

Rebuttal to Dalradian Gold Discharge consent Statement of Case

This rebuttal emphasizes potential ecological risks, shortcomings in compliance with regulatory frameworks, and gaps in data and risk assessment.

1. Current Unfavourable Conditions of the SAC

- **Applicant's Claim:** Dalradian acknowledges that the Owenkillev SAC is in an "unfavorable – no change" condition but suggests that their discharge standards will avoid further deterioration.
- **Counter:** The objective of the discharge consent should not be merely to prevent further deterioration but to contribute to the improvement and restoration of the SAC. Dalradian's proposal fails to recognize the SAC's current "unfavorable" status and the legal obligations to enhance its condition. Given that the Owenkillev River supports priority species such as the Freshwater Pearl Mussel and Atlantic Salmon, additional discharge, even within proposed limits, could inhibit necessary recovery and restoration efforts. This lack of alignment with the Conservation Objectives directly challenges the validity of the proposed discharge standards

2. Baseline Data and Inadequate Environmental Quality Standards (EQS)

- **Applicant's Claim:** Dalradian claims their approach is compliant with Environmental Quality Standards based on baseline data that considers existing conditions.
- **Counter:** The reliance on current baseline data, especially in an already degraded SAC, may not account for the necessary improvements required for the ecosystem. EQS compliance should be stricter than the baseline due to the SAC's sensitive status. The NIEA emphasizes that Dalradian's proposed standards for BOD, nitrates, and phosphorus exceed those needed for favorable SAC conditions, making it unlikely that discharge will facilitate ecological recovery. Therefore, the applicant's standards do not meet the stringent criteria essential for the Owenkillev SAC's ecological health.

3. Functional Linkages of Tributaries and "Low Ecological Value" Classifications

- **Applicant's Claim:** The applicant downplays the importance of tributaries like Pollanroe and Curraghinalt Burns, classifying them as low ecological value.
- **Counter:** NIEA, along with the Loughs Agency, contends that tributaries like Pollanroe and Curraghinalt play crucial roles in the ecological integrity of the Owenkillev River system, providing connectivity and contributing to habitat diversity for salmonids and other aquatic life. Classifying them as "low ecological value" disregards the cumulative impact of pollutants and sedimentation, which may disrupt species that rely on these tributaries. Furthermore, recent surveys reveal salmonids' presence, highlighting the ecological value of these tributaries, which require stringent protective measures. The applicant's minimization of

these tributaries' importance is therefore inconsistent with established conservation standards.

4. Outdated and Insufficient Ecological Data

- **Applicant's Claim:** Dalradian's SoC uses ecological data to suggest minimal impacts on sensitive species.
- **Counter:** NIEA and Dfl both highlight that much of the ecological data on which Dalradian relies is outdated, with some dating back to 2015/2016. Given the time elapsed and recent identification of salmonids and other species in local waterways, updated surveys are essential to accurately reflect the current ecosystem health. Failing to update data risks underestimating the effects of discharge on sensitive and potentially recovering species, making the proposed mitigation measures insufficient and out of line with the precautionary principle.

5. Concerns Over Long-Term Technological Efficacy and Environmental Risks of Reverse Osmosis

While Dalradian has proposed reverse osmosis (RO) as a solution to achieve high water quality standards, significant concerns remain regarding its practicality and environmental impact, especially within a mining context where consistent, large-scale operation is required. Beyond technical challenges, RO-treated water itself poses ecological risks that could be detrimental to the local environment. Key concerns include:

- **High Energy Consumption:** RO systems require substantial energy to maintain the high pressures necessary for effective filtration, leading to high operational costs. The continuous energy demands associated with RO, especially in a long-term project like this, may strain resources and raise sustainability concerns. Additionally, the dependence on high energy use leaves the system vulnerable to operational or supply disruptions, which could result in untreated or partially treated water impacting the environment.
- **Membrane Fouling and Maintenance Requirements:** The presence of suspended solids, minerals, and other scaling agents in mine water increases the likelihood of membrane fouling in RO systems, leading to frequent maintenance needs and reduced efficiency. The frequent downtime and maintenance required to address fouling are operationally costly and may lead to lapses in water quality management if membranes are not serviced in a timely manner. These issues introduce uncertainty about the consistency and reliability of RO as a treatment solution, potentially endangering water quality if maintenance schedules are not rigorously maintained.
- **Concentrate Disposal Challenges:** RO systems produce a concentrated byproduct, rich in the contaminants removed from the water, including heavy metals, salts, and other toxic substances. Proper disposal of this concentrate is necessary to avoid secondary environmental contamination. Disposal options are limited and complex, often requiring additional treatment or safe containment, both of which involve further cost and logistical planning. If not managed properly, concentrate disposal could lead to significant

environmental consequences, especially in hydrologically sensitive areas, where contaminants could migrate into groundwater or nearby water systems, impacting aquatic life and potentially contaminating drinking water supplies.

- **Acidification of Receiving Waters:** RO-treated water is typically slightly acidic, with a pH between 5.0 and 6.5, due to the removal of dissolved minerals. When discharged into natural water bodies, this more acidic water can alter the pH of the receiving waters, leading to acidification that disrupts the biological processes of aquatic organisms. Many species are highly sensitive to pH fluctuations, and even minor changes can result in stress, reduced reproductive success, or mortality, impacting the diversity and health of the ecosystem.
- **Disruption of Mineral Balances:** Natural water bodies contain essential dissolved minerals such as calcium and magnesium that support various forms of aquatic life. RO-treated water, being stripped of these minerals, can dilute mineral concentrations in the receiving environment, leading to deficiencies that negatively affect the growth and reproduction of aquatic organisms. For instance, calcium is vital for the development of fish bone structures and the exoskeletons of crustaceans. A reduction in these essential minerals can compromise the health and viability of aquatic populations, with wider ecosystem implications.
- **Impact on Water Chemistry and Buffering Capacity:** The removal of minerals during RO treatment also reduces the buffering capacity of the water, making it more susceptible to pH fluctuations. This lack of stability can exacerbate the effects of acidic inputs, such as acid rain, further stressing the ecosystem. Consistent buffering capacity is essential for maintaining chemical equilibrium within water bodies, and the introduction of demineralized water undermines this stability, posing risks to sensitive ecosystems.
- **Potential Harm to Sensitive Species:** Certain species, such as freshwater mussels and particular fish, are especially sensitive to changes in water chemistry. The altered mineral balance and lower pH of RO-treated water can create unfavorable conditions that may lead to population declines. For example, freshwater mussels rely on specific mineral concentrations for shell formation and general health, and any shifts in these concentrations can directly impact their survival.

While RO technology may provide an initial solution for mine water treatment, its application in a large-scale mining operation introduces a host of potential environmental risks. These range from operational challenges and high costs to significant ecological impacts due to altered water chemistry and mineral composition. Given these issues, Dalradian's reliance on RO as a primary treatment method without additional safeguards will not ensure the necessary protection for local ecosystems, particularly for sensitive species and habitats. This highlights the need for a more comprehensive water treatment plan that includes post-treatment adjustments to stabilize pH, remineralize the water, and mitigate potential harm to the surrounding environment, if this can even be done effectively considering the sensitive receptor of the discharged water and how even the smallest of variations can cause irreversible harms, so the proposed mitigations still run the high potential for harm.

6. Risk of Increased Flow Rates and Altered Hydrology

- **Applicant's Claim:** Dalradian states that the proposed discharge will not adversely impact the flow or hydrology of the SAC and associated watercourses.

- **Counter:** NIEA's findings suggest otherwise, indicating that the discharge could increase the flow in tributaries like Pollanroe Burn by up to 244%. Such a change can destabilize the watercourse, alter sediment levels, and harm critical habitats. Dalradian's assessment underestimates these potential disruptions and does not sufficiently address the ecological consequences of altered hydrology on the SAC and other protected areas. This issue alone highlights significant gaps in the applicant's risk assessment, suggesting that the potential impacts of discharge are underplayed.

7. Lack of Alignment with Water Framework Directive and Conservation Regulations

- **Applicant's Claim:** Dalradian asserts compliance with relevant regulations without fully detailing alignment with the Water Framework Directive and Conservation (Natural Habitats) Regulations.
- **Counter:** DfI's SoC stresses that regulatory compliance is essential, particularly for projects impacting drinking water catchment areas and protected habitats. The applicant's approach does not seem to satisfy the precautionary principle required by these regulations, nor does it sufficiently consider indirect and cumulative impacts. Dalradian's proposal, as it currently stands, appears to fall short of achieving the standards necessary under the Water Framework Directive, Conservation Regulations, and Groundwater Regulations, calling into question the validity of their regulatory claims

8. Concerns Over Long-Term Impact on Drinking Water and Private Supplies

- **Applicant's Claim:** Dalradian's SoC suggests no significant risk to public or private drinking water sources.
- **Counter:** The site is within a Drinking Water Protected Area, with significant implications for over 40,000 people who rely on it. DAERA's Drinking Water Inspectorate and the NIEA emphasize the need for detailed impact assessments on both public and private water supplies. Dalradian's general assurance lacks specifics, particularly for private water supplies that could be affected by pollutants and changes in groundwater levels. The rebuttal should underscore that these potential impacts require more stringent preventive measures.

9. Inadequate Waste and Peat Management Plans

- **Applicant's Claim:** Dalradian argues that their Mine Waste Management Plan (MWMP) and peat handling procedures are sufficient.
- **Counter:** The NIEA has raised concerns about the stability and containment of the proposed dry stack facility, especially its impact on nearby watercourses if leachate or sediment escapes. Further, the peat management strategy, without adequate risk assessments for slope stability, could result in landslides, leachate flow, and disruption to water quality in SACs and ASSIs. This weakens Dalradian's position, as their MWMP fails to meet the standards needed to protect the sensitive hydrology and ecology of the area.

10. Lack of Long-Term Financial Security and Post-Closure Accountability

- **Applicant's Claim:** Dalradian provides general assurances regarding long-term monitoring and management of the site.
- **Counter:** The long-term impact of mining operations and waste management demands clear financial accountability and security for post-closure monitoring, restoration, and potential emergency responses. Dfl's SoC suggests the necessity of a robust restoration bond. The applicant's current plans lack a clear, binding framework for financing these activities beyond operational life, raising concerns over post-closure impacts on water quality and habitat recovery. Dalradian's commitment to financial security measures should be formalized under a legally binding section 76 planning agreement. This has also not been considered in the economics of the application.

Conclusion

Dalradian's SoC for discharge consent inadequately addresses the potential for both immediate and long-term ecological, hydrological, and social impacts. By relying on outdated data, insufficient standards, and vague assurances, the applicant's proposal appears to be misaligned with environmental protections mandated under various regional and European laws. This rebuttal underscores the need for stricter discharge conditions, updated environmental assessments, and clearer financial and operational commitments to protect the Owenkillow SAC, the public water supply, and the surrounding communities.

Yours sincerely

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