Dalradian Gold Limited

Curraghinalt Project

County Tyrone

Northern Ireland

Rebuttal Report

Ecological Matters

Mine Application

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CONTENTS

Appendices

1. INTRODUCTION

This Rebuttal Report (RR) has been prepared by Karl Goodbun (MCIEEM) of Karl Goodbun Limited on behalf of the Applicant (Dalradian Gold Limited – "DGL") pursuant to the Mine Application. In preparing this RR, regard has also been had to comments raised by others in respect of Water Abstraction where relevant.

Regard has been had to the expert opinion of other consultants instructed by the Applicant, namely, Dr Michael Stewart of Kaya Consulting, Mr Mervyn Keegan of Aona, Mr Steve Coates of RSK and Mr Steve Judge of Green and Blue Ecology.

Specific regard has been had to matter raised by:

1) DFI / NIEA
2) Loughs Agency;
3) Fermanagh and Omagh District Council (FODC);
4) Communities Against Mining;
5) Save Our Sperrins;
6) Sinn Féin and
7) Individual objectors.

It is noted that Mid Ulster District Council raise no issues in relation to ecology and nature conservation matters.

There are certain points or topics which are common to the submissions of the parties. In order to address matters succinctly, whilst pertinent points are summarised, cross referencing has been used to direct the reader to where a point has already been addressed in this RR, or where the detailed information relevant to the response can be found.

2. SUMMARY AND ANALYSIS OF SALIENT POINTS RAISED

DfI / NIEA – Mine Application

The DfI SoC summarises, at sections 6.3 and 6.4, concerns raised by consultees relating to Ecology and Nature Conservation Sites and the Water Environment. In relation to matters concerning the Water Environment, some cited issues relate either directly or indirectly to ecological or nature conservation matters, however the points are duplicated elsewhere and to try and keep this RR as succinct as possible, responses on topic areas are not duplicated.

The DfI SoC in relation to the Mine Application includes at its Appendix 2, the "Statement of Case input" from NIEA, with input provided from relevant branches / teams within NIEA. Of specific relevance to this RR are the responses provided by:

NED - Countryside, Coast and Landscape Planning Branch;

NED - Biodiversity and Wildlife Unit & Conservation Designation and Protection Branch; and

RED - Water Management Unit.

The DfI SoC includes a statement provided by Loughs Agency at its Appendix 3.

The above are all considered relevant to this RR and the pertinent points raised are set out and addressed below.

NED - Countryside, Coast and Landscape Planning Branch

Sections 3 to 9 of the NED Countryside, Coast and Landscape Planning Branch (NED – CCLPB) concern relevant protected species. Matters are discussed below.

Sections 3, 4, 6, 7 8 and 9 concern birds, bats, Badges, Common Lizard, Smooth Newt and Marsh Fritillary (butterfly) respectively. For each of these species, the only concern raised relates to the length of time that has elapsed between the original surveys and whether any changes to mitigation are required.

This matter is fully addressed by reference to the updated survey work undertaken in the interim period, with copies of the relevant reports provided at Annexes 2, 3, 5, 6, 7, 8 and 9 of the TR6 in respect of Ecology and Nature Conservation (hereafter "TR6"). For clarity, the results of those update surveys confirmed that the mitigation measures, as originally identified and considered sound by NED, remain appropriate with no changes required.

Section 5 concerns Otters. The only concern raised relates to the fact that subsequent to the submission of the 2017 planning application, evidence of Otter was recorded in 2018. NED state that: “NED require mitigation for otters using the watercourses within the site, including a pre-construction otter survey carried out by the ECoW to check for otter activity within 150m of works, and standard mammal protection measures to be implemented during any construction works”.

As with other relevant species, updated survey work has been undertaken in respect of Otter and the results presented in the report included at Annex 4 of the TR6. The baseline situation is consistent with that for 2018 and referenced by NED.

Ecological monitoring and oversight are fundamental to the approach regarding construction related ecological mitigation. The mitigation as cited by NED forms part of any final CEMP and can simply be conditioned.

Sections 10 and 11 concern invasive species and Northern Ireland Priority Habitats. NED confirms that it is content that appropriate mitigation measures are proposed. This is welcomed.

Insofar as matters concern the age of data and the validity of the assessment conclusions, it is relevant to consider the judgment in respect of Newry and Mourne [2015] NIQB 65). It is stated:

> *“[57] I agree with the Respondent that the age of the assessment as a factor in and of itself is irrelevant. The central question is whether the assessment was adequate and reliance upon it reasonable. As the Respondent pointed out other than the issue of the subsequent three permissions, the applicant does not suggest that the assessment is otherwise inadequate or out of date."*

NED do not specifically question the assessment. In relation to the Mine Application, for determination purposes there is a suite of data spanning many years and this includes data gathered post application such that full confidence can be given to assessment findings and conclusions. Moreover surveys have been updated as appropriate and set out in TR6 and this RR. The assessment (with references to the ES package of information and the Ecology and Nature Conservation TR6) is adequate and is not out of date.

NED - Biodiversity and Wildlife Unit & Conservation Designation and Protection Branch

The overarching position of NED Biodiversity and Wildlife Unit & Conservation Designation and Protection Branch (NED BWU&CDPB) is that:

"Based on the current information, the proposal is contrary to policy NE01 Nature Conservation of the Fermanagh and Omagh District Council Local Development Plan 2030 in that that development would be likely to have a significant adverse impact on areas or features of international/national/local importance, namely the Owenkillew River SAC and the Owenreagh River ASSI, and reasonable scientific doubt remains."

Concerns raised by NED BWU&CDPB can be distilled as follows:

a) Matters concerning the ecological value of the Curraghinalt and Pollanroe burns;
b) Matters concerning the unfavourable condition of relevant designated rivers and the need for "Stringent standards" to be applied in relation to water discharges within the Curraghinalt and Pollanroe Burns";
c) Air Quality Considerations

These matters are addressed below.

<u>Ecological value of the Curraghinalt and Pollanroe burns</u>

NED BWU&CDPB state that, based on the fact that "electrofishing surveys undertaken by Loughs Agency in June 2021 and Dalradian commissioned consultants supervised by Loughs Agency staff in June 2022", it does not agree that the Pollanroe Burn and Curraghinalt Burn are of 'low risk' and have limited ecological value.

Dealing first with the matter of ecological value, it is maintained that both burns can be considered as having limited ecological value. Context in relation to the baseline conditions is important and the following points are made.

First and foremost, in October 2018, NED confirmed in its consultation response on the application that it did not disagree that Pollanroe Burn, which has a catchment size twice that of Curraghinalt Burn, had 'limited ecological value'. Its change in stance, as is clear from the SoC input it has provided to DfI, relates solely to the salmonid baseline data and in particular that relating to Atlantic Salmon.

The burns comprise rocky / stoney substrate, are 'flashy' (subject to fast changing flows and neither burn supports any vegetation of note. Further, the long-term river invertebrate monitoring and WFD classification results (see Annex 10 TR6) support the assertion that the burns are of low ecological value. River invertebrate monitoring is a well-established methodology which is used as part of the environmental assessment process.

Regarding fish, to avoid unnecessary repetition here, the full results of relevant survey work can be found at Annexes 14 and 16 of the TR6 in respect of Ecology and Nature Conservation. To be clear, the electrofishing survey work undertaken and cited by NED confirmed the

presence of low numbers of Atlantic Salmon parr and Brown Trout in the Pollanroe Burn and very low numbers of Brown Trout within the Curraghinalt Burn. Regarding the Curraghinalt Burn, fish can only access the burn during high flow events due to its perched nature and it is considered that the trout recorded during the surveys are fish which have become trapped having accessed it during such flow events. Further, the absence of Atlantic Salmon has been further clarified through the undertaking of eDNA survey work (Annex 16 of TR6). Specifically, regarding the Pollanroe Burn, the recorded fish were all in the lower sections of the burn close to its confluence with the Owenreagh River.

In terms of habitat suitability for salmonids, reference is drawn to section 5 of TR6. For all relevant habitat requirements (e.g. spawning, nursery and holding) all survey sections were recorded as 'failing' when the relevant grading criteria are applied. There is no optimal salmonid habitat present in the burns and for both burns there are features present which significantly limit the extent of habitat which can be accessed by salmonids.

Thus, with reference to the above in tandem with the detail provided at TR6, the following broad conclusions arise:

1. The Curraghinalt burn does not support Atlantic Salmon and is used sporadically by individual Broun Trout when conditions allow;
2. The Pollanroe Burn supports Atlantic Salmon parr and Brown Trout in the lower reaches only;
3. Neither Burn provides optimal salmonid habitat; and
4. Any value (at whatever scale) to salmonids attributed to the Pollanroe burn is highly localised, being constrained to the lower reaches close to the confluence.

In view of the foregoing, the evidence objectively assessed confirms that the burns are of limited ecological value.

Regarding "risk", this links directly with the level of impacts which are considered to arise, the sensitivities of the features present and the detail of the proposed mitigation. These are matters considered further below, but the short point is that full regard has been had to the updated baseline regarding salmonids and the discharge proposals have been revised by the Applicant in order to reflect this, a matter covered in detail within the TR6, the Applicant's SoC in relation to Water Discharges and the Applicants RS Water Discharges.

<u>Condition of relevant designated rivers and the need for "Stringent standards" to be applied in relation to water discharges within the Curraghinalt and Pollanroe Burns</u>

NED BWU&CDPB state:

"Given the current condition of the designated sites, degraded water quality in both watercourses could potentially be significant. Stringent standards for water discharges within the Curraghinalt Burn and Pollanroe Burns must be met, to avoid a likely significant or adverse effect on designated sites. This is also applicable to discharges that may impact Freshwater Pearl Mussel and their ability to be self-sustaining, as water quality is the single biggest factor that determines their condition status. It is expected, however, that suitable standards set for Atlantic Salmon at specific locations in both the Pollanroe and Curraghinalt Burns will also afford protection for Freshwater Pearl Mussel. Furthermore, maintaining stringent (and suitable) standards for Atlantic Salmon and subsequently Freshwater Pearl Mussel, will have wider ecological benefits for protected riverine sites and features, such as otters"

It is also stated that:

"NED would advise water discharges into the Burns are set based on targets of an annual mean of <10mgL-1 (spawning & nursery grounds) for suspended solids, as outlined in the Owenkillew SAC Conservation Objectives. These levels for suspended solids should be met 40 m upstream of the confluence between the Curraghinalt Burn and the Owenkillew River and 1.2 km upstream of the confluence of the Pollanroe Burn and the Owenreagh River, and not as previously modelled at the confluences."

The response goes on to discuss some additional Freshwater Peal Mussel Considerations at the very end of the document. These comments relate to population size / status, sensitivities of the species and the need to restore feature condition to favourable status.

Matters concerning baseline water quality and the Applicant's approach to defining appropriate limit values associated with discharged water are discussed in detail at section 13 of the Applicant's TR6 and the outline Betterment Plan included at Annex 13 of that TR6. Such matters are also discussed within the Applicant's RS in respect of the Water Discharges SoC.

By way of summary, and cognisant of the relevant water quality baseline and the results of the updated fish surveys of the two burns subject to proposed water discharges, the Applicant has revised the proposed discharge limits (see section 13 of TR6). These new limit values not only protect the environmental conditions of the burns (are protective of salmonids) but will also improve baseline water conditions associated with the main rivers; conditions which have deteriorated through the actions of others. A Betterment Plan (Annex 13 of t TR6) is also put forward which will see additional benefits in terms of water quality (e.g. reduction in nitrates through changes in land management and habitat enhancements, including at the banks of the Owenkillew itself).

Specifically, regarding NED's "advice" that water discharges into the Burns should be set based on targets of an annual mean of <10mgL-1 (spawning & nursery grounds) for suspended solids, this is considered to be a misinterpretation of the available survey evidence and inappropriate given the level of risk. The matter is covered in detail within the Applicant's

RS submitted in respect of the Water Discharges SoC. For clarity, the Applicant's proposed 50mgL (Max EQS) for both burns and an additional 25mgL (Annual Average EQS) is considered appropriate and protective of the relevant environmental conditions in view of the baseline evidence.

Air Quality Considerations

NED BWU&CDPB state that NIEA have now developed an interim assessment approach in relation to assessing the impacts of air pollution on the Natural Environment. It states that on the information currently provided it cannot apply its interim assessment approach and in this light, it states that:

> *"Given the approach has now changed, further information is required to enable NED to provide updated advice. This would include output data from the model in the form of annual predicted levels, from which the final Process Contribution (PC) for NOx emissions on each of the designated site identified within the Zone of Influence (ZoI) have been provided."*

It goes on to state:

> *"Therefore, the applicant must therefore submit these as part of the air quality impact assessment to include both nitrogen deposition (Critical Loads) and emissions (Critical Levels) from NOx with appropriate screening distances to allow a full and robust assessment of designated site impacts. NED also require co-ordinates used to model source and receptor to the nearest point of each designated site."*

The above is addressed in full within the Air Quality RR prepared by AONA on behalf of the Applicant (see Section 1.2.2 of that RR). All of the information requested by NIEA is presented. The assessment is comprehensive, with emissions from both ventilation raises and site traffic considered using 'measured concentration' data. The assessment work presented in that Rebuttal Report demonstrates that, the 'nugatory' threshold of 0.1% attributable to Process Contributions for NOx and Nitrogen deposition is not exceeded.

NIEA RED Water Management Unit

The key issues raised by NIEA NED Water Management Unit (NED WMU) can be distilled as follows

1) Concerns regarding deficiencies in the fisheries habitat assessment work; and
2) Following from this, "*in the absence of a detailed fisheries habitat assessment of the Unnamed Watercourse, Attagh Burn and the Glenealy Burn, it is not possible to rule out any potential likely significant effects, from the proposal, on these Burns and any fish that they may, or may not, suppor*t".

In the above matters, NED WMU refer to the electrofishing survey undertaken by Loughs Agency (June 2021) in in respect of the Pollanroe and Curraghinalt burns. Also cited is documentation produced by the Applicant addressing that survey work in the context of implications for salmonids and the relevant designated sites. Reference is also made to EIA documentation submitted by the Applicant with specific reference to assessment information regarding the ecological value, and specifically the value to fish, of several waterbodies, namely:

a) Pollanroe Burn;
b) Unnamed Watercourse;
c) Curraghinalt Burn;
d) Attagh Burn; and
e) Glenealy Burn.

The specific concerns expressed by NED WMU in its submission are that:

1) The environmental impact assessment process has not considered the potential impacts from the mine proposal on fish, and their habitat, identified within the Pollanroe Burn and the Curraghinalt Burn;
2) The environmental impact assessment process has not included specific survey work on the other small waterways, (listed above), "*impacted by the scheme, to determine if they contain fish, and their range of habitat"*.

These matters are addressed below.

In relation to implications for fish species (and their habitat) identified within the Pollanroe and Curraghinalt burns, such implications have been fully considered by the Applicant. The information and analysis is not rehearsed again here and instead the reader is directed to the discussion above in relation to the position of NED BWU&CDPB, the Applicant's TR6 (and outline Betterment Plan included at Annex 13 of TR6), together with the Applicant's Water Discharges SoC and RS submitted in respect of the Water Discharges applications.

For completeness, the baseline position regarding fish presence (and extent thereof) in both burns, has informed revisions to the proposed discharge consent limit values associated with the Water Discharge Applications. The proposals are considered fully protective of the fish in these burns (and main rivers).

Regarding the other watercourses cited, namely the Unnamed Watercourse, Attagh Burn, and Glenealy Burn, the following is important.

First, the purpose of EIA is to assess the significance of (in this instance ecological) effects. Unlike with the Curraghinalt and Pollanroe burns, no water discharges are proposed in relation to the three cited burns and impacts on flows are not assessed as being significant (e.g. in

relation to fish / salmonids). No direct or indirect significant effects could arise in relation to fish species through the proposals.

Notwithstanding the above, and in view of the concerns raised by NED WMU and those similar concerns raised by Loughs Agency, which additionally presents survey data regarding the presence of salmonids in the Unnamed Watercourse, additional survey and assessment work has been undertaken by the Applicant. A report[1] detailing the methodologies employed and the results of the surveys is presented at Appendix 1 of this RS, entitled Small Burn Surveys - Fish Habitat and River Habitat Assessment of the Attagh Burn, Glenealy Burn and Unnamed Burn (November 2024), RSK.

By way of brief summary, these surveys demonstrate:

a) Significant barriers to the movement of fish species along each of these watercourses are present, significantly limiting any potential value to fish species along the length of the watercourses;
b) The presence of Brown/sea trout[2] within the lower section of the Attagh Burn. No evidence of other fish of potential concern was recorded;
c) Brown/sea trout are present within the lower section of the Glenealy Burn. No evidence of other fish of potential concern was recorded;
d) Brown/sea trout and Atlantic Salmon are present in the lower reaches of the Unnamed Burn, close to the confluence with the Owenreagh River and below the pipe culvert. Upstream of the pipe culvert eDNA results show no evidence of other fish of potential concern.

As already discussed, no discharges are proposed in relation to these burns and any changes to the flow regime are concluded to be not significant in the context of implications for fish. In view of the evidence relating to Atlantic Salmon presence in the Unnamed Burn and the changes to its catchment resulting from the Mine drainage proposals, specific consideration has been given to the magnitude and significance of any change in flows within the RR relating to Surface Water submitted on behalf of the Applicant.

In view of the above and with reference to the detailed information provided at Appendix 1 of this RR along with the information presented in the RR relating to Surface Water submitted on behalf of the Applicant, the concerns raised by NIEA WMU are fully addressed.

NIEA – Abstraction Applications

[1] Small Burn Surveys - Fish Habitat and River Habitat Assessment of the Attagh Burn, Glenealy Burn and Unnamed Burn (November 2024), RSK.
[2] Brown trout and sea trout are the same species and it is impossible to differentiate between the two species using eDNA.

The NIEA SoC raises concerns in relation to implications for ecological receptors, most notably implications for the Owenkillew River SAC and associated qualifying interest features.

Matters concerning the ecological baseline associated with the relevant minor watercourses (e.g. Pollanroe Burn and Curraghinalt Burn) and those areas where there is dispute regarding the assertion by NIEA that Functional Linkage is demonstrated between the burns and the SAC, are dealt with elsewhere within this RR, and / or within the RS pursuant to the Discharge Applications submitted by the Applicant.

Matters concerning implications for relevant water courses in terms of flows are specifically addressed within the RRs in relation to Ground Water and Surface Water, submitted by the Applicant. Additionally, matters concerning proposed water discharge rates applicable to the Pollanroe and Curraghinalt burns are addressed in the RS pursuant to the Discharge Applications.

In relation to the definition of Headwaters and the applicability of JNCC CSM guidance to considerations regarding non designated watercourse the reader is directed to the RS (pursuant to the Discharge Applications.

Contrary to the position adopted by NIEA, the evidence soundly demonstrates that no adverse effects on the integrity of the Owenkillew River SAC will arise through the proposals and further that no significant adverse effects arise in relation to other ecological receptors.

Loughs Agency

Loughs Agency – Mine Application SoC

Loughs Agency's overarching position as expressed within its submissions is that the application documentation is fundamentally flawed. It cites the following as forming the basis of that conclusion:

a) *"Factually incorrect information presented as data*
b) *Outdated survey results and datasets*
c) *Surveys not carried out using accepted best practice methodologies appropriate for the area*
d) *Apparent inappropriate application of international standards*
e) *Failure to appropriately consider impacts on surrounding watercourses, in particular; the Pollanroe and Owenreagh as well as "Un-named watercourse", in the context of salmonid populations. "*

Lough's Agency proceed to highlight specific concerns under various topic headings. Pertinent points are addressed below.

Matters Concerning the sHRA

Survey data relied upon is out of date.

This matter is addressed elsewhere within this RR. For completeness, the baseline information, as relevant to ecological receptors (including fish) has continued to be updated.

There is no evidence of any kind to suggest that the survey material is out of date. Moreover, LA has been engaged in observing survey work. Regrettably, LA has not been forthcoming with providing information to the Applicant in relation to the Unnamed watercourse. The Applicant's Solicitors made an EIR request for the fish survey information relating to the unnamed watercourse that was referenced in the LA SoC and not provided. It is plainly unhelpful to the Applicant that material is not disclosed and it is particularly surprising to see a government agency conduct itself in this fashion. This issue is addressed further in legal submissions.

The age of a survey is not the determining factor, and that is also addressed in legal submissions separately. However, the fact is that assessments have continued to be updated and the point is without merit.

Lack of consideration of those electrofishing surveys undertaken by Loughs Agency and the Applicant

The results of the electrofishing surveys have been fully considered by the Applicant. Detailed consideration is given to this data within TR6. It has also helped inform the revisions to the proposed discharge consent application limit values.

Regarding the Applicant's engagement with Lough's Agency, and in particular matters concerning the survey work associated with relevant burns, a chronology is presented at Appendix 2.

"The presence of Atlantic salmon within the Curraghinalt & Pollanroe Burns as well as the Owenreagh River should elevate the level of consideration given to these watercourses";

A common theme throughout the Loughs Agency SoC is the misleading suggestion that Atlantic Salmon are present within the Curraghinalt burn. There is positive evidence that they are not present.

Matters concerning the Holohan judgement, and the disparity between the sHRA associated with LA10/2017/1249/F and that for LA10/2019/1386/F and LA11/2019/1000/F;

It is understood that the principal concern of Loughs Agency in this matter is that the Pollanroe Burn and Owenreagh River should have been subject to assessment as part of the sHRA process, a point which is made by Loughs Agency in several instances. Tied to this are the various references by Loughs Agency to insufficient consideration being given to the Curraghinalt and Pollanroe Burns as part of the sHRA process.

Concerns regarding the approach in relation to Water Quality have been addressed through the revised proposed discharge limit values. Further, as discussed within the RRs in relation to Ground Water and Surface Water, implications on flows in relevant water bodies do not give rise to effects which could be considered to impact the integrity of the relevant designated sites. Matters concerning Functional Linkage are discussed within the Rebuttal Statement in relation to Discharge Consent Applications, submitted by the Applicant. Further, it remains the position that potential construction related impacts on relevant watercourses (including the burns), for example through surface water runoff (e,g, leading to short term increases in suspended solids) can be mitigated through the implementation of agreed measures forming part of the final CEMP.

It is also important to recognise and understand that perceived failings in any information presented as part of a shadow HRA would not be a reason in itself to conclude that the Integrity test is failed when the Competent Authority undertakes its Appropriate Assessment. In undertaking that assessment, the Competent Authority would have regard to the full suite of available information and that includes the updated survey and assessment information relied upon within the Applicant's SoCs, Rebuttal Statements and Reports, and the SoCs of other parties and the nature of any conditions or obligations which may be secured.

Peat excavation and changes in hydrology have potential to adversely affect salmonids and (by association) Freshwater Pearl Mussel);

Regarding peat excavation and potential mobilisation of soils (suspended solid and siltation considerations), again it is considered that the CEMP and the associated mitigation provides a robust mechanism to avoid significant effects on watercourses and associated relevant species. Matters concerning the hydrological regime are dealt with in detail within the Ground Water and Surface Water TRs and Rebuttal Reports submitted by the Applicant.

No consideration of noise impacts on the Owenreagh River, with reference to implications for Atlantic Salmon;

Effects in relation to noise impacts on the relevant designated sites were screened out. That conclusion remains valid in view of the updated evidence base (discussed variously within this RS).

Use of Alaskan standards in relation to vibration limits and potential impacts from blasting on the Pollanroe and Owenreagh may have impacts on salmonid habitat and migration patterns, which has not been included in this sHRA

In the absence of any appropriate UK and European standards, standards developed by the Alaskan Department of Fish and Game (ADFG) have been considered. The ADFG developed blasting standards for the protection of fish in 1991, as the ADFG has a responsibility to issue permits in relation to projects that involve pile driving, blasting and seismic activity. In 2011 the ADFG published further guidance in support of their standards and this report considers the blasting effects upon salmonid fish. The 2011 report not only reviews the effects upon caged salmonid fish but also the effects of blasting and mechanical shock on salmonid embryos. It is noted that the fish involved within the studies are species that belong to the genus *Oncorhynchus*, though other salmonid species, coarse fish and marine fish species are also considered. A key species within the studies is Rainbow trout (Oncorhynchus mykiss), which has been used a surrogate species for members of the Salmo genus e.g. Atlantic salmon (*Salmo salar*) and Brown/Sea trout (Salmo trutta) in relation to ecotoxicological studies. A key conclusion within the 2011 ADFG report is that the ADFG 1991 blasting standards are more than sufficient to protect fish and embryos that may be present during blasting. It is understood that the standard has a ten-fold precautionary buffer.

With reference to the precautionary buffer and the efficacy of the standards proposed by the Applicant, attention is drawn to the report prepared for the Alaska Department of Fish and Game in relation to blasting effects on Salmonids. A copy is provided at Appendix 3. Section 4 of the document concerns effects on salmonid embryos (most sensitive part of the life cycle) and several scientific studies (empirical evidence) are discussed. In relation to "Jensen 2003, Jensen and Alderdice 1989" (see pages 9 and 10 of Appendix 3) it is stated:

> *"In this study Jensen (2003) compared velocity thresholds to PPV criteria recommended by Wright and Hopky (1998) and concluded that the current DFO guideline criteria of 0.5 in/s (13 mm/s) provided at least a ten-fold margin of protection for Pacific salmon eggs during their most sensitive life stages."*

The report at Appendix 3 describes the research that underpins Canadian and Alaskan guidelines relating to blasting.

There is no evidence to suggest that the limit proposed by Loughs Agency is relevant to the protection of Salmonids. On the contrary, a robust evidence base is available to demonstrate that the Applicant's proposals are fully protective of salmonids.

Confirmation required that there will be no habitat loss or fragmentation due to blasting from the mine site on the Pollanroe Burn and Owenreagh River;

The adoption of an appropriate standard and monitoring to ensure compliance will mitigate against habitat loss or fragmentation due to blasting. To be clear, any considerations regarding

implications from blasting on the Pollanroe Burn would be limited to the lower reaches close to the confluence with the Owenreagh River given the evidence regarding fish use of this burn.

Clarification on the meaning of 'limited potential for significant abstraction' in relation to paragraph 5.67 of the sHRA

This paragraph is simply referring to the sensitivities of the catchment in relation to abstraction. As determined through the ground water assessment work undertaken by the Applicant, effects of proposed abstraction are not significant and do not give rise to adverse effects on the relevant designated sites, or supported qualifying species populations.

The application proposes discharge limits which may not be appropriate or transferable to the species and habitat present within the Pollanroe Burn and Owenreagh River.

Matters concerning water discharges are considered in detail within the Rebuttal Statement submitted in relation to the Water Discharges Applications.

Comparing the sources of impact for the Owenreagh catchment against those for the Owenkillew catchment shows the significantly higher potential of impacts on an important salmonid habitat which has not been included in this sHRA.

Relevant matters have been fully considered and where necessary, in view of further information regarding for example in relation to salmonid presence in minor watercourses, revisions to mitigation (including discharge limits) have been proposed. That information is before the Inquiry.

Not including the Owenreagh River allows for this sHRA to make a determination of 'no likely adverse impacts' on the Owenkillew River and tributaries ASSI/SAC from surface water impacts due to the 6km hydrological buffer.

This point is addressed by reference to responses provided elsewhere in the Rebuttal Report regarding the regard had to further information and revisions to mitigation proposals.

If the Reverse Osmosis plant can produce 'significantly higher quality effluent than is required by the site discharge consent' then the limits of the discharge consent should be lowered to meet the efficacy of the plant.

The intent of discharge consent limit values is to enforce an obligation to discharge parameter concentrations that are not harmful to the receiving water course. While the proposed water

treatment process will deliver compliant water, it would be wholly inappropriate (and unnecessary) to enforce against those values which the plant can deliver. The absurd situation would arise where the operator would constantly be 'walking a tightrope' in terms of breaching standards and being enforced against, despite the discharge being at a level which is not harmful.

Water quality impacts on the Pollanroe Burn and Owenreagh River should be negligible from the discharge point, not at the confluence with the Owenkillew SAC and concerns regarding proposed discharge consent limit values more generally.

Matters concerning water discharges are considered in detail within the Rebuttal Statement submitted in relation to the Water Discharges Applications

Regarding agriculture and the sHRAs consideration that benefits arise from the change of land use – Loughs Agency state that simply replacing one invasive anthropogenic land use with another does not necessarily represent a reduced impact.

As accepted by Loughs Agency, agriculture is a significant contributor to the (poor) quality of the catchment. It is of course the net position which is important. Off-setting agricultural emissions / depositions is a mitigation tool which is widely accepted by statutory agencies, including Natural England. The matter is considered in detail within the Betterment Plan located at Annex 13 of TR6.

Given the disruption to the catchment of the un-named watercourse, as a result of the creation of attenuation ponds there is likely to be significant impact on the salmonid habitat within the Pollanroe Burn.

This matter is disputed. The ecological value of the burn is discussed in detail withinTR6 and at various places within this Rebuttal Report. Mitigation regarding construction stage impacts, such as that set out within the outline CEMP will be conditioned, agreed and implemented.

<u>Matters concerning the Ecological Impact Assessment</u>

Several matters are raised in relation to the Ecological Impact Assessment. These propositions can be distilled to the following broad topics:

a) Survey data is out of date;
b) The confirmed presence of salmonids in the Curraghinalt, Pollanroe and Unnamed tributaries lead Loughs Agency to conclude that their classification as being of Local (Higher) value requires revision;

c) Aquatic species such as fish, FWPM and invertebrates should be considered due to their potential to be affected by the transfer of detrimental contaminants and pollutants and excessive discharge volumes downstream of the proposed development;
d) The assessment fails to consider any negative construction affects on the tributaries of the Owenkillew and Owenreagh;
e) The effect of noise and visual disturbance on Atlantic salmon and Otter populations of the Owenkillew SAC were not considered;
f) If flows are limited during the salmon's life cycle it will restrict its movements into headwaters to spawn. There is also a possibility that reduced flows could leave Atlantic salmon and trout spawning beds with insufficient water to develop and hatch within the gravels;
g) The effect of a discharge (as proposed) of this volume into a small tributary like the Curraghinalt is likely to be significant on the salmonids and other species utilising the burn. This level of discharge is also very likely to deteriorate both spawning and nursery habitat within the burn;
h) Table 16 of the EIA suggests any work or activities within the construction phase of the mine will not result in any direct loss, damage or disturbance to any habitats within the defined boundaries of the Owenkillew River ASSI. This assessment fails to consider any negative affect this phase could have on the tributaries of the Owenkillew and Owenreagh;
i) The stripping of land around the development site, prior to building of the attenuation ponds, has potential to cause significant pollution to the tributaries of the Owenkillew and Owenreagh rivers and have serious detrimental effects downstream;
j) Reduction in flow has the potential to significantly reduce salmonid habitat in the already small, un-named tributary; and
k) The alterations to the Pollanroe and un-named stream catchments outlined in table 16 (of the EcIA cannot be interpreted as a '*Not significant*' impact.

The above are cited for completeness, however it is considered that the points are addressed by reference to information contained within this Rebuttal Report and those Rebuttal Reports submitted by others on behalf of the Applicant, including in relation to Surface Water, Ground Water and the Rebuttal Statement in relation to the Water Discharge applications.

<u>Fisheries Habitat Assessment and River Habitat Survey of the Owenkillew and Owenreagh Rivers 2017</u>

Various claims are made in relation to the soundness of the assessment methodology and conclusions reached. The salient points raised by Loughs Agency are set out below:

a) It is essential that fish surveys are carried out on any watercourse hydrologically connected to the development site.
b) In relation to the Glenlark River - Loughs Agency's juvenile electrofishing data show that not only are Atlantic salmon and trout present below the bridge but that they are also present further upstream where it was assumed they were '*unlikely*' to be present;
c) In relation to the Coneyglen Burn - Recent Loughs Agency data shows that not only are Atlantic salmon present they are also hugely abundant within the Coneyglen Burn;

d) Any detrimental impact on the Owenkillew has the potential to lower the WFD fish classification which may cause the catchment to fail WFD standards;
e) The accuracy of the RHA claiming only '*small, localised beds of* stream water-crowfoot' remains uncertain due to the poor and restricted visibility conditions during the survey and this, along with the unsuitable conditions during the initial survey, leaves the potential for there to be significantly more of this Annex I habitat under the Habitats Directive in these rivers;
f) The fisheries and habitat survey has failed to assess many rivers in the catchments in relation to habitat and fisheries potential for example the Glenlark and Coneyglen Burns.

Due to these failings, the accuracy and validity of this survey is severely flawed throughout and misrepresents many of the small tributaries within the Owenreagh and Owenkillew catchments.

Regarding the soundness of the reporting, it should be noted that at the point of submission, the cited data was accurate. Changes in baseline regarding the cited burns, as reported by Lough's Agency are noted but that do not have a significant bearing on the consideration of impacts relating to the Mine proposals. Matters concerning implications for relevant water courses are considered elsewhere and that information is not repeated.

Regarding matters concerning stream water-crowfoot the following comments are made. The River Habitat Survey (RHS) methodology developed for the UK and Ireland allows for certain features to be recorded as not visible given the practicalities of carrying out RHS surveys within the UK and Ireland. One of the key contributors to the RHS 2003 field survey guidance manual is the Environment and Heritage Service (then part of the Department of the Environment for Northern Ireland). Section 2.5 of the RHA report states the 'uncertainties' but also, the fact that staff had access to the channel. As such, where certain features were not clear from the riverbank, surveyors would enter the channel to characterise features. It is considered that areas of water crowfoot would therefore have been identifiable at the time of survey.

<u>Powerline Application SoC</u>

It is relevant to consider Lough's Agency submissions in relation to the Powerline Application as part of this RR since it contains comments which directly relate to the Mine Application.

Issues regarding the evidence of the Loughs Agency and one of its officers are addressed in legal submissions.

Loughs Agency details a range of concerns within its submission (dated 30th April 2024). It is noted that ahead of its substantive submissions regarding baseline, impacts (or potential impacts) on fish species (with primary concerns relating to Atlantic Salmon) and implications for relevant designated sites, its consultation responses are set out in summary form. The actual responses are appended to its submission.

The Loughs Agency consultation responses relating to the mine application are addressed at section 12 of the TR6.

The key issues to be addressed, and those which form the basis of Loughs Agency's overall position as described within its submission, are as follows:

1) Baseline fish survey data;
2) The assertion by Loughs Agency that tributaries of the Owenkillew River and the Owenreagh River, which support Atlantic Salmon (or other relevant species) should be screened into the HRA process;
3) Following from this, the assertion that "The Precautionary Principle dictates that all hydrologically connects tributaries to the SAC ought to be treated with the same level of protection as the SAC itself";
4) The conclusions drawn in the Applicants HRA "do not take into account potential impacts on designated species and water quality of the Owenreagh catchment".

It should be noted at this point that flowing from the above matters, which are addressed below, Loughs Agency has also submitted its concerns regarding the Water Discharge applications, by way of a SoC. Those concerns are addressed in detail within the RS submitted in respect of the Water Discharges applications, and the RR relating to Surface Water submitted on behalf of the Applicant.

As a point of clarification ahead of dealing with the substantive points, it is noted that Loughs Agency protest that survey data collected by the Applicant has not been provided to it. It is stated:

> *"Loughs Agency, as a standard condition of a Section 69 consent, request the survey data within one month of completion. The Agency are yet to be furnished with this data."*

Copies of the survey data were sent to Mark McCauley, John McCartney, Seamus Cullinan Caitriona Downey (all Loughs Agency staff), by way of email on 14th October 2022.

Regarding baseline survey information, at page 3 of its submission, Loughs Agency state:

> *"Loughs Agency believe that these planning applications should be denied on the grounds that up to date scientific surveys are required to inform an accurate Environmental Impact Assessment /Environmental Statement and Habitat Regulation Assessment process."*

This point is addressed simply by reference to the fact that despite the application being submitted several years ago, it is plainly evident from TR6 (and that in relation to Surface Water for example) that the ecological and water environment baseline data has been

regularly updated. A comprehensive suite of data has informed the planning process and to ensure robust judgements can be made in determining the applications, updated data has necessarily been presented as part of the package of evidence for Inquiry.

Loughs Agency make much of the electrofishing surveys undertaken both by it and by the Applicant. The language used and inclusion of the Witness Statement by Mr Seamus Cullinan (confirming the undertaking of the surveys) gives the impression that the Applicant denies any such surveys took place. It is a surprisingly hostile approach because plainly that is not the case. All of the surveys cited are fully reported and assessed within the TR6. Further, the results of the surveys have informed the revisions to the proposed discharge limits associated with the Discharge Applications. The analysis of the survey results is not repeated here, instead the reader is directed to sections 5 and 13 of the TR6. The headline summary is that the importance of the Curraghinalt and Pollanroe burns for salmonid species is very significantly and unjustifiably overstated by Loughs Agency; irrrationally so in relation to the Curraghinalt burn.

Regarding Loughs Agency's comments in relation to the Applicant attributing the term 'low ecological value' to minor water courses (specifically, as cited the Curraghinalt and Pollanroe Burns), and the assertion that any such classification is "outdated and inaccurate", as already discussed it remains the Applicant's case on the basis of the evidence that these burns are of low ecological value. The points are not set out again here and instead the reader is directed to the discussion above in relation to the position of NED BWU&CDPB.

Insofar as the assessment process is concerned, the decision to exclude the smaller tributaries from further assessment was based upon the baseline electrofishing and fisheries habitat assessment undertaken by Paul Johnston Associates and the LA data which identified the most likely spawning areas

In relation to the assertion by Loughs Agency that tributaries of the Owenkillew River and the Owenreagh River, which support Atlantic Salmon (or other relevant species) should be screened into the HRA process, the simple answer is that impacts on relevant waterbodies were assessed and appropriate consideration was given to implications on Atlantic Salmon as a qualifying interest feature of the relevant designated sites. The decision to exclude the smaller tributaries from further detailed fish assessments as part of the ES submissions was based upon the baseline electrofishing and fisheries habitat assessment undertaken by Paul Johnston Associates on behalf of the Applicant) and Loughs Agency data which identified the most likely spawning areas.

It should be noted that the updated baseline position regarding the presence of salmonid species in the burns is fully reflected in the revisions made to the proposed water discharge limit values, which in tandem with additional Betterment proposals (see Annex 13 of the TR6) will deliver improved water quality in the main rivers including the Owenkillew SAC. In defining those proposals, regard has been had to the views of NIEA in relation to water quality target values. The proposals are of direct benefit to Atlantic Salmon (and fish species more generally and they help to directly remedy the poor water quality of the main rivers which arises as a result of the actions or inactions of others.

Further, as already discussed above, detailed additional survey and assessment work has been undertaken in relation to the Attagh Burn, Glenealy Burn and Unnamed Burn. That assessment work concludes that no adverse effects will arise in relation to fish species as a result of the proposals.

Loughs Agency's statement that "T*he Precautionary Principle dictates that all hydrologically connects tributaries to the SAC ought to be treated with the same level of protection as the SAC itself*" belies a fundamental misunderstanding of the tests associated with the legislation and a misinterpretation of guidance. The precautionary principle, in simple terms, dictates that where doubt remains as to whether an adverse effect on Integrity arises (after mitigation) then it is not possible to conclude that such an effect does not exist. If the effect on a water course will be nugatory (for example by reference to flows or discharges), or where habitat quality (for fish) is sub-optimal and or restricted in extent, or only low numbers of qualifying fish species are present, then clearly the level of protection afforded to the SAC should not be transposed onto the tributary. It is correct, and necessary however when undertaking an Appropriate Assessment (as will be done by the decision takers in relation to the applications subject to the Inquiry) to have due regard to the implications for the qualifying features of the SAC (including Atlantic Salmon) and in doing so have regard to the scientific evidence relating to Atlantic Salmon presence within the burns. Matters concerning the evidence regarding salmonid presence in the relevant burns have already been addressed elsewhere.

Regarding impacts on "designated species and water quality of the Owenreagh catchment", it is highlighted that the EIA package of information (including submitted HRAs) produced and submitted by the Applicant, specifically considered water quality and quantity (e.g. flows) relating to the Pollanroe Burn and Owenreagh river.

Contrary to the views expressed by Loughs Agency, in undertaking an Appropriate Assessment the Competent Authority has all of the necessary information in order to undertake that assessment and reach a sound conclusion that the proposals will not adversely affect the integrity of any European designated site (without recourse to apply the precautionary principle).

<u>Consideration of additional matters raised in relation to the Abstraction application, pursuant to ecological matters</u>

Many of the points raised by Loughs Agency in relation to the Abstraction licence application are repeated in relation to the Mine application. Those matters are not addressed again here. Instead, the focus is on additional matters arising, which are not addressed by others on behalf of the Applicant.

At page 3, in relation to the Loughs Agency surveys of the Curraghinalt and Pollanroe burns, it is stated that "Atlantic salmon and trout were present in both watercourses". This is not correct. Atlantic Salmon were not recorded in the Curraghinalt Burn and nor were they recorded during the Applicant's surveys of 2022.

At page 4 it is stated:

> *"Loughs Agency believe that any assessments/models/decisions taken based on the assumption of no salmonid presence/low ecological value within the Pollanroe and Curraghinalt Burns must be reevaluated to appropriately consider potential impacts on fish species."*

The presence of salmonid fish species within the Pollanroe and Curraghinalt Burns has been fully reported and assessed. That information has been used to guide the proposed mitigation package of measures, including the proposed Discharge Consent limits.

At page 8 it is stated:

> *"…this assessment has considered flow change reference values for Good Status, salmonid watercourses'. The applicant has considered the Pollanroe absent of salmonids and of 'low ecological value'. Loughs Agency would like to highlight the discrepancy in classifying this watercourse against Good Status salmonid watercourses whilst also considering this watercourse of 'low ecological value' absent of salmonids".*

Matters concerning the ecological value of the burns has already been addressed. In relation to the purported discrepancy, the use of reference values for Good Status, salmonid watercourses' is simply a reflection of the adoption of the most appropriate and precautionary approach to assessment.

At page 9 reference is drawn to "approximate 5% decrease in flows in the unnamed watercourse at the confluence with the Owenreagh River. it is stated:

> *"Again, Loughs Agency would like to highlight that decreased flows can result in higher instream temperatures during low water conditions and can also lead to a reduction in dissolved oxygen which greatly stresses fish species present".*

Matters concerning effects on flows at the Unnamed watercourse are dealt with in detail within the RS in relation to Surface Water submitted by the Applicant. The minor changes in flows are not significant with regard to salmonids. Indeed. changes are within acceptable target values as cited within JNCC CSM Rivers guidance (Annex 23 of TR6), applicable to monitoring feature condition at designated sites.

FODC

FODC raises a number of issues relating to ecology as detailed in its SoC. FODC places reliance upon statements prepared by Dr Catherine Isherwood and Mr Jon Davies. The focus of Dr Isherwood's statement is upon hydrological matters (with reference to ecological sensitivities), whilst Mr Davies focusses upon ecology. It is considered that he issues raised by Dr Isherwood are all addressed either by reference the information contained in this RR, or those produced in relation to Surface Water and Ground Water. Matters raised by Mr Davies are addressed below.

The issues raised by Mr Davies can be broadly distilled into three main areas of concern and these are:

1. It has not been demonstrated to the requisite standard of beyond reasonable scientific doubt that there will be no adverse impact on the integrity of European designated sites.
2. The ecological information contained within the environmental statement is also considered to be deficient.
3. Approval of the proposal would not further the conservation of biodiversity or would not further the conservation and enhancement of the flora, fauna or geological, physiographical or other features for which Areas of Special Scientific Interest (ASSIs) have been designated.

For reference, unless otherwise stated, the paragraph numbers cited in the relevant sections below refer to Mr Davies SoC on which FODC rely.

Matters concerning Habitat Regulations Assessment

Issues raised in relation to the adequacy of the sHRA are based on the following six points:

a) The adequacy of screening (Section 7.3).

b) Lack of detail in identification of source-impact-pathway (Section 7.4)

c) Lack of consideration of potential impacts on supporting habitats (Section 7.5).

d) Adequacy of ecological surveys (Section 7.6 and Chapter 5).

e) Adequacy of assessment in respect to disturbance from human activity (Section 7.7) and hydrological implications (Section 7.8).

f) Adequacy of in-combination assessment (Section 7.9).

Paragraph 7.3.3 states "i*n my opinion a more thorough justification is required explaining why the other impacts have been screened out for these sites. This should include clear identification of the source-impact-pathway (as discussed below) and a clear explanation 'beyond reasonable scientific doubt' for the lack of impact, taking into account the precautionary principle*".

The sHRA dated November 2020 provides a summary of screening that builds upon the screening presented in the previous 2019 version of the sHRA whilst providing further clarity on the European site screened-in and screened-out for further assessment.

Paragraph 7.3.4 concerns the discharge licence sHRA and states *"However there is no justification as to why potential impacts on the other designated sites downstream of the Owenkillew River SAC (i.e. the River Foyle and Tributaries SAC, Lough Foyle SPA, Lough Foyle Ramsar site and River Finn SAC) have been screened out."*

The sHRA dated November 2020 which includes specific consideration of discharges has not screened-out the River Foyle and Tributaries SAC, Lough Foyle SPA, Lough Foyle Ramsar Site and River Finn SAC from further assessment and it is expressly stated that:

> ***"it is considered that effects relating to changes in water quality and the hydrogeological and hydrological regime are of greatest relevance to the Owenkillew River SAC, but that effects could extend to River Foyle and Tributaries SAC, Lough Foyle SPA (UK and ROI), Lough Foyle Ramsar site and the River Finn SAC"***.

The FODC assertion is therefore wrong, and the scoping of the HRA assessment work undertaken by the Applicant is considered to be robust.

Paragraph 7.3.6 states "*the potential air quality impacts on sensitive qualifying habitats associated with increased nitrogen deposition are also screened out without any clear justification. This includes the SAC designated features 'Bog Woodland' and 'Old Sessile Oak woods with Ilex and Blechnum')*".

This is also wrong. The potential changes in air quality have not been screened-out in the sHRA dated November 2020 and this includes specific assessment of the implications of traffic emissions and the deposition of nitrogen on the integrity of the Owenkillew River SAC that includes its Annex I qualifying habitats. Additional information in relation to air quality is presented above in this RR in view of points raised by NIEA.

Paragraphs 7.4.1, 7.4.3 and 7.4.5 infers that the sHRA lacks clear identification of the ecological impacts that could potentially arise from the activities associated with the proposed project, and although the assessment includes reference to the source-impact-pathway methodology, FODCs position is that the assessment does not clearly describe the impact sources during each phase of the project.

Under each impact source, the sHRA identifies the ecological impacts that could potentially arise and describes the impact from each phase of the project on the integrity of the relevant European / Ramsar site and which links back to assessments carried out as part of the

Environmental Impact Assessment where deemed appropriate. Thus, the position of FODC is refuted.

Paragraph 7.4.9 states "*in my opinion bespoke assessment and detailed consideration of the potential air quality impacts upon both the bog woodland within the Owenkillew River SAC and the raised bog at the Black Bog SAC and Ramsar site are required in order to understand the implications of the proposals for these sensitive habitats (and in the light of the current serious situation regarding nitrogen deposition on SACs in Northern Ireland)".*

The existing background nitrogen deposition rates and NOx concentrations at the nearest designated European sites were determined from the APIS website and on a determination of a realistic nitrogen oxide (NOx) emission rate from the mine development from diffusion tube monitoring that was used to assess the potential for nitrogen deposition and NOx concentration impacts versus the nitrogen deposition Critical Load limits and NOx concentration Critical Levels taking into consideration the potential zone of influence of the source of the impact. The sHRA quotes the Design Manual for Roads and Bridges (DRMB) guidance that identified deposition at or beyond 200m from a road is at a level which is so small as to be insignificant. Based on this Black Bog SAC was screened out from requiring any further assessment. The reader is additionally referred to the discussion regarding air quality matters presented above in respect of comments made by NIEA.

Paragraph 7.5.2 states that "b*oth the sHRA and discharge licence sHRA focus on direct impacts within the boundary of the Owenkillew River SAC rather than considering functionally-linked habitats and features outside the SAC. Further, it is the position of FODC that although the sHRA mentions discharges into three 'less sensitive' tributaries of the Owenkillew River SAC (the Pollanroe Burn, Curraghinalt Burn and Attagh Burn), the implication is that these watercourses are not part of the SAC and are therefore not important".*

Matters concerning functional linkage are addressed within the RS pursuant to the Discharge Consent Applications. Matters concerning the ecological value of burns within the Application Site are also addressed in respect of points raised by NIEA and the reader is directed to that information. In short, the evidence base does not point to the burns being of a value that would determine them as being of significance to populations of qualifying species for the SAC. Specifically, regarding the Attagh burn, no potential impacts from the proposals are considered to arise in any event.

Section 6.6 and Section 5 questions the adequacy of ecological surveys and Para 5.2.11 states "*the aquatic habitat surveys have been insufficient to properly assess the value of the watercourses present on site, specifically with regard to their suitability to support important species such as lamprey, pearl mussels and salmonids. It is asserted that "this in turn means that the impact assessments carried out both for the ES and HRA are flawed, since the assessment of 'low sensitivity' for these watercourses, which are due to be both directly and indirectly affected by the proposals, likely understates their nature conservation value"*.

The Ecological Impact Assessment (EcIA) submitted as a supporting document to the Environmental Statement at Appendix C8, included a Fisheries Habitat Assessment and River Habitat Survey of the Owenkillew and Owenreagh Rivers (Appendix 8 -Annex L), as part of the 2017 planning application. This EcIA evaluated the Pollanroe Burn and un-named tributary flowing through the proposed infrastructure site at being of ecological value at Local (higher) level. These waterbodies were not screened-out from assessment as part of Environmental Statement nor within the sHRA. That assertion is also wrong.

The implications of the mine development considered the Pollanroe Burn and un-named tributary assessed under 'running water (streams)' habitat and with the Attagh Burn and Curraghinalt Burn considered as part of the assessment on the Owenkillew River SAC. The significance of any impact was assessed before and after mitigation.

It is important to note that based on guidelines produced by the Chartered Institute of Ecology and Environmental Management (CIEEM) defines significance as:

> *"Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of EcIA, 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features'."*

CIEEM further state that:

> *"A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect is a positive or negative ecological effect that should be given weight in judging whether to authorise a project: it can influence whether permission is given or refused and, if given, whether the effect is important enough to warrant conditions, restrictions or further requirements such as monitoring. A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission."*

CIEEM then go on to how significant effects should be qualified with a reference to an appropriate geographic scale that identifies that:

> *"European case law is specific regarding significance in relation to European sites and Annexed habitats. However, the scale of significance of an effect may not be the same as the geographic context in which the feature is considered important. For example, an effect on a species which is on a national list of species of principal importance for biodiversity may not have a significant effect on its national population."*

Based on the above and taking into consideration each waterbody in its entirety, it is considered that the evaluation given to minor tributaries (e.g. Pollanroe Burn, un-named tributary, Curraghinalt Burn and Attagh Burn) is appropriate, taking fully into account the evidence that some qualifying Annex II species associated with the Owenkillew River SAC may be present in lower sections at the confluence with the main river.

Paragraph 5.3.1 refers to no fish surveys being undertaken in the smaller watercourses and that during a site visit in March 2024, Dr Peter Walker observed a small section of the lower reaches of Pollanroe Burn from a road bridge concluding that the habitat was almost certainly capable of supporting various fishes, including juvenile salmonids, contrary to the habitat assessment undertaken.

This observation and assessment has been made on a small section of the Pollanroe Burn and does not take into account the potential barriers to the passage of fish including the culvert under the road bridge from where Dr Walker observed this waterbody. Detailed consideration regarding matters concerning fish presence is given above in relation to addressing matters raised by NIEA and Loughs Agency.

Paragraph 5.4.1 refers to freshwater pearl mussel surveys completed in 2015 and that data for this and a previous survey should be considered out of date. By way of response, the TR submitted by the Applicant in respect of Ecology and Nature Conservation matters includes updated survey and assessment information relating to this species. The age of ecological survey data has been fully addressed by the Applicant.

With reference to paragraph 5.5.1 and Dr Walker's observation that the small section of the Pollanroe Burn appears that the habitat is generally suitable for supporting white-clawed crayfish the following is important.

The distribution of white-clawed crayfish in Northern Ireland is largely restricted to the south west of the country in suitable streams flowing into Lower Lough Erne, in lakes on the Lough Navar highlands and in streams on the easter side of Upper Lough Erne and in the marl lakes on the Fermanagh, Monaghan county boundary, with outlier populations in the River Blackwater and Ballinderry in the Lough Neagh catchment.

The Owenkillew and Owenreagh catchments lie outside the area where this species is distributed and through earlier survey work as part of an Environmental Baseline Study, desk-based studies and consultation with NIEA it was considered that white-clawed crayfish surveys were not necessary with all reasonably likelihood of absence within the Owenkillew River catchment.

Paragraph 6.6.1 refers to otter surveys carried out in 2012 yielding many more results than those carried out in 2015/16, and that surveys undertaken in relation to the smaller watercourses were not extensive and generally were limited as the surveyors were only able to access small areas within the development site. It is stated that in light of these deficiencies, the potential for significant impacts on otters cannot be ruled out.

It is recognised that the otter surveys of some of the smaller watercourses was constrained due to access. However, surveillance of bridges also indicates that otter remain ubiquitous and active along the Owenkillew and Owenreagh rivers. In addition, ecological monitoring carried out at the proposed infrastructure site has recorded otter and it is considered that the Pollanroe Bridge marks the territory boundary of an Otter. The proposed infrastructure site will continue to be monitored and appropriate mitigation developed where it is considered this species has the potential to be affected by construction activities.

Paragraph 7.6.2 states:

> *"without reliable information regarding the presence, distribution and abundance of these species, it is not possible to properly quantify the effects, especially with regard to favourable conservation status. It is therefore my professional opinion that it cannot be demonstrated that the habitats regulation assessments have been based on 'the best available scientific evidence"*.

The Habitats Regulations Assessment work undertaken by the Applicant has specifically considered implications for Otter, based on the known presence of the species throughout the catchment. Contrary to the assertions of FODC, firm conclusions can be drawn on the implications for Otter in view of the evidence base which is robust for assessment purposes.

Paragraphs 7.7.1 and 7.7.2 concern potential visual disturbance impacts on Otters and an assertion that this pathway has not been addressed by the Applicant. It is stated:

> "*given the likely presence of otters within what is currently a tranquil environment with very few people, there is the* potential *for the otter population to be excluded from the area, and for many years, through a combination of noise, visual disturbance and general human activity over a large area*".

Regarding this matter, it is important to have regard to the fact that visual disturbance will typically also be associated with noise from human activity. The sHRA in considering noise has assessed the potential impact of disturbance based on worst-case scenario whereas the potential impact from visual disturbance will be minimal due to the screening of the main channel of the Owenkillew River by trees and its banks.

Broadly, paragraphs 7.8.5 to 7.8.9 and 7.8.16 concern the efficacy of the mitigation proposals and assertions that there is insufficient evidence to conclude, beyond reasonable scientific doubt, that there will be no adverse effect on the integrity of the SAC. Specific reference is made to losses to the Pollanroe burn and the proposed water discharges. Such matters are fully addressed by reference to the RS pursuant to the Discharge Applications, the TR submitted by the Applicant in respect of Ecology and Nature Conservation (notably consideration of the revised proposed discharge limits and the Betterment Plan), the

Applicants SoC in relation to the Water Discharge applications and the RR regarding Surface Water prepared by Kaya Consulting. In short, the Applicant's proposals are fully protective of the water environment and will deliver betterment in water quality terms for the SAC.

Paragraph 7.9.1 notes that the sHRA states 'no other plans or projects have been identified which must be considered in-combination with the project proposals'. It is also stated at Paragraph 7.9.1 that "there is insufficient explanation as to why other plans and projects have not been considered, given the potential for in-combination and cumulative impacts with the mine project". In this matter it should be noted that the screening of plans and projects for in-combination assessment was detailed in the sHRA dated 2019, linking to the list of plans and projects identified with potential cumulative impacts as part of the EIA process. It was through this process that other than the proposed powerline, no other plans or projects were identified at the time the sHRA was updated in 2020.

Matters concerning the Environmental Statement

Issues raised which relate to the adequacy of the impact assessments provided in the ES can be distilled to the following broad topic areas:

a) Impacts on designated sites.

b) Impacts on habitats.

c) Impacts on species.

Key points are discussed below.

Paragraph 6.2.1 infers that the impact assessment has not properly considered the nature of the works and the sensitivities of the species and habitats of four sensitive designated sites (Owenkillew River SAC, Owenkillew River ASSSI, Drumlea and Mullan Woods ASSI and Owenreagh River ASSI). This is disputed.

Appendix C8 to the Environmental Statement provides an Ecological Impact Assessment (EcIA) on the potential effects of the gold mine development on relevant designated sites. Habitats Regulations Assessments were completed and additional (e.g. assessment) work has been undertaken by the Applicant in order to fine tune mitigation since the 2020 FEI2 submission, and this is included within the Applicant's SoCs in relation to the Inquiry.

Paragraph 6.2.2 states that "*a key potential impact on designated sites is related to suspended solids in the Owenreagh River ASSI" and Para 6.2.3 states "the accepted critical sediment preference for salmon is 10mg/l, and is therefore expected that loading of sediment at this critical limit, over the full period of period of the mine operation, could impact on salmonids"*. This matter is specifically addressed within the Applicant's RS in relation to the Discharge Applications and that information is not repeated here.

Paragraph 6.2.5 concerns dust emissions from construction and operational activities at the proposed infrastructure site and implications for the Drumlea and Mulan Woods ASSI, which "lies between 79m and 300m north of the Project Areas".

For clarity, the Drumlea and Mullan Woods ASSI is not identified as being within the potential zone of influence for dust emissions. It was therefore screened out of further assessment as part of the EcIA. However, the effects of dust on the Owenkillew River SAC was assessed, and that assessment included the Annex I qualifying woodland habitat associated with the Drumlea and Mullan Woods (a component ASSI of the SAC).

Paragraph 6.2.6 asserts that insufficient consideration has been given to the potential for the qualifying features of the designated sites to be adversely affected. This is disputed since the EcIA specifically assesses the implications of the construction and operational phases of the mine development on designated sites, together with the level of any significant effect before and after mitigation.

Paragraph 6.3.3 questions the classification of the Pollanroe Burn as being of limited ecological value, especially as it flows directly into the designed Owenreagh River. This is a matter dealt with in detail above and the reader is directed to that information.

The Pollanroe Burn was evaluated as being of Local (Higher) value and which is considered appropriate based on the entirety of this water body and not just considering where it joins the Owenreagh River. The 975m of watercourse that will be lost is not considered to meet the criteria of a headwater and therefore priority habitat due to its highly modified current state as confirmed by Natural Environment Division (NED) of DAERA in their consultation response to the 2020 FEI2 submission.

Paragraph 6.3.9 concerns impacts on peatland habitats. It states, "*current plans show a loss of 30.25 hectares of five peatland habitats with affinities to Annex 1 Habitats and Northern Ireland Priority Habitats" and the "loss of 7.94 hectares of valley mire"*.

For clarity, the stated 30.25 hectares of five peatland habitats is for the area of Annex I habitat within the proposed infrastructure site. However, the area of peatland habitat that would be lost (as detailed in the ES) is much smaller. It includes wet heath / acid grassland 2.62 ha, blanket bog 8.96ha, flush and spring 0.03ha, fen valley mire 7.94 and 6.20 ha of marsh / marshy grassland communities where present on peat, or peat derived soils.

Paragraph 6.3.12 concerns the level of compensation to be delivered in respect of peatland losses. The assertion is that the proposed ratio of 2:1 for compensation area (relative the area being lost) is inadequate.

For clarity, the ratio figure of 2:1 was agreed with NIEA. FODC at no stage during consultation raised concerns regarding the level of compensation proposed.

Paragraphs 6.3.13, 6.3.14 and 6.3.15 suggest that the impact assessment is fundamentally wrong because the existing surface infrastructure site was not reinstated as it was required to be as part of the consent related to it. The assertion is that this has led to the Applicant gaining an unfair advantage due to unauthorised EIA development since the baseline comprised buildings and other lower-value habitats.

In this matter, the simple answer is that no such restoration was in fact required. The Restoration Method Statement prepared by Dalradian specifically included the provision that if exploration determined that commercially and technically viable resources were present, it is unlikely that the site will be decommissioned until the end of the mine life, with a new application for a mine development prepared and submitted. Such an application was made (the 2017 application), with the inclusion of the existing infrastructure site as part of the overall mine development. FODC itself recognises (Para 5.11) that an application currently remains under active consideration by the Council for the amendment of Condition 6 to allow for an extension of time for the restoration of the existing infrastructure site. In this regard therefore, the appropriate baseline situation has been assessed and there has been no unfair advantage.

Paragraph 6.4.3 concerns habitat creation / enhancement proposals specifically commenting that the enhancement of semi-improved grassland is not appropriate as it could introduce species not typically associated with the peatland communities, potentially causing changes to the plant communities and ground conditions.

It should be noted that careful consideration was given to such matters. For clarity, proposed enhancement of semi-improved grasslands will be downslope of retained peatland areas, limiting the potential for colonisation of peatland communities by undesirable species. Monitoring is also proposed in relation to the habitat creation / enhancement and future management, providing a mechanism to report and control any identified issues.

Paragraph 6.4.4 concerns impacts on Otter. It states, "*the ES (2017) does not refer to any impacts on otters from the development" and that "without additional survey effort along the Pollanroe Burn, the presence of otters along this watercourse cannot be ruled out, and the removal of 975m of this watercourse could present significant impacts for this species (both in terms of the loss of potential holt and foraging habitat and the fragmentation effect) as well as result in a breach of protected species legislation*."

Potential impacts on Otters have been fully considered. Otters are recognised as being present in the local area and the proposed infrastructure site has been subject to ecological monitoring since 2017 including the section of Pollanroe Burn and un-named tributary flowing through this site. Evidence of sprainting has been recorded at the Pollanroe Bridge, but the value to Otters, of the sections of watercourse within the proposed infrastructure site is limited. Evidence shows that any impacts are not likely but monitoring will continue and Ecological Clerk of Works supervision during construction is proposed. Appropriate mitigation would be delivered if required.

Paragraph 6.4.11 concerns Badgers. The assertion is that the loss of an active sett and proposed losses to suitable foraging habitat "could" be of significance, contrary to the conclusions reached in the ES.

Impacts on Badgers have been fully considered and the EcIA identifies that the mine development would be of significance at Local (higher) value. Badgers have been continuously monitored at the proposed infrastructure site since 2017 with the most recent survey report submitted as part of TR6 (Annex 2). The mitigation proposed is appropriate and proportionate to the scale of the identified impacts. It should be noted that NIEA NED do not raise concerns with the mitigation proposed by the Applicant.

Paragraph 6.4.18 concerns the reported survey effort in respect of Marsh Fritillary butterfly and suggests that a single year's survey effort (where the previous year had been "very poor weather conditions for all butterfly species") means it would not be appropriate to assume the absence of this species.

It should be noted that an updated Marsh Fritillary survey was completed at the proposed infrastructure site at the locations where devil's-bit scabious (larval food plant) was present in 2022/23. The survey report is included at Annex 9 of the Ecology and Nature Conservation TR. For clarity, consistent with the previous findings, the survey did not record this species as present.

Adequacy of Biodiversity Net Gain Assessment

Issues are raised in relation to the accuracy of the metric used to assess Biodiversity Net Gain (BNG) and that the use of the Statutory Biodiversity Metric (SBM) should be a material consideration for the Inquiry. This position is strongly refuted, as discussed below.

Paragraph 8.2.1 states that

> *"There is an obvious direction of travel in policy terms, and it is this that the applicant was responding to in their consideration of the implications of their proposals on biodiversity. To do this they used a version of the Defra biodiversity metric ('Version 1') that was current at the time (2017), I and my BNG team reviewed how this was done and whether the methods and assumptions were appropriate. We then re-assessed the biodiversity implications of the proposals using the current version of the metric - the Statutory Biodiversity Metric (SBM) – to consider how using better-developed methodologies might influence the conclusions".*

The key point is that BNG assessment is not a statutory requirement in Northern Ireland neither is it defined or required by way of any planning policy contained with the FODC Local Development Plan (March 2023).

The Applicant opted to undertake such an assessment to provide a quantitative assessment of the habitat impacts of the development (above ground infrastructure). It was recognised that it would not be possible to mitigate against the loss of all habitats of higher conservation value and to identify areas of additional land required to deliver compensation it was deemed that the most appropriate and transparent tool to use was the BNG metric. The assessment demonstrated that at least a 2:1 ratio for peatland habitat compensation will be delivered and NIEA NED have not raised any concerns in this regard.

The requirement for SBM in England did not apply to planning applications made before February 2024. This, in tandem with the foregoing means that the SBM is not relevant to considerations relating to this planning application.

Paragraphs 8.2.9 and 8.2.11 raise concerns about proposed habitat creation and enhancement, and the likelihood of success of peatland habitat creation to replace the loss of valley mire and blanket bog.

For clarity, the EcIA is clear that it will not be possible to mitigate against the loss of blanket bog and valley mire habitat and habitat compensatory measures are proposed. The purpose of the habitat creation proposed is not to directly replace the loss of the existing peatland habitats but rather to ensure re-use of peat overburden in the creation, therefore, of habitats of conservation value relevant to the setting.

As fully acknowledged in the EcMMP there is no guarantee for restored / created peatland communities to become 'active' (i.e. peat forming). However, as demonstrated in areas of cutover bog, it is anticipated that where habitat creation occurs, these will develop peatland habitats that have the potential to be assessed as being in good condition and high distinctiveness albeit they may not be a replacement like for like the habitats lost to development for example heath-type habitat.

Paragraphs 8.2.13 and 8.2.14 assert a key error in the (Applicant's) BNG calculations. This relates to the Applicant having subtracted the Habitat Impact Score (HIS) from the Habitat Mitigation Score (HMS) to provide the overall BNG figure. It is stated that the net change in units should be calculated with reference to the baseline habitat score across the whole site (Areas A, B and C combined), not just to the score associated with habitat loss (associated with the infrastructure site).

The calculations presented by Mr Davies (his para 8.2.14) are in fact erroneous. The figures presented to demonstrate a net loss includes the subtraction of the total Habitat Biodiversity Value from the HMS. This does not take into account those habitats to be retained with no change and those retained with enhancement.

For clarity, the biodiversity metric presented by the Applicant calculates the Site Habitat Biodiversity Value and then assesses the HIS based on those habitat being negatively affected by the development. The HMS is then calculated based on the proposed habitat creation and enhancement. The Habitat Biodiversity Impact Score is then derived by the subtraction of the HMS from the HIS to identify the impact to habitat biodiversity as a result of the development. This is an appropriate means of demonstrating the net position regarding habitat impacts arising from the proposals. With regard also had to the detail provided within the Outline Betterment Plan, the quantitative habitat assessment work undertaken clearly demonstrates that the Mine Proposals comply with the duties in the Wildlife and Natural Environment Act (Northern Ireland) 2011 and the Environment Order (Northern Ireland) 2010, furthering the conservation of biodiversity.

<u>Issues raised in relation to the Abstraction application, pursuant to ecological matters</u>

It is considered that no additional matters are raised which require addressing within this RR.

Communities Against Mining

In its SoC Communities Against Mining (CAM) raise no specific issues in relation to ecology and nature conservation. A report by Dr Emerman is appended to CAM's SoC. This report formed the basis of an assertion that dust impacts on the Black Bog Ramsar site had not been adequately assessed. That matter is specifically dealt with at Section 14 of the TR6.

Issues raised in relation to the Abstraction application, pursuant to ecological matters

CAM raises several concerns in relation to implications for ecological receptors as a result of the proposals. The concerns relate to the age of the data used for assessment purposes, implications for the relevant designated sites, Atlantic Salmon, trout and “downstream ecosystems”.

All of these matters are dealt with by reference to other sections of this RR, the RRs in relation to Ground Water and Surface Water, submitted by the Applicant and the RS pursuant to the Discharge Applications, submitted by the Applicant.

Save our Sperrins

Save our Sperrins (SoS) raise numerous points regarding matters concerning ecology and nature conservation matters. The main thrust is that a range of protected species are “at risk” from the proposals and the assessment baseline is not current for assessment purposes. A broad range of legislation is cited which SoS infer will be breached should permission be granted. Reference is also made to alleged “deterioration of the status of a body of surface water”, linking with its claim that the proposals are not compliant with WFD requirements (a matter addressed below in relation to individual objectors).

No new / additional substantive issues are raised and it is considered that the information contained in this RR, in tandem with the TR in respect of Ecology and Nature Conservation Matters addresses the concerns raised.

Sinn Féin

Only broad concerns are raised regarding impacts relating to ecological receptors. It is stated:

> *“The construction of this mine and its accompanying infrastructure could have devastating consequences for the local environment and biodiversity.*
>
> *Proposals to discharge wastewater containing heavy metals and corrosive substances into nearby waterways are extremely concerning.”*

No new / additional substantive issues are raised and it is considered that the information contained in this RR, in tandem with the TR in respect of Ecology and Nature Conservation Matters addresses the concerns raised.

Individuals

Individual third party objectors also raise points regarding ecology and nature conservation matters. It is considered that no additional points are raised which require specific consideration in this RR.

Issues raised in relation to the Abstraction application, pursuant to ecological matters

Several points are raised by individual objectors in relation to concerns regarding implications for habitats (including peatland), species and relevant designated sites. Matters concerning the age of survey data area also raised. It is considered that all such points are addressed in other sections of this RR, the RRs in relation to Ground Water and Surface Water, submitted by the Applicant and the RS pursuant to Water Discharges, submitted by the Applicant.

WFD Considerations

It is noted that several objectors raise the issue of non-compliance with the Water Framework Directive. The directive and transposing regulations are also cited by NIEA (for example within the SoC in relation to Water Discharge Applications). Contrary to assertions made, the proposals are fully protective of the water environment and no deterioration in water quality arises, rather betterment will be achieved. It is demonstrated through evidence presented by the Applicant, with reference in particular to that contained within TR6, TR9 and TR10, the Applicants SoC and RS in relation to Water Discharges and the RRs in respect of Ecology, Surface Water and Groundwater, that full compliance is demonstrated.

Dalradian Gold Limited

Small Burn Surveys

Fish Habitat and River Habitat Assessment of the Attagh Burn, Glenealy Burn and Unnamed Burn

2488365

NOVEMBER 2024

RSK GENERAL NOTES

Project No: 2488365

Title: Small Burn Surveys

Client: Dalradian Gold Limited

Date: 22nd November 2024

Office: Glasgow

Status: 2488365 D01(00)

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Signature:

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Contents

EXECUTIVE SUMMARY

1. RSK Biocensus was appointed by Dalradian Gold Limited to carry out a fish and river habitat assessment of Attagh Burn, Glenealy Burn and Unnamed Burn.
2. The fish and river habitat survey was undertaken on 5th November 2024.
3. Results and interpretation of the fish eDNA survey carried out during October 2024, are also included within this report.

1 INTRODUCTION

1.1 Purpose of this report

1.1.1 RSK Biocensus was appointed by Dalradian Gold Limited to carry out a fish and river habitat assessment of the Attagh Burn, Glenealy Burn and Unnamed Burn within the proposed development site.

1.1.2 It is understood that this report is required in connection with Curraghinalt Project planning application in County Tyrone.

1.2 Proposed development

1.2.1 Dalradian Gold Limited (DGL) is proposing to develop and operate an underground gold mine as part of the Curraghinalt Project in County Tyrone. The Curraghinalt gold deposit is located within County Tyrone, approximately 127km west of Belfast, 15km northeast of the town of Omagh and 7km east of the village of Gortin, and between the settlements of Rouskey and Greencastle.

1.3 Landscape context

1.3.1 The application site is situated on the southern edge of the Sperrin Mountains. The local landscape is dominated by the river valleys of the Owenkillew and Owenreagh catchments which are separated by the broad ridge of Crocknamoghil that rises to a height of 335m above sea level. The valley slopes are deeply undulated and dissected by numerous tributary burns, typically with stony substrates and lined with trees.

2 METHODOLOGY

2.1 Introduction

2.1.1 The fish and river habitat assessment of the Attagh Burn, Glenealy Burn and Unnamed Burn was carried out on the 5th November 2024 and baseline environmental data were collated through field surveys in accordance with current standard methodologies and published good practice[1].

2.1.2 The location of the Attagh Burn, Glenealy Burn and Unnamed Burn is shown within Figure 1.

2.1.3 All equipment and PPE used as part of the field surveys were disinfected prior to use with Virkon™ to prevent the spread of Non-Native Species (NNS), fish diseases and/or parasites[2].

2.1.4 This report draws upon data previously collated by SLR in 2020[3] along with a previous fisheries assessment commissioned by SLR and carried out by Paul Johnston Associates[4]. This previous work formed part of the Environmental Baseline Study (EBS) to inform DGL's exploratory works on the Curraghinalt gold deposits and was supplemented through further field surveys along sections of river not previously surveyed.

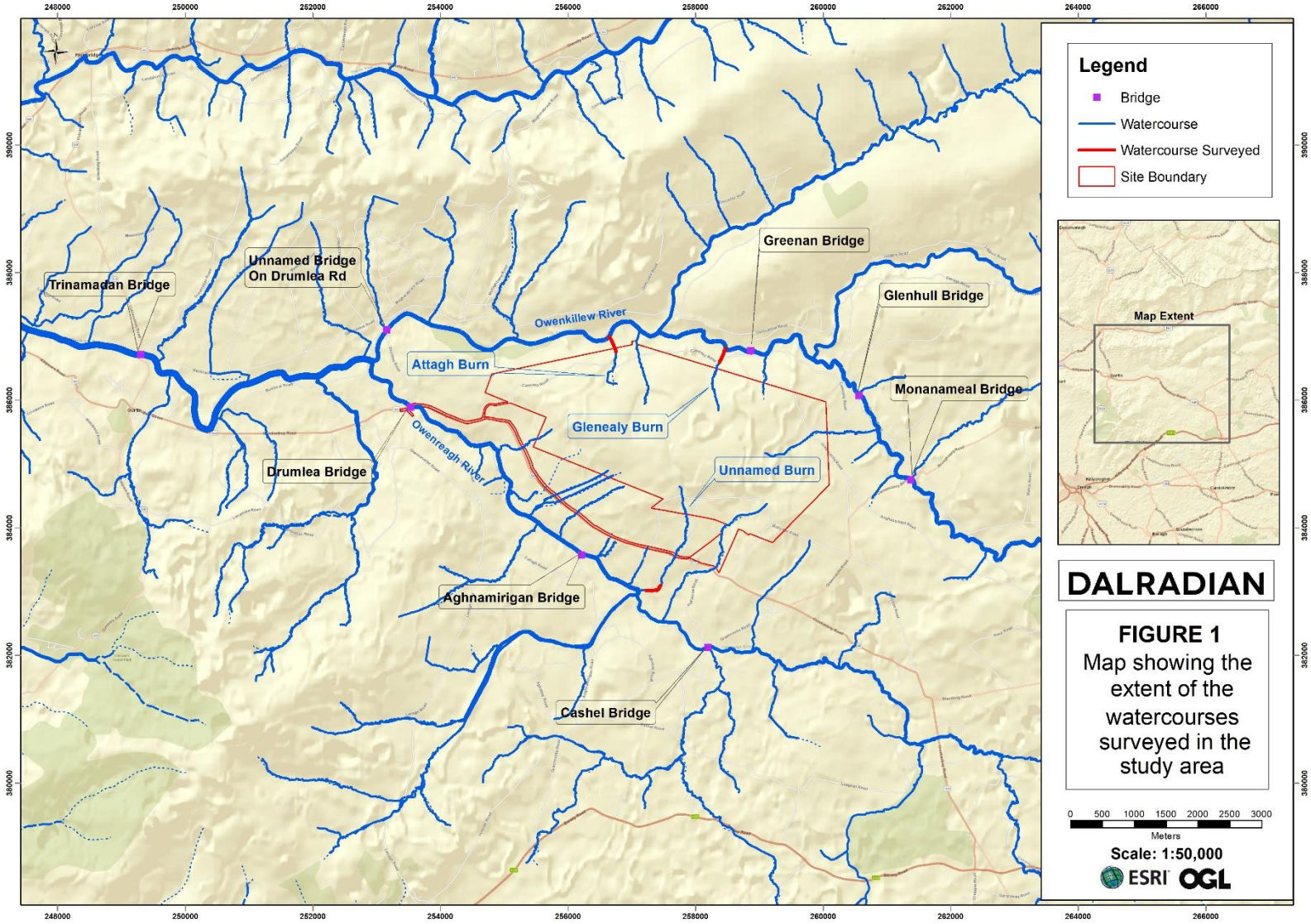
[1] CIEEM (2024). Guidelines for ecological impact assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine

[2] https://www.nonnativespecies.org/biosecurity/

[3] SLR Consulting (2021). River and Fish Habitat Assessment of the Owenkillew River, Owenreagh River and Tributaries for the Curraghinalt Gold Project, County Tyrone, Northern Ireland.

[4] Paul Johnson Associates (2014). DGL Curraghinalt Gold Project: Fisheries Baseline Assessment.

Figure 1 Map showing the extent of the watercourses surveyed in the study area



2.2 Fish Habitat Field Survey Methodology

2.2.1 The survey uses the Life Cycle Unit Method (LCUM) which was developed in Northern Ireland by the Loughs Agency to assess the river habitat requirements of salmonid fish (salmon and trout)[5]. LCUM surveys are undertaken by identifying suitable reaches of river which are then sub-divided into 100 m sections. Each LCUM section is walked by a surveyor (either upstream or downstream), from either the left or right bank though this is dependent upon safe/suitable access.

2.2.2 The LCUM assessment is used for all salmonid fish life stages (including spawning) and the fish habitat assessment is graded in relation to substrate size/type, flow and water depth. LCUM also provides a broad habitat type map which can cover large areas of rivers. This methodology is currently used by the Loughs Agency and the optimal field survey period is during low river flow conditions which enables visual habitat observation[6].

2.2.3 The LCUM assessment requires that the surveyor identifies a selected number of categorised salmonid requirements. These include:

- holding areas for adults;
- nursery areas for juvenile fish; and
- spawning locations.

2.2.4 A summary of the habitat requirements for salmonid used in the assessment is summarised in Table 1 and the criteria used in the classification of salmonid habitat in Table 2.

Table 1 Habitats for Different Life Stages of Salmon and Trout

Life Stage	Salmon Requirements	Trout Requirements
Eggs / Alevins	Golf ball to tennis ball sized substrate.	Dependent upon fish size: Golf-ball to tennis-ball substrate for large brown trout. Pea to golf-ball sized material for smaller trout
Fry (<1 year old)	Golf ball to tennis ball sized substrate, fast flowing, shallow broken water.	Golf ball to tennis ball sized substrate, slow to medium flowing water, often concentrated in stream margins
Parr (≥1 year old)	Tennis ball to football sized substrate, fast flowing broken water, often slightly deeper than fry	Variety of substrate, undercut banks, tree roots, big rocks, deeper slower water.
Smolts	Unknown	Unknown
Adults	Deep pools	Deeper areas sustained by flow but not too fast, undercut banks, tree roots, instream vegetation and large rocks

[5] Kennedy GJA (1984). E*valuation of Techniques for Classifying Habitats for Juvenile Salmon* (*Salmo salar* L.). Proceedings of the Atlantic Salmon Trust Workshop on Stock Enhancement.
[6] Department of Agriculture Northern Ireland (2005). *The Evaluation of Habitat for Salmon and Trout*. Advisory Leaflet No. 1. Fisheries Division, Stormont, Belfast.

Table 2 Criteria for Salmonid Habitat Classification

Habitat	Grade	Criteria
Nursery	1	Water depth 50-250mm. 0.5 – 8% gradient. Stable cobble/boulder substrate with at least 70% coverage of riverbed.
	2	Marginally outside Grade1 in a single criterion.
	3	Well outside Grade1 in one or more criteria.
Spawning	1	Flow 300-600 mm/sec. Water depth 150-700mm. Gravel size 30-80mm with at least 70% coverage of riverbed. Gravel depth 50-150mm. Near holding area. Nursery area downstream.
	2 - 3	Failing as for spawning habitat above.
Holding	1	Minimum depth 1m. Adequate instream/bankside cover. Stable banks and substrate. Spawning area nearby.
	2 - 3	Failing as for holding habitat above;
Unclassified		Unsuitable for fish – not classifiable as any of the 3 habitat types Typically, shallow, silty substrate or 100% bedrock, channelized section or other engineered channel of low morphological status.

2.3 River Habitat Survey (RHS)

2.3.1 Standard Environment Agency RHS methodology was used to undertake and complete the field work[7]. A RHS requires that each length of river is divided into 500m sections of river channel. Each RHS section is walked by a surveyor (either upstream or downstream), from either the left or right bank though this is dependent upon safe/suitable access.

2.3.2 For every 500m section a comprehensive range of physical information and other data is gathered covering the following:

- Bank - composition (material), artificial modifications and other (natural) features (such as side and point bars and eroding cliffs);
- Channel - composition of substrate (if visible), modifications and other features (including exposed boulders, mid-channel bars, islands etc.);
- Flow types – including number of riffles and pools per 500m section;

[7] Environment Agency (2003). River Habitat Survey in Britain and Ireland – Field Survey Guidance Manual: 2003 version. Environment Agency, Scottish Environmental Protection Agency (SEPA) & Environment and Heritage Service (NI).

- Land use - extending to 50m distance of bank top;
- Presence of specific artificial features (culverts, weirs, dams, bridges and fords etc.);
- Presence and extent of alders (diseased or otherwise);
- Presence and degree of shading;
- Presence and extent of woody debris;
- Vegetation – banktop / bankface and in-channel vegetation types;
- Vegetation – invasive species e.g. Himalayan balsam (*Impatiens glandulifera*);
- Channel dimensions;
- Evidence of recent management; and
- Observations of riverine birds, mammals and other associated species.

2.3.3 It should be noted that the RHS methodology records many of the features that support fish within a river and RHS notes features that may displace fish from a section or reach of river and even features that may influence fish spawning. However, the RHS methodology does not record the level of detail required in order to describe the suitability of a section of river for a particular fish species or family of fish and their particular habitat requirements e.g. salmonid (salmon and trout), lamprey species, coarse fish, European eel and minor fish species.

2.3.4 Both the fish habitat assessment and the river habitat survey was Steve Coates who is an Associate Director of ecology at RSK Biocensus. He has over 30 years' experience in carrying out aquatic surveys and monitoring and is highly skilled in carrying out fish habitat and river habitat surveys. He is a member of:

- The Chartered Institute of Water and Environmental Management (CIWEM) - Chartered Water Environment Manager (C.WEM);
- The Royal Society of Biology (MRSB) - Chartered Biologist (C. Biol);
- Freshwater Biological Association (FBA); and
- The Institute of Fisheries Management (IFM).

2.4 eDNA survey

2.4.1 Environmental deoxyribonucleic acid (eDNA) monitoring was carried out by DGL and eDNA samples were collected on Wednesday 23rd October 2024 on the Attagh Burn, Glenealy Burn and the Unnamed Burn. One additional eDNA sample was collected on the Unnamed Burn next to the Crockanboy Road (SW30) on Thursday 24th October 2024.

2.4.2 All three burns were in low flow and were similar conditions to those present during the fish habitat and river habitat survey on Tuesday 5th November 2024.

2.4.3 eDNA monitoring followed SureScreen Scientifics sample collection guidance[8].

2.4.4 Post sample collection the eDNA samples were sent to SureScreen Scientifics for laboratory analysis (Appendix A).

[8] SureScreen Scientifics (2024). Detailed Filtration Sample Collection Guidance.

2.5 Survey limitations

2.5.1 The LCUM and RHS site visits were planned to be carried out during suitable weather conditions i.e. when water levels are sufficiently low to allow full access to the channels and banks of the watercourses surveyed.

2.5.2 RSK Biocensus had access to the riverbanks and channel where DGL had agreed access with landowners. This meant that some access restrictions applied to the bottom of Unnamed Burn only.

2.5.3 Due to site access restrictions then it was not possible to complete a full 500m sections of river channel for the RHS survey.

2.5.4 Due to site access restrictions then it was not possible to survey the lower section of the Unnamed Burn and where the burn meets the Owenreagh River.

3 RESULTS

3.1 Attagh Burn

3.1.1 The location of fisheries habitat assessment, RHS survey and eDNA sampling are shown in Figure 2 and the findings of the fisheries habitat assessment, RHS survey is presented in Table 3. Results of the Attagh Burn eDNA laboratory analysis are presented within Appendix A.

3.1.2 At the time of survey four barriers to fish migration were observed and these were:

- The 'perched' nature of the Attagh Burn at the confluence of the Owenreagh River at site RHS1 (Table 3), which meant that there was no free access for fish between the river and the burn;
- A major ford within site RHS3 (Table 3), which was circa 70m upstream of the confluence with the Owenkillew River;
- An intermediate ford within site RHS4 (Table 3), which was circa 160m upstream of the confluence with the Owenkillew River; and
- A culvert upstream of site RHS5 (Table 3), where the Attagh Burn flows under the road circa 280m upstream of the confluence with the Owenkillew River.

3.1.3 Results from the (eDNA monitoring carried out during October 2024 at two sites within the Attagh Burn (Figure 2) indicate that only brown/sea trout (*Salmo trutta*) are present within this lower section of the burn.

3.1.4 Two further fish species of conservation interest were also tested as part of the eDNA monitoring and these were brook lamprey (*Lampetra planeri*) and European eel (*Anguilla anguilla*). The results of the eDNA monitoring indicate that brook lamprey and European eel are not present within Attagh Burn.

3.1.5 The eDNA sites are downstream of the major ford and no Atlantic salmon (*Salmo salar*) eDNA was detected within Attagh Burn.

Figure 2 Map showing the eDNA sampling locations and the extent of the fish habitat and river habitat survey within the Attagh Burn

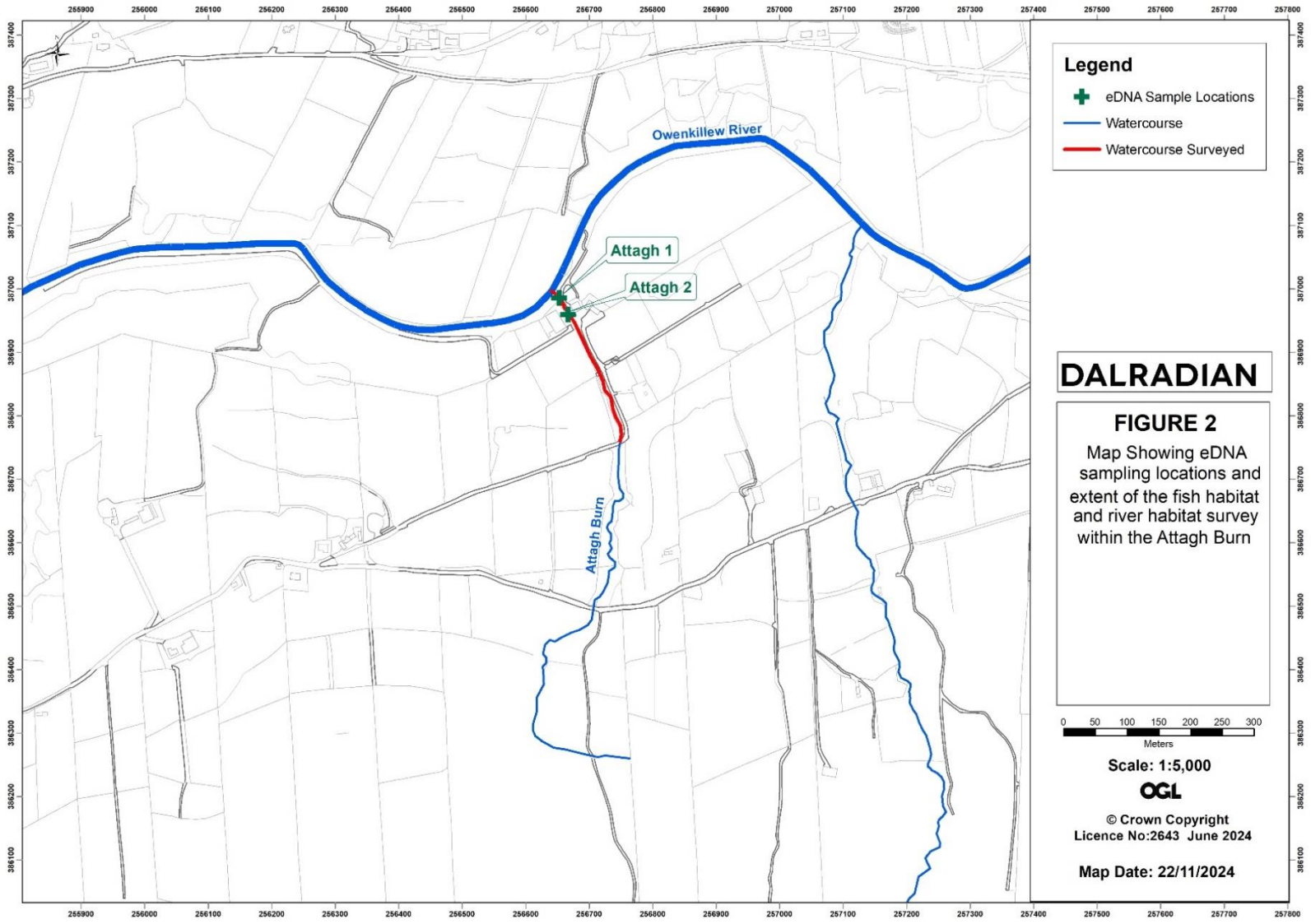


Table 3 Attagh Burn RHS sites and fish habitat descriptions

Attagh Burn RHS sites and fish habitat descriptions	
RHS1 – Upstream View	**RHS1 – Downstream View**
	
Site was at the confluence with the Owenkillew River and at this location the Attagh Burn is 'perched' above the Owenkillew River. This section of watercourse was 2.3m wide, shallow (5 cm deep), and the bed substrate was predominantly cobble. The watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Attagh Burn. The site is also considered unsuitable for FWPM.	
RHS2 – Upstream View	**RHS2 – Downstream View**
	
Site 50m upstream of RHS1 and this section of the Attagh Burn was narrow (1m wide), steep, shallow (5 cm deep), and the bed substrate was predominantly boulder interspaced by patches of gravel and pebble. The watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Attagh Burn. The site is also considered unsuitable for FWPM.	

RHS3 – Upstream View	RHS3 – Downstream View
	
Site 50m upstream of RHS2 and this section of the Attagh Burn was narrow (1.3 m wide), steep, shallow (5 cm deep), and the bed substrate was predominantly cobble interspaced by patches of gravel and pebble. The watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Attagh Burn. The site is also considered unsuitable for FWPM. Upstream of this location was a major ford which is considered to be a barrier to fish migration.	
RHS4 – Upstream View	**RHS4 – Downstream View**
	
Site 50m upstream of RHS3 and this section of the Attagh Burn was relatively narrow (2m wide), steep, shallow (5cm deep), and the bed substrate was predominantly boulder and cobble interspaced by patches of gravel and pebble. The watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Attagh Burn. The site is also considered unsuitable for FWPM. At this location was a minor ford which is considered to be a barrier to fish migration at the time of survey.	

RHS5 – Upstream View	RHS5 – Downstream View
	
Site 50m upstream of RHS4 and this section of the Attagh Burn was relatively narrow (1.2m wide), steep, shallow (5 cm deep), and the bed substrate was predominantly cobble interspaced by patches of gravel and pebble. The watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Unnamed Burn. The site is also considered unsuitable for FWPM. Above this location the Attagh Burn flows under a road within a culvert, which is considered to be a barrier to fish migration.	

3.2 Glenealy Burn

3.2.1 The location of fisheries habitat assessment, RHS survey and eDNA sampling is shown in Figure 3 and the findings of the fisheries habitat assessment, RHS survey are presented in Table 4. Results of the Glenealy Burn eDNA laboratory analysis are presented within Appendix A.

3.2.2 At the time of survey three barriers to fish migration were observed and these were:

- At the Camcosy Road bridge there was a >1m waterfall downstream of the bridge i.e. upstream of site RHS1 (Table 4), which is circa 230m upstream of the confluence of the Owenkillew River;
- A 'chute' feature within site RHS1 (Table 4), which is circa 200m upstream of the confluence of the Owenkillew River; and
- The 'perched' nature of the Glenealy Burn at the confluence of the Owenreagh River at site RHS5 (Table 4), which meant that there was no free access for fish between the river and the burn.

3.2.3 Results from the (eDNA monitoring carried out during October 2024 at one site within the Glenealy Burn (Figure 3) indicate that only brown/sea trout are present within this lower section of the burn. The eDNA site is downstream of the chute feature and no Atlantic salmon eDNA was detected within the Glenealy Burn.

3.2.4 Two further fish species of conservation interest were also tested as part of the eDNA monitoring and these were brook lamprey and European eel and eDNA monitoring indicate that brook lamprey and European eel are not present within the Glenealy Burn.

Figure 3 Map showing the eDNA sampling locations and the extent of the fish habitat and river habitat survey within the Glenealy Burn

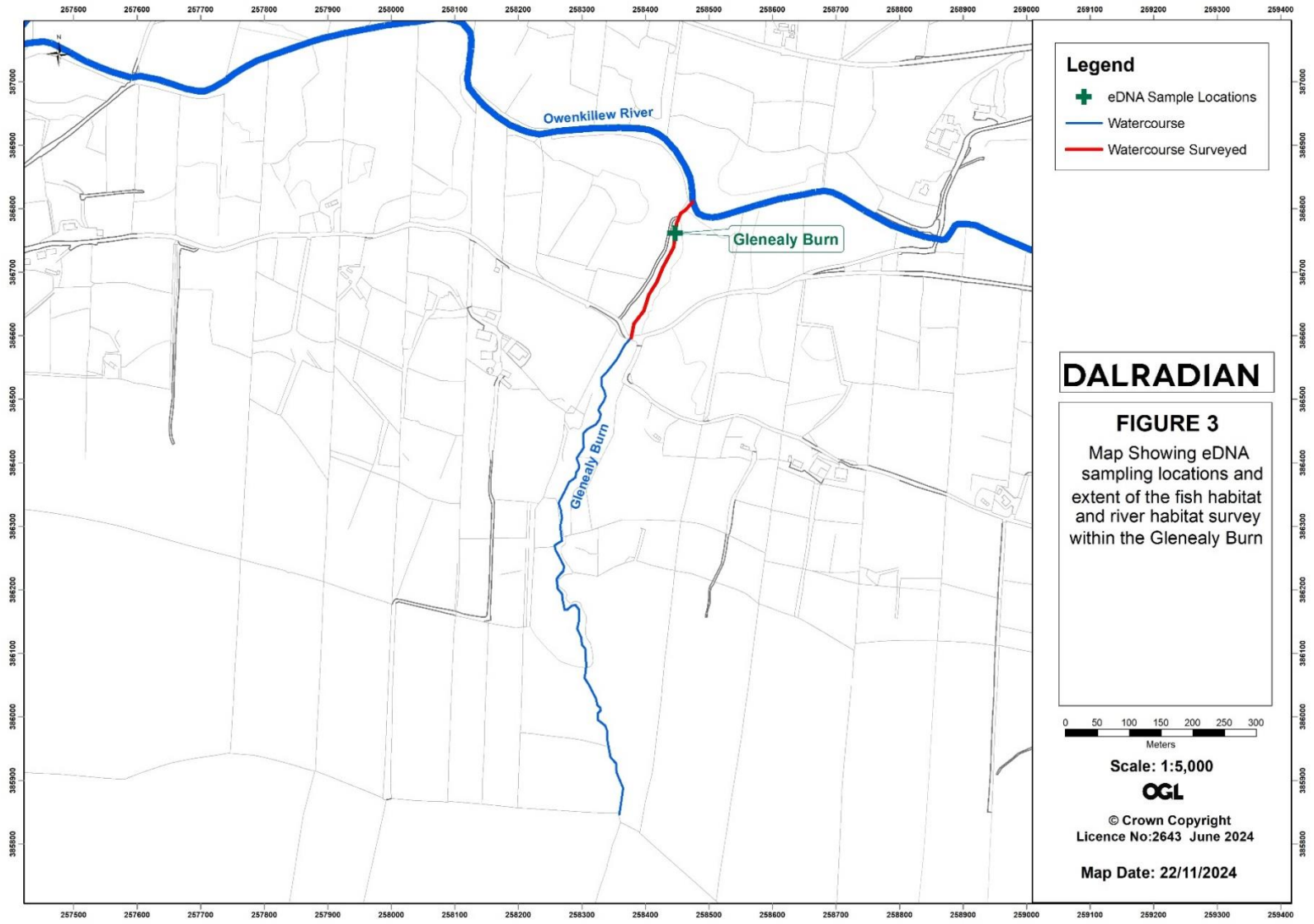


Table 4 Glenealy Burn RHS sites and fish habitat descriptions

Glenealy Burn RHS sites and fish habitat descriptions	
RHS1 – Upstream View	**RHS1 – Downstream View**
	
Site downstream of Camcosy Road and the Glenealy Burn was 2.2m wide, shallow (10cm deep), very steep and within this section. No suitable habitat for juvenile salmonid fish was observed at time of survey. The bed substrate is predominantly bedrock and a small waterfall (>1m) was present, which then flowed through a chute. It is considered that both these structures create a barrier to the upstream movement of fish. No spawning redds and no suitable salmonid spawning areas were observed and this section of the Glenealy is considered unsuitable for FWPM.	
RHS2 – Upstream View	**RHS2 – Downstream View**
	
Site 50m downstream of RHS1 and this section of the Glenealy Burn was 1.4m wide, steep, shallow (5cm deep), and the bed substrate was a mix of cobble and boulder. The watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Glenealy Burn. The site is also considered unsuitable for FWPM.	

RHS3 – Upstream View	RHS3 – Downstream View
	
Site 50m downstream of RHS2 and this section of the Glenealy Burn was 1.2m wide, steep, shallow (10cm deep), and the bed substrate was predominantly cobble. The watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Glenealy Burn. The site is also considered unsuitable for FWPM.	
RHS4 – Upstream View	**RHS4 – Downstream View**
	
Site 50m downstream of RHS3 and this section of the Glenealy Burn was 2m wide, shallow (10cm deep), linear in nature and with a modest gradient. The bed substrate was predominantly cobble and the watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Glenealy Burn. The site is also considered unsuitable for FWPM	

RHS5 – Upstream View	RHS5 – Downstream View
	
Site was 50m downstream of RHS4 and just upstream of the confluence with the Owenkillew River. At this location the Glenealy Burn is 'perched' above the Owenkillew and this section of watercourse was 1.8m wide, shallow (10cm deep), and the bed substrate was predominantly cobble. The watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Glenealy Burn. The site is also considered unsuitable for FWPM.	

3.3 Unnamed Burn

3.3.1 The location of fisheries habitat assessment, RHS survey and eDNA sampling is shown in Figure 4 and the findings of the fisheries habitat assessment, RHS survey is presented in Table 5. Results of the Unnamed Burn eDNA laboratory analysis are presented with Appendix A.

3.3.2 At the time of survey there was a major barrier to fish migration observed, which was in the form of a pipe culvert which is situated circa 300m upstream of the Owenreagh confluence.

3.3.3 Results from the (eDNA monitoring carried out during October 2024 at three sites within the Unnamed Burn (Figure 4) indicate that brown/sea trout and Atlantic salmon are present below the pipe culvert within the Unnamed Burn.

3.3.4 Two further fish species of conservation interest were also tested as part of the eDNA monitoring and these were brook lamprey and European eel and eDNA monitoring indicate that brook lamprey and European eel are not present below the pipe culvert within the Glenealy Burn.

3.3.5 The two eDNA sites above the pipe culvert indicated that no Atlantic salmon, brown/sea trout, brook lamprey and European eel eDNA was detected within this reach of the Unnamed Burn.

Figure 4 Map showing the eDNA sampling locations and the extent of the fish habitat and river habitat survey within the Unnamed Burn

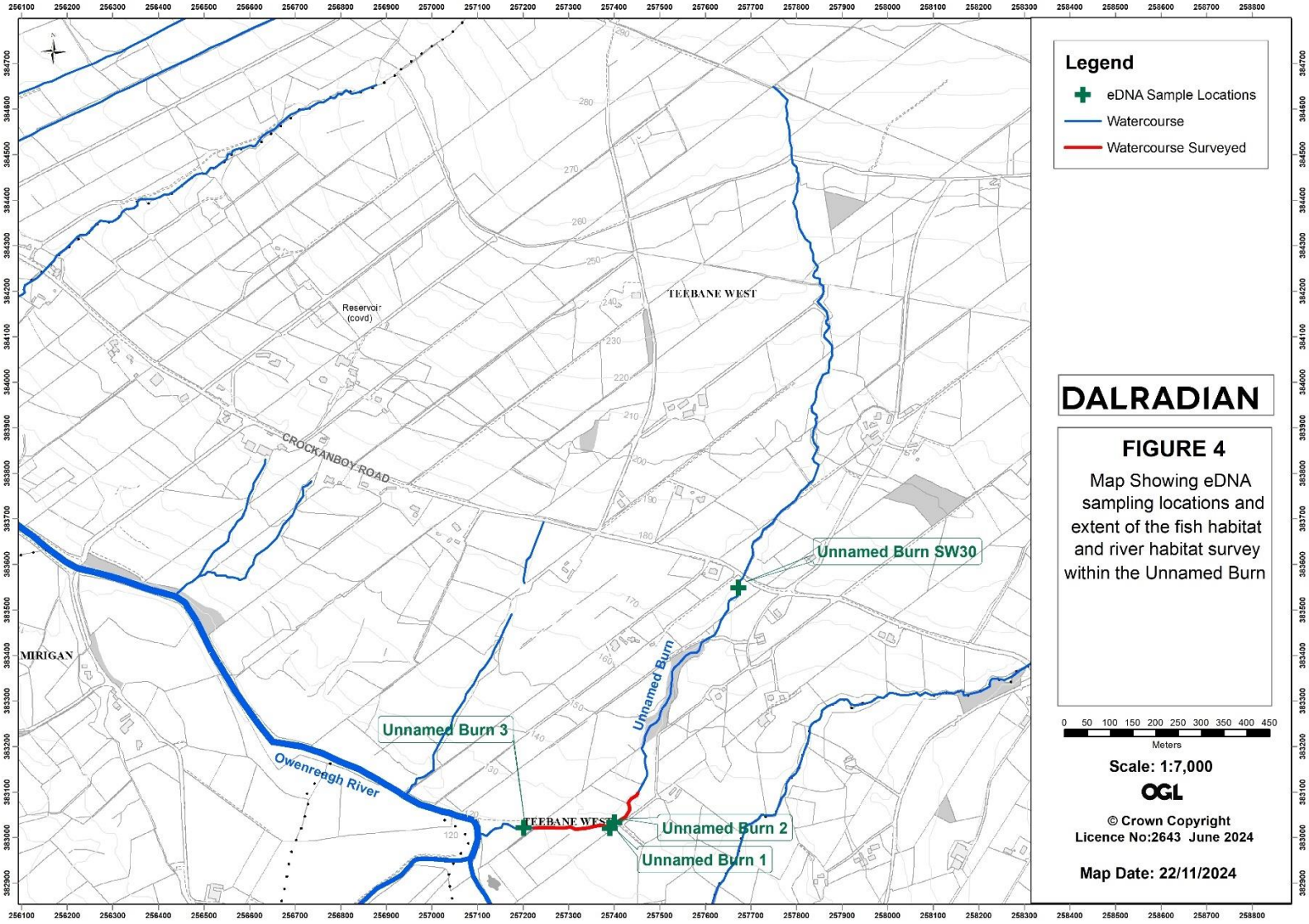


Table 5 Unnamed Burn RHS sites and fish habitat descriptions

<table>
<tr><th colspan="2">Unnamed Burn RHS sites and fish habitat descriptions</th></tr>
<tr><td>RHS1 – Upstream View
  </td><td>RHS1 – Downstream View
  </td></tr>
<tr><td colspan="2">Site is circa 100m upstream of the confluence of the Owenreagh River and this section of the Unnamed Burn was 1.8m wide, shallow (5cm deep), and the bed substrate was a mix of gravels and pebbles. The watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Unnamed Burn. The site is also considered unsuitable for FWPM.</td></tr>
<tr><td>RHS2 – Upstream View
  </td><td>RHS2 – Downstream View
  </td></tr>
<tr><td colspan="2">Site 50m upstream of RHS1 and this section of the Unnamed Burn was 1.6m wide, steep, shallow (5cm deep), and the bed substrate was predominantly gravel and pebble along with patches of cobble and boulder. The watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Unnamed Burn. The site is also considered unsuitable for FWPM.</td></tr>
</table>

RHS3 – Upstream View	RHS3 – Downstream View
	
Site 50m upstream of RHS2 and this section of the Unnamed Burn was 2m wide, steep, shallow (5cm deep), and the bed substrate was predominantly gravel and pebble along with patches of cobble and boulder. The watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Unnamed Burn. The site is also considered unsuitable for FWPM.	
RHS4 – Upstream View	**RHS4 – Downstream View**
	
Site 50m upstream of RHS3 and this section of the Unnamed Burn was 2m wide, steep, shallow (10 cm deep), and the bed substrate was predominantly cobble along with patches of gravel and pebble and boulder. The watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Unnamed Burn. The site is also considered unsuitable for FWPM. At a top of this section the Unnamed Burn flows through a pipe culvert (110 cm diameter and circa 10-12 metres long) and it is considered that the culvert is a barrier to the upstream migration of fish.	

RHS5 – Upstream View	RHS5 – Downstream View
	
Site 50m upstream of RHS4 and upstream of the pipe culvert. This section of the Unnamed Burn was 1.2m wide, steep, shallow (5cm deep), and the bed substrate was predominantly gravel and pebble along with patches of cobble with the occasional boulder. The watercourse at the time of survey offered limited habitat for juvenile salmonid fish and no spawning redds and no suitable salmonid spawning areas were observed within this section of the Unnamed Burn. The site is also considered unsuitable for FWPM.	

4 CONCLUSION

4.1 Attagh Burn

4.1.1 At the time of survey four barriers to fish migration were observed and these were due to the 'perched' nature of the Attagh Burn at the confluence of the Owenreagh River, a major ford and intermediate ford and a road culvert upstream of site. All four of these barriers are within the first 280m of the Attagh Burn upstream of the confluence with the Owenkillew River. As such, fish migration and movement will be restricted by these features.

4.1.2 Results from the (eDNA monitoring carried out during October 2024 at two sites within the Attagh Burn indicate that only brown/sea trout are present within this lower section of the burn. It should be noted that brown trout and sea trout are the same species and it is impossible to differentiate between the two species using eDNA.

4.1.3 Three further fish species of conservation interest were also tested as part of the eDNA monitoring and these were Atlantic salmon, brook lamprey and European eel. The results of the eDNA monitoring indicate that brook lamprey and European eel were not present within the Attagh Burn.

4.1.4 Due to the linear nature of the channel, gradient of the Attagh Burn and lack of upstream connectivity from the Owenkillew River then it is considered that the presence of brown/sea trout is due to fish entering the burn from the main river during flood flow conditions and subsequently becoming trapped when the flood flow water levels recede.

4.2 Glenealy Burn

4.2.1 At the time of survey three barriers to fish migration were observed and these were the waterfall below the Camcosy Road bridge, a 'chute' feature and the 'perched' nature of the Glenealy Burn at the confluence of the Owenkillew River. All three of these barriers are within the first 230m of the Glenealy Burn upstream of the confluence with the Owenkillew River. As such, fish migration and movement will be restricted by these features.

4.2.2 Results from the (eDNA monitoring carried out during October 2024 at one site within the Glenealy Burn indicate that only brown/sea trout are present within this lower section of the burn. It should be noted that brown trout and sea trout are the same species and it is impossible to differentiate between the two species using eDNA.

4.2.3 Three further fish species of conservation interest were also tested as part of the eDNA monitoring and these were Atlantic salmon, brook lamprey and European eel. The results of the eDNA monitoring indicate that brook lamprey and European eel are not present within the Glenealy Burn.

4.2.4 Due to the linear nature of the channel, gradient of the Glenealy Burn and lack of upstream connectivity from the Owenkillew River then it is considered that the presence of brown/sea trout is due to fish entering the burn from the main river during flood flow conditions and subsequently becoming trapped when the flood flow water levels recede.

4.3 Unnamed Burn

4.3.1 Due to access restrictions it was not possible to visit the confluence of the Unnamed Burn, but from satellite imagery provide by Google Earth Pro then there appears to be connectivity of the Unnamed Burn and the Owenreagh River.

4.3.2 At the time of survey there was a major barrier to fish migration observed, which was in the form of a pipe culvert which is situated circa 300m upstream of the Owenreagh confluence.

4.3.3 Results from the (eDNA monitoring carried out during October 2024 at three sites within the Unnamed Burn indicate that brown/sea trout and Atlantic salmon are present below the pipe culvert.

4.3.4 Two further fish species of conservation interest were also tested as part of the eDNA monitoring and these were brook lamprey and European eel and eDNA monitoring indicate that brook lamprey and European eel are not present below the pipe culvert within the Unnamed Burn.

4.3.5 The two eDNA sites above the pipe culvert indicated that no Atlantic salmon, brown/sea trout, brook lamprey and European eel eDNA was detected within this reach of the Unnamed Burn.

APPENDIX A –EDNA SURVEY RESULTS

Folio No:	3618-2024
Contact:	Dalradian Gold Limited
Issue Date:	31.10.2024
Received Date:	24.10.2024

eDNA Report

Technical Report

eDNA Analysis

Summary

When aquatic organisms inhabit a waterbody such as a pond, lake or river they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm the presence or absence of the target species within the waterbody.

Results

Lab ID	Site Name	OS Reference	Target Species	Sample Integrity Check	Result	Positive Replicates
FK2479	Greencastle - Unnamed Burn No 2		Atlantic salmon	Pass	Negative	0
			Brook lamprey	Pass	Negative	0
			Brown (sea) trout	Pass	Negative	0
			European eel	Pass	Negative	0
FK2480 No	Attagh Burn		Atlantic salmon	Pass	Negative	0

		Brook lamprey	Pass	Negative	0
		Brown (sea) trout	Pass	Positive	12
		European eel	Pass	Negative	0
FK2789	Greencastle - Unnamed Burn No 1	Atlantic salmon	Pass	Negative	0

		Brook lamprey	Pass	Negative	0
		Brown (sea) trout	Pass	Positive	5
		European eel	Pass	Positive	2
FK2794	Greencastle - Unnamed Burn No 3	Atlantic salmon	Pass	Positive	2
		Brook lamprey	Pass	Negative	0
		Brown (sea) trout	Pass	Positive	7
		European eel	Pass	Negative	0
FK2797	Glenealy Burn	Atlantic salmon	Pass	Negative	0
		Brook lamprey	Pass	Negative	0
		Brown (sea) trout	Pass	Positive	5
		European eel	Pass	Negative	0
FK2798	Attagh No 2	Atlantic salmon	Pass	Negative	0
		Brook lamprey	Pass	Negative	0
		Brown (sea) trout	Pass	Positive	12

European eel	Pass	Positive	3

Matters affecting result: none

Reported by:Lauryn Jewkes

Approved by: Chelsea Warner

Methodology

Samples have been analyzed for the presence of target species eDNA following readily available and scientifically published eDNA assays and protocols.

The analysis is conducted in two phases. The sample first goes through an extraction process where the filter is incubated in order to obtain any DNA within the sample. The extracted sample is then tested via real-time PCR (also called q-PCR) for each of the selected target species. This process uses species-specific molecular markers (known as primers) to amplify a select part of the DNA, allowing it to be detected and measured in 'real time' as the analytical process develops. qPCR combines amplification and detection of target DNA into a single step. With qPCR, fluorescent dyes specific to the target sequence are used to label targeted PCR products during thermal cycling. The accumulation of fluorescent signals during this reaction is measured for fast and objective data analysis. The primers used in this process are specific to a part of mitochondrial DNA only found in each individual species.

Separate primers are used for each of the species, ensuring no DNA from any other species present in the water is amplified. If target species DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If target DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent the risk of false positive and false negative results. True positive controls, negative controls, and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared. Stages of the analysis are also conducted in different buildings at our premises for added security. SureScreen Scientifics Ltd is ISO9001 accredited and participates in Natural England's proficiency testing scheme for GCN eDNA testing.

Interpretation of Results

Sample Integrity Check:

Laboratory Arrival:

When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results. Any samples which fail this test are rejected and eliminated before analysis.

Degradation and Inhibition check:

Analysis of the spiked DNA marker to see if there has been degradation or inhibition of the kit or sample, between the date it was made to the date of analysis. Degradation of the spiked DNA marker may indicate a risk of false negative results. If inhibition is detected, samples are purified and re-analyzed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: **Presence of eDNA (Positive/Negative/Inconclusive)**

Positive: DNA was identified within the sample, indicative of species presence within the sampling location at the time the sample was taken or within the recent past.

Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for species presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. Even a score as low as 1/12 is declared positive. 0/12 indicates negative species presence.

Negative: eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of species absence, however, does not exclude the potential for species presence below the limit of detection.

Inconclusive: Controls indicate inhibition or degradation of the sample, resulting in the inability to provide conclusive evidence for species presence or absence.

Folio No:	3625-2024
Contact:	Dalradian Gold Limited
Issue Date:	01.11.2024
Received Date:	25.10.2024

eDNA Report

Technical Report

SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE, UK

Folio No: 3625-2024
Purchase Order:Contact: 0000007875
Dalradian Gold Limited
Issue Date: 01.11.2024

SureScreen Scientifics

eDNA Analysis

Summary

When aquatic organisms inhabit a waterbody such as a pond, lake or river they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm the presence or absence of the target species within the waterbody.

Results

Lab ID	Site Name	OS Reference	Target Species	Sample Integrity Check	Result	Positive Replicates
FK2790	Greencastle Unnamed burn SW30		Atlantic salmon	Pass	Negative	0
			Brook lamprey	Pass	Negative	0
			Brown (sea) trout	Pass	Negative	0
			European eel	Pass	Negative	0

Folio No:	3625-2024
Purchase Order:Contact:	0000007875
	Dalradian Gold Limited
Issue Date:	01.11.2024

Matters affecting result: none

Reported by:Chelsea Warner

Approved by: Lauryn Jewkes

Methodology

Samples have been analyzed for the presence of target species eDNA following readily available and scientificallypublished eDNA assays and protocols.

The analysis is conducted in two phases. The sample first goes through an extraction process where the filter is incubated in order to obtain any DNA within the sample. The extracted sample is then tested via real-time PCR (alsocalled q-PCR) for each of the selected target species. This process uses species-specific molecular markers (known as primers) to amplify a select part of the DNA, allowing it to be detected and measured in 'real time' as the analytical process develops. qPCR combines amplification and detection of target DNA into a single step. With qPCR, fluorescent dyes specific to the target sequence are used to label targeted PCR products during thermal cycling. The accumulation of fluorescent signals during this reaction is measured for fast and objective data analysis.The primers used in this process are specific to a part of mitochondrial DNA only found in each individual species.

Separate primers are used for each of the species, ensuring no DNA from any other species present in the water is amplified. If target species DNA is present, the DNA is amplified up to a detectable level, resulting in positive speciesdetection. If target DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent the risk of false positive and false negative results. True positive controls, negative controls, and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared. Stages of the analysis are also conducted in different buildings at our premises for added security. SureScreen Scientifics Ltd is ISO9001 accredited and participates in Natural England's proficiency testing scheme for GCN eDNA testing.

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Folio No:	3625-2024
Purchase Order:Contact:	0000007875
	Dalradian Gold Limited
Issue Date:	01.11.2024

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Negative: eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of species absence, however, does not exclude the potential for species presence below the limit of detection.

Inconclusive: Controls indicate inhibition or degradation of the sample, resulting in theinability to provide conclusive evidence for species presence or absence.

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Registered in England No. 04364279
www.rsk.co.uk

Loughs Agency Chronology

DATE	SUMMARY OF EVENTS
January 2016	Pre-application engagement commenced with Loughs Agency (LA) and other statutory consultees
12 January 2016	Pre-Application Discussion (PAD) on water management– Declan Lawlor (DL) and Oisin Doherty (OS) of Loughs Agency were in attendance.
30 March 2016	Response from Loughs Agency to request for scoping opinion. They raised questions to better understand the proposal – in particular the generation of cyanide solution and details on the storage, transportation and any breakdown products required, and safeguarding against emergency environmental incidents.
27 April 2016	Meeting with DL on site
29 March 2018	DL acknowledges receipt of planning application
20 April 2018	Letter from Loughs Agency to DfI
13 September 2018	Further letter from Loughs Agency to DfI
7 October 2018	Seamus Cullinan of 181 Edergole Road, Fintona submits two letters of objection to DfI: • Obj 8092 – to goldmine application • Obj 722 – to Mine Waste Management Plan
13 December 2018	Unannounced visit to site by Loughs Agency personnel (John McCartney & Seamus Cullinan) to DGL site.
10 January 2019	Loughs Agency provide consultation response.
July 2019	DGL submit First Addendum to ES
26 November 2019	Meeting with Loughs Agency
19 December 2019	FEI1 Consultation response from John McCartney of Loughs Agency.
23 June 2020	John McCartney of Loughs Agency confirms they have no further comment to make
October 2020	DGL submit Second Addendum
15 December 2020	Second Addendum Consultation response from Loughs Agency – seeking an extension to the deadline in order to consider the level detail in the further information presented.
6 January 2021	Loughs Agency sought a further extension of time to provide a response – to 26 February 2021 'Loughs Agency have held extensive internal discussions in relation to this application'.

11 February 2021	Loughs Agency and NIEA staff carried out unannounced visit of Curraghinalt and Pollanroe burn tributaries to take initial look at availability of potential fish habitat.
18 February 2021	Ms Downey from Loughs Agency arranged a meeting with DGL and representatives for 22nd February 2021 and identified 3 areas that were to be discussed • Seepage from the Mine Waste Facility /Dry Stack Facility (discharge and treatment) • Explanation on the reduction of groundwater base flow and impacts of the surface water environment • Impact on the surface water environment post closure
22 February 2021	Prior to the meeting Cleaver Fulton Rankin (CFR) on behalf of DGL sought confirmation from Mr McCartney, then Director of Conservation and Protection at Loughs Agency, that none of those attending the meeting on behalf of Loughs Agency had lodged objections or posted negative comments on social media regarding the proposal. A copy of the Agency's Register of Interest and its Conflict of Interest policy were also requested. No substantive response was received from Mr McCartney and the meeting did not take place
1 March 2021	Mr McCartney provided CFR with soft copy of Conflict of Interest policy but omitted providing Register of Interests
5 March 2021	Loughs Agency Consultation response to FEI2 received - raised several issues including a number which had not been raised in the proposed isseus for discussion for meeting on 22 February 2022; --- CFR made request for disclosure of copies of material in Loughs Agency's possession re the company (DGL), its proposal for the mine and current planning application Request for information was acknowledged by Loughs Agency
16 March 2021	CFR emailed Mr McCartney seeking Register of Interest and clarification on number of related queries – no response received
12 April 2021	CFR request for disclosure (dated 5th March 2021) was refused by Loughs Agency
29 April 2021	CFR email to Mr McCartney seeking Register of Interest and clarification on number of related queries – no response received
30 April 2021	An internal review by Loughs Agency of the refusal to disclose decision of 12th April 2021, was requested by CFR
20 May 2021	Follow up CFR email to Mr McCartney seeking Register of Interest and clarification on number of related queries – no response received

26 May 2021	Further letter CFR KLB to Loughs Agency seeking update re request for internal review Loughs Agency advised KLB no record of receiving request for review Further copy of 30 April 2021 internal review request was emailed to Loughs Agency --- Liz Smyth of NIEA advised a survey of the burns would be led by Loughs Agency and NIEA would be attending to advise and DGL could attend in observatory capacity
27 May 2021	Loughs Agency acknowledged receipt of further copy review request of 26th May 2021
3 June 2021	NIEA advised that Loughs Agency were not willing to have a representative of DGL attend the survey of the burns
4 June 2021	DGL sent letter to Dr T Kearney of NIEA expressing concern at the decision to refuse the attendance of ecologist on behalf of DGL at the burns survey
8 June 2021	Letter from NIEA advising that it was not possible to secure agreement for the representatives of DGL to attend the survey of the burns with Loughs Agency.
9 June 2021	DGL advised by Neil McAllister, lead coordinator/ Major Client Interface for Project in the Development Management Team at DAERA that he did not expect the Loughs Agency site visit to take place until July as Loughs Agency were awaiting equipment to come over from GB. --- DGL wrote to Chief Executive of Loughs Agency requesting that Loughs Agency urgently revisit the position re the joint approach to the survey at the burns, and to consider the attendance of an independent Ecologist at the survey. No response was received
10 June 2021	Loughs Agency carried out electrofishing surveys in Curraghinalt and Pollanroe Burns --- DGL advised that Loughs Agency had carried out the survey without advising Ms Smyth or Mr McAllister (DAERA). In recent SoC Loughs Agency have also referenced electrofishing surveys for the Unnamed Burn for 2021, 2022, 2023 and 2024.
17 June 2021	Correspondence received from Loughs Agency confirming Chief Executive had referred request for internal review to Agency's solicitors, Arthur Cox.
20 August 2021	Reminder sent from CFR to Arthur Cox on behalf of Loughs Agency seeking a response to request for internal review
14 September 2021	Complaint submitted to ICO re Loughs Agency's refusal to provide information requested, and failure to respond to request for internal review
8 October 2021	Response to request for internal review received from Arthur Cox on behalf of Loughs Agency – letter from Loughs Agency dated 6th October 2021

13 October 2021	Response received from ICO, advising that Loughs Agency as a north-south body is not a public authority for the purposes of FOIA and that Loughs Agency website states that it is a public authority for the purposes of the EIR. ICO confirmed that they referred matter back to Loughs Agency to respond and stated outcome of internal review should be issued within 10 working day, following consideration of the request under EIR
27 June 2022	Electro-fishing carried out in Curraghinalt and Pollanroe Burns. with DGL consultants and Loughs Agency, including Mr Cullinan
18 October 2024 (received 25 October 2024)	Loughs Agency SoC disclosing survey work from 2021 onwards in the unnamed watercourse. Survey results were not appended to the SoC.
31 October 2024	EIR request made by CFR for 'copies of all material including survey results, reports, notes, emails and internal memos relating to electrofishing surveys carried out in the unnamed watercourse between 2021-2024, as referred to at page 41 and 42 of your Statement of Case, lodged with the Planning Appeals Commission for the Curraghinalt Project.' Not received as of 22 November 2024