Microsoft Operations Ireland Ltd

Operational Report

Attachment-4-8-1

December 2022 (Updated March 2023)

Licence Application (LA010454)

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1.0 INTRODUCTION

The following Operational Report relates to the Microsoft Operations Ireland Limited (MS Ireland) data storage facility Dub 6, 7, 8, 9, 10, 12 and 13 in Grange Castle Business Park, Clondalkin, Co. Dublin. The data storage facility provides secure data storage services, and distribution of information to individuals, businesses and organisations.

The facility consists of seven datacentres (Dub 6, 7, 8, 9, 10, 12 and 13). The permitted site and main buildings are shown on Figure 1.1 below and Drawings A1000 and A1002: Site Location Plan and site layout plan included with this application.

The power requirements for the development are currently provided via a connection to an existing substation on the site and the utility 110 kV Substation (Corkagh).

Backup generators are located at each of the datacentres.. There are 15 generators at Dub 6, 15 generators at Dub 7, 15 generators at Dub 8, 12 generators at Dub 9, 12 generators at Dub 10, 12 generators at Dub 12 and 8 generators at Dub 13. The capacity of the backup generators is 579.28 MWth. The requirement for an Industrial Emissions (IE) Licence is outlined within the First Schedule of the EPA Act 1992. Activity '*Class 2.1 Combustion of fuels in installations with a total rated thermal input of 50 MW or more'* specifically relates to this facility. The applicant is therefore, applying to the Environmental Protection Agency (EPA) for an Industrial Emissions (IE) Licence to operate the facility under Activity Class 2.1.

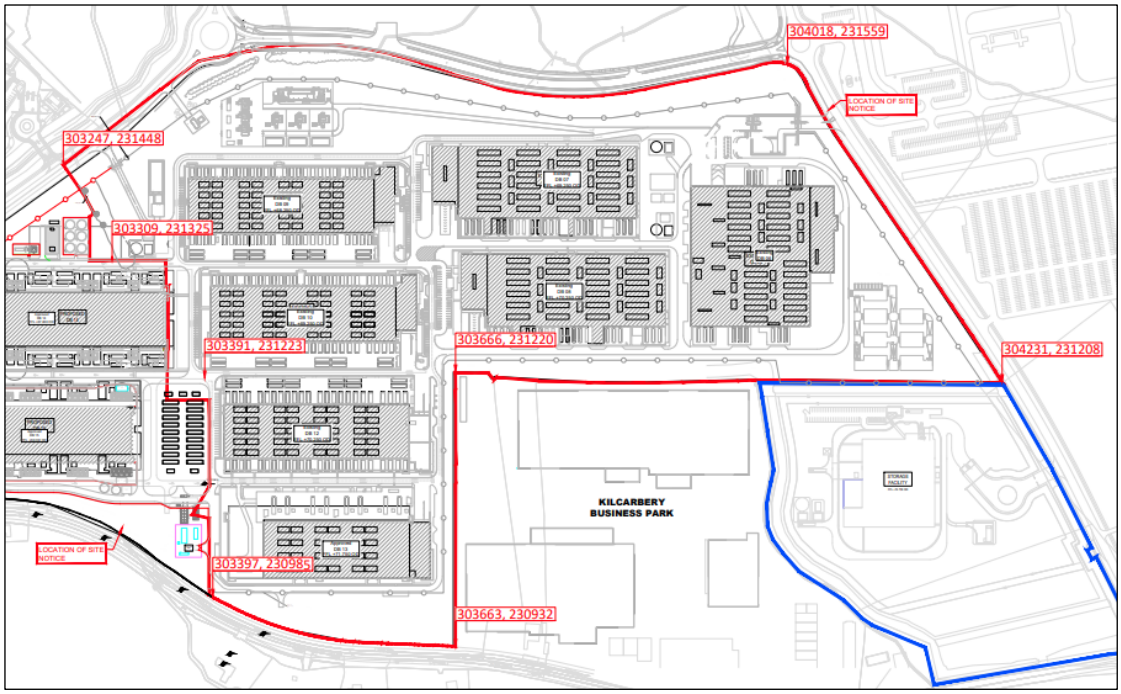


Figure 1.1 *Facility Overview*

The development has the required Greenhouse Gas (GHG) Emissions permit in place in accordance with the European Communities (Greenhouse Gas Emissions Trading) Regulations 2004, (S.I. 437 of 2004 and amendments) when 20MW$_{th}$ capacity is exceeded.

The facility has been constructed and developed in a number of phases, Dub 6 in 2014, Dub 7 and 8 from 2016 and Dub 9, 10 , 12 and 13 in the period between 2018 2022 (approximately).

2.0 SITE CONTEXT

The site comprises lands directly north of the New Nangor Road (R134) within the Grange Castle International Business Park, Clondalkin, Co Dublin and is located in the central and eastern part of the larger Microsoft Ireland data centre campus. The site is c. 30 ha and is bound to the west by the permitted Dub 14 and 15 facilities currently under construction, to the east by PRL – P&G Ireland Warehouse, BWG Foods NDC and an internal access road for Grange Castle International Business Park, to the south the New Nangor Road, BWG Foods NDC and the operational Dub 11 facility, and to the north by an internal access road for Grange Castle International Business Park, Grifols Ireland and Takeda Ireland Ltd. Prior to the construction of the facility the site was an unmanaged greenfield. Construction for the facility has been completed in three phases, in line with the planning permissions detailed below in Section 3.0 – *Planning Status*.

The wider context of the proposed development is defined primarily by commercial and industrial development, with the remainder of the Microsoft Data Centre Campus in the immediate vicinity to the west. The surrounding 5 km of the site also includes IE and IPC Licenced sites including:

- Microsoft Ireland (P1190) located c. 500m to the west of the site
- Microsoft Ireland (P1187) Located adjacent and to the west of the site
- Takeda Ireland Limited (P0693-02) located immediately north-west of the site.
- Amazon Data Services Ireland Ltd (P1170) located immediately Southwest of the site.
- Adsil Grange Castle South (P1184) located c. 570m south-west of the site.
- Google Ireland Limited (P1189) Location c. 600m south of the site
- Data and Power Hub Services Limited (P1165) located c. 1.5km to the south west
- Pfizer Ireland Pharmaceuticals (P0652-01) located immediately north-east of the Site.
- Grange Backup Power Limited (P1033) located c. 590m North of the site.
- Rilta Environmental (W0185) located approximately c. 2.8km south-west of the site.
- Rilta Environmental (W0192) located approximately c. 2.8km south-west of the site.
- Starrus Eco Holdings Limited (Greenogue) (W0188) located approximately c.3 km south-south-west of the site.
- BBALP Limited (P0275) located approximately c.3 Km South of the site.

The site layout is presented in Drawing A1000 Site Location Plan included with this application.

3.0 PLANNING STATUS

Phase 1 of the development, regarding Dub 6, was granted planning permission Reg. Ref: SD13A/0143 by South Dublin County Council (SDCC) on 23rd October 2013 subject to conditions. Following the original grant of planning permission, amendments to the original application were sought with Reg. Ref: SD13A/0265 and SD14A/0194 and permission was granted on 24th March 2014 and 19th December 2014 respectively. Phase 2 of the development, regarding Dub 7 and 8, was granted further planning permission for Reg Ref: SD15A/0343 by SDCC on 23rd February 2016 to construct Dub 7 and 8 at the site to the west of Dub 6. To initiate Phase 3 of the development, permission was granted under Reg. Ref: SD16A/0087 on 20th June 2016 for site enabling works to facilitate the construction of Dub 9, 10, 12 and 13. Permission to construct Dub 9, 10, 12 and 13 to the west of Dub 7 and 8 was granted on 13th June 2016 under Reg. Ref: SD16A/0088. On 28th January 2022 permission was granted for the addition of photovoltaic panels on the roof of Dub 12 under Reg. Ref: SD21A/0288.

4.0 DESCRIPTION OF ACTIVITY

4.1 SITE OVERVIEW

The 7 no. data storage buildings (Dub 6, 7, 8, 9, 10, 12 and 13) have a total building footprint of approximately 150,000m^2.

The components of Dub 6 include:

- Single storey datacentre;
- IT and technical hardware;
- Administration blocks (comprising offices, canteen, loading dock, storage and ancillary areas);
- Maintenance and storage space;
- Electrical plant rooms;
- Main Distribution Frame (MDF) rooms;
- Air Handling Unit (AHU) plant space; and
- Corridors and ancillary spaces.

The components of Dub 7 and 8 include:

- Single storey datacentre;
- IT and technical hardware;
- Administration blocks (comprising offices, canteen, loading dock, storage and ancillary areas);
- Electrical plant rooms;
- Air Handling Unit (AHU) plant space; and
- Corridors and ancillary spaces.

The components of Dub 9, 10, 12 and 13 include:

- Single storey datacentre;
- IT and technical hardware;
- Administration blocks (comprising offices, canteen, loading dock, storage and ancillary areas);
- Electrical plant rooms;
- Air Handling Unit (AHU) plant space; and
- Corridors and ancillary spaces.

There are 97 no. backup generators and associated sub-station. There are 15 mechanical flues (each c. 25 m high) located to the north and south of Dub 6, 16 mechanical flues (each c. 25 m high) located to the south of Dub 7, 16 mechanical flues (each c. 25 m high) located to the south of Dub 8, 13 mechanical flues (each c. 25 m high) located to the south of Dub 9, 13 mechanical flues (each c. 25 m high) located to the south of Dub 10, 13 mechanical flues (each c. 24 m high) located to the north of Dub 12 and 9 mechanical flues (each c. 23.25 m high) located to the north of Dub 13. Each generator at Dub 6, 7 and 8 are supplied with a 25 m^3 fuel belly tank . Each generator at Dub 9, 10, 12 and 13 are supplied with a 40 m^3 fuel belly tank. There are 2 no. fire pumps serving Dub 6 and 7 located to the west of Dub 6. These pumps are supported by two backup generators (0.5 MWth) which are each supplied by a 0.8 m^3 fuel tank.

The installation is in operation 24 hours a day, 7 days a week. There are approximately 400 personnel employed at the facility.

The power requirements for the proposed development is provided via a connection to an on-site 110 kV Substation.

In the event of a loss of power supply i.e. power blackout, there are 95 no. backup generators at Dub 6, 7, 8, 9, 10, 12 and 13 which have 95 no. flues either 25 m, 24 m or 23.25 m high. A further 2 no. standby generators support the 2 no. fire pumps serving Dub 6 and 7, with 2 no. flues 3 m high. Generators are supplied by fuel belly tank.

4.2 PRIMARY PROCESSES

4.2.1 Backup Generators

The facility is supported by containerised backup generators with belly tanks that are located north and south of Dub 6, south of Dub 7, south of Dub 8, south of Dub 9, south of Dub 10, north of Dub 12 and north of Dub 13. These generators provide the necessary power to ensure the data hall can operate optimally in the event of a failure of electricity supply.

The overall site includes 95 backup generators. Each individual generator includes an exhaust flue which is either 25, 24 or 23.25 meters high. The two fire pump engines have flues that are 3 metres high. There are therefore 97 minor emission points in total associated with the backup generators at Dub 6, 7, 8, 9, 10, 12 and 13.

The generators are tested on an individual basis once per month; the current testing regime is presented below:

- 8 Monthly tests, no load runs for 15 minutes (completed in house)
- 3 Quarterly tests, on 70% load for 30 minutes (completed in house & vendor)
- 1 Annual Preventative Maintenance including Full Load run for 60 minutes (completed in house & vendor)

These generators provide backup electrical supply to power the data centre in the event of mains failure, during occasional breakdown or other maintenance/testing scenarios.

In accordance with the Commission for Energy Regulation (CER) regulations low sulphur distillate oil is used as the backup fuel. Fuel oil is stored locally within a double

skinned belly tank for each of the 95 backup generators. 43 no. of the tanks store 25 m^3, 44 no. of the tanks store 40 m^3, 3 no. of the tanks store 20 m^3, 2 no. of the tanks store 18 m^3, 2 no. of the tanks store 7.8 m^3 and 1 no. of the tanks store 8.7 m^3. Additionally the 2 no. tanks supplying the generators associated with fire pumps each store 0.8 m^3.

The generators are located within a generator yard in individual containers with various designed control measures in place. The generator yards consist of impermeable concrete and the fuel delivery hard standing area is sloped to contain any potential fuel spillage. The individual belly tanks are double skinned tanks, with level gauges (high and low) within the fuel tanks connected to an onboard controller which will alarm to prevent overfilling and identify a sudden loss of fuel within the tank. The containerised generator housing includes retention bunding in the base of the container, there are leak detection systems within the bund to alert in the event of a leak from the generator fuel tank or lubricating oil tank. The onboard controller for individual generators is connected to the Building Management System (BMS). These belly tanks provide approximately 48 hours fuel storage at 75 percent of the generators nameplate kW rating.

4.2.2 Data Storage Building(s)

The primary reason for the installation is to provide data storage. Data storage facilities are centralised computer hardware systems on a large scale designed and operated for the purpose of storing, managing, distributing information to individuals, businesses and organisations.

The data centre facility consists of seven buildings containing hardware needed to store the data, deliver this content when requested, and allow quick and efficient communication between customers. The data storage facility (involving systemised racks of hundreds/thousands of server units), offers significant advantages (and economies of scale) over traditional in-house data storage systems.

It is shown by the numerous other data centres in Ireland, the temperate climate is ideally suited. The naturally cool ambient temperature means the data halls require less cooling than if the facility were located in regions of the world subject to greater temperature and humidity variation. The computer hardware is cooled by natural air intake supplied to Air Handling Units (AHUs) at the data centre.

4.2.3 Data Storage Cooling Systems

The data centre hardware and associated ancillary equipment produces heat which must be managed by the cooling systems. The data centres are cooled primarily utilising outside air, via roof mounted Air Handling Units (AHU) . Conditions in Ireland are conducive to this free cooling strategy, which essentially moves outside air across the servers to cool and then exhaust the higher temperature air to atmosphere. There are other small areas in the building which require additional cooling, i.e. the PCCR Rooms, but the majority of the building is serviced by outside air cooling. In order to achieve such high levels of optimisation the Cooling units operate on two different modes dry cooling and evaporative cooling mode. The AHUs primarily operate in a dry cooling mode air from inside the data hall is cooled using external air via an air-to-air heat exchanger before being supplied back to the data hall. It is expected that the AHUs will operate in dry mode for c.95% in a typical year.

During the warmest periods of the year (less than. 5% of a typical year) evaporative (adiabatic) cooling (integrated into the AHUs) is utilised to ensure the data halls are

kept to the designed temperature. The air itself is cooled by saturating the wetted media pads located in the incoming air stream. Water is consumed through the adiabatic cooling by mist spraying water on to media pads which cools the incoming air. The benefits of this type of technology is that it is very compact compared to alternative technologies and represents a much smaller massing on the site whilst still offering very low power consumption.

It is anticipated that the evaporative cooling system will be required very infrequently, however water used within the system at Dub 6, 7, 8, 9, 10, 12 and 13 is flushed from the system periodically to mitigate against legionella risks.

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.

There is a cooling water demand which is currently drawn from the main water supply. The use of rainwater harvesting will be implemented for Dub 9, 10, 12 and 13 in future (2024 approx). The wetting water from the cooling system is not directly heated and therefore the opportunity for heat recovery is limited.

The cooling water is recirculated within the Indirect Evaporative Cooling (IEC) units during normal use the spent cooling water that is not evaporated in the AHU is pumped off to the stormwater system. An average of 8.2m^3 of excess cooling water is discharged from Dub 6, 7 and 8 while currently an average of 7.4m^3 is discharged from Dub 9, 10, 12 and 13. Following the commissioning of the water treatment plant at the site the excess cooling water from Dub 9 and10, will be recycled through the water harvesting system thus significantly reducing the discharge volumes.

The annual water consumption for the site including the cooling system is detailed in the water and energy use section of the application. The water use is monitored by the Building Management System (BMS).

4.3 SECONDARY PROCESSES

4.3.1 Ancillary infrastructure

. The ancillary infrastructure comprises the following main components;

- Reception and security area;
- Administration Offices for staff and management;
- Staff cafeteria;
- Sanitary facilities;
- Waste compound;
- Internal road network and car and cycle parking;
- Bicycle Shelters;
- Sprinkler Tanks and Pump House;
- Security fencing; and
- Drainage infrastructure including underground attenuation.

The layout of the facility is shown on Drawing Ref. A1002 Site Layout Plan included with this application.

4.4 WATER, SEWER, AND STORMWATER DRAINAGE INFRASTRUCTURE

4.4.1 Potable water

The facility has both domestic water and cooling water demand. The potable water supply is supplied through a 100mm diameter main which is connected to the existing Irish Water watermain. The use of rainwater harvesting will be implemented for Dub 9, 10, 12 and 13 in 2024 to support the demand for cooling water.

4.4.2 Foul and Process Sewer

The sanitary effluent from the washroom facilities and break room areas from the data centre buildings is collected in gravity foul sewers and discharge at four outfalls (SE-1, SE-2, SE-3 and SE-4). SE-1, SE-2 and SE-3 collect foul effluent from Dub 6 and are located to the south, east and north respectively of the Dub 6 building. Foul effluent from each of the remaining buildings, Dub 7, 8, 9, 10, 12 and 13, is collected and discharged to SE-4 to the north of the site. Each of the four outfalls discharge to the existing local foul sewer network to the north, east and south of the site. The proposed maximum wastewater flow from the permitted development across all 4 no. emission points combined is c. 40 m^3 per day.

The local foul drainage network ultimately discharges to Ringsend Wastewater Treatment Plant. The foul water discharge connection is in place in line with the applicable planning permission granted by South Dublin County Council.

Refer to Drawings A1011, A1011-1 to A1011-8 included with this application for the Foul Water drainage layout.

4.4.3 Stormwater Drainage Systems

The surface water measures have been designed in relation to Sustainable Urban Drainage Systems in accordance with the guidelines of the Greater Dublin Strategic Drainage Strategy. All stormwater passes through retention fuel separators with carbon monitors and control valves linked to the facilities BMS, prior to discharge to the existing stormwater sewers from 7 no. outfalls, SW1, SW2, SW3, SW4, SW6, SW7 and SW8. Discharge from Dub 6, 7 and 8 drains to SW1 to the north east of the site. Discharge from the roof of Dub 6 drains to SW2 to the east of the site. Discharge from the car park east of Dub 6 drains to SW3 to the east of the site. SW1, SW2 and SW3 drain to the existing stormwater sewer to the east of the site. The existing stormwater sewer to the east of the site discharges to the Grange Castle Business Park attenuation pond, which ultimately discharges to the River Griffeen. Discharge from the onsite substation drains to SW4 to the north west of the site. Rainwater discharge from Dub 9 drains to SW5 to the north west of the site. Stormwater discharge from Dub 9 and Dub 10 drains to SW6 to the north west of the site. SW4, SW5 and SW6 drain to the existing stormwater system to the west of the site, which in turn discharges into the River Griffeen. Rainwater discharge from Dub 10 drains to SW7 to the west of the site. SW7 drains to the rainwater harvesting network of the neighbouring Microsoft Dub 14 and 15 facility immediately to the west of the site (see Licence Application LA010221), which ultimately drains to the River Griffeen. Stormwater and Rainwater discharge from Dub 12 and 13 drains to SW8 to the west of the site. SW8 drains to the stormwater network of the neighbouring Microsoft Dub 14 and 15 facility immediately to the west of the site, which ultimately drains to the River Griffeen.

The control measures in place ensure only clean uncontaminated surface water will enter the existing stormwater sewer and be subsequently discharged to the River

Griffeen. The outfall from the site into the existing stormwater system is via a hydrobrake flow control devise (limited to 83m3 per hour) at SW5 and SW6 which is downstream of the attenuation and rain water harvesting tanks in place along the western boundary of Dub 9 and 10. Stormwater flow from Dub 7 and 8 is controlled by silt traps. Outflow from SW7 and SW8 enters the neighbouring Microsoft Dub 14 and 15 facility's stormwater system. Outflow from this site is restricted by way of Hydrobrake (limited to 21.6l/s), as per Licence Application LA010221. A series of control valves are provided across the site to isolate the stormwater network, this allows for the attenuation systems and fuel separators to intercept runoff in the event of a fire or major spill event at the site.

The storm water drainage within the entire development has been designed to accommodate attenuation requirements of 1:10, 1:30 and 1:100 year storm event via the on-site attenuation tanks to the west of the site, the combined capacity of the attenuation and rain water harvesting tanks is 5,235m^3 .

For more information on the surface water network layout. refer to drawings Ref. A1011, A1011-1 to A1011-8 with this application.

5.0 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 5.1:

Table 5.1 *Applicable BAT documents*

Horizontal BREF	Publication date	Attachment
Best Available Techniques (BAT) Reference Document for Large Combustion Plants	2017	Attachment-4-7-1-BREF - 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 has demonstrated that the installation will comply with all applicable BAT Conclusion requirements specified in the CID and will be in line with the guidance specified in the other relevant BREF Documents and relevant national BAT notes.

The individual backup generators are subject to the Medium Combustion Plant (MCP) Regulations (S.I No. 595 of 2017), which transposed the Medium Combustion Plant Directive ((EU) 2015/2193), applies to the individual plant. The generators are intended for backup only and are not anticipated to operate in excess of 500 hours per annum. Therefore, the generators as proposed are exempt from complying with the emission

limit values subject to Section 13(3) of the Medium Combustion Plant (MCP) Regulations.

6.0 EMISSIONS AND ABATEMENT TREATMENT SYSTEMS

This section describes the emissions from the unit 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 AIR EMISSIONS

Minor Air Emissions

Dub 6 has 15 no. standby generators with 15 no. flues, each of which are 25 m above ground level resulting in a total of 15 emission points each. Dub 7 and 8 each have 16 no. standby generators with 16 no. flues, each of which are 25 m above ground level resulting in a total of 16 emission points each. Dub 9 and 10 each have 13 no. standby generators with 13 no. flues, each of which are 25 m above ground level resulting in a total of 13 emission points each. Dub 12 has 13 no. standby generators with 13 no. flues, each of which are 24 m above ground level resulting in a total of 13 emission points. Dub 13 has 9 no. standby generators with 9 no. flues, each of which are 23.25 m above ground level resulting in 9 emissions points. Additionally, both Dub 6 and 7 have 1 no. standby generator to support 1 no. fire pump each, with 1 no. flue 3 m above ground level each. In total, there are 97 minor air emission points across the site. These generators are only used during abnormal operating in the case of emergencies and are classified as minor emission points due to their periodic testing and infrequent use. The emission points from each generator have been labelled Emission Points A3-1 to A3-97 in Attachment 7.4.2. These emission points are shown in Drawing Ref. A1021 Minor Air Emission included with this application.

It is anticipated, based on the applicants' experience, that backup generators will be used infrequently. They are tested and used in maintenance related activities periodically as per the following:

- A conservative assumption has been made for the purpose of the air dispersion modelling assessment that the standby generators will be tested sequentially for one hour once per week at 100% loading;
- All testing was assumed to occur from 9am to 5pm, Monday to Friday only; and
- Additional annual maintenance and other ad hoc maintenance requirements.

The backup generators are not expected to run in excess of 500 hours per year. Generators are fitted with a data logger which tracks the number of hours the generators operate.

The AHUs are not considered as minor emissions as these emit warm (35 degrees C) air only.

Potential Emissions

These are emissions which only operate under abnormal process conditions. Typical examples include bursting discs, pressure relief valves, and emergency generators.

The back up generators and tanks at the facility each include two-way normal pressure (breather) and pressure relief vents on the fuel belly tanks. These produce minor hydrocarbon vapour (trace) emissions.

There is an additional backup generator (0.175 MWth) at Dub 6 that serves as a backup supply for ancillary services at the on-site substation. The generator has 1 no. flue 2 m above ground level. The generator is supplied by a 0.2 m^3 fuel tank. This generator is considered a potential emission point rather than a minor emission point because it not associated with the data building backup generator network and is not subject to the routine testing described above. This emission point has been labelled A4-1 in Attachment 7.4.2 and is shown in Drawing A1021 included with this application.

Fugitive Emissions

Fugitive emissions are defined as low level diffuse emissions, mainly of volatile organic compounds, that occur when either gaseous or liquid process fluids escape from plant equipment. There are no such emissions anticipated from the installation.

6.1.1 Treatment and Abatement Systems

The emissions from the gas generation plant have been considered against the Industrial Emissions Directive (IED) (Directive 2010/75/EU) was adopted on 7 January 2013 and is the key European Directive which covers the regulation of the majority of processes in the EU. As part of the IED Article 15 - Paragraph 2 requires Emissions Limit Values (ELVs) are based on best available techniques (BAT) and the relevant sector Reference Document of Best Available Techniques (BREF documents).

The most relevant BAT sector document for the activities at the installation is the Best Available Techniques (BAT) Reference Document for Large Combustion Plants LCP. ELVs set out in the LCP BAT are applicable to individual combustion plant greater than 15 MWth. However, the individual generators are below the 15 MWth threshold and therefore does not apply in this case. The Medium Combustion Plant (MCP) Regulations (S.I No. 595 of 2017), which transposed the Medium Combustion Plant Directive ((EU) 2015/2193), applies to the individual plant in this case. Regardless, of the emission limit values, 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. Air dispersion modelling has been undertaken as discussed in Attachment 7.1.3.2 (Air Emissions Impact Assessment) to ensure that the appropriate ambient air quality standards are met. The modelling has been undertaken using the AERMOD air dispersion model in line with EPA Guidance Note AG4.

The stack heights of the backup generators for the facility have been designed to ensure that an adequate height was selected to aid dispersion of the emissions and achieve compliance with these ambient air quality standards at all off-site locations (including background concentrations). There is no SCR abatement or treatment systems proposed or required for the gas generation plant and backup generators.

The assessment methodology determined that in the worst-case year, the facility can run for 220 hours per year without a likelihood of an exceedance at the nearest residential receptor (at a 98^{th} percentile confidence level). In the cumulative assessment, including neighbouring IED licenced sites, the assessment methodology determined that the facility could operate for 143 hours before there is a likelihood of an exceedance of the ambient air quality standard (at a 98^{th} percentile confidence level). However, the UK guidance recommends that there should be no running time

restrictions placed on standby generators which provide power on site during an emergency power outage.

6.1.2 Control and Monitoring

The emissions from the backup generators have been considered against the Medium Combustion Plant (MCP) Regulations (S.I No. 595 of 2017), which transposed the Medium Combustion Plant Directive ((EU) 2015/2193).

The generators are for backup only and are not anticipated to operate in excess of 500 hours per annum. Therefore, the generators as proposed are exempt from complying with the emission limit values subject to Section 13(3) of the Medium Combustion Plant (MCP) Regulations.

6.2 EMISSIONS TO SEWER (WASTEWATER EMISSIONS)

The foul drainage includes domestic effluent from the seven data halls Dub 6, 7, 8, 9, 10, 12 and 13. The proposed maximum wastewater flow from the permitted development across all 4 no. emission points combined is c. 40 m^3 per day.

6.2.1 Treatment and Abatement systems

There is no requirement for onsite treatment or abatement for foul effluent produced from the facility. The foul effluent comprises of sanitary waste only. The effluent is treated offsite at the Ringsend Wastewater Treatment Plant.

Flow volume monitoring of the overall sewer discharge is in place with flow meters at each foul sewer outfalls SE-1, SE-2, SE-3 and SE-4. The location of the monitoring equipment SE1-1, SE2-1, SE3-1 and SE4-1 are identified on Drawings Ref. A1011, A1011-1 to A1011-8 included with the application.

6.3 STORMWATER EMISSIONS

The surface water is ultimately discharged to the stormwater network to the north, east and west, via Emission Points SW1, SW2, SW3, SW4, SW5, SW6, SW7 and SW8. Stormwater discharging from SW1, SW2 and SW3 flows to the Grange Castle Business Park attenuation pond, which ultimately discharges to the River Griffeen. Stormwater discharging from SW4, SW5 and SW6 flows into the stormwater system to the west of the site and into the River Griffeen. Stormwater from SW7 and SW8 drains to the stormwater system and attenuation tanks located in the neighbouring Microsoft Dub 14 & 15 site to the west, ultimately discharging to the River Griffeen. The stormwater emission points are shown in Drawing A1011, A1011-1 to A1011-8 included with the application. The foul water is separated from all stormwater lines in accordance with BAT.

The only bulk chemicals stored are hydrocarbons (Diesel/HVO) and there is a low risk of contamination of stormwater, this would only be from complete containment failure resulting in a major leak or spill or emergency situation such as fire. The implemented mitigations below are will further reduce that risk.

Excess cooling water used in the AHU's is periodically discharged to the stormwater surface drain . The excess water is unused clean mains water which has not been subject to any addition of chemicals. The water is discharged every 72 hours (assuming no call for cooling water in the interim) and or where conductivity exceeds

1,000µs/cm. An average of 8.2m^3 of excess cooling water is discharged from Dub 6, 7 and 8 while currently an average of 7.4m^3 is discharged from Dub 9, 10, 12 and 13. Following the commissioning of the water treatment plant at the site the excess cooling water from Dub 9 and 10 will be recycled through the water harvesting system thus significantly reducing the discharge volumes. Dub 6, 7 and 8 will not be serviced by the water treatment plant and will continue to operate as is currently the case.

The discharge is programmed into the panel on each AHU, each AHU drops its water at different times to the other AHU's around it this then limits excessive drain down flow rates.

6.3.1 Treatment and abatement systems

In the unlikely event of a leak or spills at the site there are mitigations and designed containment measures in place.

The generators are housed within a generator yard with various designed control measures in place. The individual belly tanks are double skinned tanks, with level gauges (high and low) within the fuel tanks connected to an onboard controller which will alarm to prevent overfilling and identify a sudden loss of fuel within the tank. The containerised generator housing includes retention bunding in the base of the container, there are leak detection systems within the bund to alert in the event of a leak from the generator fuel tank or lubricating oil tank. The onboard controller for individual generators is connected to the Building Management System (BMS).

The hardstanding areas that drain surface water from the generator yard, loading dock, and fuel delivery areas pass through retention fuel separators prior to entering the existing surface water drainage system. The carparking areas also pass through retention fuel separators prior to entering the existing surface water. The fuel separators treat rainfall and prevent hydrocarbon spillages entering the existing stormwater sewer and stormwater attenuation tanks. There are level alarms connected to the BMS within the fuel separators to alarm when they are full and require maintenance.

The outflow from the installation is restricted by way of Hydrobrake facilities at stormwater discharge point SW5 and SW6. Stormwater from Dub 6, 7 and 8 and the roof of Dub 6 drains to SW1 and SW2 respectively and passed through a silt trap which controls flow rate. Stormwater from the carpark at Dub 6 (SW3) and the substation area (SW4) does not require flow control. Outflow from SW7 and SW8 enters the neighbouring Microsoft Dub 14 and 15 facility's stormwater system. Outflow from this site is restricted by way of Hydrobrake, as per Licence Application LA010221. These flow controls in place are based on a requirement to achieve greenfield runoff rates.

In the event of a major spill or a fire, there are a series of control valves which can close off the stormwater whilst the matter is being addressed. This allows for the attenuation systems and stormwater system to intercept runoff in the event of a fire or major spill at the site. The site is manned 24/7 and the site emergency response includes procedures for locking down the stormwater network.

Potentially contaminated stormwater (e.g. in the event of a fire) that enters the stormwater attenuation tanks and system will be tested prior to discharge to the off-site storm water network/River Griffeen. Any stormwater of unacceptable quality will be pumped out of the attenuation tanks and system and disposed of appropriately.

There is no further requirement for abatement of the stormwater from the site.

6.3.2 Control and Monitoring

It is proposed that weekly visual inspections for discolouration and odour are undertaken of the stormwater discharge monitoring points (SW1-1, SW2-1, SW3-1, SW4-1, SW5-1, SW6-1, SW7-1 and SW8-1).

Due to the lack of bulk chemicals storage on site, and the robust control measures outlined above it is considered that weekly visual monitoring is suitable.

6.4 NOISE EMISSIONS

The primary source of noise arises from the building service plant which are required to service the Data Centre (i.e. the AHU air intake and the AHU air exhaust), routine testing of the emergency backup generators, and in the event of a power failure there will also be noise produced by the generators.

An assessment of the noise emission impacts in line with the EPA *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* has been conducted and the results are summarised in Attachment 7.1.3.2 (Noise Impact Assessment).

6.4.1 Treatment and abatement systems

Plant have been selected in order to achieve the stated noise levels and / or appropriate attenuation has been incorporated into the design of the plant / building in order that the plant noise emission levels are achieved on site.

Each emergency generator is contained within an acoustic container to dampen the noise. The noise mitigation measures incorporated into the site design includes the installation of either acoustic louvres, or low noise equipment as set out in Attachment 7.1.3.2 (Noise Emissions Impact Assessment).

It is anticipated that the noise abatement measures are sufficient to ensure that the noise levels comply with the daytime, evening and night-time noise limits proposed, to be stipulated in the IE licence at the nearest noise sensitive receptors.

6.4.2 Control and Monitoring

Annual day time, evening and night-time monitoring will be undertaken in accordance with the IE licence requirements.

7.0 MANAGEMENT OF RAW MATERIALS, INTERMEDIARIES AND WASTES

A list of all raw materials in use on the site is provided in Attachment 4.6.2. The only bulk chemicals stored are hydrocarbons (Diesel and HVO) The fuel storage locations are indicated on drawings A1221 fuel Storage. There are no intermediaries or products at this facility.

7.1 RAW MATERIALS

Fuel Oil

Fuel oil is stored within the belly storage tanks incorporated into the containerized backup generators at Dub 6, 7, 8, 9, 10, 12 and 13 (95 no.). The capacity for each tank unit is either 40 m^3 (44 no.), 25 m^3 (43 no.), 20 m^3 (3 no.), 18 m^3 (2 no.), 7.8 m^3 (2 no.) or 8.7 m^3 (1 no.). There is a further 1.6 m^3 of fuel storage associated with the fire pumps and an additional 0.2 m^3 associated with the backup generator (0.175 MWth) at Dub 6 that serves as a backup supply for ancillary services at the on-site substation. The total maximum capacity of fuel oil stored at the site is 2,957.1 m^3.

Each of the individual belly tanks are double skinned tanks, with level gauges (high and low) within the fuel tanks connected to an onboard controller which will alarm to prevent overfilling and identify a sudden loss of fuel within the tank. There are drip trays at the fuel fill points. The containerised generator housing includes retention bunding in the base of the container, there are leak detection systems within the bund to alert in the event of a leak from the generator fuel tank or lubricating oil tank. The onboard controller for individual generators is connected to the Building Management System (BMS). This belly tank provides approximately 48 hours fuel storage.

A project to substitute Hydrotreated Vegetable Oil (HVO) for traditional diesel fuel, where feasible to do so, is also currently being trialled. This may result in HVO being substituted for diesel at Dub 6, 7, 8, 9, 10, 12 and 13 in future.

The hardstanding areas that drain surface water from the generator yard, loading dock, and fuel delivery areas pass through retention fuel separators prior to entering the existing surface water drainage system which discharges to the River Griffeen.

7.2 WASTE MANAGEMENT

The site will produce a minimal amounts of waste. Details of the estimated waste volumes, types, disposal/recovery techniques are provided in Section 8 of this application. The majority of the wastes generated are non-hazardous. Appropriate segregation and management of waste operators ensures no significant impacts on downstream facilities.

Wastes with the greatest potential for impact are waste oils from generator equipment. The waste oil from the generators is not stored on site, it is removed by the maintenance contractor the same day as removal.

Other smaller amounts of domestic waste are produced at the Admin Buildings and other staff areas including the Data Centre.

Waste storage areas are identified on the site plan.

7.3 ENERGY EFFICIENCY AND RESOURCE USE

The operation of the installation will involve the consumption of electricity, fuel and mains water. The estimated quantities to be used when the installation is operational are specified in Attachment 4.6.1 of the application. The applicant will employ a variety of technologies to maximise the efficient use of energy within the installation. The installation will be operated in accordance with an Energy Management System

(EnMS), which will be compliant with the requirements of ISO50001, as well as the requirements of BAT.

In the application of BAT provides for the efficient use of resources and energy in all site operations. It requires an energy audit to be carried out and repeated at intervals as required by the Agency. Microsoft has developed bespoke environmental procedures and policies to form its own internal Environmental Management System (EMS). These procedures will include auditing and will address the recommendations of these audit.

8.0 PREVENTION OF ACCIDENTS

It should be noted the SEVESO directive does not currently apply to this site however because some of the substances stored are classed under the SEVESO Directive, the site is currently undergoing a process to become a Lower Tier Seveso site.

The Seveso Directive (2012/18/EU) was developed by the EU after a series of catastrophic accidents involving major industrial sites and dangerous substances. Such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), implement the latest Seveso III Directive (2012/18/EU).

The only substance currently stored on site controlled under Seveso/COMAH is diesel for the backup generators. The development can store a maximum of 2,957.1 m^3 of diesel at any one time. This is c. 2,498.75 tonnes of diesel (specific gravity 0.845 kg/ m^3). Additional storage of HVO fuel not subject to COMAH regulation may also occur at the site.

Regardless of the potential for major accident hazards, the operation of any activity involves a certain amount of risk to the environment and human health. The main risks of the installation includes:

- Potential for an accident or hazardous/ emergency situation to arise from activities at the installation
- Potential for fire due to the quantities of fuel stored on site, leading to emissions to air, water and/or soil;
- Spillages/leaks due to accidents on-site;
- Spillages of diesel during delivery and unloading operations;
- Failure of the hydro-brake on the attenuation system and/or the three retention fuel separators leading to a discharge of contaminated water; and
- Malfunction of the plant including backup generators leading to spills of diesel or emissions to air.

Preventative/Control measures to reduce the likelihood of accidents and mitigate the effects of the consequences of an accident at the installation.

- An Emergency Response Plan (ERP) based on a comprehensive risk assessment of all aspects of the operation of the installation is in place;
- Fire detection and suppression systems are in place;
- Emergency response procedures will be developed for the site;
- Loading and unloading is completed in a designated hardstanding area, with run-off drains and fuel separators;

- Hydrobrakes are fitted on the stormwater drainage line from the attenuation pond to the stream to control the flow;
- A series of lockdown valves are provided upstream of the outfall from the attenuation system, these can be closed in the event of a major fire or spill;
- Potentially contaminated storm water (e.g. in the event of a fire) that enters the storm water attenuation network will be tested prior to discharge to the receiving surface water body. Any storm water of unacceptable quality will be pumped out of the attenuation system and disposed of appropriately; and
- There is a regular maintenance programme for all plant.

9.0 MANAGEMENT AND PROCESS CONTROL SYSTEMS

9.1 ENVIRONMENTAL SYSTEMS

Microsoft has developed bespoke environmental procedures and policies to form its own internal Environmental Management System (EMS). These procedures will be supplemented to meet the requirements of BAT and the IE licence.

9.2 BUILDING MANAGEMENT SYSTEM (BMS)

The facility operates a Building Management System (BMS) this is 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 provides control and monitoring of the building engineering systems and services throughout the datacentre 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.

9.3 ELECTRICAL POWER MANAGEMENT SYSTEM (EPMS)

The electrical distribution services is 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;

1. HV to MV Transformers
2. Medium voltage relay protection
3. Medium Voltage Meters
4. MV to LV Transformers
5. Low Voltage circuit breakers
6. Low voltage meters
7. UPS modules
8. UPS battery monitoring
9. IT power Busbar Tap offs
10. IEC unit tap offs
11. General lighting and Power Distribution boards
12. Generator Controls
13. Generator Fuel System
14. TVSS/SPD
15. Fire pump ATS
16. MV and Generator Aux Supply ATS

9.4 STANDARD OPERATING PROCEDURES AND EMERGENCY RESPONSE PLAN

The facility has a number of Standard Operating Procedures (SOPs). These address all relevant operational process and environmental matters onsite including, but not limited to;

- Emergency Response Plan, including fire and explosion response, incident, spill response procedures,
- Generator testing
- Operational Waste Management;
- Chemical and fuel delivery, storage and handling;
- Water treatment plant processes;
- Maintenance schedule;
- Reporting on, investigating, and documenting incidents;

9.5 FIRE MANAGEMENT

There is a system for detection, alarm and fire suppression systems to enhance life safety and protection of property by the detection of fire, enabling an audio/visual alarm to be given such that emergency actions may be taken fully compliant with Irish and EU regulations and in accordance with the insurers requirements.

The system incorporates fire alarm panels strategically located throughout the building to provide both Fire Fighters and operational staff detailed indications of the fire alarm status and report any alarm or fault events and to provide detailed device address information including an active graphical display. Detection shall comprise manual call points, smoke and/or heat detectors and aspirating detection.

The fire detection and alarm systems is subject to routine checks by site personnel and is inspected and tested by the external service provider on a regular basis.

There is a fire/sprinkler main supplied from a dedicated set of firewater storage tanks and associated pumps which will pressurise a separate firemain network.

Contaminated fire water drains to the onsite attenuation storage, the lockdown valves will be activated to close off the outflow whilst the matter is being addressed. This allows for the attenuation systems to intercept runoff in the event of a fire. The retention allows for contaminated firewater to be tested prior to release, or if substantially contaminated removed by tanker truck.

A firewater retention risk assessment will be completed for the installation as and when requested by the Agency. Based on relatively few hazardous substances present on site and a high standard of containment coupled with comprehensive leak detection systems connected to the BMS it is unlikely that additional firewater retention would be required.

9.5.1 Data Processing Areas

The fire alarm and detection system shall incorporate Smoke Detection systems within the data processing facility for high sensitivity technical/pre-alarm only. The system shall interface to the main fire alarm systems.

Fire alarm interfaces are provided for all security doors and access control equipment. The fire alarm shall release all doors in the event of a fire condition or by manual and automatic programmed override control from the fire alarm panel. The fire alarm shall interface with the building management system.

Specialist Contractors are retained to complete testing and maintenance on the gas fire suppression systems within the main buildings and the plant areas.

The data halls have gas fire suppression system installed integrated with the fire alarm system to operate upon a fire condition. After a pre-determined time, delay period following the required operation of smoke detectors the gas shall be released.

9.5.2 Ancillary Office Areas

Detection comprises manual call points, smoke and/or heat detectors ass appropriate. Duct mounted smoke probes shall be installed on the supply air to the offices and shall incorporate interfaces to shut down fresh air intake AHU plant in the event of a fire condition external to the building.

Fire alarm interfaces are provided for all security doors and access control equipment. The fire alarm shall release all doors in the event of a fire condition or by manual and automatic programmed override control from the fire alarm panel. The fire alarm shall interface with the building management system.

10.0 CESSATION OF ACTIVITY

10.1 SITE CLOSURE

A certain amount of environmental risk is associated with the cessation of any licensable activity (site closure). An outline Site Closure report has been provided in Section 9 of this application. Details outlined in the Site Closure Plan include the following:

- Decommissioning of equipment will involve disconnecting all electrical connections and decommissioning the IT Hardware, the backup generators,

the transformers, and all other relevant operational equipment at the installation;
- The backup generators, transformers, servers and other equipment will be removed and sold to a third party or scrapped depending on the age/condition at the time of closure;
- Hazardous materials stored in chem-stores, raw materials in the operations area, and any other materials on site will either be returned to the suppliers or disposed of as hazardous waste by a suitable waste contractor; and
- All non-hazardous waste will be sent for appropriate recycling, recovery, treatment or disposal;
- Decontamination of cleaning of plant and equipment where required will be completed and documented.

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

10.2 BASELINE REPORT

A complete Baseline Report for the site has been produced and included in Attachment 4-8-3 Complete Baseline Report. The baseline report provides conditions of the site as it existed prior to the construction and operation of the permitted facility.

On the basis of the site investigations undertaken prior to construction and an assessment of source-pathways-receptors, the Baseline Report concludes that:

- A review of the available soil and water quality data confirms that there is no evidence of extensive contamination beneath the site.
- There is only bulk fuel storage at the facility and the risk of a largescale leak/spill is reduced as fuel is stored in a series of individual belly tanks within the containerised generators. The risk prevention measures in place at the facility significantly reduce the potential for an environmental impact to soil or water to occur. These measures include bunded and double contained vessels, leak detection alarms, fuel separators and spill management procedures.
- Source-pathway-receptor linkages were assessed for the bulk storage areas. It was concluded that there are no direct pathways to either the soil, groundwater or surface water environment. A leakage from a bulk tank would be fully contained in the designated bund or the double skin lining of the tank, with leaks during delivery fully contained within the continuous hard stand delivery area. Any leakage outside of the delivery area would be contained within the drainage system.

11.0 ENVIRONMENTAL IMPACT ASSESSMENT

11.1.1 Environmental Impact Assessment

A total of 5 no. Environmental Impact Statements (EIS) relating to this activity have been prepared on behalf of Microsoft Operations Ireland Ltd were previously submitted to SDCC and have been submitted to the Agency as part of this application:

- EIS dated July 2013 submitted to SDCC under Reg. Ref: SD13A/0143 and included in this application as Attachment 6-3-8;

- EIS dated December 2013 submitted to SDCC under Reg. Ref: SD13A/0265 and included in this application as Attachment 6-3-9;
- EIS dated September 2014 submitted to SDCC under Reg. Ref: SD14A/0194 and included in this application as Attachment 6-3-10;
- EIS dated November 2015 submitted to SDCC under Reg. Ref: SD15A/0343 and included in this application as Attachment 6-3-11; and
- EIS dated March 2016 submitted to SDCC under Reg. Ref: SD16A/0088 and included in this application as Attachment 6-3-12.

All planning permissions for the data storage facilities that are relevant to this Licence application under Class 2.1 of the EPA Act 1992 (as amended) have been granted on site.

The installation has been constructed and operates in accordance with SDCC for Reg. Ref: SD13A/0143, SD13A/0265, SD14A/0194, SD15A/0343, SD16A/0087, SD16A/0088, and SD21A/0288. Therefore the various EIS submitted to the EPA detailed above (Attachment 6-3-8 to 6-3-12 of the IE Licence application) are relevant to this IE License activity. Any further information, including reports and advice, relating to the environmental impact assessment of the proposed activity is made available and contained within Section 7 of this licence application .

Appropriate Assessment Screenings completed as part of these EIS submitted with SD13A/0143, SD13A/0265, SD14A/0194, SD15A/0343 and SD16A/0088 concluded that there is no potential for meaningful biological or relevant hydrological connectivity to any European sites (Natura 2000) and therefore the potential for adverse effects on any European sites as a result of the development is highly unlikely. Additionally, the development in combination with other projects, is not likely to have significant effects on the European sites considered in this assessment in view of their conservation objectives.

The development is located in an area of low to moderate ecological value and as such predicted to have a ***neutral*** and ***imperceptible*** effect on biodiversity.

A detailed Air Quality Impact Assessment Report has been completed on the facility which demonstrates that the development will not result in any off-site exceedances of the applicable ambient air quality standards (including at the nearest residential receptors).

The Noise Impact Assessment Report has assessed the potential noise impact of the development and concluded that the development, will comply with the relevant noise criteria at noise sensitive locations.

11.2 ALTERNATIVES

11.2.1 Alternative locations and layouts

Planning permission is in place for the operational facility, the applicant owns the land and the facility is fully constructed, with works beginning in 2014. A ‘do nothing’ scenario is not applicable.

The facility is ideally located adjacent to other existing Microsoft data halls.

A total of 6 no. alternative project locations with suitable zoning and access to utilities were assessed during the procurement and planning stages of the development in

2013. It was concluded that having considered alternative sites that Grangecastle was a preferred option.

Several iterations of site layout were considered during planning stages of each phase of the development to arrive at the current constructed arrangement of buildings and site infrastructure.

11.2.2 Alternative Processes/Technologies

In terms of the proposed technology, the engineering design team for the development have considered technology that is used at the existing Microsoft datacentres and by other operators in Ireland and around the world. The design represents state of the art technology and has been evolving since the datacentres were commissioned.

Alternative technologies are considered on an ongoing basis as part of the ongoing maintenance and improvement to the operational efficiency of the technology at the facility. Technical feasibility, environmental impact, efficiency, security, reliability, and cost are carefully considered when upgrading or replacing elements of the datacentres.

The applicant has a programme in place which continually assesses and improves this technology particularly with respect to minimising power and water consumption. Designs are constantly evolving, and replacement hardware is chosen with energy efficiency central to the decision-making process.

Substantial work has been undertaken to determine the most environmentally friendly and energy efficient solutions for the installation. In respect of the technology chosen:

- The data processing buildings have been designed to operate at the warmest practical conditions*;*
- The cooling systems have been designed and optimised to these warmer conditions such that they do not require chillers (noise generating) at all and therefore 100% of the cooling is achieved, compressor free for 100% of the year;
- 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;
- Rainwater harvesting systems will be employed to reduce water demand from the mains supply; and
- The Emergency Generators have been chosen with acoustic enclosures to dampen sound to appropriate levels.

Emerging Techniques

An ‘Emerging technique’ is defined as a novel technique for an industrial emissions directive activity that, if commercially developed, could provide either a higher general level of protection of the environment or at least the same level of protection of the environment and higher cost savings than existing best available techniques.

The proposed technology, is based on successful and proven technologies and processes already developed and in manufacture and use at the wider site, is not novel and no specific aspect is considered to represent an “Emerging technique”.

11.2.3 Alternative Mitigation

A total of 5 no. Environmental Impact Statements (EIS) relating to this activity have been prepared on behalf of Microsoft Operations Ireland Ltd were previously submitted to SDCC and have been submitted to the Agency as part of this application:

- EIS dated July 2013 submitted to SDCC under Reg. Ref: SD13A/0143 and included in this application as Attachment 6-3-8;
- EIS dated December 2013 submitted to SDCC under Reg. Ref: SD13A/0265 and included in this application as Attachment 6-3-9;
- EIS dated September 2014 submitted to SDCC under Reg. Ref: SD14A/0194 and included in this application as Attachment 6-3-10;
- EIS dated November 2015 submitted to SDCC under Reg. Ref: SD15A/0343 and included in this application as Attachment 6-3-11; and
- EIS dated March 2016 submitted to SDCC under Reg. Ref: SD16A/0088 and included in this application as Attachment 6-3-12.

The mitigation measures proposed are outlined in the EIS 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 EIS, 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 EIS Chapters (Attachment 6-3-8 to 6-3-12 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.