5	44.6	40.9	40.4	39.4
07/07/2021 17:30:01	07/07/2021 17:45:01	00:15:00	49.7	71.4	61.3	52.7	50.9	44.8	41.0	40.4	39.6
07/07/2021 17:45:01	07/07/2021 18:00:01	00:15:00	46.9	57.5	54.4	51.7	50.2	44.7	41.7	41.3	40.5
07/07/2021 18:00:01	07/07/2021 18:15:01	00:15:00	47.6	67.8	57.1	52.5	50.1	44.3	40.6	40.2	39.4
07/07/2021 18:15:01	07/07/2021 18:30:01	00:15:00	45.5	57.3	53.2	50.0	48.5	43.7	40.1	39.6	38.6

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07/07/2021 18:45:01	07/07/2021 19:00:01	00:15:00	44.6	59.1	52.0	49.2	47.6	42.6	39.6	39.0	37.9
07/07/2021 19:00:01	07/07/2021 19:15:01	00:15:00	48.3	61.8	58.8	53.6	51.0	44.3	39.9	39.1	36.9
07/07/2021 19:15:01	07/07/2021 19:30:01	00:15:00	43.8	58.1	52.0	48.6	47.1	41.5	36.5	35.1	32.9
07/07/2021 19:30:01	07/07/2021 19:45:01	00:15:00	42.9	54.4	51.1	48.0	46.3	40.4	37.1	36.5	35.2
07/07/2021 19:45:01	07/07/2021 20:00:01	00:15:00	44.0	57.4	52.2	49.5	47.5	41.4	37.3	36.6	35.3
07/07/2021 20:00:01	07/07/2021 20:15:01	00:15:00	45.4	58.7	53.2	50.4	48.8	43.2	38.7	37.8	36.1
07/07/2021 20:15:01	07/07/2021 20:30:01	00:15:00	44.8	59.5	53.7	50.0	48.2	41.9	36.9	35.7	33.0
07/07/2021 20:30:01	07/07/2021 20:45:01	00:15:00	43.8	58.4	53.0	50.0	48.0	39.2	34.1	33.3	32.1
07/07/2021 20:45:02	07/07/2021 21:00:02	00:15:00	42.4	56.2	51.1	48.2	46.1	38.8	32.9	30.6	27.6
07/07/2021 21:00:01	07/07/2021 21:15:01	00:15:00	38.9	51.5	46.2	43.8	42.0	36.9	32.0	30.9	29.7
07/07/2021 21:15:01	07/07/2021 21:30:01	00:15:00	40.7	55.5	50.4	46.4	43.8	37.7	31.7	30.2	28.0
07/07/2021 21:30:01	07/07/2021 21:45:01	00:15:00	41.7	57.2	51.7	47.8	45.5	37.5	30.5	28.4	25.7
07/07/2021 21:45:02	07/07/2021 22:00:02	00:15:00	40.5	58.1	50.5	46.3	44.1	36.1	29.9	27.0	24.4
07/07/2021 22:00:01	07/07/2021 22:15:01	00:15:00	39.0	56.3	49.6	45.5	42.5	33.5	27.3	25.9	24.4
07/07/2021 22:15:01	07/07/2021 22:30:01	00:15:00	39.8	55.6	49.5	45.5	43.1	36.1	30.8	29.2	27.0
07/07/2021 22:30:01	07/07/2021 22:45:01	00:15:00	33.8	50.5	42.8	38.2	36.6	31.6	25.1	23.8	22.1
07/07/2021 22:45:01	07/07/2021 23:00:01	00:15:00	36.8	52.3	47.3	43.1	39.6	32.7	26.0	24.6	21.5
07/07/2021 23:00:01	07/07/2021 23:15:01	00:15:00	37.3	53.5	48.9	43.8	40.3	31.7	24.6	23.3	21.7
07/07/2021 23:15:01	07/07/2021 23:30:01	00:15:00	33.5	49.0	43.3	38.0	36.2	31.0	23.5	21.3	20.0
07/07/2021 23:30:01	07/07/2021 23:45:01	00:15:00	32.6	61.7	39.4	37.1	35.5	29.8	23.8	22.6	20.0
07/07/2021 23:45:01	08/07/2021 00:00:01	00:15:00	32.3	49.3	41.0	38.0	36.0	28.8	20.9	20.0	20.0
08/07/2021 00:00:01	08/07/2021 00:15:01	00:15:00	37.7	61.4	51.5	39.8	36.7	30.3	22.3	21.1	20.0
08/07/2021 00:15:01	08/07/2021 00:30:01	00:15:00	30.6	40.0	37.7	35.7	34.1	28.1	22.1	20.8	20.0
08/07/2021 00:30:01	08/07/2021 00:45:01	00:15:00	31.7	44.6	39.5	37.0	35.7	28.9	23.3	22.3	20.7
08/07/2021 00:45:01	08/07/2021 01:00:01	00:15:00	31.8	40.7	38.9	37.3	36.0	29.3	22.0	20.5	20.0

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08/07/2021 01:00:01	08/07/2021 01:15:01	00:15:00	30.1	42.8	37.4	34.8	33.3	27.8	20.2	20.0	20.0
08/07/2021 01:15:01	08/07/2021 01:30:01	00:15:00	30.3	50.2	37.4	35.0	33.5	27.9	22.9	22.1	21.2
08/07/2021 01:30:01	08/07/2021 01:45:01	00:15:00	31.8	52.2	39.2	36.6	35.1	29.7	24.9	23.4	21.8
08/07/2021 01:45:01	08/07/2021 02:00:01	00:15:00	30.1	51.6	37.0	35.2	33.6	27.5	20.0	20.0	20.0
08/07/2021 02:00:01	08/07/2021 02:15:01	00:15:00	31.8	48.2	39.8	36.9	35.4	29.2	22.2	20.6	20.0
08/07/2021 02:15:01	08/07/2021 02:30:01	00:15:00	32.7	48.3	43.8	36.8	34.7	29.3	23.6	22.6	21.4
08/07/2021 02:30:02	08/07/2021 02:45:02	00:15:00	30.2	41.1	37.7	35.3	33.6	27.6	22.4	21.8	20.8
08/07/2021 02:45:01	08/07/2021 03:00:01	00:15:00	29.1	39.3	36.2	34.2	32.7	26.6	20.0	20.0	20.0
08/07/2021 03:00:01	08/07/2021 03:15:01	00:15:00	31.1	41.2	38.1	35.8	34.5	29.3	22.9	21.9	20.2
08/07/2021 03:15:01	08/07/2021 03:30:01	00:15:00	33.8	50.2	43.3	39.2	37.3	30.3	24.8	23.8	22.2
08/07/2021 03:30:02	08/07/2021 03:45:02	00:15:00	46.2	63.4	57.4	54.8	51.8	36.4	30.8	28.5	24.5
08/07/2021 03:45:01	08/07/2021 04:00:01	00:15:00	53.3	63.5	59.5	57.8	56.8	52.5	37.2	35.2	32.1
08/07/2021 04:00:01	08/07/2021 04:15:01	00:15:00	51.5	73.6	59.4	56.6	55.3	47.3	35.1	33.5	31.1
08/07/2021 04:15:01	08/07/2021 04:30:01	00:15:00	48.3	60.0	55.4	53.6	52.4	45.1	36.8	35.3	33.1
08/07/2021 04:30:02	08/07/2021 04:45:02	00:15:00	44.3	61.0	54.0	50.6	47.8	40.0	36.0	34.9	32.7
08/07/2021 04:45:01	08/07/2021 05:00:01	00:15:00	41.8	53.9	48.4	46.1	44.7	40.4	37.4	36.3	34.0
08/07/2021 05:00:01	08/07/2021 05:15:01	00:15:00	41.2	53.4	47.5	44.9	43.4	40.2	37.7	37.0	35.6
08/07/2021 05:15:01	08/07/2021 05:30:01	00:15:00	41.9	54.6	49.7	46.5	44.5	40.2	37.2	36.5	35.2
08/07/2021 05:30:02	08/07/2021 05:45:02	00:15:00	42.1	56.2	49.0	46.2	44.9	40.5	37.1	36.3	34.8
08/07/2021 05:45:01	08/07/2021 06:00:01	00:15:00	41.2	54.4	47.5	44.8	43.6	39.9	37.3	36.6	35.3
08/07/2021 06:00:01	08/07/2021 06:15:01	00:15:00	41.7	56.0	48.4	45.3	44.1	40.5	37.3	36.5	34.8
08/07/2021 06:15:01	08/07/2021 06:30:01	00:15:00	45.6	61.7	55.9	50.3	47.4	42.2	39.1	38.1	36.4
08/07/2021 06:30:02	08/07/2021 06:45:02	00:15:00	42.0	58.1	49.0	45.9	44.5	40.6	38.0	37.3	36.2
08/07/2021 06:45:01	08/07/2021 07:00:01	00:15:00	44.1	61.3	50.6	47.5	46.4	42.3	38.9	38.1	36.6
08/07/2021 07:00:01	08/07/2021 07:15:01	00:15:00	42.5	60.5	49.5	46.3	45.0	40.9	37.2	36.2	34.8
08/07/2021 07:15:01	08/07/2021 07:30:01	00:15:00	42.5	60.3	48.7	45.7	44.5	40.9	37.9	37.0	35.1

ReportId

08/07/2021 07:30:02	08/07/2021 07:45:02	00:15:00	41.8	56.0	47.3	45.2	44.1	41.0	38.1	37.1	35.5
08/07/2021 07:45:01	08/07/2021 08:00:01	00:15:00	42.5	54.0	48.3	45.8	44.8	41.6	38.6	37.8	36.2
08/07/2021 08:00:01	08/07/2021 08:15:01	00:15:00	41.7	51.5	46.6	45.0	44.1	41.0	38.0	36.7	33.8
08/07/2021 08:15:01	08/07/2021 08:30:01	00:15:00	42.7	60.9	50.2	45.5	44.4	41.2	38.0	37.0	35.2
08/07/2021 08:30:02	08/07/2021 08:45:02	00:15:00	43.6	66.1	52.5	47.3	45.4	41.3	37.9	36.7	33.5
08/07/2021 08:45:01	08/07/2021 09:00:01	00:15:00	42.0	54.9	48.6	45.8	44.4	40.9	37.6	36.8	35.3
08/07/2021 09:00:01	08/07/2021 09:15:01	00:15:00	45.9	68.1	53.3	48.5	47.6	43.9	40.0	38.4	36.1
08/07/2021 09:15:01	08/07/2021 09:30:01	00:15:00	44.2	59.9	51.1	47.5	46.3	43.1	40.1	39.3	37.8
08/07/2021 09:30:02	08/07/2021 09:45:02	00:15:00	53.8	87.0	58.7	47.8	45.4	42.1	39.3	38.4	36.9
08/07/2021 09:45:01	08/07/2021 10:00:01	00:15:00	43.4	58.8	48.0	46.3	45.6	42.5	40.1	39.4	37.9
08/07/2021 10:00:01	08/07/2021 10:15:01	00:15:00	42.9	56.5	48.1	45.7	44.8	42.1	39.5	38.7	37.5
08/07/2021 10:15:01	08/07/2021 10:30:01	00:15:00	42.5	53.1	46.6	45.2	44.4	42.0	39.8	39.2	38.4
08/07/2021 10:30:02	08/07/2021 10:45:02	00:15:00	43.5	56.8	49.8	46.4	45.4	42.6	40.1	39.5	38.5
08/07/2021 10:45:01	08/07/2021 11:00:01	00:15:00	43.7	61.2	47.8	46.2	45.5	43.0	40.7	40.0	38.3
08/07/2021 11:00:01	08/07/2021 11:15:01	00:15:00	43.0	49.2	47.2	45.5	44.9	42.8	39.9	38.2	34.9
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08/07/2021 11:30:02	08/07/2021 11:45:02	00:15:00	45.7	60.8	56.0	48.7	45.9	43.7	41.3	40.5	39.1
08/07/2021 11:45:01	08/07/2021 12:00:01	00:15:00	43.2	63.2	48.2	45.3	44.5	42.4	40.3	39.5	38.2
08/07/2021 12:00:01	08/07/2021 12:15:01	00:15:00	44.9	58.4	53.7	48.7	46.5	43.3	41.2	40.7	39.6
08/07/2021 12:15:01	08/07/2021 12:30:01	00:15:00	45.7	60.6	54.2	50.5	48.0	43.8	40.8	39.9	38.5
08/07/2021 12:30:02	08/07/2021 12:45:02	00:15:00	41.3	56.4	46.9	44.9	43.3	40.1	37.8	37.4	36.7
08/07/2021 12:45:01	08/07/2021 13:00:01	00:15:00	41.5	48.5	45.2	44.3	43.6	41.0	38.3	37.4	36.3
08/07/2021 13:00:01	08/07/2021 13:15:01	00:15:00	42.4	49.3	46.0	44.8	44.2	42.0	39.4	38.8	37.9
08/07/2021 13:15:01	08/07/2021 13:30:01	00:15:00	42.2	51.5	46.0	45.0	44.1	41.8	39.5	38.8	36.5
08/07/2021 13:30:01	08/07/2021 13:45:01	00:15:00	42.6	59.1	46.9	45.5	44.6	42.0	40.0	39.4	38.2
08/07/2021 13:45:01	08/07/2021 14:00:01	00:15:00	42.6	58.9	46.7	45.5	44.8	41.9	39.2	38.5	37.1

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08/07/2021 14:15:01	08/07/2021 14:30:01	00:15:00	44.9	64.5	59.0	46.0	44.3	40.1	36.8	35.8	33.7
08/07/2021 14:30:01	08/07/2021 14:45:01	00:15:00	42.7	52.9	49.3	46.2	44.9	41.5	39.1	38.5	36.7
08/07/2021 14:45:02	08/07/2021 15:00:02	00:15:00	43.3	58.3	50.2	46.5	45.4	42.3	39.0	37.9	36.7
08/07/2021 15:00:01	08/07/2021 15:15:01	00:15:00	45.5	67.8	53.1	47.0	46.1	43.8	40.7	39.8	38.8
08/07/2021 15:15:01	08/07/2021 15:30:01	00:15:00	49.1	68.9	61.9	53.6	48.6	43.8	40.2	39.2	37.2
08/07/2021 15:30:02	08/07/2021 15:45:02	00:15:00	44.2	49.8	48.3	46.8	46.0	43.9	41.2	39.8	37.3
08/07/2021 15:45:02	08/07/2021 16:00:02	00:15:00	48.1	66.8	59.3	49.7	48.2	45.3	42.2	41.2	39.3
08/07/2021 16:00:01	08/07/2021 16:15:01	00:15:00	45.5	55.8	49.7	47.8	47.1	45.1	42.5	41.7	40.0
08/07/2021 16:15:01	08/07/2021 16:30:01	00:15:00	44.8	58.8	49.4	47.2	46.4	44.3	41.9	41.1	39.7
08/07/2021 16:30:01	08/07/2021 16:45:01	00:15:00	45.4	67.0	52.7	47.8	46.8	43.5	40.3	39.7	38.4
08/07/2021 16:45:02	08/07/2021 17:00:02	00:15:00	43.0	49.4	46.8	45.7	45.1	42.5	39.6	38.8	36.9
08/07/2021 17:00:01	08/07/2021 17:15:01	00:15:00	46.2	69.7	54.7	45.9	45.3	42.8	39.7	38.2	35.9
08/07/2021 17:15:01	08/07/2021 17:30:01	00:15:00	43.9	57.0	48.2	46.3	45.6	43.3	40.6	39.9	38.6
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08/07/2021 17:45:02	08/07/2021 18:00:02	00:15:00	44.1	49.9	47.8	46.9	46.4	43.7	40.5	39.5	37.7
08/07/2021 18:00:01	08/07/2021 18:15:01	00:15:00	44.2	65.2	48.4	47.0	46.3	43.6	40.5	39.4	36.7
08/07/2021 18:15:01	08/07/2021 18:30:01	00:15:00	43.3	50.5	47.6	46.4	45.7	42.8	39.7	38.7	36.4
08/07/2021 18:30:02	08/07/2021 18:45:02	00:15:00	42.3	48.1	46.4	45.3	44.6	41.9	37.9	36.6	35.2
08/07/2021 18:45:01	08/07/2021 19:00:01	00:15:00	43.0	52.2	48.4	46.2	45.3	42.4	38.0	36.3	33.5
08/07/2021 19:00:01	08/07/2021 19:15:01	00:15:00	43.4	57.2	50.4	46.4	45.5	42.5	38.5	37.2	34.5
08/07/2021 19:15:01	08/07/2021 19:30:01	00:15:00	41.7	49.1	46.6	45.3	44.2	41.1	36.4	34.6	32.2
08/07/2021 19:30:02	08/07/2021 19:45:02	00:15:00	42.2	50.5	46.7	45.3	44.5	41.6	38.1	36.4	33.1
08/07/2021 19:45:01	08/07/2021 20:00:01	00:15:00	41.9	49.1	46.2	44.9	44.2	41.4	37.8	37.0	35.5
08/07/2021 20:00:01	08/07/2021 20:15:01	00:15:00	42.4	59.8	47.9	45.6	44.4	40.8	36.6	35.5	32.9
08/07/2021 20:15:01	08/07/2021 20:30:01	00:15:00	41.1	54.4	47.9	45.0	43.6	39.9	35.8	34.6	32.8

ReportId

08/07/2021 20:30:02	08/07/2021 20:45:02	00:15:00	40.3	48.4	45.6	43.9	42.9	39.6	35.3	33.7	31.4
08/07/2021 20:45:01	08/07/2021 21:00:01	00:15:00	40.0	48.4	44.9	43.4	42.7	39.1	35.6	34.7	33.5
08/07/2021 21:00:01	08/07/2021 21:15:01	00:15:00	40.2	52.1	46.4	44.1	42.9	39.0	34.0	32.5	29.7
08/07/2021 21:15:01	08/07/2021 21:30:01	00:15:00	39.3	48.6	45.2	42.9	41.6	38.4	34.5	33.1	31.5
08/07/2021 21:30:02	08/07/2021 21:45:02	00:15:00	37.4	48.0	43.1	41.4	40.5	36.3	31.4	30.1	27.5
08/07/2021 21:45:01	08/07/2021 22:00:01	00:15:00	37.6	51.8	44.5	42.0	40.7	36.1	29.8	28.2	25.8
08/07/2021 22:00:01	08/07/2021 22:15:01	00:15:00	37.3	52.6	47.3	42.5	40.3	33.8	28.2	27.1	25.3
08/07/2021 22:15:01	08/07/2021 22:30:01	00:15:00	37.1	53.6	46.1	42.1	40.3	33.8	25.7	23.2	20.2
08/07/2021 22:30:02	08/07/2021 22:45:02	00:15:00	33.7	43.1	41.7	39.4	37.8	30.8	23.0	20.7	20.0
08/07/2021 22:45:01	08/07/2021 23:00:01	00:15:00	35.0	50.4	43.7	40.1	38.2	32.1	23.4	21.6	20.0
08/07/2021 23:00:01	08/07/2021 23:15:01	00:15:00	34.5	46.8	41.8	40.1	38.3	32.0	23.7	21.8	20.0
08/07/2021 23:15:01	08/07/2021 23:30:01	00:15:00	35.1	50.3	42.6	40.5	39.1	32.3	25.7	24.4	23.0
08/07/2021 23:30:02	08/07/2021 23:45:02	00:15:00	34.6	46.0	42.2	39.5	38.2	32.4	23.9	22.3	20.3
08/07/2021 23:45:01	09/07/2021 00:00:01	00:15:00	31.6	47.8	39.9	37.1	34.9	29.1	21.2	20.0	20.0
09/07/2021 00:00:01	09/07/2021 00:15:01	00:15:00	36.2	50.6	44.0	41.7	40.2	33.1	24.2	22.1	20.0
09/07/2021 00:15:01	09/07/2021 00:30:01	00:15:00	39.1	50.9	46.6	44.0	42.6	37.1	30.5	28.7	25.8
09/07/2021 00:30:02	09/07/2021 00:45:02	00:15:00	40.5	53.9	48.3	46.3	44.7	36.6	24.2	20.7	20.0
09/07/2021 00:45:01	09/07/2021 01:00:01	00:15:00	36.4	48.2	44.0	41.2	40.0	34.5	24.5	22.4	20.0
09/07/2021 01:00:01	09/07/2021 01:15:01	00:15:00	34.8	48.4	43.1	40.5	38.9	31.6	20.2	20.0	20.0
09/07/2021 01:15:01	09/07/2021 01:30:01	00:15:00	38.1	50.4	46.8	43.9	42.7	32.2	20.0	20.0	20.0
09/07/2021 01:30:01	09/07/2021 01:45:01	00:15:00	41.0	54.7	48.2	46.9	45.8	35.7	22.8	21.2	20.0
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09/07/2021 02:00:01	09/07/2021 02:15:01	00:15:00	42.4	55.2	49.9	47.5	46.2	40.4	30.1	27.0	20.0
09/07/2021 02:15:01	09/07/2021 02:30:01	00:15:00	43.9	54.2	52.1	49.8	48.3	40.8	25.7	22.9	20.0
09/07/2021 02:30:01	09/07/2021 02:45:01	00:15:00	44.3	58.7	55.4	50.7	48.7	36.1	22.9	20.1	20.0
09/07/2021 02:45:01	09/07/2021 03:00:01	00:15:00	45.1	58.0	54.0	50.4	48.9	42.1	30.7	27.0	22.9

ReportId

09/07/2021 03:00:01	09/07/2021 03:15:01	00:15:00	43.8	56.1	52.4	49.8	48.3	39.7	27.3	23.8	20.2
09/07/2021 03:15:01	09/07/2021 03:30:01	00:15:00	44.1	55.2	51.2	49.2	48.0	42.0	32.4	30.3	25.2
09/07/2021 03:30:01	09/07/2021 03:45:01	00:15:00	47.1	62.6	57.1	54.0	50.3	42.6	34.2	32.2	28.6
09/07/2021 03:45:01	09/07/2021 04:00:01	00:15:00	53.3	62.9	59.1	57.6	56.7	52.6	41.6	39.8	36.3
09/07/2021 04:00:01	09/07/2021 04:15:01	00:15:00	49.1	61.0	56.8	54.9	53.7	45.0	39.8	38.7	36.8
09/07/2021 04:15:01	09/07/2021 04:30:01	00:15:00	45.5	54.7	51.7	49.7	48.6	44.2	39.0	37.1	34.4
09/07/2021 04:30:02	09/07/2021 04:45:02	00:15:00	48.4	68.0	53.5	51.7	50.9	47.4	43.6	41.5	38.0
09/07/2021 04:45:01	09/07/2021 05:00:01	00:15:00	49.9	56.9	54.2	52.9	52.2	49.4	46.2	45.2	43.7
09/07/2021 05:00:01	09/07/2021 05:15:01	00:15:00	48.3	65.4	53.5	51.3	50.2	47.6	44.5	43.6	41.4
09/07/2021 05:15:01	09/07/2021 05:30:01	00:15:00	47.1	60.4	52.5	50.7	49.5	45.9	43.3	42.6	40.8
09/07/2021 05:30:01	09/07/2021 05:45:01	00:15:00	46.0	59.5	50.5	49.1	48.2	45.3	42.1	41.1	38.8
09/07/2021 05:45:01	09/07/2021 06:00:01	00:15:00	46.9	52.5	50.7	49.6	49.0	46.6	43.4	42.3	38.0
09/07/2021 06:00:01	09/07/2021 06:15:01	00:15:00	45.9	58.9	50.2	49.0	48.1	45.3	42.8	41.9	40.3
09/07/2021 06:15:02	09/07/2021 06:30:02	00:15:00	46.2	54.6	50.7	48.9	48.3	45.7	42.7	41.7	39.0
09/07/2021 06:30:01	09/07/2021 06:45:01	00:15:00	46.2	56.1	50.3	48.8	48.2	45.7	42.4	41.7	40.0
09/07/2021 06:45:01	09/07/2021 07:00:01	00:15:00	44.7	56.2	49.0	47.9	47.1	44.0	40.5	39.5	36.9
09/07/2021 07:00:01	09/07/2021 07:15:01	00:15:00	45.6	53.8	49.8	48.5	47.8	44.9	41.9	41.0	39.7
09/07/2021 07:15:02	09/07/2021 07:30:02	00:15:00	48.7	58.6	54.1	52.2	51.1	48.0	43.6	41.5	36.0
09/07/2021 07:30:01	09/07/2021 07:45:01	00:15:00	50.5	59.4	54.9	53.5	52.6	50.0	46.7	45.7	44.1
09/07/2021 07:45:01	09/07/2021 08:00:01	00:15:00	48.8	63.2	54.6	52.3	51.3	47.9	43.5	42.1	39.5
09/07/2021 08:00:01	09/07/2021 08:15:01	00:15:00	48.2	55.8	52.8	51.5	50.6	47.5	44.7	43.9	39.9
09/07/2021 08:15:01	09/07/2021 08:30:01	00:15:00	46.6	58.2	52.5	49.5	48.5	45.7	43.3	42.6	41.6
09/07/2021 08:30:01	09/07/2021 08:45:01	00:15:00	47.6	56.2	51.7	50.5	49.8	47.2	43.5	42.3	40.5
09/07/2021 08:45:01	09/07/2021 09:00:01	00:15:00	48.5	57.3	52.8	51.7	50.9	48.1	44.3	42.8	40.4
09/07/2021 09:00:01	09/07/2021 09:15:01	00:15:00	48.4	55.7	53.0	51.6	50.8	47.8	44.5	43.6	41.8
09/07/2021 09:15:01	09/07/2021 09:30:01	00:15:00	49.3	57.7	54.1	52.7	52.0	48.5	44.3	43.2	41.7

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09/07/2021 09:30:01	09/07/2021 09:45:01	00:15:00	50.6	59.1	55.0	53.5	52.9	50.2	46.0	44.7	42.0
09/07/2021 09:45:01	09/07/2021 10:00:01	00:15:00	50.1	59.4	54.6	53.1	52.4	49.5	46.4	45.6	43.8
09/07/2021 10:00:01	09/07/2021 10:15:01	00:15:00	51.4	60.7	56.1	54.7	53.8	50.6	48.0	47.3	45.4
09/07/2021 10:15:01	09/07/2021 10:30:01	00:15:00	50.6	60.4	56.5	53.7	52.8	49.8	47.2	46.4	44.8
09/07/2021 10:30:01	09/07/2021 10:45:01	00:15:00	50.7	59.3	55.8	54.2	52.9	49.9	46.9	46.1	45.0
09/07/2021 10:45:01	09/07/2021 11:00:01	00:15:00	51.5	63.2	56.7	54.7	53.8	50.7	47.9	47.3	46.1
09/07/2021 11:00:01	09/07/2021 11:15:01	00:15:00	51.8	60.3	56.7	55.3	54.5	50.9	46.8	45.6	43.7
09/07/2021 11:15:01	09/07/2021 11:30:01	00:15:00	52.5	61.9	57.0	55.6	54.9	51.8	49.0	48.3	46.5
09/07/2021 11:30:01	09/07/2021 11:45:01	00:15:00	52.7	61.7	58.3	56.4	55.4	51.7	48.1	47.4	46.3
09/07/2021 11:45:01	09/07/2021 12:00:01	00:15:00	50.5	63.6	55.8	53.3	52.4	49.9	46.9	45.9	43.9
09/07/2021 12:00:01	09/07/2021 12:15:01	00:15:00	52.8	61.8	57.3	55.7	54.9	52.2	49.5	48.8	47.8
09/07/2021 12:15:01	09/07/2021 12:30:01	00:15:00	53.1	61.3	58.3	56.2	55.3	52.5	49.2	48.3	46.7
09/07/2021 12:30:01	09/07/2021 12:45:01	00:15:00	54.5	61.2	58.7	57.4	56.6	54.1	51.3	50.4	48.6
09/07/2021 12:45:01	09/07/2021 13:00:01	00:15:00	54.5	62.1	59.1	57.7	56.8	53.9	51.0	50.2	47.7
09/07/2021 13:00:01	09/07/2021 13:15:01	00:15:00	53.4	59.1	57.0	55.9	55.3	53.1	49.9	49.1	48.1
09/07/2021 13:15:02	09/07/2021 13:30:02	00:15:00	53.2	62.4	57.8	56.4	55.5	52.5	50.0	49.3	48.3
09/07/2021 13:30:01	09/07/2021 13:45:01	00:15:00	53.2	63.0	58.9	56.9	55.8	52.1	49.4	48.8	47.9
09/07/2021 13:45:01	09/07/2021 14:00:01	00:15:00	53.5	60.6	57.8	56.6	55.9	52.9	49.9	48.9	45.5
09/07/2021 14:00:01	09/07/2021 14:15:01	00:15:00	53.7	65.9	57.7	56.5	55.9	53.1	50.4	49.8	48.8
09/07/2021 14:15:02	09/07/2021 14:30:02	00:15:00	54.0	61.9	58.1	56.7	56.0	53.4	51.0	50.4	49.5
09/07/2021 14:30:01	09/07/2021 14:45:01	00:15:00	53.9	61.4	58.1	56.7	55.9	53.5	50.5	49.8	48.9
09/07/2021 14:45:01	09/07/2021 15:00:01	00:15:00	55.9	63.5	60.0	58.7	58.2	55.3	52.6	51.6	48.3
09/07/2021 15:00:01	09/07/2021 15:15:01	00:15:00	53.9	64.5	57.7	56.5	55.8	53.4	50.7	50.0	48.9
09/07/2021 15:15:02	09/07/2021 15:30:02	00:15:00	51.9	59.6	56.1	54.9	54.1	51.3	48.9	48.2	46.9
09/07/2021 15:30:01	09/07/2021 15:45:01	00:15:00	52.5	58.6	55.8	54.9	54.3	52.1	49.9	49.3	48.2
09/07/2021 15:45:01	09/07/2021 16:00:01	00:15:00	51.8	59.6	56.8	54.7	53.9	51.2	48.5	47.8	46.6

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09/07/2021 16:00:01	09/07/2021 16:15:01	00:15:00	52.6	59.8	56.8	55.3	54.6	52.0	50.0	49.4	48.4
09/07/2021 16:15:02	09/07/2021 16:30:02	00:15:00	54.9	65.8	59.5	57.7	56.9	54.3	51.7	50.9	49.0
09/07/2021 16:30:01	09/07/2021 16:45:01	00:15:00	55.2	62.0	59.3	57.8	57.0	54.8	52.6	51.8	50.1
09/07/2021 16:45:01	09/07/2021 17:00:01	00:15:00	55.8	63.8	60.2	58.8	58.0	55.1	52.5	51.7	48.8
09/07/2021 17:00:01	09/07/2021 17:15:01	00:15:00	55.4	63.6	60.7	58.8	57.8	54.5	51.7	50.8	49.3
09/07/2021 17:15:02	09/07/2021 17:30:02	00:15:00	52.1	57.3	55.3	54.4	53.8	51.6	49.8	49.3	48.0
09/07/2021 17:30:01	09/07/2021 17:45:01	00:15:00	52.5	59.4	56.6	55.4	54.7	52.1	49.0	48.1	46.2
09/07/2021 17:45:01	09/07/2021 18:00:01	00:15:00	54.4	61.5	58.5	57.3	56.5	53.8	51.4	50.7	49.4
09/07/2021 18:00:01	09/07/2021 18:15:01	00:15:00	54.1	62.5	58.4	56.9	56.3	53.5	51.0	50.1	48.7
09/07/2021 18:15:01	09/07/2021 18:30:01	00:15:00	53.9	62.1	58.2	56.9	56.3	53.3	50.2	49.0	46.6
09/07/2021 18:30:01	09/07/2021 18:45:01	00:15:00	53.6	60.7	58.4	57.0	56.0	52.8	49.6	48.5	46.5
09/07/2021 18:45:01	09/07/2021 19:00:01	00:15:00	54.0	61.4	58.0	56.9	56.1	53.7	50.3	48.9	43.3
09/07/2021 19:00:01	09/07/2021 19:15:01	00:15:00	54.1	61.9	58.7	57.0	56.2	53.5	50.5	49.4	47.0
09/07/2021 19:15:02	09/07/2021 19:30:02	00:15:00	53.9	61.1	58.2	56.8	56.0	53.3	50.3	49.1	45.6
09/07/2021 19:30:01	09/07/2021 19:45:01	00:15:00	53.2	60.6	57.6	56.3	55.5	52.7	48.4	47.2	45.7
09/07/2021 19:45:01	09/07/2021 20:00:01	00:15:00	53.5	64.0	59.7	57.3	56.1	52.5	48.9	47.5	45.7
09/07/2021 20:00:01	09/07/2021 20:15:01	00:15:00	52.2	60.7	56.7	55.3	54.6	51.8	47.1	44.7	40.1
09/07/2021 20:15:02	09/07/2021 20:30:02	00:15:00	50.5	59.7	55.8	53.8	52.9	49.8	45.9	44.3	41.4
09/07/2021 20:30:01	09/07/2021 20:45:01	00:15:00	49.5	58.9	55.5	53.6	52.7	48.4	41.8	39.5	36.0
09/07/2021 20:45:01	09/07/2021 21:00:01	00:15:00	49.9	58.2	55.1	53.5	52.5	49.1	44.0	42.1	38.8
09/07/2021 21:00:01	09/07/2021 21:15:01	00:15:00	50.1	59.3	56.0	54.3	53.3	49.2	39.2	32.9	28.2
09/07/2021 21:15:02	09/07/2021 21:30:02	00:15:00	49.4	62.5	56.3	54.3	53.0	47.6	39.6	37.3	34.8
09/07/2021 21:30:01	09/07/2021 21:45:01	00:15:00	49.5	60.2	56.1	54.1	52.8	48.1	37.8	35.5	33.4
09/07/2021 21:45:01	09/07/2021 22:00:01	00:15:00	49.1	61.1	56.1	53.8	52.5	47.2	40.3	38.7	34.5
09/07/2021 22:00:01	09/07/2021 22:15:01	00:15:00	48.2	59.1	55.1	53.0	51.8	46.2	38.8	37.2	34.8
09/07/2021 22:15:02	09/07/2021 22:30:02	00:15:00	49.0	60.3	55.5	53.5	52.5	47.4	40.3	38.3	36.0

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09/07/2021 22:30:01	09/07/2021 22:45:01	00:15:00	46.0	58.3	54.2	51.6	49.9	43.0	30.7	28.8	26.9
09/07/2021 22:45:01	09/07/2021 23:00:01	00:15:00	47.7	59.1	55.0	52.5	51.3	45.7	37.2	34.7	31.2
09/07/2021 23:00:02	09/07/2021 23:15:02	00:15:00	45.3	57.6	53.8	51.0	49.7	41.3	33.1	31.1	28.3
09/07/2021 23:15:01	09/07/2021 23:30:01	00:15:00	44.0	57.9	52.8	49.9	48.2	39.3	28.0	25.2	21.4
09/07/2021 23:30:01	09/07/2021 23:45:01	00:15:00	43.8	56.3	51.7	49.5	48.0	40.5	28.0	23.0	21.0
09/07/2021 23:45:01	10/07/2021 00:00:01	00:15:00	43.4	57.5	51.5	49.5	48.3	37.4	25.6	24.2	22.3
10/07/2021 00:00:01	10/07/2021 00:15:01	00:15:00	42.6	56.2	50.9	48.1	46.9	38.3	23.2	20.7	20.0
10/07/2021 00:15:01	10/07/2021 00:30:01	00:15:00	43.2	56.1	51.5	48.9	47.7	38.0	26.1	24.7	22.9
10/07/2021 00:30:01	10/07/2021 00:45:01	00:15:00	41.0	55.0	50.7	48.0	46.0	31.3	21.5	20.6	20.0
10/07/2021 00:45:01	10/07/2021 01:00:01	00:15:00	41.8	56.5	52.2	49.3	46.4	31.5	20.5	20.0	20.0
10/07/2021 01:00:02	10/07/2021 01:15:02	00:15:00	41.9	55.8	51.6	48.5	46.6	34.6	23.5	21.8	20.0
10/07/2021 01:15:01	10/07/2021 01:30:01	00:15:00	41.0	53.3	50.4	47.9	46.1	33.1	21.6	20.0	20.0
10/07/2021 01:30:01	10/07/2021 01:45:01	00:15:00	44.6	55.8	52.2	50.3	49.1	41.0	28.4	26.4	24.3
10/07/2021 01:45:01	10/07/2021 02:00:01	00:15:00	43.3	57.2	52.4	49.7	48.0	37.2	26.6	25.1	23.3
10/07/2021 02:00:02	10/07/2021 02:15:02	00:15:00	41.2	55.6	50.9	48.5	46.7	31.4	23.3	22.0	20.1
10/07/2021 02:15:01	10/07/2021 02:30:01	00:15:00	43.2	58.3	53.4	49.9	48.1	33.9	22.6	21.1	20.0
10/07/2021 02:30:01	10/07/2021 02:45:01	00:15:00	43.0	55.1	52.3	49.4	47.7	35.1	26.1	24.1	21.6
10/07/2021 02:45:02	10/07/2021 03:00:02	00:15:00	41.2	57.8	50.7	47.9	46.2	31.7	20.0	20.0	20.0
10/07/2021 03:00:01	10/07/2021 03:15:01	00:15:00	41.4	58.9	52.2	48.3	45.9	32.0	21.8	20.0	20.0
10/07/2021 03:15:01	10/07/2021 03:30:01	00:15:00	43.0	55.4	51.6	49.1	47.9	37.7	27.6	25.4	22.5
10/07/2021 03:30:01	10/07/2021 03:45:01	00:15:00	50.8	72.4	58.6	56.7	55.6	43.0	33.4	31.7	28.0
10/07/2021 03:45:02	10/07/2021 04:00:02	00:15:00	50.0	62.3	58.7	56.8	55.4	42.0	32.0	30.3	26.7
10/07/2021 04:00:01	10/07/2021 04:15:01	00:15:00	44.4	58.4	51.9	49.4	48.0	42.0	33.1	30.9	26.7
10/07/2021 04:15:01	10/07/2021 04:30:01	00:15:00	45.4	59.9	54.2	51.1	49.6	41.5	34.0	32.3	28.5
10/07/2021 04:30:01	10/07/2021 04:45:01	00:15:00	46.8	63.4	55.2	52.3	50.3	43.7	35.0	32.8	29.8
10/07/2021 04:45:02	10/07/2021 05:00:02	00:15:00	47.2	58.9	54.7	52.1	50.8	44.7	39.3	37.8	33.9

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10/07/2021 05:15:01	10/07/2021 05:30:01	00:15:00	48.5	60.1	55.7	53.7	52.4	46.4	38.4	36.7	33.2
10/07/2021 05:30:01	10/07/2021 05:45:01	00:15:00	48.1	72.3	54.8	52.6	51.3	45.6	37.9	36.3	34.1
10/07/2021 05:45:02	10/07/2021 06:00:02	00:15:00	49.1	60.6	56.1	53.8	52.4	47.4	40.9	38.9	36.3
10/07/2021 06:00:01	10/07/2021 06:15:01	00:15:00	49.3	61.1	55.4	53.3	52.3	48.0	43.2	41.8	39.4
10/07/2021 06:15:01	10/07/2021 06:30:01	00:15:00	50.2	60.1	56.0	54.1	53.0	49.3	43.1	41.0	37.3
10/07/2021 06:30:01	10/07/2021 06:45:01	00:15:00	50.5	59.3	56.5	54.5	53.5	49.4	44.6	42.7	40.2
10/07/2021 06:45:02	10/07/2021 07:00:02	00:15:00	50.4	62.7	56.8	54.6	53.4	49.0	44.6	43.2	41.2
10/07/2021 07:00:01	10/07/2021 07:15:01	00:15:00	49.9	61.6	56.7	54.4	53.2	48.3	43.3	41.7	39.7
10/07/2021 07:15:01	10/07/2021 07:30:01	00:15:00	50.6	60.9	56.1	54.4	53.5	49.6	45.5	44.1	42.0
10/07/2021 07:30:01	10/07/2021 07:45:01	00:15:00	50.7	60.5	56.9	54.8	53.6	49.4	45.2	43.6	41.2
10/07/2021 07:45:02	10/07/2021 08:00:02	00:15:00	51.1	60.7	56.8	54.9	53.8	50.1	45.7	44.7	43.0
10/07/2021 08:00:01	10/07/2021 08:15:01	00:15:00	51.0	64.2	57.1	54.8	53.6	49.8	46.3	45.2	44.0
10/07/2021 08:15:01	10/07/2021 08:30:01	00:15:00	50.9	61.6	57.2	55.2	54.0	49.4	45.4	44.2	42.1
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10/07/2021 08:45:02	10/07/2021 09:00:02	00:15:00	48.4	57.9	53.5	51.7	50.8	47.8	44.0	43.2	41.8
10/07/2021 09:00:01	10/07/2021 09:15:01	00:15:00	50.9	60.1	56.7	54.8	53.8	49.9	45.1	44.0	42.4
10/07/2021 09:15:01	10/07/2021 09:30:01	00:15:00	50.8	57.9	56.1	54.8	54.0	49.8	43.3	41.3	38.7
10/07/2021 09:30:01	10/07/2021 09:45:01	00:15:00	49.0	58.1	54.2	52.8	51.9	48.0	43.4	42.3	40.6
10/07/2021 09:45:02	10/07/2021 10:00:02	00:15:00	52.4	65.6	57.0	55.5	54.7	51.9	48.6	47.6	45.8
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10/07/2021 10:15:01	10/07/2021 10:30:01	00:15:00	52.2	60.8	57.9	56.2	54.9	51.1	47.2	45.9	42.9
10/07/2021 10:30:01	10/07/2021 10:45:01	00:15:00	54.3	61.8	59.0	57.5	56.8	53.5	50.1	49.3	48.3
10/07/2021 10:45:02	10/07/2021 11:00:02	00:15:00	51.8	58.1	55.6	54.4	53.8	51.4	48.7	48.0	46.5
10/07/2021 11:00:01	10/07/2021 11:15:01	00:15:00	50.4	57.7	54.4	53.1	52.4	49.9	47.4	46.7	44.4
10/07/2021 11:15:01	10/07/2021 11:30:01	00:15:00	52.3	61.9	59.5	57.4	55.6	50.3	46.8	45.8	43.1

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10/07/2021 11:30:01	10/07/2021 11:45:01	00:15:00	49.9	63.8	54.8	52.9	52.2	49.1	45.9	44.9	43.1
10/07/2021 11:45:01	10/07/2021 12:00:01	00:15:00	49.6	56.2	54.7	52.5	51.5	49.0	46.9	46.3	44.6
10/07/2021 12:00:01	10/07/2021 12:15:01	00:15:00	50.6	58.3	55.6	54.0	53.1	49.8	46.8	46.1	44.7
10/07/2021 12:15:01	10/07/2021 12:30:01	00:15:00	51.9	62.4	56.4	55.1	54.3	51.2	48.4	47.7	46.1
10/07/2021 12:30:01	10/07/2021 12:45:01	00:15:00	51.8	58.9	56.1	54.5	53.9	51.5	48.1	47.3	46.3
10/07/2021 12:45:01	10/07/2021 13:00:01	00:15:00	54.2	61.6	58.0	56.8	56.1	53.8	51.3	50.6	49.4
10/07/2021 13:00:01	10/07/2021 13:15:01	00:15:00	52.9	58.1	56.5	55.1	54.5	52.7	50.1	49.3	47.7
10/07/2021 13:15:01	10/07/2021 13:30:01	00:15:00	53.2	59.7	56.7	55.5	54.9	52.9	50.5	49.9	48.9
10/07/2021 13:30:01	10/07/2021 13:45:01	00:15:00	54.6	69.1	59.2	57.8	57.0	54.0	49.9	49.0	47.9
10/07/2021 13:45:01	10/07/2021 14:00:01	00:15:00	56.0	73.8	66.9	58.6	57.2	53.7	49.6	47.7	46.2
10/07/2021 14:00:01	10/07/2021 14:15:01	00:15:00	51.0	61.0	55.3	53.7	52.9	50.4	48.6	48.1	47.4
10/07/2021 14:15:01	10/07/2021 14:30:01	00:15:00	54.1	62.2	58.5	57.0	56.2	53.4	50.6	49.8	48.6
10/07/2021 14:30:01	10/07/2021 14:45:01	00:15:00	52.8	59.5	57.1	55.9	55.1	52.3	48.9	47.8	46.5
10/07/2021 14:45:01	10/07/2021 15:00:01	00:15:00	54.7	62.1	59.0	57.6	56.9	54.1	51.4	50.7	49.7
10/07/2021 15:00:01	10/07/2021 15:15:01	00:15:00	54.9	62.5	59.1	57.7	56.9	54.3	51.5	50.6	49.0
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10/07/2021 15:30:01	10/07/2021 15:45:01	00:15:00	55.4	64.3	60.7	58.7	57.9	54.6	51.1	50.1	47.1
10/07/2021 15:45:01	10/07/2021 16:00:01	00:15:00	55.1	62.8	60.4	58.9	57.9	54.2	50.1	48.9	45.1
10/07/2021 16:00:01	10/07/2021 16:15:01	00:15:00	55.6	67.1	61.1	59.0	58.0	54.8	51.0	49.8	47.5
10/07/2021 16:15:01	10/07/2021 16:30:01	00:15:00	55.2	64.4	60.4	58.6	57.7	54.3	50.7	49.4	47.1
10/07/2021 16:30:01	10/07/2021 16:45:01	00:15:00	55.0	62.3	59.7	58.3	57.6	54.3	50.8	49.6	47.7
10/07/2021 16:45:01	10/07/2021 17:00:01	00:15:00	54.6	63.8	60.0	58.0	57.2	53.5	50.5	49.6	48.2
10/07/2021 17:00:02	10/07/2021 17:15:02	00:15:00	54.7	63.2	60.5	58.4	57.3	53.8	50.2	48.9	45.4
10/07/2021 17:15:01	10/07/2021 17:30:01	00:15:00	53.9	62.4	59.3	57.5	56.7	53.1	48.8	47.0	44.6
10/07/2021 17:30:01	10/07/2021 17:45:01	00:15:00	54.0	62.8	59.7	57.6	56.7	53.2	49.3	46.9	40.6
10/07/2021 17:45:01	10/07/2021 18:00:01	00:15:00	54.0	65.0	59.3	57.3	56.4	53.3	49.7	48.6	45.7

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10/07/2021 18:00:02	10/07/2021 18:15:02	00:15:00	54.5	64.2	59.4	58.0	57.1	53.6	50.6	49.4	46.0
10/07/2021 18:15:01	10/07/2021 18:30:01	00:15:00	53.5	61.5	58.5	56.9	56.1	52.7	48.9	47.5	45.1
10/07/2021 18:30:01	10/07/2021 18:45:01	00:15:00	52.7	62.4	57.6	56.1	55.2	52.1	47.5	45.9	43.5
10/07/2021 18:45:02	10/07/2021 19:00:02	00:15:00	52.1	60.6	56.6	55.3	54.6	51.4	47.3	45.8	43.8
10/07/2021 19:00:01	10/07/2021 19:15:01	00:15:00	49.4	56.7	54.4	53.0	52.0	48.8	43.9	42.5	38.5
10/07/2021 19:15:01	10/07/2021 19:30:01	00:15:00	51.6	64.8	58.0	55.5	54.4	50.5	45.9	43.4	39.2
10/07/2021 19:30:01	10/07/2021 19:45:01	00:15:00	51.1	61.3	57.2	54.9	53.8	50.1	44.4	42.1	40.2
10/07/2021 19:45:02	10/07/2021 20:00:02	00:15:00	51.5	60.1	56.8	55.1	54.3	50.7	45.7	44.4	42.6
10/07/2021 20:00:01	10/07/2021 20:15:01	00:15:00	50.9	58.9	55.9	54.6	53.9	50.0	43.8	42.1	39.4
10/07/2021 20:15:01	10/07/2021 20:30:01	00:15:00	51.0	60.6	56.8	55.0	54.0	49.9	44.7	42.6	40.2
10/07/2021 20:30:01	10/07/2021 20:45:01	00:15:00	50.8	59.2	56.6	54.8	53.8	49.7	43.2	41.4	39.3
10/07/2021 20:45:02	10/07/2021 21:00:02	00:15:00	51.0	58.2	56.3	54.6	53.7	50.3	43.8	41.4	38.5
10/07/2021 21:00:01	10/07/2021 21:15:01	00:15:00	50.2	59.3	56.3	54.4	53.5	48.8	41.9	38.9	30.2
10/07/2021 21:15:01	10/07/2021 21:30:01	00:15:00	51.4	61.0	57.4	55.7	54.7	50.1	43.9	42.0	39.4
10/07/2021 21:30:01	10/07/2021 21:45:01	00:15:00	50.9	59.3	55.4	54.2	53.6	50.1	46.1	44.8	42.7
10/07/2021 21:45:02	10/07/2021 22:00:02	00:15:00	49.8	62.3	55.1	53.6	52.8	49.0	40.9	38.8	36.4
10/07/2021 22:00:01	10/07/2021 22:15:01	00:15:00	48.9	58.0	55.3	53.6	52.7	46.9	40.1	38.4	36.5
10/07/2021 22:15:01	10/07/2021 22:30:01	00:15:00	48.1	60.4	54.7	52.7	51.5	46.8	35.1	31.8	27.1
10/07/2021 22:30:01	10/07/2021 22:45:01	00:15:00	45.1	57.6	51.8	50.3	49.2	43.0	32.2	28.6	25.1
10/07/2021 22:45:02	10/07/2021 23:00:02	00:15:00	45.9	59.2	54.4	51.5	49.8	42.9	28.9	27.1	24.3
10/07/2021 23:00:01	10/07/2021 23:15:01	00:15:00	46.0	57.1	53.9	51.5	49.9	43.2	36.0	33.8	30.5
10/07/2021 23:15:01	10/07/2021 23:30:01	00:15:00	44.0	57.6	53.3	50.5	48.5	38.3	25.7	23.9	21.4
10/07/2021 23:30:01	10/07/2021 23:45:01	00:15:00	46.5	60.0	56.0	52.5	50.5	42.3	30.5	28.0	24.6
10/07/2021 23:45:02	11/07/2021 00:00:02	00:15:00	43.5	58.3	53.6	49.7	47.8	38.1	26.9	26.0	24.7
11/07/2021 00:00:01	11/07/2021 00:15:01	00:15:00	42.1	61.0	53.2	48.4	46.3	32.0	23.9	22.2	20.9
11/07/2021 00:15:01	11/07/2021 00:30:01	00:15:00	38.0	52.0	47.6	45.2	42.9	31.6	23.6	22.6	21.5

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11/07/2021 00:45:02	11/07/2021 01:00:02	00:15:00	41.8	55.0	51.7	48.4	46.7	32.6	24.2	22.6	20.6
11/07/2021 01:00:01	11/07/2021 01:15:01	00:15:00	39.7	54.0	49.4	46.8	44.8	31.8	22.6	21.5	20.0
11/07/2021 01:15:01	11/07/2021 01:30:01	00:15:00	39.4	54.3	49.7	46.3	44.1	31.6	20.6	20.0	20.0
11/07/2021 01:30:01	11/07/2021 01:45:01	00:15:00	39.2	54.8	49.6	46.3	44.2	29.6	20.0	20.0	20.0
11/07/2021 01:45:01	11/07/2021 02:00:01	00:15:00	38.9	55.8	50.1	46.5	44.0	27.8	20.0	20.0	20.0
11/07/2021 02:00:01	11/07/2021 02:15:01	00:15:00	40.2	54.5	49.4	46.9	45.3	32.3	22.1	20.7	20.0
11/07/2021 02:15:01	11/07/2021 02:30:01	00:15:00	40.7	57.7	50.8	48.0	46.0	31.2	22.3	21.4	20.3
11/07/2021 02:30:01	11/07/2021 02:45:01	00:15:00	40.9	55.7	50.0	47.6	45.8	34.5	23.7	22.5	21.4
11/07/2021 02:45:01	11/07/2021 03:00:01	00:15:00	38.9	53.4	49.6	46.4	43.9	29.3	22.9	22.2	21.1
11/07/2021 03:00:01	11/07/2021 03:15:01	00:15:00	41.4	64.4	51.0	47.0	45.3	33.3	23.1	21.3	20.0
11/07/2021 03:15:01	11/07/2021 03:30:01	00:15:00	40.0	56.2	48.2	44.9	43.4	37.3	32.8	31.6	29.2
11/07/2021 03:30:02	11/07/2021 03:45:02	00:15:00	51.0	60.0	57.3	55.8	55.0	48.7	37.8	35.4	32.6
11/07/2021 03:45:01	11/07/2021 04:00:01	00:15:00	49.5	61.5	57.7	55.9	54.6	44.0	37.3	35.8	33.4
11/07/2021 04:00:01	11/07/2021 04:15:01	00:15:00	44.1	60.1	55.5	51.2	46.8	37.5	29.7	27.7	25.5
11/07/2021 04:15:01	11/07/2021 04:30:01	00:15:00	41.6	55.3	50.2	47.5	45.6	37.9	29.4	27.6	25.0
11/07/2021 04:30:02	11/07/2021 04:45:02	00:15:00	43.4	55.1	51.3	48.5	46.8	41.3	33.7	32.2	28.8
11/07/2021 04:45:01	11/07/2021 05:00:01	00:15:00	45.1	63.3	53.0	50.7	49.3	41.9	34.2	32.5	29.6
11/07/2021 05:00:01	11/07/2021 05:15:01	00:15:00	46.7	60.3	53.6	51.2	50.0	44.9	36.9	34.4	30.1
11/07/2021 05:15:01	11/07/2021 05:30:01	00:15:00	47.4	58.0	54.0	52.1	51.1	45.7	35.2	32.9	28.6
11/07/2021 05:30:02	11/07/2021 05:45:02	00:15:00	47.0	58.3	54.0	51.7	50.5	45.6	36.1	31.9	27.3
11/07/2021 05:45:01	11/07/2021 06:00:01	00:15:00	46.4	56.2	53.4	51.2	50.0	44.4	36.8	35.0	32.9
11/07/2021 06:00:01	11/07/2021 06:15:01	00:15:00	46.5	58.6	53.8	51.3	49.8	44.7	38.9	37.2	31.5
11/07/2021 06:15:01	11/07/2021 06:30:01	00:15:00	46.7	60.2	54.5	52.1	50.6	43.4	34.6	32.3	29.4
11/07/2021 06:30:02	11/07/2021 06:45:02	00:15:00	49.1	59.2	55.4	53.5	52.4	47.9	41.2	39.3	36.1
11/07/2021 06:45:01	11/07/2021 07:00:01	00:15:00	49.7	62.6	56.0	54.0	53.0	48.5	40.5	37.0	32.2

ReportId

11/07/2021 07:00:01	11/07/2021 07:15:01	00:15:00	49.5	60.3	56.3	53.9	52.7	47.9	42.5	41.0	38.5
11/07/2021 07:15:02	11/07/2021 07:30:02	00:15:00	50.3	62.9	57.3	55.4	54.1	48.2	41.5	39.6	36.9
11/07/2021 07:30:02	11/07/2021 07:45:02	00:15:00	50.4	62.0	57.5	55.0	53.6	48.8	42.6	41.1	38.8
11/07/2021 07:45:01	11/07/2021 08:00:01	00:15:00	51.6	62.5	57.7	55.9	54.9	50.3	44.0	39.7	36.9
11/07/2021 08:00:01	11/07/2021 08:15:01	00:15:00	52.6	61.5	57.8	56.4	55.5	51.7	46.3	44.4	40.0
11/07/2021 08:15:01	11/07/2021 08:30:01	00:15:00	53.5	61.9	59.0	57.4	56.3	52.6	48.1	46.9	45.3
11/07/2021 08:30:02	11/07/2021 08:45:02	00:15:00	52.9	63.5	57.9	56.5	55.7	52.1	47.5	46.1	44.4
11/07/2021 08:45:01	11/07/2021 09:00:01	00:15:00	52.7	62.4	58.5	56.4	55.4	51.9	47.6	46.4	43.4
11/07/2021 09:00:01	11/07/2021 09:15:01	00:15:00	53.1	63.4	58.7	57.2	56.2	51.8	46.2	43.9	38.5
11/07/2021 09:15:01	11/07/2021 09:30:01	00:15:00	55.3	67.4	62.7	58.9	57.6	54.1	50.1	49.0	46.0
11/07/2021 09:30:01	11/07/2021 09:45:01	00:15:00	53.8	61.8	58.5	57.0	56.2	53.1	49.8	48.8	47.4
11/07/2021 09:45:01	11/07/2021 10:00:01	00:15:00	55.1	65.5	60.1	58.2	57.3	54.5	51.7	51.0	49.6
11/07/2021 10:00:01	11/07/2021 10:15:01	00:15:00	55.4	64.0	59.6	58.3	57.6	54.9	52.3	51.7	50.1
11/07/2021 10:15:01	11/07/2021 10:30:01	00:15:00	55.5	65.3	60.7	58.6	57.6	54.8	52.0	51.0	49.3
11/07/2021 10:30:01	11/07/2021 10:45:01	00:15:00	56.1	65.5	60.6	59.0	58.2	55.6	52.3	51.1	49.7
11/07/2021 10:45:01	11/07/2021 11:00:01	00:15:00	57.1	65.3	61.3	60.0	59.2	56.7	54.0	52.9	51.5
11/07/2021 11:00:01	11/07/2021 11:15:01	00:15:00	57.2	64.1	60.9	59.8	59.2	56.7	54.3	53.6	51.8
11/07/2021 11:15:01	11/07/2021 11:30:01	00:15:00	57.1	64.2	60.7	59.5	58.9	56.7	54.3	53.7	52.5
11/07/2021 11:30:01	11/07/2021 11:45:01	00:15:00	56.7	63.8	60.9	59.6	58.9	56.2	53.3	52.5	50.9
11/07/2021 11:45:01	11/07/2021 12:00:01	00:15:00	56.7	65.7	60.8	59.6	58.8	56.1	53.6	52.8	51.6
11/07/2021 12:00:01	11/07/2021 12:15:01	00:15:00	57.9	64.3	62.1	60.7	59.9	57.4	55.0	54.2	52.5
11/07/2021 12:15:01	11/07/2021 12:30:01	00:15:00	57.6	64.4	61.7	60.1	59.4	57.1	55.0	54.4	53.2
11/07/2021 12:30:01	11/07/2021 12:45:01	00:15:00	58.3	65.0	62.5	61.2	60.4	57.7	55.1	54.3	52.8
11/07/2021 12:45:01	11/07/2021 13:00:01	00:15:00	58.2	65.8	62.3	61.1	60.4	57.6	54.8	54.1	52.7
11/07/2021 13:00:01	11/07/2021 13:15:01	00:15:00	58.3	66.3	62.4	61.0	60.1	57.8	55.8	55.4	54.4
11/07/2021 13:15:01	11/07/2021 13:30:01	00:15:00	57.8	66.2	62.5	60.5	59.8	57.3	54.6	53.5	49.1

ReportId

11/07/2021 13:30:01	11/07/2021 13:45:01	00:15:00	58.6	65.8	62.9	61.6	60.8	58.0	54.9	53.9	52.7
11/07/2021 13:45:01	11/07/2021 14:00:01	00:15:00	57.5	65.4	62.3	60.7	59.6	57.0	54.0	53.2	51.9
11/07/2021 14:00:01	11/07/2021 14:15:01	00:15:00	57.2	65.3	62.3	60.5	59.6	56.4	53.1	51.9	50.1
11/07/2021 14:15:01	11/07/2021 14:30:01	00:15:00	58.1	65.6	62.6	60.9	60.1	57.6	54.5	53.0	50.8
11/07/2021 14:30:02	11/07/2021 14:45:02	00:15:00	57.8	66.2	62.9	61.1	60.2	57.0	54.1	53.1	50.8
11/07/2021 14:45:01	11/07/2021 15:00:01	00:15:00	58.2	66.9	63.5	61.6	60.5	57.5	54.2	53.1	51.0
11/07/2021 15:00:01	11/07/2021 15:15:01	00:15:00	57.9	64.4	62.1	60.9	60.1	57.2	54.5	53.8	52.1
11/07/2021 15:15:01	11/07/2021 15:30:01	00:15:00	57.5	65.2	61.6	60.3	59.6	56.9	54.7	54.1	53.0
11/07/2021 15:30:01	11/07/2021 15:45:01	00:15:00	58.4	64.2	62.2	61.2	60.5	57.9	55.2	54.4	51.8
11/07/2021 15:45:01	11/07/2021 16:00:01	00:15:00	58.4	65.2	63.1	61.7	60.8	57.7	54.8	53.9	52.4
11/07/2021 16:00:01	11/07/2021 16:15:01	00:15:00	57.5	66.8	62.0	60.6	59.6	56.9	54.4	53.8	52.3
11/07/2021 16:15:01	11/07/2021 16:30:01	00:15:00	58.5	64.8	62.7	61.2	60.5	58.1	55.3	54.5	53.0
11/07/2021 16:30:01	11/07/2021 16:45:01	00:15:00	58.2	67.3	63.0	61.4	60.5	57.6	54.5	53.3	51.2
11/07/2021 16:45:01	11/07/2021 17:00:01	00:15:00	57.6	66.4	62.1	60.2	59.4	57.0	54.8	54.2	53.3
11/07/2021 17:00:01	11/07/2021 17:15:01	00:15:00	57.7	65.1	61.7	60.4	59.7	57.3	54.8	54.1	52.8
11/07/2021 17:15:01	11/07/2021 17:30:01	00:15:00	57.6	70.7	62.4	60.0	59.4	57.1	54.3	53.6	52.2
11/07/2021 17:30:01	11/07/2021 17:45:01	00:15:00	57.2	64.4	62.0	60.4	59.5	56.5	53.7	52.7	51.5
11/07/2021 17:45:01	11/07/2021 18:00:01	00:15:00	57.7	65.0	62.0	60.4	59.6	57.2	54.7	53.8	52.2
11/07/2021 18:00:01	11/07/2021 18:15:01	00:15:00	57.4	64.2	61.8	60.2	59.5	56.9	54.2	53.4	51.4
11/07/2021 18:15:01	11/07/2021 18:30:01	00:15:00	56.8	63.5	61.1	59.7	59.0	56.2	53.7	53.0	51.8
11/07/2021 18:30:02	11/07/2021 18:45:02	00:15:00	56.2	65.7	60.6	59.4	58.6	55.6	52.4	51.5	50.3
11/07/2021 18:45:01	11/07/2021 19:00:01	00:15:00	55.1	65.4	60.6	58.4	57.4	54.3	50.9	50.0	48.2
11/07/2021 19:00:01	11/07/2021 19:15:01	00:15:00	54.6	62.2	59.6	58.0	57.1	53.8	49.8	48.9	47.5
11/07/2021 19:15:01	11/07/2021 19:30:01	00:15:00	54.7	62.5	59.8	58.3	57.3	54.0	49.6	48.3	45.9
11/07/2021 19:30:01	11/07/2021 19:45:01	00:15:00	53.7	63.0	59.5	57.7	56.6	52.7	47.7	46.2	43.9
11/07/2021 19:45:01	11/07/2021 20:00:01	00:15:00	51.5	60.6	57.5	55.7	54.6	50.4	44.4	42.4	37.7

ReportId

11/07/2021 20:00:01	11/07/2021 20:15:01	00:15:00	53.1	61.6	59.1	57.2	56.1	52.0	46.3	44.8	42.1
11/07/2021 20:15:01	11/07/2021 20:30:01	00:15:00	51.9	63.6	57.7	56.0	55.1	50.8	43.9	40.2	36.1
11/07/2021 20:30:01	11/07/2021 20:45:01	00:15:00	50.3	61.5	57.1	54.6	53.4	48.9	42.2	40.3	38.0
11/07/2021 20:45:01	11/07/2021 21:00:01	00:15:00	50.1	62.1	56.2	54.4	53.2	48.9	43.8	41.9	39.9
11/07/2021 21:00:01	11/07/2021 21:15:01	00:15:00	49.4	61.6	56.3	53.9	52.6	47.7	42.6	40.7	36.9
11/07/2021 21:15:02	11/07/2021 21:30:02	00:15:00	48.8	59.4	55.3	53.4	52.3	47.2	40.3	38.9	36.9
11/07/2021 21:30:01	11/07/2021 21:45:01	00:15:00	48.7	59.0	55.5	53.7	52.5	46.6	36.1	33.5	31.0
11/07/2021 21:45:01	11/07/2021 22:00:01	00:15:00	47.0	58.7	54.7	52.4	51.0	44.2	35.5	33.4	31.1
11/07/2021 22:00:01	11/07/2021 22:15:01	00:15:00	46.5	60.7	54.7	51.7	50.3	43.7	32.4	29.3	26.0
11/07/2021 22:15:01	11/07/2021 22:30:01	00:15:00	47.6	57.7	54.5	52.5	51.2	45.7	38.1	34.7	30.9
11/07/2021 22:30:01	11/07/2021 22:45:01	00:15:00	48.9	60.6	56.0	53.8	52.5	47.1	37.7	36.1	33.9
11/07/2021 22:45:01	11/07/2021 23:00:01	00:15:00	47.9	58.4	54.6	52.3	51.0	46.4	40.6	39.0	35.2
11/07/2021 23:00:01	11/07/2021 23:15:01	00:15:00	47.7	61.1	54.5	52.4	51.1	45.9	40.6	39.2	37.0
11/07/2021 23:15:02	11/07/2021 23:30:02	00:15:00	47.6	59.0	54.9	52.5	51.2	45.5	33.3	30.5	27.3
11/07/2021 23:30:01	11/07/2021 23:45:01	00:15:00	46.5	59.9	54.2	51.7	50.2	44.5	34.5	32.7	29.8
11/07/2021 23:45:01	12/07/2021 00:00:01	00:15:00	45.8	58.9	54.1	51.5	49.8	42.4	31.9	28.4	25.9
12/07/2021 00:00:01	12/07/2021 00:15:01	00:15:00	45.5	58.8	53.3	50.6	49.3	42.6	33.7	31.3	28.7
12/07/2021 00:15:02	12/07/2021 00:30:02	00:15:00	43.0	56.6	53.0	49.6	47.4	37.1	31.0	30.0	28.1
12/07/2021 00:30:01	12/07/2021 00:45:01	00:15:00	40.1	56.2	50.4	47.5	44.8	31.7	25.2	24.2	23.0
12/07/2021 00:45:01	12/07/2021 01:00:01	00:15:00	43.6	56.0	53.9	50.0	47.9	37.3	26.4	24.9	23.3
12/07/2021 01:00:01	12/07/2021 01:15:01	00:15:00	41.4	59.1	51.9	47.9	45.6	33.9	28.2	27.2	25.5
12/07/2021 01:15:02	12/07/2021 01:30:02	00:15:00	42.8	63.7	53.3	48.6	46.5	35.3	26.9	25.9	24.6
12/07/2021 01:30:01	12/07/2021 01:45:01	00:15:00	43.1	60.9	52.2	49.0	47.3	37.4	28.6	27.5	25.7
12/07/2021 01:45:01	12/07/2021 02:00:01	00:15:00	41.5	58.2	52.4	48.6	45.9	32.4	24.9	23.5	22.5
12/07/2021 02:00:02	12/07/2021 02:15:02	00:15:00	43.0	58.1	53.5	49.8	47.1	36.9	26.5	25.4	24.3
12/07/2021 02:15:01	12/07/2021 02:30:01	00:15:00	42.7	54.8	51.5	49.0	47.0	37.2	28.4	26.1	23.3

ReportId

12/07/2021 02:30:01	12/07/2021 02:45:01	00:15:00	44.6	57.5	52.7	50.3	48.6	41.6	30.5	27.2	24.2
12/07/2021 02:45:01	12/07/2021 03:00:01	00:15:00	43.3	58.2	52.4	49.2	47.3	39.2	31.7	30.3	28.2
12/07/2021 03:00:02	12/07/2021 03:15:02	00:15:00	45.9	56.9	53.6	51.3	49.8	43.2	36.8	35.2	32.1
12/07/2021 03:15:01	12/07/2021 03:30:01	00:15:00	46.8	56.7	53.3	51.2	50.1	45.4	37.9	35.2	32.1
12/07/2021 03:30:01	12/07/2021 03:45:01	00:15:00	47.4	61.3	55.0	52.5	51.2	44.7	37.9	36.5	34.3
12/07/2021 03:45:01	12/07/2021 04:00:01	00:15:00	48.9	61.9	56.0	54.0	52.8	46.4	37.5	36.1	33.7
12/07/2021 04:00:02	12/07/2021 04:15:02	00:15:00	49.8	60.7	56.6	54.2	52.9	48.3	43.4	42.4	39.9
12/07/2021 04:15:01	12/07/2021 04:30:01	00:15:00	52.5	62.0	58.3	56.4	55.2	51.5	47.0	45.6	42.4
12/07/2021 04:30:01	12/07/2021 04:45:01	00:15:00	53.2	61.0	58.2	56.7	55.8	52.4	47.8	46.1	44.2
12/07/2021 04:45:01	12/07/2021 05:00:01	00:15:00	56.1	63.7	60.6	59.3	58.5	55.4	51.9	50.8	48.7
12/07/2021 05:00:02	12/07/2021 05:15:02	00:15:00	56.7	68.4	61.5	59.8	58.9	56.0	52.8	52.0	50.5
12/07/2021 05:15:01	12/07/2021 05:30:01	00:15:00	55.2	60.7	59.1	58.1	57.4	54.6	51.8	50.8	49.3
12/07/2021 05:30:01	12/07/2021 05:45:01	00:15:00	53.5	63.5	58.6	56.5	55.7	52.7	50.1	49.5	48.7
12/07/2021 05:45:01	12/07/2021 06:00:01	00:15:00	53.6	62.1	57.7	56.4	55.7	53.0	50.8	50.1	48.8
12/07/2021 06:00:02	12/07/2021 06:15:02	00:15:00	49.8	60.0	55.1	53.5	52.5	48.8	46.1	45.5	44.5
12/07/2021 06:15:01	12/07/2021 06:30:01	00:15:00	50.1	57.5	54.0	52.9	52.1	49.4	47.5	46.9	46.1
12/07/2021 06:30:01	12/07/2021 06:45:01	00:15:00	50.1	56.9	54.0	52.7	52.0	49.6	47.8	47.3	46.5
12/07/2021 06:45:01	12/07/2021 07:00:01	00:15:00	48.7	57.0	52.6	51.2	50.6	48.3	45.4	44.7	43.3
12/07/2021 07:00:02	12/07/2021 07:15:02	00:15:00	51.6	66.8	55.7	54.5	53.8	51.1	48.2	47.6	46.0
12/07/2021 07:15:01	12/07/2021 07:30:01	00:15:00	51.9	59.7	56.4	54.9	54.0	51.3	48.9	48.2	46.7
12/07/2021 07:30:01	12/07/2021 07:45:01	00:15:00	51.8	60.3	55.8	54.6	53.9	51.3	48.3	47.3	45.9
12/07/2021 07:45:01	12/07/2021 08:00:01	00:15:00	48.8	63.8	53.8	51.7	50.7	48.1	45.3	44.4	43.2
12/07/2021 08:00:01	12/07/2021 08:15:01	00:15:00	50.2	59.5	55.4	53.4	52.5	49.3	46.7	45.7	43.7
12/07/2021 08:15:01	12/07/2021 08:30:01	00:15:00	47.1	55.9	52.3	50.8	50.0	45.7	41.9	40.8	39.4
12/07/2021 08:30:01	12/07/2021 08:45:01	00:15:00	41.6	58.1	47.3	45.0	43.8	40.7	37.5	36.6	35.2
12/07/2021 08:45:01	12/07/2021 09:00:01	00:15:00	42.0	61.5	47.8	45.4	44.2	41.1	37.9	37.1	35.5

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12/07/2021 09:00:01	12/07/2021 09:15:01	00:15:00	43.6	59.5	50.9	47.3	46.0	42.0	39.1	38.2	36.5
12/07/2021 09:15:01	12/07/2021 09:30:01	00:15:00	58.7	72.1	70.1	67.6	62.6	45.6	39.4	38.2	36.0
12/07/2021 09:30:01	12/07/2021 09:45:01	00:15:00	42.2	51.8	46.7	45.3	44.5	41.6	38.8	38.1	36.3
12/07/2021 09:45:02	12/07/2021 10:00:02	00:15:00	48.9	84.8	48.8	46.3	45.1	41.4	38.3	37.6	36.8
12/07/2021 10:00:01	12/07/2021 10:15:01	00:15:00	40.8	53.2	46.6	44.0	42.9	40.1	37.5	36.7	34.9
12/07/2021 10:15:01	12/07/2021 10:30:01	00:15:00	40.8	49.8	46.9	44.6	43.2	39.9	36.9	36.0	34.4
12/07/2021 10:30:01	12/07/2021 10:45:01	00:15:00	42.7	55.3	49.4	46.3	44.9	41.6	38.7	37.9	36.7
12/07/2021 10:45:02	12/07/2021 11:00:02	00:15:00	42.9	55.8	49.2	47.1	45.8	41.4	38.4	37.5	36.6
12/07/2021 11:00:01	12/07/2021 11:15:01	00:15:00	43.7	56.5	50.1	47.8	46.3	42.5	39.0	38.2	36.2
12/07/2021 11:15:01	12/07/2021 11:30:01	00:15:00	41.2	51.1	46.6	44.5	43.4	40.5	37.7	36.8	36.0
12/07/2021 11:30:01	12/07/2021 11:45:01	00:15:00	42.5	53.0	48.5	46.3	45.2	41.0	38.3	37.7	36.7
12/07/2021 11:45:02	12/07/2021 12:00:02	00:15:00	42.3	55.1	49.0	46.3	45.0	40.7	37.8	37.1	35.9
12/07/2021 12:00:01	12/07/2021 12:15:01	00:15:00	41.2	57.2	46.0	44.2	43.1	40.4	38.5	37.7	36.1
12/07/2021 12:15:01	12/07/2021 12:30:01	00:15:00	42.9	54.0	50.3	46.7	45.2	41.3	38.4	37.7	36.7
12/07/2021 12:30:01	12/07/2021 12:45:01	00:15:00	44.9	61.9	55.2	47.9	46.0	42.4	39.3	38.3	37.0
12/07/2021 12:45:02	12/07/2021 13:00:02	00:15:00	41.3	50.5	46.3	44.6	43.5	40.4	38.1	37.4	36.6
12/07/2021 13:00:01	12/07/2021 13:15:01	00:15:00	44.9	62.6	52.6	47.5	46.4	43.4	40.0	38.9	37.5

ReportId

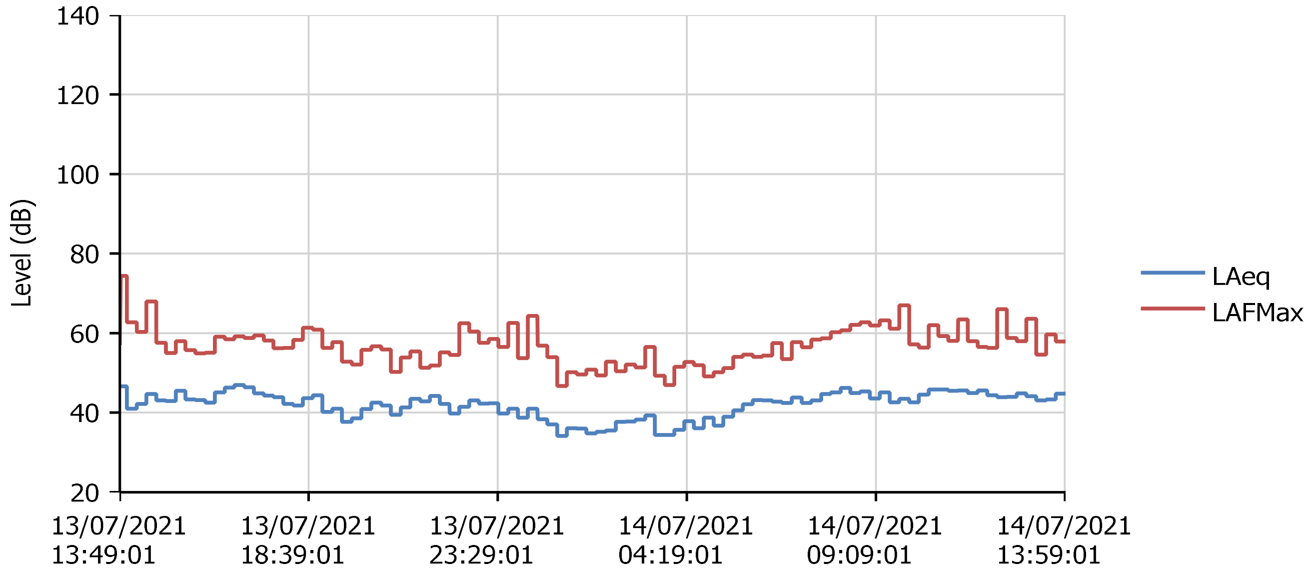
Cirrus Research plc

HALSTON

Measurement List Report

Name SEP-0347 (NSR-102)
Start Time 13/07/2021 13:49:01
End Time 14/07/2021 14:00:01

Calibration Before	13/07/2021 12:46:53	Offset	1.38 dB
Calibration After	14/07/2021 16:32:02	Offset	0.78 dB



Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
13/07/2021 13:49:01	13/07/2021 13:49:04	00:00:03	---	57.0	---	---	---	---	---	---	---
13/07/2021 13:50:32	13/07/2021 14:00:01	00:09:29	46.6	74.4	54.7	49.7	48.1	42.9	38.0	37.2	36.4
13/07/2021 14:00:02	13/07/2021 14:15:02	00:15:00	41.0	62.8	47.5	45.0	43.8	39.4	35.8	34.8	33.6
13/07/2021 14:15:01	13/07/2021 14:30:01	00:15:00	42.2	60.3	49.5	46.4	44.9	40.1	37.1	36.2	35.2
13/07/2021 14:30:01	13/07/2021 14:45:01	00:15:00	44.7	68.0	53.9	49.0	47.2	41.2	37.4	36.7	35.7
13/07/2021 14:45:01	13/07/2021 15:00:01	00:15:00	43.1	57.5	50.1	47.3	45.8	41.4	37.7	36.9	35.1
13/07/2021 15:00:02	13/07/2021 15:15:02	00:15:00	42.9	55.0	50.5	47.5	46.1	40.8	37.1	36.1	34.6
13/07/2021 15:15:01	13/07/2021 15:30:01	00:15:00	45.5	58.0	51.3	48.7	47.7	44.6	41.8	41.1	39.7
13/07/2021 15:30:01	13/07/2021 15:45:01	00:15:00	43.3	55.8	50.3	47.4	45.8	41.9	38.6	37.8	36.7
13/07/2021 15:45:01	13/07/2021 16:00:01	00:15:00	43.1	54.9	49.0	46.7	45.6	41.9	39.3	38.7	37.8
13/07/2021 16:00:02	13/07/2021 16:15:02	00:15:00	42.5	55.1	47.2	45.3	44.4	41.9	39.4	38.7	37.7
13/07/2021 16:15:01	13/07/2021 16:30:01	00:15:00	45.1	59.1	51.7	48.8	47.6	43.8	40.4	39.6	38.6
13/07/2021 16:30:01	13/07/2021 16:45:01	00:15:00	46.3	58.4	52.1	49.8	48.6	45.3	42.4	41.6	40.0

13/07/2021 16:45:02	13/07/2021 17:00:02	00:15:00	46.9	59.2	54.3	51.6	50.2	44.9	41.4	40.6	39.7
13/07/2021 17:00:01	13/07/2021 17:15:01	00:15:00	46.4	58.8	54.3	50.7	49.1	44.6	41.2	40.4	39.0
13/07/2021 17:15:01	13/07/2021 17:30:01	00:15:00	44.9	59.4	52.0	49.2	47.7	43.3	39.2	38.3	36.8
13/07/2021 17:30:01	13/07/2021 17:45:01	00:15:00	44.3	58.1	51.6	48.6	47.3	42.2	39.2	38.7	38.0
13/07/2021 17:45:02	13/07/2021 18:00:02	00:15:00	43.9	56.2	51.2	48.7	47.3	41.7	38.3	37.8	37.0
13/07/2021 18:00:01	13/07/2021 18:15:01	00:15:00	42.2	56.2	50.8	47.0	45.4	40.0	34.2	33.6	32.7
13/07/2021 18:15:01	13/07/2021 18:30:01	00:15:00	41.8	58.3	51.1	47.5	45.4	38.2	34.6	33.9	33.1
13/07/2021 18:30:01	13/07/2021 18:45:01	00:15:00	43.6	61.3	50.7	48.0	46.6	41.6	37.6	36.8	35.1
13/07/2021 18:45:02	13/07/2021 19:00:02	00:15:00	44.4	60.9	52.3	49.3	47.6	42.3	36.8	35.7	33.1
13/07/2021 19:00:01	13/07/2021 19:15:01	00:15:00	40.2	56.3	47.4	44.2	42.8	38.5	34.9	34.2	33.1
13/07/2021 19:15:01	13/07/2021 19:30:01	00:15:00	41.0	57.7	50.2	45.8	44.0	37.9	33.8	33.1	31.5
13/07/2021 19:30:01	13/07/2021 19:45:01	00:15:00	37.7	52.8	44.8	42.1	40.6	36.0	31.6	30.7	29.9
13/07/2021 19:45:02	13/07/2021 20:00:02	00:15:00	38.6	52.1	46.4	42.7	41.5	36.7	33.7	33.1	31.8
13/07/2021 20:00:01	13/07/2021 20:15:01	00:15:00	40.9	55.8	48.8	46.1	44.6	38.5	32.8	31.8	30.3
13/07/2021 20:15:01	13/07/2021 20:30:01	00:15:00	42.5	56.7	50.6	47.7	46.2	39.8	33.7	31.7	30.2
13/07/2021 20:30:01	13/07/2021 20:45:01	00:15:00	41.8	55.9	49.9	46.4	44.9	39.9	35.0	34.0	31.3
13/07/2021 20:45:02	13/07/2021 21:00:02	00:15:00	39.5	50.3	46.8	43.9	42.6	37.9	33.8	31.5	28.8
13/07/2021 21:00:01	13/07/2021 21:15:01	00:15:00	41.3	53.9	47.4	45.4	44.4	40.1	35.1	33.9	29.6
13/07/2021 21:15:01	13/07/2021 21:30:01	00:15:00	43.5	55.4	50.2	47.7	46.7	42.1	35.8	33.9	31.6
13/07/2021 21:30:01	13/07/2021 21:45:01	00:15:00	42.9	51.3	47.9	46.5	45.6	42.2	37.1	35.0	30.9
13/07/2021 21:45:02	13/07/2021 22:00:02	00:15:00	44.2	51.9	49.3	47.9	47.1	43.5	37.9	35.3	31.8
13/07/2021 22:00:01	13/07/2021 22:15:01	00:15:00	42.2	55.1	49.2	46.8	45.2	40.4	36.1	34.8	32.3
13/07/2021 22:15:01	13/07/2021 22:30:01	00:15:00	39.8	54.5	48.2	44.0	42.3	38.3	33.0	31.1	27.4
13/07/2021 22:30:01	13/07/2021 22:45:01	00:15:00	41.5	62.5	51.7	46.7	44.0	37.9	31.4	29.8	28.0
13/07/2021 22:45:02	13/07/2021 23:00:02	00:15:00	43.0	60.4	53.0	49.0	46.6	38.7	34.3	33.3	32.2
13/07/2021 23:00:01	13/07/2021 23:15:01	00:15:00	42.3	57.6	51.3	47.2	45.1	39.9	33.2	32.2	30.7
13/07/2021 23:15:01	13/07/2021 23:30:01	00:15:00	42.3	58.5	51.5	47.4	45.2	39.3	34.6	33.6	30.8
13/07/2021 23:30:01	13/07/2021 23:45:01	00:15:00	39.8	56.5	50.6	45.3	42.5	35.9	30.4	29.3	27.6
13/07/2021 23:45:02	14/07/2021 00:00:02	00:15:00	41.0	62.6	51.7	45.8	43.1	36.8	25.8	24.4	23.0
14/07/2021 00:00:01	14/07/2021 00:15:01	00:15:00	38.7	53.7	48.4	44.7	42.6	34.5	26.8	24.8	22.6
14/07/2021 00:15:01	14/07/2021 00:30:01	00:15:00	41.0	64.3	52.6	44.6	41.7	35.2	29.3	27.0	23.0
14/07/2021 00:30:01	14/07/2021 00:45:01	00:15:00	38.3	56.8	47.9	43.8	41.8	35.2	22.4	20.9	20.0
14/07/2021 00:45:02	14/07/2021 01:00:02	00:15:00	37.0	54.0	45.6	42.6	40.9	33.7	21.7	20.7	20.0
14/07/2021 01:00:01	14/07/2021 01:15:01	00:15:00	34.2	46.7	42.7	40.0	38.5	27.0	20.2	20.0	20.0

14/07/2021 01:15:01	14/07/2021 01:30:01	00:15:00	36.1	50.2	44.6	40.4	39.0	34.1	26.1	24.5	21.5
14/07/2021 01:30:01	14/07/2021 01:45:01	00:15:00	36.0	49.6	44.3	41.6	40.0	32.7	23.5	22.5	21.6
14/07/2021 01:45:02	14/07/2021 02:00:02	00:15:00	34.8	50.8	44.6	41.0	38.9	26.9	20.5	20.2	20.0
14/07/2021 02:00:01	14/07/2021 02:15:01	00:15:00	35.2	49.4	44.9	41.0	39.0	30.3	21.8	21.4	21.0
14/07/2021 02:15:01	14/07/2021 02:30:01	00:15:00	35.5	52.8	45.0	40.9	39.1	31.1	22.8	22.3	21.9
14/07/2021 02:30:01	14/07/2021 02:45:01	00:15:00	37.7	50.4	45.9	42.7	41.1	35.6	25.7	24.1	23.0
14/07/2021 02:45:02	14/07/2021 03:00:02	00:15:00	37.8	52.1	46.4	42.6	41.1	35.3	26.8	25.1	23.7
14/07/2021 03:00:01	14/07/2021 03:15:01	00:15:00	38.3	51.4	47.6	43.0	41.2	36.1	25.6	22.0	21.1
14/07/2021 03:15:01	14/07/2021 03:30:01	00:15:00	39.3	56.5	49.2	44.7	42.8	35.5	26.1	24.9	21.6
14/07/2021 03:30:01	14/07/2021 03:45:01	00:15:00	34.4	49.3	42.6	39.8	38.3	30.5	23.1	22.7	21.8
14/07/2021 03:45:02	14/07/2021 04:00:02	00:15:00	34.4	46.9	42.7	39.8	37.8	31.9	24.5	23.7	22.8
14/07/2021 04:00:01	14/07/2021 04:15:01	00:15:00	35.7	51.5	44.4	41.1	39.4	32.4	24.6	23.4	21.2
14/07/2021 04:15:01	14/07/2021 04:30:01	00:15:00	37.8	52.7	45.6	42.8	41.6	35.4	22.5	21.6	20.2
14/07/2021 04:30:01	14/07/2021 04:45:01	00:15:00	36.1	51.9	43.3	41.0	39.8	34.0	22.1	21.1	20.4
14/07/2021 04:45:02	14/07/2021 05:00:02	00:15:00	38.7	49.1	44.7	42.8	41.5	37.6	32.8	30.0	25.3
14/07/2021 05:00:01	14/07/2021 05:15:01	00:15:00	36.7	50.2	42.7	40.6	39.6	35.4	30.5	29.0	27.2
14/07/2021 05:15:01	14/07/2021 05:30:01	00:15:00	39.0	51.2	45.2	43.0	41.7	38.0	32.9	31.6	29.7
14/07/2021 05:30:01	14/07/2021 05:45:01	00:15:00	40.6	54.0	46.9	44.7	43.1	39.4	36.5	35.5	33.6
14/07/2021 05:45:02	14/07/2021 06:00:02	00:15:00	42.2	54.6	48.5	45.5	44.1	41.2	38.6	37.8	35.5
14/07/2021 06:00:01	14/07/2021 06:15:01	00:15:00	43.2	54.0	49.7	46.9	45.7	41.9	39.2	38.5	37.5
14/07/2021 06:15:01	14/07/2021 06:30:01	00:15:00	43.1	54.3	49.4	47.2	45.8	41.7	38.9	38.4	37.5
14/07/2021 06:30:01	14/07/2021 06:45:01	00:15:00	42.7	57.5	49.8	46.6	45.0	41.3	39.0	38.3	37.4
14/07/2021 06:45:02	14/07/2021 07:00:02	00:15:00	42.5	53.5	48.8	46.4	45.0	41.2	38.9	38.1	37.0
14/07/2021 07:00:01	14/07/2021 07:15:01	00:15:00	43.8	57.8	50.4	48.1	46.8	41.9	39.2	38.6	37.6
14/07/2021 07:15:01	14/07/2021 07:30:01	00:15:00	42.4	56.5	50.1	46.8	45.3	40.6	37.8	37.1	36.1
14/07/2021 07:30:01	14/07/2021 07:45:01	00:15:00	43.1	58.3	51.3	48.1	46.5	40.2	36.5	35.7	34.5
14/07/2021 07:45:02	14/07/2021 08:00:02	00:15:00	44.7	58.7	53.2	49.1	47.2	42.5	39.9	39.3	37.8
14/07/2021 08:00:01	14/07/2021 08:15:01	00:15:00	45.1	60.2	52.9	49.4	47.9	43.2	40.3	39.6	38.4
14/07/2021 08:15:01	14/07/2021 08:30:01	00:15:00	46.2	60.7	55.2	51.5	49.2	43.7	39.8	39.3	38.3
14/07/2021 08:30:01	14/07/2021 08:45:01	00:15:00	44.9	62.1	54.1	49.8	47.7	42.5	38.8	38.2	37.6
14/07/2021 08:45:02	14/07/2021 09:00:02	00:15:00	45.3	62.7	54.8	50.1	48.0	42.5	38.9	38.1	37.0
14/07/2021 09:00:01	14/07/2021 09:15:01	00:15:00	43.6	61.9	52.1	48.1	46.5	40.9	37.5	36.8	35.6
14/07/2021 09:15:01	14/07/2021 09:30:01	00:15:00	45.1	63.2	53.3	50.0	48.3	42.6	37.7	36.8	36.0
14/07/2021 09:30:01	14/07/2021 09:45:01	00:15:00	42.6	61.1	49.8	47.0	45.7	40.8	36.6	35.9	34.9

14/07/2021 09:45:02	14/07/2021 10:00:02	00:15:00	43.5	67.0	51.5	48.6	46.8	40.9	35.7	34.7	33.5
14/07/2021 10:00:01	14/07/2021 10:15:01	00:15:00	42.6	57.1	50.2	47.2	45.5	40.7	36.7	35.9	35.0
14/07/2021 10:15:01	14/07/2021 10:30:01	00:15:00	44.5	56.4	51.7	48.6	47.3	42.9	39.6	38.9	37.6
14/07/2021 10:30:02	14/07/2021 10:45:02	00:15:00	45.8	62.0	54.0	50.2	48.6	43.5	40.3	39.6	38.3
14/07/2021 10:45:01	14/07/2021 11:00:01	00:15:00	45.8	59.3	53.9	50.5	48.7	43.8	41.0	40.3	39.4
14/07/2021 11:00:01	14/07/2021 11:15:01	00:15:00	45.5	58.1	51.2	48.9	47.8	44.5	41.5	40.7	39.3
14/07/2021 11:15:01	14/07/2021 11:30:01	00:15:00	45.6	63.5	52.0	49.0	47.9	44.3	41.6	41.0	39.8
14/07/2021 11:30:02	14/07/2021 11:45:02	00:15:00	45.0	58.0	51.8	48.7	47.5	43.6	40.9	40.3	39.4
14/07/2021 11:45:01	14/07/2021 12:00:01	00:15:00	45.6	56.5	52.8	49.9	48.3	44.1	41.2	40.5	39.4
14/07/2021 12:00:01	14/07/2021 12:15:01	00:15:00	44.3	56.3	50.9	48.3	47.1	43.1	39.5	38.9	38.2
14/07/2021 12:15:01	14/07/2021 12:30:01	00:15:00	43.9	66.1	51.5	47.9	46.4	41.9	38.6	38.0	37.0
14/07/2021 12:30:02	14/07/2021 12:45:02	00:15:00	44.0	58.8	51.4	48.5	46.9	42.0	39.0	38.5	37.8
14/07/2021 12:45:01	14/07/2021 13:00:01	00:15:00	44.8	58.0	52.7	49.5	47.7	42.9	39.9	39.2	38.4
14/07/2021 13:00:01	14/07/2021 13:15:01	00:15:00	44.1	63.6	51.3	48.5	47.0	42.2	39.0	38.5	37.6
14/07/2021 13:15:01	14/07/2021 13:30:01	00:15:00	43.1	54.6	49.5	47.1	46.0	41.6	38.4	37.9	37.0
14/07/2021 13:30:02	14/07/2021 13:45:02	00:15:00	43.4	59.7	51.0	47.5	46.0	41.4	38.6	38.0	37.2
14/07/2021 13:45:01	14/07/2021 14:00:01	00:15:00	44.8	57.9	52.4	48.9	47.6	42.9	39.2	38.6	37.6

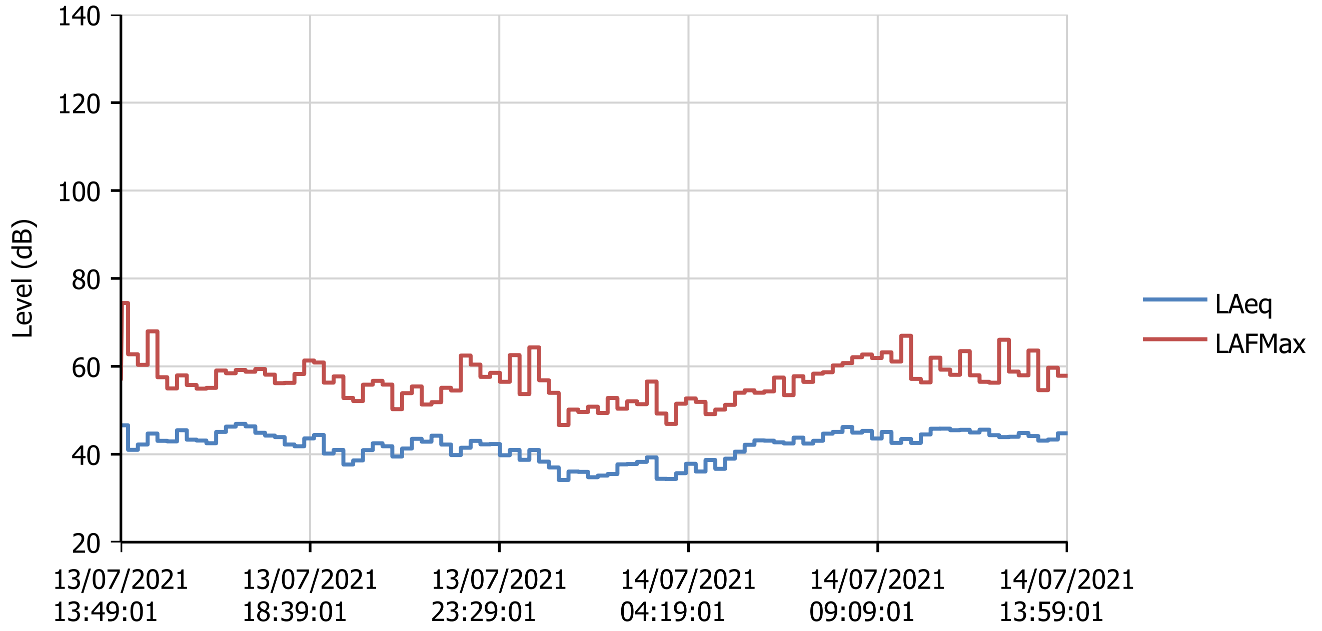
Cirrus Research plc

HALSTON

Measurement List Report

Name SEP-0347 (NSR-102)
Start Time 13/07/2021 13:49:01
End Time 14/07/2021 14:00:01

Calibration Before	13/07/2021 12:46:53	Offset	1.38 dB



Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
13/07/2021 13:49:01	13/07/2021 13:49:04	00:00:03	---	57.0	---	---	---	---	---	---	---
13/07/2021 13:50:32	13/07/2021 14:00:01	00:09:29	46.6	74.4	54.7	49.7	48.1	42.9	38.0	37.2	36.4
13/07/2021 14:00:02	13/07/2021 14:15:02	00:15:00	41.0	62.8	47.5	45.0	43.8	39.4	35.8	34.8	33.6
13/07/2021 14:15:01	13/07/2021 14:30:01	00:15:00	42.2	60.3	49.5	46.4	44.9	40.1	37.1	36.2	35.2
13/07/2021 14:30:01	13/07/2021 14:45:01	00:15:00	44.7	68.0	53.9	49.0	47.2	41.2	37.4	36.7	35.7
13/07/2021 14:45:01	13/07/2021 15:00:01	00:15:00	43.1	57.5	50.1	47.3	45.8	41.4	37.7	36.9	35.1

ReportId

13/07/2021 15:00:02	13/07/2021 15:15:02	00:15:00	42.9	55.0	50.5	47.5	46.1	40.8	37.1	36.1	34.6
13/07/2021 15:15:01	13/07/2021 15:30:01	00:15:00	45.5	58.0	51.3	48.7	47.7	44.6	41.8	41.1	39.7
13/07/2021 15:30:01	13/07/2021 15:45:01	00:15:00	43.3	55.8	50.3	47.4	45.8	41.9	38.6	37.8	36.7
13/07/2021 15:45:01	13/07/2021 16:00:01	00:15:00	43.1	54.9	49.0	46.7	45.6	41.9	39.3	38.7	37.8
13/07/2021 16:00:02	13/07/2021 16:15:02	00:15:00	42.5	55.1	47.2	45.3	44.4	41.9	39.4	38.7	37.7
13/07/2021 16:15:01	13/07/2021 16:30:01	00:15:00	45.1	59.1	51.7	48.8	47.6	43.8	40.4	39.6	38.6
13/07/2021 16:30:01	13/07/2021 16:45:01	00:15:00	46.3	58.4	52.1	49.8	48.6	45.3	42.4	41.6	40.0
13/07/2021 16:45:02	13/07/2021 17:00:02	00:15:00	46.9	59.2	54.3	51.6	50.2	44.9	41.4	40.6	39.7
13/07/2021 17:00:01	13/07/2021 17:15:01	00:15:00	46.4	58.8	54.3	50.7	49.1	44.6	41.2	40.4	39.0
13/07/2021 17:15:01	13/07/2021 17:30:01	00:15:00	44.9	59.4	52.0	49.2	47.7	43.3	39.2	38.3	36.8
13/07/2021 17:30:01	13/07/2021 17:45:01	00:15:00	44.3	58.1	51.6	48.6	47.3	42.2	39.2	38.7	38.0
13/07/2021 17:45:02	13/07/2021 18:00:02	00:15:00	43.9	56.2	51.2	48.7	47.3	41.7	38.3	37.8	37.0
13/07/2021 18:00:01	13/07/2021 18:15:01	00:15:00	42.2	56.2	50.8	47.0	45.4	40.0	34.2	33.6	32.7
13/07/2021 18:15:01	13/07/2021 18:30:01	00:15:00	41.8	58.3	51.1	47.5	45.4	38.2	34.6	33.9	33.1
13/07/2021 18:30:01	13/07/2021 18:45:01	00:15:00	43.6	61.3	50.7	48.0	46.6	41.6	37.6	36.8	35.1
13/07/2021 18:45:02	13/07/2021 19:00:02	00:15:00	44.4	60.9	52.3	49.3	47.6	42.3	36.8	35.7	33.1
13/07/2021 19:00:01	13/07/2021 19:15:01	00:15:00	40.2	56.3	47.4	44.2	42.8	38.5	34.9	34.2	33.1
13/07/2021 19:15:01	13/07/2021 19:30:01	00:15:00	41.0	57.7	50.2	45.8	44.0	37.9	33.8	33.1	31.5
13/07/2021 19:30:01	13/07/2021 19:45:01	00:15:00	37.7	52.8	44.8	42.1	40.6	36.0	31.6	30.7	29.9
13/07/2021 19:45:02	13/07/2021 20:00:02	00:15:00	38.6	52.1	46.4	42.7	41.5	36.7	33.7	33.1	31.8
13/07/2021 20:00:01	13/07/2021 20:15:01	00:15:00	40.9	55.8	48.8	46.1	44.6	38.5	32.8	31.8	30.3
13/07/2021 20:15:01	13/07/2021 20:30:01	00:15:00	42.5	56.7	50.6	47.7	46.2	39.8	33.7	31.7	30.2
13/07/2021 20:30:01	13/07/2021 20:45:01	00:15:00	41.8	55.9	49.9	46.4	44.9	39.9	35.0	34.0	31.3
13/07/2021 20:45:02	13/07/2021 21:00:02	00:15:00	39.5	50.3	46.8	43.9	42.6	37.9	33.8	31.5	28.8
13/07/2021 21:00:01	13/07/2021 21:15:01	00:15:00	41.3	53.9	47.4	45.4	44.4	40.1	35.1	33.9	29.6
13/07/2021 21:15:01	13/07/2021 21:30:01	00:15:00	43.5	55.4	50.2	47.7	46.7	42.1	35.8	33.9	31.6

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13/07/2021 21:30:01	13/07/2021 21:45:01	00:15:00	42.9	51.3	47.9	46.5	45.6	42.2	37.1	35.0	30.9
13/07/2021 21:45:02	13/07/2021 22:00:02	00:15:00	44.2	51.9	49.3	47.9	47.1	43.5	37.9	35.3	31.8
13/07/2021 22:00:01	13/07/2021 22:15:01	00:15:00	42.2	55.1	49.2	46.8	45.2	40.4	36.1	34.8	32.3
13/07/2021 22:15:01	13/07/2021 22:30:01	00:15:00	39.8	54.5	48.2	44.0	42.3	38.3	33.0	31.1	27.4
13/07/2021 22:30:01	13/07/2021 22:45:01	00:15:00	41.5	62.5	51.7	46.7	44.0	37.9	31.4	29.8	28.0
13/07/2021 22:45:02	13/07/2021 23:00:02	00:15:00	43.0	60.4	53.0	49.0	46.6	38.7	34.3	33.3	32.2
13/07/2021 23:00:01	13/07/2021 23:15:01	00:15:00	42.3	57.6	51.3	47.2	45.1	39.9	33.2	32.2	30.7
13/07/2021 23:15:01	13/07/2021 23:30:01	00:15:00	42.3	58.5	51.5	47.4	45.2	39.3	34.6	33.6	30.8
13/07/2021 23:30:01	13/07/2021 23:45:01	00:15:00	39.8	56.5	50.6	45.3	42.5	35.9	30.4	29.3	27.6
13/07/2021 23:45:02	14/07/2021 00:00:02	00:15:00	41.0	62.6	51.7	45.8	43.1	36.8	25.8	24.4	23.0
14/07/2021 00:00:01	14/07/2021 00:15:01	00:15:00	38.7	53.7	48.4	44.7	42.6	34.5	26.8	24.8	22.6
14/07/2021 00:15:01	14/07/2021 00:30:01	00:15:00	41.0	64.3	52.6	44.6	41.7	35.2	29.3	27.0	23.0
14/07/2021 00:30:01	14/07/2021 00:45:01	00:15:00	38.3	56.8	47.9	43.8	41.8	35.2	22.4	20.9	20.0
14/07/2021 00:45:02	14/07/2021 01:00:02	00:15:00	37.0	54.0	45.6	42.6	40.9	33.7	21.7	20.7	20.0
14/07/2021 01:00:01	14/07/2021 01:15:01	00:15:00	34.2	46.7	42.7	40.0	38.5	27.0	20.2	20.0	20.0
14/07/2021 01:15:01	14/07/2021 01:30:01	00:15:00	36.1	50.2	44.6	40.4	39.0	34.1	26.1	24.5	21.5
14/07/2021 01:30:01	14/07/2021 01:45:01	00:15:00	36.0	49.6	44.3	41.6	40.0	32.7	23.5	22.5	21.6
14/07/2021 01:45:02	14/07/2021 02:00:02	00:15:00	34.8	50.8	44.6	41.0	38.9	26.9	20.5	20.2	20.0
14/07/2021 02:00:01	14/07/2021 02:15:01	00:15:00	35.2	49.4	44.9	41.0	39.0	30.3	21.8	21.4	21.0
14/07/2021 02:15:01	14/07/2021 02:30:01	00:15:00	35.5	52.8	45.0	40.9	39.1	31.1	22.8	22.3	21.9
14/07/2021 02:30:01	14/07/2021 02:45:01	00:15:00	37.7	50.4	45.9	42.7	41.1	35.6	25.7	24.1	23.0
14/07/2021 02:45:02	14/07/2021 03:00:02	00:15:00	37.8	52.1	46.4	42.6	41.1	35.3	26.8	25.1	23.7
14/07/2021 03:00:01	14/07/2021 03:15:01	00:15:00	38.3	51.4	47.6	43.0	41.2	36.1	25.6	22.0	21.1
14/07/2021 03:15:01	14/07/2021 03:30:01	00:15:00	39.3	56.5	49.2	44.7	42.8	35.5	26.1	24.9	21.6
14/07/2021 03:30:01	14/07/2021 03:45:01	00:15:00	34.4	49.3	42.6	39.8	38.3	30.5	23.1	22.7	21.8
14/07/2021 03:45:02	14/07/2021 04:00:02	00:15:00	34.4	46.9	42.7	39.8	37.8	31.9	24.5	23.7	22.8

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14/07/2021 04:00:01	14/07/2021 04:15:01	00:15:00	35.7	51.5	44.4	41.1	39.4	32.4	24.6	23.4	21.2
14/07/2021 04:15:01	14/07/2021 04:30:01	00:15:00	37.8	52.7	45.6	42.8	41.6	35.4	22.5	21.6	20.2
14/07/2021 04:30:01	14/07/2021 04:45:01	00:15:00	36.1	51.9	43.3	41.0	39.8	34.0	22.1	21.1	20.4
14/07/2021 04:45:02	14/07/2021 05:00:02	00:15:00	38.7	49.1	44.7	42.8	41.5	37.6	32.8	30.0	25.3
14/07/2021 05:00:01	14/07/2021 05:15:01	00:15:00	36.7	50.2	42.7	40.6	39.6	35.4	30.5	29.0	27.2
14/07/2021 05:15:01	14/07/2021 05:30:01	00:15:00	39.0	51.2	45.2	43.0	41.7	38.0	32.9	31.6	29.7
14/07/2021 05:30:01	14/07/2021 05:45:01	00:15:00	40.6	54.0	46.9	44.7	43.1	39.4	36.5	35.5	33.6
14/07/2021 05:45:02	14/07/2021 06:00:02	00:15:00	42.2	54.6	48.5	45.5	44.1	41.2	38.6	37.8	35.5
14/07/2021 06:00:01	14/07/2021 06:15:01	00:15:00	43.2	54.0	49.7	46.9	45.7	41.9	39.2	38.5	37.5
14/07/2021 06:15:01	14/07/2021 06:30:01	00:15:00	43.1	54.3	49.4	47.2	45.8	41.7	38.9	38.4	37.5
14/07/2021 06:30:01	14/07/2021 06:45:01	00:15:00	42.7	57.5	49.8	46.6	45.0	41.3	39.0	38.3	37.4
14/07/2021 06:45:02	14/07/2021 07:00:02	00:15:00	42.5	53.5	48.8	46.4	45.0	41.2	38.9	38.1	37.0
14/07/2021 07:00:01	14/07/2021 07:15:01	00:15:00	43.8	57.8	50.4	48.1	46.8	41.9	39.2	38.6	37.6
14/07/2021 07:15:01	14/07/2021 07:30:01	00:15:00	42.4	56.5	50.1	46.8	45.3	40.6	37.8	37.1	36.1
14/07/2021 07:30:01	14/07/2021 07:45:01	00:15:00	43.1	58.3	51.3	48.1	46.5	40.2	36.5	35.7	34.5
14/07/2021 07:45:02	14/07/2021 08:00:02	00:15:00	44.7	58.7	53.2	49.1	47.2	42.5	39.9	39.3	37.8
14/07/2021 08:00:01	14/07/2021 08:15:01	00:15:00	45.1	60.2	52.9	49.4	47.9	43.2	40.3	39.6	38.4
14/07/2021 08:15:01	14/07/2021 08:30:01	00:15:00	46.2	60.7	55.2	51.5	49.2	43.7	39.8	39.3	38.3
14/07/2021 08:30:01	14/07/2021 08:45:01	00:15:00	44.9	62.1	54.1	49.8	47.7	42.5	38.8	38.2	37.6
14/07/2021 08:45:02	14/07/2021 09:00:02	00:15:00	45.3	62.7	54.8	50.1	48.0	42.5	38.9	38.1	37.0
14/07/2021 09:00:01	14/07/2021 09:15:01	00:15:00	43.6	61.9	52.1	48.1	46.5	40.9	37.5	36.8	35.6
14/07/2021 09:15:01	14/07/2021 09:30:01	00:15:00	45.1	63.2	53.3	50.0	48.3	42.6	37.7	36.8	36.0
14/07/2021 09:30:01	14/07/2021 09:45:01	00:15:00	42.6	61.1	49.8	47.0	45.7	40.8	36.6	35.9	34.9
14/07/2021 09:45:02	14/07/2021 10:00:02	00:15:00	43.5	67.0	51.5	48.6	46.8	40.9	35.7	34.7	33.5
14/07/2021 10:00:01	14/07/2021 10:15:01	00:15:00	42.6	57.1	50.2	47.2	45.5	40.7	36.7	35.9	35.0
14/07/2021 10:15:01	14/07/2021 10:30:01	00:15:00	44.5	56.4	51.7	48.6	47.3	42.9	39.6	38.9	37.6

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14/07/2021 10:30:02	14/07/2021 10:45:02	00:15:00	45.8	62.0	54.0	50.2	48.6	43.5	40.3	39.6	38.3
14/07/2021 10:45:01	14/07/2021 11:00:01	00:15:00	45.8	59.3	53.9	50.5	48.7	43.8	41.0	40.3	39.4
14/07/2021 11:00:01	14/07/2021 11:15:01	00:15:00	45.5	58.1	51.2	48.9	47.8	44.5	41.5	40.7	39.3
14/07/2021 11:15:01	14/07/2021 11:30:01	00:15:00	45.6	63.5	52.0	49.0	47.9	44.3	41.6	41.0	39.8
14/07/2021 11:30:02	14/07/2021 11:45:02	00:15:00	45.0	58.0	51.8	48.7	47.5	43.6	40.9	40.3	39.4
14/07/2021 11:45:01	14/07/2021 12:00:01	00:15:00	45.6	56.5	52.8	49.9	48.3	44.1	41.2	40.5	39.4
14/07/2021 12:00:01	14/07/2021 12:15:01	00:15:00	44.3	56.3	50.9	48.3	47.1	43.1	39.5	38.9	38.2
14/07/2021 12:15:01	14/07/2021 12:30:01	00:15:00	43.9	66.1	51.5	47.9	46.4	41.9	38.6	38.0	37.0
14/07/2021 12:30:02	14/07/2021 12:45:02	00:15:00	44.0	58.8	51.4	48.5	46.9	42.0	39.0	38.5	37.8
14/07/2021 12:45:01	14/07/2021 13:00:01	00:15:00	44.8	58.0	52.7	49.5	47.7	42.9	39.9	39.2	38.4
14/07/2021 13:00:01	14/07/2021 13:15:01	00:15:00	44.1	63.6	51.3	48.5	47.0	42.2	39.0	38.5	37.6
14/07/2021 13:15:01	14/07/2021 13:30:01	00:15:00	43.1	54.6	49.5	47.1	46.0	41.6	38.4	37.9	37.0
14/07/2021 13:30:02	14/07/2021 13:45:02	00:15:00	43.4	59.7	51.0	47.5	46.0	41.4	38.6	38.0	37.2
14/07/2021 13:45:01	14/07/2021 14:00:01	00:15:00	44.8	57.9	52.4	48.9	47.6	42.9	39.2	38.6	37.6

ReportId

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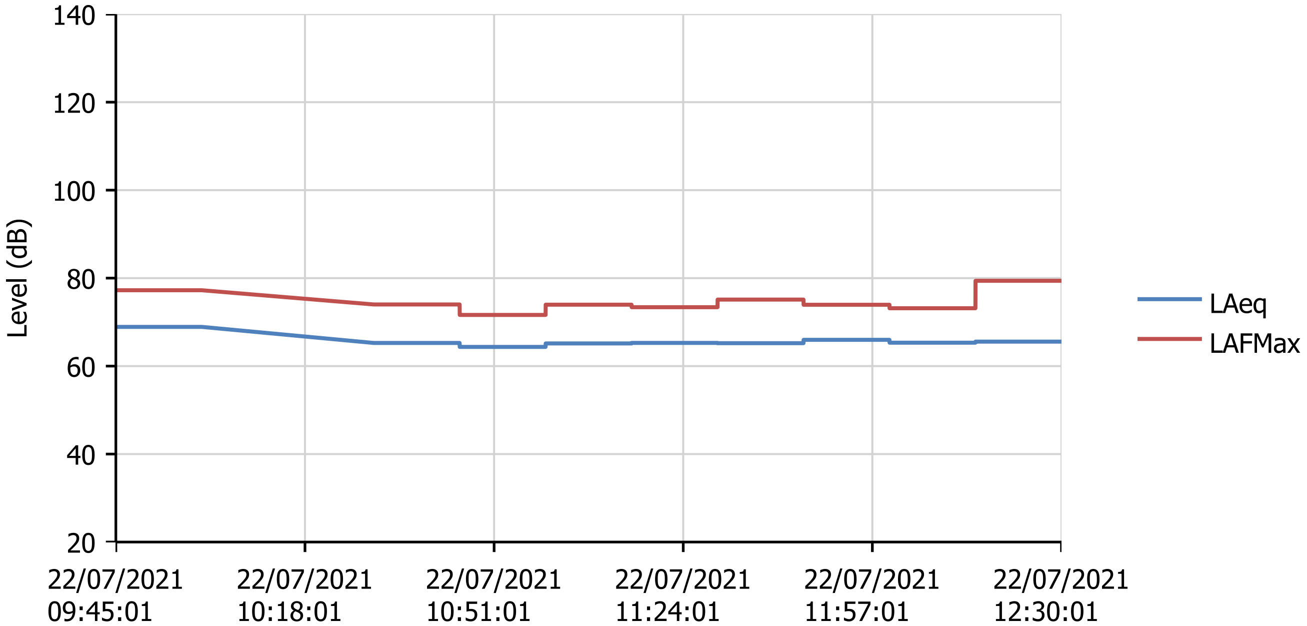
Measurement List Report

Name SEP-0347 (NSR-103)

Start Time 22/07/2021 09:45:01

End Time 22/07/2021 12:30:01

Calibration Before	19/07/2021 11:39:22	Offset	0.00 dB
Calibration After	23/07/2021 11:37:44	Offset	0.36 dB



Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
22/07/2021 09:45:01	22/07/2021 10:00:01	00:15:00	68.9	77.2	74.7	73.0	71.9	67.8	62.1	59.0	54.6
22/07/2021 10:30:01	22/07/2021 10:45:01	00:15:00	65.3	74.0	70.8	68.9	68.0	64.4	59.9	57.6	54.3
22/07/2021 10:45:01	22/07/2021 11:00:01	00:15:00	64.4	71.6	69.4	68.1	67.3	63.5	58.6	57.3	54.0
22/07/2021 11:00:01	22/07/2021 11:15:01	00:15:00	65.2	74.0	70.8	69.1	68.1	64.0	59.0	57.3	52.0
22/07/2021 11:15:01	22/07/2021 11:30:01	00:15:00	65.3	73.4	70.4	69.1	68.1	64.5	58.7	56.8	53.1

ReportId

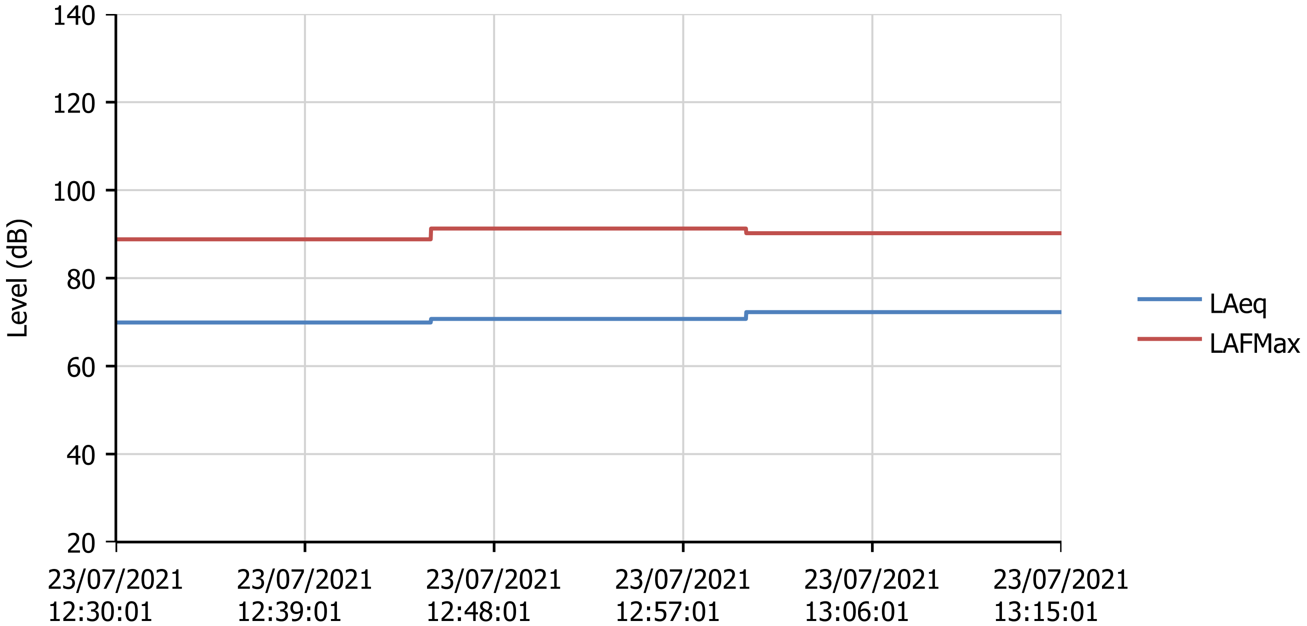
22/07/2021 11:30:01	22/07/2021 11:45:01	00:15:00	65.2	75.1	71.2	69.4	68.4	64.1	58.5	56.5	53.5
22/07/2021 11:45:01	22/07/2021 12:00:01	00:15:00	66.0	73.9	71.0	69.5	68.7	65.2	60.2	58.9	55.7
22/07/2021 12:00:01	22/07/2021 12:15:01	00:15:00	65.3	73.2	70.7	69.0	68.2	64.4	58.7	56.4	52.8
22/07/2021 12:15:01	22/07/2021 12:30:01	00:15:00	65.6	79.4	71.0	69.0	68.1	64.6	60.0	58.3	56.1

ReportId

Measurement List Report

Name	SEP-0347 (NSR-104)
Start Time	23/07/2021 12:30:01
End Time	23/07/2021 13:15:01

Calibration Before	23/07/2021 12:19:24	Offset	0.55 dB
Calibration After	23/07/2021 15:48:58	Offset	0.66 dB



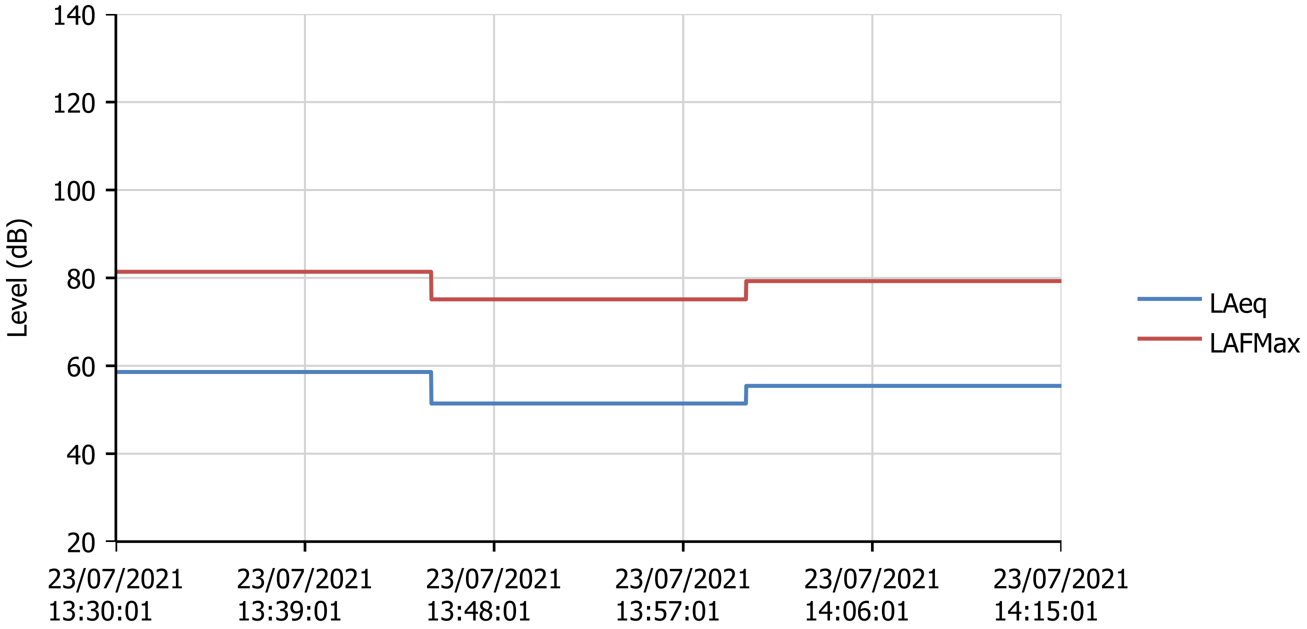
Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
23/07/2021 12:30:01	23/07/2021 12:45:01	00:15:00	69.9	88.8	83.8	76.3	69.2	46.6	41.4	40.8	39.4
23/07/2021 12:45:01	23/07/2021 13:00:01	00:15:00	70.7	91.3	84.0	78.3	71.4	47.5	40.6	39.8	38.4
23/07/2021 13:00:01	23/07/2021 13:15:01	00:15:00	72.3	90.2	85.2	80.0	74.4	50.3	42.4	41.4	40.0

ReportId

Measurement List Report

Name SEP-0347 (NSR-105)
Start Time 23/07/2021 13:30:01
End Time 23/07/2021 14:15:01

Calibration Before	23/07/2021 12:19:24	Offset	0.55 dB
Calibration After	23/07/2021 15:48:58	Offset	0.66 dB



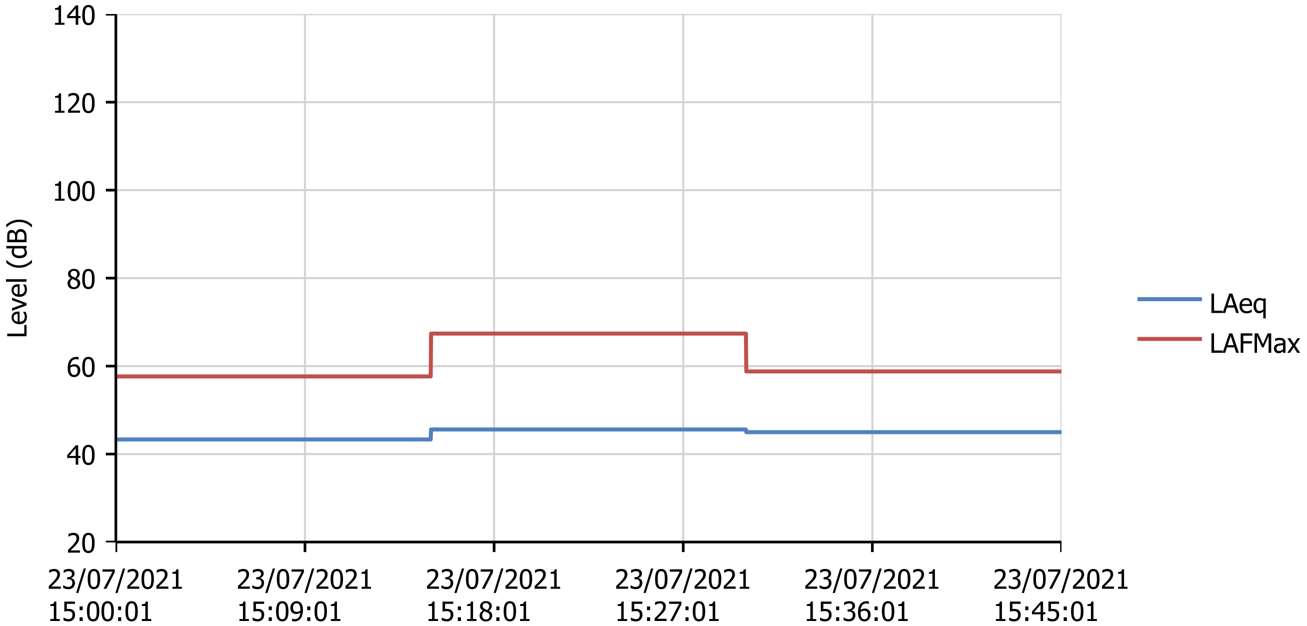
Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
23/07/2021 13:30:01	23/07/2021 13:45:01	00:15:00	58.6	81.4	70.1	59.1	55.7	48.8	43.9	42.6	40.2
23/07/2021 13:45:02	23/07/2021 14:00:02	00:15:00	51.4	75.1	63.9	54.5	50.5	43.5	39.1	37.9	35.9
23/07/2021 14:00:01	23/07/2021 14:15:01	00:15:00	55.4	79.3	65.0	56.5	52.7	44.8	40.7	39.6	38.2

ReportId

Measurement List Report

Name SEP-0347 (NSR-106)
Start Time 23/07/2021 15:00:01
End Time 23/07/2021 15:45:01

Calibration Before	23/07/2021 12:19:24	Offset	0.55 dB
Calibration After	23/07/2021 15:48:58	Offset	0.66 dB



Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
23/07/2021 15:00:01	23/07/2021 15:15:01	00:15:00	43.3	57.7	48.2	46.3	45.4	42.6	40.3	39.8	38.8
23/07/2021 15:15:01	23/07/2021 15:30:01	00:15:00	45.6	67.4	52.6	48.9	47.6	44.2	41.6	41.0	40.0
23/07/2021 15:30:01	23/07/2021 15:45:01	00:15:00	45.0	58.8	51.2	48.3	46.8	44.0	41.6	41.0	40.2

ReportId

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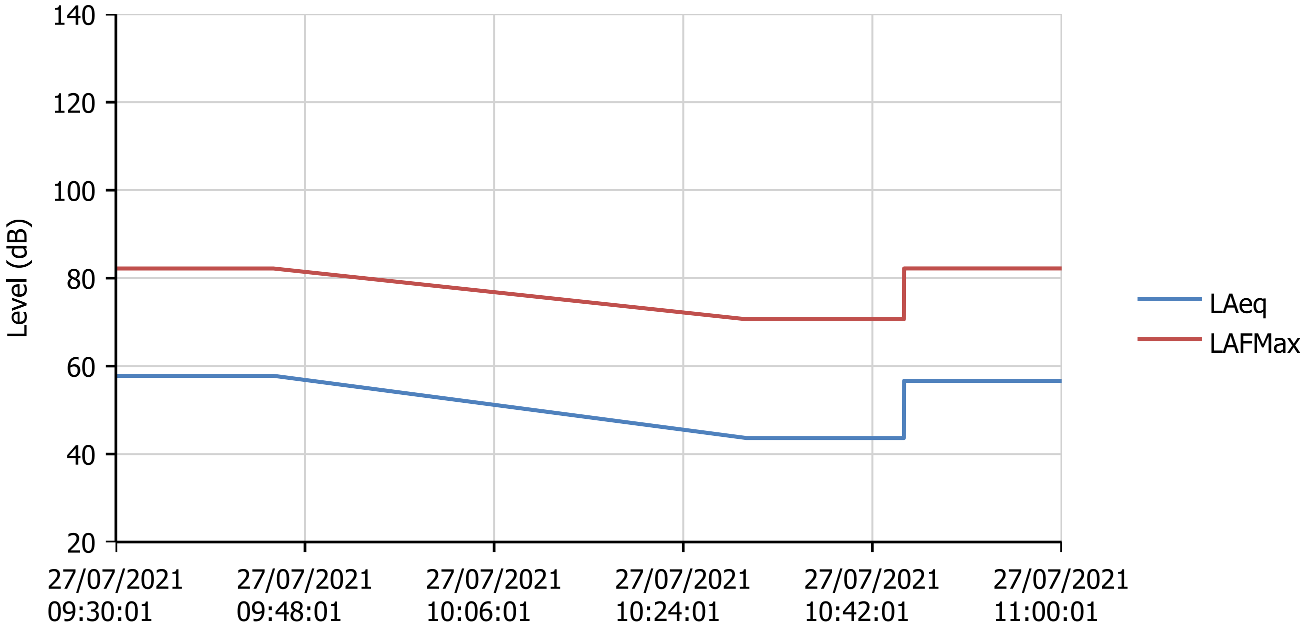
Measurement List Report

Name SEP-0347 (NSR-107)
Start Time 27/07/2021 09:30:01
End Time 27/07/2021 11:00:02

Calibration Before	27/07/2021 09:15:12	Offset	0.14 dB
Calibration After	28/07/2021 14:43:29	Offset	0.27 dB



Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
27/07/2021 09:30:01	27/07/2021 09:45:01	00:15:00	57.8	82.2	69.7	52.8	49.0	32.3	27.1	26.4	25.6
27/07/2021 10:30:01	27/07/2021 10:45:01	00:15:00	43.7	70.7	48.9	38.3	35.4	29.2	26.5	25.9	24.7
27/07/2021 10:45:02	27/07/2021 11:00:02	00:15:00	56.7	82.2	68.9	50.4	40.6	29.4	26.2	25.6	24.8

ReportId

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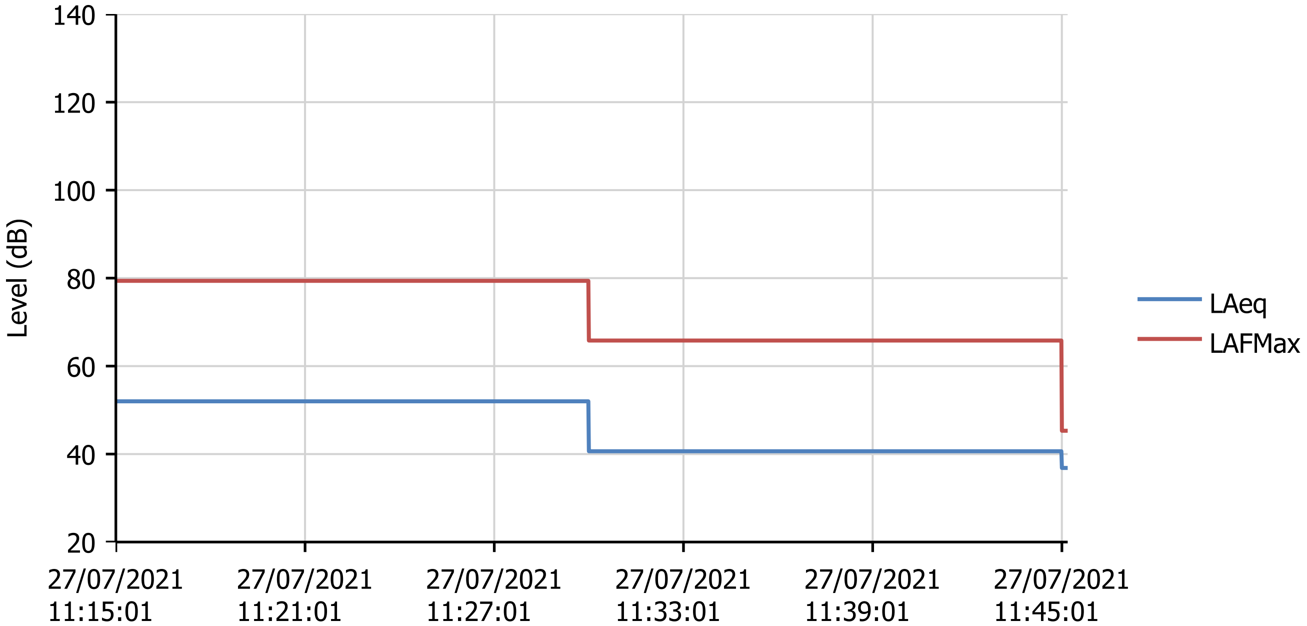
Measurement List Report

Name	SEP-0347 (NSR-108)
Start Time	27/07/2021 11:15:01
End Time	27/07/2021 11:45:12

Calibration Before	27/07/2021 10:24:18	Offset	0.34 dB
Calibration After	28/07/2021 14:43:29	Offset	0.27 dB



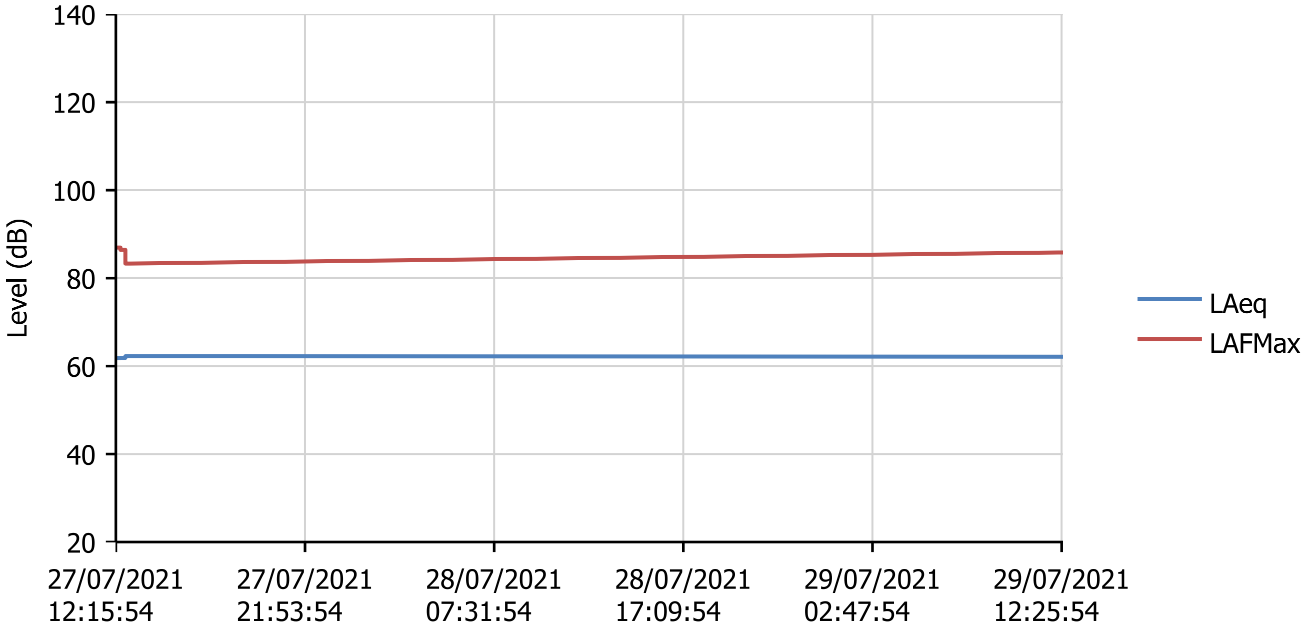
Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
27/07/2021 11:15:01	27/07/2021 11:30:01	00:15:00	52.0	79.4	61.7	46.2	41.0	34.9	32.6	32.0	31.2
27/07/2021 11:30:01	27/07/2021 11:45:01	00:15:00	40.6	65.8	50.5	42.4	40.6	35.8	32.1	31.5	30.4
27/07/2021 11:45:01	27/07/2021 11:45:12	00:00:11	36.8	45.3	43.9	41.8	39.9	34.3	33.3	33.2	33.0

ReportId

Measurement List Report

Name SEP-0347 (NSR-109)
Start Time 27/07/2021 12:15:54
End Time 29/07/2021 12:30:01

Calibration Before	27/07/2021 10:24:18	Offset	0.34 dB
Calibration After	29/07/2021 12:33:12	Offset	0.40 dB



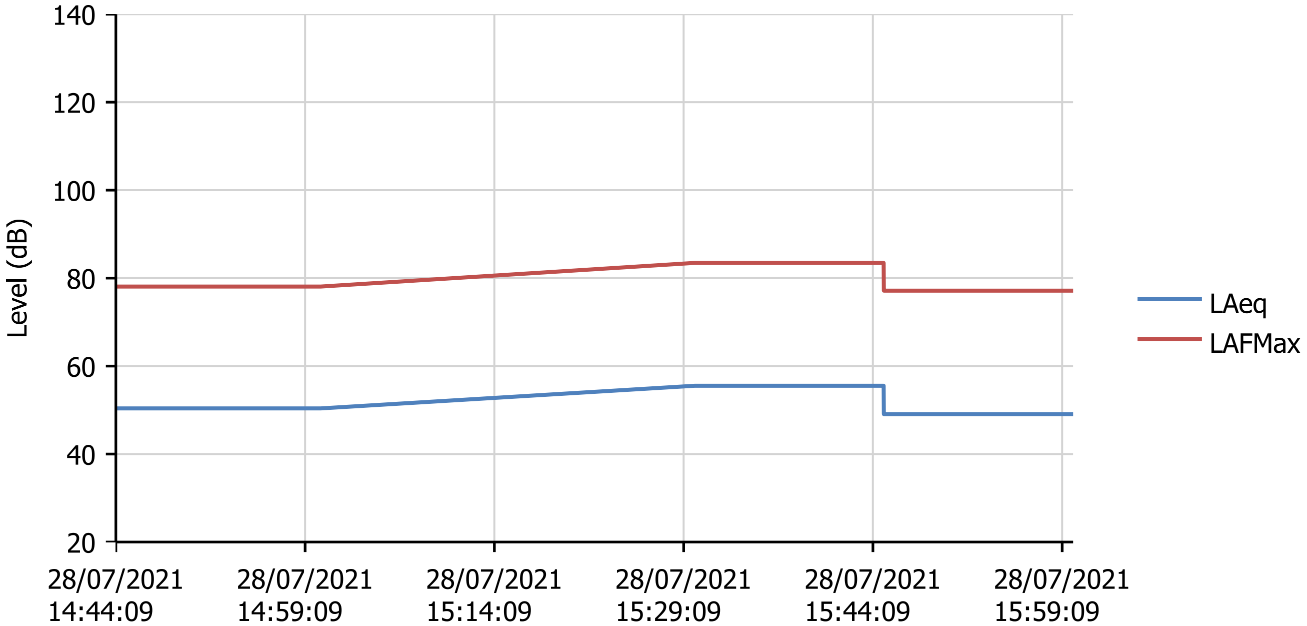
Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
27/07/2021 12:15:54	27/07/2021 12:30:01	00:14:07	61.8	87.0	76.1	60.6	52.1	36.2	32.3	31.7	30.3
27/07/2021 12:30:02	27/07/2021 12:45:02	00:15:00	61.9	86.4	75.6	61.4	52.8	38.8	33.6	32.7	31.2
27/07/2021 12:45:01	27/07/2021 13:00:01	00:15:00	62.2	83.3	77.2	65.1	55.2	40.9	36.2	35.3	33.3
29/07/2021 12:15:01	29/07/2021 12:30:01	00:15:00	62.1	85.8	75.7	63.6	57.6	42.4	34.4	33.5	32.3

ReportId

Measurement List Report

Name SEP-0347 (NSR-110)
Start Time 28/07/2021 14:44:09
End Time 28/07/2021 16:00:01

Calibration Before	28/07/2021 14:43:29	Offset	0.27 dB
Calibration After	29/07/2021 08:22:44	Offset	0.44 dB



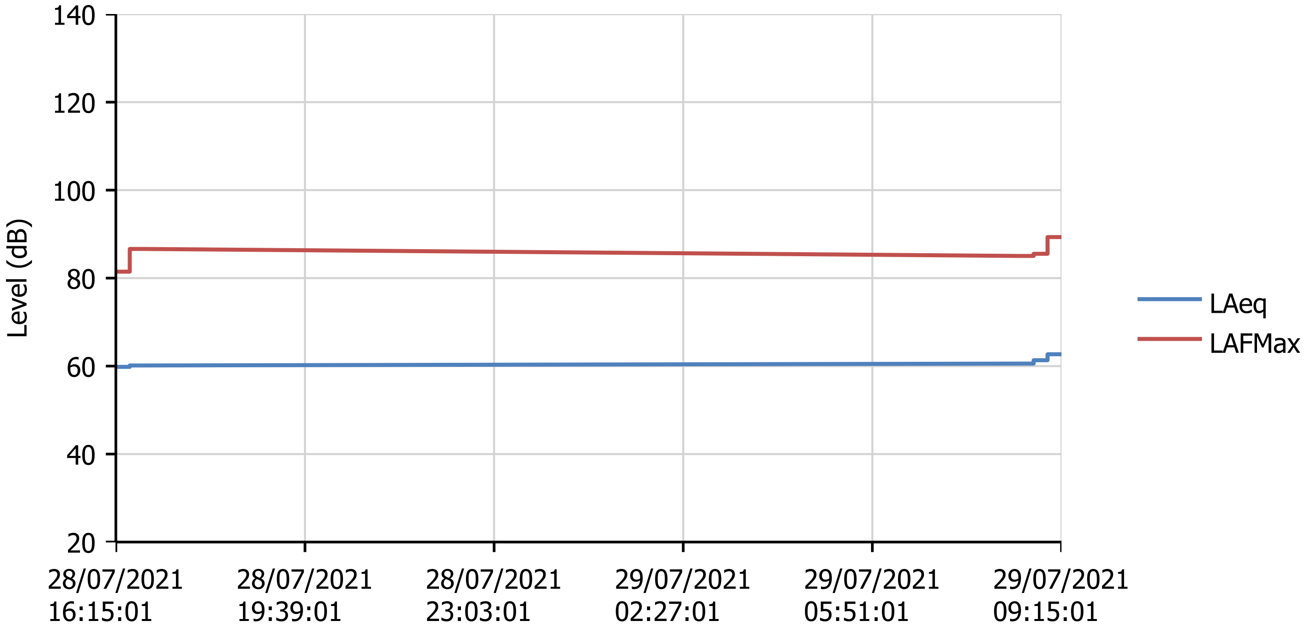
Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
28/07/2021 14:44:09	28/07/2021 15:00:23	00:16:14	50.4	78.1	54.5	51.0	49.5	45.1	41.4	39.8	38.0
28/07/2021 15:30:02	28/07/2021 15:45:02	00:15:00	55.5	83.5	64.5	51.3	46.9	38.3	33.6	32.8	31.7
28/07/2021 15:45:01	28/07/2021 16:00:01	00:15:00	49.1	77.2	52.0	48.4	46.7	40.6	35.7	35.0	33.8

ReportId

Measurement List Report

Name SEP-0347 (NSR-111)
Start Time 28/07/2021 16:15:01
End Time 29/07/2021 09:15:01

Calibration Before	28/07/2021 14:43:29	Offset	0.27 dB
Calibration After	29/07/2021 12:33:12	Offset	0.40 dB



Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
28/07/2021 16:15:01	28/07/2021 16:30:01	00:15:00	59.8	81.5	72.8	62.4	59.4	52.8	46.7	45.1	43.5
28/07/2021 16:30:01	28/07/2021 16:45:01	00:15:00	60.1	86.6	73.4	62.8	58.9	50.2	43.6	42.4	40.3
29/07/2021 08:30:01	29/07/2021 08:45:01	00:15:00	60.6	85.0	73.5	57.7	48.4	40.7	38.2	37.7	36.5
29/07/2021 08:45:01	29/07/2021 09:00:01	00:15:00	61.3	85.5	74.7	62.0	53.6	42.5	38.3	37.6	36.8
29/07/2021 09:00:01	29/07/2021 09:15:01	00:15:00	62.7	89.3	75.0	61.6	53.0	41.6	38.6	37.8	36.7

ReportId

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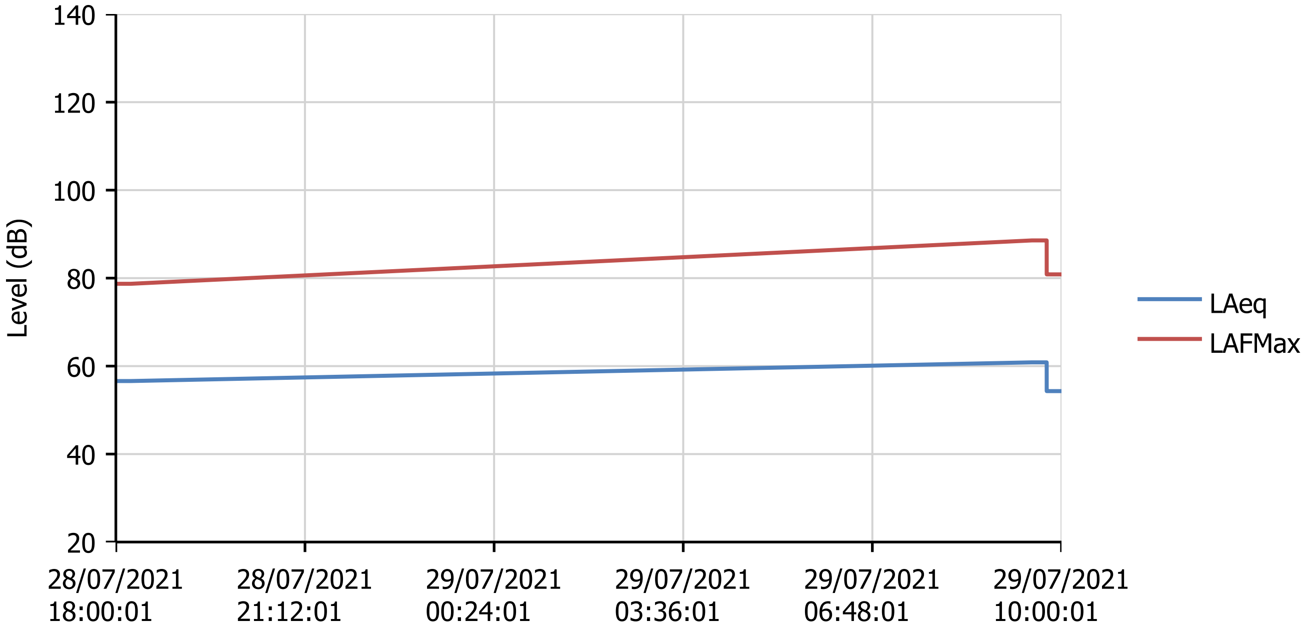
Measurement List Report

Name SEP-0347 (NSR-112)
Start Time 28/07/2021 18:00:01
End Time 29/07/2021 10:00:01

Calibration Before	28/07/2021 14:43:29	Offset	0.27 dB
Calibration After	29/07/2021 12:33:12	Offset	0.40 dB



Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
28/07/2021 18:00:01	28/07/2021 18:15:01	00:15:00	56.6	78.7	71.5	55.6	49.7	40.7	36.6	35.6	34.5
29/07/2021 09:30:01	29/07/2021 09:45:01	00:15:00	60.9	88.6	71.4	58.5	52.3	43.2	36.9	36.1	35.0
29/07/2021 09:45:01	29/07/2021 10:00:01	00:15:00	54.3	80.9	64.7	54.5	49.6	41.2	37.0	35.8	34.8

ReportId

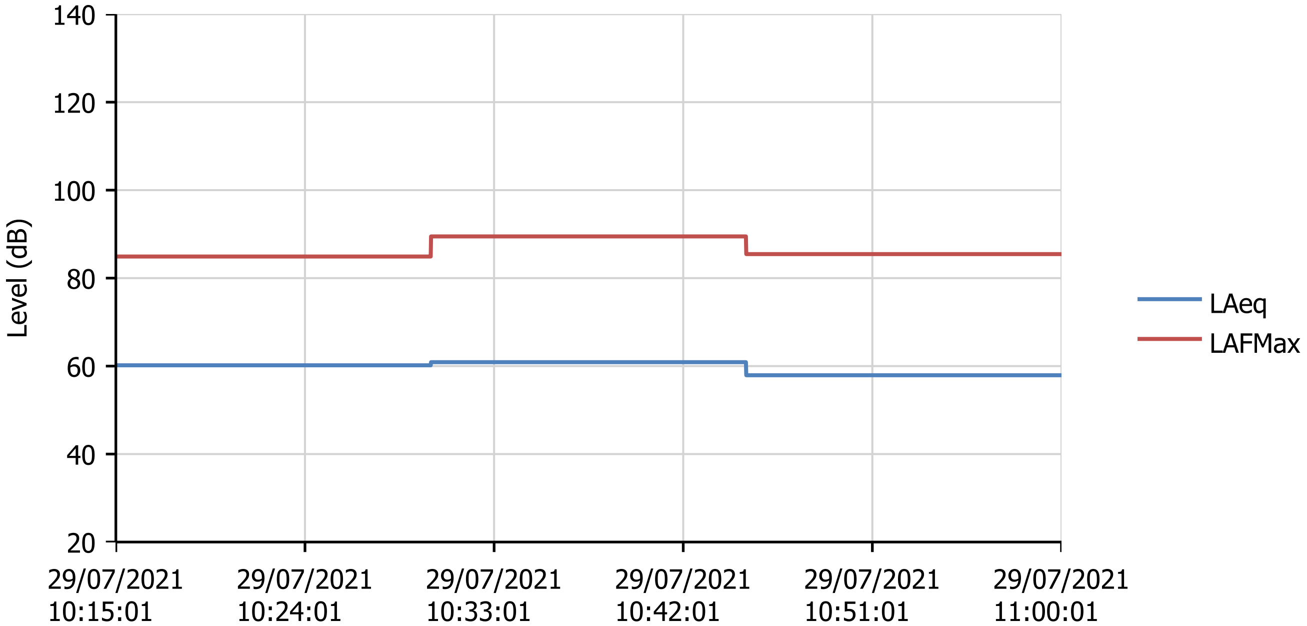
Cirrus Research plc

HALSTON

Measurement List Report

Name SEP-0347 (NSR-113)
Start Time 29/07/2021 10:15:01
End Time 29/07/2021 11:00:01

Calibration Before	29/07/2021 08:22:44	Offset	0.44 dB
Calibration After	29/07/2021 12:33:12	Offset	0.40 dB



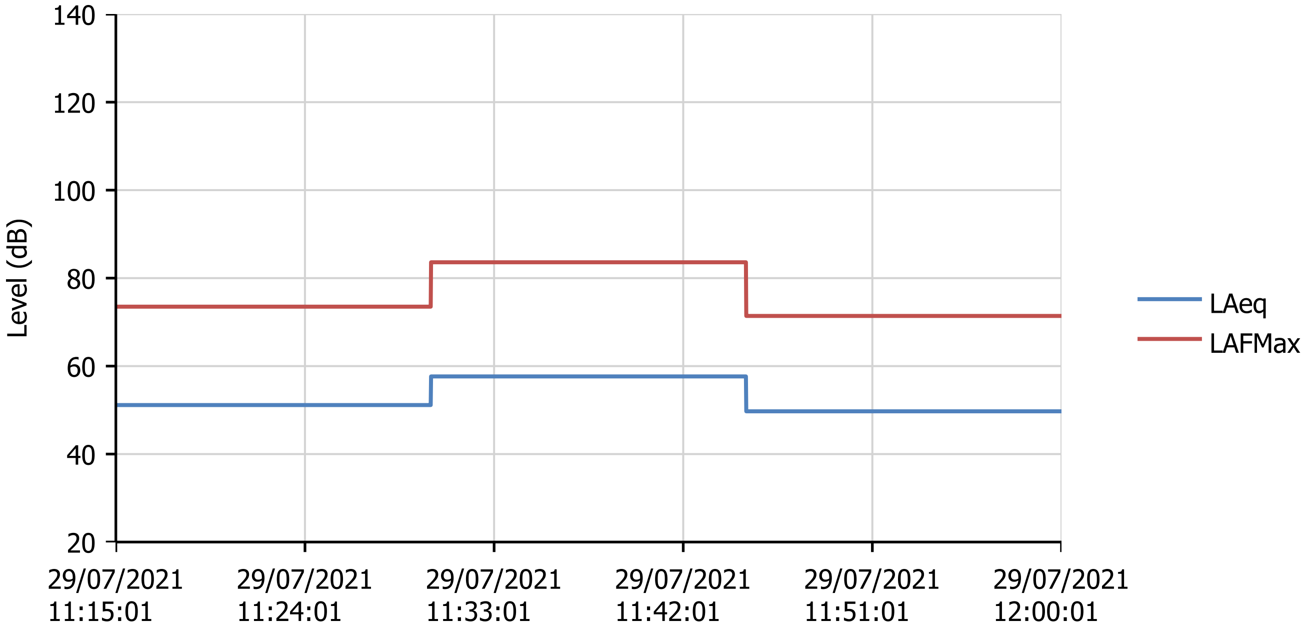
Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
29/07/2021 10:15:01	29/07/2021 10:30:01	00:15:00	60.2	84.9	70.2	55.3	47.6	39.8	34.6	33.1	31.9
29/07/2021 10:30:01	29/07/2021 10:45:01	00:15:00	60.9	89.5	69.2	50.4	45.2	38.5	34.7	34.2	33.5
29/07/2021 10:45:01	29/07/2021 11:00:01	00:15:00	57.9	85.5	64.1	44.9	43.0	37.4	33.8	33.2	31.5

ReportId

Measurement List Report

Name SEP-0347 (NSR-114)
Start Time 29/07/2021 11:15:01
End Time 29/07/2021 12:00:01

Calibration Before	29/07/2021 08:22:44	Offset	0.44 dB
Calibration After	29/07/2021 12:33:12	Offset	0.40 dB



Start Time	End Time	Duration	LAeq (dB)	LAFMax	Ln1	Ln2	Ln3	Ln4	Ln5	Ln6	Ln7
29/07/2021 11:15:01	29/07/2021 11:30:01	00:15:00	51.1	73.5	63.9	55.7	50.6	40.3	34.7	33.6	32.4
29/07/2021 11:30:01	29/07/2021 11:45:01	00:15:00	57.7	83.6	69.7	59.0	54.3	39.1	33.5	32.8	31.9
29/07/2021 11:45:01	29/07/2021 12:00:01	00:15:00	49.7	71.4	62.3	54.5	49.2	38.7	34.0	33.2	32.0

ReportId

Appendix 11.1

Visual Impact Assessment at Selected Viewpoints

APPENDIX 11.1

VISUAL IMPACT ASSESSMENT AT SELECTED VIEWPOINTS

Sensitivity of Visual Receptors

Analysis of Visual Receptor Sensitivity at Viewshed Reference Points Scale of value for each criterion

Strong association	Moderate association	Mild association	Negligible association

Values associated with the view	**VP1**	**VP2**	**VP3**	**VP4**	**VP5**	**VP6**	**VP7**	**VP8**	**VP9**	**VP10**
Susceptibility of viewers to changes in view										
Recognised scenic value of the view										
Views from within highly sensitive landscape areas										
Primary views from residences										
Intensity of use, popularity (number of viewers)										
Viewer connection with the landscape										
Provision of vast, elevated panoramic views										
Sense of remoteness / tranquillity at the viewing location										
Degree of perceived naturalness										
Presence of striking or noteworthy features										
Sense of Historical, cultural and / or spiritual significance										
Rarity or uniqueness of the view										
Integrity of the landscape character within the view										
Sense of place at the viewing location										
Sense of awe										
Overall sensitivity receptor assessment	**ML**	**ML**	**L**	**M**	**M**	**HM**	**L**	**ML**	**HM**	**L**

N = Negligible; **L** = low sensitivity; **ML** = medium-low sensitivity **M** = medium sensitivity; **HM** = High-medium sensitivity; **H** = high sensitivity; **VH** = very high sensitivity

Magnitude of Visual Effects

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the proposed development. These viewpoint locations were agreed with the Planning Authority during the pre-planning consultation meeting.

Photomontages are a 'photo-real' depiction of the scheme within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. Please refer to Appendix G. For each viewpoint, the following images have been produced:

1. Existing View;
2. Outline view (yellow outline showing the extent of the development overlaid on the photograph);
3. Montage View Pre-mitigation (proposed development prior to the establishment of mitigation); and,
4. Montage View with Mitigation Established.

Viewshed Reference Point		**Viewing distance to nearest panel**	**Direction of View**
VP1	Local road northeast of site		SW
Representative of:	• Local Community Views		
Receptor Sensitivity	**Medium-low**		
Existing View	This is a brief open view from in front of the southernmost dwelling that lines the local road to the east of the site. More open views to the southwest tend to be precluded by roadside vegetation and buildings further north along this road. The view takes in a manicured lawn and hedge lined by a couple of mature specimen trees. Beyond is a more agricultural context of fields and hedgerows with an electricity pylon rising above in the near-middle distance.		
Visual Impact of proposed development/s before mitigation	The most distinctive feature of the proposed development will be the GIS building from project 2, which presents as a broad horizontal block that fills a gap in the intervening hedgerow and matches the foreground and background vegetation band in terms of its height. Only the communications mast from the Project 2 will rise noticeably above the height of the vegetation band and as a light lattice structure adjacent to the existing 22kV pylon, it is not a prominent feature. Two of the stacks from the Project 1 Flexgen as well lightning rods from Project 3 are also visible in other gaps in the vegetation. The proposed development will impart an industrial presence within the otherwise rural scene increasing the scale and intensity of built		

	development. However it does not block or intrude on any important vistas and is substantially screened. Overall, the magnitude of visual impact is deemed to be Medium-low.		
Visual Impact following mitigation establishment	Mitigation screen planting does not have a strong bearing on the visibility of the structures of the development from this angle, but it will screen the less prominent stacks and lightning poles from Project 1 and project 3. Given the much stronger relative visual presence of the GIS building, the magnitude of impact is not considered to decrease by a full assessment category.		
Summary	Based on the assessment criteria and matrices outlined at Section 11.3 the significance of residual visual impact is summarised below.		
	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**
Pre-mitigation	Medium-low	Medium-low	**Moderate-slight**
Residual	Medium-low	Medium-low	**Moderate-slight**

Viewshed Reference Point		**Viewing distance to nearest panel**	**Direction of View**
VP2	Local road east of site		W
Representative of:	• Local Community Views		
Receptor Sensitivity	**Medium-low**		
Existing View	This is a similar view to that experienced from VP1 except it is further south from the nearest houses and closer to the motorway. It takes in a foreground of agricultural grassland bordered by sporadic hedgerows that along with the ascending terrain limit the view to the west at a short distance. Broader views to the southwest across the motorway corridor take in a dense band of conifer plantation. A high voltage line and pylons runs across the middle ground.		
Visual Impact of proposed development/s before mitigation	The most noticeable aspect of the proposed development will be the project 2 GIS substation building and project 1 stacks, which will rise well above the intervening hedgerow vegetation in silhouette against the sky. It has considerable horizontal bulk, but the light tone will recede against the backdrop of sky. The taller communications mast that sits immediately to the fore of the GIS building is also substantially visible, but has a much lower visual presence due to its narrow and light lattice		

	form. Light tone stacks form the project 1 Flexgen will be visible just above and to the right of the GIS building and the GIS Lightning poles from the Project 3 battery storage element will also be seen rising in silhouette above the intervening vegetation further to the right. It should be noted that the proposed project 2 pylon will simply replace the existing one at a near identical location. Overall, the proposed development is considered to have a co-dominant visual presence from here. In terms of aesthetics and context, the proposed development and mainly the project 2 GIS building will generate a stronger sense of the industrial within this predominantly rural view along within an increased intensity and diversity of built development. However, it is also seen within the immediate context of the motorway corridor and an existing high voltage line, which already contribute to a utilitarian aesthetic and in combination with the proposed development, has some thematic (and physical) connection. On balance of the reasons outlined above, the magnitude of visual impact is deemed to be Medium.
Visual Impact following mitigation establishment	The nearest of the proposed planted berms occurs to the northeast of the site where they will benefit the nearest dwellings, but less so this westerly view. The planting will serve to screen some of the lightning poles from project 3 and adds some verticality to the skyline that helps to balance the scale of the GIS building downslope to the south. However, these effects are not marked enough to reduce the overall visual impact.
Summary	Based on the assessment criteria and matrices outlined at Section 11.3 the significance of residual visual impact is summarised below.

	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**
Pre-mitigation	Medium-low	Medium	Moderate
Residual	Medium-low	Medium	**Moderate**

Viewshed Reference Point		**Viewing distance to nearest panel**	**Direction of View**
VP3	Local road overpass of M6 motorway southeast of site		NW
Representative of:	• Local road overpass of a ‘major route’ • Local community views		

Receptor Sensitivity	**Low**
Existing View	This view is mainly used to provide context for the development as it illustrates the relationship between the proposed development and the motorway, but without being located on the motorway. The overpass only appear to serve local landowner access to lands on the southern side of the roadway and does not connect to the local road network beyond or appear to be heavily utilised. The dominant component of the view is the broad and busy motorway corridor below. A short roadside embankment then separates the motorway from the agricultural fields beyond. These stretch for a modest distance before a low, treelined ridge truncates the view. There is a high voltage line and associated pylons crossing the middle ground of the view.
Visual Impact of proposed development/s before mitigation	A substantial portion of the proposed development is visible, albeit partially, from this location. By far the most prominent feature is the GIS substation building from project 2, which presents as a bulky horizontal block in the near middle ground. The southernmost stack from the project 1 Flexgen is visible beyond and to left of the GIS building close to the road corridor, whilst the top portions of each of its counterparts will rise just above the GIS builidng. To the right can be seen some of the battery units from project 3 along with the building and lightning poles from this project. The additional pylon for project 2 is also on the same alignment and slightly to the fore of the project 3 elements. The horizontally stratified colour scheme for the main buildings is effective at helping these structures recede against both the lower level vegetation and the lighter backdrop of sky for uppermost sections. In terms of visual presence, the proposed development is deemed to be co-dominant in this setting. Even in the context of the motorway, the proposed development will noticeably increase the quantum and diversity of built development and contribute to an increased sense of the industrial within this setting. However, there is also a contextual compatibility formed by the confluence of the motorway, the high voltage line and the proposed electrical infrastructure development, which clearly takes advantage of the utilitarian setting to aid assimilation. On the basis of the reasons outlined above, the magnitude of visual impact is deemed to be Medium.
Visual Impact following mitigation establishment	The proposed planted embankment occurs substantially on the far side of the development as seen from here. Thus, it serves to envelop and partially screen aspects of the project 3 battery storage element, but will not screen the most overt elements closer to the motorway alignment. The magnitude of impact remains the same.
Summary	Based on the assessment criteria and matrices outlined at Section 11.3 the significance of residual visual impact is summarised below.

	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**
Pre-mitigation	Low	Medium	Slight
Residual	Low	Medium	**Slight**

Viewshed Reference Point				**Viewing distance to nearest panel**	**Direction of View**
VP4	R446 north of site				S
Representative of:	• A designated scenic route • A major route • Local community views				
Receptor Sensitivity	**Medium**				
Existing View	This is a broadly horizontal view across large foreground fields contained in cropping. These are bordered on their southern and western sides by large mature treelines and there is a copse of trees defining a ring fort just out of the depicted view to the east. Unlike the majority of the scenic route, which lies to the west, this sections of road does not afford vast elevated views. However it does have a pleasant pastoral aesthetic.				
Visual Impact of proposed development/s before mitigation	The only aspect of the proposed development that will be visible from here is the new access road that can be seen in the immediate foreground. Although this adds marginally to built form within the foreground scene and will divide the foreground field, this has little bearing on visual amenity. It is also a very localised effect that is apparent only in close proximity to the site entrance. Overall, the magnitude of visual impact will be Low-negligible.				
Visual Impact following mitigation establishment	The proposed mitigation planting will serve to bolster the perceived density of the middle distance treeline and will help to preclude visibility of the proposed electrical structures during winter months. However, it will not have a bearing on the visual impact judgement.				
Summary	Based on the assessment criteria and matrices outlined at Section 11.3 the significance of residual visual impact is summarised below.				
	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**		

Pre-mitigation	Medium	Low-negligible	**Slight-imperceptible**
Residual	Medium	Low-negligible	**Slight-imperceptible**

Viewshed Reference Point		**Viewing distance to nearest panel**	**Direction of View**
VP5	R446 northwest of site	SE	

Representative of:	• A designated scenic route • A major route • Local community views		
Receptor Sensitivity	**Medium**		
Existing View	This is a view from slightly further west along the R446 designated scenic routes where the road is more elevated than at VP4. There are intermittent long distance views afforded beyond the road corridor between roadside planting and nearby hedgerows, but these are generally to the north. In this instance a brief gateway opening adjacent to a roadside dwelling affords a relatively restricted view to the southeast. A treelined hedgerow just beyond the foreground field allows brief glimpses of the lower agricultural landscape beyond.		
Visual Impact of proposed development/s before mitigation	Only the very tip of the communications mast from project 2 will be potentially visible from here above foreground vegetation, but this will not be noticed by a casual observer. Nor does it have the potential to reduce visual amenity to any material degree. Thus, the visual impact is deemed to be Negligible.		
Visual Impact following mitigation establishment	Mitigation screen planting will not be visible from here.		
Summary	Based on the assessment criteria and matrices outlined at Section 11.3 the significance of residual visual impact is summarised below.		
	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**
Pre-mitigation	Medium	Negligible	**Imperceptible**
Residual	Medium	Negligible	**Imperceptible**

Viewshed Reference Point				Viewing distance to nearest panel	Direction of View
VP6	R446 at Garrane High				E
Representative of:	• A designated scenic route • A major route • A small centre of population				
Receptor Sensitivity	**Medium**				
Existing View	This is a hilltop view from the western end of the R446 designated scenic route the cross roads settlement of Garrane High. There are intermittent extensive views in many directions as well as some sections of more contained visibility such as to the east in the direction of the site. This view has an open foreground field, but is then substantially contained by a mature treeline on the opposite side, there are brief glimpses of the lowlands beyond between some section of the treeline.				
Visual Impact of proposed development/s before mitigation	The proposed development will not be visible from here and the magnitude of impact is Negligible by default. This is used as an illustrative view i.e. to illustrate the absence of impact from an important designated receptor.				
Visual Impact following mitigation establishment	Mitigation screen planting will not be visible from here.				
Summary	Based on the assessment criteria and matrices outlined at Section 11.3 the significance of residual visual impact is summarised below.				
	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**		
Pre-mitigation	High-medium	Negligible	**Imperceptible**		
Residual	High-medium	Negligible	**Imperceptible**		

Viewshed Reference Point		Viewing distance to nearest panel	Direction of View
VP7	Local road overpass of M6 motorway at		NE

	Garrane			

Representative of:	• Local road overpass of a 'major route' • Local community views		
Receptor Sensitivity	**Low**		
Existing View	This is a view from a high local road overpass above the M6 motorway looking eastwards along a substantial section of cut in the road corridor. Beyond the foreground setting of the road corridor, distant views of the lowland landscape to the east with the Platin cement factory near Kinnegad, a very distant skyline feature. A high voltage line and pylons cross the road corridor near the end of the cut section in the middle ground.		
Visual Impact of proposed development/s before mitigation	Only the very top of the project 2 communications mast and associated pylon will be visible from here above intervening landform and vegetation. They will be seen in the context of other pylons and the distant cement factory where they will add marginally to the visual clutter but without a noticeable consequence for visual amenity, which is limited at this location anyway. The magnitude of visual impact is deemed to be Low-negligible.		
Visual Impact following mitigation establishment	Mitigation screen planting will not be visible from here.		
Summary	Based on the assessment criteria and matrices outlined at Section 11.3 the significance of residual visual impact is summarised below.		
	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**
Pre-mitigation	Low	Low-negligible	**Imperceptible**
Residual	Low	Low-negligible	**Imperceptible**

Viewshed Reference Point		**Viewing distance to nearest panel**	**Direction of View**
VP8	Local road at Rahincuill		NE
Representative of:	• Local Community Views		

Receptor Sensitivity	**Medium low**		
Existing View	This is a contained gateway view from a small and dispersed rural community setting on the opposite side of the motorway to the proposed development. The large fore-to-middle ground field is strongly contained by mature treelines on all sides.		
Visual Impact of proposed development/s before mitigation	There will be partial views of some of the taller components of predominantly project 1 and project 2 through small gaps in the distant treeline. However given the distance and degree of screening this will not have a material effect on visual amenity here. It should also be noted that there are few opportunities for open visibility to the north beyond the roadside along this section of local road. The magnitude of impact will be Negligible.		
Visual Impact following mitigation establishment	Mitigation screen planting will not be visible from here.		
Summary	Based on the assessment criteria and matrices outlined at Section 11.3 the significance of residual visual impact is summarised below.		
	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**
Pre-mitigation	Medium-low	Negligible	Imperceptible
Residual	Medium-low	Negligible	**Imperceptible**

Viewshed Reference Point		**Viewing distance to nearest panel**	**Direction of View**
VP9	Local road on Croghan Hill		NW
Representative of:	• An iconic midlands landscape feature • A sensitive landscape designation		
Receptor Sensitivity	**High-medium**		
Existing View	This is a vast panoramic view to the north from a local road that traverses the upper northern slopes of Croghan Hill. The views takes in a descending foreground of rough grazing that gives way to a lowland landscape of settled pastoral farmland. The distant middle ground then consists of conifer flanked peat bog before rising into farmland again in		

	the distance.
Visual Impact of proposed development/s before mitigation	The proposed development will be partially visible, nestled within the dense matrix of vegetation in the distant middle ground just beyond a conifer plantation which substantially screens it. Only the tallest light framed features (communications mast and lightning masts are potentially visible and at this distance they are barely discernible. There will be no material effect on visual amenity within this richly textured rural scene and the visual impact is deemed to be Negligible.
Visual Impact following mitigation establishment	Mitigation screen planting will not be visible from here.
Summary	Based on the assessment criteria and matrices outlined at Section 11.3 the significance of residual visual impact is summarised below.

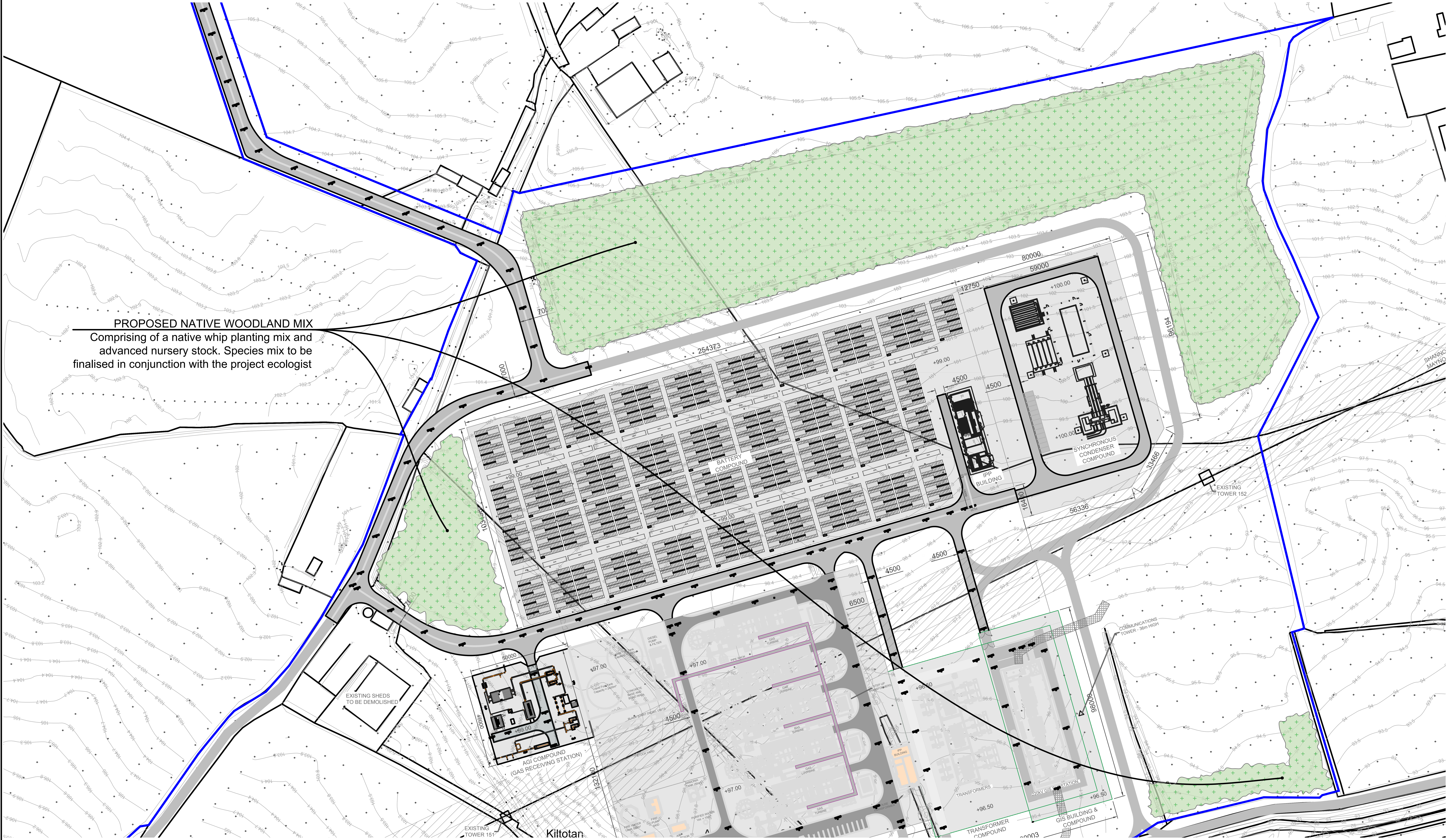
	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**
Pre-mitigation	High-medium	Negligible	**Imperceptible**
Residual	High-medium	Negligible	**Imperceptible**

Viewshed Reference Point		**Viewing distance to nearest panel**	**Direction of View**
VP10	Layby on M6 motorway		NW
Representative of:	• A major route		
Receptor Sensitivity	**Low**		
Existing View	This is a contained view to the north from a motorway layby used by motorists for rest stops. There is a short distance view towards a c. 2m high grassed embankment backed by a treelines hedgerow planted alng the edge of the road corridor. High voltage pylons can be seen rising above the planted embankment in the near distance.		
Visual Impact of proposed development/s before mitigation	The proposed GIS substation building from project 2 will be the most prominent feature of the development rising in silhouette against the sky a short distance away to the northwest. The visibility of this feature is accentuated by the fact that the motorway tree establishment in this direction is not as strong as other sections left and right. The lattice		

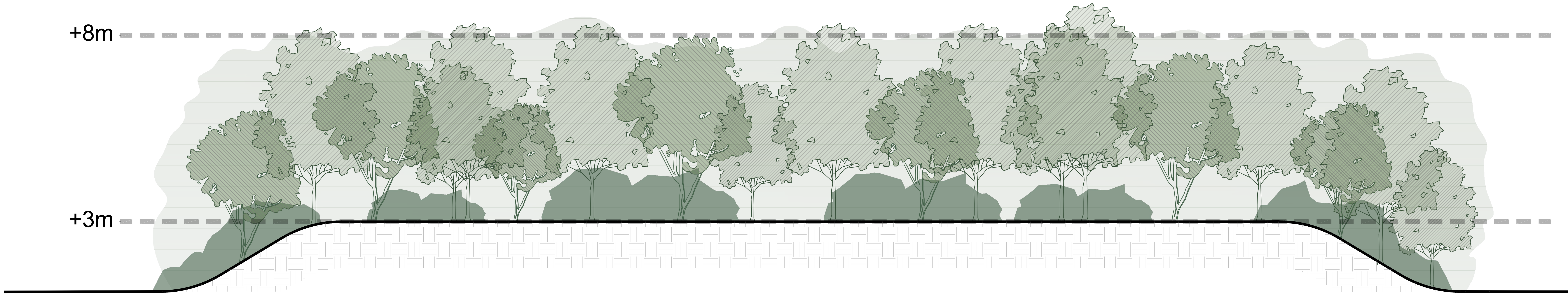
	steel communications mast presents as a tall narrow feature to the fore of the GIS building but with a lesser visual presence due to relative bulk. Just beyond the GIS are some of the stacks from the Project 1 Flexgen, which also rise prominently above roadside planting, albeit a more consolidated screen. Further to the north can be seen lightening poles from project 3, but these narrow structures are much less noticeable from this distance than the nearer structures. This will be a fleeting view for most motorists, but a more mongering one for those who stop at the layby. The majority of the development is screened from view and this is likely to increase as roadside planting matures. For these reasons the visual presence of the proposed development is deemed to be in the order of Dominant to Co-dominant. In terms of context, there are numerous instances of seeing large industrial buildings and stack at relatively close remove from the motorway, but less so in rural areas such as this. The fact that the proposed projects lie in close proximity to the motorway will not be incongruous as this will be perceived as preferable to a wholly greenfield site. Overall, the magnitude of visual impact at this location is deemed to be High-medium.		
Visual Impact following mitigation establishment	Mitigation screen planting will not be visible from here.		
Summary	Based on the assessment criteria and matrices outlined at Section 11.3 the significance of residual visual impact is summarised below.		
	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**
Pre-mitigation	Low	High-medium	Moderate-slight
Residual	Low	High-medium	**Moderate-slight**

Appendix 11.2

Landscape Mitigation Plan (provided in separate booklet)



TYPICAL SECTION OF BERM @ 1:100



macroworks

Registered Landscape Architect

Legend:

- PROPOSED WOODLAND MIX
- OWNERSHIP BOUNDARY

Notes:

The function of the proposed mitigation planting is primarily for screening, but it will also enhance the ecological corridors within the surrounding area.

Woodland Planting Mix
Woodland planting mix to comprise of High Canopy Dominants (<20%), Low-canopy: Sub-dominants (20-25%), Understorey and Fringe: High-Shrubs (20-40%) and Understorey and Edge: Lower-Shrubs (15-25%). Planting to be allowed to grow to reach maturity. Trees to be planted at varying distances from 1.5m x 1.5m to 3.0m x 3.0m. Smaller shrubs to be planted at spacing between 900mm and 1500mm centres depending on species.

Species mix to be finalised in conjunction with the project ecologist. All species to be from certified native stock and preferably from an approved supplier of the Green, Low-Carbon, Agri Environment Scheme (GLAS).

WOODLAND MIX SPECIES:

Botanical name	Common name	Size	%
High Canopy (Dominants);			
Quercus Robur	Pendunculate Oak	Standard Tree, 250-300cm, bare root	<20%
Pinus sylvestris	Scots Pine	Feathered Trees, 250-300cm, root ball	
Low Canopy (Sub-dominants);			
Alnus glutinosa	Alder	Feathered Trees, 250-300cm, bare root	20-25%
Betula pubescens	Downy Birch	Feathered Trees, 250-300cm, bare root	
Prunus avium	Wild Cherry	1+1tr, 90-120cm, bare root	
Understory and fringe (higher shrubs);			
Prunus Padus	Crab Apple	1+1tr 90-120cm	20-40%
Corylus avellana	Hazel	1+1tr 90-120cm	
Ilex aquifolium	Holly	1+1tr 90-120cm	
Crataegus monogyna	Hawthorn	1+1tr 90-120cm	
Understory and edge (lower shrubs);			
Prunus spinosa	Blackthorn	1+1tr 40-60cm	15-25%
Rosa-canina	Dog-rose	1+1tr 40-60cm	
Euonymus europaeus	Spindle	1+1tr 40-60cm	

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Site location:
CASTLELOST
COUNTY WESTMEATH

Drawing Title:
LANDSCAPE PLAN

Project:
LEL FLEXGEN, CASTLELOST CO. WESTMEATH

Drawn by:	Checked by:
CD	RB

Drawing Ref:
LD.LELFLXGN.1.1

Scale:	Date:
1:1000 @ A1	SEPTEMBER 2021

DRAFT

Appendix 11.3

Photomontages (provided in separate booklet)

Appendix 12.1

Traffic Counts

Automatic Traffic Count – Traffic Volume Output
Location – R446 at proposed development access
Equipment – Metrocount RoadPodVT
Survey Duration – 24 hour (08:00 09/09/2021 – 07:59 10/09/2021)

Time Period	Eastbound				Westbound			
	Light Vehicles	Medium Vehicles	Heavy Vehicles	Total Vehicles	Light Vehicles	Medium Vehicles	Heavy Vehicles	Total Vehicles
00:00-00:59	1	0	0	1	2	0	0	2
01:00-01:59	1	0	0	1	0	0	0	0
02:00-02:59	0	0	0	0	1	0	0	1
03:00-03:59	0	1	0	1	0	0	0	0
04:00-04:59	0	0	0	0	0	0	0	0
05:00-05:59	15	0	0	15	2	0	0	2
06:00-06:59	11	2	2	15	23	0	0	23
07:00-07:59	31	6	3	40	30	5	0	35
08:00-08:59	78	4	1	83	84	4	1	89
09:00-09:59	59	0	2	61	70	2	1	73
10:00-10:59	43	6	0	49	48	0	2	50
11:00-11:59	45	0	2	47	65	2	2	69
12:00-12:59	57	3	4	64	57	2	2	61
13:00-13:59	53	1	1	55	46	1	2	49
14:00-14:59	91	4	2	97	68	3	1	72
15:00-15:59	73	0	0	73	88	8	2	98
16:00-16:59	90	2	3	95	82	3	3	88
17:00-17:59	101	2	2	105	91	4	1	96
18:00-18:59	75	2	1	78	60	4	0	64
19:00-19:59	48	0	1	49	49	7	1	57
20:00-20:59	28	1	0	29	48	1	0	49
21:00-21:59	38	0	1	39	25	1	0	26
22:00-22:59	17	0	0	17	11	0	0	11
23:00-23:59	7	0	0	7	5	2	0	7

Video-based Manual Classified Count Thursday 9th September 2021
Existing R446/L5125 (3-arm Stop Controlled) Junction

Arm A – R446 to/from West
Arm B – L5125 to/from North
Arm C – R446 to/from East

PCU Factors

Car/LGV	1
HGV/PSV	2.3

***Incidents**: None*
***Weather**: Dry*

Car / LGV	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:59	0	80	2	2	87	1
17:00-17:59	1	103	0	0	93	2

HGV/PSV	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:59	0	1	0	0	0	2
17:00-17:59	0	1	0	1	0	1

Total Vehicles	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:59	0	81	2	2	87	3
17:00-17:59	1	104	0	1	93	3

PCUS	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:59	0	82	2	2	87	6
17:00-17:59	1	105	0	2	93	4

PCUs are rounded to the nearest whole number

Video-based Manual Classified Count Thursday 9th September 2021
Existing R446/L51251 (3-arm Stop Controlled) Junction

TTRSA Traffic : Transport : Road Safety

Arm A – R446 to/from East
Arm B – L51251 to/from South
Arm C – R446 to/from West

PCU Factors

Car/LGV	1
HGV/PSV	2.3

Incidents: *None*
Weather: *Dry*

Car / LGV	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:59	6	86	6	2	81	1
17:00-17:59	4	92	3	3	101	2

HGV/PSV	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:59	0	1	1	0	1	0
17:00-17:59	0	1	1	0	2	0

Total Vehicles	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:59	6	87	7	2	82	1
17:00-17:59	4	93	4	3	103	2

PCUS	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:59	6	88	8	2	83	1
17:00-17:59	4	94	5	3	106	2

PCUs are rounded to the nearest whole number

Appendix 12.2

Trip Generation

Project Programme and Trip Generation Calculations

Year	2022			2023												2024												2025	
Month	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2
LEL Flexgen Castlelost	E&P					C&S							M&E								C&T								
LEL GIS Castlelost	E&P			C&S						M&E						C&T													
LEL ESS Castlelost						E&P			C&S							M&E									C&T				

Construction Personnel on site per day

		2022			2023												2024												2025	
Project	Phase	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2
LEL Flexgen Castlelost	E&P	20	20	20	40	40																								
	C&S						80	80	80	150	150	150	130																	
	M&E													130	130	100	100	100	120	120	120									
	C&T																					150	150	150	100	100				
LEL GIS Castlelost	E&P	20	20	20																										
	C&S				30	30	30	30	30	30																				
	M&E										50	50	50	50	50	50														
	C&T																40	40	30											
LEL ESS Castlelost	E&P						20	30	30																					
	C&S									50	60	70	70	60	60	60														
	M&E																70	70	80	90	100	100	100	100	100					
	C&T																									100	100	100	100	
	Total	20	20	20	30	30	50	60	60	80	110	120	120	110	110	110	110	110	110	90	100	100	100	100	100	100	100	100	100	0

One-way HGV Movements per day – rigid and articulated trucks

		2022			2023												2024												2025	
Project	Phase	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2
LEL Flexgen Castlelost	E&P	10	10	16	10	10																								
	C&S						20	30	30	20	20	10	10																	
	M&E													10	10	10	10	10	10	6	4									
	C&T																					6	6	4	2	2				
LEL GIS Castlelost	E&P	10	16	10																										
	C&S				20	20	20	20	20	10																				
	M&E										10	10	10	10	10	6														
	C&T																6	6	2											
LEL ESS Castlelost	E&P						10	16	10																					
	C&S									40	40	40	40	40	20	10														
	M&E																10	10	10	10	10	10	10	10	10					
	C&T																									6	6	2	2	
	Total (One-way Movements)	10	16	10	20	20	30	36	30	50	50	50	50	50	30	16	16	16	12	10	10	10	10	10	10	6	6	2	2	0

All Phases	Year	2022			2023												2024												2025	
	Month	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2
LEL Flexgen Castlelost	Construction Personnel	20	20	20	40	40	80	80	80	150	150	150	130	130	130	100	100	100	120	120	120	150	150	150	100	100	0	0	0	0
	HGV movements (one way)	10	10	16	10	10	20	30	30	20	20	10	10	10	10	10	10	10	10	6	4	6	6	4	2	2	0	0	0	0
	Operational Personnel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	20
LEL GIS Castlelost	Construction Personnel	20	20	20	30	30	30	30	30	30	50	50	50	50	50	50	40	40	30	0	0	0	0	0	0	0	0	0	0	0
	HGV movements (one way)	10	16	10	20	20	20	20	20	10	10	10	10	10	10	6	6	6	2	0	0	0	0	0	0	0	0	0	0	0
	Operational Personnel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LEL ESS Castlelost	Construction Personnel	0	0	0	0	0	20	30	30	50	60	70	70	60	60	60	70	70	80	90	100	100	100	100	100	100	100	100	100	0
	HGV movements (one way)	0	0	0	0	0	10	16	10	40	40	40	40	40	20	10	10	10	10	10	10	10	10	10	10	6	6	2	2	0
	Operational Personnel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Cumulative	Construction Personnel	40	40	40	70	70	130	140	140	230	260	270	250	240	240	210	210	210	230	210	220	250	250	250	200	200	100	100	100	0
	HGV movements (one way)	20	26	26	30	30	50	66	60	70	70	60	60	60	40	26	26	26	22	16	14	16	16	14	12	8	6	2	2	0
	Operational Personnel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	25

Daily Traffic Movements (Veh.)	Year	2022			2023												2024												2025	
	Month	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2
LEL Flexgen Castlelost Construction	Personnel Arrivals (1.5 veh occupancy)	13	13	13	27	27	53	53	53	100	100	100	87	87	87	67	67	67	80	80	80	100	100	100	67	67	0	0	0	0
	Personnel Departures (1.5 veh occupancy)	13	13	13	27	27	53	53	53	100	100	100	87	87	87	67	67	67	80	80	80	100	100	100	67	67	0	0	0	0
	HGV Arrivals	5	5	8	5	5	10	15	15	10	10	5	5	5	5	5	5	5	5	3	2	3	3	2	1	1	0	0	0	0
	HGV Departures	5	5	8	5	5	10	15	15	10	10	5	5	5	5	5	5	5	5	3	2	3	3	2	1	1	0	0	0	0
Operation	Personnel Arrivals (1 veh occupancy)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	20
	Personnel Departures (1 veh occupancy)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	20
LEL GIS Castlelost Construction	Personnel Arrivals (1.5 veh occupancy)	13	13	13	20	20	20	20	20	20	33	33	33	33	33	33	27	27	20	0	0	0	0	0	0	0	0	0	0	0
	Personnel Departures (1.5 veh occupancy)	13	13	13	20	20	20	20	20	20	33	33	33	33	33	33	27	27	20	0	0	0	0	0	0	0	0	0	0	0
	HGV Arrivals	5	8	5	10	10	10	10	10	5	5	5	5	5	5	3	3	3	1	0	0	0	0	0	0	0	0	0	0	0
	HGV Departures	5	8	5	10	10	10	10	10	5	5	5	5	5	5	3	3	3	1	0	0	0	0	0	0	0	0	0	0	0
Operation	Personnel Arrivals (1 veh occupancy)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Personnel Departures (1 veh occupancy)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LEL ESS Castlelost Construction	Personnel Arrivals (1.5 veh occupancy)	0	0	0	0	0	13	20	20	33	40	47	47	40	40	40	47	47	53	60	67	67	67	67	67	67	67	67	67	0
	Personnel Departures (1.5 veh occupancy)	0	0	0	0	0	13	20	20	33	40	47	47	40	40	40	47	47	53	60	67	67	67	67	67	67	67	67	67	0
	HGV Arrivals	0	0	0	0	0	5	8	5	20	20	20	20	20	10	5	5	5	5	5	5	5	5	5	5	3	3	1	1	0
	HGV Departures	0	0	0	0	0	5	8	5	20	20	20	20	20	10	5	5	5	5	5	5	5	5	5	5	3	3	1	1	0
Operation	Personnel Arrivals (1 veh occupancy)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
	Personnel Departures (1 veh occupancy)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Cumulative Construction	Personnel Arrivals (1.5 veh occupancy)	27	27	27	47	47	87	93	93	153	173	180	167	160	160	140	140	140	153	140	147	167	167	167	133	133	67	67	67	0
	Personnel Departures (1.5 veh occupancy)	27	27	27	47	47	87	93	93	153	173	180	167	160	160	140	140	140	153	140	147	167	167	167	133	133	67	67	67	0
	HGV Arrivals	10	13	13	15	15	25	33	30	35	35	30	30	30	20	13	13	13	11	8	7	8	8	7	6	4	3	1	1	0
	HGV Departures	10	13	13	15	15	25	33	30	35	35	30	30	30	20	13	13	13	11	8	7	8	8	7	6	4	3	1	1	0
Operation	Personnel Arrivals (1 veh occupancy)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	25
	Personnel Departures (1 veh occupancy)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	25

Movements rounded to nearest whole vehicle

Daily Peak Hour Movements (Veh.)	Year	2022			2023												2024												2025	
	Month	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2
LEL Flexgen Castlelost Construction	Personnel Arrivals (AM) (75% of total)	10	10	10	20	20	40	40	40	75	75	75	65	65	65	50	50	50	60	60	60	75	75	75	50	50	0	0	0	0
	Personnel Departures (PM) (75% of total)	10	10	10	20	20	40	40	40	75	75	75	65	65	65	50	50	50	60	60	60	75	75	75	50	50	0	0	0	0
	HGV Arrivals (AM/PM) (15% of total)	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
	HGV Departures (AM/PM) (15% of total)	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Operation	Personnel Arrivals (AM) (100% of total)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	20
	Personnel Departures (PM) (100% of total)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	20
LEL GIS Castlelost Construction	Personnel Arrivals (AM) (75% of total)	10	10	10	15	15	15	15	15	15	25	25	25	25	25	25	20	20	15	0	0	0	0	0	0	0	0	0	0	0
	Personnel Departures (PM) (75% of total)	10	10	10	15	15	15	15	15	15	25	25	25	25	25	25	20	20	15	0	0	0	0	0	0	0	0	0	0	0
	HGV Arrivals (AM/PM) (15% of total)	1	1	1	2	2	2	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	HGV Departures (AM/PM) (15% of total)	1	1	1	2	2	2	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operation	Personnel Arrivals (AM) (100% of total)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Personnel Departures (PM) (100% of total)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Personnel Arrivals (AM) (75% of total)	0	0	0	0	0	10	15	15	25	30	35	35	30	30	30	35	35	40	45	50	50	50	50	50	50	50	50	50	0

LEL ESS Castlelost Construction	Personnel Departures (PM) (75% of total)	0	0	0	0	0	10	15	15	25	30	35	35	30	30	30	35	35	40	45	50	50	50	50	50	50	50	50	50	0
	HGV Arrivals (AM/PM) (15% of total)	0	0	0	0	0	1	1	1	3	3	3	3	3	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
	HGV Departures (AM/PM) (15% of total)	0	0	0	0	0	1	1	1	3	3	3	3	3	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
Operation	Personnel Arrivals (AM) (100% of total)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
	Personnel Departures (PM) (100% of total)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Cumulative	Personnel Arrivals (AM) (75% of total)	20	20	20	35	35	65	70	70	115	130	135	125	120	120	105	105	105	115	105	110	125	125	125	100	100	50	50	50	0
	Personnel Departures (PM) (75% of total)	20	20	20	35	35	65	70	70	115	130	135	125	120	120	105	105	105	115	105	110	125	125	125	100	100	50	50	50	0
	HGV Arrivals (AM/PM) (15% of total)	2	2	2	2	2	4	5	5	5	5	5	5	5	3	2	2	2	2	1	1	1	1	1	1	1	0	0	0	0
	HGV Departures (AM/PM) (15% of total)	2	2	2	2	2	4	5	5	5	5	5	5	5	3	2	2	2	2	1	1	1	1	1	1	1	0	0	0	0
Operation	Personnel Arrivals (AM) (100% of total)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	25
	Personnel Departures (PM) (100% of total)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	25

Movements rounded to nearest whole vehicle

Daily Peak Hour	Year	2022			2023												2024												2025	
Movements (PCU)	Month	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2
LEL Flexgen Castlelost Construction	AM Arrivals	12	12	13	22	22	43	45	45	**78**	**78**	77	67	67	67	52	52	52	62	61	61	76	76	76	50	50	0	0	0	0
	AM Departures	2	2	3	2	2	3	5	5	**3**	**3**	2	2	2	2	2	2	2	2	1	1	1	1	1	0	0	0	0	0	0
	PM Arrivals	2	2	3	2	2	3	5	5	**3**	**3**	2	2	2	2	2	2	2	2	1	1	1	1	1	0	0	0	0	0	0
	PM Departures	12	12	13	22	22	43	45	45	**78**	**78**	77	67	67	67	52	52	52	62	61	61	76	76	76	50	50	0	0	0	0
Operation	AM Arrivals	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	20
	PM Departures	0	0	0	0	0	0	0	0	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	20
LEL GIS Castlelost Construction	AM Arrivals	12	13	12	18	18	18	18	18	17	**27**	**27**	**27**	**27**	**27**	26	21	21	15	0	0	0	0	0	0	0	0	0	0	0
	AM Departures	2	3	2	3	3	3	3	3	2	**2**	**2**	**2**	**2**	**2**	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	PM Arrivals	2	3	2	3	3	3	3	3	2	**2**	**2**	**2**	**2**	**2**	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	PM Departures	12	13	12	18	18	18	18	18	17	**27**	**27**	**27**	**27**	**27**	26	21	21	15	0	0	0	0	0	0	0	0	0	0	0
Operation	AM Arrivals	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	PM Departures	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LEL ESS Castlelost Construction	AM Arrivals	0	0	0	0	0	12	18	17	32	37	42	42	37	33	32	37	37	42	47	**52**	**52**	**52**	**52**	**52**	51	51	50	50	0
	AM Departures	0	0	0	0	0	2	3	2	7	7	7	7	7	3	2	2	2	2	2	**2**	**2**	**2**	**2**	**2**	1	1	0	0	0
	PM Arrivals	0	0	0	0	0	2	3	2	7	7	7	7	7	3	2	2	2	2	2	**2**	**2**	**2**	**2**	**2**	1	1	0	0	0
	PM Departures	0	0	0	0	0	12	18	17	32	37	42	42	37	33	32	37	37	42	47	**52**	**52**	**52**	**52**	**52**	51	51	50	50	0
Operation	AM Arrivals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**	0	0	0	0	5
	PM Departures	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**	**0**	0	0	0	0	5
Cumulative	AM Arrivals	23	24	24	40	40	74	81	80	127	142	**145**	135	130	127	109	109	109	119	108	112	128	128	127	102	101	51	50	50	**0**
	AM Departures	3	4	4	5	5	9	11	10	12	12	**10**	10	10	7	4	4	4	4	3	2	3	3	2	2	1	1	0	0	**0**
	PM Arrivals	3	4	4	5	5	9	11	10	12	12	**10**	10	10	7	4	4	4	4	3	2	3	3	2	2	1	1	0	0	**0**
	PM Departures	23	24	24	40	40	74	81	80	127	142	**145**	135	130	127	109	109	109	119	108	112	128	128	127	102	101	51	50	50	**0**
Operation	AM Arrivals	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	**25**
	PM Departures	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20	20	**25**

Movements rounded to nearest whole PCU

Appendix 12.3

Traffic Calculations

Proposed R446/L5125/Flexgen Castlelost Project Site Access junction (4-arm Staggered Stop Controlled)

Arm A – R446 to/from West
Arm B – L5125 to/from North
Arm C – R446 to/from East
Arm D = Development Access

Scenario	A-B	A-C	A-D	B-A	B-C	B-D	C-A	C-B	C-D	D-A	D-B	D-C
2021 AM Peak Hour Traffic Count (08:00-08:59)	0	82	0	2	2	0	87	6	0	0	0	0
2023 AM Peak Hour (Factor = 1.033)	0	85	0	2	2	0	90	6	0	0	0	0
2025 AM Peak Hour (Factor = 1.067)	0	88	0	2	2	0	93	6	0	0	0	0
2030 AM Peak Hour (Factor = 1.147)	0	94	0	2	2	0	100	6	0	0	0	0
2040 AM Peak Hour (Factor = 1.222)	0	104	0	3	3	0	110	7	0	0	0	0
Construction related AM Peak Hour Trip Generation	0	0	41	0	0	0	0	0	38	3	0	0
2023 AM Peak Hour With Construction	**0**	**85**	**41**	**2**	**2**	**0**	**90**	**6**	**38**	**3**	**0**	**0**
Operational AM Peak Hour Trip Generation	0	0	10	0	0	0	0	0	10	0	0	0
2025 AM Peak Hour With Development	0	88	10	2	2	0	93	6	10	0	0	0
2030 AM Peak Hour With Development	0	94	10	2	2	0	100	6	10	0	0	0
2040 AM Peak Hour With Development	0	104	10	3	3	0	110	7	10	0	0	0
2021 PM Peak Hour Traffic Count (17:00-17:59)	1	105	0	0	2	0	93	4	0	0	0	0
2023 PM Peak Hour (Factor = 1.033)	1	109	0	0	2	0	96	4	0	0	0	0
2025 PM Peak Hour (Factor = 1.067)	1	112	0	0	2	0	99	5	0	0	0	0
2030 PM Peak Hour (Factor = 1.147)	1	121	0	0	3	0	107	5	0	0	0	0
2040 PM Peak Hour (Factor = 1.222)	1	133	0	0	3	0	117	5	0	0	0	0
Construction related PM Peak Hour Trip Generation	0	0	3	0	0	0	0	0	0	41	0	38
2023 AM Peak Hour With Construction	**1**	**109**	**3**	**0**	**2**	**0**	**96**	**4**	**0**	**41**	**0**	**38**
Operational PM Peak Hour Trip Generation	0	0	0	0	0	0	0	0	0	10	0	10
2025 PM Peak Hour With Development	1	112	0	0	2	0	99	5	0	10	0	10
2030 PM Peak Hour With Development	1	121	0	0	3	0	107	5	0	10	0	10
2040 PM Peak Hour With Development	1	133	0	0	3	0	117	5	0	10	0	10

Data in PCUs rounded to the nearest whole number

Proposed R446/L5125/GIS Castlelost Project Site Access junction (4-arm Staggered Stop Controlled)

Arm A – R446 to/from West
Arm B – L5125 to/from North
Arm C – R446 to/from East
Arm D = Development Access

Scenario	**A-B**	**A-C**	**A-D**	**B-A**	**B-C**	**B-D**	**C-A**	**C-B**	**C-D**	**D-A**	**D-B**	**D-C**
2021 AM Peak Hour Traffic Count (08:00-08:59)	0	82	0	2	2	0	87	6	0	0	0	0
2023 AM Peak Hour (Factor = 1.033)	0	85	0	2	2	0	90	6	0	0	0	0
Construction related AM Peak Hour Trip Generation	0	0	14	0	0	0	0	0	13	2	0	0
2023 AM Peak Hour With Construction	**0**	**85**	**14**	**2**	**2**	**0**	**90**	**6**	**13**	**2**	**0**	**0**
2021 PM Peak Hour Traffic Count (17:00-17:59)	1	105	0	0	2	0	93	4	0	0	0	0
2023 PM Peak Hour (Factor = 1.033)	1	109	0	0	2	0	96	4	0	0	0	0
Construction related PM Peak Hour Trip Generation	0	0	2	0	0	0	0	0	0	14	0	13
2023 AM Peak Hour With Construction	**1**	**109**	**2**	**0**	**2**	**0**	**96**	**4**	**0**	**14**	**0**	**13**

Data in PCUs rounded to the nearest whole number

Proposed R446/L5125/ESS Castlelost Project Site Access junction (4-arm Staggered Stop Controlled)

Arm A – R446 to/from West
Arm B – L5125 to/from North
Arm C – R446 to/from East
Arm D = Development Access

Scenario	A-B	A-C	A-D	B-A	B-C	B-D	C-A	C-B	C-D	D-A	D-B	D-C
2021 AM Peak Hour Traffic Count (08:00-08:59)	0	82	0	2	2	0	87	6	0	0	0	0
2024 AM Peak Hour (Factor = 1.050)	0	86	0	2	2	0	91	6	0	0	0	0
2025 AM Peak Hour (Factor = 1.067)	0	88	0	2	2	0	93	6	0	0	0	0
2030 AM Peak Hour (Factor = 1.147)	0	94	0	2	2	0	100	6	0	0	0	0
2040 AM Peak Hour (Factor = 1.222)	0	106	0	3	3	0	112	7	0	0	0	0
Construction related AM Peak Hour Trip Generation	0	0	27	0	0	0	0	0	25	2	0	0
2024 AM Peak Hour With Construction	**0**	**86**	**27**	**2**	**2**	**0**	**91**	**6**	**25**	**2**	**0**	**0**
Operational AM Peak Hour Trip Generation	0	0	0	0	0	0	0	0	0	0	0	0
2025 AM Peak Hour With Development	0	88	0	2	2	0	93	6	0	0	0	0
2030 AM Peak Hour With Development	0	94	0	2	2	0	100	6	0	0	0	0
2040 AM Peak Hour With Development	0	106	0	3	3	0	112	7	0	0	0	0
2021 PM Peak Hour Traffic Count (17:00-17:59)	1	105	0	0	2	0	93	4	0	0	0	0
2024 PM Peak Hour (Factor = 1.050)	1	111	0	0	2	0	98	5	0	0	0	0
2025 PM Peak Hour (Factor = 1.067)	1	112	0	0	2	0	99	5	0	0	0	0
2030 PM Peak Hour (Factor = 1.147)	1	121	0	0	3	0	107	5	0	0	0	0
2040 PM Peak Hour (Factor = 1.222)	1	135	0	0	3	0	119	6	0	0	0	0
Construction related PM Peak Hour Trip Generation	0	0	2	0	0	0	0	0	0	27	0	25
2024 AM Peak Hour With Construction	**1**	**111**	**2**	**0**	**2**	**0**	**98**	**5**	**0**	**27**	**0**	**25**
Operational PM Peak Hour Trip Generation	0	0	0	0	0	0	0	0	0	0	0	0
2025 PM Peak Hour With Development	1	112	0	0	2	0	99	5	0	0	0	0
2030 PM Peak Hour With Development	1	121	0	0	3	0	107	5	0	0	0	0
2040 PM Peak Hour With Development	1	135	0	0	3	0	119	6	0	0	0	0

Data in PCUs rounded to the nearest whole number

Proposed R446/L5125/Cumulative Castlelost Project Site Access junction (4-arm Staggered Stop Controlled)

Arm A – R446 to/from West
Arm B – L5125 to/from North
Arm C – R446 to/from East
Arm D = Development Access

Scenario	A-B	A-C	A-D	B-A	B-C	B-D	C-A	C-B	C-D	D-A	D-B	D-C
2021 AM Peak Hour Traffic Count (08:00-08:59)	0	82	0	2	2	0	87	6	0	0	0	0
2023 AM Peak Hour (Factor = 1.033)	0	85	0	2	2	0	90	6	0	0	0	0
2025 AM Peak Hour (Factor = 1.067)	0	88	0	2	2	0	93	6	0	0	0	0
2030 AM Peak Hour (Factor = 1.147)	0	94	0	2	2	0	100	6	0	0	0	0
2040 AM Peak Hour (Factor = 1.222)	0	104	0	3	3	0	110	7	0	0	0	0
Construction related AM Peak Hour Trip Generation	0	0	78	0	0	0	0	0	68	10	0	0
2023 AM Peak Hour With Construction	**0**	**85**	**78**	**2**	**2**	**0**	**90**	**6**	**68**	**10**	**0**	**0**
Operational AM Peak Hour Trip Generation	0	0	10	0	0	0	0	0	10	0	0	0
2025 AM Peak Hour With Development	0	88	10	2	2	0	93	6	10	0	0	0
2030 AM Peak Hour With Development	0	94	10	2	2	0	100	6	10	0	0	0
2040 AM Peak Hour With Development	0	104	10	3	3	0	110	7	10	0	0	0
2021 PM Peak Hour Traffic Count (17:00-17:59)	1	105	0	0	2	0	93	4	0	0	0	0
2023 PM Peak Hour (Factor = 1.033)	1	109	0	0	2	0	96	4	0	0	0	0
2025 PM Peak Hour (Factor = 1.067)	1	112	0	0	2	0	99	5	0	0	0	0
2030 PM Peak Hour (Factor = 1.147)	1	121	0	0	3	0	107	5	0	0	0	0
2040 PM Peak Hour (Factor = 1.222)	1	133	0	0	3	0	117	5	0	0	0	0
Construction related PM Peak Hour Trip Generation	0	0	10	0	0	0	0	0	0	78	0	68
2023 AM Peak Hour With Construction	**1**	**109**	**10**	**0**	**2**	**0**	**96**	**4**	**0**	**78**	**0**	**68**
Operational PM Peak Hour Trip Generation	0	0	0	0	0	0	0	0	0	10	0	10
2025 PM Peak Hour With Development	1	112	0	0	2	0	99	5	0	10	0	10
2030 PM Peak Hour With Development	1	121	0	0	3	0	107	5	0	10	0	10
2040 PM Peak Hour With Development	1	133	0	0	3	0	117	5	0	10	0	10

Data in PCUs rounded to the nearest whole number

Appendix 12.4

PICADY Analysis

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: castlelost.j9
Path: D:\ttrsa\projects\T210504_Tyrrellspass_Castlelost_Site_EIAR_Chapter_S1_RSA\picady
Report generation date: 15/09/2021 10:18:09

»2023 Flexgen Castlelost Construction, AM
»2023 GIS Castlelost Construction, AM
»2024 ESS Castlelost Construction, AM
»2023 Cumulative Castlelost Construction, AM
»2023 Flexgen Castlelost Construction, PM
»2023 GIS Castlelost Construction, PM
»2024 ESS Castlelost Construction, PM
»2023 Cumulative Castlelost Construction, PM

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2023 Flexgen Castlelost Construction									
Stream B-ACD	D1	0.0	0.00	0.00	A	D5	0.0	0.00	0.00	A
Stream AB-CD		0.1	5.54	0.07	A		0.0	5.08	0.01	A
Stream D-ABC		0.0	0.00	0.00	A		0.2	6.73	0.14	A
Stream CD-AB		0.0	5.20	0.01	A		0.0	5.01	0.01	A
	2023 GIS Castlelost Construction									
Stream B-ACD	D2	0.0	0.00	0.00	A	D6	0.0	0.00	0.00	A
Stream AB-CD		0.0	5.24	0.02	A		0.0	5.07	0.00	A
Stream D-ABC		0.0	0.00	0.00	A		0.1	6.09	0.05	A
Stream CD-AB		0.0	5.16	0.01	A		0.0	5.10	0.01	A
	2024 ESS Castlelost Construction									
Stream B-ACD	D3	0.0	0.00	0.00	A	D7	0.0	0.00	0.00	A
Stream AB-CD		0.1	5.36	0.05	A		0.0	5.07	0.00	A
Stream D-ABC		0.0	0.00	0.00	A		0.1	6.39	0.09	A
Stream CD-AB		0.0	5.18	0.01	A		0.0	5.06	0.01	A
	2023 Cumulative Castlelost Construction									
Stream B-ACD	D4	0.0	0.00	0.00	A	D8	0.0	0.00	0.00	A
Stream AB-CD		0.2	6.03	0.14	A		0.0	5.12	0.02	A
Stream D-ABC		0.0	5.12	0.02	A		0.3	7.74	0.25	A
Stream CD-AB		0.0	5.21	0.01	A		0.0	0.00	0.00	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Castlelost Project
Location	R446/L5125/Project Access Junction
Site number	
Date	15/09/2021
Version	
Status	EIAR
Identifier	
Client	Lumcloon Energy
Jobnumber	210504
Enumerator	TTRSA
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2023 Flexgen Castlelost Construction	AM	ONE HOUR	07:45	09:15	15	✓
D2	2023 GIS Castlelost Construction	AM	ONE HOUR	07:45	09:15	15	✓
D3	2024 ESS Castlelost Construction	AM	ONE HOUR	07:45	09:15	15	✓
D4	2023 Cumulative Castlelost Construction	AM	ONE HOUR	07:45	09:15	15	✓
D5	2023 Flexgen Castlelost Construction	PM	ONE HOUR	16:45	18:15	15	✓
D6	2023 GIS Castlelost Construction	PM	ONE HOUR	16:45	18:15	15	✓
D7	2024 ESS Castlelost Construction	PM	ONE HOUR	16:45	18:15	15	✓
D8	2023 Cumulative Castlelost Construction	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2023 Flexgen Castlelost Construction, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		0.60	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	R446 to/from West		Major
B	L5125 to/from North		Minor
C	R446 to/from East		Major
D	Castlelost Project Access		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
A	7.30			215.0	✓	0.00
C	7.30			215.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	2.90	75	52
D	One lane	5.00	30	30

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B
AB-D	698	-	-	-	-	-	0.255	0.255	0.255	-	-
B-A	523	0.090	0.227	0.227	-	-	0.143	0.324	-	0.143	0.324
B-CD	650	0.094	0.238	0.238	-	-	-	-	-	-	-
CD-B	698	0.255	0.255	0.255	-	-	-	-	-	-	-
D-AB	772	-	-	-	-	-	0.282	0.282	0.112	-	-
D-C	603	-	0.165	0.374	0.165	0.374	0.262	0.262	0.104	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2023 Flexgen Castlelost Construction	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.30

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	126	100.000
B		ONE HOUR	✓	4	100.000
C		ONE HOUR	✓	134	100.000
D		ONE HOUR	✓	3	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	0	85	41
	B	2	0	2	0
	C	90	6	0	38
	D	3	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	2	2	2	2
	B	2	2	2	2
	C	2	2	2	2
	D	2	2	2	2

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.00	0.00	0.0	A	0	0
A-B					0	0
A-C					78	117
A-D					38	56
AB-CD	0.07	5.54	0.1	A	42	64
AB-C					73	110
D-ABC	0.00	0.00	0.0	A	0	0
C-D					35	52
C-A					83	124
C-B					6	8
CD-AB	0.01	5.20	0.0	A	6	9
CD-A					82	123

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	550	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	64	16			64				
A-D	31	8			31				
AB-CD	34	8	713	0.048	34	0.0	0.1	5.444	A
AB-C	61	15			61				
D-ABC	0	0	640	0.000	0	0.0	0.0	0.000	A
C-D	29	7			29				
C-A	68	17			68				
C-B	5	1			5				
CD-AB	5	1	717	0.007	5	0.0	0.0	5.196	A
CD-A	67	17			67				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	545	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	76	19			76				
A-D	37	9			37				
AB-CD	41	10	716	0.058	41	0.1	0.1	5.482	A
AB-C	72	18			72				
D-ABC	0	0	632	0.000	0	0.0	0.0	0.000	A
C-D	34	9			34				
C-A	81	20			81				
C-B	5	1			5				
CD-AB	6	2	720	0.008	6	0.0	0.0	5.177	A
CD-A	80	20			80				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	537	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	94	23			94				
A-D	45	11			45				
AB-CD	52	13	720	0.072	52	0.1	0.1	5.534	A
AB-C	87	22			87				
D-ABC	0	0	622	0.000	0	0.0	0.0	0.000	A
C-D	42	10			42				
C-A	99	25			99				
C-B	7	2			7				
CD-AB	8	2	726	0.011	8	0.0	0.0	5.150	A
CD-A	98	25			98				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	537	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	94	23			94				
A-D	45	11			45				
AB-CD	52	13	720	0.072	52	0.1	0.1	5.535	A
AB-C	87	22			87				
D-ABC	0	0	622	0.000	0	0.0	0.0	0.000	A
C-D	42	10			42				
C-A	99	25			99				
C-B	7	2			7				
CD-AB	8	2	726	0.011	8	0.0	0.0	5.152	A
CD-A	98	25			98				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	545	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	76	19			76				
A-D	37	9			37				
AB-CD	41	10	716	0.058	41	0.1	0.1	5.484	A
AB-C	72	18			72				
D-ABC	0	0	632	0.000	0	0.0	0.0	0.000	A
C-D	34	9			34				
C-A	81	20			81				
C-B	5	1			5				
CD-AB	6	2	720	0.008	6	0.0	0.0	5.179	A
CD-A	80	20			80				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	550	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	64	16			64				
A-D	31	8			31				
AB-CD	34	8	713	0.048	34	0.1	0.1	5.450	A
AB-C	61	15			61				
D-ABC	0	0	640	0.000	0	0.0	0.0	0.000	A
C-D	29	7			29				
C-A	68	17			68				
C-B	5	1			5				
CD-AB	5	1	717	0.007	5	0.0	0.0	5.198	A
CD-A	67	17			67				

2023 GIS Castlelost Construction, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		0.29	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2023 GIS Castlelost Construction	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.30

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	99	100.000
B		ONE HOUR	✓	4	100.000
C		ONE HOUR	✓	109	100.000
D		ONE HOUR	✓	2	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	0	85	14
	B	2	0	2	0
	C	90	6	0	13
	D	2	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	2	2	2	2
	B	2	2	2	2
	C	2	2	2	2
	D	2	2	2	2

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.00	0.00	0.0	A	0	0
A-B					0	0
A-C					78	117
A-D					13	19
AB-CD	0.02	5.24	0.0	A	14	22
AB-C					76	115
D-ABC	0.00	0.00	0.0	A	0	0
C-D					12	18
C-A					83	124
C-B					6	8
CD-AB	0.01	5.16	0.0	A	6	9
CD-A					82	123

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	555	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	64	16			64				
A-D	11	3			11				
AB-CD	12	3	717	0.016	11	0.0	0.0	5.238	A
AB-C	63	16			63				
D-ABC	0	0	647	0.000	0	0.0	0.0	0.000	A
C-D	10	2			10				
C-A	68	17			68				
C-B	5	1			5				
CD-AB	5	1	722	0.007	5	0.0	0.0	5.160	A
CD-A	67	17			67				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	550	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	76	19			76				
A-D	13	3			13				
AB-CD	14	4	721	0.020	14	0.0	0.0	5.228	A
AB-C	75	19			75				
D-ABC	0	0	641	0.000	0	0.0	0.0	0.000	A
C-D	12	3			12				
C-A	81	20			81				
C-B	5	1			5				
CD-AB	6	2	726	0.008	6	0.0	0.0	5.134	A
CD-A	80	20			80				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	544	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	94	23			94				
A-D	15	4			15				
AB-CD	18	4	727	0.024	18	0.0	0.0	5.215	A
AB-C	91	23			91				
D-ABC	0	0	633	0.000	0	0.0	0.0	0.000	A
C-D	14	4			14				
C-A	99	25			99				
C-B	7	2			7				
CD-AB	8	2	733	0.010	8	0.0	0.0	5.099	A
CD-A	98	25			98				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	544	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	94	23			94				
A-D	15	4			15				
AB-CD	18	4	727	0.024	18	0.0	0.0	5.218	A
AB-C	91	23			91				
D-ABC	0	0	633	0.000	0	0.0	0.0	0.000	A
C-D	14	4			14				
C-A	99	25			99				
C-B	7	2			7				
CD-AB	8	2	733	0.010	8	0.0	0.0	5.101	A
CD-A	98	25			98				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	550	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	76	19			76				
A-D	13	3			13				
AB-CD	14	4	721	0.020	14	0.0	0.0	5.229	A
AB-C	75	19			75				
D-ABC	0	0	641	0.000	0	0.0	0.0	0.000	A
C-D	12	3			12				
C-A	81	20			81				
C-B	5	1			5				
CD-AB	6	2	726	0.008	6	0.0	0.0	5.136	A
CD-A	80	20			80				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	555	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	64	16			64				
A-D	11	3			11				
AB-CD	12	3	717	0.016	12	0.0	0.0	5.241	A
AB-C	63	16			63				
D-ABC	0	0	647	0.000	0	0.0	0.0	0.000	A
C-D	10	2			10				
C-A	68	17			68				
C-B	5	1			5				
CD-AB	5	1	722	0.007	5	0.0	0.0	5.160	A
CD-A	67	17			67				

2024 ESS Castlelost Construction, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		0.45	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2024 ESS Castlelost Construction	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.30

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	113	100.000
B		ONE HOUR	✓	4	100.000
C		ONE HOUR	✓	122	100.000
D		ONE HOUR	✓	2	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	0	86	27
	B	2	0	2	0
	C	91	6	0	25
	D	2	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	2	2	2	2
	B	2	2	2	2
	C	2	2	2	2
	D	2	2	2	2

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.00	0.00	0.0	A	0	0
A-B					0	0
A-C					79	118
A-D					25	37
AB-CD	0.05	5.36	0.1	A	28	42
AB-C					76	114
D-ABC	0.00	0.00	0.0	A	0	0
C-D					23	34
C-A					84	125
C-B					6	8
CD-AB	0.01	5.18	0.0	A	6	9
CD-A					83	124

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	552	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	65	16			65				
A-D	20	5			20				
AB-CD	22	6	715	0.031	22	0.0	0.0	5.335	A
AB-C	63	16			63				
D-ABC	0	0	643	0.000	0	0.0	0.0	0.000	A
C-D	19	5			19				
C-A	69	17			69				
C-B	5	1			5				
CD-AB	5	1	720	0.007	5	0.0	0.0	5.175	A
CD-A	68	17			68				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	547	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	77	19			77				
A-D	24	6			24				
AB-CD	27	7	719	0.038	27	0.0	0.0	5.345	A
AB-C	74	19			74				
D-ABC	0	0	636	0.000	0	0.0	0.0	0.000	A
C-D	22	6			22				
C-A	82	20			82				
C-B	5	1			5				
CD-AB	6	2	724	0.008	6	0.0	0.0	5.152	A
CD-A	81	20			81				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	540	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	95	24			95				
A-D	30	7			30				
AB-CD	34	9	724	0.047	34	0.0	0.1	5.361	A
AB-C	90	23			90				
D-ABC	0	0	627	0.000	0	0.0	0.0	0.000	A
C-D	28	7			28				
C-A	100	25			100				
C-B	7	2			7				
CD-AB	8	2	730	0.011	8	0.0	0.0	5.120	A
CD-A	99	25			99				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	540	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	95	24			95				
A-D	30	7			30				
AB-CD	34	9	724	0.047	34	0.1	0.1	5.364	A
AB-C	90	23			90				
D-ABC	0	0	627	0.000	0	0.0	0.0	0.000	A
C-D	28	7			28				
C-A	100	25			100				
C-B	7	2			7				
CD-AB	8	2	730	0.011	8	0.0	0.0	5.120	A
CD-A	99	25			99				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	547	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	77	19			77				
A-D	24	6			24				
AB-CD	27	7	719	0.038	27	0.1	0.0	5.346	A
AB-C	74	19			74				
D-ABC	0	0	636	0.000	0	0.0	0.0	0.000	A
C-D	22	6			22				
C-A	82	20			82				
C-B	5	1			5				
CD-AB	6	2	724	0.008	6	0.0	0.0	5.152	A
CD-A	81	20			81				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	552	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	65	16			65				
A-D	20	5			20				
AB-CD	22	6	715	0.031	22	0.0	0.0	5.338	A
AB-C	63	16			63				
D-ABC	0	0	643	0.000	0	0.0	0.0	0.000	A
C-D	19	5			19				
C-A	69	17			69				
C-B	5	1			5				
CD-AB	5	1	720	0.007	5	0.0	0.0	5.175	A
CD-A	68	17			68				

2023 Cumulative Castlelost Construction, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		1.02	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2023 Cumulative Castlelost Construction	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.30

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	163	100.000
B		ONE HOUR	✓	4	100.000
C		ONE HOUR	✓	164	100.000
D		ONE HOUR	✓	10	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	0	85	78
	B	2	0	2	0
	C	90	6	0	68
	D	10	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	2	2	2	2
	B	2	2	2	2
	C	2	2	2	2
	D	2	2	2	2

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.00	0.00	0.0	A	0	0
A-B					0	0
A-C					78	117
A-D					72	107
AB-CD	0.14	6.03	0.2	A	81	121
AB-C					69	103
D-ABC	0.02	5.12	0.0	A	9	14
C-D					62	94
C-A					83	124
C-B					6	8
CD-AB	0.01	5.21	0.0	A	6	10
CD-A					91	136

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	543	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	64	16			64				
A-D	59	15			59				
AB-CD	65	16	707	0.091	64	0.0	0.1	5.747	A
AB-C	58	15			58				
D-ABC	8	2	745	0.010	7	0.0	0.0	5.011	A
C-D	51	13			51				
C-A	68	17			68				
C-B	5	1			5				
CD-AB	5	1	714	0.007	5	0.0	0.0	5.212	A
CD-A	75	19			75				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	536	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	76	19			76				
A-D	70	18			70				
AB-CD	79	20	709	0.111	79	0.1	0.1	5.864	A
AB-C	68	17			68				
D-ABC	9	2	740	0.012	9	0.0	0.0	5.056	A
C-D	61	15			61				
C-A	81	20			81				
C-B	5	1			5				
CD-AB	6	2	718	0.009	6	0.0	0.0	5.195	A
CD-A	89	22			89				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	526	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	94	23			94				
A-D	86	21			86				
AB-CD	99	25	712	0.139	99	0.1	0.2	6.031	A
AB-C	81	20			81				
D-ABC	11	3	733	0.015	11	0.0	0.0	5.119	A
C-D	75	19			75				
C-A	99	25			99				
C-B	7	2			7				
CD-AB	8	2	723	0.011	8	0.0	0.0	5.171	A
CD-A	109	27			109				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	526	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	94	23			94				
A-D	86	21			86				
AB-CD	99	25	712	0.139	99	0.2	0.2	6.032	A
AB-C	80	20			80				
D-ABC	11	3	733	0.015	11	0.0	0.0	5.119	A
C-D	75	19			75				
C-A	99	25			99				
C-B	7	2			7				
CD-AB	8	2	723	0.011	8	0.0	0.0	5.171	A
CD-A	109	27			109				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	536	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	76	19			76				
A-D	70	18			70				
AB-CD	79	20	709	0.111	79	0.2	0.1	5.868	A
AB-C	68	17			68				
D-ABC	9	2	740	0.012	9	0.0	0.0	5.058	A
C-D	61	15			61				
C-A	81	20			81				
C-B	5	1			5				
CD-AB	6	2	718	0.009	6	0.0	0.0	5.195	A
CD-A	89	22			89				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	543	0.000	0	0.0	0.0	0.000	A
A-B	0	0			0				
A-C	64	16			64				
A-D	59	15			59				
AB-CD	65	16	707	0.091	65	0.1	0.1	5.759	A
AB-C	58	15			58				
D-ABC	8	2	745	0.010	8	0.0	0.0	5.013	A
C-D	51	13			51				
C-A	68	17			68				
C-B	5	1			5				
CD-AB	5	1	715	0.007	5	0.0	0.0	5.212	A
CD-A	75	19			75				

2023 Flexgen Castlelost Construction, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		1.05	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2023 Flexgen Castlelost Construction	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.30

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	113	100.000
B		ONE HOUR	✓	2	100.000
C		ONE HOUR	✓	100	100.000
D		ONE HOUR	✓	79	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	1	109	3
	B	0	0	2	0
	C	96	4	0	0
	D	41	0	38	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	2	2	2	2
	B	2	2	2	2
	C	2	2	2	2
	D	2	2	2	2

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.00	0.00	0.0	A	0	0
A-B					0.92	1
A-C					100	150
A-D					3	4
AB-CD	0.01	5.08	0.0	A	3	5
AB-C					100	149
D-ABC	0.14	6.73	0.2	A	72	109
C-D					0	0
C-A					88	132
C-B					4	6
CD-AB	0.01	5.01	0.0	A	4	7
CD-A					125	187

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	550	0.000	0	0.0	0.0	0.000	A
A-B	0.75	0.19			0.75				
A-C	82	21			82				
A-D	2	0.56			2				
AB-CD	3	0.64	730	0.003	3	0.0	0.0	5.080	A
AB-C	82	20			82				
D-ABC	59	15	650	0.091	59	0.0	0.1	6.251	A
C-D	0	0			0				
C-A	72	18			72				
C-B	3	0.75			3				
CD-AB	3	0.87	741	0.005	3	0.0	0.0	5.014	A
CD-A	102	26			102				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	544	0.000	0	0.0	0.0	0.000	A
A-B	0.90	0.22			0.90				
A-C	98	24			98				
A-D	3	0.67			3				
AB-CD	3	0.78	737	0.004	3	0.0	0.0	5.040	A
AB-C	98	24			98				
D-ABC	71	18	645	0.110	71	0.1	0.1	6.447	A
C-D	0	0			0				
C-A	86	22			86				
C-B	4	0.90			4				
CD-AB	4	1	750	0.006	4	0.0	0.0	4.961	A
CD-A	122	31			122				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	536	0.000	0	0.0	0.0	0.000	A
A-B	1	0.28			1				
A-C	120	30			120				
A-D	3	0.83			3				
AB-CD	4	0.98	746	0.005	4	0.0	0.0	4.985	A
AB-C	119	30			119				
D-ABC	87	22	637	0.137	87	0.1	0.2	6.726	A
C-D	0	0			0				
C-A	106	26			106				
C-B	4	1			4				
CD-AB	5	1	762	0.007	5	0.0	0.0	4.890	A
CD-A	150	37			150				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	536	0.000	0	0.0	0.0	0.000	A
A-B	1	0.28			1				
A-C	120	30			120				
A-D	3	0.83			3				
AB-CD	4	0.99	746	0.005	4	0.0	0.0	4.985	A
AB-C	119	30			119				
D-ABC	87	22	637	0.137	87	0.2	0.2	6.729	A
C-D	0	0			0				
C-A	106	26			106				
C-B	4	1			4				
CD-AB	5	1	762	0.007	5	0.0	0.0	4.890	A
CD-A	150	37			150				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	544	0.000	0	0.0	0.0	0.000	A
A-B	0.90	0.22			0.90				
A-C	98	24			98				
A-D	3	0.67			3				
AB-CD	3	0.78	737	0.004	3	0.0	0.0	5.040	A
AB-C	98	24			98				
D-ABC	71	18	645	0.110	71	0.2	0.1	6.453	A
C-D	0	0			0				
C-A	86	22			86				
C-B	4	0.90			4				
CD-AB	4	1	750	0.006	4	0.0	0.0	4.960	A
CD-A	123	31			123				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	550	0.000	0	0.0	0.0	0.000	A
A-B	0.75	0.19			0.75				
A-C	82	21			82				
A-D	2	0.56			2				
AB-CD	3	0.64	730	0.003	3	0.0	0.0	5.081	A
AB-C	82	20			82				
D-ABC	59	15	650	0.091	60	0.1	0.1	6.261	A
C-D	0	0			0				
C-A	72	18			72				
C-B	3	0.75			3				
CD-AB	4	0.88	741	0.005	4	0.0	0.0	5.013	A
CD-A	103	26			103				

2023 GIS Castlelost Construction, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		0.43	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2023 GIS Castlelost Construction	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.30

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	112	100.000
B		ONE HOUR	✓	2	100.000
C		ONE HOUR	✓	100	100.000
D		ONE HOUR	✓	27	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	1	109	2
	B	0	0	2	0
	C	96	4	0	0
	D	14	0	13	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	2	2	2	2
	B	2	2	2	2
	C	2	2	2	2
	D	2	2	2	2

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.00	0.00	0.0	A	0	0
A-B					0.92	1
A-C					100	150
A-D					2	3
AB-CD	0.00	5.07	0.0	A	2	3
AB-C					100	150
D-ABC	0.05	6.09	0.1	A	25	37
C-D					0	0
C-A					88	132
C-B					4	6
CD-AB	0.01	5.10	0.0	A	4	6
CD-A					100	150

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	552	0.000	0	0.0	0.0	0.000	A
A-B	0.75	0.19			0.75				
A-C	82	21			82				
A-D	2	0.38			2				
AB-CD	2	0.42	730	0.002	2	0.0	0.0	5.075	A
AB-C	82	20			82				
D-ABC	20	5	650	0.031	20	0.0	0.0	5.866	A
C-D	0	0			0				
C-A	72	18			72				
C-B	3	0.75			3				
CD-AB	3	0.85	729	0.005	3	0.0	0.0	5.099	A
CD-A	82	21			82				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	546	0.000	0	0.0	0.0	0.000	A
A-B	0.90	0.22			0.90				
A-C	98	24			98				
A-D	2	0.45			2				
AB-CD	2	0.52	737	0.003	2	0.0	0.0	5.033	A
AB-C	98	24			98				
D-ABC	24	6	645	0.038	24	0.0	0.0	5.960	A
C-D	0	0			0				
C-A	86	22			86				
C-B	4	0.90			4				
CD-AB	4	1	735	0.006	4	0.0	0.0	5.061	A
CD-A	98	25			98				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	539	0.000	0	0.0	0.0	0.000	A
A-B	1	0.28			1				
A-C	120	30			120				
A-D	2	0.55			2				
AB-CD	3	0.66	746	0.004	3	0.0	0.0	4.976	A
AB-C	120	30			120				
D-ABC	30	7	637	0.047	30	0.0	0.0	6.092	A
C-D	0	0			0				
C-A	106	26			106				
C-B	4	1			4				
CD-AB	5	1	743	0.007	5	0.0	0.0	5.011	A
CD-A	120	30			120				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	539	0.000	0	0.0	0.0	0.000	A
A-B	1	0.28			1				
A-C	120	30			120				
A-D	2	0.55			2				
AB-CD	3	0.66	746	0.004	3	0.0	0.0	4.978	A
AB-C	120	30			120				
D-ABC	30	7	637	0.047	30	0.0	0.1	6.092	A
C-D	0	0			0				
C-A	106	26			106				
C-B	4	1			4				
CD-AB	5	1	743	0.007	5	0.0	0.0	5.011	A
CD-A	120	30			120				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	546	0.000	0	0.0	0.0	0.000	A
A-B	0.90	0.22			0.90				
A-C	98	24			98				
A-D	2	0.45			2				
AB-CD	2	0.52	737	0.003	2	0.0	0.0	5.033	A
AB-C	98	24			98				
D-ABC	24	6	645	0.038	24	0.0	0.0	5.961	A
C-D	0	0			0				
C-A	86	22			86				
C-B	4	0.90			4				
CD-AB	4	1	735	0.006	4	0.0	0.0	5.063	A
CD-A	98	25			98				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	552	0.000	0	0.0	0.0	0.000	A
A-B	0.75	0.19			0.75				
A-C	82	21			82				
A-D	2	0.38			2				
AB-CD	2	0.42	730	0.002	2	0.0	0.0	5.075	A
AB-C	82	20			82				
D-ABC	20	5	650	0.031	20	0.0	0.0	5.871	A
C-D	0	0			0				
C-A	72	18			72				
C-B	3	0.75			3				
CD-AB	3	0.85	729	0.005	3	0.0	0.0	5.099	A
CD-A	82	21			82				

2024 ESS Castlelost Construction, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		0.73	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	2024 ESS Castlelost Construction	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.30

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	114	100.000
B		ONE HOUR	✓	2	100.000
C		ONE HOUR	✓	103	100.000
D		ONE HOUR	✓	52	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	1	111	2
	B	0	0	2	0
	C	98	5	0	0
	D	27	0	25	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	2	2	2	2
	B	2	2	2	2
	C	2	2	2	2
	D	2	2	2	2

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.00	0.00	0.0	A	0	0
A-B					0.92	1
A-C					102	153
A-D					2	3
AB-CD	0.00	5.07	0.0	A	2	3
AB-C					102	152
D-ABC	0.09	6.39	0.1	A	48	72
C-D					0	0
C-A					90	135
C-B					5	7
CD-AB	0.01	5.06	0.0	A	5	8
CD-A					114	171

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	550	0.000	0	0.0	0.0	0.000	A
A-B	0.75	0.19			0.75				
A-C	84	21			84				
A-D	2	0.38			2				
AB-CD	2	0.43	731	0.002	2	0.0	0.0	5.072	A
AB-C	83	21			83				
D-ABC	39	10	650	0.060	39	0.0	0.1	6.051	A
C-D	0	0			0				
C-A	74	18			74				
C-B	4	0.94			4				
CD-AB	4	1	735	0.006	4	0.0	0.0	5.059	A
CD-A	93	23			93				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	544	0.000	0	0.0	0.0	0.000	A
A-B	0.90	0.22			0.90				
A-C	100	25			100				
A-D	2	0.45			2				
AB-CD	2	0.52	737	0.003	2	0.0	0.0	5.030	A
AB-C	100	25			100				
D-ABC	47	12	644	0.073	47	0.1	0.1	6.193	A
C-D	0	0			0				
C-A	88	22			88				
C-B	4	1			4				
CD-AB	5	1	743	0.007	5	0.0	0.0	5.014	A
CD-A	112	28			112				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	537	0.000	0	0.0	0.0	0.000	A
A-B	1	0.28			1				
A-C	122	31			122				
A-D	2	0.55			2				
AB-CD	3	0.66	746	0.004	3	0.0	0.0	4.972	A
AB-C	122	30			122				
D-ABC	57	14	636	0.090	57	0.1	0.1	6.392	A
C-D	0	0			0				
C-A	108	27			108				
C-B	6	1			6				
CD-AB	7	2	753	0.009	7	0.0	0.0	4.954	A
CD-A	136	34			136				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	537	0.000	0	0.0	0.0	0.000	A
A-B	1	0.28			1				
A-C	122	31			122				
A-D	2	0.55			2				
AB-CD	3	0.66	746	0.004	3	0.0	0.0	4.972	A
AB-C	122	30			122				
D-ABC	57	14	636	0.090	57	0.1	0.1	6.392	A
C-D	0	0			0				
C-A	108	27			108				
C-B	6	1			6				
CD-AB	7	2	753	0.009	7	0.0	0.0	4.954	A
CD-A	136	34			136				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	544	0.000	0	0.0	0.0	0.000	A
A-B	0.90	0.22			0.90				
A-C	100	25			100				
A-D	2	0.45			2				
AB-CD	2	0.52	737	0.003	2	0.0	0.0	5.032	A
AB-C	100	25			100				
D-ABC	47	12	644	0.073	47	0.1	0.1	6.194	A
C-D	0	0			0				
C-A	88	22			88				
C-B	4	1			4				
CD-AB	5	1	743	0.007	5	0.0	0.0	5.016	A
CD-A	112	28			112				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	550	0.000	0	0.0	0.0	0.000	A
A-B	0.75	0.19			0.75				
A-C	84	21			84				
A-D	2	0.38			2				
AB-CD	2	0.43	731	0.002	2	0.0	0.0	5.074	A
AB-C	83	21			83				
D-ABC	39	10	650	0.060	39	0.1	0.1	6.057	A
C-D	0	0			0				
C-A	74	18			74				
C-B	4	0.94			4				
CD-AB	4	1	735	0.006	4	0.0	0.0	5.058	A
CD-A	94	23			94				

2023 Cumulative Castlelost Construction, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		1.82	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	2023 Cumulative Castlelost Construction	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.30

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	120	100.000
B		ONE HOUR	✓	2	100.000
C		ONE HOUR	✓	96	100.000
D		ONE HOUR	✓	146	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	1	109	10
	B	0	0	2	0
	C	96	0	0	0
	D	78	0	68	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	2	2	2	2
	B	2	2	2	2
	C	2	2	2	2
	D	2	2	2	2

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.00	0.00	0.0	A	0	0
A-B					0.92	1
A-C					100	150
A-D					9	14
AB-CD	0.02	5.12	0.0	A	11	16
AB-C					99	148
D-ABC	0.25	7.74	0.3	A	134	201
C-D					0	0
C-A					88	132
C-B					0	0
CD-AB	0.00	0.00	0.0	A	0	0
CD-A					160	239

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	547	0.000	0	0.0	0.0	0.000	A
A-B	0.75	0.19			0.75				
A-C	82	21			82				
A-D	8	2			8				
AB-CD	8	2	731	0.012	8	0.0	0.0	5.117	A
AB-C	81	20			81				
D-ABC	110	27	653	0.168	109	0.0	0.2	6.794	A
C-D	0	0			0				
C-A	72	18			72				
C-B	0	0			0				
CD-AB	0	0	675	0.000	0	0.0	0.0	0.000	A
CD-A	131	33			131				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	540	0.000	0	0.0	0.0	0.000	A
A-B	0.90	0.22			0.90				
A-C	98	24			98				
A-D	9	2			9				
AB-CD	10	3	738	0.014	10	0.0	0.0	5.084	A
AB-C	97	24			97				
D-ABC	131	33	647	0.203	131	0.2	0.3	7.166	A
C-D	0	0			0				
C-A	86	22			86				
C-B	0	0			0				
CD-AB	0	0	671	0.000	0	0.0	0.0	0.000	A
CD-A	156	39			156				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	531	0.000	0	0.0	0.0	0.000	A
A-B	1	0.28			1				
A-C	120	30			120				
A-D	11	3			11				
AB-CD	13	3	747	0.018	13	0.0	0.0	5.040	A
AB-C	118	29			118				
D-ABC	161	40	639	0.252	160	0.3	0.3	7.725	A
C-D	0	0			0				
C-A	106	26			106				
C-B	0	0			0				
CD-AB	0	0	665	0.000	0	0.0	0.0	0.000	A
CD-A	191	48			191				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	531	0.000	0	0.0	0.0	0.000	A
A-B	1	0.28			1				
A-C	120	30			120				
A-D	11	3			11				
AB-CD	13	3	747	0.018	13	0.0	0.0	5.042	A
AB-C	118	29			118				
D-ABC	161	40	639	0.252	161	0.3	0.3	7.736	A
C-D	0	0			0				
C-A	106	26			106				
C-B	0	0			0				
CD-AB	0	0	665	0.000	0	0.0	0.0	0.000	A
CD-A	192	48			192				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	540	0.000	0	0.0	0.0	0.000	A
A-B	0.90	0.22			0.90				
A-C	98	24			98				
A-D	9	2			9				
AB-CD	10	3	738	0.014	10	0.0	0.0	5.085	A
AB-C	97	24			97				
D-ABC	131	33	647	0.203	132	0.3	0.3	7.183	A
C-D	0	0			0				
C-A	86	22			86				
C-B	0	0			0				
CD-AB	0	0	671	0.000	0	0.0	0.0	0.000	A
CD-A	157	39			157				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	0	0	547	0.000	0	0.0	0.0	0.000	A
A-B	0.75	0.19			0.75				
A-C	82	21			82				
A-D	8	2			8				
AB-CD	8	2	731	0.012	9	0.0	0.0	5.119	A
AB-C	81	20			81				
D-ABC	110	27	653	0.168	110	0.3	0.2	6.818	A
C-D	0	0			0				
C-A	72	18			72				
C-B	0	0			0				
CD-AB	0	0	675	0.000	0	0.0	0.0	0.000	A
CD-A	131	33			131				

Appendix 12.5

Road Safety Audit

Site Access Junction for Proposed Energy Generation and Storage Related Development at Kiltotan, Collinstown, Oldtown, Co. Westmeath

Stage 1 Road Safety Audit

Final Report

21st December 2021

Prepared for

Lumcloon Energy

Traffic Transport and Road Safety Associates Ltd.
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TTRSA
Traffic : Transport : Road Safety

Document Control Sheet

Project Title	Site Access Junction for Proposed Energy Generation and Storage Related Development at Kiltotan, Collinstown, Oldtown, Co. Westmeath
Report Title	Stage 1 Road Safety Audit
TTRSA Ref.	T210504
Revision	2
Status	Final Report
Control Date	21st December 2021

Record of Issue

Issue	Status	Date
1/1	Draft	15/09/2021
1/2	Final	20/09/2021
2/2	Final	21/12/2021

Distribution

Organisation	Copies
Lumcloon Energy c/o Halston Environmental and Planning Ltd.	1 Electronic (pdf) copy

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2 Scheme Background **2**

3 Stage 1 Road Safety Audit Findings **4**

4 Audit Statement **7**

Appendix A – Road Safety Audit Brief

Appendix B – Road Safety Audit Feedback Form

1 Introduction

This report presents the findings of a Stage 1 Road Safety Audit (RSA) of the preliminary design of a proposed site access junction onto the R446 regional road at Kiltotan, Collinstown, Oldtown for a proposed energy generation and storage development.

This RSA was commissioned by Halston Environmental and Planning Ltd., on behalf of Lumcloon Energy. The site access design drawings for the proposed development have been prepared by a team lead by Halston Environmental and Planning Ltd.

This RSA has been undertaken by Traffic Transport and Road Safety Associates Limited (TTRSA) in accordance with the requirements of Transport Infrastructure Ireland (TII) GE-STY-01024 Road Safety Audit standard (as amended by TII to take account of associated COVID-19 legislation). The Audit Team members comprised: Matthew Steele (TII Auditor Ref. No. MS88315) and Pamela Townley (TII Auditor Ref. No. PT90300). A brief for this audit, in accordance with the requirements of TII GE-STY-01024, is included as Appendix A of this report.

A site visit for this RSA was undertaken by both Audit Team members during the AM peak traffic period on 9th September 2021. During the audit site visit it was mainly dry with very light rain showers and the road surface was damp. The RSA was undertaken by the aforementioned Audit Team in the time period 23rd August 2021 and 14th September 2021, taking account of associated COVID-19 restrictions.

This RSA examines the documents relating to the proposed scheme and on-site observations at the time of the audit site visit, and identifies issues which may have an adverse impact on road safety. The RSA does not examine or verify the proposed scheme for compliance with any other standards or criteria.

Issues which impact on road safety are listed as problems within this report, and relate to the documentation provided upon commencement of the RSA and associated clarification. The problems identified are considered to require action in order to improve the safety of the scheme and minimise collision occurrence.

The scheme employer and designer are required to respond to this RSA by completing a Road Safety Audit Feedback Form, included as Appendix B of this report. If any of the recommendations within this RSA are not accepted, a written response is required within the feedback form stating the reasons for non-acceptance.

2 Scheme Background

2.1 The proposed scheme

The scheme and scope of this RSA comprises the preliminary design of a proposed site access junction onto the southern side of the carriageway of the R446 regional road at Kiltotan, Collinstown, Oldtown for a proposed energy generation and storage development. The proposed development will employ approximately 25 people when operational. As depicted within the site layout drawing contained in Appendix A of this report, a priority stop control junction will be created with a radii of 9m and a kerbed site access road of 14m in width will extend for a short section length southwards from the site access junction and then curves in an east alignment before transitioning to a southwards alignment with a typical road width of 7m. A timber post and tension mesh fence will be provided to the back of the verge either side of the proposed site access junction. Advance warning signing indicating major road ahead will be provided on the site access road on the approach to site access junction with the R446 carriageway, and warning signing indicating the proposed t-junction for the site access is also proposed.

2.2 The existing situation

The characteristics of the existing R446 regional road in the vicinity of the proposed site access junction for the proposed energy generation and storage development, as observed at the time of the audit site visit, included the following:

- The R446 has a crowned sealed width of approximately 11.85m including hard shoulders on both sides of the carriageway. The carriageway is bound by grass verge back by hedge vegetation. There is a level difference between the verge on the southern side of the carriageway and the adjacent field boundary. The R446 carriageway in this locality is demarcated by a double solid centreline with road studs and edge-lining with road studs.
- The carriageway in this locality has a relatively straight horizontal alignment with a long downhill vertical grade east to west.
- A property access point is located on the southern side of the R446 carriageway approximately 100m to the east of the proposed site access junction and the L5125 junction is located on the northern side of the R446 carriageway approximately 65m to the west of the proposed site access junction.
- A t-junction warning sign indicating the L5125 junction is present eastwards of the proposed site access junction. A 100km/h speed limit sign is positioned within the verge on the northern side of the R446 carriageway in the vicinity of the proposed site access junction.
- Utility poles are located to the back of the southern verge of the R446 carriageway in this locality.
- No surface water drainage grips or gullies are present in this locality and no public lighting is present.

2.3 Design Standards and Departures from Standards

TII design standards are applicable for the proposed Energy Generation and Storage development. No departures from standards were reported to the audit team.

2.4 Traffic Collision Information

Consultation of the Road Safety Authority online collision data (for the period 2005 to 2016 inclusive) indicates that one minor collision resulting in injury was reported on the R446 regional road at the L5125 junction westwards of the proposed site access. This minor collision occurred between 1600 and 1900 hours on a Sunday in 2006 involving a car in angle/both straight manoeuvre resulting in minor injury to one casualty. A further two collisions have been report further east and west of the proposed site access, comprising a minor collision further eastwards of the proposed site access occurring between1600 and 1900 hours on a Monday in 2006 involving a car in rear end/straight collision resulting in minor injury to one casualty, and a fatal collision involving a motorcyclist in a head-on collision further westwards of the proposed site access occurred between the hours of 1600-1900 on a Friday in 2005. It should be noted that these collisions occurred before the opening of the M6 motorway and reclassification of the N6 national road as the R446 regional road.

2.5 Information provided for the audit

Documents and information provided for this audit are detailed with the RSA brief contained in Appendix A.

3 Stage 1 Road Safety Audit Findings

3.1 Problem: Level differences at proposed site access junction

The level difference between the existing verge and the proposed site access junction can increase the risk of loss-of-control type collisions for road-users who inadvertently over-run this verge area whilst entering/egressing the proposed site access junction.

Recommendation:

Provide adequate surface levels for the verge area and haunches adjacent to the proposed site access junction.

3.2 Problem: Potential for strike/over-run of proposed kerbing at site access junction

There is potential for road-users to strike the proposed kerbing of the site access road as they enter the site access junction, with increased risk of loss-of-control type collision. Vehicle strike and over-run of this kerbing could lead to deformation of the kerbing and road edge, further exacerbating the risk of loss-of-control type collisions.

Recommendation:

Provide appropriate kerbing including transition kerbing for the eastern radius of the site access junction, ensuring that vehicles cannot strike or over-run this kerbing whilst taking full account of the swept path of vehicles which require access at this junction and surface water drainage of the junction.

3.3 Problem: Potential for collision with the existing hedge and proposed boundary fence at site access junction

There is potential for vehicles to strike the existing hedge and proposed boundary fence positioned immediate to the edge of the carriageway of the site access road at the site access junction, leading to injury of vehicle occupants or damage to vehicles.

Recommendation:

Provide appropriate clearance set-back termination of this boundary fence from the edge of the carriageway of the site access road at the site access junction, ensuring that adequate forward visibility splay is provided on the eastern radius of the site access junction for road-users turning left into the site access.

3.4 Problem: Road-user confusion of existing and proposed t-junction warning signing

The existing and proposed t-junction ahead warning signing for the site access junction will lead to road-user confusion given the staggered form of the site access junction with the R446 and L5125, increasing the risk of misinterpretation of the form of the junction/signing and road-user collision in this locality.

Recommendation:

Replace the existing and proposed t-junction ahead warning signing with staggered junction ahead warning sign on all approaches to the R446/L5125/site access junction.

3.5 Problem: Potential for collision with utility pole/wire infrastructure

There is potential for road-users to sustain injury through direct collision with the existing utility pole/wire infrastructure which aligns the southern side of the R446 carriageway in the vicinity of the proposes site access junction.

Recommendation:

Underground this utility infrastructure in the vicinity of the site access junction.

3.6 Problem: Potential for collision with boundary fence

It is unclear from the drawing information provided, as to the ground level, and height of the proposed boundary fence relative to the existing level of the R446 carriageway and site access road. Inappropriate positioning of the boundary fence in relation to the existing topography and R446 carriageway can increase the severity of injury to road-users who errantly leave R446 carriageway and collide with this fence.

Recommendation:

Ensure that the design and construction of the boundary fence takes full account of the ground level and existing level of the R446 carriageway.

3.7 Problem: Potential for head-light glare/dazzle between parallel road sections

The proposed type of fencing along the frontage of the site with the R446 is unlikely to provide adequate screening to protect road-users from head-light glare/dazzle between the parallel route sections and between the internal western northbound section of the site access road and the L5125 junction, and can cause route alignment confusion of the two parallel routes. Head-light glare and dazzle and route alignment confusion can increase the risk of loss-of-control type collisions.

Recommendation:

Provide adequate type, density and height of site boundary screening of the proposed site access road including the vicinity of its junction onto the R446. It should be ensured that the type of screening does not adversely impact the horizontal or vertical visibility splays of the proposed site access junction.

3.8 Problem: Potential for collision due to inadequate road-side treatment aligning site access road/junction

No information has been provided for this audit of the constructed surface level, gradient or dimensions of the haunches/embankment aligning the proposed site access road relative to the surface level of the proposed site access road. Inadequate construction, dimensions and gradient of haunches/embankment can: increase the risk of high severity injury if road-users erroneously leave the carriageway of the site access road/junction; lead to deformation of the edge of the carriageway and subsequent loss-of-control collision; and, can reduce road-user forward visibility or clarity of proposed road signing. It is also unclear how the proposed road-side filter drains will provide adequate surface water drainage in this context and in relation to the proposed kerbing of the site access road. Inadequate surface water drainage can adversely affect road-user safety and increase the risk of collision, for example loss-of-control type collisions.

Recommendation:

Provide adequate road haunch/embankment treatment of the proposed site access road and junction, providing vehicle restraint measures as required. Ensure that road signing is clearly positioned taking account of the relative height of the site access road and ensure that adequate surface water drainage is provided for the proposed site access road and junction. A stage 2 road safety audit should be undertaken prior to construction.

3.9 Problem: Potential for excessive vehicle speed on the proposed site access road

Whilst the audit team acknowledge that the 14m width of the northern section of the proposed site access road (including the vicinity of the site access junction) is required for abnormal length vehicle access, the width of this section the site access road can increase the potential for excessive vehicle speed, increasing the risk of loss-of-control collision particularly in relation to the sharp curved alignment of this northern section of the site access road.

Recommendation:
The 14m width of the northern section of the site access road including in the immediate vicinity of the site access junction should be temporarily reduced (in width) during the operational phase of the development. Also provide speed reduction measures on the site access road during the operational phase of the development.

4 Audit Statement

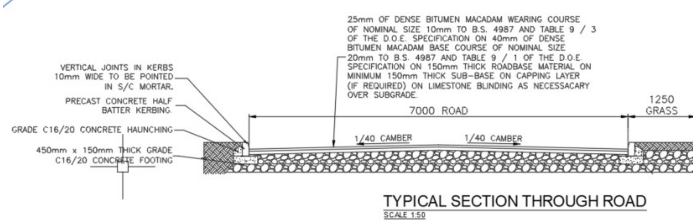
We certify that we have examined the documentation provided for the audit as detailed in Section 2 of this report, and visited the site as detailed in Section 1 of this report. The audit has been carried out in accordance with TII GE-STY-01024 (as amended by TII to take account of associated COVID-19 legislation) with the sole purpose of identifying any features of the design that could be removed or modified in order to improve the safety of the scheme. The problems that we have identified have been noted in this report, together with suggestions for safety improvement that in our opinion should be studied for implementation. The Audit has been conducted by the persons named below who are independent from the design team for the scheme.

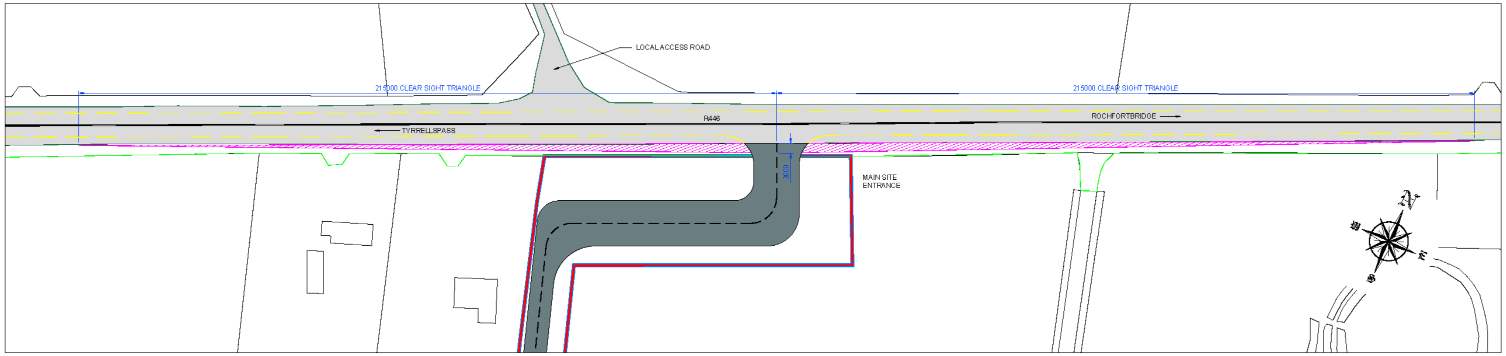
Matthew Steele (Audit Team Leader)	Signed:	Date: 15th September 2021
Pamela Townley (Audit Team Member)	Signed:	Date: 15th September 2021

Appendix A – Stage 1 Road Safety Audit Brief

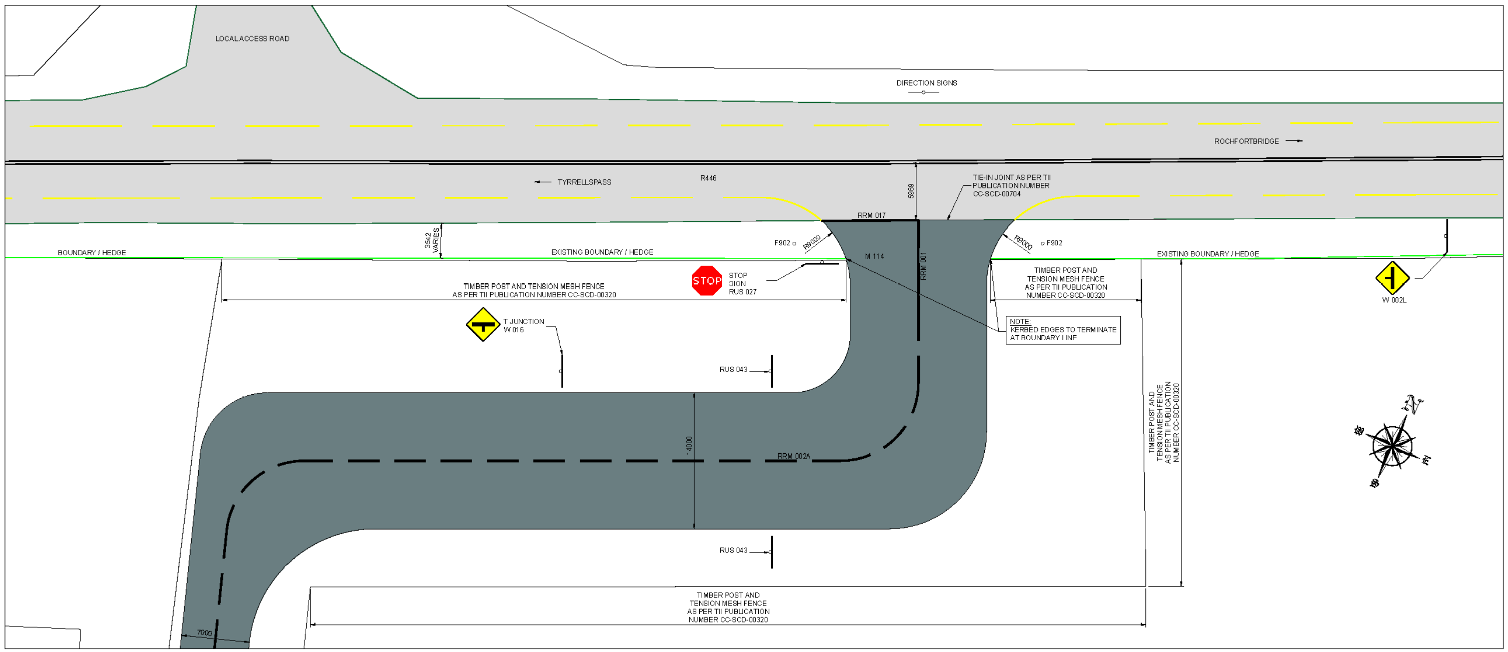
Scheme: Proposed Energy Generation and Storage Related Development at Kiltotan, Collinstown, Oldtown, Co. Westmeath

TII Checklist Item	**Yes/No/Not Applicable (N/A)**	**Comment**
Design Brief	Yes	Undertake a Stage 1 Road Safety Audit limited to the proposed design of the site access junction onto the R446 at Kiltotan for a proposed energy generation and storage related development.
Design Standard Applied	Yes	The proposed development will accord with TII standards.
Design Speed Applied	Yes	A design speed of 50km/h has been defined for the proposed site access junction onto the R446. The design speed applied for the R446 is 100km/h.
Departures from Standard	No	
Scheme Drawings	Yes	Documents prepared by Halston Environmental and Planning Ltd and provided to TTRSA by Halston Environmental and Planning Ltd on 23rd August 2021: • Drawing Title: 'Proposed Site Layout Sheet 1 of 3'; Drawing Number: 0347-PL-1002A Rev P2; dated 21.08.2021 Documents prepared by ECC Design and Engineering Ltd and provided to TTRSA by Halston Environmental and Planning Ltd on 1st September 2021: • Drawing Title: 'Proposed Access Road'; Drawing Number: 7760-003; dated 18.08.2021 Documents prepared by Halston Environmental and Planning Ltd and provided to TTRSA by Halston Environmental and Planning Ltd on 6th September 2021: • Drawing Title: 'Proposed Site Entrance and Junction Site Lines'; Drawing Number: 0347-PL-1003 Rev P2; dated 06.09.2021 • Drawing Title: 'Proposed Site Layout Sheet 1 of 3'; Drawing Number: 0347-PL-1002A Rev P3; dated 06.09.2021 Documents prepared by Halston Environmental and Planning Ltd and provided to TTRSA by Halston Environmental and Planning Ltd on 14th September 2021: • Drawing Title: 'Site Drainage Layout Sheet 1 of 2'; Drawing Number: 0347-PL-1004 Rev P1; dated Sept 2021
Other scheme details, e.g. signs schedules, traffic signal staging	No	

TII Checklist Item	**Yes/No/Not Applicable (N/A)**	**Comment**
Collision data for existing roads affected by the scheme	Yes	Road Safety Authority online collision data (for the period 2005 to 2016 inclusive) indicates that one minor collision resulting in injury was reported on the R446 regional road at the L5125 local road junction, westwards of the proposed site access junction. This minor collision occurred between 1600 and 1900 hours on a Sunday in 2006 involving a car in angle/both straight manoeuvre resulting in minor injury to one casualty. A further two collisions have been report further east and west of the proposed site access, comprising a minor collision further eastwards of the proposed site access occurring between1600 and 1900 hours on a Monday in 2006 involving a car in rear end/straight collision resulting in minor injury to one casualty, and a fatal collision involving a motorcyclist in a head-on collision further westwards of the proposed site access occurred between the hours of 1600-1900 on a Friday in 2005.
Traffic surveys	Yes	A 24-hour automatic traffic count survey was conducted on the R446 carriageway in the vicinity of the proposed site access for the proposed development on the 9th/10th September 2021. This traffic survey recorded an eastbound traffic volume of 1021 vehicles and a westbound traffic volume of 1022 vehicles.
Previous RSA Reports and Designer Responses /Feedback Form	No	
Previous Exception Reports	N/A	
Start date for construction and expected opening date	Yes	If planning is granted, the opening year for the proposed development is anticipated in year 2024/2025.
Any elements to be excluded from audit	No	
Any other information (list separately)	Yes	Information provided by Halston Environmental and Planning Ltd on 1st September 2021 for clarification of the proposed design: • The site access road will comprise the following typical highway cross-section: 



JUNCTION SIGHT LINES
SCALE 1:750



JUNCTION ROAD MARKINGS
SCALE 1:250

Rev.	Modifications	By	Date
P1	REVIEW ISSUE	BB	04.09.21
P2	REVIEW ISSUE	BB	06.09.21

NOTES:
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.

LEGEND:
- OWNERSHIP BOUNDARY
- PLANNING BOUNDARY
- 2.65m PALISADE FENCE OR AS NOTED
- POST AND RAIL STOCK FENCE OR AS NOTED
- NEW ROAD HOT ROLLED ASPHALT TO DOE SPECIFICATION FOR ROAD WORKS
- EXISTING PUBLIC ROADS

HALSTON

Email: info@halston.ie
Tel: 094 9010111

IHUB BUILDING
WESTPORT ROAD
CASTLEBAR
CO. MAYO.
F23 K162

Client	LUMCLOON ENERGY
Project	LEL FLEXGEN, CASTLELOST CO. WESTMEATH
Title	PROPOSED SITE ENTRANCE AND JUNCTION SITE LINES
Stage	PLANNING

Drawn	Checked	Approved
BB	WD	CS

Date	Sep 2021
Scales	As Shown (A1)
Sheet	1 of 1
Sheet Size	A1
Job No.	SEP-0347
Rev	P2
Dwg. No.	0347-PL-1003

Appendix B – Road Safety Audit Feedback Form

Scheme: Site Access Junction for Proposed Energy Generation and Storage Related Development
Location: Kiltotan, Collinstown, Oldtown, Co. Westmeath
Audit Stage: 1

To be completed by Design Team				To be completed by Audit Team Leader
Paragraph Number in RSA Report	**Problem accepted (Yes / No)**	**Recommended measures(s) accepted (Yes/ No)**	**Describe alternative measure(s). Give reasons for not accepting recommended measure. (Only to be completed if recommended measure is not accepted)**	**Alternative measures or reasons accepted by Audit Team (Yes / No)**
3.1	Yes	Yes		
3.2	Yes	Yes		
3.3	Yes	Yes		
3.4	Yes	Yes		
3.5	Yes	Yes		
3.6	Yes	Yes		
3.7	Yes	Yes		
3.8	Yes	Yes		
3.9	Yes	Yes		

Design Team Representative: (Halston Environmental and Planning Ltd)
PRINT NAME: Colm Staunton
(and) Signature:
Date: 20/09/2021

On behalf of scheme client: (Lumcloon Energy)
PRINT NAME: NIGEL REAMS
(and) Signature:
Date: 20/09/2021

Road Safety Audit signed of by:
Matthew Steele
BA(Hons) MSc FCILT FRGS MCIHT
(Audit Team Leader)
Signature:
Date: 20/09/2021