ARUP

Amazon Data Services Ireland Limited

DUB159 IE Licence Application

Attachment 7-1-3-2 Soil Water Impact Assessment

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1. Introduction

Amazon Data Services Ireland Limited (ADSIL) (‘*the Applicant’*) is applying to the Environmental Protection Agency (‘*the Agency’*) for an Industrial Emissions (IE) Licence for its data storage facility (hereafter referred to as the ‘*Installation’*) located at Data Centre Building B1, Kildare Innovation Campus (KIC), Barnhall Road, Leixlip, County Kildare, Ireland.

The Installation site covers an area of c. 3.645 hectares (ha) in total and is situated within the wider KIC Masterplan site, which was granted planning permission in January 2024 by Kildare County Council (KCC) (KCC Planning Ref. 23/60047). An Environmental Impact Assessment Report (EIAR) and Appropriate Assessment (AA) Screening Report were prepared as part of this planning application and have been submitted with this IE Licence application, refer to Attachment 6-3-6 and Attachment 6-2-1 respectively.

ADSIL holds a long-term lease that concerns lands within the Installation site, which sits in the northwest corner of the KIC Masterplan site. The proposed IE licence application relates only to the area concerning the Installation. The remaining areas within the KIC Masterplan site are controlled by the KIC Masterplan site owner, hereafter referred to as *“the Landowner”*.

This report presents the assessment of emissions from the Installation to water and ground as a result of the operation of the Installation. Due to the interrelationships between these aspects, both soil and water have been combined into a single Impact Assessment report. A Baseline Report has also been prepared as part of this IE Licence application (Attachment 4-8-2 Baseline Report) which relates to the baseline soil and groundwater environment and the potential for contamination at the Installation.

This report was completed in a format consistent with the EPA Licence Application Form Guidance – Industrial Emissions (IE), Integrated Pollution Control (IPC) and Waste Version 2.1 June 2021 (EPA, 2021).

The Application Form Guidance states that:

‘The expectation is for the ‘receiving environment report’ to be separate from the ‘emissions impact assessment’ but they are interrelated. Information may be combined in the ‘impact assessment report’, where it is logical to do so. In this case the reason for combining the reports should be clearly stated in the submitted report.’

Due to the nature of the localised impacts of the Installation and the completion of baseline assessment and separate modelling reports for emissions (air and noise), it is logical to combine the ‘receiving environment report’ and ‘emissions impact assessment’ into one report.

The Installation will have no proposed process emissions to ground, groundwater, or surface water.

The network within the Installation site will convey stormwater via 2 no. monitoring stations and 2 no. bypass interceptors with alarms through 2 no. emission points situated at the IE Licence site boundary (SW1 and SW2) to the KIC Masterplan site’s 1 no. attenuation pond (2,132 m^3) to the east and 1 no. attenuation pond (1,836 m^3) to the north of the Installation site boundary. Stormwater from the eastern attenuation pond on the KIC Masterplan site will flow to the northern attenuation pond on the KIC Masterplan site before combining with the remainder of the KIC Masterplan site’s stormwater network. The attenuation ponds and point of discharge to the Leixlip Reservoir will be situated within KIC Masterplan site (outside of the IE Licence site boundary) and will be under the Landowner’s control and monitoring regime.

The Installation will include 1 no. main emission to sewer, SE1.The Installation’s foul drainage network will comprise of 2 no. effluent streams. The main foul effluent and cooling water discharge from the Installation will be collected in separate streams throughout the Installation site. The main foul (domestic) and cooling water discharge streams will combine within the IE Licence site boundary prior to outfall and connection to the KIC Masterplan site’s foul water network at SE1.

The Installation will include 1 no. inbound stormwater and 1 no. inbound foul water connection point to the Landowner’s stormwater and foul networks, termed ISW1 and IF1 respectively. The stormwater and foul water entering the Installation from the Landowner’s surface water and foul networks will be monitored to identify any potential contamination prior to entering the Installation site. In the unlikely event that this

incoming stormwater and foul water is contaminated, the incoming stormwater and foul water will be subject to the same control measures as the remainder of the stormwater and foul water collected onsite.

Further detail on the Installation's stormwater and foul networks and emissions are set out in Attachment 4-8-1 Operational Report and Attachment 7-1-3-1 Emissions Compliance Report.

The only hazardous chemicals stored onsite in notable quantities will be Hydro treated Vegetable Oil (HVO), diesel or a blend of HVO and diesel used for the emergency generators. There will be no direct discharges of contaminated water to groundwater or to the soil environment during the operation of the Installation. The only potential impact of the Installation to soil, groundwater and / or water would be from indirect emissions from fuel and other accidental spills that may occur.

2. Assessment of Stormwater Emissions

2.1 Methodology

This assessment of the stormwater emissions reviews the potential impact on the surface water environment. It includes a review of the known stormwater emissions from the Installation and potential emissions through spills, accidents, etc.

The existing surface water environment at the Installation site is described in terms of water quality with reference to environmental quality objectives and standards and any objectives and standards laid down for protected areas. This is followed by a summary and an assessment of the impacts of any existing or proposed emissions on the environment, including environmental media other than those into which the emissions are to be made.

This assessment has been prepared from a desktop review of existing information and of site-specific investigations conducted IGSL Limited and RSK Group Limited as part of the KIC Masterplan site planning application (KCC Planning Ref. 23/60047). All rights to the site investigation results belong IGSL Limited, RSK Group Limited and ADSIL. The following is a list of sources of information consulted for use in this assessment:

- Geological Survey of Ireland & Google Earth Pro – aerial photographs and historical mapping;
- Environmental Protection Agency (EPA) – website mapping and database information;
- Environmental Protection Agency (EPA) – www.epa.ie on-line mapping and database information;
- Clifton Scannell Emerson Associates (February 2023). Site Specific Flood Risk Assessment Kildare Innovation Campus, Prepared by Clifton Scannell Emerson Associates (February 2023).
- Factual Ground Investigation Report (Liffey Park Technology Campus), Prepared by IGSL Limited (February 2020).
- Ground Monitoring Assessment (Hewlett Packard), Prepared RSK Group Limited (June 2018).
- Planning Application to Kildare County Council Environmental Impact Assessment Report, Prepared by Tom Phillips + Associates (July 2023).
- Planning Application to Kildare County Council Screening Assessment Report in Support of the Appropriate Assessment Process, Prepared by Ecology Ireland Wildlife Consultants Ltd. (July 2023).

2.2 Receiving Environment

The existing surface water environment in terms of water quality with reference to environmental quality objectives and standards and any objectives and standards laid down for protected areas is described in Baseline Report (Attachment 4-8-2 Baseline Report).

The topography onsite is generally flat, has an elevation of 51.0 m above Ordnance Datum (mAOD) and slopes in a southeasterly direction towards the River Liffey to the south of the Installation site. The

Installation site is located within the Liffey and Dublin Bay catchment, which encompasses an area of approximately 1,616 km^2. The Installation is within the sub-catchment Liffey_SC_080 (Catchment ID: 09).

The Leixlip Reservoir is situated southeast of the IE licence boundary and forms part of the River Liffey. The Installation will discharge its stormwater runoff to the KIC Masterplan site's network. The KIC Masterplan site's network will ultimately discharge to the Leixlip Reservoir (outside of the IE Licence boundary) near the existing KIC Masterplan site entrance off the Celbridge via an outfall pipe following confirmation of water quality through electronic monitoring mechanisms.

The Kilmacredock Upper watercourse is mapped on the EPA as flowing in a south-easterly direction through the KIC Masterplan site, however, it does not flow through the Installation site. This watercourse has already been diverted beneath the KIC Masterplan site via a 1.5m culvert and outfalls into the Leixlip Reservoir east of Celbridge Road. The Installation site will not discharge to Kilmacredock Upper. This culvert will be redesigned as part of the KIC Masterplan site construction works to ensure that there is no reduction in the hydraulic capacity of the culvert or increase in flood risk.

The most significant drainage system in the vicinity is the River Liffey which flows c. 800m south east of the IE licence boundary in a west to north east direction on the opposite side of Celbridge Road, as outlined in Figure 1.

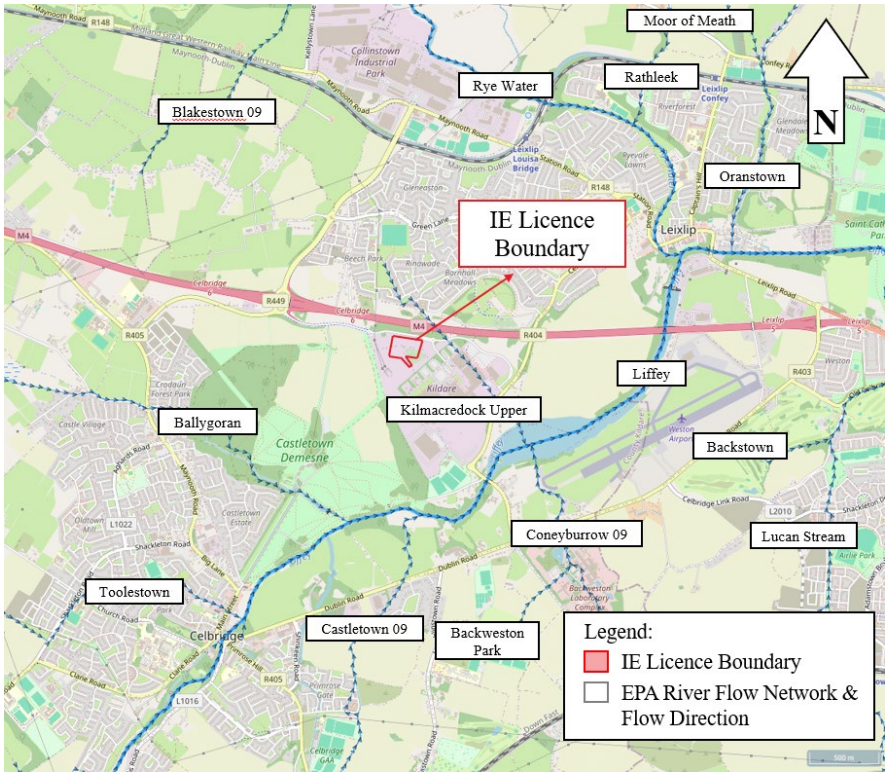

Figure 1: Local Hydrological Environment | Not to scale | GSI © Source: EPA mapping

Surface water quality is monitored periodically by the EPA at various regional locations along principal and other smaller watercourses. The EPA assess the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality.

With reference to the Installation setting, the nearest EPA Q value monitoring station is situated along the River Rye c. 1.6km north of the Installation. The EPA Q value monitoring station (Station Name: Br in Leixlip – Station Code: RS09R010600) obtained a Q3-4 Good Status in 2022.

In accordance with the WFD, each river catchment was assessed by the EPA and a water management plan detailing a programme of measures was put in place for each. Currently, the EPA classifies the WFD Ecological Status for the Liffey_150 and Rye Water_040 waterbodies as having a '*Poor'* status (2016-2021) with the current WFD River Waterbody risk score being '*Under Review'* for the Liffey_150 and '*At Risk'* for

the Ryewater_040. According to the EPA Map viewer, the Leixlip Reservoir also received a '*Poor'* status (2016-2021) and the WFD Lake Waterbodies Risk score is currently *'Under Review'*. Figure 2 and Figure 3 below presents the WFD river waterbody risk and status maps.

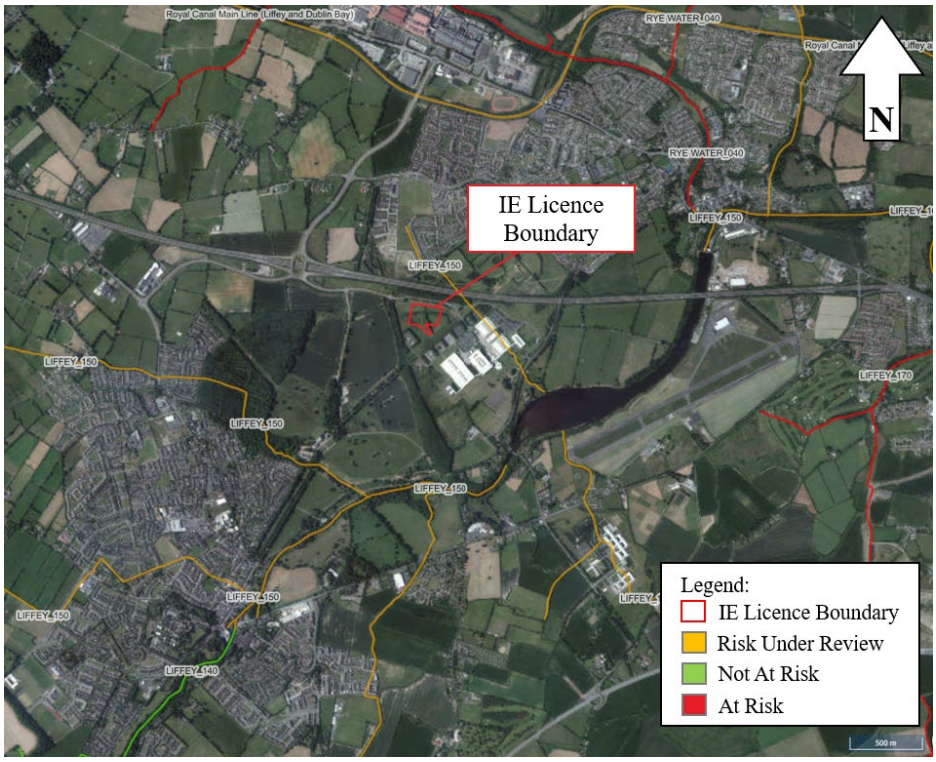

Figure 2: WFD River Water Body Risk Score | Not to scale | GSI © Source: EPA mapping

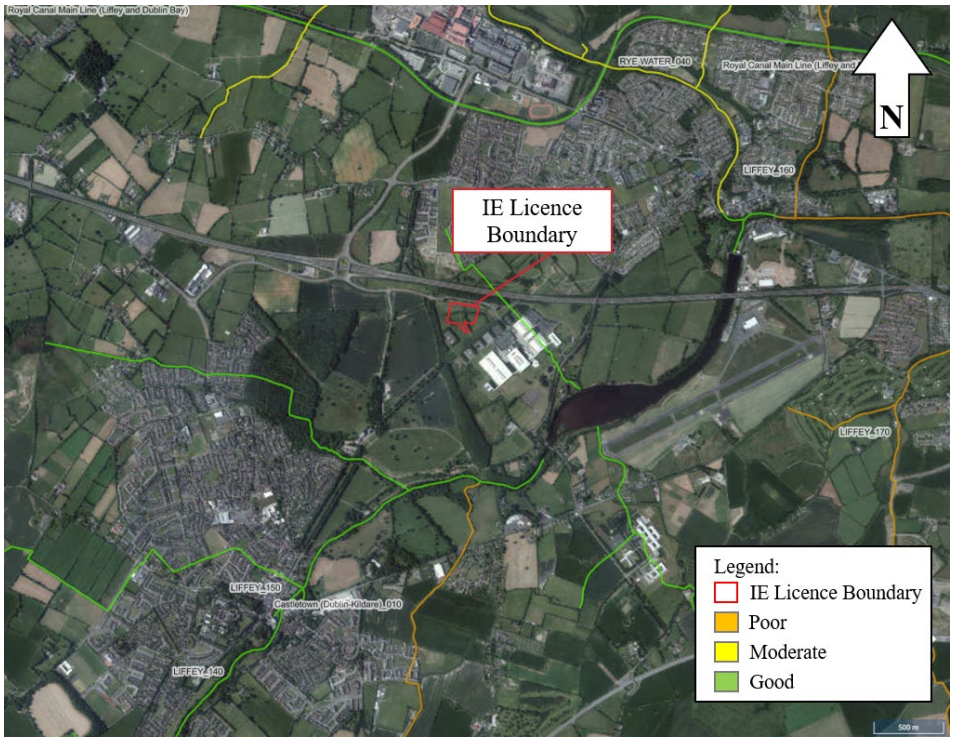

Figure 3: WFD River Water Body Status Score | Not to scale | GSI © Source: EPA mapping

2.2.1 Sensitive Areas or Areas of Special Interest

An Appropriate Assessment (AA) Screening Report has been prepared by Ecology Ireland Wildlife Consultants Ltd. as part of the KIC Masterplan site planning application (KCC Planning Ref. 23/60047) and

has been submitted with this IE licence application (Attachment 6-2-1 AA Screening July 2023). The Installation is not located on lands with formal designations. Figure 4 below presents the location of the Installation site in relation to nearby European sites.

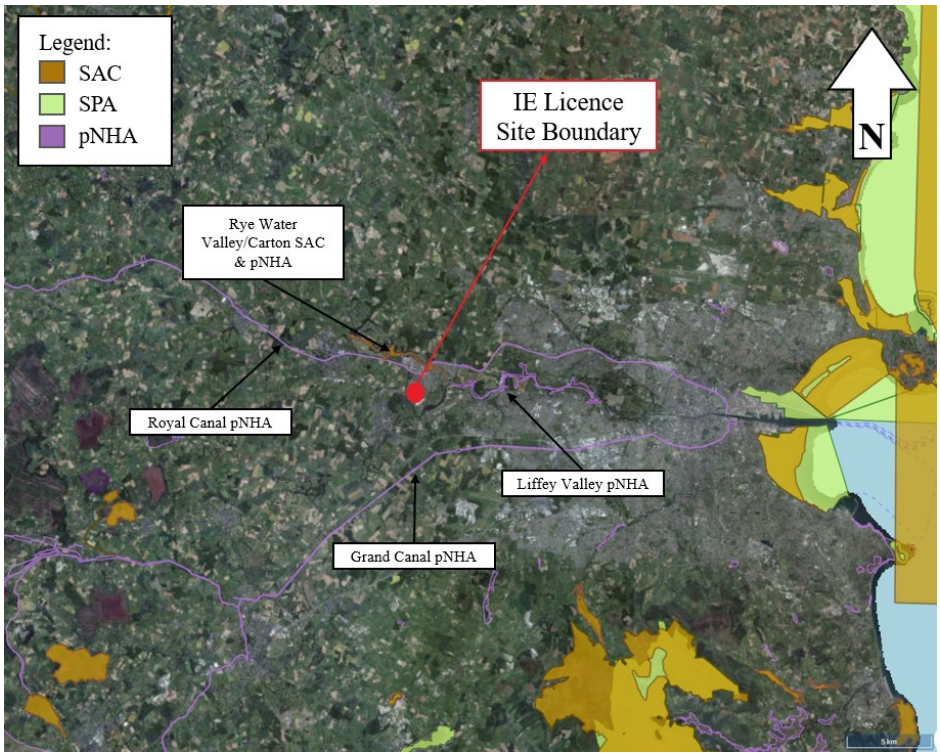

Figure 4: IE Licence Site Boundary Location in relation to nearby Areas of Conservation | Not to scale | GSI © Source: EPA mapping

There is no hydrological connection identified between the Installation and the Rye Water Valley / Carton Special Area of Conservation (SAC) or Royal Canal pNHA as these are located upstream of the River Liffey.

However, the Installation's stormwater network outfalls to the KIC Masterplan site's surface water network. Therefore, an indirect hydrological connection exists between the Installation site and the Liffey Valley pNHA (2km northeast) through the stormwater discharge from the KIC Masterplan site to the Leixlip reservoir. The Leixlip Reservoir ultimately flows into River Liffey.

According to the EIAR prepared as part of the planning application for the KIC masterplan site, which includes the Installation site, (KCC Planning Ref. 23/60047), "*Potential adverse effects on these European sites* [from the KIC Masterplan site, which includes the Installation site] *are highly unlikely given the distance of removal and integrated mitigation measures in place through standard nature-based SuDS measures on site".*

Similarly, the AA Screening Report (refer to Attachment 6-2-1 AA Screening July 2023) conducted as part planning application for the KIC masterplan site, concluded that:

'no significant effects whether arising from the [KIC Masterplan site, which includes the Installation] *itself or in combination with any other plan or project, are likely to occur to the Natura 2000 sites: South Dublin Bay and River Tolka Estuary SPA, South Dublin Bay SAC, North Dublin Bay SAC and North Bull Island SPA or any other European site in the wider hinterland.'*

This conclusion is founded on the following considerations:

- The KIC Masterplan site, which includes the Installation site, is not within or adjacent to any Natura 2000 site, nor does it provide habitat suitable for any qualifying interest species of Natura 2000 sites.
- The conservation interests of the North Dublin Bay SAC, North Bull Island SPA, South Dublin & River Tolka Estuary SPA and South Dublin Bay SAC relate to coastal habitats which are not associated with the surrounding environment of the KIC Masterplan site, which includes the Installation site.

- The KIC Masterplan site, including the Installation site, is not proximate to the relevant coastal Natura 2000 sites and the distance and potential dispersion and dilution of any pollutants arising on the sites would be such as to make any measurable impacts highly unlikely.
- The surface-water drainage system has mechanisms in place whereby surface-water run-off from the KIC Masterplan site, including surface water runoff from the Installation site, is collected by attenuation ponds and is released in a controlled manner that protects water quality downstream of the KIC Masterplan and Installation sites.
- For the operational phase of the KIC Masterplan site, which includes the operation of the Installation site, a SuDS strategy will be implemented, as required under the Kildare County Development Plan. The proposed surface-water drainage system will implement an innovative and nature-based SuDS strategy, including bio-retention areas (i.e., wetland areas), attenuation ponds, swales, filter drains, permeable paving and hydrocarbon interceptors.
- The proposed surface-water drainage system will result in an overall reduction in surface water discharge from the KIC Masterplan site, which includes the Installation site.
- Leixlip WWTP has sufficient capacity to accommodate the existing peak foul water outflow from the KIC Masterplan site, which includes the Installation site, c. 965m^3/day, as the peak hydraulic capacity of Leixlip WWTP is 65,405 m^3/day and the current hydraulic loading is 50,837m^3/day.
- The capacity of this WWTP is not expected to be exceeded within the next three years, with a remaining organic capacity limit of 11,880 PE, with the estimated PE for the operational phase of the KIC Masterplan site, which includes the Installation site: 2080.

It is the view of Ecology Ireland Wildlife Consultants Ltd. that it is not necessary to undertake any further stage of the AA process.

2.3 Emissions to Surface Water and Abatement Measures

Details of the stormwater drainage are presented in Attachment 4-8-1 Operational Report. Any accidental emissions of fuel could cause localised and temporary contamination to stormwater if the emissions enter the water environment unmitigated.

The only potential impact of the Installation to surface water would be from indirect emissions from fuel and other accidental spills that may occur at the Installation. Additionally, there is a potential for leaks and spillages from vehicles along access roads, fuel unloading bays and in parking areas. Any accidental emissions of fuel could cause contamination if the emissions enter the water environment unmitigated.

Fuel for the emergency generators will be stored in fuel storage tanks at the Installation. ADSIL is committed to using HVO as the fuel source for the emergency generators, where available. Significant environmental benefits will be achieved through the use of HVO, as it is a renewable diesel that operates as a direct replacement for conventional diesel, and is made from renewable, sustainable raw materials which do not release any new CO_2 into the atmosphere.

Fuel will be stored in multiple locations across the Installation. HVO, where supply is available, will be the preferred fuel stored at the Installation. Where insufficient quantities of HVO are available, a blend of diesel and HVO will be supplied to fuel storage tanks, and in the absence of HVO, diesel will be supplied to fuel storage tanks. Where HVO and diesel are blended in fuel storage tanks, the ratio of HVO : diesel in the fuel tanks will vary with the availability of HVO.

Bulk fuel will be stored onsite in a double skinned top up tank with a capacity of 40,000 litres. This tank will be filled to 90% capacity under normal conditions; therefore, the tank will store approximately 36,000 litres of fuel. Fuel stored in the top up tank will feed into the fuel storage tanks of each generator.

Bulk fuel will also be stored onsite for use in 15 no. double-skinned belly tanks associated with each of the 14 no. critical and 1 no. house emergency generators, which will be filled centrally from the onsite top up tank. Each belly tank associated with the 14 no. critical emergency generators will have the capacity to store 19.6 m^3 of fuel and the belly tank associated with the 1 no. house emergency generator will have the capacity to store 6.2 m^3 of fuel.

900 Litres of diesel will be stored onsite within the 2 no. double skinned fuel storage tanks associated with the diesel-powered fire sprinkler pumps. These tanks have a 500 litre capacity each and will be filled to 90% capacity under normal conditions.

In a best case scenario, where sufficient HVO quantities are available to support the Installation, a total of 268.2 tonnes of HVO (at a density of 0.846 kg/L for HVO) will be stored onsite across the top up tank, critical emergency generator belly tanks and house emergency generator belly tank. In a worst case scenario, where only diesel fuel is used to support the Installation, a total of 272.6 tonnes of diesel (at a density of 0.86 kg/L for diesel) will be stored onsite across the top up tank, critical emergency generator belly tanks and house emergency generator belly tank. Where insufficient quantities of HVO are available, HVO and diesel will be blended in the fuel storage tanks and the ratio of HVO : diesel will vary depending on the availability of HVO.

Fuel will be stored locally in the double skinned belly tanks at each emergency generator and the top up tank located within the generator yard. The individual emergency generators will be housed within containers with various acoustic designed control measures in place including acoustic attenuation and exhaust silencers.

The containerised emergency generator housing will include leak detection systems. Should hydrocarbon be detected in the base of the housing containers, the system will send an alarm signal to the Building Management System (BMS) to alert the onsite Engineering Operations Technicians (EOTs). The onboard controller for individual emergency generators will be connected to the BMS.

The individual fuel storage tanks associated with the varying types of generators and top up tank have level gauges (high and low) connected to an onboard controller which will alarm to the BMS to prevent overfilling and identify a sudden loss of fuel within the tank.

All containers will be designed to be suitable for the chemicals stored within and in accordance with the EPA's guidelines for the storage and transfer of materials for scheduled activities (EPA, 2004).

Standard operating procedures (SOPs) for fuel unloading processes will be in place at the Installation to reduce the risk of spills. Additionally, an on-site Emergency Response Plan (ERP) will be in place and the Installation will maintain spill kits at all storage areas.

The Installation will include 1 no. inbound stormwater and 1 no. inbound foul water connection points to the Landowner's stormwater and foul networks, termed ISW1 and IF1 respectively. The stormwater and foul water entering the Installation from the Landowner's surface water and foul networks will be monitored to identify any potential contamination prior to entering the Installation site. In the unlikely event that this incoming stormwater and foul water is contaminated, the incoming stormwater and foul water will be subject to the same control measures as the remainder of the stormwater and foul water collected onsite.

Fuel will be prevented from entering the stormwater network by hydrocarbon interceptors. The stormwater network will convey stormwater via monitoring stations and hydrocarbon interceptors with alarms upstream of the 2 no. Emission Points SW1 and SW2 situated at the Installation site boundary. Additionally, stormwater collected around the emergency generator yard will pass through 1 no. full retention interceptor prior to combining with the remainder of the Installation site's stormwater network.

The hydrocarbon interceptors at the Installation site will be equipped with level detection sensors which will send an alarm signal to the BMS to alert EOTs to warn of high hydrocarbon, liquid and silt levels in the separator.

Fuel will also be prevented from entering the foul network by hydrocarbon interceptors. The Installation's foul drainage network will comprise of 2 no. effluent streams. The main foul effluent and cooling water discharge from the Installation will be collected in separate streams throughout the Installation site. The main foul (domestic) and cooling water discharge streams will combine within the IE Licence site boundary prior to outfall and connection to the KIC Masterplan site's foul water network at SE1.

The fuel unloading bay at the Installation will be surrounded by ACO drainage channels which will capture any spills via a full retention interceptor and ultimately discharge to the Installation's main foul (domestic) network.

An Environmental Management System (EMS) will be in place to ensure compliance with licencing requirements. This will include full and adequate containment and management of potential contaminants. Site-specific emergency response measures will be in place and all relevant personnel will be trained accordingly. Additional measures to minimise any impact on the surface water, groundwater or soil from material spillages will be implemented including double skinned fuel storage tanks, impervious fuel unloading areas, double lined fuel delivery lines (underground), and the use of hydrocarbon interceptors on stormwater pipelines.

Penstocks will be installed on the outfalls prior to the discharge into the KIC Masterplan site's stormwater network. Once installed, the penstocks will restrict stormwater outflow in the event of a large spill or a fire. Any resulting stormwater of unacceptable quality will be pumped out or otherwise removed from the stormwater network and disposed of appropriately.

Due to the nature of the stormwater run-off (stormwater from buildings, roads and other hardstanding areas) and the inclusion of hydrocarbon interceptors, the proposed discharge is unlikely to exceed the Environmental Quality Standards as set out in the European Communities Environmental Objectives (Surface Waters) Regulations 2009 as amended.

In accordance with BAT, clean stormwater will be kept separate from contaminated wastewater and there will be no inherent risk of cross-contamination.

2.4 Surface Water Impact Assessment

There is no proposed direct discharge and no direct pathway to surface water from the Installation. However, the Installation site's stormwater network will outfall to the KIC Masterplan site's surface water network which will discharge to the Leixlip Reservoir. The Leixlip Reservoir ultimately flows into River Liffey. Therefore, an indirect hydrological connection exists between the Installation site and the River Liffey.

There is no relevant hydrological connectivity or biological connectivity to other European sites located within the zone of influence of the Installation.

As part of this assessment the surface water impact assessments included as part of the EIAR and Land Use Planning Assessment (report reference: MM.237501.0007RR01) submitted with the KIC Masterplan site planning application (KCC Planning Ref. 23/60047) were reviewed. These considered the surface water impacts of the operation of the KIC Masterplan site, which includes the operation of the Installation. The assessments conclude that:

- In relation to major accidents and disasters, there are no likely impacts to off-site receptors, as a result of the operation of the KIC Masterplan site, which includes the operation of the Installation.
- The operation of the KIC Masterplan site, including the operation of the Installation, will have a long-term, imperceptible significance with a neutral impact on surface water quality. Additionally, as all the operational cumulative developments are required to manage discharges in accordance with S.I 272/2009 and 77/2019 amendments within the KIC Masterplan site, there will be no cumulative impact to surface water quality and therefore there will be no cumulative impact on the Surface Waterbody Status.
- In the case of the KIC Masterplan site, which includes the Installation, there will be no significant residual impacts; the potential impact on surface water during operation will be long term, imperceptible and neutral i.e. an impact capable of measurement but without noticeable consequences.

The results of impact assessments submitted as part of the KIC Masterplan site planning application (KCC Planning Ref. 23/60047) indicate that the incorporation of mitigation measures should be sufficient and KIC Masterplan site, which includes the Installation site, will not impact the quality or water body status of the receiving surface water bodies.

There is a negligible risk of Principle Pollution Substances, Priority Substances or Priority Hazardous Substances (main polluting substances (as defined in the Schedule of EPA (Licensing)(Amendment) Regulations 2004, S.I. No. 394 of 2004) being discharged from the Installation above the limits outlined in the Surface Waters Regulations (S.I. No. 272 of 2009) via the stormwater network due to the stringent controls and procedures that will be in place to prevent and minimise spills and the presence of onsite mitigation measures.

Refer to Attachment 4-8-1 Operational Report for further information on mitigation measures that will be in place to prevent and minimise spills.

3. Assessment of Ground and/or Groundwater Emissions

3.1 Methodology

This section addresses the potential for emissions to soil/ground and groundwater.

The existing receiving environment is described in terms of the existing soil and groundwater quality. The potential impacts to aquifers, soils, sub-soils and rock environment of the Installation site is summarised, including any impact on environmental media other than those into which the emissions may be made. The assessment will be made against emission limit values where relevant.

This assessment has been prepared from a desktop review of existing information and site site-specific investigations undertaken as part of the KIC Masterplan site planning application (KCC Planning Ref. 23/60047). The following is a list of sources of information consulted for use in this assessment:

- Geological Survey of Ireland & Google Earth Pro- aerial photographs and historical mapping;
- Environmental Protection Agency (EPA) – website mapping and database information;
- Environmental Protection Agency (EPA) – www.epa.ie on-line mapping and database information;
- Clifton Scannell Emerson Associates (February 2023). Site Specific Flood Risk Assessment Kildare Innovation Campus, Prepared by Clifton Scannell Emerson Associates (February 2023).
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- Planning Application to Kildare County Council Screening Assessment Report in Support of the Appropriate Assessment Process, Prepared by Ecology Ireland Wildlife Consultants Ltd. (July 2023).

3.2 Receiving Environment

The baseline environment of the Installation site as it pertains to soil/ground and groundwater is described in detail in the Baseline Report (Attachment 4-8-2). An assessment of the baseline report was conducted as part of this IE Licence application and is presented in detail in the Baseline Report (Attachment 4-8-2). The following is a summary of the findings of the desktop review of Geological Survey of Ireland (GSI) and Teagasc undertaken as part of the baseline environment assessment presented in the Baseline Report:

- The principal soil type underlying the Installation site is *Mineral Poorly Drained (Mainly Basic)* (BminPD). Other soils underlying the surrounding area include *Made Ground* and *Made Ground and Deep Well Drained Mineral Soil* (BminDW).
- The principal subsoil type underlying the Installation site consists of Carboniferous limestone till (TLs) "*Till derived from limestone*".
- The solid geology underlying the Installation site is Carboniferous Limestone derived from the Lucan Formation which comprises dark-grey to black, fine-grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey. There are rare dark coarser grained calcarenitic limestones, sometimes graded, and interbedded dark-grey calcar.

- The bedrock aquifer underlying the Installation site is classified as '*Locally Important'* which is characterised as moderately productive only in Local Zones. Also, the aquifer underlying the Installation has a vulnerability classification of '*Moderate Vulnerability'*
- The topography of the Installation site is generally flat and has an elevation of 51.0 m above Ordnance Datum (mAOD). The topography of the Installation and KIC Masterplan site slopes gently in a south east direction, which is consistent with the surrounding area. It is presumed that the local groundwater flow is in an easterly direction towards Leixlip Reservoir.
- There is no evidence of karstification at the immediate vicinity of the Installation site.

With regard to groundwater quality, the Installation site is situated in the region of the site (Dublin GWB) is classified as '*Good'* per the WFD Risk Score system. The Dublin GWB (Code: IE_EA_G_008) achieved '*Good Status'* in the period 2016-2021

The European Communities Directive 2000/60/EC established a framework for community action in the field of water policy commonly known as the Water Framework Directive (WFD). The WFD aims to achieve 'Good Water Status' for all European waters through a system of river basin management planning and extensive monitoring. 'Good status' means both 'Good Ecological Status' and 'Good Chemical Status'.

Water bodies identified as being 'At Risk' of not achieving their environmental objectives need to have targeted measures implemented to achieve objectives outlined in River Basin Management Plans.

During the period between 2016 and 2021, the groundwater body (GWB) in the region of the Installation stie, Dublin GWB (Code: IE_EA_G_008), was classified as '*Under Review'* per the WFD Risk Score yet achieved '*Good Status'* per the WFD Quality Status. Refer to Figure 5 and Figure 6.

Figure 5: WFD Groundwater Body Status (2016-2021) | Not to scale | GSI © Source: EPA mapping

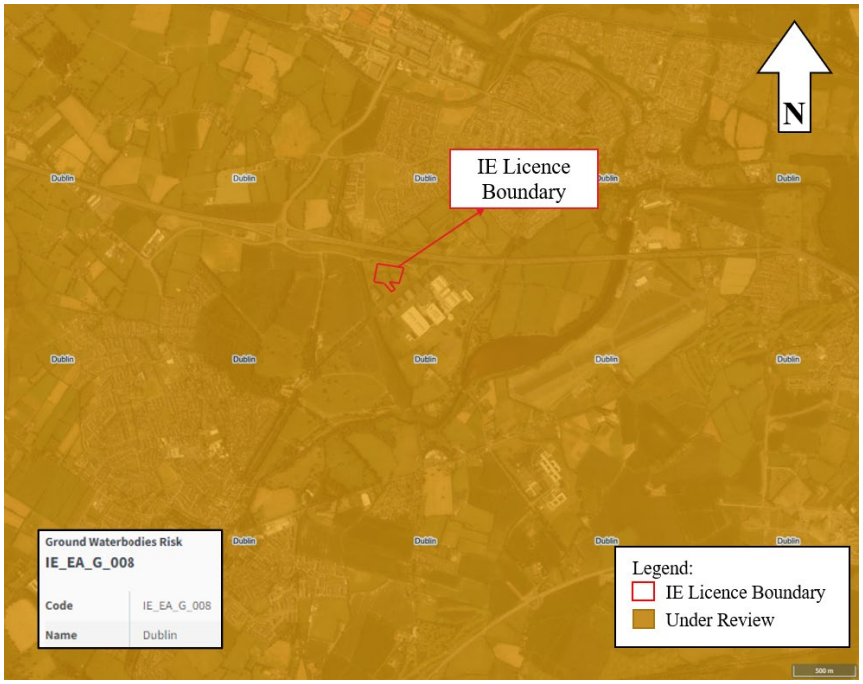

Figure 6: WFD Groundwater Body Risk Status (2016-2021) | Not to scale | GSI © Source: EPA mapping

Additionally, based on the site-specific data available from the KIC Masterplan site investigations undertaken in 2018 and 2020 as part of the KIC planning application (KCC Planning Ref. 23/60047), the following conclusions have been made:

- Bedrock at the Installation site consists of Carboniferous Limestone and a "*Locally Important*" aquifer with moderate vulnerability.
- The KIC Masterplan site, which includes the Installation site, was previously used by Hewlett Packard (HP) Manufacturing Limited which was licensed for the use of coating materials in processes using organic solvents and electroplating operations until 2019, when the license was surrendered with approval from the EPA.
- Site specific soil and water quality data show no evidence of any historical contamination at the Installation site.

Further information regarding the soil and groundwater baseline environment and historical contamination of soil and groundwater at the Installation site can be found in Attachment 4-8-2 Baseline Report.

3.3 Emissions to Ground and Abatement Measures

The Installation has no proposed direct emissions to ground or groundwater. Additionally, there will be no direct discharges of contaminated water to groundwater or to the soil environment during the operation of the Installation.

The cooling water discharge will be directed to the foul network and will comprise of cooling water used in Air Handling Units (AHUs) at the Installation. Discharges from AHUs at the Installation will consist of mains water utilised in the AHUs. No treatment chemicals will be added to water used in the AHUs. As such, cooling water discharges will be of sufficient quality to be discharged to the Installation's foul network.

Cooling water will only be used when the external temperature reaches a set point of 24 degrees Celsius, therefore the emissions to foul sewer will vary and will be low. For the majority of the year, there will be no emissions to foul sewer from the cooling systems.

The only potential impact of the Installation to surface water would be from indirect emissions from fuel and other accidental spills that may occur at the Installation. Additionally, there is a potential for leaks and

spillages from vehicles along access roads, fuel unloading bays and in parking areas. Any accidental emissions of fuel could cause contamination if the emissions enter the water environment unmitigated.

Fuel for the emergency generators will be stored in fuel storage tanks at the Installation. ADSIL is committed to using HVO as the fuel source for the emergency generators, where available. Significant environmental benefits will be achieved through the use of HVO, as it is a renewable diesel that operates as a direct replacement for conventional diesel, and is made from renewable, sustainable raw materials which do not release any new CO_2 into the atmosphere.

Fuel will be stored in multiple locations across the Installation. HVO, where supply is available, will be the preferred fuel stored at the Installation. Where insufficient quantities of HVO are available, a blend of diesel and HVO will be supplied to fuel storage tanks, and in the absence of HVO, diesel will be supplied to fuel storage tanks. Where HVO and diesel are blended in fuel storage tanks, the ratio of HVO : diesel in the fuel tanks will vary with the availability of HVO.

Bulk fuel will be stored onsite in a double skinned top up tank with a capacity of 40,000 litres. This tank will be filled to 90% capacity under normal conditions; therefore, the tank will store approximately 36,000 litres of fuel. Fuel stored in the top up tank will feed into the fuel storage tanks of each generator.

Bulk fuel will also be stored onsite for use in 15 no. double-skinned belly tanks associated with each of the 14 no. critical and 1 no. house emergency generators, which will be filled centrally from the onsite top up tank. Each belly tank associated with the 14 no. critical emergency generators will have the capacity to store 19.6 m^3 of fuel and the belly tank associated with the 1 no. house emergency generator will have the capacity to store 6.2 m^3 of fuel.

900 Litres of diesel will be stored onsite within the 2 no. double skinned fuel storage tanks associated with the diesel-powered fire sprinkler pumps. These tanks have a 500 litre capacity each and will be filled to 90% capacity under normal conditions.

In a best case scenario, where sufficient HVO quantities are available to support the Installation, a total of 268.2 tonnes of HVO (at a density of 0.846 kg/L for HVO) will be stored onsite across the top up tank, critical emergency generator belly tanks and house emergency generator belly tank. In a worst case scenario, where only diesel fuel is used to support the Installation, a total of 272.6 tonnes of diesel (at a density of 0.86 kg/L for diesel) will be stored onsite across the top up tank, critical emergency generator belly tanks and house emergency generator belly tank. Where insufficient quantities of HVO are available, HVO and diesel will be blended in the fuel storage tanks and the ratio of HVO : diesel will vary depending on the availability of HVO.

Fuel will be stored locally in the double skinned belly tanks at each emergency generator and the top up tank located within the generator yard. The individual emergency generators will be housed within containers with various acoustic designed control measures in place including acoustic attenuation and exhaust silencers.

The containerised emergency generator housing will include leak detection systems. Should hydrocarbon be detected in the base of the housing containers, the system will send an alarm signal to the Building Management System (BMS) to alert the onsite Engineering Operations Technicians (EOTs). The onboard controller for individual emergency generators will be connected to the BMS.

The individual fuel storage tanks associated with the varying types of generators and top up tank have level gauges (high and low) connected to an onboard controller which will alarm to the BMS to prevent overfilling and identify a sudden loss of fuel within the tank.

All containers will be designed to be suitable for the chemicals stored within and in accordance with the EPA's guidelines for the storage and transfer of materials for scheduled activities (EPA, 2004).

Standard operating procedures (SOPs) for fuel unloading processes will be in place at the Installation to reduce the risk of spills. Additionally, an on-site Emergency Response Plan (ERP) will be in place and the Installation will maintain spill kits at all storage areas.

The Installation will include 1 no. inbound stormwater and 1 no. inbound foul water connection points to the Landowner's stormwater and foul networks, termed ISW1 and IF1 respectively. The stormwater and foul water entering the Installation from the Landowner's surface water and foul networks will be monitored to

identify any potential contamination prior to entering the Installation site. In the unlikely event that this incoming stormwater and foul water is contaminated, the incoming stormwater and foul water will be subject to the same control measures as the remainder of the stormwater and foul water collected onsite.

Fuel will be prevented from entering the stormwater network by hydrocarbon interceptors. The stormwater network will convey stormwater via monitoring stations and hydrocarbon interceptors with alarms upstream of the 2 no. Emission Points SW1 and SW2 situated at the Installation site boundary. Additionally, stormwater collected around the emergency generator yard will pass through 1 no. full retention interceptor prior to combining with the remainder of the Installation site's stormwater network.

The hydrocarbon interceptors at the Installation site will be equipped with level detection sensors which will send an alarm signal to the BMS to alert EOTs to warn of high hydrocarbon, liquid and silt levels in the separator.

Fuel will also be prevented from entering the foul network by hydrocarbon interceptors. The fuel unloading bay at the Installation will be surrounded by ACO drainage channels which will capture any spills via a full retention interceptor and ultimately discharge to the Installation's main foul (domestic) network.

An Environmental Management System (EMS) will be in place to ensure compliance with licencing requirements. This will include full and adequate containment and management of potential contaminants. Site-specific emergency response measures will be in place and all relevant personnel will be trained accordingly. Additional measures to minimise any impact on the surface water, groundwater or soil from material spillages will be implemented including double skinned fuel storage tanks, impervious fuel unloading areas, double lined fuel delivery lines (underground), and the use of hydrocarbon interceptors on stormwater pipelines.

Groundwater and soil will be monitored for relevant hazardous substances in line with conditions set out in the IE licence, once granted.

Further detail on the fuel storage management and control features are set out in Attachment 4-8-1 Operational Report.

3.4 Groundwater Impact Assessment

There is no proposed direct discharge and no direct pathway to groundwater from the Installation. Therefore, there is no likely potential impact to the soil environment or underlying groundwater body.

There are no proposed process emissions to ground from the Installation. As such, there are no future likely exceedances of the thresholds outlined in the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010).

Ground and groundwater impact assessments were conducted by IGSL and RSK Group Ltd. as part of the EIAR submitted with the KIC Masterplan site planning application (KCC Planning Ref. 23/60047). These considered the cumulative groundwater impacts of the operation of the KIC Masterplan site, which includes the operation of the Installation.

As per the assessments, all developments in the KIC Masterplan site, which includes the Installation site, are required to ensure there is no impact on the receiving water environment in accordance with the relevant legislation (primarily the Local Government (Water Pollution) Act, 1977 and 1990 as amended, Groundwater Threshold Value (Groundwater Directive S.I. No. 9 of 2010 and amendment; S.I. No. 366 of 2016) and EPA Interim Guidelines for groundwater where available) such that developments would be required to manage runoff and fuel leakages and all developments will be required to manage any discharges to water and operate in compliance with relevant legislation (European Communities Environmental Objectives (Surface Waters); Regulations, 2009 (S.I. No. 272 of 2009 as amended by SI No. 77 of 2019).

These assessments further concluded the following:

- There are no groundwater dependent terrestrial ecosystems which have potential to be impacted by the KIC Masterplan site, which includes the Installation site, and that with mitigation measures, the KIC Masterplan site, including the Installation site, will have no significant impact on the natural groundwater regime either qualitatively or quantitatively.

- The residual cumulative impact of the KIC Masterplan site, including the Installation site, on hydrology for the operational phase is anticipated to be long-term, neutral in terms of quality and not significant, once recommended mitigation measures to manage water quality runoff in compliance with legislative requirement are put in place for each development.
- The residual cumulative impact on land, soils, geology and hydrogeology for the operational phase of the KIC Masterplan site, including the operation of the Installation, is anticipated to be long-term, neutral in terms of quality and not significant, once appropriate mitigation measures are implemented in compliance with the legislative requirements for each development.

The results of impact assessments undertaken as part of the KIC Masterplan site planning application (KCC Planning Ref. 23/60047) indicate that the incorporation of mitigation measures will be sufficient and the KIC Masterplan site, which includes the Installation site, will not impact the quality or water body status of the receiving soil/ground and / or groundwater bodies.

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