Appropriate Assessment Report

Assessment of the likely effects of maintenance dredging on the foreshore at Aughinish, Askeaton, Co. Limerick by Aughnish Alumina Ltd on the integrity of the Lower River Shannon SAC and River Shannon and River Fergus SPA.

Description of Plan/Project

Aughinish Alumina Ltd have made a Foreshore Licence application to conduct maintenance dredging to maintain charted depths at their deep water jetty and at their adjacent pilot berth on the Shannon Estuary at Askeaton, Co. Limerick.

The dredging will consist of plough dredging at three locations, two at the deep water jetty and one at the pilot berth. They are proposing an 8 year annual programme of maintenance with an annual maximum of 8,000m^3. The works are required to ensure the berths can accommodate the vessels that are essential to the working of the plant.

It is proposed to plough dredge both the outer and inner berths at the Aughinish Alumina Jetty having respective areas of 285m by 36m for the outer and 250m by 33m for the inner and also dredge at a third smaller pilot berth site measuring 75m by 25m. Occasional bed levelling will also be required within the areas. The dredging will attempt to restore sea bed depths to approximately 12.2m to 14.3m below Chart Datum at the Jetty. The quantities to be dredged will be in the region of 4,000 tonnes with an unlikely maximum dredge of 16,000 tonnes. The dredging licence application will apply for an 8 year duration with a maximum of 16,000 tonnes per annum.

As the area will be plough dredged, the dredge site and surrounding sea bed will act as the dredge disposal site availing of the strong ambient velocities to disperse the sediment widely within the middle estuary through bedload and suspended load. It is proposed that the dredging would be carried out either in September 2016 when the berths are unoccupied or at a time where the need and opportunity arises. The anticipated plough dredging rate is likely to be of the order of 1m^3 of sediment per minute which represents a dredging rate of 31.25kg/sec or 2,700 tonnes over a 24hour period. Typically a dredge event may take place over a four or five day period depending on quantity but could vary from 1000 to 4000m3.

The location and details of the proposed development is shown in the following drawings that were submitted with the application,

- Drg.No. 17076-5008 Rev. A, Drawn: 29/03/2016
- Drg.No. 17076-5005 Rev. A, Drawn: 16/12/2015,
- Drg.No. 17076-5006 Rev. A, Drawn: 16/12/2015,

The applicants submitted with the foreshore licence application a Natura Impact Statement accompanied by the following supporting documents ;

- Report: Impacts on the receiving Environment. Maintenance Dredging & Dumping at Sea Aughinish Alumina Jetty, Malachy Walsh and Partners.
- Report: Assessment of Risk to Marine Mammals from Proposed Maintenance Plough Dredging at Auginish Jetty, Co. Limerick, Dr. Joanne O'Brien.
- Report: Sediment Transport Modelling of Proposed Maintenance Dredging of the Outer and Inner Berths at the Aughinish Marine Terminal, Shannon Estuary, Hydro Environmental Ltd.
- Report: Aughinish Baseline Characterisation Report, AQUAFACT International Services Ltd.
- Report: Archaeological Impact Assessment Report, Rusal Ltd, Aughinish, Co.

These documents were considered and used in the preparation of this assessment.

Natura 2000 sites

Lower River Shannon SAC

This very large site stretches along the Shannon valley from Killaloe to Loop Head/ Kerry Head, a distance of some 120 km. The site thus encompasses the Shannon, Feale, Mulkear and Fergus Estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head.

The site is selected for lagoons and alluvial wet woodlands, both habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for floating river vegetation, Molinia meadows, estuaries, tidal mudflats, Atlantic salt meadows, Mediterranean salt meadows, Salicornia mudflats, sand banks, perennial vegetation of stony banks, sea cliffs, reefs and large shallow inlets and bays all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive – Bottle-nosed Dolphin, Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Atlantic Salmon and Otter.

There is a resident population of Bottle-nosed Dolphin in the Shannon Estuary. This is the only known resident population of this E.U. Habitats Directive Annex II species in Ireland. Otter, a species also listed on Annex II of this directive, is commonly found on the site.

The key Conservation Objectives for this site are:

- To restore the favourable conservation condition of Freshwater Pearl Mussel
- To restore the favourable conservation condition of Sea Lamprey
- To maintain the favourable conservation condition of Brook Lamprey
- To maintain the favourable conservation condition of River Lamprey
- To restore the favourable conservation condition of Salmon
- To maintain the favourable conservation condition of Sandbanks which are slightly covered by sea water all the time
- To maintain the favourable conservation condition of Estuaries
- To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide

- To restore the favourable conservation condition of Coastal lagoons
- To maintain the favourable conservation condition of Large shallow inlets and bays
- To maintain the favourable conservation condition of Reefs
- To maintain the favourable conservation condition of Perennial vegetation of stony banks
- To maintain the favourable conservation condition of Vegetated sea cliffs
- To maintain the favourable conservation condition of Salicornia and other annuals colonizing mud and sand
- To restore the favourable conservation condition of Atlantic salt meadows (Glauco Puccinellietalia maritimae)
- To maintain the favourable conservation condition of Bottlenose Dolphin
- To restore the favourable conservation condition of Otter
- To restore the favourable conservation condition of Mediterranean salt meadows (Juncetalia maritimi)
- To maintain the favourable conservation condition of Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho Batrachion vegetation
- To maintain the favourable conservation condition of Molinia meadows on calcareous, peaty or clayey silt laden soils (Molinion caeruleae)
- To restore the favourable conservation condition of alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno Padion, Alnion incanae, Salicion albae)

River Shannon and River Fergus SPA

The estuaries of the River Shannon and River Fergus form the largest estuarine complex in Ireland. The site comprises the entire estuarine habitat west from Limerick City and south from Ennis, extending west as far as Killadysert and Foynes on the north and south shores respectively of the River Shannon (a distance of some 25 km from east to west). Also included are several areas in the outer Shannon estuary, notably Clonderalaw Bay and Poulnasherry Bay, as well as the intertidal areas on the south shore of the Shannon between Tarbert and Beal Point.

The site is the most important coastal wetland site in the country and regularly supports in excess of 50,000 intering waterfowl.

The key Conservation Objectives for this site are:

- To maintain the favourable conservation condition of Cormorant.
- To maintain the favourable conservation condition of Whooper Swan.
- To maintain the favourable conservation condition of Lightbellied Brent Goose.
- To maintain the favourable conservation condition of Shelduck.
- To maintain the favourable conservation condition of Wigeon.
- To maintain the favourable conservation condition of Teal.
- To maintain the favourable conservation condition of Pintail.
- To maintain the favourable conservation condition of Shoveler.
- To maintain the favourable conservation condition of Scaup.
- To maintain the favourable conservation condition of Ringed Plover.
- To maintain the favourable conservation condition of Golden Plover.
- To maintain the favourable conservation condition of Grey Plover.

- To maintain the favourable conservation condition of Lapwing.
- To maintain the favourable conservation condition of Knot.
- To maintain the favourable conservation condition of Dunlin.
- To maintain the favourable conservation condition of Blacktailed Godwit.
- To maintain the favourable conservation condition of Bartailed Godwit.
- To maintain the favourable conservation condition of Curlew.
- To maintain the favourable conservation condition of Redshank.
- To maintain the favourable conservation condition of Greenshank.
- To maintain the favourable conservation condition of Blackheaded Gull.

To maintain the favourable conservation condition of the wetland habitat in the River Shannon and River Fergus Estuaries SPA as a resource for the regularly occurring migratory waterbirds that utilise it.

Impact of Project on key species, key habitats and integrity of the sites

Considering the location, nature and scale of the proposed works it is considered that no direct or indirect effects are likely on the following species / habitats,

- Freshwater pearl mussel (Margaritifera margaritifera) [1029];
- Brook lamprey (Lampetra planeri) [1096];
- Sandbanks which are slightly covered by sea-water all the time [1110];
- Coastal lagoons [1150];
- Large shallow inlets and bays [1160];
- Perennial vegetation of stony banks [1220];
- Vegetated sea cliffs of Atlantic and Baltic coasts [1230];
- Salicornia and other annuals colonising mud and sand [1310];
- Atlantic salt meadows (Glauco-Puccinellietalia-maritimae) [1330];
- Mediterranean salt meadows (Juncetalia maritimi) [1410];
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260];
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinia caeruleae) [6410]
- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0];
- Wetlands.

The dredging operation as proposed may have a direct or indirect effects on the following species / habitats,

- Sea lamprey (Petromyzon marinus) [1095];
- River lamprey (Lampetra fluviatilis) [1099];
- Atlantic Salmon (Salmo salar) [1106];
- Otter (Lutra lutra) [1355];
- Bottle-nosed Dolphin (Tursiops truncates) [1349];
- Estuaries [1130];
- Mudflats and sandflats not covered by seawater at low tide [1140];

- Reefs [1170];
- 21 bird species of conservation interest.

Dredging activity will result in alteration of estuary bed at the dredge sites. Water quality impacts from increased suspended sediment and turbidity in the water column potentially causing habitat alteration and/or species displacement. Pollutants/harmful substances could disperse into the aquatic environment once sediments are disturbed impacting on water quality and potentially causing indirect species displacement. Deposition of dredged material could cause habitat alteration and/or species displacement through smothering impacts on in-faunal communities, potentially affecting the food resource of SCI bird species. Increased vessel movements could result in both aquatic and avian species disturbance/displacement. Noise emissions to air during dredging operations could lead to temporary disturbance/displacement of qualifying bird/mammal species. Noise emissions to water during dredging operations could cause temporary disturbance/displacement impacts to marine mammals potentially in the area. Accidental spills of fuels/lubricants could lead to habitat alteration and/or species displacement through adverse impacts to water quality.

While species may be temporarily displaced from the area whilst dredging is taking place, or as a result of any temporary and localised increased in suspended sediment concentrations, it is expected that they will quickly return to the area once dredging activity has ceased and given that suspended material will be quickly dispersed by tidal currents. Any temporary displacement will be localised to the Aughinish area and as such displacement from key areas of habitat within the estuary is not likely to occur. Again, bearing in mind the existing levels of vessel activity throughout the estuary it is considered likely that any displacement would be short-lived and not result in any significant adverse impacts to the species

The proposed dredge activity will be short-term and intermittent in nature. Analysis of sediment characteristics has determined that the material is clean and does not pose any risk to the surrounding environment. Any material which becomes re-suspended into the water column is what already occur naturally on the estuary bed and levels of re-suspended material are not expected to exceed normal ambient background levels.

The habitats within the dredged area will be disturbed during the operations. These impacts will be temporary and localised. This will have a slight adverse impact on the Conservation Objectives for these habitat types. The total area of the "Estuary" habitat in the SAC is 24,277 Ha while the area of "Large Shallow Inlet and Bay" habitat is 35,282 Ha. Given that the total area to be dredged is only 5.04 Ha it can be concluded that the effect on these habitats will not be significant. There will not be significant disturbance to key habitats or species. Additionally there will be no habitat or species fragmentation and the overall integrity of the site will not be affected.

The Shannon Estuary is an important habitat for bottlenose dolphins. Research carried out since 1993 has shown that the dolphins are resident, occur throughout the year and it is an important calving area. Surveys carried out by Berrow et al, (2010)[1] showed that dolphins were located

1 Simon Berrow, Joanne O'Brien, Lisa Groth, Aoife Foley and Kerstin Voigt (2010) Bottlenose Dolphin SAC Survey 2010. Report to the National Parks and Wildlife Service. Shannon Dolphin and Wildlife Foundation. pp.24.

throughout the mid to outer estuary, from Tarbert west to Kilcredaun Head at the mouth of the estuary, with the main concentrations off Kilcredaun Head, Kilbaha, Leck Point in the outer estuary and Carrig buoy in the middle estuary. Noise from the works could lead to damage or disturbance of these dolphins.

The location of the proposed dredging is within the habitat used by dolphins but is not within the "critical habitat" identified in the NPWS (2012)[2].

The water column in the estuary, including those areas where it is proposed to carry out the dredging operations, is highly turbid due to resuspension by strong tidal currents. Increase in water column turbidly as a result of the dredging of the seabed will be temporary, localised and within the natural range of variability caused by current induced sediment resuspension

The proposed works could potentially result in some limited disturbance of birds in the area due to noise emissions from dredging activity. However, given that the works will be temporary and intermittent in nature any potential disturbance is expected to be short-term and not significant. Furthermore, given the high level of activity which normally takes place within the vicinity of Aughinish and throughout the greater estuarine area, it is expected that bird populations which over-winter within the SPA are already habituated to a relatively high level of noise associated with vessel movements and plant operations. Therefore, given that dredging will take place while the vessel berths are not in use, any noise emissions resulting from dredging activity are not expected to surpass those which would normally occur were the jetty fully operational. Some of the wintering species, such as shelduck, scaup and greenshank, do occasionally utilise subtidal areas for foraging. However, given that there will be no significant direct alteration of the subtidal bed areas; significant displacement of these species from potential feeding areas is not considered likely to occur. Bed material will simply be levelled, rather than removed and as such no significant impacts to potential marine prey resources for these species is envisaged.

The dredging is not expected to result in any significant indirect alteration of feeding grounds for birds as it will be conducted exclusively within the sub-tidal zone. no significant impacts to inter-tidal habitats, such as the mudflats and sandflats occurring within the vicinity of the proposed operations, which are likely to be used as feeding grounds by over-wintering species, are envisaged. The proposed works will not have any significant impacts on other estuarine habitats utilised as feeding grounds, such as rocky shore, therefore displacement from these areas is not considered likely to occur.

There will be no significant impact on wetland habitats and habitat or species fragmentation will not occur as a result of the proposed dredging operations. No areas of intertidal mudflats, saltmarsh or habitats of a similar nature are located in the proposed dredge areas and no loss of potential feeding area for waterbirds will occur. There will be no direct discharge of pollutants into the environment during the works and water quality will not be affected.

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[2] NPWS (2012) Conservation Objectives: Lower River Shannon SAC 002165. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Mitigation Measures

Marine Mammals

To minimise the risk of permanent or temporary disturbance to marine mammals, especially bottlenose dolphins in the vicinity of the dredging operations, The NPWS Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters" waters – January 2014' (NPWS 2014) recommends that stated mitigation procedures for dredging are followed and monitored by a suitable qualified Marine Mammal Observer;

The interaction with Bottle-nosed dolphins will be mitigated full implementation of the measure set out in the above Guidance document which will include by the employment of a Marine Mammal Observer and the use of "soft start" procedure. The Marine Mammal Observer will undertake 30 minutes of survey prior to commencement of the soft-start procedure to ensure that no marine mammals are within 500m of the works area.

An agreed and clear on site communication signal will be used between the MMO, and the Superintendent/Site Engineer, as to whether the relevant activity may proceed, or not, or resume following any break in activities. It shall only commence on positive confirmation with the MMO;

Dredging activities will only commence in daylight hours where effective visual monitoring, as preformed and determined by the MMO, has been achieved. Where effective monitoring (determined by the MMO), has not been achieved/was not possible for some reason, the sound producing activities will be postponed until effective monitoring is possible;

This pre-start-up monitoring will be followed immediately by normal dredging activities. The delay between the end of pre-start-up monitoring, and the full dredging must minimised;

Once normal dredging operations commence, there is no requirement to halt or discontinue the activity at night-time, nor if weather or visibility conditions deteriorate, nor if marine mammals occur within a 500m radial distance of the sound source, i.e., within the monitored zone;

Operations will cease temporarily if marine mammals are observed within the monitored zone. Then pre-start monitoring will be carried out again, prior to recommencement of dredging activities;

If there is a break in sound output for greater than 30 minutes (equipment failure/location change/shutdown), then pre-start monitoring will be carried out again, prior to recommencement of dredging activities;

Any approach by marine mammals into the immediate works area should be reported to the National Parks and Wildlife Service;

During movement of vessels (dredger etc.) caution should be exercised to minimize risks to marine mammals that may avoid detection by the MMO. A speed limit of 10 knots will be considered;

Water Quality

There will be no refuelling of the dredger at the site.

Potential leaks from vessels/boats will be mitigated by contractually requiring the contractors to only operate/supply vessels/boats that are in good working order, up to date in servicing etc., and free of leaks.

There will be no direct discharge of pollutants into the environment during the works and water quality will not be affected.

Emergency Plans and Procedures

The contractor will prepare an emergency response plan and set of procedures for events likely to cause pollution including the pollution of watercourses with fuels/oils, spillages, etc.

Dredging Activities

The dredger will operate in an appropriate safe manner.

Short term dredge events will be undertaken at optimal times in the dredge cycle in order to minimise the volume and extent of plume and dispersal.

Conclusion

Based on the above and the documents submitted it is concluded that the proposed dredging of a maximum of 16,000 tonnes per annum will not have a significant adverse impact on the Conservation Objectives of the Lower River Shannon SAC or the River Shannon and River Fergus SPA and that the integrity of these sites will not be affected.

Prepared Barry Mc Donald M.Eng. M.I.E.I. on behalf of the MLVC.

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