2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 CHARACTERISTICS OF THE PROJECT

Following the assessment of alternative plant options, it was concluded that the most suitable and appropriate plant was a mid merit plant which would be capable of producing a thermal output of approximately 350MW, would be flexible in design and operation to meet fall-off in output from wind generation plants (peaking capability) and would be capable of meeting load demand requirements as indicated in the Eirgrid forecast document 2009 to 2025.

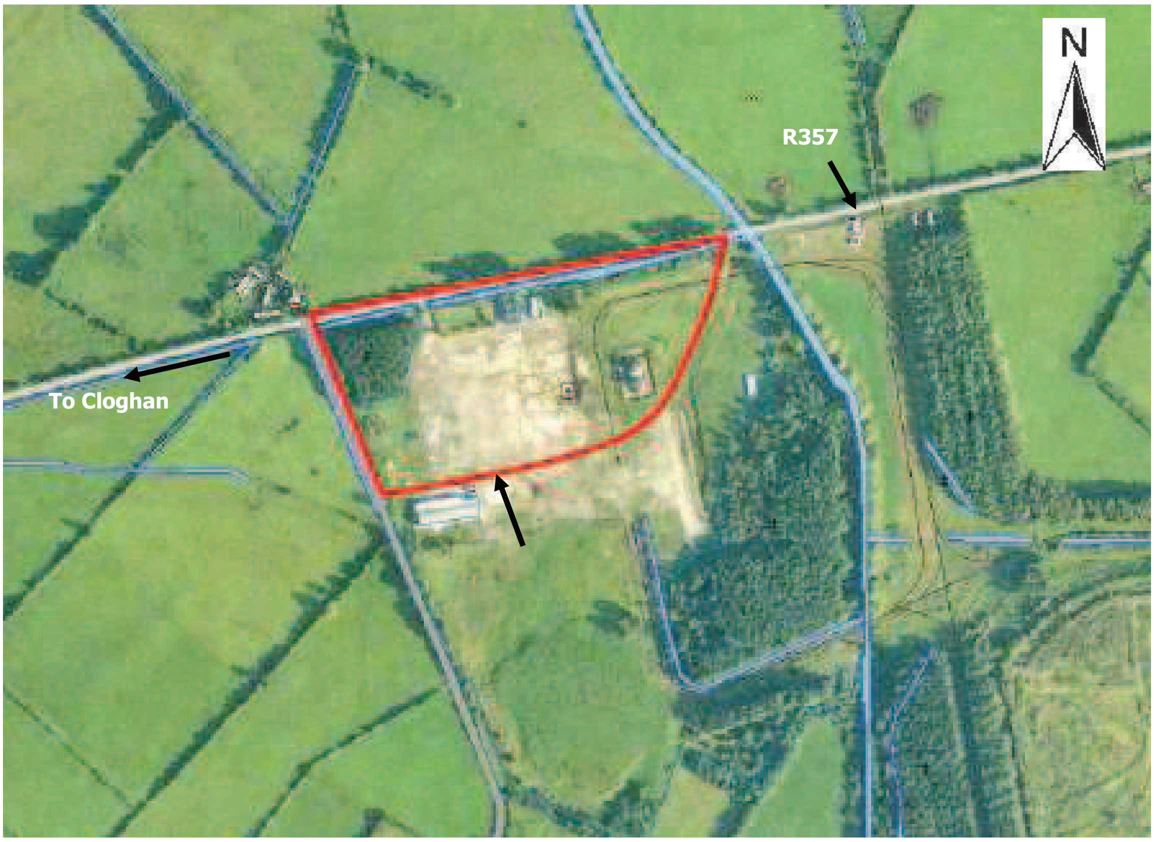
The contract to supply and construct the plant will be by open international competition. The final and precise plant output and scheme layout therefore cannot be specified at this stage without bias to a particular manufacturer or supplier. The result of a tendering process will be the award of a contract for a particular model of gas turbine. Lumcloon Energy has already received substantial interest from a number of international suppliers and is in talks with regard to determining the most suitable plant for the site. The performance of the final plant will be required to comply with the environmental objectives and design proposals as presented in this EIS in order to ensure a minimal negative impact on the receiving environment. The worst case scenarios have been considered in the EIS to ensure that the potential impacts from such a development have been assessed for all potential scenarios.

The power plant will supply electricity via the regulated electricity market. Natural gas, supplied from the Bord Gáis Network (BGN) grid, will be the primary fuel source for the facility. To comply with Commission for Energy Regulation (CER) regulations, diesel will be used as a backup fuel in the event of interruption to the natural gas supply. Five days running capacity of diesel will be stored on site, (approximately 5,200m^3) within a 110% capacity bund. The diesel oil will be limited to 0.1% sulphur in fuel as per the requirements of the Sulphur Content of Heavy Fuel Oil, Gas Oil and Marine Fuels Regulations, 2008 (S.I. 119 of 2008) *EU Directive 1999/32/EC, (relating to a reduction in the sulphur content of certain liquid fuels).*

2.1.1 Description of the Existing Site

The proposed development site is approximately 11 acres and located adjacent to the R357. The site is about 5km south east of Ferbane, circa 22km south of Athlone and 20km west of Tullamore. The proposed development lands are brownfield and the site is part of the former ESB owned peat fired power station site, which was decommissioned in 2004. The site is situated in the Shannon River basin district and the Silver River is located approximately 50m to the East of the site and flows north into the Clodiagh, which joins the Brosna River, which in turn flows into the River Shannon. There is a relatively small wooded area in the north western area of the site. There are large parcels of cutaway bogland and forestry to the south west and north-west of the site and industrial railway associated with the former peat power station run out from the former peat power station to the surrounding boglands. The surrounding topography is generally flat with nearby once-off rural housing primarily located south west of the site along a local road, which borders the site to the west and runs in a south western direction from the R357 to the R437. The existing site layout is shown on Figure 1.2 attached and on Planning Drawing Reference Number C007331-02. Figure 2.1, below, shows an aerial view of the proposed development site in 2005.

Figure 2.1 Aerial View of Proposed Site 2005



Source OSI


View south west from north east area of site


View towards west from north east area of site


View towards site entrance from south west


View towards east from south west area of site


Ground conditions adjacent to northern boundary


Ground conditions in centre of the site


Existing site entrance – facing north


View towards south east from northern boundary

2.1.1.1 Former Ferbane ESB Power Station

The existing site formed part of the former ESB peat fired power station. Construction of the former ESB owned peat power station at Lumcloon commenced in May, 1953 and the first development of 60,000 kilowatts was commissioned in 1957. A further 30,000 kilowatts was commissioned in January 1964. This brought the total capacity of the station to 90,000 kilowatts (90MW). The station burned approximately 2,000 tonnes of peat per day delivered to the site by rail from the surrounding boglands. The plant comprised four units which produced 2 million units of electricity per day when on full load. Each unit consisted of a boiler, a turbine, a generator and a transformer. The electricity was generated at 10,000 volts and transformed to 110,000 volts for transmission into the national grid. Two reinforced concrete hyperbolic cooling towers stood at the site through which 18,184m^3 of water per hour was continuously circulated and cooled. Each tower had an internal diameter of approximately 60 metres and rose to almost 90 metres in height above ground level. Figures 2.2 to 2.5 show the physical size of the former generation station at Lumcloon.

Figure 2.2 View from Entrance to the Former Ferbane Peat Fired Station

Figure 2.3 Aerial view of Former Ferbane Peat Fired Power Station

Figure 2.4 View from the South East of Former Ferbane Peat Fired Station

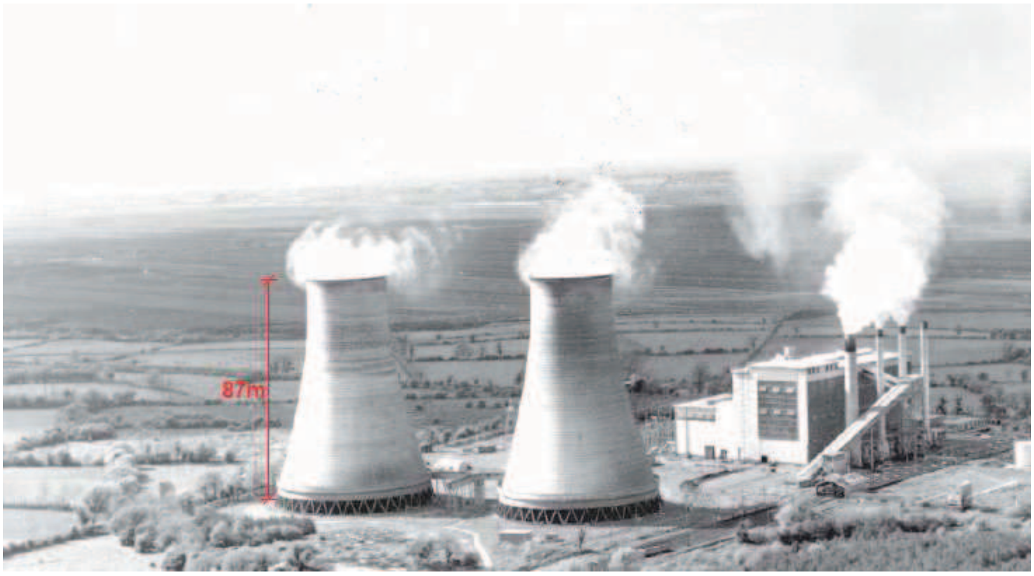
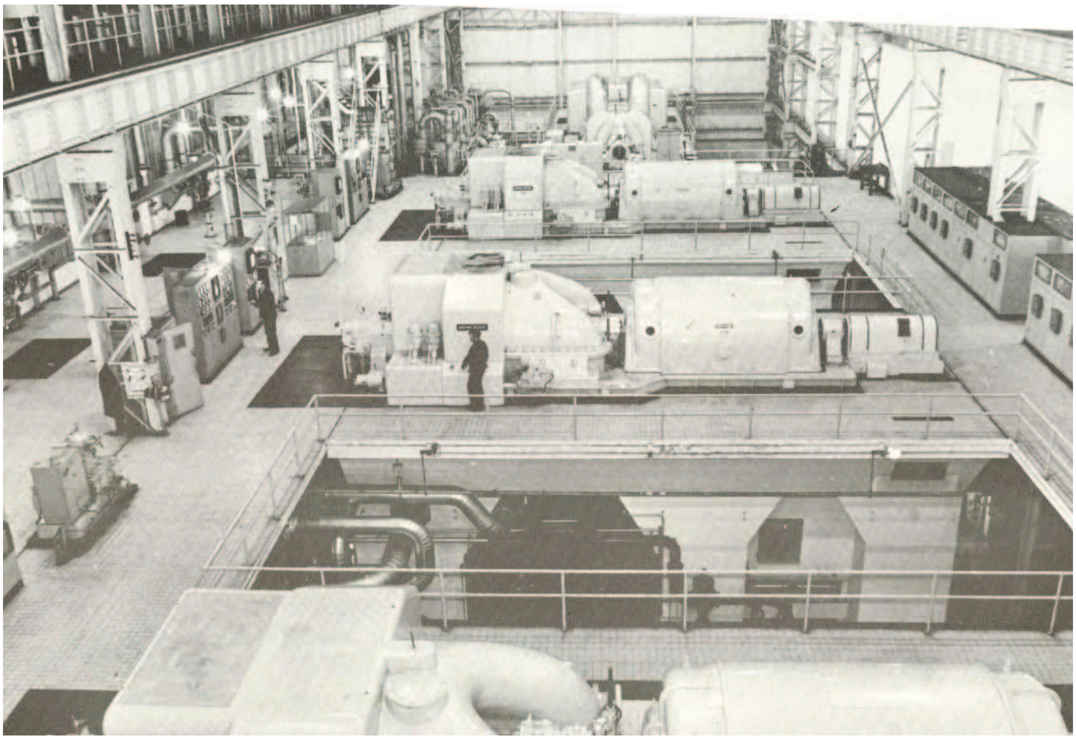


Figure 2.5 Internal View of Former Ferbane Peat Fired Station



The station was officially closed in 2001 and decommissioning works were completed in the following years. Figure 2.6 shows the first cooling tower being demolished in 1999.

Figure 2.6 Demolition of the First Cooling Tower at the Former Ferbane Peat Fired Station

Source: www.ferbane.tv

2.1.2 Description of Proposed Site Layout

The site is predominantly flat generally ranging in height (between 45m ordnance datum (OD) and 47m OD Malin Head datum). The site layout of the proposed facility is shown on Figure 2.7 attached, Planning Drawing Reference Number C007331-05.

It is proposed to access the site from the R357 through the existing entrance/exit to the site. This will be used as the main entrance to the proposed development and is located beside the proposed administration building in the north-west area of the site. It is proposed to construct a second entrance for emergency use further east along the R357 towards Lumcloon Bridge.

It is proposed to construct a two storey administration building which will be 10.6m to roof apex from ground level. Approximately 30 car parking spaces will be provided for employees and visitors in this area of the site during the operation of the plant. A 400 m^2 warehouse containing a workshop and stores will be located south of the administration block, adjacent to the switchyard.

The power generation building comprising gas turbine halls, steam turbine halls and heat recovery steam generator halls) will be constructed as one structure with different roof heights determined by the plant components within. The total footprint of the power generation building will be 6,684m^2. Two air cooled condenser (ACC) units, each with nine fans will be located on the eastern side of the power block. The parapet of both ACC units will be 24.5m above ground level. A description of all plant components is provided in Section 2.1.4.

The tallest structures on the site will be the four exhaust stacks from the HRSG units. Following air dispersion modelling it was determined that these should be 49m in height to facilitate emissions dispersion. This is significantly less than the height of the two reinforced concrete hyperbolic cooling towers which were the tallest structures (almost 90m) on site during the operation of the former peat fired station. Further details on the heights of structures at the site are presented in Section 6 Landscape.

Internal roadways will be tarmac paved and the ground around external plant components such as the AGI, gas receiving, switchyard and the ACCs will be covered with stone chippings to facilitate natural drainage.

Table 2.1 below provides details of footprints of the main structures on the site and their heights, if applicable.

Table 2.1 Size Details of Facility Components

Component	Footprint on the site (m^2)[Note 1]	Height (m)
Gas Turbine Hall (2 no) – open cycle	2,642	14.0
Heat Recovery Steam Generator Hall (2 no)	2,632	28.0
Steam Turbine Hall (2 no.)	1,410	14.0
Air Cooled Condenser (2 no.)	3,104	24.5
Ancillary area of power generation building (1 no.) -ctrl room, lab, etc	1,745	12.0
Open Cycle Stacks (4 No.)	NA	38.0
Heat Recovery Steam Generators (HRSG) stacks (4 No.)	NA	49.0
Administration Building (1 no.)	400	10.6
Warehouse/Workshop/Stores (1 no.)	840	12.9
Switchyard (1 no.)	8,583	NA
Above ground Installation (1 no.)	1,300	NA
Internal Roads and Carparking	6,675	
Bund for Diesel Storage (1 no.)	2,861	2.4
Diesel Tank (2 no.)	1,102	6.0
Fuel Oil supply pumps canopy (1 no.)	167	7.0
Raw Water Tank (1 no.)	314	11.0
Water Treatment Plant (1 no.)	800	10.0
Demineralised Water Tanks (2 no.)	113	4.3
Process Wastewater Treatment compound (1 no.) - underground	530	NA
Storm water Attenuation tank (1 no.) - underground	1,000	NA

Note
1 Where there are more than two component items, footprint detailed is for combined number specified.

The structural design of the main buildings will be conventional structural steel supported on reinforced concrete foundations. Steel columns will be fire protected as necessary to comply with the building regulations. Floors will be concrete. The administration building and some of the smaller buildings will be concrete block construction on concrete reinforced concrete foundations and rendered with nap plaster finish. Profiled metal cladding will be used for external walls on power generation buildings. The finished colour of the plant structures will be designed to favour the reduction of potential visual impacts. Non reflective finishes will be used in order to reduce or avoid impacts relating to sunlight reflection or glare. Colours of buildings will be confirmed with the planning authority prior to construction.

Roofs will be constructed of profiled metal decking on purlins spanning between rafters and will be flat or shallow pitched. Buildings will be single or two storeys with access gantries and walkways for access to plant and equipment. These will be constructed of stainless / galvanised steel open grating type flooring supported on steel beams and columns. The stack will be fabricated from painted insulated carbon steel. External doors and escape doors will generally comprise of metal flush doors and mild steel frames.

2.1.3 Description of Proposed Plant Design

The proposed plant will have capability of producing up to a maximum of 350MW of power. The plant itself (house load) will consume approximately 15MW of the total output. The power generation plant will essentially be constructed as one power block and will be capable of running in either open cycle or combined cycle modes. The proposed power block will comprises four small scale (<50MW) gas turbines, four heat recovery steam generators (HRSGs) and two steam turbine generators producing a further 75MW. Diverter dampers are installed between the gas turbines and the heat recovery boilers and will enhanced the generating flexibility of the plant. For example, the four gas turbines in open cycle mode will be capable of producing electricity in the range of 47MW to 188MW, in the event of shutdown of the steam turbines or to respond to demand by the TSO. In the event of shutdown of one of the steam turbines, the plant would still be capable of producing approximately 224MW of power (i.e. operation of two gas turbines in open cycle mode and two gas turbines in combined cycle). The plant will be capable of starting up and reaching full load in open cycle (188MW) mode in 25 minutes. In combined cycle mode, typical start-up times are as follows:

- From cold start (i.e. plant shutdown for more than 64 hours), the plant will take approximately 300 minutes to reach full load
- From warm start (i.e. plant shutdown for less than 64 hours), the plant will take approximately 220 minutes to reach full load
- From hot start (i.e. plant shutdown for less than 8 hours), the plant will take approximately 90 minutes to reach full load

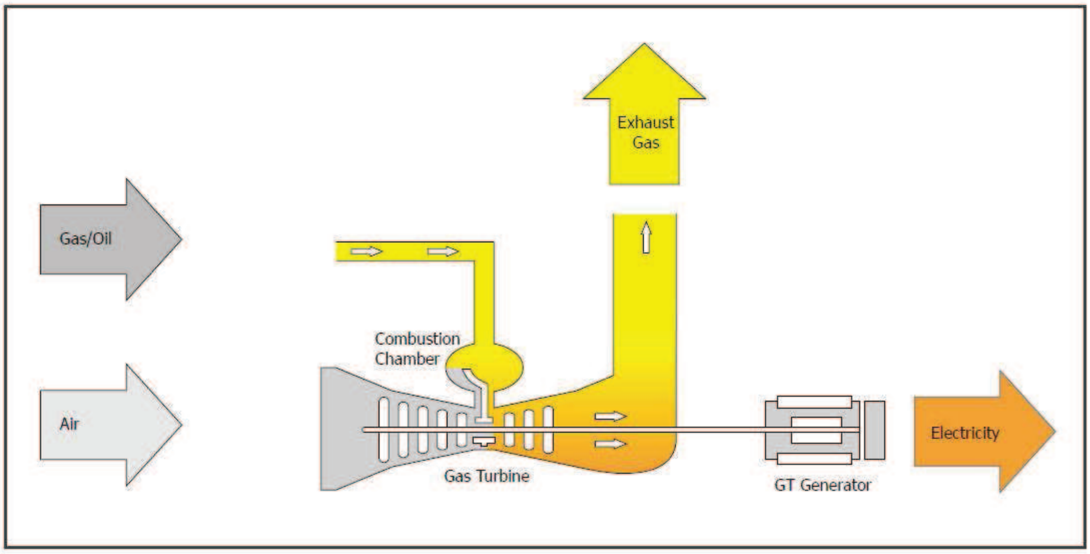
Each HRSG will also be fitted with supplementary gas burners thereby producing around 32.5MWs of power at the alternator terminals. The supplementary firing ramp-up rate is around 3MW per minute; which means that the load can increase from combined cycle operation to maximum load within 10-minutes.

The power plant will be designed and configured to allow for high efficiency base load, while also providing for peak power capacity through out a wide load range. The design concept with a total of four gas turbines and two steam turbines allows for operation at a high efficiency and low emissions values throughout a wide plant power output by the possibility to reduce the power on the GTs one by one.

2.1.3.1 Open Cycle Process

In open cycle mode, conditioned gas is burned in a gas turbine which is linked to a generator which produces electricity. The residual heat is exhausted to atmosphere at a temperature of approximately 544^{o}C, i.e. unlike in combined cycle mode where exhausted heat is recycled to generate steam and ultimately additional electricity. Open cycle gas turbines (OCGTs) are less efficient than combined cycle gas turbines (CCGTs) with typical efficiencies of approximately 37.5%. However the advantage operation in open cycle mode is that the plant can supply electricity in a much shorter timeframe than in combined cycle. In open cycle mode, the plant will be capable of producing 188MW of power. Figure 2.8 below illustrates the open cycle process.

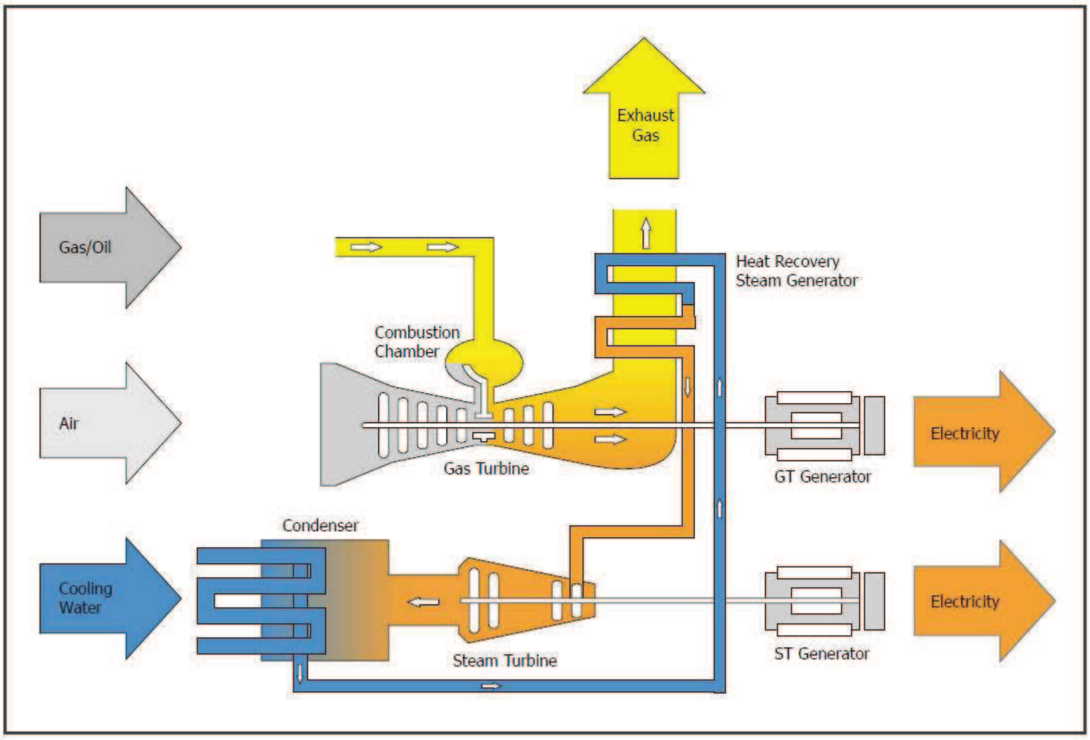
Figure 2.8 Open Cycle Process



2.1.3.2 Combined Cycle Process

In combined cycle mode, a conditioned gas is combusted in the gas turbine generator producing electricity and the waste heat from the gas turbine is used to make steam to generate additional electricity via a Heat Recovery Steam Generator (HRSG) and a steam turbine. Figure 2.9 below, illustrates the combined cycle process.

Figure 2.9 Combined Cycle Process



2.1.4 Description of Proposed Plant Components

2.1.4.1 Gas Turbine Generator

Air enters the gas turbine where it is compressed, mixed with natural gas and ignited, which causes it to expand. The pressure created from the expansion spins the turbine blades, which are attached to a shaft and a generator, creating electricity. In simplistic terms a generator can be described as a large spinning magnet inside a coil of wire and as the magnet spins, electricity is created in the wire loops. The hot exhaust gas exits the turbine and then passes through the Heat Recovery Steam Generator (HRSG).

2.1.4.2 Heat Recovery Steam Generator (HRSG) with Exhaust Stack

Within a HRSG, there are layers of tall tube bundles, filled with high purity water. The hot exhaust gas coming from the turbines passes through these tube bundles, which act like a radiator, boiling the water inside the tubes, and turning that water into steam. The gas then exits the power plant through exhaust stack(s) at a much cooler temperatures, after having given up most of its heat to the steam process. Stack height assessment was undertaken as part of air dispersion modelling with cognisance of local requirements. This is discussed in Chapter 11, Air Quality.

2.1.4.3 Steam Turbine Generator

The steam generated is sent to the steam turbine. Stem enters the turbine at very high temperatures and under high pressure. The pressure of the steam is used to spin turbine blades that are attached to a rotor and a generator, producing additional electricity. After the steam is spent in the turbine process, the residual steam leaves the turbine at low pressure and low heat, and passes into a condenser, to be turned back into water. By using a combined cycle, the plant is capable of producing more electricity. A CCGT generator can reach efficiency levels of up to 58%. The efficiency of the proposed CCGT unit means that this type of generator emits the lowest levels of greenhouse gases per unit of electricity generated when compared to any conventional generation type.

A flexible CCGT unit, such as that being proposed at Lumcloon, is also capable of varying the power generation across a wide range of power output and can turn on and off on a daily basis, which allows this unit to maximize the electricity generating potential from variable renewable energy sources such as wind.

2.1.4.4 Air Cooled Condenser

An air-cooled condenser (ACC) is used to condense the steam exhausted by the steam turbine. This solution provides a completely plume free arrangement. The hot process fluid to be cooled flows through a tube while the cooling air flows across the outer surface to remove heat. The cooling air is propelled by fans in either a forced draft or induced draft configuration. Specially designed fins are attached to the outer surface of the tube to create a large surface area for more effective cooling. The heat transfer rate is a function of the fins' surface area and the velocity of the air flow. The mechanical design of the exchanger must accommodate the process conditions including pressure and temperature and, possibly, corrosivity, fouling and condensation. While the ACC is larger in appearance than alternative cooling options, it significantly reduces the demand for water (closed loop) and does not give rise to a visible water vapour plume.

Condensate from the ACC is pumped through a series of feed-heaters to a de-aerator vessel, from where it is pressurised using high-pressure pumps, and returned to the HRSG where the overall cycle restarts.

2.1.4.5 Other Plant Components

Typical other plant components include the following:

- Above Ground Gas Installation (AGI) and associated piping

- Gas receiving plant
- Switchyard and substation
- Transformers
- Administration /control building
- Raw and fire water storage tank
- Demineralisation water treatment plant and storage
- Process wastewater treatment system
- Surface water collection system
- Foul wastewater treatment system
- Distillate storage
- Chemical storage
- Building to house power plant
- Warehouse /stores building
- Internal roads and parking

Above Ground Installation

Natural gas will be supplied from Bord Gáis Network's (BGN) at a minimum guaranteed pressure of 19 bar gauge (bar(g)) and 15^{o}C. The design maximum pressure of the BGN gas pipeline is 70 bar(g). The pressure of the gas will be regulated to approximately 35 bar(g) in the AGI. From this compound, gas will be sent to gas receiving plant for conditioning.

Gas Receiving

The gas will pass through gas conditioning plant located close to the gas turbine hall. This compound will be secured by fencing and will comprise:

- Liquid and dust separator
- Dew point heater / boiler unit
- Gas compressor
- Filter separator

Transformers

Transformers will be located outdoors and will be the oil immersed design type. Transformers will be bunded and blast protected. It is proposed to install six step-up transformers, one for each turbine generator, as part of the proposed development.

Switchyard

The electricity generated from the power plant will be fed to generator transformers where the voltage will be stepped up to 220 kV. From each transformer, the power passes to the switchyard. The power from all of the generators comes together, where it is measured, metered and directed onto the national grid in accordance with the requirement of Eirgrid. The proximity of the site to the existing transmission masts (in the south western corner of the site) enhances the proposed site location for the purposes of power plant development.

Administration /Control Room

From the control room, the plant operators monitor and operate the facility, via the plant's 'Distributed Control System', with the click of a mouse, viewing graphic representations of all MEC systems on various screens. The system gives operators both audible and visual signals to keep them informed of plant conditions at all times and to determine when preventative maintenance is required.

Raw Water

Water for use in the process will be pumped for the existing on site well which served the former peat burning power plant. Raw water will be stored on site in a tank of approximately 3,500m^3 capacity. Water will be pumped from the raw water storage tank to the water demineralisation treatment plant for use in the power generation process. The raw water storage tank will also serve as a reservoir for fire fighting purposes.

Demineralised Water Treatment and Storage

An on site water treatment plant will be required to treat abstracted groundwater for use in the HRSG. Water will be demineralised to achieve a high purity. The primary reason for process water treatment is to maintain the integrity and performance of the power plant. Critical plant applications have water purity or conditioning requirements that must be adhered to for safe, reliable and efficient power generation. Experience has shown that integration of water technology treatments with power plant design can be very important in reducing operational problems and component failures.

The characteristics of potential surface and groundwater supplies vary widely depending on their geographical location and source. Impurities such as dissolved and suspended solids, , colloidal species and dissolved organic matter, determine the suitability of the water for use in the various processes of a power plant and the necessary treatment requirements to make it acceptable for use.

The water treatment process will consist of filtration, and either a resin based or a Reverse Osmosis and Electro De-ionisation (EDI) based treatment system. pH adjustment will be provided by acid (sulphuric) or alkali (sodium hydroxide) addition as required. Additional equipment may be applied to the system if the water quality warrants it. This equipment may include an optional decarbonator and a softener, if required.

Oxygen scavenging and thermal de-aeration will be combined to remove dissolved oxygen from the boiler water which again prohibits corrosion.

It is expected that demineralisation water consumption (losses and blow-down) will be in the range of 0.5 to 1.0% of the maximum steam flow from HRSGs to compensate for boiler blow down for a condensing plant without process extractions. A 0.5% flow would equate to a need for approximately 1m^3 of water per hour per HRSG, which equates to approximately 96m^3 per day. Deviations may appear during unusual conditions and as a result requirement may at times be in the range of 3% of the HRSG steaming rate. The figure will also be influenced by raw water quality and the selected method of water treatment.

The capacity of the demineralised water storage tank will be sized following consideration of the volume required for filling up of the steam/water system. At this stage it is estimate that the volume required to fill system from empty will be approximately 420m^3. Therefore it is proposed to install two 300m^3 water tanks to supply the HRSG system.

Distillate (diesel) Storage Tank – back up fuel

Diesel will be stored in a cylindrical steel tank within a 110% capacity bund to comply with bunding requirements. The bund will be constructed in accordance with CIRIA Report 163 "Construction of bunds for oil storage tanks" and BS8007:1987, Code of practice for design of concrete structures for retaining aqueous liquids). The diesel will be delivered via road tanker. Due to the quantity of stored diesel, estimated an approximately 5,200m^3 within two tanks of a combined storage capacity of 6,000m^3, the site will be classified as lower tier COMAH in accordance with the requirements of European Communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2006 (S.I. No. 74 of 2006). In accordance with legislative requirements, a major accident hazard (MAH) report was prepared for the proposed development. This report details risk and consequence assessments for the site in accordance with the Health and Safety Authority (HSA) guidance document entitled 'Setting the Specified Area – The Approach of the HSA' related to the application of the European communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulation 2006 (S.I. No. 74 of 2006).

2.1.4.6 Process Wastewater Treatment

Process wastewater consists of wastewater from the demineralisation plant and wastewater generated from boiler blow-down. Wastewater from the demineralisation plant comprises water containing the salts removed from the raw water or neutralised backwash of the resins from the demineralisation process. Boiler blow-down comprises water which has been circulating in the water/steam cycle. If allowed to accumulate, these contaminants can reduce boiler performance. Process wastewater will be continuously generated from the plant while in combined cycle operation mode. There is little wastewater generated while in open cycle mode. Typical normal wastewater volumes generated is approximately 96m^3 per day. A water and wastewater flow diagram is illustrated in Figure 2.10 below.

Steam generated in the HRSGs is used to drive the steam turbine generators. The steam is then condensed back to water via the air cooled condensers for reuse in the process. Therefore no cooling waters will be discharged. Process effluents from the plant will be routed via the on-site process wastewater treatment plant to effluent drainage system. The Process wastewater treatment plant will comprises a below ground concrete structure containing a number of chambers which will allow agitating, pH and temperature correction. Continuous monitoring will be undertaken in the final chamber for dissolved oxygen, pH, conductivity and temperature. Treated process wastewater will then be discharged to the wastewater collection system to the Silver River via the discharge point located in the north eastern corner of the site. An automatic sampler will also be positioned at the discharge point, which will sample water discharges on a continuous basis over a given period as prescribed by the Integrated Pollution Prevention and Control (IPPC) licence. An on site laboratory will also be provided to facilitate monitoring of specific parameters on site.

The following describes the plant's process effluent streams and treatments:

<u>Gas turbine compressor cleaning solution</u>

In order to avoid/reduce the gas turbines performance degradation, offline compressor washing will be performed at certain intervals. The used gas turbine cleaning solution will be temporarily stored in a drain tank and then delivered to the treatment plant via a water/ oil separator. Normal volumes of compressor wash is estimated at 0.6m^3 per event per gas turbine compressor. Compared to wastewater produced from off-line compressor blowdown, the volume produced is relatively minor.

<u>Water treatment effluent (demineralisation wastewater)</u>

The ion exchange equipment produces both acidic and alkaline effluent streams during the equipment's periodic regeneration cycle. These streams are adjusted to neutral pH and then delivered to the process wastewater treatment plant. The reverse osmosis equipment will continuously produce a concentrated reject water stream that contains dissolved solids removed from the product water stream. Again this wastewater will be discharged to the process wastewater treatment plant prior to being discharged from site. The volume produced is dependent on the quality of raw water, but again volume is low relative to blowdown process wastewater.

Blow-down

During blow-down operation, water is blown down into the blow-down tank. Normal blowdown volume is estimated at 1m^3 per hour per gas turbine. This is a water/steam flashing mixture when it enters the blow-down tank. Here, the effluent is cooled prior to being discharged to the wastewater treatment plant where it is treated prior to being discharged to the Silver River via the drain at the along the northern boundary of the site.

Gas Turbine and Closed Cooling Water System Anti-Icing Effluent

The gas turbine anti-icing/heating system and the closed cooling water system are filled with the freeze protection agent - a synthetic and homogenized glycol free solution based on salts. Unlike other freeze protection agents (like glycols) the solution is non-toxic and biodegradable and can thus be discharged to the process wastewater treatment plant.

Effluents Resulting from Plant Commissioning

During plant commissioning effluent will be produced related to plant cleaning procedures (e.g. condensate resulting from pre-operational steam blowing of steam piping). If not classified as hazardous liquid waste, these effluents will be diverted to the process wastewater treatment plant.

Chemical Feed Area Drainage (e.g. water treatment plant, cooling tower dosing, etc.)

Chemical feed area drainage consists of spillage, tank overflows, maintenance operations and area wash-downs. This wastewater will be contained and collected in a bund area and the drainage manually emptied by means of a mobile drainage pump.

Small areas that have the potential for causing oil contamination of surface drain water will be separated from the overall surface water drainage. This comparably low volume of surface water with potential for oil contamination will be collected separately and routed through a water/oil separator prior to being discharged to the process wastewater treatment plant.

General power plant drainage

General plant drainage consists of effluents produced by sample drains, equipment drains, equipment leakage, area wash-downs, etc. This effluent will be collected in a system of floor drains and sumps and routed to the condensate pit which represents the lowest drainage point in the plant. From there it is delivered to the process wastewater treatment plant via a water/oil separator.

Fire Fighting Water

In case of fire the applied fire fighting water will be drained into those parts of the plants effluent system which drain the affected areas and the resulting streams will finally be delivered to the client's storm water drain or effluent drain.

Surface Water Treatment

Surface water collected from roofed and paved areas will be delivered to the site storm water drainage system. In order to assure that uncontaminated surface drains are not mixing with possibly oil contaminated surface drains such 'oil risk areas' will discharge into a separate collection system. Surface water will be routed via an oil/water interceptor and finally surface water will discharge through an attenuation tank (controlled discharge) to the Silver River via the stream in the north eastern corner of the site. Large external areas/compunds at the site will be surfaced with stone to allow rainwater to percolate to the underlying soils.

During times when chemicals are handled, isolation valves will be closed. This is to assure that accidently spilled chemicals do not enter the storm water drain. The isolation valves will only be opened again once it has been assured that contamination of the downstream system can be excluded.

Foul Wastewater

Foul wastewater, which comprises wastewater other than process waste water and surface water, will be treated in a proprietary treatment system prior to discharge. Treated wastewater (from canteen and toilets) will be discharged to the Silver River via the stream which runs along the northern boundary. However the option of percolating to ground will also be considered at detailed design stage following completion of a site suitability assessment, including percolation testing, which will be undertaken to determine the suitability of the site. Offaly County Council and the EPA will be consulted through the assessment process. Figure 2.10 below shows water supply, treatment and usage at the proposed facility.

Chemical storage

The following is a typical estimate and list of chemicals which will be stored on site. Chemicals will be stored in designated areas and provided with bunding where appropriate.

Water treatment chemicals

- 10-tonnes of 47% sodium hydroxide
- 10-tonnes of 95/97% sulphuric acid
- 10-tonnes of caustic brine (25% sodium chloride NaCl, 5% NaOH)

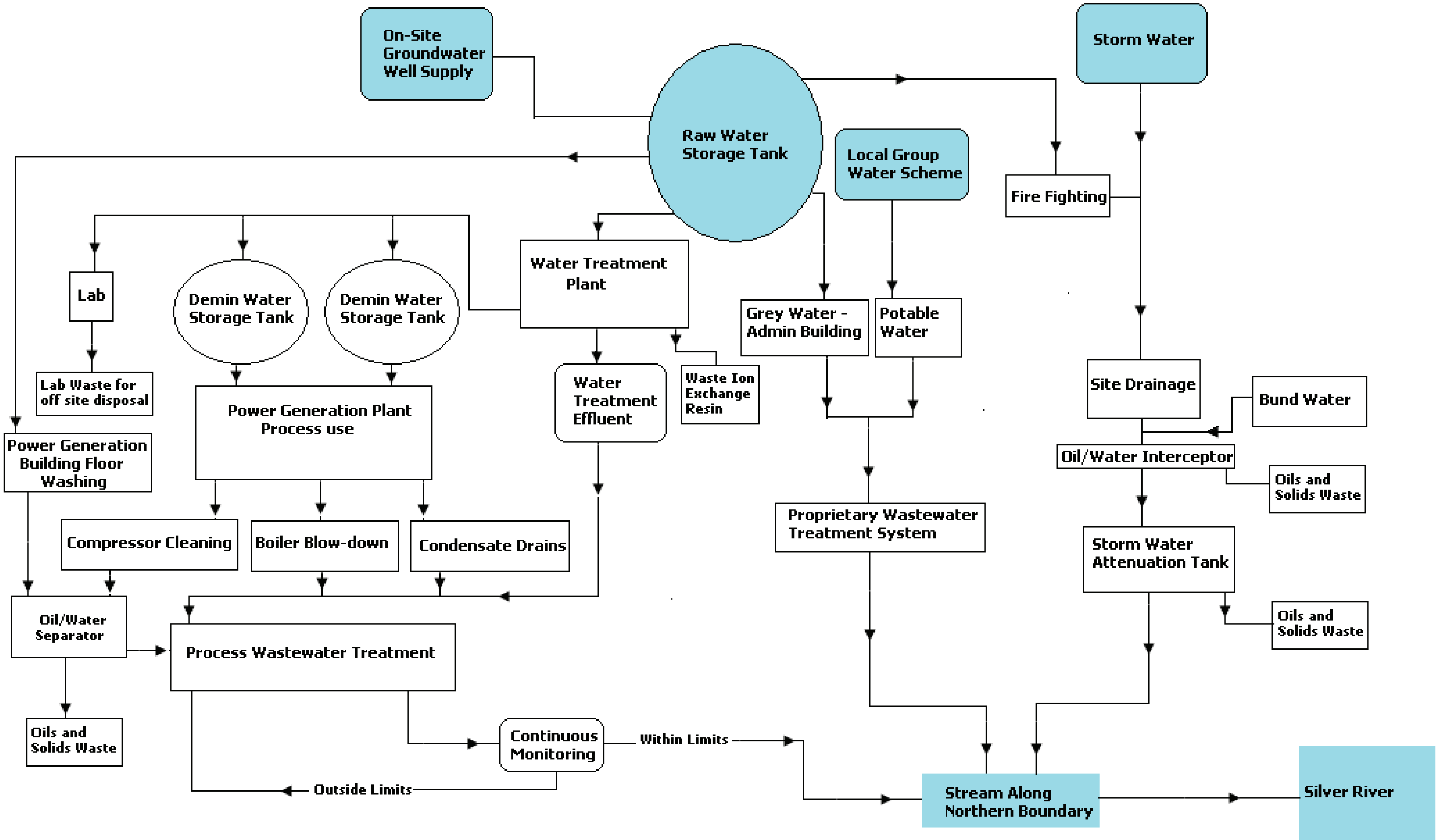
For boiler dosing

- 1.5 tonnes Ammonia
- 1.5 tonnes hydrazine
- 1.5tonnes caustic sodium hydroxide
- Also small quantities of hydrochloric acid and some other reference chemicals are required for calibrating of laboratory instruments.

Lubricants

- 1000 litres of turbine oil
- 500 litres of transformer oil
- 500 litres of assorted lubricating oils
- 100 kg of assorted greases

Figure 2.10 Water and Wastewater Flow Diagram



2.2 THE EXISTENCE OF THE PROJECT

2.2.1 Description of Construction

Description of construction is dealt with under Section 3 of the EIS.

2.2.2 Operation of the Project

The operators will recruit and train suitably qualified and technically competent staff who will be responsible for operation and maintenance of the plant. It is anticipated that the power plant will be staffed by approximately 45 employees in total. Employees will work on shift basis (three 8 hour shifts) and will cover a broad range of services including; safety, engineering, technical, security, chemical, maintenance and administrative support staff. Subcontracted maintenance staff will also be required at critical times such as an annual shutdown periods.

The plant will be operated under existing health, safety and environmental procedures, which include essential features such as staff training and awareness and an Emergency Incident Response Plan. The operator will develop an Environmental Management System which will be accredited to an international standard, e.g. ISO 14001.

Regulatory control of the facility is described previously in Section 1.2.

2.2.3 Description of Decommissioning (End of Plant Life)

The proposed Lumcloon gas fired power plant at Lumcloon has a projected life span of approximately 30 years, subject to recommended manufacturer maintenance programmes. At the end of the 30 year life cycle, there are primarily two options available for the proposed development. Theses are;

- Retrofitting the site for future power generation – upgrading plant components; and
- Decommissioning of the proposed facility in accordance with the requirements of the Environmental Liability Directive (2004/35/EC), to allow future development of the site. Decommissioning would require removal of chemicals, plant and machinery, buildings and structures, etc. from the site. The extent of decommissioning works will be determined by future use.

Environmental aspects related to decommissioning will be required as part of the application and enforcement of the IPPC Licence. The environmental liabilities risk assessment (ELRA) process will require the licensee to prepare and maintain a plan which will assess and manage environmental liabilities. This plan will be prepared in accordance with the 2006 EPA *'Guidance Document on Environmental Liabilities and Risk Assessment (ELRA), Residual Management Planning and Aftercare'*. This system of assessment and planning leads to:

- A reduction in the potential for environmental damage as the result of accidents
- Minimisation of residual / long term impacts from industrial facilities upon closure
- Forward financial planning for environmental liabilities
- Reduction in the financial provision required

Decommissioning of all aspects of the facility will be validated by the EPA prior to IPPC licence surrender.

2.2.4 Description of Other Developments

The construction of the proposed development will require construction of a gas pipeline from the existing gas network to the site at Lumcloon. This project is not part of this application and will be undertaken by Bord Gáis Networks (BGN). It is believed that the pipeline route from the gas network at Ories, near Athlone to the site in Lumcloon will be less than 20km. An Bord Gáis Networks would then apply to the CER for a licence to construct the proposed pipeline. This also requires preparation of a report to assess potential impacts to environmental aspects associated with its development.

The proposed development will require a connection to the National Grid, which is operated by Eirgrid, to allow for the supply of generated electricity to the market. However the development will not require construction of new overhead transmission lines due to the presence of four transmission lines on site, associated with the existence of the former peat fired plant at the site in Lumcloon.