Lough Ree Power IE Licence Review

Electricity Supply Board

Attachment 4-8-4 Site Condition Report

Document No.: QS-000214-01-R460-017

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1 Introduction

Lough Ree Power (LRP) Station including the Ash Disposal Facility (ADF) was developed in 2002 when planning permission was granted (Longford County Council Reg. Ref. 01/115; An Bord Pleanála Reg. Ref. PL14.125540), on lands adjacent to the former Lanesborough Generating Station. That application was accompanied by an Environmental Impact Statement (EIS) which assessed the development of a new generation station and an associated dedicated ADF in the townlands of Derraghan More and Derraghan Beg, where ash – a by-product of the combustion process, is disposed of. The planning permission which was granted in February 2002 ceases to have effect on 31st December 2020.

ESB applied for planning permission to increase the capacity of the ADF associated with the site, (Longford County Council, Planning No: 17/320) in December 2017. The application was accompanied by an Environmental Impact Assessment Report (EIAR) and a Screening for Appropriate Assessment (AA). Planning was approved by Longford County council on the 28 March 2018.

The Lough Ree Power Generating Station (including the ADF) operates in accordance with its Industrial Emissions (IE) Licence No. P0610-02 as amended.

This report is the Site Condition Report to support the LRP IE Licence Review application process and should be read in conjunction with the following attachments:

- Attachment-6-3-6-EIS-EIAR-Planning-Dec-2017 - Proposed Increase in capacity at Derraghan Ash Disposal Facility, Co Longford – Environmental Impact Assessment Report (EIAR) (ESB, 2017);
- Attachment-4-8-3-Complete Baseline Report;
- Attachment-7-1-3-1-Emissions Compliance Report_AER 2014-2016.

2 Soil and Groundwater

Details of the site conditions in relation to soil and groundwater for both the site of the LRP Generating Station and the ADF are contained within the Baseline Report that accompanies this licence review application, refer to Attachment-4-8-3-Complete Baseline Report.

In addition details in relation to soil and groundwater conditions at the station site and the ADF are contained within the Environmental Impact Assessment Report (EIAR) undertaken as part of the planning application for increasing the capacity of the ADF, see Attachment-6-3-6-EIS-EIAR-Planning-Dec-2017, Volume 2: Main Report, as follows:

- Chapter 8: Water - Groundwater; and
- Chapter 11: Land and Soils.
Under Condition 6.13.3 of the IE Licence the site is required to complete risk screening and a technical assessment of groundwater quality beneath the site. This assessment was carried out in 2015 and details are contained within the following attachments:

- Attachment-7-1-3-3-Receiving Environment Report – ESB Lough Ree Power Hydrogeological Assessment IEL P0610-02 (ESB, 2015); and
- Attachment-7-1-3-3-Receiving Environment Report ESB Lough Ree Power Further Environmental Assessment IEL P0610-02 (ESB, 2015).

For further details of conditions and compliance in relation to soil and groundwater see Attachment-4-8-3-Complete Baseline Report, a brief summary is provided below.

LRP Station has been in operation since the early 00s with the combustion by-products (bottom ash and fly ash) being landfilled at the ADF. The LRP Station site is located adjacent to the former Lanesborough Power Station and prior to that the area was agricultural land.

Chemical storage, which is primarily limited to hydrocarbons, acids and bases, is within bunded tanks and drum stores around the station area. Drainage from the station areas is through a series of drainage lines which pass through a settlement pond before discharging to the Lough Bannow Stream at a monitored surface water discharge point and onto the River Shannon.

Soil and groundwater sampling has been conducted at the station site and the ADF prior to the stations commissioning in 2004 and this was detailed in the Environmental Impact Statement (EIS) issued for planning in 2002. This sampling found that there was no soil or groundwater contamination from the previous station or associated ADF.

There are two groundwater monitoring points at the station site and four at the ADF. Samples are analysed for a suite parameters as required in Schedule C.4 of the IE licence.

Analytical results indicate that there is not a significant impact on groundwater in terms of pH, conductivity, ammonia, chloride and total hydrocarbons. However, in 2017 arsenic levels above Environmental Quality Standard (EQS) values were observed in samples taken from the ADF but sample results were below trigger levels set per EPA guidance, see Attachment-4-8-3-Complete Baseline Report.

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1 Attachment-7-1-3-3-Rec Env Report_ Hydrogeo Report & Attachment-7-1-3-3-Rec Env Report_Hydrogeo Report_2.pdf

2 As set out in S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 as amended.
3 Air

Both the LRP Power Station and the ADF site are located in Air Quality Zone D - Rural Ireland. The latest national EPA report on air quality (Air Quality in Ireland 2016, published in 2017) provides an assessment of air quality in Ireland and in particular, Nitrogen dioxide (NO2), sulphur dioxide, particulate matter (both PM\(_{10}\) and PM\(_{2.5}\)), volatile organic compounds (VOCs), polyaromatic hydrocarbons (PAHs), heavy metals, carbon monoxide and ozone.

Zone D remains in the most instances compliant with the requirements of the Clean Air for Europe Directive. In general no levels above the EU limit values were recorded at any of the air quality monitoring stations in Zone D with the exception of ozone. However, the more stringent air quality World Health Organisation (WHO) guidelines values were exceeded at all sites in Zone D for Ozone and one site in Zone D for PM\(_{2.5}\).

**Oxides of Nitrogen (NOx):** The EU annual limit value and WHO guideline value for NO\(_2\) is 40 μg/m\(^3\) and stations monitored in Zone D are below this level in 2016.

**Sulphur Dioxide (SO\(_2\)):** The EU daily limit value for SO\(_2\) is 125 μg/m\(^3\) and the WHO guideline value is 20 μg/m\(^3\) and stations monitored in Zone D are below these levels in 2016.

**Carbon Monoxide (CO):** The EU annual limit value and WHO guideline value for CO is 10 mg/m\(^3\) and stations monitored in Zone D are below this level in 2016.

**Ozone:** The EU limit value (8hr daily maximum) for ozone is 120 μg/m\(^3\) and this limit value was exceeded at one monitoring station in Zone D in 2016. The WHO guideline value of 100 μg/m\(^3\) was also exceeded at all monitoring stations in Zone D in 2016.

**Particulate Matter PM\(_{10}\):** The EU annual limit value for PM10 is 40 μg/m\(^3\) and the WHO guideline value is 20 μg/m\(^3\). Neither values were exceeded at stations monitored in Zone D in 2016.

**Particulate Matter PM\(_{2.5}\):** The EU annual limit value for PM2.5 is 25 μg/m\(^3\) and stations monitored in Zone D are below this level in 2016. The WHO guideline value of 10 μg/m\(^3\) was also exceeded at one monitoring station in Zone D in 2016.

**Heavy Metals:** Lead (Pb annual limit value 500 ng/m\(^3\)), Arsenic (annual limit value 6 ng/m\(^3\)As), Cadmium (Cd annual limit value 5 ng/m\(^3\)) and Nickel (Ni annual limit value 20 ng/m\(^3\)) were measured at five stations throughout the country in 2016, two of which are in Zone D. The annual mean concentrations measured at all stations were all below the respective target or limit values in 2016.

**Polyaromatic Hydrocarbons (PAH):** The EU limit value for PAH is 1 ng/m\(^3\) and the measured values at the Zone D station were below this in 2016 but were above the European Environment Agency (EEA) air quality estimated reference level of 0.1 at one of the 2 monitoring sites in Zone D in 2016.

More details of the Ambient Air Quality throughout Ireland and in Zone D are contained within Attachment-6-3-6-EIS-EIAR-Planning-Dec-2017, Volume 2: Main Report as follows:

- **Chapter 9:** Climate and Air Quality; and
- **Chapter 12:** Air.
An air dispersion model was prepared for the LRP Power Station in 2001 to accompany the planning application at that time. This modelling was carried out to predict the potential impact of emissions from the station on air quality in the locality. Overall, the predicted contributions to ground level concentrations of NO\textsubscript{2} dust and SO\textsubscript{2} were low. The assessment found that the ambient air quality would not be significantly affected and standards for ambient air quality would not be compromised.

The annual emissions of the licenced pollutants are reported in the LRP Power Stations Annual Environmental Report (AER), see Table 1 for a summary of the boiler stack emission (i.e. the main air emission point from the plant) in tonnes per annum. The station has adhered to the emission limits to air over the past three years with some minor exceptions. A small number of minor incidents relating to air have been reported during this period. These include breaches of Emission Limit Values (ELVs) and monitoring equipment functioning. These incidents have all been resolved and the likelihood of reoccurrence is considered to be low.

### Table 1 Annual Emissions to Air for 2014, 2015 and 2016

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PS-A1</td>
<td>Boiler Stack</td>
<td>Oxides of sulphur</td>
<td>280.59</td>
<td>298</td>
<td>316.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nitrogen oxides (as NO2)</td>
<td>562.15</td>
<td>546</td>
<td>475</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dust</td>
<td>16.92</td>
<td>6.1</td>
<td>10.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Carbon Dioxide</td>
<td>856,330</td>
<td>852,264</td>
<td>788,708</td>
</tr>
</tbody>
</table>

The LRP Power Station also operates in accordance with its Greenhouse Gas Emission (GHG) permit No. IE-GHG068-10379-3. The total amount of reportable emissions of \textsubscript{CO}2 in 2016 was 830,446 tonnes.

Dust deposition rates are monitored at the station site in line with the IE licence requirements. No breaches have been recorded for the period 2014-2016.

**Noise**

Details of the site conditions in relation to Noise are contained within the ESB Lough Ree Power Station Environmental Noise Monitoring for Industrial Emissions License Compliance (2017), see Attachment-7-1-3-3-Receiving Environment Report – Noise
Monitoring. In summary the noise limits as set out in IE Licence P0610-02 for Lough Ree Power Station and have not been breached at the nearest noise sensitive locations by the noise emanating from the facility. It is therefore concluded that Lough Ree Power Station is demonstrating compliance with the noise limits outlined for the Power Station in its IEL P0610-02.

Noise levels are not monitored at the ADF given the nature of the activities and remote nature of the site.

4 Surface Water

The station site is located in the Upper Shannon Catchment (Code:26c) and within sub-catchment Shannon[Upper]_SC_080. The site is adjacent to the Upper Shannon River and the Lough Bannow Stream waterbodies and is located upstream of Lough Ree. The WFD status of these waterbodies is poor, unassigned and moderate respectively. Water from the site is either discharged directly to the River Shannon or to the river Shannon via the Lough Bannow Stream. The Upper River Shannon discharges to Lough Ree.

The station went through a licence revision for surface water discharges and a revised licence was issued in September 2013. The LRP Power Station operates in accordance with the IE Licence P0610-02 issued by the EPA. Condition 4.3, Condition 5 and Schedule B5 of the licence sets and controls emission limits for emissions to waters.

Condition 5.5 states that:

“Discharges from the installation shall not artificially increase the ambient temperature of the receiving water by more than 1.5°C outside the mixing zone. In relation to temperature, the mixing zone shall not exceed 25% of the cross sectional area of the river at any point.”

Under the IE licence cooling water is abstracted from the River Shannon and is used to condense the steam generated to spin the turbines and generate electricity. Water is returned to the river via discharge culverts. The outfalls are located approximately 200 m downstream of the intake and approximately 160 m upstream of Lanesborough Bridge.

There have been a number of non-compliances related to condition 5.5 over the period 2013-2016. A technical amendment is being sought to amend Condition 5.5 of the current IE licence (P0610-02) in relation to the existing cooling water discharges. See Attachment-7-1-3-3-Receiving Environment Report – Thermal Plume Technical Amendment Report.

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3 Attachment-7-1-3-3-Rec Env Report_Noise Monitoring
Other non-compliances in relation to the surface water ELVs have been recorded for example in 2015 in relation to suspended solid levels. These incidents have been investigated and rectified as required, see Attachment-7-1-3-1-Emissions Compliance Report_AER 2014-2016.

The ADF site is located in the Upper Shannon Catchment (Code: 26C/26E) within sub catchments Shannon [Upper]_SC_080 and Bilberry_SC_010. The ADF is located within an area of cutaway Bord na Móna commercial peatland located at Derraghan Bog. The surface water regime on site utilises the pre-existing open drainage network available on site. Surface water discharges from the site via a main drain that leads to a Bord na Móna piped outfall to the south of the site. This piped outfall flows in a south westerly direction to a pumping station. Before entering the pumping stations all flows pass through a silt pond. From here it is pumped into the Derrymacar outfall drain flowing into Newtown Flannigan River (LEDWITHSTOWN_010) which flows into Lough Derrymacar and then onto Lough Ree. The WFD of these waterbodies is unassigned, unassigned and moderate respectively.

In addition to the EIS which was prepared out for the original develop in 2002 an EIAR was submitted with the planning applications for the increased capacity of the ADF (documentation provided in Attachment-6-3-6-EIS-EIAR-Planning-Dec-2017). The assessments concluded that no significant impact on water quality would arise from the proposed ADF project.

There is one surface water discharge point under the IE licence from the ADF. However it is noted that no leachate is discharged from the ADF and the existing IE licence issued by the EPA does not permit the discharge of any leachate to surface waters therefore there is no discharge from this point and subsequently no monitoring is undertaken.

More details on surface water in relation to the station and ADF site is contained within the following attachments:


5 Environmental Designations Adjacent to the Site

The station site is adjacent to the River Shannon and lies upstream of the Lough Ree Special Area of Conservation (Lough Ree SAC -Site Code 00440) and the Lough Ree Special Protection Area (Lough Ree SPA – Site Code 004064004077), see Location Plan. The ADF site is some 4 km from the Lough Ree SAC/SPA.

More details of the Biodiversity in relation to the station and ADF sites is contained within the following attachments:

- Attachment-6-2-1-AA-Screening-01-2018; and
- Attachment-6-3-6-EIS-EIAR-Planning-Dec-2017, Volume 2: Main Report, Chapter 6: Biodiversity.