S. 37

File With _____

SECTION 131 FORM

Appeal NO: PL/ABP 301911-18 Defer Re O/H ☑

TO:SEO

Having considered the contents of the submission ~~dated~~/ received 9/4/18

from

Applicant I recommend that section 131 of the Planning and Development Act, 2000

(be)/~~not be~~ invoked at this stage for the following reason(s):. In Interest of justice

E.O.: Rosa Q Date: 3/5/18

To EO: _____

Section 131 not to be invoked at this stage. ☐

Section 131 to be invoked – allow 2/4 weeks for reply. ☐

S.E.O.: _____ Date: _____

S.A.O: _____ Date: _____

Mr Cullen

Please prepare BP 70 - Section 131 notice enclosing a copy of the attached submission

to: ~~3rd Party / Observer~~ Planning Authority

Allow 2/3/4weeks – BP 70

EO: Separate Date: 3/7/18

AA: Hannah Cullen Date: 03/07/18

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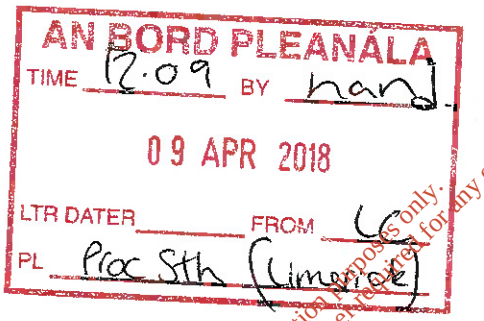
PROVISION OF A BORROW PIT AT THE AUGHINISH ALUMINA LIMITED FACILITY, AUGHINISH ISLAND, ASKEATON, CO. LIMERICK

FIRST PARTY RESPONSE TO THIRD PARTY APPEAL

An Bord Pleanála Reference: ABP-301011-18
Limerick City and County Council Reg. Ref.: 17/714



by

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6th April 2018

The Secretary
An Bord Pleanála
64 Marlborough Street
Dublin 1

6th April 2018
[By Hand]

Dear Sir/Madam

RE: FIRST PARTY RESPONSE TO THIRD PARTY APPEAL AGAINST DECISION OF LIMERICK CITY AND COUNTY COUNCIL TO GRANT PERMISSION FOR THE PROVISION OF A BORROW PIT AT THE AUGHINISH ALUMINA LIMITED FACILITY, AUGHINISH ISLAND, ASKEATON, CO. LIMERICK

1.0 INTRODUCTION

1.1 First Party Response

Tom Phillips + Associates[1], in association with Golder Associates[2], Ecology Ireland Ltd.[3] and AWN Consulting[4] have been retained by the Applicant (Aughinish Alumina Ltd.[5]) to prepare this Response to the Third Party Appeal received by Cappagh Farmers Support Group.

The Response is being submitted within the period specified by the Board (by 9th April 2018). We have provided a response to the Third Party Appeal in Section 2 below. For ease of reference we have responded to items raised in the order they appear in the Appeal.

2.0 FIRST PARTY RESPONSE TO THIRD PARTY APPEAL

Appeal by Cappagh Farmers Support Group

At the outset, it is noted that a number of the items raised by the Cappagh Farmers Support Group (CFSG) do not relate to the proposed development of the Borrow Pit or appear to be directed toward Limerick City and County Council (LCCC) and the Environmental Protection Agency (EPA). The Applicant does not intend to address these items in detail as they clearly are not relevant to the determination of the proposed development before the Board.

Some of the items raised relate to the potential impact the proposed Borrow Pit development could have on the existing Bauxite Residue Disposal Area (BRDA) at Aughinish Alumina Ltd., particularly with regard to the impacts on the BRDA by blasting/vibrations. We

[1] Nos. 80 Harcourt Street, Dublin 2
[2] Town Centre House, Naas, Co. Kildare
[3] Ballyhigh, Effin, Kilmallock, Co. Limerick
[4] The Tepcro Building, Clonshaugh Business & Technology Park, Dublin 17
[5] Aughinish Island, Askeaton, Co. Limerick.

refer to the content of the Environmental Impact Assessment Report (EIAR) which assesses the impacts of the proposed development on the surrounding environment and specifically Chapter 11: Noise and Vibration and Appendix 11.2: Phase 1 BRDA Blast Vibration Assessment (refer to Response prepared by Golder Associates in Appendix B for more detail). It is clearly illustrated in the assessment submitted with the planning application that the proposed development has had significant regard to these issues and has addressed these concerns.

Furthermore, the Appellant does not present any evidence based research to reinforce claims contained in the Appeal. The EIAR has been prepared by competent professionals in their field and provides an evidence based approach to assessing potential impacts on the surrounding environment, demonstrating that the proposed development will not significantly adversely impact the surrounding area.

Item 1 – Addressing Concerns of Community

It is stated in the Appeal that LCCC, the EPA, the Applicant or Local Representatives have not addressed concerns raised by the community in the application process.

The Applicant prepared an Environmental Impact Assessment Report (EIAR) and Appropriate Assessment (AA) Screening Report as part of the planning application to outline the potential impact on the development on the local environment. LCCC, as the competent authority, and as detailed in the Planning Authority Reports dated 18th September 2017 and 31st January 2018, carried out a *'Decision-Maker's written statement on EIA'* and an *'Appropriate Assessment Screening exercise'* which states that:

> *'It is considered that the report dated 29/01/208 [sic] contains a fair and reasonable assessment of the likely significant effects of the development on the environment. Having regard to the character of the landscape in the area, the previous use on site it is considered that subject to conditions the proposal is acceptable.'*

It is submitted that the EIAR prepared by the Applicant and the subsequent assessment provided by LCCC has had regard to the concerns raised in relation to the proposed development.

Item 2 – Public Participation

The Appellant considers that the Applicant has failed to carry out proper public consultation in contravention of the Aarhus Convention.

The Applicant has carried out public consultation in relation to the proposed development (as detailed in Chapter 6 – Statutory and Public Consultation of the EIAR) and the public have had further opportunity (as the Appellant has done) to make observations on the proposed development during the 5 week observation period associated with the planning application to LCCC.

As part of the public consultation carried out by the Applicant, a pre-application consultation document was issued to 157 No. local residents and 3 No. resident/community associations in the local area (Askeaton/Foynes/Shanagolden). The Applicant received 1 No. response in

this regard from a local resident which are addressed in the EIAR. The Applicant also issued a scoping document to Statutory Bodies for comment.

Articles 6(3) and 6(4) of the Aarhus Convention require that public procedures shall include reasonable time-frames allowing sufficient time for informing the public to participate in the process and each party shall provide for early public participation. It is evident that early public consultation took place and reasonable time-frames have been provided to the public to make formal response in the planning application process. We request the Board to dismiss this argument as it is clearly incorrect.

Item 3 – Noise

In this regard we refer to the Response prepared by AWN Consulting (attached in Appendix A) which highlights that noise levels from the existing facility do not exceed /breach EPA guidance limits.

Item 4 –Vibration

In this regard we refer to the Response prepared by Golder Associates (attached in Appendix B) which responds to the claims of the Appellant in relation to blasting and impact of vibration.

Item 5 – Human Health/External Emergency Plan

The Applicant contends that the proximity of the BRDA and its status as a Category A Waste Site has been ignored in the assessment.

In this regard we refer to the request for further information from LCCC (dated 18th September 2018) which noted that the EIAR did not refer to the Category A Site designation and the potential implications this could have for the External Emergency Plan for Aughinish Alumina Ltd. The response submitted by the Applicant (dated 28th November 2018) fully addressed this matter. The Category A Site designation requires that an External Emergency Plan be in place for the facility. As demonstrated in the further information response, the proposed development has had regard to the External Emergency Plan and is not considered to impact on the implementation of the plan and as a result the local population.

The Appellant also outlines that there is no consideration by the Applicant of cumulative impacts.

The EIAR has had regard to the cumulative effects of the proposed development with other existing and/or approved projects in the area, such as the installation of 2 No. thickeners within the refinery plant area (LCCC Reg. Ref. 16/418 refers). The Applicants overall landholding extends to c. 338 hectares relating to the entirety of Aughinish Island. It is therefore considered that no third parties could propose development that could have a cumulative effect with the proposed development within this landholding. Notwithstanding this, we are not aware of any such projects in the wider area.

Item 6 – Industrial Emissions Licence

The Appellant contends that the Applicant misled LCCC and the EPA in relation to the operation of the Borrow Pit and that it should not have been a licensable activity.

In this regard it is noted that the issue in regard to the proposed Borrow Pit being a licensable activity was discussed at pre-planning stage with LCCC and the EPA. At the time of lodgement of the application it was considered that the operation of the Borrow Pit was not required to form part of the licensable activities at the Applicant's overall landholding. Subsequently, and on foot of an observation from the EPA, LCCC requested further information be submitted which was:

> *'...requested to submit written confirmation from the Environmental Protection Agency (EPA) that the proposed development is not a licensable activity."*

We refer the Board to the response provided to LCCC, dated 28th November 2017 and the associated letter from Dr. Brian Donlon, EPA Industrial Licensing Manager (dated 14th November 2017) which considered that:

> *'...the excavation of rockfill is not a licensable activity and does not require an industrial emissions licence in its own right, however, the EPA now consider that the proposed borrow pit development is a directly associated activity within the licensable boundary and consequently it is considered that the operation of the proposed development would require a full licence review.'*

It is clear that the Applicant addressed this licensing issue during the course of the planning application and was furthermore assessed by LCCC in the determination to grant permission for the proposed Borrow Pit development.

Item 7 – Failure Scenario

This Item is directed at the assessment carried out by LCCC and refers to already permitted development at the facility.

The Appellant has misquoted the report of the Senior Executive Engineer of LCCC in stating the there is a *"1 to 10 years probability of failure scenario"* when in fact it refers to a 1 in 10,000 year probability. It is clear that the Planning Authority has addressed this issue in their determination of the planning application and outlined that they had no objection in this regard to permission being granted.

The Appellant also outlines that there has been *'No consideration for failure at Hungary 2010'*.

This comment refers to the failure of Reservoir No.10 of the Ajka Tailings Pond at the Magyar Aluminium ZRt plant in Hungary in 2010, where a containment wall failed leading to the significant spillage of red mud into the environment. It is respectfully submitted that the incident in Hungary has no relevance to the overall facility at Aughinish given the different tailings management operations and the construction methods undertaken for the containment areas:

- Reservoir 10 of the Ajka Tailings Pond is a containment reservoir, constructed from low density slag and ash sourced from a local power plant, in a single stage dam wall to a height of 20m to 25m. The dam walls allow no drainage of the red mud and has a very steep downstream slope of 1.3(H):1(V) which equates to a slope angle of 37.6 degrees. The red mud is stored at a high water content, low bulk density and the facility retained a considerable amount of water.

- The Aughinish BRDA is constructed in sequential 2m high rock fill permeable perimeter stage raises, constructed on the red mud by the upstream method. This method involves the construction of a series of retaining walls, upstream of the outer toe of the BRDA, and so forming a supporting face to the overall stack. Pore water from the red mud is permitted to drain through the rock fill stage raises and is collected by the lined perimeter channel. The downstream slope of the BRDA is very shallow at approx. 6.3(H):1(V) which equates to a slope angle of 9 degrees. Since 2008, Aughinish have engaged in farming of the red mud to further reduce the water content and increase the bulk density, hence in comparison to Ajka, the red mud stored is in a facility with dam side walls which are much shallower, the red mud is at a much lower water content, has a greater bulk density and retains little to no water on the surface.

The raising of the Aughinish BRDA in entirely performance based, assessed by regular monitoring and investigation of the red mud stored. The key elements to the design are the increase in effective overburden stress at depth and its impact on the geotechnical parameters of the red mud i.e. undrained shear strength, along with the effect of the red mud farming (reduced water content and increased dry density).

The enhanced geotechnical parameters of the red mud stored at Aughinish, the shallow downstream slope of the BRDA and the absence of surface water storage excludes the risk of an Ajka-type failure at the Aughinish facility.

Furthermore, it is noted that blasting occurred in the vicinity of the original BRDA during the construction of the Phase 1 extension, which was permitted by An Bord Pleanála under ABP Ref. PL13.217976. It is submitted that the EIAR clearly assesses the impact of the proposed development on the adjoining Phase 2 BRDA which has also had regard to blasting which has previously been carried out at the overall facility.

Item 8 – Extraction of Rock

The Appellant claims that extraction of rock at the site is a 'red herring' and instead (a) is intended to obstruct the view from the public of the BRDA and (b) will in future be used as an additional BRDA.

As outlined in the planning application and EIAR:

> *'AAL estimate there is a requirement for c. 374,000 m³ of rock (post-2017) to provide for ongoing works associated with the BRDA over the lifetime of the permitted development at Aughinish. The extracted rock will be used within the confines of the site and will not be transported off site.'*

Having regard to (a) it is noted that the floor of the proposed Borrow Pit is c. 8.5m lower than the surrounding lands to the east and south (the BRDA is located to the west and the plant area to the north). As detailed in Section 12.4 of the EIAR, crushed rock will be

stockpiled to the southern end of the proposed Borrow Pit at the excavated level and will not be stockpiled to protrude above the adjoining ground level. In this regard it is clear that the proposed development will not obscure the view of the public of any features at the existing facility.

Having regard to (b), the proposed development relates to the provision of a Borrow Pit to source rockfill for ongoing works on site. Any further development within the facility will be subject to a separate planning permission and EIAR (if required).

Item 9 – Further Developments

The Appellant contends that future public infrastructure development could take place with the reintroduction of the rail link between Foynes and Limerick.

The southern edge of the application site is located a minimum of c. 1.5km to the north of the railway line, which is not operational. It is submitted that the proposed development will not impact on the future operation of this railway line.

Item 10 – BRDA Storage

This item relates to the operation of the overall permitted facility at Aughinish Alumina Ltd. and does not relate specifically to the proposed development. We request the Board to disregard these comments as they are not relevant to the assessment.

Item 11 – Impact on Natura 2000 Sites

In this regard we refer to the Response prepared by Ecology Ireland Ltd. (attached in Appendix C) which addresses the claims made by the Appellant in relation to potential impacts on Natura 2000 sites.

Item 12 – Financial Bond

The Appellant has outlined that it was a failure on the part of the Planning Authority to not demand a financial bond as part of the grant of permission.

In this regard, we refer to Section 11.3 of the *Limerick County Development Plan 2010-2016* (as extended) which considers that cash deposits or security bonds will be included by way of condition:

> *'To ensure the satisfactory completion and maintenance of larger scale developments undertaken by private development...'*

The proposed development provides for an extraction area of c. 4.5 hectares and will provide for localised restoration of the pit void (after extraction is complete) to encourage natural regeneration of the area. It is not considered that such a development is of a large scale nature or which requires significant restoration that merits the provision of a financial bond. We request the Board to have regard to the decision of LCCC in this matter and not include a bond in any subsequent grant of permission.

Item 13 – Gas Line

The Appellant claims that LCCC failed to take into account the impact on the gas pipe line at Aughinish and implies that Gas Networks Ireland (GNI) may have been misled by the Applicant. There is no basis for these claims and they are strongly refuted. In this regard we refer to the Response prepared by Golder Associates (Appendix B) which details the vibration assessment undertaken in relation to the Borrow Pit and sensitive receptors (such as the gas line) and the discussions which took place with GNI. In this regard, a number of recommendations were detailed in the EIAR which will be implemented for the proposed development to ensure there is no adverse impact on the gas line.

Item 14 and 15 – Conflicts of Interest

The Appellant claims there is a lack of independent and transparent decision making by LCCC in relation to development at Aughinish and claims there is a conflict of interest in personnel at Aughinish being involved in the LCCC Audit Committee (which has an independent role in advising the Council on financial reporting processes and audit matters).

We strongly refute this unsubstantiated claim by the Appellant and ask the Board to disregard these comments as they are unfounded. The decision of LCCC to grant permission for the proposed development was not influenced by any external parties to the planning application process.

Item 16 – Paul Connett Comments

The Appellant has included text from an article published in the Limerick Leader which included quotes from Dr. Paul Connett speaking at an event in Limerick against a proposed development by Irish Cement. The comments from Dr. Connett are unsupported by evidence as per other claims in the Appeal. The EIAR has addressed the environmental concerns associated with the proposed development and we request the Board to confirm the decision of LCCC and grant permission for the scheme.

3.0 CONCLUSION

We trust that the issues outlined in this First Party Response will be taken into consideration as part of An Bord Pleanála's assessment and subsequent determination.

Having regard to:

- The importance of the proposed development to the long-established Aughinish Alumina Ltd facility.
- The compliance of the proposed development with the provisions of the *County Development Plan* and the *Strategic Integrated Framework Plan for the Shannon Estuary*.
- The lack of significant impact on environmental or residential amenity in the area as demonstrated in the Environmental Impact Assessment Report.
- The Appropriate Assessment Screening Report that clearly demonstrates that the proposed development will not result in any negative impacts on the integrity of the nearby *Natura 2000* sites.

We consider that the proposed development is wholly compliant with the relevant policy documents and will not seriously injure the amenities of the area or property in the vicinity, and would be acceptable in terms environmental and residential amenity impacts.

The proposed development would, therefore, be in accordance with the proper planning and sustainable development of the area.

We look forward to receiving an early and favourable response on this matter and would be happy to clarify any issue arising.

Yours faithfully

Stephen Barrett

Stephen Barrett
Associate
Tom Phillips + Associates

Encl.

APPENDIX A – RESPONSE TO APPEAL PREPARED BY AWN CONSULTING

awnconsulting

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JM/17/9643NL01
6 April 2018

Tom Phillips + Associates
80 Harcourt Street
Dublin 2
D02 F449

Dear Sirs,

RE: CAPPAGH FARMERS APPEAL OF APPLICATION 17714 (AUGHINISH ALUMINA): 3. NOISE LEVELS

This document has been prepared in order to address concerns relating to noise levels as raised in the Cappagh Farmers appeal of the Aughinish Alumina planning application. The relevant concern is presented below.

Appeal:

3. *We contend the Noise Levels at this facility already exceed / breach those laid down by the E.P.A currently reading 57dBLAec (sic). Outside the upper limits of 55dBLAeq (sic). There is no evidence that the applicant or the Local Authority has addressed this issue and the possibility of a further increase in noise levels of 5dB or more will have serious / negative impact on the residents in the local community.*

Response:

Noise emission levels from the facility do not exceed / breach the EPA licence limits. There is a misunderstanding in relation to the measured baseline noise levels, which include contributions from other noise sources not associated with the facility (i.e. traffic on the existing Local and National road network, noise from the nearby port, birdsong, pedestrian voices, dog barking, occasional aircraft movements and some slight wind generated noise on nearby foliage). The noise limits outlined in the sites Licence relate to specific noise emissions from the facility alone i.e. not the total noise level, including other sources of noise not associated with the site.

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AWN Consulting Limited
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Directors: F Callaghan, C Dilworth
T Donnelly, T Hayes, D Kelly, E Porter

Section 10.3 of the EIAR Noise and Vibration Chapter states the following:

- Noise sources that contribute to the measured noise levels include distant activity from the existing Aughinish Alumina facility as well as other noise sources such as traffic on the existing Local and National road network, noise from the nearby port, birdsong, pedestrian voices, dog barking, occasional aircraft movements and some slight wind generated noise on nearby foliage.
- Specific noise emissions from the existing Aughinish Alumina facility are in compliance with the sites noise emission limit values, as outlined in relevant License Conditions (i.e. daytime limit of 55 dB $L_{Ar\ (30\ minute)}$, Evening-time limit of 50 dB $L_{Ar(30\ minute)}$ and Night-time limit of 45dB $L_{Aeq\ (15\text{-}30\ minutes)}$), at specified noise sensitive locations.
- No tonal noise characteristics are present in noise emissions from site operations when measured at noise sensitive locations.

The annual IEL noise monitoring report was appended to the noise and vibration chapter. Relevant extracts from the annual noise monitoring report (Section 5. Conclusions & Recommendations) are presented below in order to provide further reassurance in relation to compliance with EPA licence limits:

> *No tones or impulsive noise associated with the activities at the facility were recorded during the survey periods at all NSLs during all monitoring periods.*
>
> *Day-time, evening and night-time monitoring results for facility related sound were compliant with the daytime, evening and night-time specified limits of $L_{Ar(30\ minute)}$ 55 dB, $L_{Ar(30\ minute)}$ 50 dB and $L_{Aeq(30\ minute)}$ 45dB respectively at all NSLs.*

In relation to the concern raised in relation to the potential for a *further increase in noise levels*, reference is made to the EIAR Noise and Vibration chapter (Section 10.6 *Cumulative Impacts*), which confirms the following:

> *Noise emissions from the existing Aughinish Alumina facility are monitored annually and are found to be comfortably within the IEL noise criteria for daytime, evening and night-time periods (Ref. Appendix 10.1). With consideration of the current site noise emissions and predicted noise emission values associated with the proposed borrow pit, the cumulative noise emissions are also expected to remain comfortably within the IEL noise criteria at all nearby noise sensitive locations.*

Yours sincerely,

James Mangan

JAMES MANGAN
Senior Acoustic Consultant

Aoife Kelly

Dr AOIFE KELLY
Acoustic Consultant

encl. Aughinish Alumina IEL annual noise monitoring report (Ref. R1_1017_39)

APPENDIX B – RESPONSE TO APPEAL PREPARED BY GOLDER ASSOCIATES

GOLDER

TECHNICAL MEMORANDUM

DATE 29 March 2018

Project No. 1667376.TM03.A0

TO Thomas Hartney, Aughinish Alumina Limited (AAL)

CC Roger White, Barry Balding, Gerd Janssens, Stephen Barrett (TPA), Louise Clune (AAL)

FROM Brian Keenan

EMAIL bkeenan@golder.com

RESPONSE TO ITEMS 4 AND 13 OF THE GROUNDS FOR APPEAL SUBMITTED TO AN BORD PLEANALA (ABP-301011-18) RELATING TO PLANNNG PERMISSION GRANTED BY LIMERICK CITY AND COUNTY COUNCIL FOR APPLICATION 17714, AUGHINISH ALUMINA, 31/01/2018.

This Technical Memorandum prepared by Golder Associates Ireland Limited (Golder) provides a submission / observation in relation to Items 4 and 13 of the Grounds for Appeal submitted by Mr Pat Geoghegan of the Cappagh Farmers Support Group submitted to An Bord Pleanala, appealing the planning permission granted by Limerick City and County Council to Application 17714, Aughinish Alumina, 31/01/2018.

1.0 ITEM 4 – PART 1

External Emergency Plan (EEP): The Local Authority was negligent in this area. This plan plays a vital role in the everyday operation of the facility. Reference is made to the tragic incident in Hungary 2010 resulting in loss of life. It is argued that the finished waste here (Aughinish Alumina) is solid against liquid in (Hungary) the Compound & Composition Material in the Process is the same. The Local Authority was unable to address this matter. They passed it to the H.S.E. for advice. H.S.E was / is not capable in dealing with the issue. H.S.E referred this back to Local Authority advising the issue needed **"INDEPENDENT SPECIALIST ADVICE"**. No advice obtained or submitted by Limerick City & County Council, in the application process.

The Cappagh Farmers having put forward evidence in our planning objection / observation shown in page 1 Ref 1 re- **International Journal of Chemical, Environmental & Biological Science (JCEBS) Volume 3 issue 1 - The Environmental Impacts of Rock Blasting and their Mitigation, Section 11 Re-Generation of Ground**

Vibrations; Noise and Fly rock attached. It states *"The energy carried by these waves crushes rock, which is the immediate vicinity of the hole, to a fine powder. The region in which this takes place is called shock zone. The radius of this zone is nearly two times the radius hole. Beyond the shock zone, the energy of the waves gets attenuated to some degree which causes the radical cracking of the rock mass".*

See Figure 2 in our objection / observation where it shows the type of fractures from shock, severe that takes place from blasting.

Also see Figure 2 rock breakage process - An effect of ground vibrations on the structures. *"The ground vibrations cause the ground to vibrate in transverse, longitudinal and the vertical direction leading to its damage"*

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1.1 Submission / Observation relating to Item 4 – Part 1

The Journal Article '**The Environmental Impacts of Rock Blasting and their Mitigation**' deals with a case study of blasting in a limestone quarry wherein mitigation of the environmental impacts of ground vibration, noise and fly-rock were carried out. Three initial blasts were designed to the prevailing practice and the environmental impacts were monitored. The blasts designs were then modified to mitigate the environmental impacts which were subsequently monitored and were reported in the journal article to be drastically lower.

The extracts from the article provided in Item 4 of the Grounds for Appeal indicate:

- The '**shock zone**' is the zone in the immediate vicinity of the borehole where the blast waves cruses the rock to a fine powder, is limited to two times the radius of the hole. The borehole radius for the explosive charge proposed for blasting at Aughinish (see Drawing 5 – Borrow Pit Development Indicative Phasing) is 45 mm resulting in the '**shock zone**' radius that can expected to be approximately 90 mm, as described in the Journal Article. Extract from Journal Article: '*Beyond the shock zone, the energy of the waves gets attenuated to some degree which causes radial cracking of the rock mass. The gas generated as a result of detonation enters into these cracks and displaces the rock further apart, causing its fragmentation. The region in which this phenomenon takes places is called the '**transition zone**'*. The radius of this zone is 20 to 50 times the radius of the hole; and'
- For a 45 mm radius hole, the radius for the '**transition zone**' can be expected be in the range of 0.9 m to 2.25 m. The relatively small radius of the transition zone leads to the tight borehole spacing during blasting rock, typically 3 m to 4 m (see Drawing 5 – Borrow Pit Development Indicative Phasing). The nearest blasting point from the proposed Borrow Pit to the embankment walls of the Phase 1 Extension BRDA is 53 m.

The blast design mitigation measures described in the Journal Article are applicable to the blasting proposed for the Borrow Pit, i.e. adjustments can be made to the Charge per Delay (kg), Delay Interval (ms), Spacing and Burden (m) and Direction of Initiation, to limit the intensity of ground vibration. Sections 3 and 4 of the **Golder Report, 'Borrow Pit: Phase 1 BRDA Blast Vibration Assessment' 166.73.76.R01.A1, July 2017,** deal with the intensity of ground vibrations resulting from blasting, how the intensity of these vibrations are measured, the industry equation for prediction of the intensity of these vibrations and the industry guidelines for the threshold of intensity of vibrations to prevent damage to nearby structures.

- The intensity of ground vibrations, which is an elastic effect, is mostly commonly measured in units of Peak Particle Velocity (PPV), typically in mm/s.
- The rate at which ground vibrations attenuate from a blast site is dependent on a number of variables. These include the characteristics of the blast (delay timing, type of explosive, etc.), topography of the site, as well as the characteristics of the bedrock and/or soil materials. The industry equation for predicting the PPV from surface blasting is shown below:

$$PPV = k\left(\frac{D}{\sqrt{W}}\right)^{-b}$$ **(United States Bureau of Mines, 1959)**

Where:

PPV = Peak Particle Velocity (mm/s)

D = Distance (m). Plan distance measured from the charge locations to the receptor

W = Explosive Charge Weight per Delay (kg), the Maximum Instantaneous Charge (MIC)

k and b are site-specific factors – typically determined by on-site measurement

- For the data in a given study, the 95% confidence curve for that data is typically used to define the ground vibration attenuation model. The purpose of the model equation is not so much to predict what a given vibration level would be at a particular location for a given blast, but to indicate the probability that the peak vibration would fall below the level indicated by the equation for a given distance and maximum explosive weight. The equation is therefore a useful blast design tool in establishing maximum explosive charge weights per delay for various distances from a blast site for a given maximum ground vibration level (i.e. threshold limit).

- Ground vibration guidelines are typically established for blasting sites to prevent damage to adjacent facilities or infrastructure. Exceeding these levels does not in itself imply that damage has occurred but only increases the potential that damage might occur.

- Appropriate limits for blast-induced vibrations at earth dams and embankments have been discussed in numerous publications. Blasting near earth-fill and tailings dams has the potential to increase residual pore pressure, reduce the dam's stability, induce settlements, or cause other damages. Charlie et al. (1987) suggested the following criteria for blasting near dams.

- **Table 1**, based on liquefaction potential and susceptibility to pore pressure increases.

Table 1: General Guidelines to Vibration Damage Thresholds for Blasting Near Dams

Dam Construction	PPV Limit (mm/s)
Dams constructed of or having foundation materials consisting of loose sand or silts that are sensitive to vibration.	25
Dams having medium dense sand or silts within the dam or foundation materials	50
Dams having materials insensitive to vibrations in the dam or foundation materials	100

Notes: *From Charlie et al. (1987)

The information in Table 1 can be used as general guidelines for assessing the potential for blast vibration damage to structures. Considering the material types present within the dam walls and the BRDA foundations, a conservative PPV limit of 25 mm/s would be recommended for the embankment. Charlie et. al (2001) show that significant residual pore pressure increase, at peak particle velocity exceeding 15 mm/s , may occur at shallow depths, and recommends that peak particle velocity and pore pressure should be monitored and evaluated at several locations in the dam, foundation soils, and abutments.

Section 8 of the Golder Report lists the recommendations for supporting the blast design for the proposed Borrow Pit.

Estimated set-back distances from blasts at the Borrow Pit to limit the PPV to < 25 mm/s, assuming a maximum instantaneous explosive charge weight of 35 kg (MIC), are:

i) 53 m to the BRDA embankment; and

ii) 50m at the end of the life of the Borrow Pit to the GNI gas transmission pipeline.

- Initial blasts shall be conducted on the eastern extent of the face of the proposed Borrow Pit, to maintain the furthest distance from the BRDA (approximately 150 m).

- Results of the initial blast vibration monitoring can be used to calibrate the PPV prediction model and refine the values for k and b.
- Run the calibrated prediction model to determine a maximum explosive charge weight (MIC) to remain compliant with the designated PPV limits for the extent of the Borrow Pit that is close to the BRDA.
- Blast vibration monitoring at various locations within the BRDA, and should include at a minimum the following:

i) At the toe of the slope at the location closest to the Borrow pit to provide an indication of the maximum PPV that the red mud would be exposed to; and

iii) Monitoring at the mid-point and crest of the slope, to provide an indication of the reduction in PPV with distance from the blast, but also potential amplification through the depth of the red mud.

- Pore pressure monitoring at various locations within the red mud through the installation of vibrating wire piezometers. These will measure any excess pore pressure induced by the blasting and ensuring that sufficient time is maintained between blasts to let any residual pore pressure increase to dissipate. These would be located close to the blast vibrating monitoring points to allow calibration of increased pore pressure with PPV.
- Monitor inclinometers and extensometers after each blast to confirm that there were no displacements or settlements as a result of the blast.
- A recommended threshold criteria and response framework is presented in the report. This shall be finalized prior to the blasting works.

2.0 ITEM 4 – PART 2

Our group has shown the Local Authority that there is a risk to set off explosives, especially so close to an embankment all only structured from crushed stone and storing approx. 40 million tonnes of toxic waste that can lead to damage to the environment and human health.

2.1 Submission / Observation relating to Item 4 – Part 2

The section of the BRDA adjacent to the proposed Borrow Pit is the Phase 1 Extension BRDA, which is an eastern extension of the Phase 1 BRDA. The Phase 1 Extension BRDA starts in the west with a basin elevation of approximately 2 mOD, similar to that of the Phase 1 BRDA, but ramps upwards to the east, tracking the increase in elevation of the bedrock in this area. The crest elevation of the rock fill embankment at the boundary of the Phase 1 BRDA Extension is 12 mOD. The road separating the proposed Borrow Pit and the Phase 1 Extension BRDA is known as the 'East Ridge Road' and is at approximately 16 mOD for the common section. A lined perimeter channel is constructed to the west of the 'East Ridge Road' and the rock fill dam wall constructed to the west of the perimeter channel, at a crest elevation of approximately 12 mOD, ramps downwards to the north. The foundation materials for the BRDA basin local to the proposed Borrow Pit footprint are a combination of existing bedrock and placed rock fill and the depth of red mud stored locally (within 100 m of the nearest extent of the proposed Borrow Pit) is estimated to be in the 2 m to 4 m range. The blasting in the Borrow Pit is proposed to take place from a ground elevation of approximately 16 mOD to a base elevation of 8.5 mOD (see Drawing 5 – Borrow Pit Development Indicative Phasing).

3.0 ITEM 4 – PART 3

The applicants planning application lodged by Tom Philip and Associates re letter to the Senior Executive Officer in the Planning Department of Limerick City & County Council of the 28 November 2017, page 4 paragraph 2 states that ***"Golder Associates, highlights that the effect of blasting within the footprint of the proposed borrow pit was found to pose a very unlikely risk to the stability of the adjacent BRDA".***

In fact they have shown that they are not completely sure a risk to the BRDA won't happen on behalf of the Applicant and once that doubt has been established and the failure by the local authority to take up the offer to seek independent specialist advice to remove that doubt in a scientific manner, then the only avenue open to the local Authority is to apply the precautionary principal which they failed to do and refuse planning.

The precautionary principle is detailed in Article 191 of the Treaty on the Functioning of the European Union (TFEU). It relates to an approach to risk management whereby if there is the possibility that a given policy or action might cause harm to the public or the environment and if there is still no scientific consensus on the issue, the policy or action in question should not be pursued. Once more scientific information becomes available, the situation should be reviewed.

3.1 Submission / Observation relating to Item 4 – Part 3

Section 8 of the Golder Report provides a summary of the assessment conducted:

The effect of blasting within the footprint of the proposed Borrow Pit was evaluated and found to pose a very unlikely risk to the stability of the adjacent BRDA. The intensity of ground vibrations due to the blasting, expressed as a peak particle velocity (PPV) was calculated based on the type and size of blast and characteristics of the area. This was then calibrated with previous blasting conducted in the area during the construction of the Phase 2 BRDA.

The stability analyses undertaken found that the calculated PPV, for the blast analysed, would not cause instability of the BRDA. The stability analysis consisted of a pseudo-static analysis, which evaluated the stability based on the blast vibration, and a post-blast analysis which evaluated the stability due to an increase in pore pressure within the red mud.

The initial Phase 1 Blasting is proposed to be conducted at a distance of approximately 150 m from the BRDA, at the eastern extent of the face of the Borrow Pit. Vibration and monitoring data from the initial and subsequent blasts will be used to calibrate the PPV prediction model further and assess any impacts to the BRDA prior to progressing to blast the faces closest to the BRDA. As the Borrow Pit develops, the blasting operations will progress further away from the BRDA.

4.0 ITEM 4 – PART 4

The only reason that the Applicant has for this rock blasting that we are told about at this point of time is to secure additional rock to be used to increase in height the embankment walls of BRDA 1 & BRDA 2 to store more toxic red mud waste that will dry out and will become wind born effecting Human, Animal Health and the Environment. The Applicant can source this rock at the local quarry across the road for a minimal cost that they can well afford as shown in our objection / observation. Recurring net profit for RUSAL the owners of Aughinish for 2016 was totalling US$1.3 billion, it makes no sense to rock blast unless the applicant has another motive which we have addressed in item 8 below.

There are significant environmental and health and safety benefits to provide the source of rock from the quarry **rather than importing from the 'local quarry across the road'. By removing trucks from the roads will** reduce the carbon footprint for the quarrying operation and reduce potential traffic accidents.

4.1 Submission / Observation relating to Item 4 – Part 4

AAL estimate there is a requirement for c. 374,000 m³ of rock (post-2017) to provide for ongoing works associated with the construction of the stage raises of the BRDA over the lifetime of the permitted development (to Stage 10 at 24 mOD) at Aughinish.

The extracted rock will be used within the confines of the site, will not be transported off site and shall only be used in the construction of the permitted development to its permitted height restriction.

5.0 ITEM 13

Our group feels that the Local Authority failed to take into account the potential dangers to the Gas Pipe Line that this blasting would have in an indirect way. The gas pipe line main feed into Aughinish, which is situated just 50 m from the Mud pond BRDA 1.

Again, concerns must be raised as to what was exactly shown to them, Aughinish version or Tom Philips & Associates which they signed off on. The blasting may not have a direct impact on this pipe line, but indirectly should the BRDA walls be breached or damaged containing huge amount of stone, coupled with large volumes of red mud been released then this would have a serious knock on impact on the pipe line and been 50 m away would not be sufficient to withstand the force of stone and red mud and water leading to a major disaster. We feel this has not been assessed properly on health and safety grounds and to the Plant itself.

5.1 Submission / Observation relating to Item 13

The Craggs to Aughinish, 300 mm diameter steel transmission pipe (gas main) was installed underground in 2004, along the northern extent of the proposed Borrow Pit footprint. Marker posts are positioned at regular intervals above the pipe and the pipe is installed at an elevation of approximately 16 mOD in the common area with the proposed Borrow Pit. Design pressure = 85 bar, Wall Thickness =11.91 mm and Colour Coding is Red.

Currently, approximately 500 m of undisturbed rock, at approximately elevation 16 mOD, separate the Gas Main from the BRDA, at their nearest points. Red mud stored locally within the Phase 1 Extension BRDA is a maximum elevation of 12 mOD. The Gas Main, is located approximately 340 m from the proposed Phase 1 Blasts for the Borrow Pit, at their nearest points. Six years of blasting data will be available prior to the start of the Phase 7 Blasting, which will start at approximately 100 m from the Gas Main, at which stage the distance from the BRDA will be approximately 400 m (see Drawing 5 – Borrow Pit Development Indicative Phasing). The predicted PPV value at the BRDA embankment at this distance is 2.5 mm/s (guideline threshold for a dam embankment is 25 mm/s).

Golder prepared a **Technical Memorandum in February 2017 (1667376.TM02.A0)** in preparation for a consultation meeting with Gas Networks Ireland (GNI).

Golder reviewed the Gas Networks Ireland (GNI) literature for working within the vicinity of the gas transmission network (Code of Practice and Safety Advice) and the blast and vibration data from the blasting conducted during the construction of the Phase 2 BRDA to provide an assessment of the expected Peak Particle Velocity (PPV) during the proposed Borrow Pit extraction blasting.

Following initial consultation with GNI and site visit during 2016, GNI provided clarification for the minimum offset distance for the transmission gas pipeline on site if explosive blasting was conducted in the proposed Borrow Pit and an appropriate PPV threshold for the pipeline. Email (02 November 2016) from GNI to AAL:

- Blasting may take place within 400 m of a gas transmission pipeline with the consent of GNI; and

- A limit of 75 mm/s (peak particle velocity, PPV) on the ground surface above the gas pipeline shall be applicable before a stress analysis of the pipe is required i.e. the geophone sensor shall be placed directly above the pipeline on the ground surface.

The Golder Assessment proposed to limit the threshold to 50 mm/s, rather than the 75 mm/s proposed by GNI, to allow for a margin of error and a setback distance of 50 m was recommended to meet this threshold. Section 6 of the **Golder Report, 'Borrow Pit: Phase 1 BRDA Blast Vibration Assessment' 166.73.76.R01.A1, July 2017,** deals with an assessment of ground vibrations from blasting at the Borrow Pit, assuming a Maximum Instantaneous Charge (MIC) of 35 kg. The set-back distance from the GNI Pipeline to remain compliant with the PPV= 50 mm/s threshold is estimated at 29 m, and a PPV = 25 mm/s is estimated at a set-back distance of 50 m.

A teleconference meeting with GNI, Golder and AAL took place on the 03 March 2017 and the following minutes were taken and requests agreed to:

- GNI have received and studied the Golder Associates Blast Vibration Assessment for proposed Borrow Pit;
- GNI received the Golder Drawing 05 detailing the proposed Borrow Pit Development Phasing which showed the development phasing from Year 1 to Year 7;
- Blast face only comes nearest to the GNI Transmission Pipe during Year 7;
- GNI are satisfied at this stage with the 50 m set-back to the Borrow Pit blast face and 50 mm/sec peak particle velocity threshold over/on the GNI Transmission Pipe, provided the following requests are adhered to:

i) GNI are updated with any further relevant technical development re blasting vibration at this pre-planning stage;

ii) GNI are given sufficient notice, by AAL, of the first and subsequent trial blasts during the initial development of the Borrow Pit;

iii) GNI are informed by AAL of any amendments to the vibration model based on the initial trial blasts;

iv) GNI are kept fully informed by AAL of the blasting schedule during the Borrow Pit;

v) GNI are facilitated by AAL for GNI representative to be given notice to monitor and be present during these trial blasts and subsequent blasts; and

vi) GNI are given access immediately on site to any monitoring records of those blasts on the day of the blasts.

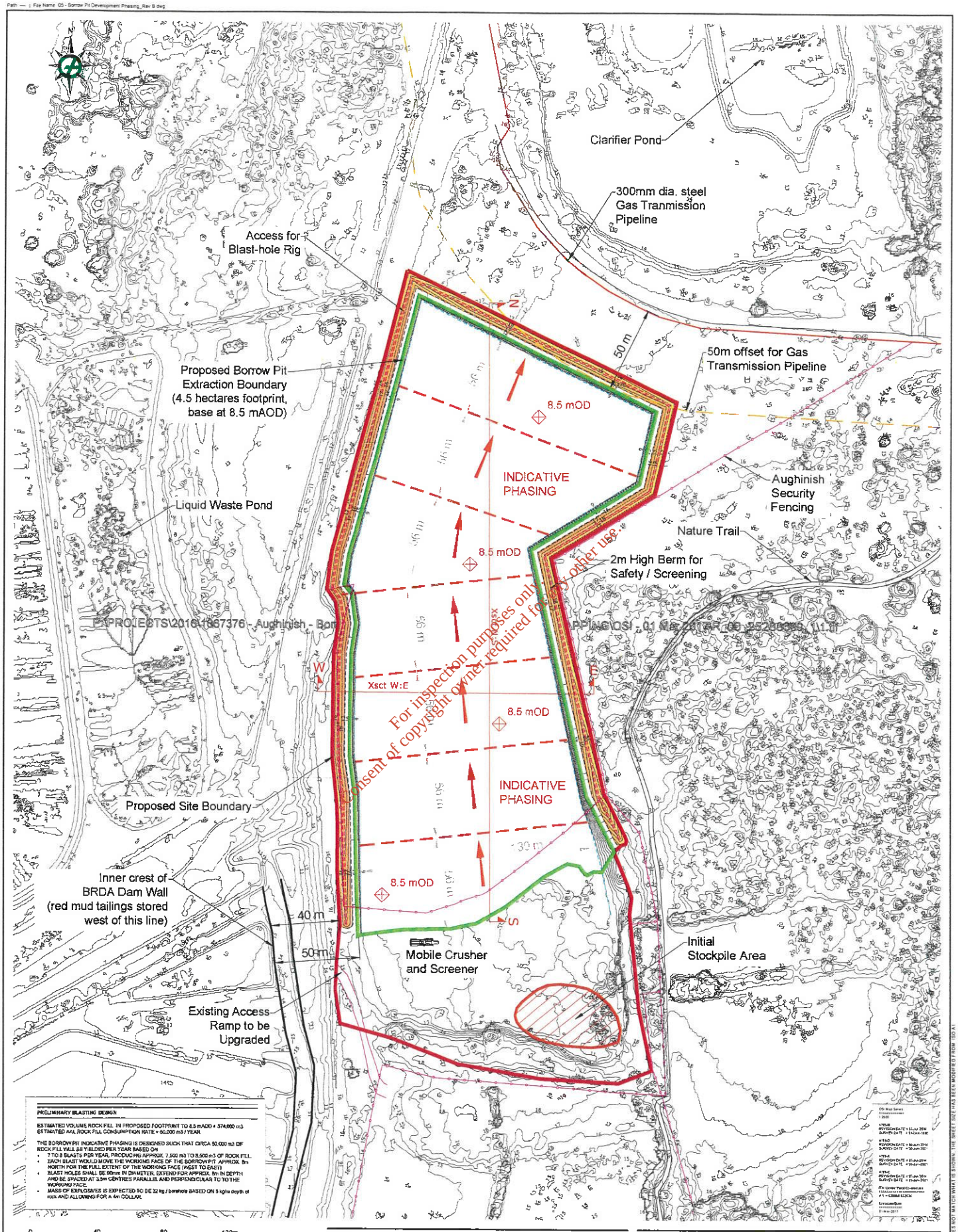
TECHNICAL MEMORANDUM SIGNATURE PAGE

GOLDER ASSOCIATES (IRELAND) LTD

Brian Keenan
Project Manager

Roger White
Principal

BK/RW/ar



APPENDIX C – RESPONSE TO APPEAL PREPARED BY ECOLOGY IRELAND LTD.

Response to Point 11 of Cappagh Farmers Support Group Submission

Cappagh Farmers Support Group have sought to appeal the grant of planning permission (17/714) related to the extension of a borrow pit area on Aughinish Island. Among the grounds for appeal included in their submission relates specifically to the potential impacts on designated sites (Point 11).

The Cappagh Farmers Support Group submission mentions:

> the requirements to provide deregation licenses in advance of consent and consultation.

There was no resting place (e.g. Otter holt, Bat roost) recorded within the application area and therefore there is no requirement for application for derogation licence as suggested in the submission.

> Clearly the amount of rock blasting that is mentioned in the application over a 10 year period been carried over 5 month period between March/September with blasting 6/7 times within that period will hugely impact negatively on habitats, birds nesting, ecosystems etc and is totally unacceptable to allow this application to go ahead as shown below under 7.4.7 & under key species of Designated areas.

It is suggested that the EIAR and associated Screening Assessment in support of the Appropriate Assessment process does not adequately "show" (assess) impact on "protected SAC's involving habitats, birds, ecosystems". The timing of the blasting in the summer period is effectively 'mitigation by avoidance' for the overwintering bird species (qualifying interests of the SPA) which could potentially be disturbed should blasting occur during the winter months. The blasting will only occur outside of the over-wintering period when the key qualifying avian interests of the River Shannon & River Fergus Estuaries SPA will not be present in significant numbers in the wider area. There is no suitable habitat for breeding Cormorant within or adjacent to the proposed development boundary and it is highly unlikely that the infrequent blasting will be a source of any significant disturbance for Cormorants during the breeding season. The low level of blasting, occurring over a 5-month summer period is unlikely to have significant adverse impact on bird species of nearby designated sites overall. Extraction works will take place during the hours of daylight, minimising disturbances to roosting birds and mammals and birds active in the nocturnal/crepuscular period. Furthermore, bird species are likely to be already somewhat tolerant of ongoing noise as the area already holds industrial facilities, an existing borrow pit, residential areas, and an overall suburban anthropogenic-influenced environment heading towards Foynes and Shannon-Foynes Port.

Chapter 7 of the EIAR (Biodiversity) fully assessed the potential ecological impacts of the proposed borrow pit extension project on the fauna, flora and habitats present. This assessment was informed by specialist field surveys and a thorough desktop review of available information on the local ecology. There appears to be some confusion on behalf of the appellant on the sections of the report describing the in situ and potential ex situ impacts of the project. There is for instance no

disagreement or conflict between the Points quoted (Section 3.3 relating to the designated Natura 2000 sites in the wider area & Section 7.4.7 relating to the potential ecological succession of the habitats present within the application boundary in the 'Do Nothing' scenario).

We see conflicting information in this application and this EIS, on one hand we see no key habitats been effected and quite the opposite on another.

Under 3.3 it states "*The site is not located within the boundaries of the Natura 2000 sites in question, **does not include in any key habitats** or species relating to the conservation objectives of the designated sites and will not require any resources from the sites, therefore there will be no direct loss of key habitats or species relating to the conservation objectives of the designated sites as a result of the proposed development and as such direct impacts of the Natura 2000 sites is not of concern*"

Under 7.4.7 Do nothing impact it states "*with regard to do nothing scenario, it is assumed that the proposed borrow pit area would essentially **remain in its current state with the continued persistence of the existing habitats (eg Dry meadow and grassy verge (GS2) and Scrub (WS1)*** habit would increase in extent over time and that Dry meadow and grassy verges (GS2) would decrease as this habit progresses to Scrub (WS1) Flora and Fauna species that are currently associated with the habitats of the proposed site and adjacent area will also continue to persist.

Under key species of Designed Sites "*Activities associated with the proposed borrow pit development have the potential to **disturb and/or displace key faunal species of the designated site** The River Shannon & River Fergus Estuaries SPA and Lower River Shannon SAC (Otter only) through increased disturbance such as, noise and /or visual cues*"

What is stated in Point 3.3 does not conflict with that presented in Point 7.4.7. The potential for disturbance of key species of the designated sites in question is dealt with in Point 7.4.1.1 of the EIAR. There the potential for noise and visual disturbance to impact upon these species is discussed, including qualifying interests of the River Shannon and River Fergus Estuaries SPA and upon Otters, a qualifying interest of the Lower River Shannon SAC. The statement quoted is acknowledging the potential sensitivity of such species to noise and visual disturbance. However, as in the case of potential impacts upon Otters the likelihood of such an impact is assessed using the detailed field observations and past knowledge of the distribution of the species across Aughinish Island. There were no sightings or signs recorded of Otter within or adjacent to the proposed borrow pit area and given the location of the proposed development, within the industrial plant away from the shoreline, it is unlikely that Otters occur in this area with any regularity. It is possible that Otters may commute across, or forage in the area on occasion, but the lack of watercourses in this part of the site

decreases the likelihood that it is an area frequented by Otters. The activity at the proposed borrow pit will be largely restricted to daylight hours when Otters are much less likely to be present in the area. This further minimises the risk that any Otters would be disturbed or displaced through the operation of machinery and personnel in the area. There are no signs that the areas within or adjacent to the proposed borrow pit area are of importance for Otters and it is not expected that the proposed development will have any significant impact upon Otters in the wider area.