CLASHINDARROCH II

WIND FARM

Draft Construction Environmental Management Plan (CEMP)
Prepared for: Vattenfall Wind Power Ltd

Technical Appendix 3.1

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PREFACE

1. This draft Construction Environmental Management Plan (CEMP) has been prepared for Vattenfall Wind Power Ltd (Vattenfall) (as the applicant) in support of an application for consent pursuant to Section 36 of the Electricity Act 1989 for Clashindarroch II Wind Farm.

2. The purpose of this draft CEMP is to demonstrate Vattenfall's intention with regards to the implementation of best environmental practice in relation to the construction, operation and decommissioning phases of the Clashindarroch II Wind Farm (the proposed development).

AIMS

3. The aim of the CEMP is to ensure that the works and environmental management on site are carried out in accordance with relevant legislation and best practice guidelines.

4. This is to be achieved by taking a fully integrated approach to project management through the complete cycle of preparation, planning, action, monitoring, checking and review. Such an approach would lead to the establishment of a full Environmental Management System (EMS). The final EMS would be based on this document and associated information, in line with ISO 14001.

5. The CEMP document will undergo several revisions. The version presented here in order to accompany the application submission is the draft CEMP. Upon receiving consent for the Clashindarroch II Wind Farm, this document will be finalised.

6. The purpose of the draft CEMP is to:

- demonstrate the applicant's intention with regards to implementation of and commitment to best environmental practice in relation to the Clashindarroch II Wind Farm;
- set out how the day to day environmental implications of site activities will be managed, particularly during the construction phase;
- outline the resources, roles and responsibilities for implementing the Environmental Management System (EMS) which incorporates this CEMP;
- incorporate mitigation and monitoring measures outlined in the various chapters of the EIA Report into one cohesive document applicable throughout the full lifecycle of the proposed development;
- provide guidance to contractors on how to prevent and/or mitigate potential environmental impacts; and
- help ensure that any pre-construction monitoring requirements can be met in a timely manner.

7. The final CEMP would provide the vehicle through which the environmental impacts associated with the proposed development would be managed. Successful implementation of the CEMP would help to:

- limit the environmental impact of the development and operation of the wind farm;
- ensure a proactive approach to management of environmental issues;
- ensure full compliance with current environmental legislation and environmental obligations;
- ensure that key staff are aware of their responsibilities regarding management and improvement of environmental issues; and
- meet the requirements of key stakeholders.

STRUCTURE OF THE CEMP

8. The CEMP consists of this main document that provides an overview of key project information, describes the policy and legal context of the CEMP, the project management framework, and how the CEMP is to be implemented.

9. It is supported by three Annexes, detailed as follows:-

- **Annex 3.1.1:** Outline Construction Method Statements (OCMS) that describe the work methods that would be employed in order to avoid and mitigate environmental harm. These Method Statements cover all of the facets of construction, such as roads and tracks, substation, turbine foundations, water abstraction and discharge, working of borrow pits, and waste management.
- **Annex 3.1.2:** This consists of Outline Briefing Notes (OBN) relevant to the construction of the wind farm that provide details of the plans and measures to be adopted to protect the environment and enshrine commitments in relation to aspects such as archaeology, ecology, hydrology, and transport.
- **Annex 3.1.3:** A draft Emergency/Pollution Incident Response Plan.

HOW THE CEMP WOULD WORK

10. Where potential impacts were identified during the Environmental Impact Assessment (EIA), mitigation and enhancement measures were proposed where possible and recorded in the EIA Report.

11. The Principal Contractor, as defined in the Construction (Design and Management) Regulations 2015, will have the primary responsibility during construction for all operations on site.

12. The Principal Contractor (and subcontractors) have the potential to cause most impacts upon the environment during the construction works, and therefore the Principal Contractor would have primary responsibility for implementing relevant mitigation measures.

13. The final CEMP would provide guidance on how to avoid the predicted impacts during the works. It would also facilitate on-going prediction and management of any other environmental impacts, through the duration of the project by requiring the contractor(s) to implement necessary control measures.

14. This present draft CEMP sets out at this pre-construction stage how the day to day environmental implications of site activities would be managed. This draft CEMP provides:

    - guidance to contractors on how to prevent and/ or mitigate environmental impacts; and
    - a means to measure and improve project environmental performance.

15. Whilst the CEMP is principally related to the initial construction works, it will have relevance to any major maintenance that may be required during the operation of the wind farm, and to the ultimate decommissioning of the wind farm.

MITIGATION

16. When developing work methods, the Principal Contractor (and subcontractors) would consider the predicted environmental impacts and relevant mitigation measures given in the OBN (see Annexe 3.1.2), and would incorporate these as appropriate into their work methods. If additional mitigation measures are required, the contractor would specify them in their work methods and incorporate them into the final construction method statements. When work methods are finalised, checks would be made to ensure that all environmental impacts associated with that piece of work are mitigated. The development would be audited onsite to ensure that mitigation measures are implemented.

PERFORMANCE

17. Project environmental impacts (including those identified during the EIA process) have been evaluated as part of the development of the CEMP in order to assign objectives and targets to the range of environmental impacts against which performance is audited.

18. This document provides the vehicle through which the environmental impacts associated with the development of the Clashindarroch II Wind Farm would be managed. Successful implementation of the final CEMP would aid in:

- limiting the environmental impact of the development and operation of the wind farm;
- ensuring a proactive approach to management of environmental issues;
- ensuring full compliance with current environmental legislation environmental contractual requirements and other environmental obligations;
- ensuring that key staff are aware of their responsibilities regarding management and improvement of environmental issues; and
- meeting the requirements of key stakeholders.

POLICY

1.1 Vattenfall's Environmental Policy

19. The following is the Applicant's company Environmental Policy, which illustrates the commitments made at a company level to environmental compliance.

Vattenfall's environmental policy is valid throughout the entire Vattenfall Group and provides the basis for the environmental management system. Vattenfall complies with legal and other requirements and fulfils commitments. Environmental considerations are fully integrated in Vattenfall's strategy, decision processes and steering. Vattenfall's CEO, together with Executive Group Management, has the overall accountability for the environmental impact of Vattenfall. The environmental policy is approved by the Board of Directors.

Our Environmental Policy

We are committed to reduce our environmental footprint. We believe continuous improvement of environmental performance in all parts of our operations is a prerequisite for sound business development. Environmental considerations are part of our daily operations, and our performance builds on the contribution of all our employees.

We provide sustainable energy solutions and services for our customers and business partners to help them reach their environmental ambitions. Through growth in renewable energy, efficient operations, electrification and innovation, we contribute to society becoming fossil free.

We commit to become climate neutral

We will be fossil free within one generation;

We actively cooperate with our suppliers, customers and partners to reduce emissions in the full value chain. To find new and better solutions we continuously challenge the way we work; and

We believe electrification and innovation are fundamental in building a sustainable society and we contribute to the change.

We commit to the protection of nature and biodiversity

We conduct environmental management in accordance with the precautionary principle and include environmental aspects early in decision-making;

We strive to avoid and minimise impacts on environment and ecosystems from our operations. Where impacts cannot be fully avoided or mitigated, we consider potential compensation and restoration measures; and

We engage with stakeholders and conduct research and development to build knowledge and reduce impacts.

We commit to sustainable use of resources

We will contribute to the transition to a circular economy;

We work to optimise use of resources such as energy, fuel, raw materials, waste, by-products, water and land in all operations, and to avoid use of hazardous chemicals; and

We consider resource efficiency already in the design phase, choose Best Available Technologies and continuously work to reduce environmental impacts based on a life-cycle perspective.

1.2 Guidance

20. The following documents were used to formulate the draft CEMP and contain information on potential environmental impacts and environmental aspects of the Clashindarroch II Wind Farm:

- Clashindarroch II Wind Farm EIA Report of which this document forms Appendix 3.1 of Chapter 3;
- aspects identified in good practice;
- Scottish Environmental Protection Agency (SEPA) guidelines;
- Scottish Natural Heritage (SNH) Guidance; and
- Scottish Government Guidance.

21. This draft CEMP focuses upon the key environmental aspects with detail provided in the OBN and OCMS.

22. This information may be supplemented as and when additional studies are undertaken throughout the subsequent phases of the development that provide details to be taken into account.

1.3 Legal and Other Requirements

23. It is important that all elements and activities associated with the development in all its phases comply with all relevant environmental legislation.

24. Lead responsibility for delivering compliance with relevant environmental obligations and legal statues would be as follows:

25. before issue of construction contracts: Vattenfall development team, working with the CEMP (including the consideration of forthcoming legislation);

26. construction: Principal Contractor, working through an EMS and their own project management team, including the application for key authorisations such as those required by the Integrated Pollution Prevention Control (IPPC) regulations and Controlled Activities Regulations (CAR);

- operation: Operations Contractor, working through an EMS; and
- decommissioning: Principal Contractor.

27. Further information on specific legal requirements for various environmental topics are provided in the individual OBN contained within this draft CEMP. It should be noted that these only consider current legislation and would be updated post-consent. These should only be used as guidance during construction, and responsibility lies with the relevant contractor to ensure that information on environmental legal requirements is current and up to date.

1.4 Objectives, Targets and Programme

28. Long-term improvement goals will be identified for the project and defined in the final CEMP. These would be compatible with the policy for the development and consider the relevant environmental impacts.

29. Vattenfall is committed to the following environmental objectives:

- exemplary performance in all aspects of environmental management;
- a proactive attitude to environmental protection;
- happy residents;
- no prosecutions;
- monitoring;
- collision risk for key species less than predicted;
- a target of no environmental incidents at any stage in the project;
- minimum peat, ornithological and ecological disturbance commensurate with building an operational wind farm; and
- regular reporting and communication on environmental performance with the local community.

30. To support the long-term goals, a series of environmental targets, focusing upon the short-term actions would be developed. These would be supported by a programme that sets out how the targets are to be achieved (e.g. resources, specific actions and timescales). Action may take the form of the following:

- development of improvement strategies in particular areas, e.g. approach to water quality;
- one-off actions, such as establishment of an environmental component to the website, introduction of technological solutions to resolve/improve environmental issues; and
- on-going actions that could be tracked over time, e.g. tonnage of waste disposed (or recycled).

31. The long-term objectives, the short-term targets and progress against these would be reviewed on a regular basis. This would form part of the management review and meetings with the independent Environmental Management Committee.

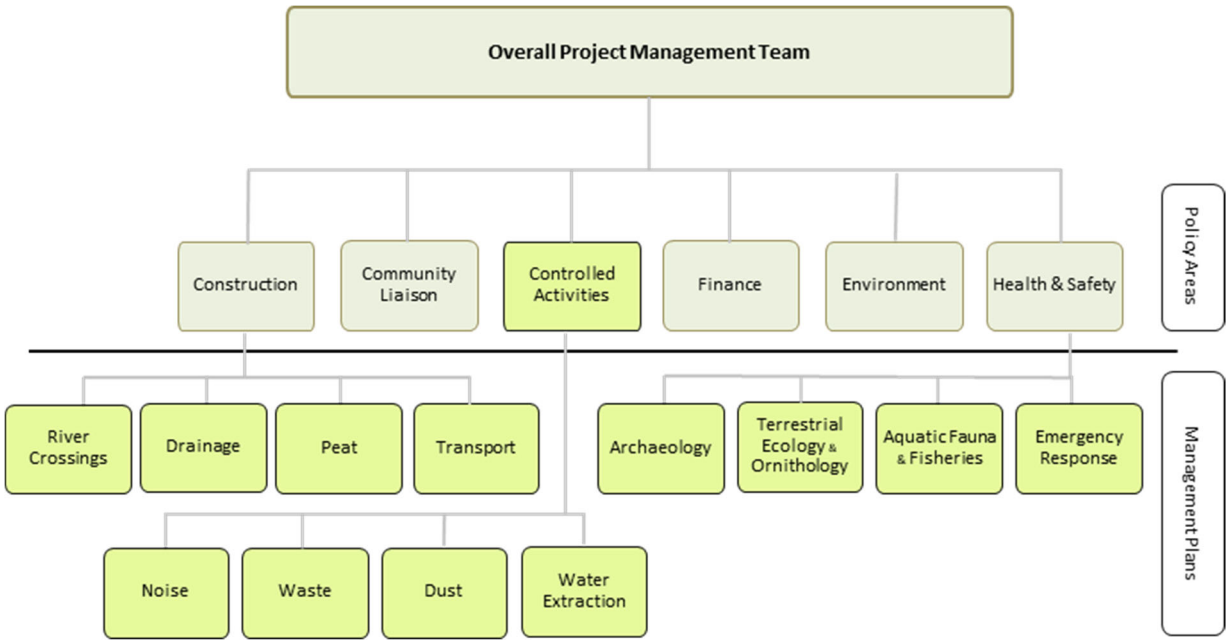
32. The review should continue through all phases of the development with the objectives, targets and management programme reflecting the key issues for the activities being undertaken and the lead responsibilities.

IMPLEMENTATION

1.5 Resources, Roles, Responsibility and Authority

33. The Site and project management would be carried out using a structure as shown in Figure 1-1.

Figure 1-1 : Project Management Chart



34. The overall project management team would have the responsibility of delivering the CEMP and subsequent EMS. In this way environmental management would be fully integrated into the running of the project. This team's roles would include:

- preparation of all method statements and review against all management plans and checking that work is carried out accordingly;
- ensuring monitoring in accordance with all management plans is carried out and reviewed; and
- reporting as required by the management plans.

35. In order to implement the management plans identified above (and the Habitat Management Plan (HMP) as described in Chapter 9: Ecology and Biodiversity of the EIA Report) and to ensure the monitoring procedures outlined in the briefing notes are implemented, the Vattenfall project management team would employ a number of skilled experts during the construction, operation and decommissioning periods. This could include:

- an ornithologist;
- an ecologist;

- an aquatic ecologist/fisheries expert; and
- an archaeologist.

1.5.1 Ecological Clerk of Works

36. An Ecological Clerk of Works (ECoW) would be employed by Vattenfall to coordinate, review and approve construction methods, and to audit the execution of the works on site against the approved method statements.

1.5.2 Incorporation of CEMP into Contracts

37. The CEMP would be incorporated into all contracts.

1.5.3 Day to Day Responsibility

38. During construction, a duty manager would be onsite or on-call and able to respond to any incident. They would have the authority to halt or modify work in response to environmental concerns and the responsibility to ensure that all monitoring and checks are carried out in accordance to the relevant schedules. They would also have the necessary training and authority to direct the emergency response team to deal with environmental incidents.

1.6 Competence, Training and Awareness

Evaluation of Contractors and Subcontractors

39. Contractors would be assessed on their ability to set up and run, or comply with, a site EMS.

1.6.1 Training

40. Vattenfall would employ suitably trained staff to manage this CEMP up to construction and fulfil the roles identified in this document. Any contractors working on studies would be selected taking into account their environmental awareness and where appropriate their experience in the implementation of CEMPs.

41. For construction, all senior project management staff would undergo environmental awareness training, such as the Institution of Occupational safety and Health (IOSH) five day course. Specific members of the team would have appropriate professional environmental training as would consultants and advisors.

42. The emergency response team would be trained to carry out their work (in the unlikely event of an incident happening) with high environmental awareness to minimise the impact of any response.

1.6.2 Site Induction

43. Environmental awareness would feature prominently in the induction for all workers and Site visitors.

1.7 Communication

1.7.1 Contractors and Subcontractors

44. During pre-construction surveys and then during construction, operation and decommissioning, there would be regular project meetings, including a review of environmental issues and current sensitivities.

45. All method statements would be subject to an environmental audit.

1.7.2 Workforce

46. At all times the workforce would be informed of specific areas of sensitivity and generally reminded of the environmental values of the site through toolbox talks, posters and in method statements. They would be encouraged to report any concerns on environmental issues immediately to the project management team. All issues and actions taken would be reviewed by the project management team as a minimum on a weekly basis.

1.7.3 Meetings Programme

47. Health, safety and environment would be on the agenda of every regular project meeting.

1.8 Documentation

48. During construction, the Site documentation would include up to date records of the site and all environmental issues so that the project management team has current information available.

49. The 'documents' available could include:

- GIS Constraints Register;
- design risk register;
- all method statements;
- all briefing notes; and
- all risk assessments.

50. All records would be kept and maintained during the operation phase so that management plans could be adapted in response to changing circumstances and so that they are available for decommissioning.

1.9 Control of Documents

51. A document management system would be in place prior to construction. All method statements, risk assessments, audits, routine checks, monitoring records, reviews and meeting minutes would be recorded in this system.

1.10 Operational Control

52. Before construction, Vattenfall would maintain records of all activities and assessments (risk assessments, pre-construction surveys), ensure they are properly controlled and the results are available to the construction and operation teams later.

53. Day to day control of the project during construction would involve:

- constraints register;
- working time;
- time of year working;
- working areas;
- project planning;
- preparation and monitoring of overall plan - six months, one year, total project;
- preparation of detailed plan - one month ahead;
- precise recording of location of roads, hard standings, foundations;
- details of water crossings;
- waste water treatment plan; and
- checks against constraints register.

1.11 Monitoring and Measurement

1.11.1 Pre-construction

54. All surveys and trials would be monitored for compliance with specifications and appropriate management plans.

1.11.2 During Construction

55. The following monitoring checks would be carried out as appropriate:

- water flows;
- water quality;
- efficacy of drainage and other pollution control measures;
- bank erosion;
- integrity of safety fencing;
- integrity of measures to keep road material out of water courses;
- noise; and
- traffic.

1.12 Evaluation of Compliance

56. Full records of all measurements, shipments and transfers would be kept to demonstrate compliance with licenses and permits. The recording systems would be prepared in advance and regularly audited and reviewed.

1.13 Non-conformity, Corrective Actions and Preventative Action

57. All non-conformity would be investigated and reported to the project management team if necessary immediately. All corrective actions would be recorded with dates for action. An overall register would be kept and regularly reviewed by the project management team.

1.14 Control of Records

58. Records would be controlled through the document management system and the project management team would have responsibility to ensure this is done.

1.15 Internal Audit

59. Regular internal audits would be carried out in accordance with a schedule agreed with the management team.

MANAGEMENT REVIEW

1.16 Regular Review of CEMP

60. This document would be reviewed regularly.

1.17 Preparation of Reports

61. The relevant project management team would be responsible for the preparation and presentation of reports to the relevant stakeholders.

1.18 Regular Review of CEMP

62. The CEMP would be reviewed when required and at key project stages, for instance, pre-construction, post-award, and as required during construction.

SUMMARY OF WIND FARM CONSTRUCTION ELEMENTS

63. The proposed wind farm consists of the elements as summarised Table 1.1 and more fully described in Chapter 3: Development Description of the EIA Report.

Table 1-1
Wind Farm Construction Elements

Infrastructure Element	Quantity	Summary Description	Figure showing Location	Figure/Document showing Specification
Wind Turbines	14 no.	Wind turbines of a nominal power output of around 4.0 MW and maximum tip height of 180m from ground level. Complete with external transformers at each turbine, located adjacent to the turbine tower (each some 6.25m by 4m in plan area and some 4m high).	3.1	EIA Report Chapter 3 Figure 3.2
Wind Turbine Hardstandings	14 no.	Area for cranes and component delivery vehicles required for wind turbine erection, foundation construction and maintenance operations. Each some 75m by 42m in plan area.	3.1	EIA Report Chapter 3 Figure 3.6
Wind Turbine Foundations	14 no.	Reinforced concrete foundations typically 20-22m in diameter and some 2.5m to 3.5m in depth, buried beneath the ground.	3.1	EIA Report Chapter 3 Figure 3.5
Permanent Wind Monitoring Mast	1 no.	Maximum 112m height free-standing steel lattice monitoring mast fitted with anemometry and monitoring equipment at various levels.	3.1	EIA Report Chapter 3 Figure 3.8
Electrical Substation Compound	1 no.	An area of hardstanding some 30m by 35m in plan area, containing the control building and switch room.	3.1	EIA Report Chapter 3 Figure 3.7

Infrastructure Element	Quantity	Summary Description	Figure showing Location	Figure/Document showing Specification
Control Building / Switchroom	1 no.	A modular single storey building some 15m by 8m in plan area and some 5.5m in height, on a reinforced concrete foundation slab, to accommodate switchgear, control facilities, welfare facilities, and stores.	3.1	EIA Report Chapter 3 Figure 37
Forestry works	125.3 ha felled. 87.1 ha net loss of woodland area.	Felling is required for construction and operation of the proposed development, which has been assessed by adopting a 2 ha (80 m radius) keyhole around each turbine, 10 m buffer for each item of infrastructure and 30 m corridor for all roads.	3.2.6	EIA Technical Appendix 3.2 Figure 3.2.6
Site Tracks	7.84km new 1.95km existing (to be upgraded) 21.0km existing (no upgrade)	New unbound and upgraded tracks to be formed from site-won cut and fill materials and with imported crushed rock surfacing layer.	3.1	EIA Report Chapter 3 Figure 3.2
Temporary Construction Compound/Laydown Area	1 no.	An area adjacent to the existing Site track, some 50m by 50m in plan area, to accommodate Site huts and amenities and materials/plant storage.	3.1	EIA Report Chapter 3 Figure 3.10
Potential Borrow Pits	3 no.	One borrow pit formed as an extension of an existing borrow pit, and two potential search areas for additional materials as and if required.	3.1	EIA Report Chapter 3 Technical Appendix 11.2 Figure 4

Infrastructure Element	Quantity	Summary Description	Figure showing Location	Figure/Document showing Specification
Grid connection	8.5km	An underground grid connection cable to be laid from the existing Scottish and Southern Electricity (SSE) substation at Craighead/ Wellheads on the A920, along the existing Site access track to a new substation located close to the existing Clashindarroch Wind Farm substation.	3.1	EIA Report Chapter 3 Figure 3.1
Electrical Cabling onsite	14 km	Underground cabling generally following the existing and proposed new Site tracks, from the new substation near the existing Clashindarroch Wind Farm substation, to each turbine.	3.1	EIA Report Chapter 3

CONSTRUCTION METHODS

64. The scope of the construction work required for the proposed development is described in Chapter 3: Description of the Development of this EIA Report.

65. Full details of the construction methods will be developed by the Principal Contractor and their sub-contractors, and be reviewed and approved by the ECoW prior to commencement of each class of activity.

66. An initial set of Outline Method Statements for typical wind farm construction techniques are provided in Annexe 3.1.1 of this CEMP. The final method statements will conform to the enclosed Outline Method Statements unless the ECoW approved a variation.

SPECIFIC MITIGATION ACTIONS

67. Certain activities onsite have the potential for specific environmental risks and harm. For that reason, a set of OBN is appended to this CEMP in Annex 3.1.2. These provide details of specific management actions that shall be required to avoid, mitigate and remediate any environmental risk and damage.

68. These Briefing Notes are relevant to the Construction and Decommissioning phases of the development. Certain sections of these are also relevant to the Operational phase of the development.

EMERGENCY AND POLLUTION INCIDENT RESPONSE PLAN

69. The Principal Contractor would be responsible for developing and exercising an Emergency and Pollution Incident Response Plan for the project. This would be developed in association with the ECoW and approved by the ECoW prior to site work commencing.

70. A draft Plan is enclosed in Annexe 3.1.3. The final method statements would conform to the enclosed Outline Method Statements unless the ECoW approved a variation.

ANNEXE 3.1.1
OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement No.	Description
OCMS 1	Road and Wind Turbine Construction
OCMS 2	Water Abstraction
OCMS 3	Dewatering
OCMS 4	Borrow Pits
OCMS 5	Pollution Prevention
OCMS 6	Temporary Compounds
OCMS 7	Operations and Maintenance
OCMS 8	Watercourse Crossing Management
OCMS 9	Discharge and Drainage Management
OCMS 10	Waste Management
OCMS 11	Decommissioning
OCMS 12	Site Reinstatement
OCMS 13	Cable Installation
OCMS 14	Substation Installation
OCMS 15	Health, Safety & Environmental Management

CLASHINDARROCH II WIND FARM
OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 1
OCMS 1
Road and Wind Turbine Construction

1.0 ROAD AND WIND TURBINE CONSTRUCTION

1.1 Wind Turbine Construction

1.1.1 Foundation Construction

1. Each wind turbine would require a reinforced concrete foundation buried beneath the ground and founded on suitable bearing strata. The exact dimensions of the foundation would depend on the choice of wind turbine used, and the ground conditions at the foundation location. A typical foundation plan is shown on Figure 3.5 of the submitted EIA Report.

2. Ground investigations would be carried out at each wind turbine location prior to construction. The construction methodology for wind turbine foundations would depend on the geotechnical conditions at each location.

3. Two methods are detailed below: foundation construction on shallow competent bearing strata and foundation construction where the strata are weak.

4. **Shallow Competent Strata** : Typical method of construction for foundations in this condition:

   - install temporary drainage around perimeter of excavation to prevent run off reaching natural drainage channels or watercourses;
   - excavate the overlying soils. This would be stockpiled and maintained to be used for restoration onsite;
   - excavate sub-strata down to a competent stratum;
   - blind excavated surface with 50-100 mm of concrete to form a level working area to build foundation upon;
   - install formwork and reinforcement;
   - pour concrete; and
   - once the concrete has cured and earthing system is in place, the foundation would be backfilled either with suitable excavated material or with imported rock.

5. **Special Foundation Requirements :** Where ground conditions at the level of the underside of the foundation are found to be of insufficient bearing capacity, local ground strengthening works would be required, these would be carried out following the appropriate guidance.

1.1.2 Foundation Drainage

6. Whilst the foundation excavation is open, it would need to be kept free of water to allow construction of the reinforced concrete base. Water ingress could be from ground water, surface run-off or direct from rainfall.

1.1.3 Concrete Supply

7. It is anticipated that concrete would be batched onsite. However, there is the possibility that concrete may need to be imported from an off-site batching plant, and therefore both options are addressed as follows:

Onsite Concrete Batching

8. An alternative method of concrete production is to batch onsite using a mobile concrete batching plant, located in a designated compound. Concrete would be distributed using onsite concrete vehicles.

9. The operation of the batching plant would meet all SEPA guidelines including:

- PPG1 – Understanding Your Environmental Responsibilities – Good Environmental Practice;
- GPP5 – Works or maintenance in or near Water;
- PPG6 – Work at Construction and Demolition Sites; and
- PPG26 – Safe Storage – Drums and Intermediate Bulk Containers.

10. Water would be required during the concrete batching process and it is proposed to abstract this from a suitable water source on site, see OCMS 2 on Water Abstraction for more information.

11. One of the advantages of batching concrete onsite is that, concrete vehicles would stay within the Site boundary until the end of construction, hence reducing the impact of construction traffic on the local road network. Using an onsite batching plant would reduce the number of concrete vehicle movements during the construction phase by approximately one third. There would still be a need to transport the raw materials used in the batching process onto Site, but there would be a net reduction in the total number of vehicle movements.

Operation of Concrete Batching Plant

12. The concrete batching plant would be used during the construction of foundations for the wind turbines, substations and control building. It would be removed once construction was complete and the Site reinstated, see OCMS 12 – Site Reinstatement. Water for the batching plant would be abstracted from a designated water source, see OCMS 2 – Water Abstraction. There would be some onsite storage of water to reduce the impact on the designated water source. Monitoring of the volume of water abstracted and the volume in the watercourse would take place to ensure compliance with any restrictions on abstraction.

Concrete Batching Pollution Control

Dust Control:

13. Careful material handling would control dust. To prevent the escape of dust, relevant delivery vehicles would be covered, materials would be stored appropriately (see below) and any conveyors would be covered or enclosed. The concrete batching plant would also be screened to protect the area from wind. When necessary (e.g. under dry conditions), the area would be watered down, and a wheel wash installed to reduce dust and prevent the escape of dust and dirt outside of the site. Run off would be collected and treated appropriately following SEPA guidelines.

Material Storage:

14. Aggregates would be stored on a hardstanding area, with suitable windshields and appropriate covering where necessary to minimise wastage and pollution through washout and as dust.

15. Any additives and other chemicals would be stored in a designated bunded area.

Water Control:

16. To prevent run off and the risk of pollution entering natural watercourses cut off ditches would be installed around the compound and all water within the compound would be collected before being treated. Possible sources of wastewater include:

- agitator washout;
- truck washing;
- yard wash down
- contaminated storm water
- concrete batching area; and
- slump stand.

17. This water would then be treated within the confines of the batching plant before being reused or discharged to an approved soakaway.

Concrete:

18. Waste concrete would be dealt with by:

- waste minimisation – Tight controls over quantities of materials required would largely eliminate any waste; and
- washout pit – Where required any waste would be placed in a washout pit, where the concrete can be washed through and aggregates and sand recovered and the wastewater treated as discussed above. See also OCMS 10 – Waste Management.

General:

19. The compound and the plant would be well maintained and inspected regularly to ensure that all the pollution control measures are functioning effectively and to evaluate if any further measures are required.

Ready-mix (Imported) Concrete

20. Ready-mixed concrete may be sourced externally should there be any difficulties in batching on site.

21. Designated areas would be provided for concrete vehicle washout. Any wastewater from the washout would be treated to remove any solids before being recycled or discharged to an appropriately designed soakaway. The sand and gravel would be recycled.

22. Transport routes would be designated, both on public roads and onsite. The purpose of this is to:

- mitigate against the impact of extra traffic on public roads; and
- to ensure consistency in the timings of arrivals of concrete deliveries.

23. Offsite transport routes would be agreed in advance with the relevant local authority.

1.1.4 Hardstandings

24. A hardstanding area would be constructed at each wind turbine location. The hardstanding area is required for the cranes and delivery vehicles involved in erecting the wind turbine. An indicative design for crane hardstandings is shown in Figure 3.6 of the submitted EIA Report.

25. Two secondary crane pads of approximately 10 m by 10 m may be required at each wind turbine location to assist with the set up of the main crane. The requirement of these crane pads are depending on the final design of the main hardstanding and the crane technology used.

26. The final dimensions of the hardstanding and its location in relation to the wind turbine may vary depending on the local topography and the wind turbine selected.

27. Temporary working areas may be required to accommodate turbine erection. Such temporary areas include a trestle area for blades and hardstanding for the assembly of the rotor. Such temporary working areas will be constructed using crushed stone, in a similar fashion to that of the main crane hardstanding and will be fully reinstated post turbine erection.

28. Where there is a steep cross slope it would be necessary to "batter back" the back slope of the hardstanding area to a steep but safe angle. This face would require re-vegetating. Appropriate techniques would be utilised for this, and where necessary hydro seeding would be carried out in consultation with the onsite ecologist.

29. The hardstanding would be formed by excavating the soils to a suitable bearing stratum, and filling with suitable rock to form an adequate bearing surface for the crane. "Floating" construction would not be permitted for crane hardstandings. The rock would be sourced from onsite borrow pits, or from rock won during foundation excavation and road building. At the time of excavation, where possible turves would be carefully stripped off and laid aside. These would be used to overlay and aid restoration of topsoiled road verges.

1.1.5 Wind Turbine Installation

Wind Turbine Delivery

30. The wind turbine components, turbine towers, blade and nacelles, are likely to be transported by trailers with self-steering rear axles to an onsite temporary component storage area or directly to the wind turbine under construction, depending on site layout and traffic management. The vehicles would move at set times of day to minimise disruption on the public roads. The site entrances would be clear to allow the vehicles to drive in without hindrance. Each vehicle would follow a detailed and designated route to ensure the minimum amount of manoeuvring and disruption to the road network. A typical wind turbine requires approximately eight to twelve delivery vehicles to deliver all components.

Cranes

31. At least two large cranes would be required for the duration of the project to assemble and erect the wind turbines. The cranes would be delivered on a number of lorries. At least six smaller auxiliary mobile cranes would also be used for unloading, assembling the large crane and to assist the main crane in lifting the tower sections from the horizontal delivery position to the vertical mounting one.

32. The cranes would be maintained where a risk assessment indicates low risk to the public, workforce or the environment. As with all other vehicles, refuelling would be carried out in accordance with site procedures to minimise the risk of spillage or pollution (see also OCMS 5 – Pollution Prevention).

33. All lifting operations would be carried out in strict accordance with the Lifting Operations & Lifting Equipment Regulations 1998 with qualified staff designing, supervising and carrying out the lifts.

34. During lifting operations the area around the lift would be cordoned off. No members of the public or non-essential workers would be allowed in this area. The area would be controlled to ensure enforcement.

Tower Erection

35. The towers would be delivered in sections. Work would not start until a suitable weather window was available. Each section would be lifted off the trailer and bolted in place. The delivery lorry would turn at the designated location before returning to base.

Nacelle Installation

36. The precise details of the delivery vehicle would depend on the wind turbine selected and may lead to minor changes in the method described. The nacelle would be delivered to the desired location. The crane would lift the unit into place on top of the tower. The installation team would then bolt the nacelle to the tower.

Blade Installation

37. Three methods can be used to attach the blades; all these methods may be used, depending on the terrain and the wind turbine location.

38. The blades can be attached to the hub on the ground. The hub and blades are then lifted as one unit. This is a quicker method than the other methods. However, this method requires a large lay down area and light vehicles have to move in this area. The forestry may limit this type of manoeuvre; however it would be possible for a number of locations.

39. The hub can be attached to the nacelle and two blades attached to the hub while the nacelle is on the ground. The nacelle is then lifted into position and the third blade lifted into place separately. This requires manoeuvring of several components on the ground and usually repositioning of cranes.

40. The third method is to lift the nacelle and hub as one unit and then lift the blades one at a time rotating the hub between lifts. The blade lifting operations do not require repositioning of lifting equipment. This method is generally preferred for areas with limited room for manoeuvring; such as forested areas.

Wind Turbine Fitting Out and Connection

41. Once all the components have been bolted together, the wind turbines are fitted out internally. This involves connecting the pre-assembled units installed in the major components. The wind turbines would then be checked and left in a safe state until the

electrical connection is available. Once the electrical connection is available, the connection is made internally to the wind turbine. All the systems are progressively checked to make sure the wind turbines are safe to run. The settings on adjustable equipment are checked and safety systems tested. The wind turbines then go through a closely monitored run in period of at least 240 hours before being cleared for automatic operation.

1.2 Road Construction

1.2.1 Site Road Design

42. The Site road network has been planned to provide access for construction and wind turbine delivery vehicles to each wind turbine. A number of factors have influenced the design of the Site road layout and these have been incorporated into the design principles:

Table A1-2
Road Design Parameters

Parameter	Design Targets
Objectives of Design	Minimise disruption to site hydrology Serviceability requirements for construction and wind turbine delivery vehicles Buildability considerations Following existing tracks as much as possible to reduce environmental impacts
Candidate Turbine	Nordex N149
Design Speed	25 km/h
Design Loading	Full construction and use with consideration for exception loads – cranes and transformers.
Road Widths	4.5 m running surface width (wider on bends) 1.0m verge on each side of the running surface Road width 8m and verge width 6m on bends
Max Gradient (General)	10% (1 in 10) on unbound road surfaces 12% (1 in 8) on bound road surfaces Gradients reduced on bends. 2% (1 in 50) crossfall
Gradients on Bends	Outer radius 60 m – max gradient 8% Outer radius 90 m – max gradient 10% (To accommodate wind turbine delivery vehicles)
Cross Slopes	Cross slope of land traversed by road no steeper than 18° (33%, 1 in 3).
Road Alignment	Roads shall fit into the landscape avoiding unstable ground, areas of technical constraint and constructed to a uniform longitudinal and horizontal profile. Minimise the crossing of watercourses and effects on local hydrology. Create loops where practical in the road system, to avoid the need for turning circles for large wind turbine delivery vehicles. Avoid identified environmental and archaeological constraints.

Parameter	Design Targets
Earthworks, cuttings and embankments	Undertaken in accordance with Clauses 601, 602 & 612 of the Design Manual for Roads & Bridges (DMRB).

43. Roads would be constructed from graded rock, envisaged to be sourced from onsite borrow pits.

44. Three different road designs are proposed for the Clashindarroch II Wind Farm each one relevant to differing ground conditions. The following section addresses construction techniques for each type.

1.2.2 Site Road Design Methodology

45. Preliminary road designs have been produced in order to assess the environmental impact and determine the material streams required for the project. As previously noted the three types of road design are likely to be adopted.

Table A1-3
Road Design Options

Design	Construction Method	Typical site conditions	Cross-slope
Excavated Road	Excavated	Shallow soils with mild cross slope and simple drainage conditions.	< 3%
Rockfill Road	Displacement and Excavation	Shallow and deep areas of wet, weak soils, steeper cross slope.	< 20%
Forest Track Upgrade	Excavated	When Site road coincides with existing forestry tracks.	NA

1.2.3 Road Construction

46. All roads would be surfaced with hard, durable, weather resistant material, Type 1 or approved equivalent, processed to give a good running surface that is free from large stones or boulders. All roads require suitable crossfalls to enable free drainage of the running surface. No ponding on the running surface would be accepted. Control measures will be in place to ensure excessive dust is not produced on the road surface.

Excavated Roads

47. Excavated roads would be constructed using the following methodology:

- Excavation for Site tracks and hardstandings would closely follow the topsoil strip and

would be taken down to suitable formation or bedrock. Where transverse sloping ground is encountered a cut and fill construction would be adopted with stone generated from the cutting of the up-slope batters and drainage channels being used to form the road embankments to the down-slope side of the track;

- The track would be constructed in layers using the courser stone dug from the uphill batter to form the base layer, with subsequent layers being filled with better-graded stone as selected from the cutting operation or as supplied from a Site borrow pit. Each layer would be fully compacted using a vibration roller and trimmed to provide a road profile and finish suitable to accommodate the wind turbine construction and delivery vehicles. The road would be capped off with good quality stone as a wearing course to ensure durability;
- A drainage channel would be formed between the toe of the uphill batter and the edge of the road. This would intercept any rainwater runoff, which would then be directed under the road via appropriate sized pipes or culverts. All drainage would be intercepted before it reaches a watercourse and directed into suitably sized settlement ponds and soakaways. Where necessary additional culverts would be installed to maintain the site hydrology. All culverts would be installed following Construction Industry Research and Information Association (CIRIA) guidance as deemed necessary by and in consultation with the onsite ecologist;
- Once the road has been constructed the following best practice method would be used to reinstate the embankments;
- Turf would be carefully cut from the line of the road using an excavator with a bucket and stored adjacent to the roads on the upslope side. Excavated soils and turf would also be used for the final restoration of the borrow pits and temporary compounds and storage areas;
- Upslope batters would be graded to create a slope suitable to hold reinstated turf on top of a soil layer – slope angles should be 25° or less to avoid the risk of slumping. Turf would be placed using a digger, with the bucket used to press the base of the turf firmly into position;
- If the upslope batter is too steep (greater than 25 degrees) and therefore unsuitable for turfing, the soils on the batter would be cut at the same angle as the main batter slope avoiding vertical or near vertical soil faces as they would re-vegetate very slowly and in some cases not at all if active slumping occurs. Any exposed bedrock on steep batters would be roughened to provide cracks and small ledges to trap soils and seeds to increase the speed of natural regeneration;
- Cable trenches would be cut running parallel to the site road. Cables or cable ducts would then be installed prior to the replacement and compacting of the excavated soil;
- Turf would be replaced on the surfaces of batters. A slight rise can be constructed from the road edge to the top of the batter, which acts as a very effective screen for the up-hill batter from views below the level of the road; and
- Any cut batters less than 25 degrees that lack turf would be reseeded using the hydraulic mulch technique. Verges would then be re-vegetated using either turfing or reseeding, (See OCMS 12 – Site Reinstatement).

48. A typical section of a track in excavated construction is shown in Figure 3.2 of the submitted EIA Report.

Floating Road

49. It is not anticipated that floating roads would be required on this Site due to the absence of peat within the footprint of the works. However, if floating road construction is required due to poor subgrade strength, the following approach would be used:

- Initially a layer of geogrid would be laid directly onto the surface;
- Stone sourced from an on site borrow pit would be placed in layers separated by further layers of geogrid. The number of layers and the quantity of stone depend on site-specific conditions and the design of geotextile chosen;
- A final capping layer would be laid to provide a road profile and finished running course to accommodate the wind turbine delivery and construction vehicles; and
- Once the road has been constructed, as above, the two slopes either side of the running width would be reinstated ; see also OCMS 12 Site Reinstatement.

Rockfilled Roads

50. Should weak subgrade conditions be identified on site and floating road construction is not suitable, a rockfill road technique may be adopted.

51. The rockfilled road construction technique requires ‘oversized' lumps of rock. It might be required to stockpile the oversize rock so that it would be available for this type of construction method. A typical section of rockfilled road is shown in Figure 3.2 of the submitted EIA Report.

52. The rockfilled road construction method is described as follows:

53. The access road would be constructed using either floating or excavated construction as close as is possible to the area where the weak soils are encountered. At this point a hammerhead would be formed to facilitate vehicle turning;

54. The oversized rock would be placed by end tipping from the rock vehicles. The choice of rockfill size will be dependent on depth of weak soils and will reduce as the depth decreases. The bulk of the displacement would be water, which would naturally drain away. Any excess soils displaced to the surface would be removed to a previously agreed reinstatement area; and

55. When the large rock appears above the original ground level the construction of the access track would revert to placing a well-graded material to form a running surface. It may be necessary to use a membrane to prevent the upper surface dropping into the voids in the large infill, but experience indicates by using a well-graded stone a membrane has not been necessary.

56. Once the road has been constructed the batters would be reinstated as noted above.

Existing Forestry Track Upgrade

57. Existing forestry tracks would be upgraded by widening and placing of additional rock. A typical section of an upgraded forestry track is shown in Figure 6.3 of the submitted EIA Report.

1.2.4 Wind Farm Road and Hardstanding Construction

58. The final design methodology would be determined by a detailed pre-construction ground investigation and consideration of any constraints relevant to the locations. The route of new tracks would be pegged out ahead of construction operations, preferably 500 - 1000 m in advance of required operations, depending on the terrain. This would allow for minor deviations to the centre line where constraints are identified according to the micrositing requirement requested in the Clashindarroch II Wind Farm EIA Report. Drainage crossing points and passing places would also be identified at this stage.

59. It is proposed that the majority of the stone required for the site roads and hardstanding areas would be sourced within the Site boundary from onsite borrow pits. However, high quality surface dressing stone will likely be sourced offsite from suitable licensed quarries. A number of suitable rock sources have been identified. Using material mostly sourced onsite reduces the negative environmental impacts of using alien stone sourced from elsewhere and significantly reduces the traffic impacts on the neighbouring public roads as well as reducing the distance the stone has to travel and thus associated emissions.

1.2.5 Road Maintenance

60. During construction the road would be regularly inspected and maintained. The following regular activities shall take place:

- The road network shall be inspected for potholes, and where they occur they would be filled;
- Drainage ditches cleared;
- Culverts, bridges and cross-drains inspected and cleared; and
- Regular emptying of catchpits (particularly when the road is newly constructed).

61. During the operation of the wind farm, the roads would be maintained to a sufficient standard to enable all maintenance activities to take place, and allow emergency access to the wind turbines. If major works are required (for example works which require a crane) the roads would be inspected to check they are of sufficient strength and quality to carry out the work, and if necessary repaired to a suitable standard.

1.3 References

Highways England (1997). Design Manual for Roads & Bridges. HMSO. Available at http://www.standardsforhighways.co.uk/ha/standards/dmrb/index.htm [Accessed August 2019]

Vattenfall (2019). Clashindarroch II Wind Farm Environmental Impact Assessment Report. Vattenfall

NetRegs (2019). Guidance for Pollution Prevention. SEPA. http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/ [Accessed August 2019]

PPG 1 – Understanding Your Environmental Responsibilities – Good Environmental Practice (2013)

GPP 5 – Works or maintenance in or near Water (2017)

PPG 6 – Working at Construction and Demolition Sites (2012)

PPG 26 – Safe Storage - Drums and Intermediate Bulk Containers (2019)

CLASHINDARROCH II WIND FARM
OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 2
OCMS 2
Water Abstraction

2.0 WATER ABSTRACTION

62. The location of a temporary concrete batching plant for use during construction of the Clashindarroch II Wind Farm is detailed on Figure 3.11, within the central Laydown Area. Water abstraction is to be taken locally from an onsite borehole within the Temporary Construction Compound. The use of a private source as water abstractions is not envisaged.

63. Under the Water Environment (Controlled Activities) (Scotland) Regulations 2011, registration is required for water abstraction whereby the volume of water abstracted is greater than 10 m3 per day and a licence is required for any water abstraction rate greater than 50 m3 per day. Abstraction rates less than 10 m3 do not need registrations or licensing. The need for this licence will be assessed once the water volumes needed for construction are determined along with a review of the suitability of onsite watercourses; however, initial calculations suggest an abstraction rate of less than 50 m3 per day is likely and initial surveys have suggested potential abstraction points are suitable and capable of meeting the demands of the regulations.

64. The water requirements for the concrete batching plant are expected to be less than 50 m3 per day when the plant is batching during the peak demand period; this peak demand could be reduced by longer abstraction periods to reduce the abstraction rate and the use of onsite water storage. This method would help preserve the water course and reduce detrimental impacts. Throughout the abstraction period careful monitoring would be in place to ensure that no detrimental impacts occur on the watercourses.

65. If the event arises where an abstraction rate of > 50 m3 is required from any of the identified potential sources, detailed monitoring would take place to justify the proposed abstraction, and consultation with SEPA.

66. Before concrete is batched onsite, consultation with SEPA would take place before abstraction begins (registration/licensing would be applied for if applicable) with monitoring during abstraction to ensure no detrimental impacts occur on the watercourse and, if applicable, the terms of the abstraction registration/licence are adhered to.

CLASHINDARROCH II WIND FARM

OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 3

OCMS 3

Dewatering

3.0 DEWATERING

67. Dewatering is most likely to be required in relation to wind turbine foundation construction.

68. All the time the wind turbine foundation excavation is open, it would be kept free of water. This is to allow the construction of the reinforced concrete base, and to prevent ground instabilities caused by the foundation filling up with water. The foundation excavation would be designed to be gravity draining, where local topographical conditions allow. If this were not possible, pumping would dewater the excavation.

69. No water from foundation dewatering operations would be discharged directly into a watercourse. All dewatering would be in accordance with SEPA/NetRegs and CIRIA guidance, and where necessary proprietary settlement tank systems such as those provided by Siltbuster (or equivalent) or settlement lagoons would be constructed. The dewatering and de-silting system would be installed before foundation excavation commenced. Drainage is discussed in more detail in OCMS 9 – Discharge and Drainage Management. The exact nature of the dewatering system would depend on the ground conditions.

70. Guidelines produced by CIRIA (C532) would be followed. The size and design of the dewatering system would depend on a number of factors including;

71. Ground Conditions: The strength of the ground needs to be assessed. Where the ground is shown to be too weak to support a silt or settlement pond then a proprietary system as noted above would be used. This system could be located on a hardstanding or other suitable bearing surface.

72. Volume of water to be treated: Factors affecting this volume include the height of the water table, soil porosity and rainfall. All of these factors need to be assessed when designing and sizing a dewatering system.

73. Other Factors: Including the environmental sensitivity of the locality.

3.1 References

H Masters-Williams et al (2001). Control of water pollution from construction sites – Guidance for Consultants and Contractors (C532D). CIRIA.

CLASHINDARROCH II WIND FARM

OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 4

OCMS 4

Borrow Pits

4.0 BORROW PITS

4.1 Wind Farm Borrow Pits

74. The construction of Site roads, hardstandings, foundations, compounds and other structures would require approximately 128,000 m3 of rock. It is anticipated that the majority of this rock can be sourced onsite from one of the onsite borrow pits, with top dressing stone for site tracks (some 2,000m3) being imported. Table A4-4 provides a breakdown of the rock volumes required from borrow pits for each element of the wind farm.

Table A4-4
Summary of Rock Volumes Required during Construction

Construction Element	Total Rock Volume Required (m^3)
Hardstandings and foundations	66,000
Roads	51,000
Temporary Compounds and Batching Plant	9,000
Substations	2,000
Total Rock Volume	128,000

4.1.1 Borrow Pits Identified.

75. As noted in Technical Appendix 11.2: Borrow Pit Assessment of this EIA Report, it is proposed to re-open an existing borrow pit that was used in the construction of Clashindarroch Wind Farm. The location of the borrow pit is shown in Figure 3.1, on the eastern flank of Craigend Hill, to the north of the proposed wind farm.

76. As shown in Figure 3.1, this borrow pit can if required be extended to the north (area shown as Borrow Pit Search Area 2), or an area opened to the south, just up-slope of the existing access track (Borrow Pit Search Area 3). The Borrow Pit Assessment indicates that Borrow Pit 1 is likely to be able to supply up to 120,000m^3 of material. For the small balance that may be required, it is likely that Search Area 2 would be used.

4.2 Borrow Pit Setup

77. Cut off ditches would be installed to intercept surface water before it reaches the workings, this together with any run off from the borrow pit would be directed into settlement ponds or similar settlement system to be agreed with SEPA prior to discharge into an existing watercourse or soak-away.

78. Fencing would be installed around the borrow pit to ensure the safety of construction workers and others during operation and post restoration.

79. The overburden would be carefully stripped and maintained in a designated area within the borrow pit site, any other overburden such as sand or clay would be stored separately.

80. An area would be designated for stone crushing and storage. This area would be screened from the wind to prevent dust been blown out of the borrow pit area. If necessary stone storage areas would be covered or sheeted when not in use.

4.3 Rock Extraction

81. Rock would, where possible, be extracted using an excavator or ripper dozer. Where this is not possible, a specialist contractor would carry out blasting. Where required the rock would be crushed at the borrow pit by jaw and cone crushers to a suitable size. The size of rock would depend on its final use. Good quality rock would be set aside to use as the wearing course on the site roads. The rock would then be graded transferred into off road dumper trucks for haulage to the construction locations where the stone is required.

82. The borrow pit/s would be operated to facilitate subsequent restoration. Permanent benches would be established and slopes restricted in gradient to allow re-vegetation post operation, also see OCMS 12 - Site Restoration.

83. All operations will be carried out in accordance with the Quarries Regulations 1999 and associated Approved Code of Practice.

4.4 Borrow Pit Restoration

84. On completion of the works, the borrow pits would be restored and reinstated to agreed profiles, indicative restoration profiles are provided in Appendix 11.2 of the submitted EIA Report. Restoration of the borrow pits would be carried out using the overburden and soft soils where practical. Benched rock faces would be angled to allow revegetation and ledge tops would be soiled and reseeded where required. Detailed proposals for the restoration of each borrow pit would be produced with the advice of the ecologist; these would be approved by the local authority and SNH prior to its commencement. An example of a previous borrow pit restoration is shown on Plate 4.1.

Plate 4.1 Photograph of typical borrow pit restoration, 18 months after completion of borrow pit operation

4.5 Environmental Controls

4.5.1 Dust

85. The controls outlined in Table A4-5 will be exercised during construction.

Table A4-5
Dust – Environmental Controls

Source	Control/Mitigation Proposals
Soil and Overburden Handling	Avoid double handling, store as close to restoration site as possible and re-use as soon as possible – i.e. have progressive restoration as the site progresses. Depending on the nature of the storage location stockpiles may be required to be protected from the wind with fences or even seeded or turfed to prevent dust.
Drilling and Blasting	Blasts will be designed with dust in mind to minimise dust production.
Loading	Covered conveyors, adjustable height chutes and conveyors, loading area regularly swept
Crushing and Grading	Covered, protected from wind, control of stockpiles
Storage of Minerals on Site	Materials to be covered if appropriate, and wind breaks provided if required.
Transport	All vehicles sheeted, dedicated well-maintained transport routes, wheel washes for vehicles leaving site.
Site Management and management of sub-contractors	To ensure that the above is enforced strong Site management is required.

4.5.2 Noise

86. The controls outlined in Table A4-6 will be exercised during construction.

Table A4-6
Noise – Environmental Controls

Source	Control/Mitigation Proposals
Blasting	Well appropriately designed and timed blasts
Vehicle Movements	Dedicated transport routes, working hours, well-maintained roads and vehicles.
Crushing and Ripping	Dedicated working hours as well as maintained vehicles.

Source	Control/Mitigation Proposals
General Operations	General quarrying operations will be limited to suitable working hours and the location of the quarry will take into consideration proximity to areas of sensitivity.

4.5.3 Drainage

87. A number of control measures will be used to prevent water pollution, these would include:

88. Cut-off ditches: To prevent run-off from reaching the workings, and to prevent any run-off leaving the workings before being treated. Cut-off ditches would be installed prior to the borrow pit being worked.

89. Oil Separators: To separate our hydrocarbons from run-off from the refuelling area where there is a risk of accidental spillage.

90. Settlement Ponds: To settle out silt from run off to the Site, before discharging water to watercourses or soakaways.

91. These measures would be sized and located according to local conditions.

92. All drainage installed would be designed to ensure the Sites natural hydrological features are maintained.

4.6 Safety at Borrow Pits

93. A health and safety plan would be developed for each borrow pit onsite. This plan will include:

- Design of Site investigations; and
- Design and monitoring of stockpiles, tips and excavations.
- Vehicle procedures including:
- Vehicle Routes;
- Interface between quarry vehicles and haulage vehicles;
- Reversing;
- Training; and
- Maintenance.
- Design of benching and haul routes:
- Explosive use procedures including:
  - Training;
  - Storage and Transportation;
  - Demarcation of danger zones;
  - How to deal with misfires;

  - Blasting specification and design for each blast to minimise the risk of fly rock or misfires; and
  - Competent explosive supervisor appointed.
- Permit-to-work procedures required/in place;
- Emergency plans, procedures, equipment and training; and
- Location and types of barriers/fences around the Site and within the site for the public and the workforce protection.

4.7 References

Health & Safety Executive (2013). Quarry Management Regulations 1999 Approved Code of Practice. HMSO.

CLASHINDARROCH II WIND FARM

OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 5

OCMS 5

Pollution Prevention

5.0 POLLUTION PREVENTION

5.1 Construction Best Practice

94. The following section summarises "best practice methods" that would be employed during the construction of the wind farm. This would be supplemented by the:

- Site Construction Environmental Management Plan (CEMP);
- Pollution Incident Response Plan; and
- Drainage Plan.

95. These plans would be part of the overall project EMS to ensure a comprehensive coordinated approach.

96. National best practice (CIRIA, Forest & Water Guidelines, SEPA/NetRegs Guidance for Pollution Prevention, etc.) shall always be followed. All personnel working onsite shall undergo a Site induction covering topics including health and safety, the environment, pollution prevention, control and response.

5.2 Potential Sources of Pollution

97. Potential sources of pollution on the Clashindarroch II Wind Farm Site are as follows:

- Silt (including dust) - from road construction, road use, and excavations;
- Fuels, oils and chemicals - from storage, plant and refuelling;
- Concrete and concrete constituents - from foundation construction and concrete batching; and
- Sewage and grey water discharges.
- Control of water pollution:
- In order to prevent water pollution from construction related activities the following procedures would be implemented:
- Drainage plan - this plan would detail all aspects of site drainage, both run-off and from site discharges, to minimise pollution of watercourses;
- Pollution prevention plan;
- Discharges - Consultation with SEPA and other relevant consultees would be carried out before any discharges are made to any watercourse or water body; and

98. Some pollution control methods are shown in **Error! Reference source not found.**.

99. Silt would be controlled by:

- Check Dams;
- Catchpits;
- Settlement Ponds (if required); and

- Other technology such as "Siltbusters" where required.

100. All these structures are to prevent any silt reaching any watercourse. As part of a regular maintenance regime these structures would be inspected and where necessary cleared to prevent blockage.

101. All works near or liable to affect watercourses would be carried out in accordance with SEPA Guidance for Pollution Prevention 05 (GPP05) – Works and maintenance in or near water.

Table A5-7
Overview of Potential Pollutants

POLLUTANT	Oil separator	Ponds	Swales	Infiltration basins	Filter drains and strips	Sediment tanks	Dynamic separators	Biofilter
Concrete, cement		✓	✓	✓	✓	✓	✓	✓
Metals, metalloids		✓			✓			
Oils and hydrocarbons	✓	✓	✓	✓	✓		✓	
PH		✓				✓		
Silt and suspended solids		✓	✓	✓	✓	✓	✓	✓

5.3 Incident Control and Emergency Procedures

102. A pollution incident response plan would be developed in conjunction with SEPA, the local authorities and any other relevant stakeholders such as the forest managers. The guidance given in SEPA GPP21 - Pollution incident response planning would be followed.

103. The plan would include:

- A cover page with the company name, date of plan and list of recipients;
- Contact list including:
  - Emergency Service numbers;
  - Environmental Regulators;
  - Local Water Supplier;
  - Health and Safety Executive (HSE);

- Specialist Clean-up contractors;

- Site drainage plan showing buildings, ditches, drains soakaways, watercourses and suitable points for pollution containment (e.g. booms etc.);
- Inventory of site chemicals, waste etc; and
- Emergency procedures including:
  - Details of trained staff, their responsibilities and provision for 24-hour cover;
  - Containment measures; and
  - Emergency discharge routes; and
  - List of appropriate equipment and clean-up materials, their locations and requirements for maintenance or replacement.

104. In order to effectively implement an incident response plan, all staff and contractors need to be aware of the plan and their roles in the procedures. Training would to be carried out where required. The emergency procedures would be regularly tested.

5.4 Pollution Control

105. A detailed pollution prevention plan would be implemented during the construction and operation of the wind farm. This plan would include best practice for pollution prevention and the incident response procedures described earlier.

5.4.1 Silt

106. Silt is controlled by the dewatering and drainage system, this is discussed in OCMS 03 (Dewatering) and OCMS 9 (Discharge and Drainage Management). Regular maintenance of drainage structures would be part of the drainage plan, as well as procedures to deal with any pollution incidents.

5.4.2 Oils and Chemicals

107. All oil and chemical storage would be built on an impervious base and suitably bunded. The design and the operation of such storage would comply with NetRegs/SEPA guidelines (GPP 2 – Above ground oil storage tanks) as well as other regulations such as the Oil Storage Regulations. Bunding would be impervious and of suitable size. Valves and trigger guns would be secured and locked when not in use to prevent vandalism and un-authorised use.

108. All refuelling would be carried out in accordance to strict procedures designed to eliminate spillage.

109. Equipment would be well maintained and checked regularly for leaks. All maintenance activities would be subject to a detailed plan and carried out in an approved designated location.

110. Spill kits would be available and staff made aware of the incident response procedures.

5.4.3 Concrete

111. The concrete batching plants would be carefully sited in locations to reduce the risk of pollution.

112. The areas would be kept clean and dust free.

113. All concrete wagons leaving the plants would have their wheels washed to ensure that pollution was contained.

114. A settlement and re-circulation system would be in place to reuse wastewater and any discharges would only be carried out after consultation with SEPA and would be treated to a suitable standard.

115. Waste concrete would be recycled or disposed of in a suitable location, and all wastewater from vehicle washing contained and dealt with appropriately.

5.4.4 Roads

116. Site roads would be well maintained to reduce the risk of mud build up.

117. All roads and drainage would be inspected regularly to ensure that there is no build-up of silt or failure of the drainage system. Where necessary catch pits and check dams would be cleared of silt, and the silt disposed of appropriately.

118. Where considered appropriate, splashboards would be used at river crossings to ensure that no water ponding on the road or road material is splashed into the watercourse by passing vehicles.

5.4.5 Sewage

119. There are likely to be septic tanks and associated soakaways at Site compounds as well as other portable welfare facilities around the Site.

120. Systems would be designed and positioned to ensure there is no risk of pollution to the land or watercourses.

121. All would be well maintained and regularly inspected.

122. Septic tanks would be designed and sized according to best practice and following NetRegs/SEPA PPG4 guidelines (PPG 4: Treatment and disposal of sewage where no foul sewer is available).

123. Building regulations and British Standards required require that septic tanks and cesspits are:

- Of adequate capacity;
- Impermeable to liquids;
- Adequately ventilated;
- Sited and constructed in such a way that they:
- Are not prejudicial to the health of anyone;
- Would not contaminate any underground water or water supply; and
- Would have adequate means of access for emptying.

5.4.6 Dust Control

124. **Error! Reference source not found.**Table A5-8 shows sources and control methods for airborne dust , based on Building Research Establishment (BRE) (2003) – Control of dust from construction and demolition activities. Dust control measures would form part of the detailed construction method statements to be produced before construction commences.

Table A5-8
Source and Control of Dust

Source of Dust	Control
Site Routes	Plan routes away from sensitive receptors.
	Plan vehicle movements to keep haulage distances to a minimum.
	Reduce speed limits to reduce dust.
	Water road during long periods of dry weather to suppress dust.
Public roads	Plan routes away from sensitive receptors.
	Clean regularly subject to Local Authority or Highways Agency approval.
	Provide vehicle and wheel washes at site exits.
Material handling and storage	Plan and keep material handling operations to a minimum.
	Use closed tankers for fine powdery materials.
	Use enclosed or sheeted vehicles for dusty materials and aggregates.
	Keep handling areas clean and free from dust.
	Damp down where possible during vehicle loadings and use methods that minimise airborne dust production.
	Enclose and damp down chutes and conveyor transfer points (particularly where stone crushing is being undertaken).
	Use solid fencing where necessary to control the effects of wind.

5.4.7 Waste Streams

125. Any waste produced on the site is termed 'controlled waste'. The following broad categories are then used:

- General waste (all non-hazardous and non-utilisable controlled waste streams);
- Special waste (controlled waste with additional hazardous properties); and
- Recyclable (the material can be recovered, reused or recycled).

126. The method of disposal is dependent upon the waste's classification and in order to comply with legislation and to fulfil the 'Duty of Care', only licensed waste management companies would be used. The Duty of Care applies to anyone who produces, imports, carries, keeps, treats or disposes of controlled waste. It places a duty on those responsible for the waste to handle it correctly and prevent others from mishandling the waste.

127. A site specific Site Waste Management Plan (SWMP) would be implemented (See OCMS 10), as part of the EMS.

5.4.8 Maintenance

128. Machines would be checked regularly for leakage. Leaks would be repaired promptly in designated areas.

129. All waste fluids would be collected in trays and containers for safe disposal offsite.

5.4.9 General

130. Machinery would be parked only in designated areas.

131. Sites would be kept clean and tidy leaving no empty packaging, containers, broken ropes and litter etc.

5.4.10 Signage

132. Signs would be installed at environmentally sensitive locations to improve awareness and clearly delineate between construction areas and no go areas.

5.4.11 Lighting Requirements

133. The construction works would if necessary be lit during normal working hours. On some occasions wind turbine erection may be undertaken at night, lighting would therefore be required. Mobile lighting would only be used where it is necessary for the safety of the works, and would be designed to avoid light spillage upwards and away from the site.

5.4.12 Noise

134. Construction work shall be limited to the times agreed within the planning conditions to reduce the noise impact on local residents. The Principal Contractor shall continually monitor all noise levels around the site from all construction operations; ensuring safe levels of noise are maintained.

CLASHINDARROCH II WIND FARM

OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 6

OCMS 6

Temporary Compounds

6.0 TEMPORARY COMPOUNDS

135. The Site compounds would house site offices, welfare facilities and material storage. An indicative design for the Temporary Construction Compound (TCC) and the Laydown Area are shown in Figures 3.10 and 3.11 of the submitted EIA Report

136. Temporary storage areas would be constructed within the Laydown Area to store construction materials and plant and the turbine equipment and components. These will be typically 100 m by 150 m in order to accommodate large turbine components, such as blades, nacelles and tower sections.

137. No run-off from Site compounds and temporary storage areas would be allowed to flow directly into a watercourse. Run-off would be captured in drainage ditches before been discharged to a settlement pond or soakaway. All drainage would be constructed in accordance with Sustainable Urban Drainage (SUDs) guidelines.

138. Temporary compounds and storage areas would be constructed by first removing any overburden. Compacted layers of graded stone would then be laid to create a surface before construction of the temporary facilities commences. Any septic tanks would be carefully designed located in consultation with SEPA, following British Standards and in compliance with NetRegs/SEPA guideline PPG4.

139. The central Laydown Area is proposed to accommodate temporary concrete batching plants for use during the construction of the wind farm. For further details regarding onsite concrete batching see OCMS 01.

6.1 Restoration of Temporary Working Areas

140. Once construction work has been completed temporary working areas would be reinstated.

141. The temporary areas would be restored by either removing the stone and re-instating with overburden before the areas are re-vegetated or by leaving them in situ, if the environmental impact assessment of this operation showed that this would do less harm than removing them. See also OCMS 12 – Site Reinstatement.

6.2 References

NetRegs (2019). Guidance for Pollution Prevention. SEPA. http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/ [Accessed August 2019]

GPP 4 – Treatment and disposal of wastewater where there is no connection to the public foul sewer (2017)

CLASHINDARROCH II WIND FARM
OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 7
OCMS 7
Operation and Maintenance

7.0 OPERATION AND MAINTENANCE

7.1 Operation

142. Once the wind farm has been fully commissioned and is operational, each wind turbine should require minimal attention apart from twice yearly maintenance. The wind turbines will be monitored remotely several times a day. The wind turbines will be visually checked monthly for vandalism or other damage.

143. The operational management of the wind farm would have much in common with that for a power station, an electricity distribution network and an electricity transmission system. Vattenfall has experience with operating wind farms.

144. A Safety, Health and Environment Management system would cover the operational period and the transition from construction.

145. Members of staff would be on standby to cover emergencies. The wind turbines have internal computers, which can control their operation and shut them down under certain conditions. The wind turbines begin to generate electricity when the wind speed at hub height exceeds around four metres per second (ms-1). The wind turbines would typically reach maximum power at wind speeds of 10 ms-1 and for safety reasons, would automatically shut down when wind speeds exceed 25 ms-1 (10 minute averages).

146. As noted above, the wind turbines would require two planned maintenance visits a year. Each visit would take two people two days. The wind turbines may occasionally have breakdowns, which the maintenance teams would also respond to.

147. An office and WC will be provided for use during the operational phase of the wind farm, within the Substation building. This facility may be used as a general rest area for members of staff during maintenance operations of the wind farm. An indicative design for the proposed substation is shown in Figure 3.7 of the submitted EIA Report.

7.2 Maintenance

7.2.1 Substation Maintenance

148. The substation and control building would be visually inspected typically every 6 months, and the equipment diagnostics checked typically once per annum. Major maintenance would be carried out if indicated by the diagnostics or otherwise typically at 5 year intervals. This maintenance would not be expected to take more than a few days, and with properly designed duplication of equipment at each substation, a complete shutdown would not be required.

7.2.2 Road Maintenance

149. The roads would generally be maintained to a standard suitable for use by maintenance vans. Should major repairs to a wind turbine require the use of a crane, the relevant road repairs would be made to allow for crane access as well as any associated turbine components or equipment. As part of routine maintenance, settlement ponds and catchpits would be cleared regularly and a check made to ensure that all culverts are clear; these checks would be undertaken during dry periods to ensure the disturbance of sediment is minimised.

7.3 Safety during the Operational Phase

150. At no time during the construction or operation of the wind turbines would the safety of the public or forestry personnel be compromised. Appropriate risk assessments would be carried out to ensure that all construction activities are carried out in a safe manner. Those working onsite would be given suitable training and would be made aware of any specific risks.

CLASHINDARROCH II WIND FARM

OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 8

OCMS 8

Watercourse Crossing Management

8.0 RIVER MANAGEMENT

152. As part of the design mitigation all wind turbine locations, site compounds, and other permanent and temporary structures have been sited at least 50 m from any watercourse. Roads where possible have been routed to stay away from watercourses. However, roads are required to cross watercourses at some locations.

153. All watercourses over which the access roads cross shall be routed through culverts or bridges appropriately sized and designed not to impede the flow of water and would allow safe passage for water borne wildlife, such as fish, water voles, otters etc. At no point, would there be any fording of watercourses.

154. Surveys would be carried out immediately prior to construction to identify up to date areas of mammal activity in watercourses to ensure that adequate mitigation is built into the design.

8.1 Determining Type of River Crossing

155. As part of the design mitigation, all watercourses on the site have been identified from OS mapping. This has informed the site layout and the road alignments. It is anticipated that a number of small watercourses are likely to be ephemeral with water flows only during periods of heavy sustained rain, and are not shown on the map. These would all be identified prior to construction and suitably sized culverts installed.

156. The ideal structure would include the following features:

- Capacity well in excess of the design flow;
- Easy to construct, designed for the life of the wind farm;
- Low maintenance;
- Provision for fish and wildlife mitigation; and
- Visually in keeping with the surroundings.

157. Before construction commences, the following methodology would be used to determine the type and size of structure used at each river crossing.

8.1.1 Data Collection

158. The following data is required:

Table A8-9
River Crossing Assessment

Category	Type	Detail
Hydraulic Data	Flood Flow	Assessment of size and nature of the catchment area upstream, scope to depend on sensitivity of location.

Category	Type	Detail
		Survey of the channel and floodplain at the site, to determine channel alignment and size, and bed slope and material.
		Any local experience of flood levels and extents.
	Low Flows	Gauging of low flows
		Any local experience
	Sediment and Debris	A survey of the type and amount of trash/debris in the channel, together with the nature of the bed sediment.
Engineering Data	Ground Conditions	Scope to depend on likely type of structure
	Other Issues	Consideration needs to be given to factors such as access, availability of materials, temporary works, and the environmental impact during construction.
Environmental Issues	Consultation	Consultation with bodies including SEPA, SNH, local authorities, local fisheries groups and other interested parties.
	Fish and Wildlife	Surveys and studies
	Other	Public safety

8.1.2 Design Considerations

159. Once data has been collected, the following design considerations can be made:
What type of structure is required (culvert or bridge);

- Decide culvert alignment, is the watercourse to be diverted to allow the road to cross it at 90 degrees, or is the culvert going to be online which may require a longer culvert,
- Carry out hydraulic design:
- Determine design flow;
- Estimate size and slope of culvert;
- Check velocities in the culvert to determine whether sedimentation or erosion is likely to occur (at low or high flows); and
- Determine type of inlet and outlet;
- Determine what wildlife and fisheries provision is required;

- A check on constructability; and
- Any other considerations.

8.1.3 Detailed Design:

160. Detailed design would be based on the above considerations. Culverts would be designed according to the CIRIA Culvert design and operation guide (CIRIA C689).

161. The following also needs to be considered as part of the detailed design:

Fisheries

162. If the watercourse is used by migratory fish or has the potential to be used, the following conditions need to be provided in the design of the structure:

- Adequate water depth during periods of migration;
- Avoidance of excessive water velocities during normal migratory conditions;
- Avoidance of creating vertical barriers, i.e. avoid the use of perching;
- If necessary ensure that adequate resting places are provided above and below the structure; and
- If necessary design and size the structure to include baffles to provide hiding places for fish to rest.

163. The above conditions will be met if the existing riverbed is used, or the new structure follows the existing riverbed gradient and maintains a similar flow regime through the structure as the original river profile.

164. The principles and guidance set out in the Scottish Executives design guidance for River Crossings and Migratory Fish would be followed.

Trash Screen

165. Wherever possible the design should avoid the need for a trash screen by ensuring more than adequately sized culverts, no changes in section or slope, no corners within the culvert and well-designed inlet and outlet structures.

166. Where a trash screen is considered necessary appropriate provision needs to be made for regular inspection and maintenance.

Erosion Protection:

167. Erosion protection is generally required at the outlet of the culvert (and to a lesser extent at the inlet). The type of erosion protection would depend on a number of factors including:

- Flow;
- Velocity;
- Channel bed material;
- Vegetation; and

- The effects/consequences of erosion.
- Types of erosion protection include:
- Dumped Stone;
- Laid Stone (Rip-rap or equivalent);
- Gabion Mattresses; and
- Concrete Block Systems.

168. Erosion protection needs to be adequately designed with a suitable filter material underneath to ensure the long-term effectiveness of the protection.

8.1.4 Structural Design

169. Consideration needs to be given to aspects such as:

- Bearing capacity of foundations (and variability of capacity); and
- Design loadings – likely to be larger during construction and decommissioning of the wind farm.

Design Options

170. The following design considerations will be applied when developing stream crossings:

Table A8-10
Culvert Design Options

Type	Shape	Construction	Environmental Impact	General Use
Culvert	Circular (Pipe)	Normally concrete or plastic, founded on compacted granular bedding	Sits in the bed of the watercourse, care is required when constructing and siting to ensure sediment is controlled and no obstacle is created for wildlife or fisheries. A separate mammal tunnel or ledge will be provided where appropriate.	Used for small watercourses and drainage ditches.

Type	Shape	Construction	Environmental Impact	General Use
	Circular (Armco)	Normally of corrugated steel, can be concrete lined if additional erosion protection is required. Generally founded on compacted granular bedding.	Sits in the bed of the watercourse, care is required when constructing and siting to ensure sediment is controlled and no obstacle is created for wildlife or fisheries. A separate mammal tunnel or ledge will be provided where appropriate.	Used for larger watercourses.
	Box	Normally precast concrete. Generally founded on compacted granular material.	Sits in the bed of the watercourse, care is required when constructing and siting to ensure sediment is controlled and no obstacle is created for wildlife or fisheries. A mammal ledge can be incorporated within the culvert as part of the design.	Used for larger watercourses or where migratory fish are present.
Bridge	Concrete or granular fill parapets, with pre-cast or pre-stressed concrete beams.	Avoids the need for construction in the river bed, but likely that scour protection would be required for the abutments. Care required when excavating abutments to ensure no silt impact on the watercourse.	Used for sensitive and large watercourses.	

171. All river crossings would be designed to convey a 1 in 200 Annual Exceedance Probability (AEP) flood event without damage to the crossing or surrounding areas, and individually sized and designed to suit the specific requirements and constraints of its location.

172. If stream diversion was necessary to minimise the impact when crossing a watercourse, SEPA and all other relevant consultees would be consulted. Prior to construction a system for

agreeing the degree of consultation considered appropriate for the level of site sensitivity, would be agreed.

8.2 Design and Construction of Different River Crossing Types

8.2.1 Culverts

173. Technical Appendix 11.3 of the EIA Report describes the existing and proposed watercourse crossings.

174. Small circular (pipe) culverts would be used where a small watercourse or stream needs to be crossed.

175. Medium to large box culverts or large Armco culverts would be used where a culverted solution is desirable or where a small piped culvert is not appropriate for environmental or channel-size reasons. The advantages of a box culvert over a circular culvert is that a more natural river bed can be reinstated and maintained, however it does require more construction work to install.

176. A reinforced concrete headwall would be provided upstream and downstream to protect the road embankment where necessary. Further protection would be provided to the banks using soft engineering techniques as much as possible. Rip-rap or similar bed protection would be provided upstream of the structure and possibly downstream depending on the local conditions. This bed protection is to protect the structure from being undermined by increased erosion forces due to increased local water velocities (scour).

177. Culverts would not be constructed under high flow conditions. The following steps would be taken in the construction of culverts:

- Before the commencement of construction the watercourse would either be diverted into a temporary channel, over pumped or the culvert would be built off line;
- The line of the culvert would be excavated to enable placement of any required bedding material. For box culverts, this needs to be a well-compacted granular material. The degree of foundation required depends on the type and size of the structure;
- The pipes or box sections would be then be laid and suitable material used to backfill around. They must be laid at the natural bed level, and the same gradient, so as not to cause a barrier to fish movement;
- Any inlet/outlet works constructed;
- The riverbed would be reinstated through the length of the culvert to keep the watercourse flowing as naturally as possible;
- A mammal tunnel would be provided where appropriate so that no restriction is created to traditional animal movement routes; and
- The watercourse shall be diverted back through the culvert.

8.2.2 Bridges

178. Bridges are the preferred solution for larger spans, and for higher flow watercourses. Bridge construction is less likely to interfere with the watercourse to the same extent as culvert construction, and can be built over the existing alignment of the river without the need for

diversion. Foundations would be required on both banks (down to a competent bearing stratum) in order to support the bridge deck. Typical bridge options (section drawings) are shown Figures 6.8 and 6.9 of the submitted EIA Report.

179. It is anticipated that spans up to 10 m across can be constructed using pre-cast concrete beams. Spans greater than 10 m would require pre-stressed concrete beams. It may be necessary, depending on the local conditions to provide a revetment protection to the bridge supports. It may also be necessary to provide bed protection.

180. The design of the abutments would depend on local ground conditions. Where possible the foundation would be excavated to a suitable bearing stratum before been constructed.

181. The watercourse would then be spanned with either pre-cast or pre-stressed concrete beams depending on the span. These would be delivered to site on a HGV and a suitably sized crane used to lift the beams into place. Local widening and strengthening of the road would be required on one side of the bridge to accommodate the crane.

8.3 References

Culvert Design and Operation Guide, Report C689 (CIRIA).

NetRegs (2019). Guidance for Pollution Prevention. SEPA. http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/ [Accessed August 2019]

GPP 5 – Works and maintenance in or near water (2017)

Scottish Govt (2000). River Crossings and Migratory Fish: Design Guidance. https://www2.gov.scot/Topics/marine/science/Publications/publicationslatest/rivercrossings [Accessed August 2019]

CLASHINDARROCH II WIND FARM

OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 9

OCMS 9

Discharge and Drainage Management

9.0 Discharge and Drainage Management

9.1 Introduction

182. A site specific drainage plan would be implemented and approved by SEPA, SNH and the local authorities. The plan would include:

- Drainage Impact Assessment;
- Plan and details of all drainage on site including an incident response plan; and
- Inspection and monitoring programmes.

9.2 Wind Turbine Foundation Drainage

183. Whilst the foundation excavation is open, it would need to be kept free of water to allow construction of the reinforced concrete base. Water ingress would be from ground, surface and rain water. The foundation excavation would be designed to be gravity draining, where local topographical conditions allow. If this were not possible, pumping would dewater the excavation. Excavations would be dewatered all the time they are open.

184. No water from foundation dewatering operations would be discharged directly into a watercourse. All dewatering would be in accordance with CIRIA and SEPA Guidance (e.g. CIRIA C532D and SEPA/NetRegs PPG1 – Understanding your environmental responsibilities – good environmental practices), and where necessary settlement tanks, systems such as Siltbusters or settlement lagoons would be constructed. The dewatering and de-silting system would be installed before foundation excavation commenced.

185. The size and design of the dewatering system would depend on a number of factors:

- Environmental Factors: Including the environmental sensitivity of the locality;
- Ground Conditions: The strength of the ground needs to be assessed. Where the ground is shown to be too weak to support a silt or settlement pond then a proprietary system such as a Siltbuster would be used. This system could be located on a hardstanding or other suitable bearing surface; and
- Volume of water to be treated: Factors affecting this volume include the height of the water table, soil porosity and rainfall. All of these factors need to be assessed when designing and sizing a dewatering system.

9.3 Road Drainage

9.3.1 Excavated Road Drainage

186. Excavated roads would have the following drainage features:

- Drainage ditches – generally on uphill side of the road, but both if there is a short section with no cross slope;
- Cross drains – There would be regular cross drains under the road. The spacing of these cross drains would depend on a number of factors discussed later; and

- Catch pits and check dams – Catchpits and check dams would ensure that any potential/accidental silt and pollutants are stopped as near to their source as possible and would ensure that the cross drains work as intended. These are also discussed in more detail later.

9.3.2 Upgraded Forest Track Drainage

187. Where an existing forestry track is upgraded the existing drainage would be reinstated, and improved where necessary.

9.3.3 Interface between Different Types of Road Drainage

188. Where the road construction method changes, the drainage methods would also change. If this results in an end point for a drainage ditch, the ditch would be piped across the road and allowed to discharge to land on the down side of the slope taking into account the precautions against pollution and erosion discussed later in the section.

9.3.4 Drainage Ditches

189. Drainage ditches would be required alongside any road, which cuts off the natural drainage across it. Although pollution prevention and control would happen at source to prevent the risk of pollution of a watercourse no water from a drainage ditch would be discharged directly to a watercourse. Instead it would pass through a sand filter, filter strip, silt trap, settlement pond or other best practice pollution control feature. Drains would not be ended directly into natural channels, ephemeral streams or old ditches. Where velocities are expected to be high and erosion a problem the ditch would be rock armoured and intermediate check dams installed.

190. Drainage ditches would be dug using a back acting excavator at the same time as the road was constructed. Material would be side cast on the downhill side of the road together with other excavated material (see road construction section).

9.3.5 Cross Drains

191. Cross drains are required to maintain the natural flow of water across the line of road. The spacing as size of the cross drains would depend on the following factors:

- area draining to cross drain;
- gradient;
- choice of material for drain; and
- choice of design condition of the drainage system.

192. Cross drains would be installed as the road is constructed. It is likely that they would be at least every 100 m. Where a cross drain is to be installed a trench would be dug, the pipe (pre-cut to size) installed and then backfill compacted around it before the road construction was completed on top.

9.3.6 Check Dams and Catch-pits

193. Where a cross-drain crosses the road a catch-pit would be installed in the drainage ditch. The purpose of this catch-pit is to slow the flow of water down the ditch and to catch and store the

sediment load in the run-off. The catch-pit needs to be suitably sized to allow it to be cleared by a small wheel excavator. To further control sediment and erosion, check dams would be installed at catch-pits to control water velocities. Where road gradients are steep, check dams may be installed at smaller intervals than catch pits to reduce damaging velocities. The spacing of check dams and catch-pits depends on the following factors:

- Gradient of the road;
- Spacing of cross-drains; and
- Depth of excavation of an excavated road.

9.3.7 Interaction between Drainage and River Crossings

194. At no point would drainage ditches discharge directly into a watercourse. This is to prevent pollution of the watercourse by silt and any other pollutants washed into the drains.

195. Where a ditch meets a watercourse the drainage ditch would be directed into a settlement pond and the run-off allowed to soakaway either in a natural manner or through a constructed soakaway. The design and size of the soakaway would be determined by the local ground conditions.

196. The size of the settlement ponds, distance between the watercourse and the ponds and the design of the soakaways are Site specific and would be sized on a crossing-by-crossing basis.

197. The settlement ponds (where required) and operation of the system would be monitored regularly, and maintained when required. During construction, and any major works at the wind farm, splashguards would be provided at the river crossing to ensure no silt and pollution reaches the watercourse. All drainage systems would be designed according to SEPA/NetRegs guidance, particularly GPP5 when affecting watercourses, and CIRIA Sustainable Drainage design guidance.

9.4 Drainage Plan

198. A detailed drainage plan would be implemented to cover all aspects of the wind farm construction and operation. This drainage plan would include a drainage impact assessment, which would be agreed with SEPA and the local authorities.

199. The drainage plan would build on industry best practice, be an evolving document as the wind farm is constructed, and fully integrated with the Site EMS.

9.5 References

NetRegs (2019). Guidance for Pollution Prevention. SEPA. http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/ [Accessed August 2019]

GPP 5 – Works or maintenance in or near Water (2017)

H Masters-Williams et al (2001). Control of water pollution from construction sites – Guidance for Consultants and Contractors (C532D). CIRIA.

B Woods Ballard et al (2015). The SuDS Manual (C753). CIRIA.

CLASHINDARROCH II WIND FARM

OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 10

OCMS 10

Waste Management

10.0 Waste Management

10.1 Waste Management Plan

200. As part of a contractors Safety, Health and Environment Management Plan the contractor would be required to develop a full site specific Site Waste Management Plan (SWMP). The principles behind the plan are set out in legislation such as Special Waste Regulations (SWR) and industry guidelines such as CIRIA SP133, SEPA/NetRegs PPG6 – Working at construction and demolition sites and are in five steps:

- *Minimise Waste* – this can be achieved through design, both of structures and of methods. For example less waste would be produced if less falsework and temporary works were required;
- *Reduce Waste* – this can be through good storage and handling of deliveries to minimise damage, and good planning of deliveries so that materials do not get damaged by over exposure to site conditions such as weather;
- *Reuse* – this can be achieved through design, for instance designing formwork that can be reused from wind turbine to wind turbine or reusing spoil for landscaping or backfilling;
- *Recycle* – planning ahead and separating wastes at source to aid recycling;
- *Recovering Energy* – Not normally applicable to construction sites; and
- *Dispose* – Ultimately some waste would need to be taken off site. All contractors onsite have a duty of care to ensure that they comply with legislation and that only licensed waste management companies are used to handle and dispose of waste.
- The Principal Contractor would be responsible for producing a Site specific SWMP, which would include ensuring that subcontractors take the same responsibility for managing their wastes. There are a number of tools available for managing waste these include:
- *Waste Transfer Notes:* These allow an audit of wastes to be carried out. This means that the waste management plan can be adapted as the job progresses and the effectiveness of those changes monitored. It also ensures compliance with the plan, and with current legislation;
- *Segregate Wastes:* Early identification and appropriate storage of wastes on site prevents pollution of the environment and contamination of other wastes which could affect its reuse/recycle potential;
- *Regular Audits:* Of the site and the Waste Management Plan; and
- *Staff Training:* To establish a re-use and recycle culture onsite.

10.2 Waste Storage

201. Methods for the storage of waste would be outlined in the SWMP. All wastes would be stored in lockable skips within designated areas and emptied on a regular basis. Any drainage from waste storage areas would be controlled. Any containers containing waste which could be blown away as dust or litter would be covered and regularly emptied.

10.3 Waste Streams

202. The following broad categories can be used for waste streams leaving Site:

- *General Waste (*all non-hazardous and non-utilisable controlled waste streams);
- *Special Waste* (controlled waste with additional hazardous properties, for instance used oil from vehicle maintenance); and
- *Recyclable Material.*

10.4 Waste Disposal

203. The method of disposal is dependent upon the waste's classification and in order to comply with legislation and to fulfil the 'Duty of Care', only licensed waste management companies would be used. The Duty of Care applies to anyone who produces, imports, carries, keeps, treats or disposes of controlled waste. It places a duty on those responsible for the waste to handle it correctly and prevent others from mishandling the waste.

204. No materials shall be burnt onsite, whilst any hazardous material shall be stored separately and disposed of by suitably licensed waste management companies and to appropriately licensed disposal sites.

205. Where appropriate, waste shall be segregated on site and shall be transported to appropriate recycling facilities. Such facilities should have the capabilities to accommodate, but not be limited to, timber, metals and plastics.

10.5 References

NetRegs (2019). Guidance for Pollution Prevention. SEPA. http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/ [Accessed August 2019]

PPG 6 – Working at Construction and Demolition Sites (2012)

P M Guthrie et al (1997). Waste Minimisation in Construction – Site Guide (SP133D). CIRIA.

Scottish Govt (1996). Special Waste Regulations 1996, as amended. HMSO.

CLASHINDARROCH II WIND FARM

OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 11

OCMS 11

Decommissioning

11.0 DECOMMISSIONING

206. At the end of the wind farm's operational lifetime, there are two options available:

- Re-power the Site with new machines, which would require a new application and environmental impact assessment process; or
- Remove the wind turbines and reinstate the Site.

207. Wind energy is a renewable resource and thus a sustainable method of generation. At the end of the wind farm life cycle there may be other sustainable commercially available energy sources. Alternatively, wind energy may still be a competitive and valuable source of energy generation and the wind farm may be upgraded or refurbished at this point. As stated above this would require a new EIA submission. In any event a decommissioning plan would be required for the removal of the wind farm.

208. If consent is granted for this proposal, Vattenfall are agreeable to a planning condition that the wind turbines are to be removed at the end of the consented lifespan, unless consent is given from the Planning Authority for them to remain or be replaced.

209. The wind turbines can easily be removed and the hard-standing areas re-instated. Prior to wind turbine removal, due consideration, in consultation with SNH, SEPA and the local authorities, would be given to any potential impacts arising from these operations. Some of the potential issues could include:

- Potential disturbance by the presence of a crane, heavy goods vehicles and engineers onsite;
- Onsite temporary compound(s) would need to be located appropriately;
- Time of year and time-scale; and
- Roads (Site tracks may remain in use for the benefit of the landowner).

210. A comprehensive plan for the decommissioning work would be drawn up in advance to ensure safety of the public and workforce and the best use of available techniques at that time.

11.1 Wind Turbine Decommissioning

211. The wind turbines can be completely dismantled and removed using a crane. The majority of parts would be recycled. The only parts which are currently difficult to recycle, are the glass fibre blades. However, techniques to chop the material up and use it as reinforcement in concrete are being developed and should be available commercially before the decommissioning of this project. Most items would be broken down so that specialist vehicles would not be required unless the wind turbines can be reused elsewhere.

212. The wind turbine foundations would be left in situ if the environmental impact assessment of this operation showed that this would do less harm than removing them. This assessment would take place closer to time to take into account changes over the project life time and technical capabilities. If the foundation is to be left *in situ*, the upper section of the foundation ring would be cut off and the ground cover reinstated and re-vegetated.

11.2 Substation Decommissioning

213. The substation and related equipment would be removed and the components reused or recycled. It is likely that the equipment would be reused as it has a life well in excess of the wind farm project. The foundations would be covered and re-vegetated.

214. The buried distribution cable would be cut off below ground level at the ends. The cables would not be removed if the environmental impact assessment proved that the operation to remove them would cause more harm than leaving them in place. The assessment would be carried out closer to the time to take into account changes over the project life.

11.3 Roads

215. It is likely that the site roads would not be removed; they would remain for use in the ongoing operation of the forest.

CLASHINDARROCH II WIND FARM

OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 12

OCMS 12

Site Reinstatement

12.0 SITE REINSTATEMENT

12.1 Reinstatement Techniques

217. Three principal methods would be adopted to recreate vegetation cover. The precise combination of these methods may vary according to the feature being reinstated and the local ground conditions. The three reinstatement techniques are:

- Turfing using material cut along the road route. Turfs would be cut by a mechanical excavator and laid upright in bucket-sized blocks along the route. It is essential to minimise disruption to the main rooting zone (0 - 250mm), especially the upper 25mm that contains most of the seed bank;
- Natural Regeneration relies on invasion of bare ground by native species colonization from adjacent habitats. Providing a roughened surface, which can trap seeds and soil to provide initial regeneration niches, can assist this process; and
- Reseeding using hydraulic technology, the seed mix is made up of sterile short-lived grasses, which would be replaced by heather and other heath and blanket bog species. The seed mix would be confirmed by the onsite ecologist.

12.2 Removal and Restorations of Temporary Compounds and Concrete Batching Plants

218. Once the wind farm construction work has been substantially completed the temporary compounds and batching plants would be removed. All the temporary buildings, machinery and other equipment and structures would be taken offsite. The temporary compounds would then be reinstated. The stone would be either be left in-situ or removed, depending on the environmental impact assessment of the operation, and the original formation would be recreated with soils excavated from construction works nearby. The soil surfaces would be restored according to the methods outlined above.

12.3 Foundations

219. Once the foundations have been backfilled the ground surface would be reinstated using topsoil and turves laid aside from the foundation construction using the methods described above.

12.4 Roads

220. Road restoration techniques are outlined in more detail in OCMS 01.

12.5 Rock Sources

221. On completion of the works at the rock sources, the overburden from the rock source as well as other suitable excavated soils from other parts of the works (for example, from the road construction) would be reinstated at the rock source.

222. Benched rock faces would be angled to allow re-vegetation and ledges tops oiled and reseeded where required. Detailed proposals for the restoration of each borrow pit would be produced with the advice of the ecologist, these would be approved by the local authority and SNH prior to its commencement. Plates 12.1 and 12.2 show the typical reinstatement of an onsite borrow pit and associated access road.

Plate 12.1 Typical Borrow Pit Reinstatement (18 months after completion of borrow pit operation)

Plate 12.2 Typical Borrow Pit Access Road Reinstatement (18 months after completion of borrow pit)

CLASHINDARROCH II WIND FARM

OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 13

OCMS 13

Cable Installation

13.0 Cable Installation

13.1 Delivery

223. The underground cabling will be delivered on cable drums by road.

13.2 Arrangement

224. All the distribution cable (typically 33 kV) connecting the wind turbines will be buried.

225. Some higher voltage cable (typically 132 kV) may be buried, particularly close to substations.

226. There may be multiple sets of cables on particular routes, particularly in congested areas e.g. close to substations.

227. Along the same route will run fibre optic communications cables and earth wires. These will all be installed at the same time to reduce environmental impact and the amount of time the trench is open to stop ponding.

228. By far the majority of the route will be alongside the road to minimise disturbance. The most likely exception will be if there is no site road link between adjacent blocks of turbines.

13.3 Cable Type

229. The distribution cable will most likely be cross-linked polyethylene (XLPE) insulated cabling with copper or aluminium conductors. The cores will be protected by steel wire armour and PVC.

230. The cable may incorporate fibre optic cores for communications, or a separate fibre optic cable will be laid alongside, for communications.

231. A bare copper earth cable will be laid alongside the cable.

232. Each circuit consists of either three single core cables arranged in trefoil or flat formation, or possibly a single three phase cable.

13.4 Installation Methods

233. The methods of installation all have to be selected to have minimum disturbance to the ground at installation or afterwards.

Table A13-11
Cable Installation Methods

Method	To be used under these circumstances	Details
Burial alongside the road, or where there is no road.	To be used in normal soil, e.g. in forest/field sites.	A trench is dug several metres to the side of the road, or where required. The base of this is filled with sand and the cables laid onto this bed. This is then topped with more sand, marking tapes or tiles placed above this in the trench, which is then backfilled with the soil previously removed. The fill is then re-seeded if required. Farming can take place above these cables. The cables are buried to a minimum depth of 0.5m.
Burial in ducts across the road	Road crossing are inevitable to allow cabling to reach turbines on the other side of the road and where both sides of the road are required for cables (especially near substations)	When the road is laid, ducts will be laid at appropriate places. The cable will be pulled through these at a later stage. Additional ducts will be laid in case some are damaged. The exits of these ducts will be clearly marked. When the cable is laid it will be necessary to dig trenches out up to two metres from the edge of the road to allow the cables to bend correctly before resuming their route alongside the road. The ducts will be corrugated plastic or concrete, appropriately specified for the environment. These ducts will typically be buried 1.2m below the surface of the road to ensure they are not crushed.
Burial in ducts in the road	This method will be used where there is restricted width for the road or where the habitat classification requires it. As it is extremely expensive it will only be used where absolutely necessary.	Ducts will be laid under the road as it is being constructed. Every two hundred metres, unless there is a turbine base nearby, these ducts will gradually be brought to pits at the side of the road. The cable will be pulled through from the ends of the ducts in the pits. The cable pulling equipment will sit on the road, or hardstanding if there is one, and not on the soil. Temporary pits will be covered in a similar manner to the ends of the road crossing ducts, described above. Both pre-cast concrete and solid plastic ducts are suitable.

Method	To be used under these circumstances	Details
Burial in ducts	This will be used for bridges and at the entry into substation buildings.	Ducts will be incorporated into the structure, with either connections for road duct or with suitably curved exits to line up with pits. Again, cable hauling equipment will be used from the roadway or adjacent hardstandings. The cable hauling equipment will be mounted on a lorry for rapid deployment. Pits will be dealt with in the manner discussed above.
Burial in excavated trenches	Most likely to be used in areas where there is no deep soil – large exposed slabs of rock or very severely eroded areas, existing road verges or across existing roads.	A trench will be dug with an excavator or rock saw as appropriate. A 100mm thick layer of fine aggregate will be put down under the cables, another 200mm laid on top followed by marker tape and then an appropriate backfill added to give a total burial depth of at least 500mm, similar to direct laid cables in soil.
Cable ploughing	Suitable for open deep soil areas. This method will only be used if there is no road nearby and will be avoided if at all possible.	Special machinery designed for burying cables in weak soils will be used. These will have low bearing pressure to minimise damage. They will make one cut into the soil, and bury the cable at a fixed depth, and let the sides of the cut close back in one pass.

234. See Figure 3.9 of the submitted EIA Report for details regarding cable trench design.

13.5 Cable Joints & Terminations

235. Cable joints can be made in-line in the ground and are therefore not visible from the surface. Joint locations such as this may be marked above ground.

236. In some locations joint pits may be required. These would typically be installed with concrete ducts. The ducts would remain accessible from the surface with removable lids.

237. Where cables split, i.e. one cable turns into 2 or more going in different directions, and this is not at a turbine and there is no switchgear, access to the cable terminations is required to reconfigure the network in case of a cable fault.

238. Such access will be provided by a small joint box at the relevant location. The cables would be brought above ground into the box and terminated onto a suitable structure. The box would be locked and marked as a substation. Such a box would be GRP or steel and could typically be 2m wide, 1.5m high and 1m deep. A small foundation is required for each cable box in order to support the weight of the cables.

239. Cables are terminated at the substation/control building and at the turbines.

240. Where the entire turbine electrical infrastructure is within the turbine, cable entries are designed into the turbine foundation design, and ducts for them to be pulled through are installed at the time of foundation construction. These are placed at appropriate locations for easy access, considering cable bending radius and depth of the cable entry specifically with respect to land slope.

241. Where the turbine transformer is external to the turbine the cables are terminated in the small adjacent building. Ducts are not required for this installation.

242. At the substation the cables will be pulled through pre-laid ducts into the 33 kV switchroom. The ducts are of sufficient size and depth to accommodate the cables' bending radii.

243. The cables are terminated, at either end, onto switchgear or directly onto a transformer, as appropriate.

13.6 Safety

244. The distribution network will be carefully checked and tested before being energised.

245. Any excavations for pits will be cordoned off and marked clearly.

246. Deep excavations will be designed out unless the topography dictates there is not alternative. In which case, appropriate protection will be provided for the workers in accordance with industry best practice.

247. Method statements will include provision for dewatering pits to ensure the water is removed in an environmentally appropriate manner.

248. Cable hauling operations will be coordinated with traffic movements especially when hauling is being carried out from the roadway.

249. Storage of cable drums, full and empty will be properly planned.

250. Cable off-cuts and waste from terminations will be systematically collected, stored and recycled or disposed of properly.

251. Security measures will be deployed to ensure the materials stay onsite and are not tampered with.

13.7 Marking

252. Cables will be marked in accordance with the Electricity Security Quality Continuity and Reliability Regulations (ESQCR) 2002.

253. These require that tapes or tiles are placed at a suitable distance above the cable, but below the soil surface, that anyone digging the area is warned of their presence.

254. Where cables do not run alongside roads, and their location is required to be known, or at sites where the number of cables, depth & which side of the road the cables are on is required on site, then marker posts will be placed in the ground above the cables with data plates attached.

CLASHINDARROCH II WIND FARM

OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 14

OCMS 14

Substation Installation

14.0 SUBSTATION INSTALLATION

14.1 Substation Design

255. Wind farm sites require a substation to accommodate the onsite switchgear and protection equipment as well as communication equipment. The switchgear, typically 33 kV, and other required equipment will be housed in a control building.

256. Larger substations are required for connection to Transmission Voltage infrastructure (132kV or 275kV), in order to accommodate the associated transformers and the Medium Voltage (33kV) infrastructure.

257. 33kV switchgear will be entirely contained within the building and is oil, SF6 or vacuum switchgear.

258. There are two main types of EHV (Extra High Voltage) substation equipment – air insulated switchgear (AIS) and gas insulated switchgear (GIS).

259. The former (AIS) is open, takes a larger area, but is lower to the ground and can more easily be shielded from view by planting etc.

260. The latter (GIS) can be indoor or outdoor. When indoor it is typically constructed inside a relatively large building, designed to blend into the local environment. The actual building size depends on the amount of equipment to be placed within it, which is very site dependent.

261. Figure 3.7 of the submitted EIA Report provides an indicative layout of the control building proposed for the Clashindarroch II Wind Farm.

14.2 Delivery

262. All components will be delivered by lorry to the Site.

263. Large transformers may be delivered in sections. The large components will be offloaded by crane and taken to Site one by one on low loaders.

14.3 Construction

264. The area for the substation will be prepared by levelling and preparing foundations, adhering to previous method statements such as OCMS 01 – Road and Wind Turbine Construction.

265. The 33kV switchgear and control building, required in entirety for small sites, or a component part of larger substations, can be constructed in one of two ways:

266. The building is constructed, as any normal building, within local constraints, and the switchgear fitted within it; or

267. The substation is pre-constructed, and substantially pre-tested, in a container. This container is then delivered to Site, placed on the prepared foundation, and connected up and tested. The container can be made to appear as brick, steel, or other façades.

268. In the case of an AIS substation or outdoor GIS substation substantial concrete foundations will be constructed for the transformer, and smaller foundations for the switchgear and control building. Between these pads the ground will be covered with a thick layer of shingle.

269. AIS substations and outdoor GIS substations are required to be surrounded by a 2.4m high protective fence. This will be a galvanised steel palisade fence. Any landscaping agreed will be installed outside this fence a minimum of 5m away to ensure that the integrity of the protection is maintained, i.e. planted trees do not enable the public to climb into the substation. A smaller post & wire fence may be constructed at the 5m boundary as a boundary indicator.

270. In the case of an indoor GIS substation the transformer would be installed at an early stage and the steel framework completed around it. The switchgear would be assembled in container-sized modules and substantially tested before shipment to site. The modules would be lifted into position by crane, bolted to the steel frame and connected up. The rest of the building would then be completed; the roof, cladding and other rooms. Pre-assembled modules will be used for ease of erection. These will be large units lifted in place to minimise the working at height and manual handling. The entire building is restricted access.

271. An earth grid will be buried in and around the entire substation. The extent of the earthing required, i.e. the amount of metalwork to be buried, will be determined by tests, and will depend upon the substrate. This underground grid may be required to extend beyond the steel fence.

14.4 Connection to Cables and Lines

272. The underground cables from the distribution system bringing electricity from the turbines will be brought underground in ducts to the appropriate switchgear inside the building. The ducts are of sufficient size and depth to accommodate the cables' bending radii. Communications cables will enter in a similar manner.

273. The connection from the substation to the electricity grid would be effected via underground cabling to the existing adjacent Clashindarroch Wind Farm substation.

CLASHINDARROCH II WIND FARM

OUTLINE CONSTRUCTION METHOD STATEMENTS

Outline Construction Method Statement 15

OCMS 15

Health, Safety and Environmental Management

15.0 HEALTH, SAFETY AND ENVIRONMENTAL PROVISIONS

15.1 Construction, Design and Management (CDM)

274. The design and the management of construction of the wind farm will be regulated under the Construction (Design and Management) or CDM Regulations 2015.

275. The CDM Regulations place specific duties on clients, designers and contractors.

276. In particular, for a project of this scale, there is a requirement for a Principal Designer to be appointed by the client, who is responsible for planning, managing, monitoring and coordinating health and safety in the pre-construction phase of a project.

277. For a project that will involve more than one contractor, the client will also require to appoint (or designate) a Principal Contractor. The Principal Contractor is appointed by the client to plan, manage, monitor and coordinate health and safety during the construction phase of a project when there's more than one contractor involved.

278. Management of the various health, safety and environmental issues that may arise during the construction, operational and decommissioning stages of the project life are key to the project's success. Awareness of the issues from the start of the construction phase will allow for all parties to develop a good understanding of the issues that may arise as well as all site specific conditions.

279. Challenges will have to be addressed in accordance with all relevant health and safety legislation as well as Vattenfall's Health and Safety Policy.

280. The CDM Regulations require that all appointees made by the client shall have sufficient competence and resources available to carry out the work in a safe manner. Vattenfall will ensure all Contractors and appointees in positions of responsibility have such competence and resources available.

281. Each Contractor's organisation shall provide sufficient competence and experience to all supervisory roles within the Project Team. Such personnel shall provide advice and support to other members Project Team with a main focus on health, safety and environmental matters in their approach to their work.

15.2 Site Safety

282. The project has various matters in which it needs to address in order to ensure health and safety is maintained whilst dealing with various environmental controls. The area of work is environmentally sensitive and is exposed to extreme weather conditions in a remote location. Contractors will take all necessary precautions to ensure a high level of health and safety is upheld and all Project Team members have a clear understanding of their responsibilities and the risks involved in their work.

283. The Contractors Health and Safety Advisor will periodically audit, without prior notice, and inspect all safety measures and procedures adopted onsite. This process of auditing shall be carried out on both formal and informal bases and any corrective actions deemed necessary shall be implemented in order to minimise risk.

284. An incident reporting procedure shall be implemented onsite in accordance with Reporting of Injuries, Diseases and dangerous Occurrences Regulations (RIDDOR) 1995, whereby any major injury or

dangerous occurrence defined in the document shall be reported to the Principle Contractor. The Principle Contractor shall be responsible for reporting the incident under the requirements of RIDDOR.

285. If any incident arises in which an accident or near miss occurs which is not reportable under RIDDOR, a full account of the occurrence shall be made which clearly states the cause and extent of any damage/injury sustained by the affected party or equipment. No work shall commence onsite until the client or client's representative have established the cause of the incident and concluded that either the incident is unlikely to happen again or a change of working method and/or design has been developed which will avoid any similar incidents arising.

286. Monthly reports shall be supplied to the client presenting accident statistics, staff numbers and cumulative man-hours on site for each working period. Such documents will be compiled and issued in an agreed format by the Principle Contractor promptly on an agreed date until completion of the contract.

15.3 Welfare Provisions

287. Welfare facilities are required by the Health and Safety at Work etc. Act 1974 and the CDM Regulations and all contractors shall provide such facilities for the use of their employees.

288. During construction, welfare facilities shall be provided at the site compounds and other portable welfare facilities will be situated around the site. At a minimum these welfare facilities shall provide toilets, washing, changing and messing facilities. The exact arrangement and location of these facilities shall be agreed between the client and the contractors engaged to carry out the works. Environmental provisions in regards to welfare facilities are discussed in section OCMS 05 - Pollution Prevention.

289. In the operational phase of the project, permanent welfare facilities containing toilets, washing and changing facilities, messing facilities and storage areas shall be provided in the at the permanent welfare facility within the substation compound, indicated on Figure 3.7 of the submitted EIA Report.

290. In the event of long term works, or works which require a large number of staff onsite where extra welfare facilities are deemed necessary, suitable temporary facilities shall be brought to Site during the period of work and removed once the work has finished.

15.4 Emergency Procedures

291. Prior to any of the Project Team beginning work onsite, an emergency procedure shall be developed and communicated to all involved in site work. The Emergency Procedures shall pay particular attention to the following:

- Lone Working;
- Lack of Mobile Phone Reception;
- Extreme weather conditions (heavy rainfall, snow and ice, wind and flooding of the Site);
- Site evacuation;
- Interaction with Forestry Commission Scotland and Clashindarroch Forestry workings and procedures;
- Interaction with members of the general public;
- Fuel Spills and Leaks to ground (also see OCMS 05 Pollution Prevention); and

- Contamination of local watercourses (also see OCMS 9 Discharge and Drainage Management).

292. In the case where work is subject to an authority other than the Clients, that authority's emergency procedure shall be evaluated and incorporated into the emergency procedures set for Site work.

15.5 Hazardous Materials

293. Any hazardous material used onsite shall be stored in a safe and secure manner whilst either waiting to be removed from site or waiting to be used. The container the material is to be stored in shall be lockable and suitable for the material to be stored.

294. All contractors handling hazardous materials shall complete Control of Substances Hazardous to Health (COSHH) assessments which will incorporate data sheets and requirements supplied by the manufacturers.

295. The storage of any hazardous material shall be as close to its source of use as possible in order to minimise site movement hence minimising risk.

296. Hazardous waste shall be removed from Site immediately and not stored on site. Any waste shall be removed by only suitably licensed waste management companies. For further methodologies in regards to waste management consult OCMS 10 - Waste Management.

15.6 Working Hours

297. No work shall commence outside of an agreed Site working hours. Vattenfall propose Site working hours of 0700 to 1900 Monday to Friday and 0700 to 1300 Saturday for all construction activities on site. An exception to this rule is allowed for the delivery of abnormal loads to site and the erection of the wind turbines as these are dependent on weather, failing light and Police or road authority requirements. Vattenfall will agree on a condition associated with acceptable onsite working hours.

298. For any work to commence outside of the proposed normal working hours above, written approval from the local planning authority will be needed.

15.7 Public and Traffic Management

299. A detailed Construction Traffic Management Plan (CTMP) shall be set up prior to the commencement of any work onsite. The Principal Contractor would be responsible for the production of the document, ensuring it directly relates to the construction program and methodologies proposed by the Contractor. For further details see Technical Appendix 13.4 of the EIA Report.

15.8 Public Relations and Consultation

300. The Principal Contractor shall provide, in collaboration with all other contractors, a community relation and consultation program with the aim for engaging the local communities during the construction period. The program will aim at discussing the effect of the construction activities on the day-to-day routines of the local community and, if applicable, where improvements can be made to accommodate the local communities' interests.

301. The program shall typically comprise of meetings, regular newsletters and a local point of contact for the local communities.

ANNEXE 3.1.2
OUTLINE BRIFING NOTES

Outline Briefing Note No.	Description
OBN 1	Infrastructure Micrositing
OBN 2	Archaeology
OBN 3	Ornithology
OBN 4	Terrestrial Habitat and Fauna
OBN 5	Aquatic Fauna and Fisheries
OBN 6	Hydrology & Hydrogeology
OBN 7	Pollution Prevention
OBN 8	Transport & Traffic

1.0 INFRASTRUCTURE MICROSITING

1.1 Background and Context

1. It is possible that during the construction or as a consequence of pre-construction surveys, minor changes (<50m) in the location of wind turbines and other infrastructure (roads, temporary compounds, concrete batching plants, and the switchroom) may be needed due to unforeseen ground conditions or may be advisable in order to further minimise environmental impact identified onsite. This briefing note will describe how such micrositing will be managed.

1.2 Mandatory Actions

1.2.1 Micrositing Approvals

2. Approval for micrositing would be managed in accordance with a protocol agreed with Aberdeenshire Council and SNH.

3. Where micrositing is required, Vattenfall would ensure continued compliance with all relevant buffers and constraints used in the original Site design.

1.3 Micrositing and Pre-construction Surveys

4. Micrositing may be required as a result of recommendations from the preconstruction surveys, including:

- local ground investigations;
- archaeological finds;
- habitat surveys;
- aquatic fauna surveys; and
- bird surveys.

1.4 Summary and Conclusions

5. Any required micrositing would be instigated as a result of pre-construction monitoring and survey work or as a consequence of factors identified during the construction process. It would be carried out to minimise the environmental impacts of the proposal and as a consequence of recommendations made by the onsite environmental team. It would be carried out according to an agreed protocol which the final version of this briefing note would set out.

2.0 ARCHAEOLOGY

2.1 Background and Context

6. An archaeological impact assessment has been undertaken for the Clashindarroch II Wind Farm Extension proposal.

7. A total of 42 heritage assets have been recorded within the study area of the proposed development. The assets are in various states of preservation. The degree of survival is fragmentary and the historic landscape largely disrupted by historically recent forestry.

8. The wind farm has been designed as far as practicable to minimise direct impacts on archaeological features. However for some sites this has not been possible where either:

- the sites are in the vicinity of proposed works and therefore could potentially be disturbed; or
- there is the potential for presently undiscovered archaeological finds.
- To deal with this the following mitigation is proposed:
- fencing off assets that might be accidentally damaged during construction works; and
- a watching brief on the elements of the ground works that would have a direct impact on the heritage assets.

2.2 Legal Framework

9. The following legislation and guidance may be relevant to works with the potential to affect archaeological sites:

- The Ancient Monuments and Archaeological Areas Act 1979;
- The Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997;
- The Historic Environment (Amendment) (Scotland) Act 2011;
- Statutory Instrument No 101 The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- Historic Environment Circular 1 May 2016a;
- Historic Environment Policy for Scotland May 2019a; and
- Planning Advice Note 2/2011: Planning and archaeology.

2.3 Mandatory Actions

10. The following measures are mandatory with regards to the construction of the Clashindarroch II Wind Farm Extension:

- compliance with the mitigation obligations in the EIA Report;
- compliance with any relevant planning conditions that may be proposed; and
- an Archaeological Construction Statement or Written Scheme of Investigation (WSI) would be issued to and adhered to by all contractors/sub-contractors onsite. A summary of the key parts of this document would be communicated to all Site workers as part of their Site induction

2.3.1 Archaeological Construction Statement

11. Vattenfall proposes the following code of practice be established and implemented for all construction activities related to the proposed Clashindarroch II Wind Farm Extension:

- the Principal Contractor would be responsible for ensuring that the Works are undertaken strictly in accordance with the methods relating to archaeology detailed in the Construction Statement;
- the Project Archaeologist is defined here as; SLR Consulting Ltd Archaeological Consultant who will be overseeing compliance with archaeological mitigation and conditions. The Project Archaeologist may require further archaeological staff or representative to be onsite during groundworks to ensure appropriate archaeological mitigation is carried out;
- the appointed Principal Contractor would have to provide access to the Project Archaeologist to undertake recording and exploratory work, where required;
- throughout the Works, the Contractor would have to minimise damage to known archaeological sites by employing the mitigation strategy outlined in this Construction Statement;
- outwith areas of known archaeological features, the Principal Contractor would have to operate vigilantly. If, during the course of the Works, any features which may be of archaeological interest were found, they would have to be reported to the Project Archaeologist, or his representative onsite, in order that they may be assessed and recorded, if considered appropriate, according to the Written Scheme of Investigation (WSI) agreed with the council's Regional Archaeologist in advance of the Works. (Training would be given as to what constitutes a find of potential archaeological interest.);
- the Principal Contractor would have to ensure that all his Works personnel are aware of the guidance relating to archaeology detailed in this Statement and information is communicated as part of their Site inductions;
- the responsibility for the security of an archaeological site would rest with the Principal Contractor. The level of security would have to be agreed between the Project Archaeologist, Vattenfall, the Project Contractor, and the Local Authorities Archaeologist; and
- the Principal contractor is obligated to give SLR Consulting two weeks' notice prior to construction works beginning. No construction works shall begin in areas where assets are required to be marked out and protected until appropriate barrier/fencing is in place.

2.3.2 Construction Activities

- Archaeological Sites that require protection shall be fenced off prior to construction activities taking place in that area;
- All ground-breaking works shall require archaeological monitoring. Including; trenching, access tracks, excavation for turbine bases, crane pads, borrow pits and similar activities;
- Archaeological monitoring shall include removal of overburden/topsoil and down to the first archaeological deposit or natural subsoil;
- All ground-breaking works under archaeological monitoring should be carried out with a smooth bladed bucket. Toothed buckets are prohibited due to the damage they can cause to masked archaeological features and thereby making it difficult for the monitoring archaeologist to see and record the archaeological remains appropriately;
- Machines stripping soil shall move away from the exposed area and shall refrain from tracking over exposed surfaces. This allows the watching archaeologist to inspect the area;

- Driving heavy vehicles over low banks can rapidly destroy or erode these away. Allowing vehicles to bog down and create deep ruts can destroy the buried parts of sites. Unnecessary ground disturbance must be avoided;
- Vehicles/machinery must be confined to defined access roads. Passage of vehicles over known archaeological sites is strictly forbidden;
- There is to be no vehicle turning, parking, dumping, material stacking or storage other than in locations specified by Vattenfall's Site representative;
- On areas of wet and soft ground or marsh, the Contractor must use low ground pressure vehicles and mats or other suitable means of minimising ground disturbance; and
- Surplus materials from excavations must not be stored on or within an appropriate stand-off buffer of archaeological sites.

2.3.3 Archaeological Discoveries

- if, during the Works, any features that might be of archaeological interest are encountered, or archaeological artefacts are found, they must be reported to the archaeologist on site. If there is no onsite archaeologist it must be reported to the Project Archaeologist to ensure that they are recorded by a professional archaeologist according to the WSI agreed with the council; they should also be digitally located by the surveyors on site who would provide these data for GIS plotting of artefacts and other archaeological remains to ensure a coherent plan of discoveries is produced;
- all newly discovered ancient objects in Scotland, whether of precious metal or not, belong to the Crown. The Crown does not always exercise its claim, but all objects found must be reported so that a decision can be made by the Crown Office;
- in the event of an archaeological find, structural feature or burial being located, work must stop on that area of excavation until the Project Archaeologist has been notified. The Project Archaeologist would then decide whether work may proceed or whether it is necessary for a recording exercise to be conducted;
- no archaeological artefacts of any kind may be removed from an archaeological site without the written permission of the Project Archaeologist;
- in nearly all cases, recording would be a simple process of note taking, drawing and photographing by a trained archaeologist. Most archaeological finds and sites are small and can be dealt with rapidly;
- where an archaeological find/artefact is accidentally excavated, it is important that the Project Archaeologist is informed of the location from where the find was recovered, and that it is stored carefully until it can be appropriately catalogued, packaged and labelled. The Council's Archaeologist would be duly notified by the Project Archaeologist; and
- all these types of evidence provide information in their own right, but equally frequently can be an indication of more substantial archaeological features in the vicinity, not affected by the construction.

2.3.4 Areas of Archaeological Interest

12. The following table provides an overview of the relevant archaeological interests at the Site (see also Table 10-6 within Chapter 10: Cultural Heritage).

Table B2-12
Areas of Archaeological Interest

Site	SLR Number	Heritage Significance	Impact Source	Impact Magnitude	Significance of Effect	Mitigation
The Shank, hollow way	**2**	Low	Track/Cabling/ Turbine base	Low adverse	Very slight	Watching Brief
Corrydown, mill lade	**4**	Low	Track/Cabling	Medium adverse	Very slight	Fencing off
Corrydown, track	**9**	Negligible	Track/Cabling	Very Low adverse	Negligible	Fencing off
Corrydown, cottage and garden	**11**	Low	Track/Cabling	Low adverse	Very slight	Fencing off/ Watching Brief
Killin Burn, dam and lade	**14**	Low	Track/Cabling	Low adverse	Very slight	Watching Brief
Ern's Criv, hollow way	**17**	Low	Track/Cabling	Low adverse	Very slight	Watching Brief
Corshalloch, farmstead and lade	**18**	Low	Track/Cabling	Very Low adverse	Negligible	Fencing off/ Watching Brief
Kye Hill, lime kilns	**38**	Negligible	Track	Very Low adverse	Negligible	Fencing Off
Queels, farmstead and enclosures	**40**	Low	Track/Laydown	Low/ Very Low adverse	Very slight /Negligible	Fencing off
Wellheads, remains of farmstead	**41**	Low	Track/Cabling	Medium adverse	Very slight	Fencing off/ Watching Brief
Wellheads, farmstead	**42**	Low	Track/Cabling	Low adverse	Very slight	Fencing off

2.4 Further Information

13. This outline briefing note (OBN) contains outline information only and would be further developed upon following planning approval.

2.5 Summary and Conclusions

14. Provision would be made for the preservation in situ, where possible, of any archaeological remains identified either during evaluations, watching briefs or by construction contractors in areas not subject to archaeological monitoring. Preservation in situ could be accomplished by recording the exposed archaeological remains prior to their reburial. Road re-routes and changes to wind turbine locations, within the consented micrositing radii, may also be possible.

15. Provision would be made for the excavation, where necessary, of any archaeological remains identified either during watching briefs or by construction contractors in areas not subject to archaeological monitoring. This provision would include the consequent production of written reports on the findings of the archaeological work conducted, with post-excavation analyses and publication of the results of the work where appropriate.

16. Written guidelines would be issued for use by all construction contractors, outlining the need to avoid causing unnecessary damage to known archaeological sites, and these can be summarised by toolbox talks if required. That document would contain arrangements for calling upon retained professional archaeological support in the event that buried archaeological remains of potential archaeological interest (such as building remains, human remains, artefacts) are discovered in areas not subject to archaeological monitoring. The guidance would make clear the legal responsibilities placed upon those who disturb artefacts or human remains.

3.0 ORNITHOLOGY

3.1 Background and Context

17. An ornithological assessment has evaluated the bird interests within and adjacent to the wind farm and assessed the potential impacts of the proposed wind farm scheme on ornithological receptors.

3.2 Legal Framework

3.2.1 The Wildlife and Countryside Act 1981 (as amended)

18. All wild birds (that is, resident, visiting and introduced species) in the UK are protected by law under the Wildlife and Countryside (WCA) Act 1981 (as amended), which makes it illegal to:

- intentionally or recklessly take, interfere with, damage or destroy the nest of any wild bird whilst it is in use or being built;
- intentionally or recklessly take, interfere with or destroy the egg of any wild bird; and
- intentionally or recklessly disturb any wild bird listed on Schedule 1 of the Act while it is nest building, or at (or near) a nest containing eggs or young, or disturb the dependent young of such a bird.

3.2.2 Other Relevant Legislation and Guidance

- EC Council Directive 79/409/EEC on the conservation of wild birds (The Birds Directive);
- The Conservation (Natural Habitats) Regulations 1994 (Habitats Regulations);
- Nature Conservation (Scotland) Act 2004;
- Wildlife and Natural Environment (Scotland) Act 2011;
- Nature conservation: Implementation in Scotland of the Habitats and Birds Directives: Scottish Executive Circular 6/1995 as amended June 2000;
- Natural Planning Policy Guidance (NPPG) 14: Natural Heritage;
- The UK Biodiversity Action Plan (UK BAP);
- Scottish Executive Ecological Advisers Unit Guidance;
- Planning Advice Note 60 on Planning for Natural Heritage.
- Environmental Impact Assessment Handbook. Guidance for competent authorities, consulting bodies, and others involved in the Environmental Impact Assessment process in Scotland (SNH 2018); and
- Chartered Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM 2018).
- Survey Methods for Assessing the Impacts of Onshore Windfarms on Bird Communities, SNH Guidance (November 2005, updated May 2014); and
- A Review of Disturbance Distances in Selected Bird Species (SNH 2007).

3.3 Mandatory Actions

3.3.1 Obligations arising from the EIA Report

19. Commitments and obligations made in Chapter 8: Ornithology of the EIA Report that are relevant to ornithological aspects are noted in Chapter 18 of the EIA Report.

3.4 Monitoring/Survey Requirements

20. A programme of monitoring would be agreed with SNH. The following table outlines monitoring/survey requirements made in this document relevant to ornithological aspects.

Table B3-13
Ornithological Monitoring and Survey Requirements

Item	Obligation
1	Breeding bird surveys would be undertaken for goshawk, merlin and hen harrier. These would be undertaken in the breeding season prior to works commencing (including felling) and for the first 10 years of the development (for the first 3 years, then 5th and 10th years as standard) and then the need for further monitoring would be reviewed.
2	Habitat quality of existing areas of suitable breeding habitat within the Site would be monitored during the lifetime of the development to inform habitat management decisions. This would be undertaken through an annual measure of the percentage cover of open ground versus tree canopy, together with a report from a walkover of the habitat in order to provide qualitative data about the habitat suitability from a suitably experienced ornithologist.
4	Surveys of black grouse and capercaillie would be undertaken in the Spring prior to works commencing (including felling) and for the first 10 years of the development (for the first 3 years, then 5th and 10th years as standard), at which point the need for further monitoring would be reviewed.

3.5 Further Information

21. The following guidance would be used:

- Dealing with construction and birds (SNH, March 2016);
- Forest Commission Scotland (2006). FCS Guidance Note 32: Forest operations and birds in Scottish forests - the law and good practice;
- Wind farm proposals on afforested sites - advice on reducing suitability for hen harrier, merlin and short-eared owl (SNH, January 2016);
- CIRIA C691 : Working with Wildlife : Guidance for the Construction Industry; and
- CIRIA C715 : Environmental Good Practice on Site.

3.6 Summary and Conclusions

22. The appointment of an experienced ornithologist(s) fully integrated into the development's project management team would ensure that the measures outlined in this outline briefing note (OBN) are undertaken and enforced throughout the pre-construction/construction and decommissioning phases of the development.

4.0 TERRESTRIAL HABITATS AND FAUNA

4.1 Background and Context

23. An impact assessment has been undertaken for the Clashindarroch II Wind Farm looking at the development's potential effects on sensitive habitats and protected fauna.

4.2 Legal Framework

24. Relevant legislation and guidance includes:

- EC Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora);
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (The Habitats Regulations);
- The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007;
- Wildlife and Countryside Act 1981 (WCA), as amended;
- Nature Conservation (Scotland) Act 2004;
- Wildlife and Natural Environment (Scotland) Act 2011;
- The Protection of Badgers Act 1992 as amended by the Nature Conservation (Scotland) Act 2004;
- European Protected Species, Development sites and the planning system: interim guidance for local authorities on licensing arrangements (Scottish Executive, 2001);
- UK Biodiversity Action Plan (UK BAP);
- The Scottish Biodiversity List;
- North East Scotland LBAP;
- National Planning Policy Guidance (NPPG) 14: Natural Heritage;
- Planning Advice Note (PAN) 60: Planning for Natural Heritage;
- Environmental Impact Assessment Handbook. Guidance for competent authorities, consulting bodies, and others involved in the Environmental Impact Assessment process in Scotland (SNH 2018); and
- Chartered Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM 2018).

4.3 Mandatory Actions

4.3.1 Obligations from the Environmental Statement (EIA Report)

25. Commitments and obligations made in Chapter 9: Ecology and Biodiversity of the EIA Report that are relevant to habitat aspects are noted in Chapter 18 of the EIA Report.

4.3.2 Compliance with Regulatory Guidance, Best Practice and Outline Construction Method Statements (OMS)

26. The measures proposed in the OCMS ensure compliance with relevant legislation, such as the Habitats Regulations 1994 (as amended) and the Wildlife and Countryside Act 1981 (as amended). The OCMS presented in Annex 3.1.1 of this document have been developed with consideration for ecological matters. They have been developed incorporating best practice guidance.

4.4 Monitoring / Survey Requirements

27. The following is a summary of the proposed monitoring and survey requirements in relation to protected species. Further information is provided in Chapter 9 and in the outline Species Protection Plans (SPPs), see Technical Appendix 9.5.

28. The Project will appoint a suitably experienced and qualified Ecological Clerk of Works (ECoW) for the duration of the pre-works, construction and site restoration phases. The appointment of the individual(s) covering the ECoW role will be agreed in advance in consultation with SNH. The ECoW will have authority to immediately halt any works that have the potential to affect protected species or that would contravene the ecological / environmental commitments.

29. The ECoW will have responsibility for checking that the species protection measures set out in the EIA report are properly implemented and adhered to.

30. A pre-works (including felling) survey for the relevant protected species (i.e. badger, bats, otter, pine marten, red squirrel and wildcat) will be completed at the appropriate time of year and not more than 8 months preceding the commencement of felling / construction.

31. Should any evidence and/or features be found that are suitable as resting places (e.g. setts, roosts, holts, dens, dreys) then this will trigger the need for more detailed surveys to be carried out to inform a specific mitigation plan to avoid or offset impacts on resting places and any derogation licences that may be required in consultation and agreement with SNH.

32. Tree felling and site clearance will be programmed outside of the main wildcat breeding season, which is March to August inclusive. This will also help to ensure that potential impacts on the majority of nesting birds is also minimised.

33. There will be a watching brief in place during the works to help ensure that the relevant SPP measures are effectively and consistently applied and also to react to any new evidence of any protected species that may be found during the construction period. This will be the responsibility the appointed ECoW.

34. All site works will be restricted to daylight hours and a <15 mph speed limit will also apply to all wind farm construction vehicles during the construction and operational phases of the Project.

35. A HMP is proposed to improve habitat quality for wildcat within Clashindarroch Forest and the wider Strathbogie Wildcat Priority Area. Further detail is provided in Chapter 9 and Technical Appendix 9.6.

36. A wildcat monitoring programme will be implemented during the operational phase of the Project. A detailed monitoring plan will be developed in advance of works commencing on the Project. The main objectives will be to determine the extent to which wildcat behaviour has been influenced by the presence of the wind farm, inform decisions on any changes to wind farm operational mitigation and

to assess the development and effectiveness of the habitat enhancement measures proposed under the HMP.

4.5 Further Information

37. The following guidance would be used:

- Scottish Natural Heritage Standing Advice Notes for Protected Species;
- SNH (2019) Good Practice during Wind Farm Construction;
- Forest Commission Scotland (2006). FCS Guidance Note 33: Forest operations and red squirrels in Scottish forests - the law and good practice;
- Forest Commission Scotland (2007). FCS Guidance Note 34: Forest operations and European protected species in Scottish forests - implications of legal changes from February 2007;
- Forest Commission Scotland (2009). FCS Guidance Note 35a: Forest operations and bats in Scotland;
- Forest Commission Scotland (2009). FCS Guidance Note 35c: Forest operations and otters in Scotland;
- Forest Commission Scotland (2009). FCS Guidance Note 35d: Forest operations and wildcats in Scotland;
- CIRIA C691 : Working with Wildlife : Guidance for the Construction Industry; and
- CIRIA C715 : Environmental Good Practice on Site.

4.6 Summary and Conclusions

38. This outline briefing note (OBN) would be further developed with the project ecologist. However supporting documentation, such as the OCMS, would ensure compliance.

5.0 AQUATIC FAUNA AND FISHERIES

5.1 Background and Context

39. An evaluation of the watercourses (and associated sub-catchments) and their fish populations within and adjacent to the wind farm is provided in Chapter 9 along with an assessment of the potential impacts of the proposed wind farm scheme on these receptors, and management actions to be implemented to mitigate any effects.

40. Fisheries interests that may be potentially subject to impacts include prolific populations of migratory salmonid and popular recreational fisheries of importance both regionally and within the national context of Scotland. The river systems are of statutory regulated fish conservation value as they support populations of Atlantic salmon (Salmo salar) and brook lamprey (Lamptera planeri).

41. The upper reaches of the River Deveron and Bogie catchments hold populations of migratory salmonids Atlantic salmon and sea trout, (Salmo trutta) non migratory trout, the brown trout, and diadromous species such as the eel (Anguilla anguilla). There are also species that have no angling or commercial value but are of conservation interest, including brook lamprey and stone loach (Nemacheilus barbatus).

42. For the proposed development it is important that the impacts from clear felling (which would occur regardless of the scheme albeit over a much longer timeframe) and construction impacts are segregated. The mitigation measures for clear felling would be pursued according to FCS guidelines to minimise short and medium term impacts on the local watercourses.

43. For mitigation regarding otters and water voles see Outline Briefing Note (OBN) 4 Terrestrial Habitats and Fauna.

44. Potential threats during the construction phase to aquatic ecology could include:

- water quality impacts;
- impacts on flow regime;
- noise and vibration; and
- impediment to fish migration

5.2 Legal Framework

45. Relevant legislation and guidance includes:

- Atlantic salmon listed in Annexes II and V of the EC Habitats Directive (94/43/EEC) and as a priority species on the UK Biodiversity Action Plan (UK BAP);
- Salmon listed on the North-East Scotland Local BAP;
- Salmon Conservation (Scotland) Act 2001, [now consolidated into the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003];
- The brook lamprey listed in Annexes II of the Habitats Directive, Appendix III of the Bern Convention and on the Scottish Biodiversity List;
- EC Water Framework Directive, incorporated into the Water Environment and Water Services

(Scotland) Act 2003 includes protection of salmonids and other native fish species of conservation concern;

- Brown trout and sea trout listed as priority species on the UK BAP and the Scottish Biodiversity List; and
- European eel – a priority species under the UK BAP and on the Scottish Biodiversity List.

5.3 Mandatory Actions

46. In order to ensure mitigation measures proposed in the fish populations and fisheries impact assessment and the fauna impact assessment are adhered to and to ensure compliance with relevant legislation and planning policy the following measures are mandatory with regards to the construction of the Clashindarroch II Wind Farm:

- compliance with the mitigation obligations in the EIA Report (as set out in the outline Fisheries Management Plan, see Technical Appendix 9.7); and
- compliance with any relevant planning conditions that may be proposed.

5.3.1 Obligations from the Environmental Statement (EIA Report)

47. Commitments and obligations made in Chapter 9: Ecology and Biodiversity and Chapter 11: Hydrology, Hydrogeology and Geology of the EIA Report that are relevant to fisheries aspects are noted in Chapter 18 of the EIA Report.

5.4 Compliance with Outline Construction Method Statements (OCMS)

48. Compliance with the principles set out in the OCMSs, is set out in Table B5-14.

Table B5-14
Compliance Table

No.	Aspect	Obligation
1	Silt / Suspended solids / Mobilisation of sediments	OCMS 01: Road and Wind Turbine Construction OCMS 04: Borrow Pits
2	Fuel, Oils and Chemicals	OCMS 01: Road and Wind Turbine Construction OCMS 05 : Pollution Prevention
3	Water Crossing Design	OCMS 08: Watercourse Crossing Management
4	Noise	OCMS 04: Borrow Pits

5.5 Monitoring/Survey Requirements

49. A monitoring plan is described the outline Fisheries Management Plan (see Appendix 9.7 of the EIA report). This plan has been discussed and agreed with the local fisheries trust (The Deveron, Bogie and Isla Rivers Charitable Trust, DBIRCT).

50. Table B5-15 provides a summary of the proposed monitoring programme:

Table B5-15
Proposed Schedule of Survey and Water Quality Monitoring

	No. Sampling Points (inc. control sites)	Frequency	Pre-construction (ideally 2 years, 12 months minimum)	Felling / Construction Phase	Monitoring Years Post-Construction			
					1	2	3	4
Water quality sampling	10	Monthly	✓	✓	✓*	✓*	✓*	✓*
Water quality monitoring (data loggers)	3	Continuous		✓	✓*			
Water quality monitoring (ECoW)	as required	As required		✓				
Water quality (operational phase)	As required	Quarterly			✓*	✓*	✓*	✓*
Electrofishing	10	Annual	✓	✓	✓*	✓*	✓*	✓*
Fish Habitat	10	Annual	✓	✓	✓*	✓*	✓*	✓*
Aquatic Macroinvertebrates	10	Annual	✓	✓	✓*	✓*	✓*	✓*

* The scope, duration and frequency of post-construction monitoring will be agreed in consultation with SEPA and the Deveron District Salmon Fishery Board / The Deveron, Bogie and Isla Rivers Charitable Trust

Table B5-16
Proposed Fish, Aquatic Macroinvertebrate and Water Quality Sampling Surveys

Site Code	Easting	Northing	Catchment
P 2	347600	834700	Priest's Water
Lg 0	344000	832950	Lag Burn
Lg 1	345200	832800	Lag Burn
Lg10	348400	834200	Lag Burn
P 8	349409	834328	Lag Burn
B 1	348800	824500	Water of Bogie, location to be moved upstream, TBC by DBIRCT
K 28	348976	831863	Kirkney Water
Ea 6	345022	830611	Ealaiche Burn
TBC	tbc	tbc	New site on Corrylair Burn to monitor potential effects from the proposed borrow pit. Location TBC by DBIRCT
TBC	c. 349582	c.827507	Control site on Burn of Easaiche, just downstream of Rhynie, location TBC by DBIRCT

51. Environmental monitoring and surveillance would pay particular attention to the watercourses within the Bogie and Deveron catchment during all phases of the development. Routine inspections would be undertaken by full-time ECoW particularly for works in the vicinity of watercourses. This would allow mitigation measures to be applied in a flexible and pro-active manner as dictated by Site conditions. Monitoring and sampling of the water quality, fish populations and macroinvertebrate community would form part of the adopted environmental surveillance strategy.

52. Prior to any potential development of the borrow pit search areas and substation, areas that are upgradient of the Corrylair and Wester Tillathrowie private water supply, a programme of baseline water monitoring would be completed (to be detailed within the final CEMP), to confirm baseline water quantities and quality. These data would be used to assess the suitability of the water source and provide a monitoring record against which the monitoring data collected during construction and operation of the wind farm could be assessed. The CEMP would also specify trigger levels and provide an action plan should a variance of water be recorded compared to baseline conditions.

53. Post-construction monitoring would be continued for a period of four years. This would include monitoring the abundance of juvenile salmonids and other fish species in the rivers draining the application area. These data will build on existing survey results and the proposed pre-works baseline surveys and allow the success of mitigation and any habitat enhancement measures to be gauged. Given their experience in this area, it is recommended that DBIRCT is commissioned to undertake this survey work. Results of the surveys may also need to be supplied to the Fishery Research Service and Scottish Government depending on conditions applied if planning is approved.

54. Benthic invertebrate monitoring would also be undertaken with an annual sampling at the 10 agreed monitoring sites prior to, during and following the construction phase of the works (i.e. up to 4 years post-construction). Results of the surveys may also need to be supplied to the River Deveron District Salmon Fisheries Board, DBIRCT, SEPA and Scottish Government depending on conditions applied if planning is approved.

5.6 Further Information

55. Construction activities will follow relevant guidance such as SEPA/NetRegs Guidance for Pollution Prevention (GPP and PPG) and the Forest and Waters Guidelines (2003). Those of relevance for protection of the watercourses from construction works are:

- PPG1: Understanding Your Environmental Responsibilities – Good Environmental Practice;
- GPP2: Above ground oil storage tanks;
- PPG3: Use and design of oil separators in surface water drainage systems;
- PPG4: Disposal of sewage where no mains drainage is available;
- GPP5: Works or maintenance in or near Water;
- PPG6: Work at Construction and Demolition Sites;
- PPG18: Managing fire water and major spillages;
- GPP21: Pollution incident response planning;
- PPG22: Incident response - Dealing with spills;
- PPG26: Safe Storage – Drums and Intermediate Bulk Containers;
- CIRIA C691: Working with Wildlife : Guidance for the Construction Industry; and

- CIRIA C715 : Environmental Good Practice on Site.
- Other documents that have been considered in the development of the mitigation measures are:
- Forestry Commission (2011) Forests and Water. UK Forestry Standard Guidelines. Forestry Commission, Edinburgh.
- Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors. CIRIA Report C532D; and
- SuDS Manual - CIRIA Report C753.

56. Industry best practice at the time of construction would be identified and followed.

5.7 Summary and Conclusions

57. The construction of the Clashindarroch II Wind Farm should be undertaken with due regard to the measures outlined in this OBN and other supporting documentation thus minimising impacts on aquatic fauna and fish populations.

6.0 HYDROLOGY, HYDROGEOLOGY AND GEOLOGY

6.1 Background and Context

58. An impact assessment has been undertaken for the Clashindarroch II Wind Farm looking at the development's potential effects on the hydrology, hydrogeology and geology of the area within which the wind farm is proposed.

6.2 Legal Framework

59. The Water Environment and Water Services (Scotland) Act 2003, implemented by:

- The Water Environment (Controlled Activities) (Scotland) Regulations 2005. (The CAR regulations). It is an offence to undertake the following activities without a CAR authorisation:
- discharges to all wetlands, surface waters and groundwaters;
- disposal to land;
- abstractions from all wetlands, surface waters and groundwaters;
- impoundments (dams and weirs) of rivers, lochs, wetlands and transitional waters; and
- engineering works in inland waters and wetlands.

6.3 Mandatory Actions

6.3.1 Obligations from the Environmental Statement (EIA Report)

60. Commitments and obligations made in Chapter 11: Hydrology, Hydrogeology and Geology of the EIA Report that are relevant to hydrological and hydrogeological aspects are noted in Chapter 18 of the EIA Report.

6.3.2 Compliance with Outline Construction Method Statement (OCMS)

61. Compliance with the principles set out in the OCMSs presented in Annex 3.1.1 of this CEMP including;

- OCMS 01 Road and Wind Turbine Construction (details dewatering and discharge management);
- OCMS 08 Watercourse Crossing Management; and
- OCMS 04 Borrow Pits (details drainage and discharge management).

6.4 Monitoring/Survey Requirements

62. A programme of surface water monitoring would be carried out during the Site's construction, operation and decommissioning, which would include water quality, fish population and macroinvertebrate community. Such a surface water monitoring programme would be site-specific and tailored so as to provide a meaningful and pragmatic indication of the state of the water environment as described in Chapter 11 Hydrology, Hydrogeology and Geology. Given the nature of the development, it is considered that the surface water monitoring programme would comprise, *inter alia*:

- regular visual inspection of surface water management features, such as culverts and receiving

watercourses, in order to establish whether there is increased erosion or deposition of sediment;

- regular visual inspection of watercourses during construction and decommissioning stages, particularly during periods of high rainfall, in order to establish that levels of suspended solids have not been increased by site activities;
- periodic, as and when required, sampling of surface waters in order to complement the programme of visual inspection; and
- regular monitoring of the acidity index of each water course, fish populations and substrate conditions.

63. Monitoring stations would be located as noted in Chapter 9: Ecology and Chapter 11: Hydrology, Hydrogeology and Geology to suit the requirements for monitoring of aquatic fauna and water quality.

64. The proposed surface water monitoring programme would form part of the CMS, which would be submitted to the appropriate planning authorities and bodies such as SEPA prior to construction and development.

65. A comprehensive baseline monitoring programme would also be undertaken prior to construction works commencing.

6.5 Further Information

66. Follow relevant guidance such as SEPA/NetRegs Guidance for Pollution Prevention (GPP and PPG) and the Forest and Waters Guidelines (2003). Those of relevance for protection of the watercourses from construction works are:

- PPG1: Understanding Your Environmental Responsibilities – Good Environmental Practice;
- GPP2: Above ground oil storage tanks;
- PPG3: Use and design of oil separators in surface water drainage systems;
- PPG4: Disposal of sewage where no mains drainage is available;
- GPP5: Works or maintenance in or near water;
- PPG6: Work at construction and demolition sites;
- PPG18: Managing fire water and major spillages;
- GPP21: Pollution incident response planning;
- PPG22: Incident response - Dealing with spills;
- CIRIA C691: Working with Wildlife : Guidance for the Construction Industry; and
- CIRIA C715: Environmental Good Practice on Site.

67. Other documents that have been considered in the development of the mitigation measures are:

- Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors. CIRIA Report C532D; and
- SuDS Manual - CIRIA Report C753;

68. Industry best practice at the time of construction would be identified and followed.

6.6 Summary and Conclusions

69. This outline briefing note (OBN) would be further developed with the project's hydrologist. However supporting documentation such as the OCMS would ensure compliance.

7.0 POLLUTION PREVENTION

7.1 Background and Context

70. Potential sources of pollution during the construction of the Clashindarroch II Wind Farm include the following:

- silt;
- fuels, oils and chemicals;
- concrete and concrete constituents;
- sewage, grey water discharges and effluents from chemical toilets;
- glacial blue clays;
- noise; and
- dust.

7.2 Legal Framework

71. The following legislation has been identified as currently relevant to pollution prevention. This list is not exhaustive and it would be the responsibility of the Principal Contractor to identify all the relevant legislation and regulations at the time of construction.

- The Control of Pollution (Oil Storage) (Scotland) Regulations 2005;
- The Water Environment (Controlled Activities) (Scotland) Regulations 2005. (The CAR regulations). It is an offence to undertake the following activities without a CAR authorisation:
- discharges to all wetlands, surface waters and groundwaters;
- disposal to land;
- abstractions from all wetlands, surface waters and groundwaters;
- impoundments (dams and weirs) of rivers, lochs, wetlands and transitional waters; or
- engineering works in inland waters and wetlands.
- Pollution Prevention and Control (Scotland) Regulations 2000; and
- Quarries Regulations 1999.

7.3 Mandatory Actions

7.3.1 Obligations from the EIA Report

72. Commitments and obligations made in the EIA Report that are relevant to pollution prevention are noted in Chapter 18 of the EIA Report. However, pollution prevention measures are integrated into all relevant aspects throughout the EIA Report and the OCMSs presented in Annex 3.1.1.

7.3.2 Compliance with Regulatory Guidance

73. Compliance will be required with the following guidance (or similar if superseded by the commencement of construction):

- SEPA/NetRegs Guidance for Pollution Prevention (GPP and PPG):
- PPG1: Understanding Your Environmental Responsibilities – Good Environmental Practice;
- GPP2: Above ground oil storage tanks;
- PPG3: Use and design of oil separators in surface water drainage systems;
- GPP4 : Treatment and disposal of sewage where there is no connection to the public foul sewer;
- GPP5: Works or maintenance in or near Water;
- PPG6: Work at Construction and Demolition Sites;
- PPG7: Safe Storage – The safe storage of refuelling facilities;
- GPP8: Safe storage and disposal of used oils;
- GPP21: Pollution incident response planning; and
- GPP26: Safe Storage – Drums and Intermediate Bulk Containers.
- SEPA Guidance and Regulatory Methods:
- Supporting Guidance (WAT-SG-12) - General Binding Rules for Surface Water Drainage Systems; and
- Regulatory Method (WAT-RM-08) - Sustainable Urban Drainage Systems (SUDS or SUD Systems).
- CIRIA Guidance:
- CIRIA C528: Environmental handbooks for building and civil engineering projects – Part 2 Construction;
- CIRIA C532D: Control of Water Pollution from construction sites – Guidance for consultants and construction;
- CIRIA C648: Control of Water Pollution from Linear Construction Projects – Technical Guidance;
- CIRIA C649: Control of Water Pollution from Linear Construction Projects – Site Guide;
- CIRIA C715: Environmental Good Practice on Site;
- CIRIA C753: SuDS Manual;
- CIRIA: Septic tank systems: A users guide;
- The control of pollution (Oil Storage) (Scotland) Regulations 2003;
- Drainage Impact Assessment – Guidance for developers and Regulators (DP 300 3/02); and
- Control of Dust from Construction Activities – Kukadia et al. BRE/DTI (2003).

74. The Principal Contractor would identify and comply with all current regulator guidance at the time of construction.

7.4 Best Practice

7.4.1 Compliance with Outline Construction Method Statements (OCMS)

75. Compliance with the principles set out in the OCMSs in Annex 3.1.1 of this draft CEMP.

Table B7-17
Pollution Prevention Compliance Table

No.	Aspect	Obligation
1	Silt	OCMS 01: Road and Wind Turbine Construction; OCMS 04: Borrow Pits.
2	Fuels, oils and chemicals	OCMS 01: Road and Wind Turbine Construction; OCMS 04: Borrow Pits.
3	Concrete and concrete constituents	OCMS 01: Road and Wind Turbine Construction
4	Sewage, grey water discharges and effluents from chemical toilets	OCMS 06: Temporary Compounds.
5	Noise	OCMS 04: Borrow Pits.
6	Dust	OCMS 01: Road and Wind Turbine Construction; OCMS 04: Borrow Pits.

7.4.2 Oil / Fuel Storage and Refuelling

76. All oil and chemical storage would be built on an impervious base and suitably bunded. The design and the operation of such storage would comply with SEPA/NetRegs guidelines (e.g. GPP 2) and guidance such as CIRIA R163D – "Construction of Bunds for Oil Storage Tanks" together with the Water Environment (Oil Storage) (Scotland) Regulations 2006. Bunding would be impervious and of suitable size. Valves and trigger guns would be secured and locked when not in use to prevent vandalism and un-authorised use.

77. All refuelling would be carried out in accordance to strict procedures designed to eliminate spillage. These procedures would be produced prior to construction commencing for approval by the relevant authorities.

78. It is anticipated that refuelling of most plants would, where possible, be carried out at temporary compounds. However it is expected that some plants, for instance cranes would be refuelled at locations such at hardstandings. All refuelling away from temporary compounds and at temporary compounds would be carried out using trained dedicated personnel and following a suitable risk assessment.

79. Equipment would be well maintained and checked regularly for leaks. All maintenance activities would be subject to a detailed plan and carried out at an approved designated location.

80. Spill kits would be widely available (for instance in every vehicle) and staff made aware of the incident response procedures.

81. Drip trays would be made readily available at machine storage and maintenance locations in case they are required.

7.4.3 Pollution Incident Response Plan

82. A pollution Incident Response Plan would be developed in conjunction with, for example, SEPA and the local authorities. The plan would include:

- a cover page with the company name, date of plan and list of recipients;
- contact list including:
- emergency service numbers;
- environmental regulators;
- local water supplier (Scottish Water);
- HSE; and
- specialist clean-up contractors or specially trained teams located in proximity.
- site drainage plan – showing locations of buildings ditches drains etc., as well as identified locations suitable for pollution containment;
- inventory of site chemicals, waste etc;
- emergency procedures including:
- details of trained staff, their responsibilities and provision of 24- hour cover;
- containment measures;
- emergency discharge routes; and
- list of appropriate equipment and clean-up materials, their locations and requirements for maintenance or replacement.

83. In order to effectively implement an incident response plan, all staff and contractors need to be aware of the plan and their roles in the procedures. Training is required, and the emergency procedures would require regular testing and review.

7.5 Monitoring/Survey Requirements

84. The following parameters would be monitored:

- water quality;
- water flow (where abstraction takes place);
- dust; and
- noise.

7.5.1 Water Quality Monitoring

85. Water quality would be monitored prior, during and post construction. A water quality monitoring plan would be produced for approval prior to construction commencing. The results of ongoing monitoring would be reported to the environmental management committee and to SEPA.

7.5.2 Water Flow Monitoring

86. Water flow monitoring would take place in advance of any abstraction to enable an application to be made under the Controlled Activity Regulations for the abstraction. The water flow would then be monitored during the abstraction period to ensure compliance with any licence conditions.

7.5.3 Dust Monitoring

87. A dust monitoring plan would be produced for the Site.

7.5.4 Noise Monitoring

88. A construction noise monitoring plan would be produced for the Site.

7.6 Further Information

89. Industry best practice at the time of construction would be identified and followed. These have been cited above.

7.7 Summary and Conclusions

90. The Principal Contractor shall produce method statements for all activities onsite. These method statements shall detail procedures and methods to minimise the risk of pollution.

91. In addition a Pollution Incident Response Plan would be produced and contingency plans produced and tested.

92. To ensure the effectiveness of the pollution prevention measures a monitoring plan would be implemented.

93. The contractor would comply with all planning conditions, would review and obtain all licences and permits required and ensure that all procedures onsite follow industry best practice.

8.0 TRANSPORT AND TRAFFIC

8.1 Background and Context

94. The Highways, Traffic and Transport assessment was carried out in line with relevant planning policy and guidance and looked at access routes to and from the Site, existing traffic flows on local roads and the volume of traffic that would be generated by the proposal.

95. There would be an increase in the flow of heavy goods vehicle (HGV) traffic during the construction phase of the development. Overall the total increase in traffic as a result of the wind farm would be not significant. Construction traffic would be managed carefully, especially in relation to the timing and use of designated routes. The increase in traffic during the operational lifetime of the wind farm is not considered to be significant.

8.2 Legal Framework

96. The Principal Contractor is required to identify and comply all relevant legislation relating to traffic and transport.

8.3 Mandatory Actions

8.3.1 Obligations from the Environmental Statement (EIA Report)

97. Commitments and obligations made in Chapter 13: Traffic of the EIA Report that are relevant to traffic and transportation are noted in Chapter 18 of the EIA Report.

8.4 Best Practice

98. The following considerations would be made by the contractor, which would form part of a Construction Traffic Management Plan.

99. To minimise disruption to local residents and businesses:

- working hours;
- speed limits – especially on floating roads;
- traffic frequency and timing; and
- safety;
- vehicle washes at Site exits; and
- cleaning of roads regularly subject to local authority or highway agency requirement.

100. To minimise environmental impact, pollution would be controlled by:

- planning routes away from sensitive areas;
- strictly controlling refuelling and maintenance; and
- sheeting vehicles before travelling.

101. To maximise safety both to residents and onsite:

- site entrances would be designed to accommodate vehicles turning in and out safely without impacting on the highway.
- warning signs would be installed around site entrances warning of vehicles turning, and transport routes would be signed to ensure vehicles use designated routes.

8.5 Traffic Management System

102. A traffic management system (TMS) would be set up by the Principal Contactor well before work commenced on the Site, in conjunction with Vattenfall, local authorities, the Highways Agency and the police.

103. The purpose of the TMS is to ensure the safety of the public and the workforce and to manage traffic on the Site efficiently.

104. The main components of the TMS would be:

- a clear statement of purpose – to ensure the safety of the public and workforce and to manage traffic on site efficiently;
- procedures and practices to deliver these;
- organisation of where and when vehicles move;
- control would know where all vehicles are and control their movement;
- agreed transport routes on public roads would be followed by all Site associated traffic;
- minimise where practical the use of public roads at busy times (rush hours and school start finish times) to be minimised;
- management of parking and storage of trailers;
- use of traffic lights would be assessed at times on public roads for safety. If they are used, traffic queues would be monitored and the sequences adjusted to reduce congestion;
- abnormal load movements to be publicised well in advance and escorted by the police;
- signage arrangements; and
- large loads would pull in at designated points on the route to let any build-up of traffic pass.

8.6 Relevant Guidance and References

- CIRIA C528: Environmental handbooks for building and civil engineering projects – Part 2 Construction;
- CIRIA C532D: Control of Water Pollution from construction sites – Guidance for consultants and construction;
- CIRIA C648: Control of Water Pollution from Linear Construction Projects – Technical Guidance;
- CIRIA C649: Control of Water Pollution from Linear Construction Projects – Site Guide;
- CIRIA C715: Environmental Good Practice on Site;
- CIRIA C753: SuDS Manual;
- PPG1: Understanding Your Environmental Responsibilities – Good Environmental Practice;

- GPP 21: Pollution incident response planning;
- Control of Dust from Construction Activities – Kukadia et al. BRE/DTI (2003); and
- The Control of Pollution (Oil Storage) (Scotland) Regulations 2003.

ANNEXE 3.1.3
EMERGENCY/POLLUTION INCIDENT RESPONSE PLAN

1.0 Policy

1. The wind farm has been designed to eliminate or minimise environmental problems during construction. However there is the possibility however remote that a severe event occurs which overwhelms the control measures, the design or control measures are inadequate or the control measures are not correctly implemented or sabotaged and as a result a pollution incident occurs. If a risk assessment indicates that sensitive receptors could be adversely affected by a particular event, then a contingency plan is required. The company would design and implement the site-specific Pollution Incident Response Plan in order to prevent and mitigate any damage to the environment caused by accidents such as spillages and fires. Such a Plan would be agreed with SEPA.

2. The contents of such a plan are outlined in Sections 1.1 to 1.4 below. The components for implementing the plan are described in Sections 1.5 to 1.10.

1.1 Plan

3. The Plan aims to identify environmentally hazardous activities and events and then assess the potential impacts on sensitive receptors in and around the Site.

4. The Pollution Incident Response Plan is likely to include the following information:

- a Site Drainage Plan showing site layout and a schematic representation of the Site drainage arrangements. This could include, inter alia: all the watercourses, discharge points and suitable points for installing pollution control booms;
- facilities used for the storage of fuel, oils and wastes (together with information relating to the areas that are bunded and the products stored);
- any potentially sensitive areas;
- facilities such as inspection points for the detection of contamination and oil interceptors; and
- a Site chemical, product and waste inventory recording all substances stored onsite as well as how and where they are stored.

1.2 Objectives

5. Establish clearly what the Emergency Response Plan has to achieve including a time table for action. The primary aim is to minimise the impact of any event by providing a timely, efficient response.

1.3 Organisation

6. Establish how the emergency response team would be organised for the Site including the management, the integration with the project management team and relevant external agencies during incidents and in reviewing the plan.

7. The Pollution Incident Response Plan is likely to include a contact list for emergency services, relevant environmental regulators, the Health and Safety Executive (HSE) and specialist clean-up contractors. Such a list should also identify key holders and staff to be contacted in the event of an incident.

1.4 Procedures

8. Establish the procedures to address the issues raised in the risk assessments in line with the objectives. These would be in line with the NetRegs Guidance for Pollution Control as advised by the Scottish Environmental Protection Agency (SEPA) (GPP and PPG).

9. The Pollution Incident Response Plan is likely to include Emergency Procedures setting out the activities covered, staff responsibilities and procedures for dealing with events such as spillage. More specifically, these could include the following actions where appropriate:

- appropriate procedures for the alerting of nearby properties etc;
- the potential consequences of an incident; and
- procedures for containing, preventing and recovery of leaks, spills or general contamination. This would include the location and use of sand and sand bags, spill kits containing proprietary absorbents, booms and other pollution control equipment. In addition contact details for clean-up companies would also be listed.

1.5 Resources

10. Establish the resources that would be required to implement the procedures. These would include:

- the personnel with appropriate skills (engineer in charge, civil engineer, ecologist, digger drivers, HGV drivers, traffic manager) from the onsite workforce;
- the time required for training;
- the plant and machinery again as far as possible from that onsite;
- the necessary Site documentation required and the processes required to ensure it is always up to date
- a communication system to alert the team and coordinate the response;
- the materials such spill kits, road stone, straw bales, pipe-work and matting, which would be separately stored so as to be available at all times; and
- prepared reception areas for temporary storage of any effluent.

1.6 Training

11. Train the actual team in their roles for each procedure.

1.7 Communication

12. This plan is part of the EMS and would be fully integrated into the overall project management of the construction.

13. Inform the relevant external agencies.

14. Include in the Site induction for all personnel, when and how to alert the emergency response team and what they should do in order that they do not to impede the emergency response team was it is called.

1.8 Testing

15. Regular testing of the response of the team would be carried out and recorded.

1.9 Auditing

16. The auditing of this plan and associated procedures would be audited as part of the overall EMS.

1.10 Review

17. Procedures would be regularly reviewed and updated as the work onsite changes. These reviews would be documented and reported to management with recommendations, if appropriate.

1.11 Guidance for Pollution Prevention - edited to produce relevant extracts

1.11.1 PPG1

"The best way for you to cope when problems and emergencies arise is to plan. Well managed premises are less likely to have problems in the first place.

We recommend that you create and implement an incident response plan. You may even have a legal responsibility to make a plan. It should include procedures to deal with problems and emergencies and a copy of your drainage plan. You should ensure everyone on your premises - including visitors- understand what they need to do. Keep a copy of your plan off site too, so you can always access it.

Check whether your premises are at risk from flooding – if you are, make a flood plan and sign up for flood warnings. Consider asking your local Fire & Rescue Service to visit and offer you advice on fire prevention and safety. They can help you to prepare a fire response plan for your premises.

Make time to regularly train people on correct procedures and responding to incidents. Review and update your procedures to keep them relevant. Do this each time you make changes to your premises.

You should provide protective clothing and pollution control equipment which is appropriate to your premises and the potential risks on your site. Make sure you keep this equipment in good condition, replaced when necessary and that people know where it is and how to use it."

1.11.2 PPG7

Environmental Management Systems

"You should use the results of your risk assessment to develop an environment management system (EMS) for your site; more details are on the Environment Agency's web site for England and Wales. This should detail the correct management and operational control procedures for your site which will greatly reduce the risk your site poses. As a minimum, the EMS produced for your site should include:

- *operational control procedures;*
- *training provision and records;*
- *on site hazards and risks;*
- *risk management and procedures;*
- *emergency response;*
- *control of contractors;*

- *maintenance regimes and records;*
- *leak detection and environmental monitoring;*
- *appropriate emergency plans."*

Incident Response

"Preparing how you'll respond to an environmental incident can significantly reduce its impact on the environment or even prevent it causing pollution. This section tells you how you can plan to respond to incidents.

To respond effectively to an environmental incident, we recommend you produce an incident response plan. There is guidance and a template to help you in our guidance in references 18, 25 and 27.

Train your staff to deal with an environmental incident – this may be a legal requirement. Keep a record of all their training. Training should include a background to environmental sensitivities around the site and a formal emergency procedure that details actions to be taken in the event of:

- *spills*
- *fires*
- *collision with storage or dispensing equipment*
- *odours being detected off-site*
- *suspected leaks.*

The following checklist outlines the main points we recommend you follow to implement your plan.

Procedures checklist

Clearly define when the plan should be activated. This will depend on the nature of your site and the type of the incident.

Make sure all relevant staff know how and when to contact other emergency responders; emergency services, us, local authority, sewage treatment providers and other organisations identified in your emergency plan.

Consider the impact that an incident on your site could have on the environment outside your boundary: nearby properties, surface waters, groundwater, downstream abstractors, agricultural land or environmentally sensitive sites. Once identified, agree contact procedures with them if possible.

Put in place staff evacuation procedures – your local authority emergency planning department will help you with these.

Identify any special methods you need to deal with substances that pose particular health or environmental risks.

Develop a fire fighting strategy with your local fire and rescue service; if a controlled burn is an agreed option, state this clearly. The same applies to the use of foam.

Train staff to use spill kits, drain blockers and other pollution control equipment and how to operate pollution control devices.

Identify procedures for recovering spilled product and the safe handling and legal disposal of any waste associated with the incident.

We recommend that you train appropriate staff to deal with media enquiries."

1.11.3 GPP21

18. The whole of this GPP should be used to guide the development of the final Emergency/Pollution Response Plan.

1.12 Incident Response Plan

Contact list

19. This should list contact numbers for:

- emergency services;
- relevant environmental regulators;
- local water supplier and sewer provider;
- Health and Safety Executive (HSE); and
- specialist clean-up contractors.

20. The list should also identify key holders and staff to be contacted in the event of a significant incident (including their home and mobile numbers). Contact numbers for sources of specialist advice such as chemical suppliers and manufacturers whose products are held onsite should also be given.

1.13 Site Drainage Plan

21. This should be a clear diagram of the Site showing layout and access details, along with a schematic representation of the site drainage arrangements.

22. Show any watercourse, spring, borehole or well located within or near the site;

23. Indicate the direction of flow (or depth for boreholes and wells), surface water outfalls from the site and suitable points for installing pollution control booms or a dam; and

24. If possible, install permanent boom anchor points at a suitable location, taking into account possible flow conditions.

25. A site drainage plan should show/identify the following:

- General layout of buildings;
- Site access routes for emergency services (marked clearly);
- Areas or facilities used for storage of raw materials, products and wastes (include details of tank sizes);
- Any bunded areas together with details of products stored and estimated retention capacity;
- Any potentially sensitive areas of porous or unmade ground;
- Location, depth and construction details of any soakaways receiving surface water discharges;
- Location of hydrants, ‘fireboxes’ (see Section 5) and pollution prevention materials (e.g. spill kits);
- Facilities such as:
  - inspection points for the detection of pollution;
  - oil separators;
  - containment tanks and pollution control devices (e.g. shut-off valves in drains); and
  - sites suitable for portable storage tanks or for blocking drains;

26. Provide a brief description of how they operate and ensure such facilities are clearly labelled aboveground.

27. In many cases, additional plans will be required to provide detailed information.

28. These should be attached to the plan and referenced within it.

1.14 Site Chemical, Product and Waste Inventory

29. The inventory should provide an up-to-date record of all substances stored onsite, together with an indication of the maximum quantity likely to be stored. Product data sheets and Control of Substances Hazardous to Health (COSHH) assessments should be attached for any substances posing a risk to health or the environment. All stores, bulk storage vessels, drums or containers used for storing oils, chemicals or other potentially polluting materials (e.g. milk or other foodstuff) should be marked on the Site plan. If oils or chemicals are regularly stored or held away from fixed installations or storage areas in any significant quantity (e.g. in production areas), indicate their whereabouts on the Site plan. If there are a number of chemical process lines, it is recommended that an annotated sketch plan of each is included.

1.15 Emergency Procedures

30. Detailed emergency procedures should be produced. These procedures should define:

- the scope of activities covered;
- staff responsibilities; and
- procedures for dealing with events such as spillages and leaking containers.

31. The level of response will depend on health and safety issues, staff training, the level of personal protective equipment (PPE) available, the nature of any spilled materials and the types of pollution control equipment available on the Site. The appropriate level of response will, therefore, be site-specific. It is important to consider what could happen in the worst case and to take this into account when developing procedures. A checklist of actions can be useful and should typically address the following issues:

- Firefighting strategy. This should be discussed with the fire service. If 'controlled burn' is an agreed option, this should be clearly stated (see PPG 18 – Managing Fire Water and Major Spillages for details);
- Alerting nearby properties, downstream abstractors or environmentally sensitive sites that could be affected by an incident. The consequences of an incident at nearby properties;
- Procedures for alerting staff onsite and, where appropriate, adjacent sites. This should include evacuation procedures;
- Contacting the emergency services, relevant Agency, local authority and other organisations, and dealing with the media;
- Substances posing particular risks (these should be highlighted in the emergency plan);
- The selection of the appropriate level of PPE;
- The means of making leaking containers safe;
- Procedures for containing leaks, spills and fire-fighting run-off and for the protection of any

onsite effluent treatment plant. The location and use of spill kits, drain blockers and other pollution control equipment and the operation of pollution control devices should be clearly documented. Stocks of pollution control equipment and materials held locally by other organisations should be identified and contact details for clean-up companies should be kept up-to-date;

- Procedures for the recovery of spilled product and the safe handling and legal disposal of any wastes arising from the incident. PPG18 contains some useful relevant information; and
- Procedures should Site workers encountered active nest sites either during construction or maintenance procedures.

1.16 Training

32. The effectiveness of any Site incident response plan will depend on staff training. All staff and contractors working onsite should be made aware of the plan and should know their role if an incident occurs. Exercises should be carried out periodically to familiarise staff with the operation of the plan and to test its effectiveness. Records of staff training should be maintained.

33. Training should include:

- awareness of the potential for harm to both personnel and the environment from the materials held onsite;
- awareness of the sensitivity of the environment surrounding the facility;
- use of the correct PPE;
- reporting to the relevant Agency if there is a risk of surface, groundwater or land contamination;
- reporting to the local sewer provider if a discharge to the foul or combined sewer is involved;
- clean-up, safe handling and legal disposal of contaminated materials and wastes resulting from an incident (including arrangements for the use of specialist contractors and services);
- the appropriate decontamination or legal disposal of contaminated PPE.
- clean-up, safe handling and legal disposal of contaminated materials and wastes resulting from an incident (including arrangements for the use of specialist contractors and services); and
- the appropriate decontamination or legal disposal of contaminated PPE.

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