

## INTRODUCTION

This is a Non Technical Summary of the Environmental Impact Statement (EIS), which has been prepared, on behalf of Lumcloon Energy Ltd. (Lumcloon Energy), to accompany an application to An Bord Pleanála for full planning permission for a 350MW gas fired power plant at Lumcloon, Cloghan, Co Offaly.

The proposed power plant will be located on 11 acres of development lands, which are under the applicant company's control. The site is situated in the town land of Lumcloon, approximately 5km south east of Ferbane, 22km south of Athlone and 20km west of Tullamore. A site location map is shown on Figure 1.1 attached and Planning Drawing Reference Number C007331-01. The site is a brownfield site and formed part of the former Ferbane peat fired power station site, which was operated by the ESB and fully decommissioned in 2004. The ESB subsequently obtained planning permission in 2004 for a 100MW gas fired power plant at the site, but did not proceed with the proposed development. 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 runs 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 (Millbrook Road) bordering the site to the west and which runs in a south western direction from the R357 to the R437. The existing site layout is shown on Figure

1.2 and Planning Drawing Reference Number C007331-02.

A preliminary meeting was held with Offaly County Council in February 2009 to notify the planning department of, and discuss the proposed development. Offaly County Council recommended that An Bord Pleanála be consulted, as it was believed that the proposed development may be considered strategic infrastructure development.

The strategic infrastructure provisions of the Planning and Development (Strategic Infrastructure) Act 2006 (the 2006 Act) came into effect on 31<sup>st</sup> January 2007. The Act, which amends the Planning and Development Act 2000 (the 2000 Act), provides generally for applications for permission/approval for specified private and public strategic infrastructure developments to be made directly to the Board.

Part 18 of the Planning and Development Regulations 2006 (S.I. No. 685 of 2006) (the 2006 Regulations) relating to strategic infrastructure development (SID) also came into effect on 31<sup>st</sup> January 2007. The 2006 Regulations amend the Planning and Development Regulations 2001.

The proposed development at Lumcloon is listed in the 7<sup>th</sup> Schedule to the 2000 Act under the following:

- *A thermal power station or other combustion installation with a total energy output of 300 megawatts or more*

In accordance with Sections 37(A) and 37(B) of the Planning Act 2000, the applicant was obliged to enter into pre-application consultations with the Board to obtain clarification on whether or not the Board regard the proposed development as strategic infrastructure.

Pre-application consultation was undertaken with An Bord Pleanála. The process resulted in the Board stating *'that the proposed development is strategic infrastructure within the meaning of Section 37A of the Planning and Development Act, 2000, as amended'*.

## PROPOSED DEVELOPMENT

### 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, and on Planning Drawing Reference Number C007331-05.

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

It is proposed to construct a two storey administration building in the north west area of the site close to the site entrance. Approximately 30 car parking spaces will be provided for employees and visitors for use during the operation of the plant. A 400m<sup>2</sup> warehouse containing a workshop and stores will be located approximately 8m 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<sup>2</sup>. Two air cooled condenser (ACC) units, each with nine fans, will be located on the eastern side of the power generation building. The parapet of both ACC units will be 24.5m above ground level.

The tallest structures on the site will be the four exhaust stacks from the HRSG units. This will be installed to 49m in height to facilitate dispersion of emissions to atmosphere.

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

## 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 be capable of running in either open cycle or combined cycle modes. The proposed power block will comprise four small scale (<50MW) gas turbines, four heat recovery steam generators (HRSGs) and two steam turbine generators producing 75MW. Diverter dampers will be installed between the gas turbines and the heat recovery boilers and this will enhance 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 system demand determined by the Transmission System Operator (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 gas turbines one by one.

A number of alternative site locations, layouts and design concepts were considered before the selection of the preferred option, as detailed in this EIS and planning application.

## CONSULTATION AND SCOPING

Prior to the commencement of the Environmental Impact Assessment (EIA) process, the scoping of the proposed

development highlighted the following environmental concerns:

- The impact of the development on local flora and fauna including terrestrial habitats and avian fauna
- The impact of the groundwater abstraction and wastewater discharges on the nearby Silver River
- The impact of the proposed development on the Landscape

The SID process includes a pre-application consultation stage. This stage of the planning process allows An Bord Pleanála to provide the applicant with its considerations which may have a bearing on the decision relating to the proper planning and sustainable development of the area. The Environmental Impact Assessment process provides for statutory pre-application consultation on the development with a number of bodies such as government departments and organisations, regional authorities and other relevant organisations. Therefore, consultation with statutory bodies was conducted as part of the EIA process, to identify all key aspects which needed to be addressed. These included the Department of the Environment Heritage and Local Government, various relevant departments of Offaly County Council, The Environmental Protection Agency, the Health and Safety Authority, the National Parks and Wildlife Service, the Shannon Regional Fisheries Board, the Office of Public Works, among others.

Comments from the relevant bodies have been considered and addressed within the various sections of the EIS.

This EIS describes the existing environment in which the development will be located. The potential impacts that the development will have on the environment have been identified and the proposed mitigation measures, which would prevent or reduce the identified potential impacts have also been specified.

## ALTERNATIVES

The EIS regulations require that alternative locations, designs and processes be considered.

### Alternative Locations

In the site selection process for a power plant, it is necessary to carefully consider not only the technical issues, but also its impact on natural environment, economy and near local communities. A site suitability assessment study was undertaken, which assessed the suitability of alternative sites; two at national level and four (including the preferred site) within the Midlands of Ireland. Following exclusion of the sites in Co Kildare and Co Louth, a site suitability matrix was prepared which scored the Midland sites relative to each other using the following assessment criteria:

- History of Power Generation
- Adequate supply of water
- Proximity to the electricity network (high voltage), including connection

- Proximity to the gas network (high pressure) <20km
- Low population density
- Land availability and ownership
- Proximity to neighbouring occupied properties
- Existing Ground Conditions
- Brownfield Site
- Traffic and Access
- Visual

The proposed site at Lumcloon was determined to be the most suitable for development of a new gas fired power station as the site fulfils many of the assessment criteria. Key determining factors included; the site's previous history of power generation and its brownfield status, its proximity to the gas network (<20km), the existence of the four transmission lines on the site formerly used for the ESB peat power plant, low population density in the vicinity of the site, its direct accessibility by regional road, the availability of a suitable water supply and the location of the nearby Silver river which has good assimilative capacity and for dealing with treated wastewater discharges.

Locating the development at Lumcloon will also address certain key issues and challenges as identified in County and Regional Development Plans prepared within and for the Midlands region.

## Alternative Designs

One of the primary considerations in determining the plant type was flexibility, i.e. the proposed plant would be designed with the capability of

fast start up and the ability to adjust load output quickly and predictably to changing market requirements. High operational flexibility and availability are seen as essential prerequisites to ensure economic success of a power generation station in a liberalised electricity market.

The principle feature of proposed plant design is that it is capable of accommodating a wind power loss in the range from 47 to 188MW in open cycle mode and could generate 3MW per minute to its maximum load in 10 minutes in supplementary firing mode. Supplementary-fired HRSGs involves further combustion of additional fuel in the gas turbine exhaust gas by utilising duct burners.

The use of supplementary firing will provide a form of spinning reserve which involves little capital cost and has an instant response to system demand, i.e. temporary increase for peak loads. Spinning reserve can be defined as the unused capacity which can be activated on decision of the transmission system operator and which is provided by devices which are synchronised to the network and able to affect the active power. These devices help maintain the security and the quality of the supply of electricity.

Following consideration of gas turbine configurations, it was decided to design a power generation station with four small scale (50MW) gas turbines, instead of for example one larger turbine. This automatically heightens the availability of output, since it reduces the likelihood of the whole plant being

rendered unavailable. In accordance with the requirements of the 2008 BAT Guidance Note for the Energy Sector (Large Combustion Plant Sector), the gas turbines will use dry low emissions technology. Dry abatement will eliminate the need for production and storage of large quantities of demineralised water for emissions control purposes. It will also significantly reduce the quantity of process wastewater (from the demineralisation process and wet scrubbing process) produced at the facility during its operation.

Following consideration of boiler types, it was proposed to install conventional drum design steam generators as this design is proven, efficient, flexible and reliable. Once through steam generator (OTSG) units were considered as an alternative and although the design has existed for many years, they are still perceived as being novel with a higher risk than the conventional drum design. Additionally it should be noted that even though OTSG design does not require bypass ducts, the absence of bypass ducts means that gas turbines must be shut down in order to carry out maintenance on the HRSG system. This therefore would result in reduction in the flexibility of the proposed plant. In terms of a suitable cooling system, it is proposed to install air cooled condenser (ACC) units. The advantage of ACC systems over wet cooling systems are that water usage requirements are minimal and there are no issues associated with blow-down disposal and plume formation. Wet cooling systems also present potential difficulties in terms of thermal discharges.

## EIS METHODOLOGY

The EIS is presented in the '*Direct Format Structure*' as set down in the '*Guidelines on Information to be Contained in an EIS*' produced by the Environmental Protection Agency (March 2002). In general, it follows the framework presented in the '*EPA Advice Notes on Current Practice in the Preparation of Environmental Impact Statements* (September 2003).

Under the EIA Regulations an EIS should contain the following:

### **Description of the proposed development (Section 2 & 3)**

- site, design and size of the proposed development
- nature and quantity of materials to be used
- physical characteristics of the development and land-use requirements during construction and operation.

### **Description of the existing environment (Sections 4-17)**

- human beings
- flora and fauna
- soil and water
- air and noise
- climatic factors and the landscape
- material assets and cultural heritage
- the inter-relationship between the above factors

### **Description of the likely significant impacts (Sections 3-17)**

- the existence of the proposed development
- residues from the proposed development
- emissions from the proposed development
- aspects of the environment to be affected by the proposed development
- the use of natural resources
- the emission of pollutants
- the creation of nuisances

### **Description of the mitigation measures (Sections 3-17)**

- Measures envisaged avoiding, reducing and if possible remedying those effects on each environmental aspect

The purpose of the EIS is to assess the suitability of the proposed site with regard to potential impacts on the environment and to propose measures to avoid, reduce or remedy undesirable potential impacts, as appropriate.

## **DESCRIPTION OF THE EXISTING ENVIRONMENT, LIKELY SIGNIFICANT IMPACTS AND MITIGATION MEASURES**

As stated above, this EIS has been prepared on behalf of Lumcloon Energy Ltd. (Lumcloon Energy) to accompany an application to An Bord Pleanála for full planning permission for a 350MW gas fired power plant at Lumcloon, Cloghan, Co Offaly.

It is estimated that the proposed development will employ approximately 400 people during its construction which will occur over a 32 month period. It is anticipated that the working hours during construction will be from Monday to Friday, 07:00 to 19:00 and Saturdays, 08:00 to 16:00.

The timing of the commencement of construction is subject to planning, design, tendering and ecological constraints. It would be expected, that any works associated with site clearance and removal of habitat, hedgerows, trees, etc would be seasonally limited to mitigate against any adverse ecological affects.

Prior to commencement of construction, geotechnical investigations such as trial pits and C.B.R. tests will be conducted to verify foundation designs and road construction.

The construction of the proposed development will be undertaken in the following phases:

### **Site Preparation and Clearance (Up to 2 months)**

This phase of construction will initially comprise clearance of part of the conifer woodland in north-west area of the site, fencing, excavation, re-grading and landscape berming and planting. The site clearance works will be undertaken in accordance with best practice. Removal of part of the conifer woodland patch in the north western area of the site will be undertaken outside the bird breeding season (1<sup>st</sup> March until the 31<sup>st</sup> July) to mitigate disturbance to birds. An environmental management plan

(EMP) will be prepared implementing mitigation measures to avoid and limit potential impact to the receiving environment. The EMP will address water run off and noise and dust generation and implement a suitable landscaping strategy to compensate for habitat loss and to benefit the wildlife of the local area.

As the site is flat there will be limited requirement for *cut and fill* activity. The proposed finished floor level (FFL) of buildings on site will be constructed 500mm above the estimated 100 year flood level of the Silver River, i.e. 46.85mOD (Malin).

Site preparation works will also involve site set-up by the building contractor, which will include provision of the following items:

- Site Office
- Site Facilities (canteen, toilets etc.)
- Office for Resident Engineer
- Secure compound for the storage of all on site machinery and materials
- Carparking
- Permanent/temporary fencing
- Site Security

Construction traffic will enter the site via the existing site access. A site compound will be installed near the site entrance to facilitate staff parking and site offices

### **Civil and Structural Works (16 months)**

This phase will comprise the construction of the buildings, bunds, roads completion, drainage and infrastructural works completion. It is anticipated that the power generation building

will be constructed on piled foundations. The foundations will be designed to withstand vibrations from turbine operations. The power generation building will be steel frame with a combination of masonry and metal cladding chosen to conform to safety requirements and minimise visual and noise impact. It is anticipated that these works will be undertaken over an approximate 16 month period. Large items of plant /equipment will be installed during this phase.

### **Mechanical & Electrical Installation (10 months)**

Mechanical installation will include gas and steam turbines, heat recovery steam generators, air cooled condensers and associated pipework. These components will be delivered to the site by the preferred supplier and will be installed in accordance with manufacturer requirements. All pipeworks and ducting will be assembled on site. The electrical installation will include transformers, wiring and cabling from the generators to the switchyard.

### **Commissioning and Testing (4 months)**

This phase will comprise the installation and testing of mechanical and electrical equipment. It is anticipated that the duration for the installation and testing works will take approximately four months. During this phase final completion and finishing works will be carried out in anticipation of handover of the project to the client.

Prior to commencement of construction a construction management plan will be

prepared. The EIS provides a framework under which construction activities, which have potential for environmental impact (e.g. generation of dust, ecological impacts, surface water discharge, etc), will be managed. The developer will audit the environmental performance of the main contractor on a regular basis and will make recommendations or log incidence as necessary. It is proposed that a programme be established for regular monitoring of construction noise, dust, air emissions and water quality.

In so far as possible, construction materials will be sourced from local suppliers. All imported material that will be used on site will be from approved sources.

Equipment which will be used during the construction of the facility will be typical of a project of this scale. In general this will include excavators, dumper trucks, mobile cranes, piling hammer, compactors, skid steer loader, bowsers, delivery and haulage HGVs and hoists and generators.

Construction activities will have potential impacts on the environment including air, dust, flora and fauna, noise, vibration, traffic, water and waste. However, with the implementation of proper construction practices and mitigation measures including an environmental management plan there will be no negative residual impacts associated with the construction of the facility.

## HUMAN BEINGS

The townland of Lumcloon is in the electoral area of Ferbane which is in the electoral division (ED) of Gallen. Central Statistics Office (CSO) data was used to evaluate the current population ED of Gallen (the study area).

During the period 2002-2006, the population of the study area increased by 5%, which is low when compared to the 8% national growth experienced in the area and 11% growth in Co. Offaly. During the period 2002 - 2006 the number of private permanent households in County Offaly increased by 18%. The number of persons in private households also increased in County Offaly rising by 11.6%. In comparison although the number of households in the study area increased by 1.8% the number of persons in private households decreased by 5%.

The assessment undertaken determined that the unemployment rate within County Offaly in 2006 was 8.5%, which is a slight decrease upon the 2002 statistic of 8.7%. Unemployment within the study area in 2006 was 12.2% which is an increase upon the 2002 statistic of 9.1%. This percentage is considered high in comparison to the national average in 2006 of 8.5%.

The proposed development at Lumcloon will make a major contribution to the local community and region through foreign direct investment, community gain, new employment and annual rates to the local authority. During

the construction phase, the proposed development will provide the following benefits to the local economy:

- Approximately 400 new jobs will be created during construction of the development
- Building materials will be sourced locally where possible
- Demand for house lettings and B&B's will increase
- Shops, pubs and restaurants will benefit creating a number of indirect jobs

When the plant is in operation:

- 45-50 high-end jobs will be created
- Derelict site will be redeveloped into a State of Art Power Plant
- Local subcontractors will be required creating a number of indirect jobs

It is anticipated that during the construction phase the proposed development will increase employment within the study area and introduce related expenditure into the economy.

During the construction stage of this project there is a potential impact on the health and safety of human beings due to the increased volume of traffic accessing the site and the typical health and safety issues associated with any construction site such as slips trips and falls, etc. There is a low risk of nuisance levels of dust and noise being generated on site and impacting in a minor way on the health and safety of human beings. There is a low risk that persons visiting the site or accessing the site illegally

during the construction stage may potentially be subjected to a range of impacts on their health and safety associated with construction sites.

The operation of industrial facilities can give rise to an impact on the health and safety of human beings if such undertakings are not managed in an appropriate manner. The health and safety of persons working at the facility and those off site may be affected by a range of hazards associated with industrial facilities of this type.

The construction stage of the project will be managed in accordance with the *Safety, Health and Welfare At Work (Construction) Regulations 2006*, the *Safety, Health and Welfare at Work Act, 2005* and any associated Codes Of Practice and international best practices for projects of this type.

*A Project Safety Plan* will be developed to ensure that the safety of human beings is not impacted on in a negative way by the construction works.

Under the European Communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2006, the facility is classified as a lower tier Seveso site due to the planned storage of diesel (back up fuel) at the site. The Health and Safety Authority (HSA) is designated as the Central Competent Authority under the Seveso Regulations. A Major Accident Hazards (MAH) Report has been prepared and provided to the HSA so that they

can provide advice to the Planning Authority on the planning application.

The report identifies all potential major accident hazards associated with the facility and includes an assessment of the extent and severity of the consequences of such accidents. The MAH report concluded that the operation of the facility would not pose undue risks either to the surrounding population or to workers in the facility.

Strict adherence to the mitigation measures outlined in the EIS will ensure that there will be no negative environmental impacts or effects on Human Beings during the construction and operation of the proposed development.

## PLANNING AND POLICY

As part of the assessment process, relevant planning policy at national, regional and local level was reviewed. The development is reviewed in the context of the following

- Planning History of the Site
- National Development Plan, 2007-2013
- National Spatial Strategy, 2002-2013
- Delivering a Sustainable Energy Future for Ireland, 2007
- Midlands Regional Planning Guidelines, 2004-2010
- Offaly County Development Plan, 2009-2015

There have been a number of various planning applications at the proposed site at Lumcloon. The major of these relate to the existence of the

former peat fired power station located on part of the proposed site. In 2008, conditional planning permission was granted by Offaly County Council to Lumcloon Partnership (Planning Ref. 071732) for the construction of an industrial development on 7.7 hectares to the south of the Lumcloon Energy site. Construction of this development had not commenced at the time of lodging this application.

The proposed development by Lumcloon Energy continues the tradition of power generation at the site and it should be noted that the proposed plant has a significantly smaller footprint, is a more efficient power plant and will have a significantly lower greenhouse gas emissions per unit of energy produced when compared with the former Ferbane peat fired power station.

Planning policy and spending on physical, social and economic infrastructure in Ireland is guided at national level by the National Development Plan (NDP), which sets out the general nature and plan for capital investment in all areas of the country. Both the NDP and the National Spatial Strategy (NSS) are aligned to promote, prioritise and encourage more balanced regional development throughout the country. The NSS outlines that there is investment and improvement opportunity for power generation plant in the midlands near existing transmission infrastructure. The Strategy also states that *'the critical mass of the Midlands and its pull factors will need reinforcement to support indigenous growth and attract investment'*.

As outlined by Eirgrid in their Grid Development Strategy, *Grid 25*, government policy and high probability areas for locating future conventional generation include brownfield sites and sites which are located close to the gas network.

In 2007, the government published an Energy Policy White Paper entitled *Delivering a Sustainable Energy Future for Ireland*, as a comprehensive action-based energy policy framework covering the period to 2020. The Government's primary policy objective is *'to ensure that energy is consistently available at competitive prices with minimal risk of supply disruption*.

The government has committed to a renewable electricity target of 40% wind generation plant penetration by 2020. However, increasing wind generation penetration does not correspondingly result in an increase in output capacity due to variability associated with wind power. Therefore, it is essential in a regime of greater variability, that new flexible, reliable and reactive (can start up and stop rapidly) conventional generation plants are installed to maintain a secure and competitive energy supply. The proposed Lumcloon power station is designed to meet the generation needs as required by the transmission operator and ensure that Ireland can meet its renewable targets and the government's primary energy policy objective, as outlined in the 2007 Energy Policy White Paper.

In their Issues Paper for the Midland Region RPGs, 2010-2022, the Midlands Regional Authority (MRA) states that *'the successful development of the Midland Region requires the*

*availability of adequate sources of energy at affordable cost*'. The MRA also say that *'electricity is the main energy demand in the Midland Region. An efficient, reliable and cost effective electricity supply is a key resource for regional development*'. These statements are supported by the fact that Eirgrid, in their strategy document (*Grid 25*), predicts that the demand for electricity in the Midlands region will grow by over 40% by 2025 and the region is expected to have up to 160MW of wind energy capacity.

The Offaly County Development Plan, 2009-2015 acknowledges that County Offaly has a long tradition of power generation. In consideration of this, the Plan states that it is Council policy *'to facilitate the continuance of power generation stations within the county*'.

It is an objective of the Council *'to support and facilitate the generation of electrical power within the county and the provision of high-voltage electricity infrastructure to cater for natural growth, new and existing large customers*'. Furthermore, the County Development Plan states that *'it is an objective of Offaly Council to ensure, insofar as is possible, that the necessary infrastructure is in place to support the existing and future economy in Offaly, to support economic development and to attract investment*'.

The Plan states that *'it is Council policy to actively encourage the redevelopment of brownfield sites for enterprise and employment creation throughout the county, in particular,*

*disused sites which were formerly ESB plants and Bord na Mona works'.*

Chapter 20 of the County Development Plan discusses Council policy in relation to regeneration and renewal including reuse of derelict sites. The Plan expresses that it is Council policy to seek to encourage the redevelopment of sites (brownfield) as an alternative to building on new undeveloped sites.

As described above, the proposed development at Lumcloon conforms to relevant National, Regional and Local planning policies.

## LANDSCAPE

The existing application site comprises a brownfield site that presents a damaged landscape with a core that possesses no unique landscape features. It is fenced off and inaccessible with well wooded or vegetated boundaries that screen the majority of the site. The key landscape features of the application site are the woodland block to the north-west and some of the vegetation aligning the boundary with the R357 road. It carries no landscape designations and has a *low value and quality*.

Beyond the site periphery, is a remote and sparsely populated landscape that has been subject to a history of large scale industrial peat extraction. Subsequent conifer plantations across the peatlands have somewhat angular forms and can be considered incongruous with what would be perceived to be the natural landscape character of this area. The essence of the Bog of

Allen landscape itself is one of notable flatness and it has a rarity in terms of character, but many areas have been affected or damaged to such a degree that restoration is required and suggests an overall rating of *medium value and quality* landscape. The Offaly County Development Plan classifies landscape sensitivity across the Bog of Allen area and the application site is located in an area classified as *'low sensitivity'*.

There are areas that have remained untouched or have been restored (such as the nearby Lough Boora Parklands) and this has redressed some of the historical lands-use disturbance and these areas have a *high value and quality*.

The proposed power generation building will comprise a main core building with roof apex of 14m and two blocks of taller buildings with 28m high apex. Four 38m and four 49m chimney stacks are included in the proposal. Ancillary development includes; air cooled condensers, administration building, water and fuel tanks, switchyard, warehouse, internal roads and formalising accesses onto the R357 road.

There will be temporary to short-term adverse effects during the construction period. Taller elements involving cranes are likely to have localised adverse visual impacts during construction of the facility. The most significant adverse effect will derive from the removal of part of the existing conifer and mixed woodland to north-west corner of the site to facilitate the above-ground installation (AGI) area. The boundary hedgerow will be retained but views

will be afforded into the application site that is currently screened by this woodland block.

The new power plant will be very evident and its introduction will constitute a moderate adverse effect on the landscape character of this part of Lumcloon over the situation that pertains at present. The building is such a scale that its upper parts and chimney stacks will be visible over the boundary hedgerows and across the townland of Lumcloon. The effects of the proposal on the character of the Bog of Allen (including the Lough Boora Parklands) will be largely negligible. The main body of the power plant will be obscured from these areas but the chimney stacks will protrude into the distant skyline. Where open/glimpse views are afforded, the introduction of these elements will suggest a change in associated land use but will not detract from the quality of this existing view or landscape character. The main visual receptors will be those who are travelling on the R357 Road and who will be passing the application site and have oblique views.

While the proposal is a significant introduction, this is an area that has had a history of major landscape and land-use change and it is considered well capable of absorbing this proposal without significant detriment to its wider character and visual amenity.

## GEOLOGY & SOILS

The assessment comprises a description of the existing soils and geology environment and a statement of the likely significant soils and

geology impacts associated with both the construction and operational phases of the proposed development. Measures to mitigate the likely significant impacts of the proposed development are proposed, and residual impacts described.

The proposed development site is underlain by Waulsortian Limestones (WA). There are no recorded karst features at the site of the proposed development and the immediate surroundings.

The subsoils in the area are dominated by cutover peat bogs with areas of till derived chiefly from limestone and areas of alluvium associated with the Silver River, which lies to the east of the site. Site investigations indicate that subsoils at the site comprise moderately permeable glacial till deposits overlying moderately to highly permeable gravels with an average thickness of 5.3m. A thin layer of black sandy clay perhaps representing peat ash was encountered in boreholes drilled in the centre and eastern areas of the proposed development site.

Environmental exit audits were undertaken by ESB and URS (on behalf of ESB) between 2003 and 2008 following closure of the former ESB owned Ferbane peat fired power station. The contamination of soils at the site comprises low-level metal and phenol contamination. This was determined to have a low environmental and human health impact. There are limited areas of low level and elevated levels of hydrocarbon contamination in the south west of the proposed development site (former ESB

electrical compound). This was determined to have a low environmental impact. The proposed development site was also determined to be 'asbestos safe'.

The proposed industrial development of the site will not be affected or restricted by the low-levels of residual soil contamination at the site. It is stated with the exit audit reports prepared on behalf of ESB that no remedial action will be required and the site is suitable for redevelopment for industrial purposes.

There are no geological heritage sites at the site of the proposed development.

There are no likely significant negative geological residual impacts from the proposed development.

There will be a temporary negligible adverse impact on soils and geology from the proposed development due to the low level of soil contamination present.

There will be temporary negligible potential adverse impact from accidental spillages or leaks from chemicals or fuels stored on the site during the construction or operational phases following implementation of recommended mitigation measures.

There will be a temporary negligible adverse impact relating to soil erosion or sediment loss during the construction phase following implementation of recommended mitigation measures.

There will be no impact relating to geotechnical issues from the proposed development.

There will be no impact on Lough Boora from the proposed development during either the construction or operational phases.

## GROUNDWATER

This assessment includes a description of the existing soils and geology environment and a statement of the likely significant hydrogeological impacts associated with both the construction and operational phases of the proposed development. Measures to mitigate the likely significant impacts of the proposed development are proposed, and residual impacts are described.

The bedrock beneath the site comprises Dinantian Pure Unbedded Limestones (DPUL) of the Waulsortian Limestone Formation (WA). The limestone in this area is classified by the GSI as Locally Important (LI) aquifer which is described as bedrock which is moderately productive in local zones only

A pumping test was undertaken on the proposed abstraction borehole at the site (PW1). Analysis of the pumping test data indicates the aquifer is very productive and more than capable of supplying the water supply requirements of the facility. There are no karst features at the site of the proposed development.

The GSI database indices groundwater vulnerability at the proposed development site

is High (H). The groundwater vulnerability at the proposed development site is revised to range from High (H) to Moderate (M), based on subsoil permeability and thickness recorded during site investigations.

The groundwater is considered to be flowing to the east/northeast towards the main groundwater discharge feature in the area, the Silver River.

A sample was taken from the proposed supply well at the site on 12<sup>th</sup> June 2009. All parameter results except for Total Ammonia and Manganese were below the relevant EPA IGVs and Drinking Water limits.

Potential impacts from the proposed development on the hydrogeological environment are the following: potential impact on third party wells in the area and flows in the Silver River from the proposed groundwater abstraction, impacts on groundwater quality from accidental spillages and leaks of chemicals/fuel and disturbance of contaminated ground during construction.

There will be no likely significant hydrogeological impacts as a result of the proposed development.

There will be a temporary slight adverse impact on groundwater quality as a result of accidental spills/leaks of fuel/chemicals to groundwater during construction.

There will be a temporary negligible impact on groundwater quality as a result of disturbing

localised areas of contaminated soils during construction.

There will be a negligible localised impact on flow in the Silver River as a result of the proposed groundwater abstraction.

There will be negligible impact on groundwater quality from potential accidental discharge of treated wastewater to ground.

## SURFACE WATER

The proposed power plant is located in the Shannon International River Basin District and the Brosna River Catchment, adjacent to the Silver River and immediately upstream of Lumcloon Bridge. The Silver River rises in the Slieve Bloom Mountains and flows in a northerly direction through Kilcormac towards Lumcloon and joins the River Brosna approximately 3km downstream from Lumcloon Bridge. These river catchments contain a wide variety of associated water features and also ecologically important areas which are reliant on good water quality.

The site itself is a brownfield site and formed part of the former Ferbane peat fired power station. The most noticeable hydrological feature within the site consists of a drainage ditch that runs along the northern site boundary and in parallel to the Regional Road R357. Changes in the hydrological regimes can occur due to alterations in the surface water drainage patterns. The conversion of relatively permeable green-field areas into impermeable surfaces, such as road and roof surfaces can

result in an increase in the runoff in terms of peak flow and flow volume.

The main potential impacts to surface water quality and character of the receiving waters are associated with increased sediment runoff and accidental spillage of polluting substances. These potential impacts are of concern for both the construction and operational phases of the proposed scheme and specific mitigation measures have been detailed to address these impacts, consisting of an enclosed drainage systems, management plans, appropriate construction methods, pollution control measures and monitoring plans.

## ECOLOGY

The proposed development is located within an unmanaged brown field site containing evidence of natural recolonisation. Nine habitats were identified at the site, the majority of which were of moderate value at a site level yet were of lower habitat quality than those in the surrounding landscape. The application site is not contained within any EU or Irish designated sites of ecological importance. Through the use of appropriate mitigation and standard good practices both during and post construction, it is considered unlikely that the proposed development will impact on designated sites.

No significant impacts are expected within the site during the construction stage of the proposed development or the operation of the facility once the mitigation measures are implemented. It is likely however that the

development will lead to some loss of roosting, commuting and foraging opportunities, for birds, badgers and bats; however this is considered to be minor negative once bird and bat boxes/bricks are incorporated into the development.

The operational phase of the development will result in regular treated discharges to the Silver River, however the impact once appropriate measures are put in place as part of the proposed development are expected to be minor to negligible. In conclusion, if suitable mitigation is implemented, the predicted impact of the proposed development on the application site will be minor negative.

## AIR QUALITY

The current air quality in the area of the proposed development was determined through the use of baseline monitoring using diffusion tubes and a desk study review of published data available from the EPA and nearby developments. The baseline air quality assessment determined that existing baseline levels of PM<sub>10</sub>, NO<sub>2</sub>, SO<sub>2</sub> and benzene are significantly below the ambient air quality standards in the region of the proposed development.

Appropriate dust minimisation techniques will be implemented during the construction phase of development including water spraying, wheel washing, etc., which will result in no significant impact on air quality during the construction phase of the development.

Air dispersion modelling was undertaken to assess the likely emissions arising from the proposed power plant, during the operation of the proposed facility. A stack height determination was undertaken to ensure that appropriate stack heights were determined for the relevant combined cycle and open cycle emission points. This measure will ensure that the impact on local air quality will not be significant. The potential air quality impacts during the operational phase were assessed, based on a 'worst-case' scenario approach by modelling emissions at the limits which will be imposed on the development. The assessments predicted that emissions will result in ambient air quality concentrations that are within the relevant air quality limit values regardless of firing on natural gas or distillate in combined or open cycle modes of operation.

The power plant will be designed to the highest modern standards and incorporate abatement techniques to ensure minimum emissions from the plant. The power plant will be regulated under the IPPC and Greenhouse Gas Emissions Permit regimes, ensuring emissions from the facility are minimised.

The impact on air quality as a result of traffic accessing the proposed development during the construction and operation of the proposed development is considered to be negligible.

## CLIMATE

An assessment was undertaken to estimate the greenhouse gas emissions arising from the

operation of the proposed development. These emission levels were then compared to relevant evaluation criteria, such as emission limitations under the Kyoto Protocol, which has set objectives to be achieved over the period 2008 – 2012. At a maximum output, the proposed power plant will emit an approximate annual CO<sub>2</sub> output of 472,100 tonnes/annum, which is approximately 0.68% of Ireland's total GHG emissions of 69.205 (2007 figures) million tonnes carbon dioxide equivalent (Mt CO<sub>2</sub>eq). Of this total, energy accounted for 21.5%. The relative amount of CO<sub>2</sub> emitted per unit of electricity generated from gas fired power plants is significantly lower than that arising from oil-fired or coal-fired power plants.

This plant will operate under the EU Emissions Trading Scheme, (EU ETS), and will need to secure a Greenhouse Gas Emissions Permit from the EPA.

## NOISE AND VIBRATION

A baseline noise survey was carried out at three nearest noise sensitive receiver locations in the vicinity of the proposed development site to establish the existing noise environment. The baseline noise survey determined that the background noise levels in proximity to the proposed development are considered to be typical of a rural location. The results of the baseline noise survey have been used to assess the likely future perceived noise impact at the three noise sensitive receiver locations due to the operational noise emissions during daytime and night-time from the proposed plant.

Construction activity will include the operation of large machinery such as earth movers, bulldozers, trucks, cranes, steel work assembly and fixing. In order to minimise the potential for a construction noise impact on the three nearby residential receivers, appropriate noise limits have been outlined and will be adhered to during the construction of the proposed development. Good construction practices will be used on site. It is not anticipated that vibration impacts will occur.

The potential noise impact during the operational phase was modelled and assessed using noise prediction software. Noise levels at the three nearest noise sensitive receptors were predicted based on source noise emission data noise for such a power plant. The predicted noise levels at the three nearby residential receivers from the proposed power plant are significantly less than the daytime and nighttime noise limits issued by the EPA. The predicted noise levels at the three nearby residential receivers are also below the World Health Organisation guideline daytime outdoor noise levels and nighttime noise levels for the prevention of sleep disturbance

The increase in noise levels as a result of traffic accessing the proposed development during the construction and operation of the proposed development are considered to be negligible.

A specific noise transmission loss performance for the cladding and roof elements of proposed buildings housing high noise generating power plant equipment has been recommended and used in the noise prediction modelling exercise. Due to the noise levels generated by the gas and

steam turbine/generator in particular, it is recommended that all major plant items are sufficiently isolation mounted to minimise noise transmission through to the building structure and the concrete floor.

## ROADS AND TRAFFIC

The Traffic Impact Assessment considered the additional traffic generated as a result of the proposed development.

The proposed junction for the development was tested for capacity with determined flows for the existing situation, the year that construction begins, the year of opening and for the design year. The existing adjacent junctions were also tested for capacity with and without development traffic for construction year traffic, opening year traffic and design year traffic. The impacts on the existing road network were defined by the changes in capacity ratio at the junctions.

The contents of the analysis were based on the recommendations of the NRA '*Traffic & Transport Assessment Guidelines*' as well as the '*Traffic Management Guidelines*' as published by the Stationery Office.

Volumes of generated traffic were based on proposed construction staff numbers of 400 and proposed operational and maintenance staff number of 15 per 8 eight hour work shift. A vehicle occupancy of two was assumed for the construction phase and a vehicle occupancy of one was assumed after opening

The Construction phase of the development will have the largest impact on the R357 in terms of traffic flows; however it will be of a short term nature. The operational phase impacts are much smaller. Both scenarios result in total traffic volumes much less than the capacity of the existing R357.

Analysis was carried out on the proposed development junction with the development in place. It was found to have adequate reserve capacity when tested for the critical cases of the morning and evening peaks during construction, in the opening year and in the Design Year.

This existing R357/R437 staggered junction when tested without the development was found to be operating efficiently. The junction has spare capacity for the natural growth of traffic as well as the development generated traffic for all scenarios.

The existing local road T-Junction with the R357 is shown to have more than adequate spare capacity in the design year with all developments in place.

## CULTURAL HERITAGE

The assessment comprises the results of a desk top study and field survey of the land on which the development is planned.

The results of the archaeological assessment indicate that, although there are no recorded archaeological monuments in the immediate area of the proposed development, the site is nonetheless regarded as being of high

archaeological potential. In order to mitigate for the potential occurrence of sub-surface archaeological remains in the area of the proposed development, it is recommended that further archaeological assessment should be undertaken by a suitably qualified archaeologist. A programme of archaeological test excavation in northeast end of the development site is proposed as this area appears to have been largely undisturbed by previous development and is therefore the area most likely to reveal archaeological remains.

The results of the architectural heritage assessment indicate that only two features of architectural heritage significance within the study area namely Lumcloon Bridge and the bridge which carried the bog railway over the Silver River. Both structures are listed in the Bridges of Offaly County: an Industrial Heritage Review (Ref. No. OFIAR-023-060 & Ref. No. OFIAR-023-020) and are rated as being of local heritage significance. Both are located outside the area that will be developed as part of the current proposal and will not be directly impacted. Therefore no further mitigation measures are required.

## MATERIAL ASSETS

The evaluation of the existing economic assets at the development included an assessment of ownership and access, local settlements, water supply and usage, non renewable resources, waste management and site utilities.

The assessment of air, water, settlements and transportation infrastructure is detailed previously. The impacts associated with renewable and non renewable resources indicated that where possible non renewable resources will be sourced from locally approved sources. It is proposed to source water for use in the process from the existing on site well which served the former peat burning power plant and cooling towers. Potable water will be obtained from the Leabeg – Leamore Group Water Scheme.

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 comprise a below-ground concrete structure containing a number of chambers, which will allow agitating and pH and temperature correction. Foul wastewater, comprising wastewater other than process waste water and surface water, will be treated in a proprietary treatment system prior to discharge.

The power station itself will consume approximately 15MW of power when operational. There will be no severance of land as a result of the proposed development or loss of rights of ways or amenities.

Overall it was concluded that there will be no significant negative impact on material assets.

## INTERACTIONS OF THE FOREGOING

While all environmental topics are inter-related to some extent, the significant interactions were taken into consideration by each specialist during preparation of the EIS. This required each specialist to review other relevant Chapters of the EIS prior to determining the potential interactions. Potential impacts identified can be eliminated by the implementation of mitigation measures as detailed in each Chapter of the EIS.

## CONCLUSION

The EIS concludes that there will be no significant effect on the environment arising out of the proposed development of the gas fired power station at Lumcloon, Co. Offaly.