



Trinity
Consultants

awnconsulting

Attachment-4-8-1 Operational Report

CLIENT

Microsoft Ireland
Operations Limited

DOCUMENT REFERENCE

237501.0051FR01

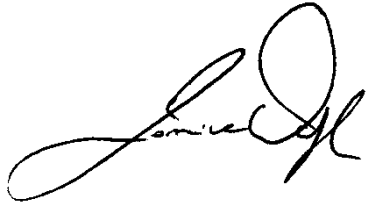
DATE

14 September 2026

DOCUMENT CONTROL SHEET

Document Control Sheet	
Our Reference	237501.0051FR01
Original Issue Date	14 September 2026
Client:	Microsoft Ireland Operations Limited
Client Address:	70 Sir John Rogerson's Quay, Dublin 2

Revision	Revision Date	Description

Details	Written by	Approved by
Signature		
Name	Lorraine Walsh	Jonathan Gauntlett
Title	Senior Environmental Consultant	Associate
Date	14 September 2026	

Disclaimer

This report considers the specific instructions and requirements of our client. It is not intended for third-party use or reliance, and no responsibility is accepted for any third party. The provisions in this report apply solely to this project and should not be assumed applicable to other developments without review and modification.



TABLE OF CONTENTS

1. INTRODUCTION	3
1.1 Site Context	4
2. PLANNING AND DEVELOPMENT TIMELINES	5
2.1 Planning Permissions Related to Main Activity.....	5
2.2 Additional Permits	6
2.2.1 Greenhouse Gas Emissions Permit	6
2.3 Development Timeline	6
3. DESCRIPTION OF ACTIVITY	7
3.1 Primary Processes/Activities	7
3.1.1 Data Centre Buildings	7
3.1.2 Emergency Generators	7
3.1.3 Data Centre Cooling Systems	8
3.1.4 Cooling Water Supply and Water Treatment Plant.....	9
3.2 Secondary Processes/Activities	11
3.2.1 Ancillary Infrastructure	11
3.2.2 Liquid Fuel Supply and Usage.....	11
3.2.3 Electrical Supply and Usage	12
3.2.4 Water Supply Infrastructure	12
3.2.5 Wastewater Drainage Infrastructure	13
3.2.6 Stormwater Drainage Infrastructure.....	13
4. BEST AVAILABLE TECHNIQUES AND COMMISSION IMPLEMENTING DECISION	17
5. MANAGEMENT OF RAW MATERIALS, INTERMEDIARIES AND WASTES	18
5.1 Raw Materials Management	18
5.1.1 Liquid Fuel Storage (LFO) (HVO/Diesel)	18
5.1.2 Water Treatment Plant Chemicals	20
5.1.3 Ancillary Raw Materials	20
5.2 Intermediates and Products	20
5.3 Waste Management	20
5.3.1 Non-Hazardous Waste Storage Areas.....	21
5.3.2 Maintenance Waste and Equipment Changeout.....	21
5.3.3 Hydrocarbon Interceptor Cleaning	21
5.3.4 Emergency Generator Stack Wastewater	22
5.4 Fuel and Chemical Handling.....	22
5.4.1 Fuel Delivery.....	22
5.4.2 Water Treatment Chemical Delivery	23
5.4.3 Alarm Response and Spill Management Procedures	23
5.5 Control of Major Accident Hazards Status	23
5.5.1 Assessment of Qualifying Quantities	23
5.5.2 HVO Fuel and COMAH Status	24
6. EMISSIONS AND ABATEMENT TREATMENT SYSTEMS	25
6.1 Emissions to Atmosphere.....	25
6.1.1 Air Emissions	25
6.1.2 Treatment and Abatement Systems	26
6.1.3 Control and Monitoring	26
6.2 Wastewater Emissions	27
6.2.1 Emissions	27
6.2.2 Treatment and Abatement Systems	28

6.2.3	Control and Monitoring	28
6.3	Stormwater Emissions	28
6.3.1	Emissions	28
6.3.2	Treatment and Abatement Systems	28
6.3.3	Control and Monitoring	29
6.4	Noise Emissions	29
6.4.1	Emissions	29
6.4.2	Treatment And Abatement Systems	30
6.4.3	Control And Monitoring	30
6.5	Greenhouse Gas Emissions	30
6.5.1	Emissions CO ₂	30
6.5.2	Mitigation	32
6.5.3	Control and Monitoring	32
6.6	Emissions to Ground	33
7.	MANAGEMENT AND PROCESS CONTROL SYSTEMS	34
7.1	Environmental Management Plan (EMP)	34
7.2	Energy Efficiency Management System (EnEMS)	34
7.3	Building Management System and Electrical Power Monitoring System	35
7.4	Electrical Power Monitoring System	35
7.5	Accident Prevention Procedure (APP)	36
7.6	Emergency Response Procedure (ERP)	36
7.7	Preventative Maintenance Programme	37
7.8	Fire Management	37
8.	CESSATION OF ACTIVITY	39
8.1	Site Closure	39
8.2	Baseline Report	39
9.	ENVIRONMENTAL IMPACT ASSESSMENT REPORT	40
10.	PROJECT ALTERNATIVES	41
10.1	Do-Nothing Alternative	41
10.2	Alternative Processes	41
10.3	Alternative Locations and Layouts	41
10.4	Alternative Mitigation	42

1. INTRODUCTION

This Operational Report relates to the Microsoft Ireland Operations Limited ("MS Ireland" or 'the Applicant') data storage facility (the subject 'Installation' under this licence application), located at Huntstown Data Centre Campus, North Road, Coldwinters, Dublin 11. The site location and Industrial Emissions (IE) site boundary is shown on Drawing Ref. 24_175-CSE-XX-00-DR-C-0001 included with this application. The application relates to the Installation that covers c. 11.97 hectares (ha) in total ('the Site').

The proposed licenced Installation will comprise the following main elements (see further details in Section 3 of this report):

- ▶ 2 no. data halls, referred to as Building A and Building B, each include emergency generators located in adjacent generator yards east and west of the building.
- ▶ Water Treatment Plant and associated plant
- ▶ Ancillary elements of the development, including mechanical and electrical galleries, ancillary offices including meeting rooms, workshop spaces, staff areas including break rooms, toilets, shower/changing facilities, storage areas, lobbies, loading bays and docks, photovoltaic panels and screened plant areas at roof levels, circulation areas and stair and lift cores throughout, sprinkler tanks, pump house, fire sprinkler pumps, security and utility spaces, underground foul and stormwater drainage networks, attenuation systems, an internal road network, and site landscaping.
- ▶ Once fully operational, the Installation will employ approximately 225 full-time staff.

The proposed licenced Installation and associated site infrastructure is shown on Drawing Ref. 24_175-CSE-XX-00-DR-C-0002 included with the application.

Under normal operating conditions, the Data Centre will be supplied with electricity via the 220 kV Substation (known as "Mooretown") located to the west of the site. The emergency generators provide a backup electrical supply to maintain operation of the Data Centre and associated critical infrastructure in the event of an interruption to, or instability in, the site's electricity supply. The generators will operate to provide power to the facility until normal electricity supply arrangements are restored. Outside of emergency situations, operation of the generators is limited to routine testing and maintenance activities.

The relevant requirement for an Industrial Emissions (IE) Licence is Activity Class 2.1 of the First Schedule of the Environmental Protection Agency EPA Act 1992 (as amended) (EPA Act 1992). Activity Class 2.1 states: *Combustion of fuels in installations with a total rated thermal input of 50 MW or more.*

The Installation will include the following combustion emission sources listed in Table 1.1 below.

Table 1.1 Installation Combustion Plant

Emission Point	Description ^(a)	Quantity	Rated Thermal Input (MW _{th}) Per Unit	Stack Height (m)
A3-1 to A3-28	Building A Emergency Generator	28	8.42	31
A3-29	Building A Admin Emergency Generator	1	2.53	31
A3-30 to A3-57	Building B Emergency Generator	28	8.42	31
A3-58	Building B Admin Emergency Generator	1	2.53	31
A4-1	Water Treatment Plant (WTP) Generator	1	0.83	-
A4-2 and A4-3	Fire Sprinkler Pump	2	0.42	-

- a. Please note that some terms are used interchangeably throughout this Application in reference to the site's combustion / generation plant. For the purposes of EPA licensing and applicable regulations: the emergency

generators, emergency admin generators, water treatment plant generators, and fire sprinkler pumps are all 'diesel engines'.

1.1 Site Context

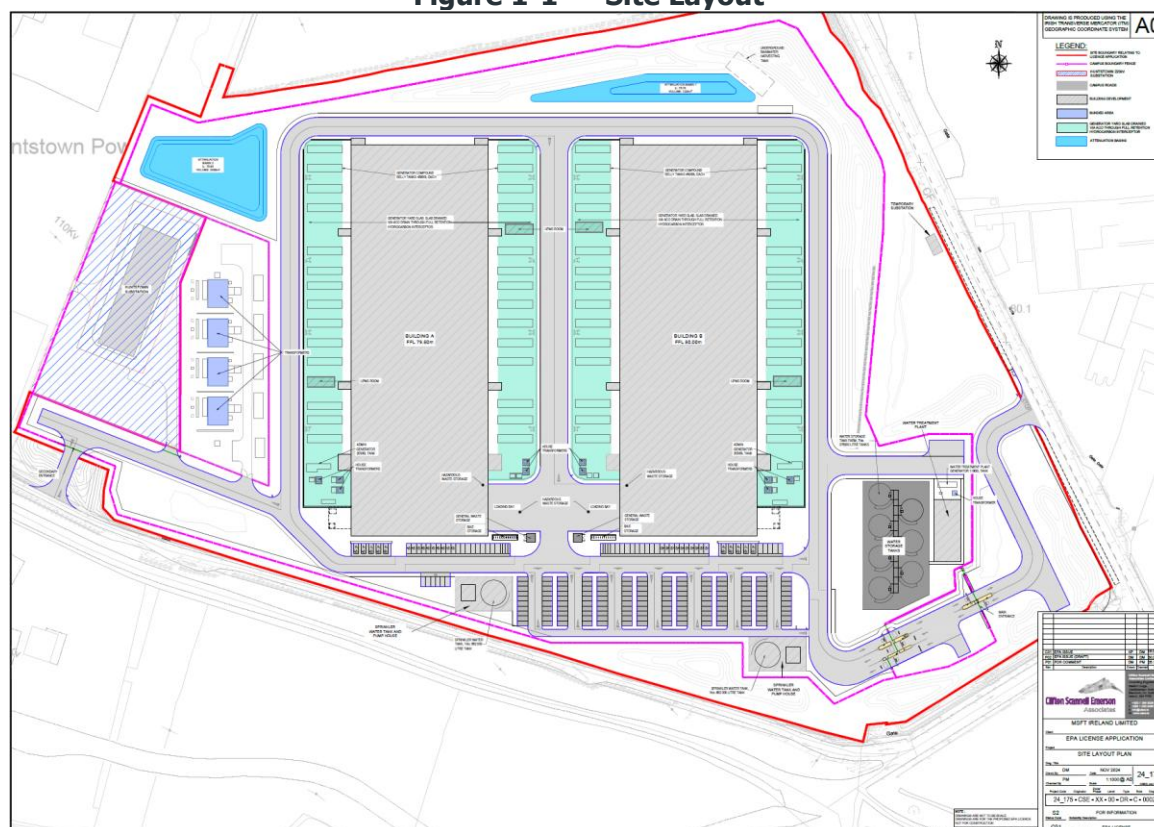
The site comprises c. 11.97 ha of land shown in **Figure 1-1** and is located northwest of the M50 orbital ring in the townland of Huntstown, North Road, Finglas, Dublin 11. It lies approximately 1 kilometre from the M50/N2 interchange, within Fingal County. Historically comprising predominantly agricultural and undeveloped lands, the site is currently undergoing construction works associated with the permitted development.

The surrounding context is characterised by a variety of energy, industrial, commercial, quarrying, agricultural and residential uses. The subject site is generally bounded to the north by the Dogs Trust (Dog Rescue and Rehoming Charity), to the south by a vehicular entrance leading to the Huntstown Quarry and further southwest by an Anaerobic Digestion Plant, to the east by the North Road (R135) and two residential properties fronting the R135 which form part of the subject site and to the west by Huntstown Power Station.

A number of large logistics warehouse parks are located to the northeast of the site including Dublin Airport Logistics Park and Vantage Business Park. Several small scale commercial and service uses are scattered along the frontages of the R135 including: a garden centre; veterinary clinic and car repair facility.

A drainage ditch located on the western site boundary separates the subject site from the adjoining Huntstown Power Plant. Underground electricity infrastructure associated with the Finglas 220 kV Substation complex is located within the site, following the undergrounding of the former 110 kV and 38 kV overhead transmission lines that previously traversed the site in a north-south direction (Reg. Ref: FW21A/0144). The underground utility wayleave is illustrated on Drawing Ref. 24_175-CSE-XX-00-DR-C-0001.

Figure 1-1 Site Layout



2. PLANNING AND DEVELOPMENT TIMELINES

2.1 Planning Permissions Related to Main Activity

All planning permissions that are relevant to this Licence application under Class 2.1 of the EPA Act 1992 (as amended) have been granted by Fingal County Council (FCC) and An Bord Pleanála (ABP) (refer to Section 6 of this licence application).

Table 2.1 Planning Permissions

Application Details	Description of Development
Fingal County Council (FCC Reg Ref: FW21A/0151) Final Grant: 21-Mar-2025 under ABP 313583-22	Demolition of 2 no. existing residential dwellings and ancillary structures to the east of the site (c.344qm total floor area); Construction of 2 no. data hall buildings (Buildings A and B) comprising data hall rooms, mechanical and electrical galleries, ancillary offices including meeting rooms, workshop spaces, staff areas including break rooms, toilets, shower/changing facilities, storage areas, lobbies, outdoor staff areas, loading bays and docks, associated plant throughout, photovoltaic panels and screened plant areas at roof levels, circulation areas and stair and lift cores throughout; External plant and 58 no. emergency generators located within a generator yard to the east and west of Buildings A and B at ground level. The area is enclosed by a c.6.5m high louvred screen wall; The proposed data halls (Buildings A and B) are arranged over 3 storeys with a gross floor area of c.37,647sqm each; The overall height of the data hall buildings is c28m to roof parapet level and c32m including roof plant, roof vents and flues. The total height of Buildings A and B does not exceed 112m OD (above sea level); The proposed development includes the provision of a temporary substation (c.32sqm), water treatment building (c. 369sqm and c.7.7m high), 7 no. water storage tanks (2,800m³ in total and c.6.4m high each), 2 no. sprinkler tanks (c.670m³ each and c.7.9m high each) with 2 no. pump houses each (c.40sqm and c. 6m high each); The total gross floor area of the data halls and ancillary structures is c.75,775sqm; All associated site development works, services provision, drainage upgrade works, 2 no. attenuation basins, landscaping and berming (c.6m high), boundary treatment works and security fencing up to c.2.4m high, new vehicular entrance from the North Road, secondary access to the south west of the site from the existing private road, all internal access roads, security gates, pedestrian/cyclist routes, lighting, 2 no. bin stores, 2 no. bicycle stores serving 48 no. bicycle spaces, 208 no. parking spaces including 10 no. accessible spaces, 20 no. electric vehicle charging spaces and 8 no. motorcycle spaces; Existing electricity overhead lines traversing the site will be undergrounded under concurrent application Ref. FW21A/0144;
SID ABP 311528-21 Final Grant 21-Mar-2025	Construction of a two storey 220 kilovolt Gas Insulated Switchgear (GIS) substation known as 'Mooretown' comprising switchgear floor, cable pit/entry room, generator room, relay room, battery room, workshop, toilet, store room, mess room, hoist space, stair cores and circulation areas (circa 2,068 square metres total gross floor area) with an overall height of circa 17 metres located within an overall EirGrid and customer compound (circa 11,231 square metres in area). Lightning electrodes are attached to the roof of the substation building resulting in an overall height of circa 20 metres. The compound includes four number 220/20 kilovolt transformers, four number 20 kilovolt switchgear buildings and one number 20 kilovolt control room buildings (circa five metres high and circa 35.5 square metres in area each), 220 kilovolt series coil (equipment), fire walls (ranging from circa ten metres - 12.5 metres high), lightning finials and monopoles (circa 20 metres high). The overall compound is surrounded by a circa 2.6 metres high palisade fence. The proposed substation will serve the data centre proposed under concurrent application reference: FW21A0151 The underground cable (Cable Number One) will follow a route originating at the proposed Mooretown Substation extending south and then west along the private road connecting the North Road with Huntstown Power Station and Huntstown Quarry. The route terminates at a proposed joint bay on the existing Corduff cable route. The underground cable (Cable Number Two) will follow a route originating at the proposed Mooretown Substation Compound/series coil extending south across the internal road connecting the North Road with Huntstown Power Station and Huntstown Quarry. The route terminates at a proposed joint bay on the existing Finglas cable route. Removal of the redundant sections of the 220 kilovolt Corduff cables and 220 kilovolt Finglas cables serving the existing air insulated

	switchgear bay to Huntstown Power Station. The underground cable (Cable Number 3) will follow a route originating at the Mooretown air insulated switchgear substation extending south and then west to the adjacent existing Electricity Supply Board Huntstown A air insulated switchgear station. The route terminates in the Electricity Supply Board Huntstown A air insulated switchgear station. The underground cable (Cable Number Four) will follow a route originating at the Mooretown air insulated switchgear substation extending south and then west to the adjacent existing Huntstown B air insulated switchgear station. The route terminates in the Electricity Supply Board Huntstown B air insulated switchgear station ; The development includes all associated and ancillary site development and construction works, services provision, drainage works, connections to the substations, all internal road/footpath access routes, landscaping and boundary treatment works, vehicular access onto the private road to the south of the site and provision of nine number car parking spaces in the overall compound.
FCC Reg Ref: FW21A/0144 Final Grant: 11 Nov 2021	The development will consist of the installation of electrical infrastructure between Finglas substation and Huntstown Power Station to facilitate the retirement of existing Electricity Supply Board overhead powerlines and facilitate site clearance for the future development of a data centre and substation (subject to separate planning applications). This will include (i) the installation of approximately three underground cable circuits of 1.2km length (110kV) and one circuit 1.2km length (38kV) and associated underground ducting, joint bays and infrastructure between the existing ESB Finglas substation and an agreed location within Huntstown Power Station (ii) installation of one c.28m double circuit 110 kV cable end tower and one c.17 single circuit 110kV angle mast (iii) removal of 10Nr. existing 110kV timber polesets, 9 Nr. existing 38kV timber polesets, 3 Nr. 38kV lattice steel tower & associated overhead line electrical infrastructure; all associated and ancillary site development, landscaping and construction works, all within the townlands of Johnstown, Huntstown, Coldwinters & Baleskin at Blanchardstown & Finglas, County Dublin.

2.2 Additional Permits

2.2.1 Greenhouse Gas Emissions Permit

At the time of writing, an application for a greenhouse gas emissions permit under the European Union Emissions Trading System (EU ETS) has been submitted for the Installation. The application is currently under review by the EPA and has not yet been granted.

2.3 Development Timeline

Due to the scale and complexity of the Installation, the Installation will undergo a staggered commissioning process, with phased construction completion and operational ramp-up across the various development elements. Main construction works are currently ongoing for all elements of the development.

An overview of the projected timelines is provided in Table 2.2 below.

Table 2.2 Estimated Development Timeline

Development	Estimated Ready for Operational Commencement
Building A	Q2 2028
Building B	Q2 2029

3. DESCRIPTION OF ACTIVITY

3.1 Primary Processes/Activities

3.1.1 Data Centre Buildings

The overall purpose of the Installation is to provide a secure location for data storage. Upon completion, the data centre buildings, Building A and Building B, will house IT equipment, servers and associated technical infrastructure required to support the delivery of secure, reliable and scalable digital services. The Installation will form part of Microsoft's wider cloud infrastructure network, enabling the storage, processing and transmission of digital information and supporting a broad range of business, public sector and consumer services. Data centres provide highly resilient, secure and energy-efficient computing environments through the use of redundant systems, advanced security measures and purpose-built infrastructure.

The Installation will include two separate data centre buildings:

- ▶ Building A will be a three-storey data centre building with a gross floor area of 37,647sqm. It will include 28 emergency generators within the generator yard to the east and west of the building.
- ▶ Building B will be a three-storey data centre building with a gross floor area of 37,647sqm. It will include 28 emergency generators arranged within the generator yard to the east and west of the building.

Each data centre building will incorporate a range of functional spaces to support facility operations. These will include IT equipment rooms (data halls), electrical and mechanical plant rooms, loading bays, maintenance and storage areas, and office and administrative support spaces. Roof-level plant will be photovoltaic (PV) panels and plant areas.

The data centres will be equipped with power, cooling, and connectivity technologies, alongside robust security measures to ensure strict control over access to stored information. The IT hardware and associated equipment generate significant heat, which must be effectively managed by the cooling systems.

The primary power demands arise from operating the IT hardware within the two data halls and the air-handling units responsible for regulating temperature and humidity. Maintaining a consistent temperature is critical for the reliable operation of the IT hardware.

Ireland's temperate climate is particularly well-suited for data centre operations, as demonstrated by numerous existing facilities across the country. The naturally cool ambient temperatures reduce the cooling requirements compared to facilities located in regions with more extreme temperature and humidity fluctuations.

Each data centre will operate on a 24/7 basis, with staff working in shifts to ensure continuous monitoring and operational support. Reduced staffing levels will be present during night shifts, but essential personnel—including operations, engineering, and security staff—will be available at all times. In addition to permanent staff, there will be ad-hoc attendance by maintenance contractors and approved visitors as required. On-site security and operational teams are in place around the clock to ensure immediate response to any incident.

3.1.2 Emergency Generators

The data centre buildings, Building A and Building B, are supported by containerised (enclosed) emergency generators located on either side of each building. These generators are designed to provide immediate backup power to maintain operation of the data centre and associated critical infrastructure in the event

of an interruption to the site's electricity supply. An uninterruptible power supply (UPS) system is also provided to ensure continuity of power during the transition from mains electricity to the emergency generators.

The data centre buildings include the following emergency generators dedicated to each building:

- ▶ Building A: 28 no. 8.42 MW_{th} emergency generators, each with an associated flue extending to approximately 31 metres in height. Up to 28 emergency generators will run simultaneously during a power outage.
- ▶ Building B: 28 no. 8.42 MW_{th} emergency generators, each with an associated flue extending to approximately 31 metres in height. Up to 28 emergency generators will run simultaneously during a power outage.

Fuel for the emergency generators (either HVO or diesel) is stored locally at each unit. Each emergency generator has an individual double-skinned Belly Fuel Tank that are equipped with level gauges (high and low) within the fuel tanks. These are connected to an onboard controller which will alarm to prevent overfilling and identify a sudden loss of fuel within the tank. No centralised bulk fuel storage or tank farm is provided for these generators. A fuel refilling cabinet is provided at each generator along the access road that includes drip trays to capture any potential spills, thereby reducing the risk of environmental contamination during refuelling. Fuel is delivered by road tanker to the refilling cabinet, from which it is transferred to the Belly Fuel Tanks.

Each generator will be served by a Belly Fuel Tank with a maximum storage capacity of 45,000 litres, providing approximately 48 hours of operation. Further information on fuel storage capacity and containment systems is provided in Section 5.1.1.

In the event of an emergency generator fault or abnormal condition, all system alarms are linked to the site's Building Management System (BMS), which is monitored 24/7 by on-site personnel in the Critical Facilities Operations Centre (CFOC), ensuring immediate response to any issue. Additionally, each unit operating hours can be tracked using through the genset control panel.

The UPS systems are contained in separate battery rooms of each cell. The UPS system is designed to operate for up to 1 minute to allow time for the emergency back-up generators to start up and stabilise. The system runs on multiple UPS systems and if one area fails, the remaining UPS systems immediately pick up the extra load. For 10 seconds, those UPSs carry the higher load until the flex controller automatically reduces server power consumption. The total IT load is brought down to 2.4 MW (megawatts), which is a level the remaining UPS systems can safely support.

Any rainwater entering the emergency generator exhaust stacks, along with condensate generated from the cold surfaces of the stacks, has the potential to come into contact with combustion residues. This wastewater is drained to prevent pooling in low spots of the stack, which could cause corrosion over time. As a precaution, this water is collected at the low point of each stack and directed into a 1,250 litre containment tank located at the base of each flue tower. There is no discharge directly to the stormwater or foul water network from these containment tanks. In total, there are 16 flue towers, giving a total of 16 × 1,250 litre tanks. See further Section 5.3.4 on waste management.

3.1.3 Data Centre Cooling Systems

The data centre buildings, Building A and Building B, operate using the same cooling system design. The data centre hardware and associated ancillary equipment produces heat which must be managed by the cooling system. Heat generated by the IT equipment and associated ancillary systems is managed through a combination of free cooling and evaporative cooling technologies.

In order to achieve high levels of energy efficiency, the cooling system operates in two distinct modes:

- ▶ Free Cooling Mode (c. 99% of a typical year): Under normal operating conditions, the AHUs utilise ambient external air to remove heat from the data halls without the need for evaporative cooling. This mode is expected to provide the primary means of cooling throughout the year due to Ireland's temperate climate.
- ▶ Evaporative (Adiabatic) Cooling Mode (<1% of a typical year): During periods of elevated ambient temperatures, Indirect Evaporative Cooling (IEC) systems integrated within the AHUs is utilised to maintain the required data hall temperatures. In this mode, water is sprayed onto wetted media pads located within the incoming air stream. The evaporation of water from the media pads reduces the temperature of the incoming air, thereby enhancing the cooling capacity of the system. This mode is expected to operate infrequently and will predominantly utilise recycled rainwater.

The data processing buildings have been designed to operate at the warmest practical conditions in order to create a system where the internal data areas are operating at a warmer temperature than the local external ambient temperature. The cooling systems have been designed and optimised to these warmer conditions such that they do not require chillers. All the fan motors within the indirect mass air free cooling air handling units utilise EC (electrically commutated) DC motor technology with variable speed control. This ensures the air handling units also benefit from the ability to be efficiently "turned down" to accurately match the demand. EC fans are typically 20% more efficient than conventional AC fans and motors. The fans meet the highest applicable European fan/motor efficiency ratings.

There will be a cooling water demand which will be achieved through rainwater harvesting with a backup mains water supply. The rainwater will be treated and supplied as cooling water from the water treatment plant and stored in tanks adjacent to the water treatment plant building until it is needed for cooling. The cooling water is recirculated through the cooling systems during normal use up to 5 times and is continuously monitored for conductivity while within the system. The cooling water that is not recovered for reuse is pumped off to the foul sewer system through a controlled bleed off.

The annual water consumption for the site including the cooling system is detailed in the water and energy use section of the application (Attachment 4-6-1 Water Energy Usage). The water use will be monitored by the Building Management System (BMS). All alarms are connected to the site's BMS, which is continuously monitored 24/7 by trained on-site staff. This ensures that any abnormal condition is responded to immediately.

In addition to the main data hall cooling systems, the data centre also contains a number of smaller Refrigerant Air Conditioning systems, which are distributed throughout switchrooms, electrical rooms, administration areas, battery rooms and plant rooms. These auxiliary systems are designed to provide localised temperature control. They operate using small quantities of refrigerant with a Global Warming Potential of 675 or less.

3.1.4 Cooling Water Supply and Water Treatment Plant

There will be a single storey water treatment plant and associated tanks located to the east of the data centre buildings. The system is designed to maximise the use of harvested rainwater and recovered process water to minimise the dependence on the mains water supply. There are three inputs to the plant; harvested rainwater, mains supply and the recovered blowdown from the air handling units (AHUs). Please refer to Figure 3-1 Schematic of Water Treatment Plant.

Rainwater Harvesting System

An underground rainwater harvesting tank north of Building B collects runoff from the roof of Building B and the non-risk impermeable surface of the generator yard, see Section 3.2.6 for further information. This rainwater then flows from the underground tank into a 10m³ rainwater storage tank in the water treatment plant building. This rainwater is then disinfected using UV treatment before passing through two stages of filtration that remove suspended solids, organic matter, and colour. Once filtered, the

rainwater is stored in a 10m³ water storage tank in the water treatment plant building, where it is mixed with the mains water supply to guarantee there is always water available to the main treatment plant.

Mains Water Supply

The mains water supply mixes with the filtered rainwater in a 10m³ water storage tank in the water treatment plant building. This water is disinfected by UV Treatment which will neutralise any pathogens in the water and reduce the chance of biofilm forming on the equipment downstream. It is then passed through a duplex reverse osmosis system where anti-scalant and sodium bisulphite are dosed into the water. Anti-scalant and sodium bisulphite will be stored in 1m³ tanks in the water treatment plant building. After treatment, the water is remineralised and adjusted to the required pH and conductivity before being stored in the seven above ground process water storage tanks. These tanks have a capacity of 375m³ each and are located to the west of the Water Treatment Plant building.

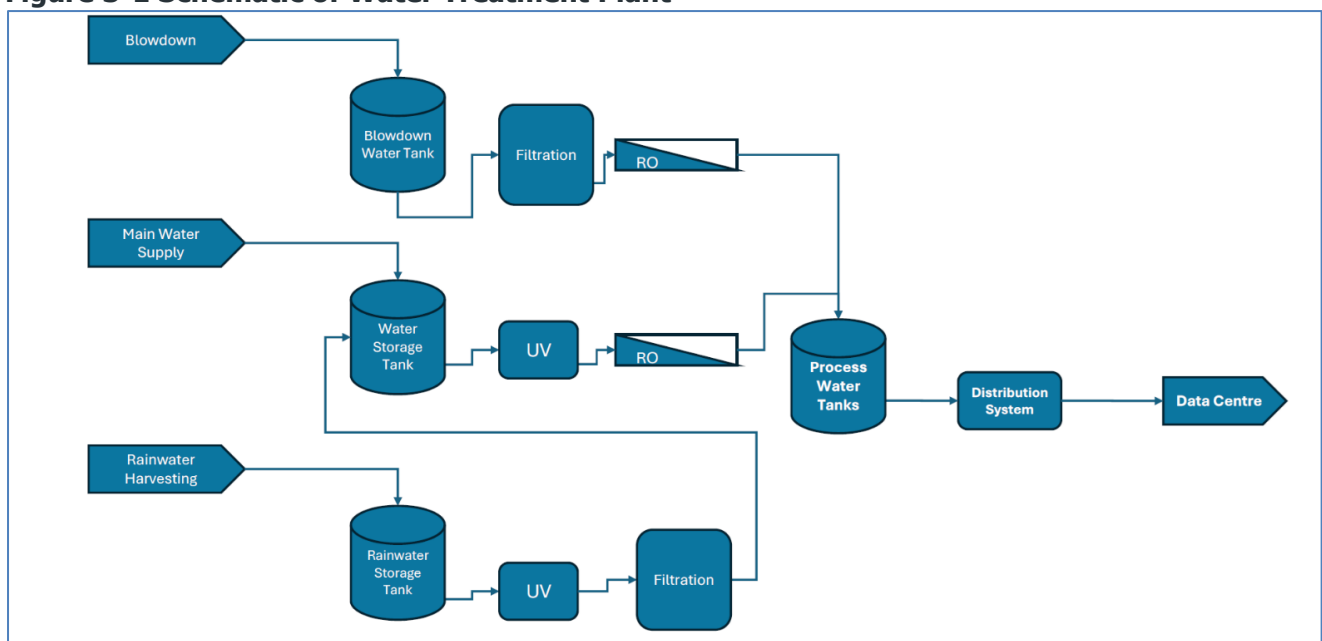
As water needs to be stored for extended periods, the design includes measures to maintain water quality. To guarantee microbiological safety and prevent biofilm formation during long term storage, the water will be recirculated, and each stream's recirculation line will have a chlorination disinfection system with onsite generation of sodium hypochlorite. On-site sodium hypochlorite generation uses electrolysis of a simple brine solution which allows the production of a safe, stable liquid disinfectant without the hazards of handling bulk chemicals. Before periods of high demand, the stored water can be recirculated through the treatment plant again in a polishing process to restore water quality and reduce any increase in conductivity that may have occurred during storage. Any discharge from the reverse osmosis units from this process is sent to the blowdown water tank for treatment and recovery.

Blowdown Recovery

Blowdown water returning from the AHUs is collected in a 10 m³ blowdown water tank located within the water treatment plant building. The blowdown water undergoes filtration, softening and reverse osmosis treatment before being returned to the process water storage tanks located west of the water treatment plant building for reuse within the cooling system.

While the majority of the blowdown water is recovered and recycled, approximately 25–30% of the blowdown water is ultimately discharged to the foul sewer.

Figure 3-1 Schematic of Water Treatment Plant



3.2 Secondary Processes/Activities

3.2.1 Ancillary Infrastructure

The Installation will be supported by a range of ancillary infrastructure and utilities designed to ensure safe, efficient, and continuous operation. These include:

- ▶ Electrical infrastructure, comprising electrical substation rooms, switch rooms, and transformers to support power distribution across the site;
- ▶ Fire protection systems, including fire sprinkler pumps and fuel tanks, sprinkler tanks, a pump house, and associated utility compounds to support fire suppression and safety;
- ▶ Underground infrastructure, consisting of water supply lines, underground foul and stormwater drainage network with associated attenuation systems to manage runoff and maintain water quality;
- ▶ Underground utilities, such as ducting and electrical cabling, to provide connections between core buildings and infrastructure elements;
- ▶ Internal access roads, forming a dedicated road network to facilitate safe vehicle circulation for both operational and maintenance purposes, and car parking to support staff and operational needs;
- ▶ Hard and soft landscaping to support site integration and visual screening;
- ▶ Security and site infrastructure, incorporating external lighting, fencing, CCTV, access control systems, and site signage; and
- ▶ 1 no. transformer compound located to the west of Building A with associated control room (operated by Microsoft).

3.2.2 Liquid Fuel Supply and Usage

Hydrotreated Vegetable Oil (HVO) is now used on all MS Ireland sites (when available) to power backup emergency generators. MS Ireland is committed to operating all of their data centres on the basis of net zero greenhouse gas (GHG) emissions. HVO has the advantage of GHG emission reductions of greater than 75% compared to fossil-fuel derived diesel and thus will contribute to achieving net zero GHG emissions by 2050 in line with Irish and EU targets.

MS Ireland use HVO suppliers that can provide Proof of Sustainability (PoS) under the Renewable Energy Directive (RED) Voluntary Scheme system. Ireland does not have its own national RED certification scheme so compliance must be demonstrated through a European Commission approved scheme or the national scheme of another Member State such as the International Sustainability and Carbon Certification (ISCC) or similar.

Under the PoS the HVO Feedstock is certified to ensure that it meets the definition of waste or residue under the REDIII Directive. At present, Microsoft utilises Certa as a supplier of HVO Fuel. Certa's current supplies of HVO are derived from used cooking oil (UCO).

Under the PoS the HVO Feedstock is fully traceable and is certified to ensure that it meets the definition of waste or residue under the Renewable Energy Directive (RED II) – Directive (EU) 2018/2001 as amended by Directive (EU) 2023/2413 (RED III). Each proof of sustainability confirms: production facility, raw material origin and type, supplier, traceability and the ability to sell into the market.

There is currently no significant commercial HVO fuel production in Ireland. The fuel is produced outside Ireland and imported into Ireland as a finished product. Since the imported HVO fuel is a product, and not a waste, its use as fuel does not fall within the scope of the Waste Framework Directive. HVO fuel complies with EN 15940 standards (paraffinic diesel fuel).

The Installation will utilise HVO as its primary fuel wherever available. However, to ensure operational resilience and security of supply, the facility will retain the capability to operate on conventional diesel if required. HVO will therefore represent the standard operational fuel, with diesel serving as a contingency or back-up fuel only.

The maximum annual liquid fuel usage is up to 3,840 tonnes of HVO per year (or 4,200 tonnes if only diesel was used). This is highly conservative; it is based on engine operation at 100% load and assumes the following operational hours:

- ▶ 106 hours per engine per year (emergency, testing and maintenance) per engine for the 58 no. emergency generators.

This calculation approach overestimates fuel usage, as it assumes sustained operation at high load and full utilisation of the maximum annual operating and testing hours. In practice, generator operation is limited to emergency events and the minimum testing necessary, and actual annual fuel consumption is expected to be significantly lower.

3.2.3 Electrical Supply and Usage

The incoming electrical supply connection for the Installation will be delivered via the 220 kV Gas Insulated Switchgear (GIS) Substation Compound known as Mooretown (Strategic Infrastructure Development Reference: ABP-311528-21), which is being constructed at the time of submission of this application. It will be located off-site to the western side of the site.

The 220 kV GIS substation building, and associated transmission infrastructure form part of the EirGrid transmission network and are located outside the IE licence boundary. EirGrid, in its role as Transmission System Operator (TSO), will be responsible for operation of the transmission network, while ESB Networks, as Transmission Asset Owner (TAO), will own the associated transmission assets

The Mooretown Substation benefits from a short grid connection are extremely efficient and combining the connections to the Corduff and Finglas 220kV substations to the southwest and west of the site, strengthens and increases resilience and redundancy of the existing electricity grid network in north Dublin.

Electricity will be supplied from the Mooretown Substation to the Installation via underground electrical connections. Within the IE licence boundary, the electrical infrastructure comprises four 220/20 kV transformers, four medium-voltage (MV) switchgear buildings and an MV control room. This equipment receives the incoming electrical supply, transforms the voltage for site use and distributes power throughout the Installation.

3.2.4 Water Supply Infrastructure

General potable supply will be required for domestic (drinking and sanitary facilities) as well as for industrial water uses (cooling water) and firefighting purposes. Water will be supplied to the Installation from the following sources:

- ▶ Public water supply (Uisce Éireann)
- ▶ Harvested rainwater
- ▶ Recovered blowdown water (refer to section 3.1.4)

The water supply infrastructure serving the site includes a connection to the Uisce Éireann (UÉ) watermain network within the R135. An incoming 200 mm diameter watermain will provide water to the Installation, including connections to the administration areas, water treatment plant and firewater storage infrastructure associated with the data centre development.

The Installation has been designed to minimise potable water demand through rainwater harvesting and water recovery systems, as described elsewhere in this report. There will be no abstraction of groundwater or surface water associated with the Installation.

Fire hydrants will be installed in accordance with the Building Regulations and the recommendations set out in Technical Guidance Document B – Fire Safety (2006). Fire sprinkler tanks will be provided on site

for the long-term storage of firefighting water; these tanks will be filled during commissioning and maintained in a state of operational readiness.

The UÉ Water Services Connection Agreement for the Installation is under CDS number 2000446801.

3.2.5 Wastewater Drainage Infrastructure

Foul wastewater generated by the Installation will comprise of:

- ▶ Domestic sewage generated from staff welfare facilities, including (but not limited to) toilets, showers and cleaning/maintenance washbasins from the administration area of the Data Centre Buildings
- ▶ Domestic wastewater arising from welfare facilities within the adjacent Mooretown GIS substation, and
- ▶ Process wastewater from the Water Treatment Plant (see wastewater emissions Section 6.2).

The domestic sewage from the Installation will be conveyed via internal drainage systems and connect via a new 150mm Ø gravity foul sewer to pumping station, PS1. The GIS substation domestic sewage will be directed to pumping station PS3 within the substation boundary, where a rising main will connect the wastewater to the 150mm Ø gravity foul sewer, combining with the Installation domestic sewage, to pumping station PS1. An 80mm Ø foul water rising main will connect the pumping station, PS1, to the single discharge manhole east of the Water Treatment Plant building where it will combine with the process wastewater from the Water Treatment Plant.

The cooling water discharge from the Data Centre Buildings will be conveyed via the network to pumping station PS2 north of Building B. A rising main will connect the cooling water discharge from PS2 to the Water Treatment Plant for recovery. The Water Treatment process wastewater comprises of wastewater from the maintenance of the water treatment system and spent cooling water discharge (25% - 30% will not be recovered) during extreme warm ambient days. This process wastewater will pass through monitoring point SE1-1 before combining with the domestic sewage.

The Installation foul wastewater will then discharge from the Installation at emission point SE1 and tie into the existing 225mm Ø sewer located in the R135 Regional Road to the east of the site. The sewer on the R135 road network ultimately connects to the wider Uisce Éireann (UÉ) foul sewer network, then to the Ringsend Wastewater Treatment Plant (WWTP), operated by UÉ, and licensed by the EPA under Industrial Emissions Licence Reg. No. D0034-02.

The UÉ Water Services Connection Agreement for the Installation is under CDS number 2000446801. A wastewater application has been submitted to Uisce Éireann, Application Ref. S99-PC-12791.

3.2.6 Stormwater Drainage Infrastructure

Stormwater management at the Installation has been designed by the project engineers in accordance with the requirements of FCC, the *Regional Code of Practice for Drainage Works*, and the *Greater Dublin Strategic Drainage Study*. Sustainable Urban Drainage Systems (SUDs) have been incorporated into the drainage design for the Installation.

Rainwater runoff from hardstanding surfaces will be collected via the newly constructed stormwater drainage network. There are two separate surface water drainage networks which will convey flows to the on-site stormwater attenuation systems, via hydrocarbon interceptors, prior to controlled discharge to the adjacent ditch. The stormwater attenuation basins have been designed to accommodate a 1:100-year storm event plus 10% for climate change adaptation.

Outflows from the attenuation basins will be restricted using hydrobrake flow control devices limiting discharge to the permitted flow rates of 12.0l/s from Attenuation Basin 1 and 16.5l/s from Attenuation Basin 2. An automatic penstock valve is installed at the emission point and is linked to the site fire alarm

system. In the event of an alarm activation, the penstock will automatically close, preventing stormwater from leaving the site.

Attenuated storm water discharges at SW1 to a drainage ditch which subsequently flows to the Huntstown Stream, then to the Ward River before discharging to the sea at Malahide Estuary over 15 river km downstream of the Installation.

For more information on the stormwater network layout refer to Drawing Ref. 24_175-CSE-XX-00-DR-C-0003.

Table 3.1 sets out the attenuation storage volumes, associated emission and monitoring points.

Table 3.1 Attenuation Storage and Emission Points

Feature	Attenuation Storage Volume (m3)	Offsite Emission	Monitoring Point
Basin 1	1,233	SW1 – Huntstown Stream	SW1-1 - Undertaken at discharge point
Basin 2	2,439	SW1 – Huntstown Stream	SW1-1 - Undertaken at discharge point

During the operational phase, there is potential for accidental hydrocarbon releases to enter the stormwater network and cause contamination if unmitigated. The primary risk relates to spills or failures involving liquid fuel (HVO/diesel). To mitigate this risk the Installation includes a number of hydrocarbon interceptors. Hydrocarbon interceptors are designed to contain and manage accidental hydrocarbon spills by capturing and separating hydrocarbons from stormwater runoff before it is discharged from the site. The interceptors' function by retaining hydrocarbons, which are lighter than water, within an impervious chamber, while allowing clean rainwater water to pass through. In the event of accidental spills, the hydrocarbons are trapped within the interceptor, preventing pollutants such as diesel or HVO from being discharged from the site. Two hydrodynamic solid separators will also be provided within the drainage network to screen rubbish, debris and sediment from the surface water runoff before it enters the attenuation basins. Table 3.2 sets out the type and class of the hydrocarbon interceptors that are shown on the stormwater network layout Drawing Ref. 24_175-CSE-XX-00-DR-C-0003.

All hydrocarbon interceptors are fitted with high liquid level alarm system that alerts when the interceptors oil storage is at capacity. The alarm will be installed, tested, commissioned and regularly serviced by a qualified technician. All hydrocarbon interceptors will be maintained and cleaned out (if required) every 6 months in accordance with manufacturers guidelines. Oil/fuel accumulated in hydrocarbon interceptors will remain in the tanks until removal by a specialist contractor (see Section 5.3.3).

Table 3.2 Schedule of Hydrocarbon Interceptors

Interceptor	Class	Type
Hydrocarbon Interceptor FRS 01	Class 1	Full Retention
Hydrocarbon Interceptor FRS 02		Full Retention
Hydrocarbon Interceptor FRS 03		Full Retention
Hydrocarbon Interceptor FRS 04		Full Retention
Hydrocarbon Interceptor FRS 05		Full Retention
Hydrocarbon Interceptor FRS 06		Full Retention
Hydrocarbon Interceptor FRS 07		Full Retention
Hydrocarbon Interceptor FRS 08		Full Retention
Hydrocarbon Interceptor FRS 09		By-Pass
Hydrocarbon Interceptor FRS 10		By-Pass
Hydrocarbon Interceptor FRS 11		Full Retention
Hydrocarbon Interceptor FRS 12		By-Pass

Building A Stormwater Management

- ▶ Rainwater from the roof of Building A is collected via a series of downpipes located on the eastern and western sides of the building and conveyed directly to Basin 2. No hydrocarbon interceptor is required for this roof drainage network.
- ▶ Stormwater drainage serving the house transformers and internal building areas (sprinkler discharge, if activated) drains to the east and west of the building before passing through hydrocarbon interceptors FRS 05 and FRS 07, respectively, prior to discharge to Basin 2.
- ▶ Stormwater from the loading bay area flows north between Building A and Building B before being directed west through hydrocarbon interceptor FRS 06. The stormwater then discharges to Basin 2.
- ▶ The generator yard slab is graded towards an ACO drain system located between the generators and the access roads. The ACO drains serving the generator yard on the western side of the building passes through hydrocarbon interceptor FRS 08 before discharging to Basin 2. The ACO drains serving the generator yard on the eastern side of the building passes through hydrocarbon interceptor FRS 06 before discharging to Basin 2.
- ▶ A separate ACO drain system is provided between the generators and Building A to prevent the ponding of rainwater between the building and the generators. This drainage system serves a non-risk area, as the generator yard slab is graded away from the drain such that any fuel or oil spillages would be directed away from this network. This drainage system bypasses hydrocarbon interception and discharges directly to Basin 2.

Building B Stormwater Management

- ▶ Rainwater from the roof of Building B is collected in a series of downpipes both east and west of the building and directed to the rainwater harvesting tank north of the building (no hydrocarbon interceptor). This rainwater harvesting tank supplies rainwater to the rainwater storage tank in the Water Treatment Plant building.
- ▶ Stormwater drainage serving the house transformers and internal building areas (sprinkler discharge, if activated) drains to both east and west of the building and flow through hydrocarbon interceptors FRS 02 and FRS 04 respectively and then finally through hydrocarbon interceptor FRS 03 before discharging into Basin 1.
- ▶ The generator yard slab is graded towards an ACO drain system located between the generators and the access roads. The ACO drains serving the generator yard to the west of the building will be directed into the stormwater drain flowing north between Building A and B which flows through hydrocarbon interceptor FRS 06 before discharging to Basin 2. The ACO drains serving the generators to the east of the building will flow through hydrocarbon interceptor FRS 03 before discharging into Basin 1.
- ▶ A separate ACO drain system is provided between the generators and Building A to prevent the ponding of rainwater between the building and the generators. This drainage system serves a non-risk area, as the generator yard slab is graded away from the drain such that any fuel or oil spillages would be directed away from this network. This drainage system bypasses hydrocarbon interception and flows directly into the rainwater harvesting tank north of the building.
- ▶ The rainwater harvesting tank, if rainwater is not required overflows to Basin 1.

Mooretown GIS Substation

Storm water runoff from the adjacent Mooretown GIS substation enters the Installation boundary south of Attenuation Basin 2 after passing through hydrocarbon interceptor FRS 12. Although the GIS Substation is located outside the IE licence boundary, a monitoring kiosk will be provided at monitoring point SW1-2 where monitoring of the incoming flow from the substation will occur. There will be continuous monitoring of pH, TOC and flow at this monitoring point which will be connected to the BMS / EPMS system and will alert in the event of abnormal monitoring results. Monitoring at SW1-2 is provided as an internal operational control measure and does not constitute a licenced emission monitoring point. This flow discharges into Attenuation Basin 2. Refer to Drawing Ref. 24_175-CSE-XX-00-DR-C-0003.

Ancillary Site Areas

- ▶ Storm water runoff from the transformer bays located to the west of the site at the Mooretown GIS substation, will be collected in the stormwater drainage network and will pass through a full retention hydrocarbon interceptor, FRS 11 before discharging to Basin 2.
- ▶ Storm water runoff from the Water Treatment Plant building, water storage tanks and the refuelling area for the generator, will flow into the drainage network and flow north around Building B and discharge into Basin 1 after passing through hydrocarbon interceptor FRS 03.
- ▶ Rainwater flow from the car park and fire sprinkler tank and pump house will first pass through a bypass hydrocarbon interceptor FRS 09 and then flow west of Building A and pass through hydrocarbon interceptor FRS 08 with the clean stormwater entering Basin 2.

4. BEST AVAILABLE TECHNIQUES AND COMMISSION IMPLEMENTING DECISION

Section 86A(3) of the EPA Act 1992 as amended, requires that the Agency shall apply BAT conclusions as a reference for attaching one or more conditions to an IE Licence. The Installation has principally been assessed against the BAT conclusions contained in Table 4.1 below: Table 4.1 Applicable BAT documents

Table 4.1 Applicable BAT documents

BAT Documents	Publication date	Attachment
Best Available Techniques (BAT) Reference Document for Large Combustion Plants Commission Implementing Decision	2021	Attachment-4-7-1-CID-Large Combustion Plants
Reference Document on the Best Available Techniques for Energy Efficiency	2009	Attachment-4-7-2-BREF - Energy Efficiency
Reference Document on the Best Available Techniques on Emissions from Storage	2006	Attachment-4-7-3 BAT REF - Emissions from Storage
Reference Document on the application of Best Available Techniques to Industrial Cooling Systems	2001	Attachment-4-7-4 BAT REF - Industrial Cooling Systems

The assessment against the BAT has demonstrated that the Installation will comply with all applicable BAT Conclusion requirements specified in the Commission Implementing Decision (CID) and will align with the guidance set out in other relevant BREF documents and national BAT notes.

5. MANAGEMENT OF RAW MATERIALS, INTERMEDIARIES AND WASTES

5.1 Raw Materials Management

A list of all raw materials in use on the Site is provided in Attachment-4-6-2.

5.1.1 Liquid Fuel Storage (LFO) (HVO/Diesel)

The Installation includes a number of liquid fuel (Hydrotreated Vegetable Oil (HVO)/ Diesel) storage tanks designed to support the reliable operation of key infrastructure, including emergency generators and fire sprinkler pumps. Further details on the types, capacities, containment systems, and associated controls for each fuel storage tank are provided in the sections below. HVO is the intended primary source of liquid fuel, however over the site's operational lifetime Gas Oil (diesel fuel) may be used as an alternative fuel if HVO is not available.

A summary of the Installation fuel storage is shown in Table 5.1 (these figures have been rounded to 2 decimal places) the fuel tanks are illustrated on Drawing Ref. 24_175-CSE-XX-00-DR-C-0005. All fuel storage tanks listed in Table 5.1 are of double-skinned construction.

Table 5.1 Summary Storage of Liquid Fuel

Fuel Tank	Quantity of tanks	Tank capacity (m3)	Total storage capacity (m3)	Total Diesel storage (Tonnes) (note a)	Total HVO storage (Tonnes) (note b)
Building A Belly Fuel Tank	28	45	1,260	1,064.7	974
Building B Belly Fuel Tank	28	45	1,260	1,064.7	974
Building A Admin Fuel Tank	1	20.3	20.3	17.15	15.7
Building B Admin Fuel Tank	1	20.3	20.3	17.15	15.7
Fire Sprinkler Pump Fuel Tank	2	0.76	1.52	1.28	1.17
WTP Fuel Tank	1	11.9	11.9	10	9.19
Total Fuel Storage				2,174.98	1,989.76

a. Density of Diesel is 845 kg/m³ according to SEAI density figures

b. Density of HVO is 773 kg/m³ according to SEAI density figures

HVO and diesel fuel would be stored simultaneously/interchangeably in the same fuel tanks. There are no separate or dedicated tanks exclusively for each fuel type. Due to HVO's slightly lower density (0.773 t/m³ compared to diesel's 0.845 t/m³), this difference affects the total storage capacity when expressed in tonnes.

The figures in Table 5.1 represent alternative maximums depending on the fuel in use; they are not cumulative, as both fuels are not stored in separate quantities simultaneously. The maximum total weight of stored fuel at any time is therefore governed by the volume limit and the density of the fuel used.

Further details regarding the Control of Major Accident Hazards (COMAH) status of the Installation, including an assessment of the applicability of the COMAH Regulations, are provided in Section 5.5.

Emergency Generator Belly Fuel Tank Fuel Storage

The emergency generator Belly Fuel Tanks are located within the associated generator yard. The quantity and storage volumes of these tanks are detailed in Table 5.1 and illustrated on Drawing Ref. 24_175-CSE-XX-00-DR-C-0005. All Belly Fuel Tanks include the following measures:

- ▶ Belly Fuel Tanks are double-skinned; the double-skinned construction provides primary containment and integral secondary containment.
- ▶ The secondary containment is designed to contain 110% of the design capacity in line with the EPA's Guidance on the Storage and Transfer of Materials for Scheduled Activities (2013).
- ▶ Leak detection systems are installed within interstitial space of the double-skinned tanks to detect and signal an alarm (audible and red warning light) any fuel or oil leakage from the primary containment. Alarms are linked to an onboard controller and the site EPMS.
- ▶ Integrity testing will be carried out periodically in accordance with EPA guidance to confirm the structural integrity and leak-tightness.

Level alarm systems and drainage flow paths for the Belly Fuel Tanks are identical for Building A and Building B and include:

- ▶ Each emergency generator Belly Fuel Tank includes level monitoring and fixed-point level alarms based on the fill capacity. The alarms are set at Low-low (6%), Low (20%), High (93%), High-high (95%), these alarms (audible alarm and red warning light) are linked to an onboard controller and the site BMS/EPMS. This system raises the alarm in case of overfilling or a sudden drop in fuel levels.
- ▶ The double-skinned Belly Fuel Tanks are located over impermeable hardstanding surfaces, in the event of a major oil spill that cannot be contained at source, the fuel spill is contained on the impermeable surfaces, and any hydrocarbon runoff is contained in the drainage network interceptors. Refer to Section 3.2.6 Stormwater Drainage Infrastructure for a detailed description of the Stormwater Drainage Infrastructure containment measures.

Ancillary Plant Fuel Storage

There are relatively smaller volumes of ancillary plant fuel storage located at the installation. These include fuel tanks serving the fire sprinkler pumps and the Water Treatment Plant generator. The quantities and storage volumes of these tanks are detailed in Table 5.1 and illustrated on Drawing Ref. 24_175-CSE-XX-00-DR-C-0005.

All of the ancillary plant fuel tanks are of double-skinned construction; the double-skinned construction provides primary containment and integral secondary containment. The interstitial space of the double-skinned tank is fitted with a leak detection alarm to identify any loss of integrity in the primary containment.

The double-skinned containment is designed to contain 110% of the design capacity in line with the EPA's Guidance on the Storage and Transfer of Materials for Scheduled Activities (2013).

Level alarm systems and drainage flow paths for the fire sprinkler pump fuel tanks include:

- ▶ Tanks are fitted with low-level alarms set at two-thirds capacity, as required by National Fire Protection Association (NFPA) standards, to alert operators when fuel levels drop below operational requirements. Diesel filling is carried out manually via the supplied hand pump, with the tank fitted with a mechanical level gauge to indicate when the tank is full during refuelling.
- ▶ In the event of a fuel/oil leak, from the fire sprinkler pumps, these tanks are located internally, and the stormwater system is not at risk in the event of a fuel or oil leak.

Level alarm systems and drainage flow paths for the water treatment plant generator fuel tank include:

- ▶ The Fuel Tank includes level monitoring and fixed-point level alarms based on the fill capacity. The alarms are set at Low-low (6%), Low (20%), High (93%), High-high (95%), these alarms (audible

alarm and red warning light) are linked to an onboard controller and the site BMS/EPMS. This system raises the alarm in case of overfilling or a sudden drop in fuel levels.

- ▶ The double-skinned Fuel Tank is located over an impermeable hardstanding surface, in the event of an oil spill that cannot be contained at source, the fuel spill is contained on the impermeable surface, and any hydrocarbon runoff is contained in the drainage network interceptors. Refer to Section 3.2.6 for a detailed description of the Stormwater Drainage Infrastructure containment measures.

5.1.2 Water Treatment Plant Chemicals

The Installation includes a limited quantity of water treatment chemicals. These chemicals are used to maintain water quality. Further details regarding water treatment are provided in Section 3.1.4.

A summary of the water treatment chemical storage provided at the Installation is shown in Table 5.2.

Table 5.2 Summary Water Treatment Storage

Tank	Quantity of tanks	Tank capacity (m3)
Antiscalant	1	1
Sodium Bisulphite	1	1

These chemicals will be stored within dedicated storage tanks located inside the water treatment plant building. The water treatment plant building will be fitted with impermeable floors and contained drainage arrangements to prevent any accidental releases from entering soil, groundwater or the surface water drainage system.

5.1.3 Ancillary Raw Materials

Small quantities of oils, paints, adhesives, lubricants and other maintenance materials may be brought on-site to facilitate routine repair and maintenance activities. These materials will typically be supplied by specialist contractors, used as required and removed from the Installation following completion of the works. Any such materials will be managed in accordance with site environmental, health and safety procedures.

Small quantity of refrigerants used within the heating ventilation and cooling systems serving the office and support areas, and data centre buildings is fully enclosed within sealed systems. The refrigerant is retained throughout the system's operational life and will only be recovered during decommissioning or major servicing. Routine inspections are undertaken in accordance with the F-gas Regulations, and any servicing is conducted by certified contractors. Topping up of refrigerant is conducted only when necessary and solely by licensed refrigeration professionals in compliance with manufacturer specifications.

The handling, storage and use of chemicals and maintenance materials will be controlled through the site Environmental Management System (EMS). Appropriate spill prevention measures, secondary containment, staff training, emergency response procedures and periodic inspections will be implemented to minimise the risk of accidental releases and to ensure compliance with relevant environmental and safety requirements.

5.2 Intermediates and Products

There are no intermediates or products produced as part of the site operations.

5.3 Waste Management

Waste Management Procedures will be implemented for the operation of the Installation to ensure the proper management and recycling of wastes generated on site. These procedures aim to establish a systematic and environmentally responsible approach to waste handling.

The Waste Management Procedures will align with the targets and policies outlined in the Eastern-Midlands Region Waste Management Plan 2015–2021 and the National Waste Management Plan for a Circular Economy 2024 – 2030. By adhering to this plan, the Installation seeks to improve its environmental performance and sustainability.

The overarching management procedures (Attachment 8-2-1 Waste Hierarchy) and the estimated waste generation (Attachment 8-1 Waste Generated) are detailed in Section 8 of this application. Furthermore, all waste generated will be monitored and reported to the EPA as part of the Annual Environmental Report (AER).

This section of the operational report describes waste storage arrangements at the installation, as shown on Drawing Ref. 24_175-CSE-XX-00-DR-C-0005, as well as the hydrocarbon interceptors located on underground drainage.

There will be minimal solid and liquid waste produced at the Installation, the waste will comprise mainly of domestic wastes, kitchen wastes, packaging wastes, non-hazardous WEEE, E-Waste, filters, waste oils and spent batteries. A more detailed description of the waste types and their management is provided in Section 8 of this application. Wastewater emissions to sewer are detailed in Section 6.2.

5.3.1 Non-Hazardous Waste Storage Areas

The majority of waste generated at the Installation will be classified as non-hazardous. Key non-hazardous waste streams include: Dry Mixed Recyclables (DMR), Mixed Municipal Waste (MMW), Food Waste, Confidential Waste, and Metals. These streams will be segregated in 240 L or 1,100 L wheelie bins in dedicated bin stores and sent offsite for recycling / recovery. Storage points shown on Drawing Ref. 24_175-CSE-XX-00-DR-C-0005.

5.3.2 Maintenance Waste and Equipment Changeout

Hazardous waste generated such as waste oils, oily rags, and used filters will primarily result from planned maintenance activities and will be managed directly by maintenance contractors. Liquid waste during maintenance will be securely contained in sealed drums or intermediate bulk containers (IBCs), stored in the loading bay within bunded zones, such as portable PVC bunds, specifically designated for waste storage.

Trained maintenance contractors engaged under maintenance contracts will manage hazardous wastes generated during maintenance and change out activities, ensuring immediate removal of maintenance wastes. These contractors are responsible for the immediate collection and removal of all hazardous waste at the end of works. This approach eliminates the storage of hazardous waste onsite and reduces environmental risk.

Hazardous Waste Electrical and Electronic Equipment (WEEE), including batteries, circuit boards, and other components containing hazardous substances, is collected in dedicated receptacles in the loading bays.

Throughout all maintenance waste handling and storage activities, spill kits will be readily available, and all procedures will be conducted in strict accordance with site Standard Operating Procedures (SOPs), environmental protocols, and permit-to-work requirements to prevent accidental releases or contamination.

5.3.3 Hydrocarbon Interceptor Cleaning

Oil and hydrocarbon residues captured in the hydrocarbon interceptors on the underground drainage system will be retained within the interceptor tanks until removed by a qualified specialist contractor as a waste.

Interceptors are emptied when full, typically in response to an alarm or spill event, and will be inspected at least every 6 months in line with the manufacturer's maintenance recommendations, with cleaning carried out if required.

A trained waste contractor will use a vacuum tanker to extract the oily water mixture from the interceptors, after which the collected waste is transported off-site by a licensed waste contractor for appropriate recovery or disposal.

Oil/fuel accumulated in the hydrocarbon interceptors will remain in the tanks until removal by a specialist contractor. Integrity testing will be carried out periodically in accordance with EPA guidance to confirm the structural integrity and leak-tightness.

5.3.4 Emergency Generator Stack Wastewater

Rainwater and condensate from the emergency generator exhaust stacks is drained to prevent pooling in low spots of the stack, which could cause corrosion over time. To prevent pooling and potential corrosion within the flues, this water is drained and collected at the low point of each flue tower to 16 × 1250-litre tanks located within each emergency generator yard. Although this water is generally clean, it is contained and managed as a waste stream on a precautionary basis.

No alarms or BMS monitoring is provided for these drains or drums; instead, the system will be managed through a planned maintenance regime. Weekly inspections ensure that any filled tanks are identified, preventing overflow or release. Each tank will be double-skinned and integrally bunded with a sight glass to allow for visual monitoring of water levels.

Based on the MS Ireland Grangecastle campus, the collected rainwater and condensate is disposed of approximately annually, or as required based on the regular inspection of the gauges, by a registered waste carrier or licenced waste disposal specialist. This approach ensures that any potentially contaminated water is removed in a controlled manner, in compliance with waste management regulations and to eliminate the risk of uncontrolled discharge.

In the unlikely event that any tanks were to overtop, the excess water would be treated through the stormwater drainage network and relevant hydrocarbon interceptors prior to discharge from the site.

5.4 Fuel and Chemical Handling

5.4.1 Fuel Delivery

Fuel (HVO/Diesel) will be delivered to site by qualified professionals, with all unloading activities supervised and will be carried out in accordance with Standard Operating Procedures (SOPs). Deliveries will be directed to each generator fuel refilling cabinet along the access roads. Each generator has a dedicated refilling cabinet.

The access roads are impermeable hardstanding surfaces to minimise the risk of ground contamination. All access roads have full retention hydrocarbon interceptors to protect against stormwater contamination. The refilling cabinets include drip trays to capture any potential spills, thereby reducing the risk of environmental contamination during refuelling. The unloading process will be fully supervised, with the delivery driver remaining present at all times to monitor and control the operation. This controlled approach ensures that any risk of accidental spillage during deliveries is significantly reduced.

Fuel for the fire sprinkler pump system will be delivered in small volumes and transferred manually from portable fuel containers rather than by bulk fuel tanker. Refuelling will be undertaken by trained personnel in accordance with site SOPs, with spill kits available and all activities supervised.

Spill response measures will be in place at all unloading locations, including accessible spill kits to contain or isolate any leaks or accidental discharges. All refuelling cabinets are fitted with drip tray containment systems to prevent spillage during hose connection or disconnection, and fill dials to enable drivers to monitor tank capacity during transfer. Delivery volumes and locations are specified in advance by site personnel to ensure controlled and accurate transfer.

5.4.2 Water Treatment Chemical Delivery

Water treatment chemicals will be delivered to the Installation by appropriately qualified suppliers, with all unloading and transfer activities undertaken in accordance with site Standard Operating Procedures (SOPs). Deliveries will be directed to the unloading locations associated with the water treatment plant building, with chemicals transferred directly to the relevant storage tanks.

All chemical deliveries and transfer operations will be supervised by trained personnel for the safe handling of the water treatment chemicals. The unloading process will be fully supervised, with the delivery driver and site personnel remaining present throughout.

Spill response measures will be available at all unloading locations, including readily accessible spill kits and absorbent materials to contain or isolate any leaks or accidental discharges.

5.4.3 Alarm Response and Spill Management Procedures

Response in the Event of an Alarm

The Installation will be in operation 24 hours a day, 7 days a week with a Critical Environment shift team on site around the clock ensuring that any alarm or incident can be responded to immediately. All monitored alarms — including interceptor high-level alarms, tank level and overfill protection, and leak-detection systems — will annunciate to the Building Management System (BMS) and the Critical Facilities Operations Centre (CFOC). In the event of any alarm triggered the CFOC will follow the Spill Prevention and Response Plan which forms part of the site Accident Prevention Procedures and Emergency Response Procedures (see Section 7.5 and 7.6).

Spill Response Procedures

Spill kits will be located across the Site in highly visible and mobile units. These will include absorbent socks, mats, pads, disposable bags, and PPE. Spill kits will be utilised in the event of a spill and staff will be trained in the use of spill management materials. Staff will be fully trained in site procedures, including all Standard Operating Procedures (SOPs) and emergency response and safety procedures in relation to the storage and handling of all substances being used at the Installation. Spill response procedures will form part of the site Accident Prevention Procedures and Emergency Response Procedures (see Section 7.5 and 7.6).

5.5 Control of Major Accident Hazards Status

5.5.1 Assessment of Qualifying Quantities

Under S.I. No. 209/2015 - Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015, as amended (the 'COMAH Regulations') named dangerous substances Schedule 1 specifies the qualifying quantities of named dangerous substances to which lower tier status and upper tier status apply. The relevant substances to this Installation and their thresholds are set out in Table 5.3.

Table 5.3 Relevant Substances (Schedule 1 COMAH Regulations)

Named Substance	Threshold Lower Tier (tonnes)	Threshold Upper Tier(tonnes)
Petroleum products – (Diesel Fuel Oil EN590)	2,500	25000

HVO and diesel fuel would be stored simultaneously/interchangeably in the same fuel tanks. The storage of Diesel and HVO are alternative maximums they are not cumulative.

The maximum quantity of petroleum products (diesel) that may be stored at any one time (refer Table 5.1) is below the lower tier threshold of 2,500 tonnes, and therefore the Installation does not qualify as a COMAH establishment.

Hydrotreated Vegetable Oil (HVO) is not included under the COMAH Regulations (see Section 5.5.2). This means that HVO is not a controlled substance under the COMAH Regulations. However, for completeness, if a conservative position is adopted and HVO treated as “alternative fuel serving the same purposes and with similar properties as regards flammability and environmental hazards [to petroleum products]” as stated in Schedule 1, Part 2, (named dangerous substances no. 34) of the COMAH Regulations, the total storage volume of HVO would still be Lower Tier threshold of 2,500 tonnes (refer Table 5.1)), and therefore the Installation does not qualify as a COMAH establishment.

5.5.2 HVO Fuel and COMAH Status

It should also be noted that, despite its similar applications, HVO differs significantly in terms of flammability and environmental hazards, when compared to conventional crude oil derivatives like gasoline, kerosene, diesel, and heavy fuel oils. Table 5.4 below sets out a summary comparison of Gas Oil (Diesel) and HVO.

Table 5.4 Comparison of Gas Oil (Diesel) and HVO Fuel

Characteristic	Gas Oil (Diesel)	Hydrotreated Vegetable Oil (HVO)
Source	Derived from crude oil	Derived from renewable sources (waste plant matter or animal fats)
Renewable	No, derived from crude oil	Yes, derived from renewable sources
Carbon Footprint	Higher carbon footprint due to crude oil extraction and refining	Lower carbon footprint, considered a more sustainable option
Hazard Phrases	H226 – Flammable liquid and vapour H304 – May be fatal if swallowed and enters airways H332 – Harmful if inhaled H315 – Causes skin irritation H351 – Suspected of causing cancer H373 – May cause damage to organs through prolonged or repeated exposure H411 – Toxic to aquatic life with long lasting effects	H304 – May be fatal if swallowed and enters airways
Substance Regulated under COMAH	Subject to COMAH (petroleum products and alternative fuels), due to flammability and toxicity and environmental hazards	Not subject to COMAH; considered a non-COMAH substance due to absence of relevant COMAH hazard phrases

6. EMISSIONS AND ABATEMENT TREATMENT SYSTEMS

This section describes the emissions from the operations above and the abatement or treatment system in place for those emissions and summarises any monitoring controls in place. There are no planned emissions to ground or ground water from the operational development therefore this has not been described.

6.1 Emissions to Atmosphere

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. The modelling of air emissions from the site was carried out by AWN to assess concentrations of nitrogen dioxide (NO₂), carbon monoxide (CO), particulate matter (PM₁₀ and PM_{2.5}) and sulphur dioxide (SO₂) at a variety of locations beyond the site boundary, alone and in combination with other facilities with Industrial Emissions licences or granted planning permissions in the surrounding Huntstown area. The results of the modelling assessment indicate that ambient ground level pollutant concentrations are in compliance with the relevant air quality standards for under all operational scenarios assessed as outlined in Attachment-7-1-3-2-Air Emissions Impact.

6.1.1 Air Emissions

Full details of the air emission points, including coordinates and descriptions, are provided in Attachment-7-4-2–Emissions to Air Minor and Potential and Drawing Ref. 24_175-CSE-XX-00-DR-C-0006.

Table 6.1 Summary of Emissions to Atmosphere

Emissions Type	Emission Points	Emission Source
Main emission to Atmosphere	N/A	N/A
Minor emission to Atmosphere	A3-1 to A3-28	Building A Emergency Generators combusting liquid fuel (HVO/Diesel)
	A3-29	Building A Admin Generator combusting liquid fuel (HVO/Diesel)
	A3-30 to A3 57	Building B Emergency Generators combusting liquid fuel (HVO/Diesel)
	A3-58	Building B Admin Generator combusting liquid fuel (HVO/Diesel)
Potential emission to Atmosphere	A4-1	Water Treatment Plant Generator liquid fuel (HVO/Diesel)
	A4-2 and A4-3	Fire Sprinkler Pump combusting liquid fuel (HVO/Diesel)

The IE licence application and associated impact assessment (see Attachment-7-1-3-2–Air Emissions Impact Assessment) evaluated the operation of the combustion plant based on the operational running hours set out in **Table 6.2**. These represent worst-case operating scenarios rather than typical or expected usage patterns, ensuring a conservative and robust assessment of potential air emissions.

Table 6.2 Annual Operational Hours Under the Licence Application

Operations	Annual Running Hours Per Engine
58 no. Building A and Building B Emergency Generators (Emergency Operations)	100 hours
58 no. Building A and Building B Emergency Generators (Testing/Maintenance)	6 hours (15 minutes per month at 25% load, 1 hour semi-annual up to 100% load, 1 hour per year at 100% load), up to 4 generators at one time

6.1.2 Treatment and Abatement Systems

Further details on compliance with the EU ambient air quality standards is provided in Attachment-7-1-3-2 – Air Emissions Impact Assessment of the IE Licence application, which sets out the full air emissions modelling and impact assessment.

Minor Emissions to Atmosphere

There are no abatement or treatment systems proposed or required for the individual emergency generators (A3-1 to A3-58) due to their limited annual operating time.

In accordance with Regulation 13(3) of S.I. No. 595/2017 – European Union (Medium Combustion Plants) Regulations 2017, new medium combustion plants which do not operate more than 500 operating hours per year, calculated as a rolling average over a period of three years, shall not be required to comply with the emission limit values set out in Part 2 of Schedule 2.

The stack heights of the emergency generators have been designed to ensure that an adequate height was selected to aid dispersion of the emissions and achieve compliance with the EU ambient air quality standards at all off-site locations (including background concentrations).

Potential Emissions to Atmosphere

There are no abatement or treatment systems proposed or required for the fire sprinkler pumps or water treatment plant emergency generator (A4-1 to A4-3) due to their limited size and limited operational requirements (in accordance with Regulation 13(3) of S.I. No. 595/2017).

Fugitive Emissions to Atmosphere

There are no fugitive emissions (principal polluting substances) expected from the Installation. There are no abatement or treatment systems proposed or required.

6.1.3 Control and Monitoring

Minor Emissions to Atmosphere

The emergency generators (A3-1 to A3-58) are >1MW_{th} input and their emissions are regulated by the Medium Combustion Plant (MCP) Regulations (S.I. No. 595 of 2017), which transpose the requirements of the Medium Combustion Plant Directive ((EU) 2015/2193).

The emergency generators (A3-1 to A3-58) are intended for emergency use only and will not operate in excess of 500 hours per annum. As such, they qualify for the exemption from ELVs, in line with Regulation 13(3) of S.I. No. 595/2017.

Each emergency generator (A3-1 to A3-58) will be fitted with control systems that monitor performance and alert operators to any faults or malfunctions. In addition, a data logging system will be installed to record the number of operational hours, ensuring that usage remains within the annual limitations.

In accordance with the EPA's sectoral guidance for data centre sites licenced under IE Class 2.1, emissions monitoring will be undertaken on a representative basis. A different 10% of each generator type will be monitored annually over a rolling five-year cycle, resulting in approximately 50% of generators of each type being sampled during a five-year period. The monitoring programme will include a minimum of two units from each unique generator type. Monitoring will be undertaken by an ISO 17025 accredited contractor using applicable CEN standards.

Monitoring parameters will be as specified in the IE Licence Schedule of Environmental Emissions. Monitoring is expected to include nitrogen oxides (expressed as NO_x/NO₂), sulphur dioxide (SO₂), carbon

monoxide (CO), particulate matter (PM) and associated operational parameters, as required. Monitoring will be undertaken at up to 80% of the maximum load, with the unit loading recorded as part of the monitoring report.

The monitoring programme described above reflects the EPA's current published position on representative monitoring of emergency generators at licenced data centre installations. Monitoring will be undertaken in accordance with the EPA guidance, or any alternative monitoring arrangements that may be agreed with the Agency.

Potential Emissions to Atmosphere

There is no control or monitoring systems proposed or required for the Water Treatment Plant Generator (A4-1) and Fire Sprinkler Pumps (A4-2 and A4-3), as these combustion plants are <1MW_{th} input and no monitoring or emission limit values are required.

Fugitive Emissions to Atmosphere

There is no fugitive emissions expected from the Installation. There is no control or monitoring systems proposed or required.

6.2 Wastewater Emissions

6.2.1 Emissions

Wastewater Emissions to Foul Sewer

Wastewater drainage is collected in the onsite foul network and will be discharged to the external off site foul sewer network at emission discharge point labelled SE1 on Drawing Ref. 24_175-CSE-XX-00-DR-C-0004. The wastewater discharged from the Site will ultimately be treated at the Ringsend WWTP.

The wastewater discharge from the installation to sewer will comprise domestic sewage generated from staff welfare facilities (from Building A and Building B administration buildings and the adjacent GIS substation) and process wastewater from the Water Treatment Plant.

The Water Treatment Plant process wastewater comprises of wastewater from the maintenance of the water treatment system and spent cooling water discharge during extreme warm ambient days. The spent cooling water discharge would not be uniform over 365 days but based on the demand of cooling water by the AHU's. It is estimated that there would be 24 non-consecutive hours of cooling on extreme warm days per annum. In peak demand, 25% to 30% of the spent cooling water that is not reused in the system will be discharged from the Water Treatment Plant to the foul sewer network. There would also be a low quantity of discharge from a weekly maintenance flushing cycle of the system.

Wastewater Drainage to Holding Tanks

Rainwater and condensate from the emergency generator (A3-1 to A3-58) exhaust stacks have the potential to come into contact with combustion residues within the exhaust stacks. This water is drained and collected at the low point of each flue tower. There are 16 no flue towers, each serving individual exhaust stacks and corresponding tank, giving a total of 16 no. 1250-litre tanks. Although the rainwater is generally clean, it is managed as a waste stream on a precautionary basis. See further Section 5.3.4 on waste management.

6.2.2 Treatment and Abatement Systems

Wastewater Emissions to Foul Sewer

There is no requirement for onsite treatment or abatement wastewater from the Installation. Wastewater will be treated offsite at the Ringsend WWTP.

Wastewater Drainage to Holding Tanks

Wastewater collected in the emergency generator (A3-1 to A3-58) stack tanks is handled as a liquid waste, there is no onsite abatement or treatment.

6.2.3 Control and Monitoring

Wastewater Emissions to Foul Sewer

There is one monitoring point allowing for the inspection of process water quality labelled SE1-1 on Drawing Ref. 24_175-CSE-XX-00-DR-C-0004. The monitoring point is located on the flow from the water treatment plant before it combines with the domestic foul network. Based on the characteristics of the discharge, it is proposed to install in-line monitoring for flow, pH and temperature. Flow proportional sampling is proposed for BOD, COD, Suspended Solids, Chloride and Sulphate.

The UÉ Water Services Connection Agreement for the Installation is under CDS number 2000446801. A wastewater application has been submitted to Uisce Éireann, Application Ref. S99-PC-12791.

Wastewater Drainage to Holding Tanks

Wastewater collected in the emergency generator (A3-1 to A3-58) stack tanks is handled as a liquid waste and recorded in line with waste management practices. See further Section 5.3.4 on waste management.

6.3 Stormwater Emissions

6.3.1 Emissions

Rainwater runoff from the site including building roofs, asphalt roads, site concrete pavements, parking areas, service yards, and other hardstanding surfaces will be collected via the newly constructed stormwater drainage network.

The stormwater discharges off site at emission point SW1 to a drainage ditch northwest of the site and to Huntstown stream. The site stormwater drainage is shown on Drawing Ref. 24_175-CSE-XX-00-DR-C-0003 included with this application.

6.3.2 Treatment and Abatement Systems

The stormwater emissions from the Installation are expected to be of a clean discharge quality. Stormwater is maintained in a clean condition through the following abatement/treatment systems, in combination with site management procedures:

- ▶ Hydrocarbon interceptors (Class 1 Full Retention and Bypass types) installed to capture hydrocarbons (HVO, diesel) before off-site discharge. Locations of these are shown on Drawing Ref. 24_175-CSE-XX-00-DR-C-0004 and types of interceptors are described Section 3.2.6 above.
- ▶ All Hydrocarbon Interceptors will be fitted with high liquid level alarm system that alerts when the interceptors oil storage is at capacity. The alarm is installed, tested, commissioned and regularly serviced by a qualified technician.
- ▶ Trapped gullies will be utilised in all storm water systems to the road, turning bays and carpark infrastructure so that sediment pollution is minimised.

- ▶ A standard operating procedure (SOP) for fuel unloading and an on-site Emergency Response Plan (ERP) will be established at the Site to reduce the risk of spills, and spill kits will be maintained at all storage areas.
- ▶ All Hydrocarbon Interceptors will be maintained and cleaned out (if required) every 6 months in accordance with manufacturers guidelines. Oil and hydrocarbon residues captured in the hydrocarbon interceptors on the underground drainage system are retained within the interceptor tanks until removed by a qualified specialist contractor as a waste. Integrity testing will be carried out periodically in accordance with EPA guidance to confirm the structural integrity and leak-tightness.
- ▶ Good Housekeeping Practices: Housekeeping measures will be enforced to ensure that spill-prone areas are kept clean and free from potential contaminants. Regular inspections and maintenance will be conducted to prevent leaks or spills, in addition to regular inspections and maintenance of the hydrocarbon interceptor to ensure its proper functioning.

The handling of raw materials and wastes to minimise spills and incidents is described in Section 5 of this report. Site management procedures, along with alarm systems on storage tanks, are designed to prevent spills and leaks. In the unlikely event of such incidents, the alarm systems will notify site personnel, enabling a prompt response. The hydrocarbon interceptors provide a final treatment measure should any hydrocarbons enter the stormwater drainage system.

6.3.3 Control and Monitoring

No on-line monitoring is proposed for the stormwater discharge. However, at-source control measures (as set out in Section 5) are implemented to monitor and manage any potential leaks or spills associated with storage tanks/areas. Stormwater network controls include:

- ▶ Stormwater discharges are restricted to greenfield QBAR rates using Hydrobrake flow controls.
- ▶ Automatic penstock valve at the emission point, linked to the fire alarm system, automatically shut during emergencies.

It is proposed that storm water monitoring takes place as follows:

- ▶ Weekly monitoring for pH, Conductivity, Temperature and Total Organic Carbon (TOC);
- ▶ Daily visual inspections for discolouration and odour; and
- ▶ Monitoring is undertaken upstream of the storm water discharge point at Monitoring Point SW1-1.

The stormwater monitoring locations are shown in Attachment 7-7 – Storm Water Discharges and Drawing Ref. 24_175-CSE-XX-00-DR-C-0003. Monitoring details are provided in Attachment 7-7-1 – Stormwater Monitoring.

Post-commencement of stormwater monitoring, trigger levels will be established for the site in accordance with EPA licence requirements.

6.4 Noise Emissions

6.4.1 Emissions

The operational Installation includes various sources that contribute to outward noise emissions. The primary sources of outward noise have been identified as follows:

- ▶ Building Services Noise: Building services refer to the mechanical and electrical systems within the Installation that provide essential functions such as heating, ventilation, air conditioning, and electrical distribution. These systems can produce noise during their normal operation, which may contribute to the overall noise profile of the Installation.
- ▶ Emergency Generator Routine Testing/Maintenance Operations: During the daytime emergency generators will be tested and maintained to ensure operational readiness.

- ▶ **Emergency Site Operations:** During emergency situations or power outages, the Emergency Generators will operate to provide power to the data centre buildings.

To ensure compliance with environmental regulations and best practices, a comprehensive assessment of the noise emission impacts has been conducted. This assessment aligns with the guidelines outlined in the Environmental Protection Agency (EPA) Guidance Note for Noise: Licence Applications, Surveys, and Assessments in Relation to Scheduled Activities (NG4).

The results of the noise impact assessment are detailed in Attachment-7-1-3-2-Noise Impact Assessment. This document provides the findings and implications of the assessment, including predictions of noise levels at various locations around the Installation during different operational scenarios.

6.4.2 Treatment And Abatement Systems

The Installation plant items (equipment and machinery) have been carefully chosen to meet specific noise level requirements. This means selecting machinery and devices that inherently produce lower noise levels during their operation. By incorporating low noise equipment, the overall noise impact of the plant is reduced. The main objective is to ensure that the noise generated by the Installation during its operations remains within acceptable limits.

To further control noise emissions, the following measures will be implemented:

- ▶ **Emergency Generators:** Each generator is enclosed within an acoustic container designed to effectively dampen the noise produced during operation.
- ▶ **Air Intake and Exhaust Attenuators:** All air intake and exhaust points are fitted with atmosphere-side attenuators to reduce noise emissions and ensure compliance with the adopted noise criteria.
- ▶ The generator yard is enclosed by a 6.5m high louvred screen wall.

The aim of these noise abatement measures is to ensure that the plant's noise levels comply with Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).

6.4.3 Control And Monitoring

Annual day time, evening and night-time monitoring is proposed to be undertaken in accordance with standard IE licence requirements. Proposed monitoring locations are set out in Attachment-7-5.

The predicted noise levels at all NSLs are below the relevant day, evening and night-time noise criteria derived from the site operations in line with the EPAs NG4 (2016) document.

Running of the generators during emergencies will be managed through a Noise Management Plan (NMP).

During night-time hours, there will be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise-sensitive location.

Where any unforeseen substantial variation in noise emission levels occurs post-installation, additional noise control measures such as attenuator systems will be employed where necessary to ensure ongoing compliance with the required noise criteria set out in this report or defined in the Licence issued to the operator.

6.5 Greenhouse Gas Emissions

6.5.1 Emissions CO₂

The indirect (electricity-related) and direct (fuel-related) annual CO₂e emissions associated with operation of the Installation under this Licence Application have been estimated below on a worst-case basis. This

section provides an updated quantification of greenhouse gas emissions relative to the EIAR-stage assessment, based on the worst-case operational scenario assessed under this Licence Application.

The projected carbon intensity of grid electricity for the period 2028 to 2032 is presented in Table 6-3.

Greenhouse gas emissions associated with diesel fuel use at the Installation have been calculated using published Sustainable Energy Authority of Ireland (SEAI) emission factors, reproduced in Table 6-4.

Table 6-3 Projected Carbon Intensity of Electricity From 2028 - 2032

Year	Predicted Electricity ^{Note (a)} (g CO₂ / kWh)
2028	160.1
2029	147.6
2030	135.0
2031	128.3
2032	121.5

a. Based on the SEAI¹ carbon intensity of 197.8 g CO₂ / kWh in 2025 and assuming linear interpolation to 135 g CO₂ / kWh by 2030 and net zero by 2050. The 2030 target is equivalent to reaching 68.3% renewable electricity by 2030 as outlined by the EPA (EPA, 2025) whilst net zero is the 2050 target as outlined in CAP25.

Table 6-4 Emission factors for CO₂ produced from combustion of Liquid fuels

Liquid	gCO₂/kWh	gCO₂/MJ	kgCO₂/kg	kgCO₂/l
Diesel / gasoil (100% petroleum)	263.9	73.30	3.174	2.682

The Installation will primarily use electricity supplied from the National Grid. The maximum annual electricity demand, if supplied entirely from the grid, would be 1,491,153 MWh. However, for the purposes of this assessment, it has been assumed that the emergency generators operate for up to 100 hours per year. During this period, the equivalent electricity demand is assumed to be provided by the emergency generators rather than by grid electricity.

On this basis, the maximum grid electricity demand used in the assessment is 1,474,130 MWh per annum, based on 8,660 hours of grid-supplied operation. This avoids double-counting the electricity demand associated with the 100 hours of emergency generator operation.

Direct emissions from emergency generator operation have been calculated separately, based on a maximum annual fuel consumption of 4,200 tonnes (as set out in Section 3.2.2). For the purpose of this conservative worst-case assessment, it has been assumed that diesel is used as the fuel source.

Based on a projected 2028 opening-year electricity mix, and including direct emissions from emergency generator operation, this results in total estimated direct and indirect greenhouse gas emissions of approximately 249,355.9 tonnes CO₂e as presented in Table 6-55.

This estimate represents a conservative upper bound. In practice, the Installation's actual emissions are expected to be significantly lower, as the site is not expected to operate continuously at maximum electrical load. Annual grid electricity consumption is therefore expected to be lower than the worst-case value assessed. In addition, the intended use of HVO fuel, which has lower associated CO₂ emissions than diesel, and the limited use of emergency generators are expected to further reduce direct emissions.

Table 6-5 Predicted Direct and Indirect GHG Emissions (Tonnes CO₂eq)

Year	Back-Up Generator GHG Emissions (tonnes CO₂eq)	Electricity GHG Emissions (tonnes CO₂eq)	Total (tonnes CO₂eq)
2028	13,330.8	236,025.1	249,355.9

¹ SEAI Emissions Factors for Electricity: <https://www.seai.ie/data-and-insights/seai-statistics/conversion-factors>

Year	Back-Up Generator GHG Emissions (tonnes CO2eq)	Electricity GHG Emissions (tonnes CO2eq)	Total (tonnes CO2eq)
2029	13,330.8	217,516.3	230,847.1
2030	13,330.8	199,007.6	212,338.4
2031	13,330.8	189,057.2	202,388.0
2032	13,330.8	179,106.8	192,437.6

6.5.2 Mitigation

The Installation has been designed to minimise greenhouse gas emissions through a combination of low-carbon fuel use, energy-efficient design, renewable energy generation and resource efficiency measures. Key climate mitigation measures incorporated into the design and operation of the Installation include:

- ▶ Emergency generators are designed to operate primarily on Hydrotreated Vegetable Oil (HVO), a renewable fuel with a lower lifecycle greenhouse gas intensity than conventional diesel. Where HVO is utilised, it will be sourced from suppliers operating under recognised sustainability certification schemes.
- ▶ Emergency generators are intended solely for emergency operation, maintenance and testing activities, resulting in limited annual fuel consumption and associated combustion emissions.
- ▶ The Installation will operate with an EU Emissions Trading System (EU ETS) permit, and greenhouse gas emissions associated with generator operation will be managed in accordance with the requirements of the site's Greenhouse Gas Permit.
- ▶ On-site renewable energy generation is provided through rooftop photovoltaic (PV) installations, contributing to the electrical demand of the facility.
- ▶ The energy consumed by the development is matched by long-term Corporate Power Purchase Agreements from new renewable energy generation that is located in Ireland.
- ▶ The data centre has been designed to achieve high levels of operational efficiency, including low Power Usage Effectiveness (PUE) and Water Usage Effectiveness (WUE), thereby reducing overall resource consumption.
- ▶ The cooling system is optimised to maximise the use of free cooling, with evaporative cooling required only during limited periods of elevated ambient temperatures. This significantly reduces the energy demand associated with cooling operations.
- ▶ High-efficiency electrically commutated (EC) fan motors, variable-speed drives and advanced Building Management System (BMS) controls are utilised throughout the Installation to optimise equipment performance and minimise energy consumption.
- ▶ Energy-efficient LED lighting and associated control systems are incorporated throughout the facility to reduce electricity demand.
- ▶ Rainwater harvesting and water recovery systems are incorporated into the cooling system design, reducing demand for treated potable water supplies and improving overall resource efficiency.

6.5.3 Control and Monitoring

Under the Greenhouse Gas (GHG) Permit the operator will be required to report annually all direct CO₂ emissions from the Installation and to surrender EU allowances to cover the emissions of the previous calendar year. Fuel usage will be metered and recorded for all relevant combustion plant, and this data will form the basis of GHG reporting and verification.

The annual operating hours of the emergency generation plant will be restricted as set out in Table 6.2.

Energy usage will be reported to the EPA as part of the Annual Environmental Report, along with Environmental Performance Reporting as required by the IE Licence. These reports are made publicly available.

The potential release of fluorinated greenhouse gases is controlled under the F Regulation (EU) No. 517/2014 on fluorinated greenhouse gases. The Installation will implement appropriate management procedures to ensure compliance, including periodic leak testing of relevant equipment, prompt repair of any detected leaks, and proper record maintenance.

6.6 Emissions to Ground

There are no emissions to ground from the Installation.

7. MANAGEMENT AND PROCESS CONTROL SYSTEMS

7.1 Environmental Management Plan (EMP)

The Environmental Management System (EMS) for the Installation will be implemented once the site is operational and the IE Licence is granted. MS Ireland has an ISO14001 accredited Environmental Management System in place at the existing datacentre campus. This accredited EMS will be implemented at Installation subject to this IEL application.

The key elements of the management system will include:

- ▶ Environmental, quality and management policies.
- ▶ Key roles, responsibilities and organisational structure.
- ▶ Document and data control.
- ▶ Raw material purchasing, use and efficiency.
- ▶ Waste treatment and disposal activities.
- ▶ Process control, inspection and equipment maintenance.
- ▶ Material handling and storage.
- ▶ Internal audit procedures and training; and
- ▶ Continuous improvement.

The EMS is accredited to ISO14001:2015 e.g., policy, procedures, training, and audit. The starting point of the management system is the EHS Policy that is signed by the site leader and endorsed by the site leadership team. The Policy supports and implements the Corporate EHS Policy within the site. The Policy sets out the overall requirements for the management system and the EHS expectations for management and staff.

This EMS will aim to ensure comprehensive environmental management and continuous improvement in performance across the Installation's lifecycle.

7.2 Energy Efficiency Management System (EnEMS)

The Energy Efficiency Management System (EnEMS) for the Installation will be implemented once the site is operational and the IE Licence is granted. MS Ireland has an ISO50001 accredited system in place for the Grangecastle campus which will extend to include the Huntstown Data Centre Campus. The EnEMS will be broadly in line with BAT 1 of the Energy Efficiency BAT Reference Document and will form part of the overall site Environmental Management System (EMS):

- ▶ Energy Efficiency Policy and Management Commitment
- ▶ Setting of Objectives and Targets
- ▶ Planning and implementation of procedures including training, communication, employee involvement, and documentation.
- ▶ Benchmarking, power use effectiveness, and energy audits
- ▶ Performance Monitoring and Corrective Action
- ▶ Review and Evaluation

The EnEMS enables the Installation to identify opportunities for energy efficiency improvements, reduce energy consumption, cut costs, and contribute to environmental sustainability goals, proportionate to the scale and complexity of the Installation.

7.3 Building Management System and Electrical Power Monitoring System

The Installation once constructed will operate a Building Management System (BMS). This will be a highly sophisticated automation system for control, monitoring, data collection and alarm/reporting of all site wide process and conditions, electrical and mechanical systems.

The BMS will provide control and monitoring of the building engineering systems and services throughout the data centre and the admin block and will typically provide the following functions:

- ▶ Plant control and feedback monitoring
- ▶ System performance monitoring
- ▶ Plant and components conditional based monitoring
- ▶ Fault detection and alarms
- ▶ Energy, water and fuel monitoring and metering

Within each mechanical plantroom or service area a wall or control panel mounted operator HMI touchscreen is to be provided. These are to be used by the operations team to access the BMS system remotely whilst attending to any breakdowns or planned service works within the plantrooms. These control panels are connected via ethernet to the local Network Switch within the BMS.

Environmental emissions control and monitoring systems as required by the IE licence are likely to be integrated into the BMS data management functionalities.

Overall, the BMS enables the operator to more promptly respond to problems as well as to identify, diagnose and address potential problems before they affect operations.

7.4 Electrical Power Monitoring System

The electrical distribution services will be provided with a dedicated Electrical Power Management System (EPMS) with interface facilities for the BMS to monitor, alarm and display the status of the plant for the Critical Environment (CE) Team. Data shall be stored in the Microsoft Cloud Infrastructure Health (CIH).

The EPMS will monitor the following items;

- ▶ HV to MV Transformers
- ▶ Medium voltage relay protection
- ▶ Medium Voltage Meters
- ▶ MV to LV Transformers
- ▶ Low Voltage circuit breakers
- ▶ Low voltage meters
- ▶ UPS modules
- ▶ UPS battery monitoring
- ▶ IT power Busbar Tap offs
- ▶ IEC unit tap offs
- ▶ General lighting and Power Distribution boards
- ▶ Generator Controls
- ▶ Generator Fuel System
- ▶ TVSS/SPD
- ▶ Fire pump ATS
- ▶ MV and Generator Aux Supply ATS

7.5 Accident Prevention Procedure (APP)

The Accident Prevention Procedure (APP) for the Installation will be developed once the site is operational and the IE Licence is granted. The APP will include an initial environmental risk assessment, and a scoping exercise will be undertaken to encompass all likely accident scenarios specific to the site. The primary objective of the APP is to proactively mitigate on-site hazards before they escalate into accidents or emergencies.

The prevention procedure will include the following key elements:

- ▶ Identification of on-site hazards and risks and mitigation measures to prevent accidents with adverse environmental impact and minimise consequences when accidents occur.
- ▶ Details on the storage and transfer of all raw materials in accordance with EPA's guidelines for the storage and transfer of materials for scheduled activities (EPA, 2004).
- ▶ Procedures for the management of both Hazardous and non-Hazardous waste, covering segregation, labelling, and secure containment in alignment with the Waste Management Act 1996 (as amended).
- ▶ Clear and effective procedures for the safe handling of chemicals and hazardous materials, aimed at preventing spills or accidental leaks.
- ▶ Detailing essential design components for the secure containment of chemicals and raw materials. This encompasses specifics on the location and features of stormwater petrol interceptors (Class I), bunds, pipelines, and protocols for ongoing maintenance to ensure effectiveness.
- ▶ Specifying protocols for the regular integrity testing of tanks, pipelines, and designated chemical storage areas in accordance with EPA's guidelines for the storage and transfer of materials for scheduled activities (EPA, 2004).
- ▶ This procedure links to related organisational documents and Standard Operating Procedures (SOP), Environmental Management Systems (EMS) as required.
- ▶ In the event of an emergency or accident at the Installation, the Emergency Response Procedures (ERP) will be followed including notification to the EPA as required.
- ▶ A structured procedure to investigating any on-site accidents or incidents. This includes documenting the event, determining its root cause, summarising response actions, evaluating environmental impact, and extracting lessons for prevention and future response.
- ▶ Annual review process to ensure its continued effectiveness. The review process will be documented and will consider any corrective actions identified from accidents since the previous review.
- ▶ All relevant staff members will undergo annual training on the procedure. Records of staff training will be maintained and accessible for review.

The APP will be designed to ensure that all staff members have a clear understanding of the prevention measures in place on site and the standard operating procedures related to high-risk activities. It will be structured to facilitate ongoing review, improvement, and refinement.

7.6 Emergency Response Procedure (ERP)

The Emergency Response Procedure (ERP) for the Installation will be developed once the site is operational and the IE Licence is granted. The ERP will serve as a comprehensive guide outlining the necessary steps and protocols to effectively address potential emergency situations. It will provide a comprehensive guide for addressing potential emergencies, covering scenarios like fire, spills, floods, etc. Key components include:

- ▶ Environmental impact minimisation measures and specific response procedures for various scenarios.
- ▶ Clear communication plans for the Emergency Response Team (ERT) and staff alerts, especially during non-standard hours.
- ▶ Identification of external support, including emergency services.
- ▶ Safety protocols, linking to related documents and Standard Operating Procedures.
- ▶ Update to date chemical inventory with safety data sheets.

- ▶ An inventory of all incident response and pollution prevention equipment on-site.
- ▶ Site plans for equipment and drainage,
- ▶ EPA notification details in accordance with licence requirements.
- ▶ Scheduled testing and maintenance of response equipment.
- ▶ Annual document review and staff training, covering roles, equipment use and communication.

The ERP will be designed to ensure that all staff members are equipped to respond effectively and efficiently to any potential emergency situation. It will be structured to facilitate ongoing improvement and refinement, aligning with best practices in emergency response management. Provision of digital and physical copies of the ERP will be available to guarantee its accessibility at all times.

7.7 Preventative Maintenance Programme

The Preventative Maintenance (PM) programme is set out to ensure the reliable and efficient operation of critical infrastructure. The following PM programme will be developed for the site:

- ▶ Inventory of all critical equipment and systems will be developed.
- ▶ Regular inspections of all equipment and systems will be undertaken in accordance with manufacturer's recommendations and industry best practices.
- ▶ Periodically test equipment to ensure they can handle the expected load during emergencies or high-demand periods.
- ▶ For equipment with lubricants or fluids, regular oil analysis to detect early signs of wear or contamination will be conducted. Replace fluids as recommended by the manufacturer.
- ▶ Electrical distribution systems will be inspected to identify and resolve any potential issues with power distribution and protection.
- ▶ Detailed records of all maintenance activities will be kept, including dates, tasks performed, and any identified issues.

The specific details of the PM programme will be implemented depending on the size, complexity, and criticality of the equipment, and manufacturer's recommendations, industry best practices.

7.8 Fire Management

Buildings are provided with fire detection, alarm, and fire suppression systems to enhance life safety/protection of occupants and property in compliance with Irish, EU and NFPA regulations (insurers' requirements).

The entire buildings are equipped with early warning fire detection systems (aspirating smoke detection systems) in critical areas and point type fire detectors within the admin spaces that notify operations staff/occupants of a fire. These detectors are connected to the main fire panel located in the security office which is manned at all times. In the event that a fire is detected, the fire alarm panel will notify the operations staff, requiring an investigation to be undertaken. If a fire is confirmed or the investigation period elapses, a building wide fire alarm will be activated.

Building Sprinkler systems: The fire detection and alarm systems are interfaced with the fire protection system, which will trigger pre-action sprinkler systems in a specific zone within the building. As a parallel operation, relay signals from the fire alarm panel to shutoff valves upstream of the outfall will be triggered – preventing sprinkler water discharge into the storm water drainage system.

Campus Hydrant systems: The campus (Installation) is also provided with an external hydrant system that can be used by the fire services personnel if deemed necessary to fight a fire. The action of upstream valve shutoff will happen automatically and even before the fire services arrive at the campus - preventing hydrant water discharge into the storm water drainage system.

The fire detection and alarm systems and the fire protection systems will be maintained, inspected and tested by an approved external service provider on a regular basis.

8. CESSATION OF ACTIVITY

8.1 Site Closure

A certain amount of environmental risk is associated with the cessation of any licensable activity (site closure). An outline Site Closure report (Attachment 9-2-3 Site Closure) has been provided in Section 9 of this application.

The basis of the outline Site Closure is to ensure that, upon completion of implementation of the plan, the Installation would be in a suitable state for future industrial use and would not pose a risk to public health and safety or the environment.

It is anticipated that the EPA will impose suitable Conditions in the IE Licence once granted to ensure the proper closure of the activity with aim of protecting the environment.

8.2 Baseline Report

A Complete Baseline Report (Attachment 4-8-3 Complete Baseline Report) for the site has been produced and included in Section 4 of this application. The complete baseline report provides conditions of the site prior to the construction of the Installation.

9. ENVIRONMENTAL IMPACT ASSESSMENT REPORT

This section provides an overview of the Environmental Impact Assessment Reports (EIARs) prepared in relation to the activity under this licence application, which have previously been submitted to Fingal County Council (FCC).

The EIARs related to the installation site under this licence are as follows:

- ▶ EIAR dated August 2021 submitted to FCC under Reg. Ref: FW21A/0151 and included in this application as Attachment 6-3-6;
- ▶ EIAR dated September 2021 submitted to ABP under Reg. Ref: ABP-311528-21 and included in this application as Attachment 6-3-6; and
- ▶ EIAR Addendum dated February 2022 submitted to FCC under Reg. Ref.: FW21A/0151 following a request for additional information and included in this application as Attachment 6-3-6.

10. PROJECT ALTERNATIVES

Chapter 4 of the EIAR (February 2022) included in the licence documentation as Attachment-6-3-6-EIAR-Addendum-Mar-2025 outlines the reasonable alternatives considered by the Applicant in developing the proposed data centre project.

It discusses main types of alternatives: the 'Do-Nothing' scenario, alternative sites, and alternative land uses, and alternative layouts. A summary of these alternatives is set out in this section.

10.1 Do-Nothing Alternative

The 'Do-Nothing' alternative considered leaving the site undeveloped, maintaining its state as largely unused agricultural land. This option was dismissed because it would be a failure to realise its developmental potential in land zoned HI (Heavy Industry). The Fingal County Development Plan encourages the provision of specialised facilities for sectors such as data centres, pharmaceuticals, food production, and logistics. The development is presented as being consistent with County Development Plan policies, particularly Objective ED110, which supports the needs of industries requiring bespoke facilities, including data centres. This site allows for on-site power generation to secure firm grid access for the data centre campus and as such aligns with the bespoke building requirements for data centres in the County Development Plan.

10.2 Alternative Processes

As detailed above in 10.1, proposal is suitably located given its co-locational benefits with the adjoining Power Station. New on-site generation would be required if the proposal was placed at an alternative location. Alternative technologies are considered on an ongoing basis as a part of each of its designs based on many factors, including technical feasibility, environmental impact, efficiency, security, reliability and cost. The Applicant is committed to continually assessing and improving this technology, particularly with respect to minimising power and water consumption, in accordance with the goals of Ireland's Framework for Sustainable Development 'Our Sustainable Future'. Designs are constantly evolving, and hardware is chosen with energy efficiency central to the decision-making process.

10.3 Alternative Locations and Layouts

The facility location was considered the most appropriate location for the proposed data centre having regard to the co-locational benefits beside the power station, in line with 'Eirgrid's Data Centre Connection Offer Process and Policy, 2020' (which necessitates the provision of on-site dispatchable generation for firm capacity for data centres within the Greater Dublin Area). The short grid connection to the electricity network was also deemed suitable, as this decreases overall energy losses and improves energy efficiency to the development. The site is ideally located regarding transportation connections to the M50 and N2. The size of the site is ideally suited the scale of the data centre.

Several iterations of site layout were considered during planning stages of the development to arrive at the current arrangement of buildings and site infrastructure. The proposed layout, with the two buildings, is considered to be the optimal design. The two building layout prevents the overdevelopment of the lands and allows for movement around the site and appropriate separation from the boundary and road frontage. The data centre building was orientated to maximise land use and minimise noise impact and visual impacts at the site boundaries for sensitive receptors.

The final design was influenced by the requirement to underground existing 110kV overhead power lines crossing the site and by the planned location of a 220kV substation that will provide the facility's permanent power supply. Alternative configurations were evaluated for their potential environmental impacts, particularly in relation to nearby residential areas, the Dogs Trust facility, and the North Road (R135).

10.4 Alternative Mitigation

The mitigation measures proposed are outlined in the EIARs (refer Section 9) completed for the installation at planning phase (operational phase and construction phase). These represent the best practice for achieving minimal impact on the receiving environment.

For each environmental factor considered within the EIARs, the specialist considered the existing environment, likely impacts of the development and reviewed feasible mitigation measures to identify the most suitable measure appropriate to the environmental setting the project design. In making a decision on the most suitable mitigation measure the specialist considered relevant guidance and legislation at the time. The selected mitigation measures are set out in the EIAR Chapters (Attachments 6-3-6 of the IE Licence application).

In each case, the specialist at the time reviewed the possible mitigation measures available and considered the use of the mitigation in terms of the likely residual impact on the environment. The four established strategies for mitigation of effects have been considered: avoidance, prevention, reduction and offsetting (not required in this development). The mitigation measures presented in the EIS represent the best options for the site.

The mitigation measures for the environmental aspects considered under this IE licence application (if relevant) are set out in the accompanying emissions impact assessment reports within Section 7 of this licence application.