CLIENT REPORT:
Mid Moile Wind Farm

FEIR APPENDIX 13.4: WASTE MANAGEMENT PLAN

MID MOILE

DUMFRIES & GALLOWAY

23/06/2023

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1. Introduction

Mid Moile Wind Farm is a development proposal encompassing 15 turbines and associated infrastructure. To facilitate the wind farm creation, felling of a significant proportion of the commercial timber crop is required, approval for which is being obtained through a consent under Section 36 of The Electricity Act (1989). Associated felling as part of this proposal totals 347.60ha of forest land use. The majority of the forest was planted between 1983 and 1992, therefore, a large proportion of the forest is at maturity or 10 years away from achieving maturity.

Where forestry operations are taking place, UK Forest Standard (UKFS) and Forest and Water Guidelines will be adhered to. It is in the interest of the client and site managers for all harvested material to be extracted and used for economic or environmental benefit, rather than left as waste. The products of all harvesting interventions or any waste produced during associated forestry operations still have the potential to cause significant environmental effects if unmanaged. Therefore, it recommended the developer appoints a professional forester to engage with SEPA and implement all forestry practices in accordance with UK Forest Standard (UKFS) and Forest and Water Guidelines.

Effective use of harvesting products, where extraction for commercial timber is not practicable, can have the potential to offset and mitigate other environmental damage. In accordance with The Waste (Scotland) Regulations 2011, a full waste management plan to address these potential issues and outline all measures taken to mitigate against them will be prepared as part of a Construction Environmental Management Plan (CEMP) to be prepared post-consent via condition. Published SEPA guidelines have also been consulted to further inform best practice.

2. Forest Waste

Where possible, waste will be minimised, and as much marketable produce will be extracted during the harvesting process. To reduce waste on site, a combination of harvesting methods will be used to ensure this is the case. This includes conventional harvesting, whole tree harvesting with tree shears and mulching which are shown in section 3.

It is estimated there will be up to 50 tonnes/ha of waste arising from felling in areas of maturing Sitka spruce. Other mature conifer species will produce slightly lower level due to the growth form of these species. Additionally areas relatively recently re-stocked holding immature crops are estimated to produce as little as 5 tonnes/ha. Waste will either be re-purposed on site or removed as part of off-site biomass. Taking this into account the estimate volume of waste arising from the wind farm development is illustrated in Table 1 below:

Table 1 - Forestry Waste Table

Category	Species	Area (ha)	Planting Year	Tonnes per ha	Total Tonnes
Felling for infrastructure construction	LAR	0.95	1985/6	40	38
	MB	0.05	1987	40	2
	NS	0.14	2019	5	1
	SS Mature	64.84	1984-92	50	3,242
	SS Immature	14.09	2019/24	5	70
	SS/LP	16.08	1985/86	50	804
Management Felling	LAR	0.06	1985	40	2
	SS	193.85	1980's	50	9,693
	SS/LP	57.61	1985/86	50	2,881
Total		**275.61**			**16,732**

3. Harvesting Methods

3.1. Conventional Harvesting

The guidance document *Use of Trees Cleared to Facilitate Development on Afforested Land* (2014, SEPA, SNH, FCS) states that 'any timber of diameter greater than 7 cm, bark included, should be considered as merchantable timber'. Trees exceeding this will be mechanically felled where possible and extracted for delivery to timber markets.

The total standing timber, timber felled to stump, and extracted timber will be estimated during regular site visits, providing an indication of the running total of biomass exported from the site. Trees will be felled as close to the base of the stump as possible with stumps left on site to degrade naturally. Stumps will be treated with urea to reduce the spread of *Heterobasidion annosum*.

Felled trees will be kept clear of watercourses at stump and when stacked. The 'lop and top' or foliage and material of unmerchantable diameter will be kept on site for the construction of brash mats. This will provide a stable surface for the harvester and forwarder, whilst reducing soil erosion. It is the responsibility of the operator to ensure that all harvester/forwarder routes are adequately brashed, maintaining them with fresh material where appropriate. All brash should be stacked and kept a minimum distance from watercourses, adhering to forest and water guidelines. Excess brash will be raked and removed from site (see below).

3.2. Whole-tree harvesting

Whole tree harvesting will be used to maximize the timber produce being extracted from site and reduce the amount of nutrients being leached. This method may be used in areas where tree age is young, or the yield class is lower due to poor soils present on site. Trees will be felled using an excavator and tree shears.

Like conventional harvesting, a brash matt will be required to assist with machinery movement across the site and reduce soil erosion/compaction. Produce created by this method will be forwarded and processed at roadside for chip or pulp depending on timber quality and markets available.

3.3. Whole-tree mulching

Whole-tree mulching will be applied in areas where the standing crop is of insufficient diameter, either due to age or poor growth conditions, to warrant conventional felling for marketable timber. It would also be of benefit in areas where the stocking densities are deemed insufficient to support large movements of forest machinery. SEPA guidance note *Use of Trees Cleared to Facilitate Development on Afforested Land* section 4.1.1.c outlines this.

The production of waste of this kind is not normally subject to waste management regulations (*SEPA – Management of Forest Waste* - Paragraph 7), provided that it is applied for 'benefit to agriculture or ecological improvement'. A proportion of the felling area within the scope of this plan is to be developed for the construction of wind turbines, and associated infrastructure. This shift in land use means that agricultural/ecological improvement would not be a valid reason for mulch retention across much of the site. However, if applied correctly, mulch can have a number of benefits. Many of these are ecological, but mulch can also help to reduce soil erosion through weathering and vehicle damage. Additionally, if mixed with the topsoil, it can increase nutrient levels for revegetating open ground around turbine infrastructure. A paragraph 12 exemption may be applied for to allow composting of biodegradable waste in conjunction with a Paragraph 7 exemption to permit nutrient release into the soil.

Trees will be processed by the harvester as low to the ground as the head will allow, and mulch will be spread in a thin, uniform layer of random particle size between 5 and 30cm in length. This permits regeneration at the site in future and ensures adequate coverage.

3.4. Brash Removal

Leaching of organic nitrate and phosphate ions from needles and brash is a common issue on harvesting sites. Furthermore, due to the shift in land-use, from commercial forestry to construction of wind turbines and associated infrastructure, retention of organic material for ecological remediation and benefits to the soil fertility is not necessary in many areas. With all of this in mind, the potential negative impacts of brash, and the lack of justifiable reasons for retention mean that brash will be removed from areas where construction is taking place.

There are cases where material is required to be left on site. Where tree planting is taking place, it is deemed that brash removal will have a negative impact on the soil fertility due to the removal of nutrients. Therefore it will be left in-situ in areas which are to the restocked to aid tree growth. Additionally, so as to reduce soil erosion, brash may be re-purposed on main timber extraction routes. Alternatively, where new road construction is required brash may be used to "float" the road as dictated by ground conditions. Where it is deemed appropriate, brash may also be used to encourage peatland re-establishment promoting sphagnum growth.

The developer will engage with SEPA to determine the levels of brash being used in such operations and the levels of brash used will be monitored to ensure that such activities are not treated as waste disposal operations.

4. Water

It is the responsibility of the operator to ensure that all drains are well maintained. In some cases, blocking of drains will be encouraged to reinstate bog habitat and reduce surface run-off before the commencement of forestry operations. Where crossing a drain for timber extraction is unavoidable, the drain can be bridged or culverted using timber and brash.

In addition to these measures, along forest roads and extraction routes with adjacent drainage, watercourses will be culverted and diverted to avoid mixing with the water in drainage ditches, in line with best practice. All ditches will be fitted with silt traps to intercept sediment before it reaches watercourses which will be cleared after operations have ceased.

Timing of operations is key; high rainfall compromises the integrity of the soil, so avoiding operations during periods of heavy rainfall is advised. Operations will be stopped or postponed if the weather is adverse. Where possible, the timing of harvesting operations will be planned for the summer months to help reduce likelihood of surface runoff.

Restocking provides an opportunity to enhance riparian zones with buffers according to the forest and water guidelines.