



Mullach Mor, Isle of Rum

Local Waste Solids Deposition Modelling Report

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QUALITY ASSURANCE

Mowi Scotland maintains a Quality Manual which defines the Quality and Environmental Policy of Mowi Scotland Farming Limited and includes an overview of its processes and acts as a signpost to key elements of its Quality Management System according to the requirements of BS EN ISO 9001, BS EN ISO 14001, GLOBALG.A.P. and British Retail Consortium Global Standard Food. Note the BRC standard is relevant to Blar Mhor processing plant only.

EXECUTIVE SUMMARY

Model simulations have been performed to assess the likely deposition of waste solids at a proposed salmon farm site Mullach Mor, off the Isle of Rum. This report explains the application of the NewDepomod model to describe the deposition of waste solids beneath the pens and in the surrounding environment. The modelling procedure followed as far as possible guidance presented by the Scottish Environment Protection Agency (SEPA) in January 2024 (SEPA, 2024).

Results indicated that deposition at Mullach Mor will be low, with a maximum deposition of 15,491.5 g m⁻² (Table 1). The footprint area, where the deposition exceeded the critical deposition rate of 250 g m⁻², was 0.205 km². The intensity of deposition, 1,198 g m⁻², was less than the critical value of 4,000 g m⁻² for this exposed site.

These results indicate that the proposed farm at Mullach Mor will comfortably meet pertinent Environmental Quality Standards for salmon farm waste solids.

Potential interactions with Important Ecological Features are considered in Section 3.3 in line with the EIA scoping request by NatureScot (Nature Scot 2026).

Table 1. Site details & summary of results

Site Details	
Site Name:	Mullach Mor
Site Location:	Isle of Rum
Peak Biomass (T):	2,650
Feed Load (T/year):	6,643
Pen Details	
Number of Pens:	8
Pen Dimensions:	160m Circumference
Working Depth (m):	16
Configuration:	2x4, 100m matrix
NewDepomod Results	
120% Allowable Mixing Zone (m ²):	212,452.4
Maximum Deposition (g m ⁻²):	14,655.1
Modelled Footprint Area (m ²):	198,750.0
Mean Footprint Deposition (g m ⁻²):	1,180.9
In-feed Medicine	
Enamectin Benzoate MEQ (g)	23

1. INTRODUCTION

This report has been prepared by Mowi Scotland Ltd. to describe the deposition of waste solids from a proposed marine salmon farm at Mullach Mor, Isle of Rum (Figure 1). The proposed site incorporates 8 x 160 m pens, with a working depth of 16 m. The report describes the application of the NewDepomod model to describe the deposition of waste solids beneath the pens and in the surrounding environment. The modelling procedure followed as far as possible guidance presented by the Scottish Environment Protection Agency (SEPA) in 2024 (SEPA, 2024).

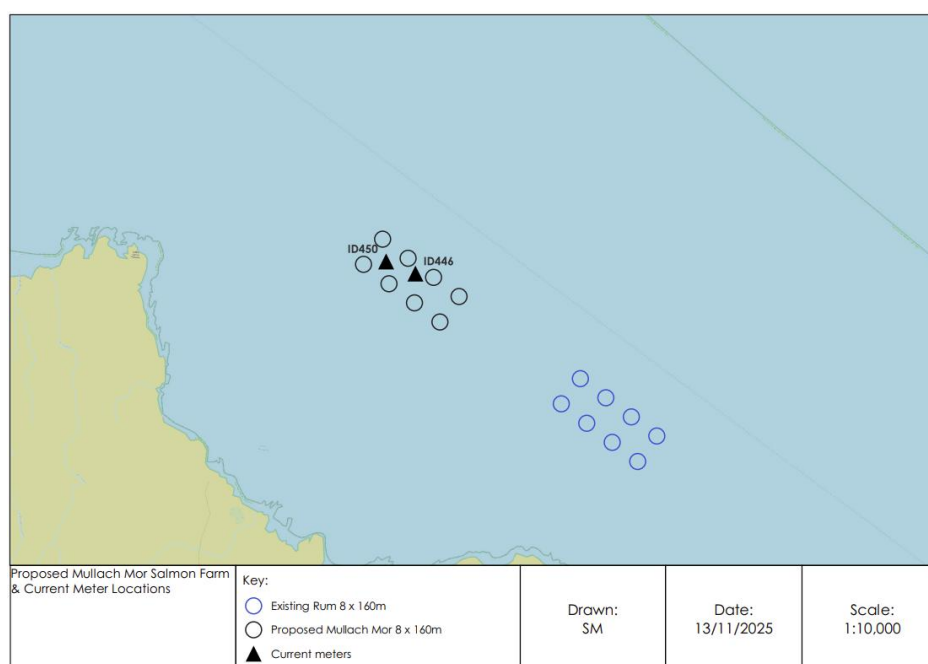


Figure 1. Pen locations (O) for the existing Rum site (blue) and proposed new Mullach Mor site (black). Current meter deployment locations are marked (▲).

1.1 Site Details

The proposed site is situated West of the existing Rum salmon farm (Figure 1). The proposed pen centre locations are given in Table 2; these locations were used in the computer modelling (Section 2). Details of the site and hydrographic summary are provided in Table 3. Hydrographic data were collected over two deployments in 2025 (ID450 and ID446, Figure 1). The receiving water is defined as open water.

The proposed location at Mullach Mor is sited in a high wave exposure location (wave exposure index = 3.5); as such, the deposition intensity limit within the modelled footprint will be set at 4,000 g m² and the footprint area must be less than 120% of the 100 m mixing zone (SEPA, 2024).

Table 2. Details of the proposed 8 x160 m pen centre locations and net depths used in the modelling for Mullach Mor.

Pen	Easting	Northing	Net Depth (m)
1	140466	803507	16
2	140546	803447	16
3	140626	803387	16
4	140706	803327	16
5	140406	803428	16
6	140486	803367	16
7	140566	803307	16
8	140646	803247	16

2. MODEL DETAILS

Simulations were performed utilising the NewDepomod model which focussed on localised deposition of waste solids from the proposed pen locations. The model was configured with the standard default parameter values specified by SEPA and using measured flow data to force the model.

Table 3. Summary of the near-bed hydrographic data at Mullach Mor.

Hydrographic Summary	ID446	ID450
Deployment Date	Feb – Apr 2025	Jun – Aug 2025
Easting	140569	140477
Northing	803399	803437
Mean Speed (m/s)	0.093	0.091
Residual Speed (m/s)	0.026	0.021
Residual Direction (°G)	293	152
Tidal Amplitude Parallel (m/s)	0.133	0.129
Tidal Amplitude Normal (m/s)	0.052	0.058
Major Axis (°G)	310	135

2.1 Local Deposition: NewDepomod

NewDepomod is a bespoke modelling software designed to simulate the dispersion of particulate wastes from salmon farms. The model (SAMS, 2021) has been developed by the Scottish Association for Marine Science (SAMS) and is supplied under licence. The version used for the modelling described here was version 1.5.0.

A regular model grid was prepared. The grid for simulating solids deposition covered a 2 km x 2 km area, with a 25 m grid spacing in both directions. The grid size was 80 x 80 cells. A flat bathymetry was used, with a water depth of 31.3 m, this was the recorded depth from ID446 which made up the majority of the data used. The flowmetry file combined the data from ID450 and ID446; after merging the length of the combined record was truncated to exactly 90 days in total. The site has a wave exposure index of 3.5 which allows for 120% of the mixing zone to be utilised (SEPA 2024). This area constraint was applied in the waste solids modelling.

2.1.1 Feed and Faeces

The model was configured exactly as specified by SEPA in the modelling guidance published in 2024 (SEPA, 2024). The site was modelled for a maximum biomass of 2,650 tonnes with a feed load of 7 kg tonne⁻¹ day⁻¹. This configuration of the model produces a conservative estimate of the benthic footprint, with a deposition rate of 250 g m⁻² equating approximately to an Infaunal Quality Index (IQI) of 0.64 (the boundary between moderate and good status). Work by SEPA has shown that footprints predicted by this “standard default” configuration broadly match the footprint area derived from seabed samples, although there is a great deal of variability from site to site.

Following the standard default approach, NewDepomod was used to simulate one year of deposition at the maximum farm biomass. Results were analysed over the final 90 days of the simulation, with the mean deposition rate across the model domain being calculated and the footprint area being delimited by the 250 g m⁻² contour (SEPA, 2024). The results are presented in §3.1.

2.1.2 In-feed Medicine

The NewDepomod model was run using an optimisation script to find the highest value of Emamectin Benzoate (EMBZ) that can be used on site at Mullach Mor while still meeting environmental quality standards. The model was run for 118 days, with hourly results over the final two days (days 116 – 118) saved to file. This approach followed that of the standard default modelling approach outlined in the SEPA Regulatory Modelling Guidance (SEPA 2024). The mean concentrations of EMBZ were calculated from this output for comparison with the EQS value of 0.136 ug/kg (wet weight, equivalent to 0.272 ug/kg dry weight), which is the current position standard.

2.1.3 Interactions with PMFs

The Burrowed Mud PMF identified to be at potential risk from solids deposition (SEPA 2025) will be overlaid with the solids and in-feed medicine footprints to check for any interaction. For the solids footprints, both the 250 g m⁻² contour (used in the standard screening approach) and a 100 g C m⁻² contour (specified by Nature Scot, Nature Scot 2026) will be used.

3. RESULTS

3.1 Waste Feed and Faeces Deposition

The modelled footprint for the proposed Mullach Mor farm using the SEPA standard default method is shown in Figure 2. The area of the modelled footprint, defined as the area where the deposition rate exceeds 250 g m⁻², was 0.198750 km² which is within 120% of the 100 m mixing zone. The mean intensity of deposition within the footprint was 1,180.9 g m⁻², well below the critical value of 4,000 g m⁻² for this highly exposed site (wave exposure index of 3.5, §1.1).

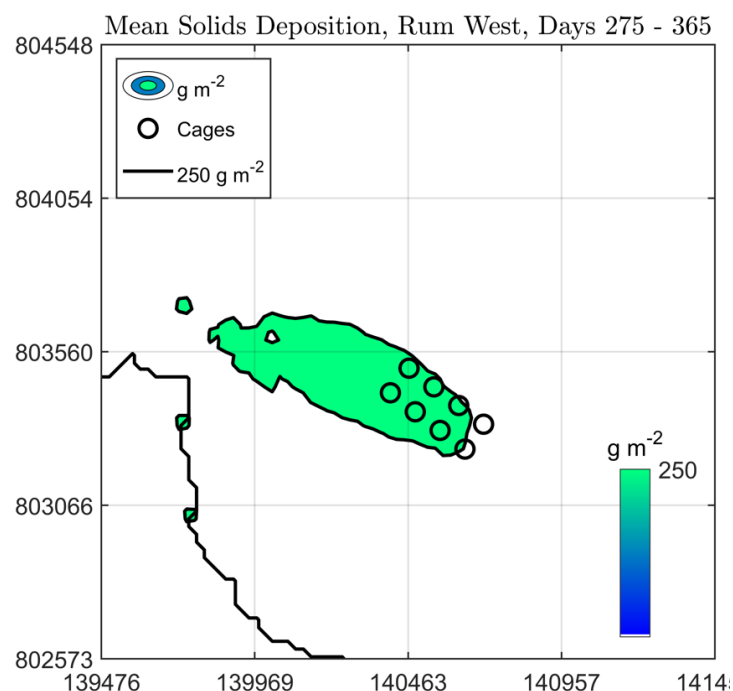


Figure 2. The modelled footprint for Mullach Mor using the SEPA standard default method for the proposed biomass of 2,650 tonnes with 8 x 160 m pens (O).

3.2 In-feed Medicine Deposition

The in-feed medicine model of NewDepomod was run for the proposed Mullach Mor farm using the SEPA standard default method, giving the footprint shown in Figure 3. The area of the modelled footprint, defined as the area where the deposition rate exceeds 0.136 ug/kg was 0.211875 km² which was well within 120% of the allowable mixing zone. The compliant footprint was achieved with a treatment quantity of 32 g of emamectin benzoate, giving a Maximum Environmental Quantity (MEQ) of 23 g.

3.3 Interactions with PMFs

The results from sections 3.1 (using footprint contours of 250 g m⁻² and 100 g C m⁻²) and 3.2 have been plotted over the Burrowed Mud feature of interest (SEPA 2025) in Figure 4, Figure 5 and Figure 6. It is clear that there is overlap, however the impact is very localised and, likely due to the dispersive characteristics of the surrounding environment. Burrowed Mud is widespread in the Scottish marine environment, particularly in the Small Isles MPA; therefore, these localised effects represent a tiny proportion of the habitats overall distribution and are not expected to affect the integrity of the special feature in this area.

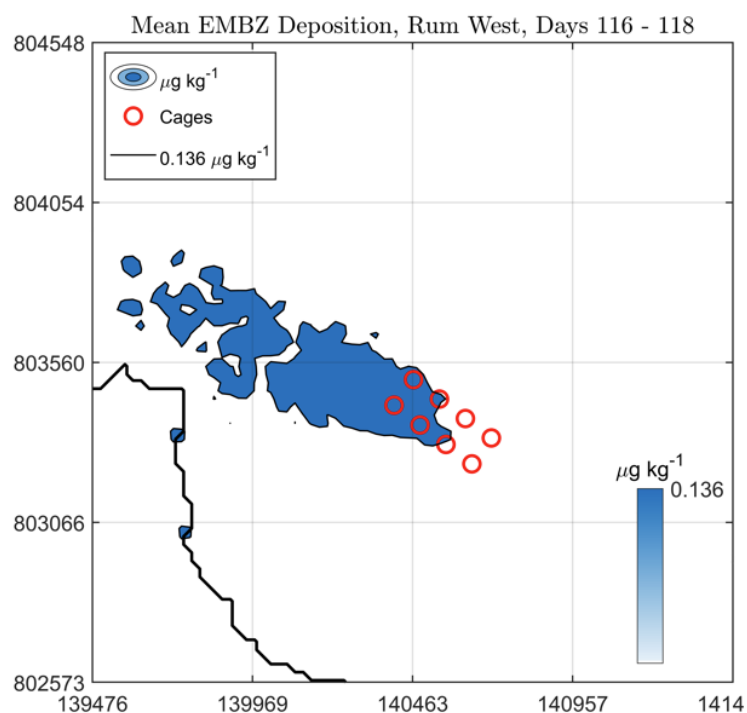


Figure 3. The modelled footprint for Mullach Mor using the SEPA standard default method for the proposed EMBZ amount of 32 g with 8 x 160 m pens (O).

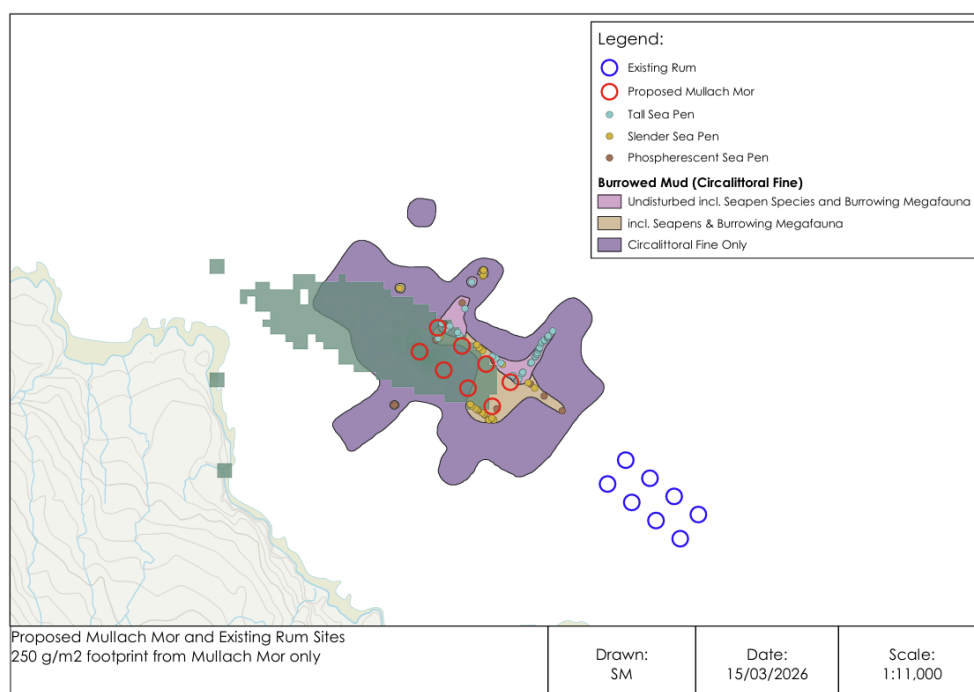


Figure 4. Burrowed Mud PMF distribution overlain with the standard solids screening footprint (using the 250 g m⁻² contour).

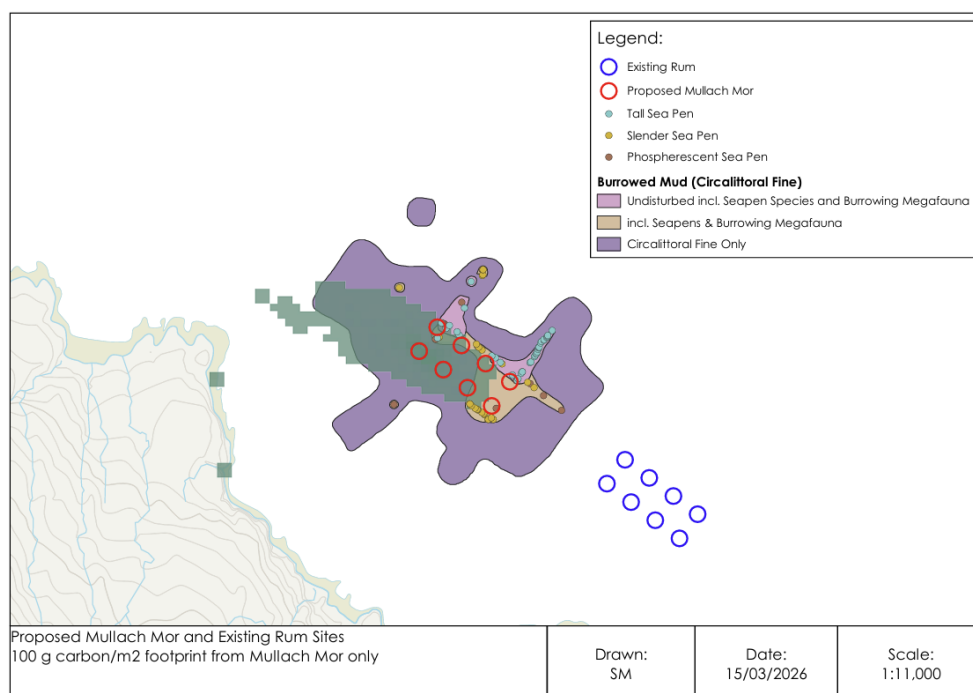


Figure 5. Burrowed Mud PMF distribution overlain with the carbon footprint (using the 100 g C m⁻² contour).

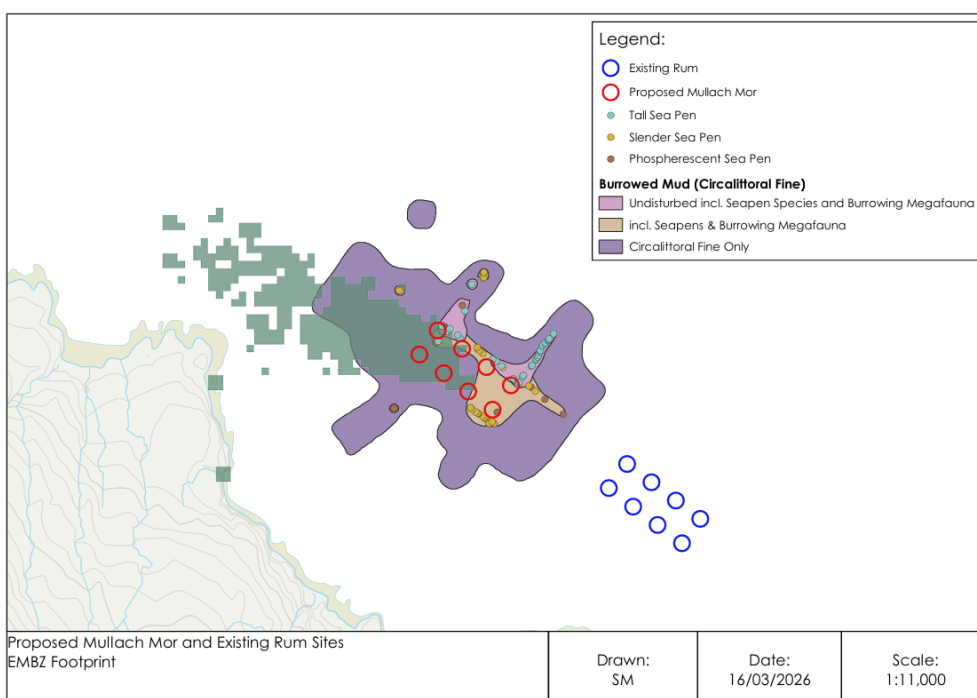


Figure 6. Burrowed Mud PMF distribution overlain with the standard EMBZ screening footprint (using the 0.136 ug kg⁻¹ contour).

4. SUMMARY AND CONCLUSIONS

The proposed biomass of 2,650 tonnes in 8 x 160 m pens requested for consent at Mullach Mor, and the associated feed loading (Table 4), has been shown to meet pertinent Environmental Quality Standards. The SEPA standard default method, which is designed to provide a conservative prediction of particulate deposition, predicted that deposition would meet both mixing zone area and deposition intensity criteria. The results also showed that the solids deposition from the proposed Mullach Mor site is not expected to affect the integrity of the special feature in this area.

The modelling has also shown that an MEQ consent of 23 g of EMBZ will comfortably meet environmental quality standards.

Table 4. Summary of Results

Site Details	
Site Name:	Mullach Mor
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Enamectin Benzoate MEQ (g)	23

5. REFERENCES

NatureScot, 2026. Statutory Consultee Response to EIA scoping request under the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, dated 13/02/2026. Highland Council Planning Portal, Ref. No. 25/04321/SCOP.

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