Crag Arklow Limited Industrial Emissions Licence Application

Attachment 4-8-1 Operational Report

Sweco Ireland Ltd	
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Controlled by	Tim O'Shea
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Author	Jessica Long
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Revision history

Ver	Date	Description of the change	Reviewed	Approved by
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1 Introduction

1.1 Background

This Operational Report has been prepared by Sweco Ireland Limited on behalf of Crag Arklow Limited (CAL), in support of an application to the Environmental Protection Agency (EPA) by CAL for an Industrial Emissions (IE) licence.

The IE licence application is being made pursuant to the requirements of the EPA Acts 1992 to 2011 for the purposes of a new Energy Centre facility and associated infrastructure which is planned for development at Avoca River Park, Arklow, Co. Wicklow. Final grant of planning permission has been received from Wicklow County Council (WCC) for the proposed Energy Centre (WCC ref. no. 21/1080).

The purpose of the Energy Centre facility is to provide power to the National Electricity Transmission Network (NETN) as a peaking plant, in an area where demand is forecast to increase significantly (providing capacity where it is most needed). To supply the NETN, the Energy Centre will connect to the planned new 220 kV substation being developed by Sure Partners Ltd. (a partnership between SSE Renewables and Echelon Data Centres) on a nearby site within Avoca River Park to the west. The 220 kV substation is also the point of grid connection for the import of renewable power from the planned Arklow Bank Wind Park Phase Two, being developed by SSE Renewables. Echelon Data Centres has separately secured planning permission for data centre development within Avoca River Park.

The gas fired Energy Centre will support the grid in times of low renewable energy generation (low wind).

1.2 Site Overview

The site is located within the Avoca River Park Industrial Estate, approximately 2 km northwest of Arklow, Co. Wicklow. The site boundary for the proposed licensed activity is shown in Figure 1 and in the drawings accompanying the IE licence application.

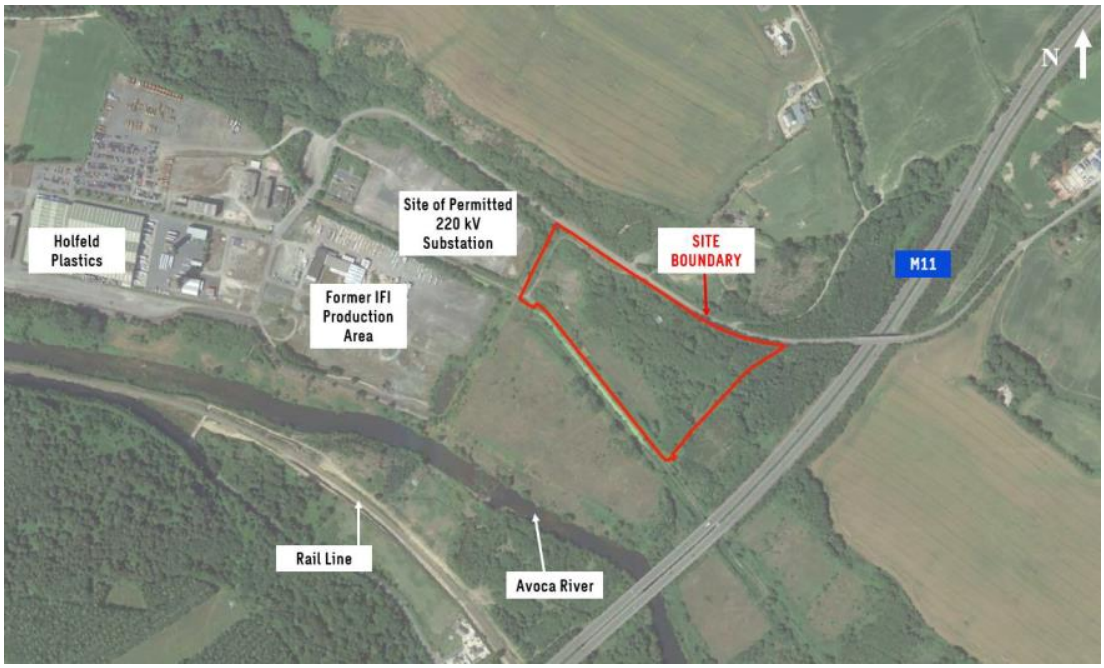

Figure 1: Site overview

The Energy Centre site (approx. 5 ha in size) is west of the M11 motorway and north of the Avoca River and rail line (Arklow-Dublin).

1.2.1 Licensing History

The Energy Centre site is part of the former Irish Fertilisers Industry (IFI) lands, which were used for fertiliser manufacturing operations between the 1960s up to 2002. The site history is further described in the Baseline Report included as part of the licence application (Attachment 4-8-3). Further information on the site is also included in the Site Condition Report (Attachment 4-8-4).

An IPC licence was first granted to IFI by the EPA in 1997 for the fertiliser manufacturing activities (IPPC reg. no. P0031-01). This licence was reviewed in 2000 (P0031-02) as a result of process modifications and associated changes. This preceded the cessation of fertiliser production activities in 2002.

In 2005, the licence P0031-02 was transferred to Holfeld Plastics Ltd., who took over the operation of the licensed site. The commercial activity of Holfeld Plastics (a Waddington Europe company) comprises the manufacture of rigid plastic packaging, which does not fall within the scope of IPPC or IE licensing. The commercial operations of Holfeld Plastics remain limited to the former IFI bulk storage buildings (refurbished), in addition to external yard and vehicle parking areas.

In 2008 and 2012, certain areas of the former IFI land were excluded from the IPPC licensed boundary by way of Technical Amendments A and B respectively. The area excluded from the licensed boundary incorporated the buildings which remain in active use by Holfeld Plastics.

In 2017, a change in the licensee name from Holfeld Plastics Ltd. to Avoca River Park Ltd. was agreed with the EPA.

In 2021, the IPPC licence was transferred to Crag Arklow Ltd. as part of the acquisition by Crag Arklow of the remaining licensed site.

Crag Arklow Ltd. is now applying to the EPA for a new Industrial Emissions licence for the operation of a planned Energy Centre facility.

In parallel with the new IE licence application, a Technical Amendment request has been submitted by Crag Arklow Ltd. to remove the area of land within the Energy Centre site boundary from the current IPPC licensed site (P0031-02).

1.2.2 Planned Energy Centre

An overview of the planned new Energy Centre development is shown in Figure 2 and the Site Layout Plan drawing accompanying the IE licence application (drawing no. 66500282-SWE-XX-XX-D-J-0002).

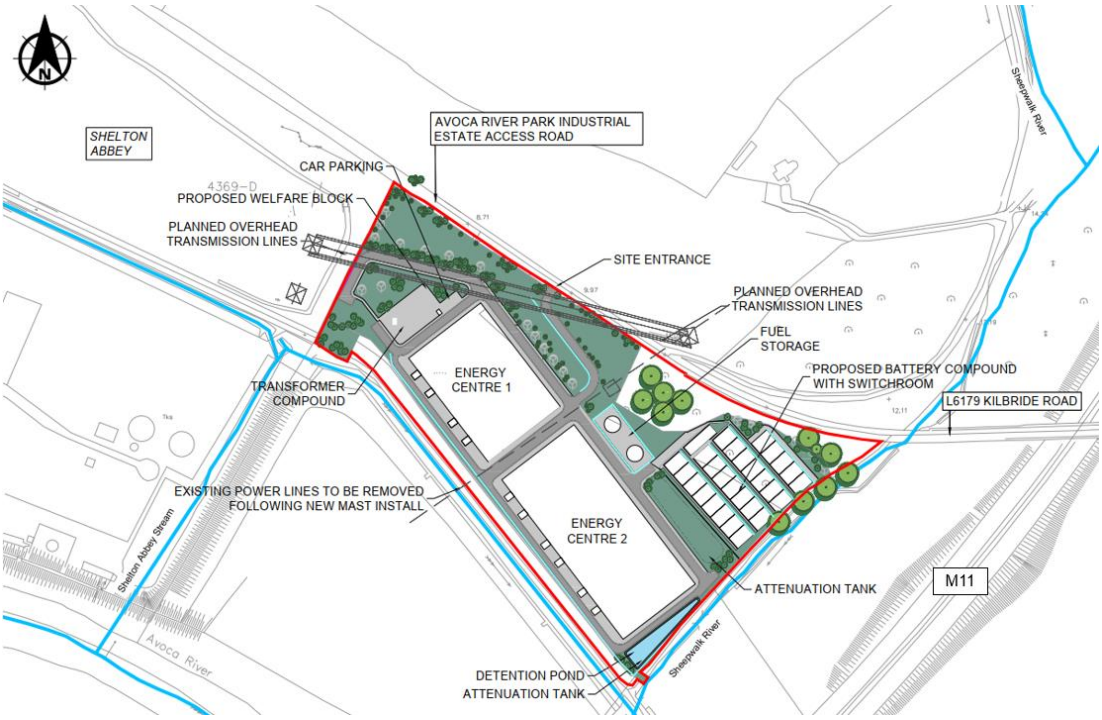

Figure 2: Overview of planned Energy Centre development

2 Plant Description

The installation and associated plant consists of a gas fire Energy Centre, which is being developed as a peaking plant. The new Energy Centre will consist of two buildings.

Energy Centre 1 will have capacity to generate a total of approx. 100 MWe and will consist of:

- A gross floor area (GFA) of 5,965 m^2 within a single-story building
- 12 no. gas engines
- Each engine will have an individual flue, with engine flues grouped in 4 no. stacks (3 no. flues per stack), each 33 m in height

Energy Centre 2 will have capacity to generate a total of approx. 150 MWe and will consist of:

- A gross floor area (GFA) of 9,180 m^2 within a single-storey building
- 18 no. gas engines
- Each engine will have an individual flue, with engine flues grouped in 6 no. stacks (3 no. flues per stack), each 33 m in height

The gas engines are dual fuel design for compliance with CRU secondary fuel obligations. Back-up fuel will be diesel (or a future non-fossil diesel fuel replacement). The primary fuel to be used by the engines is gas. There is an existing gas line and gas skid on-site capable of providing 23 MW_{th}.

Associated infrastructure on the site will include:

- A Battery Energy Storage compound (approx. 0.7 ha) containing a modular array of battery containers plus electrical infrastructure to connect into the generation system (in the range of 100-200 MW output);
    - Containerised Li-Ion batteries to provide up to four hours of supply. The battery equipment will be used in conjunction with the generation equipment to optimise the operational profile and provide no-break power;
    - 27 no. battery arrays;
    - Single storey MV switchroom building to the west of the battery compound;
- A transformer compound (to the northwest of Energy Centre 1), along with a welfare building (38 m^2 GFA);
- Fuel storage tanks (2 no.) having total storage capacity of 1000 m^3, located within a concrete bunded area to the north of Energy Centre 2;
- Construction of a new site entrance from the existing Avoca River Park estate access road to the north of the site, internal road network and circulation areas, footpaths, provision of 6 no. car parking spaces and 4 no. cycle parling spaces;
- Landscaping and planting, boundary treatment, lighting, security fencing, and all associated ancillary and site works including underground foul and storm water drainage network (including on-site wastewater treatment system), and utility cables.

2.1 Hours of Operation

The facility will operate on a 24/7 basis across 2 no. 12-hour shifts:

- 7 am to 7 pm
- 7 pm to 7 am

The Energy Centre is designed as a peaking plant, providing a source of electrical supply to the national grid during periods of low supply from alternative sources including renewables. The facility will have the capability to run on a 24 hour / 7 day basis, however the actual periods of operation will correspond to periods of high grid demand. For example, during periods of low wind speed when renewable energy generation is low, the peaking plant may be required to operate for periods of days or weeks. Conversely, during periods of high wind speed when renewable energy supply to the national grid is high, the peaking plant may be out of operation for days or weeks at a time.

Maintenance and inspection activities will also be carried out during daytime hours within the Energy Centre, including periods when the combustion plant is not operational.

2.2 Site Personnel

Once fully operational, it is anticipated that c. 7 staff will be onsite during the day shift. During the night shift c. 2 staff will be based in the Energy Centre.

3 Primary Processes & Activities

3.1 Licensed Activity

With reference to the First Schedule to the EPA Acts 1992 to 2011, the licensed activity within the installation boundary will be:

"Combustion of fuels in installations with a total rated thermal input of 50 MW or more."

Each individual gas engine unit will have a rated thermal input of approx. 19.355 MW_{th}. Within Energy Centre 1, the 12 no. reciprocating gas engines will have a total rated thermal input of approx. 232.26 MW_{th} (capable of generating 100 MWe). Within Energy Centre 2, the 18 no. reciprocating gas engines will have a total rated thermal input of approx. 348.38 MW_{th} (capable of generating 150 MWe).

Regarding aggregation of the combustion plant, each of the 30 no. engines will be served by individual flues (30 no. flues) housed in a total of 10 stacks.

Each of the 10 no. stacks will house 3 no. engine flues (rated thermal input of associated combustion plant approx. 58.064 MW_{th}), as follows:

- Energy Centre 1 will be served by 4 no. stacks (12 no. engine flues), 33 m in height.
- Energy Centre 2 will be served by 6 no. stacks (18 no. engine flues), 33 m in height.

3.2 Power Generation

The 30 no. Reciprocating Internal Combustion Engine (RICE) units will combust natural gas sourced from the existing gas line and gas skid on-site (capable of providing 23 MW_{th}). The Energy Centre will act as a peaking plant with energy sourced from the gas combustion on-site being exported to the National Grid. The Energy Centre is designed with capacity to generate up to 250 MWe of electricity.

For compliance with the secondary fuel obligations of the Commission for Regulation of Utilities (CRU), a dual fuel engine type has been selected such that the engines may be operated using a back-up liquid fuel supply (diesel) if necessary. It is noted that interruption to or failure of the natural gas mains supply is rare in Ireland and operation of the engines using back-up liquid fuel (diesel) will only be required during emergency (abnormal) conditions in the event of loss of natural gas supply to the site.

Within Energy Centre 1, up to 10 of the 12 no. engines may be operated with 2 no. units on standby. Within Energy Centre 2 up to 15 of the 18 no. engines may be operated with 3 no. units on standby. The number of units in operation at a given time will vary in response to grid demand. In addition to the gas engines, the Energy Centre buildings will also house MV/LV switchgear.

The operation of the 30 no. gas engines will result in emissions to atmosphere. The associated emissions are described in Section 6. Each engine will have an individual flue for emissions to atmosphere (33 m high). As described previously, the engine flues will be grouped in three and housed in 10 no. stacks The emission from the engines will be released through the 10 flues between the two energy centre buildings (33 m high). A schematic (plan view) of the gas engines showing the configuration of the flues and stacks for Energy Centre 1 is shown in Figure 3 with an equivalent configuration for Energy Centre 2 (18 no. engines, 6 no. flue stacks).

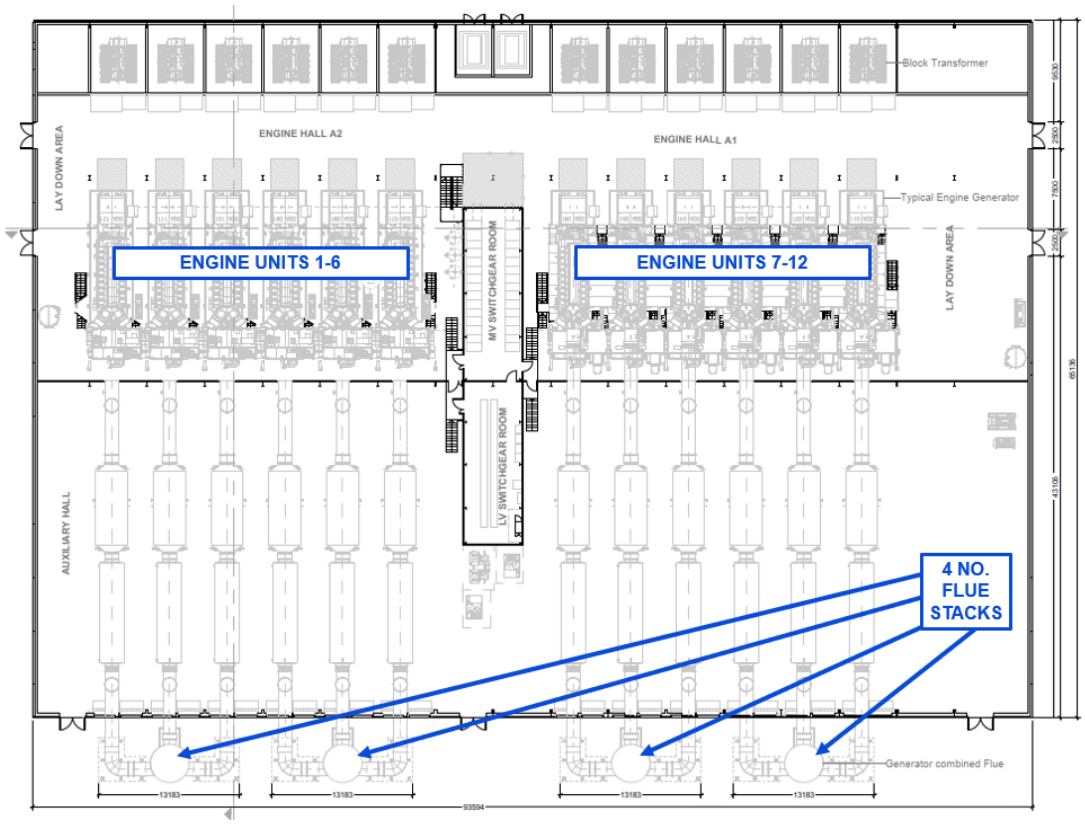

Figure 3: Energy Centre 1 - Gas Engine Schematic & Flue / Stack Configuration

A battery compound will be located to the northeast of Energy Centre 2 and will provide electricity storage and backup power. The battery compound will consist of 27 no. battery arrays within a compound area of c. 0.7 hectares. The use of batteries for energy storage will augment the gas combustion plant. The intended operation of the Energy Centre is as a grid support system, where the plant operates intermittently to maintain the stability of the electricity grid. This will facilitate the transition of the electricity network to greater levels of renewable electricity generation. Such plants are required as renewable electricity generation fluctuates due to weather conditions, as well as fluctuating customer demand.

The battery units will provide short term power rapidly to the electricity grid (from 0.15 seconds to 15 minutes). The gas engines will be able to start up in about five minutes and can provide longer term support covering shortfalls in renewable generation.

4 Services & Utilities

4.1 Water Supply

The Energy Centre will be supplied with water via a new 50 mm diameter connection to the existing two-inch watermain, on the southwest boundary. The water supply required for the site will be limited to the local welfare facilities required for maintenance staff. The peak water demand has been calculated to be 0.075 l/s.

The feasibility of the water connection has been confirmed by Irish Water based on a pre-connection enquiry.

4.2 Electricity Requirements

A 49 kVA domestic supply is available within the existing ESB Networks medium voltage substation within the industrial estate.

The purpose of the Energy Centre facility is to generate electrical power for export to the NETN. As described in Section 1.1 previously, the Energy Centre will connect to the planned new 220 kV substation being developed by Sure Partners Ltd. (a partnership between SSE Renewables and Echelon Data Centres) on a nearby site within Avoca River Park to the west. The 220 kV substation is also the point of grid connection for the import of renewable power from the planned Arklow Bank Wind Park Phase Two, being developed by SSE Renewables.

4.3 Natural Gas Requirements

There is an existing gas line and gas skid on-site capable of providing 23 MW_{th}.

A separate planning application and connection process with Gas Networks Ireland (GNI) is being advanced for upgrades to the gas network in the area, which will facilitate the necessary gas supply for the operation of the Energy Centre at full capacity.

4.4 Telecommunications

A telecommunications distribution network is in place in the area. The requirement for telecoms is minor for this proposed development and there is sufficient capacity in the network.

4.5 Building Management System

The installation will incorporate an automated Building Management System (BMS) for control, monitoring, data collection and alarm/reporting of the key plant and utility control systems site wide. Subject to detailed design, it is anticipated that the BMS will monitor electrical supply, engines and engine cooling, water supply and natural gas systems.

The BMS will ensure the facility is running optimally and will alert the operators in the event of a malfunction using visual and audible alarms.

Changeover controls will be implemented for the transition from natural gas to the back-up fuel (diesel).

5 Management of Raw Materials, Intermediates and Wastes

5.1 Raw Materials Management

5.1.1 Diesel

The diesel (back up fuel) storage for the Energy Centre will be in 2 no. bulk tanks (providing storage for 1,000 m^3), within a concrete bund to the north of the Energy Centre 2 building (Figure 2).

Diesel is to be used as a back-up fuel only within the Energy Centre and as such will remain in storage during normal operations. The use of diesel will be limited to emergency scenarios and for testing.

The transfer of diesel from the bunded storage tanks to the engines will be via double contained overground pipes equipped with leak detection.

5.1.2 Containment Measures

All aqueous emissions will be collected in underground surface water and foul water drainage networks prior to discharge. As described above, the main storage of raw materials relates to the two bulk diesel storage tanks. These will be located within a concrete bund, constructed in accordance with EPA guidance i.e. to provide 110% of the largest tank volume or 25% of the overall volume stored within the bund. The engine units will be located internally within the Energy Centre 1 and 2 buildings.

The following additional containment arrangements are planned to be in place at the site to prevent any accidental release of diesel (back up fuel):

- Storage tanks will be equipped with alarmed leak (level) detection;
- Provision of spill kit facilities and training of site personnel in use of same;
- Double lined distribution lines (above ground) with alarmed leak detection will supply diesel to the gas engines;
- Storm water to be discharged offsite will pass through oil interceptors (as detailed in the Surface Water and Foul Water Layout Drawing, drawing no. 66500282-SWE-XX-XX-D-J-0005, accompanying the IE licence application);
- In the event of a fire or other major leak / incident (e.g. during delivery), run-off from the road and hardstand areas will drain to the onsite attenuation tanks which will be equipped with a shut off valve for closure until sampling is undertaken. The results of sample analysis will be used to determine whether the runoff contained in the attenuation tanks is contaminated (requiring offsite treatment) or suitable for discharge.

5.2 Intermediates

The Energy Centre is for the generation of electricity. There will be no intermediates produced as part of the operation of the installation.

5.3 Waste Management

The expected quantities of waste generated at the new installation are set out in Attachment 8.1 of the IE licence application.

There will be minimal solid waste produced from the Energy Centre. The SCR abatement catalyst within each engine will require replacement every 15,000-25,000 operating hours.

Waste oil from the gas engines will be drummed and contained in the bunded tank storage area pending removal offsite for suitable treatment by an authorised waste haulier. The oil interceptor serving the onsite drainage system will be subject to routine maintenance and the contents will be pumped to a road tanker and transported offsite by an authorised haulier for suitable treatment.

6 Emissions

6.1 Air Emissions

6.1.1 Main Emissions

The main emission points comprise the 30 no. flues associated with the 30 no. gas engines within the Energy Centre. As a peaking plant, the timing and duration of emissions to air will be variable in response to grid demand coinciding with periods of low generation from alternative sources including renewables.

The emission point (flues) from each gas engine have been labelled Emission Point A2-1 to A2-30 in Attachment 7.4.1 and are shown on the drawing 'Main Air Emission Points' (drawing no. 66500282-SWE-XX-XX-D-J-0007) accompanying the licence application.

Monitoring will be undertaken in accordance with the requirements of the European Union (Large Combustion Plants) Regulations 2012 (S.I. 566 of 2012), LCP BAT Conclusions and relevant IE Licence conditions.

6.1.2 Minor & Potential Emissions

There will no emissions to atmosphere which qualify as minor emissions.

Potential emissions at the site are limited to the diesel storage tank relief vents. These emissions would only occur during abnormal events, for example over-pressurisation.

The potential emission points are listed in Attachment 7.4.2 of the IE licence application.

6.1.3 Fugitive Emissions

Fugitive emissions are defined in the Industrial Emissions Directive (IED) (2010/75/EU) as "*any emissions not in waste gases of volatile organic compounds into air, soil and water as well as solvents contained in any products, unless otherwise stated in Part 2 of Annex VII".* 'Waste gases' are also defined by the IED as "*the final gaseous discharge containing volatile organic compounds or other pollutants from a stack or abatement equipment into air".*

There are no fugitive emissions anticipated from the operation of the installation. External pipelines containing back up fuel (diesel) will have flange guards. Gas pipelines will be fully welded.

6.2 Stormwater Emissions

Rainwater run-off from building roofs and hardstanding areas of the site (including car park and yard areas) will be drained via the surface water drainage network routing to attenuation and detention ponds prior to discharge via a single emission point SW1 to the existing drainage ditch southeast of the site (draining to the Avoca River via the marshlands downstream of the site). The surface water drainage system has been sized to incorporate all developments within the installation boundary

Details of the stormwater discharge are set out in Attachment 7.7 of the IE licence application. A description of the stormwater attenuation features is included in Section 7.2. The location of the stormwater emission point to the existing drainage ditch (SW1) is shown

on the drawing ‘Proposed Surface Water & Foul Water Overall Layout’ (drawing no. 66500282-SWE-XX-XX-D-J-0005) accompanying the licence application.

The stormwater emission will be subject to routine visual inspection in accordance with IE licence requirements.

6.3 Foul Effluent Emission

The wastewater generated at the site will be limited to the welfare facilities (toilets, sinks etc.) that will be required for Energy Centre operators and visitors only. There will be no process or cooling water discharge associated with the operation of the Energy Centre.

There is no existing public sewer in the vicinity of the site. Accordingly, a packaged wastewater treatment system will be installed, providing for the discharge of treated sanitary effluent to an existing drainage ditch (emission to ground) via soil polishing filter. Further details are included in Section 6.4.

6.4 Emission to Ground

There will be a single emission to ground comprising the discharge of treated sanitary effluent from the packaged wastewater treatment plant. Foul effluent from the toilets and sinks of the Energy Centre welfare facility will be collected separately to the stormwater network, in a dedicated foul effluent pipe network. The peak design foul flow has been calculated as 0.059 l/s.

A new on-site packaged wastewater treatment system will be installed to treat the sanitary effluent from the welfare facility and will be located at the west part of the site.

The locations of the packaged treatment plant, polishing filter, emission point to ground (SL1) and foul inspection chamber are shown on the drawing ‘Proposed Surface Water & Foul Water Overall Layout’ (drawing no. 66500282-SWE-XX-XX-D-J-0005) accompanying the licence application.

6.5 Noise Emissions

The main sources of noise associated with the operation of the installation will be the operation of the gas engines (i.e. generator air intake, generator air exhaust and generator engine exhaust), radiator coolers, transformer compound and battery units. It is noted that the gas engines will be housed internally within the Energy Centre buildings. The Energy Centre will operate on a 24/7 basis. As a peaking plant, the gas engines will be operated in response to grid demand meaning that the duration, extent and frequency of plant operations will be variable.

A detailed assessment of the noise sources was undertaken as part of the planning application for the Energy Centre (planning ref. 21/1080) and Environmental Impact Assessment Report (EIAR). This EIAR is included as part of the IE licence application.

Further details on noise emissions and the associated impact assessment are included in Attachment 7.1.3.2 of the IE licence application.

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

7 Treatment and Abatement Systems

7.1 Air Emissions

The stack heights of the engines (33 m) for the Energy Centre have been designed in an iterative fashion to ensure that an adequate height was selected to aid dispersion of the emissions and achieve compliance with the EU ambient air quality standards at all off-site locations (including background concentrations).

The natural gas engines will incorporate selective catalytic reduction (SCR) abatement technology in order to reduce NO_x concentrations to 65 mg/Nm^3. These abatement systems will be in place for each of the 30 no. gas engines.

Air dispersion modelling has been completed with further details contained in Attachment 7.1.3.2. The modelling of air emissions from the site was carried out to assess the concentrations of nitrogen dioxide (NO_2), carbon monoxide (CO), sulphur dioxide (SO_2) and carbon monoxide (CO) resulting beyond the site boundary.

While the Energy Centre will be operated as a peaking plant, the air emissions impact assessment (including air dispersion modelling) has conservatively assumed a normal operations scenario assuming the continuous operation of 25 of the 30 no. engines operating on natural gas (24 hours per day, 365 days per year). It is noted that the remaining five engine units are designed for standby use (i.e. in the event of failure of a duty unit).

The results indicate that ambient ground level concentrations are below the relevant air quality standards for the pollutants modelled. The scenario modelled represents a conservative, worst case scenario whereby the plant is operated at full capacity (24/7/365) whereas the plant will operate intermittently during the year in response to grid demand.

7.2 Stormwater

As described in Section 6.2 previously, stormwater will be discharged from the site via a single emission point SW1 to an existing drainage ditch (draining in turn to the Avoca River via marshlands downstream of the site).

Prior to emission via SW1, stormwater flow will be attenuated in 2 no. geocellular attenuation storage systems (total capacity 1,770 m^3) and a detention basin (capacity 200 m^3) located at the southeast corner of the site.

Rain gardens and filter drains will provide a further 306 m^3 of below ground attenuation while the underground stormwater network will provide an additional 55 m^3 capacity.

The overall attenuation volume for the site has been designed to cater for the 30-year (1% AEP[1]) event plus 10% allowance for climate change. The 100-year (1% AEP) event will be contained within the bounds of the site, in accordance with the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS). Outflow from the site will be controlled using a vortex flow control device (hydrobrake or similar) to the greenfield run-off rate of 15.2 l/s. The stormwater network will also be equipped with a number of Class 1 bypass separators, as detailed in the Surface Water and Foul Water Layout Drawing (drawing no. 66500282-SWE-XX-XX-D-J-0005), accompanying the IE licence application

In the event of a spill or a fire, an automated penstock on the final outfall line will close off the outflow to contain any release of potentially contaminated material onsite pending further

[1] AEP = Annual Exceedance Probability

assessment. Potentially contaminated stormwater (e.g. in the event of a spill/loss of containment) that enters the stormwater attenuation/detention tanks will be tested prior to discharge to the receiving drainage ditch. Contaminated stormwater will be pumped out of the attenuation tank(s) for appropriate offsite treatment.

7.3 Wastewater

There is no process or cooling wastewater stream associated with the operation of the Energy Centre.

Wastewater emissions will be limited to the sanitary effluent from the Energy Centre welfare facility, as described in Sections 6.3 and 6.4 previously. A new on-site packaged wastewater treatment system will treat the sanitary effluent from the welfare facility and will be located at the west part of the site. The locations of the packaged treatment plant, polishing filter, emission point to ground (SL1) and foul inspection chamber are shown on the drawing 'Proposed Surface Water & Foul Water Overall Layout' (drawing no. 66500282-SWE-XX-XX-D-J-0005) accompanying the licence application.

The plant will require periodic maintenance and will have a warning system capable of offsite notification.

The treated secondary effluent from the onsite package wastewater treatment plant will discharge into a tertiary soil polishing filter to ensure that the final discharge to the existing ditch (ground) is in compliance with the EPA Code of Practice Domestic Waste Water Treatment Systems (Population Equivalent ≤10). A site suitability assessment has been completed in accordance with Section 5 of the Code of Practice to determine the exact sizing of the percolation area and design of the polishing filter. Further details are included in Attachment 7.6.2 (Sanitary Effluent Compliance) of the IE licence application.

7.4 Noise Emissions

Plant items will be selected in order to achieve the required noise levels and or appropriate attenuation will be incorporated into the design of the plant/buildings in order that the plant noise emission levels are achieved on site (including any system regenerated noise).

The operation of the main combustion plant (gas engines) will be enclosed in the two Energy Centre buildings. Detailed design will ensure that the building envelope offers sufficient sound insulation in order to attenuate internal noise sources in an appropriate manner. Air intake and exhaust points associated with the Energy Centre will incorporate suitable atmosphere side attenuation (as required) in order to achieve the requisite noise levels for compliance with emission limit values.

As outlined in Attachment 7.1.3.2, it is anticipated that the noise design measures will be sufficient to ensure that the noise levels comply with the daytime, evening and night-time noise limits to be stipulated in the IE licence at the nearest noise sensitive receptors.

7.5 Waste

No onsite waste treatment activities are required or proposed as part of the proposed installation.

The majority of the waste streams generated onsite will be non-hazardous. Appropriate segregation and management of waste streams will ensure no significant impacts on downstream facilities.

The waste stream with the greatest potential for impact are waste oils. Appropriate storage and management of these liquid wastes will ensure adequate protection from unauthorised discharges to ground / groundwater.

All waste generated onsite will be managed in accordance with IE licence requirements.

8 Systems & Procedures

8.1 Environmental Management System

An Environmental Management System (EMS) will be developed for the site in accordance with the requirements of BAT and as required by the IE Licence. The EMS will govern the management of the site's environmental programme and will be consistent with best practice requirements (e.g., international standard for environmental management ISO 14001).

8.2 Accident Prevention & Emergency Response Procedures

An Accident Prevention Procedure (APP) and Emergency Response Procedure (ERP) will be developed for the site in accordance with IE Licence requirements and latest EPA guidance. The APP will describe the measures and procedures in place to prevent and minimise the risk of accidents. The ERP will detail the required actions to be undertaken in the event of an incident on site and will cover all possible emergency scenarios including fires, chemical spills, explosions, etc. The ERP will include arrangements for contacting the EPA, emergency services, other relevant authorities and those people in the surrounding environment that may be affected. The ERP will also include the training required to provide the onsite Emergency Response Team (ERT) with adequate skills. The APP and ERP will be reviewed regularly (at least annually) and updated as required.

8.3 Standard Operating Procedures

A number of Standard Operating Procedures (SOPs) will be developed for the site in conjunction with the EMS. These will address all the relevant environmental matters onsite including, but not limited to:

- Incident response procedures
- Reporting on, investigating, and documenting incidents
- Waste management
- Bund and pipeline integrity testing
- Fuel and chemical delivery, storage and handling.

8.4 Fire Management

The installation will be equipped with automated fire detection systems (heat and smoke) as well as natural gas detection systems in the Energy Centre. These will be connected to a main fire panel. If a fire is detected, the fire panel will display the location of the detected fire.

Once detected, the location of the potential fire will go into an alarm state. The fire detection and alarm systems will be connected to the sprinkler system and these will be triggered in the event of a fire. In the event of a fire in the Energy Centre, the supply of natural gas to the engines will cease.

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

A firewater retention risk assessment will be completed for the installation in compliance with IE licence requirements.

9 Alternatives Considered

The development of a peaker plant is intended to support the increasing share of renewable energy supplying the national grid, consistent with Ireland's commitments in the area of climate change generally, including a transition from non-renewable sources of energy. Renewable generation in Ireland (including wind and solar energy) is intermittent. During periods of low wind and during night-time in the case of solar energy, renewable energy alone is insufficient to power the National Grid and requires support from alternative energy sources.

9.1 Energy Storage

Alternative means of power generation to support renewable energy sources include hydroelectric storage such as the Turlough Hill scheme in Co. Wicklow. This facility is capable of supplying power to the grid for several hours or during night-time. However, the scale and number of hydroelectric storage facilities required to support the grid would not be feasible given the specific conditions required for such development (i.e. large volumes of water with a major change in elevation).

Large battery facilities could also support renewable generation however this would be limited to very short durations e.g. up to 1 hour only. The Energy Centre installation includes for a 0.7 ha battery array to augment and optimise the operation of the gas fired peaking plant.

9.2 Alternative Non-Renewable Fuels

The proven technology to supply power during long periods of low renewable generation remains fossil fuel however, among the most appropriate and climate sensitive use of such fuels is the development of fast responding peaking power plants (such as the proposed Energy Centre) which use the least amount of non-renewable energy possible.

Natural gas is the cleanest-burning hydrocarbon, producing around half the carbon dioxide (CO_2) and just one tenth of the air pollutants of coal when burnt to generate electricity.

The utilisation of natural gas over solid and liquid fuel alternatives is also endorsed by the Commission for Regulation of Utilities (CRU). Every year EirGrid publishes a long-term outlook (Generation Capacity Statement or 'GCS') which outlines the generation needs for the coming 10-year period. The 2021 GCS has identified an increased need for power generation between Winter 2022/'23 and Winter 2025/'26. To address this challenge, the CRU, incorporating the recommendations of EirGrid and in conjunction with the Department of Environment, Climate and Communications (DECC), has developed a supply programme of work to be delivered in the coming years. This programme supports an increase in flexible gas-fired generation capacity by 2030 to mitigate potential power supply shortfalls.

Consistent with this position of the regulatory authorities and considering the greater environmental impact associated with the combustion of solid and liquid fuels, a gas fired peaking plant has been selected as the most suitable means of power generation for the new facility.

9.3 Alternative Scale / Electrical Output

The Irish National Grid operates at voltages of 10, 20, 38, 110, 220 and 400 kV. The scale of the Energy Centre proposed has considered the adjacency of newly planned and permitted

220 kV substation at the nearby site in Avoca River Park as well as the spatial constraints of the site and surrounding area. The current and future gas network available to supply the Energy Centre has also informed the sizing of the plant.

9.4 Alternative Combustion Technology

Combined Cycle Gas Turbines (CCGT) are utilised in many power generation facilities, including those of larger scale and electrical output. The ‘combined cycle’ involves the use of both gas and steam turbines. However, CCGT is not suited to rapid start up and shutdown in response to grid demand as it takes time to produce enough heat for steam generation and in turn pressure to initiate the steam turbine. These CCGT plants operate best when run consistently as base load or at least for significant periods of time. By contrast, the peaker plant design selected, utilising gas engines and battery storage, will be able to rapidly ramp up and down in response to fluctuations in grid demand.

9.5 Alternative Location

Alternative sites within the Avoca River Park were examined as part of the EIAR submitted with this application but were not suitable for the proposed development.